

Preliminary analysis of fishing activities of Purse Seiners fishing in the Western Indian Ocean over the period January to June 2012.

by

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Abstract

The goal of this paper is to analyze the catches and CPUE of the Purse seine fleet active in the western Indian Ocean during the first 6 months of 2012 and to compare these results with the same parameters observed during the same period of previous years. The paper also analyses the fishing zones exploited during the first six months of 2012, in comparison with the same period of the previous year. It is anticipated that the findings from the most recent fishery data, be incorporate in the discussion of the Stock Assessment results.

The analyses show that the fleet is progressively returning to their traditional fishing grounds, after moving eastwards of exploited zones in 2009. Slight increases in catches were recorded in the Seychelles Zones, particularly in the SE of the Seychelles. The NW of the Seychelles is considered as an area where large yellowfin tuna are caught in great quantities each year during the 1st quarter (spawning strata). Some catches of principally yellowfin tuna was recorded in this zone in June 2012. During the period under review, yellowfin tuna catches, particularly that of large specimens (YFT3; > 30kg) increased by 136%, compared to the same period of 2011. Similarly the catches of large bigeye tuna (BET3; > 30kg) also increased, whilst that of juvenile bigeye tuna (BET1; <30kg) decreased by 56%.

It is worth nothing the gradual decline of sets made on FADs associated schools over past 2 years, following a significant increase in 2009 and 2010. The increase (32%) in set made on free swimming schools have subsequently lead to the increase in catches of large yellowfin and bigeye tuna, whilst reduced effort on FADs associated schools have subsequently lead to a significant decrease in the catches of small (< 10kg) bigeye (-56%) and yellowfin (-14%) tuna often in caught association with these floating objects. The increase yield of large yellowfin and large bigeye tuna (>30 kg) should be investigated further, preferably after all data for 2012 have become available.

1. Introduction

It is always interesting, by definition, to incorporate the most recent fishery data, in the discussion of the Stock Assessment results, more so given the impact that factors such as piracy and the mitigation measures adopted by fishing operators, could have on the industrial tuna fishing activities

In this case, the activities of the purse seine fleet operating in the Western Indian Ocean (effort, catches by species and sizes) can easily be followed based on the analysis of logbook data and landings in Port Victoria, Seychelles, as these catches correspond to a great proportion of their activities.

This paper analyze the catches and CPUE of the Purse seine fleet active in the western Indian Ocean during the first 6 months of 2012 and compare these results with the same parameters observed during the same period of previous years.

2. Materials and methods

The statistics compiled in this report are information gathered from the mandatory purse seine logbooks system for all vessels licensed to operate in the Seychelles exclusive economic Zone. Due to excellent cooperation with vessels owners, the statistic cover activities conducted throughout the Indian Ocean. The data cover most of the purse seiners active in the Western Indian Ocean during the period 2000 to June 2012; however for some analysis the aggregated historical data (1984-1999) has also been used for comparison purposes. The logbook species composition has been corrected using port sampling data and the logbook data has also been raised to its corresponding landing data. These data (logbooks and port sampling data) allow the estimation of the catch at size landed by the purse seine fishery.

Three categories of yellowfin and bigeye tuna have been considered for this analysis; YFT1; <10kg (Yellowfin tuna less that 10 kg), YFT2; (Yellowfin tuna between 10-30kg) and YFT3; >30kg (Yellowfin tuna more than 30 kg).

BET1; <10kg, (Bigeye tuna less that 10 kg), BET2; Bigeye tuna between 10-30kg and BET3; >30kg, (Bigeye tuna more than 30 kg).

All catch statistics of the purse seine fleet have been stratified in these analysis under two main types of schools, FADs associated and Free swimming schools, as the species composition and sizes caught in these 2 fishing modes are widely different.

3. Results

3.1. Vessels active

The number of vessels active during the first semester of 2012 has decreased by 3% when compared to the same period of the previous year (figure 1). Since 2007 the number of vessels active during the first semester of the years has been on a decline. In recent years this can be attributed to a reduction in the number of vessels taking licenses to operate inside of the Seychelles EEZ.

3.2. Nominal effort

The total number of fishing days reported by purse seiners in the Western Indian Ocean during the first six months of the year has shown an overall sharp declining trend between 2007 and 2010. This trend has stabilized over the past 2 years and in 2012 a 6% decrease (figure 2) was recorded. Again this decline can be attributed to the decreasing number of vessels taking licenses to operate inside of the Seychelles EEZ.

3.3. Nominal catches

The total nominal catches recorded by purse seiners during the period under review (January to June 2012) is estimated at 117,538 Mt. This represents a slight increase of 2% (2,127 Mt) over the catches reported for the same period of the previous year. Since 2008 nominal catches reported during the first semester of the year have fluctuating slightly, but overall showing an increasing trend (figure 3).

3.4. Species composition

Readers should note that logbook declarations have been corrected using actual species composition data collected via port sampling.

Analysis of species composition revealed significant change in the nominal catches of two out of the three major species targeted by the purse seine fishery in the Indian Ocean throughout the period under review (figure 3).

The reported nominal catch of yellowfin tuna increased by 64%, from 39,951 Mt in 2011 to 65,479 Mt in 2012. On the other hand the nominal catches of skipjack tuna decreased by 36 % (23,511 Mt) from 64,804 Mt during the first semester of 2011 to 41,293 Mt in 2012. The nominal catches of Bigeye tuna decreased by only 2%, from 9,983 Mt in 2011 to 9,761 Mt in 2012.

The first semester of 2012 has therefore been a relatively good year in term of yellowfin catches, surpassed only by catches reported over the same period between 2003 to 2006.

3.5. Nominal catch rate

The corresponding nominal catch rate expressed in terms of catch per fishing day is shown in figure 4. The figure revealed that despite the security issue, the overall CPUE has been on the increase since 2007, reaching an average of 28.52 Mt/fishing days in 2010 then decreasing slightly to 25.24 Mt/fishing days in 2011. During the first semester of 2012, the CPUE increase by 8 % to reach 27.08 Mt/fishing day.

Similarly the nominal catch rate of yellowfin tuna increased from 8.65Mt/ fishing day in 2011 to an average of 15.09 Mt/fishing day in 2012. The nominal catch rate of bigeye tuna increased slightly from 2.16 Mt/fishing day to 2.25 Mt/fishing day whilst that for skipjack tuna decreased from 14.03 Mt/fishing day in 2010 to 9.51 Mt/fishing day in 2012.

3.6. Activities by Fishing Mode

During the first semester of 2012, a decrease of 13% was recorded in sets made on FAD's associated schools whilst the number of sets made on free swimming schools increased by 32%, (figure 5).

Nominal catches on FAD's associated schools decreased by 21% whilst those on free swimming schools increased by 97 % (figure 6). In the first semester 2012, 62% of the total catches were from FAD's associated schools compared to 80% for the same period during the previous year.

The corresponding species composition shows an increase of 165% and 216% in yellowfin and bigeye tuna nominal catches and a decrease of 68% for skipjack tuna reported on free swimming schools respectively compare to the same period during the previous year, (figure 8). As for catches on FADs associated schools, skipjack and bigeye tuna recorded a decrease of 33% and 46% respectively whilst yellowfin increase by 12% (figure 9).

The nominal catch rate on free school increase from 4.87 Mt/fishing day in 2011 to 10.23 Mt/fishing day in 2012 whilst catch rate on FADs associated school decreased from 20.09 Mt/fishing day to 16.84 Mt/fishing day (figure 7). Figure 10 shows that catch rate for yellowfin and bigeye tuna on free school has increased during the first semester of 2012 when compared to the same period in 2011. The catch rates for skipjack and bigeye tuna on FAD's associated schools has decreased (figure 11).

3.7. Catches by size categories

The total nominal catches of large yellowfin (>30kg), reported during the first semester of the year have been declining since the record catch of such size class in 2004 (100,960 Mt). However during the first six months of 2012 the catch of such large yellowfin (YFT3) increased by 136% from 20,010 Mt during first semester 2011 to 46,728 Mt for 2012 (figure 12). The nominal catches of YFT2 (yellowfin of 10-30kg) have also increased (69%) in 2012, whilst YFT1 (yellowfin <10kg,) has decreased (-14%).

The total nominal catches of small bigeye (<10kg) has decreased by 56% from 8,276 Mt in 2011 to 3,677 Mt in 2012 of which 98% was caught on FAD's associated school (figure 13). Catches of large bigeye tuna (> 30kg) increase by 4,316 Mt during the period under review in 2012 when compared to the same period of 2011.

3.8. Fishing ground exploited

Map 14 show slight increases in catches taken in the Seychelles Zones (SE and NW). The North West of the Seychelles, which is considered as spawning ground for large yellowfin (Fonteneau *et al*, 2008), reported significant decline in catches in 2009. Map 15 show increase catches of yellowfin reported on free swimming schools in SE Seychelles (January to April), East Somalia (May), and NW Seychelles in June 2012. No significant changes were observed in catches reported on FAD's associated schools.

It would appear that the purse seine fishing fleet are finding ways to mitigate the impact of piracy and little by little returning to their traditional fishing zones.

4. Discussion

There is no doubt that piracy has had significant impact on the fishing pattern in the purse seine fishery (particularly in 2009 and 2010). However it seems that the fleet is finding ways for mitigation and is slowly returning to their traditional fishing zones (particularly E. Somalia and East and North West of Seychelles).

It should be noted that reduction in fishing zones may have resulted in the increase in effort on FADs particularly in 2009 and 2010. The level of productivity on FAD's observed for the first semester of 2009 and 2010 were very good, and although it declined in 2011 and declined further in 2012, productivity on FAD's reported during the period under review is still relatively high compared to historical level recorded during the same period.

The increase in productivity on free swimming schools particularly the increase CPUE on large yellowfin tuna (>30 Kg) is worth pointing out given that there had been a declining trend since 2004 (with the exception in 2008). The return to more productive historical fishing grounds could be a factor for this increase in catches of large yellowfin.

Similarly, the significant increase in catches of large BET (> 30 Kg) reported during the first semester of 2012 should also be noted following the declining trend since 2008. Finally catches of juvenile (<10kg) bigeye tuna reported for the first semester over the past 3 years have been declining, with a sharp drop in 2012. Catch level for the first semester 2012 is still higher than for 2007, which may be a point for concern.

Increase efficiency of mitigation measures against the threat of piracy over the past 2 years is the likely cause for the purse seine fleet returned to traditional fishing ground. However, it would be difficult to establish its direct contribution given that other factors such as the IOTC close area/season, Chagos No take zones, also need to be considered. The increase yield of large yellowfin and large bigeye tuna (>30 kg) should be investigated further, preferably after all data for 2012 are available.

5. References

Fonteneau A., Lucas V., Tewkai E., Delgado A., Demarcq H. 2008., **Mesoscale exploitation of a major tuna concentration in the Indian Ocean**. Aquatic Living Resources. **Vol-21**, 109–121.

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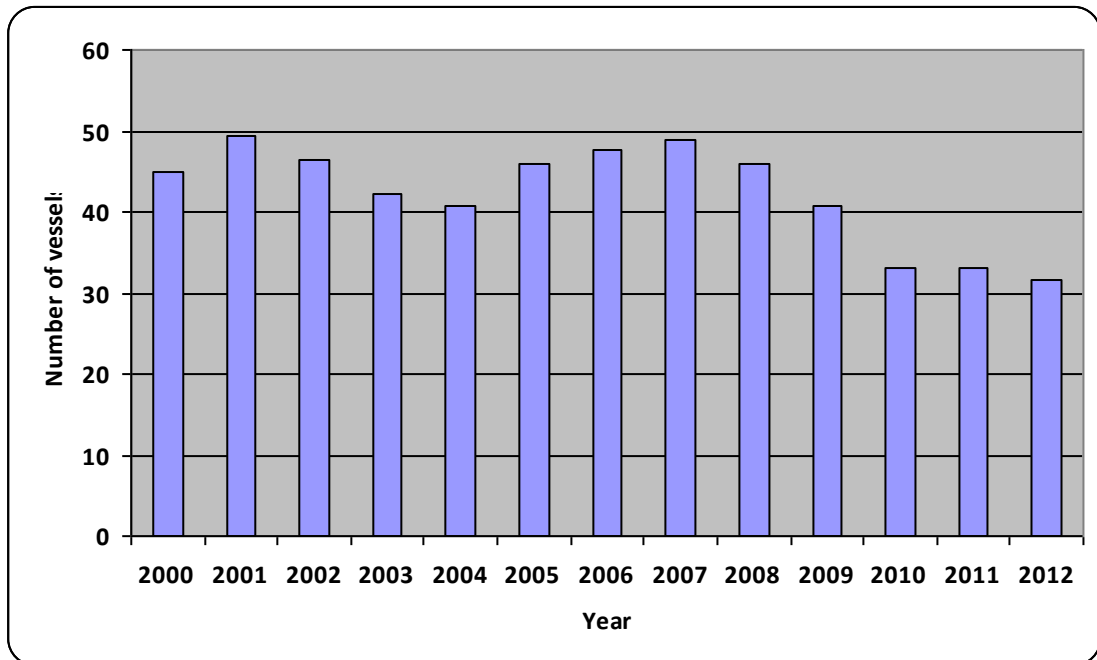


Figure 1. Number of vessel active, January to June, 2000 – 2012.

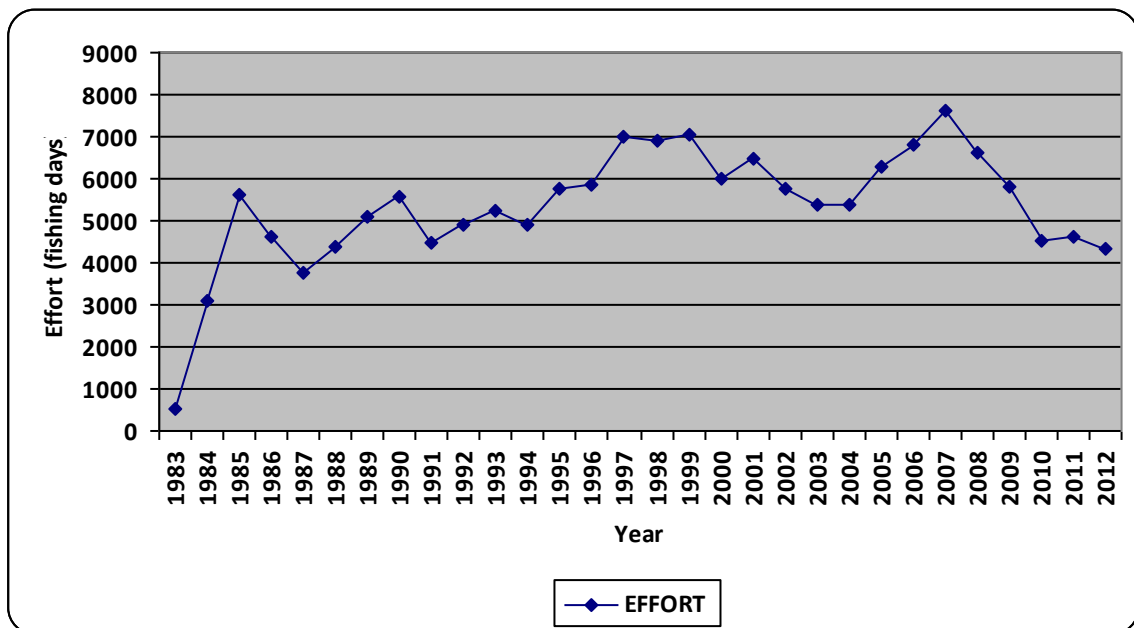


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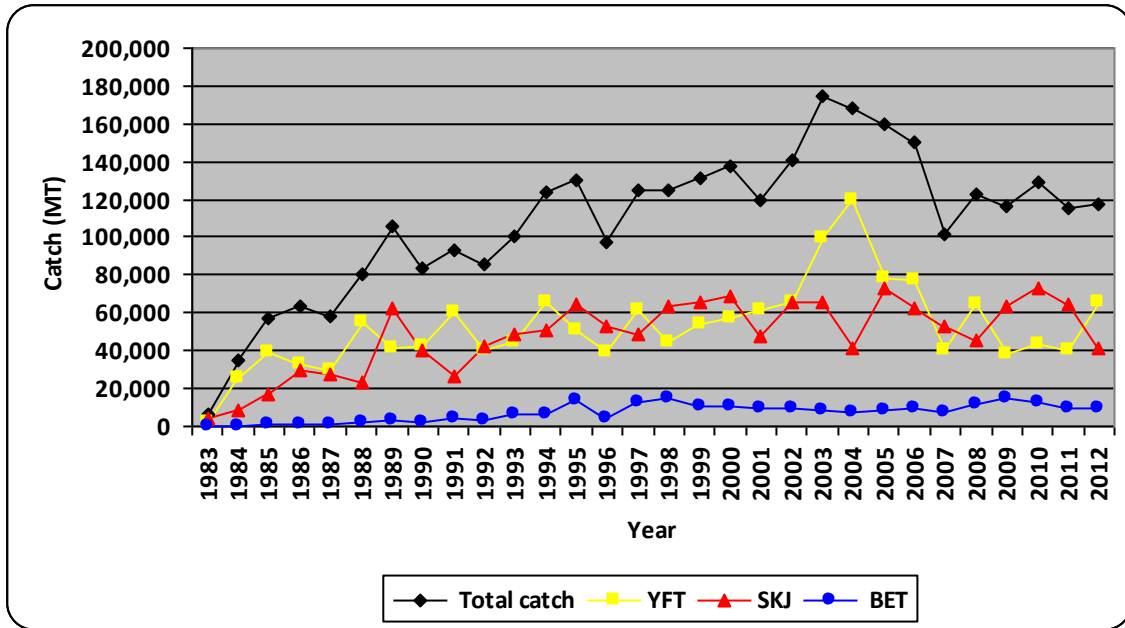


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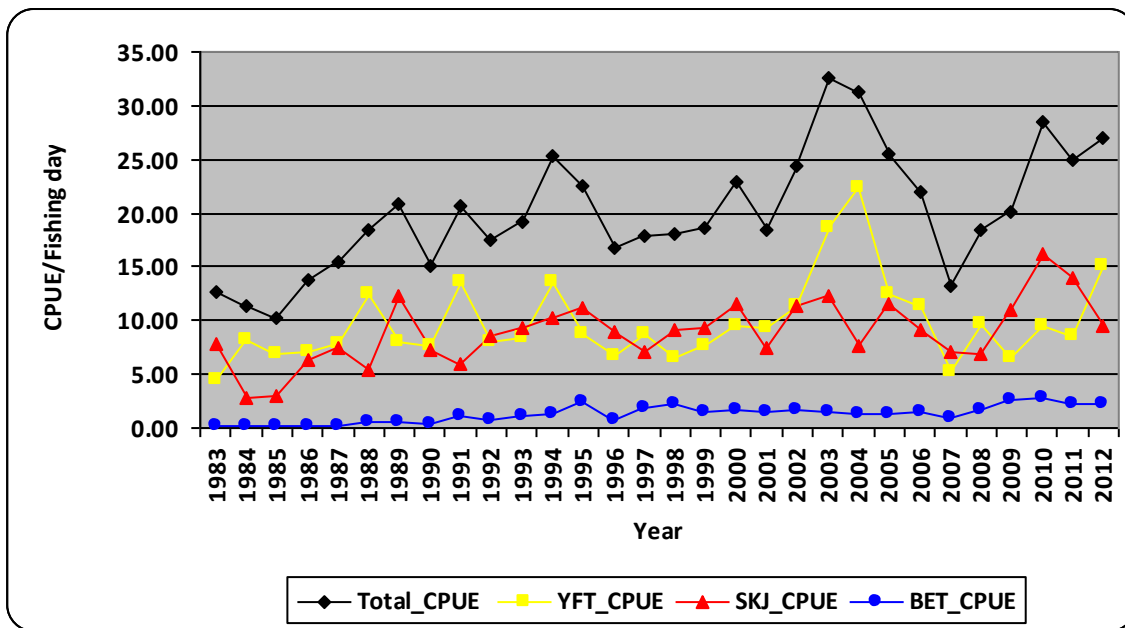


Figure 4. Nominal CPUE (Mt/fishing day) by species, January to June, 1983 – 2012

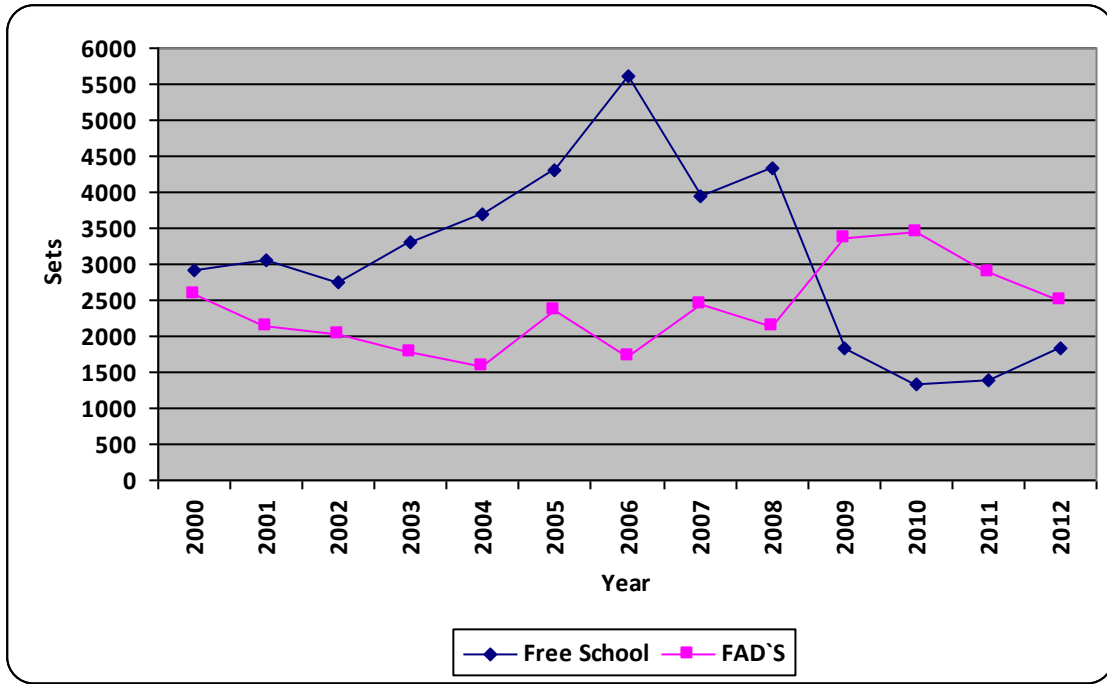


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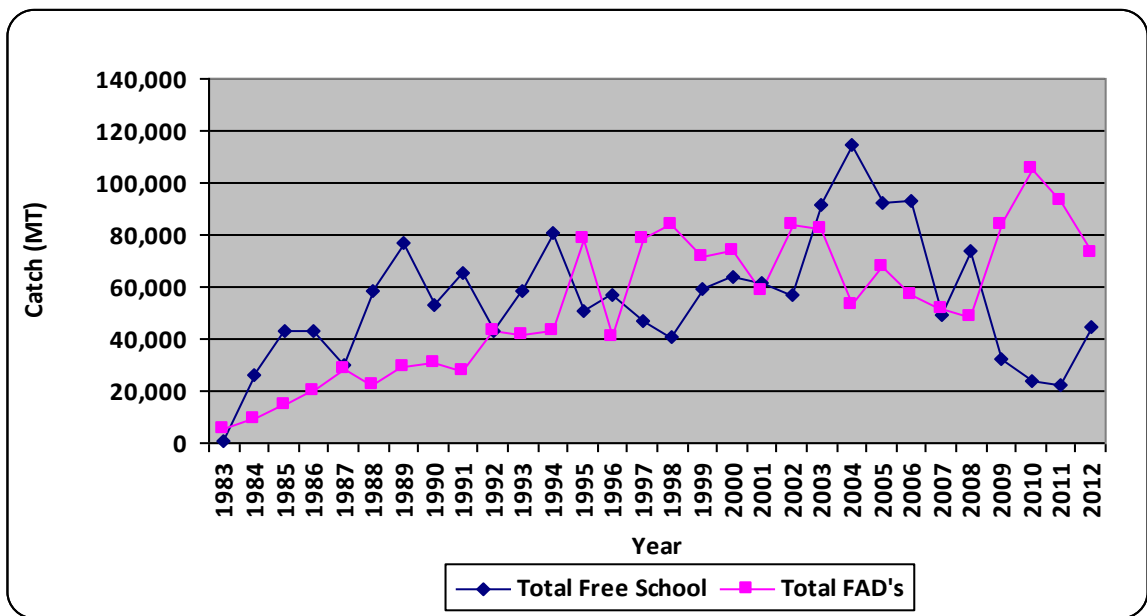


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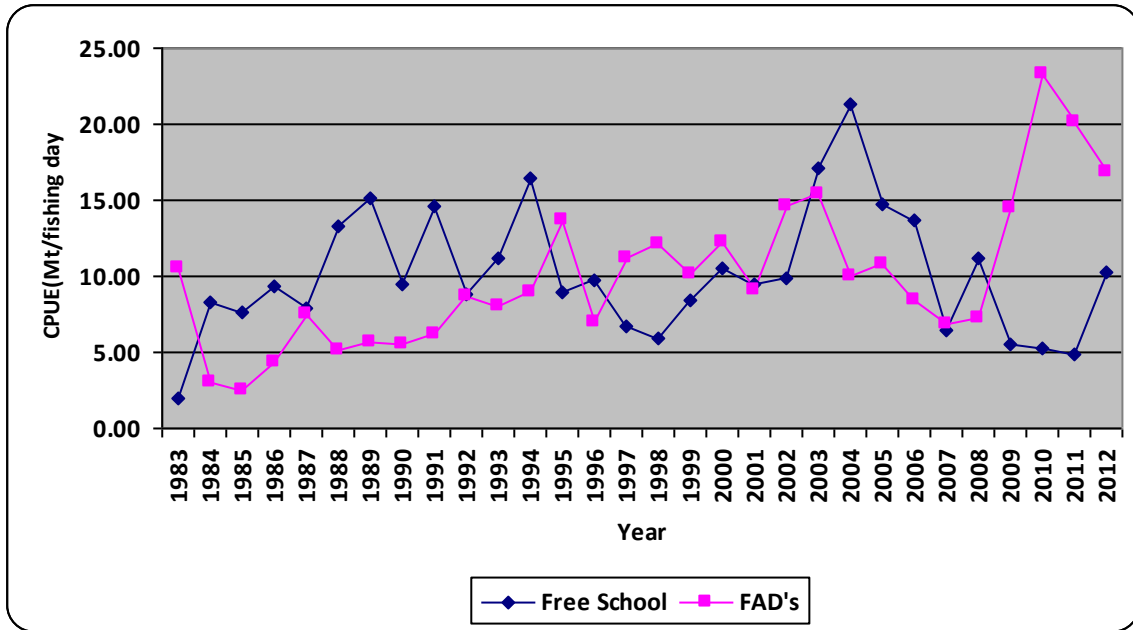


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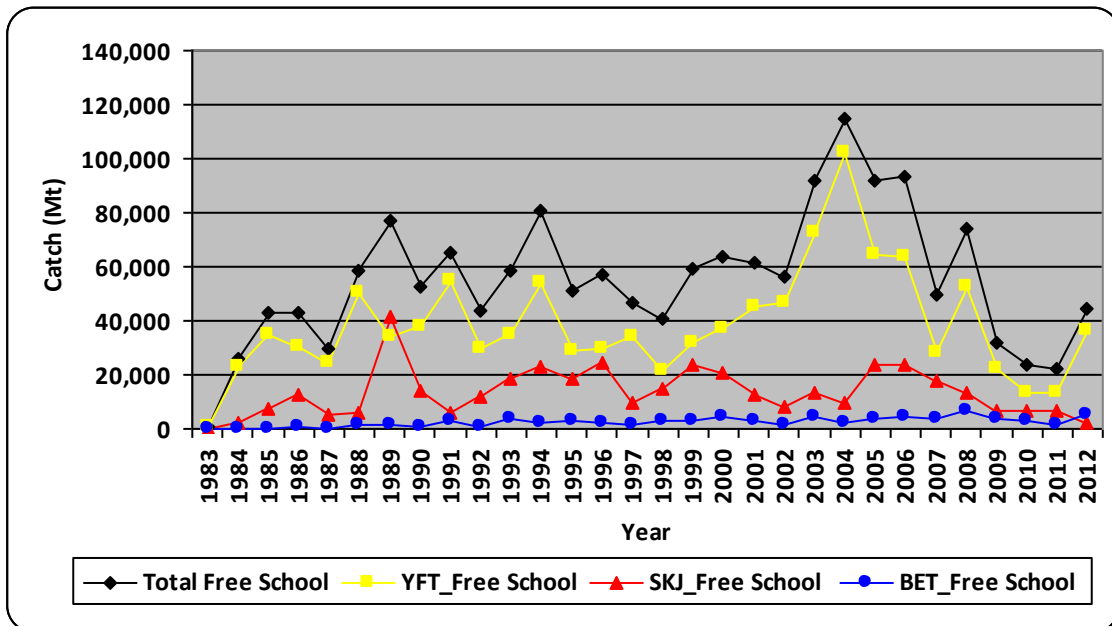


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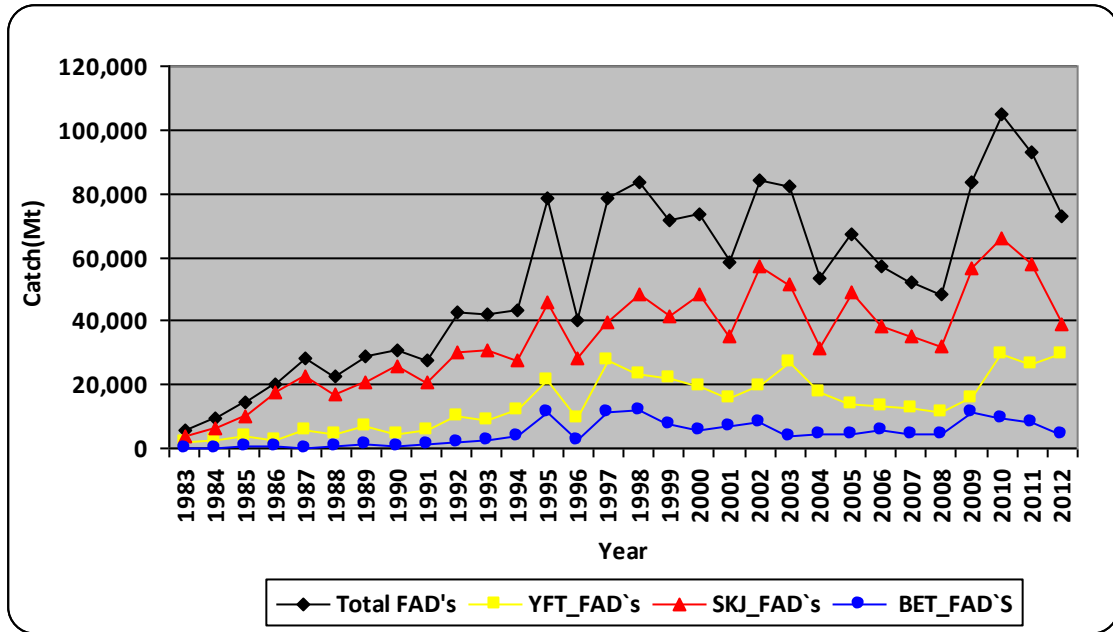


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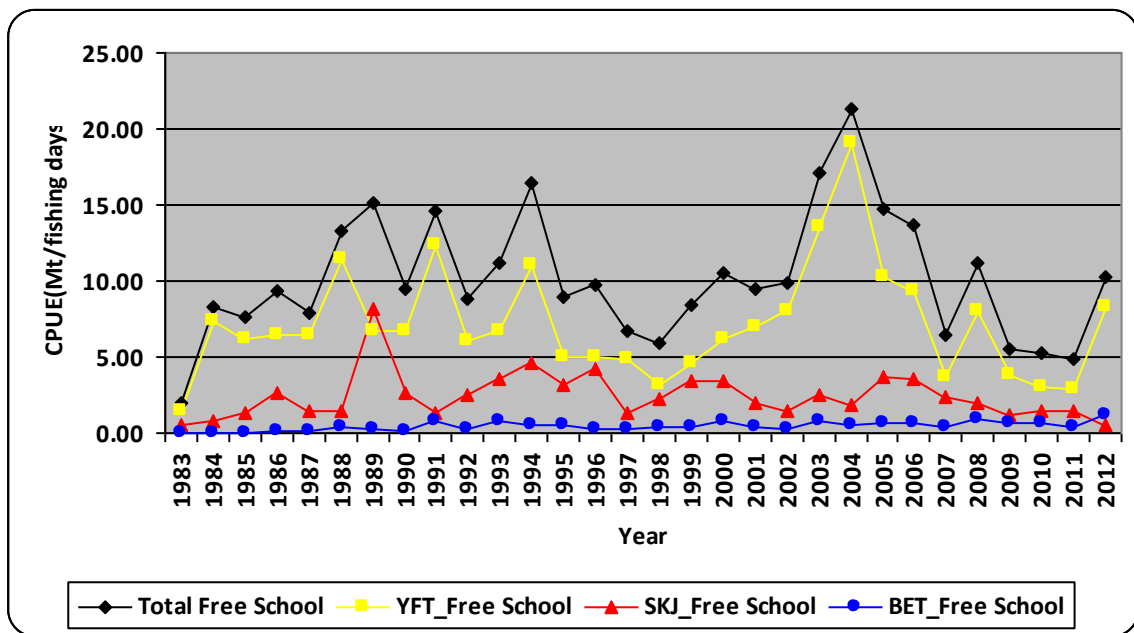


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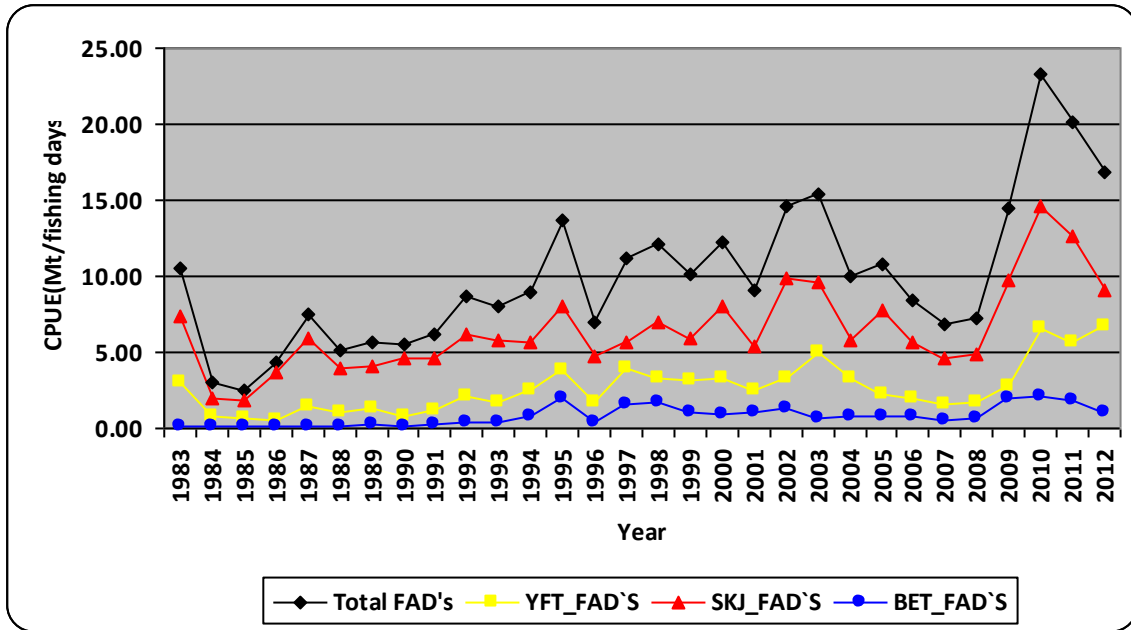


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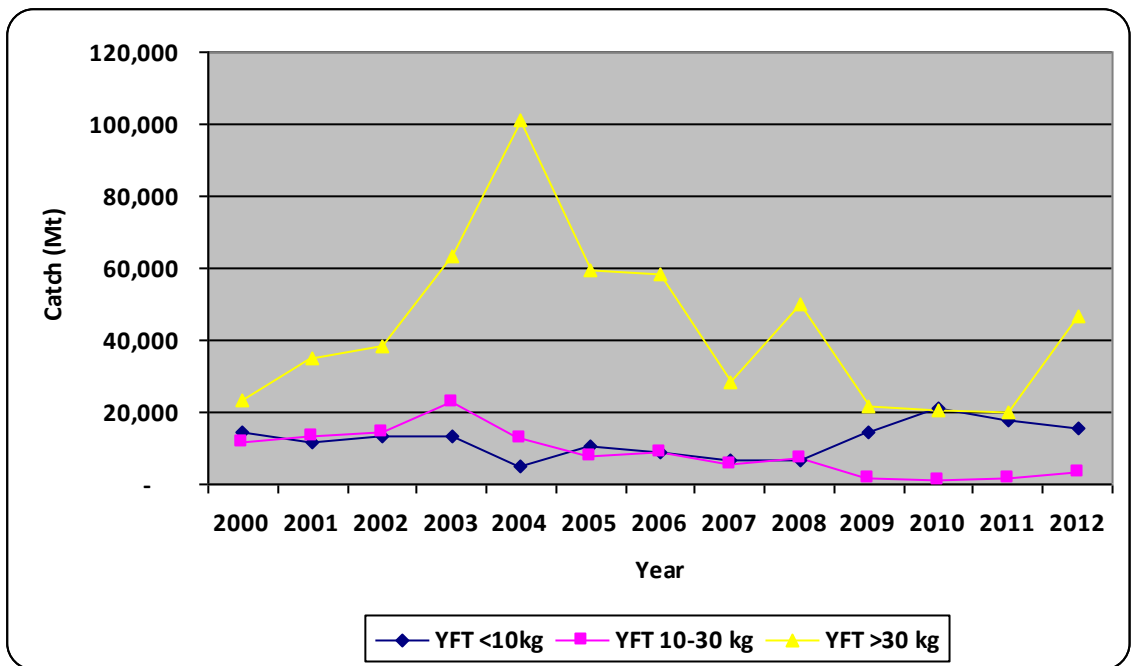


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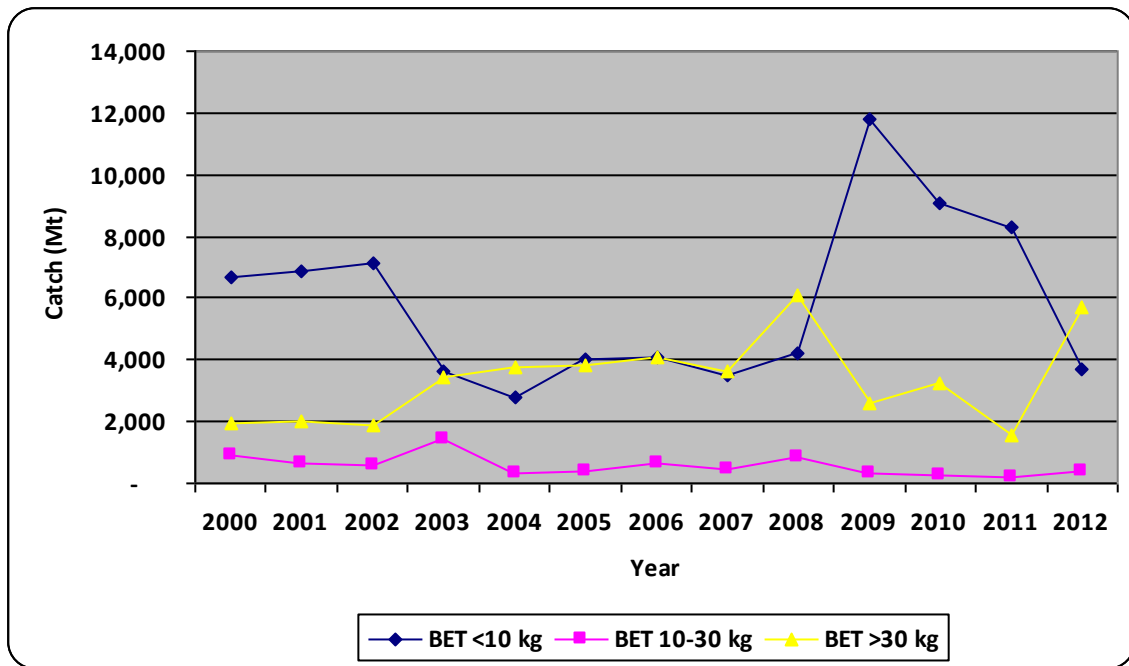


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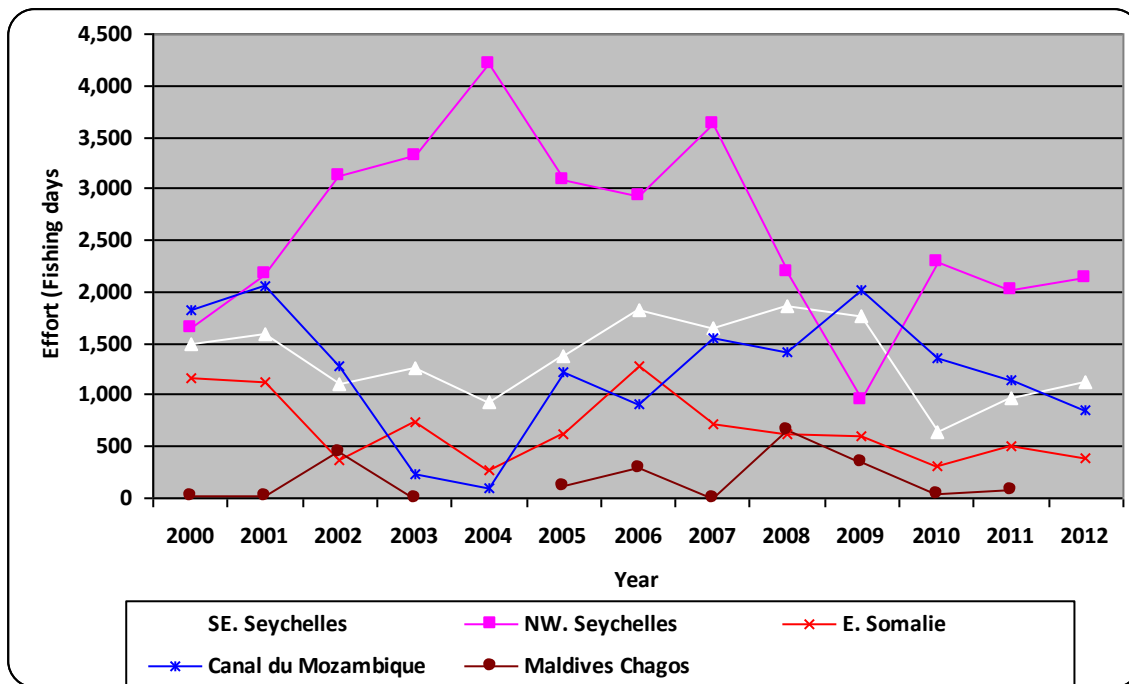


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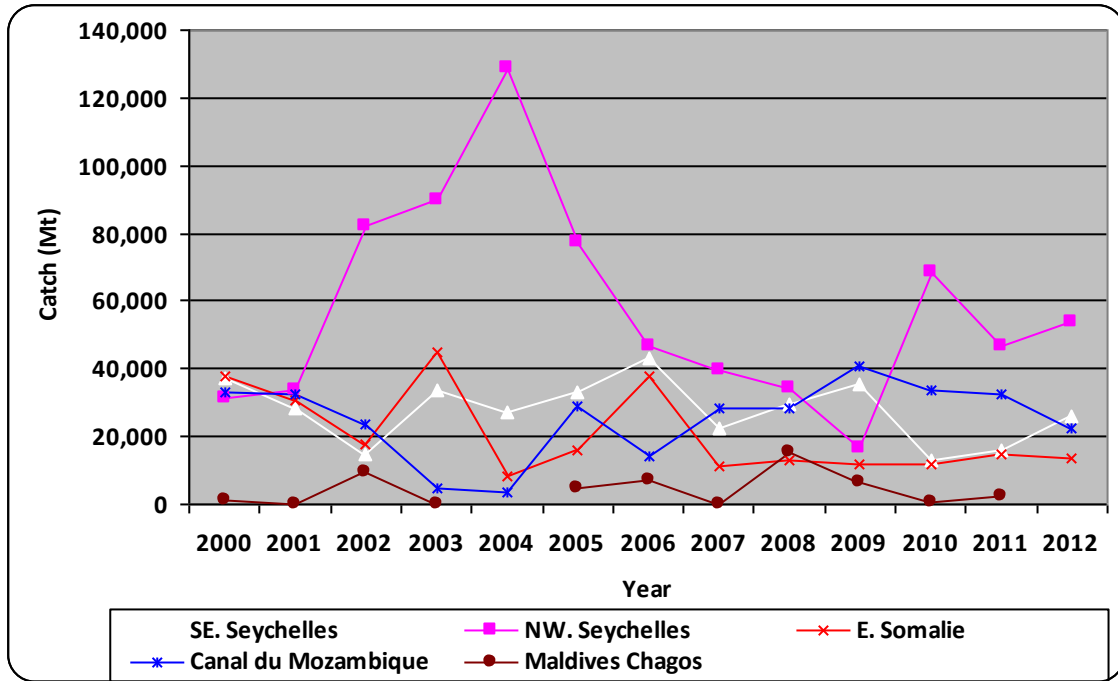


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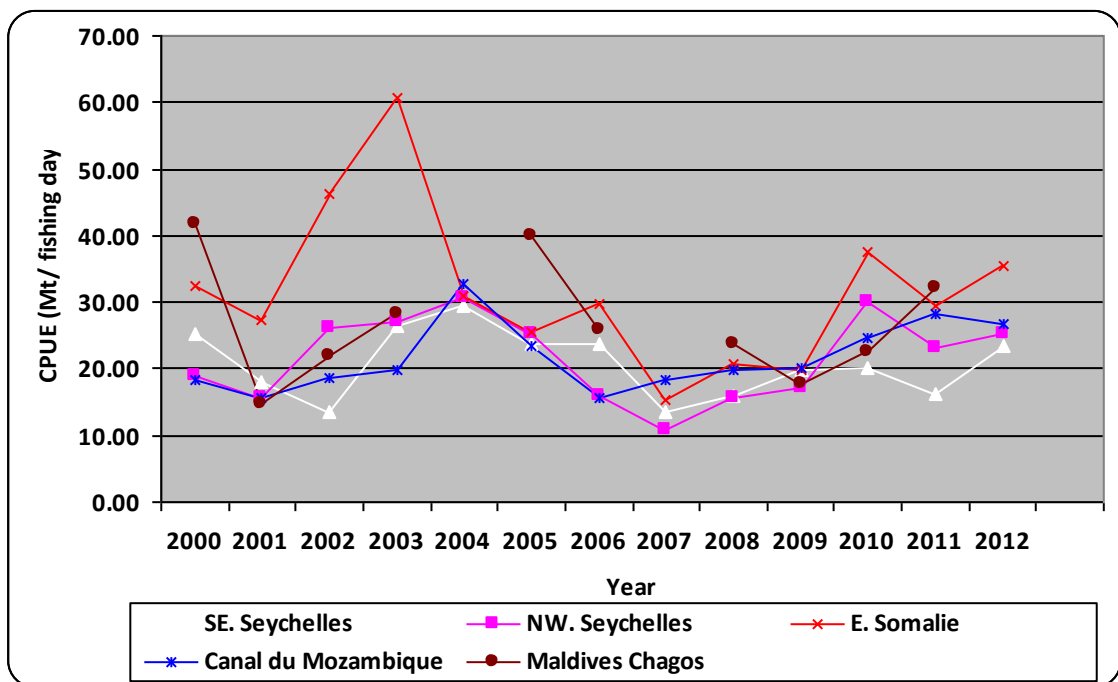
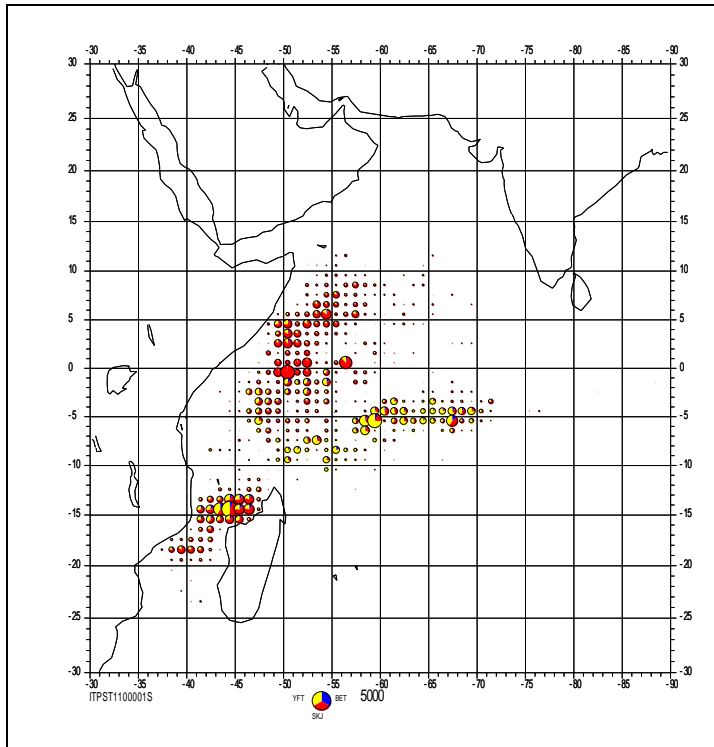
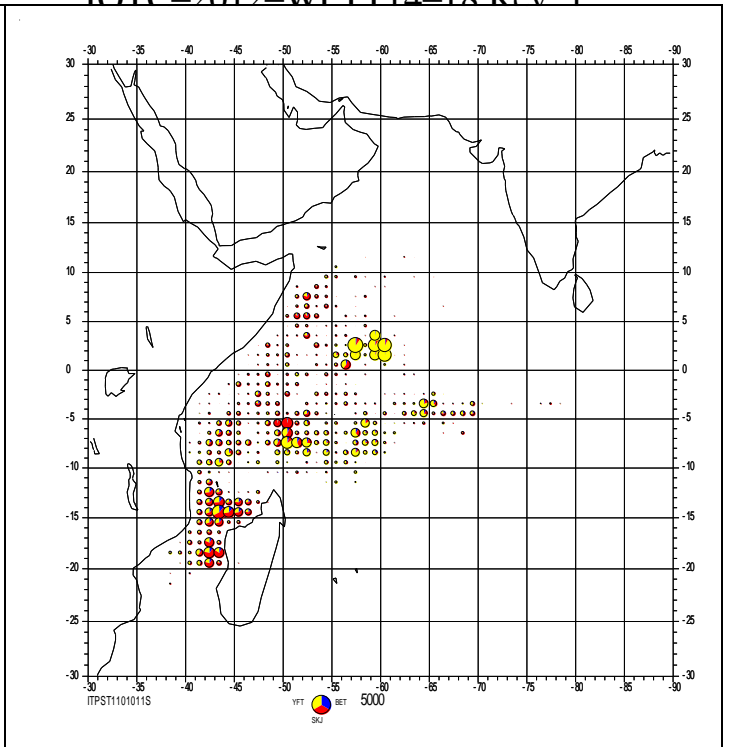


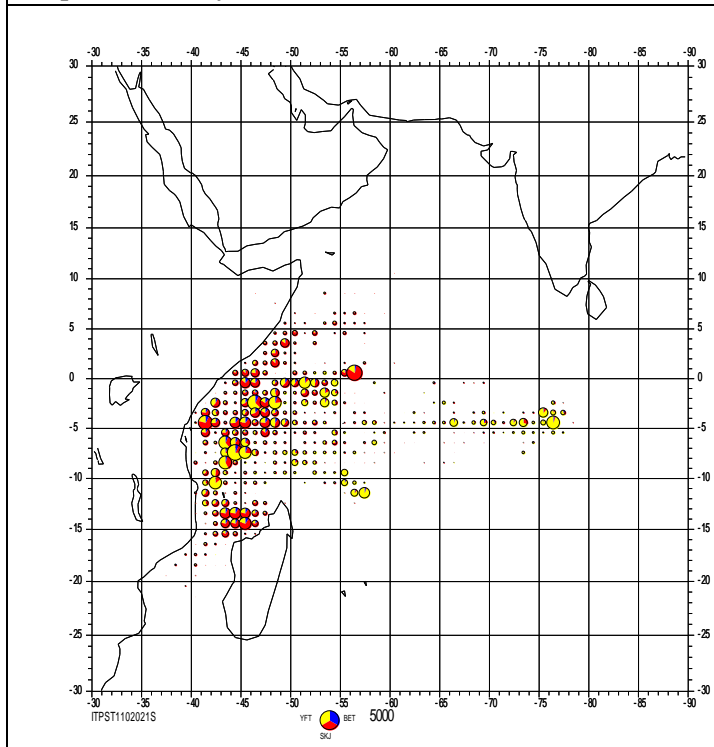
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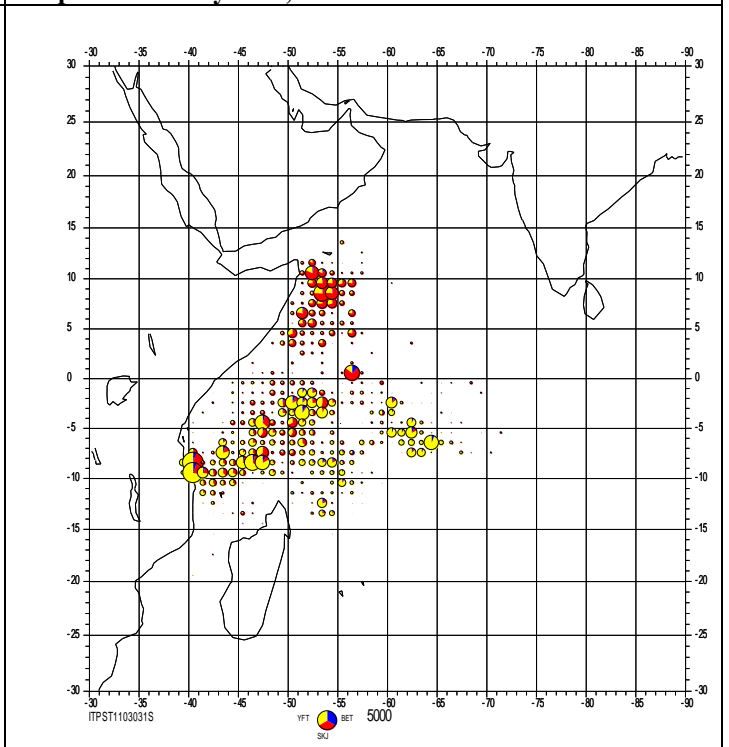
Map 1: Catches by zone, Jan - June 2000



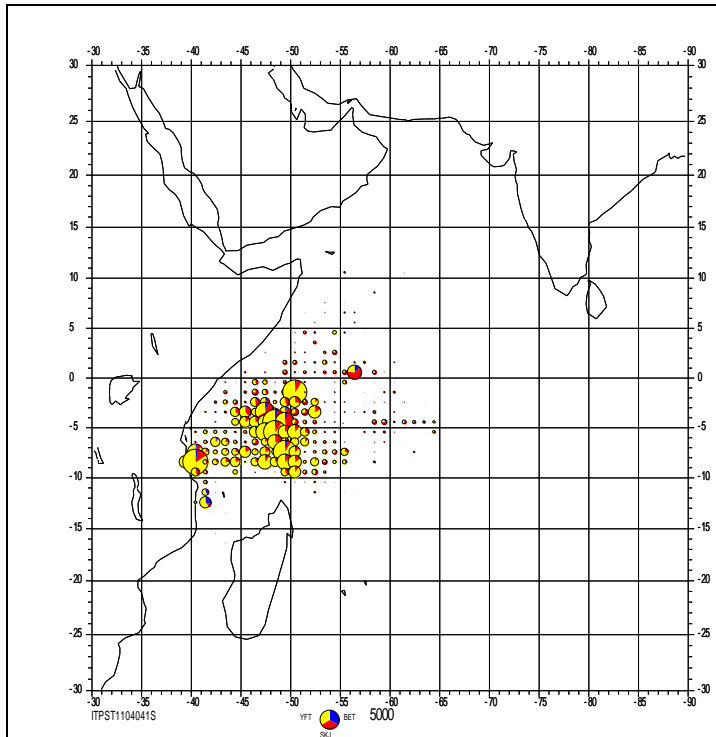
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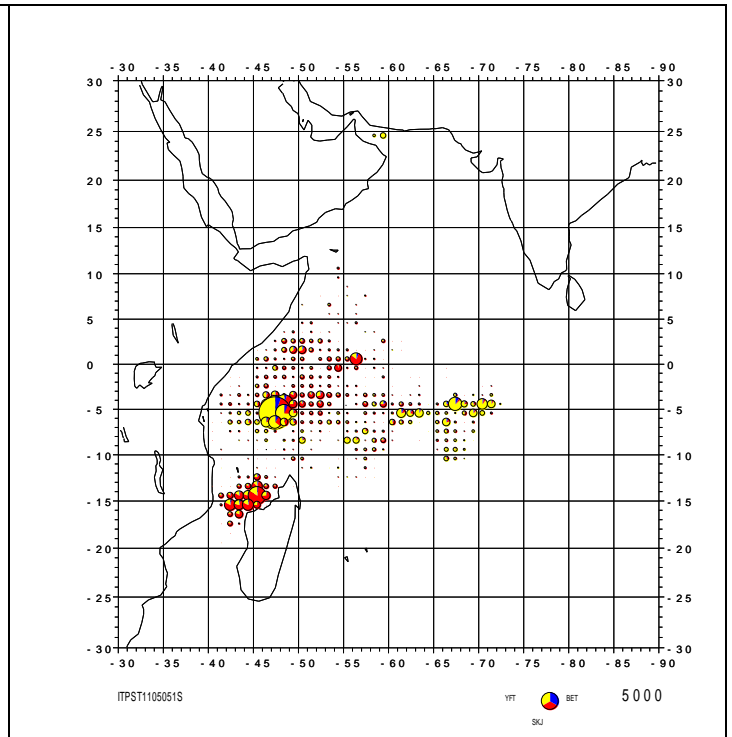
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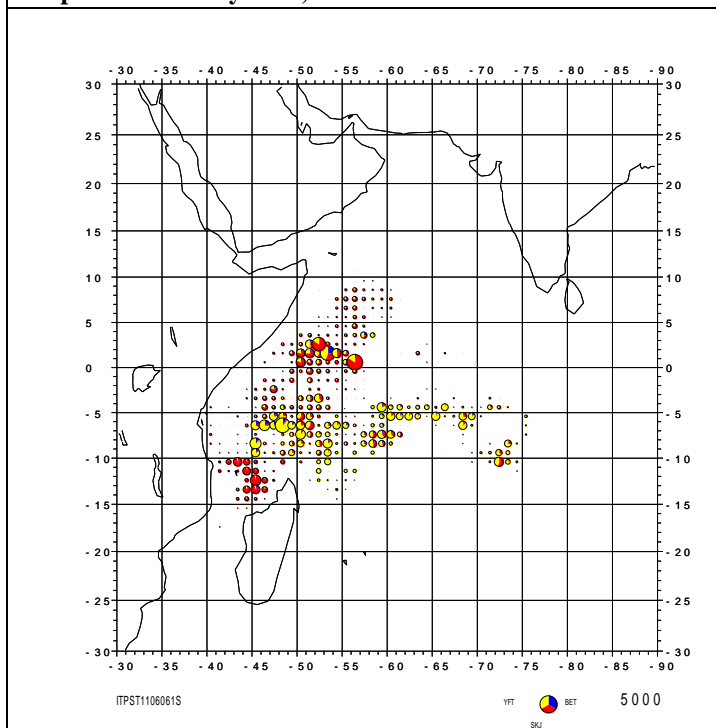
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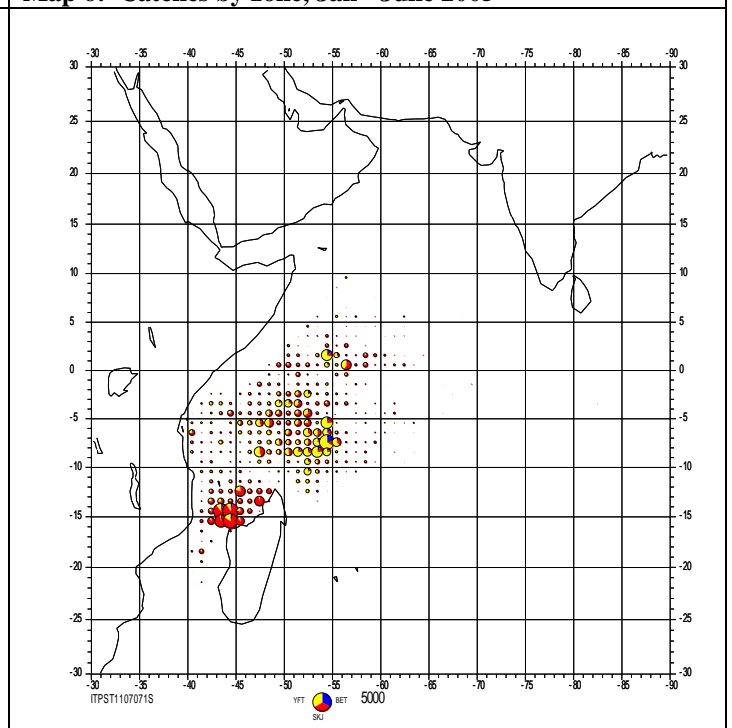
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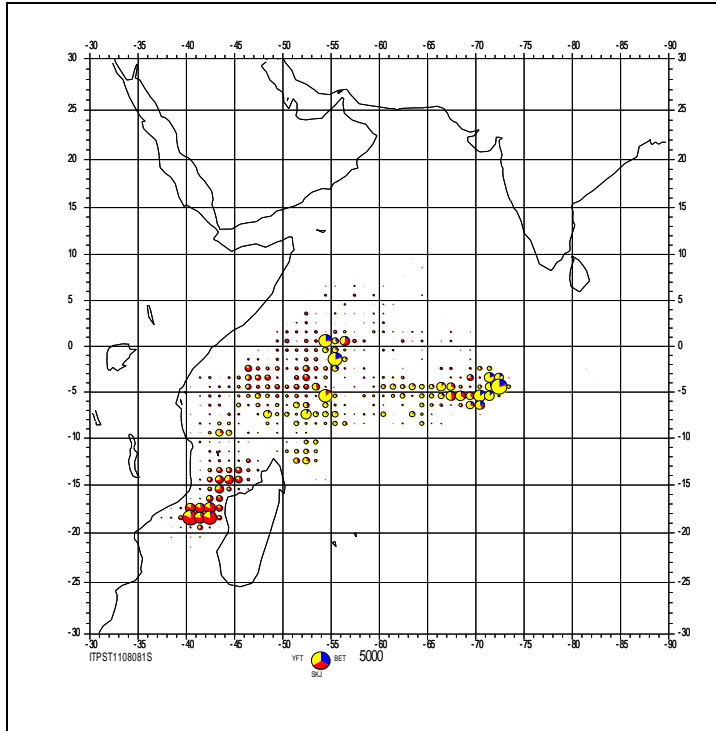
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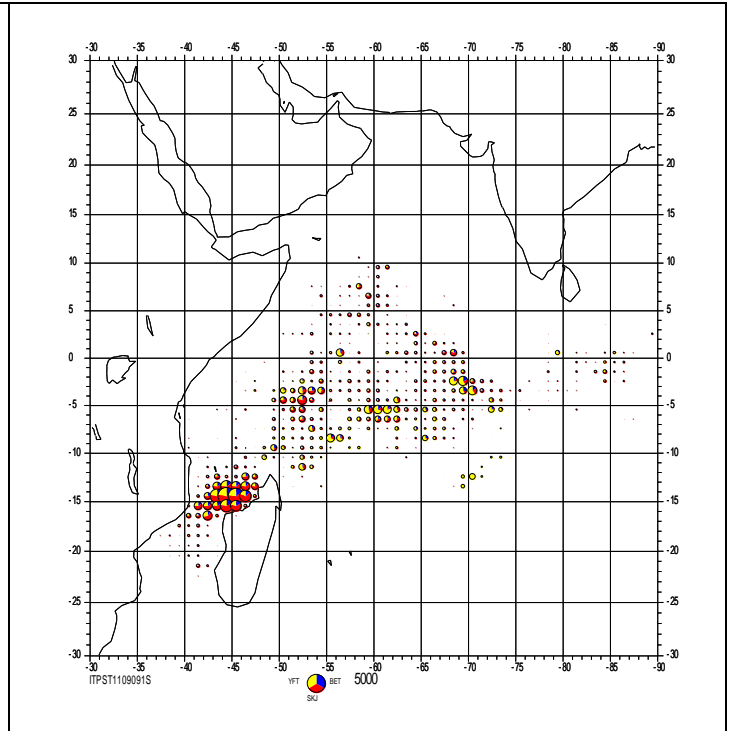
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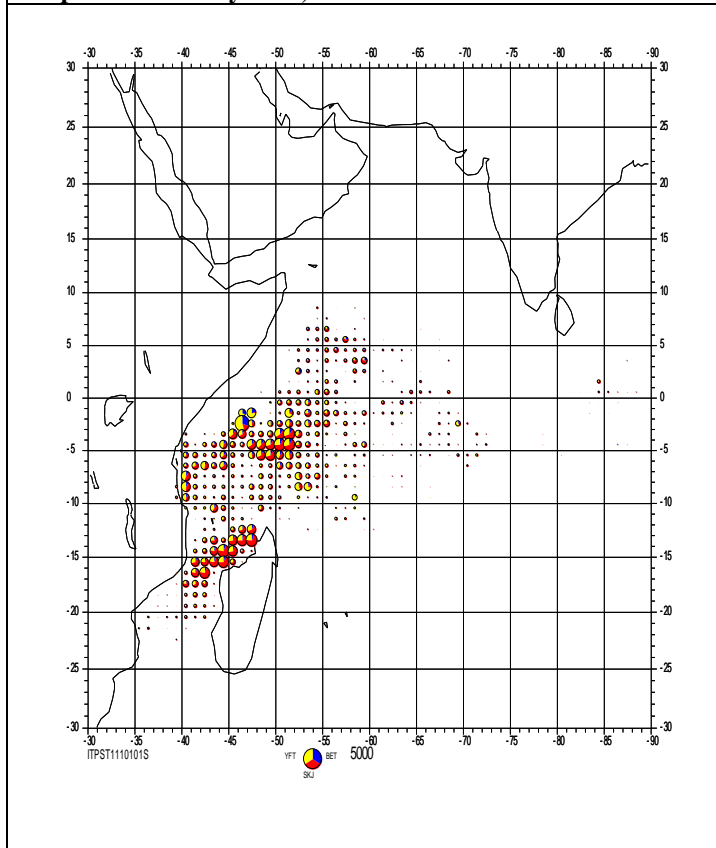
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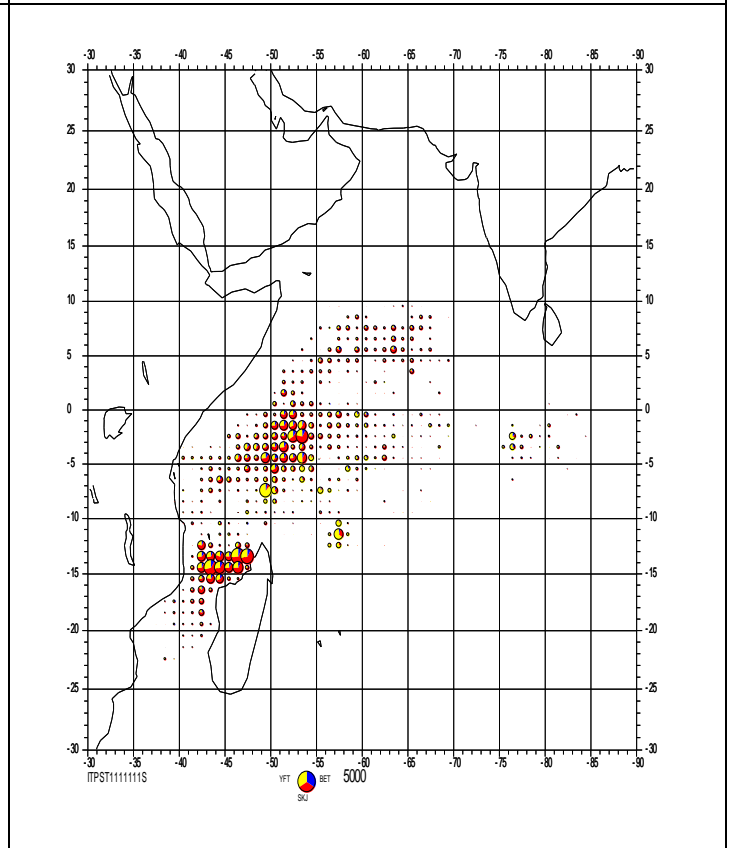
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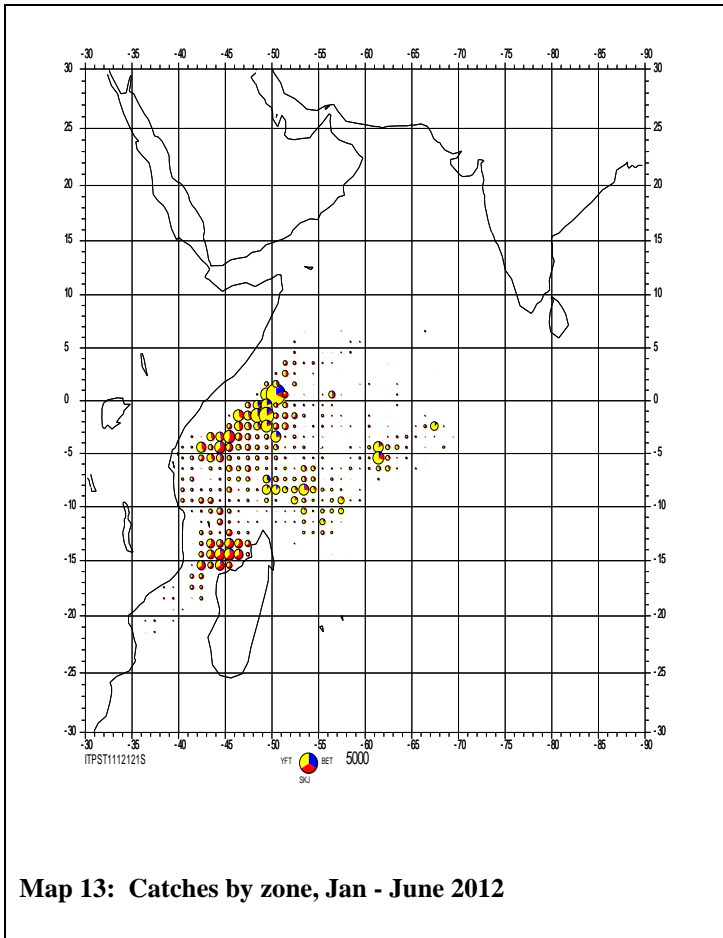
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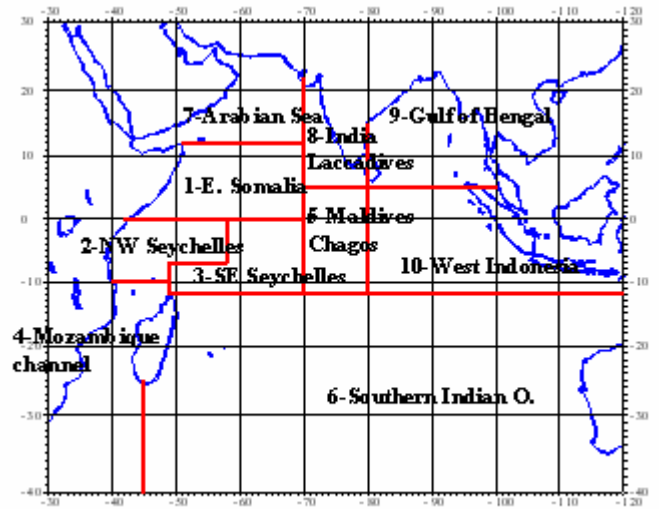
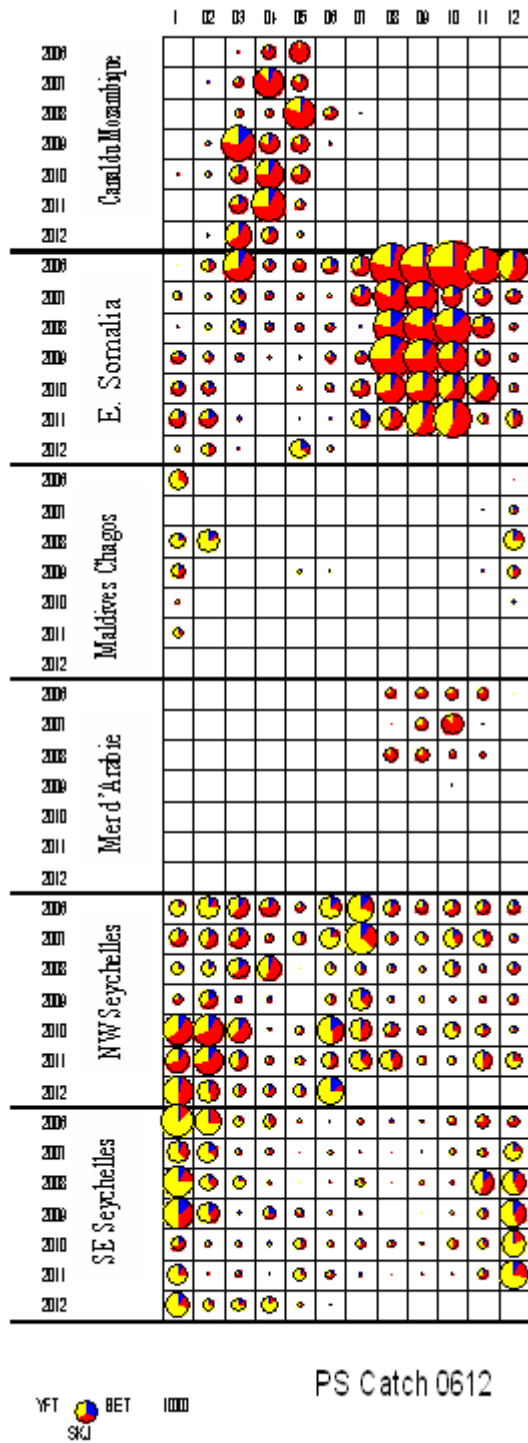


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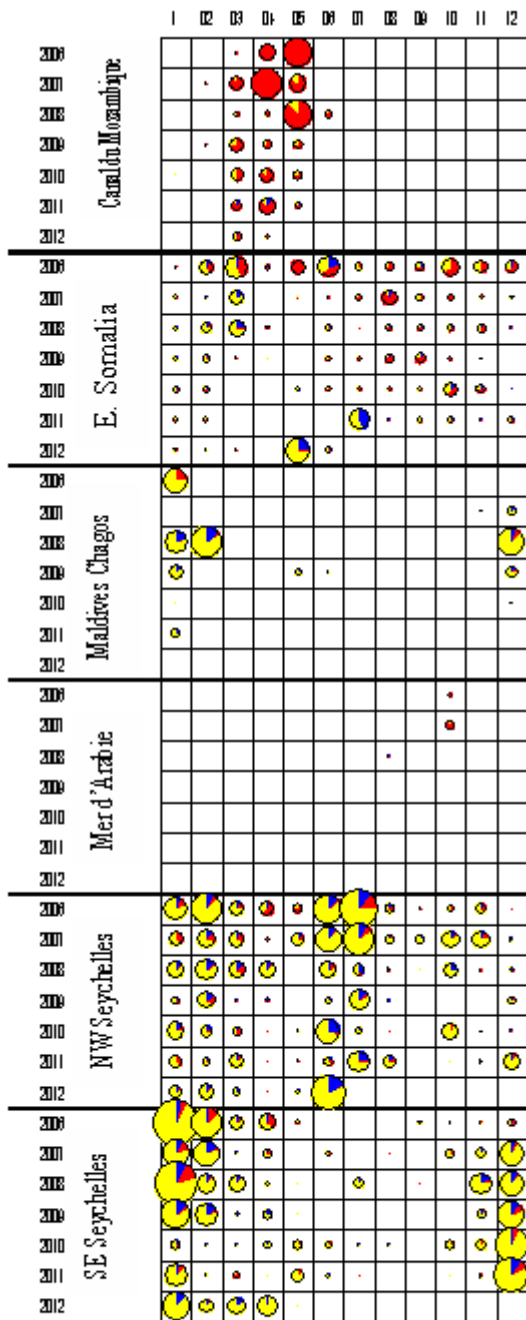


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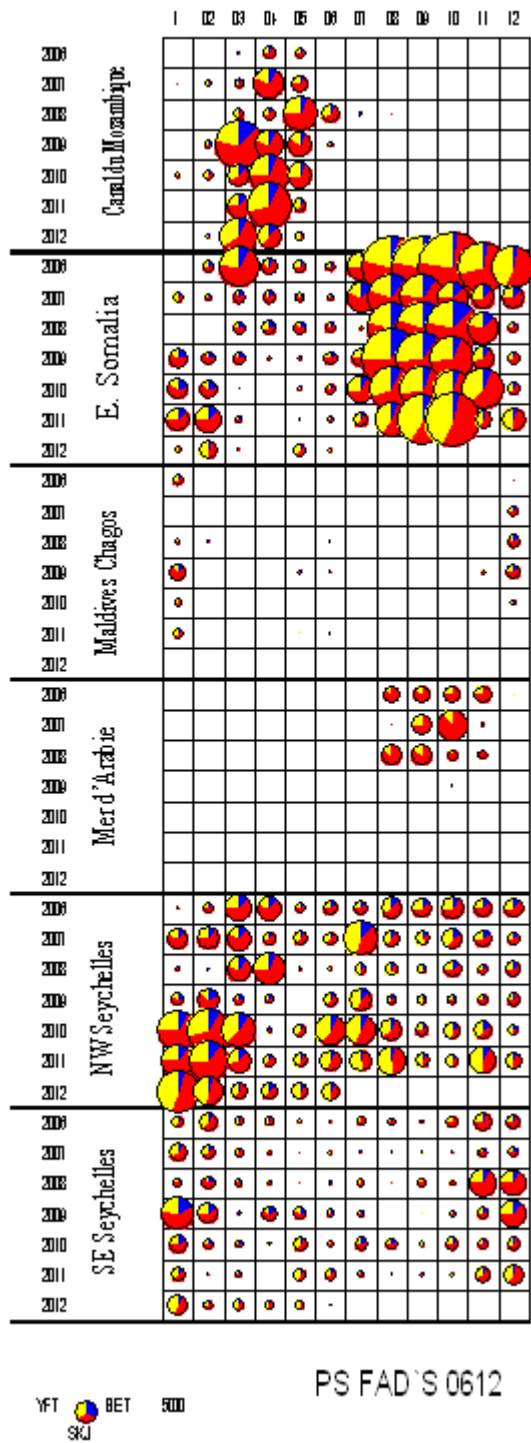
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YFT BET SKJ

PS free school 0612

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