

Recent evolution of the Reunion longline fishery

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Abstract

The longline fishery in La Réunion began in 1991 and the number of boats and catch increased quickly. The first difficulties were faced in 2001-2002. This note will try to explain the decrease in number and in mean length of longliners and also the significant decrease of some target species catch. The results observed in 2003 confirm the high exploitation level of swordfish (*Xiphias gladius*) in La Réunion area. The swordfish catch decreased in 2002 (from 1500 to less than 800 metric tons) and remained at this level in 2003. The trend for albacore tuna (*Thunnus alalunga*) catch is similar but, on the other hand, yellowfin tuna (*Thunnus albacares*) catch increased significantly and reached 2000 and 2001 levels. An assessment of catch by unit effort (CPUE), in kilos of fish per 1000 hooks, demonstrates that the decrease of fishing yield for swordfish observed since 1999 stopped in 2002: the CPUE for swordfish increased in 2003. To keep companies in profit, fishermen are planning on fishing further. To do this, they need larger vessels to stay at sea longer. The positive results obtained during the first semester of 2004 by some longliners that fished in the southeast of Madagascar, encourage them in this way.

Résumé

*La pêcherie palangrière a démarré en 1991 à La Réunion et a connu une progression rapide du nombre de bateaux et des captures. Au début des années 2000, les premières difficultés sont apparues. Cette note tente d'expliquer la diminution du nombre et de la taille moyenne des bateaux ainsi que la baisse des apports pour certaines espèces cibles de cette flottille. Les résultats observés en 2003 confirment que l'espardon (*Xiphias gladius*) est localement fortement exploité. Les captures de cette espèce ont connu une chute importante en 2002 confirmée en 2003 (passant de 1500 à moins de 800 tonnes). La tendance est la même pour le germon (*Thunnus alalunga*) par contre les apports d'albacore (*Thunnus albacares*) ont progressé et dépassé le niveau atteint en 2000 et 2001. L'estimation des Captures Par Unité d'Effort (CPUE), en kilos de poisson pêché pour 1000 hameçons filés, montre que la baisse sensible des rendements de pêche pour l'espardon enregistrée depuis 1999, s'est arrêtée en 2002. Les CPUE d'espardon obtenues sont plus élevées en 2003. Pour maintenir la rentabilité de leurs entreprises, les pêcheurs envisagent d'exploiter des zones de pêche plus lointaines. Pour cela, ils ont besoin de bateaux plus grands afin d'augmenter leur rayon d'action. Les résultats encourageants obtenus par les bateaux ayant pêchés dans la zone sud-est de Madagascar au premier semestre de l'année en cours, confortent cette option.*

1. Introduction

The longline fishery in La Réunion has developed quickly since the nineties reaching more than 30 ships in 1998. Ten years after its appearance, the fishery is facing difficulties, the number of boats using longline has reached a ceiling, large ships have left La Réunion and large pelagic species catch hasn't risen and for some of them has decreased.

The aim of this paper is to present the results recorded in 2003 and try to explain the main trends.

All the results have been obtained from the Maritime Affairs database which is filed monthly from main fishing company declarations. These voluntary declarations cover about 95% of longliners catch.

This database includes catch information and also the number of sets done by each ship. From that we can calculate CPUE.

The results obtained in 2003 are then compared with previous years.

2. Evolution of the longliner fleet in La Réunion

The number of longliners increased quickly during the first ten years of exploitation and then levelled off at 38 boats. In 2003, 33 fishing boats used longline in La Réunion.

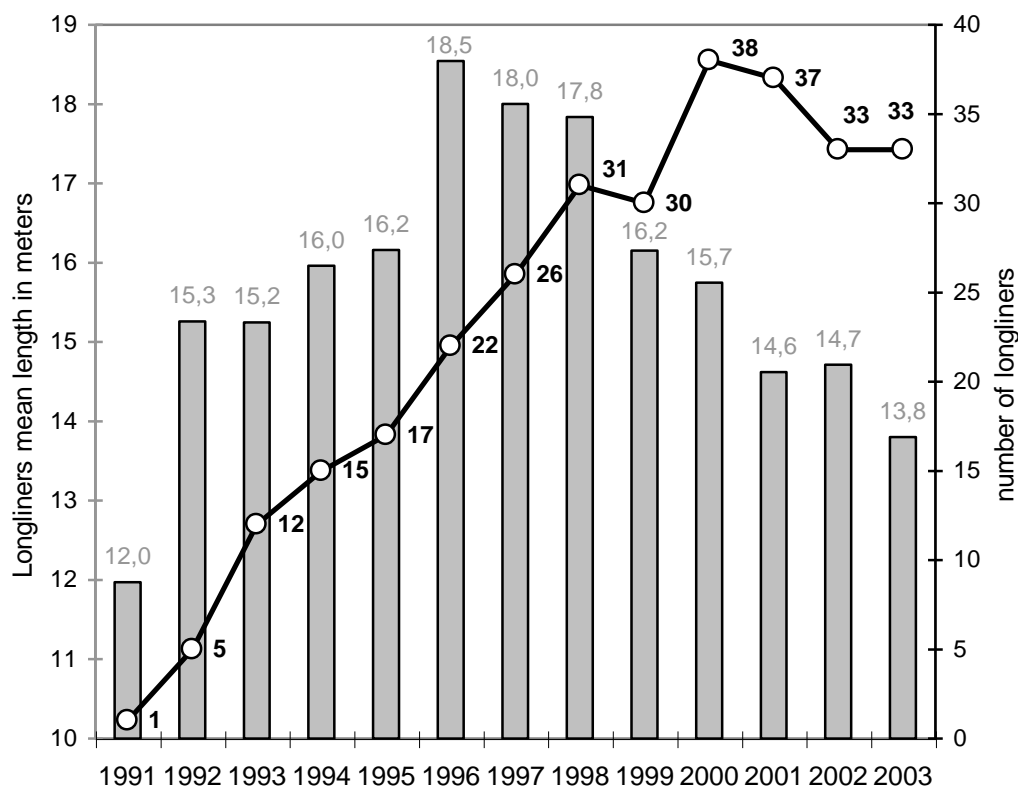


Figure 1 : evolution of the number and mean size of longliners in La Réunion from 1991 to 2003.

The mean length of the vessels, which was over 18 meters in 1996, is currently about 14 meters. This can be explained with the departure or the sale of some vessels over 20 meters long for financial reasons (and without direct connection to fishing).

So most of the boats are between 9 and 14 meters long and they can only operate around La Réunion island.

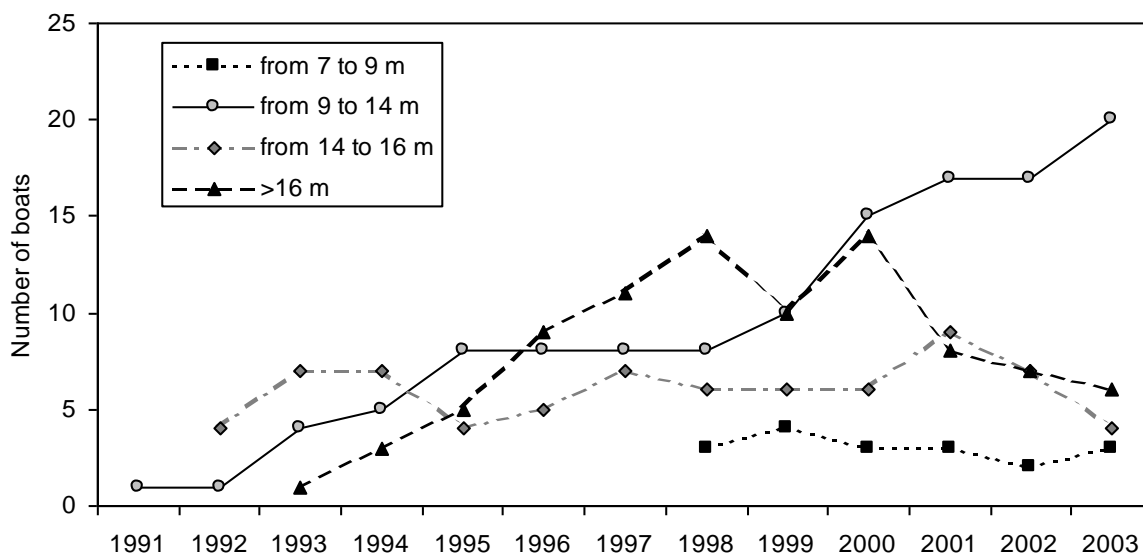


Figure 2 : fluctuations of the longliners number for each length class, from 1991 to 2003.

Fishing companies inform us about the main fishing areas where the longliners operate. The most frequented areas are to the west of La Réunion and to the north of Mauritius for the smaller vessels and the waters near Madagascar and Mayotte for the largest (over 16 m long).

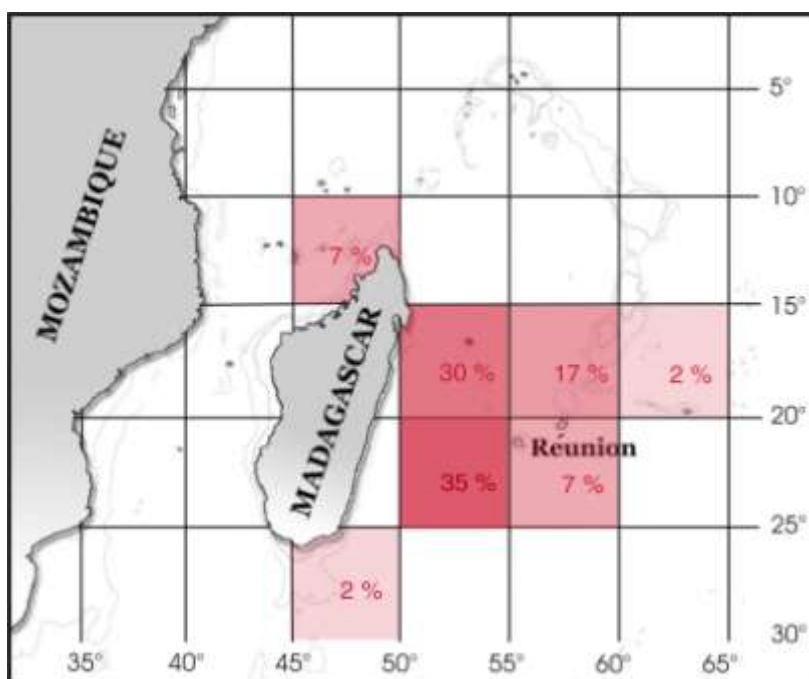


Figure 3 : localisation of the reunionese longliners effort in 2003.

3. Large pelagic fish catch

Catch declared by fishing companies are mainly swordfish (*Xiphias gladius*), tuna (*Thunnus albacares*, *Thunnus obesus*, *Thunnus alalunga*, *Katsuwonus pelamis*), other billfish (*Istiophorus platypterus*, *Makaira mazara*...), sharks (*Carcharhinus longimanus*, *Prionace glauca*, *Isurus oxyrinchus*, *Alopias sp.* ...), dolphin fish (*Coryphaena hippurus*) and wahoo (*Acanthocybium solandri*).

Declared catch breakdown was (in weight) 46 % swordfish and 44 % tuna in 2003 (Figure 4). It was 65 % and 26 % respectively in 1999. Tuna catch became as important as swordfish catch.

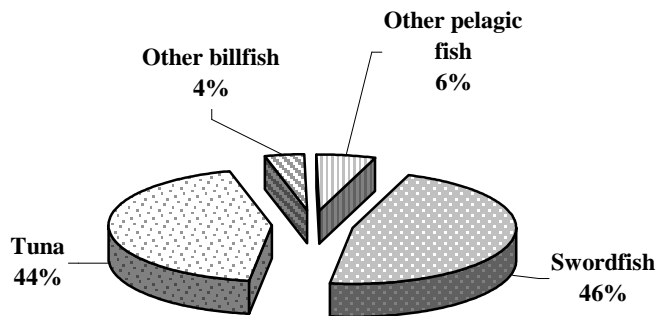


Figure 4 : large pelagic species breakdown in longliners catch in La Réunion in 2003.

Large pelagic catch of the reunionese longliners levelled off at 3000 tons from 1998 to 2000, plunged from 2001 to 2002 and remained at this level (Figure 5). This fall was, in part, the consequence of the departure of vessels over 20 meters long. On first semester basis, the 2004 results should be better.

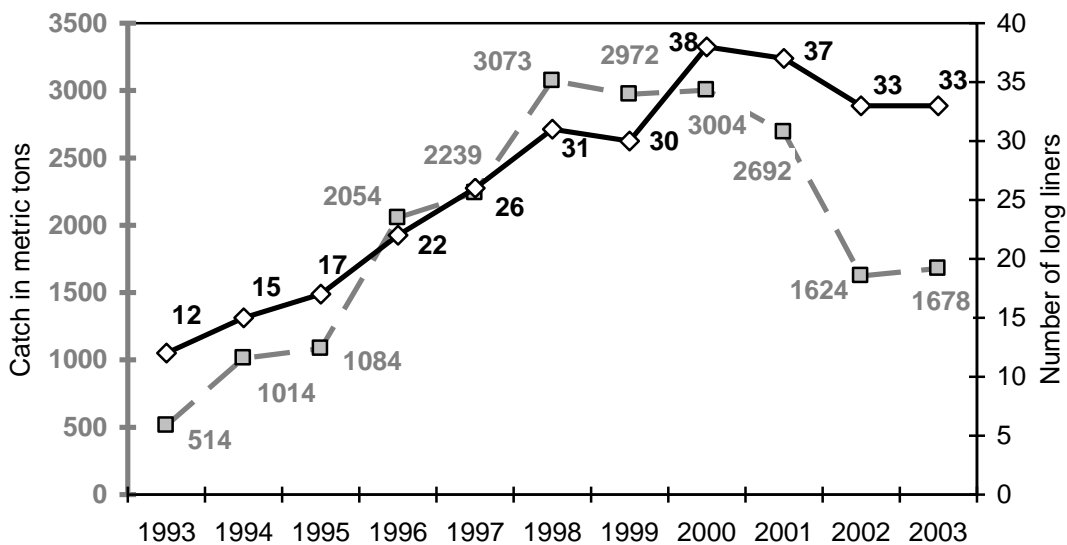


Figure 5 : large pelagic catch fluctuation in La Réunion and evolution of longliners number from 1993 to 2003.

Swordfish catch levelled off at 800 metric tons since two years (figure 6) and albacore at 300 metric tons after reaching a double value in 2001 for these two species.

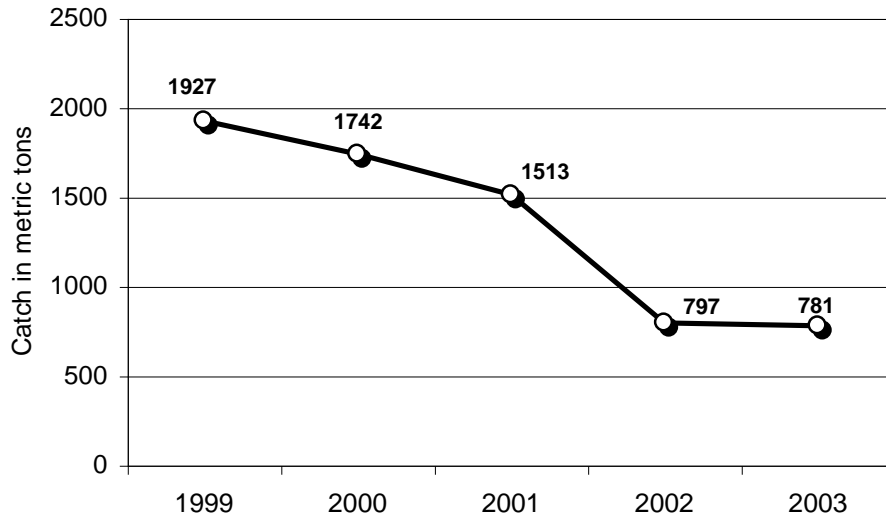


Figure 6: swordfish reunionese longliners catch from 1999 to 2003 .

Dolphin fish and bigeye catch remained very low. On the other hand, yellowfin catch increased in 2003 and reached 358 metric tons (figure 7), equal to maximum catch realized by this longliner fleet in 1998.

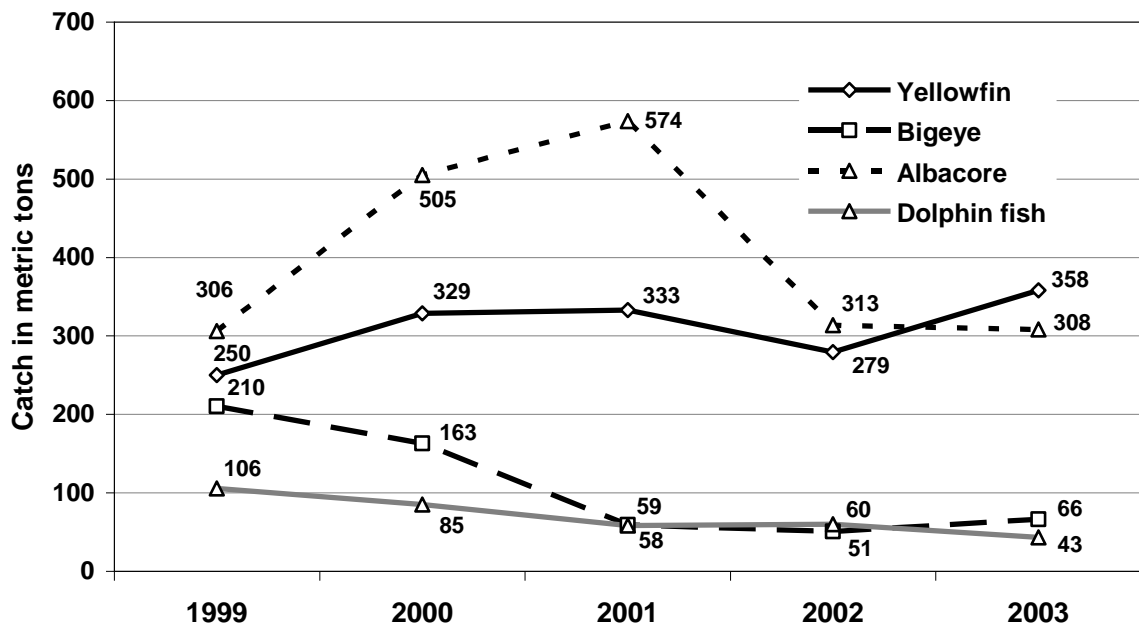


Figure 7: other pelagic reunioneuse longliners catch from 1999 to 2003.

Swordfish catch sampling done by Ifremer fisheries laboratory in La Réunion shows no indicative trend of the yearly mean length evolution (but seasonal fluctuations).

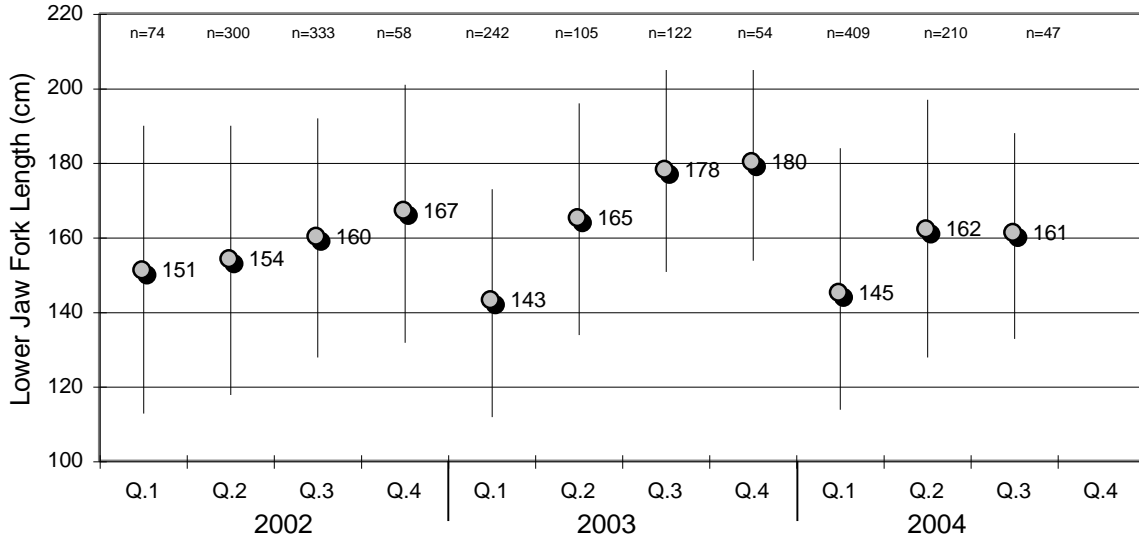


Figure 8 : swordfish quarterly mean length evolution in reunioneuse longliners catch from 2002 to 2004.

4. Fishing effort and mean yield evolution.

The Affairs Maritimes of La Réunion database includes the number of fishing trips and sets the longliners have done during the year. Using a mean number of hooks for each set by boat length class estimated by Ifremer research program led on the longline activity in La Réunion (Poisson & Taquet, 2001), we calculated a mean fishing effort from 1999 to 2003.

In 2003, the fishing effort developed by reunioneuse longliners decreased to 2.5 millions hooks even when it reached 4 millions hooks in 2000 (Figure 9).

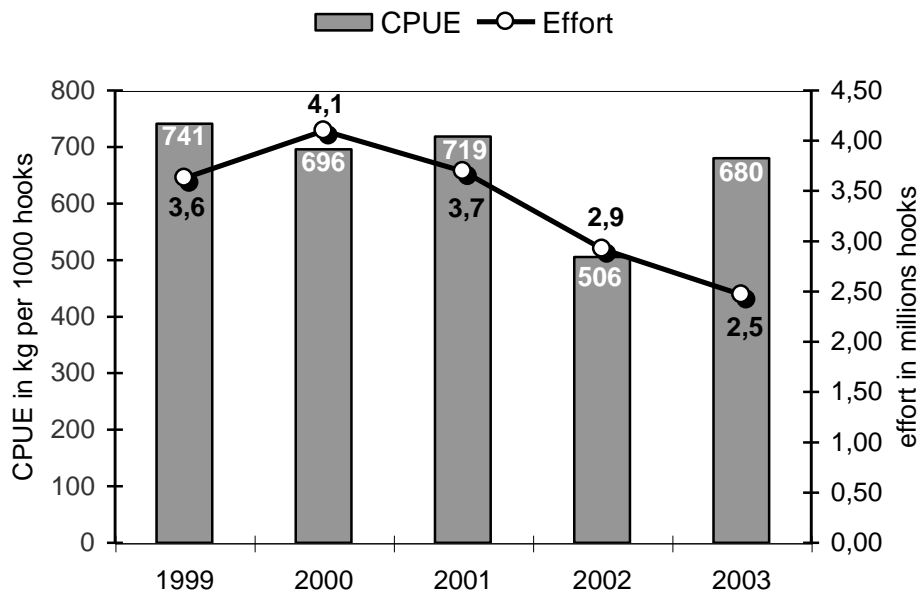


Figure 9 : effort in number of hooks and catch per unit effort (CPUE) in weight of large pelagic fish for 1000 hooks from 1999 to 2003.

The catch per unit effort (CPUE) were estimated in live weight of large pelagic fish per 1000 hooks. These total CPUE calculated for 2003 were 680 kg of pelagic fish per 1000 hooks that is to say increasing since 2002 up to 2000-2001 level (figure 9).

For swordfish, CPUE remained at a low level even though they increased since the previous year. Yellowfin CPUE significantly increased and albacore CPUE increased weakly.

Bigeye and dolphin fish CPUE remained at a low level.

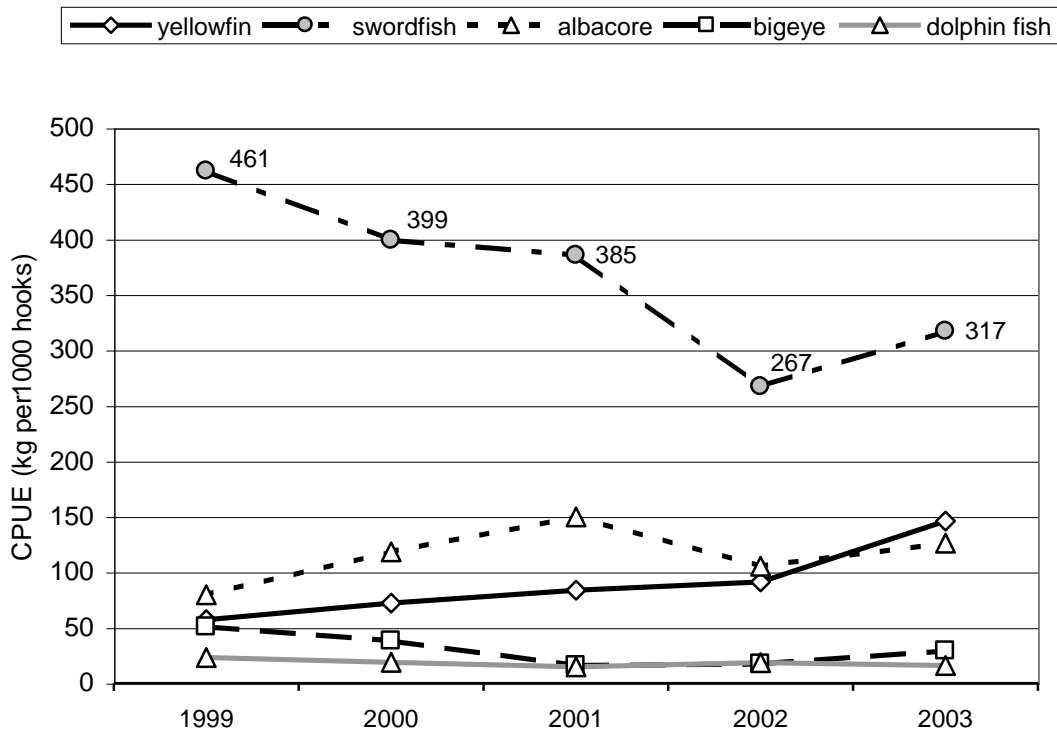


Figure 10 : CPUE estimated for main pelagic species fished by longliners in La Réunion from 1999 to 2003.

5. Discussion

The total decrease of large pelagic fish catch in La Réunion which was 3000 tons in 2000 and 1678 tons in 2003 can be attributing to the departure of some large vessels. It had influenced the total fishing effort of the reunionese longliner fleet.

But the decrease of the catch is not the same for all the species. It is a noticeable decrease for swordfish, albacore, bigeye and dolphin fish. On the other hand, a steady increase of the catch is recorded for yellowfin during the same period. For this species, we notice that this increase in 2003 correspond to the increase of purse seine catch observed in equatorial area.

The decrease of swordfish yield (from 461 kg for 1000 hooks in 1999 to 267 kg for 1000 hooks in 2002) could be the result of a more important fishing pressure in areas close to The Reunion island (stock viscosity). The number of boats of the whole fleet had decreased but the number of small boats (with a limited range) had proportionally increased, creating the nearest areas over exploitation. Bad results in 2002 have encouraged

fishing companies to look for new fishing zones within the framework of regional agreement (licence in Mauritius and in Madagascar). This geographical redeployment of some vessels to less exploited areas can explain the increase of CPUE in 2003 (317 kg for 1000 hooks).

If the follow-up of the length distribution of the swordfish catch presents a steady seasonal evolution, it doesn't show a decreasing trend. It is a reassuring fact about swordfish stock health in this fishing zone.

It seems that longliners which are fishing further have good results. It's the reason why the reunionese fishermen wished larger vessels.

Because of the economical importance of longline fishery, Ifremer will follow this fishery activity. We currently put in place a fishery information system (SIH) according with persons in charge of fishing activities to have a high-performance tool to measure and follow the yearly evolution of the exploitation parameters of this fishery.

The knowledge of the swordfish stock structure in the Indian Ocean remains a priority to understand this species distribution and its susceptibility to exploitation. The Ifremer laboratory in La Réunion plan to go through this way in starting a new project based on a genetic study of this species in the Indian Ocean.

References

Poisson F., Taquet M., 2001. L'espadon : de la recherche à l'exploitation durable. Programme Palangre Réunionnais, Rapport final, 248 p.