

An update on the Shark bycatch of tuna gillnet fisheries of Pakistan

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Abstract

The working paper presents an update on the shark by-catch of tuna gillnet fisheries of Pakistan. This includes the landing data of sharks collected by observers from the period of June 2012 – May 2013. The most common shark species in the gillnet operations identified through the landing data are Short-fin mako (*Isurus oxyrinchus*), Big-eye thresher (*Alopias superciliosus*) and Silky shark (*Carcharhinus falciformis*). All of the 3 species are of international concern whereas short-fin mako is expected to be species of interest for international scale – stock assessments in the foreseeable future. Nominal catches of elasmobranchs were reported from 1999 – 2007 indicating a decline in the apex predators (Shahid and Khan, 2012). The data presented herein, summarizes the by catch of elasmobranch from tuna gillnet operations data.

Introduction

Pakistan has a resourceful fisheries comprising of coastal and offshore fisheries and holds potential and scope for both artisanal and industrial fisheries. This includes the catch of commercially important tuna and tuna like species which are generally fished through gillnets from near shore to off shore waters in the EEZ. Around 500 tuna gillnet vessels operate in the area ranging from a size of 15 – 20 m. The stretched mesh size net¹ of the gillnet ranges from 13-17 cm and its lengths² varies from area to area³ (M. Khan 2012). While the fisheries range in size and it is difficult to distinguish from catch landings about the discards, catch effort and catch areas which arises obvious gaps in the data and pose hindrance in fisheries management as a whole.

In order to address the gaps in data and to address to policy makers that the fisheries is 'not' facing a decline in a unilateral way it is important to have a robust and adequate monitoring and management system in place. The presence of such a system opens avenues of research, improves data resolution enabling informed decision making. The observer coverage (2012 – 2013) on-board tuna gillnet vessels has been initiated and is helping to improve the database and the present study looks at how both the improved management can help compare the data gaps from landing and observer coverage data collected. This has been done through training and financing the skippers of the tuna gillnet vessels which collaborates to a total of 0.8% coverage which however is well below the par 5% coverage assigned by IOTC. Although, the coverage is less it provides an overview of the fishing areas and species composition in particular shark by catch. The details of the fishing operations including boats, gear type, by catch species composition is given in Moazzam (2012).

¹ Surface gillnetting use polyamide nets

² 4.5 km to 11 Km in the high seas with a breadth of 14 m.

³ Zones in the exclusive economic zone i.e. near shore to off shore to areas beyond national jurisdiction

Methodology

WWF – Pakistan in collaboration with the Indo-pacific Cetacean Research Conservation Fund (Government of Australia) has initiated an observer programme for data collection on-board tuna gillnet vessels whereas the Smart Fishing Initiative has helped cover the landing data. At this initial stage, four observers (skippers of tuna gillnet vessels) are involved in collection of data. The observers have been trained and are provided data sheets to gather valuable information, moreover for increasing the reliability on the data digital camera's have been provided to record all the catches. GPS and length measurements are taken by the observers which also highlights the fishing grounds. The data presented in this paper reflects the shark by catch from 4 tuna gillnet vessels (the data cannot be generalized, this is the first time that Pakistan has collected data from on-board vessels). WWF – Pakistan and Smart Fishing Initiative collectively will up-scale the observer coverage by end 2013 and expect to achieve 5% coverage of gillnet vessels by end 2015.

Further data collection is being ensured through WWF and SFI (ABNJ) areas beyond national jurisdiction project which will be helpful in analyzing the data along with trophic cascade research. The catches indicate short fin mako as the highest caught shark species followed by big eye thresher as the most abundant by catch species. The dominant peak catches are reported in June and April. Sharks landing as by catch are consumed in the local market and the fins are exported to China and Hong Kong. The data has been collected from Karachi Fish Harbor and it is estimated that around 70% of the total fish catch (including tuna) of Pakistan is landed at this fish landing center (Khan 2013).

Results

Shark data analysis from landing sites indicate that Short fin mako is the most dominant species in the pelagic tuna gillnet operations where the most dominant catches of tuna include longtail tuna followed by kawakawa, frigate and bullet tuna (Khan 2013). Among sharks there are a number of shark species which are found as by catch in Pakistan, a list is attached as annex. These vessels operate in both near shore and offshore areas thus their catches comprise of both neritic and offshore tuna species i.e. Yellowfin and skipjack.

A simple analysis of the data show an oscillation catch trend with small peaks in August, October and a major increase during May for tuna, whereas for sharks June and April has the highest peaks and the graph (please see table 1) indicates a massive rise and drop in the period of 2012 – 2013. If we compare the 2 data sets from current year for tuna a potential cycle is identified where the reported catches have a steady increase and decline showing the seasonal variations of the tuna catches in gillnet operations. In the case of sharks, there is a sudden increase and a drop which is quiet alarming. It is essential to look at the time series data from 2002 – 2012 (below) as the comparison of data from landing site indicates obvious gaps. These are currently being addressed through a series of programmes undertaken under the umbrella of Smart Fishing Initiative by WWF.

Table I: Shark Landings of Pakistan in tonnes from 2002 - 2012

Area	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Sindh	15,111	14,100	11,274	9,199	7,611	5,111	4,721	2,911	2,540	2,170	2009
Balochistan	7,357	4,597	4,257	3,009	3,049	3,378	1,257	3,006	2,214	2,490	2,800
EEZ	3	-	2	42	21	-	74	-	-	-	-
Total	22,471	18,697	15,533	12,250	10,681	8,489	6,052	5,917	4,754	4,660	4,809

The above table showcases the shark catches from all fishing vessels operating in the area. Due to the fact that Pakistan had a dedicated shark fishery in the recent years it is difficult to say whether the catches are from gillnet or trawl or any other fishing operation. Moreover, the species composition data is also missing along with length frequency of dominant caught species. Below is a comparison of the shark and tuna percent contributions from gillnet operations recorded by observers at landing center (Karachi Fish harbor). It shows the overlap of shark and tuna catches and indicates peak catches in April and June.

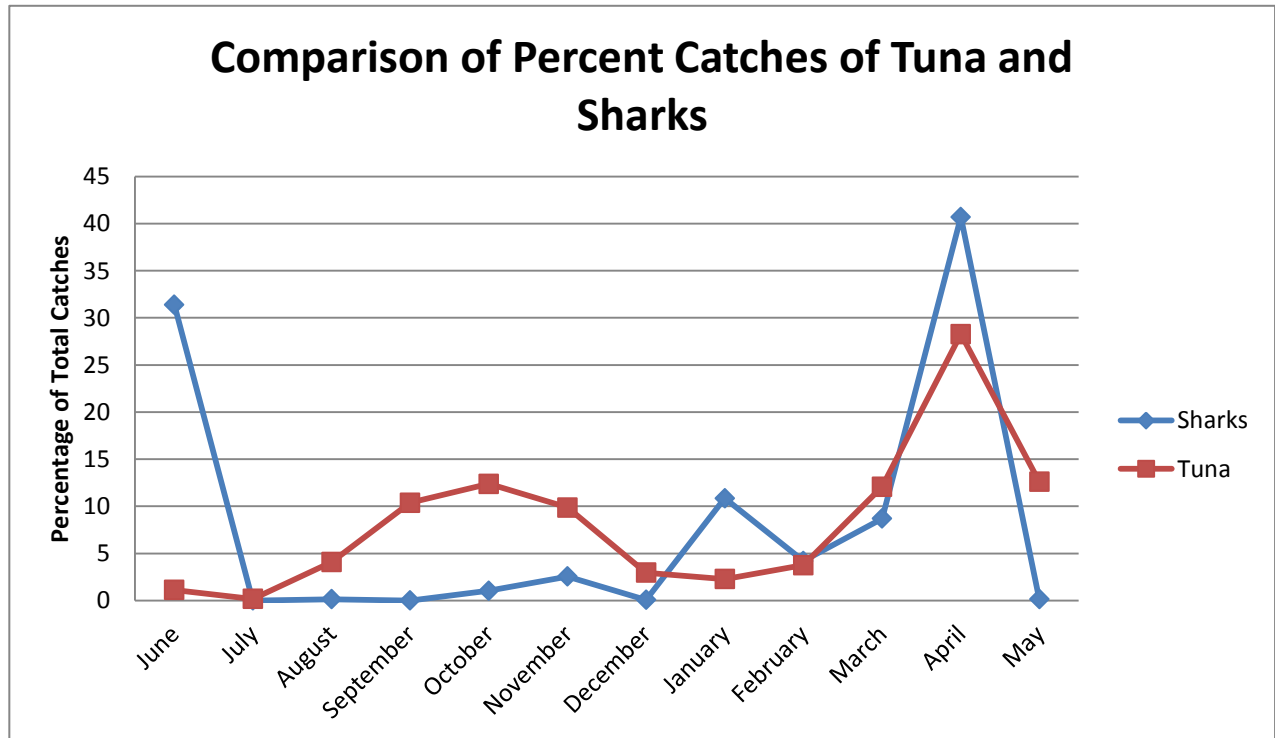


Fig 1: Shows the percent contributions of sharks and tuna per month from their total contribution in gillnet operations from June 2012 – May 2013

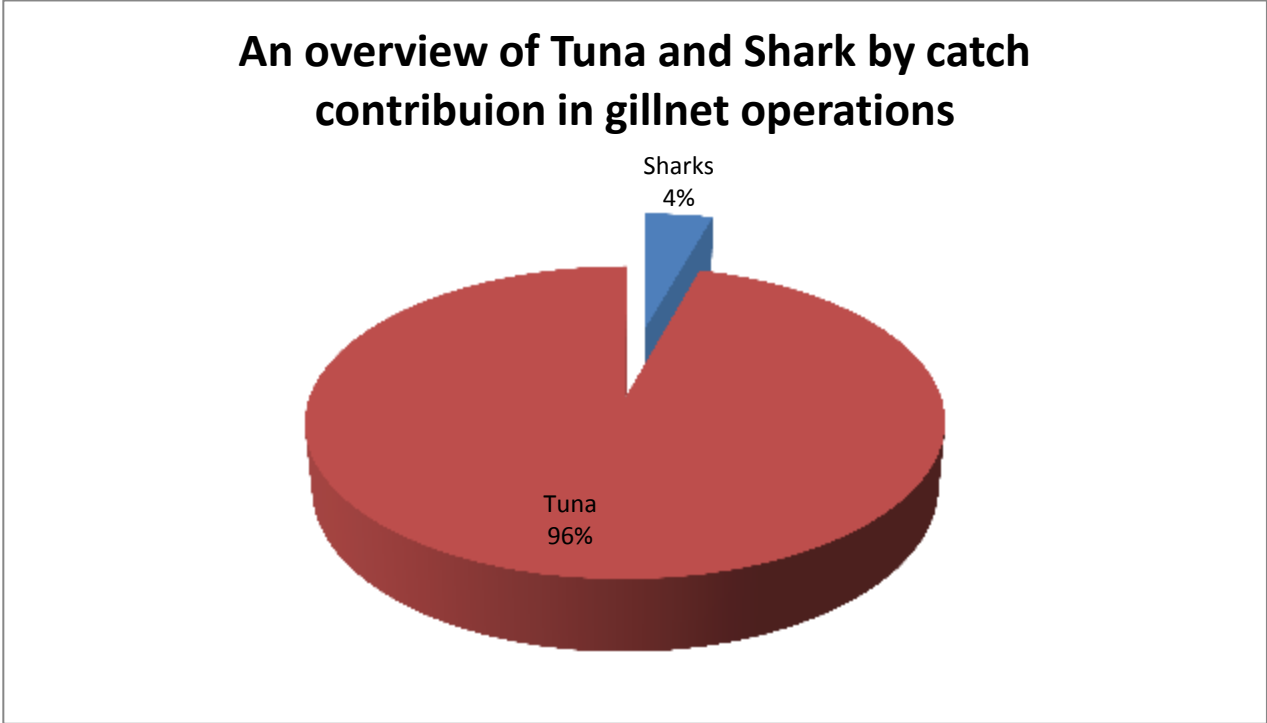


Fig 2: Showcases the total weightage contribution from total catch of tuna and shark species only from the time period of June 2012 – May 2013.

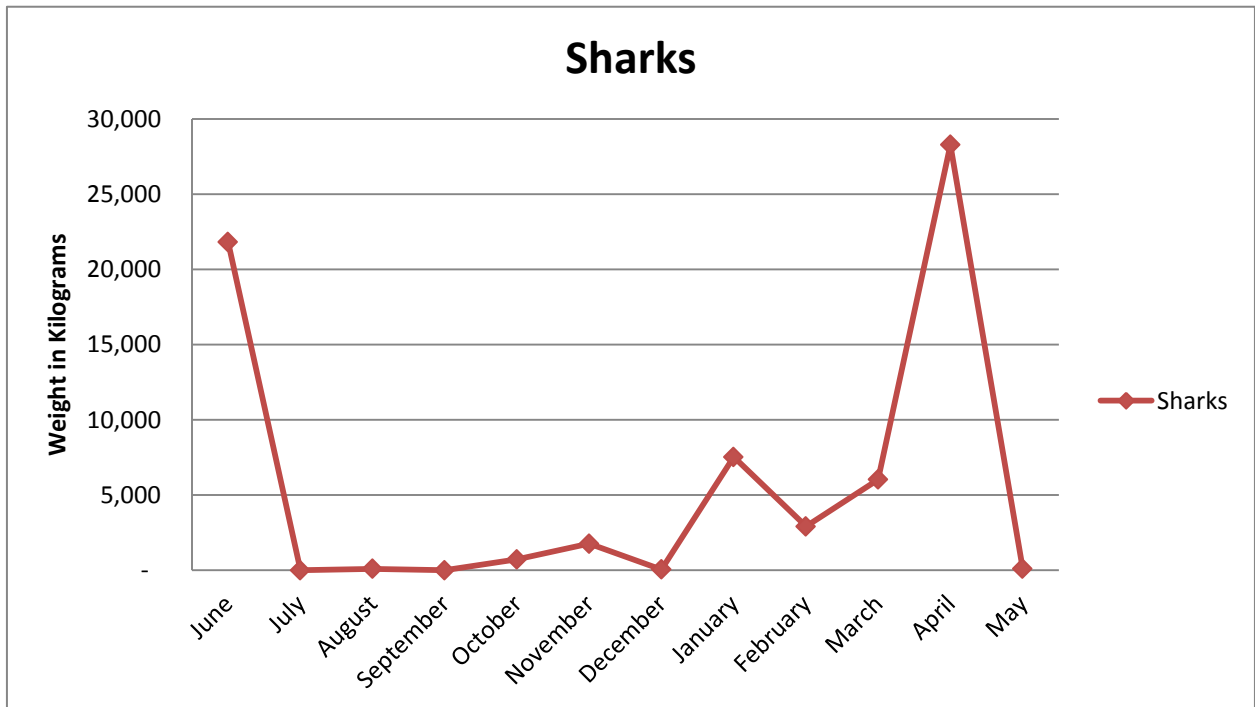


Fig 3: Monthly Landings of Sharks from tuna gillnet operations at Karachi Fish Harbor (June 2012 - May 2013)

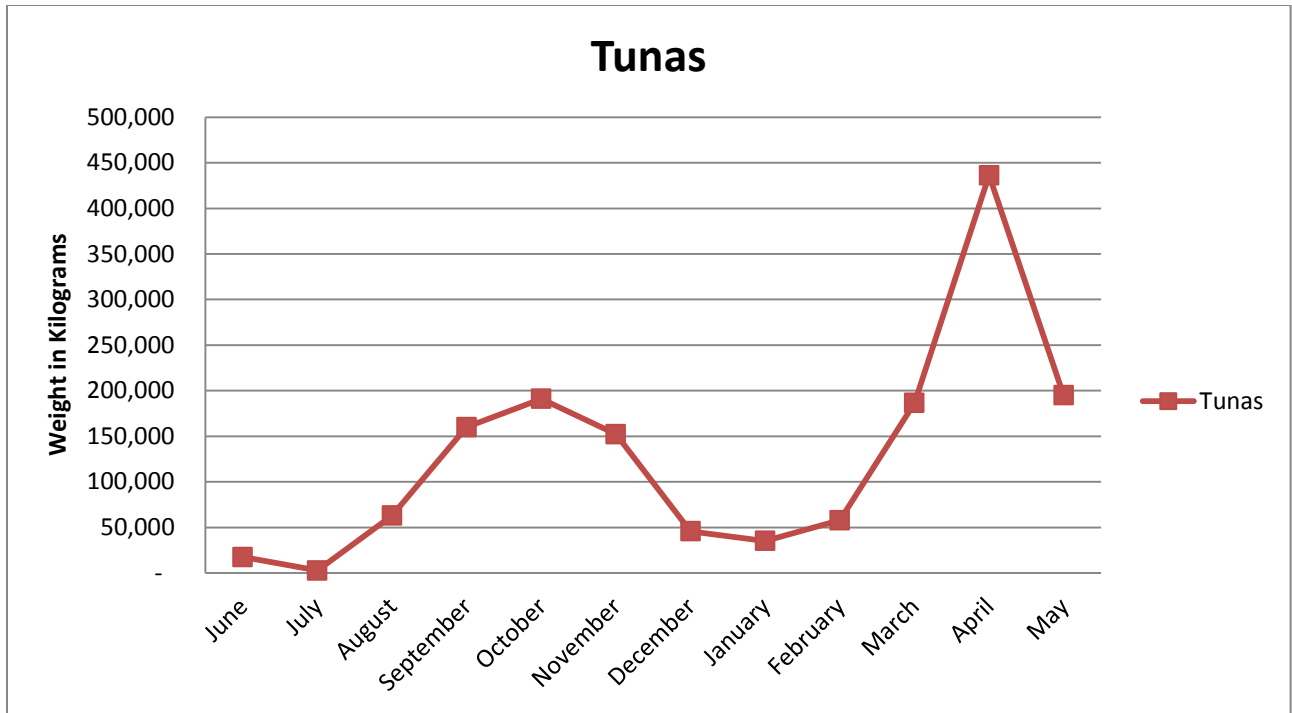


Fig 4: Monthly Landings of Tuna in gillnet operation from Karachi Fish Harbor (June 2012 - May 2013)

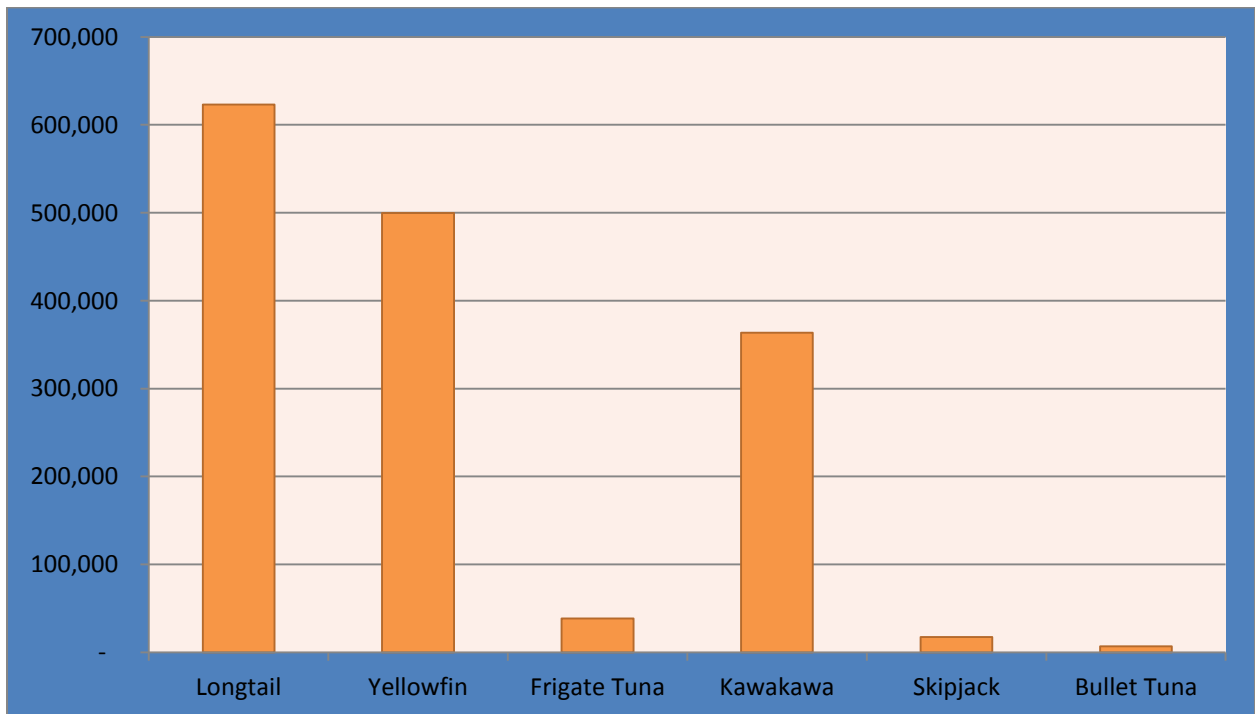


Fig 5: Landings of different Tuna species in gillnet operations collected from Karachi Fish Harbor

Discussion

Shark by catch data is preliminary at this stage and needs more time and attention to relate to seasonal variations and with tuna catches from gillnet operations. At this stage it is possible that the bloom in tuna catches maybe associated with fishermen involved in offshore trade of tuna with Iran with its market demand. Pakistan having a low commercial value and low consumption gives rise to offshore trade. The data presented in this paper directly relates to and refers to the by catch of sharks.

Due to the fact that the project scope was to determine tuna catches in gillnet operations, shark species composition was not looked into detail and lacks the nominal catch data. WWF – Pakistan is collecting data on a day to day basis regarding tuna gillnet operations along the coast of Pakistan since June 2013 from both landing sites and on-board tuna gillnet vessels with the aim to gather important information on discards, releases, enmeshment of target and non-target species. Preliminary data analysis is being done and will be shared with IOTC in the next working party on ecosystem and by catch.

The results identify an immediate need for having a strategy to replace high impact fishing gears to low impact fishing gears and to transform conservation initiatives to be looked at in the ecosystem based approach system. Whereas, the trophic level changes and interactions in the marine ecosystem requires further research.

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