Analysis of the observer data from the Indian Ocean purse seine tuna FIP (Dongwon)

Confidential Report

Version 1.1 (August 2022)

Prepared by

by Key Traceability Ltd.

August 2022

Key Traceability Ltd.
+44 7505 122728
Info@keytraceability.com
England Registered Company 09730288
70 Londesborough Road, Portsmouth, PO4 0EX

Project ref. 0082c

Introduction

The Dongwon Indian Ocean purse seine tuna FIP targets skipjack (*Katsuwonus pelamis*), bigeye (*Thunnus obesus*) and yellowfin (*Thunnus albacares*) tuna. The fishing vessels are flagged to the Republic of Korea and operate in the Indian Ocean (IO) high seas and the Seychelles exclusive economic zones EEZ. The fishery operates using fish aggregation devices (FADs) and on free schools of tuna and is regionally managed by the Indian Ocean Tuna Commission (IOTC).

The FIP encompasses two fishing vessels. These vessels are as detailed the table below (Figure 1).

Table 1. Vessels by flag included in the FIP

Vessel name	IRCS	IMO number	Flag	Areas of operation
Blue Ocean	DTBU5	9509396	Republic of Korea	Seychelles EEZ and high seas
Adria	DTBY3	8919489	Republic of Korea	Seychelles EEZ and high seas

It is a pre-requisite of the MSC that all certified FIPs have demonstrated five years of robust catch composition data (MSC Guidance to the Fisheries Standard v2.01: GSA3.2.4), and therefore, the aim of this analysis is to provide critical information about the impact of the purse seine fishery on target catch rates of tuna, as well as bycatch rates of endangered, threatened, and protected (ETP) species, and secondary species.

A primary species is defined as:

- Species not covered under P1;
- Species within the scope of the MSC programme;
- Species where management tools and measures are in place to manage the stock in relation to a Limit Reference Point (LRP) or Target Reference Point (TRP).

A secondary species is defined as:

- Species not managed and do not meet primary species criteria;
- Species that are out of the scope of the programme but do not meet ETP criteria.

ETP species is defined as:

- Species recognised by national ETP legislation;
- Species listed in binding international agreements (e.g. Convention on Migratory Species (CMS);
- Species classified as 'out-of-scope' which are assessed by the IUCN Red List as 'vulnerable' or above.

Primary and secondary species are defined as 'main' species when the following criteria are met:

- The catch comprises 5 % or more by weight of the total catch of all species by the UoA;
- The species is classified as 'less resilient' and comprises 2 % or more by weight of the total catch of all species by the UoC. Less resilient is defined here as having low to medium

productivity, or species for which resilience has been lowered due to anthropogenic or natural changes to its life-history;

- The species is out of scope but is not considered an ETP species (secondary species only);
- Exceptions to the rule may apply in the case of exceptionally large catches of bycatch species.

Robust catch data is essential to close out Principle 2 actions and propel the FIP towards entering certification from the Marine Stewardship Council MSC).

This report aims to identify the main species with which the fishery interacts, based on observer reports from fourteen different fishing trips over one year, from December 2020 and December 2021. Nine observer reports were provided for the vessel, ADRIA, and a further five trips for BLUE OCEAN. Using the data collected from observers, the report also aims to verify the relevant management policies are being adhered to aboard the vessels, including no shark finning and relevant FAD management procedures, as outlined in the pre-existing FAD management policy.

Methodology

Fishery observers were employed on the two vessels within the scope of the Indian Ocean purse seine tuna FIP (Dongwon) between 2020 and 2021. They were provided with a reporting template to use when recording the species with which the vessels have interacted. The recorded data was preliminarily processed by the Seychelles Fishing Authority (SFA) before being sent to Key Traceability for further analysis. The analysis of the data focussed on the robustness of the reporting, by assessing whether there were inclusive of MSC requirements, including records of specific species, size (weight and/or length), fate (discarded or retained), condition (dead or alive), and FAD usage.

The weight data for each individual caught enabled each species to be categorised into one of the MSC designations; primary, secondary, and ETP (**Table 2**). The main data analysis and results are described and explained in the report below.

Table 2: MSC designation table and supporting justification for the designation for all species caught by the two vessels in the Indian Ocean purse seine tuna FIP fleet (Dongwon)

Scientific name	Common name	Designation	Category	Justification	Weight (t)
Katsuwonus pelamis	Skipjack tuna	Target	P1	N/A	9167.00
Thunnus albacares	Yellowfin tuna	Target	P1	N/A	2869.00
Thunnus obesus	Bigeye tuna	Target	P1	N/A	895.00
Coryphaena hippurus	Mahi mahi	Secondary	Minor	<2% total catch weight	21.23
Decapterus macarellus	Mackerel scad	Secondary	Minor	<2% total catch weight	246.96
Elegatis bipinnulata	Rainbow runner	Secondary	Minor	<2% total catch weight	207.62
Gempylus serpens	Snake mackerel	Secondary	Minor	<2% total catch weight	10.28
Canthidermis maculata	Rough triggerfish	Secondary	Minor	<2% total catch weight	8.58
Makaira nigricans	Blue marlin	Secondary	Minor	<2% total catch weight	4.99
Lobotes surnamensis	Atlantic tripletail	Secondary	Minor	<2% total catch weight	3.58
Acanothcybium solandri	Wahoo	Secondary	Minor	<2% total catch weight	2.82
Sphyraena barracuda	Great barracuda	Secondary	Minor	<2% total catch weight	0.99
Makaira indica	Black marlin	Secondary	Minor	<2% total catch weight	0.78
Aluterus monoceros	Unicorn leatherjacket filefish	Secondary	Minor	<2% total catch weight	0.54
Diodontidae	Porcupinefish	Secondary	Minor	<2% total catch weight	0.33
Seriola rivoliana	Longfin yellowtail	Secondary	Minor	<2% total catch weight	0.11
Platax teira	Longfin batfish	Secondary	Minor	<2% total catch weight	0.09

Uraspis secunda	Cottonmouth jack	Secondary	Minor	<2% total catch weight	0.09
Mola mola	Ocean sunfish	Secondary	Minor	<2% total catch weight	0.08
Kyphosus vaigiensis	Brassy chub	Secondary	Minor	<2% total catch weight	0.06
Caranx sexfaticus	Bigeye trevally	Secondary	Minor	<2% total catch weight	0.06
Tylosurus crocodilus	Houndfish	Secondary	Minor	<2% total catch weight	0.02
Kyphosus cinerascens	Blue sea chub	Secondary	Minor	<2% total catch weight	0.02
Belonidae	Needlefish	Secondary	Minor	<2% total catch weight	0.01
Naucrates doctor	Pilotfish	Secondary	Minor	<2% total catch weight	0.004
Pteroplatytrygon violacea	Pelagic stingray	Secondary	Minor	<2% total catch weight	0.003
Brama brama	Atlantic pomfret	Secondary	Minor	<2% total catch weight	0.00016
Carcharhinus falciformis	Silky shark	ETP	N/A	CMS Appendix II; IUCN Red List (VU); IOTC Res. 17/05	59.49
Rhincodon typus	Whale shark	ETP	N/A	CMS Appendix I; IUCN Red List (EN); IOTC Res. 13/05	9.69
Carcharhinus longimanus	Oceanic whitetip	ETP	N/A	CITES Appendix II; CMS Appendix I; IUCN Red List (CR); IOTC res. 17/05	0.38
Mobula mobular	Giant oceanic manta ray	ETP	N/A	CITES Appendix II; CMS Appendix I; IUCN Red List (EN); IOTC Res. 19/03	0.34
Caretta caretta	Loggerhead turtle	ETP	N/A	CMS Appendix I; IUCN Red List	0.08

				(VU); IOTC Res. 12/04	
Chelonia mydas	Green turtle	ETP	N/A	CITES Appendix II; CMS Appendix I; IUCN Red List (EN); IOTC Res. 12/04	0.006

Results

Due to the COVID-19 travel restrictions and quarantine rules, the observer coverage onboard the two vessels were significantly lower in 2020, than in 2021 (20-22%, and 50-83% of trips, respectively). The IOTC enforces a 5% observer coverage (IOTC Res. 11-04) on all vessels operating in the area, which means that the FIP follows the RFMO standards, and those set by the MSC. The total weight and the composition of each designation to total catch biomass can be seen in Figure 3.

Table 3: The total weight of each MSC designation and the composition of each designation to the total catch weight

Species designation	Total weight (t)	Composition to total catch weight
Target	12,933.00	95.7%
Secondary	488.44	3.6%
ETP	69.99	0.5%
Primary	20.78	0.2%
Total	**13,512.21**	**100%**

Total biomass

The total catch biomass combines both the target catch biomass and bycatch biomass, in order to show the respective contribution to fishing effort. Target species contributed to the largest proportion of total biomass (96%) (Figure 1Figure 7). The remaining 4% of the total catch biomass came from the bycatch, which included a range of ETP species, secondary species, and primary species, which will be discussed further on in the report.

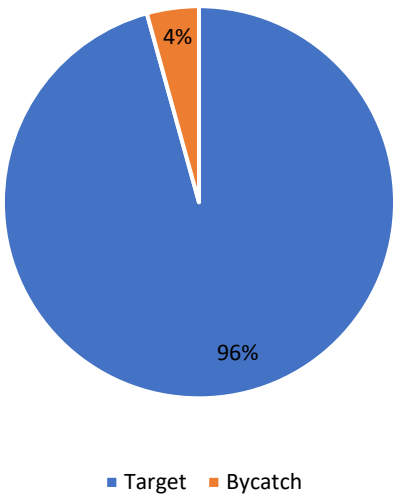

Figure 1: The percentage composition of target and bycatch biomass to total catch biomass

The observers recorded target and bycatch incidents separately, which means there is no correlation with the FAD usage information on the impacts that the FADs may have had on either target or bycatch biomass. Therefore, the rest of this report will address target species, bycatch species, and FAD usage data separately.

Target species

The FIP targets Indian Ocean skipjack, bigeye, and yellowfin tuna and the observer data showed that the majority of the total catch weight derives from skipjack tuna (71%). Yellowfin tuna contributed 22% of the total catch weight, and bigeye 7% (Figure 2**Error! Reference source not found.**).

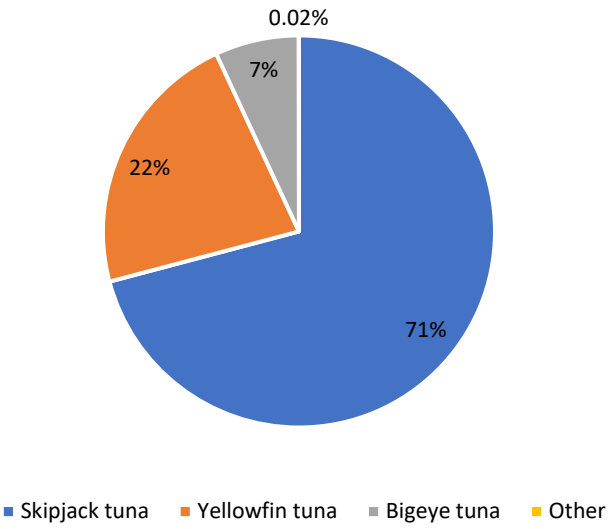

Figure 2: The percentage composition of each tuna species to the total catch weight of target species.

The majority of the target catch biomass was caught whilst the vessels were using free schools of tuna (64%) and the remaining 36% of the total catch was caught using FADs (Figure 3). There was no indication that the FADs used onboard the vessels met the ISSF best practice FAD management requirements of being non-entangling and/or biodegradable. However, the IOTC is, currently, the only Regional Fisheries Management Organisation (RFMO) to outline that all vessels must use non-entangling FADs on board the vessels (IOTC Res. 19-02). Therefore, it is more than likely that the vessels will be using non-entangling FADs.

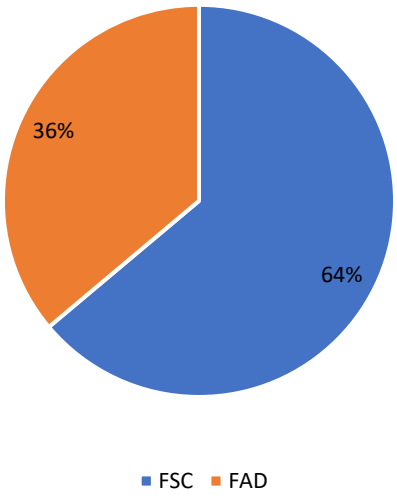

Figure 3: The percentage contribution to total catch biomass from free school (FSC), and FAD fishing.

Bycatch species

The observer data was robust enough to identify the specific species that the fishing vessels interacted with throughout the duration of the fishing trips. Although the bycatch biomass contributed to 4% of the total catch biomass, the species were able to be segregated into MSC designation groups, "primary", "secondary", and "ETP" species. The primary species are those that are not target species but may have management measures in place that help to protect the population from overfishing, including by the use of target or limit reference points (TRP and LRP, respectively). The secondary species are those that have no existing management measures and can be segregated into 'main' and 'minor' based on the relative contribution to total catch biomass. All individual bycatch species contributed to less than 2% of the total catch biomass, which means most are secondary 'minor' species. The ETP species are those that are 'in-scope' species that are recognised by national threatened species legislation like Conservation Management Measures (CMM) or species that are listed on the Convention on International Trade in Endangered species (CITES). 'Out-of-scope' species (amphibians, reptiles, birds, and mammals) are also designated as ETP if they are listed on the IUCN Red List as either vulnerable (VU), endangered (EN), or critically endangered (CE).

The majority of the species caught by the fishing vessels were designated to the secondary species label and contributed to the highest proportion of individuals to the total bycatch biomass (84%). The ETP species contributed to 12% of the total bycatch species and primary species contributed to the remaining 4% (Figure 4).

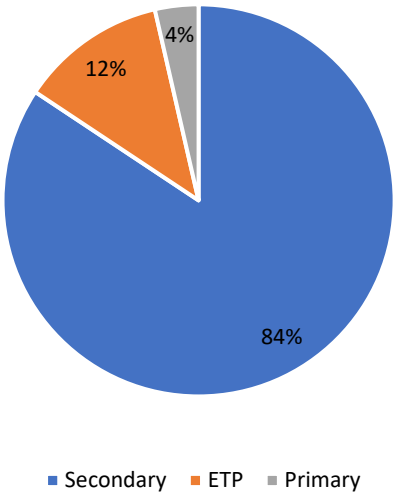

Figure 4: The percentage composition to total catch biomass of species grouped by MSC designations, including Primary, Secondary, and ETP species.

The second largest contribution to total bycatch biomass were from ETP species, and predominantly from silky sharks (10.27%) (Figure 5). There were no interactions with marine mammals, and no fishing activity occurred by setting on whales. However, there was an incident on each vessel where a whale shark (*Rhincodon typus*) was caught in the purse seine nets. The whale sharks were reported to both be alive when they were discarded, which is evidence that the crew were following the steps provided by the ISSF best practice handling techniques. The FAD management plan and the IOTC Resolutions clearly state that there must be no intentional setting on whale sharks (IOTC Res. 13-05), which suggests that the captured whale shark was accidental.

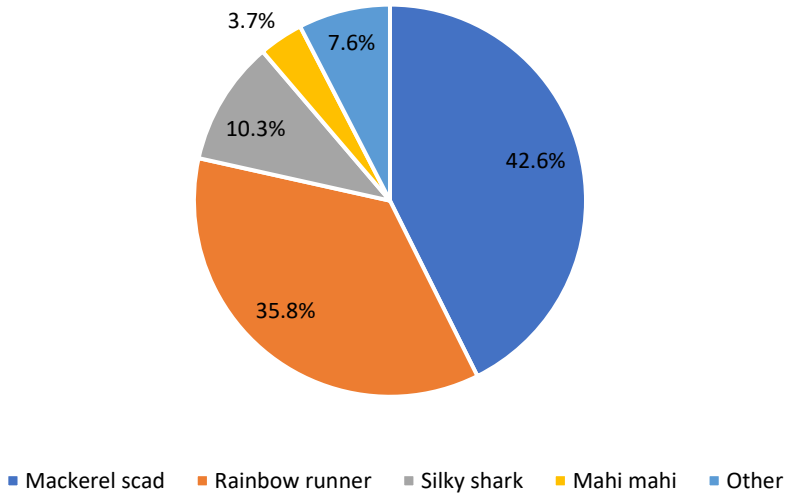

Figure 5: The percentage composition of bycatch species to the total bycatch biomass. The highest contribution to total catch biomass came from four species; mackerel scad, rainbow runner, silky shark, and mahi mahi. The remaining 7.6% is composed of 26 different species, including ETP species.

The silky shark bycatch also contributed to the majority of the ETP bycatch biomass at 98.7% (Figure 6). The remaining 1.3% of total ETP species biomass consists of giant oceanic manta (*Mobula mobular*), oceanic whitetip shark (*Carcharhinus longimanus*), green turtle (*Chelonia mydas*), loggerhead turtle (*Caretta carettea*), and whale shark (*Rhincodon typus*). There was no mention of shark finning onboard the vessels at any time and 100% of the ETP species catch was discarded and not retained or landed.

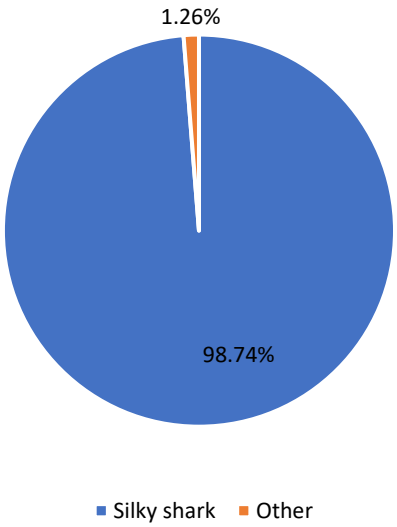

Figure 6: The percentage composition of each species to the total ETP species biomass.

The fate and conditions of each individual were also recorded, adding to the robustness of the data recorded by the observers. There was a 100% discard rate of ETP species, meaning none of the individuals caught were retained on the vessels. The majority of the ETP species were alive when they were discarded (69%), indicating that the vessels are using the ISSF best practice handling techniques

for ETP species like sharks and turtles (Figure 7). However, more improvement in the efficiency and care provided to the animal from the crew could ensure that the percentage of animals that are discarded alive increases.

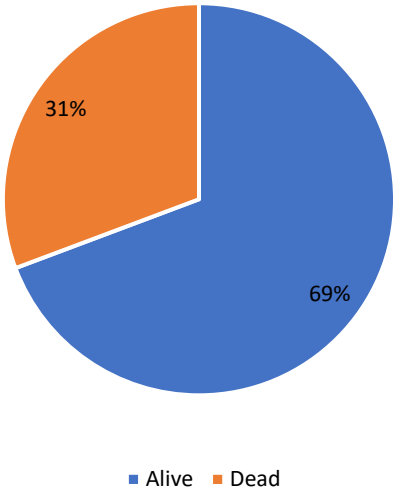

Figure 7: The percentage composition of species to total ETP species biomass, segregated by condition (alive or dead).

FAD and floating object data

The observer data provided by the SFA also included specific reference to the use of floating objects and FADs across the two vessels and designated the different types into drifting FADs (dFADs), anchored FADs (aFADs), natural logs (NLOG) and artificial logs (ALOG). Within the NLOG and ALOG designations, there are specific materials described to differentiate between catches, including tree trunks, branches, palms (VNLOG), dead animals (ANLOG), nets, ropes, and buoys (FALOG), and empty cans, household appliances, etc., (HALOG).

Across the two vessels, and the 14 fishing trips, a total of 359 floating objects and FADs were encountered and fished on, and 401 were encountered but not fished on. Of the total FADs encountered, only four were aFADs, and 730 dFADs. A total of 126 FADs were directly deployed by the fishing vessels.

There were 19 ALOGs encountered by the fishing vessels, and 10 were fished on. Whereas there were six NLOGs encountered by the fishing vessels, with only one vessel fishing on the object.

In the raw FAD and floating object data, there were also records of turtle association with fishing effort. There were three incidents of turtles being associated with the vessels, however, it is unclear if the vessels intentionally set on the turtles, or if this was merely reporting the sighting of them. Only one of the vessels that demonstrated there was turtle association also reported that a singular loggerhead turtle was caught by the net. The remaining two vessels did not report on catching a turtle.

Conclusion

The observer data received from the Seychelles Fishing Authority (SFA) was robust and included critical information that allows the FIP to improve the score from Principle 2 requirements. Important

data that was recorded and analysed here includes individual size, weight, fate, and condition of each individual caught, as well as useful FAD information, which helps to verify that the relevant FAD management procedures are being adhered to. Using this data, analysis was conducted to identify the discrepancies within the data and to learn more about the interactions the fishing vessels have with non-target species.

The majority of the total catch biomass was contributed by target tuna species, skipjack, yellowfin, and bigeye tuna. The remaining 4% of the total catch biomass was bycatch

Next steps

1. Crew training

In order to improve the outcome for ETP species in particular, it is recommended that the crew on board both vessels undergo further training on the ISSF best practice handling techniques. Rapid, but careful manoeuvring of the animals is critical in ensuring they are discarded safely and improve their prospect of survival. Likewise, the safety of the crew is imperative, therefore educating them on the most efficient ways of handling the animals will not only ensure the longevity of the animal, but also the safety of the crew member.

2. Coordinates of ETP interactions

It would be beneficial to the FIP and the vessels to record where the incidents of ETP species bycatch took place. This could then be used as a guide to avoid species hotspots or migration areas in the future.

3. FAD information

The FAD information already being recorded is comprehensive, however, to be in full compliance with the FAD management policy, it is important that the FIP provides specific information on the location where the FADs were deployed, in order to allow for future tracking and detailed understanding of where the FADs are used and drifting to. This is also of great importance when it comes to retrieving the FADs.

4. More data

The data provided spans only one year of FIP operation. Clearly the COVID-19 restrictions on observers on board the vessels limited the number of reports during 2020. However, with restrictions easing the FIP should endeavour to employ more observers on the vessels. Furthermore, the MSC Guidance to the Fisheries Standard v2.01 states that the applicant FIPs need to consider the variability of catch composition data for at least five years, meaning this will be a pre-requisite for certification (GSA3.4.2). With more observer data, analysis will be more accurate and improve the reliability of the rate of interactions with both target and non-target species. This will be imperative for the FIP to enter into MSC certification because without clarity on all the species the fishery interacts with, there is no way to ensure that the fishery is operating in a sustainable manner in line with MSC requirements. Furthermore, the observer data is instrumental in verifying that the various fisheries management policies are being appropriately and fully adhered to, which also has implications for passing MSC certification requirements.