PRELIMINARY ANALYSIS OF OBSERVERS DATA AVAILABLE FROM THE 1998-1999 MORATORIUM IN THE INDIAN OCEAN.

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SUMMARY

A preliminary analysis on the observers' data collected during the 1998-1999 moratorium on the FAD´s sets in the Indian Ocean has been performed. Only part of the information is analysed in order to have preliminary estimations of fishing areas, effort (number of sets and number of successful sets), species composition of the catch, yield by set, and percentage and size distributions of discards.

INTRODUCTION

The three European organizations of frozen tuna producers (ANABAC-OPTUC, OPAGAC and ORTHONGEL) adopted an agreement in September 1998 by means of witch there was not possible to use FADs for fishing tuna in the area delimited by 5º South - 10º North in latitude and 53º East – African coast in longitude. The banning period was from 15 th of November 1998 till 15th of January 1999 (Artetxe 1999).

The control of the fulfilment of the moratorium was made by means of observers aboard each one of the vessels, both purse seiners and supliers.

In this paper a very preliminary analysis on the biological and fishery data collected by the observers has been performed.

MATERIAL AND METHODS:

The formularies used for data collection on route parameters, catches and size distributions were adopted from the ones used in the research project UE 96/028 (Delgado de Molina et al. 1997).

40 observers went aboard 10 auxiliary boats and 30 purse seiners belonging to the Spanish organizations OPTUC-ANABAC and OPAGAC. In the auxiliary boats, 583 days were observed, 520 of them corresponding to the moratorium period (covering a 83.9 % of the theoretical moratorium days). With respect the purse seiners, a total of 1886 days were observed, from witch 1719 corresponded to the moratorium period (covering 92.42% of the theoretical moratorium days).

For this preliminary analysis, route parameters of one single vessel and catch, effort and discard size distributions from 12 of the tuna fishing boats have been considered. Data analysed includes fishing operations carried out between the 11th of November 1998 and the 17th of January 1999. All the information corresponds with fishing activities located outside the specified moratorium area.

Route parameters of one single vessel have been mapped in order to see its behaviour between November 1998 and January 1999. This behaviour is considered to be representative of the majority of the Spanish boats' behaviour in that period.

For this single vessel, FAD associated or free school associated fishing days and number of sets have been characterized. The separation of the fishing days dedicated to FAD associated or free school fishing has been done by considering that the period of time between two consecutive fishing operations has been invested exclusively in the fishing modality of the latter operation.

Fishing effort for the totality of the vessels considered has been computed in number of sets and in number of positive sets, by fishing modality (FAD or free school associated).

Catches by species presented in this paper are direct estimates of the skippers, as they have not been recalculated with the length sample information.

RESULTS

Figure 1 shows the fishing trip of one of the vessels between 20th November 1998 and the 13th January 1999, with the positions of all the fishing operations either FAD associated or free school. It is quite clear that three main fishing grounds were explored:

The first attempt was made in the Eastern Somalia area, were 6 out of 7 sets were FAD associated. Then there was an active displacement to the West Indonesia area where 14 out of 15 sets were on free schools. The third fishing area explored was mixed between Maldives-Chagos and SE Seychelles areas, where 11 out of 12 operations where on free schools.

This makes a total amount of 34 sets, 8 FAD associated and 26 on free schools, with a total amount of 11 failed operations (1 FAD associated, 10 on free schools). A total amount of 10751 nautical miles were explored in 54 days at sea, with 50.9 fishing days (21.36 fishing days for free school fishing and 29,58 fishing days fishing on FADs)

For this single vessel, the number of FAD associated and free school sets per fishing day are 0.27 and 1.22 respectively (0.67 operations per fishing day in total)

Table 1 shows the number of total and successful sets by month and fishing modality for the 12 vessels studied. It shows a shift in fishing modality (from FAD to free schools), witch is in accord with the fishing pattern showed by the single fishing trip mapped and the fleet fishing pattern in this period of the year.

Figure 2 shows that a 60.6% and a 93.2% of the sets are successful in free school and FAD associated fishing respectively.

Figure 3 represents the species compositions of the FAD and free school catches and discards (note that the species composition of free school discards are based on only two observations).

In figure 4 the percentage of discards (relative to catches) is presented by fishing modality for the fishing operations observed, showing a 9.76 % of discards in FAD associated catches versus a 0.08% in free schools.

Figures 5a and 5b show the yield (t) by set and by successful set respectively, by fishing modality, showing that although the yield per set is higher for FAD associated catches, the yield per successful set is slightly higher for free school ones. The highest value of the yield per successful set is 24,2 t, for free school yellowfin, followed by 17,3 t for FAD associated skipjack.

Figure 6 shows the available size distributions of discarded yellowfin, skipjack and frigate.

DISCUSSION

Although we know that lots of vessels followed more or less the behaviour of the one used to map the fishing trip, with is corroborated in table 1, its completely necessary to study all the route parameters of the rest of the purse seiners in order to achieve a better characterization of the behaviour and activity of the fleet. In addition to this, it would be very useful to map and characterize the activity of auxiliary vessels in order to try to measure the effect of them in the fishing capacity of the purse seiner.

In this example, the three areas explored are very regular in the sense that, in each of them, almost all the sets are FAD or free school associated, but not mixed. This can justify the method used for computing the fishing effort (in days of fishing), in order to better estimate the effort invested and yield achieved in each of the fishing modalities.

Some species compositions and size distributions presented in this paper are based on a relatively small amount of samples, as it is only based in partial information collected by observers. It is necessary to compute all the information available from the 1998-1999 moratorium in order to improve the quality of these estimations, as well as to estimate additional parameters (as catch size frequencies, e.g.)

AKNOWLEDGEMENTS

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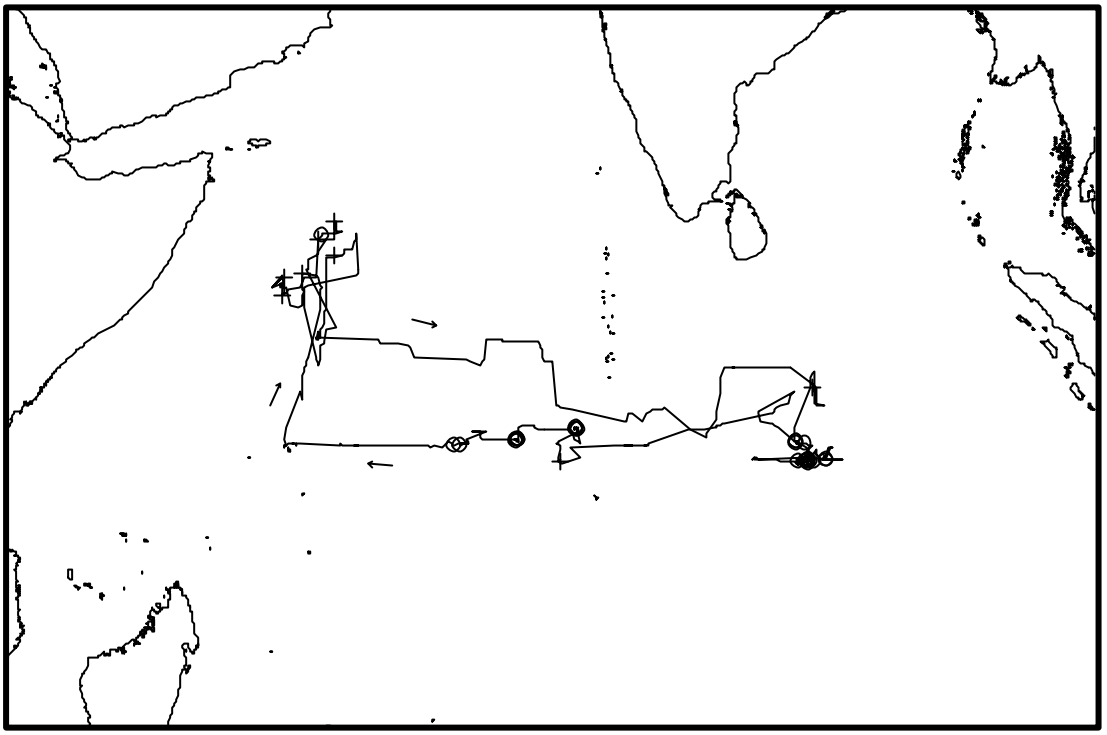

Fig 1. Fishing trip and fishing operations of one of the Spanish vessels involved in the Indian Ocean Moratorium during 15th November 1998 - 15th January 1999.
'+' indicates a FAD associated set.
'O' indicates a free school set.
The arrows indicate the direction of movement.

	N^{er} of Fishing Operations			N^{er} Successful Fishing Operations		
	nov-98	**dic-98**	**ene-99**	**nov-98**	**dic-98**	**ene-99**
Free School	14	117	105	6	68	69
FAD	73	70	17	66	66	14
Total	87	187	122	72	134	83

Table 1: Number of fishing operations and successful fishing operations by month and fishing modality (free school or FAD associated).

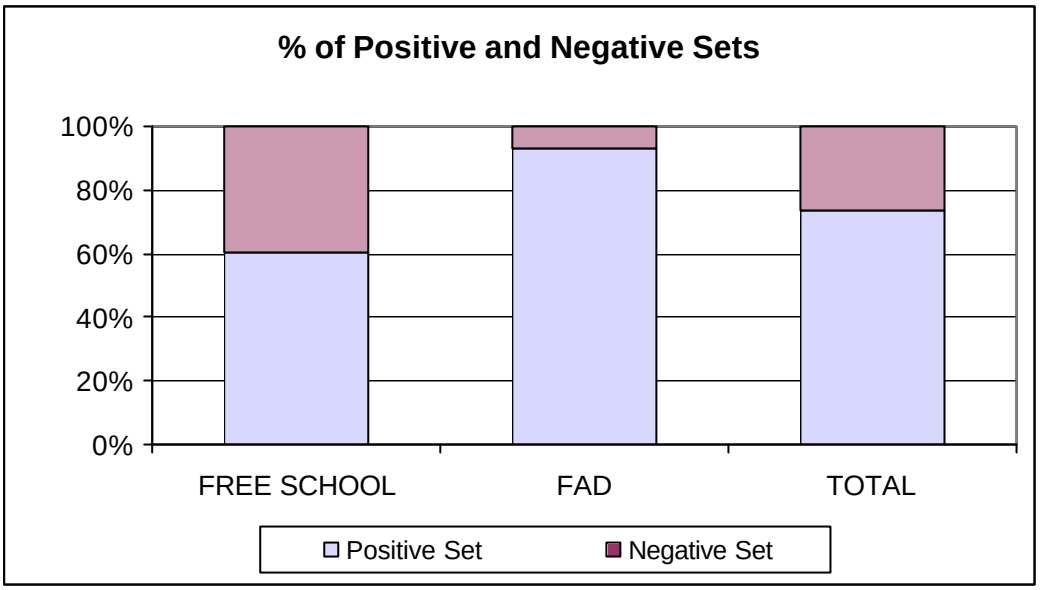

Figure 2: Percentage of positive and negative sets for free school and FAD associated fishing, observed during the 1998 –1999 moratorium in the Indian Ocean.

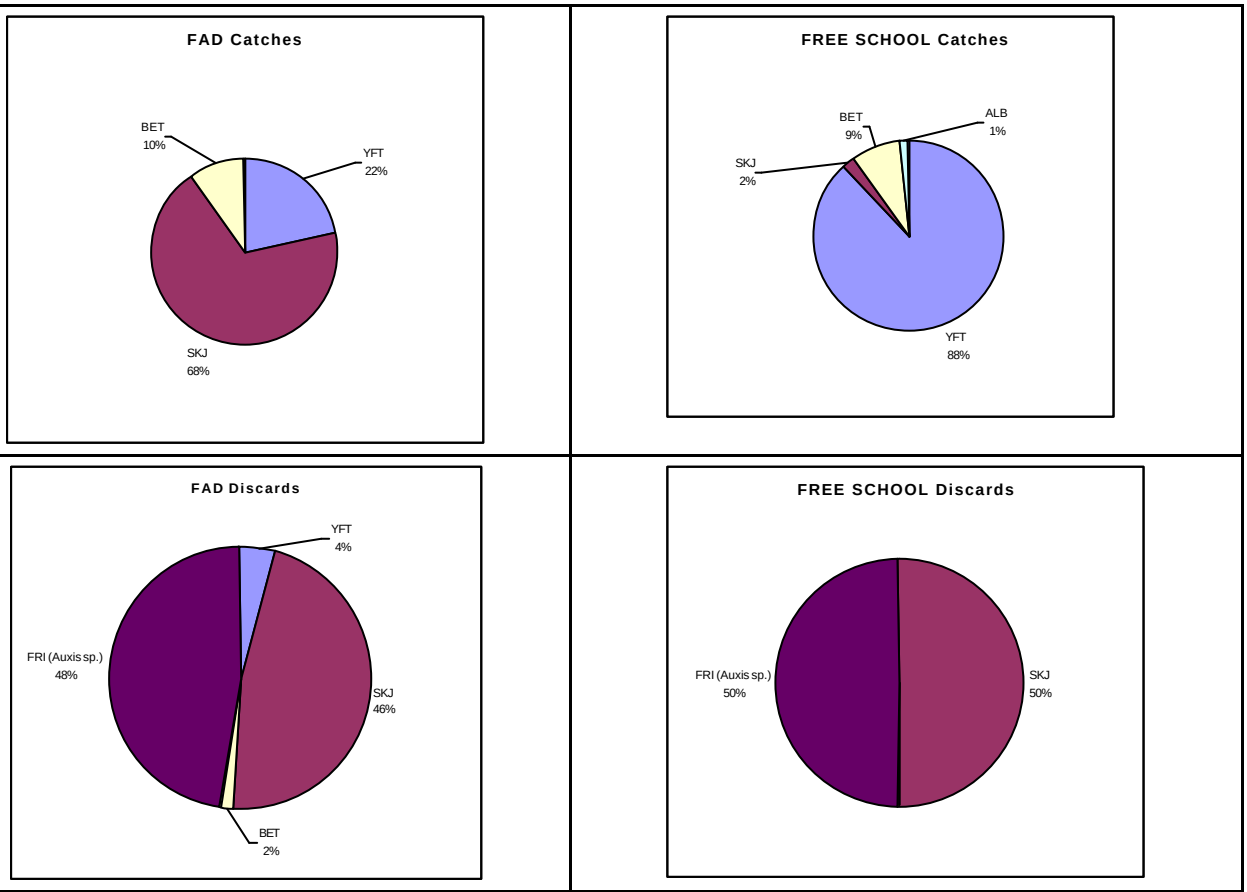

Figure 3: Species composition of FAD and free school associated catches and discards during the 1998-1999 moratorium in the Indian Ocean.

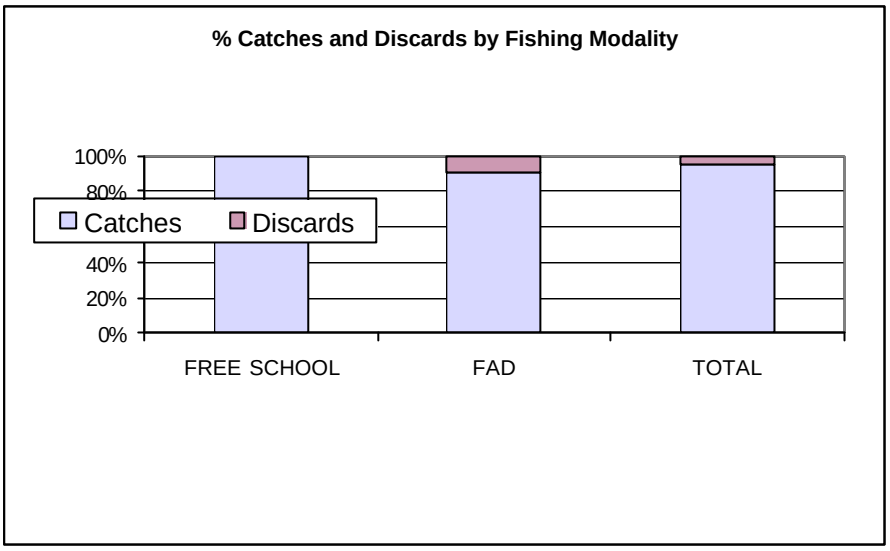

Figure 4: Percentage of discards in FAD and free school associated sets.

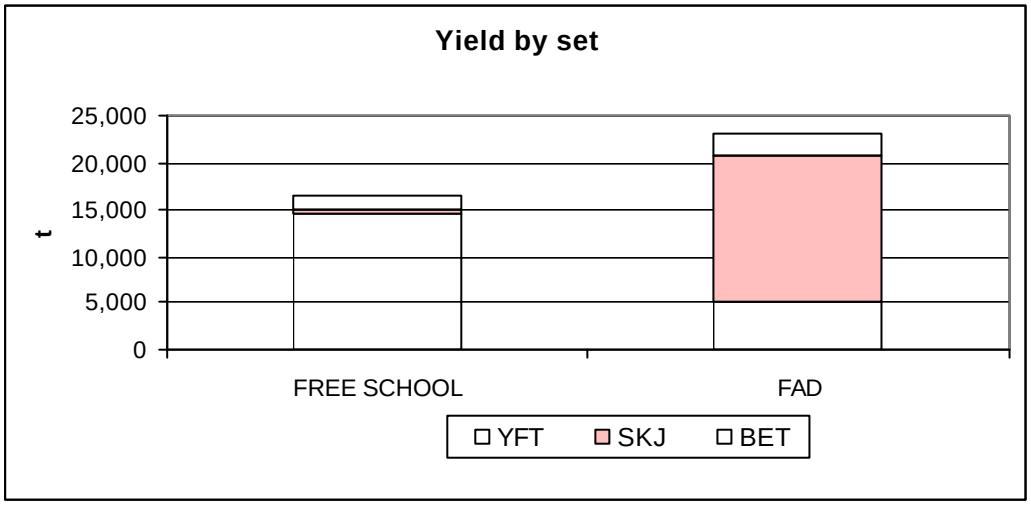

Figure 5a: Yield by set for free school and FAD associated sets.

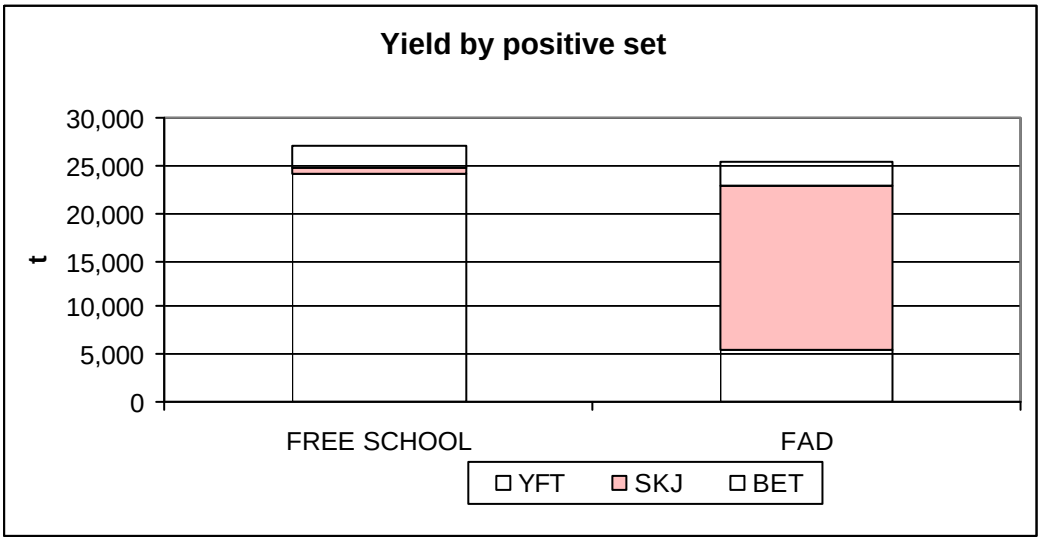

Figure 5b: Yield by positive set for free school and FAD associated sets.

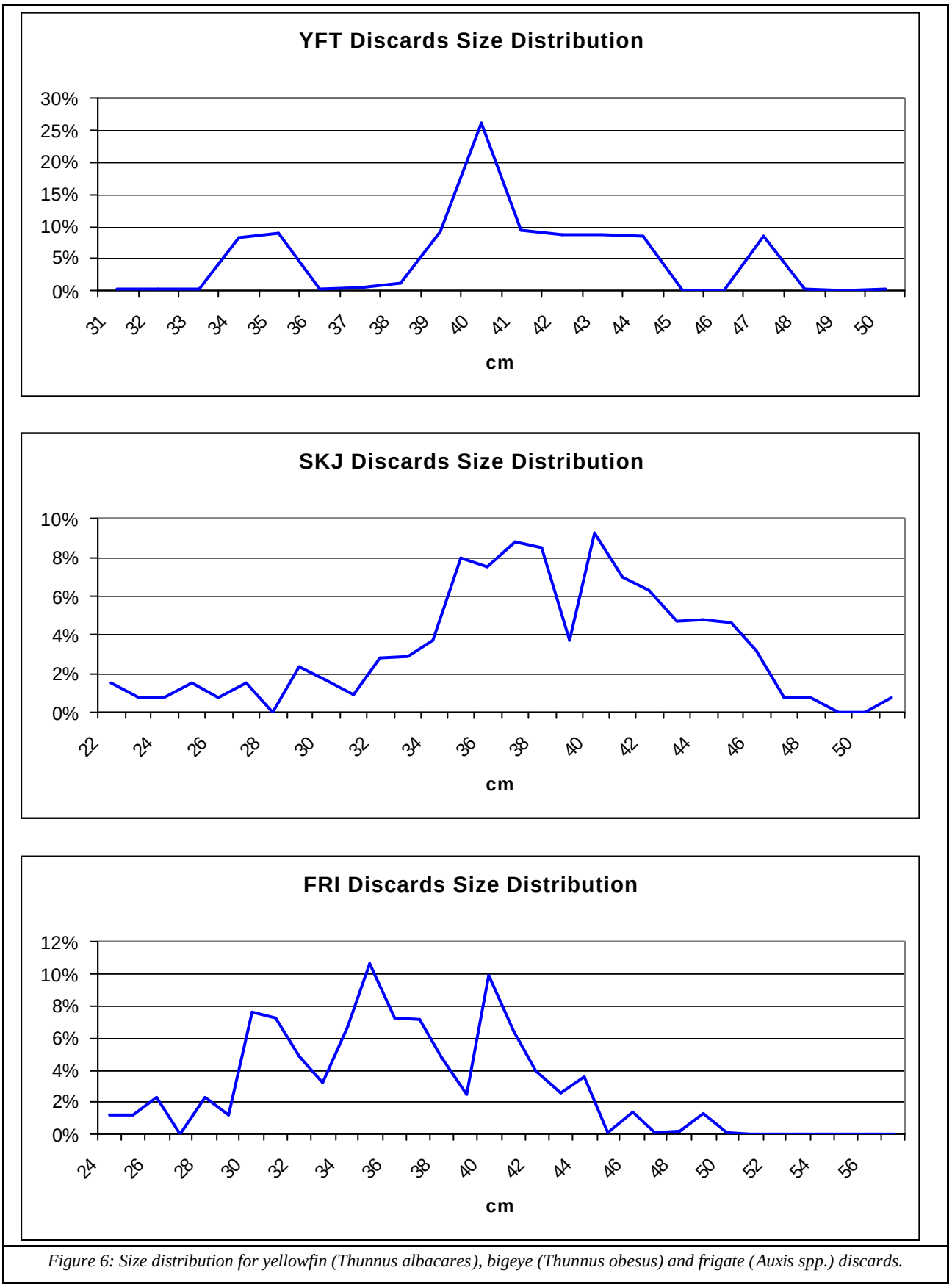

Figure 6: Size distribution for yellowfin (Thunnus albacares), bigeye (Thunnus obesus) and frigate (Auxis spp.) discards.