Assessment of the tuna catch composition of a longline vessel in the Kenyan EEZ and the high seas

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The fishing period for under comparison was July to November in 2016 and the same period in 2017. Yellowfin tuna (*Thunnus albacares*), and bigeye tuna (*Thunnus obesus*) were the main target pelagic species caught by a Kenyan longliner in the Kenyan EEZ during the year 2016 representing 25.6% and 18.4% of the catches respectively. In the high seas, the main catches were albacore and yellowfin tuna representing 27.8% and 17.8% of the total catch. Although the species caught in both areas were similar, blue sharks were caught in Kenyan EEZ while in the high seas the reported catches were of tiger sharks. The average deepest hook depth was 349m, 341m and 313m for the bigeye tuna, yellowfin tuna and albacore respectively in the high seas while the depth of 276 m and 203 m for bigeye and yellowfin tuna respectively was noted in the Kenyan EEZ. A look at the temporal distribution of the catches showed the albacore were more dominant in August and September while yellowfin and bigeye were more dominant in October and November respectively in the high seas. In the EEZ, bigeye tuna dominated in September while the yellowfin tuna was more dominant in July and November. The average weights of Bigeye tuna and yellowfin tuna were 49.2 ± 7.3 kgs and 44.2 ± 13.7 kgs respectively for the EEZ catches while the average weights of albacore, bigeye tuna and yellowfin tuna in the high seas were 17.7 ± 4.5 kgs, 36.1 ± 16.6 kgs and 30.5 ± 10.8 kgs respectively.

Introduction

Fishing in the Kenyan EEZs has been affected by piracy for a long time and the last time a Kenyan longliner fished in the waters was in 2011 when the only Kenyan longliner was hijacked by the pirates. Ever since then, little activity has been observed in the waters until recently when the foreign longliners and a local one returned to fish in the area. The activities of these DWFN were quite high during the 2005 to 2007 season before the full impact of piracy, which led to disappearance of the vessels. This report looks at the data reported by the Kenyan longliner in 2017 fishing in the high seas and compares it with the catches reported by the longliner during the year 2016 in the Kenya EEZ. The daily catch report is as per the recording of the skippers in the logbook.

Overall Catch Composition

During the year 2017, the fishing vessel operated between the months of July and November. A total of 2,577 fish were caught weighing 51,278 Kgs. Albacore was the fish caught most in the high seas composing 28% 0f nthe toatal catch by weight followed by yellowfin tuna and bigeye tuna composing 18% and 15% of the total catch by weight respectively (Figure 1). In the Kenya EEZ, a total of 1,827 fish weighing 53,404 Kgs was caught during the same period. The bigeye tuna composed most of the catch representing 36% of the landed catch followed by swordfish and yellowfin tuna representing 23% and 15% of the catch respectively (Figure 2). Although the tunas were the highest catches in both areas, the shift of catches from albacore in the high seas to swordfish as the other main catch in the EEZ is clear.

Average weight

The average weight of bigeye tuna in 2016 was 49.2 ±19.5 Kgs (n=376) while the yellowfin tuna catches were 44.6 ± 20.2 Kgs (n=197). In comparison, the average weight in 2017 was 36.1 ± 16.6 (n=213), 30.5 ± 10.8 (n=336) and 17.7 ± 4.5 (n=852) for bigeye tuna, yellowfin tuna and albacore respectively.

Operational time and fishing depths

The operation time difference can also be noted as the setting of the lines was at night in 2016 while the line shooting in 2017 was done in the early morning hours. In the high seas, the average fishing depth of the deep hooks was 341m while the fishing depths in the EEZ varies with the shallow settings at 87m depth on average while the deep settings were on average at 340m. The species composition in the deep and shallow operations was dominated by the bigeye tuna in both fishing areas. Although the composition of the catch by species was similar for many species, the tiger sharks were caught more in the shallow operations representing 14% of the catch compared to deep shootings where the contribution of the catch was 2.5% of the landed catch (Table 1). On the reverse, the black marlins were more caught in the deeper waters representing 6.5% of the catch compared to the shallow shootings where the catch representation was 2.7% (Table 2).

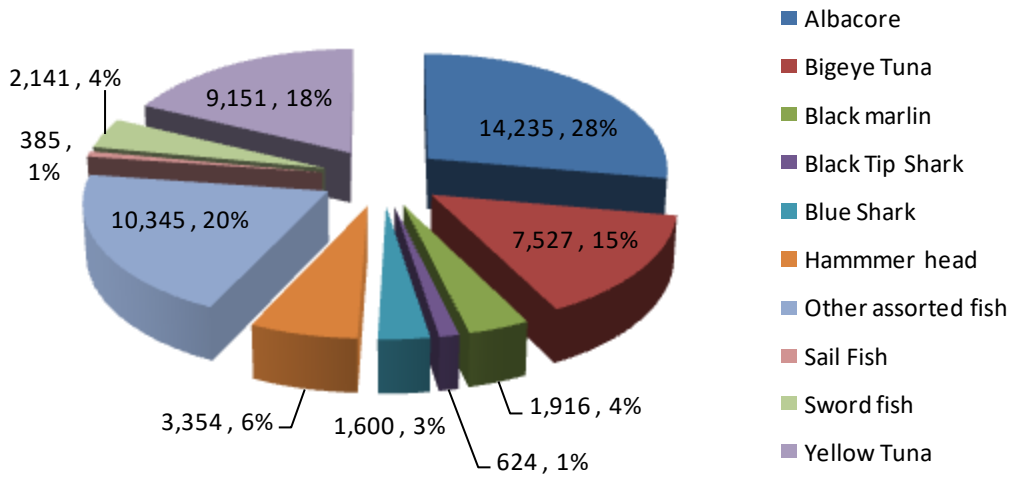


Figure 1: Longline catch composition in the high sea

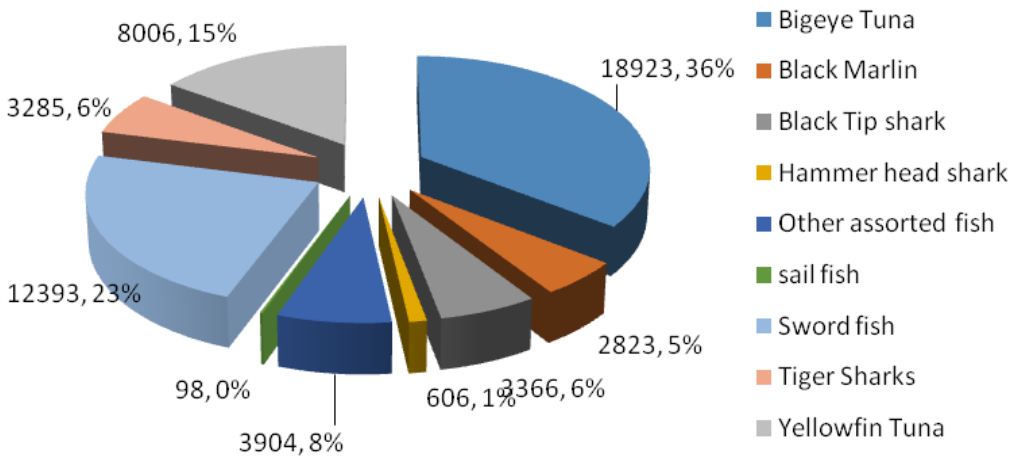


Figure 2: Longline catch composition in the Kenyan EEZ

Table 1: Catch composition in shallow waters

Species	Catch (Kgs)	%
Bigeye Tuna	4,638	27.3
Sword fish	3,404	20.1
Other assorted fish	3,370	19.9
Tiger Sharks	2,375	14.0
Yellowfin Tuna	2,223	13.1
Hammer head shark	503	3.0
Black Marlin	452	2.7
Total	16,965	

Table 2: Catch composition in deep waters

Species	Catch (Kgs)	%
Bigeye Tuna	14,285	39.2
Sword fish	8,989	24.7
Yellowfin Tuna	5,783	15.9
Black Tip shark	3,366	9.2
Black Marlin	2,371	6.5
Tiger Sharks	910	2.5
Other assorted fish	534	1.5
hammer head shark	103	0.3
sail fish	98	0.3
	36,439	

Temporal distribution of the catch.

In the high seas, the month of November was when the highest catches ≈ 10 tons while in the months of August and September catches were ≈ 9 and ≈ 8.5 tons respectively. In the month of October is when the lowest catches were reported approximating 4.5 tons (Figure 3). In 2016, the highest landings were reported in September and November with ≈ 11.5 and 8.1 tons reported respectively. The lowest catches were recorded in August and October, representing 3.1tons and 3.9 tons respectively (Figure 4). In the high seas, albacore catches dominated in august and September while the yellowfin tuna catches were dominant in November. In the Kenyan EEZ, bigeye tuna catches were dominant in September.

The catches of 2016 were dominated by yellowfin tuna while those of 2017 were dominated by albacore. The difference in the catches could be due to the area of operation. The 2017 catches of albacore were recorded on the southern part of the Reunion and Mauritius EEZs while the domination of yellowfin tuna and bigeye tuna was noted during the months of October and November when fishing took place within the 10º to 12º latitudes

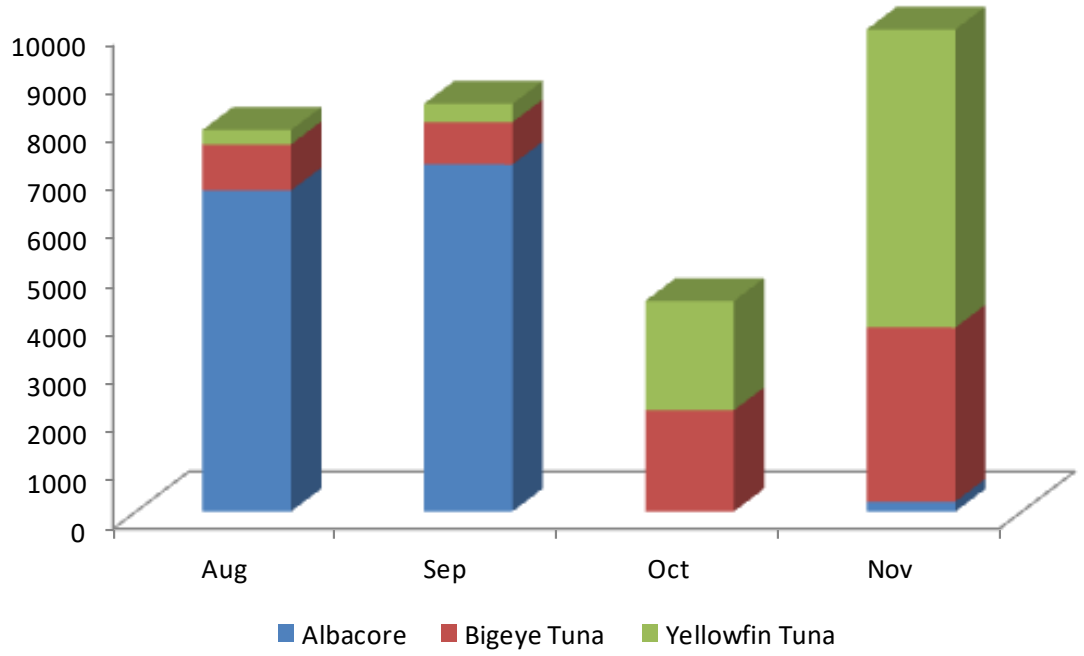
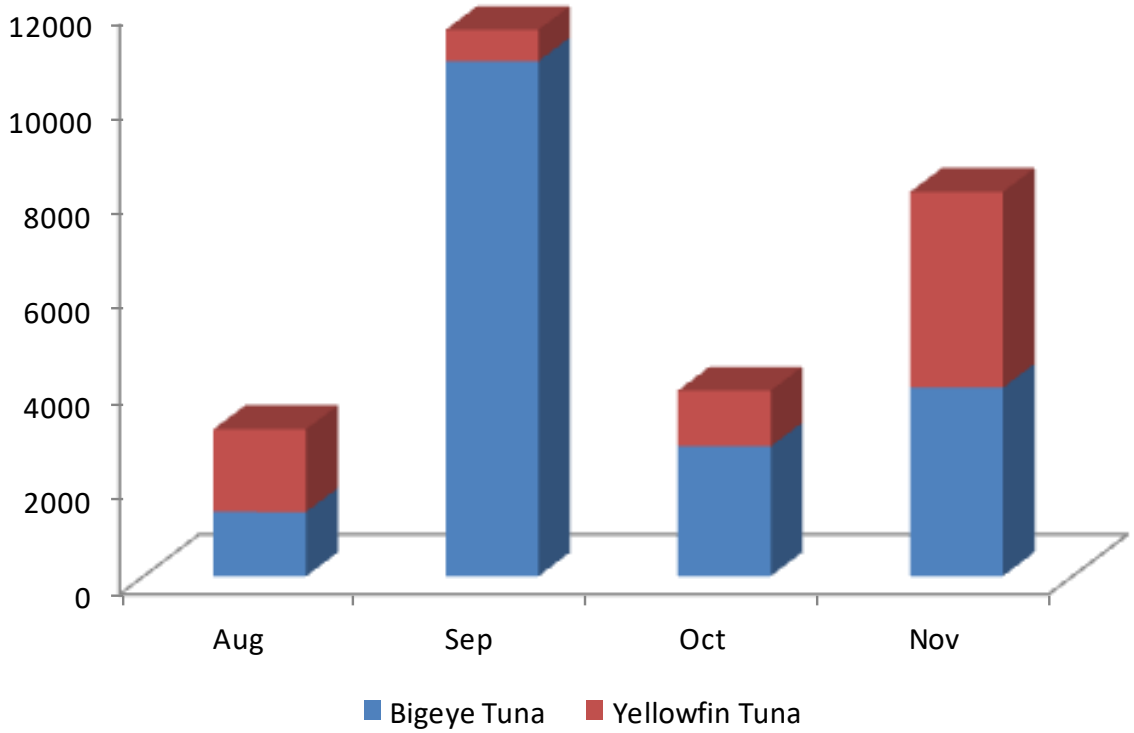


Figure 3: Temporal distribution of the catches in 2017



Fishing effort

The fishing effort here is considered in terms of the average number of hooks deployed per vessel per month and also the number of days when actual fishing took place. The average number of hooks deployed per day in August was 1,500 but the numbers increased from September to 2,200 with the highest reported in November with an average of 2,400 hooks (Table 3). The number of hooks deployed by the longliner in 2017 ranged between 2,950 and 3,200 (Table 4). In 2016, the vessel fished for a total of 56 days with November fishing days totalling 20 while in September, fishing took place for eight days only. The total number of fishing days recorded in 2017 was 81 with the highest number in November where fishing took place on 29 days while in October; fishing took place on 13 days.

Table 3: Effort in terms of average hooks per day and number of fishing days in 2016

Month	Av. No. of hooks per day	Number of fishing days	Total catch
August	1,500	12	9,730
September	2,200	8	17,307
October	2,300	16	9,909
November	2,400	20	14,410
Total		**56**	**51,356**

Table 4: Effort in terms of average hooks per day and number of fishing days in 2017

Month	Av. No. of hooks per day	Number of fishing days	Total catch
August	2,950	24	15,402
September	3,000	15	11,530
October	3,200	13	6,635
November	3,100	29	`16,588
Total		**81**	**50,155**

Conclusion

The catches from the high seas in the higher latitudes were dominated by the albacore while in the tropics, the yellowfin tuna and bigeye tuna dominated in the catches. In deeper waters, the catches of bigeye tuna were more than those of the yellowfin tuna. In terms of average weight, the

yellowfin tuna and bigeye tunas from the EEZ were bigger than those caught in the high seas. Despite the bigeye tuna dominating in the catches from tropical waters for both shallow and deep water hook settings, the catches of tiger sharks were more in shallow water while black marlins were more abundant in deeper settings than shallow ones in the tropical waters.