ISSF INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION

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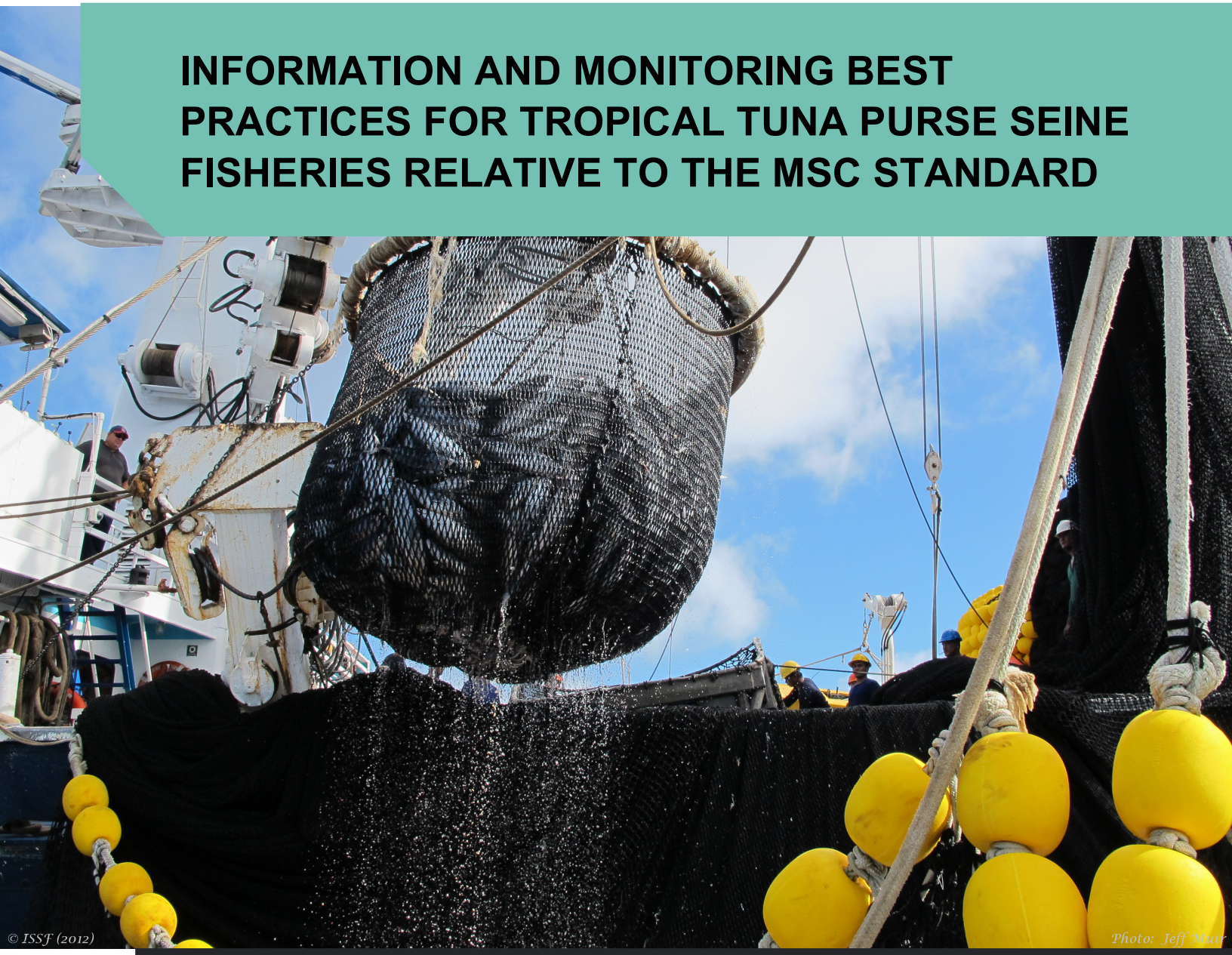
INFORMATION AND MONITORING BEST PRACTICES FOR TROPICAL TUNA PURSE SEINE FISHERIES RELATIVE TO THE MSC STANDARD



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Topic Categories: MSC, Purse seine, FADs, FIPs

Abstract

The objective of this paper is to describe best practices in collecting fisheries information to monitor fishing activities relative to Marine Stewardship Council (MSC) scoring indicators. Best-practice monitoring activities are described for each MSC Performance Indicator (PI) based on data needs to ensure effective and enforceable sustainable fishery management as well as to identify data monitoring systems, sources, and technology that can be used to collect this information.

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1.INTRODUCTION

The Marine Stewardship Council (MSC) Fishery Standard consists of three Principles: Sustainable Fish Stocks (P1), Minimizing Environmental Impact (P2), and Effective Fishery Management (P3). The MSC Fishery Standard evaluates and reviews information, evidence, and monitoring requirements and needs that inform and support sustainable fisheries management. It also provides an opportunity to develop a global view of best practices in information and monitoring requirements across a range of fishery types, management situations, and regions.

Many tuna fisheries seek MSC certification or participation in Fishery Improvement Projects (FIPs) that will better position them to achieve MSC certification. This includes tropical tuna purse-seine fisheries that make sets on drifting floating objects (referred to as "FADs" in this document), dolphin sets, and free-swimming schools of tuna as well as longline and pole-and-line tuna fisheries.

Our objective in this paper is to identify best practices in collecting fisheries information to monitor purse-seine fishery activities in relation to MSC Performance Indicators (PIs) under the three Principles, with an emphasis on FADs. However, many of these best practices could also apply to longline, pole-and-line, and other tuna fisheries. The best practices for each MSC Performance Indicator are described considering the data needs to ensure that the requirement of a particular PI is being effectively implemented and can be verified. Moreover, data sources and technology (when possible) to collect this information are identified.

The best practices focus on two main topics:

1. Fishery information (e.g., trends in bycatch, trends in stock status, etc.) needed to score each MSC Performance Indicator
2. Best practice for fishery monitoring systems, tools, and approaches to generate and verify this information (e.g., 100% observer coverage with 20% review of information to estimate discard levels, etc.)

Most best practices are actions that the fleets could implement in the water; however, as monitoring best practices are also focused on improving stock assessment and management framework under P1 and P3, other best practices cannot be solely implemented by the fleet. In those cases, the fleet can support, and advocate for, the implementation of those best practices by the relevant national or regional agencies.

The current document identifies *monitoring* best practices for monitoring and verifying the implementation of fishing best practices, such as the use of non-entangling FADs. Other ISSF Technical Reports, listed below, contain present additional fishing best practices that purse-seine and longline fisheries can implement on the water to achieve an unconditional passing score (i.e., SG80) on each MSC PI.

- Restrepo, V., H. Koehler, G. Moreno and H. Murua (2019). Recommended Best Practices for FAD management in Tropical Tuna Purse Seine Fisheries. ISSF Technical Report 2019-11. International Seafood Sustainability Foundation, Washington, D.C., USA.
- Restrepo, V. J.P. Monteagudo, A. Justel-Rubio, and H. Murua. (2020). Recommended best practices for tuna longline fisheries in transition to MSC certification (Version 2). ISSF Technical Report 2020-10. International Seafood Sustainability Foundation, Washington, D.C., USA.
- Restrepo, V., A. Justel-Rubio, J.P. Monteagudo, G. Moreno and H. Murua. (2020). Recommended best practices for tropical tuna purse seine fisheries in transition to MSC certification, with emphasis on FADs (Version 2). ISSF Technical Report 2020-11. International Seafood Sustainability Foundation, Washington, D.C., USA.

2. METHODOLOGY

This report uses MSC Fisheries Certification Requirements and Guidance (version 2.01), which outlines requirements for fisheries to be scored at various levels. For each MSC Principle, there is a set of Performance Indicators (PIs) that cover different aspects of the Principle. In turn, for each PI, there are one or more Scoring Issues (SIs).

A score of 80 or higher is required for a fishery to "pass" an individual PI without conditions. This document uses the description of SG80 (Scoring Guidance for a score of 80) for the various SIs in the default assessment tree to (1) provide best practices for fishing activity to obtain SG80 score, and then (2) identify the associated data and information best practice to monitor and verify that a particular fishing activity is implemented on the water.

Appendix 1 lists all of the PIs and their SIs and identifies actions expected to lead to scores of 80 or higher as well as the associated data and monitoring needed to achieve best practices for sustainable fishery management. The recommendations below are reasonably implementable best practices as we authors understand them based on our knowledge of the fishery, the MSC system, Regional Fisheries Management Organizations (RFMOs), and interviews with skippers. By no means is this list intended to be exhaustive or exclusive. These are simply recommended actions that the authors believe can lead to better MSC assessment scores.

Since the same monitoring best practice can address several MSC PIs, summary tables identifying a group of best practices for monitoring systems and technologies for those PIs are presented in **Section 3.** These summary tables identify best practices for monitoring purse-seine fisheries. Each group includes available fishery monitoring systems to earn MSC passing scores in Principles 1, 2 and 3. All data needs and monitoring best practices for each PI are detailed in **Appendix 1**.

3. SUMMARY OF RECOMMENDED PRACTICES

NOTES ON UNIT OF ASSESSMENT AND PRIMARY SPECIES

Currently, the MSC system allows Clients and Assessment teams to decide which species are candidates for MSC certification. These constitute the "Unit of Assessment" (UoA). This process lets Clients seek certification for some of the targeted species by assessing them under P1 while excluding other targeted species from certification by assessing them under P2.

- **Primary** species are not under P1, but they have management tools and measures in place.
- **Secondary** species are not in P1; not Primary; and not Endangered, Threatened or Protected (ETP).
- **ETP** species are protected by national legislation and specific international agreements.
- In terms of volume, **Main** species are 5% or more of the total catch of all P1 and P2 species, and **Minor** species are <5%, unless they are considered "vulnerable" (e.g., based on the life history or stock status), in which case the cutoff between main and minor is reduced to 2%. There is no distinction between main and minor for ETP species. A species may also be considered main if the total catch is very large (despite being a low percentage — i.e., in very-high-volume fisheries) or at the discretion of the MSC assessment team.

In this report, we assume that tropical tuna purse-seine fisheries will want all target tropical tuna species (yellowfin, skipjack and bigeye) to be candidates for certification — i.e., to be assessed under P1. Therefore, none of these target species are treated as "Main Primary" species under P2.

- If bigeye, yellowfin and skipjack are in P1 (UoA), it is unlikely there will be any **main primary** species in the tropical tuna purse-seine fishery.
- **Minor primary species** include albacore tuna and swordfish, which are assessed and managed, and in some cases also bluefin tuna. In some RFMOs, minor primary species may also include some of the small tuna species, mahi-mahi (although they would typically be secondary), some shark species (although some sharks may be treated as ETP), and billfishes such as sailfish and marlins if they have stock assessment and management measures in place.
- No single species is likely to be classified as **Main secondary** because catches of any individual species will be <5% of the P1 catches.
- There are likely to be 40 or more **Minor secondary** species in the purse-seine fishery. These will include some sharks (those that are not treated as ETP), small tunas, other bony fishes, and billfishes.
- In the tropical tuna purse-seine fishery, **ETP** species will normally include turtles, rays, whale sharks and cetaceans (even if the interaction rates are low), and some shark species, which in some ocean regions may include silky and/or oceanic whitetip sharks.

Table 1 Summary table identifying a group of Monitoring Best Practices for purse seine fisheries addressing several PIs. Each group, which addresses main MSC Component and PI themes (e.g., Stock Status, Harvest Strategies, ETPs, etc.), includes available fishery monitoring systems to achieve MSC passing scores on Principles 1 and 2.

MSC Component/PI	Data Needs	Best Practice for Monitoring	Principle 1	Principle 2
STOCK STATUS	• Periodic stock assessment and stock status indicators • SSB/SSBmsy, Spawning Stock Biomass in relation to Limit Reference Points (LRPs), and F/Fmsy annual trends, including confidence intervals (or probabilities) • SSB/SSBmsy and F/Fmsy projections into the future • Annual trends of fishery impacts by gear to evaluate the impact on population status by each gear type (this will also help to evaluate the impact of each gear type and the cumulative impacts) • Stock recruitment relationships to set the point below which the recruitment is impaired, when Limit Reference Points are not established • Catch trend information by fleet • Stock structure information	• Nominal catch as well as catch and effort/size logsheet information to flag state/RFMO as per RFMO requirement • Voluntary reporting to RFMOs of additional operational data (e.g., set by set data information to inform CPUE and stock assessment) • 100% observer coverage, either human or electronic monitoring, for bycatch/discard estimation, with a minimum requirement of 20% of the trip/set analyzed to be increased on a risk assessment basis • Electronic reporting of all data above to flag state/RFMOs • Collection of biological information for stock assessment (growth, fecundity, maturity, etc.) • Tagging data, genetic, and/or otolith microchemistry (or any other method) research for stock structure delineation • Fishery independent surveys for abundance/biomass estimation • Estimation of CPUE as a proxy for abundance indicator	**PI 1.1.1(a)** **PI 1.1.1(b)** **PI 1.1.2(a)** **PI 1.1.2(b)** **PI 1.2.3(a)** **PI 1.2.3(b)** **PI 1.2.3(c)** **PI 1.2.4(a)** **PI 1.2.4(b)** **PI 1.2.4(c)** **PI 1.2.4(d)** **PI 1.2.4(e)**	**PI 2.1.1(a)** **PI 2.1.1(b)** **PI 2.1.3(a)**[1] **PI 2.1.3(b)** **PI 2.2.1(a)**[2] **PI 2.2.1(b)**[2] **PI 2.2.3(a)**[1] **PI 2.2.3(b)** **PI 2.2.3(c)** **PI 2.3.1(a)** **PI 2.3.1(b)** **PI 2.3.1(c)** **PI 2.3.3(a)**[1] **PI 2.3.3(b)**

[1] When stock status indicators are not available, Risk-Based Framework (RBF) is applied, but data needs and best practices for monitoring are the same.

[2] For main and minor secondary species, biomass, fishing mortality, and/or fishery indicator (e.g., CPUE) trends are needed since, in most cases, reference points are not available (otherwise they would be considered primary species).

MSC Component/PI	Data Needs	Best Practice for Monitoring	Principle 1	Principle 2
HARVEST STRAEGIES AND HARVEST CONTROL RULES	In addition to the data needs above: • Target and Limit Reference Points and a decision framework to guide management actions • Information on applied Harvest Strategy • Information on input and output management measures agreed upon by tuna RFMO • Tuna RFMO ability to implement necessary management measures to achieve objectives (this is reviewed under PI 3)	In addition to the monitoring best practices above: • Review[3] and evaluation of the effectiveness of tuna RFMO-adopted Harvest Strategy and Harvest Control Rule • Review and evaluation of the effectiveness of Tuna RFMO-adopted input, output and any other management measures • Review and evaluation of the effectiveness of Tuna RFMO-adopted mitigation measures such as spatio-temporal closures, gear modifications, and practices to minimize bycatch	**PI 1.2.1(a)** **PI 1.2.1(b)** **PI 1.2.1(c)** **PI 1.2.1(d)** **PI 1.2.1(f)** **PI 1.2.2(a)** **PI 1.2.2(b)** **PI 1.2.2(c)**	**PI 2.1.2(a)** **PI 2.1.2(b)** **PI 2.1.2(c)** **PI 2.1.2(e)** **PI 2.1.3 (c)** **PI 2.2.2 (a)** **PI 2.2.2 (b)** **PI 2.2.2 (c)** **PI 2.2.2 (e)** **PI 2.3.3(c)** **PI 2.3.2(a)** **PI 2.3.2(b)** **PI 2.3.2(c)** **PI 2.3.2(d)** **PI 2.3.2(e)**

[3] Review and evaluation of the HS and HCR using information and monitoring best practices to monitor stock status (upper row in the table).

MSC Component/PI	Data Needs	Best Practice for Monitoring	Principle 1	Principle 2
SHARK FINNING AND ETP SPECIES	• Nominal catch and bycatch (including discards) data • Evidence of shark-finning occurrence/non-occurrence (e.g.. shark carcass/fins — and/or other parts — catch data to verify that shark finning is not occurring)	• Logbook and/or e-logbook (100% coverage) • 100% observer coverage, either human or electronic monitoring, for discard estimation, with a minimum requirement of 20% of the trip/set analyzed to increase on a risk-assessment basis • To monitor the use of non-entangling FADs, FAD logbooks with information on FAD type structure and materials, observer or EM, and lifting the FADs for observation when fished are needed. Another alternative could be checking and making inventories of FADs in port • Electronic reporting to flag state/RFMOs • Port inspection reports to look for sharks and shark fins	**PI 1.2.1(e)** **PI 1.2.1(f)**	**PI 2.1.2(d)** **PI 2.1.2(e)** **PI 2.2.2(d)** **PI 2.3.1(a)** **PI 2.3.1(b)** **PI 2.3.1(c)** **PI 2.3.2(a)** **PI 2.3.2(b)** **PI 2.3.2(c)** **PI 2.3.2(d)** **PI 2.3.2(e)** **PI 2.3.3(a)** **PI 2.3.3(b)**

MSC Component/PI	Data Needs	Best Practice for Monitoring	Principle 1	Principle 2
HABITATS AND ECOSYSTEM	• Observer and EMS data on FADs activity • Information on FAD type, design, and material • FAD-related activities and FAD structure characteristics (deployment, repair, loss, sinking, etc.) • FAD buoy information on activities (deployed by brand, numbers of active, density, loss, etc.) • FAD buoy tracking data during FAD´s lifetime (beaching, sinking or ownership change) • Echo-sounder buoy acoustic biomass data • Number of FADs deployed, recovered, lost or abandoned, retrieved, and active or inactive	• FAD logbook including activities associated to FAD fishing (deployments, retrieval, recoveries, losses and abandonments, etc.) as well as information on FAD type, structure and materials • Observer data and/or electronic monitoring systems data on FAD activity and FAD types/design/materials • FAD buoy operational tracking data during FAD´s lifetime (beaching, sinking or ownership change) • Echo-sounder biomass estimates during FAD's lifetime		**PI 2.4.1(a)** **PI 2.4.1(b)** **PI 2.4.1(c)** **PI 2.4.2(a)** **PI 2.4.2(b)** **PI 2.4.2(c)** **PI 2.4.2(d)** **PI 2.4.3(a)** **PI 2.4.3(b)** **PI 2.4.3(c)** **PI 2.5.1(a)** **PI 2.5.2(a)** **PI 2.5.2(b)** **PI 2.5.2(c)** **PI 2.5.3(a)** **PI 2.5.3(b)** **PI 2.5.3(c)** **PI 2.5.3(d)** **PI 2.5.3(e)**

Table 2 .- Summary table identifying a group of Monitoring Best Practices for purse-seine fisheries addressing several PIs. Each group, which addresses main MSC Components and PI themes (e.g., Legal framework, resolution of disputes, governance and policy, etc.), includes available fishery monitoring systems to achieve MSC passing scores on Principle 3.

MSC Component/PI	Data Needs	Best Practice for Monitoring	Principle 3
LEGAL FRAMEWORK	• RFMO mandate • Information that vessels are operating in an RFMO where they are flagged to an RFMO member (cooperating) country • Vessels in the RFMO list of authorized vessels • Vessels have valid registration and authorization to fish issued by the flag state • Vessels have a valid license to fish in a given EEZ	• Information on the flag of the vessel (annual) operating in the RFMO • Verifying the RFMO authorized list of vessels (annual) • Verifying flag state fishery authorization (annual) • Verifying EEZ country fishery authorization (annual)	**PI 3.1.1(a)** **PI 3.2.2(e)** **PI 3.2.3(a)** **PI 3.2.3(b)**
RESOLUTION OF DISPUTES	• Resolution at RFMO level with a protocol to dispute any legal matter • National-level management system or law for a transparent mechanism for the resolution of any legal dispute • Any judicial decisions on the matter	• Verifying RFMO resolutions on how to resolve legal matters (annual) • Verification of national management systems in relation to conflict resolutions (annual) • Verifying RFMO resolutions that address the legal right of people dependent on fishing for food or livelihood	**PI 3.1.1(a)** **PI 3.1.1(b)**
GOVERNANCE AND POLICY	• RFMO mandate • RFMO rules of procedures • RFMO resolutions • National-level fishery management plan	• Verifying that RFMO mandate, rules of procedures and new resolutions to identify functions, roles and responsibilities, are clearly defined • Verifying National Fishery Management Plan to ensure that functions, roles and responsibilities are clearly defined/identified	**PI 3.1.2(a)** **PI 3.1.2(b)** **PI 3.1.2(c)** **PI 3.1.3(a)** **PI 3.2.1(a)**

MSC Component/PI	Data Needs	Best Practice for Monitoring	Principle 3
DECISION-MAKING PROCESSES	• RFMO Commission meeting reports with agreements and adopted management measures • RFMO Management Resolutions • RFMO Compliance Committee Reports to review that agreed-upon measures are implemented • RFMO resolutions on non-compliance • RFMO protocol to address and correct non-compliance • Transparent RFMO Compliance Committees, with data and reports available to accredited observers • RFMO Compliance reports that contain data on member non-compliance and their planned actions to address it • RFMO resolutions on precautionary approach and best available science	• RFMO Commission reports to review if the management measures follow scientific advice • Verifying RFMO compliance reports for non-compliance and corrective actions (sanctions) • Resolutions on measures applicable in case of non-compliance of obligations • Resolutions on promoting the implementation of management measures • Creation of a Working Group under the Commission to review progress implementing management measures by tuna RFMO member countries • Reports from RFMO, each member country and fishery under UoA on the progress on implementation and fulfilment of management measures, to be presented to RFMO Compliance group • Verifying each tuna RFMO member country report on the implementation and progress of fulfilment of different management regulations by fishery presented to the Compliance Report	**PI 3.2.2 (a)** **PI 3.2.2 (b)** **PI 3.2.2 (c)** **PI 3.2.2 (d)** **PI 3.2.3(a)**
COMPLIANCE AND ENFORCEMENT	In addition to the above: • Resolution on Port State Measures • Resolution on VMS and VMS data (e.g., every hour information) to verify legal fishing operations • Resolution on fishing vessels authorized to fish in the RFMO • Fishing licenses by RFMO, flag state, and the EEZ country where vessels are licensed to fish • Resolution on mandatory fishery data collection and submission • Resolution on observers • Resolutions to establish a system of inspections at port All resolutions should be established at RFMO, flag state and Port State level.	In addition to the above: • VMS data analysis of fishing locations • Fishery data and observer data (100%, either human or EM) is made available and submitted to the RFMO • E-reporting of logbooks and observer information • Verifying RFMO authorized list of vessels • Flag state fishery authorization • EEZ country fishery authorization • Verify that vessel is not on any RFMO IUU list • Review the flag State RFMO Compliance Report to ensure that the fishery complies with management measures	**PI 3.2.3(a)** **PI 3.2.3(c)** **PI 3.2.3(d)**

MSC Component/PI	Data Needs	Best Practice for Monitoring	Principle 3
MANAGEMENT PERFORMANCE EVALUATION	• RFMO management resolutions (see above) on fishery short- and long-term objectives for target/bycatch species and P1-P2 • Fishery-specific management plan for target/bycatch species and P1-P2 • Internal and external peer-review process of RFMO management measures and progress/effectiveness • Review of fishery-specific management plan aligned with RFMO requirement	• Review fishery-specific performance against RFMO management regulations in place • Review fishery-specific performance against fishery-specific management plan (action plan) • RFMO Performance Peer-Review system, including a revision of the process but also analysis on whether the management measures are complied with and effective (Compliance Reports)	**PI 3.2.4 (a)** **PI 3.2.4 (b)**

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APPENDIX 1- MSC Performance Indicators (FCR 2.01), Scoring Issues, Scoring Guidelines 80, and best practices to support SG80 with associated monitoring best practices.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
Principle 1			
PI 1.1.1 (stock status) The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.			
(a) Stock status relative to recruitment impairment.	It is highly likely that the stock is above the PRI.	Stock status of a target tuna stock ultimately depends on the impacts of fishing by all fishing gears and fleets. It is unlikely that the fishery in a single FIP can affect stock status unless it accounts for a significant proportion of the fishing mortality. The fishery should support (with the flag states, coastal states where they are licensed to operate, and in the relevant RFMO): • Support the adoption of management measures that clearly identify the shares of the catch and/or effort that should go to different gear types. • Setting of catch or effort limits for the purse seine fishery and other gear types that will allow the stock to fluctuate around a level consistent with MSY (or the target reference point, if one has been adopted). • Analyses that can lead to scientifically-sound or precautionary limits on the number of FADs or FAD sets. • Other analyses that support RFMO management objectives (e.g. reduce effort, or the catch of small individuals through time/area closures). • Participate in research that can lead to more selective fishing.	<u>What data is needed?</u> • Periodic stock assessment and stock status indicators, • SSB/SSBmsy, Spawning Stock Biomass in relation to Limit Reference Points (LRPs), and F/Fmsy annual trends including confidence intervals (or probabilities), • SSB/SSBmsy and F/Fmsy projections into the future, • Fishery impacts annual trends to evaluate the impact on population status by each gear type (this will also help to evaluate the impact of each gear type and the cumulative impacts). • In the case that Limit Reference Points are not established, Stock recruitment relationships to set the point below which the recruitment is impaired.
(b) Stock status in relation to achievement of Maximum Sustainable Yield (MSY).	The stock is at or fluctuating around a level consistent with MSY.		

Scoring Issues	SG80	Best practices	Monitoring Best Practices
PI 1.1.2 (stock rebuilding) Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.			Best Practices for monitoring: • Nominal catch and Catch and effort/size logsheet information to flag state/RFMO as per RFMO requirement, • Voluntary reporting of additional operational data (e.g. set by set data information to inform CPUE and stock assessment), • Observer data and/or electronic monitoring systems for bycatch and discards, • Electronic reporting of all data above to flag state/RFMOs, • Biological information for stock assessment (growth, fecundity, maturity, etc.), • Fishery independent surveys/data for abundance/biomass estimation, • CPUE as a proxy for abundance indicator.
(a) Rebuilding timeframes	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	Similar comments to PI 1.1.1 apply. If the stock is overfished, the fishery should support the adoption by the relevant RFMO of rebuilding plans that are consistent with the MSC requirements for rebuilding timeframes.	
(b) Rebuilding evaluation	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.		
PI 1.2.1 (harvest strategy) There is a robust and precautionary harvest strategy in place.			
(a) Harvest strategy design	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.	Similar comments to PI 1.1.1 apply. The fishery should support the adoption by the relevant RFMO of harvest strategies (including reference points, HCR and monitoring mechanisms) that are consistent with the MSC requirements.	What data is needed? • Target and Limit Reference Points and a decision framework to guide management actions, • Information of applied Harvest Strategy, • TunaRFMO agreed input and output management measures.
(b) Harvest strategy evaluation	The harvest strategy may not have been fully tested		

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	but evidence exists that it is achieving its objectives.		• TunaRFMO ability to implement necessary management measures to achieve objectives (this is reviewed under PI 3), • Periodic stock assessment and stock status indicator updates and stock projections, • Catch trend information by fleet. <u>Best Practices for monitoring</u>: • See PI 1.1.1 and 1.1.2 • Review of tunaRFMO adopted Harvest Strategy management measures, • Review of TunaRFMO adopted input, output and any other management measures.
(c) Harvest strategy monitoring	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
(d) Harvest strategy review	No SG80 guidance		
(e) Shark finning	It is highly likely that shark finning is not taking place.	This scoring issue only needs to be scored when one of the target species is a shark, which should not be the norm in tropical tuna purse seine fisheries.	See SI 2.1.2(d)
(f) Review of alternative measures	There is a regular review of the potential effectiveness and practicality of alternative measures to minimize UoA- related mortality of unwanted catch of the target stock and they are implemented as appropriate.	Similar comments to SI(a).	<u>What data is needed?</u> • Target species discard estimation trends to infer mortality decrease, • Information on additional measures to reduce unwanted target catch such as spatio-temporal closures and gear modifications. • Periodic stock assessment to estimate mortality of the unwanted target species. <u>Best Practices for monitoring</u>: • 100 % observer coverage either human or electronic monitoring for discard estimation with a minimum requirement of 20 % of the

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			trip/set analysed to increase on a risk assessment basis. • Review of management measures intended to reduce unwanted target catch. • For stock assessment see SI 1.2.1(a), (b), (c), and (d).
PI 1.2.2 (Harvest control rules and tools) There are well defined and effective harvest control rules (HCRs) in place.			
(a) HCRs design and application	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.	Similar comments to PI 1.1.1 apply. The fishery should support the timely adoption by the relevant RFMO of harvest control rules that are consistent with the MSC requirements.	What data is needed? • Target and Limit Reference Points and a decision framework to guide management actions, • Harvest Control Rules with trigger/threshold reference points for management actions, • Periodic stock assessment and stock status indicator updates and stock projections. Best Practices for monitoring: • See PI 1.1.1, 1.1.2, and 1.2.1
(b) HCRs robustness to uncertainty	The HCRs are likely to be robust to the main uncertainties.		What data is needed? • Management Strategy Evaluation (MSE) to test the HCR in relation to major uncertainties, • Information of major uncertainties of the stock assessment/population dynamic to include in the MSE. Best Practices for monitoring: • See PI 1.1.1, 1.1.2, and 1.2.1

Scoring Issues	SG80	Best practices	Monitoring Best Practices
(c) HCRs evaluation	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.		What data is needed? • Review of input and output management measures applied in the tunaRFMO, • TunaRFMO ability to implement necessary management measures to achieve objectives (this is reviewed under PI 3), • Periodic stock assessment, stock status indicators, and stock projections, • SSB/SSBmsy, Spawning Stock Biomass in relation to Limit Reference Points (LRPs), and F/Fmsy annual trends. Best Practices for monitoring: • See PI 1.1.1, 1.1.2, and 1.2.1
PI 1.2.3 (Information and monitoring) Relevant information is collected to support the harvest strategy.			
(a) Range of information	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	Similar comments to PI 1.1.1 apply. The fishery should support research into stock structure and productivity if it is not already available. The fishery should ensure that flag state authorities know its composition in detail and support an equal level of monitoring for all other fisheries and gear types. The fishery should support training of regional observers, to ensure a consistent supply of high-quality observers for the fishery. Skipjack fisheries in particular should support research towards the development of a purse seine CPUE index as a proxy biomass indicator for use in stock assessment.	What data is needed? • Stock structure information, • Stock assessment information, • Stock productivity (growth, maturity, fecundity, etc), • Relative stock abundance indices (fishery independent or CPUE), • Fleet composition and effort by gear, Catch information by fleet, • TunaRFMO agreed input and output management measures. Best Practices for monitoring:

Scoring Issues	SG80	Best practices	Monitoring Best Practices

			• Nominal catch and Catch and effort/size logsheet by gear and/or set type (ie for PS) to flag state/RFMO as per RFMO requirement,
			• Tagging data, genetic, otolith microchemistry (or any other method) for stock structure delineation,
			• Review of management measures,
			• Observer data (human or electronic) both for collecting fishery information (e.g. bycatch information) as well as for collecting biological information for maturity/fecundity,
			• Operational data for CPUE estimation,
			• For PS FAD fisheries:
			  ○ FAD related activities and FAD design characteristics,
			  ○ FAD buoy information on activities (deployed by brand, operative, density, lost, etc.),
			  ○ FAD buoy track data and echosounder acoustic biomass signals from buoys.

(b) Monitoring	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.	The fishery must comply with flag state and RFMO catch and effort reporting obligations. This should include species composition and catch by set type in order to feed the information into stock assessments. The fishery should report data on FADs that can result in improved stock assessments. See **Section 3.1** for example.	<u>What data is needed?</u> • See 1.2.3(a) • Removals by fleet/gear, • Stock abundance indices by fleets <u>Best Practices for monitoring:</u> • See 1.2.3(a) • Nominal catch and Catch and effort/size logsheet by gear and/or set type (ie for PS) to flag state/RFMO as per RFMO requirement

Scoring Issues	SG80	Best practices	Monitoring Best Practices
(c) Comprehensiveness of information	There is good information on all other fishery removals from the stock.	The fishery should support an equal level of monitoring for all other fisheries and gear types.	(both for the UoA SI 1.2.3(b) and for the rest of fleets SI 1.2.3(c), • Operational data for CPUE estimation by fleet (both for the UoA 1.2.3(b) and for the rest of fleets 1.2.3(c).
PI 1.2.4 (Assessment of stock status) There is an adequate assessment of the stock status.			
(a) Appropriateness of assessment to stock under consideration	The assessment is appropriate for the stock and for the harvest control rule.	Similar comments to PI 1.1.1 apply. The fishery must comply with its reporting obligations and support equal levels of monitoring for all other fisheries so as to enable robust stock assessments. In case lack of certain data from the purse seine fishery are identified as a source of uncertainty in the assessment, the fishery should facilitate such data to the flag state and RFMO (RFMO science body). Data reported with sufficient time lag so as to not be commercially sensitive can still be useful for assessment purposes. The fishery should report data on FADs that can result in improved stock assessments. See **Section 3.1** for example.	<u>What data is needed?</u> • Periodic stock assessments, • Generic or species-specific reference points, • SSB/SSBmsy, Spawning Stock Biomass in relation to Limit Reference Points (LRPs), and F/Fmsy annual trends, • Alternative stock assessment models, and/or alternative hypothesis of model configuration, and/or statistical uncertainty in inputs parameters, • Internal and external peer review. <u>Best Practices for monitoring:</u> • See PI 1.1.1, 1.1.2, and 1.2.1
(b) Assessment approach	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.		
(c) Uncertainty in the assessment	The assessment takes uncertainty into account.		
(d) Evaluation of assessment	No SG80 guidance		
(e) Peer review of assessment	The assessment of stock status is subject to peer review.		
Principle 2			
PI 2.1.1 (Primary species outcome) The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI.			

Scoring Issues	SG80	Best practices	Monitoring Best Practices
(a) Main primary species stock status	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.	**Primary** species are those that are not under P1, but which have management tools and measures in place. **Main** are species whose catch is 5% or more of the total catch of all P1 and P2 species. If yellowfin, skipjack and bigeye are all in the UoA, there is no other individual species likely to be classified as 'main primary' (bycatch rates for **all species** combined in floating object sets range from 1% to 8.4% depending on ocean region – see Justel and Restrepo (2017) ISSF Technical Report 2017-01).	However, in case that only one species of the three tropical tuna species is included, the other two will be considered Main Primary species for which monitoring should consider the following: What data is needed? • Periodic stock assessment and stock status indicators, • SSB/SSBmsy, Spawning Stock Biomass in relation to Limit Reference Points (LRPs), and F/Fmsy annual trends including confidence intervals (or probabilities), • Fishery impacts annual trends to evaluate the impact on population status by each gear type (this will also help to evaluate the impact of each gear type), • Catch and effort information by fleet (to assess all MSC UoAs catch relative to total catch). Best Practices for monitoring: • Nominal catch and Catch and effort/size logsheet information by fleet to flag state/RFMO as per RFMO requirement, • Voluntary reporting of additional data (e.g. set by set data information to inform CPUE and stock assessment), • Electronic reporting of all data above to flag state/RFMOs, • Biological information for stock assessment (growth, fecundity, maturity, etc.),
(b) Minor primary species stock status	No SG80 guidance	**Minor** primary species are all other species for which there are (RFMO or national) management tools and measures in place, but whose catch is <5% of the total catch of all P1 and P2 species; unless the species is considered 'vulnerable' (e.g. based on the life history or stock status), in which case the cut-off between main and minor is reduced to 2%. In all RFMOs these will include albacore tuna and swordfish, which are assessed and managed. In some RFMOs, minor primary species will also include some of the small tuna species, mahi-mahi, some shark species (although some sharks may be treated as ETP) and billfishes such as sailfish and marlins if management measures are in place. The amount of catches of these species in the fishery should be negligible compared to other fisheries	

Scoring Issues	SG80	Best practices	Monitoring Best Practices
		(gears) and unlikely to hinder recovery if any minor primary species is overfished.	• Fishery independent surveys for abundance/biomass estimation, • CPUE as a proxy for abundance indicator.
PI 2.1.2 (Primary species management strategy) 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.			
(a) Management strategy is in place	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	If the catches by the fishery are negligible, measures and a partial strategy may not be necessary. Nevertheless, the fishery should support any efforts (by the RFMO and at the national level) to assess and manage primary species so that they are maintained at healthy levels of abundance. The fishery must demonstrate compliance with any such measures that affect it (e.g. catch limits, closed areas).	<u>What data is needed?</u> • Target and Limit Reference Points and a decision framework to guide management actions, • Review of input and output management measures applied in the tunaRFMO, • TunaRFMO ability to implement necessary output/input management measures to achieve objectives (this is reviewed under PI 3), • Periodic stock assessment and stock status indicator updates and stock projections, • Catch trend information by fleet, • Fishery impacts annual trends to evaluate the impact on population status by each gear type (this will also help to evaluate the cumulative impacts). <u>Best Practices for monitoring</u>: • See PI 2.1.1. • Review of TunaRFMO adopted input, output and any other management measures, • VMS data for fishing effort control by fleet, • Observer data and/or electronic monitoring systems.
(b) Management strategy evaluation	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.	The amount of catches of these primary species in the fishery should be negligible compared to other fisheries (gears) and it is likely that there would be an objective basis to determine if management of these impacts be important in terms of maintaining the stocks at healthy levels.	
(c) Management strategy implementation	There is some evidence that the measures/ partial strategy is being implemented successfully.	See above	

Scoring Issues	SG80	Best practices	Monitoring Best Practices
(d) Shark finning	It is highly likely that shark finning is not taking place.	This applies only if some shark species have been designed as primary in the FIP/MSC certification. If so, the fishery should prohibit shark finning and demonstrate that it does not take place.	<u>What data is needed?</u> • Nominal shark catch and bycatch data, • Shark carcass/fins (and/or other parts) catch data to verify that shark finning is not occurring, • Port inspection reports. <u>Best Practices for monitoring</u> • Logbook and/or e-logbook (100 % coverage), • 100 % observer coverage either human or electronic monitoring for discard estimation with a minimum requirement of 20 % of the trip/set analysed to be increased on a risk assessment basis, • Electronic reporting to flag state/RFMOs.
(e) Review of alternative measures	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.	It is unlikely that there will be main primary species (see PI 2.1.1(a)). For minor primary species, the fishery should have a policy on bycatch management that includes: • reporting of catches and discards • promoting retention and utilization, unless retention is prohibited by management • following best practices to release unwanted catch alive (e.g. as in the ISSF Skippers Guidebooks). This includes sorting practices and equipment that allow for quick and gentle release after sorting, and providing regular training for skippers and crew in bycatch handling. • Supporting research on bycatch mitigation	<u>What data is needed?</u> • Nominal catch and bycatch data of primary species, • Discard trends of primary species, • Periodic stock assessment to estimate mortality of the unwanted main primary species, • Information on additional measures to reduce unwanted main primary species catch such as spatio-temporal closures and gear modifications. • Application of best practices for handling and safe-release of unwanted main primary species, • Fishery impacts annual trends to evaluate the impact on population status by each gear

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			type (this will also help to evaluate the cumulative impacts). Best Practices for monitoring: • Logbook and/or e-logbook (100 % coverage), • 100 % observer coverage either human or electronic monitoring for discard estimation with a minimum requirement of 20 % of the trip/set analysed to be increased on a risk assessment basis, • Electronic reporting to flag state/RFMOs, • The species for which retention is prohibited, EM is necessary to monitor the safe release (using best practices) in the upper deck and post-release mortality information.
PI 2.1.3 (Primary species information) Information on the nature and amount of primary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species.			
(a) Information adequacy for assessment of impact on main primary species	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	It is unlikely that there will be main primary species (see PI 2.1.1(a)).	See PI 2.1.1 and 2.1.2.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
(b) Information adequacy for assessment of impact on minor primary species	There is no SG80 guidance	The fishery must report all catches of minor primary species so that they are included in the assessments. This would allow estimation of the impact of the UoA on minor primary species with respect to status.	
(c) Information adequacy for management strategy	Information is adequate to support a partial strategy to manage main primary species.	There are no main primary species. For minor primary species, the fishery should collect the data required for a partial strategy (e.g. 100% observer coverage and port sampling).	
PI 2.2.1 (Secondary species outcome) The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biologically based limit.			
(a) Main secondary species stock status	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,	Secondary species are those that are not in P1, are not Primary (see PI 2.1.1(a)) and are not ETP. No single species is likely to be classified as **Main secondary** because individual catches will be <<5% of the P1 catches. However, it may apply if there is concern over bycatch or FAD-related mortality for a species which is not protected (and therefore not ETP) but nevertheless potentially at risk – e.g. silky sharks in some oceans.	<u>What data is needed?</u> Results from the agreed stock assessment/HS: • Biomass and fishing mortality annual trends, • Fishery indicators (e.g. CPUE) annual trends, • Fishery impacts annual trends to evaluate the impact on population status by each gear type (this will also help to evaluate the cumulative impacts). <u>Best Practices for monitoring</u> • Nominal catch and Catch and effort/size logsheet data to flag state/RFMO as per RFMO requirement, • Voluntary reporting of additional data (e.g. set by set data information to inform CPUE and stock assessment, • Observer data and/or electronic monitoring systems.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.		• Electronic reporting to flag state/RFMOs.
(b) Minor secondary species stock status	There is no SG80 guidance	There are likely 40 or more **minor secondary** species in the fishery. These will include some sharks (those that are not treated as ETP), billfishes, pelagic stingrays, etc. The majority of the catches will be of minor tuna species, and many small bony fish species, all of which are thought to be highly productive. The catch of any one of these species individually is likely well below 0.5% of the total catch of P1 species. If any one of these species were overfished, it is unlikely that the catch by the fishery will hinder their recovery. The magnitude of the catches needs to be corroborated with observer data.	
PI 2.2.2 (Secondary species management strategy) 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.			
(a) Management strategy in place	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure	There are likely no main secondary species, unless there is concern over bycatch or FAD-related mortality for a species which is not protected (and therefore not ETP) but nevertheless potentially at risk – e.g. silky sharks in some oceans. For minor secondary species, if the catches by the fishery are negligible, measures and a partial strategy may not be necessary. Nevertheless, the fishery should support any efforts (by the RFMO and at the	See PI 2.1.2

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	that the UoA does not hinder their recovery.	national level) to assess and manage secondary species so that they are maintained at healthy levels of abundance. The fishery must demonstrate compliance with any such measures that affect it (e.g. catch limits, closed areas).	
(b) Management strategy evaluation	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.	The amount of catches of the minor secondary species in the fishery should be negligible compared to other fisheries (gears) and it is likely that there would be an objective basis to determine if management of these impacts will matter in maintaining the stocks at healthy levels.	See PI 2.1.2
(c) Management strategy implementation	There is some evidence that the measures/ partial strategy is being implemented successfully.	See above.	See PI 2.1.2
(d) Shark finning	It is highly likely that shark finning is not taking place.	Some shark species such as bull and tiger sharks could be classified as minor secondary. The fishery should prohibit shark finning and demonstrate that it does not take place.	<u>What data is needed?</u> • Nominal shark catch and bycatch data, • Shark carcass/fins (and/or other parts) catch data to verify that shark finning is not occurring. • Port inspection reports. <u>Best Practices for monitoring</u> • Logbook and/or e-logbook (100 % coverage), • 100 % observer coverage either human or electronic monitoring for discard estimation with a minimum requirement of 20 % of the trip/set analysed to be increased on a risk assessment basis, • Electronic reporting to flag state/RFMOs.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
(e) Review of alternative measures to minimise mortality of unwanted catch	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.	For minor secondary species, the fishery should have a policy on bycatch management that includes: • reporting of catches and discards • promoting retention and utilization, unless retention is prohibited by management • following best practices to release unwanted catch alive (e.g. as in the ISSF Skippers Guidebooks). This includes sorting practices and equipment that allow for quick and gentle release after sorting, and providing regular training for skippers and crew in bycatch handling • Supporting research on bycatch mitigation	<u>What data is needed?</u> • Nominal catch and bycatch data of primary species, • Discard trends of secondary species, • Information on release of secondary unwanted catch alive, • Information on additional measures to reduce unwanted secondary catch such as gear modifications. • Application of best practices for handling and safe-release of unwanted secondary species. <u>Best Practices for monitoring</u> • Application of best practices for handling and safe-release of unwanted secondary species, • Logbook and/or e-logbook (100 % coverage), • 100 % observer coverage either human or electronic monitoring for discard estimation with a minimum requirement of 20 % of the trip/set analysed to be increased on a risk assessment basis, • Electronic reporting to flag state/RFMOs, • EM or observer to estimate the fate of released secondary species, • The species for which retention is prohibited, EM is necessary to monitor the safe release (using best practices) in the upper deck.
PI 2.2.3 (Secondary species information) 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.			
(a) Information adequacy for	Some quantitative information is available and	There are no main secondary species.	See PI 2.2.1 and 2.2.2.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
assessment of impact on main secondary species	is adequate to assess 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: Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.		
(b) Information adequacy for assessment of impact on minor secondary species	There is no SG80 guidance.	The fishery must report all catches of minor secondary species so that they are included in the assessments, if any. This would allow estimation of the impact of the UoA on minor primary species with respect to status.	See PI 2.2.1 and 2.2.2.
(c) Information adequacy for management strategy	Information is adequate to support a partial strategy to manage main secondary species.	There are no main secondary species. For minor secondary species, the fishery should collect the data required for a partial strategy (e.g. 100% observer coverage and port sampling).	See PI 2.2.1 and 2.2.2.
PI 2.3.1 (ETP species outcome) The UoA meets national and international requirements for protection of ETP species. The UoA does not hinder recovery of ETP species.			
(a) Effects of the UoA on population/ stocks within national or international limits, where applicable	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known	ETP (Endangered, threatened or protected) species are those that are recognized by national legislation and specific international agreements. In the tropical tuna purse seine fishery, this will normally include turtles, some rays, whale sharks and cetaceans. In addition, some assessments may include as ETP the two shark species with the highest bycatch rates: silky	What data is needed? • Bycatch data of ETP species, • Spatial distribution of fishing effort and ETP interactions, • Number of interactions with ETP species,

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	and highly likely to be within these limits.	and oceanic whitetip sharks (depending on RFMO or national protection regulations). Restrepo *et al.* (2018) ISSF Technical Report 2018-20 offers some information relevant to these. **Silky and oceanic whitetip shark** bycatches in the fishery are likely less than 0.5% of the catch of P1 species. However, the impact of purse seine fisheries relative to other gears likely varies by region. For instance, in the eastern Pacific PS catch of silky shark is <5% of the total, while in the western Pacific it is about 38%. Furthermore, if purse seine fisheries use FADs that are entangling, there will be additional unobserved mortality and thus higher impacts on the stocks. Up to 20% of the sharks brought onboard can survive if best practice release practices are used (see ISSF Skippers' Guidebook). Most RFMOs prohibit the retention and sale of silky and oceanic whitetip sharks by purse seine fleets and thus it is in the interest of the fleets to minimize these catches. **Whale sharks** are sometimes encircled by purse seine nets. These interactions are very low and usually result in the live release of the animal, so they probably would not hinder recovery of stocks that are at low levels. Several RFMOs prohibit deliberate setting on whale sharks. Manta and devil **rays** are incidentally caught by purse seiners. These catches are low compared with other fisheries, and most rays can be released alive if best practices are followed (see ISSF Skippers' Guidebook). The resulting mortality rate after using best release practices probably would not hinder	• Information on release of ETP species by fate (alive, death), • ETP species habitat distribution information, • Application of best practices for handling and safe-release of unwanted secondary species, • Information on FAD structure (e.g. the use of non-entangling FADs), • Periodic assessment of mortality, if possible, of ETP species by the UoA. Best Practices for monitoring • Catch and effort/size logsheet data to flag state/RFMO as per RFMO requirement, • Logbook information on ETP interactions, • Logbook and/or e-logbook (100 % coverage), • 100 % observer coverage either human or electronic monitoring for ETP interaction estimation with a minimum requirement of 20 % of the trip/set analysed to be increased on a risk assessment basis, • Electronic reporting to flag state/RFMOs, • The species for which retention is prohibited, EM is necessary to monitor the safe release (using best practices) in the upper deck, • To monitor the use of non-entangling FADs, FAD logbooks with information on FAD type structure and materials, observer or EM, and lifting the FADs for observation when fished are needed. Another alternative could be checking and making inventories of FADs in port.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
		recovery of stocks that are at low levels. One RFMO prohibits retention of rays. Sea **turtles** are caught in very small numbers by purse seine fisheries and over 90% of them will survive if best release practices are used (ISSF Skippers Guidebook). However, if purse seine fisheries use FADs that are entangling, there will be additional unobserved mortality and thus higher impacts on the stocks. The resulting mortality rate after using best release practices and non-entangling FADs probably would not hinder recovery of stocks that are at low levels. **Cetaceans** such as fin whales and false killer whales can also be encircled incidentally but these are rare occurrences. Best release practices can be used to ensure that these interactions do not hinder recovery. For all ETP species, the fishery must report interactions and fate of any releases (e.g. released alive, discarded dead, injuries), and collect any data requested by scientists (e.g. photographs). This will allow assessment of the impacts.	
(b) Direct effects	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	If best release practices (see ISSF Skippers' Guidebook) and non-entangling FADs are used for all ETP species, it is highly likely that the fishery will not hinder recovery of any such species, except perhaps for silky sharks. In some regions, catch of silky shark by purse seiners is as high as 38% of the total silky shark catch. And, even with best release practices, about 80% of those individuals caught will die. Therefore, FIPs in those regions will need to implement further mitigation efforts such as avoiding sets on FADs with small tuna	See SI 2.3.1(a).

Scoring Issues	SG80	Best practices	Monitoring Best Practices
		aggregations and releasing sharks alive from the net (see Restrepo *et al.* (2016) ISSF Technical Report 2016-17).	
(c) Indirect effects	Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	Possible indirect effects on ETP include competition for forage species and disturbance of ETP species habitat. These are unlikely in the purse seine fishery.	See SI 2.3.1(a).
PI 2.3.2 (ETP species management strategy) The UoA has in place precautionary management strategies designed to: - meet national and international requirements; and - 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.			
(a) Management strategy in place (national and international requirements)	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.	With the exception of silky sharks in some regions, the impact of the fishery on ETP species is low, or can be low if best release practices are used. These practices can be adopted voluntarily by the fishery. In order to ensure that the entire purse seine fisheries minimize their impacts on ETP species, the fishery should work with the RFMO to adopt mandatory handling and release practices for ETP species. In addition, some RFMOs and/or national legislation have measures that are related to ETP species (e.g. prohibitions on intentional setting or retention). FIPs in other regions should also support the adoption of similar measures. Similarly, FIPs must support the requirement for non-entangling FADs in the RFMOs where they are not binding.	See PI 2.3.1. What data is needed? • Information on release of secondary unwanted catch alive, • Information on additional measures to reduce ETP catch such as gear modifications, spatio-temporal closures, • The use of non-entangling FADs, • Application of best practices for handling and safe-release of ETP species. Best Practices for monitoring • Application of best practices for handling and safe-release of ETP species, • Logbook and/or e-logbook (100 % coverage),

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			• 100 % observer coverage either human or electronic monitoring for discard estimation with a minimum requirement of 20 % of the trip/set analysed to be increased on a risk assessment basis, • Electronic reporting to flag state/RFMOs, • EM or observer to estimate the fate of released ETP species, • The species for which retention is prohibited, EM is necessary to monitor the safe release (using best practices) in the upper deck.
(b) Management strategy in place (alternative)	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	See previous SI.	See PI 2.3.1.
(c) Management strategy evaluation	There is an objective basis for confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or the species involved.	The use of any best practices such as non-entangling FADs and live release need to be documented and reported so that any such measures can be evaluated. Fisheries that do not have 100% observer coverage (human or electronic) should implement it.	See PI 2.3.1.
(d) Management strategy implementation	There is some evidence that the measures/strategy is being implemented successfully.	See previous SI.	See PI 2.3.1.
(e) Review of alternative measures to minimise mortality of ETP species	There is a regular review of the potential effectiveness and practicality of alternative measures to	The fishery should facilitate research that addresses mitigation of ETP species bycatch and voluntarily adopt best practices when these become known.	See PI 2.3.1.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	minimise UoA- related mortality of ETP species and they are implemented as appropriate.	Skippers should participate in ISSF Skippers' Workshops. In addition, there are opportunities to participate in programs that reduce mortality of ETP species outside the fishery. For example, ISSF projects to protect turtle nesting beaches can greatly increase turtle survival.	
2.3.3 (ETP species information) 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			
(a) Information adequacy for assessment of impacts	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.	The use of entangling FADs is problematic because they result in unobserved mortality of some ETP species like turtles and sharks. Most sharks that are entangled only remain entangled for less than two days before falling off, so these interactions are extremely unlikely to be detected. Entangling FADs must be prohibited by the fishery. Observer data are the main source of information for ETP species interactions. For very rare interactions (e.g. with cetaceans), 100% coverage is needed for adequacy. This percent coverage is already required for most purse seine vessels in the Pacific Ocean. FIPs in other regions should support adoption by the RFMOs of 100% observer coverage (human or electronic).	<u>What data is needed?</u> See PI 2.3.1. <u>Best Practices for monitoring</u> • See PI 2.3.1. • 100 % observer coverage either human or electronic monitoring for discard estimation with a minimum requirement of 20 % of the trip/set analysed to be increased on a risk assessment basis, • The species for which retention is prohibited, EM is necessary to monitor the safe release (using best practices) in the upper deck, • To monitor the use of non-entangling FADs, FAD logbooks with information on FAD type structure and materials, observer or EM, and lifting the FADs for observation when fished are needed. Another alternative could be checking and making inventories of FADs in port.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
(b) Information adequacy for management strategy	Information is adequate to measure trends and support a strategy to manage impacts on ETP species	See SI above.	See PI 2.3.1 and 2.3.3(a).
PI 2.4.1 (Habitats outcome) The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.			

(a) Commonly encountered habitat status	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.	The purse seine fishery takes place in the epipelagic ecosystem. The purse seine nets do not make contact with the seabed or biogenic reefs. However, some FADs do sink to the bottom. While the structure and function of these habitats is unlikely to be harmed substantially, the fishery should support research into biodegradable FADs.
		
		Also, some FADs drift away from the fishing area and end up beaching on coral reefs (see next SI).
			<u>What data is needed?</u>
			• Information on the type, design, and material of the FAD use,
			• For PS and FAD fisheries:
			  ○ FAD related activities (deployment, repairment, lost, etc.) and FAD design characteristics,
			  ○ FAD buoy information on activities (deployed by brand, operative, density, lost, etc.),
			  ○ FAD buoy track data till the end of FAD´s lifetime,
			  ○ Echo-sounder acoustic biomass data from tracking buoys,
			• Number of FAD deployed, recovered, lost and abandoned, beached retrieved, active and inactive.
			
			<u>Best Practices for monitoring</u>
			• FAD logbook including activities associated to FAD fishing (deployments, retrieved, recovered, lost and abandoned, etc.) as well as information on FAD type, design and materials,

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			• Observer data and/or electronic monitoring systems data on FAD activity and FAD types/design, • Electronic reporting to flag state/RFMOs, • FAD buoy track data till the end of FAD´s lifetime, • Echo-sounder acoustic biomass data from tracking buoys.
(b) VME habitat status	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.	Currently, a proportion of the FADs used in all purse seine fisheries end up in coral reefs which can be considered VMEs (vulnerable marine ecosystems). The overall impact of this has not been quantified, but stakeholders have expressed concern that it is an issue. The fishery should support efforts to assess the impact of these events on coral reefs in the different ocean regions.	<u>What data is needed?</u> • Information on number of FADs beached in sensitive areas such as VMEs, • Map of sensitive areas and VMEs in the region, • Information on FAD drift in the area, • Information on FAD deployment by season/area, • Information on the number of non-entangling and biodegradable FADs used by the fishery. <u>Best Practices for monitoring</u> • FAD logbook including activities associated to FAD fishing (deployments, retrieved, recovered, lost and abandoned, etc.) as well as information on FAD type, design, and materials (biodegradable), • FAD buoy operational tracking data till the end of the life of the FAD, • Echo-sounder buoy´s biomass estimates till the end of the life of the FAD.
(c) Minor habitat status	There is no SG80 guidance.	Some FADs may come ashore on rocky, sandy or muddy shoreline, which are considered minor habitats,	See SI 2.4.1(a) and (b)

Scoring Issues	SG80	Best practices	Monitoring Best Practices
		and it is not likely that this would cause serious or irreversible harm to these habitats.	
PI 2.4.2 (Habitats management strategy) 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.			
(a) Management strategy in place	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	A management strategy is probably not necessary for managing impacts on the seabed. For coral reefs, a management strategy should be developed by the fishery. This could include the following elements: • Use of biodegradable FADs • Arrangements with governments and NGOs coastal countries to alert them of FADs drifting in their direction • A program to recover FADs before they drift away from the fishing area • A program to take FADs out of the water at the end of the fishing season • Limits on the overall number of FADs used by purse seine fisheries in each RFMO • Support and collaboration with tuna RFMO Working Groups on FADs (e.g. in improvement of biodegradable FAD designs, FAD impact studies)	<u>What data is needed?</u> • Trend in the number of FAD deployed, recovered, lost, and stranded, • Trend in the number of non-entangling and biodegradable FADs used by the fishery, • Information on FAD related management measures such as FAD number limits, the use of non-entangling and biodegradable FADs. <u>Best Practices for monitoring:</u> • FAD logbook including activities associated to FAD fishing (deployments, retrieved, recovered, lost and abandoned, etc.) as well as information on FAD type, design and materials (biodegradable), • FAD buoy operational tracking data till the end of the life of the FAD, • Echo-sounder biomass estimates till the end of the life of the FAD, • FAD characteristics data for non-entangling and biodegradable FADs regulations.
(b) Management strategy evaluation	There is some objective basis for confidence that the measures/ partial strategy will work, based on information directly about	Any strategy such as those listed on the above SI needs to be documented and quantified.	See SI 2.4.1(a), (b) and 2.4.2(a)

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	the UoA and/or habitats involved.		
(c) Management strategy implementation	There is some quantitative evidence that the measures/ partial strategy is being implemented successfully.	See above	See SI 2.4.1(a), (b) and 2.4.2(a)
(d) Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures 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.	Evidence of compliance with any strategy as in SIa needs to be available	See SI 2.4.1(a), (b) and 2.4.2(a)
PI 2.4.3 (Habitats information) 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.			
(a) Information quality	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	The nature, distribution and vulnerability of both the epipelagic ecosystem and the VME (coral reefs) are well known in all oceans.	See SI 2.4.1(a), (b) and 2.4.2(a)

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	types and distribution of the main habitats.		
(b) Information adequacy for assessment of impacts	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.	There is extensive information on the extension and status of coral reefs globally. The impact of derelict FADs on these habitats is known, but it is not well documented in most areas. Thus, the fishery should support research aimed to assess the level of impact of FAD fisheries on these habitats.	<u>What data is needed?</u> • Trend in the number of FAD deployed, recovered, lost, and stranded, • Trend in the number of non-entangling and biodegradable FADs used by the fishery, <u>Best Practices for monitoring</u> • FAD logbook including activities associated to FAD fishing (deployments, retrieved, recovered, lost and abandoned, etc.) as well as information on FAD type, design, and materials (biodegradable), • FAD buoy operational tracking data till the end of the life of the FAD, • Echo-sounder buoy´s biomass estimates till the end of the life of the FAD.
(c) Monitoring	Adequate information continues to be collected to detect any increase in risk to the main habitats.	The fishery must continue reporting any information necessary to monitor whether the risk to coral reefs increases. This would include any available information necessary to identify a potential increase in interaction between the fishery and these habitats (e.g. VMS positions, number of FADs used).	See SI 2.4.1(a), (b) and 2.4.2(a)
PI 2.5.1 (Ecosystem outcome) The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.			
(a) Ecosystem status	The UoA is highly unlikely to disrupt the key elements underlying ecosystem	Tropical tuna purse seine fisheries probably do not cause significant changes in marine ecosystems. However, the potential of FADs to act as 'ecological	See PI 2.4.1, 2.4.2 and 2.4.3

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	structure and function to a point where there would be a serious or irreversible harm.	traps', as well as the potential impact of derelict FADs on ecosystem components are still not well understood. Therefore, the fishery should support any research aimed at better understanding these two issues.	
PI 2.5.2 (Ecosystem management strategy) There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.			
(a) Management strategy in place	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.	General management measures for tuna stocks adopted by RFMOs indirectly serve as a partial strategy to limit the impact of tuna fisheries on ecosystems (e.g. limit on vessel capacity, number of FADs, banning of entangling FADs, setting of TACs, etc.). The fishery should promote and support work in RFMOs to improve information about and management of FADs.	<u>What data is needed?</u> • Total number of FADs/buoys of FADs and density in the Ocean, • FAD/Buoy data for FAD limits, • FAD characteristics data for non-entangling and biodegradable FADs regulations. <u>Best Practices for monitoring</u> • Nominal catch and catch and effort/size logsheet information to flag state and RFMO, • Observer data and/or electronic monitoring systems. • FAD logbooks information with FAD activities and FAD characteristics, • FAD buoy operational tracking data and buoy echosounder biomass estimates till the end of the life of the FAD, • Electronic reporting to flag state/RFMOs.
(b) Management strategy evaluation	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about	The fishery should be engaged with the relevant RFMO to support that the implementation of management measures (described in the previous SI) is closely monitored. All the risks are linked to fishing effort, so it is essential that the fishery provides the	See PI 2.4.2 and SI 2.5.2(a)

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	the UoA and/or the ecosystem involved.	required information on effort (both free swimming school and FAD sets) to the flag state and the RFMO.	
(c) Management strategy implementation	There is some evidence that the measures/partial strategy is being implemented successfully.	Evidence that the measures are being implemented successfully are primarily at the level of the relevant RFMO. This includes fishing effort data, monitoring of the impacts of the fishery (e.g. through stock assessments) and compliance with existing management measures.	See PI 2.4.2 and SI 2.5.2(a)
PI 2.5.3 (Ecosystem information) There is adequate knowledge of the impacts of the UoA on the ecosystem.			
(a) Information quality	Information is adequate to broadly understand the key elements of the ecosystem.	Information on the components of oceanic ecosystems worldwide is available from several international scientific institutions such as FAO, NOAA, RFMOs, etc.; as well as from local governments.	<u>What data is needed?</u> • Catch and discards of target, primary, secondary and ETP species, • VMS data for fishing effort control, • Ecosystem modelling (trophic interactions, habitats, etc.), • Total number of FADs/buoys in the Ocean, • FAD/Buoy data for FAD limits, • FAD characteristics data for non-entangling and biodegradable FADs regulations. <u>Best Practices for monitoring</u> • Logbooks for target catch, • Observers/EMS information for bycatch and discards, • FAD logbook including activities associated to FAD fishing (deployments, retrieved, recovered, lost and abandoned, etc.) as well as information on FAD type, design, and materials (biodegradable), • FAD buoy operational tracking data till the end of the life of the FAD,

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			• Echo-sounder buoy´s biomass estimates till the end of the life of the FAD.
(b) Investigation of UoA impacts	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	See 2.5.1(a)	See SI 2.5.2(a) and 2.5.3(a)
(c) Understanding of component functions	The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known.	The main issues that need further research are the potential of FADs to act as ecological traps, and the actual level of impact of FAD fisheries on coral reefs. The fishery should support efforts in these two research areas.	See SI 2.5.2(a) and 2.5.3(a)
(d) Information relevance	Adequate information is available on the impacts of the UoA on these	See previous SI.	See SI 2.5.2(a) and 2.5.3(a)

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	components to allow some of the main consequences for the ecosystem to be inferred.		
(e) Monitoring	Adequate data continue to be collected to detect any increase in risk level.	Data collected as part of existing RFMO tuna management measures are a source of data to assess potential impact to ecosystem components. Additionally, fisheries must report any other data identified as relevant as a result of research of FADs as ecological traps and FAD impacts on coral reefs.	See SI 2.5.2(a) and 2.5.3(a)
Principle 3			
PI 3.1.1 (Legal and/or customary framework) The management system exists within an appropriate and effective legal and/or customary framework which ensures that it: - Is capable of delivering sustainability in the UoA(s) - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and - Incorporates an appropriate dispute resolution framework.			
(a) Compatibility of laws or standards with effective management	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.	The management system for the fishery needs to be viewed in terms of the flag state(s), the RFMO where it operates, and the countries in whose EEZs it is licensed to fish. The vessels must be flagged to a country that is effectively a member of the RFMO, which provides the basis for international cooperation. This is the intent of ISSF Conservation Measure 1.2.	What data is needed? • Information that vessels are operating in a RFMO where they are flagged to a RFMO member (cooperating) country, • Vessels listed in the list of authorized vessels of the RFMO, • Vessels have valid registration and authorization to fish issued by the flag state, • Vessel have a valid license to fish in a given EEZ. Best Practices for monitoring:

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			• Information of the flag of the vessel (annual) operating in the RFMO, • Verifying the list of RFMO authorized list of vessels (annual), • Verifying flag state fishery authorization (annual), • Verifying EEZ country fishery authorization (annual).
(b) Resolution of disputes	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 fishery must advocate for a transparent mechanism for the resolution of legal disputes at both the national and RFMO levels, if such mechanisms do not exist.	<u>What data is needed?</u> • Resolution at RFMO level with a protocol to dispute any legal matter, • National level management system or law for a transparent mechanism for the resolution of any legal dispute. <u>Best Practices for monitoring:</u> • Verifying RFMO resolutions on how to resolve legal matters, • Verification of National management systems in relation to conflict resolutions.
(c) Respect for rights	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.	All tuna RFMOs contemplate this aspect in their conventions and/or management systems to some degree (for example in quota allocations). Purse seine fisheries should advocate for the correct implementation of the relevant RFMO measures, if necessary.	<u>What data is needed?</u> • RFMO mandate, • RFMO Resolutions. <u>Best Practices for monitoring</u> • Verifying RFMO resolutions on how they address the legal right of people dependent on fishing for food or livelihood.

Scoring Issues	SG80	Best practices	Monitoring Best Practices
PI 3.1.2 (Consultation, roles and responsibilities) 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.			
(a) Roles and responsibilities	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	Generally, the RFMOs will have well understood roles for monitoring, stock assessment and management. Enforcement will likely be at the national level. The fishery must advocate for explicitly defined and well understood functions, roles and responsibilities at both the national and RFMO levels, if necessary.	What data is needed? • RFMO mandate, • RFMO rules of procedures, • RFMO Resolutions, • National level fishery management plan. Best Practices for monitoring • Verifying RFMO mandate, rules of procedures and new resolutions to identify functions, roles and responsibilities are clearly defined, • Verifying National Fishery Management Plan to ensure that functions, roles and responsibilities are clearly defined/identified.
(b) Consultation processes	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	At the RFMO level, the consultation processes differ. In most cases, local knowledge is provided by the RFMO member countries. And, relevant information from NGOs, industry and other stakeholders is usually considered (although not always accepted). The scoring of this SI may be more variable at the national level. The fishery should advocate that the national management system includes such a participatory consultation process.	What data is needed? • RFMO mandate, • RFMO rules of procedures, • RFMO Resolutions, • National level fishery management plan. Best Practices for monitoring • Verifying RFMO mandate and rules of procedures to ensure that a consultation process is in place. At least, to verify that interested stakeholders can participate in the Commission and subsidiary bodies meetings,
(c) Participation	The consultation process provides opportunity for all		

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	interested and affected parties to be involved.		• Verifying National Fishery Management Plan to ensure that a consultation process is in place.
PI 3.1.3 (Long-term objectives) The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard and incorporates the precautionary approach.			
(a) Objectives	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within management policy.	Long-term objectives tend to be clear in RFMOs in terms of sustainable use, MSY, and the precautionary approach. At the national level this is not necessarily the case. If it is not, the fishery should advocate so that objectives become part of the national fisheries legislation.	<u>What data is needed?</u> • RFMO mandate, • RFMO resolutions (e.g. on precautionary approach, limit and reference points, and management objectives), • National level fishery management plan. <u>Best Practices for monitoring</u> • Verifying RFMO mandate and resolutions to identify clear long-term objectives and the use of precautionary approach, • Verifying National Fishery Management Plan includes the long-term sustainability objectives and precautionary approach aligned with RFMO long-term objectives.
PI 3.2.1 (Fishery-specific objectives) The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.			
(a) Objectives	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2,	See P1 and P2 in general. The RFMO should have short and long-term objectives for bigeye, yellowfin and skipjack (the P1 species) as well as for P2. If this is not the case, the fishery should engage with its flag	<u>What data is needed?</u> • RFMO resolutions (e.g. on precautionary approach, limit and reference points, and management objectives),

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	are explicit within the fishery-specific management system.	state to ensure management objectives are established with the RFMO.	• RFMO resolutions on P1 and P2 for target/bycatch species, • National level fishery management plan. Best Practices for monitoring • Verifying RFMO resolutions to identify clear short and long-term objectives and the use of precautionary approach for target and bycatch species to meet P1 and P2 – see above, • Verifying National Fishery Management Plan includes the short and long-term sustainability objectives and precautionary approach for target and bycatch species under P1 and P2 – see above, • Fleet or UoA-specific management plans to ensure the sustainability of P1 and P2 species.
PI 3.2.2 (Decision-making processes) 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.			
(a) Decision-making processes	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives	Scoring of these SIs will vary by RFMO. It is important that the RFMO demonstrates that it takes action when one or more of the target stocks are being overfished, to address data gaps, etc. The fishery should promote this adaptive decision-making and act proactively to build support for action (e.g. by lobbying their flag state, working with other FIP fisheries etc.).	What data is needed? • RFMO Commission meeting reports with agreements and adopted management measures, • RFMO Management Resolutions, • RFMO Compliance Committee Reports to review that agreed measures are implemented, • RFMO Resolutions on non-compliance,
(b) Responsiveness of decision-making processes	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation,		

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	in a transparent, timely and adaptive manner and take account of the wider implications of decisions.		• RFMO protocol to address and correct non-compliance, • RFMO Resolutions on precautionary approach and best available science. <u>Best Practices for monitoring</u> • RFMO Commission reports to review if the management measures follow scientific advice, • Verifying RFMO compliance reports for non-compliance and corrective actions (sanctions), • Resolutions on measures applicable in case of non-compliance of obligations, • Resolutions on promoting the implementation of management measures, • Creation of a Working Group under the Commission to review the progress of implementation of the management measures by tunaRFMO member countries, • A report of RFMO, each member country and fishery under UoA on the progress on implementation and fulfilment of management measures to be presented to RFMO Compliance group.
(c) Use of precautionary approach	Decision-making processes use the precautionary approach and are based on best available information.		
(d) Accountability and transparency of management system and decision-making process	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	Information on tropical tuna purse seine fisheries is generally available, although it is only improving in recent years with regards to FADs. However, it is not always clear how available information has been used or why it has not been used. In addition, in some RFMOs, meetings to negotiate management measures or assess the compliance of members are closed to observers, and thus not transparent. The	<u>What data is needed?</u> • Fishery specific information from National reports, RFMO database, RFMO data reviews, RFMO Scientific Committee reports, • Transparent RFMO Compliance Committees with data and reports available to accredited observers,

Scoring Issues	SG80	Best practices	Monitoring Best Practices
	recommendations emerging from research, monitoring evaluation and review activity.	fishery should support transparency in the decision-making process and compliance assessment evaluations.	• RFMO Compliance reports that contain data on member non-compliance and their planned actions to address it, • tunaRFMO member country or fishery UoA specific report on the implementation and progress of fulfilment of different management regulations presented to the Compliance Committee by fishery. Best Practices for monitoring • Verifying RFMO compliance reports for non-compliance and corrective actions by fishery – including sanctions, • Resolutions on measures applicable in case of non-compliance of obligations for each fishery, • Verify RFMO Scientific Committee report and Data and Statistic Working Group reports to identify any lack of information from the fishery for fishery data, research, and monitoring, • Verify each tunaRFMO member country report on the implementation and progress of fulfilment of different management regulations by fishery presented to the Compliance Report.
(e) Approach to disputes	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	If the fishery has faced legal challenges at the RFMO level, flag state level, or in countries in whose EEZ it is licensed to fish, it should demonstrate how it has worked to comply with judicial decisions.	What data is needed? • Legal matter dispute progress reports by involved fishery member countries to the RFMO, • Any judicial decisions on the matter, • Vessels listed in the list of authorized vessels of the RFMO,

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			• Vessels have valid registration and authorization to fish issued by the flag state, • Vessel have a valid license to fish in a given EEZ, • Vessel not listed in the RFMO IUU list. <u>Best Practices for monitoring</u> • Information of the flag of the vessel (annual) operating in the RFMO, • Verifying the list of RFMO authorized list of vessels (annual), • Verifying flag state fishery authorization (annual), • Verifying EEZ country fishery authorization (annual), • Verify that vessel is not listed on any RFMO IUU list.
PI 3.2.3 (Compliance and enforcement) Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.			
(a) MCS implementation	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.	MCS tools include vessel licensing and registration, VMS, electronic logbooks, observer coverage, the monitoring of landings and transhipments (in port or at sea), and consequences for IUU activities or non-compliance with requirements, including - at the RFMO level - robust compliance assessment processes and IUU vessel lists - and by States through national enforcement and the application of penalties. Electronic Monitoring systems are a good tool to complement or augment MCS capabilities. The MCS system should be implemented by the flag state, port state, coastal state, RFMOs and also to ensure the laws of the countries where the fishery is licensed to	<u>What data is needed?</u> • Resolution on Port State Measures, • Resolution on VMS and VMS data (e.g. every hour) to verify legal fishing operations, • Resolution on fishing vessels authorized to fish in the RFMO, • Fishing licenses by RFMO, flag state, and by the EEZ country is licensed to fish, • Resolution on mandatory fishery data collection and submission, • Resolution on Observers,

Scoring Issues	SG80	Best practices	Monitoring Best Practices
		operate are followed. RFMO and national MCS tools, as well as tuna RFMO compliance processes, should be designed and function in accordance with modern best practices as described in Koehler (2020a) for RFMO compliance processes, Koehler (2020b) for VMS, van der Geest (2020a) for IUU, and van der Geest (2020b) for transhipment. The data needs and monitoring best practices for strong MSC system should follow the recommendations in Koehler (2020a,b) and Van der Geest (2020a,b).	• Resolutions to establish a system of inspections at port. All above should be established at RFMO, flag state and Port State level. <u>Best Practices for monitoring</u> • VMS data analysis of fishing locations, • Fishery data and observer data (100% either human or EM) to make available and check if it has been submitted to the RFMO, • E-reporting of logbooks and observer information, • Verifying the list of RFMO authorized list of vessels, • Flag state fishery authorization, • EEZ country fishery authorization, • Verify that vessel is not listed on any RFMO IUU list, • Review the flag State RFMO Compliance Report to ensure that the fishery comply with management measures.
(b) Sanctions	Sanctions to deal with non-compliance exist, are of such severity as to deprive the vessel owner/operator of the benefits of its illegal/non-compliant activities, are consistently and fairly applied and thought to provide effective deterrence to future infractions.	The scoring of this SI will depend on the RFMO, flag state and license countries and the fishery should be able to provide this evidence.	<u>What data is needed?</u> • At RFMO level, a Resolution on sanctions on case of non-compliance (see above SI 2.3.2(a)), • At flag state and license country level, a fishery management system and protocol including sanctions for non-compliance; but also data as above for VMS, fishery data collection, logbooks, observer data. <u>Best Practices for monitoring</u>

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			• Resolutions on measures applicable in case of non-compliance of obligations for each fishery, • Verifying RFMO compliance reports for non-compliance and corrective actions by fishery – including sanctions, • Reviewing flag state and license country fishery management protocol to review and sanction non-compliance; including revision of non-compliance report by vessels.
(c) Compliance	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.	The fishery should make available this evidence. In addition, it would be good practice for the fleet manager to instruct skippers about regulations at the RFMO and flag state in addition to countries in whose EEZ the vessels are licensed to fish. Some VMS and EMS can be programmed to warn the vessel and managers when approaching an area where the vessel cannot legally fish.	See PI 3.2.2 and SI 3.2.3(a) and (b)
(d) Systematic non-compliance	There is no evidence of systematic non-compliance.		
PI 3.2.4 (Monitoring and management performance evaluation) There is a system for 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.			
(a) Evaluation coverage	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	Key parts of the fishery-specific management system will be at the RFMO and flag state level and it should be easy to demonstrate the mechanisms in place.	<u>What data is needed?</u> • RFMO management resolutions (see above) in relation to fishery short- and long-term objectives for target/bycatch species and P1-2, • Fishery-specific management plan for target/bycatch species and P1-2,

Scoring Issues	SG80	Best practices	Monitoring Best Practices
			Best Practices for monitoring • Review fishery specific performance against RFMO management regulations in place, • Review fishery specific performance against Fishery specific management plan (action plan) established.
(b) Internal and/or external review	The fishery- specific management system is subject to regular internal and occasional external review.	External reviews of all RFMOs have taken place. The fishery should support efforts to review the flag state management system if they are absent.	What data is needed? • Internal and External peer-review process of RFMO management measures and its progress/effectiveness, • A review of fishery specific management plan aligned with RFMO requirement. Best Practices for monitoring • RFMO Performance Peer-Review system, including a revision of the process but also whether the management measures are being complied with and are effective (Compliance Reports).

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