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# Distribution and abundance of skipjack tuna along the Pakistan coast

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## ABSTRACT

Skipjack tuna (*Katsuwonus pelamis*) is second most important tropical tuna species after yellowfin tuna (*Thunnus albacares*) which is caught by about 700 gillnet vessels that operate on coastal and offshore waters of Pakistan. Annual landings of tropical tuna in Pakistan have increased by 8.04 % in 2021 as compared to landings of 2020. Higher catches of skipjack tuna were recorded in 2016 and 2017 which has steadily decreased since then. Catches to skipjack tuna have increased by 13.76 % in the same period. Studies of distribution and abundance of skipjack tuna indicates overall higher catches during January to April whereas its catches was comparatively lower during post monsoon months (October to December). Higher catch (11.190 m. tons) of skipjack tuna was recorded by an observer in September 2018.

## INTRODUCTION

Pelagic gillnetting is main method being used in catching tunas in Pakistan. A major part of tuna gillnet fleet is based in two coastal cities Karachi and Gwadar whereas small gillnet vessels targeting neritic tuna are based in almost all coastal towns and villages along the Pakistan coast. Gillnets consisting of multifilament are used in Pakistan for catching tropical tunas including yellowfin tuna (*Thunnus albacares*) and skipjack tuna (*Katsuwonus pelamis*). Bigeye tuna (*Thunnus obesus*) is extremely rare in Pakistan and seldom caught by tuna fleet of Pakistan. In addition to analysis of tropical tuna landings during 2021 and trend of their landings since 1987, present paper deals with distribution and abundance of skipjack tuna in Pakistan.

## Tropical Tuna Landings

Information about tropical tuna fisheries of Pakistan is known through the work of Khan (2016), Moazzam (2011, 2012a-b, 2018, 2020, 2022), Moazzam *et al.*, (2017, 2019, 2020, 2021), Nawaz and Moazzam (2014) and Shahid *et al.* (2018). These studies were based mainly on the fisheries statistical data that was published by Marine Fisheries Department, Government of Pakistan. A Crew-based Observer Programme initiated by WWF-Pakistan since 2012 which was completed in September 2019 but a number of

these observers are still providing information which is also incorporated in the studies during 2020 and 2022.

Tropical tuna landings during 2021 was, as reported by Moazzam (2022) to be comparatively higher than in 2020. Total landings of tropical tuna was observed to be 6,408 m. tons during 2021 whereas it was 5,931 m. tons during 2020 (Table-I). The landings of tropical tuna, therefore was 8.04 % higher than 2020 as compared to landings of 2021. Landing of yellowfin tuna (*Thunnus albacares*) was 5,598 m. tons during 2021 and 5,219 m. tons in 2020. Annual landings of skipjack tuna (*Katsuwonus pelamis*) during 2021 were recorded to be 810 m. tons which was 712 m. tons during 2020.

Table-I: Annual Landings of Tropical Tuna Landings during 2020 and 2021

Species	Scientific Names	2020	2021	% Increase/Decrease
Yellowfin tuna	<i>Thunnus albacores</i>	5,219	5,598	7.26
Skipjack Tuna	<i>Katsuwonus pelamis</i>	712	810	13.76
Bigeye tuna	<i>Thunnus obesus</i>	0	0	-
Subtotal (TT)	Tropical tuna	5,931	6,408	8.04
Subtotal (NT)	Neritic tuna	20,286	15,667	-22.70
TOTAL (Tuna Landings)TT+NT		26,217	22,075	-15.80

Source: Marine Fisheries Department, Government of Pakistan

## TREND OF TROPICAL TUNA LANDINGS

Tropical tuna has always been very important component of large pelagic fisheries in Pakistan. Landings data which was reconstructed by Marine Fisheries Department, Government of Pakistan and WWF-Pakistan (Moazzam, 2021; Moazzam *et al.*, 2017) indicates that the annual landings of tropical tuna ranged between 6,000 m. tons during 1987 to a maximum of about 29,000 in 2017 (Fig.1). Unprecedented increase in the annual landings of tropical tuna was noticed in 2017, thereafter the landings to tropical tunas plunged down to a level of about 16,500 m. tons in 2018, to 5,931 m. tons in 2020. In 2021, it showed a minor increase to a level of 6,408 m. tons.

Analysis of the reconstructed landing data also indicates that yellowfin tuna (*Thunnus albacares*) is the most dominating species among all tunas species. An increasing trend in the annual landings is noticeable since 2000 when landings of yellowfin tuna were 8,000 m. tons which steadily increased to 23,992 m. tons in 2017, thereafter it decreased

to a level of 5,219 m. tons in 2020 but showed an increase in 2021 to a level of 5,598 (Fig. 2).

An opposite trend was observed in case of skipjack tuna (*Katsuwonus pelamis*). Its annual landings were observed to have a maxima in 1994 when it reached to a level of 8,000 m. tons. Since then its annual landings decreased to 485 m. tons in 1999. This decrease can be attributed to impact of Somali piracy (Moazzam 2012). Annual landings of skipjack tuna remained low (between 485 m. tons and 1,118 m. tons) during 1994 and 2016. An unprecedented increase in annual landings of skipjack tuna was noticed in 2017 when it reached a level of 3,000 m. tons. Since 2017, a decreasing trend was observed till 2020 when it reached mere 712 m. tons. Annual landings of skipjack tuna were shown an increase in 2021 when it reached a level of 810 m. tons. Seasonal changes in the tropical tuna landings in 2021 is not studied due to limited information available through observers but it is believed to follow the pattern already reported for 2018 and 2019 (Moazzam, 2020; 2022; Moazzam *et al.*, 2019).

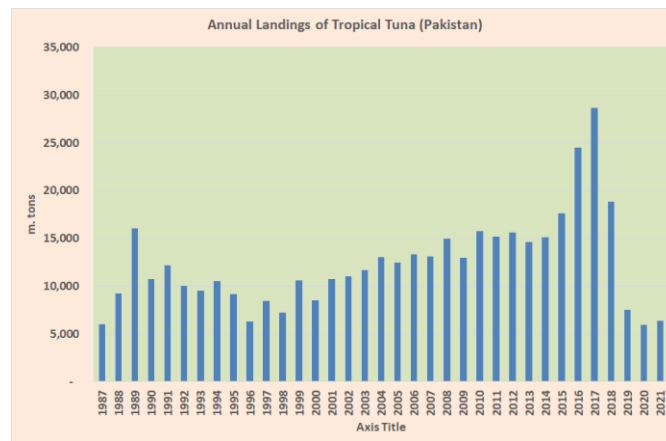


Fig. 1: Trend of landings of tropical tuna in Pakistan.

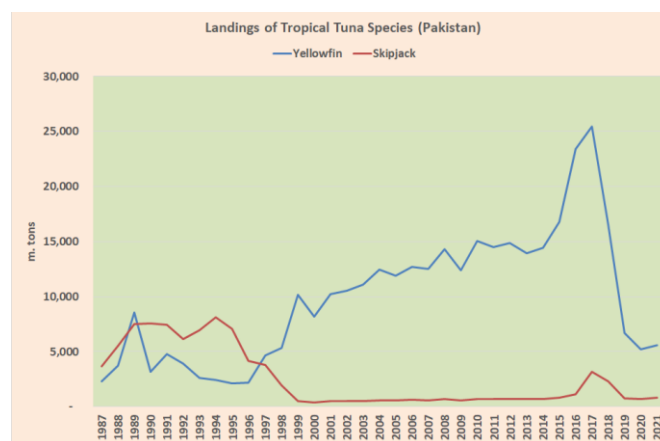


Fig.2: Trend of landings of tropical tuna species in Pakistan

## Distribution and Abundance of Skipjack Tuna

Analysis of the pooled CPUE data collected by the WWF-Pakistan's Crew based Observers for the catches of skipjack tuna for the year 2013-2019 reveals that its CPUE were overall higher during January and April whereas CPUE during August and December were observed to be lower except in September when overall high CPUE of skipjack were recorded. This is mainly because an observer reported extremely high catches of 11,190 kg during September 2018. If this high figure are not considered then the CPUE of the month of September flattens and became comparable to October to December.

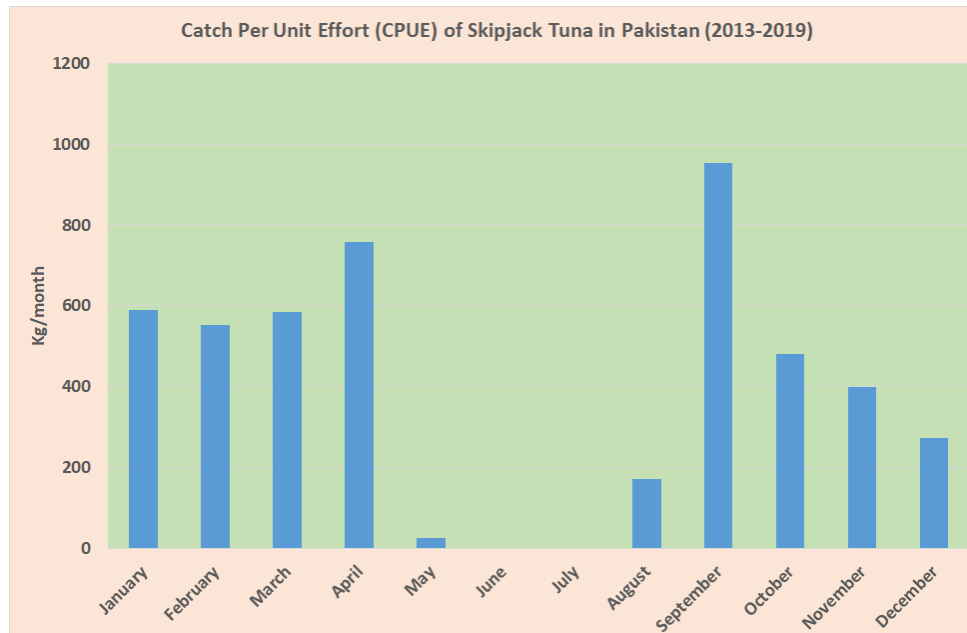
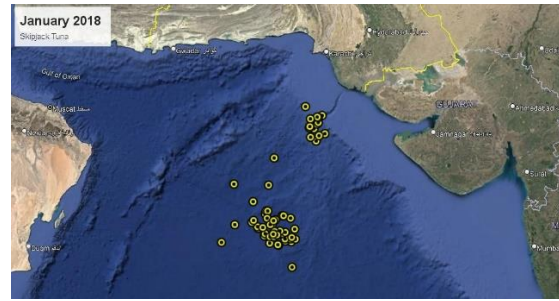
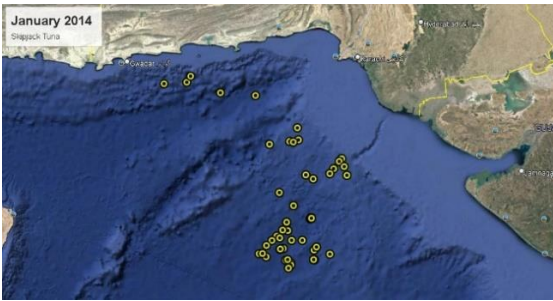


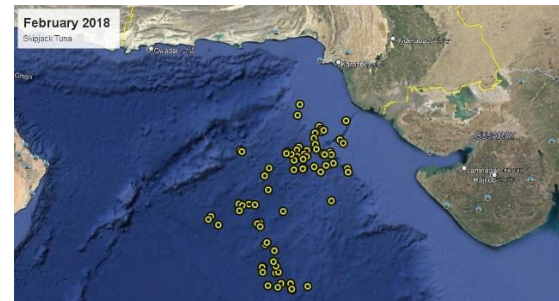
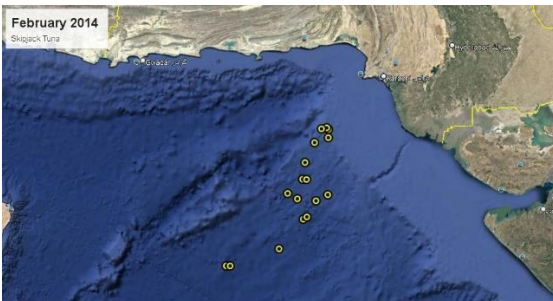
Fig. 3. Seasonal changes in CPUE of Skipjack Tuna (2013-2019)

Fig. 4. Shows seasonal changes in the areas where skipjack was caught along the Pakistan coast during 2014 and 2018. During January and May, fishing vessels operate in the offshore waters targeting tuna species along continental margin. They mainly operate in the offshore waters along Sonmiani Bay (Murray Ridge) area or offshore Indus Canyon area. They also operate in the offshore Arabian Sea Basin off Indus Delta. In Post Southwest Monsoon Season (September to November) and Northeast Monsoon Season (December to March) demand for fishes such as narrow barred Spanish mackerels, barracuda, queenfish and other perciform fishes increase in local market, therefore, tuna gillnet vessels prefer to operate in the coastal and on the continental shelf areas where these fishes are found in abundance whereas skipjack tuna which is an oceanic tuna is seldom caught in these area which is indicative from their less representation in Fig. 4 during these periods.

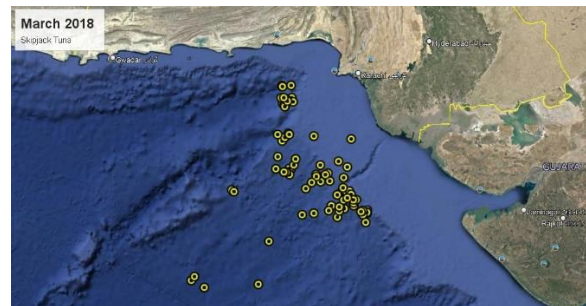
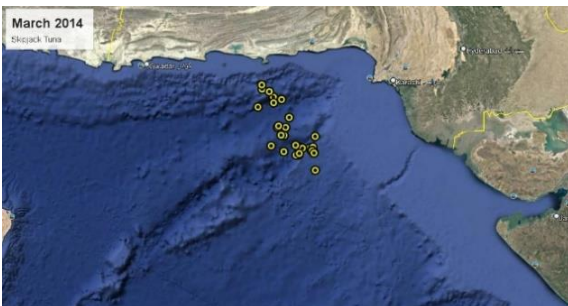
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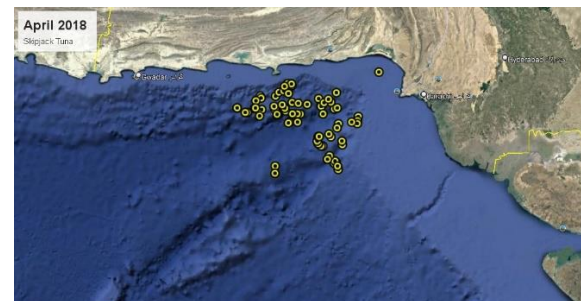
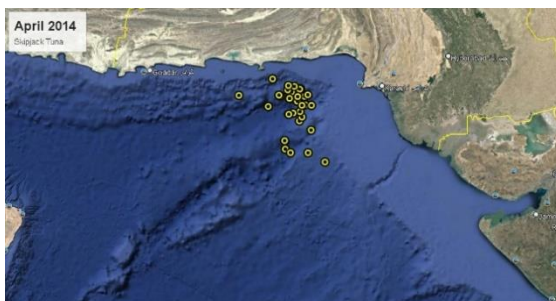
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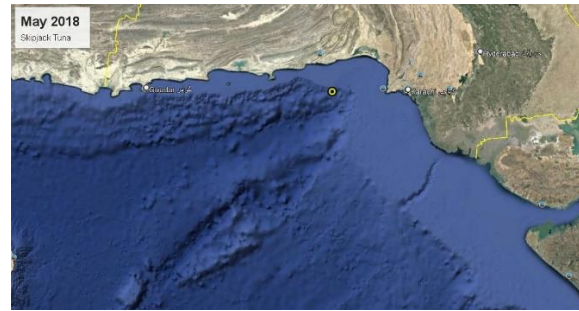
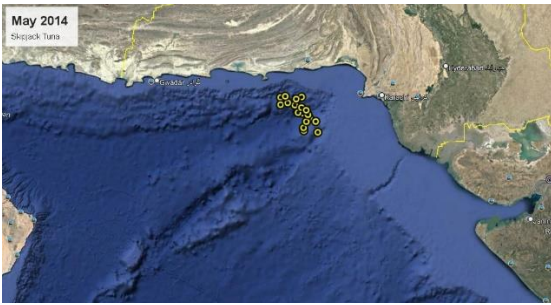
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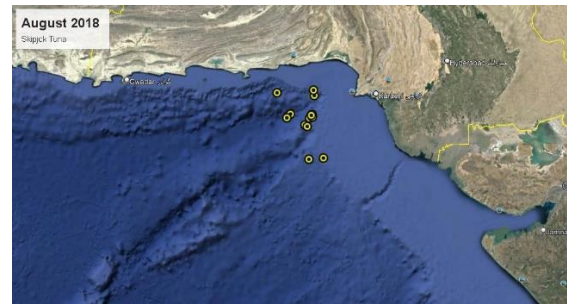
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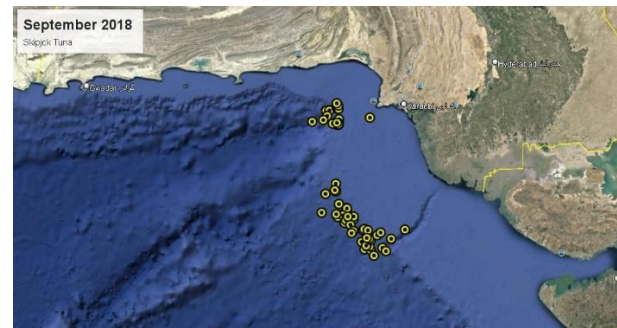
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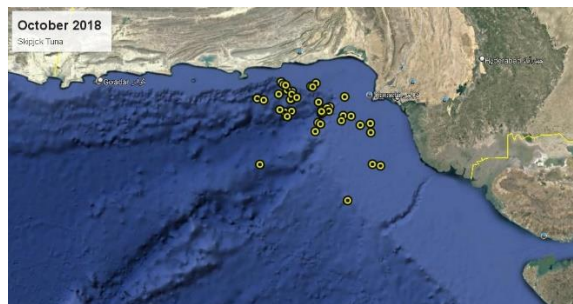
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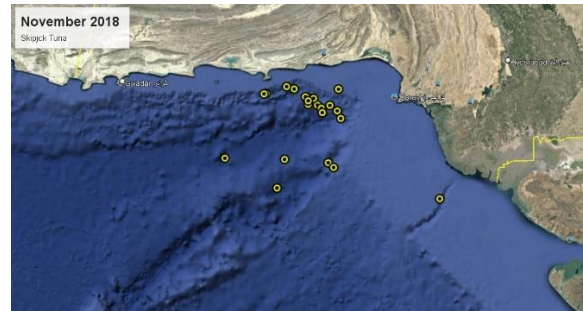
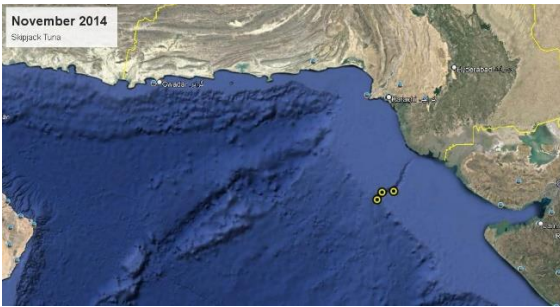
## September



## October



## November



## December

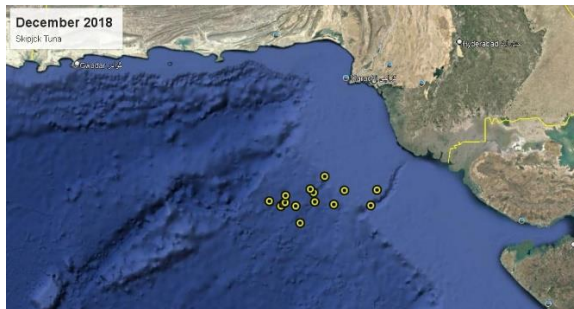
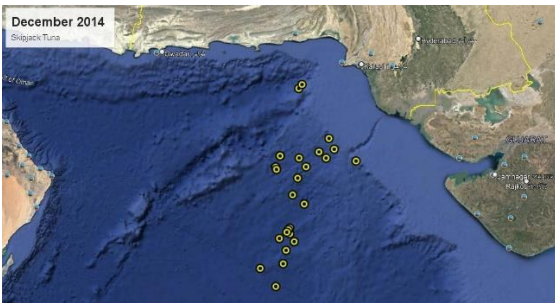


Fig. 4. Seasonal changes in the area of operation of tuna gillnetters along Pakistan coast during 2014 and 2018

It may be noticed that during January to April, 2014 and 2018, the areas of operation of tuna gillnetters were almost same. Therefore, there is no much difference in areas of fishing for skipjack. In May 2018, tuna gillnet operation was closed earlier in the month due to factors already explained by Moazzam (2020), therefore, only limited areas where skipjack were caught were depicted. It may be added that June and July are observed as voluntary close season, therefore, no data for these months were available.

Skipjack areas of fishing during August to November during 2014 was extremely limited as compared to corresponding period in 2018. Somali piracy were reported to be at highest peak in waters of Pakistan during this period in 2014, therefore, tuna gillnet operations were restricted to coastal area of Pakistan where skipjack tuna are seldom found.

## CONCLUSION

Tropical tuna species forms the important part of the tuna fisheries in Pakistan (Moazzam, 2018, 2020, 2022). During 2021, tropical tuna landings was observed to be about 8.04 % higher than 2020 which is mainly because of operation of tuna fleet in comparatively deeper oceanic waters during August to December 2020. Landings of skipjack tuna as well as yellowfin tuna has shown an increasing trend (about 8.04 %) whereas major

decrease (-22.70) was noticed in case of neritic tuna. The study of distribution of skipjack tuna indicates that it is mainly caught during January and April, when tuna gillnet vessels operate in deeper oceanic waters (Fig. 4) whereas in period between October and December, their catches were observed to be poor because these vessels operate in comparatively shallow coastal water. Unprecedented increase in CPUE of skipjack was noticed in September, 2018 which was because of extremely high catches of 11,190 kg during September 2018. It may be added that skipjack tuna is a preferred species in target market in neighboring country, therefore, tuna gillnet vessels from Pakistan operate in deeper oceanic waters during January and April.

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