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Yellowfin Tuna Fishery of the Maldives – is the Size of Tuna decreasing?

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Abstract

Yellowfin tuna has been the second most important species of tuna caught by the Maldivian fishermen. Total catches were around 25,000 t in 2007 but since then recorded catches declined to13,000t in 2010, representing about 17% of the tuna catch reported nationally. Since skipjack used to be the preferred tuna there was no targeted fishery for large yellowfin tuna in the past. But today yellowfin are targeted by both pole-and-line and handline fishery. The greater access to overseas fresh fish markets led to the development of the handline fishery targeting only larger yellowfin (>80cm). The Marine Research Centre employed field-officers to collect detailed information about the fishery and undertake size sampling. Sampling data of 10 years (2001 to 2010) were analysed for this study (166,956 YFT were measured). Additional data for this study was obtained from the Ministry of Fisheries and Agriculture. The national fisheries statistics data used in this study (2006 to 2010) showed that the yellowfin catch reached a peak of 24,414 t in 2007 and since then it started to decline reaching 13,137 t in 2010. Though the catch declined the size of yellowfin caught by both pole-and-line and handline fishery did not decline much as claimed by many local fishermen. Most of the YFT catch was reported were caught from the northern parts of the Maldives. Today as the fishermen use bigger vessels with better facilities include ice on board and they often operate all over the country. With no geo-reference to the location of the catch it has proved to be difficult to assign the location of catch. To fully understand the YFT fishery, it is necessary to device a more comprehensive sampling system that could minimize such errors.

Introduction

Maldivian tuna fishery targets two main species of tuna – skipjack tuna (*Katsuwonus pelamis* and yellowfin tuna (*Thunnus albacares*). In the past less importance was given to yellowfin tuna (particularly large yellowfin: >80cm) as skipjack was more popular among the locals. Only juveniles (<60cm) were caught. But in the recent past greater access to overseas fresh fish markets led to the development of the handline fishery targeting only larger yellowfin (>80cm). Recent catches of yellowfin tuna amounts to 13,000 t in 2010 representing about 17% of the reported tuna landings. Traditionally yellowfin tuna are caught from livebait pole-and-line fishery. These were mainly juveniles (30-60 cm FL) caught from surface schools along with skipjack (Adam and Anderson 1996). Even today a large proportion of yellowfin tuna are caught from pole-and-line fishery though a significant amount is now also caught from the handline and longline fishery. These are mainly the large yellowfin tuna which has led to the development of a new handline fishery and has become an important component for the fishery exports.

Since 1960s the Ministry of Fisheries and Agriculture (MoFA) has been collecting fishery statistics and has a long time series of tuna catch and effort data from 1970 (Anderson, 1986). Traditionally and still in practice, data are collected through fishermen voluntarily reporting catch and effort data to the island offices. Enumerated catch by species is reported to the Ministry of Fisheries and Agriculture as monthly summaries where conversion factors have been used to report the weights (Anderson and Hafiz, 1996). As the fishery expanded and diversified other means of data collection were also introduced. Data collection forms have been introduced in large yellowfin tuna fishery (Anderson et al 2003). Reporting of the data is mandatory. Unfortunately due to lack of oversight and follow-up nearly all fishery reporting are unsatisfactory. Thus national catch statistics are based on fishermen reported catches only.

This study looks at the variation of yellowfin tuna catch over the past 5 years and the variation in size of yellowfin caught by both pole-and-line and handline fishery over the past 10 years. The study will compare the average sizes of yellowfin tuna caught over the past 10 years to verify the claims made by the local fishermen over the reduction in size of yellowfin tuna caught by the pole and line fishery.

Method

The data used in this study were gathered by field officers working for Marine Research Centre (MRC) under contract throughout the Maldives (Ahusan et al, 2011, presented to this meeting). They are based on island across the Maldives from the north to the south of the Maldives (figure 1). In addition to this data catch statistics reported by both pole-and-line and handline fishermen are used to estimate the total yellowfin tuna catch over the past 5 years

Selected fishermen from a number of islands (figure 1) throughout the country are trained and employed by MRC to sample tuna catch. Data gathered, by field officers working on fishing vessels based on these islands, are collected by MRC staff and compiled. These field officers, who are actually active fishermen on board the vessels measure and record the sizes of fish caught from their vessels. In this study total length of yellowfin tuna (YFT) caught were used to measure the average size of YFT caught each year. These values were compared to see if there were any variations in the sizes of YFT caught over the years.

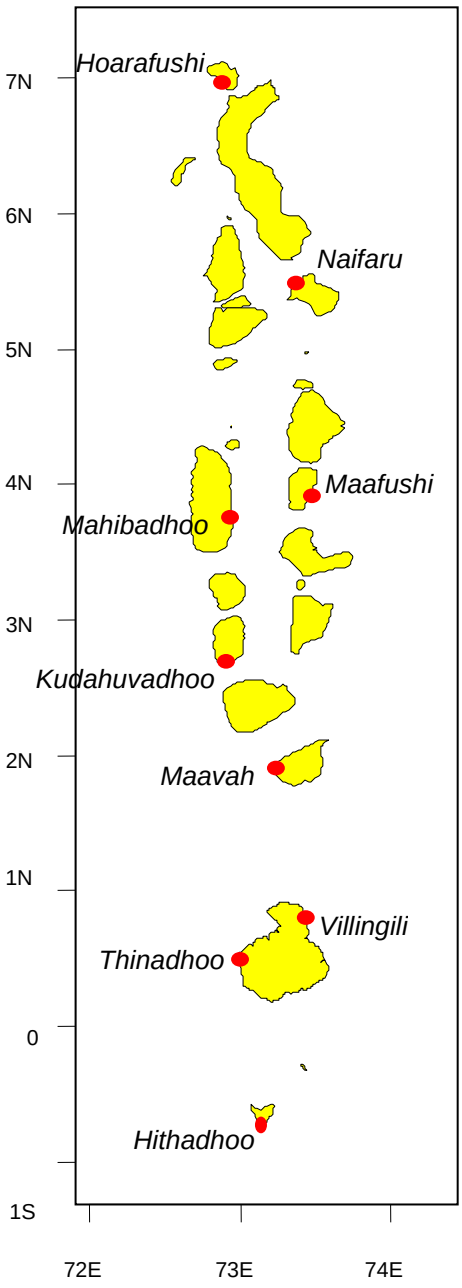

Figure 1: Islands where MRC field officers are based.

Results

MRC field officers measured total length of 166956 YFT over the 10 years from 2001 to 2010 (table 1).

Table 1: Number of YFT sampled and the mean size of catch by pole and line (PL) and handline(HL) fishery over the 10 years.

YEAR	TYPE	TOTAL	YEAR TOTAL	MEAN SIZE (CM)	MODE
2001	PL	9233	9624	50±0.10	46
	HL	391		107±1.60	135
2002	PL	13190	13808	48±0.08	49
	HL	618		113±0.70	124
2003	PL	32392	35262	53±0.06	49
	HL	2870		96±0.33	84
2004	PL	11061	14108	51±0.09	46
	HL	3047		113±0.31	120
2005	PL	10781	12528	52±0.11	46
	HL	1747		113±0.45	115
2006	PL	5366	8710	54±0.13	50
	HL	3344		113±0.45	115
2007	PL	11202	14896	48±0.09	46
	HL	3694		106±0.20	100
2008	PL	18053	21048	46±0.07	41
	HL	2995		138±0.44	140
2009	PL	19260	23047	46±0.06	46
	HL	3787		123±0.39	120
2010	PL	11808	13925	46±0.07	43
	HL	2117		128±0.53	102

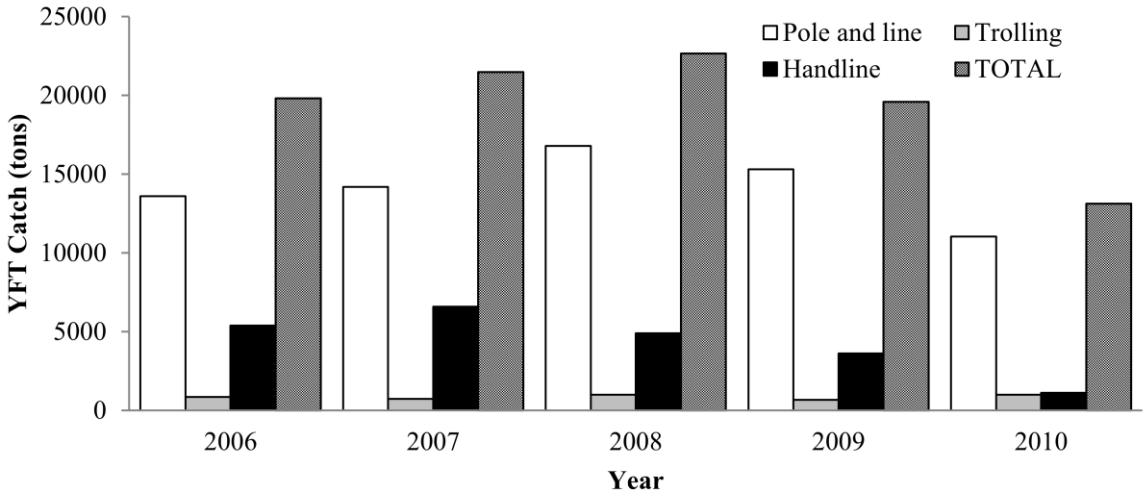

Figure 1: Total YFT catch by three different methods of fishing. More than 65% of the catch was caught by pole and line. (MOFA data).

The average size of YFT caught by pole and line fishery was 46±0.07cm in 2010 while it was 53±0.06cm in 2003. The average size of YFT caught by handline fishery was 128±0.53cm in 2010 and 138±0.44cm in 2008. The average size of the pole and line catch was largest in 2006 – 54±0.13cm and smallest in last three years – 46±0.07cm (figure 3). The average size of the handline catch was largest in 2008 – 138±0.44cm and smallest in 2003 – 96±0.33cm (figure 3).The average monthly YFT catch over the five years (2006 to 2010) was higher during northeast monsoon from November to March (figure 4). The average YFT catch was lowest during May (figure 4). The catch per unit effort (CPUE) was highest during 2008 (figure 5). Since 2008 the CPUE has declined. More than 65% of the YFT were caught by pole and line fishery in the past 5 years (figure 4). In 2010, 84% of the catch was taken by the

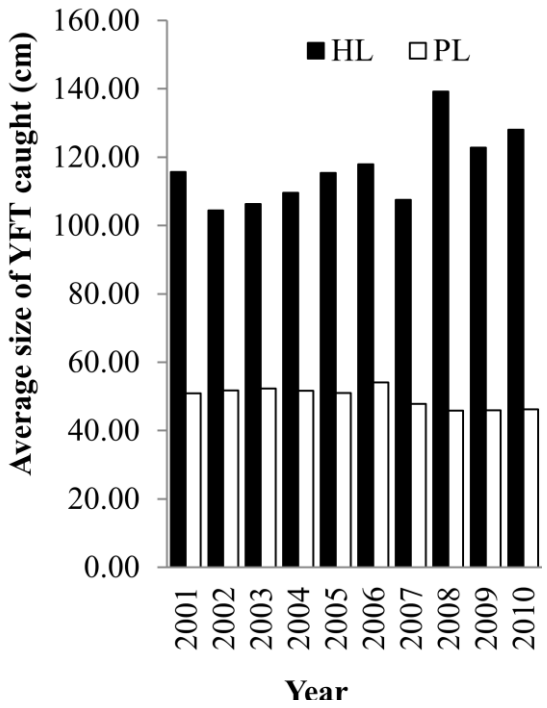

Figure 3: Average size of yellowfin tuna (YFT) over the years from 2001 to 2010 varied in both pole and line (PL) and handline (HL) fisheries.

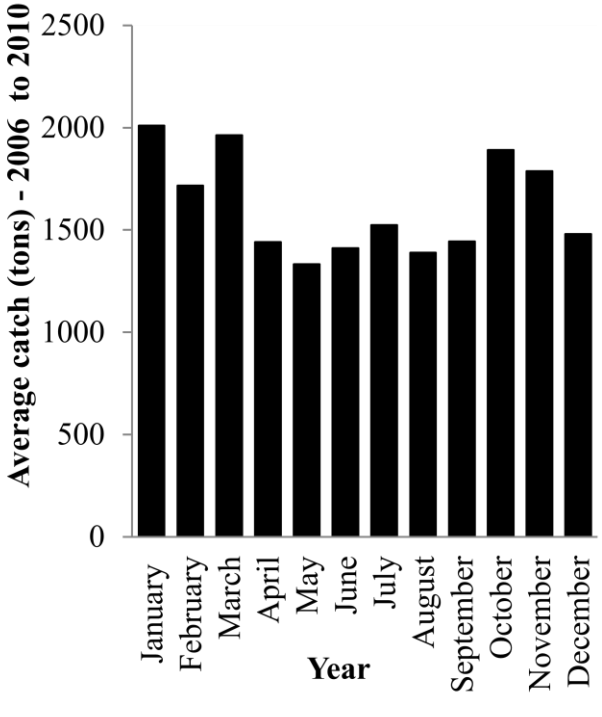

Figure 4: Average monthly catch of yellowfin tuna over the 5 years from 2006 to 2010. The catch is higher during the northeast monsoon – November to March (MOFA data).

pole and line fishery while <9% of the catch was taken by the handline fishery. In 2007, >27% of the catch was taken by the handline fishery. A small proportion (<5%) of the catch was taken by trolling from 2006 to 2009 but ~7% of the catch was taken by trolling in 2010. Most of the YFT catch was reported in Male' (figure 5).

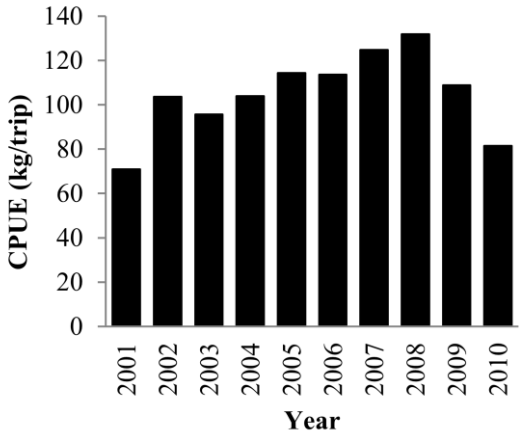

Figure 5: Catch per unit effort (CPUE) was highest in 2008 (MOFA data).

Discussion

A number of fishermen in recent years have claimed that the size of the tuna caught around Maldives has declined over the years. It was stated that the YFT caught in the recent years were much smaller than those caught in the past. To verify the statement data from the tuna sampling activities conducted over the past 10 years (2001 to 2010) were analysed. The results showed that the average size of YFT caught has not changed very much over the past ten year in both the pole and line and the handline fishery (pole and line fishery: 2001 – 50.91cm and 2010 – 46.20cm; handline fishery: 2001 115.66cm and 2010 – 128.07cm). The smallest YFT were caught by pole and line in 2008 (average: 45.87cm) while the handline catchers were largest during the same year too (average: 139.15cm).

Over the last five years, from 2006 to 2010, the YFT catches were higher during the months from November to March which also fall in to the northeast monsoon period in Maldives. This could be due to the rough seas and bad weather experienced during the southwest monsoon making it difficult for the fishermen to venture out looking for tuna. In Maldives often the northeast monsoon period has calm seas and less rain. Pole and line and handlines are the most common methods used for catching YFT in Maldives but trolling is also carried out less frequently. More than 65% of all YFT caught in the country were caught by pole and line fishery in the past 5 years. In 2010 nearly 85% of the catch was taken by the pole and line fishery. The handline fishery targets mainly large yellowfin (~100cm FL) and their average catches were around 20% of the total YFT caught in the country. The highest percentage of YFT catch by the handline fishery was reported in 2007 (>30%).

The comparison of the YFT catches across the latitudes showed that a larger portion of the catch was taken from the waters in the north of the Maldives. The catch around the equator was around 1000 tons while the catches around the north were around 5000 tons over the 5 years from 2006 to 2010. The YFT catch reported between 3 and 5 degrees north was highest (average for the 5 years – 5124.00 tons). Since the pole and line fishery expanded and fishermen became bolder to venture out further away from their islands in their bigger vessels (20m to 35m) the catch reported in the islands were not necessarily caught from that area. In addition the chilling facilities on many vessels allowed the fishermen to keep their fish relatively fresh over several days before heading into a port to sell their catch. The day trips made by the fishermen have now become a multiday day trip. This would definitely have some errors in the reporting of catch from different islands, atolls and regions of the Maldives. A large proportion of the catch was sold in Male', as the buyers offered a better price in the capital, and also the exporters of the fresh YFT are based near the international airport near Male'. Thus the catch reported in Male' were caught from different parts of the country and brought to Male' for sale. To fully understand the catch rate from different regions of the country a more comprehensive mechanism to sample needs to be developed.

Acknowledgement

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