Report on the observer data for the Indian Ocean longline tuna FIP

Data analysis

Introduction

The Indian Ocean longline tuna FIP targeting albacore (*Thunnus alalunga*), bigeye (*Thunnus obesus*), and yellowfin tuna (*Thunnus albacares*). The vessel consists of longline vessels flagged to both Malaysia and Taiwan. The FIP is currently in its fourth year of the project and will be preparing to enter MSC certification within the next year. Currently, there are some areas that are lacking in information, including Principle 2.3.1 - ETP species outcome. In order to improve these scores and meet a pass at MSC certification level, the FIP needs to be able to demonstrate that the ISSF best practice bycatch handling techniques are being adequately utilised onboard the vessels.

The FIP has received 3 years' worth of observer data from the Taiwan Fisheries Agency (TFA) from 2017 to 2020. The observer data provided from this report was robust and clear. However, there were initial concerns about the lack of specific data completed by the observer regarding the weights of the discarded species. Absence of weight data from discarded species is not atypical for observer reports because the catch was not retained, however it is an area that could be improved on in the future to ensure that we are aware of all the catch biomass.

Furthermore, a large number of the endangered, threatened, and protected (ETP) species caught were not weighed either, which is detrimental to the FIP because it means there is not enough information to show how much the ETP species catch contributed to total catch biomass. Without knowing the composition to total catch biomass, we cannot determine the true impact that the FIP is having on the ETP species.

Nonetheless, the observer data did show that the largest majority of catch composition derives from the three main target species, albacore (*Thunnus alalunga*), bigeye (*Thunnus obesus*), and yellowfin (*Thunnus albacares*) tuna. Likewise, the number of ETP species caught in comparison to the target and primary species was minimal.

Data analysis

Weight data

The observer data showed that the largest contribution to the total catch biomass derived from the three target tuna species, albacore (58%), bigeye (14%), and yellowfin tuna (11%). The remaining 17% is composed of a range of primary (1%), secondary (15%), and ETP species (0.4%). However, as mentioned in the introduction, the data for the ETP species is not reliable because the incidents were not recorded or even estimated by their weight before they were discarded, therefore we do not know the true ETP species weight composition to the total catch biomass (Figure 1) (Table 1).

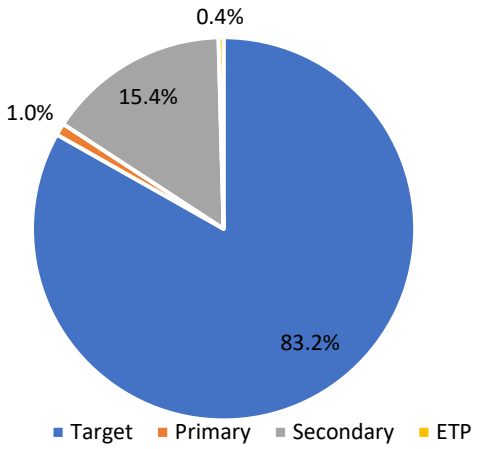

Figure 1: The percentage (%) catch composition of the different MSC designation groups to the total catch biomass

Table 1: MSC species designation table identifying the different categories that each species is associated with based on their contribution to the total catch biomass (Target, Primary, Secondary, and ETP species)

Scientific name	Common name	% composition to total catch weight	MSC designation	Main/Minor
Thunnus alalunga	Albacore tuna	58.3%	Target	N/a
Thunnus obesus	Bigeye tuna	14.1%	Target	N/a
Thunnus albacares	Yellowfin tuna	10.7%	Target	N/a
Katsuwonus pelamis	Skipjack tuna	1.0%	Primary	Minor (<2% of total catch weight)
Lepidocybium flavobrunneum	Escolar	4.0%	Secondary	Minor (<5% total catch weight)
Lampris guttatus	Opah	2.3%	Secondary	Minor (<5% total catch weight)
Prionace glauca	Blue shark	1.8%	Secondary	Minor (<5% total catch weight)
Xiphias gladius	Swordfish	1.7%	Secondary	Minor (<5% total catch weight)
Ruvettus pretiosus	Oilfish	1.4%	Secondary	Minor (<5% total catch weight)
Coryphaena hippurus	Mahi mahi	1.2%	Secondary	Minor (<5% total catch weight)
Acanthocybium solandri	Wahoo	1.2%	Secondary	Minor (<5% total catch weight)
Makaira nigricans	Blue marlin	0.9%	Secondary	Minor (<5% total catch weight)
Tetrapterus angustirostris	Shortbill spearfish	0.2%	Secondary	Minor (<5% total catch weight)
Makaira indica	Black marlin	0.2%	Secondary	Minor (<5% total catch weight)
Istiophorus platypterus	Indo-Pacific sailfish	0.1%	Secondary	Minor (<5% total catch weight)

Tetrapterus audax	Striped marlin	0.1%	Secondary	Minor (<5% total catch weight)
Spyraena spp.	Barracuda	0.1%	Secondary	Minor (<5% total catch weight)
Thunnus maccoyi	Southern bluefin tuna	0.040%	Secondary	Minor (<5% total catch weight)
Galeocerdo cuvier	Tiger shark	0.016%	Secondary	Minor (<5% total catch weight)
Bramidae	Pomfret	0.012%	Secondary	Minor (<5% total catch weight)
Unknown	Unknown	0.008%	Secondary	Minor (<5% total catch weight)
Centrolophus niger	Black ruff	0.007%	Secondary	Minor (<5% total catch weight)
Carcharhinus galapagensis	Galapagos shark	0.007%	Secondary	Minor (<5% total catch weight)
Mola mola	Ocean sunfish	0.004%	Secondary	Minor (<5% total catch weight)
Trachipterus spp.	Ribbonfish	0.002%	Secondary	Minor (<5% total catch weight)
Elegatis bipinnulata	Rainbow runner	0.001%	Secondary	Minor (<5% total catch weight)
Pseudocarcharius kamoharai	Crocodile shark	0.001%	Secondary	Minor (<5% total catch weight)
Regalecus glesne	Giant oarfish	0%	Secondary	Minor (<5% total catch weight)
Stercorarius skua	Great skua	0%	Secondary	Minor (<5% total catch weight)
Alepisaurus ferox	Long-snouted lancetfish	0%	Secondary	Minor (<5% total catch weight)
Dasyatis violacea	Pelagic stingray	0%	Secondary	Minor (<5% total catch weight)
Dasyatis spp.	Stingray spp.	0%	Secondary	Minor (<5% total catch weight)
Isurus oxyrhinchus	Shortfin mako	0.3%	ETP	IUCN Redlist (EN); CMS Appendix II
Carcharhinus falciformis	Silky shark	0.1%	ETP	IUCN Redlist (VU); CMS Appendix II
Isurus paucus	Longfin mako	0.04%	ETP	IUCN Redlist (EN); CMS Appendix II
Carcharhinus longimanus	Oceanic whitetip shark	0.01%	ETP	IUCN Redlist (CR); CMS Appendix I
Phoebetria fusca	Sooty albatross	0.001%	ETP	IUCN Redlist (EN); CMS Appendix II
Procellaria aequinoctialis	White chinned petrel	0.0002%	ETP	IUCN Redlist (VU); CMS Appendix II

Alopias supeciliosus	Bigeye thresher shark	0%	ETP	IUCN Redlist (VU); CMS Appendix II
Alopias vulpinus	Common thresher shark	0%	ETP	IUCN Redlist (VU); CMS Appendix II
Manta birostris	Giant oceanic manta	0%	ETP	IUCN Redlist (EN); CMS Appendix II
Caretta caretta	Loggerhead turtle	0%	ETP	IUCN Redlist (VU); CMS Appendix I
Mobula spp.	Mobula	0%	ETP	IUCN Redlist (EN); CMS Appendix II
Alopias pelagicus	Pelagic thresher shark	0%	ETP	IUCN Redlist (VU); CMS Appendix II
Sphyrna lewini	Smooth hammerhead	0%	ETP	IUCN Redlist (VU); CMS Appendix II
Elasmobranchii	Sharks spp.	0%	Unknown	Unknown

Total catch data

As a result of the observer data excluding the specific information related to ETP species weights, the analysis was altered to review the impact of ETP species on the total number of species caught by the FIP vessels. However, there was little change in the representation of ETP species to the total catch composition (Figure 2). In fact, the greatest difference seen between the weight composition and the number composition was from the secondary species. This could be due to many of the secondary species being small, which means by quantity they are abundant, but they do not weigh enough to contribute as much to the total catch biomass as with the target tuna species.

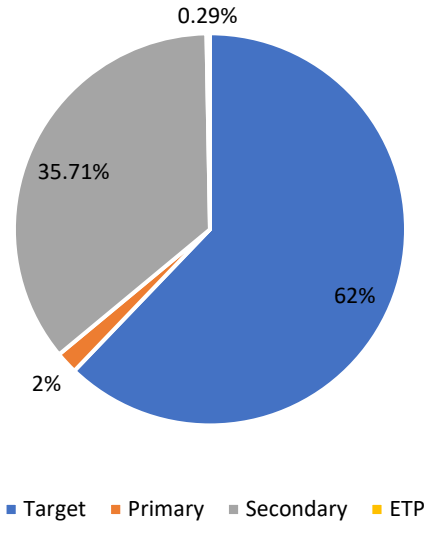

Figure 2: Catch composition of the different MSC designations using the total catch number

Species fates and conditions

There was a small percentage (14%) of discards associated with the observer data reports provided (Figure *3*). The figure was calculated using the total number of species individuals rather than weights of those individuals because none of the discards were weighed. As mentioned, this is not uncommon in observer data because the individuals were not landed or considered part of the immediate catch.

However, this could be relevant for the future understanding of the impact that the FIP has on non-target species and should be considered during future observer reports.

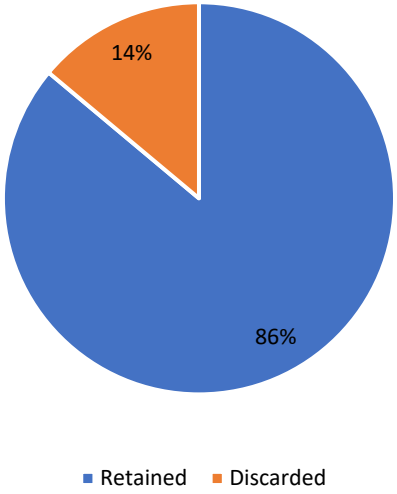

Figure 3: Species fate (retained or discarded) composition to total catch

Of discarded species, the condition (dead or alive) of the majority (75%) was not recorded (Figure 4). This is a significant aspect of observer reporting to understand about the true impact that the FIP is having on non-target, bycatch species. Discarding species alive is the best option for a fishing vessel to try and reduce the detrimental impact it has on non-target species. However, the data analysis showed that only 8% of discarded individuals were alive when they were released. More than double (17%) of discards were dead when they were released.

Extrapolating this information to estimate the condition of the remaining 75%,could suggest that the majority of them were dead when they were discarded. Improvement in the observer recording of species discards is imperative to understand the full impact that the fishing vessels have on the non-target species.

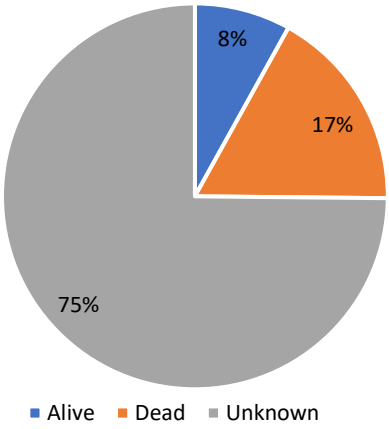

Figure 4: Percentage composition of discarded animals that were alive, dead, or unknown condition, to the total discard catch biomass

ETP species composition

The major ETP species that were identified consisted primarily of shortfin mako sharks (59%), followed by silky sharks (16%) and a combination of other shark, ray, turtle, and seabird species (Figure 5).

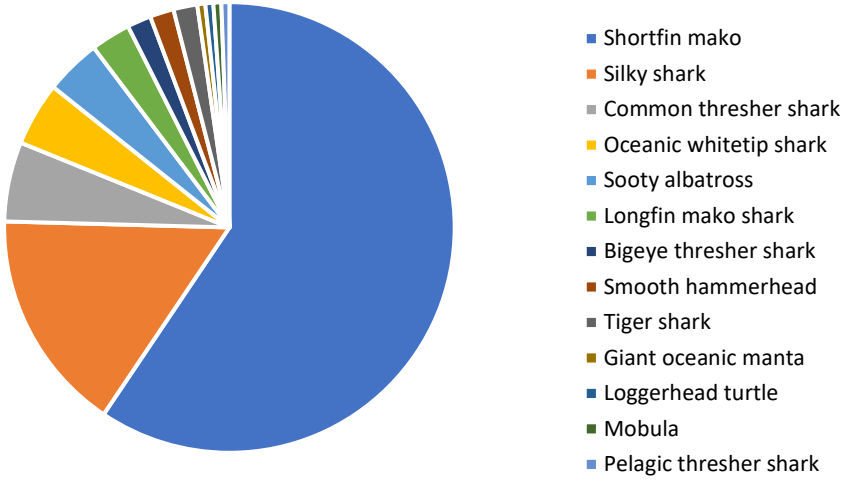

Figure 5: Catch composition of species to the total number of ETP species recorded by observer data

As is evident from Figure 5, the type of ETP species contributing the most to the total ETP catch composition is from sharks and rays (95%), followed by seabirds (4%) (Figure 6).

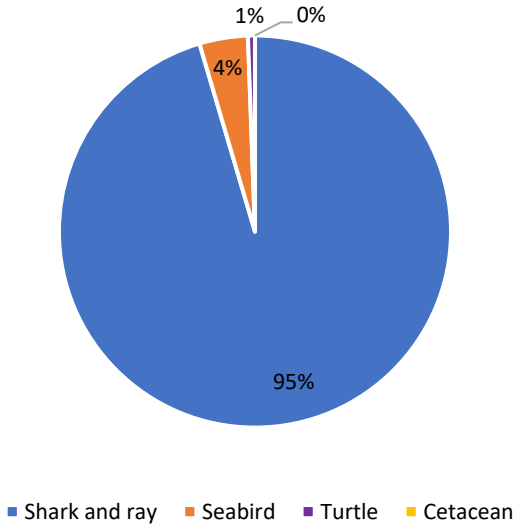

Figure 6: ETP species type composition to total ETP species catch

There were no incidents of cetacean bycatch reported by the observers, however there were seven incidents of sooty albatross (*Phoebetria fusca*), which are listed as endangered on the IUCN Redlist and are currently protected under the CMS Appendix II list. All seven incidents of sooty albatross were reportedly dead upon release. According to Heerah et., al. (2016), there are only 400 breeding pairs of Sooty albatross on Amsterdam Island, in the Southern part of the Indian Ocean. This means that any deductions could be detrimental to the larger population. A way of identifying or estimating which population specific individuals come from is to observe vessel monitoring/surveillance data to see where the incidental bycatch occurred.

Conclusion

The observer data is largely robust. However, there are still a number of areas that could be improved upon to ensure that the observers are recording as much information and data as possible, to show the true impact that the FIP is having on target and non-target (bycatch) species. The following section of the report will discuss some of the next steps that the FIP and observers will need to take in order to improve the information that is known about the fishery's interaction with non-target species.

Next steps

1. Weight data

   Require all observers to record the weights of all individual incidents on board the vessel. Specifically, for the ETP species so that we can understand more about the composition of these species to the total catch composition.

2. Species fates and condition

   The fate (retained or discarded) and condition (dead or alive) of every individual caught should be recorded. For discarded species, it is important that the conditions are recorded, specifically for ETP species because the FIP should be adhering to ISSF best practice handling techniques, wherein effort should be made to ensure that all ETP incidents are handled in the safest manner to reduce detrimental impact to both animal and crew. Therefore, the number of discards that were alive should be higher than is currently being reported.

3. ETP species

   The ETP species recording was successful in noting down the specific species identification, as well as the fate of those individuals (discarded or retained). Of course, none of the ETP species were retained, as required by the ISSF best practice framework for bycatch, which is good evidence to show that the FIP is complying with those regulations. However, there were many incidents where the condition of the species was not recorded, so there is now way of knowing whether the individuals were alive or dead upon release.

   a. Seabird bycatch mitigation techniques
      The number of sooty albatross is concerning because they are an endangered species, currently listed as decreasing in population by the IUCN, which means any incident of bycatch may be significant on species populations. Using mitigation techniques, including bird scaring lines (Tori lines), night-setting, weighted bait hooks, etc., could reduce the number of bird interactions.

4. Vessel monitoring systems

   Using vessel monitoring is an efficient way of learning where the non-target species are found. This is particularly important for some ETP species because it can be used to advise where and when not to operate in the future.

   Furthermore, as mentioned above, there are some populations of ETP seabird that are more vulnerable than others. Understanding where the vessels operate can infer the potential impact the vessels may have on the populations.