



**Fisheries Improvement Project – Skipjack and Yellowfin
Tuna Purse Seine fishery, Kendari, Southeast Sulawesi,
Indonesia.**

Six Year Review and Progress Report

Prepared for

WWF Italy

Prepared by

FishListic Pty Ltd

October 2025

Table of Contents

Glossary	3
Executive Summary	4
Introduction	6
Fisheries Standard versions.....	7
Definition of the Objectives	10
FIP Actions and Review of Progress	11
Task 1.1 – Archipelagic waters Harvest Strategy & Control Rules	11
Justification:	13
Recommendations:	21
Task 2.1 – e-logbooks and observer program	22
Justification:	23
Recommendations:	31
E-logbooks:.....	31
Observers:	31
Task 3.1 – Bigeye tuna catch data	32
Justification:	33
Recommendations:	35
Task 3.2 – Secondary and ETP species catch data	36
Justification:	37
Recommendations:	38
Task 3.3 – Impact of aFADs	39
Justification:	40
Recommendations:	41
Task 3.4 – aFAD database	42
Justification:	43
Recommendations:	45
Task 4.1 – Implementation of WCPFC measures in zones 716 & 717	46
Justification:	47
Task 5.1 – Purse seine specific objectives	48
Justification:	49
Recommendations:	50
Task 6.1 – Decision making processes	51
Justification:	52
Task 7.1 – Fishery specific management	54
Justification:	55
Recommendations:	55
Task 8.1 – Compliance risk assessment	56
Justification:	57
Recommendations:	57
Task 8.2 – MCS tools	58
Justification:	59
Recommendations:	60
Task 8.3 – Fisher compliance	61
Justification:	62
Recommendations:	62
Task 8.4 – Sanctions	63
Justification:	64
Recommendations:	64
Appendix 1 – stakeholder interviews	65
References	65

Glossary

aFAD	Anchored Fish Aggregating Device
BET	Bigeye Tuna
BRIN	National Research & Innovation Agency, Indonesia
CDSI	Centre of Data Statistics & Information, Indonesia
CODRS	Crew Operated Data Recording System
CoC	Chain of Custody
DGCF	Directorate General, Capture Fisheries
EEZ	Exclusive Economic Zone
e-logbooks	electronic logbooks
ETPs	Endangered, Threatened and Protected species
FAD	Fish Aggregating Device
FIP	Fisheries Improvement Project
GT	Gross Tonnage
HCR	Harvest Control Rules
HL	Hand Line
HS	Harvest Strategy
IUU	Illegal, Unreported, Unregulated
IAW	Indonesian Archipelagic Waters
LRP	Limit Reference Point
MCS	Monitoring, Control and Surveillance
MMAF	Ministry of Marine and Fisheries, Indonesia
MSC	Marine Stewardship Council
NPOA	National Plan of Action
NTMP	National Tuna Management Plan
PBN	PT Pahala Bahari Nusantara
PS	Purse Seine
PL	Pole and Line
RFMO	Regional Fisheries Management Organisation
RPOA	Regional Plan of Action
SC	Scientific Committee
SPB	Surat Persetujuan Berlayar Kapal (Sailing Permit)
TAC	Total Allowable Catch
TMI	Tuna Management Institute
TRP	Target Reference Point
UoA	Unit of Assessment
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission
WPP/WPPNRI	<i>Wilayah Pengelolaan Perikanan</i> (Fisheries Management Area) of the Republic of Indonesia
WFF	Walton Family Foundation
WWF	World Wildlife Fund for Nature
YKAN	Yayasan Konservasi Alam Nusantara (Traces of People and Nature)

Executive Summary

This report details the outcomes of an independent review (sixth year review) of the Fisheries Improvement Project (FIP) for the Indonesian Southeast Sulawesi Skipjack and Yellowfin tuna purse seine fishery, for vessels supplying to PT Pahala Bahari Nusantara and Tri Marine.

It is important to note that this review report does not repeat background information that was provided in earlier review reports. Therefore, this report should be read in conjunction with the first-year report (2000), and the third-year report (2022) for a more thorough understanding of progress.

The initial Marine Stewardship Council (MSC) pre-assessment (Banks, 2018) used version 2.0 of the Fisheries Standard, and outcomes and scores (Table 1) indicated that the fishery required significant improvement across a range of indicators in order to be eligible for full assessment certification. The FIP was originally developed to address these key areas of improvement over a five-year period, and was independently reviewed in 2022.

The 2018 pre-assessment identified key areas that needed attention including:

- **Principle 1** – development and implementation of harvest strategy (1.2.1) and harvest control rules (1.2.2);
- **Principle 2** – greater data and information for primary species (2.1.3); secondary species (2.2.3); endangered, threatened and protected (ETP) species (2.3.3); and habitats (2.4.3); better understanding of fishery impacts and management of secondary species (2.2.1, 2.2.2) and habitats (2.4.1, 2.4.2); and
- **Principle 3** – legal and customary framework (3.1.1), fishery specific objectives (3.2.1), decision making (3.2.2) and compliance and enforcement (3.2.3).

This review report consists of:

1. Detailed review of the FIP deliverables in the past 36 months against the FIP Action Plan milestones.
2. Proposed updates to the initial (2018) MSC pre-assessment scoring against MSC Fisheries Standard (FS), considering deliverables achieved since 2022.
3. Recommendations for the FIP Action Plan.

There has been significant progress made in key areas as all parties (government, fishers, PBN, WWF, etc.) involved in the FIP deliverables have clearly conducted numerous projects aimed at addressing various tasks associated with the FIP. Everyone involved in the FIP activities to date should be commended for this progress. However, despite these improvements, additional work is still required. There has been some scoring issue changes for some FIP tasks, but Performance Indicator scores have not changed.

The results of this review found that with all the effort conducted to date, the overall MSC scores have altered from that of the 2018 pre-assessment and the third-year review. There has been improvement of some scoring issues that unfortunately did not equate to improvements in overall Principle Indicator scores. For example, Task 1.1 related to four Scoring Issues from two Principle Indicators, and some did not improve. Three PIs are now likely to be above SG 80, although the fishery still needs improvement in the following areas:

- 1) Continued development and implementation of the harvest control rules within the Harvest Strategy with emphasis on deciding appropriate target reference points (TRP) for each species;
- 2) Improving data for all species through greater compliance/verification of e-logbooks and consistently applied observer coverage;
- 3) Greater implementation of compliance and enforcement tools, measures, and sanctions.

The review has made 38 recommendations, the most imperative being the review of the 2018 pre-assessment and FIP WorkPlan to align with a current version of the MSC FS.

Table 1: MSC pre-assessment scores post sixth year (2025) FIP review.

Component		Performance Indicator	SKJ	YFT
Principle 1	Outcome	1.1.1 – Stock status	≥80	≥80
		1.1.2 – Stock rebuilding.	NA	NA
	Management	1.2.1 – Harvest Strategy	<60	<60
		1.2.2 – Harvest control rules and tools	<60	<60
		1.2.3 – Information and monitoring	≥80	≥80
Principle 2	Primary Species	1.2.4 – Assessment of stock status	≥80	≥80
		2.1.1 – Outcome	≥80	≥80
		2.1.2 – Management strategy	≥80	≥80
	Secondary species	2.1.3 – Information	60-79	60-79
		2.2.1 – Outcome	60-79	60-79
		2.2.2 – Management strategy	60-79	60-79
	ETP species	2.2.3 – Information	60-79	60-79
		2.3.1 – Outcome	≥80	≥80
		2.3.2 – Management strategy	≥80	≥80
	Habitats	2.3.3 – Information	60-79	60-79
2.4.1 – Outcome		60-79	60-79	
2.4.2 – Management strategy		60-79	60-79	
Ecosystems	2.4.3 – Information	≥80	≥80	
	2.5.1 – Outcome	≥80	≥80	
	2.5.2 – Management strategy	≥80	≥80	
Principle 3	Governance and Policy	2.5.3 – Information	≥80	≥80
		3.1.1 – Legal and/or customary framework	≥80	≥80
		3.1.2 – Consultation, roles, and responsibilities	≥80	≥80
	Fishery Specific Management Systems	3.1.3 – Long term objectives	≥80	≥80
		3.2.1 – Fishery-specific objectives	60-79	60-79
		3.2.2 – Decision-making processes	60-79	60-79
		3.2.3 – Compliance and enforcement	<60	<60
	3.2.4 – Management performance evaluation	≥80	≥80	

Introduction

Indonesia's maritime waters, including both archipelagic and oceanic waters, are covered by 11 Fisheries Management Areas (*Wilayah Pengelolaan Perikanan, WPP*). Areas WPP 713, WPP 714 and WPP 715 fall within the Indonesian Archipelagic Waters (IAW), which is subject to national jurisdiction (Figure 1).

This Fisheries Improvement Project (FIP) consists of two Units of Assessment (UoA), Skipjack Tuna (*Katsuwonus pelamis*) and Yellowfin Tuna (*Thunnus albacares*), taken using purse seine gear, operating in Archipelagic waters within the exclusive economic zone (EEZ) of Indonesia in the following Indonesian management areas: WPP 713 (The Makassar Strait and the Flores Sea), WPP 714 (The Banda Seas) and WPP 715 (The Maluku and Seram Seas) (FAO area 71).

The number of vessels representing the Unit of Certification (UoC) is expected to be fluid (2018 (97 vessels), 2019 (59 vessels), 2020 (78 vessels), 2021 (24 vessels). In 2025 the Vessel list included 162 vessels each being ≥ 10 GT and longer than 12 m (Filename: 'Vessel List Fishery Progress 04.06.25.xls'). In general, tuna is purchased from vessels ≤ 30 GT, with only one exception being vessel being recorded as 31 GT since 2017.

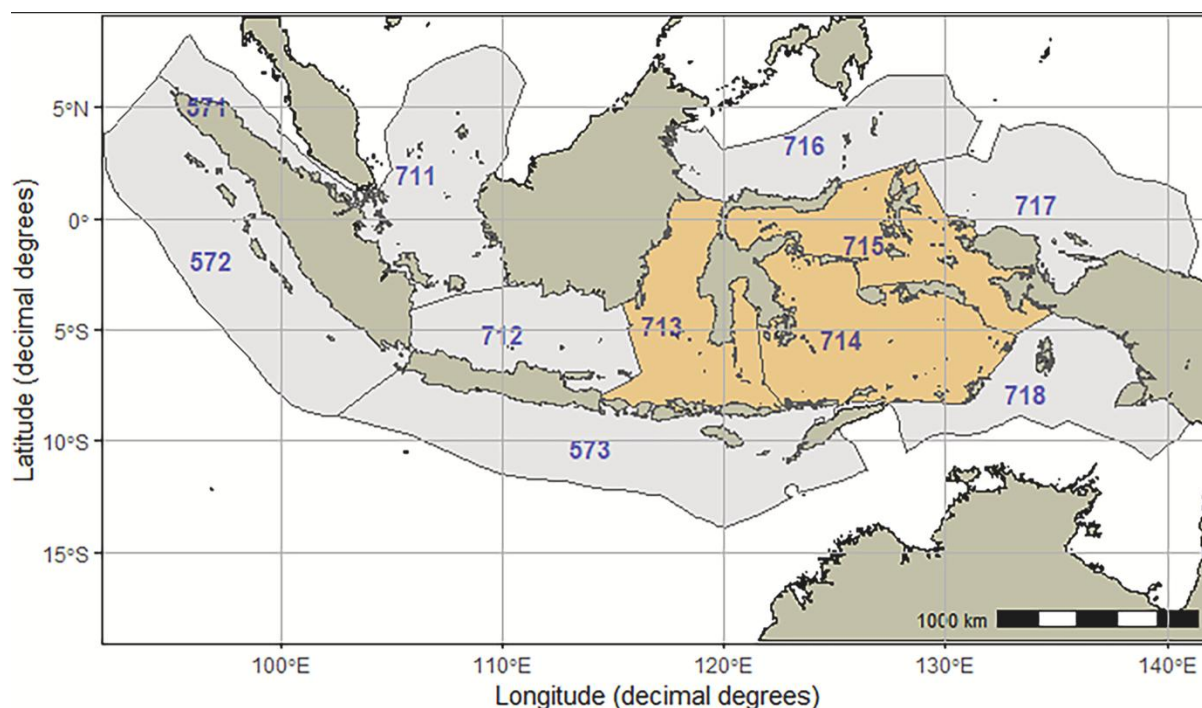


Figure 1. Map of Indonesian fishing areas highlighting WPP 713, 714 and 715 (Source: Hoshino et al. 2024).

In IAW, purse seine vessels target straddling tuna stocks from the Western and Central Pacific Ocean (WCPO). These vessels catch the two principal tropical tuna species, Skipjack (SKJ) and

Yellowfin (YFT), but as part of their day-to-day operations, may also catch smaller pelagic species (*Decapterus* spp), other tuna species like Bigeye Tuna (*Thunnus obesus*) and some neritic tunas (e.g., Bullet Tuna (*Auxis rochei*)).

The UoAs are:

- Pacific Ocean Skipjack Tuna (UoA 1),
- Pacific Ocean Yellowfin Tuna (UoA 2)

Fisheries Standard versions

The FIP Action Plan was developed as a result of the 2018 MSC pre-assessment scoring outcomes conducted using the Marine Stewardship Council Fisheries Certification Requirements, Version 2, 2014. Table 2 presents the initial preassessment scores of the fishery for each of the UoAs in 2018 (Banks, 2018). It is important to note that the MSC Fisheries Standard has been updated several times since the first pre-assessment, with [version 2.01](#) released in 2018 and version 3.0 released in 2024. Version 3.1 is also currently available although it remains in review till early 2027. At this stage, any new fishery entering the MSC full certification process has until October 2027 to use version 2.01 or version 3.0. As FS v 2.0 is no longer applicable, the wording within some tasks will reflect FS v 2.01 and associated guidance.

Table 2: Original 2018 MSC pre-assessment scoring outcomes for the Kendari Tuna Purse Seine Fishery (Adapted from Banks, 2018)

		Year	2018	2018
		Unit of Assessment number	UoA 1	UoA 2
		Species	SKJ	YFT
		Fishery/Zone/Gear	Purse Seine	Purse Seine
Component		Performance Indicator		
Principle 1	Outcome	1.1.1 – Stock status	≥80	≥80
		1.1.2 – Stock rebuilding.	NA	NA
	Management	1.2.1 – Harvest Strategy	<60	<60
		1.2.2 – Harvest control rules and tools	<60	<60
		1.2.3 – Information and monitoring	60-79	60-79
	1.2.4 – Assessment of stock status	≥80	≥80	
Principle 2	Primary Species	2.1.1 – Outcome	≥80	≥80
		2.1.2 – Management strategy	≥80	≥80
		2.1.3 – Information	60-79	60-79
	Secondary species	2.2.1 – Outcome	60-79	60-79
		2.2.2 – Management strategy	60-79	60-79
		2.2.3 – Information	60-79	60-79
	ETP species	2.3.1 – Outcome	60-79	60-79
		2.3.2 – Management strategy	60-79	60-79
		2.3.3 – Information	60-79	60-79
	Habitats	2.4.1 – Outcome	60-79	60-79
		2.4.2 – Management strategy	60-79	60-79
		2.4.3 – Information	60-79	60-79
	Ecosystems	2.5.1 – Outcome	≥80	≥80
2.5.2 – Management strategy		≥80	≥80	
2.5.3 – Information		≥80	≥80	
Principle 3	Governance and Policy	3.1.1 – Legal and/or customary framework	<60	<60
		3.1.2 – Consultation, roles, and responsibilities	≥80	≥80
		3.1.3 – Long term objectives	≥80	≥80
	Fishery Specific Management Systems	3.2.1 – Fishery-specific objectives	60-79	60-79
		3.2.2 – Decision-making processes	60-79	60-79
		3.2.3 – Compliance and enforcement	<60	<60
		3.2.4 – Management performance evaluation	≥80	≥80

The initial MSC pre-assessment scores (Table 2) were updated in:

- 2020 in accordance with the Year 1 FIP review outcomes,
- 2022 for the third year review (Table 3); and
- 2025 as a part of this sixth year review (Tables 1 & 3)

Table 3: Comparison of MSC pre-assessment scores in 2018, with those from the third review (2022) and this review (2025) .

		Year	2018	2018	2022	2022	2025	2025
			UoA 1	UoA 2	UoA 1	UoA 2	UoA 1	UoA 2
		Species	SKJ	YFT	SKJ	YFT	SKJ	YFT
		Fishery/Zone/Gear	Purse Seine	Purse Seine	Purse Seine	Purse Seine	Purse Seine	Purse Seine
	Component	Performance Indicator						
Principle 1	Outcome	1.1.1 – Stock status	≥80	≥80	≥80	≥80	≥80	≥80
		1.1.2 – Stock rebuilding.	NA	NA	NA	NA	NA	NA
	Management	1.2.1 – Harvest Strategy	<60	<60	<60	<60	<60	<60
		1.2.2 – Harvest control rules and tools	<60	<60	<60	<60	<60	<60
Principle 2	Primary Species	1.2.3 – Information and monitoring	60-79	60-79	60-79	60-79	≥80	≥80
		1.2.4 – Assessment of stock status	≥80	≥80	≥80	≥80	≥80	≥80
		2.1.1 – Outcome	≥80	≥80	≥80	≥80	≥80	≥80
		2.1.2 – Management strategy	≥80	≥80	≥80	≥80	≥80	≥80
	Secondary species	2.1.3 – Information	60-79	60-79	60-79	60-79	60-79	60-79
		2.2.1 – Outcome	60-79	60-79	60-79	60-79	60-79	60-79
		2.2.2 – Management strategy	60-79	60-79	60-79	60-79	60-79	60-79
		2.2.3 – Information	60-79	60-79	60-79	60-79	60-79	60-79
	ETP species	2.3.1 – Outcome	60-79	60-79	≥80	≥80	≥80	≥80
		2.3.2 – Management strategy	60-79	60-79	≥80	≥80	≥80	≥80
		2.3.3 – Information	60-79	60-79	60-79	60-79	60-79	60-79
	Habitats	2.4.1 – Outcome	60-79	60-79	60-79	60-79	60-79	60-79
2.4.2 – Management strategy		60-79	60-79	60-79	60-79	60-79	60-79	
2.4.3 – Information		60-79	60-79	60-79	60-79	≥80	≥80	
Ecosystems	2.5.1 – Outcome	≥80	≥80	≥80	≥80	≥80	≥80	
	2.5.2 – Management strategy	≥80	≥80	≥80	≥80	≥80	≥80	
	2.5.3 – Information	≥80	≥80	≥80	≥80	≥80	≥80	
Principle 3	Governance and Policy	3.1.1 – Legal and/or customary framework	<60	<60	<60	<60	≥80	≥80
		3.1.2 – Consultation, roles, and responsibilities	≥80	≥80	≥80	≥80	≥80	≥80
		3.1.3 – Long term objectives	≥80	≥80	≥80	≥80	≥80	≥80
	Fishery Specific Management Systems	3.2.1 – Fishery-specific objectives	60-79	60-79	60-79	60-79	60-79	60-79
		3.2.2 – Decision-making processes	60-79	60-79	60-79	60-79	60-79	60-79
		3.2.3 – Compliance and enforcement	<60	<60	<60	<60	<60	<60
		3.2.4 – Management performance evaluation	≥80	≥80	≥80	≥80	≥80	≥80

This technical report presents the findings and outcomes of the sixth-year review and progress update of the Kendari tuna purse seine FIP, based in the port of Kendari and fishing in Archipelagic and Territorial Waters within management areas WPP 713 (The Makassar Strait and the Flores Sea), WPP 714 (the Banda Seas) and WPP 715 (the Maluku and Seram Seas).

This review has been conducted in accordance with the requirements of a comprehensive FIP and fisheryprogress.org guidelines. The review consisted of:

- Stakeholder consultation meetings conducted via Microsoft Teams (Appendix 1);
- Desktop review of current FIP materials and external information;
- Complete analysis of FIP deliverables in the past 36 months against FIP action plan milestones;
- MSC pre-assessment outcomes; and
- Updated MSC pre-assessment scores against the MSC standard version 2.01, taking into account deliverables achieved.

Definition of the Objectives

The project's objective is:

To ensure the long-term livelihood of fishers by establishing sustainable resource management for the Kendari purse seine tuna fishery, and supporting preservation of allied ecosystems from which these resources depend.

The sub-objectives include:

- Target species are well managed;
- Information on fleet composition and species catch strengthened;
- The ecosystem-based approach to fisheries management integrated;
- The effective application of regional (RFMO) and national measures for straddling stocks;
- Fishery specific management planning effective; and
- Compliance systems within the tuna fisheries strengthened.

Specific actions (goals and names) and tasks are defined under each sub-objective. These are assigned timelines, a more comprehensive description of what is required, along with the principal implementing authority; and the scoring guidance issue that has to be met.

FIP Actions and Review of Progress

Task 1.1 – Archipelagic waters Harvest Strategy & Control Rules

Project Objective		<i>To ensure the long-term livelihood of fishers by establishing sustainable resource management for the Kendari purse seine tuna fishery, and supporting preservation of allied ecosystems from which these resources depend'</i>				
Sub objective 1: Target species well managed						
Action goal: Archipelagic Harvest Strategies in Place and Implemented (713/714/715)						
Action name 1: Complete the development of the national harvest strategy for Archipelagic Waters that is compatible with WCPFC						
Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre-assessment scoring (Oct 2018)	MSC Scoring guidepost 60 & 80	Updated review Progress score (2025)
Direktorat Jenderal Perikanan Tangkap/PUSRISKAN	Provide support to the development of the AW Management system including: Testing, refinement and selection of operational objectives and harvest strategy, including a Management Strategy Evaluation, where testing on the HCR allows for the main uncertainties; Specification and implementation of management measures for all participating fleets with well-defined HCRs in place that ensure that the exploitation rate is reduced as the PRI is approached, or are expected to keep the stock fluctuating around a target level consistent with (or above) MSY; Strengthening the information base and monitoring stock status and the responsiveness of the management system and fleet to stock status; Determining necessary regulatory and monitoring requirements for implementation; and providing available evidence indicates that the tools in use are appropriate and effective.	Jun-19	MSE and Workshop Reports		1.2.1a Harvest Strategy Design: SG 60: The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80. SG 80: Elements of the harvest strategy work together to achieve stock management objectives.	<60
					1.2.1b SG 60: The harvest strategy is likely to work based on prior experience or plausible argument. SG 80: Harvest Strategy Evaluation: The HS may not have been fully tested but evidence exists that it is meeting its objectives.	60-79
					1.2.2a HCR design and application: SG 60: Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached. SG 80: 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	60-79

					key LTL species a level consistent with ecosystem needs.	
					<p>1.2.2c HCR evaluation:</p> <p>SG 60: There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.</p> <p>SG 80: Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.</p>	<60

Justification:

Harvest strategy and control rules

The ‘*Framework for Harvest Strategy for Tropical Tuna in Archipelagic waters of Indonesia*’ was developed through a 9-year national consultative process, commencing in 2014 and culminating in the official adoption of the framework in June 2023. This harvest strategy framework for tropical tuna is a departure from a previously open-access fishery, and Hoshino et al. (2024) outlined the processes and challenges encountered in its development. Bigeye tuna is also included in the harvest strategy, but is not a UoA species for the FIP although is the subject of Task 3.1 below.

Hoshino et al. (2024) provided insight into the process of developing the harvest strategy for the fishery. ACAIR (2023) also includes commentary on the development of the harvest strategy and reported that one of the major difficulties in implementing the harvest strategy successfully was getting stakeholder agreement on harvest control rules for the fishery.

The harvest strategy¹ outlines the management measures in place, and in addition, on 6 March 2023, *Regulation Number 11 of 2023 on Measured Fishing* was enacted. Key provisions relevant to the FIP include:

- Measured fishing zones 1-6 with the scope outlining the fishing territory (WPPNRI) covered.
- Fishing quotas within measures fishing zones that determined by the Minister. Quota consists of (i) industrial quota; (ii) local quota; and (iii) non-commercial quota.
- The introduction of base ports and the requirement to land catch at one of the five appropriate ports per fishing zone.
- Indonesian fishing crew requirement.
- Rules for the transportation of captured fish.

Stakeholders have also agreed to cease further licenses for vessels > 30 GT in archipelagic waters. MMAF implemented this limited entry management measures.

Reference Points

In IAW, the LRP of 0.2 has been defined for YFT and SKJ, although a Target Reference Point (TRP) for both species remains undecided. Satria et al. (2023) provided the most recent update on the harvest strategy to WCPFC. The Harvest Strategy² operational objective is “*Maintaining spawning stock biomass (SSB) above reference limit point (LRP) 0.2 of the uncaptured level with a probability of 90%*”. Davies et al. (2024) provided details on the facilitation of the policy and technical consultative processes for the development of the Harvest Strategy Framework for the tropical tuna fisheries in Indonesia. Davies et al. noted that the rationale for HS operation objective mentioned above “*was to avoid declines in the average recruitment, subsequent reductions in long-term sustainable catches from the fishery and risk to the stock. This LRP was consistent with those adopted by several tuna RFMOs, including WCPFC and IOTC. Moreover, based on the preliminary results of the Management*

¹ Filename: *Katimja ZEEI_Pengantar HS.id.en*

² Filename: *Katimja ZEEI_Pengantar HS.id.en*

Strategy Evaluation (MSE) and the latest stock assessment results that indicate declining trend of the stocks, the stakeholders recommended the government to adopt policy measures, including a ban on new licenses for vessels over 30 GT in 2019 and adoption of a precautionary catch reduction plan in 2023, as agreed at the Stakeholder Workshop in November 2022. These policy decisions are evidence that the project has already had direct impacts for the management of this important fishery.” A TRP has not been agreed for IAW, however RFMOs have been discussing TRPs for numerous years.

Skipjack: The WCPFC interim TRP for Skipjack is that the spawning biomass should be 36 – 50 percent of the unfished spawning biomass on average (*WCPFC18-2021-10*). The IOTC TRP is spawning biomass should be 40 percent of the estimated unfished spawning biomass on average (*IOTC Resolution 2016-02*). The most recent estimate of spawning stock biomass for Skipjack comes from the latest WCPFC SKJ stock assessment by Tears et al. (2025). Spawning biomass estimates were provided for 8 regions of the WCPO, of which Indonesia is in Region 5 (see Figure 1 of Tears et al. 2025). Length composition data suggests that smaller fish were caught after 2010 in Region 5 and Region 5 has the lowest $SB/SB_{F=0}$. However, Region 5 is not below the LRP of 0.2 set by the HS (see Figure 79 of Tears et al. 2025), and results were presented against a recalibrated iTRP. As a whole, the $SB_{\text{recent}}/SB_{F=0}$ for SKJ stock was estimated to be 0.51 (0.45–0.63 80% confidence), and the stock is not listed as overfished or subject to overfishing.

Yellowfin: The IOTC interim TRP is the fishing mortality that gives maximum sustainable yield (F_{MSY}). A TRP for YFT has not been agreed by WCPFC, however, pending agreement on a TRP, the spawning biomass depletion ratio (spawning biomass relative to unfished spawning biomass) is to be maintained at, or above, the average depletion for the period 2012-2015 (CMM 2020-01).

The 2023 WCPO yellowfin tuna stock assessment median depletion from the model grid for the recent period (2018–2021; $SB_{\text{recent}}/SB_{F=0}$) was estimated at 0.47 (10th to 90th percentile interval of 0.42 to 0.52, including estimation and structural uncertainty). As such the YFT WCPO stock is above the LRP set by the HS.

Measures in the Harvest Strategy

Current measures in the Harvest Strategy include:

- (1) Fish Aggregating Devices (FADs).
FAD management developed through *MMAF Regulation No. 18/2021* concerning placement fishing gear and auxiliary fishing gear in FMA, and *MMAF Decree No. 7/2022* concerning FADs allocation within the 3rd fishing lane in FMA that limits the placement and number of FADs in FMA >12 nm.
- (2) Spatial closure (of important spawning or nursery grounds) and temporal closure (during important events, such as spawning). Amendment of *MMAF Regulation No. 4/2015* by *MMAF Regulation No. 26/2020* on prohibition of fishing in the important events and habitat of YFT at FMA 714 between October and December.
- (3) Total Allowable Catch (TAC) limits per Fishery Management Area. Initial fishing allocation policy in FMA was introduced by MMAF through *DGCF Decree No. 132/Kep-DJPT/2018*. This policy has been updated by *DGCF Decree No. 9, 20-29/Kep- DJPT/2020*. Quota- and zone-based fishing policy is regulated through

Government Regulation No. 11/2023 on quota- and zone-based fishing (Penangkapan Ikan Terukur – PIT). Based on *Government Regulation No. 11/2023*, the breakdown of TAC by commodity and FMA will be further developed through Ministerial Regulation of MMAF. Through a series of technical and stakeholder workshops, it was agreed to take action in implementing precautionary catch reduction plan for tropical tuna in the IAW.

Each measure and any deficiencies are discussed in more detail below.

1. Limiting FADs

The *Minister of Maritime Affairs and Fisheries Decree No. 7/2022* concerns the allocation of fish aggregating devices (FADs) in fishing lane III in WPPNRI and it limits the placement and number of FADs in waters greater than 12 miles from shore.

It was identified that that lack of reliable data on the number and position of FADs posed challenges for effective management. In 2021, collaborative research was conducted between the Centre for Fisheries Research (CFR)-MMAF and the MDPI Foundation to support the effective implementation of this management measure. One major challenge is the reluctance of fishers to register the FADs they deploy at sea, making it difficult to obtain crucial data such as the number and positions of FADs. More recent research findings (Widodo et al. 2023) highlighted the challenges in managing aFADs due to the unavailability of comprehensive data and information on their number and position.

Surface FADs (drifting FADs (dFADs) and anchored FADs (aFADs)) are most common for tuna fisheries and Widodo et al. (2022³) provided a comprehensive overview of FADs in Indonesia. Widodo et al. (2023⁴) conducted research utilising Sentinel-1 satellite image data from July and August 2020. The images were analysed using the Constant False Alarm Rate algorithm and a geospatial approach. Waters >12 nm from the coastline of IAW were investigated and the estimated the number of FADs in Indonesia FMA 713, 714, and 715 was 661, 608, and 291 units respectively. The distance between FADs was generally less than ten nautical miles.

In late 2022 the FIP noted that: *“MMAF together with MDPI and the Walton Tuna Consortium have conducted two workshops on FAD registration for vessels <30GT, and have identified several bottlenecks during the process, and work on streamlining for future applications”*.

There is no data or further information on discussions for aFAD registry and compliance. The FIP team have indicated that an aFAD registry in IAW is unlikely to eventuate as both Captains and vessel owners consider locations to be commercially confidential information with little to no transparency. Moreover, the regulated FAD registration for waters outside 12nm (outside of this FIP) has also been delayed. At this stage there is a distinct lack of willingness to participate in the development of an aFAD registry for the IAW. Electronic logbooks have the entry field for FAD vs non-FAD settings, but it is uncertain if the data is consistently

³ Widodo Agustinus Anung, Wilcox Chris, Sadiyah Lilis, Satria Fayakun, Wudianto , Ford Jessica, Hardesty Britta Denise (2023) Developing indicators to detect the use of fish-aggregating devices. *Marine and Freshwater Research* **74**, 535-543.

⁴ Widodo, Anung & Wudianto, Wudianto & Satria, Fayakun & Hargiyatno, Ignatius & Sadiyah, Lilis & Timur, Putra & Wibowo, Sandi & Anggawangsa, Regi & Hartaty, Hety & Yati, Emi. (2023). Estimation of number and position of fish aggregating devices in Indonesia Archipelagic Waters. E3S Web of Conferences. 442. 10.1051/e3sconf/202344203002.

entered. Both logbooks and observer forms are very similar with regard to field settings, and observer data might be suitable for verification of e-logbooks FAD/non-FAD settings. Whilst no evidence was provided of systematic non-compliance or sanctions for any non-compliance relating to FADs or fishing inside/outside 12 nm regulations, it is unclear if this is due to good compliance to regulation by fishers or paucity of monitoring/penalties issued. The review team was told that suspicious movements in restricted areas (identified via SpotTrace) can trigger an investigation by MMAF, however the FIP team is unaware of any sanctions being imposed for those vessels. Requests were made to MMAF and Kendari Port Authority for compliance data, although none was provided.

2. Closures

The 2023 harvest strategy outlined the management measures already in place including the YFT spawning closure through *Ministerial Decree 26/2020*. This temporal spatial closure prohibits fishing for YFT in an area indicated in WPP 714 and out to 12 nm off the coastline between the months of October to December inclusive (Figure 2) (Permen KP 26_2020 Banda Sea closure.pdf).

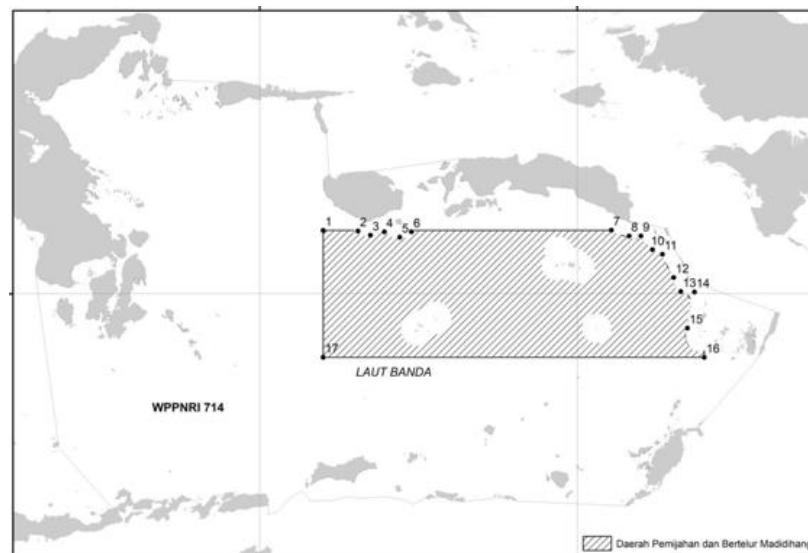


Figure 2: Yellowfin spawning closure in WPP 714 (Permen KP 26_2020 Banda Sea closure.pdf).

While the Yellowfin tuna spawning closure has been implemented in the fishery, the effectiveness of the closure to help meet the HS objective has not been defined. The closure is implemented in a small area inside one WPP (714). Yellowfin tuna is still allowed to be harvested in WPP 714, just not from the small closed area during October-December. Preliminary life history research was conducted (Davies et al. 2024⁵) of these species in IAW. Davies et al. (2024) reported that YFT were spawning at a smaller size (63 cm FL) in the east (Bitung/Kendari) compared to the west (Palabuhanratu/Cilacap) (103 cm FL).

Preliminary analysis of the sampling data was completed in August 2022 during in-person training workshop, although this part of the project remains incomplete. With regard to this

⁵ <https://www.aciar.gov.au/publication/fis-2016-116-final-report>

project's importance in supporting the Harvest Strategy it was noted that: *"Unable to commence sample processing due to extended administrative delay due to BRIN restructure, which resulted in ACIAR decision to close project. Samples collated and secured at BRIN and MMAF facilities, with intention to process as soon as resources are available and current administrative issues are resolved. HS process confirmed the priority and value of these data for Indonesian specific population parameters for Harvest Strategy and wider WCPFC stock assessments."* Given that fishers are still permitted to harvest YFT from all other parts of WPP 714, no additional data was provided that supports the suitability of the current spawning closure in meeting the objectives of the HS.

In 2020, PBN data indicates that over 800 t of YFT was purchased from WPP 714 between the months of October and December, while in 2021, about 400 t was purchased. This reduction potentially corresponds with the large reduction (from 78 to 24) in the number of active vessels supplying PBN that year. The review team requested data on the amount of YFT purchased from WPP 714 between October and December but it was unavailable in time.

Compliance with the closure

The introduction of *Spot Trace* is a positive development within the fishery and has the potential to assist the FIP and the wider fishery's vessels with MCS requirements, especially compliance and enforcement. However, the number of vessels currently implementing *Spot Trace*, or any other vessel monitoring system, is still very low and not representative of the fishery or the FIP. Without stronger MCS tools (e.g., greater uptake of vessel monitoring systems such as *Spot Trace*) to assist verification of fishing location during these closure periods, it will be difficult to assess the effectiveness of these measures in meeting objectives associated with the harvest strategy.

Compliance and the issuing of sanctions remains a potential issue as smaller vessels < 30 GT are not legally required to operate VMS or have observers onboard. Hence, the vessels in the FIP are not required to operate VMS, or have observers onboard, making verification of fisher compliance with closures problematic. However, this review notes that vessels participating in the FIP are all voluntarily installing *Spot Trace* VMS units and/or carrying human observers. Efforts continue to increase coverage across the entire FIP fleet supplying PBN (Table 3).

The successful implementation of this management measure is yet to be determined, given the practicalities and realities of the current fishery, its management and compliance mechanisms. In WPP 714, Irwan Nur (2025)⁶ noted that YFT spawning occurs August to October yet the closures to protect spawning YFT is October to December.

Recommendations

1. Data on effort and YFT catch outside of the spatial closure from October to December needs to be analysed to determine if the closure has shifted effort and/or altered YFT catches.
2. Analysis and interrogation of *Spot Trace* data to evaluate compliance of closure.

⁶ *Filename: Paparan Dr Andi Irwan Nur_WPP 714 - 2025-08-03 13-11-47_EN.pdf*

3. Although the purse seine operations are unlikely to interact with spawning sized fish, the effectiveness of the YFT closure needs to be reviewed in light of data on YFT spawning season in the WPP 714 area.

3. Quota management

In late 2022, a new Ministerial Regulation on quota and zone-based fishery management policy (*Penangkapan Ikan Terukur – PIT, Regulation No. 11/2023*) was announced by the Minister of MMAF. It stipulates that quota or allocation for Indonesian fish resources, including tropical tuna, is to be set up for each FMA. ACAIR (2023) noted that “*this was somewhat of a surprise to the stakeholder groups*”, as output control measures had previously considered to be less feasible options compared to other potential management measures due to:

- a limited capacity to accurately estimate total landings of tuna in Indonesia;
- a lack of near real-time reporting to be able to close the fishery/FMA when the quota limit is reached; and
- limited surveillance capacity to monitor compliance.

ACAIR (2023) also noted that the advice on the levels of harvest would be based on pre-agreed decision rules and feed-back monitoring, and that such issues need to be addressed with refinement and implementation of the harvest strategy (i.e., as the harvest strategy is updated). It has been noted that in June 2025, MMAF held a technical meeting on quota allocation (Evidence of meeting: *Rumusan_Breakout_Room_WPPNRI_714.id.en.pdf* and ‘*Katimja LBPI_Mekanisme Penghitungan Kuota PIT bahan Makasar.id.en*’), although MMAF advised in October that allocation had not been finalised for the 2026 fishing season.

Davies et al. (2024⁷) presented total YFT, SKJ and BET catch (all gears) for WPP 713-717 and FAO 71 for 2018. The catch in 2021 was not presented although 2021 is listed as ‘baseline’. The reduction in catch from the 2021 ‘baseline’ was presented by Suadela (2025)⁸ as follows:

- 4% reduction in 2023
- 3% reduction in 2024
- 3% reduction in 2025

In July 2025, quota allocations were designated for WPP 714: YFT 14,994.1 t and SKJ 17,197 t. However, it is unclear if these changes will be implemented given the latest statement⁹: “*This means a reduction of catch by approximately 10%; the exact numbers are not final and dynamic, and will be updated by the next reporting period to FP.org*”. Instructions were provided¹⁰ to illustrate how quota was allocated and a July 2025 meeting¹¹ was held to distribute the quota allocation between provinces. In September 2025, MMAF informed the

⁷ <https://www.aciar.gov.au/publication/fis-2016-116-final-report>

⁸ Filename: *Katimja ZEEI_Pengantar HS.id.en*

⁹ Filename: *draft_FP.org Jul 25 update_final*

¹⁰ Filename: ‘*14.07.2025 Kuota Penangkapan Ikan di WPPNRI 714.id.en*’

¹¹ Filename: ‘*Rumusan-Breakout-Room-UPP-WPPNRI-714.id.en.pdf*’

review that they have yet to allocate quota to any WPP and that the desired reductions across 2023 – 2025 were not achieved (Appendix 1).

Management Plan:

The *National Tuna Management Plan* (NTMP) is referred to in the Decree as TCT RPP, came into effect on 27 December 2021 with *Ministerial Decree 121/2021* (Kepmen-KP No 121 Tahun 2021 ttg Rencana Pengelolaan Perikanan Tuna Cakalang dan Tongkol [001-160].pdf).

Within the NTMP, the Indonesian Tropical Tuna Fisheries encompass three areas:

- (1) Indian Ocean Tuna Fisheries,
- (2) Pacific Ocean Tuna Fisheries, and
- (3) Archipelagic Water Tuna Fisheries (Indonesia Archipelagic Waters-IAW).

The NTMP contains a detailed Action Plan tables for each of the fishing areas and addresses the various issues associated with the FIP, such as FAD usage, compliance, VMS, e-logbooks and catches.

The purpose of the NTMP is intended as an effort to support policy management of tuna, skipjack and tuna fish resources. The scope of the NTMP includes:

1. Tuna stocks:
 - a) status of Tuna stocks; and
 - b) strategic plan for the management of Tuna, Skipjack, and Tongkol.
2. Management and implementation area:
 - a) WPPNRI 571, WPPNRI 572, and WPPNRI 573 and the sea off the Indian Ocean *Indian Ocean Tuna Commission* management area (IOTC), and specifically for Southern Bluefin Tuna (*Southern Bluefin Tuna*) managed by *the Commission for the Conservation of Southern Bluefin Tuna* (CCSBT);
 - b) WPPNRI 716 and WPPNRI 717 and the High Seas Pacific which is part of the management area *Western and Central Pacific Fisheries Commission* (WCPFC); and
 - c) Indonesian archipelagic waters, namely WPPNRI 711, WPPNRI 712, WPPNRI 713, WPPNRI 714, WPPNRI 715, and WPPNRI 718.

Review of current measures and stock status

The FIP provided the MMAF minutes of the July 2025 *Annual Meeting of the Fisheries Management Units (UPP) of the Indonesia Fisheries Management Units (WPPNIR 713-714-715¹²)*. Irwan Nur (2025)¹³ provided a WPP 714 tuna stock status report in relation to the current harvest strategy and it was noted that:

- In WPP 714 spawning occurs in May-July for SKJ and August-October for YFT.

¹² Filename: [Rumusan Breakout Room UPP WPPNRI 714.id.en](#)

¹³ Filename: [Paparan Dr Andi Irwan Nur WPP 714 - 2025-08-03 13-11-47 EN.pdf](#)

- In WPP 714, SKJ mature at about 41.8cm and YFT mature at 106.0 cm
- There is a potential impact to biological characteristics with a faster growth rate in SKJ
- Fishing mortality of SKJ exceeded natural mortality and overfishing likely to be occurring.
- Overfishing is likely as decline in CPUE in Banda Sea and decrease in biomass by 32%.
- Juveniles still dominate the catch, with 69.9% of SKJ catch in WPP 714 being juveniles (2019-2024).
- Recruitment season has shifted with June-Sept now considered “peak recruitment”. The shift indicates *“serious population stress and requires immediate management measures to prevent stock collapse”*.

Numerous recommendations were made, and some differed from any previous management recommendations, these include:

- Protect juveniles (SKJ <49cm; YFT <106 cm and BET <110cm);
- Temporal closure during peak recruitment season (June-Sept);
- Reduce fishing mortality F to <0.6;
- Strengthen seasonal closures during spawning and recruitment;
- Evaluation of measures after 6 months to model impact of quota on i) stock; ii) fisher income and iii) conflict.
- Evaluate the longitudinal trends in biological characteristics for each tuna species and use this information when setting quota in WPP714.

Additional recommendations were made by Irwan Nu (2025)¹⁴ with regard to purse seine operations in WPP 714, namely:

- Complete the implementation and governance of FAD limitations;
- Advocate for complete migration of purse seine Area A and adjust mesh-size to >2 inches (excl. vessels <5GT);
- Limit the number of new licenses issued for small purse seiners that use a mesh size <2 inches.
- Prioritise licensing and quota to handline and pole-and-line operations
- Model purse seine management considering zones and mesh size, and model licensing based on biological/social indicators;
- Integrate oceanographic and climate change factors into models and management measures. For example, adjust seasonal closures during months based on interactions between sea surface temperature (SST) and Chlorophyll-a with ENSO phase (normal; El Nino or La Nina phase).

In light of this new information, it is imperative to consider the latest stock assessment for WCPO SKJ and YFT. The [21st Regular Session of the Scientific Committee](#)¹⁵ discussed the outcomes of the most recent SKJ stock assessment (Teears et al. 2025). Whilst the FIP provided the presentation *‘Paparan Dr Andi Irwan Nur_WPP 714 - 2025-08-03 13-11-47_EN.pdf’* and it provided new insight and recommendations, the latest WCPFC SKJ stock assessment by Teears et al. (2025) provided spawning biomass estimates for eight regions.

¹⁴ Filename: *Paparan Dr Andi Irwan Nur_WPP 714 - 2025-08-03 13-11-47_EN.pdf*

¹⁵ https://meetings.wcpfc.int/meetings/sc21#term_tid_2465

Indonesia is included in Region 5 (see Figure 1 of Teears et al. 2025). Whilst Region 5 has the lowest $SB/SB_{F=0}$, it is not below the LRP of 0.2 (see Figure 79 of Teears et al. 2025). Fishing mortality is also highest in Region 5 (and 6). Given the stock structure for SKJ is not divided into these regions, and a single stock is assumed; the Kobe plot for WCPO SKJ suggests that the stock is not overfished (0.51) or subject to overfishing.

This review is of the opinion that this FIP would not achieve an SG60 for all four scoring issues. Whilst the harvest strategy for IAW has been fully implemented and it could be argued that the tools are available, there is uncertainty regarding their effectiveness in achieving MSC objective and controlling the state of the stock (e.g., compliance and enforcement, appropriateness of closure times etc.).

Recommendations:

1. Ensure that a well-defined TRP is in place and available evidence indicates that the tools are appropriate and effective (1.2.2 (a)(c)).
2. Analysis of compliance and enforcement data regarding management measures associated with the HS demonstrate effective implementation and are achieving objectives.

Task 2.1 – e-logbooks and observer program

Sub objective 2: Information on fleet composition and species catch strengthened							
Action goal 2: Information systems upgraded and applied extensively across the purse seine fleet							
Action name 2: Strengthen information systems for target species, neritic tuna and small pelagic bycatch							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Establish data sharing protocols to exchange logbook and landings data (research and fishing companies to meet regularly); and review and determine the levels of observer coverage and port sampling to establish scientifically robust bycatch estimates, and apply these across the range of purse seine groups. This may require separate action by vessel group	Direktorat Jenderal Perikanan Tangkap/Industry Associations	Protocols developed with vessel owners to ensure strengthening of logbook reporting. Develop an electronic system for all fishers supplying the PBN chain such that information is available in near real time to all users - MMAF/DKP/PSDKP, and Vessel owners, a commitment to observer coverage, an extension of port sampling to include ≤ 30 GT vessels, and a systematic check on processing receipts to compliment validation of quantities received against logbook returns. Note that the Protocols should satisfy the MSC requirement: <i>MSC specifies “good external validation” should be understood to indicate a validation level equivalent to a nominal observer coverage of 20% of effort, although this allows for the acceptance of other rates and alternative measures/evidence with sufficient justification that the same scientific outcome (highly likely confidence that finning is not taking place) is delivered (MSC, Attachment K, Annex C at SG 80)</i>	Dec-19			<i>1.2.3b 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.</i>	≥80

Justification:

Note: The Scoring Guidepost in the table above for Task 2. 1 was amended from 1.2.3 c) to 1.2.3 b) as it is likely that this was an oversight during the preparation of the initial FIP workplan. Furthermore, Task 2.2 regarding the costs associated with the observer program have been rolled into this Task.

Since 2017, based on *One Data Policy* within the Ministry of Marine and Fisheries Affairs (MMAF), data collection has been conducted by Centre of Data Statistic and Information (CDSI). CDSI is responsible for designing survey method, supervision of the survey, tabulation/compilation, analysing, and publishing of National Capture Fisheries Statistics.

In 2021–25, the national capture fisheries statistic team was led by DGCF and reported to CDSI. The data validation process is conducted with hierarchical scheme from district, provincial to MMAF. Validation for catches is conducted by the Directorate General of Capture Fisheries. All data from the DG as well as from Districts and Provinces is validated by CDSI. Data collection conducted at fishing ports is derived from fishing logbook, landing data information, initial sheet for catch certification, vessel Inspection Report and observer program.

The stock assessment reports for Skipjack and Yellowfin, together with the WPEA projects and associated reports have greatly improved understanding of and inputs from the main fisheries operating in Indonesia / Philippines / Vietnam¹⁶.

The harvest strategy¹⁷ outlines the management measures in place, and in addition, on 6 March 2023, *Regulation Number 11 of 2023 on Measured Fishing* was enacted. Key provisions that are relevant to “good information on fishing removals” include:

- Measured fishing zones 1-6 with the scope outlining the fishing territory (WPPNRI) covered.
- Fishing quotas within measures fishing zones that determined by the Minister. Quota consists of (i) industrial quota; (ii) local quota; and (iii) non-commercial quota.
- The introduction of base ports and the requirement to land catch at one of the five appropriate ports per fishing zone.
- Rules for the transportation of captured fish.

Copies of invitations¹⁸, letters of support¹⁹ and presentations²⁰ regarding logbooks, observers and data evaluation were provided to the review team. Additional files relating the confirmation of observers being on vessels was also provided²¹.

¹⁶ CSIRO report WCPFC-SC21-2025/SA-WP-13 to <https://meetings.wcpfc.int/node/26654>

¹⁷ Filename: Katimja ZEEL_Pengantar HS.id.en

¹⁸ Example includes Filename: 2024_12 Undangan_Evaluasi_Data_Pusat_Inf

¹⁹ Example includes Filename: 2024_12_Surat Permohonan Dunkungan Pelatihan

²⁰ Example includes Filename: 2024_12 Undangan_Emumerator_Validation_Peneta

²¹ Filename: Surat Konfirm asi Trip Observer di Kendari

Indonesia recently reported fleet size, catches and observer data at the SC of the 21st WCPFC Meeting in Tonga²². Catch estimates for 2024 was agreed in the ITFACE-16 (2025) by DGCF, BRIN, PUSDATIN and relevant stakeholders from fishing association, fishing industry and non-governments organisation. In 2024, the total reported catch (all areas, all gears) was 255,073 mt for SKJ and 215,728 mt for YFT. Of this, 163,242 mt (SKJ) and 145,203 mt (YFT) came from WPP 713-715 using all gear types. With regard to observer data, in 2024 there were 89 trips equating to 864 sea-days observed (all gear types in WPP 713–717). Purse Seine in WPP 714 had the most observer days of any gear or location (586 sea days in first 5 months of 2025) (Table 4).

All data provided by e-logbooks is handled by the Central Government in Jakarta with ports such as Kendari being able to access the data upon request and used for local jurisdictional reporting. MMAF informed the review team in September 2025 (Appendix 1) that the Kendari Port Authority conducted compliance inspections in port by reviewing licences, gear etc.

E-logbooks within FIP

The 2022 review found that about 50% of e-logbook entries were of an “*acceptable standard*” and in accordance with operating procedures (pers comm. Syahri Abdul Rauf, March 2022). Unfortunately, no further compliance data or explanation was provided regarding e-logbooks standards.

Since the 2022 review, the use and training of the industry in e-logbook use has increased. Nationally there has been direct training held, including presentations on improving species identification on both target and protected species. Logbooks usage has improved significantly since the pre-assessment was completed. Nationally, in 2018 there were 1,247 vessels using e-logbooks compared to 16,056 in 2023. Electronic logbooks are most common in vessels sized 21–30 GT (36% of vessels)²³. Furthermore, the number of ports that have implemented fishery logbooks has increased from 58 in 2018 to 175 in 2023²⁴. At a FIP level, in 2025 the vessel list included 162 vessels, each being ≥10 GT and longer than 12 m (Filename: ‘*Vessel List Fishery Progress 04.06.25.xls*’). In general, tuna is purchased from vessels ≤ 30 GT, with only one exception being a vessel recorded as 31 GT since 2017.

In order to improve stock analysis of YFT in WPP 714, Irwan Nur (2024²⁵) suggested that following recommendations, of which some aim to improve the logbook system, including:

- Budgetary policy for logbook-based data collection by 29 ports and 5 provincial Fisheries agencies per quarter.
- Increased data collaboration and sharing between PIPP and foreign NGOs and providing access to the national data center.

²² file:///Users/peter2/Downloads/SC21-AR-CCM-09_Indonesia_Rev.01.pdf

²³ Slide 19 in Filename: 2024_12 Sosialisasi Keberlanjutan Sumber Daya Ikan melalui Kuota Penangkapan Ikan Dit SDI PPTX

²⁴ Slide 20 in Filename: 2024_12 Sosialisasi Keberlanjutan Sumber Daya Ikan melalui Kuota Penangkapan Ikan Dit SDI PPTX

²⁵ Filename: 024_12 Materi EVALUASI STOK LPP WPPNRI_714PPTX

- Collaboration with universities to collect data on the biological conditions of fish (enumerators and observers) in every fishing port.
- Fish stock estimation training for managers in every fishing port using the latest analysis methods.
- Closed area and season management instruments must be accompanied by:
 - Controlling the number of vessels and trips (central and provincial licensing control);
 - Operational subsidies for environmentally friendly gear types (handline and pole & line);
 - Subsidies for purse seine vessels > 30 GT with mesh size > 2 inches;
 - Exemption from non-tax state revenue from October to December for compliant operators; and
 - Changing the management regime from production volume (actual MSY) to productivity (Maximum Economic Yield) Yield as a target reference point.
- Facilitation and institutional assistance for entrepreneurs/fishermen for YFT fisheries co-management (Consensus Building)

A compliance risk assessment has not yet been conducted for the e-logbook system, although, there is ongoing monitoring of the system and its implementation across Indonesia in each harbour. There are routine evaluations of activities, challenges and improvements required for the following year through internal mechanisms but there is no external review. MMAF conducts a review of the data each month for each harbour by investigating whether: 1) compliance letters that were sent, are being addressed by the local authorities; 2) growing usage of e-logbooks; and 3) trend in compliance rates from harbour over time.

Observer program

The National Research and Innovation Agency (BRIN) is responsible for scientific observer programs and for technical training of compliance observers. All observer activities for all vessel size classes (<30 GT – >30GT) are controlled and implemented by MMAF.

In Kendari, the government through SDI provides the observer standard and operating procedures and training, as well as assisting the co-ordination of observers between the various FIPs. The FIP supports observers' housing, and facilitates observer placements through:

- Recruiting captains to the voluntary observer program;
- Monitoring vessel departure schedules; and
- Requesting observer placements on vessels that are "ready".

The physical formal placement of observers on vessels is at MMAF's discretion.

There are several significant challenges with the observer program, these include:

- Attraction and retention of observers. Currently people do not see the observer jobs as a career and do not rate the position in their top 3 or 4 preferred jobs. Once an observer has been recruited to the program, retention is another matter that must be

addressed. Observers often leave the program as work and pay can be limited in the initial stages and some can be without any pay for months. Therefore, even lower paying jobs are more attractive.

- Attraction and retention of vessels allowing observers onboard to observe. Currently the FIP has general agreements in place with 48 vessels/captains to participate in the program. However, not all vessels are participating equally in the program with most only conducting one or two trips, whilst a handful of vessels conduct multiple trips with observers. Which is not a true reflection of the overall fishery operations. There is a requirement to increase industry awareness of the importance of the observer programs and encourage participation.
- Data quality and consistency with observer data sheets having reoccurring errors and poor recording of data in the correct fields.
- Capacity building.
- Funding.

Within the FIP, observer placement and payment data was supplied for March 2021-June 2025. In 2025, observer placement and payment data was supplied for 26 observers in Kendari. A total of 58 different observers worked in Kendari between March 2021 and June 2025. The number of sea-days observed has varied each year (Table 4). It was noted that in 2022, observer coverage was about 24% of effort. The decline in coverage in 2023 was due to the migration of licensing from a provincial level to the national level, the overall number of trips as well as the number of trips with observer coverage was therefore lower. A further decline in 2024 was explained as MMAF reducing the number of observers on active duty in favor of covering tuna longline and transshipment vessels in the Indian Ocean. However, new observers were recruited and trained by MMAF in 2024; the number of observers increased in 2025 and 18% of FIP operations had observer coverage.

A database provided by the FIP team regarding observer placements (Filename: “*observer placement and payment*”), indicated that between 2024 and May 2025, there were 172 observer trips conducted on >60 different FIP purse seine vessels. Since 2022 (Jan 2022–May 2025), there were 611 observer trips totalling 4295 days. The average number of days per trip was seven (1–21 days), with only 13 trips being a single day and 14 trips exceeding 14 days (to max of 21 days).

It is the review team’s opinion that fishing effort by the FIP has not been accurately determined. Instead, it is estimated using the average trip length of 7 days, and the number of active vessels. If there are 36 trips per active vessel each year, the total fishing effort can be estimated. There is a need to verify the length of time each FIP vessel operates per year if this method is to be used with reliability. That is, does each FIP vessel operate for about 252 days per year? Port data may be useful in establishing the amount of time each vessel is in port per year. The FIP team provided a vessel list for 2024 and 2025²⁶. This list included 154 and 162 vessels for 2024 and 2025 respectively, although the list is cumulative, and as such some vessels may be active or irregularly supply the FIP each year.

²⁶ Filename: ‘Vessel List - Fishery Progress 13.06.2024XLSX’

There is still some uncertainty regarding the proportion of fishing that is subject to the observer program. Whilst the number of observers, vessels and dates were provided, the estimation/calculation of fishing effort is likely to be inaccurately estimated. The report 'FP.org July 25 update_final' provided an update on the FIPs progress. It noted that "From 29 March to 31 December 2022, a total of 278 Purse Seine trips by FIP vessels were covered by observers. In 2022, there were 92 vessels on the priority list, resulting in an estimated minimal observer coverage of 11.2% of all FIP vessel trips in 2022." The raw data provided for 2022 (Table 4) suggest 281 observer trips on 51 vessels.

Table 4. Observer coverage by year for Kendari purse seine FIP operations.

	YEAR	2022	2023	2024	Jan-May 2025
Vessels & Effort	No. of vessels listed (in June)			154	162
	No. of active vessels in FIP	32	53	59	31
	Estimated No. trips per year @7 days	36	36	36	15 in 5 months
	Estimated Fishing effort (days) in FIP	8,064	13,356	14,868	3255 in 5 months
Observers	No of trips with observers	281	157	93	79
	No. different vessels with observers	51	44	39	41
	No. of observers	20	21	28	26
	Average length of trip (days)	7.0	6.8	7.1	7.4
	Observer coverage (days)	1,976	1,069	664	586 in 5 months
	% Observer coverage	24.5%	8.0%	4.5%	18.0%

All observer reports and raw data are sent directly to MMAF in Jakarta. Only MMAF are able to access the raw data, and all data requests must be sent to Jakarta for approval. Third party access to the data is limited, however, it is shared with scientists for the development of the harvest strategy and control rules, as well as with universities. Access to accurate and timely observer data is one of the main requirements of the harvest strategy, although MMAF provided no indication of formal debriefing of observers.

In 2021, the observer programs cost 7 billion IDR. Previously, the government covered the costs associated with the RFMO requirements. However, MMAF prefers to work with partners to implement observer programs, such as FIPs. In 2022, FIPs were contributing >80% of observer running costs across the board, and this contribution has since increased. The FIP funds the transport and training for all new Kendari observers, with some additional trainings conducted in partnership with the Tuna Consortium for port enumerators for all of Indonesia. The FIP also funds the housing costs for observers, as well as basic equipment. A running cost for the Program in 2025 was not provided. Further information is required to determine the level of retention of trained observers, and if they remain in the FIP or are deployed to other fisheries/areas.

Observer Strategy

In 2020, the FIP teams for purse seine, handline and pole and line fisheries operating out of Kendari, developed and initiated the implementation of an observer strategy "Indonesia South East Sulawesi Purse Seine and Pole and Line Fisheries Improvement Projects Onboard

*Observer Strategy – October 2020*²⁷. The objective of the strategy was to establish a framework to increase observer coverage onboard tuna purse seine, pole and line, and handline vessels participating in Fisheries Improvement Projects (FIPs) in Kendari; and the tuna FIPs in Kendari will coordinate and ensure onboard observer placements are requested properly and proportionally across the fishing gears.

With the primary aim of the strategy being to gradually increase human observer coverage to reach an equivalent of 20% of fishing days for each gear type, in line with globally recognized scientifically representative coverage rates by 2023. Specifically focused on the purse seine FIP, the Strategy’s operational objectives are outlined below (Table 5). The Strategy outlined details regarding observer placements, field coordination, recruitment and training, observer safety, data management, and FIP support.

Table 5: Observer Strategy – Purse Seine (2020 – 2023)(Indo FIPs - Observer Strategy_Final_Clean_EN.docx).

Total number of vessels	100			
Total number of days fished annually^a	16,000 days			
Year End Milestone	2020-2021		2022	2023
Observer coverage rate	5%	10%	15%	20%
No. of fishing days observed	800	1,600	2,400	3,200
No. of observers required^b	4	8	12	16
No. of observers in pool^c	8.0	16.0	24.0	32.0

^a Average 5 days/fishing trip; 4 trips/month; operating 8 months per year (Source: Kendari purse seine vessel operators).

^b Average 200 days at sea/year/observer.

^c Two observers in pool for every observer required to account for observer downtime.

When comparing the observer strategy (Table 5) and the Kendari observer data (Table 4), it is clear that in 2025 the number of observers (26) exceeded that required by the Strategy (16), although the total number of days at sea was significantly less than the recommended 3200 days. Each observer is averaging less than 50 days at sea per year in the FIP rather than the recommended 200 days. Whilst the observer coverage for the first half of 2025 was 18% of estimated effort, the Observer Strategy should be revisited and revised to ensure there are sufficient active observers available into the future. The number of active vessels in the FIP is also significantly less than the 100 FV listed in the Strategy, although this would not impact coverage rate. MMAF has confirmed there is no plan to review the strategy in the near-term.

Observer Training

Since the third review in 2022 there has been additional training and resources provided to observers, including:

- 2024: Standard Operating Procedure for Handling Rare Marine Biota threatened with extinction and protected as bycatch or accidentally caught. A copy of the manual was provided as file: *'Modul 03.id.en'* and evidence it was used in training is provided as file: *'14.07.2025 Kuota Penangkapan Ikan di WPPNRI 714.id.en'*

²⁷ Filename: Indo FIPs - Observer Strategy_Final_Clean_EN.docx

- January 2025: Technical guidance for observers using E-torch (improve handling and reporting of ETP and ERS). A copy of the invitation and agenda was provided as file: 'signed__Undangan_bimtek_observer_20250118101254.id.en'
- Species identification guide and presentation used for training observers on ETP species. A copy of the presentations were provided as file: '1. HTS_ERS_ETP_TUNA_2025.id.en' and '0. TUNA ID_2025.id.en'

The purpose of the training was to provide the necessary skills and knowledge expected of an observer onboard vessels and at port.

This and previous reviews have witnessed observer tools and materials including:

- Species identification guide;
- Monitoring protocols for pole and line, handline;
- Briefing and debriefing procedures;
- ETP species and how to safely release these species and how to help avoid ETP/bycatch;
- Ethics and safety whilst working at sea;
- How the various different gears work and operate;
- Monitoring, roles and responsibilities, identification and measurement, port sampling.

Data provided by the FIP team, indicated that most FIP vessels are only being subjected to one observer trip. However, 44 vessels were subjected to 79 observer trips in 2025 suggesting that some vessels are hosting observers more than once a year, and some vessels are not hosting observers at all.

Clear evidence was provided²⁸ to the review indicating that numerous requests for observer placements on purse seine vessels operating out of Kendari are made by PBN to the government. Information reviewed from the Director General of Capture Fisheries Director of Fish Resources Management, Head of Port – Kendari, provided details of observer placements taking place on purse seine vessels operating out of Kendari.

In the previous 2022 review, a document titled “*Quick analysis of onboard observer coverage on FIP priority vessels YTD 14 September 2021*” (2021_09 Kendari PS observer placement review (internal).docx) provided a rapid analysis aimed at reviewing the then current (mid-September 2021) number of observer placements on purse seine vessels operating out of Kendari against the strategic plan for improving observer coverage (Table 5). That report indicated that the number of observer days was behind the requirements of the strategy. Whilst there is no analysis document provided for this review to compare recent observer rate and with the Strategy, Table 4 provides data on the observer coverage since 2022. The most obvious difference is that the proposed number of at-sea days is lower than the listed 200 days per observer per year. Observer numbers have increased recently and in 2025 there were 26 observers listed up from the required 16 in 2023 listed in the Strategy. At present, each observer averaged <50 at sea-days for 2023–25; in the first five months of 2025, each observer only worked an average of 20 days. However, the proportion of the total fishing effort that is observer is more indicative of an effective strategy than how many days each

²⁸ For example: letter at file named “signed__Undangan_bimtek_observer_20250118101254.id.en”

observer was at sea. In the first 5 months of 2025, observer coverage rose to 18% from 4.5% in 2024.

In a report provided by the FIP team ('FP.org Jul 25 update_final'), an overview of the observer program since the FIP began was provided. The 2022 review noted that there was an expectation that observers would mainly be placed on purse seine vessels, although in 2024 observer deployment was prioritised by MMAF away from the FIP to longline operations. As a consequence, additional observers were trained in late 2024. Given that the FIP funds the bulk of the observer program, further discussions/agreements may be required to ensure that observer efforts are not redirected from the FIP vessels. MMAF confirmed that there is no plan to review the observer strategy in the near-term. Although the FIP provides resources to implement the program and train new members, MMAF is ultimately in charge of the deployment of observers. The logistics, together with the long-term funding questions, leave the longevity of the observer program in a questionable position. Furthermore, MMAF suggested that there remains issues with the quality of data with no indication of observers being formally debriefed.

The 2022 review found that the Observer program was experiencing some issues regarding quality of data, these include:

- Blank data fields or incorrect data;
- Incorrect data especially regarding the size and weight of the fish caught that does not match the length of the fish;
- Incorrect identification of fish species, with incorrect names and types of fish not matching the fish identification book given by the Directorate.
- Several Observers stationed at the Fishing Port did not carry out their duties properly (not at the premises during working hours); and
- Some Observers still use the old format for data entry and monitoring results

There is evidence that some of these areas have been addressed by the introduction of electronic forms and additional staff training for data verification. All data is now verified before entering the data base and grab-sample correction protocol are used for species identification verification.

[Cost effective observer program](#)

Ensuring the ongoing viability of the fishery observer program is important, and industry contributions are not uncommon practise (e.g., cost-recovery models or a mixture of industry fees and donor support). The previous FIP review (2022) made comment on a separate review ("*Summary Report Fisheries Observer Coverage, Electronic Monitoring and Vessel Monitoring Systems in Indonesia*") that was completed in March 2020. Whilst that review investigated observer coverage, funding gaps, potential technical solutions for small-scale vessels, and options for scaling up the Program, the FIP has informed the review that as of July 2025 MMAF is reducing/eliminating all government funding for observer programs. It appears that timely access to observer data may also be hindered, and this requires further investigation.

The FIP covers all observers' payments for days-at-sea when onboard FIP vessels; evidence was provided of wage costs, trip date, vessel name for FIP observers. The 2022 FIP review

noted that, after considering other forms of payment structures to observers, the purse seine FIP costs for observers is currently paid through a third-party, APSI (Indonesia Fishery Product Processing & Marketing Association), in order to separate observer payments, information was provided on the cost associated with training.

While industry-funded observer programs are common and not unique, these other programs are generally supported by a formal cost recovery mechanism supported by, and even implemented by government. The FIP informed the review team that it is actively working with MMAF to find solutions that lead to a best-practice observer program, including transparency, data management, and observer safety. Improvements need to be conducted to develop a longer-term commitment from all parties and cost-recovery mechanism for observer placements.

Summary

It is clear that there has been significant progress made with regard to the observer program and placements on purse seine vessels operating out of Kendari, albeit with a decline in numbers in 2024 followed by subsequent increases in 2025. This progress has been well supported by all parties involved in the FIP. Despite this progress the observer coverage rate falls slightly short of that stipulated in the Observer Strategy.

As per the last FIP review, the observer program would benefit from an independent review, including the outputs from observer reporting to ensure consistency and quality of data.

Recommendations:

E-logbooks:

1. Access compliance data with regard to:
 - a. use and activation of e-logbooks (ongoing);
 - b. compliance of data entries; and
 - c. accuracy and verification of data entries.
2. Conduct a compliance risk assessment of the use of e-logbooks and implement findings of the assessment.

Observers:

1. Review the efficacy of the current 'Observer Strategy – Purse Seine'. In particular, ensure that the number of days per observer is practical and the total number of available observers allows for sufficient coverage;
2. Ensure deployment of observers align with RFMO requirements;
3. Ensure the observer program for vessels $\leq 30\text{GT}$ operating in the FIP from Kendari and supplying PBN supply chain, is statistically robust and provides appropriate data to a level that meets coverage rates defined in the updated strategy ;
4. Conduct an independent review of the observer program, including the outputs from observer reporting to ensure consistency and quality of data.
5. Obtain Government and industry commitment and resources to the above observer program requirements, with a focus on retention and deployment within the FIP.
6. Develop and implement long-term funding model for the Observer Program.

Task 3.1 – Bigeye tuna catch data

Sub objective 3: The ecosystem-based approach to fisheries management integrated							
Action goal 3: Partial strategies established on target species and related ecosystems (Purse seine)							
Action name 3: Implement ecosystem management actions							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Strengthen catch data for BET and develop, if required, partial strategies.	Direktorat Jenderal Perikanan Tangkap	Ensure that robust data is available to the research organisation on the catch of BET and assess the risks to BET within WPP 713, 714 and 715, and if risks are identified, implement a partial strategy that covers fishing inside and outside 12 nm.	Ongoing	Data reports and stock status reports		2.1.3a Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status.	60-79
						2.1.3c Information is adequate to support measures to manage main primary species.	60-79

Justification:

This Task 3.1 is heavily reliant on the successful outcomes under Tasks 2.1-2.3 with regard to e-logbook implementation, compliance, enforcement, data sharing and observer coverage rates and reporting structures. The e-logbook uptake has increased significantly and the first half of 2025 observer coverage is at 18%.

Status of BET

Bigeye Tuna was last assessed in 2023 (WCPFC SC 19). The spatial structure of the stock was presented, and IAW is in Region 7. The assessment found the stock was at 0.35 SB_0 (for 2018–2021) whilst fishing mortality was 0.59 (for 2017–2020; F_{recent}/F_{MSY}). Management objectives for BET (CMM 2021-01) recommended spawning biomass remain above 0.34 SB_0 . The overall BET stock is not overfished or subject to overfishing, but for Region 7 (IAW) BET spawning biomass is close to the LRP of 0.2.

In 2022, BET was predominately caught by longline and FAD associated purse seine operations. In Region 7, ‘misc’ gear type followed by FAD associated purse seine operations pose the greatest impact to spawning potential. Furthermore, the misidentification of juvenile BET and YFT has been recognized and addressed through the development of a photographic guide of internal organs to help observers differentiate the two species.

Obtaining qualitative information on BET

The FIP team advised that species misidentification and/or misreporting (YFT/BET labelled as SKJ) has been investigated and was found to have reduced in 2024 (i.e., grab sample correction protocols were used for verification). Evidence of species ID guides and training was provided. Davies et al. (2024) provides insight into how to identify tuna species including how YFT and BET can be separated using internal organs (swim bladder and liver) when external features have been degraded.

The e-logbooks are capable of capturing relevant information regarding Bigeye Tuna catches in the fishery; however, this is for simple identification and fish numbers, as it is not designed to capture biological information. For verification and greater granularity of data, an observer is required for the collection of data such as fish length, number, spatial and temporal, and number of sets. At this stage, while the e-logbook system captures the volume of Bigeye Tuna caught by the fishery, the verification of the data regarding length, spatial and temporal, number of sets needs improvement as outlined in 2.1 above for YFT and SKJ.

Projects

In regard to improvements in monitoring, the 2024–2027 Implementation Plan for the WPEA-ITM project (Olsen, 2024) noted that: *“Improvements in reporting and increased logbook coverage have been evident. This was recognized at WCPFC20. Improved data on yellowfin and bigeye catch in the three partner countries contributed to new stock assessments for these species in 2023.”* Whilst this project is not explicitly linked to FIP operations as it involves collaboration between Indonesia, Vietnam and the Philippines, any monitoring data from the WPEA-ITM project in Indonesia may be suitable for comparing with that collected by FIP observers as a means of verification. An overview of West Pacific East Asia–Sustainable Pacific

Fisheries (WPEA-SPF) project was provided (Olsen, 2025²⁹). This new project started on 1 July 2024 and will run until 30 June 2027.

The activities specific to Indonesia include:

- Twelve enumerators were supported in Indonesia from July–December 2024 and continue to be supported in 2025. They are based out of the main WCPFC tuna fisheries port of Bitung, Sulawesi. The data collected by these enumerators is key to the calibration of the catch estimates used for WCPFC reporting.
- Two delegates from Indonesia were supported to attend the annual Pre Assessment Workshop (PAW) held at SPC headquarters in Noumea, New Caledonia from 7-11 March, 2025. Delegates were given the opportunity to receive input and advice for the SKJ assessments analysis from swordfish and oceanic whitetip shark, plus the revision of the striped marlin assessment. It was also used to present and discuss recent work related to technical aspects that is relevant to the skipjack, billfish and shark assessment work and to consult and understand the process of the SKJ stock assessment in particular impact of SKJ harvest in the WPEA region within the WCPO.
- An Indonesian Port Sampling Audit and Annual Catch Estimates workshop was planned for 29 July–7 August. The Port Sampling Audit will be in the port of Bitung, Sulawesi and will include a field visit to another landing site in the area. The ACE will be held in Jakarta and Bogor from 4-7 August.

There is a plan for improve data collection as listed in the WPEA -SPF project for Indonesia in 2025, these include:

- Operational level catch and effort data reporting training (train the trainer approach)
- Operational training of catch and effort data reporting
- Annual Catch Estimates workshop
- Large and smaller vessel fisheries profiles
- Exploration of establishing a national tuna data warehouse
- Observer data workshops
- Purchase of port sampling tools
- Workshop to improve port data collection methodology

The 2022 FIP review noted that that FIP was working collaboratively with IPNLF, YKAN and the Walton Family Foundation Indonesia Tuna Consortium. Phase 2 of the project focused on data collection, quality, and management. In 2022, the FIP team provided a confidential Action Plan for consideration. It was clear that the planned activities under phase 2 of the Tuna Consortium would help address a number of data quality issues. The FIP team have advised that as of July 2025 *“MMAF together with BRIN and external partners from the Walton Family Foundation Tuna Consortium are planning a pilot project for full implementation of the Harvest Strategy in WPP 714, centered in Kendari and led by the harbor master there as the lead for WPP 714. This was planned before the recent Government of Indonesia budget cuts, but the commitment stands nevertheless. Discussions on timelines continue, as the sharing of responsibilities evolves.”* Further information is required to determine if the pilot project will improve monitoring, particularly of Bigeye Tuna.

²⁹ Filename: [WPEA 12-month update](#)

Davies et al. (2024) conducted a biological sampling program to obtain sufficient samples of bigeye (BET), (yellowfin (YFT) and skipjack (SKJ)) tuna from three regions (east, central and west) across the Indonesian archipelago to enable statistically robust analysis of the population biology between the sampling regions.

Measures to manage BET

In late 2022, a new Ministerial Regulation on quota and zone-based fishery management policy (*Penangkapan Ikan Terukur – PIT, Regulation No. 11/2023*) was announced by the Minister of MMAF. It stipulates that quota or allocation for Indonesian fish resources, including tropical tuna, is to be set up for each FMA. The Harvest Strategy (discussed at Task 2.1 in greater detail) is also applicable to Bigeye Tuna. In July 2025, quota allocations were designated for WPP 714, although it is unclear if these changes will be implemented given that the reduction of catch by approximately 10% are not final, and will be updated by the next reporting period to FP.org.

MMAF Decree No. 7 (2022) related to FAD placement and number

In March 2023 Regulation No. 11 of 2023 on measured fishing was enacted. Key provisions relevant to BET include:

- Measured fishing zones 1–6 with the scope outlining the fishing territories (WPPNRI)
- Quotas³⁰. A detailed analysis of tuna catches, summarizing catch composition and fleet characteristics of tuna fisheries operating in Indonesia’s Archipelagic Waters (IAW) (WPP 713, 714 and 715) is conducted (e.g., TNC/YKAN, 2021). Davies et al. (2024³¹) presented total YFT, SKJ and BET catch (all gears) for WPP 713-717 and FAO 71 for 2018. The catch in 2021 was not presented although 2021 is listed as ‘baseline’. In July 2025, MMAF presented³² how quota was estimated. The reduction in catch from the 2021 ‘baseline’ was presented by Suadela (2025)³³ as follows:
 - 4% reduction in 2023
 - 3% reduction in 2024
 - 3% reduction in 2025
- Base ports as a requirement to land catch at one of the five appropriate ports per fishing zone.
- Transportation of captured fishes.

In June 2023, MMAF releases the ‘Framework for Harvest Strategy for Tropical Tuna in Archipelagic Waters of Indonesia’, this is relevant to BET.

Recommendations:

1. Verify the accuracy and effectiveness of the e-logbook system to capture qualitative BET data.

³⁰ [14.07.2025 Kuota Penangkapan Ikan di WPPNRI 714.id.en](https://www.aciar.gov.au/publication/fis-2016-116-final-report)

³¹ <https://www.aciar.gov.au/publication/fis-2016-116-final-report>

³² *Filename: [Katimja LBPI Mekanisme Penghitungan Kuota PIT bahan Makasar.id.en](https://www.aciar.gov.au/publication/fis-2016-116-final-report)*

³³ *Filename: ‘1. Katimja ZEEI_Pengantar HS.id.en’*

Task 3.2 – Secondary and ETP species catch data

Sub objective 3: The ecosystem-based approach to fisheries management integrated							
Action goal 3: Partial strategies established on target species and related ecosystems (Purse seine)							
Action name 3: Implement ecosystem management actions							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Strengthen catch data for neritic tunas and small pelagic and develop if required, partial strategies; provide evidence that shark finning is not occurring, and if it is occurring take the necessary steps to prohibit occurrence including legislation and enforcement	PUSRISKAN / SEAFDEC / PSDKP / Direktorat Jenderal Perikanan Tangkap	Ensure that robust data is available to the research organisation on the catch of neritic tunas and small pelagic species and assess the risks to these species within WPP 714/715, and if risks are identified, implement a partial strategy that covers fishing inside and outside 12 nm. Use of the RBF may be required to assess the impact on baitfish, given some uncertainties in MMAF stock assessment process. Review observer workbooks to provide evidence that shark finning is not occurring and provide results to the SIP Assessment team. In the event that finning incidents are detected, provide support to the development of a national measure preventing finning.	Ongoing	Data reports and SEAFDEC stock assessment, observer reports		<p>2.2.1(a) Main secondary species are highly likely to be above biologically based limits.</p> <p>2.2.2. (a) There is a partial strategy in place, if necessary, for the UoA that is expected to maintain species at levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder recovery</p> <p>2.2.3 (b) Information is adequate to measure trends and support a strategy is not met</p> <p>2.3.1 (a) 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</p> <p>2.3.2 (c) 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.</p> <p>2.3.3 (a) 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</p>	

Justification:

Refer also to Task 2.1 – 2.3 and Task 3.1 above.

The observer program for the FIP operators has improved since 2022 for those larger vessels operating out from Kendari (see Table 5 for observer data by year).

Sharks

At present it is not possible to quantitatively or qualitatively identify whether shark finning is occurring. The FIP team noted that in 2023 that preliminary discussions between the FIP and MMAF have led to the conclusion that especially data on ETP interactions (sharks) were substantially lacking. In 2022 MMAF agreed that improvements on observer identification skills for ETP, reporting mechanisms, and data management will be tackled in early 2024 although many observers were relocated to longline vessels in 2024. Additional observers were trained in late 2024; in the first half of the 2025 season, the estimated observer coverage was 18% of FIP effort. In January 2025, observers gained additional training by BRIN on ETP species and in May 2025, additional training was conducted in Kendari focusing on species identification (especially sharks) and appropriate handling of ETP species to improve survivability on release. The training was also conducted by BRIN and the review team were provided with presentations.

At present there is a discrepancy with regard to the retention of sharks. MMAF advised that “no sharks are caught” although other data suggests sharks have been onboard (unclear if discarded). Either way, there is currently no policy of management measure in place relating to sharks (e.g., a non-retention policy, a fins-naturally-attached FNA policy etc.).

The review team recommends this Task be split, and shark retention becomes a separate Task under this FIP WorkPlan.

ETP

It is imperative to have robust statistically significant data available regarding other species such as neritic tunas, ETPs, small pelagic, catches and information to an appropriate level to support management measures or a partial strategy. However, the e-logbooks do have the ability to capture basic catch data of other species such as species identification, number and weight.

Observers are required in the fishery in order to increase data verification for bycatch and ETP species. The current level of data capture and verification does not provide information and evidence supporting highly likely (70th percentile) that other species interacting with the fishery are above biologically based limits.

The observer programs initial stages have been focused on establishing the program, getting observer capacity to carry out the required works, as well as funding the program. As a result, data quality, consistency, and robustness of information has been somewhat lacking with regard to qualitative data for tuna and other species. The FIP has acknowledged that there

are several obvious areas for improvement with the data. The FIP is now focused on significantly improving and strengthening the data quality coming from the FIP program. The FIP is working with a range of stakeholders (MMAF SDI, TNC, YKAN, Tuna Consortium, etc.) to help develop a more robust program for data quality.

Recommendations:

1. Develop and implement research project(s) to investigate how effective skippers, fishers, e-logbooks, and observer programs are at identifying and recording other species (ETPs, small pelagics and neritic tunas) and more specifically estimating size and weight data of these species.
2. Develop an additional Task specific to:
 - i. clarifying the level of shark retention, and
 - ii. developing policy that meets the requirements of MSC FS.
3. Implement measures or code of conduct relating to shark retention/discarding.
4. Analyze port and any at-sea inspection reports to ensure there is certainty regarding shark interactions.

Task 3.3 – Impact of aFADs

Sub objective 3: The ecosystem-based approach to fisheries management integrated							
Action goal 3: Partial strategies established on target species and related ecosystems (Purse seine)							
Action name 3: Implement ecosystem management actions							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Conduct research into the impact of aFADs which should include: (1) assessment of the impact of FADs on the e-pelagic ecosystem; (2) whether a FAD Registration system may be needed; (3) type and distribution of habitats (commonly encountered, VME, etc.), including the overall footprint being impacted.	PUSRISKAN	Evaluate international research into the likely impacts on the e-pelagic environment from AFADS; Conduct parallel research within Indonesian waters and if proven to have detrimental impacts on tuna stocks and allied ecosystems, implement a FAD registration system (See compliance below). The work of this research should feed into the design of management measures (input and output restrictions) being explored under Task 1, where FAD controls are being assessed as a principal management control measure against other options (e.g. quota controls or effort limitation).	Dec-20	Research report		2.4.1 (a) <i>The UoA is highly unlikely to reduce the structure and function of commonly encountered habitats</i>	
						2.4.2 (a) <i>There is a partial strategy in place if necessary that is expected to achieve habitat outcome 80 level of performance or above.</i>	
						2.4.2 (b) <i>Some objective basis for confidence that the measures/partial strategy will work , based on information directly about UoA and/or habitats.</i>	
						2.4.2 (c) <i>Some quantitative evidence the measures/partial strategy is being implemented successfully.</i>	

Justification:

The purse seine vessels operating out of Kendari use anchored Fish Aggregation Devices (aFADs). The aFADs used by the fishery predominantly consists of biodegradable materials and are non-entangling, using only natural materials (e.g., palm fronds) as attractors. Only limited amounts of synthetic materials are used, mostly for mooring. There are measures in place, set through Ministerial Decrees, to restrict the use of aFADs. These regulations stipulate closure periods for use of FADs and that each vessel may not deploy or use more than three (3) aFADs (PER.30/MEN/2004; PER.08/MEN/2011 and PERMEN (MMAF, 2014b), Ministerial Decree 26/2015).

Regulation 26/2014 stipulates that each vessel must have a licence to use FADs, and every six months each region must submit a FAD report (detailing number of FADs, number of licences issued, etc.) to the Director General. Each vessel using FADs must also submit an application letter to the Director General outlining the following:

- Number of FADs;
- Location (co-ordinates) of each FAD;
- Date and time of FAD deployment;
- Frequency of use of FADs;
- Estimated species and number of fish caught (kg) at each location of FAD use; and
- Technical aspects of each FAD (materials, size, etc.).

This Regulation also stipulates how FADs can be deployed and used (e.g., FADs cannot be deployed within 10 nautical miles to each other, and cannot be set in a zig-zag pattern, etc.). *Regulation 26/2014* also contains clear sanctions for those who do not comply with the requirements. At WCPFC12 (2015), the Commission agreed that vessel operators should report data on FAD design and construction (materials, electronics, size, etc.) and FAD activity (deploying, retrieving, setting, visiting, loss, etc. Widyatmoko et al. (2021) reported that aFAD deployments in Indonesia are very dense, and frequently well inside the minimum ten nautical miles spacing required by law. FAD logbooks were discussed with proposed minimum data fields for such logbooks (WCPFC-SC21-ST/WP-07³⁴).

Additional measures have been introduced since the third review in 2022, including:

- *Regulation of the Minister of Maritime Affairs and Fisheries No 36/2023*
 - Stipulated the placement of fishing gear and aids in measured fishing zones;
 - Provides a legal FAD definition;
 - Rules around marking, placement and materials of FAD.
- *Decree of the Minister of Maritime Affairs and Fisheries No 7/2022*
 - FAD allocations in Fishing Lane III;
 - Determination of 3443 placement location points for FADs in 11 WPPNRI;
 - This Decree used when considering the issuing of SIPR for aFAD in Fishing Lane III

³⁴ <https://meetings.wcpfc.int/node/26572>

In June 2025, MMAF presented an overview on FAD management discussions³⁵. Timur (2025)³⁶ presented an overview of the issues with licensing of FADs. The FIP team also participated in a meeting where current FAD placements, allocations per WPP, and bottlenecks for formal registration were discussed. There is a lack of willingness by Captains and vessel owners to participate in the development of a registry for IAW. A review of the tuna catches associated with FADs in IAW was presented by YKAN (2025)³⁷. The species and size composition of tuna associated with FAD and free-school sets was analysed using data collected between 2020 and 2023. A total of 4905 fishing trips were examined, of which 581 trips were from 33 purse seine operations. Data was collected using the Crew Operated Data Recording System (CODRS), Cameras and SpotTrace. The FIP noted that stakeholders realised that the process needs to be further streamlined in order to achieve higher industry/fisher compliance although there are no minutes for the meeting to confirm any agreement or pathway forward.

MMAF (2025³⁸) provided an update and overview of the efforts that have been made to license FADs and improve compliance. It was noted that:

- The number and distribution of FADs remain uncontrolled;
- Uncertainty about how many vessels use each FAD;

In the 2022 the fisheries management authority in Kendari confirmed that the number of aFADs being used was unknown. MMAF provided aFAD numbers in September 2025 although they differ significantly from those presented by Widodo et al. (2022). Some FADs are operated by businessmen without a fishing business, and local fishing authorities have never issued licenses for this, essentially FADs have become an income stream within themselves with people owning FADs but no vessel. Further, FADs remain the responsibility of the provincial governments and Kendari PPS does not have any data concerning FADs or usage of these devices .

Recommendations:

For all purse seine vessels supplying PBN and considered to be included in the FIP:

1. Review FAD reports and applications, as required to be submitted by Regulation 26/2014.
2. Review the number of sanctions issued in accordance with regulations.
3. Investigate potential linkages with the adoption of e-logbooks to include recording of aFADs. Starting with simple data fields such as location, number, depth, habitat, etc.
4. Investigate ways of identifying and marking aFADs, along with developing a registration system.
5. Investigate location, number and footprint of aFADs, overlaid with known habitats and conduct analysis of impact on habitats.

³⁵ *Filename: [Draft Pres Temu Stakeholder Rumpon 6Mei2025.id.en](#)*

³⁶ *Filename: [20250603_Kompilasi Kendala dan Permasalahan Perizinan PKKPR dan SIPR.id.en](#)*

³⁷ *Filename: [YKAN-FAD-June2025_ID_id_en.pdf](#)*

³⁸ *(Filename: [Draft Pres Temu Stakeholder Rumpon 6Mei2025.id.en](#)).*

Task 3.4 – aFAD database

Sub objective 3: The ecosystem-based approach to fisheries management integrated							
Action goal 3: Partial strategies established on target species and related ecosystems (Purse seine)							
Action name 3: Implement ecosystem management actions							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Record information on FAD placement	Direktorat Jenderal Perikanan Tangkap	Record information on FAD ownership and placement	Dec-20	CFR / DGCF Report		<p>2.4.3a</p> <p>SG 60: The types and distribution of the main habitats are broadly understood.</p> <p>SG 80: 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.</p>	≥80

Justification:

Task 3.4 has close linkages to Task 3.3 and the WFF aFAD project. Please refer to Task 3.3 narrative and recommendations above.

Whilst the title of this Task relates to an aFAD registry, the scoring issue 2.4.3 a) primarily considers the information available to assess the impact of operations on habitats. The Review Team recommend reviewing the appropriate scoring issue for i) a FAD registry and ii) the impact of aFADs on ecosystems, as the ecosystem component may be more relevant than habitats.

FADs

Widyatnoko et al. (2021) suggested there were 3,858 aFADs in Indonesian waters but noted that the life-time of each aFAD can be only 2 years, and the number of aFADs deployed is likely to be considerably higher. Proctor et al. (2019) estimated 5,000–10,000 aFADs in Indonesian waters, and Widodo et al. (2023) estimated 10,000–50,000. Widyatnoko et al. noted that aFAD loss would contribute to impacting the habitat and ecosystem although there was no mention of impact whilst in use. Information on impact to epipelagic and benthic habitats is presented below.

Results of research discussed in the 2022 review noted that:

1. Three tuna fisheries (purse seine, pole and line and a combination of hand line-troll line) in 713, 714, and 715 that are associated with FADs;
2. FADs used in FMAs 713, 714, and 715 are anchored FADs (a-FADs);
3. Estimated number of a-FADs in FMAs 713 (661 units), 714 (608 units), and 715 (291 units);
4. Closest distance between objects (proximity) was < 250 meters. The distance between a-FADs in the three FMAs was < 10 miles; and
5. The largest density of a-FADs in FMAs 713 was around the 25 NM area east of Bulukumba, in FMAs 714 it was around the 83 NM area east of Morowali and in FMAs 715 it was around 58 NM southeast of Bitung.

That 2022 review was informed that there was a FAD register, and that FADs were required to be licenced to a vessel. However, it was not verified with no reports or register being provided, despite requests for this information. This current review notes there is still no FAD registry in IAW and there is a reluctance to develop one in IAW. Hargiyatno et al. (2025) recently reported that all aFADs were privately owned, either by vessel captains, vessel owners, fishing associations, or companies, with aFAD sharing primarily occurring within the same aFAD ownership group.

Whilst the precise number of aFADs is unknown, there is at least 1,560 in the FIP area (Widodo et al. 2022). Each aFAD is generally anchored with a concrete base. If one aFAD has a footprint of 3m² (for example), the cumulative total of 1,560 FAD anchors used by the FIP is 4,680m² or 0.0047km². The size of WPP 713, 714 and 715 is known and collectively about 3.1 million km².

The impact of FADs has been investigated with the impact on the pelagic ecosystem, including habitat changes (since FADs increase the numbers of floating objects in the open ocean), altering tuna behaviour and changes ecological processes (Dupaix et al., 2024). Importantly, a new study on handline tuna catches (Rumba et al. 2025) found that the distribution of FADs influenced tuna migration patterns in WPP 713 and WPP 714. Whilst purse seine fishing is conducted in the pelagic water habitat, aFADs directly interact with the seafloor and this impact must also be considered. Importantly, it is acknowledged that aFADs are placed in deep-waters ≥ 200 m; whilst many vulnerable marine environments (e.g., coral reefs, seagrass) are not found at such depths, sponge meadows are found at such depths. Putra et al. (2024) discussed sponge biodiversity in the small area of a shallow region in WPP 713, although there is less data available for sponges in deeper waters.

Habitats

Pelagic:

FAD design has not been identified to influence the attractiveness of FADs although Dupaix et al. (2024) noted that there might be a difference in “detectability” of aFADs given their larger overall size, and their structure containing a metal chain and anchor. However, there is no data to suggest that the associative behaviour of fish to aFADs is different from drifting FADs (Dupaix et al. 2021). There is considerable information on the impact of FADs on the pelagic habitat (e.g., Dupaix et al. 2024 and references within). Floating objects (including FADs) represent a key source of habitat heterogeneity for pelagic species including tropical tunas, although the precise importance of FADs in the ontogeny or ecology of many species remains uncertain. (Pérez et al. 2020). Dupaix et al. (2024) reported a strong influence of fisheries-induced habitat modifications on tuna associative behaviour in the western Indian Ocean. The habitat modification of FADs meant an increase in the percentage of time that tuna spend near a FAD, which can directly influence tuna availability to fishers, which can impact fishing mortality and tuna fitness.

Benthic:

Widodo et al. (2016) and Proctor et al. (2019) provided a characterisation of FAD-based tuna fisheries in IAW. Anchored FADs are generally in very deep waters outside of the range of many vulnerable habitats. However, the benthic habitat and associated biota, and the impact of aFADs remains unclear. Sechi et al. (2025) investigated aFADs in the Mediterranean Sea, and Pérez et al. (2020) investigated the effect of FADs on habitats and animal behaviour, but did not specifically look at benthic habitats below FADs.

Benthic mapping has been conducted in various areas of the FIP (Hafizt et al. 2024) and the types of benthic habitat is broadly understood. However, deeper waters may include sponge meadows or soft coral reefs. In Indonesia, ecosystem mapping has been conducted across local and regional scales, reflecting the nation's commitment to understanding and managing its marine biodiversity (Gunawan et al. 2025)

Niyazi et al. (2025) presented a global overview on seafloor mapping, and the proportion not yet mapped for each countries EEZ. For Indonesia, 19.7% of the 5.98 million km² EEZ is known. Interestingly, the seafloor of deeper zones were better understood with shallow regions (<200 m) having 4% mapped, and 200–1,000 m (where aFADs are placed) having 12.5%

mapped. Additional information on Indonesia's marine spatial planning is available at <https://www.mspglobal2030.org/msp-roadmap/msp-around-the-world/asia/indonesia/>

In summary:

- Information is available on the use of FADs in Indonesia; although there is no registry with ownership and location available there are estimates on the number of aFADs in WPP 713, 714 and 715.
- the number of aFADs in each area has previously been estimated, although it is likely to be an underestimate given the life-span of devices and lack of registry.
- Impact of aFADs to epipelagic habitat is known, with studies on species associated with aFADs and time spent by primary target species. The increase in availability of species is well understood.
- There is no specific benthic habitat data for WPP 713, 714 and 715 under aFADs but 12.5% of seafloor mapped at depths of 200-1,000 m in Indonesia is available.
- Sufficient surrogate information is available and the likelihood of vulnerable benthic habitats is reduced by depth.
- The footprint of a single anchor is known (3 m²) and the cumulative footprint of 10,000 aFADs is 0.03 km².
- the collective size of the three management areas is ~3.1 million km².
- the cumulative footprint of 10,000 FAD anchors is 0.000001% of the three fishing areas.

Recommendations:

1. Review the Scoring Issue for this Task to ensure SI 2.4.3 Habitat information is appropriate.
2. Review FAD reports and applications, as required to be submitted by regulation 26/2014.
3. Review the feasibility and benefit of a FAD register and how this links to vessel license.

Task 4.1 – Implementation of WCPFC measures in zones 716 & 717

Sub-objective 4: The effective application of regional (RFMO) and national measures for straddling stocks						
Action goal 4: RFMO and national measures applied effectively						
Action name 4: Apply international measures are required by WCPFC CMMs						
Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Direktorat Jenderal Perikanan Tangkap	<p>MMAF to implement WCPFC measures in zones 716/717 (CMM2017-01), which specifically set out measures to implement prohibition of deploying, servicing or setting on FADs shall be in place between 0001 hours UTC on 1 July and 2359 hours UTC on 30 September each year for all purse seine vessels (Para 16); Notify the Commission of restrictions to purse seine effort and/or catch of skipjack, yellowfin and bigeye tuna within their EEZs in accordance with the effort limits established (Para 25); Ensure that all purse seine vessels fishing solely within its national jurisdiction within the area bounded by 20°N and 20°S carry an observer (Para 35);In 2022 it was a recommendation to remove this part of text from action.</p> <p>Take necessary measures to ensure that the total catch of Indonesia's respective other commercial tuna fisheries for bigeye, yellowfin or skipjack tuna, but excluding those fisheries taking less than 2,000 tonnes of bigeye, yellowfin and skipjack, shall not exceed either the average level for the period 2001-2004 or the level of 2004</p>	Dec-20	National Decrees		3.1.1 (a) There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes.	Delete this Task

Justification:

This task was first identified through the 2018 MSC pre- assessment, where a set of landing data points in December 2016 recorded a few trips from WPP 716. As of 2024, the FIP voluntarily installed Spot Trace units on its vessels. In 2021, the 13 vessels equipped with Spot Trace units only fished in WPP 714 and as far as the northern part of WPP 714. In 2024, data was all incorporated into the maps presented during the WPP 713/714/715 meetings and the SE-Sulawesi FCMC meeting. Very brief meeting minutes were provided (Filename: Regional FCMC_May30_PBN) with a link to slide presentations.

The FIP has collected a number of indicators and greater data to refute claims that the fishery is operating in WPP 716 and 717, and MMAF has recently confirmed that there is no activity in WPP 716 or 717 relevant to the FIP. Without this Task, PI 3.1.1 would likely score ≥ 80 and as such the 3.1 1 PI score was amended (Table 3).

Recommendation

1. This Task be deleted from the FIP and 3.1.1 be rescored in light of information that confirms the FIP does not operate in zones 716 and 717.

Task 5.1 – Purse seine specific objectives

Sub-objective 5: Tuna management plan improved							
Action goal 5: Explicit fishery specific tuna management and ecosystem fishery objectives incorporated, and measurable indicators defined							
Action name 5: Defining fishery specific tuna management and ecosystem objectives, with measurable indicators defined							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre-assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Management Plan improved to incorporate explicit fishery specific objectives and actions	Direktorat Jenderal Perikanan Tangkap	MMAF to include PS specific objective in national (WPP 713, 714, 715) fisheries management plan	Dec-20	Management plan		3.2.1 (SG 80) Short- and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 & 2, are explicit with the fishery specific management system;	60-79

Justification:

Harmonisation of the MSC Fisheries Standard was not available when the pre-assessment or third year review were conducted, the harmonisation of this scoring issue is now likely to be available as a certified tuna fishery operates in IAWs (<https://fisheries.msc.org/en/fisheries/indonesia-pole-and-line-and-handline-skipjack-and-yellowfin-tuna-of-western-and-central-pacific-archipelagic-waters>). However, a thorough review of the scoring issues and justification is recommended prior to harmonisation. At present the review team believe there is a difficulty in harmonising with the Certified Pole and Line Fishery as evidence to the contrary was presented to the review team (e.g., logbooks do not report use of FADs). With regard to 3.2.1. the Certification report of the Indonesian Pole and Line SKJ and YFT fishery stated that *“SG80 is partially met, as some component (mention of) short- and long-term fisheries management objectives consistent with outcomes of MSC’s Principle 1 and 2 are explicit within the fishery-specific management system. Nevertheless, no evidence of explicit objectives around stock status relative to the target reference point (TRP) both at the CMM and Indonesia AW Harvest Strategy.”*

The main means of verification for this Task is the implementation of the TCT RPP, and verifying whether it contains specific purse seine fishery short- and long-term objectives and actions, specific to fishing areas of WPP 713, 714 and 715.

The 2022 review noted that the TCT RPP contains detailed information regarding the tuna stocks and utilization of tuna within Indonesian waters, including WPP 713, 714, and 715. The Plan also includes details regarding the gear types used, fishing areas associated with each of the key tRFMOs (WCPFC, IOTC, CCSBT) and the use of FADs. Although the Plan provides good information, providing guidance and direction, as the Decree states. It is not a management plan that has the ability to constrain catch, and manages the fishing activity through sections or clauses.

The objectives listed in the TCT RPP are broad ranging. There are specific action plans contained in the TCT RPP that outline clear indicators and benchmarks that are gear specific and species-specific in some instances.

The TCT RPP contains broad ranging long-term objectives covering tuna fisheries in general, and also includes shorter term objectives (targets and action plans) that are more gear and species-specific in some instances (yellowfin and bigeye tuna and purse seine).

The Plan lacks explicit long-term purse seine fishery objectives but does contain short-term purse seine targets and actions, while most could be considered more implicit. Therefore, under the MSC standard wording, *“SG 80 Short- and long-term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 & 2, are **explicit** within the fishery specific management system”*, the fishery does not meet SG80 as the current management system does not contain explicit objectives that are consistent with achieving the outcomes expressed by MSC's Principles 1 & 2.

The scope of the NTMP includes:

- Tuna stocks:
 - Status of tuna stocks; and
 - Strategic plan for the management of tuna.
- Management and implementation area:
 - a) WPPNRI 571, 572, and 573 and the sea off Indian Ocean IOTC management area, and specifically for SBT managed by the *Commission for the Conservation of SBT (CCSBT)*;
 - b) WPPNRI 716 and 717 and the High Seas Pacific which is part of the management area of the WCPFC; and
 - c) IAW, namely 711, 712, 713, 714, 715, and 718.

The NTMP contains a detailed Action Plan tables for each of the fishing area and addresses and various issues associated with the FIP, such as FAD usage compliance VMS, e-logbooks and catches.

As discussed previously, the harvest strategy has been implemented in the fishery. With regard to MSC Principle 1, there are objectives contained within the interim harvest strategy document for Indonesia’s Archipelagic Waters (IAW). These include management and operational objectives:

- Management objective: *“to ensure the sustainability of yellowfin tuna, bigeye tuna and skipjack tuna resources” through harvest strategy implementation.*
- Operational objective: *“To maintain spawning stock biomass (SSB) above the limit reference point (LRP) of 0.2 of the unfished level, with the probability of 90% over the 10- year projection period” (MMAF, 2018a).*

Recommendations:

1. Develop and implement explicit short-and-long term fishery specific objectives.
2. Combine this Task with Task 7.1 below.

Task 6.1 – Decision making processes

Sub-objective 6: Decision making processes improved							
Action goal 6: WPP consultation and Decision making specifically addresses tuna management							
Action name 6: Strengthen the current WPP Decision making procedure to ensure that it responds to fisheries specific requirements							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Decision-making processes for tuna sub fisheries adjusted and incorporate specific actions	Direktorat Jenderal Perikanan Tangkap / IPP	Revisit the rationale for sub regional decision-making processes of tuna management under the WPP framework and seek to establish a more centralised decision-making structure where the principal management, research and regulatory groups can work collectively and apply a coherent regulatory framework across all WPPs.	Dec-19	Revised WWP Plan		3.2.2 (a) <i>There is an established decision making process that results in measures and strategies to achieve fishery specific objectives;</i>	≥80
						3.2.2 (b) <i>Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions</i>	60-79

Justification:

Harmonisation of the MSC Fisheries Standard was not available when the 2018 pre-assessment or 2022 third year review were conducted, although the harmonisation of this scoring issue is now likely to be available as a certified tuna fishery operates in IAWs (<https://fisheries.msc.org/en/fisheries/indonesia-pole-and-line-and-handline-skipjack-and-yellowfin-tuna-of-western-and-central-pacific-archipelagic-waters>). However, a thorough review of the scoring issues and justification is recommended prior to harmonisation.

There are clear formal and established decision-making processes within Indonesia with regard to tuna management.

Decision-making by the Director General Capture Fisheries and the Forum of management and utilisation of Fisheries resources Indonesia, demonstrate established decision-making processes. These processes result in measures and strategies to achieve high level objectives and decisions take account of serious and other important research, monitoring and evaluation, as well as the wider implications of decisions; stakeholder management meetings are held annually. MMAF makes informed decisions benefiting from the results of research conducted by various institutes.

There are currently good decision-making processes in place, Indonesia is aiming to strengthen these processes through the development and implementation of the Tuna Management Institution (TMI). The TMI brings together all the current processes for decision-making into one formal setting and better co-ordinates each aspect. It is currently proposed that the TMI will have at least three functions:

- Coordination functions: The TMI will coordinate the input for final decision-making process by the MMAF regarding the development of tuna fisheries. Since tuna fisheries involve a number of institutions and stakeholders both internal and external of the MMAF, the TMI will have a mandate to conduct coordination meetings to discuss and produce solutions on the problems before MMAF makes the final decision.
- Management functions: the TMI will have a nation-wide management scope, and will be partnering and collaborating in support of the Fisheries Management Area or WPP Management Institution scopes.
- Scientific functions: The TMI will have members from academia and people with backgrounds in research, so its scientific function will be to support decision making based on scientific analysis and research (Hatfield, 2019).

The TCT RPP provides for a clear action item and target to establish a formal mechanism to coordinate stakeholders in the management of Tuna and Skipjack. The Plan states that this is to be done within five years. The process has begun and expected to conclude in 2026. However, the formal processes and mechanisms will have been established and utilised prior to this end date.

Whilst there are a number of examples of results from these decision-making processes, there is still a lack of examples where decision making apply to achieve fishery-specific objectives in a timely and adaptive manner. The development and implementation of a harvest strategy for IAW, adoption of e-logbooks, and the adoption of several management measures into the fishery as part of the harvest control rules support a SG80 for SI 3.2.2 a),

although some components of the 2023 Harvest Strategy have not yet been fully-realised (e.g., allocation of quota) and SG 80 is not met for 3.2.2 b).

Task 7.1 – Fishery specific management

Sub-objective 7: Fishery specific management planning effective							
Action goal 7: Ensure that purse seine specific management outcomes are determined for WPP 714, 715 and 713 that are consistent with national policy							
Action name 7: Fisheries management planning & coordination							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Work with MMAF to ensure that purse seine specific outcomes for 714/715 are integrated into the RFMO and AW tuna management framework	Direktorat Jenderal Perikanan Tangkap	Strengthen the national tuna management plan to ensure that fishery specific management outcomes (purse seine) are explicit within the NTMP and that they address the following: the tuna regulatory framework as applied to the purse seine fleet, inside and outside 12 nm; inside IAW and the EEZ; the implementation of ecosystem related measures	Dec-19	Revised NTMP		3.2.1 <i>Short and long-term objectives are consistent with MSC outcomes and are explicit within the fishery specific management system is not met</i>	<i>60-79</i>

Justification:

There is an option to combine this Task with Task 5.1 as they both consider fishery-specific management measures. If not, Harmonisation of this Scoring Issue is now available using the Harmonisation Database. With regard to 3.2.1. the certification report of the Indonesian Pole and Line SKJ and YFT fishery stated that *“SG80 is partially met, as some component (mention of) short- and long-term fisheries management objectives consistent with outcomes of MSC’s Principle 1 and 2 are explicit within the fishery-specific management system. Nevertheless, no evidence of explicit objectives around stock status relative to the target reference point (TRP) both at the CMM and Indonesia AW Harvest Strategy.”*

The main means of verification for this task is the development and final implementation of the TCT RPP, and verifying whether it contains specific purse seine fishery management measures, specific to fishing areas of WPP 713, 714 and 715.

As previously stated at Task 5.1, the TCT RPP contains detailed information regarding the tuna stocks and utilization of tuna within Indonesian waters, including WPP 713, 714, and 715. The Plan also includes details regarding the gear types used, fishing areas associated with each of the key tRFMOs (WCPFC, IOTC, CCSBT) and the use of FADs. The Plan provides good information and is written in a format that resembles a detailed workplan and strategy document, providing guidance and direction, as the Decree states. The Plan is not a management plan that constrains catch and manages the fishing activity through sections or clauses. There are no fishery-specific management measures contained within the TCT RPP that are relevant to WPP 713, 714 or 715.

However, the TCT RPP does contain action plans that stipulate targets, indicators and benchmarks that are more gear and species specific in some instances. The Plan does lack explicit management measures for the purse seine fishery, but does contain short-term management objectives for the fishery and sets clear timelines for these to be met. The current format of the TCT RPP is the step where information is gathered, analyses conducted, and arrangements made, before setting explicit management measures.

There are also objectives contained within the interim harvest strategy document for Indonesia’s Archipelagic Waters (IAW). These include management and operational objectives:

- Management objective: *“to ensure the sustainability of yellowfin tuna, bigeye tuna and skipjack tuna resources” through harvest strategy implementation.* And
- Operational objective: *“To maintain spawning stock biomass (SSB) above the limit reference point (LRP) of 0.2 of the unfished level, with the probability of 90% over the 10- year projection period” (MMAF, 2018a).*

Recommendations:

1. Combine Tasks 5.1 and 7.1

Task 8.1 – Compliance risk assessment

Sub objective 8: Compliance systems within the tuna fisheries strengthened							
Action goal 8: Effective application of the compliance system							
Activity name 8: Compliance system strengthened							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Compliance Risk Assessment workshop completed after the adoption of management tools	PSDKP	With the suite of management measures identified (Task 1), undertake a risk assessment of the purse seine fleet to determine risks and optimisation of deployment strategies	Dec-21	Risk Assessment Reports		3.2.3 (a) A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures and strategies	

Justification:

The operation of YFT and SKJ purse seine fisheries under assessment operate throughout three FMAs, namely FMA 713, 714, and 715. Since the last review there has been some progress with regard to management measures, including further training and deployment of onboard observers on FIP vessels (see Table 3), the requirement to use e-logbooks and use of SpotTrace to track vessels. However, compliance with these new measures, together with other measures within the harvest strategy (i.e., the WPP 714 spatial spawning closure, quota and limiting FADs), needs to be further understood. Task 8.1 specifically requires a compliance risk assessment workshop be conducted. To date this has not been done, and the review team suggests revising the original MSC pre-assessment to allow an improved alignment with Scoring Issues in later versions of the Fisheries Standard (i.e., 3.2.3 c is likely more applicable to this Task).

MMAF advised that compliance with many of the measures is based on the use of another measure (e.g., the compliance with YFT spatial closure can be obtained by reviewing e-logbook data). An appropriate risk assessment should include the implementation of measures and adherence by fishers. Although there has been no compliance risk assessment performed nor any compliance workshop conducted on the fishery, this scoring issue is likely to meet SG 60 as per the justification provided in Task 8.2.

Recommendations:

1. Determine if a risk assessment workshop is still the best course of action to meet this Scoring Issue. If so, conduct compliance risk assessment workshop, considering all facets of the fishery and operations (e-logbooks, aFADs, licenses, transshipment, transfers, management options going forward, etc.).
2. Develop a timetable for ongoing compliance risk assessment workshops (preferably annually or more often).
3. Develop feedback loop from the compliance risk assessment workshop outcomes into management agencies, MMAF, law enforcement, fisher education and training programs, development of harvest strategies and control rules as well as management options.

Task 8.2 – MCS tools

Sub objective 8: Compliance systems within the tuna fisheries strengthened							
Action goal 8: Effective application of the compliance system							
Activity name 8: Compliance system strengthened							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Identify and apply compliance tools to effectively enforce relevant management measures, strategies and/or rules (logbook, FAD Limits, VMS and Licensing controls)	PSDKP	Appropriately resource compliance tools to ensure that deterrent measures are being effectively applied	Dec-22	NPOA - IUU		3.2.3 (a) A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures and strategies and/or rules	

Justification:

Since the 2022 review, additional monitoring, control and surveillance mechanisms have been implemented in the fishery, and there is a reasonable expectation that they are effective. However, this task specifically requires “compliance tools” and “deterrent measures” and there is a lack on data available regarding non-compliance and application of sanctions. Many of the mechanisms to ensure compliance and enforcement for YFT and SKJ are the same as those currently in place for Southern Bluefin Tuna.

The MCS mechanisms available to the FIP include:

- Vessels >10GT are required to register a sailing declaration that must be carried on board;
- Licensed vessels are referred to (SEACOM) in order to check Vessel Size classification before a final fishing permit can be issued;
- Vessel licensing regulations;
- Distinct fisheries courts to handle fishery related compliance matters;
- Government patrol vessels;
- Observer coverage: rates are variable and presented in Table 4;
- E-logbooks: a large focus on the use of electronic logbooks with increasing usage by vessel and port. Any improvements in entries needs to be analysed as in 2022 half of the entries were not to an acceptable standard. Task 2.1 provides further information about e-logbooks;
- VMS: Mandatory use for vessels >31GT, however, FIP vessels are ≤30GT;
- SpotTrace: Voluntarily installed VMS by FIP vessels as a compact, as it is low cost tracking and motion alert device, powered by 100% satellite technology on Tracertrak.
- Crew Operated Data Recording System (CODRS)³⁹.

Furthermore, the Indonesian Government is a member of the *Regional Plan of Action (RPOA) to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated Fishing in the Region (RPOA-IUU)*⁴⁰. From the RPOA IUU initiative, Indonesia has developed and continues to implement a broad *National Plan of Action for Illegal, Unregulated and Unreported (IUU) fishing (NPOA-IUU) 2012 – 2016*. The NPOA recently been reviewed and is now dated 2025–2029. The updated NPOA-IUU remains voluntary, is globally recognised, was presented by MMAF in October 2025⁴¹.

Given that “*monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and associated enhancement activities, and there is a reasonable expectation that they are effective.*” SG 60 is likely to be met. However, the purse seine sector, especially that associated with the FIP operating out of Kendari, currently lacks a “demonstrated” MCS system and SG 80 is unlikely to be met. There is limited clarity as to whether sanctions to deal with non-compliance are consistently applied and thought not to provide effective deterrence.

³⁹ <https://www.ykan.or.id/en/about-us/our-science/crew-operated-data-recording-system/>

⁴⁰ <https://rpoaiuu.org>

⁴¹ <https://www.seafdec.or.th/iuu-events/against-iuu-workshop-2025/downloads/presentations/Indonesia.pdf>

Recommendations:

1. In parallel with recommendations from Task 8.1 above, assess if the current MCS tools and systems employed are directly relevant to the FIP purse seine vessels.
2. Taking the results from the recommendation outcomes under 8.1 and outcomes from the MCS review, conduct a gap analysis to identify required MCS tools and systems improvements that may be required in the future. The gap analysis should also provide insight into MCS systems and tool options to be trialled and adopted in the fishery.
3. Develop and implement relevant MCS tools and systems identified from the compliance risk assessment, MCS review and gap analysis report outcomes.
4. Conduct analysis into e-logbook and SpotTrace GPS data sources from Kendari vessels, to provide confirmation that these vessels are not fishing in WPP 716 and 717 areas.

Task 8.3 – Fisher compliance

Sub objective 8: Compliance systems within the tuna fisheries strengthened							
Action goal 8: Effective application of the compliance system							
Activity name 8: Compliance system strengthened							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Provide information on VMS, logbook returns, aFAD coverage to demonstrate that reporting measures are in place, including fishers when required, providing information of importance to the effective management of the fishery.	PSDKP/DKP and fishers	Fishers engaged to support and provide information of importance to the effective management of the fishery, including catch logbook returns and FAD Registration (if required) (Task 7)	Jun-23			3.2.3 (c) SG 60 : Fishers are generally thought to comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	

Justification:

Once again, the Scoring Issue mentioned in this Task (3.2.3 c) is likely to be inaccurate as it differs from wording in version 1.3 and later versions of the Fisheries Standard. The Review Team recommends the 2018 pre-assessment be updated to version to ensure the gaps are addressed.

There are clear examples where fishers are currently in non-compliance with the management system and measures in place for the fishery (i.e., use of greater number of aFADs than permitted). As discussed in Task 8.2, there appears to be a lack of compliance and enforcement of the management system and measures in place for the fishery.

There has been a significant improvement, specifically with regard to e-logbook activation, observer coverage and vessels participating in observer program. There are also a greater number of fishers engaged in processes and discussions regarding the fishery, and training in e-logbooks. There is now 100% use and activation of e-logbooks, but compliance rates of data entry into the e-logbook needs to be analysed.

Recommendations:

1. Continue to actively engage and communicate with fishers of their requirements to engage and support the fishery through provision of robust and reliable data (e-logbooks, VMS, aFADs, etc.) that can be used for management purposes.
2. Continue to ensure that fishers are willing to participate in the observer program to allow the program to reach a consistent proportion of coverage.
3. Linked with recommendations from Tasks 2.1 and 8.1 and 8.2 on an ongoing basis, monitor fishers compliance to the above requirements.

Task 8.4 – Sanctions

Sub objective 8: Compliance systems within the tuna fisheries strengthened							
Action goal 8: Effective application of the compliance system							
Activity name 8: Compliance system strengthened							
	Primary Agency / recommended coordinator	Task description	Expected outcome achieved by	Means of verification	Pre assessment scoring (10/18)	MSC Scoring guidepost	Updated review Progress score (2025)
Provide evidence that sanctions are being applied to the tuna sector and that they are an effective deterrent	PSDKP	Make available details of the sanction system applied including withholding sailing permits, warnings and sanctions, when implemented.	Jun-23	Summary reports of fishery specific sanctions		3.2.3 (b) Sanctions to deal with non-compliance are consistently applied	

Justification:

Harmonisation of the MSC Fisheries Standard was not available when the pre-assessment or third year review were conducted, the harmonisation of this scoring issue is now likely to be available as a certified tuna fishery operates in IAWs (<https://fisheries.msc.org/en/fisheries/indonesia-pole-and-line-and-handline-skipjack-and-yellowfin-tuna-of-western-and-central-pacific-archipelagic-waters>). However, a thorough review of the scoring issues and justification is recommended prior to harmonisation. PI 3.2.3 relates to Fishery Specific Management Systems and as such harmonisation is not applicable for this Scoring Issue.

To date, the Review Team was not made aware of any specific sanctions associated directly with the purse seine sector. However, sanctions to deal with non-compliance exist and there is some evidence that they are applied in other fisheries. There are sanctions associated with other operational aspects of fisheries in Indonesia including logbooks, sailing permit, vessel registration. Examples of these include:

- logbook regulation is covered by Ministerial Decree 48/2014 and supported by a sanction system;
- restrict the use of more than 3 AFADs per vessel (PER.30/MEN/2004; PER.08/MEN/2011 and PERMEN No. 26/PERMEN-KP/2014);
- Fishery Act 31/2004 sets out penalty Schedules;
- Enforcement includes the graduated fiscal penalties, suspension or cancellation of licenses, refusal for new licenses and full removal from the fishery as penalty options;
- Revision issued on 2009 No 45. lists penalties and fines to deal with specific violations.

Given that there is no assurance that sanctions to deal with non-compliance are consistently applied and whether they provide effective deterrence this scoring issue is unlikely to reach SG 80. Whilst e-logbook and Spot Trace data could provide important information on the compliance with spatial closures in WPP 714, there is no evidence that this data has been analysed or that sanctions were applied to any vessel for non-compliance. Furthermore, the 2022 review stated that there was evidence to suggest that fishers are openly using more aFADs per vessel than what is permitted, without any compliance or enforcement ramifications with no sanctions being applied. In the three years since that review, there has been no further information on compliance and sanctions for using more than three aFADs per vessel. SG60 is not met.

Recommendations:

1. Obtain and review compliance and enforcement statistical reports, and any subsequent court proceedings, associated with the tuna purse seine fleet operating out from Kendari port.
2. Review trends in data over several years, concerning infringements and associated penalties and sanctions issued.

Appendix 1 – Stakeholder interviews

Date	Topic(s)	Attendance
Sept 2025	<ul style="list-style-type: none"> • Vessel operations and make up • Spot Trace • Compliance and enforcement • Infringements and sanctions • aFADs • yellowfin tuna spawning closure • quota allocations • e-logbooks 	Sven Blackenhorn - Consultant Sonya Puspita - PBN
Sept 2025	<ul style="list-style-type: none"> • Vessel operations and make up • Observer program • Funding of Program • Habitats • Spot Trace • Compliance and enforcement • Infringements and sanctions • aFADs • yellowfin tuna spawning closure • quota allocations • e-logbooks 	Dodiet Rachmadi Slamet, S.Pi. Head of MMAF SDI working group for onboard observation.

References

- Banks, R., 2018. Pre-Assessment of the Kendari based tuna purse fishery operating in Archipelagic and Territorial Waters within management areas WPP 713 (The Makassar Strait and the Flores Sea), WPP 714 (the Banda Seas) and WPP 715 (the Maluku and Seram Seas).
- Dupaix, Amaël., Manuela Capello, Christophe Lett, Marco Andrello, Nicolas Barrier, Gaëlle Viennois, Laurent Dagorn (2021) Surface habitat modification through industrial tuna fishery practices, *ICES Journal of Marine Science*, 78(9): 3075-88. <https://doi.org/10.1093/icesjms/fsab175>
- Dupaix, Amaël., Matthieu Lengaigne, Marco Andrello, Nicolas Barrier, Laurent Dagorn, Quentin Gusmai, Gaëlle Viennois, Manuela Capello (2024) Floating objects in the open ocean: Unveiling modifications of the pelagic habitat induced by forest cover change and climate variations. *Global Environmental Change*. Volume 88,
- Gunawan TS, Hamidah M, Rahayu AK, Septiani NN, Pingkan J, Hermansyah A, Farhan M, Sholihah R, Arundina AB, Minarni DR, Susanti R, Gustiar GG, Kusumastuti DN, Maharani GR, Nurhakim MD, Khalishah PV, Rahman IF, Nugianto N, Hakim A, Agung F, Rosdiana A, Retnoningtyas H, Hartati ID, Muttaqin E, German S, Gacutan J, Yulianto I (2025) National-scale mapping of ecosystems to improve ocean accounting for marine and coastal management in Indonesia. *One Ecosystem* 10: e155166
- Hafizt, H. D. M. Yuwono, Z. Janwar, Suyarso, S. Wouthuyzen (2024) Benthic habitat mapping

for estimating seagrass carbon stock across Takabonerate Islands, Indonesia, *Regional Studies in Marine Science*, Volume 77.

<https://www.sciencedirect.com/science/article/abs/pii/S2352485524003360>

Hargiyatno, I.T., Wudianto, Laurent Dagorn, Fayakun Satria, Lilis Sadiyah, Monique Simier, John H. Hutapea, Agustinus A. Widodo, Manuela Capello (2025) Reliance and usage of anchored Fish Aggregating Devices (aFADs) in the Indonesian tuna fisheries. *Regional Studies in Marine Science*. Volume 89
<https://doi.org/10.1016/j.rsma.2025.104362>

Hatfield, P., (2019). Workshop Report - Re-Institutionalizing Tuna Fisheries Management in Indonesia Bogor 19 DECEMBER, 2019.

Hoshino, E., Hillary, R., Davies, C., Sarwono, E., Sadiyah, L., Satria, F., Proctor, C., (2018). Development of prototype operating models for exploring harvest strategies for tropical tuna in Indonesian archipelagic waters: case studies for skipjack and yellowfin tuna., Report to the Western Central Pacific Fisheries Commission.

Hoshino, E., Hillary, R., Davies, C., Satria, F., Sadiyah, L., Ernawati, T., Proctor, C., (2020). Development of pilot empirical harvest strategies for tropical tuna in Indonesian archipelagic waters: Case studies of skipjack and yellowfin tuna. *Fish. Res.* 227, 105539. <https://doi.org/10.1016/j.fishres.2020.105539>

Hoshino, E., F. Satria, L. Sadiyah, T. Yunanda, P. Suadela, C. Proctor, J. Dell, C. Davies (2024) Experiences in developing empirical harvest strategies for the Indonesian tropical tuna fisheries, *Ocean & Coastal Management*. 253, <https://www.sciencedirect.com/science/article/pii/S0964569124001236>

Olsen, L (2024) Activity Completion Report: West Pacific East Asia – Improved Tuna Monitoring. WPEA-ITM Project. Document IDN: 2496815.
<https://www.wcpfc.int/doc/2024/activity-completion-report-wpea-itm-final>

Pérez, Géraldine & Dagorn, Laurent & Deneubourg, Jean-Louis & Forget, Fabien & Filmlalter, John & Holland, Kim & Itano, David & Adam, Shiham & Jauharee, Ahmed Riyaz & Beeharry, Sunil & Capello, Manuela. (2020). Effects of habitat modifications on the movement behavior of animals: the case study of Fish Aggregating Devices (FADs) and tropical tunas. *Movement Ecology*. 8. <https://doi.org/10.1186/s40462-020-00230-w>

Putra, Singgih & Ambo Rappe, Rohani & Jompa, Jamaluddin & de Voogd, Nicole. (2024). Preliminary study of marine sponges (Porifera) in the littoral of Spermonde Archipelago, Indonesia. *ZooKeys*. 1208. 275-313. 10.3897/zookeys.1208.113603.

Proctor C. H., Natsir M., Mahiswara, Widodo A. A., Utama A. A., Wudianto, Satria F., Hargiyatno I. T., Sedana I. G. B., Cooper S. P., Sadiyah L., Nurdin E., Anggawangsa R. F. and Susanto K. (2019). A characterisation of FAD-based tuna fisheries in Indonesian waters. Final Report as output of ACIAR Project FIS/2009/059. Australian Centre for International Agricultural Research, Canberra. 111 pp.

MMAF. 2019. R-VIA. Record Of Vessel Authorized to Fish For Tuna Within Indonesia Archipelagic and Territorial Waters. Accessed on January 2019.

- <http://rvia.kkp.go.id/tentang-rvia>. MAAF, Jakarta.
- MMAF, 2018a. Interim harvest strategies for tropical tuna in Archipelagic Waters of Indonesia.
- MMAF, 2018b. Technical Instructions for Implementing Logbook Fishing - 11/2018. Director General of Fishery Capture.
- MMAF, 2014a. Logbook of Catching Fish - 48/2014. Minister of Marine and Fisheries.
- MMAF, 2014b. Rumpon. Minister of Marine and Fisheries.
- Niyazi, Yakup & Thomas, Elin & Pucino, Nicolas & Swanborn, Denise & Stewart, Heather & Jamieson, Alan. (2025). Status of global seafloor mapping effort and priority areas for future mapping. *Frontiers in Marine Science*. 12. 10.3389/fmars.2025.1543885.
- Rauf, S., 2019. The Implementation Of Log Book and Observer Program in Indonesia.
- Rochwulaningsih, Y. Singgih Tri Sulistiyono, Noor Naelil Masruroh, Nazala Noor Maulany. 2019. Marine policy basis of Indonesia as a maritime state: The importance of integrated economy. *Marine Policy*: 108, <https://doi.org/10.1016/j.marpol.2019.103602>
- Rumpa, Arham & Krisnafi, Yaser & Syamsuddin, Muhidin & Rasdam, & Pontoh, Peggy & Kasim, Muh & Ikhsan, Muhammad & Runtukahu, Zulfatan & Baroqi, A. & Timur, Satria & Wulandari, Novita. (2025). Potential Fishing Ground Based On Tuna Handline Movement In Fish Aggregating Device Areas In Fisheries Management Areas (Fmas) 713 And 714. *Journal Penelitian Perikanan Indonesia*. 31. 148-159. 10.15578/jppi.31.3.2025.148-159.
- Satria F, Sadiyah L, Suadela P, Hernuryadin Y, Budiarto A, Pratiwi MC, Hoshino E, Davies C, Hillary R, Dell J. 2023. Harvest strategies for tropical tuna in archipelagic waters of Indonesia: Update. Presented at the Nineteenth Regular Session of the Scientific Committee Meeting. Koror, Palau, 16 -24 August 2023. WCPFC-SC19-2023/MI-IP-10. <https://meetings.wcpfc.int/node/20107>
- Sechi, I.D., Roberta Pietrasanta, Francesco Caruso, Alessandro Bocconcelli, Tommaso De Lorenzi, Andrea Morello, Massimiliano Rosso (2025). Anchored Fish Aggregating Devices (FADs) are overlooked and growing source of pollution in Western Mediterranean Sea, *Marine Pollution Bulletin*, 219 <https://doi.org/10.1016/j.marpolbul.2025.118305>
- SC19, W., 2021. The Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. Seventeenth Regular Session of the Scientific Committee. Electronic Meeting 11–19 August 2021 - SUMMARY REPORT.
- Tears, T., N. Davies, P. Hamer, A. Magnusson, T. Peatman, J. Scutt Phillips, G. Pilling, R. Scott T. Vidal, J. Hampton (2025) Stock assessment of skipjack tuna in the Western and Central Pacific Ocean: 2025. WCPFC-SC21-2025/SA-WP-02 (REV3). 05 August 2025. <https://meetings.wcpfc.int/node/26679>
- TNC/YKAN, 2021. Length-Based Assessment of Tuna Fisheries in Indonesia Archipelagic Waters (Fishery Management Areas 713,714, and 715).

Widyatmoko, A. C., Hardest, B. D., Wilcox, C. (2021) [Detecting anchored fish aggregating devices \(AFADs\) and estimating use patterns from vessel tracking data in small-scale fisheries](#). *Scientific Reports*. Vol. 11, article number: 17909.

Widodo AA, Wudianto, Proctor C, Satria F, Mahiswara, Natsir M, Sedana IGB, Hargiyatno I, Cooper S. 2016. Characteristics of tuna fisheries associated with Indonesian anchored FADs in waters of the West Pacific and the Indonesian archipelago. Meeting paper ST-IP- 06, Scientific Committee Meeting of Western and Central Pacific Fisheries Commission, Bali, 3 – 11 August 2016.

Widodo, Anung & Wudianto, Wudianto & Satria, Fayakun & Hargiyatno, Ignatius & Sadiyah, Lilis & Timur, Putra & Wibowo, Sandi & Anggawangsa, Regi & Hartaty, Hety & Yati, Emi. (2023). Estimation of number and position of fish aggregating devices in Indonesia Archipelagic Waters. *E3S Web of Conferences*. 442. 10.1051/e3sconf/202344203002.