Kenyan sports fishing Tuna CPUE

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ABSTRACT

Catch per unit effort (CPUE) can be used as an indicator of fish abundance especially when a long time catch and effort data is available. This is mostly so for a fishery that does not change quickly with time thus maintaining a similar catchability for the target species. This report presents the CPUE for tuna species caught by the sports fishers in Malindi sport fishing club. The catch data is for 18 years from 1987 to 2006. The years 1988 and 1999 are not included as the data was missing. The CPUE for yellowfin tuna (*Thunnus albacares*) remained stable with occasional rise and fall. The situation was different for the skipjack tuna (*Katsuwonus pelamis*) which increased remarkably up to 1998 and has from then been on a decline. The Neritic tuna (Kawakawa (*Euthynnus affinis*), Kingfish (*Scomberomorous commerson*) and frigate tuna (*Auxis thazard*) however showed an increase in CPUE over the same duration.

1. INTRODUCTION

1.1. Background information on the data

Fisheries Department had been collecting data on sport fishing since 1940, but the data had not been computerised. In February 2006, the Indian Ocean Tuna Commission and the Overseas Fishery Cooperation Foundation (IOTC-OFCF) embarked on a fact-finding mission in Kenya. They found historical sport fishing data in Malindi and Watamu and implemented a project for computerization of historical data from sport fishing clubs, as a component of activities under the Cooperation project for enhancing the data collection and processing systems for the Tuna resources in the Indian Ocean.

A sport-fishing database was developed from this project and was useful in providing useful analytical details for the Fisheries Department. Previously unreported data, for example, on catch effort and weight/length frequency for specific species can now be derived from the database. Much emphasis, however, needs to be placed on improving the sport fishing clubs' data recording procedures and updating the database. It will be necessary for the Fisheries Department to provide the technical support required for this task.

1.2. Description of the fishery

The Kenyan coastline spreads for a distance of 640 km from the northern Kenya border with Somalia (1^0 45' South of the Equator) to the Tanzanian boarder (5^0

South of the Equator). Most of the sports fishing activities take place in Malindi and Watamu although other areas such as Lamu and Shimoni do have considerable activities. The Pemba Channel off Shimoni in south coast Kenya is 40 km wide and 100 km long. On either side the bottom drops to about 1000 metres and is an ideal fishing ground. (Hemphill).

Literally, there are 2 sport-fishing seasons per calendar year. The first and most intense season runs through the last two quarters of the year i.e. July to December, while the second runs through the first quarter, January to March. However, fishing seasons could be divided into two with regard to calmness or roughness of the sea. The two seasons are *Kus*i (Southeast monsoon winds) and *Kaskazi* (Northeast monsoon winds). *Kusi* is characterized by rough sea, which at its worst fishing is suspended until it is calm. This season is between the months of April to September, whereas *Kaskazi* season is experienced between the months of October and March. During the months of May to July, there is little or no fishing at all as the sea is stormy and considered dangerous to the anglers and the crews. The table below shows the average catches per month for 14 years.

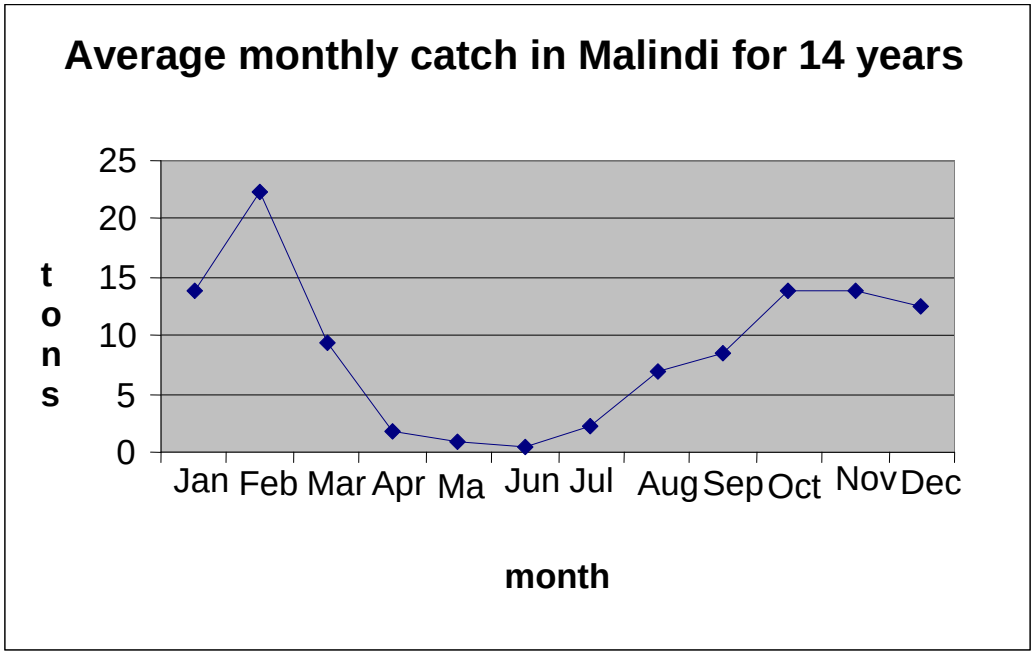

Figure 1: Monthly catches from Malindi sports-fishing club

Sport fishing as a recreational activity has been taking place all along the Kenyan Coast within the confines of various registered clubs and at times on individual basis. Different species are caught at different seasons of the year. The best months for billfish (Blue Marlin (*Makaira nigricans*), Black Marlin (*Makaira indica*), Stripped Marlin (*Tetrapturus audax*), Broadbill Swordfish (*Xiphias gladias*) and Sailfish (*Istiophorus platypterus*)), however, run from October through to April during the time the Northeast Monsoon blows and the sea is rather calm. Many large marlins are often landed in the months of July to August but the sea normally becomes pretty rough during the period due to the strong Southeast monsoon winds. Black Marlin can be encountered almost any time but again numbers increase January through

March (Duncan McKenzie). Tagging mainly targets the sailfish and the marlins with all tagged fish released back to the waters. Other catches include the Tuna (Big eye tuna (*Thunnus obesus*), Long tail tuna (*Thunnus tonggol*), Skipjack tuna (*Katsuwonus pelamis*) and Yellowfin tuna (*Thunnus albacares*)), Kawakawa (*Euthynnus affinis*), Frigate tuna (*Auxis thazard*) Wahoo (*Acanthocybium solandri*), Barracuda (*Sphyraena spp*.), Cobia (*Rachycentron canadum*), Dolphin fish (*Coryphaena hippurus*), Kingfish (*Scomberomorous commerson*), Sharks (Hammerhead (*Sphyrna spp*), Mako shark (*Isurus oxyrinchus*.), Silvertip shark (*Carcharhinus albimarginatus*) and Tiger shark(*Galeocerdo cuvieri*), Trevallies (*Caranx spp*.) and Rainbow Runner (*Elagatis bipinnulata)*.

1.3. Data recording

Malindi Sea Fishing Club is one of the major recreational fishing clubs in north coast. Data is recorded on a daily basis in a hard cover note book. The data recorded contains the date, name of boat, species of fish caught; number caught total weight per species, and remarks on whether tagged, released, or retained. On average, 9 boats were noted to be in the ocean per day.

Photo 1: Sports fishing boats

Photo 2: A day's catch from a sports fishing boat

2. Results

2.1. Fishing Effort

From the data recorded for 18 years provided by the club, more than 170 boats were recorded which made more than 22, 000 fishing trips. The table below summarizes the data recorded for the 18 years by Malindi sports-fishing club. In the year 2002, the data available was for 6 months while 2003 had only one month's data. Due to this, both years have the lowest figures.

Year	Data available	No. of trips	Catch in No.	Weight in Kgs.
1987	Jan- Dec	1,259	7,918	71,865
1990	Jan- Dec	1,536	10,317	75,002
1991	Jan- Dec	1,827	12,753	120,222
1992	Jan- Dec	1,755	13,358	123,502
1993	Jan- Dec	1,585	10,696	123,231
1994	Jan- Dec	1,581	12,742	129,991
1995	Jan- Dec	1,468	12,404	110,764
1996	Jan- Dec	1,408	11,979	105,745
1997	Jan- Dec	1,198	8,459	81,174
1998	Jan- Dec	808	7,712	57,891
1999	Jan- Dec	1,061	9,936	84,922
2000	Jan- Dec	1,153	8,978	94,137
2001	Jan- Dec	1,161	8,384	99,491
2002	Jan- Jun	471	4,191	33,528
2003	Dec	157	1,452	23,213
2004	Jan- Dec	1,195	10,353	108,982
2005	Jan- Dec	1,182	10,553	94,680
2006	Jan- Dec	1,218	8,331	95,314

Table 1: Malindi sports fishing effort from 1987 to 2006

The catches for the year 2003 were thereby excluded from this analysis to avoid bias. The figure

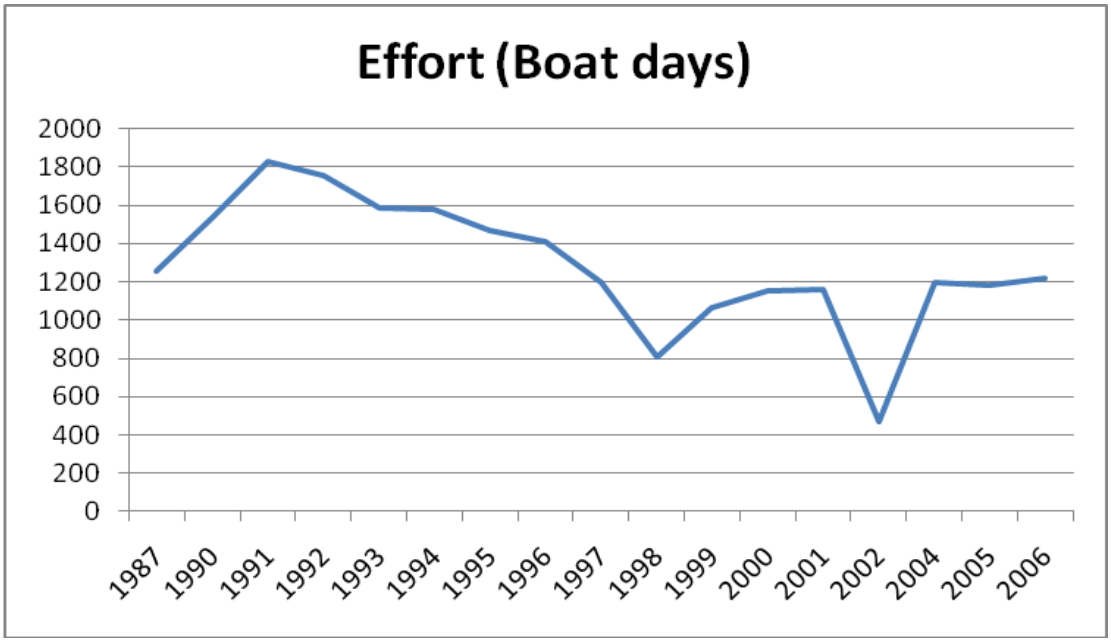

Figure 2: Fishing effort for the Malindi sports fishing club

The average fishing effort has reduced from the level of 1600 in the early 90s to 1200 trips yearly. This level has been maintained to date. During the year 2002 and 2003, there is a missing gap from the records and hence this is not the true reflection of the total fishing effort. In the year 1998, the number of trips reduced drastically due to the elnino rains that continued from January to March thus reducing the number of fishing trips.

2.2. Catch per unit effort

The Catch per day for each species was recorded and from this it is easy to come up with the CPUE indices for each species. The total catch in number of each species showed variation and the results for the various tuna species are reported below.

2.2.1. Yelowfin tuna

The catches of Yellowfin tuna were highest in the year 2001 and had another peak in 2004 after which the CPUE has gone down to about the 1990 level. The average catch is 1.6 fish per trip. The two peaks were experienced when the industrial catches of purse seiners and longliners were high. The reduced CPUE in 1998 can be associated to the elnino rains that pounded the area during the busy January to March period. Apart from the 2001 to 2004 period, the abundance of yellowfin could be described as relatively stable for the reporting period.

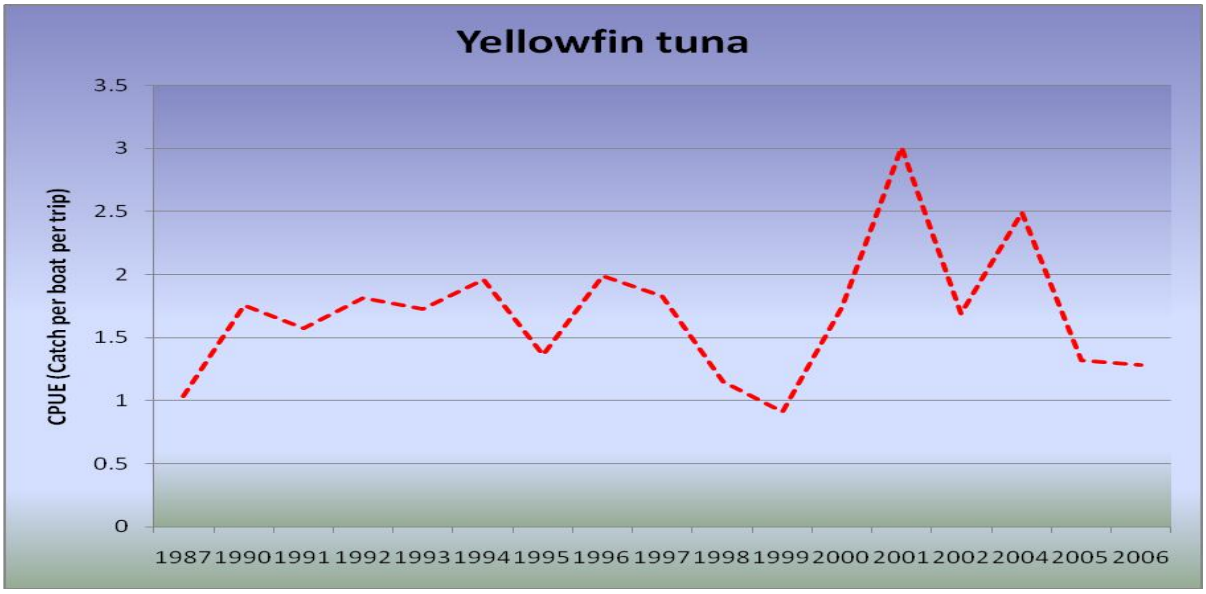

Figure 3: Yellowfin CPUE

2.2.2. Skipjack tuna

The catches of Skipjack tuna have been on a steady decrease. There are two peaks in the catches of the Skipjack in 1990 and 1998. Both peaks are followed by reduced catches. The 1998 peak coincided with the elnino rains and since then, skipjack catches have been on a steady decline. This could be an indicator of reduction of the skipjack biomass. This reduction shows that even if the skipjack tuna is regarded not to have been overfished, the biomass is reducing drastically. Personal communications with the sports fishers indicates that although the species was encountered in plenty in the 80s, the population has dwindled with time.

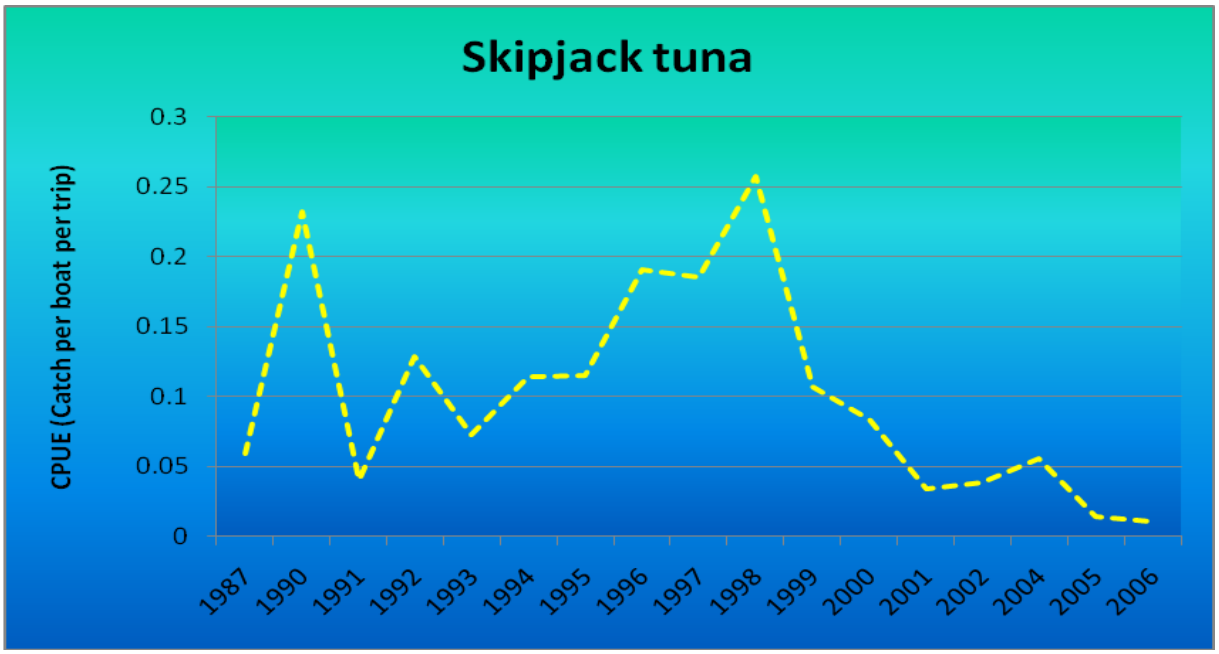

Figure 4: Skipjack CPUE

2.2.3. Neritic tuna

There are three species of Neritic tuna caught by the sports fishers namely Kawakawa (*Euthynnus affinis*), Frigate tuna (*Auxis thazard*) and Kingfish (*Scomberomorus commerson*). Of the three, Kawakawa seems to be the most available and the catch trends resemble those of the skipjack tuna. Between the years 1994 and 2000, the catches were higher than the preceding years but have reduced to the previous level of 1.3 fish per trip. The peak catches were in 1998 at a level of 3.4 fish per trip.

Both frigate tuna and kingfish had a rather constant catch until the year 2000. The catches have from then increased and so the biomass could be said to be on the increase.

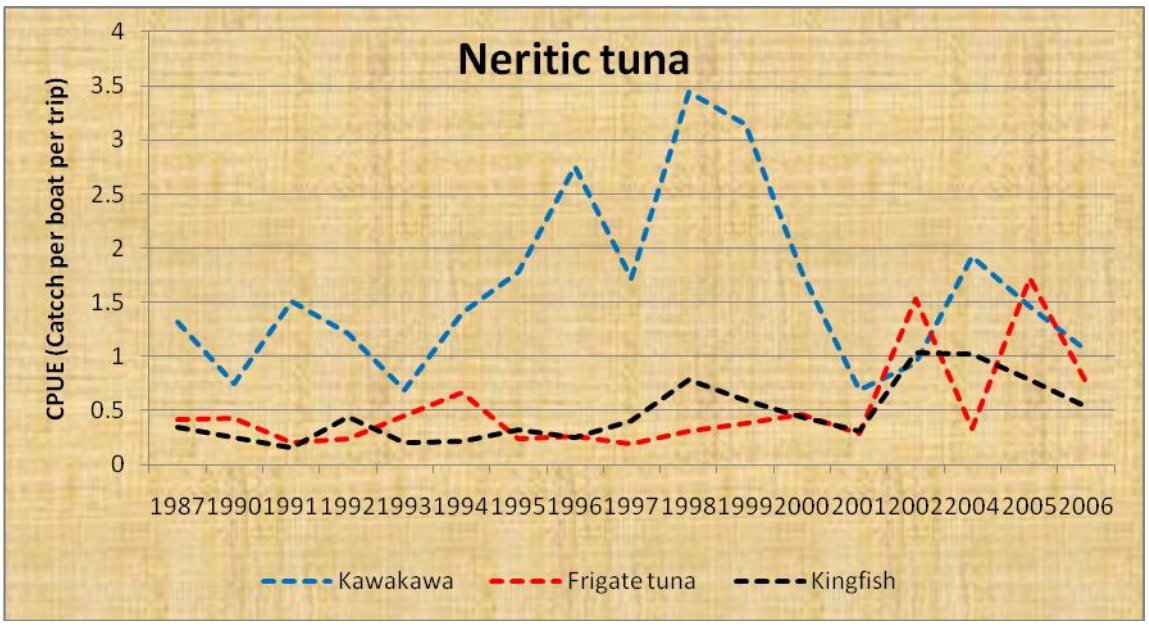

Figure 5: Neritic tuna CPUE

3. Recommendation

The catches of sports fishing can be used as an indicator of the index of abundance of the fish species. Monitoring of the sports fishing catches in the region could also add more information to the working party on tropical tuna.

Due to the decrease in the catches of skipjack tuna showing a probable reduction in the biomass, the species investigated to ascertain its current status.