

CHARACTERIZATION OF MADEIRA TUNA FLEET, FOR 1979-1986

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SUMMARY

In this paper, the composition of the tuna fleet operating in Madeira in 1979-1986 is described. Information on tuna catches and on fishing grounds is also provided.

RESUME

Le présent document décrit la composition de la flottille thonière qui a pêché à Madère de 1979 à 1986. Il fournit également une information sur les prises de thonidés et sur les lieux de pêche.

RESUMEN

En este documento se describe la composición de la flota atunera que operó en Madeira durante el período 1979-1986. Se facilita información sobre las capturas de túnidos y los caladeros de pesca.

1. INTRODUCTION

Tuna fishery in Madeira islands is a traditional one, which started a long time ago and has been largely artisanal up to now.

As an important fishing resource, most of the local fishing boats are engaged in the fishery, operating in areas close to the islands and, recently, near some Seamounts of the Regional EEZ.

The fishing gear used is the pole and line with live bait, but also a small percentage of Tuna is caught by hand lines in incidental catches.

The amount of total catch has sharply decreased between 1974 (5,373 MT) and 1980 (311 MT). From this time on, catches have slightly increased up to 1986 (2,092MT).

Although a great number of Atlantic Tuna species are caught in Madeira waters, the Bigeye (*Thunnus obesus*) and the Skipjack (*Katsuwonus pelamis*) are the most abundant species with 78.2% and 16.8% of the total Tuna landed.

Throughout the year, the maximum of the catches takes place during Spring (May-June), being the Bigeye the main species and a lower peak in the Autumn (August-September) when the Skipjack is caught, which shows the typical seasonality of the fishery.

2. MATERIAL AND METHODS

All data were taken from daily records of Tuna landed per boat for each year between the period of 1979-1986, kept in the filing department of the Fishing Port, in Funchal. Based on these files, it was possible to make available the number of boats dealing with Tuna fishery, regarding the total Tuna catch and the average catch/boat in each year (Table 1; Figure 1).

The total number of boats/year was divided in two categories:

a) Boats of Class I - includes all the boats which individual Tuna catch reached more than 50% of the total catch involving other species, with a minimum of 5 MT/year.

b) Boats of Class II - includes all the boats which individual Tuna catch was lesser than 50% of each total catch involving other species and caught below 5 MT/year.

The characteristics of the boats (Gross Tonnage, Horse Power of the engines and overall length) were taken from files kept by the Regional Directorate for Fisheries and the Port Captancy in Funchal (Tables III and IV; Figures 2 and 3).

The fishing grounds/year were made known through inquiries done while the Tuna sampling was taking place in the local fishing port (Figure 6).

3. MADEIRA TUNA FLEET

The boats operating in the Archipelago all the year round, are local and very heterogeneous. They are small sized vessels which do not spend their total effort on Tuna, sharing it with species of other fisheries, which depends on the season and abundance of each fishing resource.

Nearly all the units are wooden made, motorized and have iced isolated holds.

3.1. BOATS OF CLASS I

Although the high number of boats engaged in the fishery, only a small part (boats of Class I) is directly involved on it. These spend its main effort catching Tuna during the strong season, reaching 90% of the total Tuna catch/year (Figure 1).

The number of active boats has dropped from 42 in 1979 to 19 in 1983, due to demolition of old boats, shipwrecks, gear conversion to other fisheries and displacement to the Azores islands probably connected with bad years of Tuna catch in Madeira.

The slight increase after 1983 up to 32 boats in 1986, is owed to the incorporation of brand new ones and the improvement of old units (nautical equipments, gears and engines) so far linked with other fisheries.

The average catch/boat achieved a minimum in 1980 (11.5 MT) but during the following years, the tendency grew up reaching over 64 MT for the last two years (Figure 1). This follows the total catch evolution, making us thinking that the resource was more available in Madeira waters, during that period.

Concerning the boats characteristics most of them run from 15 to 20 meters of overall length, 20 to 50 of Gross Tonnage and 150 to 250 of Horse Power engines (Figure 2). The crew varies from 15 to 24 men, usually.

Almost all of these boats are more powerful than those enclosed in Class II, getting more autonomy at sea (2-6 days) and having the possibility of searching Tuna schools

further away inside the EEZ. To this fact, also contributed the improvement on motorization and tonnage made in some baitboats, occurred in the last years.

3.2. BOATS OF CLASS II

The number of boats belonging to this category is higher, but its effort and real catch (10%) contribution is lower and incidental.

They usually are coasting boats of small size and tonnage, weak engine power, which catch Tuna when they come close to the coast or incidentally when they are fishing other species (Figure 3).

4. CATCH SEASONALITY AND FISHING GROUNDS

Every year Tuna fishery starts in March/April with the Bigeye, raises up to its maximum level in May/June and goes down gradually till the end of the year, with the Skipjack fishery during the Autumn (Figures 4 and 5).

The major effort takes place during the second and third quarters by boats of Class I. During this period of the year, the fishing grounds are the vicinity of the islands and the Seine Seamount.

For the period 1979-1986 the displacement of the Tuna fleet was done from South to North of the Regional EEZ (Figure 6).

Between 1979-1981 the fleet concentrated its activity close to the islands, remarking that in 1979 it worked mainly in Selvages islands. In 1980-1981 the fleet restricted its fishery to areas off Madeira, Deserts and Porto Santo islands, bearing in mind a big decrease in the number of operating boats, and low catches that took place during those years.

Since 1982 the fleet straightened its fishing operations to North-Northeast of the main island, towards Seine Seamount. Here the effort was increased during the following years up to 1984, which might be due to the improvement of some boats and the resource availability in the area.

During 1985-1986 the Tuna fishery has mainly occurred around Porto Santo island, although a small percentage that was kept in the Seine Seamount.

Tab. I - Total catch (live weight), number of boats and evolution of catch by boat (Cl. I and Cl.II) since 1979 to 1986.

| YEARS | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|------------------------------------|--------|-------|-------|--------|-------|--------|--------|--------|
| TOTAL CATCH (MT) | 1139.0 | 311.0 | 524.0 | 1002.0 | 840.0 | 1257.0 | 1669.0 | 2092.0 |
| TOTAL CATCH (MT) BY BOATS (CL. I) | 1671.8 | 219.3 | 461.1 | 956.9 | 789.6 | 1213.0 | 1670.9 | 2048.1 |
| N. BOATS (CL. I) | 42 | 19 | 24 | 22 | 19 | 27 | 26 | 32 |
| CATCH/BOAT (MT) | 25.5 | 11.5 | 20.0 | 43.5 | 41.2 | 52.7 | 64.3 | 64.0 |
| YEARS | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
| TOTAL CATCH (MT) | 1139.0 | 311.0 | 524.0 | 1002.0 | 840.0 | 1257.0 | 1669.0 | 2092.0 |
| TOTAL CATCH (MT) BY BOATS (CL. II) | 67.2 | 91.6 | 52.9 | 45.1 | 50.4 | 44.0 | 196.1 | 43.9 |
| N. BOATS (CL. II) | 93 | 170 | 113 | 110 | 109 | 106 | 138 | 109 |
| CATCH/BOAT (MT) | 0.7 | 0.5 | 0.5 | 0.4 | 0.5 | 0.4 | 1.4 | 0.4 |

Tab. II - Total catch (live weight) and catch by species recorded in Madeira for 1979-1986.

| YEAR | SP | RET | SLJ | ALF | YFT | BFT | RON | FKI | EIL | SHC | TOTAL |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|
| 1979 | 1615 | 29 | 18 | 5 | 27 | 6 | 0 | 0 | 0 | 29 | 1139 |
| 1980 | 224 | 20 | 7 | 15 | 7 | 13 | 0 | 0 | 15 | 311 | |
| 1981 | 439 | 77 | 2 | 1 | 1 | 7 | 0 | 0 | 8 | 524 | |
| 1982 | 708 | 152 | 117 | 15 | 1 | 1 | 0 | 1 | 7 | 1002 | |
| 1983 | 741 | 21 | 18 | 7 | 47 | 1 | 0 | 2 | 6 | 840 | |
| 1984 | 830 | 175 | 196 | 32 | 1 | 1 | 14 | 1 | 7 | 1257 | |
| 1985 | 1403 | 285 | 127 | 14 | 1 | 1 | 30 | 1 | 7 | 1669 | |
| 1986 | 1696 | 329 | 13 | 10 | 1 | 1 | 31 | 1 | 7 | 2092 | |

Tab. III - Number of boats (Class I) concerning its Gross Tonnage, Horse Power and overall Length for 1979-1986.

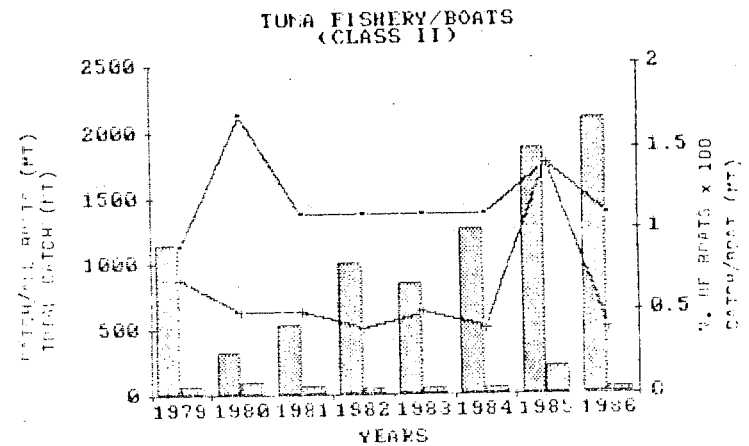
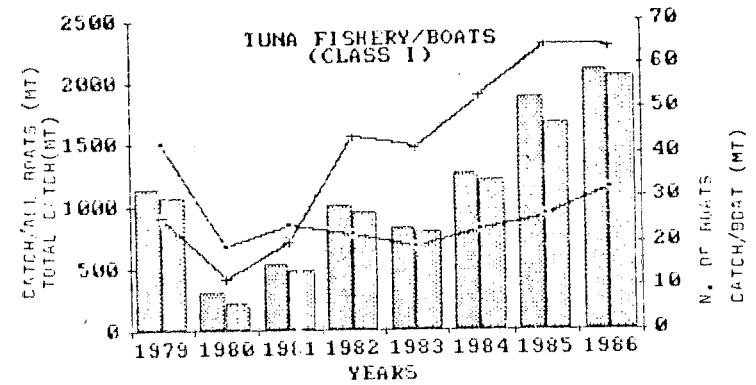
| TUNA FISHERY | | | | | | | | |
|----------------------------|----|----|----------|-----------|-----------|-----------|-------|-------|
| NUMBER OF BOATS (CLASSE I) | | | | | | | | |
| YEAR | GT | 10 | 10-19.9 | 20-49.9 | 50-99.9 | 100 | TOTAL | |
| 1979 | 1 | 2 | 1 | 33 | 6 | 0 | 42 | |
| 1980 | 1 | 0 | 0 | 15 | 4 | 0 | 19 | |
| 1981 | 1 | 0 | 0 | 19 | 5 | 0 | 24 | |
| 1982 | 1 | 2 | 1 | 16 | 3 | 0 | 22 | |
| 1983 | 1 | 0 | 0 | 14 | 5 | 0 | 19 | |
| 1984 | 1 | 1 | 1 | 15 | 5 | 1 | 23 | |
| 1985 | 1 | 5 | 3 | 13 | 5 | 0 | 26 | |
| 1986 | 1 | 5 | 4 | 17 | 6 | 0 | 32 | |
| YEAR | HP | 50 | 50-149.9 | 150-249.9 | 250-349.9 | 350-449.9 | 450 | TOTAL |
| 1979 | 1 | 2 | 6 | 19 | 6 | 5 | 0 | 42 |
| 1980 | 1 | 0 | 1 | 9 | 5 | 2 | 0 | 19 |
| 1981 | 1 | 0 | 2 | 13 | 5 | 4 | 0 | 24 |
| 1982 | 1 | 1 | 3 | 13 | 4 | 1 | 0 | 22 |
| 1983 | 1 | 0 | 2 | 11 | 3 | 3 | 0 | 19 |
| 1984 | 1 | 1 | 3 | 11 | 3 | 4 | 1 | 23 |
| 1985 | 1 | 3 | 6 | 6 | 3 | 4 | 0 | 26 |
| 1986 | 1 | 4 | 10 | 9 | 2 | 7 | 0 | 32 |
| YEAR | LT | 5 | 5-9.9 | 10-14.9 | 15-19.9 | 20-24.9 | 25 | TOTAL |
| 1979 | 1 | 0 | 2 | 9 | 24 | 7 | 0 | 42 |
| 1980 | 1 | 0 | 0 | 1 | 15 | 3 | 0 | 19 |
| 1981 | 1 | 0 | 0 | 4 | 17 | 3 | 0 | 24 |
| 1982 | 1 | 1 | 1 | 3 | 16 | 1 | 0 | 22 |
| 1983 | 1 | 0 | 0 | 2 | 14 | 3 | 0 | 19 |
| 1984 | 1 | 0 | 1 | 3 | 16 | 2 | 1 | 23 |
| 1985 | 1 | 0 | 3 | 7 | 13 | 2 | 1 | 26 |
| 1986 | 1 | 0 | 6 | 7 | 15 | 3 | 1 | 32 |

Tab. IV - Number of boats (Cl. II) concerning its Gross Tonnage, Horse Power and overall Length, for 1979-1986.

| TUNA FISHERY | | | | | | | |
|-----------------------------|-----|---------|---------|---------|------|-------|--|
| NUMBER OF BOATS (CLASSE II) | | | | | | | |
| YEAR/GT | <10 | 10-19.9 | 20-49.9 | 50-99.9 | >100 | TOTAL | |
| 1979 | 75 | 10 | 7 | 1 | 0 | 93 | |
| 1980 | 124 | 22 | 21 | 3 | 0 | 170 | |
| 1981 | 85 | 17 | 11 | 0 | 0 | 113 | |
| 1982 | 62 | 15 | 12 | 1 | 0 | 110 | |
| 1983 | 79 | 15 | 14 | 1 | 0 | 109 | |
| 1984 | 66 | 11 | 11 | 0 | 0 | 108 | |
| 1985 | 119 | 10 | 9 | 0 | 0 | 138 | |
| 1986 | 91 | 12 | 6 | 0 | 0 | 109 | |

| YEAR/HP | 50 | 50-149.9 | 150-249.9 | 250-349.9 | 350-449.9 | 450 | TOTAL |
|---------|-----|----------|-----------|-----------|-----------|-----|-------|
| 1979 | 70 | 19 | 1 | 3 | 0 | 0 | 93 |
| 1980 | 114 | 36 | 12 | 7 | 1 | 0 | 170 |
| 1981 | 78 | 30 | 4 | 0 | 0 | 0 | 113 |
| 1982 | 72 | 26 | 4 | 1 | 1 | 0 | 104 |
| 1983 | 72 | 26 | 4 | 3 | 1 | 0 | 106 |
| 1984 | 62 | 24 | 4 | 0 | 0 | 0 | 106 |
| 1985 | 119 | 13 | 5 | 1 | 0 | 0 | 138 |
| 1986 | 66 | 17 | 5 | 1 | 0 | 0 | 109 |

| YEAR/Length | 4.5 | 5-9.9 | 10-14.9 | 15-19.9 | 20-24.9 | 25 | TOTAL |
|-------------|-----|-------|---------|---------|---------|----|-------|
| 1979 | 16 | 62 | 10 | 4 | 1 | 0 | 93 |
| 1980 | 32 | 97 | 26 | 10 | 3 | 0 | 170 |
| 1981 | 13 | 76 | 19 | 5 | 0 | 0 | 113 |
| 1982 | 16 | 69 | 20 | 5 | 0 | 0 | 110 |
| 1983 | 19 | 62 | 23 | 5 | 0 | 0 | 109 |
| 1984 | 19 | 66 | 19 | 2 | 0 | 0 | 106 |
| 1985 | 47 | 76 | 10 | 5 | 0 | 0 | 138 |
| 1986 | 22 | 72 | 12 | 3 | 0 | 0 | 109 |



TOTAL CATCH(MT)
 CATCH(MT)/ALL BOATS

--- N. BOATS
 CATCH/BOAT (MT)

Fig. 1 - Total Catch, number of boats and evolution on catch/boat since 1979 to 1986.

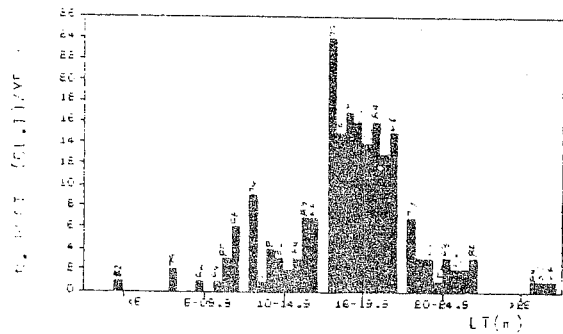
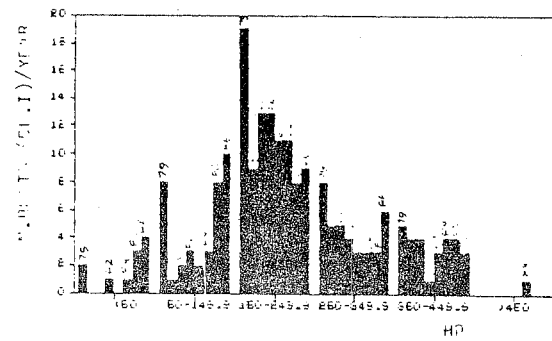
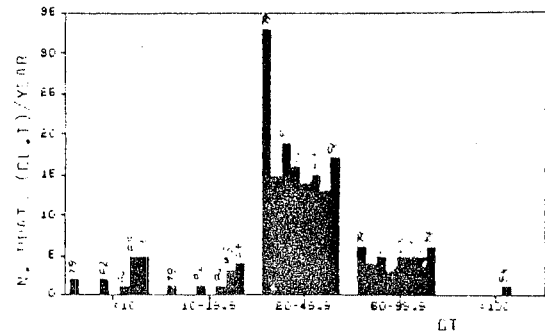


Fig. 2 - Distribution of Tuna fleet (boats of CL. I) concerning the Gross Tonnage, Horse Power and overall Length, operating in Madeira for 1979-1986.

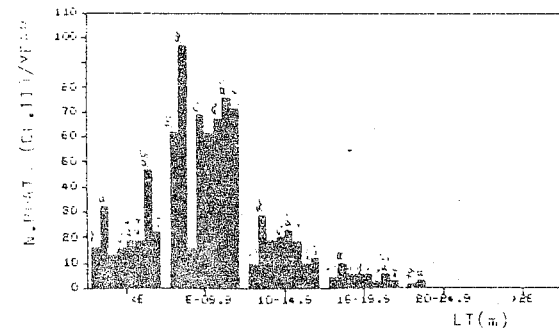
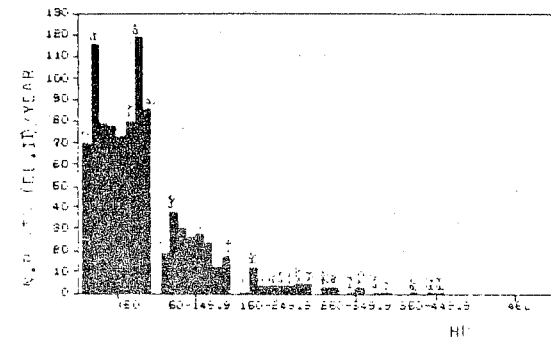
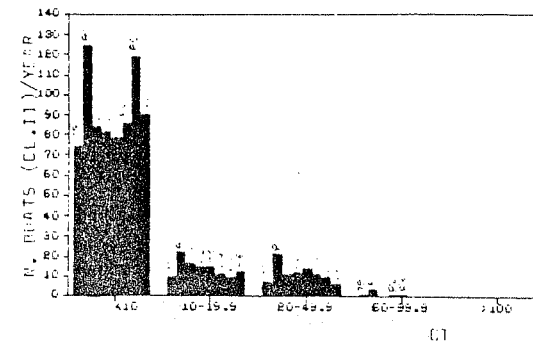


Fig. 3 - Number of boats (CL. II) concerning its Tonnage, Horse Power and overall Length, operating in Madeira for 1979-1986.

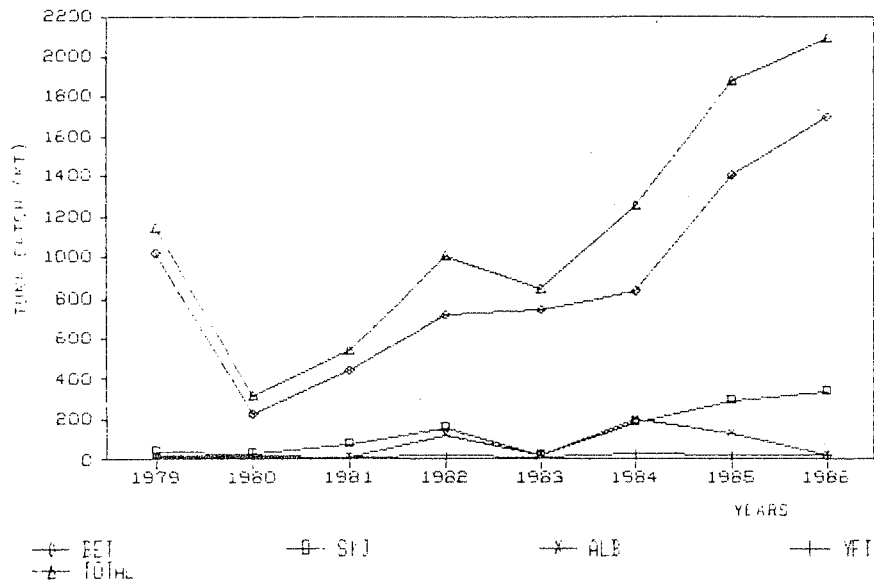


Fig. 4 - Total catch and catch by main species landed in Madeira during 1979-1986.

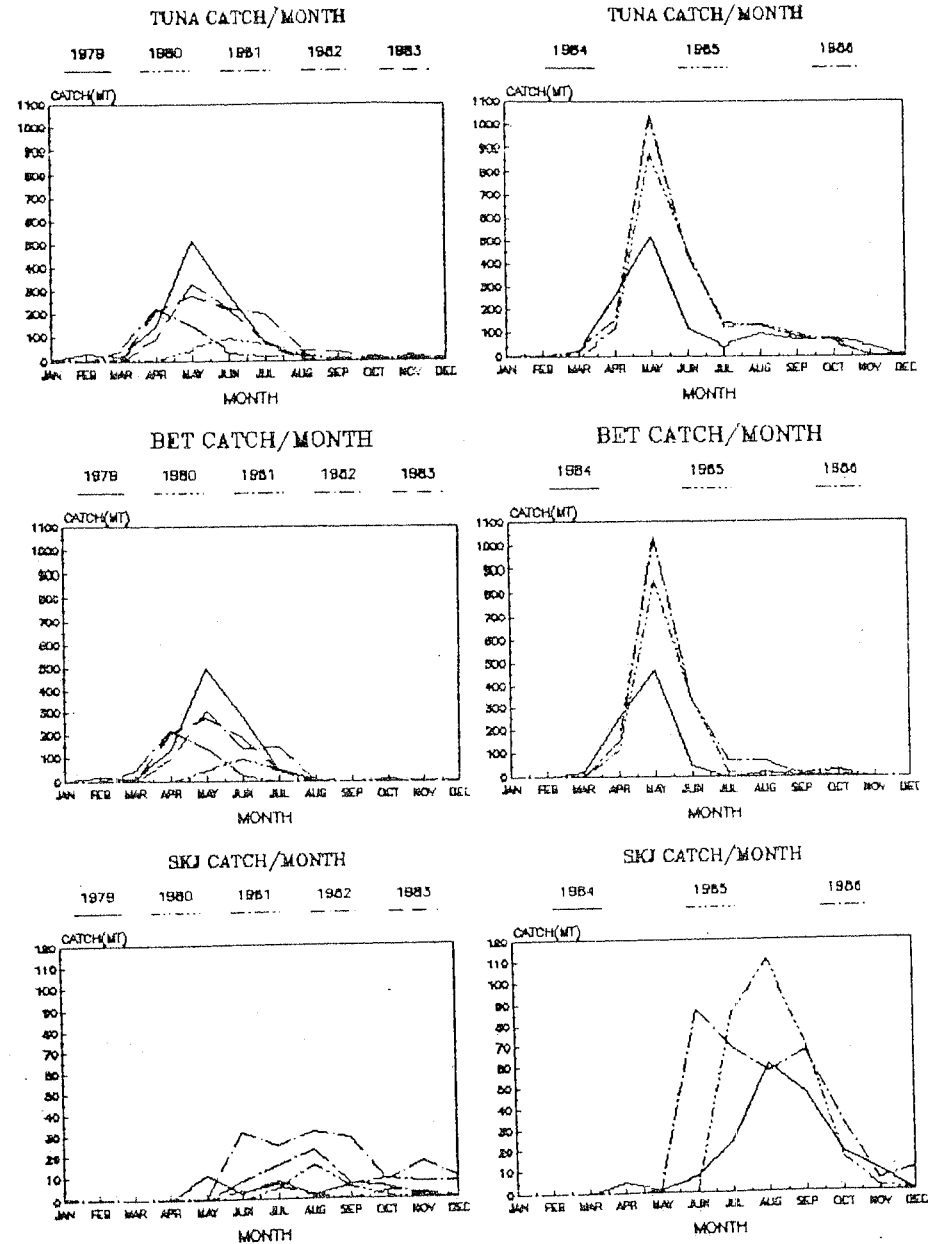


Fig. 5 - Total monthly catch by main species landed in Madeira, during 1979-1986.

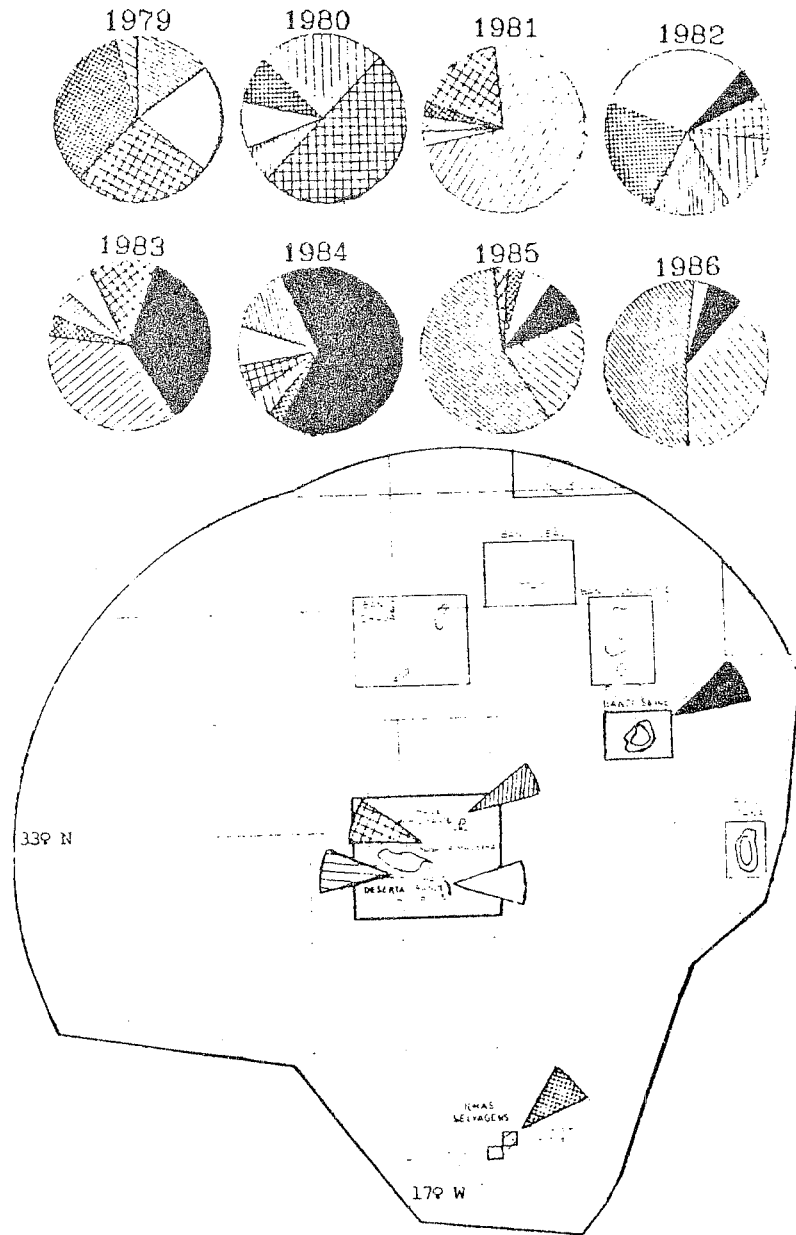


Fig. 6 - Displacement of the Tuna fleet inside the traditional fishing areas, during 1979-1986.