

## **RECENT TREND IN FAD FISHING ACTIVITIES BY PURSE SEINERS LICENSED TO FISH INSIDE OF THE SEYCHELLES EEZ**

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### **Abstract**

*This paper will present an overview of the recent trend (2000 – 2004) in the Indian Ocean FAD's fishery for vessels primarily fishing under European Union flags or of European Union origin licensed to operate inside of the Seychelles EEZ.*

*There has been a slight downward trend in catches made on FAD's associated schools in recent year (from 2002 onward). On the other hand catches on free-swimming schools is showing an increasing trend. The difference between size distributions from catches on free schools and catches on FADs, for bigeye and yellowfin show that significant quantities of small juveniles (< 10 kg) of both species are captured in association with FAD's.*

*Analysis of fishery statistics reported by vessels fishing in association with supply vessels shows that these vessels are more efficient (both on FAD's and on free swimming schools) than vessels that are not associated with supply vessels. They reported higher mean catch rate both on FAD's associated schools and free-swimming schools.*

*There is a need to collect more information on the activity of supply vessels which will allow a more detailed evaluation of the effect that these vessels and the number of drifting objects they deployed have on the fishing power of their associated vessels. Understanding the role that these vessels plays will lead to better management of purse seine FAD's fishing in the Indian Ocean.*

### **1.0 INTRODUCTION**

Prior to the 1980's, the Indian Ocean accounted for less than 8% of world tuna production. Most of the catch came from artisanal fisheries in Sri Lanka and the Maldives, augmented by distant water longline fleets. In the early 1980's, French and Spanish purse seine vessels, faced by poor catch rate in the Atlantic Ocean, moved to the Western Indian Ocean. As they expanded their operations, tuna catches increased rapidly and over the last several years, averaged about 20% of the world total tuna catch. In the beginning about 50% of total catches were being taken on natural logs. This already significant percentage has increased significantly since the early nineties following a massive use of artificial FADs equipped with electronic devices. The Indian Ocean FAD fishery has been producing during recent years (up to 2001) more than 70% of the total purse seiner catches, (Fonteneau, 2003). These high catches are increasingly a source of concern in the Indian Ocean as well as in the other

oceans as many small tunas are taken under. Furthermore discards of by-catches are often greater on FAD's associated schools than on free-swimming schools.

As requested by the Commission resolution 02/08 at its 7<sup>th</sup> session, the WPTT at its 5<sup>th</sup> session (June 2003) evaluated a number of potential management measures that could lead to a reduction in the fishing mortality on juvenile bigeye and yellowfin tunas. Various measures were considered ranging from a moratorium on FAD's fishery to ban of supply vessels. These were presented to the Commission for consideration. However to date no management measures have been introduced to reduce the fishing mortality on juvenile bigeye and yellowfin tuna associated with FAD's fishery.

This paper will present an overview of the recent trend (2000 – 2004) in the Indian Ocean FAD's fishery for vessels primarily fishing under European Union flags or of European Union origin. It compares the activities and catch of the two fishing modes i.e. free swimming and FAD's associated schools. All the main characteristics and trends of these two fishing modes will be compared in detail. This paper also attempt to evaluate the effect that supply vessels can have on the efficiency of their associated vessels, by comparing fishery statistics of vessels associated with supply vessels and those not associated.

## **2.0 Overview of FAD's fishing activities (vessels licensed to operate inside of the Seychelles EEZ.**

### **2.1 Fleet size.**

Figure 1 shows the trend in total gross registered tonnage of the purse seine fleet (associated to supply vessels and not associated to supply vessels), licenced to operate inside of the Seychelles EEZ. Overall the purse seine fleet has remained relatively constant over the past 5 years. However the number of supply vessels and vessels associated with them have increased during the past two years

### **2.2 Trend in catch and effort**

Figure 2 and 3 shows the trend in catch by species reported on FAD's associated schools and free-swimming schools. Since 2002, the total purse sine catch on Fads have decreases steadily, despite the record catch in 2003. On the other hand, catches on free school have increase significantly over the last two years up to representing 50% of the total catch in 2004. Catch per unit effort have remained higher on FAD's than on free school over the past five years. The average CPUE for FAD's fishery and free school for the period under study are 53.02 MT/day and 37.85 MT/day respectively (Figure 6 and 7)

#### **2.2.1. Yellowfin**

Yellowfin catches on FAD's associated schools have remained more or less constant throughout the period under study with a mean catch of approximately 50,000 MT per year.

Catches and catch rate of yellowfin on free school show a significant increasing trend over the five-year period reaching a record catch of 155,975 MT with a CPUE of 41.45 MT/day in the year 2004. Throughout this study period yellowfin has remained the dominant species

caught on free swimming school. On average 38% of the total yellowfin catch was on Fads while 61% was on free school for the five-year period.

### **2.2.2. Bigeye**

The bigeye tuna catch and catch rate on both FAD's and free school has remained more or less constant throughout this 5 years. A record catch of 7,030 MT of bigeye tuna was recorded on free school in 2003. On average 78% of the bigeye tuna caught was reported on FAD's associated schools.

### **2.2.3. Skipjack**

Skipjack has been the dominant species taken on FAD's over the last five years. A reported 185,639 MT of Skipjack were taken under FAD's in 2002. However since then, the Skipjack catch on FAD's has been decreasing steadily.

### **2.2.4 Purse seiners associated with supply vessels.**

Figure 4 and 5 shows that purse seiners associated with supply vessels record higher catch rate on FAD's associated schools compared to those not associated with supply vessels. This is not the case for free swimming schools. In fact over the past two years purse seiners not associated with supply vessels reported higher average catch on free-swimming schools.

Figure 8 and 9 shows that the reported CPUE recorded both on FAD's and on free swimming schools are higher for vessels associated with supply vessel, than for those not associated with supply vessels.

## **3.0 Yellowfin and bigeye tuna catch by category**

Figure 10 shows the catches of bigeye tuna reported on FAD's and on free-swimming schools by categories (BE1= big eye less than 10 kg, BE2 = big eye 10-30 kg and BE3= big eye more than 30 kg). More bigeye are captured on FAD's associated schools and most fall under the category less than 10 kg.

Figure 11 shows the same information for yellowfin tuna.(YF1= yellowfin less than 10 kg, YF2 = yellowfin 10-30 kg and YF3= yellowfin more than 30 kg). Yellowfin tuna are captured in greater proportion on free-swimming schools and most are in the category more than 30 kg. Yellowfin taken on FAD's are usually less than 10 kg or greater than 30 kg.

These indicate bi-modality in the size distribution of yellowfin and bigeye tuna catches from purse seiners.

#### **4.0. Catch by zones**

Figure 12 shows maps of FAD's associated schools and free-swimming schools catches by fishing zones. The Somalie area is the most important fishing ground as far as fishing on FAD's is concern. The West and East of Seychelles zones are dominated by fishing on free-swimming schools.

#### **5.0 Conclusion**

FAD technology has changed rapidly in the past years and includes devices like echosounders coupled with satellite data transmission equipment and can be polled remotely. This has resulted in a large increase in tuna catches in the Indian Ocean over recent years. There is an increasing need to control this fishing technique, however our current knowledge of FAD's and support vessel operations is very limited. This paper shows that there has been a slight downward trend in catches made on FAD's associated schools in recent year (from 2002 onward). On the other hand catches on free-swimming schools is showing an increasing trend. Significant quantities of bigeye tuna and yellowfin tuna are taken under FAD's and most are small juveniles of less than 10 Kg.

This paper also shows that the number of supply vessels and number of vessels associated with supply vessels have increase over recent years. Analysis of fishery statistics reported by vessels fishing in association with supply vessels shows that these vessels are more efficient (both on FAD's and on free swimming schools) than vessels that are not associated with supply vessels.

It was believed that supply vessels, which can assist with deployment and checking of FADs can increase the fishing power, however quantify such increase will require more detailed analysis.

There is a need to collect information about the number of drifting objects deployed or checked by supply vessels. This will allow a more detailed evaluation of the effect that supply vessels and the number of drifting objects they deployed have on the fishing power of their associated vessels.

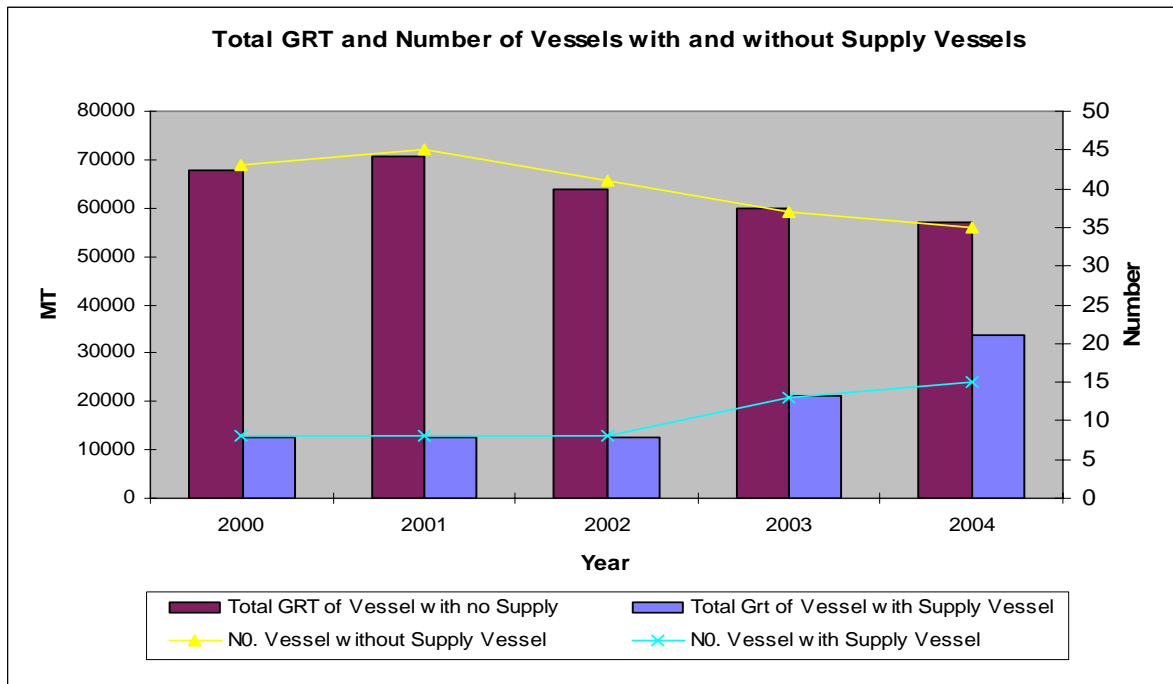


Figure 1. Trend in total gross registered tonnage of the purse seine fleet (associated to supply vessels and not associated to supply vessels) licenced to operate inside of the Seychelles EEZ.

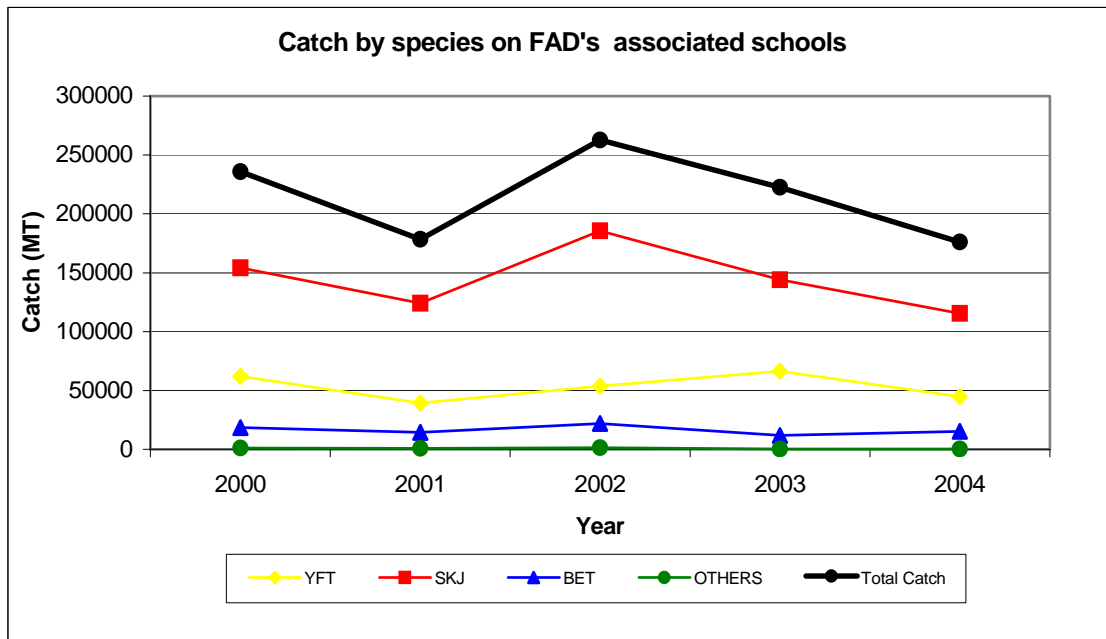


Figure 2. Catch by species reported on FAD's associated schools from 2000 – 2004 (all purse seiners)

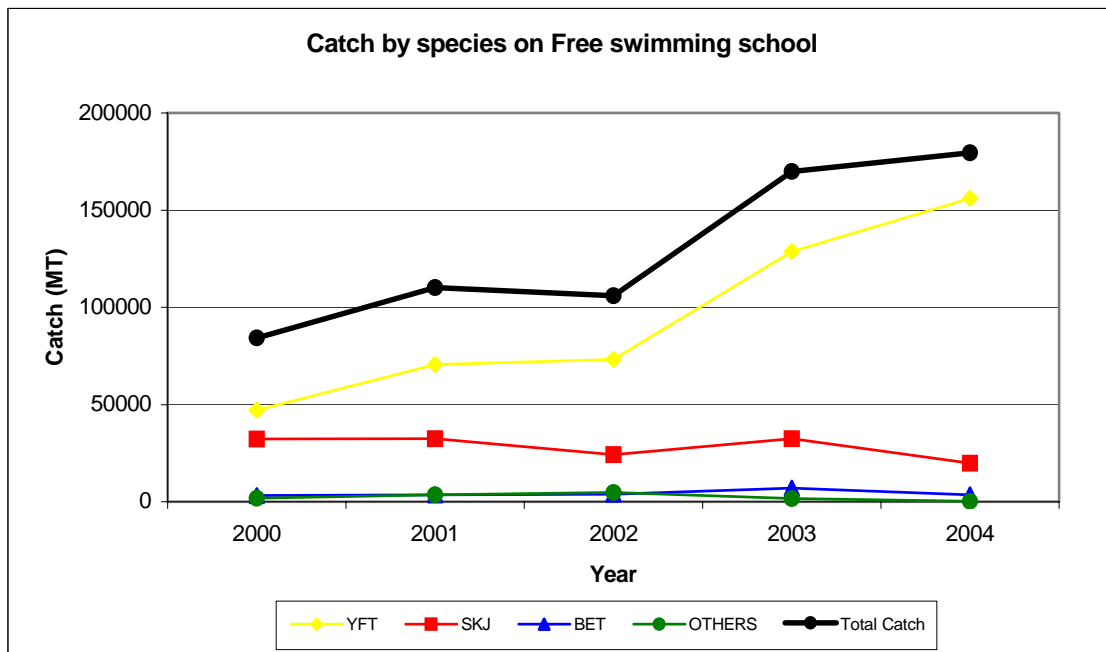


Figure 3. Catch by specie reported on Free Swimming Schools from 2000 – 2004 (all purse seiners)

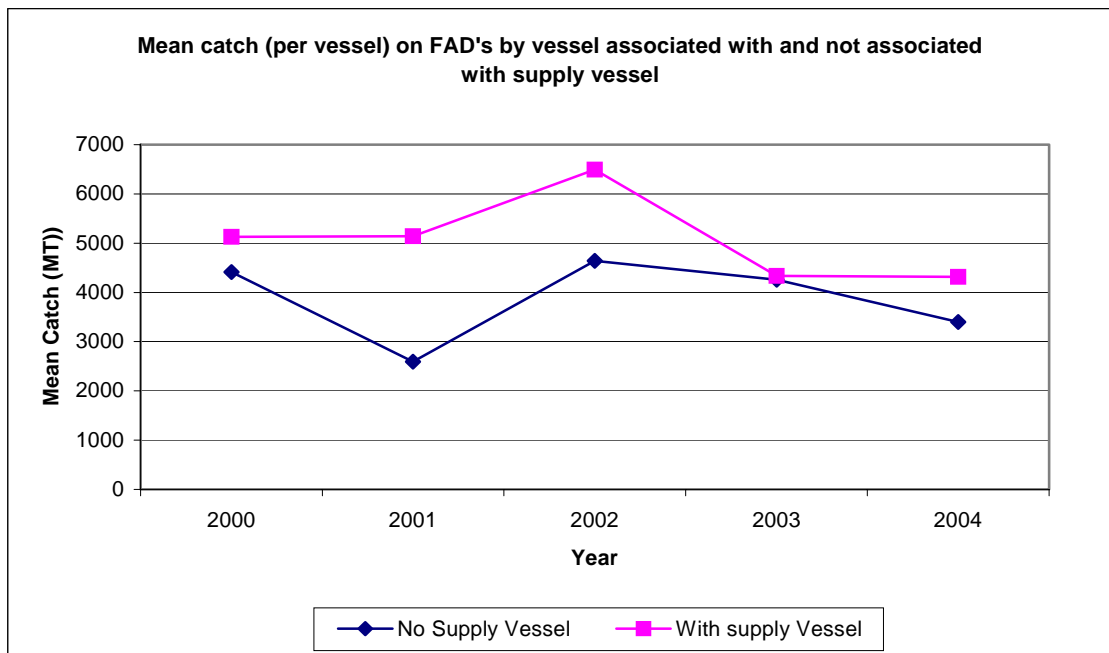


Figure 4. Mean catches reported on FAD's associated schools by vessels associated with supply vessels and vessels not associated with supply vessels

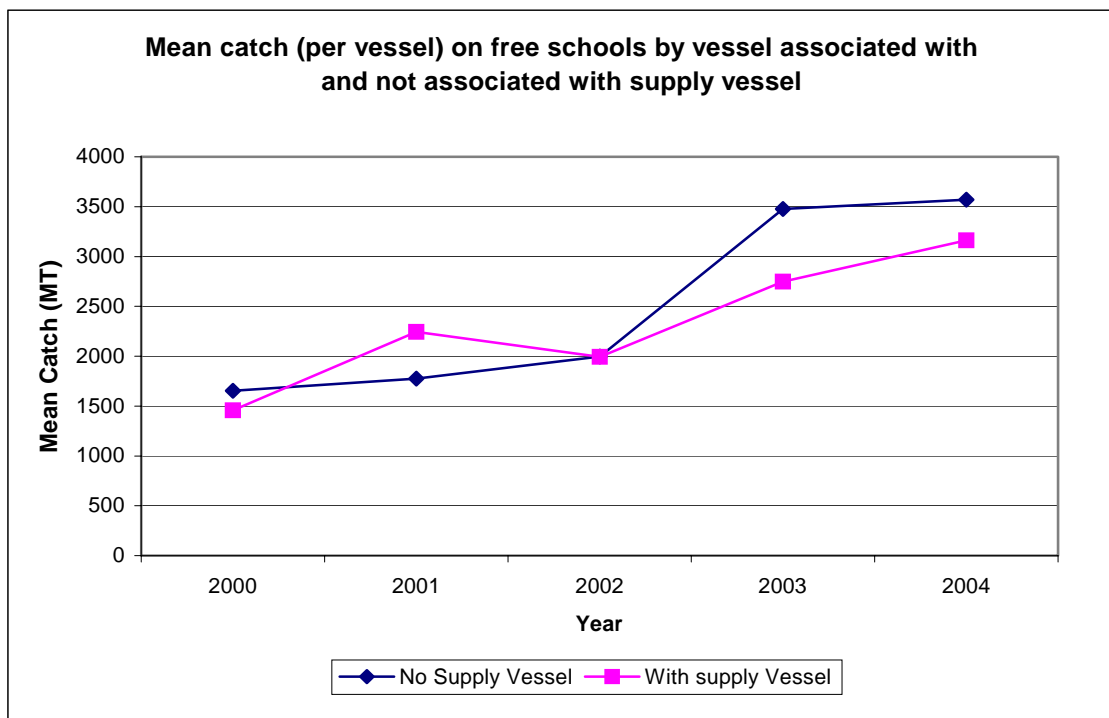


Figure 5. Mean catches reported on free-swimming schools by vessels associated with supply vessels and vessels not associated with supply vessels

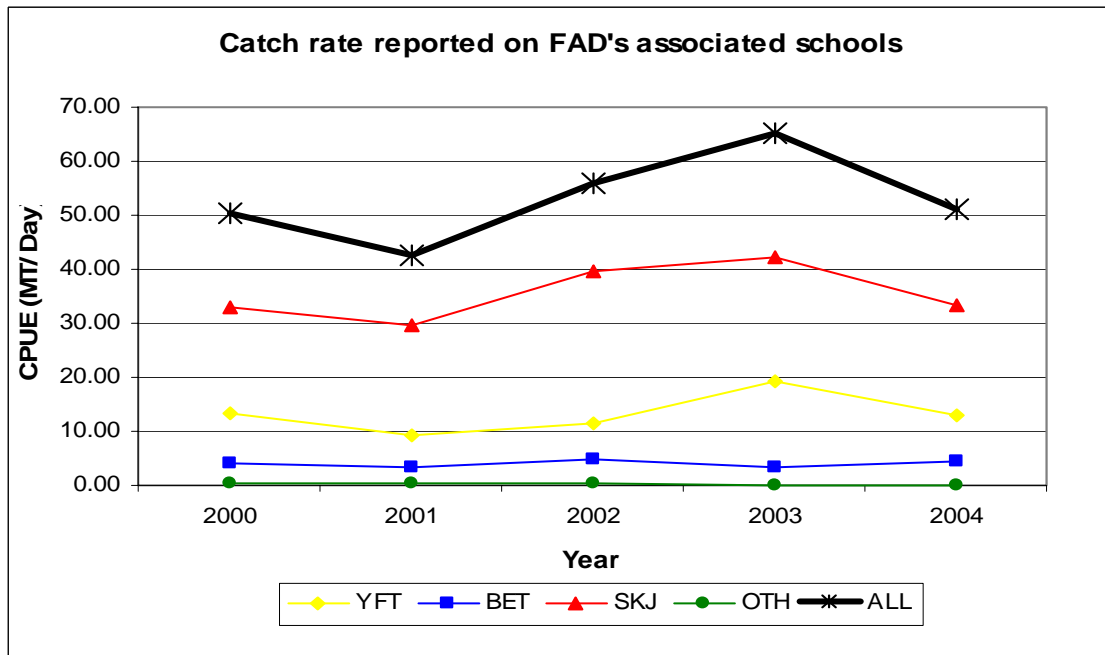


Figure 6. Catch rate reported on FAD's associated schools from 2000 – 2004 (all purse seiners)

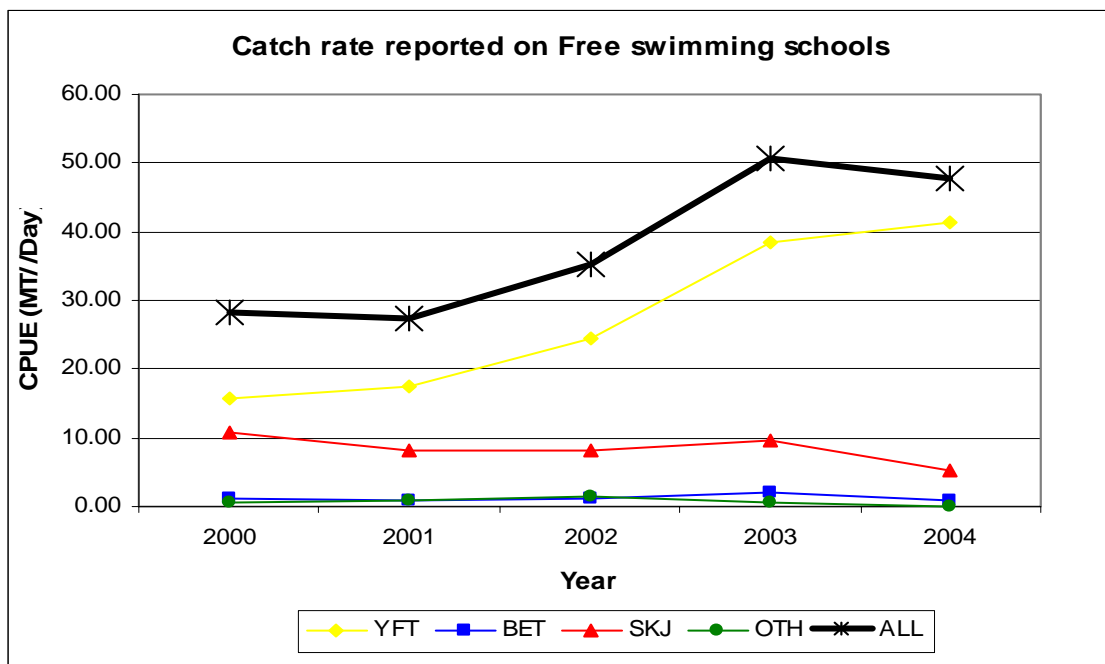


Figure 7. Catch rate reported on free swimming schools from 2000 – 2004 (all purse seiners)



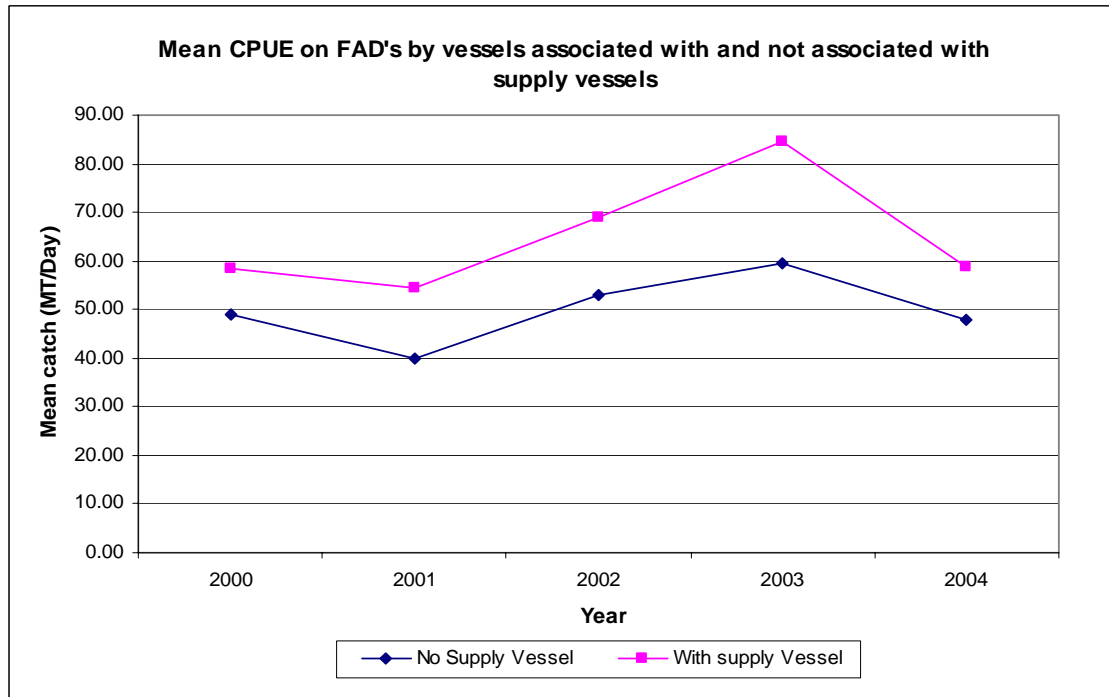


Figure 8. Catch rate reported on FAD's from 2000 – 2004 (purse seiners associated with supply vessels and purse seiners not associated with supply vessels).

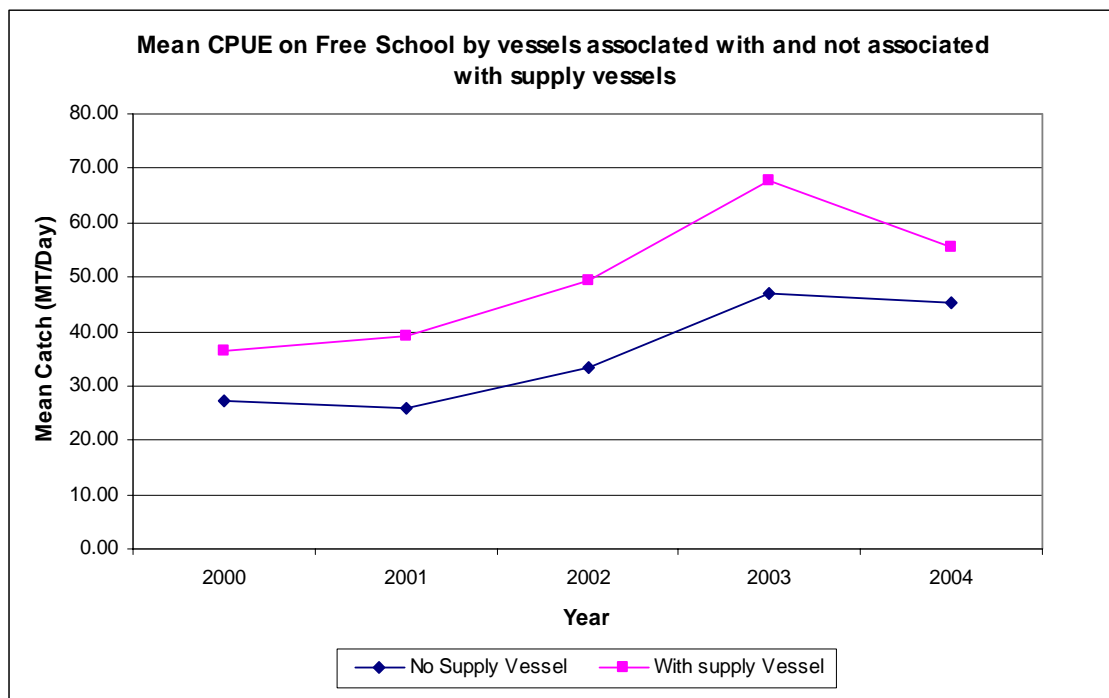
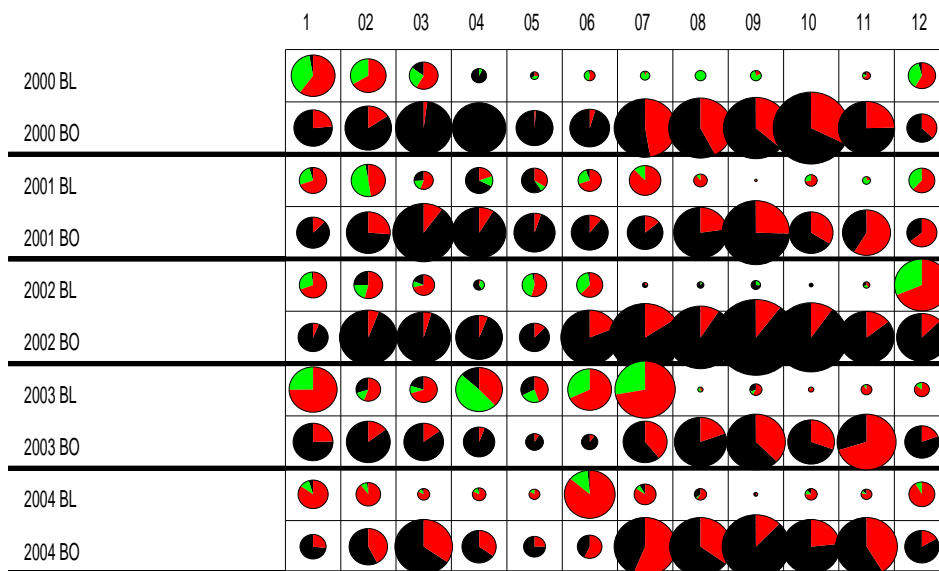
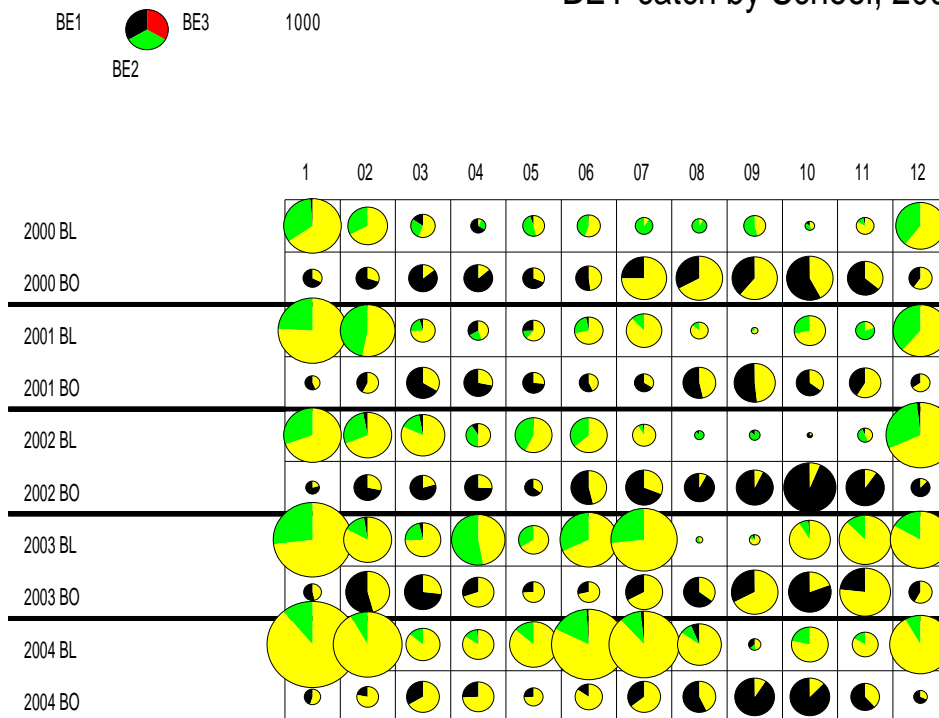


Figure 9. Catch rate reported on free schools from 2000 – 2004 (purse seiners associated with supply vessels and purse seiners not associated with supply vessels).

Figure 10 and 11 show reported catch by categories on FAD's and on free swimming Schools.



BET catch by School, 2000 - 2004



YFT catch by School, 2000 - 2004

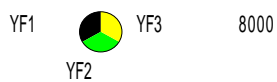
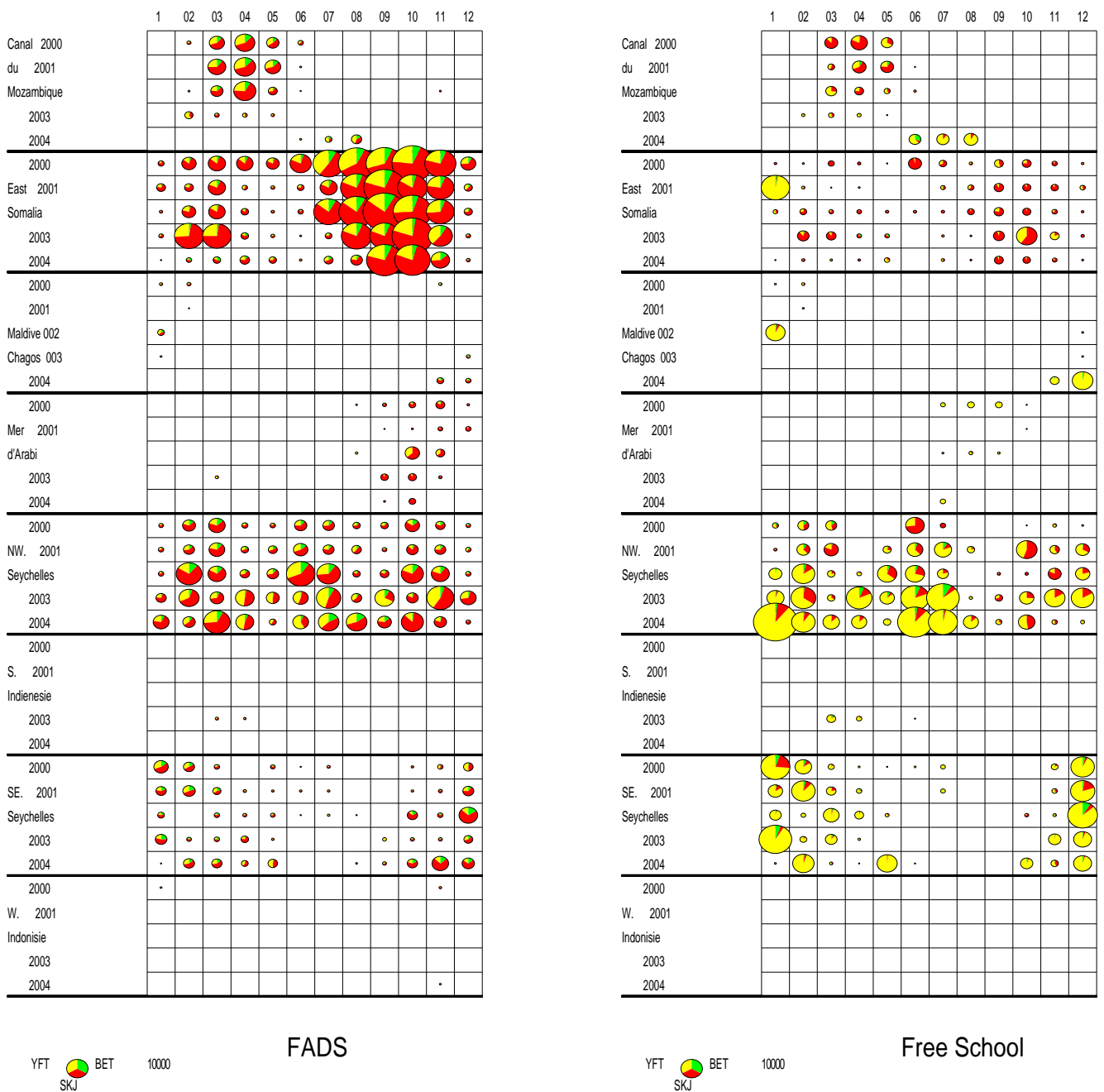


Figure 12. Map of fishing zone on FAD's associated schools and free swimming schools.



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