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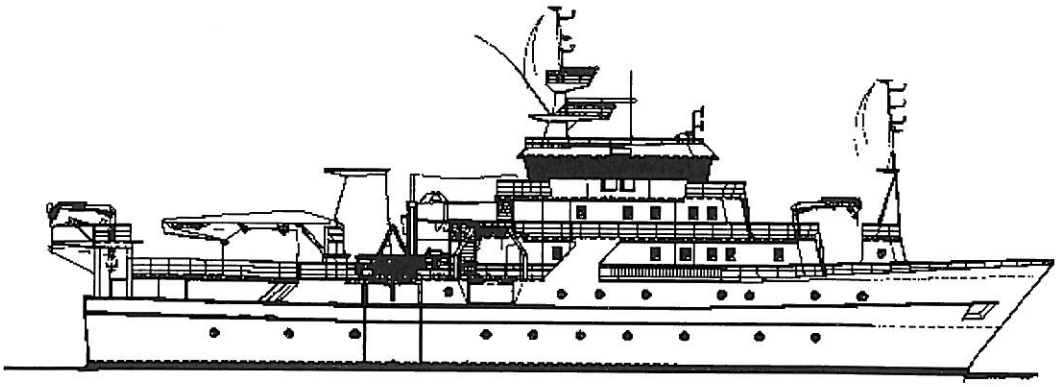
CRUISE REPORTS "DR. FRIDTJOF NANSEN"



SURVEYS OF THE FISH RESOURCES OF ANGOLA

Preliminary Cruise Report No 3/98

Survey of the pelagic resources
27 July - 23 August 1998

Institute of Marine Research
IMR, Bergen

Institute of Fisheries Research
IIP,Luanda

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SURVEYS OF THE FISH RESOURCES OF ANGOLA

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Survey of the pelagic resources
27 July - 23 August 1998

by

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CHAPTER 1 INTRODUCTION

1.1 Objectives

The objectives of the survey, previously agreed upon with the Director of the Instituto de Investigação Pesqueira (IIP) are the following:

- To map the distribution and estimate the abundance of commercially important pelagic and semi-pelagic fish species in Angolan waters, including the two sardinella species *Sardinella aurita* and *S. maderensis*, the Cunene horse mackerel *Trachurus trecae*, the Cape horse mackerel *Trachurus capensis*, the pilchard *Sardinops ocellata* and other pelagic species, mainly carangids.

- To carry out biological studies on the main species, i.e. determination of biological condition, estimation of length weight-relationships and assessment of reproductive stages. A special study on feeding habits of horse mackerel would also be carried out.

- Map the general hydrographic regime in the survey area by continuous recording of a weather station and by using a CTD-sonde in a grid of stations covering the whole area. IIP standard profiles of temperature, salinity and oxygen will be also carried out at agreed locations in the Angolan coast.

- Conduct current measurements with ADCP system.

- On-the-job training for the Angolan participants on the main survey routines would be imparted, including training on the use of our database, scrutinizing of echograms and biomass estimation with the acoustic system.

The aim of these surveys is to build a time series to allow a better understanding of the fluctuations in the main pelagic stocks and of the biology of the main species.

1.2 Participation

The scientific staff consisted of:

From IIP, Luanda: Júlia FERREIRA, Enoque VASCO CANGAJO, Fernando NGOMBO, Makuta NKONDO, David QUISSUNGO, Filomena VAZ-VELHO,

From IMR, Bergen: Oddgeir ALVHEIM, Guillermo BURGOS, Martin DAHL, Erling MOLVÆR

1.3 Narrative

The vessel left Walvis Bay (Namibia) on the afternoon of July 27 and steamed to the Cunene River where the survey started early in the morning of July 29. During the cruise, the shelf was surveyed from aproximately 20 m depth to beyond the isobath of 200 m until no important registrations of pelagic fish were expected. Acoustic sampling in the area started following a course track in parallel transects set aproximately 5-7 NM apart until Tombua, where the inter-transect distance was increased to 10 NM. From Namibe until Benguela, an area where the continental shelf is very narrow, a course track following triangular transects was adopted. From Benguela and northwards, parallel transects separated by 5NM were set. This sampling strategy was kept until Cabeça de Cobra. Only in the area between Pta. das Palmerinhas and Luanda, triangular transects were used instead. Finally, between Cabeça de Cobra and Congo River, a course track in parallel transects separated about 7NM was followed. The original sampling plan was modified between N'zeto and the Congo River, where several transects had to be interrupted. Restricted areas related to the operation of oil plataforms were the cause for those changes in the plan. CTD (Conductivity-Temperature-Depth) and ADCP (Acoustic Doppler Current Profiler) measurements were taken on standard hydrographical sections and along the course track. The vessel reached Congo River on August 19 and started to sail southwards. On its way south, a last pelagic trawl was made close to Pta. das Palmerihas. The vessel call in Walvis Bay (Namibia) on August 23.

The surveyed area was divided in three regions. Congo River - north of Pta. das Palmerinhas (9° 00'S) - ANGOLA NORTH - was covered from 12 to 19 of August. The region between 9°S and 13°S - ANGOLA CENTRAL - was surveyed from 3 to 12 of August. The region limited by the parallel of 13°S and Cunene River - ANGOLA SOUTH - was covered from 29 of July to 3 of August. In this last area, inside Elephants' Bay (aprox. 13° 15'S), a calibration of two 38 Khz echo-sounders was performed during August 3.

1.4 Survey effort

Figures 1a-c show the cruise tracks with fishing and hydrographic stations, and Table 1 summarises the survey effort in each region.

Table 1 Number of bottom (BT) and pelagic (PT) trawl stations, hydrographic stations and distance surveyed (NM) by area.

Area	BT	PT	CTD	Distance surveyed
Congo R. - Pta. Palmerinhas	9	27	54	1 305
Pta. Palmerinhas - Benguela	12	30	65	1 480
Benguela -Cunene	10	15	46	925
Total	35	63	165	3710

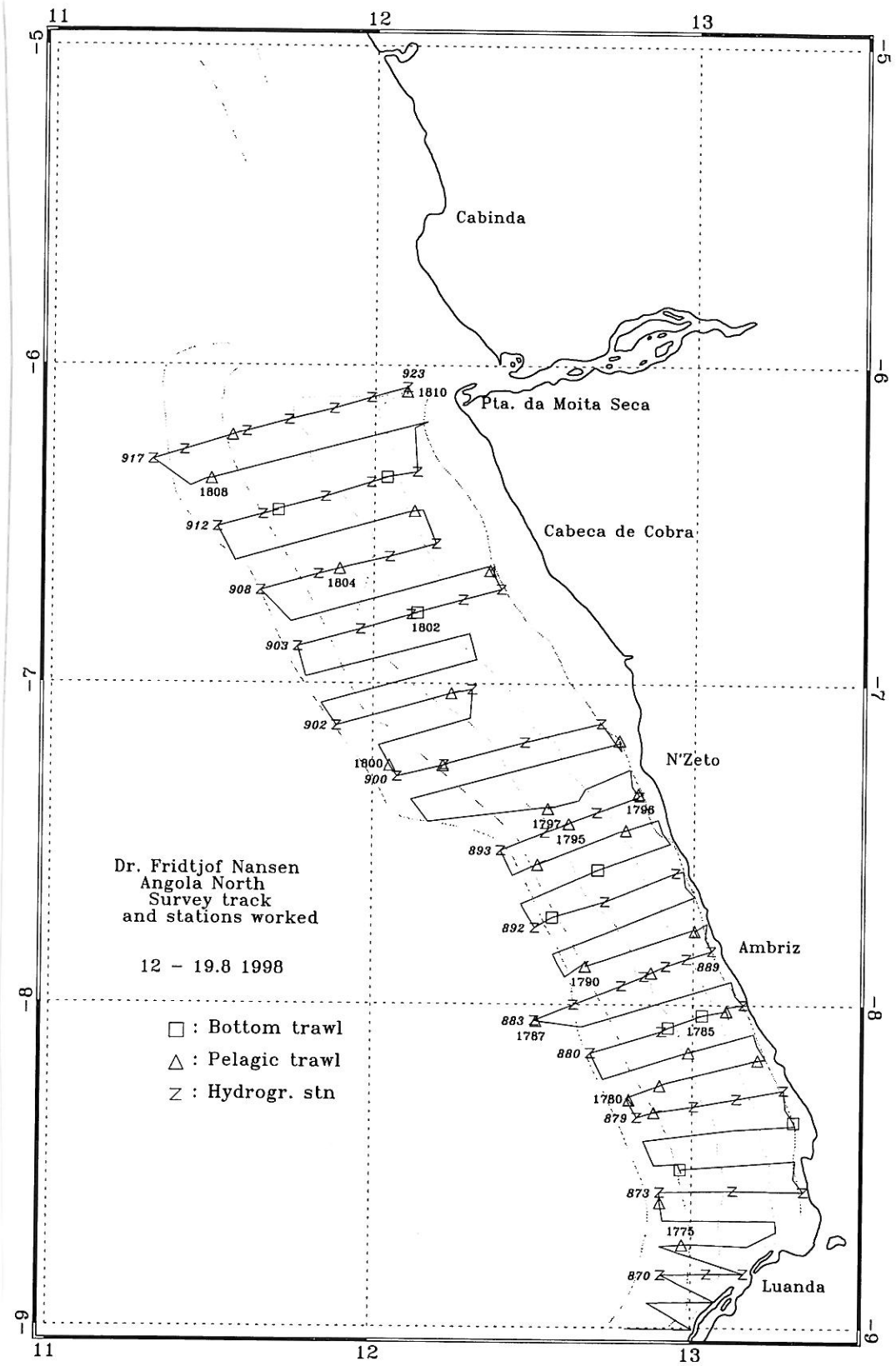


Figure 1a. Course track with fishing and hydrographic stations, Congo River - Pta. das Palmerinhas.

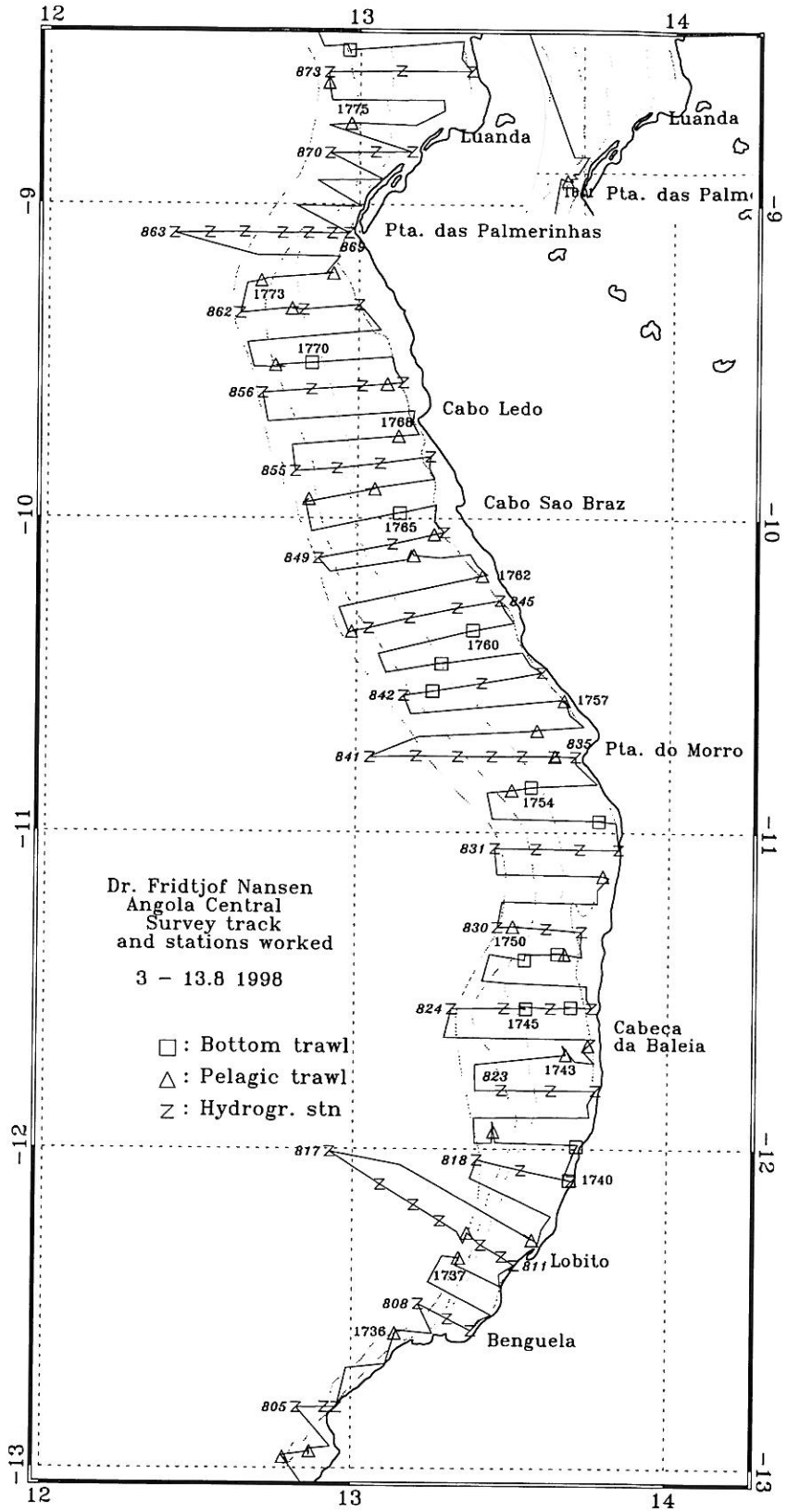


Figure 1b. Course track with fishing and hydrographic stations, Pta. das Palmerinhas - Benguela.

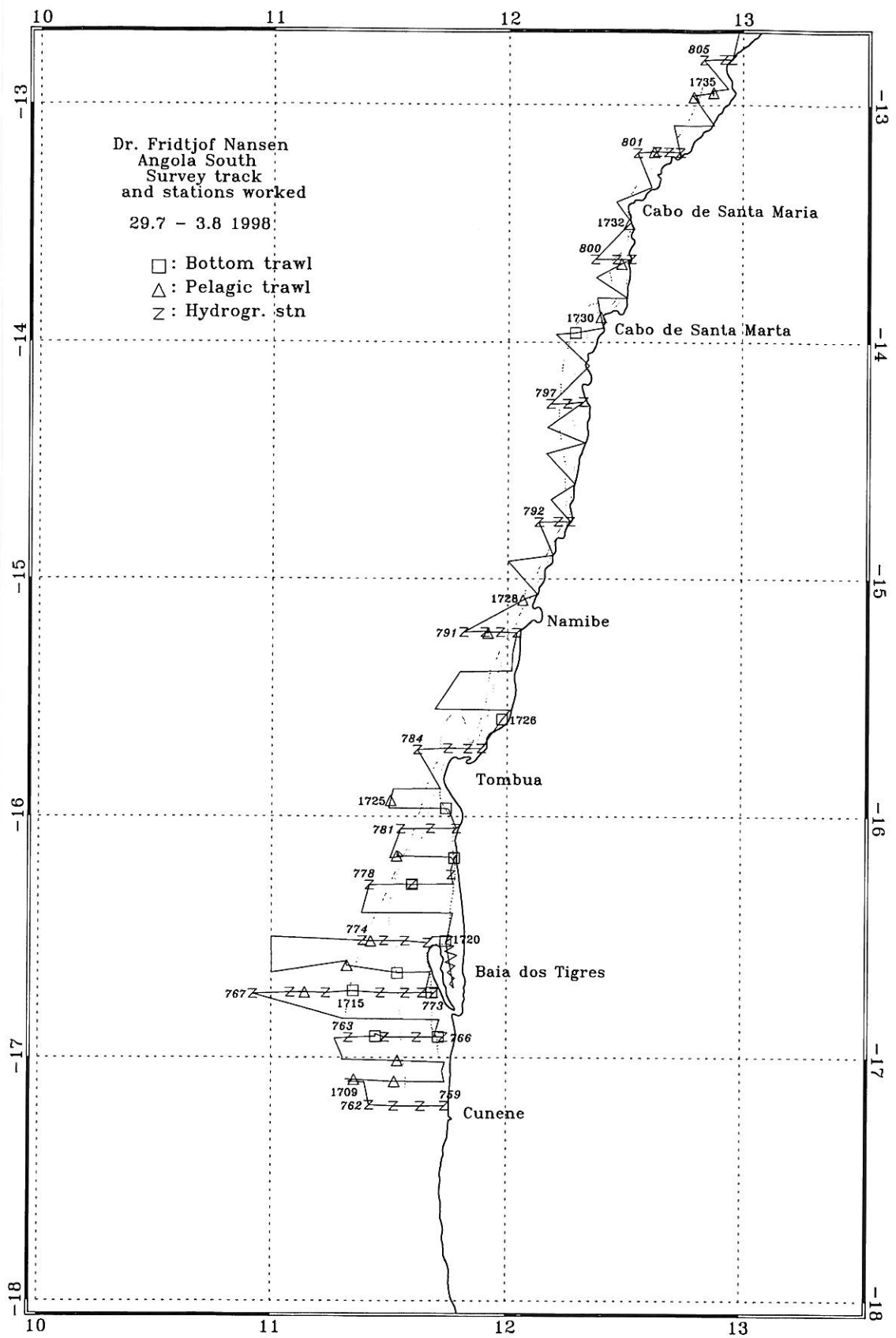


Figure 1c. Course track with fishing and hydrographic stations, Benguela-Cunene.

CHAPTER 2 METHODS

2.1 Hydrographic sampling

A Seabird 911 + CTD probe was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the Seabird Seasave software installed on a PC. CTD stations were conducted along the cruise track in transects set about 15NM apart. The profiles were in general taken down to a few meters above the bottom. In deep stations, however, data logging was interrupted at 700m. Water samples were collected only at the stations corresponding to the standard IIP profiles. In those stations, two Niskin bottles were triggered, one near the surface and one near the bottom. To calibrate the oxygen and salinity sensors, water samples were analysed for dissolved oxygen using the Winkler method and salinity using a Guildline Portasal salinometer mod. 8410.

A total of 70 samples were accepted for oxygen calibration. A linear regression of the Winkler determinations on the CTD values gave the following results:

$$O_2 = 1.010 * O_2CTD + 0.092$$

The standard deviation of the difference between both measurements was 0.132.

A total of 71 salinity samples were accepted for calibration. The average difference between laboratory and CTD values was -0.027 with a standard deviation of 0.015.

Current measurements were carried out with a ship-borne Acoustic Doppler Profiler (ADCP) at each hydrographic station. The ADCP was set to ping every 8 seconds, the depth cell was set to 8 m and the number of cells to 40. As a routine data were averaged over 300 seconds, stored on files and finally analysed by the PC software UMS (Underway Mapping System), supported by Sea Fisheries Research Institute, Cape Town, South Africa.

Meteorological observations including wind direction and speed, air temperature, global radiation and sea surface temperature (SST) were automatically logged every nautical mile using an Aanderaa meteorological station.

2.2 Fish sampling

Abundance estimation

The catches were sampled for species composition, by weight and numbers. Biological samples, i.e. length and weight compositions were taken for the target species. Records of fishing stations are presented in Annex I. Pooled length frequency distributions of selected species by area, are shown in Annex II.
A description of the acoustic instruments and their standard settings is given in Annex III. This also includes a description of the fishing gear used.

The following target strength (TS) function was applied to convert S_A-values (mean integrator value for a given area) to number of fish:

$$TS = 20 \log L - 72 \text{ dB} \qquad (1)$$

or in the form

$$C_F = 1.26 \cdot 10^6 \cdot L^{-2} \qquad (2)$$

where L is total length and C_F is the fish conversion factor.

This target strength to body length relationship has been used for all the target species although originally estimated for North Sea herring. No specific target strength determinations are at present available for the species under studies.

The following formula was used to calculate the number of fish in each length group (cm) for each fish concentration:

$$\rho_i = S_A \cdot \frac{p_i}{\sum_{i=1}^{n} \frac{p_i}{C_{F_i}}} \qquad (3)$$

where: ρ_i = density of fish in length group i

S_A = mean integrator value

p_i = proportion of fish in length group i

C_{Fi} = fish conversion factor for length group

The length distribution of a given species within an area was computed by weighing the length frequencies obtained in each trawl sample within the area by the average S_A value attributed to that species in the 3 miles where the sample was taken.

The biomass of fish in each length per unit area was calculated by multiplying the number of fish in each length class by their estimated mean weight obtained from the length-weight relationship of the particular region. The number and biomass per length group in a particular concentration was calculated by multiplying the estimated size distribution by the area occupied by the concentration. The number of individuals and total biomass in each area was obtained by summing up the number and biomass of each length group over the whole size. The number and biomass per length group in each concentration were at last summed to obtain the totals for each region.

In the case of co-occurrence of target species of the same genus like *Sardinella aurita* and *S. maderensis* or *Trachurus trecae* and *T. capensis*, the S_A values allocated to the category 'sardinella' or 'Horse mackerel' were split according to their length distribution and their catch rate in numbers.

The mean integrator values in each sampling unit (S_A-values) were divided between the following categories on the basis of trawl catches and characteristics of the echo traces:

- sardinella (*S. aurita* and *S. maderensis*)
- horse mackerel (*T. trecae and T. capensis*)
- pilchard
- anchovy
- big-eye grunt (*Brachydeuterus auritus*)
- P2 (carangids (other than *Trachurus sp*), scombrids, barracudas and hairtails)
- other demersal fish
- Mesopelagic fish
- plankton

Biological sampling

Total length and body weight were recorded for sardinella and horse mackerel to the nearest 1 cm or 1 g below, respectively. Sex and reproductive stages were described by macroscopic examination, scoring each individually sampled fish according to the following categories:

1	Juvenile
2	Inactive
3	Active
4	Ripe
5	Running/ Spent

Stomachs were taken of Cunene horse mackerel for a study of the feeding habits of this species in relation to the observed dial vertical migrations. Ten stomachs per length group of 5 cm were collected at each station were the species occurred. The samples were immediately frozen for later analysis at the laboratories of IIP, Luanda.

CHAPTER 3 OCEANOGRAPHIC CONDITIONS

Surface distribution

Figures 2 a and b show the horizontal distribution of temperature and salinity, respectively, for the region between the Congo River and Pta das Palmeirinhas. Surface sea temperature (SST) varied from 19 °C to 22 °C, and surface salinity from 35.5 to 35.9 psu, except for the areas influenced by the discharge of the Congo and Cuanza Rivers. During the last pelagic survey, carried out in March, anomalous conditions were found in the temperature and salinity distributions in this region, that is, SST of 28-30°C and an upper layer of brackish water extending throughout the whole region. During this cruise, sea surface temperatures 8-9 °C lower than those in the warm season were recorded and the upper part of the water column showed high salinity values. This change in the temperature and salinity fields between warm and cold season has been reported in previous cruises.

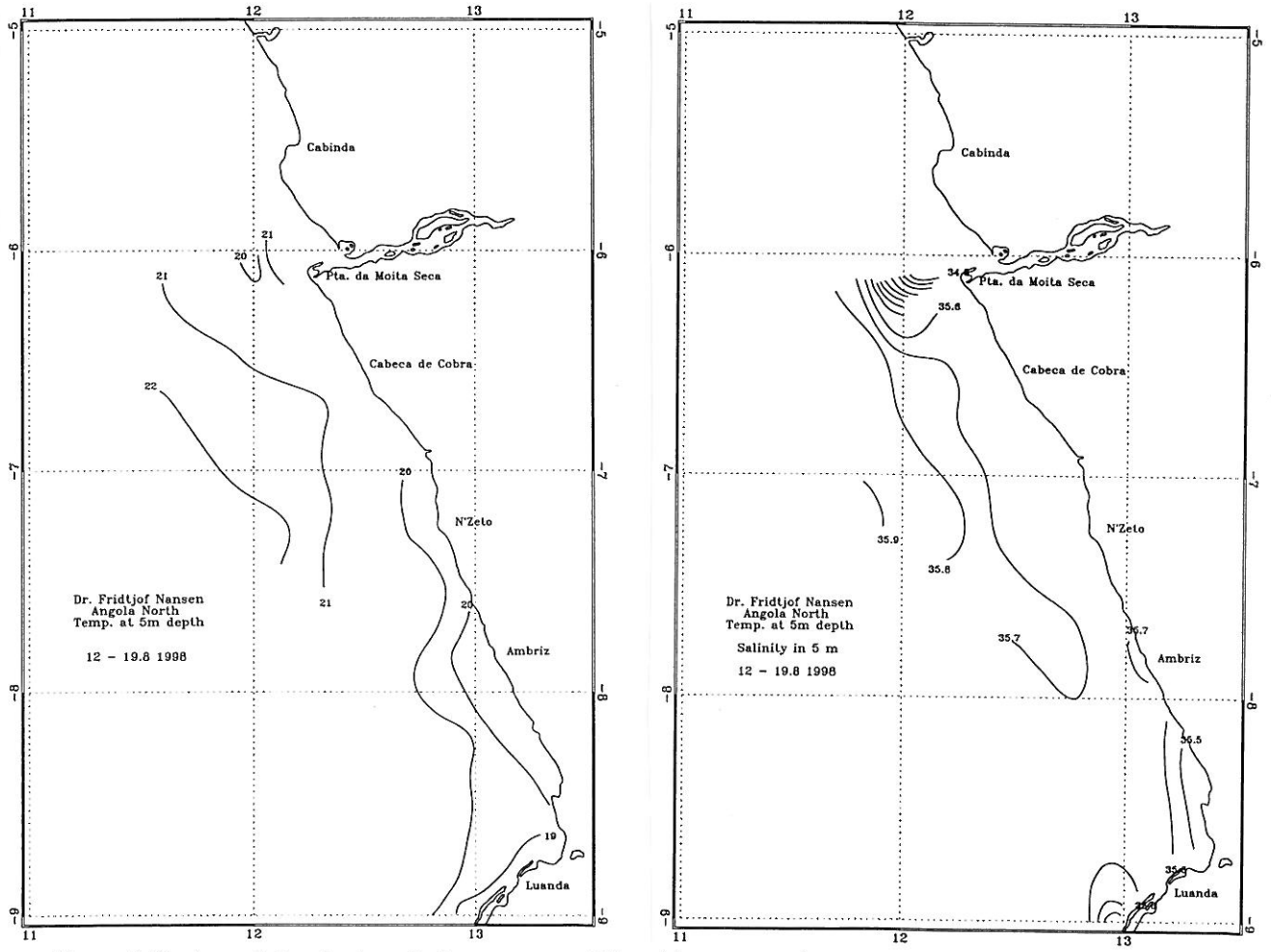


Figure 2. Horizontal distribution of a) temperature(°C) and b) salinity (‰), Congo River - Pta das Palmeirinha

In the region Pta das Palmeirinhas-Benguela (Fig 3 a and b), temperature values between 18°C and 20°C and salinity between 35.5 and 36 psu dominated in the upper water column. Both parameters increasing with increasing depth. Influence of freshwater runoff can be seen off Pta. das Palmerinhas and to a lesser degree off Pta. do Morro and Lobito.

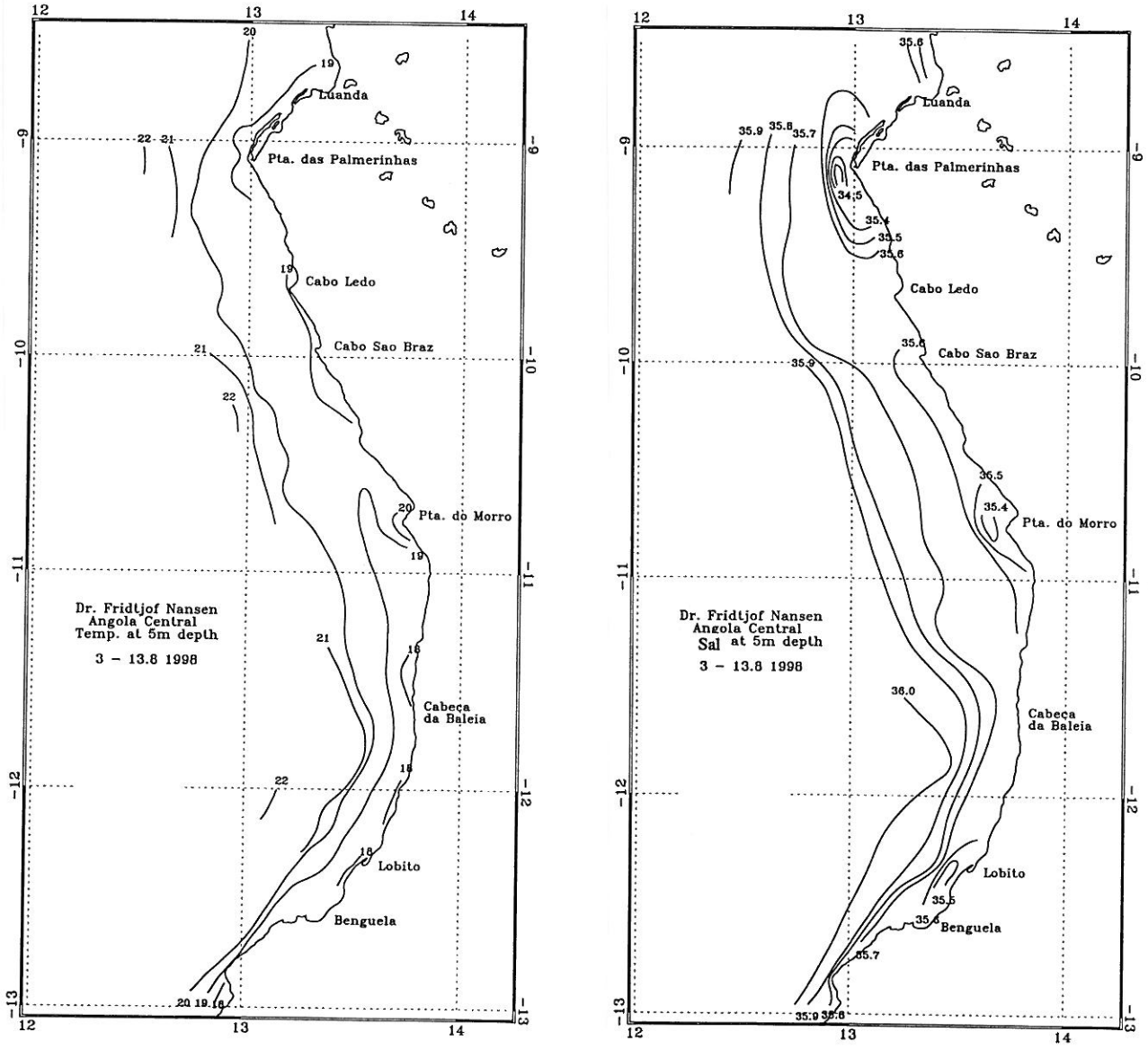


Figure 3. Horizontal distribution of temperature(°C) and salinity (‰), Pta das Palmeirinhas - Benguela

Figures 4 a and 4b show the temperature and salinity at 5 m depth, respectively, for the region from south of Benguela to Cunene river. In the narrow shelf between 13°S and Tombua, surface temperature between 16-20 °C and surface salinity between 35.6 and 36 psu were recorded. A strong horizontal gradient of temperature and salinity corresponding to the Angolan-Benguela front can be seen north of Cape of Santa Marta, that is, 1.5 to 2 degrees latitude north of the position that was recorded in March. In the area south of Tombua, temperature varied between 14°C and 17°C and salinity between 35.2 and 35.8. Colder and less saline upwelled water off Baia dos Tigres, causes the isoterms to bend towards the seaside.

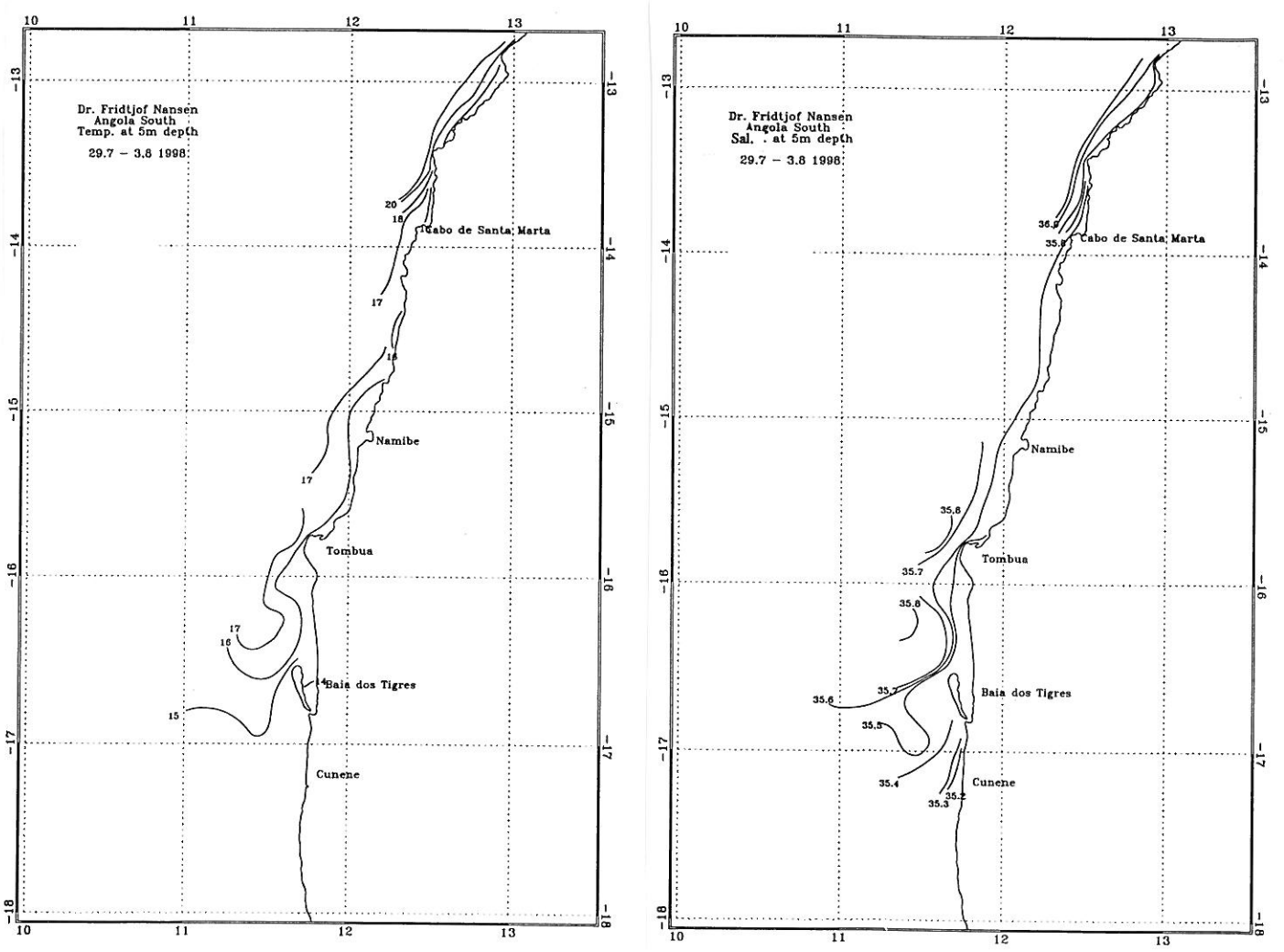
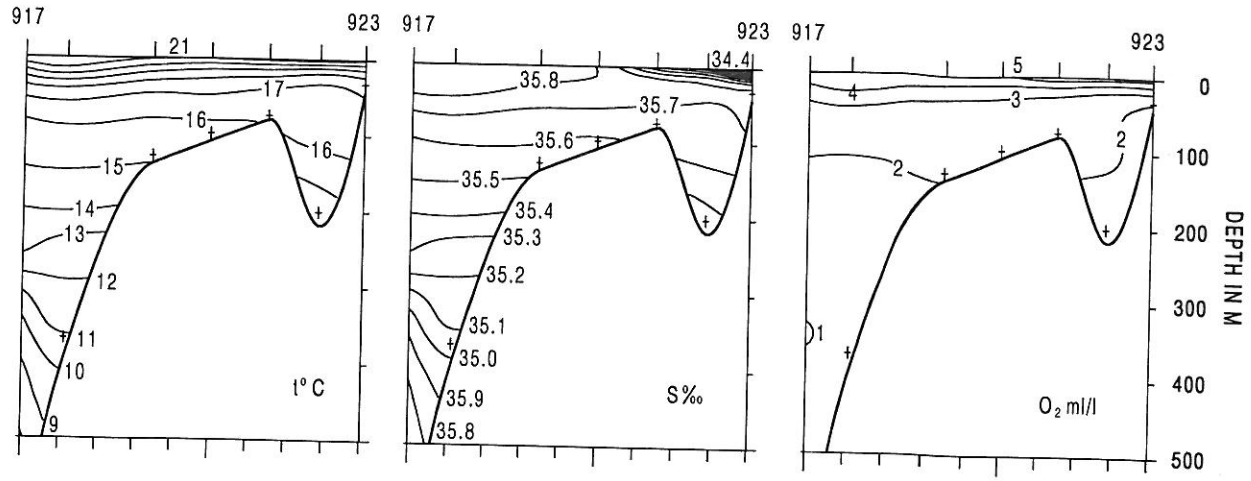


Figure 4. Horizontal distribution of temperature(°C) and salinity (‰), Benguela - Cunene.

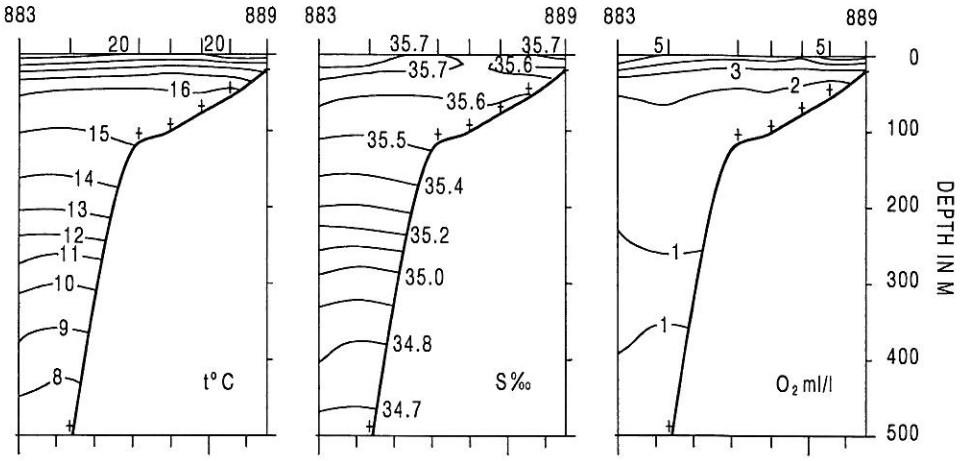
Vertical distribution

The vertical distributions of temperature, salinity and oxygen along the standard sections are shown in Figures 5 a-f.

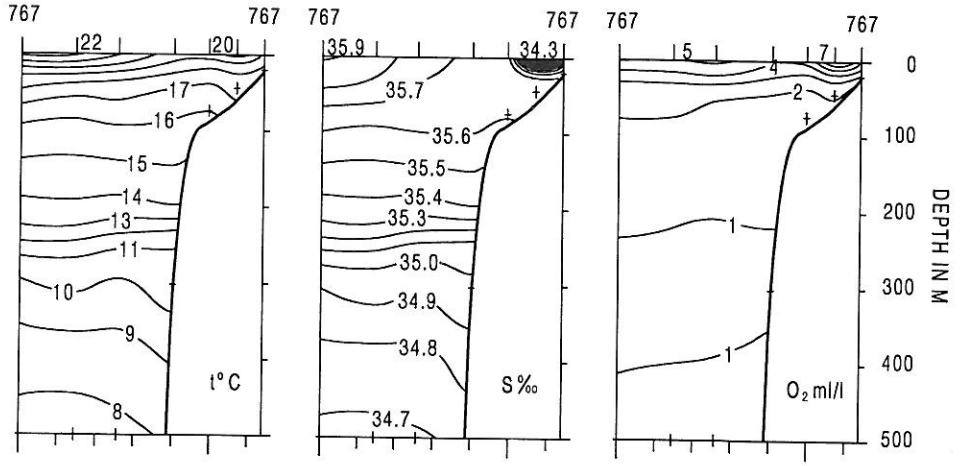
The section of Pta da Moita Seca, (Fig 5a) presents a flat distribution of isotherms with a shallow termocline located at around 15 m depth. The salinity profile shows the influence of the waters of the Congo River defining an upper layer of relatively low salinity (34-35 psu) in the inner part of the shelf. At Ambriz (Fig 5b), a well stratified profile in the three parameters analysed can be seen, no signs of freshwater runoff was found. At Pta. das Palmerinhas (Fig. 5c) the strong stratification is only disturbed by the presence, in the inner part of the section, of less saline mixed water probably reflecting the influence of freshwater coming from the Cuanza River. Two termoclines are evident in this profile, one very superficial and the other at around 200-250 m depth. Both profiles at Pta. do Morro and Lobito (Fig. 5d and 5e), inside the isobath of 100m, show a thin upper layer of less saline water. At Pta. do Morro this layer has high content of oxygen suggesting a mixing with freshwater runoff. At Lobito, low oxygen values indicate a certain degree of vertical mixing with subsurface water. The profiles at Bahia dos Tigres (Fig. 5e) show a clear sign of coastal upwelling with uplifting of the isolines in the first 100m depth of the three parameters analysed. Low values of oxygen content at the bottom of the shelf can also be observed. Otherwise, no oxygen limitations seem to exist in the Angolan shelf during the period studied. Summarising, most of the area north of the Angolan-Benguela front showed a stratified vertical structure characterised by flat distribution of the isolines which indicated very weak mixing processes.



Pta. das Moita Seca 18 - 19.8 1998



Ambriz 14/08 1998



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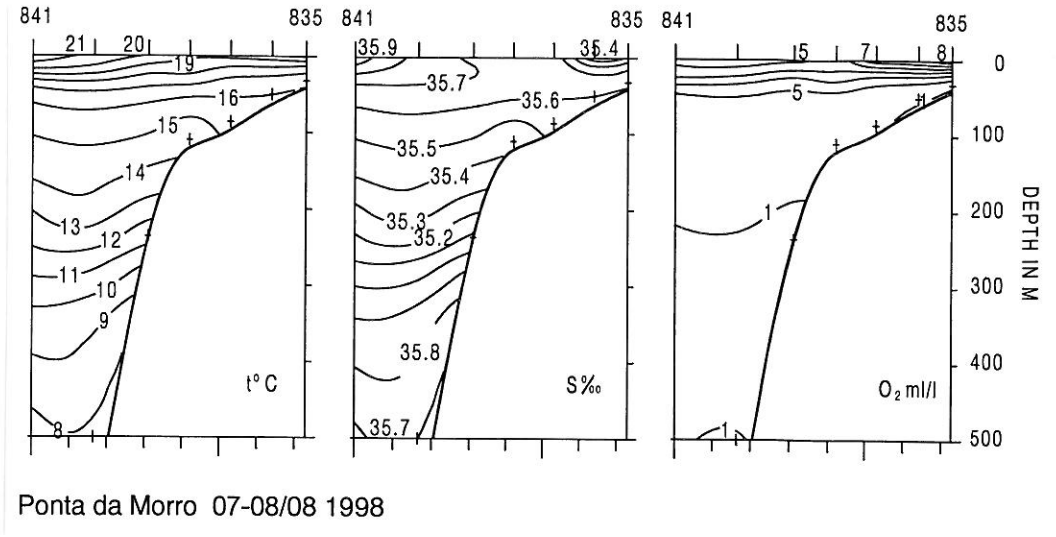
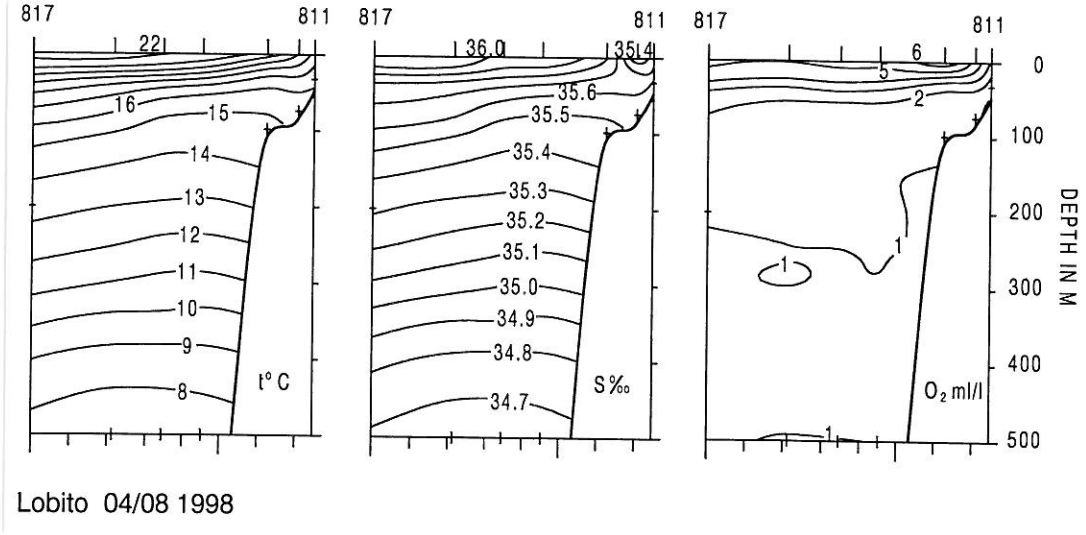




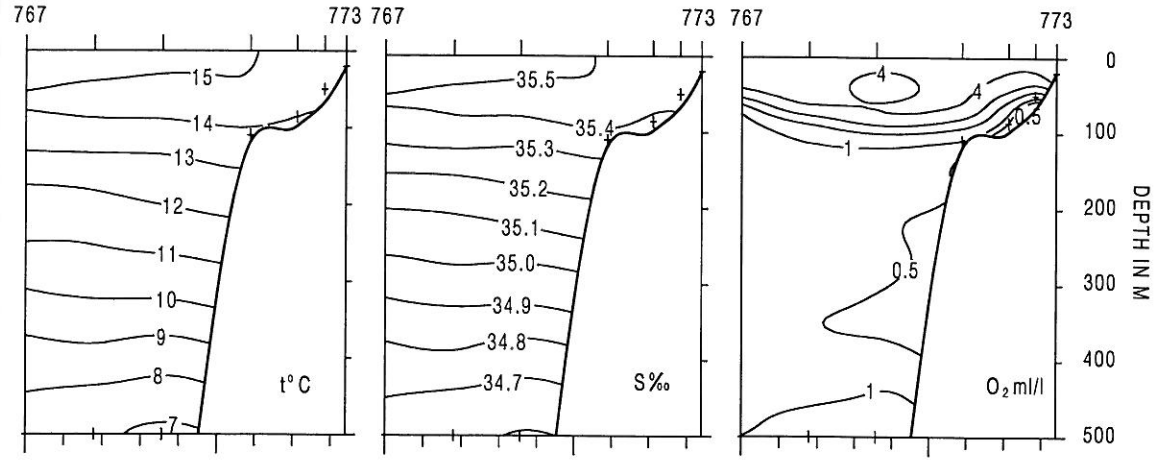


Figure 5. Vertical profiles of temperature(°C), salinity (‰) and oxygen(ml/l).

Current measurements (ADCP)

The results of the ADCP measurements at 35m depth are shown in Fig 6. All accepted 5 min averages are presented. Great variability of these non filter data exists both between close stations and inside the same station. South of Congo River, a southwards current decreases intensity reaching Ambiz. Between Ambriz and Luanda, low current values directed northwards were recorded. From the west, a current reaches Pta. das Palmerinhas and seems to continue southwards but decreases in intensity north of Pta. do Morro and invert direction. Strong southerly currents were recorded in the outer shelf off Lobito. South of Benguela a strong northerly coastal current can be followed until Baia dos Tigres. However, in the outer shelf off Baia dos Tigres, a strong southerly current was recorded.

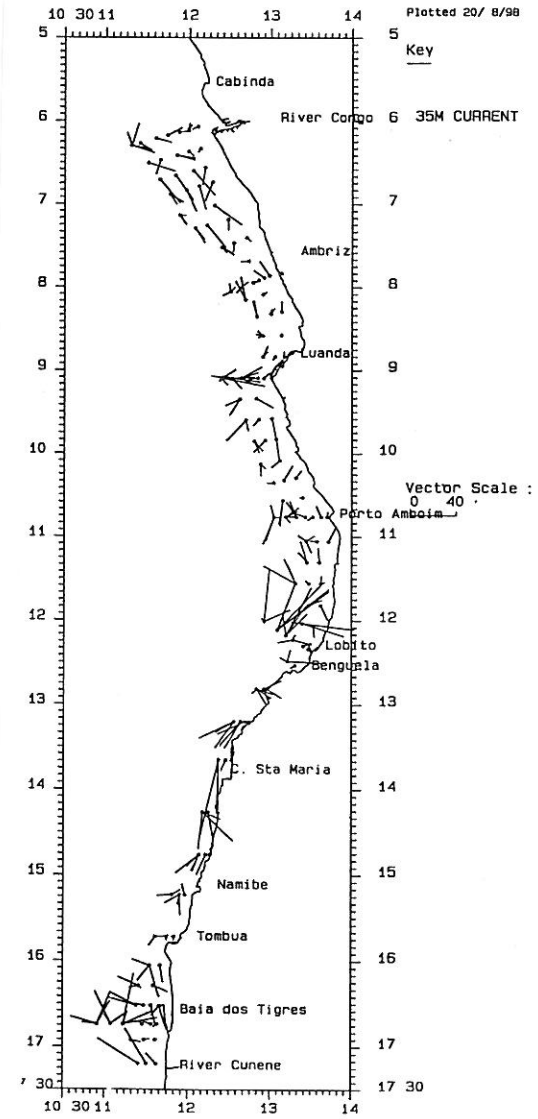


Figure 6. ADCP current measurements. Congo River to Cunene River.

Wind conditions

Wind measurements in the survey area are presented in Fig. 7. In general, good weather and sea conditions for acoustic assessment prevailed. Generally, winds from the south-southwest were dominant occasionally rotating towards the southeast.

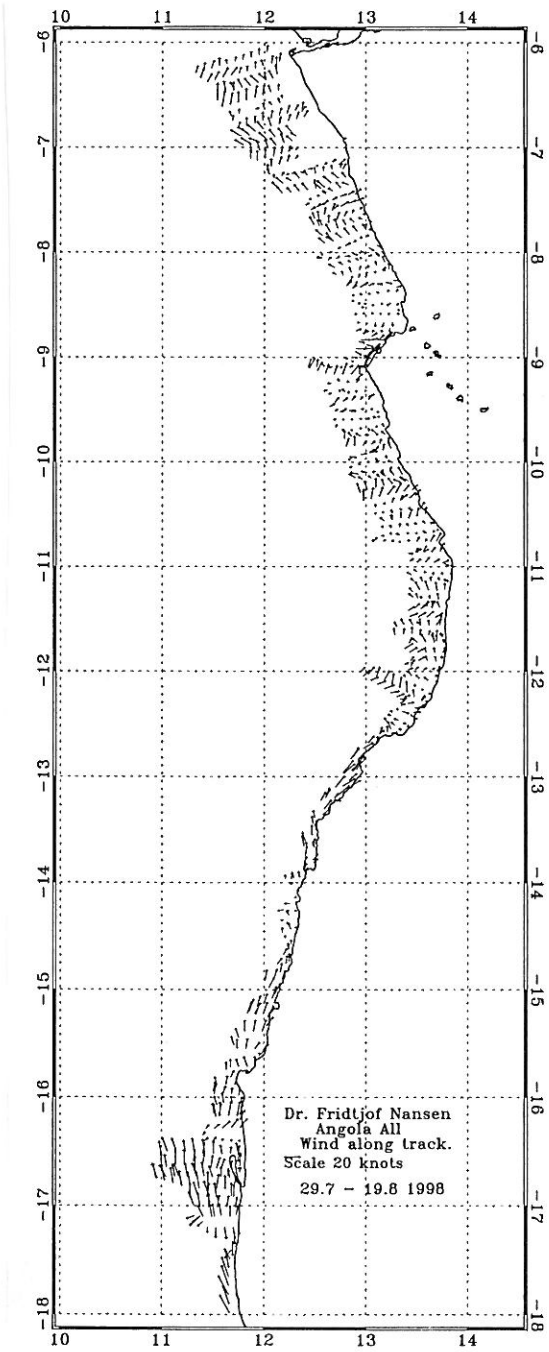


Figure 7. Wind measurements. Congo River to Cunene River.

CHAPTER 4 DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF PELAGIC FISH

4.1 Congo River - Pta das Palmeirinhas

4.1.1 Sardinella

Both *Sardinella aurita*, the round sardinella, and *Sardinella maderensis*, the flat sardinella, were found in the nothern region from the Congo River to Pta das Palmeirinhas. Figure 8 shows the geographical distribution of both sardinellas in the region represented by strata of ranked mean acoustic integrator values. As mentioned in the introduction, the inner shelf of this area was partially covered because of restrictions in the access to shallow areas where oil platforms were operating. This limited the possibility of comparing the results with those ones collected in other surveys. In fact, in the previous pelagic survey conducted in the cold season (August 1996), high concentrations of mainly juvenile round sardinella were found in shallow waters between Pta. da Moita Seca and Cabeça de Cobra. In the present survey, round sardinella was very scarce throughout the whole studied area and in particular in the northern region.

Two main concentrations were detected, both in the inner part of the shelf. One off Cabeça de Cobra and the other off Ambriz. Otherwise, sardinella was found distributed with low densities in the middle and inner shelf of the area. The biomass of sardinella was estimated in 159 000 tonnes and round sardinella made only 1% out of this total.

Figure 9 a and b shows the length distribution for the whole area for *S. aurita* and S. *maderensis* respectively. The distribution of round sardinella consisted of a small fraction of juveniles between 15 and 20 cm and two main modes, one at 27 cm and the other around 32 cm. The distribution of flat sardinella showed also a clear mode at 27 cm and a secondary mode around 32 cm. Compared with the length distribution of sardinellas for the same season in 1996, it is evident that during the current cruise only few small individuals (total length less than 15 cm) were caught. Restrictions in the access to shallow waters may partly explain this difference. The very low catch of round sardinella constituted another difference.

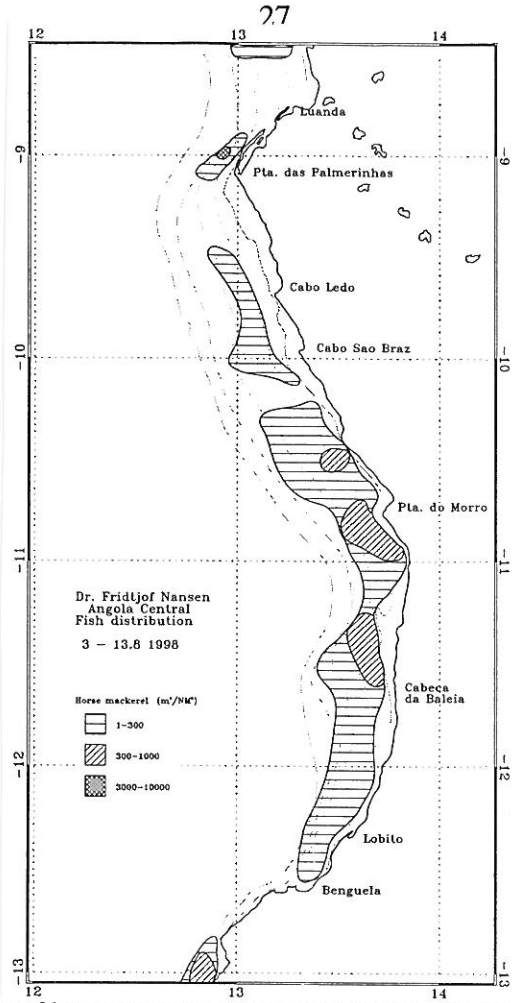


Figure 15. Distribution of horse mackerel (*Trachurus trecae*), Pta das Palmeirinhas - Benguela

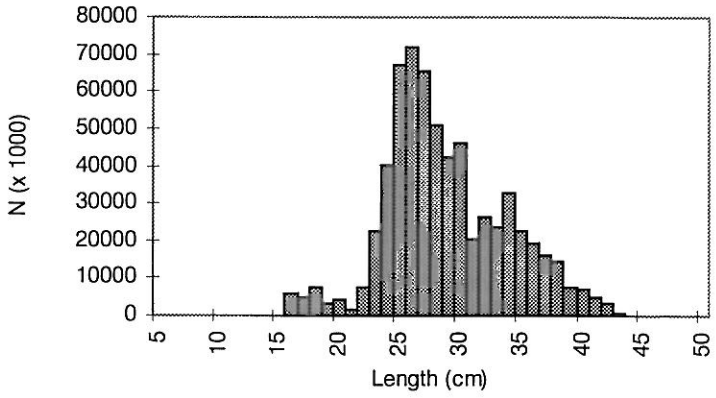


Figure 16. Total length distribution of horse mackerel (*Trachurus trecae*), Pta das Palmeirinhas-Benguela.

Figure 16 presents the length distribution of Cunene horse mackerel in the central region. A wide range of sizes were found in the samples of this region with several overlapping modes. A preliminary decomposition of the size distribution suggested that modes may be found at 19, 27, 33 and 38 cm. Notice than in the central region modes at 27 and 38 cm were

discriminated.

The estimated biomass for the central area was 112 000 tonnes.

4.2.3 Other pelagic species

Figure 17 shows that 'pelagic species type 2' were scattered occupying most of the shelf of the region with low densities. Medium density concentrations were only found off Cape Sao Braz.

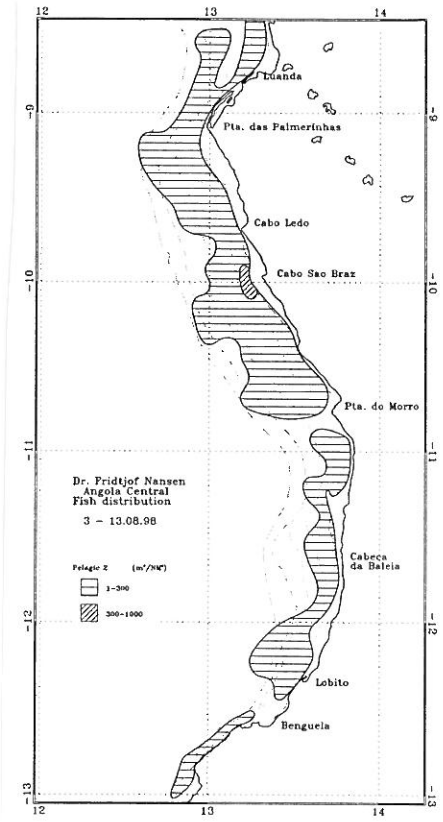


Figure 17. Distribution of other pelagic species. Pta das Palmeirinhas - Benguela.

Catch rates of the main components of this group of pelagic fish are presented in Table 3. Hairtails were found over the whole depth range but were particularly abundant close to the shelf break. As in the northern region, the most important species of 'other carangids' *were Selene dorsalis* and *Chloroscombrus chrysurus*. Barracudas *(Sphyraena sphyraena and S. guachancho)* were frequently caught at depths less than 50 m. Scombrids were represented by *Scomberomorus tritor* in relatively shallow waters and by *Scomber japonicus*, *Sarda sarda* and *Euthynnus alletteratus* in the mid shelf and slope area.

The estimated biomass for the area was about 81 000 tonnes, using an average length of 30 cm.

Table 3. Catch rates (kg/h) of main groups of pelagic fish. Pta das Palmeirinhas - Benguela

ST.NO.	DEP.	Carangids	Barracudas	Scombrids	Hairtails	Other
1734	20			12.88	59.80	995.92
1735	40					1485.15
1736	10					540.00
1737	290					166.67
1738	300					183.71
1739	20			5.20	24.40	498.00
1740	30	5.79			54.00	452.91
1741	10	4.80	1.80	2.10	20.70	59.19
1742	300				0.18	146.82
1743	38		1.74		25.16	240.07
1744	15				2.21	247.58
1745	95	8.40		13.60	6.00	953.40
1746	37	1.26	2.37		5.21	731.88
1747	55					289.80
1748	40		10.80		27.45	539.16
1749	5		40.23		10.89	2846.01
1750	5				7.74	
1751	20	0.49		5.84	20.27	255.55
1752	43	12.60			18.90	1569.24
1753	88				1.29	4.50
1754	115				3.33	842.78
1755	10		2.00		65.20	488.52
1756	10			42.00	57.47	2258.05
1757	10	6.60	116.40		12.00	188.25
1758	127				57.14	262.13
1759	101					851.16
1760	67	9.45				824.55
1761	10					335.04
1762	10	4.00	18.00		26.00	971.50
1763	20	2.00			380.80	2.00
1764	5	532.92	95.79	10.29	43.84	1123.08
1765	64				691.20	178.17
1766	20					
1767	10	2.04				80.96
1768	10			14.00	120.00	1441.80
1769	5	3.32				
1770	107				101.79	798.21
1771	5					
1772		5.55		99.45	111.57	995.58
1773	10				30.00	376.75
1774	10	848.57			13.14	262.01
MEAN		35.31	7.05	5.01	48.72	597.22

4.3. Benguela - Cunene

4.3.1 Sardinella

No positive identification of sardinella was made in this region.

4.3.2 Horse mackerel

In southern Angola, the pelagic environment was dominated by horse mackerel. In this region, two species of horse mackerel are found: Cunene horse mackerel (*Trachurus trecae*), a species that distributes in most of the Angolan shelf and the Cape horse mackerel (*Trachurus capensis*) a species associated with the cold waters of the Benguela current. During this cruise, the Angolan-Benguela front was located moves northwards reaching the

During this cruise, the Angolan-Benguela front was located around Cape of Santa Marta. Concomitantly, the Cape horse mackerel was found from the Cape of Santa Marta mixed with Cunene horse mackerel, that is, more than three degrees latitude inside Angolan waters. This population of Cape horse mackerel is a continuation of the Namibian stock that distributes from Cape Frio- Rocky Point. Figure 20 presents the distribution of both species combined in the form of strata of ranked mean integrator value. Horse mackerel occupied all the narrow shelf between Benguela and Tombua, and became specially abundant in the area Tombua-Cunene. High concentrations were recorded off Namibe, between Namibe and Tombua, and outside Baia dos Tigres. A high density area was found from the Cunene extending in the middle and outer shelf up to the north of Baia dos tigres. In this area, the maximum concentrations were detected. In general, Cape horse mackerel were found dominating the slope area and forming during the day, schools that distribute beyond the slope over the layer of mesopelagic fish at depths of around 200m. Since in previous cruises, Cape horse mackerel were recorded far offshore reaching a western limit at 11°E, four transects off baia dos Tigres were extended to cover this area. A positive trawl was made at 1300 m bottom depth during the night, more than ten miles from the slope break. Cape horse mackerel of body length between 22 and 33cm and modal size at 26cm were caught. Inside the shelf, both species of horse mackerel mix and in general the inner shelf is occupied by Cunene horse mackerel. North of Tombua, Cunene horse mackerel gradually dominated in the catches.

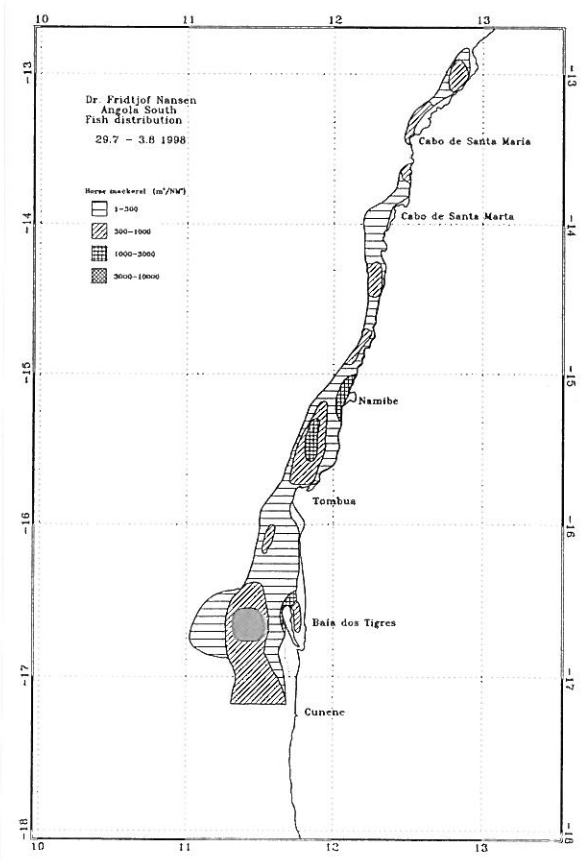
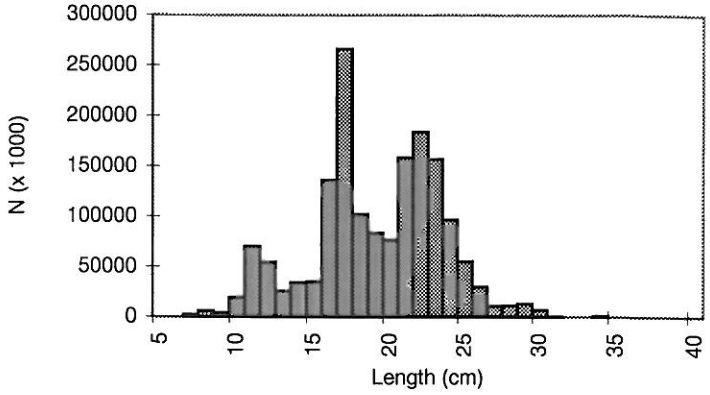
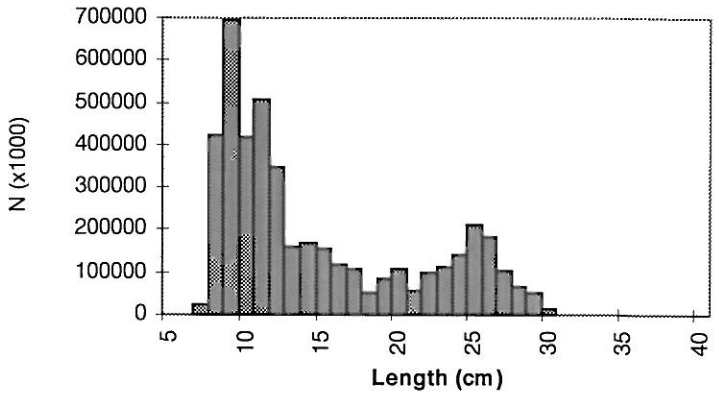


Figure 20. Distribution of Horse mackerel. Benguela - Cunene.

Figure 21 a and b shows the size distributions of Cunene and Cape horse mackerel, respectively, for the southern region.



a) *Trachurus trecae*



b) *Trachurus capensis*

Figure 21. Total length distribution of a) *Trachurus trecae* and *b) T.capensis*. Benguela-Tombua.

A preliminary separation of modes in the size distribution of Cunene horse mackerel indicated 4 possible modes at 12, 17, 23 and 29 cm body length. Cape horse mackerel had possible modes at 10, 15, 21 and 25 cm body length with a less clear definition of modes.

The biomass estimate for horse mackerel in the southern region was 324 000 tonnes split in 118 000 tonnes for Cunene horse mackerel and 206 000 tonnes for Cape horse mackerel.

4.3.3 Other pelagic species

Among the other pelagic species expected to be in the area, only the European anchovy (*Engraulis encrasicolus*) and round herring (*Etrumeus whiteheadi*) were recorded in the southern part of the area. A biomass estimation at least for round herring will be attempted for the final version of this report.

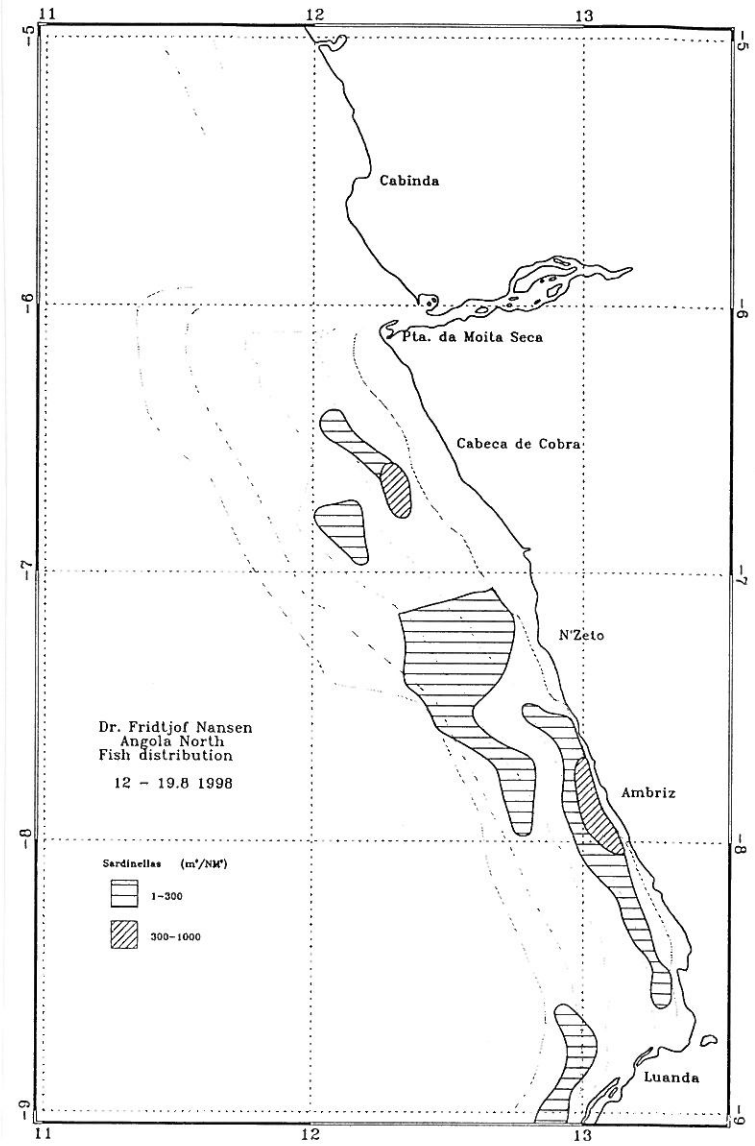
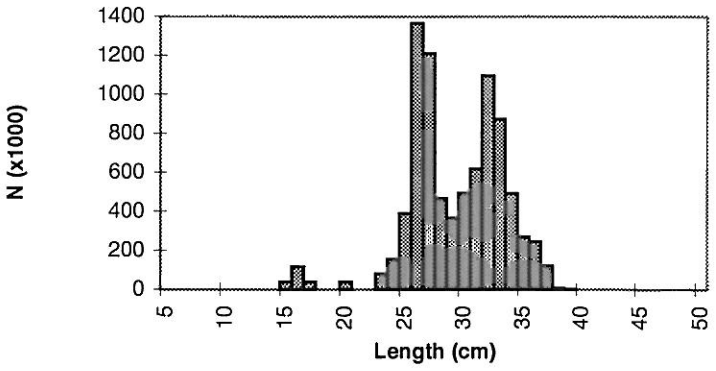
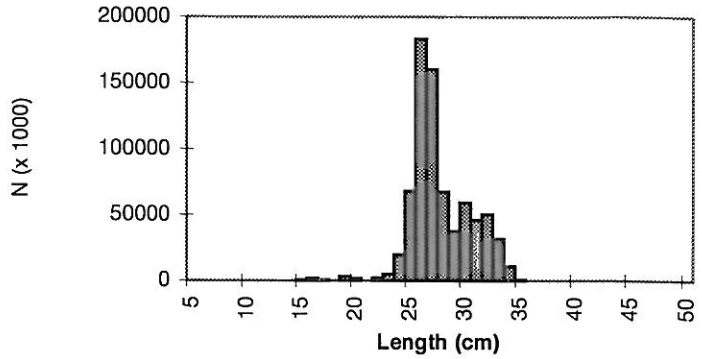


Figure 8. Distribution of *Sardinella* spp.Congo River-Pta das Palmeirinhas



a) *Sardinella aurita*



b) *Sardinella maderensis*

Figure 9. Total length distribution of a) round sardinella (*S. aurita*) and b) flat sardinella (*Sardinella maderensis*). Congo River-Pta das Palmeirinhas.

4.1.2 Cunene horse mackerel

Figure 10 shows the distribution of horse mackerel for the region from Congo River to Pta das Palmeirinhas. The species was found scattered throughout this region. The densities were in general low, except for a small area north of Pta. das Palmerinhas.

Figure 11 shows the length distribution of horse mackerel for the whole region. Although the distribution did not show clear modes, a mode separation was attempted defining a mode around 27 cm and another at 38 cm. In any case, the bulk of the distribution is made up by mature fish of more than 30 cm total length.

The estimated biomass for the northern region was 37 000 tonnes.

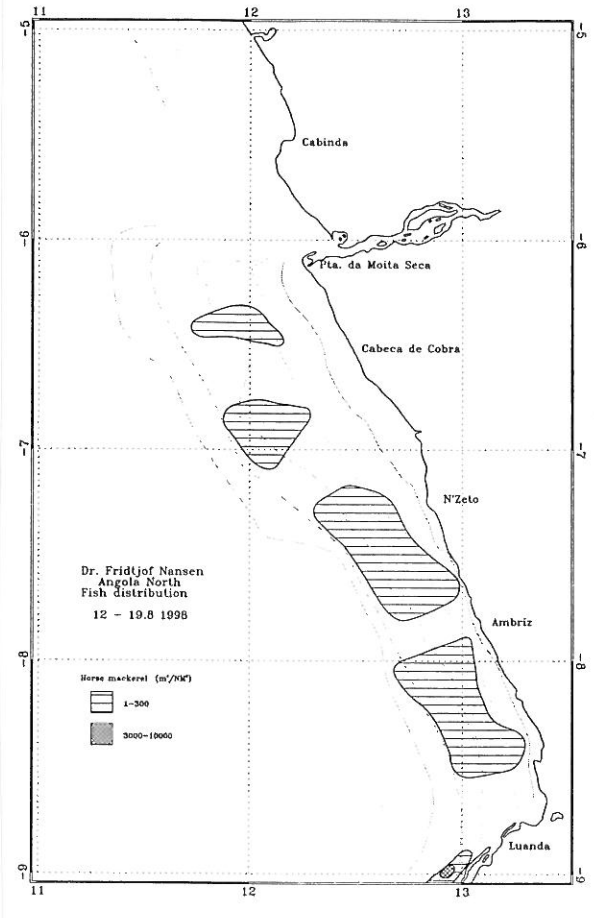


Figure 10. Distribution of Cunene horse mackerel (*Trachurus trecae*) by length groups. Congo River - Pta das Palmeirinhas

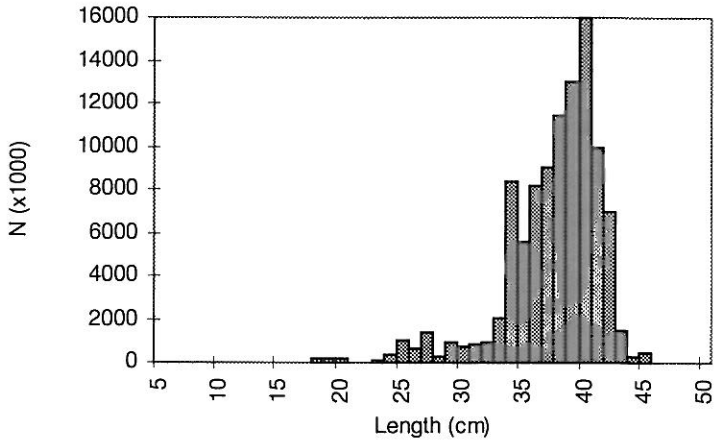


Figure 11. Total length distribution of Cunene horse mackerel (*Trachurus trecae*). Congo River - Pta das Palmeirinhas

4.1.3 Other pelagic species

This category includes a large number of pelagic species of the families Carangidae, Sphyraenidae, Trichiuridae, and Scombridae, usually mixed in a highly diverse pelagic community. This makes the abundance estimation with acoustics, at species level, practically impossible. For this reason all these species are treated together to give an idea of the order of magnitude of these resources. Figure 12 shows the distribution of 'pelagic fish type 2' for the region. Table 2 presents the catch rates of the main categories included in this group.

'Pelagic fish type 2' were found distributed throughout the area in relatively low densities. The biomass estimate was obtained using an overall average body length of 30.5 cm and resulted in a value of about 57 000 tonnes.

Carangids, other than *Trachurs sp,* were the most important members of this group in the catches of this area. The most abundant species were African lookdown (*Selene dorsalis),* blue runner (*Caranx crysos*) and False scad (*Decapterus ronchus*). Hairtails (*Trichiurus lepturus*), as usual, were found occupying a wide depth range and at the slope were recorded associated with small tunas preying on mesopelagic fish. Clupeids (except sardinellas) were represented by West African ilisha (*Ilisha africana*), specially abundant in shallow waters. The Scombrids were represented by Frigate tuna (*Auxis thazard*), Atlantic bonito (*Sarda sarda*), Little tunny (Euthynnus alletteratus), Atlantic mackerel (Scomber japonicus) and West Atlantic Spanish mackerel (*Scomberomorus tritor*).

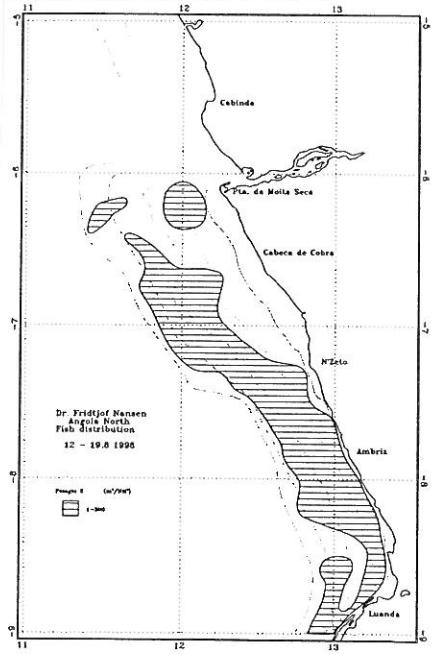


Figure 12. Distribution of other pelagic species. Congo River - Pta das Palmeirinhas

Table 2. Catch rates (kg/h) of main groups of pelagic fish. Congo River-Pta das Palmeirinhas

ST.NO.	DEP.	Carangids	Barracudas	Scombrids	Hairtails	Other
1775	10	2.70			57.00	843.00
1776	1				41.63	660.00
1777	189				9.60	222.60
1778	24	6.00			90.00	554.57
1779	5			266.85	8.19	391.58
1780	5	6.00		18.15	55.50	467.85
1781	5				31.65	77.40
1782	5		64.61		35.19	672.36
1783	10	1.00		5.14	221.14	38.43
1784	107					246.40
1785	75	742.50			19.50	368.70
1786	10	165.00	11.13	330.00	97.50	4867.50
1787	200					483.87
1788	5	1.80		28.70	52.50	170.40
1789	5				39.27	2675.47
1790	10				264.60	298.50
1791	281				66.00	990.00
1792	92				1.80	222.60
1793	5	30.90	8.40		12.90	117.15
1794	5	5.59		25.76	127.86	435.42
1795	10				18.75	69.45
1796	5		10.29		2.00	17.86
1797	5	91.38		6.75	19.95	89.55
1798	10		6.30	4.00		283.90
1799	5				783.00	10.50
1800	5			44.36	14.79	286.07
1801	10	11.77	9.00	2.54	75.00	151.60
1802	80			0.60		217.35
1803	10		5.40		3.60	32.10
1804					266.14	40.43
1805		9.60		2.40	66.00	521.40
1806	143			5.55	292.05	23.10
1807	72	3696.00				8364.00
1808	5				237.94	142.88
1809	5	0.06		3.43	268.00	42.00
1810	5				60.60	214.80
MEAN		132.51	3.20	20.67	92.77	703.08

4.2 Luanda-Benguela

4.2.1 Sardinella

Concentrations of both species of sardinella were found in the inner part of the shelf throughout the region, with highest concentrations off Cape Sao Braz, Pta. do Morro, north of Cabeça da Baleia, and between Cabeça da Baleia and Lobito. Medium and low concentrations were found also in the outer shelf and beyond the slope in a stripe extending from north of Cape Ledo to north of Luanda. Figure 13 shows the distribution for this region of both species combined, with an indication of their relative densities expressed in ranked mean integrator values. The length distributions for round and flat sardinellas are presented in Figure 14 a and b, respectively. The length distribution of round sardinella although did not show clear modes, presented two distinct groups of sizes. A first group of juveniles between 10 and 20 cm and a second group of mature individuals between 29 and 37 cm total body length. Flat sardinella instead showed modes at 10, 21 and 30 cm and a possible additional one around 33 cm.

The estimated biomass for sardinella was 233 000 tonnes distributed in 208 000 tonnes for flat sardinella and 25 000 tonnes for round sardinella.

It is important to mention that during the cruise, several observations were made by bare eye and by a scanning sonar of schools of sardinella swimming at the sea surface during day time. During these observations almost no registrations appeared in the vertical echo-sounder. At night, the situation became even more difficult because of the existence of less dense schools mixed with other species that migrate to the surface after darkness. Therefore, the present estimation of sardinella should be considered as an underestimation. An analysis of past information from both scanning sonar and vertical echo-sounder and the implementation of a new sonar system onboard will try to assess the importance of these concentrations that remain outside the integration range of the echo-sounder. Our impression is that this swimming behaviour of sardinella at the surface was more pronounce during the cold season than during the cruise carried out in March.

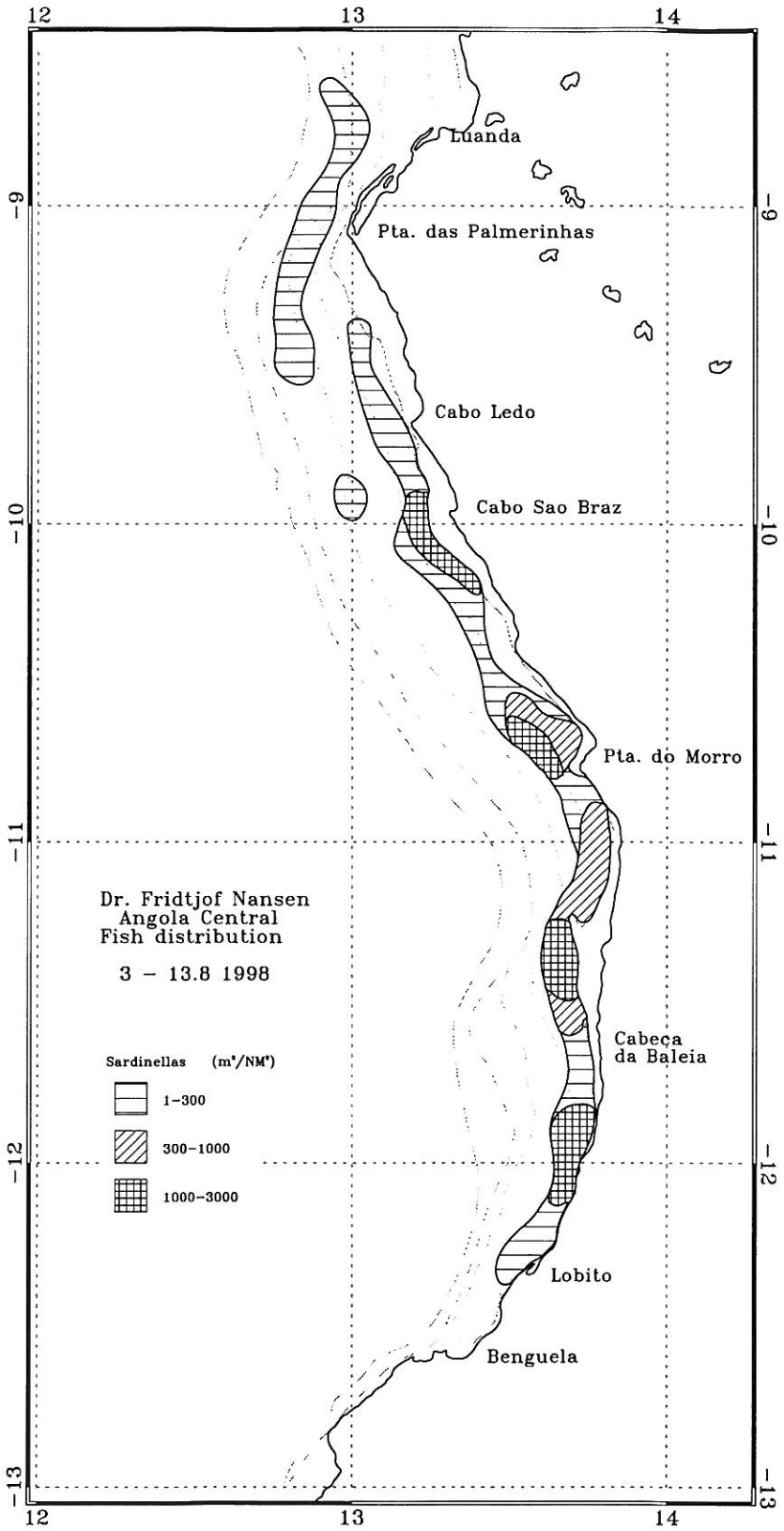
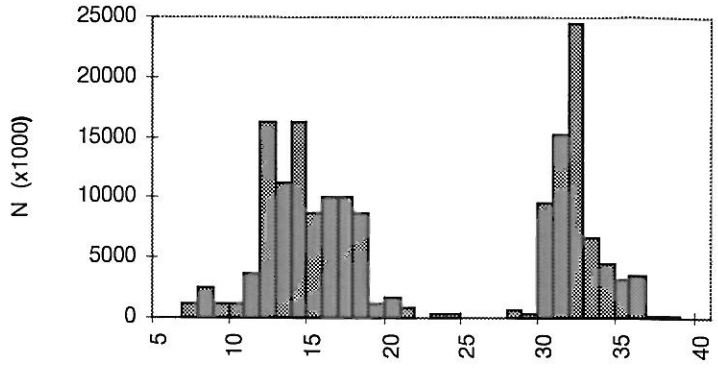
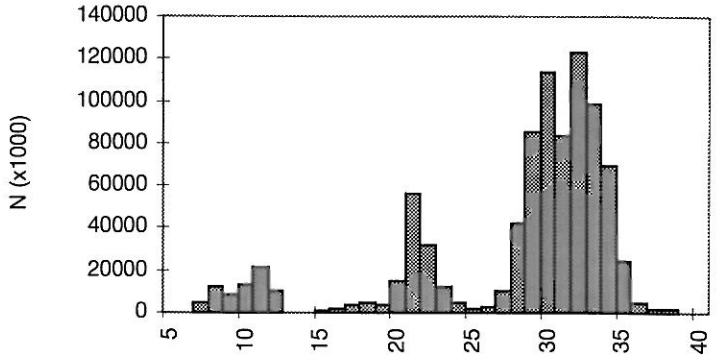


Figure 13. Distribution of *Sardinella* spp. Pta das Palmeirinhas - Benguela.



a) *Sardinella aurita*



b) Sardinella maderensis

Figure 14. Total length distribution of a) round sardinella (*S. aurita*) and b) flat sardinella (*Sardinella maderensis*). Pta das Palmeirinhas - Benguela

4.2.2 Cunene horse mackerel

Horse mackerel were distributed over most of shelf in low densities (Fig. 15). Larger concentrations were only found, close to the coast, around Pta. do Morro, north of Cabeça da Baleia and at the southern limit of the area, north of Pta das Palmerinhas.

CHAPTER 5 REVIEW OF SURVEY RESULTS AND AVAILABILITY FOR THE FISHERY

5.1 Sardinella and horse mackerel

The total biomass of sardinellas was estimated to 392 000 tonnes (Table 4). This value is relatively similar to the last estimate obtained in the previous cruise carried out in the cold season, that is, August 1996. However, this similarity in the total biomass estimate should be analysed in more detail. From Table 4 it is also evident that in the cold season of 1996, 2/3 of the sardinella biomass was recorded in the northern area while in this cruise only 40% corresponded to that area. Besides, an important part of concentrations in 1996 were found in areas that were not accessible to this cruise.

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Table 4 Biomass estimates of sardinellas by regions and surveys (1 000 tonnes)

Survey	Cunene-Benguela	Benguela-Luanda	Luanda-Cabinda	Benguela-Cabinda	TOTAL
1/85	25	220	80	300	325
2/85	110	190	180	370	480
3/85	0	70	190	260	260
4/85	0	200	110	310	310
1/86	10	140	110	250	260
2/86	10	130	130	260	270
1/89	40	200	60	260	300
2/89	20	40	130	170	190
3/89	40	100	60	160	200
1/91	+	180	120	300	300
2/91	+	68	154	222	222
1/92	+	119	161	280	280
1/94	*	410	100	510	510
2/94	*	245	290	535	535
1/95	*	140	24	164	
2/95	+	277	297	574	574
1/96	49	175	70	245	294
2/96	+	130	233	363	363
1\97		195	†300	495	495
1/98	75	389	†79	468	543
3/98	+	**233**	**†159**	**392**	**392**

* not surveyed

† surveyed from Congo River to Pta das Palmerinhas

It is also necessary to insist in the difficulties of estimating sardinella with a vertical echo-sounder when this species is found swimming near the sea surface most of the time as in this last cruise. Therefore, it is recommended that more weight should be given to the signal obtained in the cruise carried out last March of an expanding sardinella stock.

The total biomass of Cunene horse mackerel was estimated in 267 000 tonnes. As in the cruise in 1996, most of the concentrations were found in the southern and central area. This result is in accordance with the estimation obtained during the survey last March and indicates a reduction in the stock size of horse mackerel. It is recommended to complement these observations with data from the commercial fisheries to try to see if important changes in the exploitation pattern have occurred lately.

Table 5 Biomass estimates of Cunene horse mackerel by regions and surveys (1 000 tonnes)

Survey	Cunene-Benguela	Benguela-Luanda	Luanda-Cabinda	Benguela-Cabinda	TOTAL
1/85	30	195	40	235	265
3/85	50	90	40	130	180
4/851/86	100	125	20	145	245
1/89	35	55	40	95	130
3/89	170	40	35	75	245
1/91	100	80	20	100	200
2/91	100	70	30	100	200
1/92	98	86	80	166	264
1/94	*	238	1	239	
2/94	*	130	120	250	
1/95	*	*	84	84	
2/95	70	160	110	270	340
1/96	286	214	6	220	506
2/96	140	157	63	220	360
1/97	234	55	†138	193	427
1/98	163	58	†18	76	239
3/98	**118**	**112**	**†37**	**149**	**267**

* not surveyed

† surveyed from Congo River- Pta das Palmerinhas

Annex 1 Records of fishing stations

PROJECT STATION:1709

DATE:29/ 7/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1705
start stop duration Long E 1121
TIME :06:11:09 06:42:16 31 (min) Purpose code: 1
LOG :5120.49 5122.61 2.10 Area code : 3
FDEPTH: 75 75 GearCond.code:
BDEPTH: 182 367 Validity code:
Towing dir: 270° Wire out: 300 m Speed: 35 kn*10

Sorted: 125 Kg Total catch: 1111.29 CATCH/HOUR: 2150.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	2090.32	130217	97.18	4170
Brama brama	31.43	17	1.46	
Etrumeus whiteheadi	29.13	435	1.35	
Total	2150.88		99.99	

PROJECT STATION:1710

DATE:29/ 7/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1706
start stop duration Long E 1131
TIME :08:46:38 08:55:02 8 (min) Purpose code: 1
LOG :5138.53 5138.99 0.46 Area code : 3
FDEPTH: 50 50 GearCond.code:
BDEPTH: 110 116 Validity code:
Towing dir: 270° Wire out: 150 m Speed: 35 kn*10

Sorted: 69 Kg Total catch: 279.09 CATCH/HOUR: 2093.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Etrumeus whiteheadi	1510.50	69975	72.16	4172
Trachurus capensis	570.00	57000	27.23	4171
Sardinops ocellatus	8.18	323	0.39	
Schedophilus pemarco	3.00	38	0.14	
Illex coindetii	1.50	38	0.07	
Total	2093.18		99.99	

PROJECT STATION:1711

DATE:29/ 7/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1701
start stop duration Long E 1132
TIME :12:24:53 12:30:49 6 (min) Purpose code: 1
LOG :5172.06 5172.44 0.37 Area code : 3
FDEPTH: 65 65 GearCond.code:
BDEPTH: 100 100 Validity code:
Towing dir: 90° Wire out: 230 m Speed: 40 kn*10

Sorted: 20 Kg Total catch: 49.00 CATCH/HOUR: 490.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	410.00	54050	83.67	4173
Etrumeus whiteheadi	80.00	3520	16.33	4174
Total	490.00		100.00	

PROJECT STATION:1712

DATE:29/ 7/98 GEAR TYPE: BT No: 1 POSITION:Lat S 1655
start stop duration Long E 1127
TIME :16:27:15 16:41:10 14 (min) Purpose code: 1
LOG :5206.99 5207.66 0.66 Area code : 3
FDEPTH: 119 122 GearCond.code: 1
BDEPTH: 119 122 Validity code: 1
Towing dir: 350° Wire out: 430 m Speed: 30 kn*10

Sorted: 124 Kg Total catch: 620.00 CATCH/HOUR: 2657.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	1611.43	63536	60.65	4175
Dentex macrophthalmus	604.29	6900	22.74	
Merluccius polli	235.71	1479	8.87	
Callorhinchus capensis	98.57	64	3.71	
Pterothrissus belloci	51.43	471	1.94	
Pteroscion peli	21.43	107	0.81	
Chelidonichthys capensis	17.14	21	0.65	
Etrumeus whiteheadi	12.86	300	0.48	
Zenopsis conchifer	4.29	21	0.16	
Total	2657.15		100.01	

PROJECT STATION:1713

DATE:29/ 7/98 GEAR TYPE: P7 No: 7 POSITION:Lat S 1655
start stop duration Long E 1143
TIME :19:11:00 19:30:00 19 (min) Purpose code: 1
LOG :5226.70 5227.70 1.00 Area code : 3
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 22 26 Validity code: 1
Towing dir: 360° Wire out: 150 m Speed: 35 kn*10

Sorted: 103 Kg Total catch: 412.00 CATCH/HOUR: 1301.05

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis sp.	1301.05	80488	100.00	4176
Total	1301.05		100.00	

PROJECT STATION:1714

DATE:30/ 7/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1644
start stop duration Long E 1108
TIME :03:32:35 03:58:58 26 (min) Purpose code: 1
LOG :5297.98 5299.55 1.55 Area code : 3
FDEPTH: 160 160 GearCond.code: 1
BDEPTH: 1300 Validity code: 1
Towing dir: 270° Wire out: 600 m Speed: 40 kn*10

Sorted: 69 Kg Total catch: 171.66 CATCH/HOUR: 396.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	274.62	1685	69.32	4177
MELANOSTOMIATIDAE	34.62	1495	8.74	
Shrimps, small, non comm.	26.26		6.63	
Yarrella blackfordi	23.08	162	5.83	
Zenopsis conchifer	17.31	30	4.37	
Small squids	6.35	7	1.60	
MYCTOPHIDAE	4.62	134	1.17	
Melanostomias sp.	3.99	7	1.01	
Lampadena sp.	2.88	277	0.73	
Xenodermichthys copei	1.73	272	0.44	
Hoplostethus cadenati	0.58	30	0.15	
Nemichthys scolopaceus	0.12	12	0.03	
Shrimps, small, non comm.	0.00			
MYCLA09	0.00			
MYCLA04	0.00			
ALEYY02	0.00			
ALEXX02	0.00			
Total	396.16		100.02	

PROJECT STATION:1715

DATE:30/ 7/98 GEAR TYPE: BT No: 1 POSITION:Lat S 1643
start stop duration Long E 1121
TIME :07:00:10 07:14:33 14 (min) Purpose code: 1
LOG :5317.92 5318.68 0.76 Area code : 3
FDEPTH: 135 148 GearCond.code: 1
BDEPTH: 135 148 Validity code: 1
Towing dir: 270° Wire out: 450 m Speed: 32 kn*10

Sorted: 124 Kg Total catch: 1662.24 CATCH/HOUR: 7123.89

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	6708.56	150951	94.17	4178
Merluccius polli	199.63	407	2.80	
Peristedion cataphractum	47.44	60	0.67	
Dentex macrophthalmus	46.29	60	0.65	
Citharus linguatula	36.47	60	0.51	
Zenopsis conchifer	27.00	347	0.38	
Todaropsis eblanae	24.90	60	0.35	
Small squids	14.49	60	0.20	
Zeus faber	11.57	60	0.16	
Scorpaena normani	7.54	60	0.11	
SQUOMS1	0.00			
Total	7123.89		100.00	

PROJECT STATION:1716

DATE:30/ 7/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1644
start stop duration Long E 1141
TIME :10:22:37 10:52:27 30 (min) Purpose code: 1
LOG :5341.37 5342.95 1.55 Area code : 3
FDEPTH: 25 51 GearCond.code:
BDEPTH: 25 51 Validity code:
Towing dir: 270° Wire out: 200 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 3337.00 CATCH/HOUR: 6674.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	4150.00	302706	62.18	4179
Trachurus trecae	1916.00	118154	28.71	4180
Etrumeus whiteheadi	560.00	27000	8.39	4181
Chelidonichthys capensis	40.00	200	0.60	
Maja squinado	8.00	200	0.12	
Total	6674.00		100.00	

PROJECT STATION:1717

DATE:30/ 7/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1639
start stop duration Long E 1132
TIME :12:45:58 12:56:00 10 (min) Purpose code: 1
LOG :5359.01 5359.49 0.47 Area code : 3
FDEPTH: 102 100 GearCond.code:
BDEPTH: 102 100 Validity code:
Towing dir: 90° Wire out:4003 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 3895.00 CATCH/HOUR: 23370.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	22875.00	957138	97.88	4182
Merluccius polli	427.50	3750	1.83	
Etrumeus whiteheadi	45.00	750	0.19	
Dentex macrophthalmus	22.50	750	0.10	
Total	23370.00		100.00	

PROJECT STATION:1718

DATE:30/ 7/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1637
start stop duration Long E 1119
TIME :14:57:30 15:15:43 18 (min) Purpose code: 1
LOG :5376.14 5377.25 1.11 Area code : 3
FDEPTH: 200 200 GearCond.code:
BDEPTH: 372 408 Validity code:
Towing dir: 360° Wire out: 700 m Speed: 40 kn*10

Sorted: 115 Kg Total catch: 7489.80 CATCH/HOUR: 24966.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	22180.00	200820	88.84	4183
Merluccius capensis	1400.00	7600	5.61	
Zenopsis conchifer	1080.00	3200	4.33	
Lepidopus caudatus	120.00	200	0.48	
MYCTOPHIDAE	100.00		0.40	
Dentex macrophthalmus	86.00	200	0.34	
Total	24966.00		100.00	

PROJECT STATION:1719

DATE:30/ 7/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1631
start stop duration Long E 1125
TIME :21:11:42 21:20:24 9 (min) Purpose code: 1
LOG :5432.31 5432.86 0.53 Area code : 3
FDEPTH: 250 31 GearCond.code: 1
BDEPTH: 114 118 Validity code: 1
Towing dir: 270° Wire out: 125 m Speed: 40 kn*10

Sorted: 99 Kg Total catch: 958.30 CATCH/HOUR: 6388.67

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	6388.67	95540	100.00	4184
Total	6388.67		100.00	

PROJECT STATION:1720

DATE:31/ 7/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1631
start stop duration Long E 1144
TIME :05:22:07 05:32:24 10 (min) Purpose code: 1
LOG :5493.73 5494.31 0.55 Area code : 3
FDEPTH: 25 24 GearCond.code: 1
BDEPTH: 25 24 Validity code: 1
Towing dir: 180° Wire out: 125 m Speed: 30 kn*10

Sorted: 178 Kg Total catch: 5202.47 CATCH/HOUR: 31214.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	31066.08	1732872	99.52	4185
Myliobatis aquila	149.82	174	0.48	
Total	31215.90		100.00	

PROJECT STATION:1721

DATE:31/ 7/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1617
start stop duration Long E 1136
TIME :11:40:21 12:10:18 30 (min) Purpose code: 1
LOG :5545.39 5546.93 1.51 Area code : 3
FDEPTH: 78 83 GearCond.code:
BDEPTH: 78 83 Validity code:
Towing dir: 270° Wire out: 320 m Speed: 30 kn*10

Sorted: 92 Kg Total catch: 1468.80 CATCH/HOUR: 2937.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	1465.60	14150	49.89	
Trachurus trecae	921.60	11612	31.37	4176
Trachurus capensis	184.32	2950	6.27	4177
Loligo vulgaris	104.00	384	3.54	
Mustelus mustelus	83.20	96	2.83	
Squalus megalops	73.60	160	2.51	
Pagellus bellottii	57.60	512	1.96	
Trigla lyra	16.00	64	0.54	
Sepia officinalis hierredda	14.72	64	0.50	
Zeus faber	12.80	96	0.44	
Dentex barnardi	2.24	32	0.08	
Dentex canariensis	1.92	32	0.07	
Total	2937.60		100.00	

PROJECT STATION:1722

DATE:31/ 7/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1610
start stop duration Long E 1147
TIME :14:50:22 15:00:54 11 (min) Purpose code: 1
LOG :5570.48 5571.11 0.62 Area code : 3
FDEPTH: 29 31 GearCond.code:
BDEPTH: 29 31 Validity code:
Towing dir: 190° Wire out: 80 m Speed: 40 kn*10

Sorted: Kg Total catch: 1.23 CATCH/HOUR: 6.71

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	4.15	185	61.85	4178
Schedophilus pemarco	2.02	5	30.10	
Decapterus rhonchus	0.55	11	8.20	
Total	6.72		100.15	

PROJECT STATION:1723

DATE:31/ 7/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1610
start stop duration Long E 1132
TIME :17:08:30 17:27:28 19 (min) Purpose code: 1
LOG :5589.78 5591.00 1.21 Area code : 3
FDEPTH: 200 170 GearCond.code: 1
BDEPTH: 842 841 Validity code: 1
Towing dir: 18° Wire out: 750 m Speed: 40 kn*10

Sorted: 91 Kg Total catch: 392.90 CATCH/HOUR: 1240.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	966.73	8492	77.92	4179
Zenopsis conchifer	211.26	669	17.03	
Shrimps, small, non comm.	20.24	5005	1.63	
MYCTOPHIDAE	13.39	3041	1.08	
Yarrella blackfordi	9.98	164	0.80	
Beryx splendens	7.52	54	0.61	
Merluccius polli	5.46	28	0.44	
Trachurus trecae	3.41	28	0.27	
GONOSTOMATIDAE	2.75	54	0.22	
MERMEL0	0.00			
MZRME03	0.00			
Total	1240.74		100.00	

PROJECT STATION:1724

DATE:31/ 7/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1558
start stop duration Long E 1144
TIME :21:57:56 22:12:56 15 (min) Purpose code: 1
LOG :5625.61 5626.37 0.76 Area code : 3
FDEPTH: 24 26 GearCond.code:
BDEPTH: 24 26 Validity code:
Towing dir: 270° Wire out: 125 m Speed: 30 kn*10

Sorted: 36 Kg Total catch: 128.00 CATCH/HOUR: 512.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	155.20	1952	30.31	4180
Pomadasys incisus	76.00	1200	14.84	
Pagellus bellottii	60.00	1424	11.72	
Dentex barnardi	47.20	624	9.22	
Lithognathus mormyrus	40.80	48	7.97	
Atractoscion aequidens	38.40	32	7.50	
Sepia officinalis hierredda	34.40	16	6.72	
Sphyraena sphyraena	31.20	32	6.09	
Gymnura altavela	12.20	4	2.38	
Dasyatis marmorata	11.00	4	2.15	
Umbrina canariensis	3.04	64	0.59	
Trachinus armatus	2.56	80	0.50	
Total	512.00		99.99	

PROJECT STATION:1725

DATE: 1/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1556
start stop duration Long E 1130
TIME :00:08:20 00:38:07 30 (min) Purpose code: 1
LOG :5643.83 5645.75 1.87 Area code : 3
FDEPTH: 50 100 GearCond.code:
BDEPTH: 1265 1204 Validity code:
Towing dir: 90° Wire out: 350 m Speed: 40 kn*10

Sorted: 57 Kg Total catch: 227.08 CATCH/HOUR: 454.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	308.80	1950	67.99	4181
MELANOSTOMIATIDAE	104.00	5138	22.90	
Yarrella blackfordi	23.20	2526	5.11	
Centrolophus niger	5.60	16	1.23	
MELANOSTOMIATIDAE	4.00	280	0.88	
Trachipterus sp.	3.20	8	0.70	
Zenopsis conchifer	2.80	8	0.62	
Hoplostethus cadenati	0.80	48	0.18	
MYCTOPHIDAE	0.80	280	0.18	
Nemichthys scolopaceus	0.80	120	0.18	
Gadella imberbis	0.08	16	0.02	
PARALEPIDIDAE	0.08	16	0.02	
Melanocetus johnsoni	0.00	8		
Total	454.16		100.01	

PROJECT STATION:1726

DATE: 1/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1536
start stop duration Long E 1159
TIME :07:19:18 07:34:06 15 (min) Purpose code: 1
LOG :5702.49 5703.25 0.75 Area code : 3
FDEPTH: 55 64 GearCond.code: 1
BDEPTH: 55 64 Validity code: 1
Towing dir: 216° Wire out: 250 m Speed: 30 kn*10

Sorted: 131 Kg Total catch: 500.12 CATCH/HOUR: 2000.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	567.72	4116	28.38	
Dentex barnardi	308.28	1876	15.41	
Trachurus trecae	307.32	2844	15.36	4182
Plectorhinchus mediterraneus	161.00	212	8.05	
Dentex macrophthalmus	144.20	1668	7.21	
Squatina aculeata	103.00	4	5.15	
Pomadasys incisus	84.28	492	4.21	
Parapristipoma octolineatum	69.32	296	3.47	
Boops boops	44.08	240	2.20	
Lithognathus mormyrus	37.12	168	1.86	
Diplodus cervinus cervinus	29.40	56	1.47	
Dentex gibbosus	28.00	84	1.40	
Argyrosomus hololepidotus	27.44	84	1.37	
Rhinobatos albomaculatus	24.20	8	1.21	
Dasyatis marmorata	17.60	12	0.88	
Pseudotolithus typus	16.00	16	0.80	
Squalus megalops	13.20	20	0.66	
Squatina oculata	10.60	4	0.53	
Pomadasys jubelini	4.92	16	0.25	
Pseudupeneus prayensis	2.80	16	0.14	
Total	2000.48		100.01	

PROJECT STATION:1727

DATE: 1/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1514
start stop duration Long E 1155
TIME :15:35:37 15:45:59 10 (min) Purpose code: 1
LOG :5777.30 5777.85 0.54 Area code : 3
FDEPTH: 200 200 GearCond.code:
BDEPTH: 344 349 Validity code:
Towing dir: 344° Wire out: 700 m Speed: 40 kn*10

Sorted: Kg Total catch: 0.14 CATCH/HOUR: 0.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenopsis conchifer	0.84	18	100.00	
Total	0.84		100.00	

PROJECT STATION:1728

DATE: 1/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1505
start stop duration Long E 1204
TIME :19:00:53 19:15:00 14 (min) Purpose code: 1
LOG :5803.01 5803.96 0.93 Area code : 3
FDEPTH: 30 30 GearCond.code: 1
BDEPTH: 511 283 Validity code: 1
Towing dir: 63° Wire out: 125 m Speed: 40 kn*10

Sorted: 131 Kg Total catch: 1764.87 CATCH/HOUR: 7563.73

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	6422.14	61273	84.91	4184
Trachurus capensis	1044.34	6827	13.81	4183
Albula vulpes	75.21	116	0.99	
MYCTOPHIDAE	14.49	8854	0.19	
Trichiurus lepturus	7.54	176	0.10	
Total	7563.72		100.00	

PROJECT STATION:1729

DATE: 2/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1358
start stop duration Long E 1217
TIME :10:34:45 10:49:29 15 (min) Purpose code: 1
LOG :5947.56 5948.35 0.77 Area code : 3
FDEPTH: 125 146 GearCond.code:
BDEPTH: 125 146 Validity code:
Towing dir: 264° Wire out: 400 m Speed: 30 kn*10

Sorted: 95 Kg Total catch: 1137.00 CATCH/HOUR: 4548.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	3384.00	19740	74.41	4185
Trachurus trecae	1024.80	13216	22.53	4186
Trichiurus lepturus	50.40	32	1.11	
Pagellus bellottii	31.20	384	0.69	
Dentex gibbosus	26.40	48	0.58	
Lagocephalus laevigatus	12.00	32	0.26	
Illex coindetii	12.00	432	0.26	
Boops boops	7.20	32	0.16	
Total	4548.00		100.00	

PROJECT STATION:1730

DATE: 2/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1354
start stop duration Long E 1224
TIME :13:10:03 13:24:23 14 (min) Purpose code: 1
LOG :5967.78 5968.60 0.80 Area code : 3
FDEPTH: 50 50 GearCond.code:
BDEPTH: 88 91 Validity code:
Towing dir: 350° Wire out: 200 m Speed: 40 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
N O C A T C H	0.00			

PROJECT STATION:1731

DATE: 2/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 1340
start stop duration Long E 1229
TIME :17:16:56 17:17:45 1 (min) Purpose code: 1
LOG :6002.10 6002.12 0.02 Area code : 3
FDEPTH: 80 80 GearCond.code: 1
BDEPTH: 116 116 Validity code: 1
Towing dir: 260° Wire out: 420 m Speed: 35 kn*10

Sorted: Kg Total catch: 7.30 CATCH/HOUR: 438.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	258.00	2100	58.90	4187
Trachurus capensis	141.00	600	32.19	4188
Boops boops	21.00	180	4.79	
Todaropsis eblanae	18.00	240	4.11	
Total	438.00		99.99	

PROJECT STATION:1732

DATE: 2/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1330
start stop duration Long E 1231
TIME :20:49:39 21:19:28 30 (min) Purpose code: 1
LOG :6028.41 6030.37 1.94 Area code : 3
FDEPTH: 20 20 GearCond.code: 1
BDEPTH: 604 744 Validity code: 1
Towing dir: 220° Wire out: 100 m Speed: 40 kn*10

Sorted: 76 Kg Total catch: 191.13 CATCH/HOUR: 382.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	194.26	7836	50.82	
Trachurus trecae	146.00	1056	38.19	4189
Trichiurus lepturus	42.00	226	10.99	
Total	382.26		100.00	

PROJECT STATION:1733

DATE: 3/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1312
start stop duration Long E 1237
TIME :01:43:59 01:59:08 15 (min) Purpose code: 3
LOG :6065.63 6066.72 1.06 Area code : 1
FDEPTH: 20 20 GearCond.code:
BDEPTH: 453 770 Validity code:
Towing dir: 270° Wire out: 150 m Speed: 40 kn*10

Sorted: 78 Kg Total catch: 222.95 CATCH/HOUR: 891.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	759.60		85.18	
Trachurus trecae	83.40	612	9.35	4190
Prionace glauca	19.40	4	2.18	
Trachipterus sp.	16.80	24	1.88	
Centrolophus niger	7.80	24	0.87	
Trichiurus lepturus	4.20	36	0.47	
MELANOSTOMIATIDAE	0.60	24	0.07	
Total	891.80		100.00	

PROJECT STATION:1734

DATE: 3/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1258
start stop duration Long E 1247
TIME :17:47:06 18:02:09 15 (min) Purpose code: 1
LOG :6110.40 6111.50 1.09 Area code : 3
FDEPTH: 20 20 GearCond.code: 1
BDEPTH: 629 366 Validity code: 1
Towing dir: 140° Wire out: 100 m Speed: 40 kn*10

Sorted: 116 Kg Total catch: 267.15 CATCH/HOUR: 1068.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	625.16	395920	58.50	
Trachurus trecae	370.76	2540	34.70	4191
Trichiurus lepturus	59.80	248	5.60	
Sarda sarda	12.88	8	1.21	
Total	1068.60		100.01	

PROJECT STATION:1735

DATE: 3/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1257
start stop duration Long E 1252
TIME :19:40:15 19:52:05 12 (min) Purpose code: 1
LOG :6124.02 6124.78 0.75 Area code : 3
FDEPTH: 40 40 GearCond.code: 1
BDEPTH: 79 81 Validity code: 1
Towing dir: 200° Wire out: 150 m Speed: 40 kn*10

Sorted: 132 Kg Total catch: 297.03 CATCH/HOUR: 1485.15

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1428.75	8110	96.20	4192
MYCTOPHIDAE	53.45	24220	3.60	
Boops boops	2.95	10	0.20	
Total	1485.15		100.00	

PROJECT STATION:1736

DATE: 4/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 1235
start stop duration Long E 1308
TIME :01:44:09 02:03:49 20 (min) Purpose code: 1
LOG :6171.79 6172.83 1.00 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 540 440 Validity code:
Towing dir: 200° Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 180.00 CATCH/HOUR: 540.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	540.00		100.00	
Total	540.00		100.00	

PROJECT STATION:1737

DATE: 4/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1220
start stop duration Long E 1320
TIME :10:10:08 10:27:53 18 (min) Purpose code: 1
LOG :6231.51 6232.48 0.97 Area code : 2
FDEPTH: 280 300 GearCond.code:
BDEPTH: 499 507 Validity code:
Towing dir: 30° Wire out: 900 m Speed: 35 kn*10

Sorted: Kg Total catch: 50.00 CATCH/HOUR: 166.67

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alopias superciliosus	166.67	3	100.00	
Total	166.67		100.00	

PROJECT STATION:1738

DATE: 4/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1216
start stop duration Long E 1322
TIME :15:33:23 16:08:57 36 (min) Purpose code: 1
LOG :6270.92 6273.07 2.11 Area code : 2
FDEPTH: 300 300 GearCond.code:
BDEPTH: 538 523 Validity code:
Towing dir: 206° Wire out:1000 m Speed: 40 kn*10

Sorted: Kg Total catch: 110.23 CATCH/HOUR: 183.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	150.00		81.65	
Alopias superciliosus	33.33	2	18.14	
Brama brama	0.38	2	0.21	
Total	183.71		100.00	

PROJECT STATION:1739

DATE: 5/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 1217
start stop duration Long E 1334
TIME :02:04:55 02:34:36 30 (min) Purpose code: 1
LOG :6352.34 6354.08 1.73 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 53 70 Validity code:
Towing dir: 294° Wire out: 150 m Speed: 40 kn*10

Sorted: 68 Kg Total catch: 263.80 CATCH/HOUR: 527.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	404.00	3210	76.57	4193
Sardinella maderensis	90.40	248	17.13	4194
Trichiurus lepturus	24.40	296	4.62	
Sarda sarda	5.20	4	0.99	
Lolligoncula mercatoris	2.40		0.45	
Sepia sp.	1.20	8	0.23	
Total	527.60		99.99	

PROJECT STATION:1740

DATE: 5/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1206
start stop duration Long E 1341
TIME :08:37:43 08:59:24 22 (min) Purpose code: 1
LOG :6404.88 6406.05 1.16 Area code : 2
FDEPTH: 26 33 GearCond.code:
BDEPTH: 26 33 Validity code:
Towing dir: 285° Wire out: 150 m Speed: 30 kn*10

Sorted: 91 Kg Total catch: 190.78 CATCH/HOUR: 520.31

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	111.27	551	21.39	4195
Pomadasys jubelini	83.45	136	16.04	
Trichiurus lepturus	54.00	513	10.38	
Pomadasys incisus	38.73	311	7.44	
Pteroscion peli	31.64	905	6.08	
Stromateus fiatola	30.55	55	5.87	
Pseudotolithus typus	22.91	22	4.40	
Brachydeuterus auritus	18.82	715	3.62	
Lagocephalus laevigatus	15.55	55	2.99	
Sepia bertheloti	13.69	16	2.63	
Branchiostegus semifasciatus	13.64	93	2.62	
Pagellus bellottii	13.64	55	2.62	
Lithognathus mormyrus	13.64	33	2.62	
Conger conger	10.36	3	1.99	
Ilisha africana	7.64	82	1.47	
Atractoscion aequidens	6.00	16	1.15	
Raja miraletus	5.45	5	1.05	
Selene dorsalis	4.64	5	0.89	
Sardinella maderensis	4.64	11	0.89	
Penaeus notialis	4.09	109	0.79	
Rhinobatos rhinobatos	3.82	5	0.73	
Dentex barnardi	2.67	11	0.51	
Syacium micrurum	2.35	22	0.45	
Dicologoglossa hexophthalma	2.29	38	0.44	
Zeus faber	1.64	5	0.32	
Chloroscombrus chrysurus	1.15	5	0.22	
Bembrops heterurus	0.98	11	0.19	
Sepia orbignyana	0.82	11	0.16	
Torpedo torpedo	0.27	5	0.05	
Total	520.34		100.00	

PROJECT STATION:1741

DATE: 5/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 1159
start stop duration Long E 1343
TIME :10:10:05 10:50:32 40 (min) Purpose code: 1
LOG :6414.29 6416.66 2.34 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 27 31 Validity code:
Towing dir: 211° Wire out: 150 m Speed: 37 kn*10

Sorted: 59 Kg Total catch: 59.05 CATCH/HOUR: 88.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	51.45	146	58.08	4196
Trichiurus lepturus	20.70	51	23.37	
Selene dorsalis	4.50	11	5.08	
Trachurus trecae	4.05	24	4.57	4197
Sardinella aurita	2.25	6	2.54	4198
Scomberomorus tritor	2.10	2	2.37	
Sphyraena sphyraena	1.80	6	2.03	
Lithognathus mormyrus	0.53	2	0.60	
Loligo vulgaris	0.45	2	0.51	
Chloroscombrus chrysurus	0.30	2	0.34	
Dicologoglossa cuneata	0.23	3	0.26	
Dasyatis margarita	0.23	2	0.26	
Total	88.59		100.01	

PROJECT STATION:1742

DATE: 5/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1157
start stop duration Long E 1327
TIME :13:22:10 13:56:01 34 (min) Purpose code: 1
LOG :6439.22 6441.12 1.88 Area code : 2
FDEPTH: 300 300 GearCond.code:
BDEPTH: 364 347 Validity code:
Towing dir: 360° Wire out:1000 m Speed: 40 kn*10

Sorted: 1 Kg Total catch: 83.30 CATCH/HOUR: 147.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus sp.	88.24	110128	60.03	
Krill	44.12	81446	30.01	
MYCTOPHIDAE	12.35	11808	8.40	
Zenopsis conchifer	1.76	35	1.20	
PARALEPIDIDAE	0.35	18	0.24	
Trichiurus lepturus	0.18	18	0.12	
Total	147.00		100.00	

PROJECT STATION:1743

DATE: 6/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1142
start stop duration Long E 1340
TIME :02:52:01 00:22:45 31 (min) Purpose code: 1
LOG :6532.89 6534.84 1.93 Area code : 2
FDEPTH: 45 30 GearCond.code:
BDEPTH: 60 60 Validity code:
Towing dir: 340° Wire out: 130 m Speed: 40 kn*10

Sorted: 69 Kg Total catch: 137.94 CATCH/HOUR: 266.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	237.29	1548	88.88	4199
Trichiurus lepturus	25.16	120	9.42	
Sepia officinalis hierredda	2.32	8	0.87	
Sphyraena sphyraena	1.74	4	0.65	
Saurida brasiliensis	0.46	97	0.17	
Total	266.97		99.99	

PROJECT STATION:1744

DATE: 6/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 1140
start stop duration Long E 1345
TIME :02:11:02 02:30:10 19 (min) Purpose code: 1
LOG :6549.79 6551.00 1.20 Area code : 2
FDEPTH: 15 15 GearCond.code:
BDEPTH: 32 34 Validity code:
Towing dir: 225° Wire out: 120 m Speed: 40 kn*10

Sorted: 85 Kg Total catch: 85.45 CATCH/HOUR: 269.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	216.00	783	80.05	4201
Engraulis encrasicolus	20.05	4011	7.43	
Sardinella aurita	14.84	47	5.50	4200
Brachydeuterus auritus	9.63	685	3.57	
Trachurus trecae	6.32	38	2.34	4202
Trichiurus lepturus	2.21	9	0.82	
Decapterus rhonchus	0.79	3	0.29	
Total	269.84		100.00	

PROJECT STATION:1745

DATE: 6/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1134
start stop duration Long E 1333
TIME :08:24:46 08:54:23 30 (min) Purpose code: 1
LOG :6605.58 6607.07 1.48 Area code : 2
FDEPTH: 91 99 GearCond.code:
BDEPTH: 91 99 Validity code:
Towing dir: 270° Wire out: 300 m Speed: 30 kn*10

Sorted: 122 Kg Total catch: 490.50 CATCH/HOUR: 981.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	576.80	3168	58.80	4203
Dentex macrophthalmus	344.00	2528	35.07	
Sarda sarda	13.60	8	1.39	
Selene dorsalis	8.40	24	0.86	
Trichiurus lepturus	6.00	24	0.61	
Torpedo torpedo	5.60	8	0.57	
Branchiostegus semifasciatus	5.20	8	0.53	
Pagellus bellottii	4.80	8	0.49	
Octopus vulgaris	3.80	2	0.39	
Zeus faber	3.20	24	0.33	
Todaropsis eblanae	2.88	8	0.29	
Pagrus africanus	2.48	8	0.25	
Pterothrissus belloci	2.40	8	0.24	
Chelidonichthys capensis	1.20	8	0.12	
Synagrops microlepis	0.56	104	0.06	
Syacium micrurum	0.40	8	0.04	
Saurida brasiliensis	0.08	16	0.01	
Total	981.40		100.05	

PROJECT STATION:1746

DATE: 6/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1133
start stop duration Long E 1341
TIME :10:24:34 10:43:44 19 (min) Purpose code: 1
LOG :6619.13 6620.16 1.02 Area code : 2
FDEPTH: 35 38 GearCond.code:
BDEPTH: 35 38 Validity code:
Towing dir: 270° Wire out: 150 m Speed: 30 kn*10

Sorted: 235 Kg Total catch: 235.18 CATCH/HOUR: 742.67

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	556.36	2331	74.91	4204
Pomadasys incisus	32.84	224	4.42	
Brachydeuterus auritus	26.84	1055	3.61	
Epinephelus costae	22.67	54	3.05	
Dentex barnardi	20.84	82	2.81	
Stromateus fiatola	9.79	47	1.32	
Plectorhinchus mediterraneus	9.47	19	1.28	
Rhinobatos albomaculatus	8.53	3	1.15	
Pagellus bellottii	7.11	38	0.96	
Pseudupeneus prayensis	6.32	51	0.85	
Trichiurus lepturus	5.21	13	0.70	
Decapterus rhonchus	4.74	57	0.64	
Chaetodon hoefleri	4.58	28	0.62	
Atractoscion aequidens	4.42	6	0.60	
Octopus vulgaris	4.11	3	0.55	
Pomadasys jubelini	3.16	3	0.43	
Balistes capriscus	2.84	3	0.38	
Sphyraena sphyraena	2.37	6	0.32	
Loligo vulgaris	2.05	3	0.28	
Lithognathus mormyrus	1.89	3	0.25	
Sepia officinalis hierredda	1.42	3	0.19	
Selene dorsalis	1.26	3	0.17	
Trachurus trecae, juvenile	1.11	164	0.15	
Fistularia petimba	0.47	3	0.06	
Alloteuthis africana	0.32		0.04	
Total	740.72		99.74	

PROJECT STATION:1747

DATE: 6/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1124
start stop duration Long E 1332
TIME :15:17:12 15:36:48 20 (min) Purpose code: 1
LOG :6666.32 6667.36 1.02 Area code : 2
FDEPTH: 57 53 GearCond.code:
BDEPTH: 57 53 Validity code:
Towing dir: 8° Wire out: 420 m Speed: 30 kn*10

Sorted: 97 Kg Total catch: 96.60 CATCH/HOUR: 289.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	165.30	819	57.04	4205
Dentex barnardi	71.10	297	24.53	
Pomadasys incisus	19.35	78	6.68	
Pseudupeneus prayensis	9.30	60	3.21	
Decapterus rhonchus	7.50	9	2.59	
Epinephelus costae	5.40	9	1.86	
Dentex gibbosus	3.75	9	1.29	
Torpedo torpedo	1.35	3	0.47	
Chaetodon hoefleri	1.35	9	0.47	
Zeus faber	1.20	3	0.41	
Alloteuthis africana	1.05	3	0.36	
Plectorhinchus mediterraneus	1.05	3	0.36	
Fistularia petimba	0.75	9	0.26	
Trachurus trecae	0.45	3	0.16	
Uranoscopus polli	0.30	3	0.10	
Trachinus armatus	0.30	6	0.10	
Lepidotrigla cadmani	0.30	6	0.10	
Total	289.80		99.99	

PROJECT STATION:1748

DATE: 6/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1123
start stop duration Long E 1339
TIME :16:40:45 16:40:48 20 (min) Purpose code: 1
LOG :6675.67 6676.75 1.06 Area code : 2
FDEPTH: 38 42 GearCond.code: 1
BDEPTH: 38 42 Validity code: 2
Towing dir: 273° Wire out: 150 m Speed: 30 kn*10

Sorted: 128 Kg Total catch: 192.41 CATCH/HOUR: 577.23

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	246.60	9501	42.72	
Pomadasys incisus	69.75	393	12.08	
Pteroscion peli	47.49	729	8.23	
Pagellus bellottii	39.84	189	6.90	
Pseudotolithus typus	31.95	45	5.54	
Chelidonichthys capensis	31.83	177	5.51	
Trichiurus lepturus	27.45	69	4.76	
Sepia orbignyana	11.25	105	1.95	
Sphyraena guachancho	10.80	15	1.87	
Trachurus trecae	8.55	54	1.48	4206
Trachurus trecae, juvenile	6.54	1008	1.13	4207
Sepia officinalis hierredda	6.30	18	1.09	
Pomadasys jubelini	5.40	9	0.94	
Cynoglossus canariensis	4.74	15	0.82	
Syacium micrurum	4.74	141	0.82	
Raja miraletus	4.29	6	0.74	
Galeoides decadactylus	3.84	45	0.67	
Argyrosomus hololepidotus	3.84	9	0.67	
Epinephelus aeneus	3.39	6	0.59	
Bembrops heterurus	2.25	33	0.39	
Dentex barnardi	2.04	6	0.35	
Lithognathus mormyrus	1.80	6	0.31	
Octopus macropus	1.59	6	0.28	
Zeus faber	1.14	6	0.20	
Total	577.41		100.04	

PROJECT STATION:1749

DATE: 6/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1123
start stop duration Long E 1340
TIME :17:46:33 18:06:17 20 (min) Purpose code: 1
LOG :6681.58 6682.86 1.26 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 33 37 Validity code:
Towing dir: 270° Wire out: 160 m Speed: 35 kn*10

Sorted: 133 Kg Total catch: 965.70 CATCH/HOUR: 2897.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	1152.75	3873	39.79	4209
Brachydeuterus auritus	1001.58	8895	34.57	
Trachurus trecae	504.60	2871	17.42	4208
Pomadasys rogeri	82.65	153	2.85	
Atractoscion aequidens	46.77	45	1.61	
Sphyraena sphyraena	40.23	45	1.39	
Sepia officinalis hierredda	32.64	45	1.13	
Galeoides decadactylus	19.59	153	0.68	
Trichiurus lepturus	10.89	45	0.38	
Sepia orbignyana	5.43	21	0.19	
Total	2897.13		100.01	

PROJECT STATION:1750

DATE: 6/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1118
start stop duration Long E 1330
TIME :21:33:40 21:53:02 19 (min) Purpose code:
LOG :6708.36 6709.53 1.16 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 368 318 Validity code:
Towing dir: 90° Wire out: 160 m Speed: 35 kn*10

Sorted: Kg Total catch: 2.45 CATCH/HOUR: 7.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	7.74	28	100.00	
Total	7.74		100.00	

PROJECT STATION:1751

DATE: 7/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 1108
start stop duration Long E 1347
TIME :02:21:49 02:58:29 37 (min) Purpose code: 1
LOG :6749.89 6752.05 2.14 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 50 63 Validity code:
Towing dir: 272° Wire out: 150 m Speed: 30 kn*10

Sorted: 76 Kg Total catch: 177.58 CATCH/HOUR: 287.97

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	196.22	623	68.14	4211
Trachurus trecae	23.11	110	8.03	4212
Trichiurus lepturus	20.27	143	7.04	
Brachydeuterus auritus	16.62	135	5.77	
Sepia officinalis hierredda	6.49	8	2.25	
Engraulis encrasicolus	6.49	1686	2.25	
Scomberomorus tritor	5.84	2	2.03	
Sardinella aurita	5.68	21	1.97	4210
Lagocephalus laevigatus	2.27	2	0.79	
Pomatomus saltatrix	2.11	2	0.73	
Rhizoprionodon acutus	1.46	2	0.51	
Alloteuthis africana	1.05		0.36	
Trachurus trecae, juvenile	0.54	94	0.19	
Trachinotus ovatus	0.49	2	0.17	
Total	288.64		100.23	

PROJECT STATION:1752

DATE: 7/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1057
start stop duration Long E 1346
TIME :09:53:00 10:13:00 20 (min) Purpose code: 1
LOG :6809.90 6810.90 1.00 Area code : 2
FDEPTH: 45 40 GearCond.code:
BDEPTH: 45 40 Validity code:
Towing dir: 270° Wire out: 150 m Speed: 30 kn*10

Sorted: 89 Kg Total catch: 533.58 CATCH/HOUR: 1600.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	1438.20	16092	89.85	
Pomadasys jubelini	30.96	36	1.93	
Trachurus trecae	28.80	144	1.80	4213
Trichiurus lepturus	18.90	90	1.18	
Arius parkii	16.38	18	1.02	
Selene dorsalis	12.60	36	0.79	
Argyrosomus hololepidotus	11.70	36	0.73	
Pteroscion peli	9.00	324	0.56	
Atractoscion aequidens	9.00	36	0.56	
Dentex gibbosus	7.20	18	0.45	
Chaetodon hoefleri	4.50	18	0.28	
Pegusa lascaris	3.60	90	0.22	
Epinephelus aeneus	3.60	18	0.22	
Pagellus bellottii	3.60	18	0.22	
Pomadasys incisus	1.80	18	0.11	
Cynoglossus canariensis	0.90	18	0.06	
Total	1600.74		99.98	

PROJECT STATION:1753

DATE: 7/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 1052
start stop duration Long E 1329
TIME :14:05:00 14:19:00 14 (min) Purpose code: 1
LOG :6846.07 6846.89 0.82 Area code : 2
FDEPTH: 80 95 GearCond.code:
BDEPTH: 144 157 Validity code:
Towing dir: 260° Wire out: 370 m Speed: 35 kn*10

Sorted: 1 Kg Total catch: 1.35 CATCH/HOUR: 5.79

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
STEMA01	4.29		74.09	
Trichiurus lepturus	1.29	4	22.28	
Zenopsis conchifer	0.21	4	3.63	
Total	5.79		100.00	

PROJECT STATION:1754

DATE: 7/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1051
start stop duration Long E 1333
TIME :15:28:46 15:56:10 27 (min) Purpose code: 1
LOG :6854.99 6856.43 1.41 Area code : 2
FDEPTH: 112 118 GearCond.code:
BDEPTH: 112 118 Validity code:
Towing dir: 270° Wire out: 400 m Speed: 30 kn*10

Sorted: 126 Kg Total catch: 380.75 CATCH/HOUR: 846.11

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	386.67	2480	45.70	4215
Trachurus trecae	313.00	907	36.99	4214
Dentex angolensis	34.33	147	4.06	4216
Todaropsis eblanae	19.00	433	2.25	
Umbrina canariensis	14.00	60	1.65	
Atractoscion aequidens	12.67	13	1.50	
Boops boops	9.33	120	1.10	
Brotula barbata	9.00	27	1.06	
Scorpaena normani	7.33	40	0.87	
Brachydeuterus auritus	7.00	47	0.83	
Squatina oculata	6.78	2	0.80	
Raja miraletus	6.67	7	0.79	
Zeus faber	6.33	27	0.75	
Branchiostegus semifasciatus	3.33	7	0.39	
Trichiurus lepturus	3.33	7	0.39	
Dentex barnardi	3.00	13	0.35	
Uranoscopus polli	2.67	27	0.32	
Lepidotrigla cadmani	1.33	13	0.16	
Monolene microstoma	0.27	13	0.03	
Peristedion cataphractum	0.07	7	0.01	
Total	846.11		100.00	

PROJECT STATION:1755

DATE: 7/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1045
start stop duration Long E 1338
TIME :19:07:32 19:22:18 15 (min) Purpose code: 1
LOG :6883.75 6884.59 0.83 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 62 57 Validity code:
Towing dir: 90° Wire out: 150 m Speed: 35 kn*10

Sorted: Kg Total catch: 139.38 CATCH/HOUR: 557.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	305.00	1632	54.71	4217
Sardinella maderensis	154.20	452	27.66	4218
Trichiurus lepturus	65.20	244	11.69	
Brachydeuterus auritus	15.60	108	2.80	
Alloteuthis africana	5.40	2020	0.97	
Trachurus trecae, juvenile	4.32	108	0.77	
Pomatomus saltatrix	4.00	4	0.72	
Sphyraena guachancho	2.00	4	0.36	
Engraulis encrasicolus	1.80	684	0.32	
Total	557.52		100.00	

PROJECT STATION:1756

DATE: 8/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 1041
start stop duration Long E 1334
TIME :03:44:29 04:03:43 19 (min) Purpose code: 1
LOG :6956.08 6957.17 1.07 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 62 67 Validity code:
Towing dir: 270° Wire out: 150 m Speed: 40 kn*10

Sorted: 107 Kg Total catch: 746.55 CATCH/HOUR: 2357.53

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	1890.00	6278	80.17	4220
Trachurus trecae	265.26	1371	11.25	4221
Sardinella aurita	91.74	287	3.89	4219
Trichiurus lepturus	57.47	155	2.44	
Sarda sarda	28.74	22	1.22	
Scomber japonicus	13.26	22	0.56	
Lagocephalus laevigatus	11.05	22	0.47	
Total	2357.52		100.00	

PROJECT STATION:1757

DATE: 8/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 1035
start stop duration Long E 1340
TIME :06:45:37 07:05:18 20 (min) Purpose code: 1
LOG :6976.90 6978.15 1.25 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 22 21 Validity code:
Towing dir: 130° Wire out: 150 m Speed: 35 kn*10

Sorted: Kg Total catch: 107.75 CATCH/HOUR: 323.25

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena guachancho	116.40	171	36.01	
Pomadasys jubelini	59.70	84	18.47	
Brachydeuterus auritus	53.25	1077	16.47	
Sardinella maderensis	34.65	114	10.72	4223
Trachurus trecae	25.95	69	8.03	4222
Trichiurus lepturus	12.00	27	3.71	
Selene dorsalis	6.30	48	1.95	
Pomatomus saltatrix	6.15	6	1.90	
Stromateus fiatola	3.45	9	1.07	
Pomadasys incisus	2.55	9	0.79	
Lithognathus mormyrus	1.50	3	0.46	
Galeoides decadactylus	1.05	3	0.32	
Chloroscombrus chrysurus	0.30	12	0.09	
Total	323.25		99.99	

PROJECT STATION:1758

DATE: 8/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1033
start stop duration Long E 1314
TIME :11:27:27 11:48:07 21 (min) Purpose code: 1
LOG :7020.74 7021.79 1.02 Area code : 2
FDEPTH: 125 128 GearCond.code:
BDEPTH: 125 128 Validity code:
Towing dir: 265° Wire out: 450 m Speed: 30 kn*10

Sorted: 57 Kg Total catch: 111.74 CATCH/HOUR: 319.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	158.29	394	49.58	4224
Trichiurus lepturus	57.14	91	17.90	
Dentex angolensis	34.29	177	10.74	4225
Dentex macrophthalmus	20.57	86	6.44	4226
Raja miraletus	8.29	11	2.60	
Dentex gibbosus	7.71	6	2.41	
Todaropsis eblanae	6.00		1.88	
Zeus faber	6.00	23	1.88	
Atractoscion aequidens	5.71	3	1.79	
Umbrina canariensis	4.86	6	1.52	
Lepidotrigla cadmani	3.43	29	1.07	
Pagrus africanus	2.57	6	0.80	
Branchiostegus semifasciatus	2.00	6	0.63	
Dentex barnardi	1.14	6	0.36	
Peristedion cataphractum	0.57	11	0.18	
Uranoscopus polli	0.29	6	0.09	
Pagellus bellottii	0.29	6	0.09	
Monolene microstoma	0.06	6	0.02	
Merluccius polli	0.06	6	0.02	
Total	319.27		100.00	

PROJECT STATION:1759

DATE: 9/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1028
start stop duration Long E 1316
TIME :10:01:32 10:21:34 20 (min) Purpose code: 1
LOG :7076.32 7077.44 1.09 Area code : 2
FDEPTH: 103 99 GearCond.code:
BDEPTH: 103 99 Validity code:
Towing dir: 80° Wire out: 350 m Speed: 30 kn*10

Sorted: 71 Kg Total catch: 283.72 CATCH/HOUR: 851.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	567.60	1860	66.69	4227
Dentex macrophthalmus	199.20	1320	23.40	
Lagocephalus laevigatus	16.80	36	1.97	
Umbrina canariensis	15.00	24	1.76	
Raja miraletus	13.80	24	1.62	
Atractoscion aequidens	13.20	12	1.55	
Todaropsis eblanae	7.80	444	0.92	
Zeus faber	7.20	24	0.85	
Dentex gibbosus	4.80	84	0.56	
Synagrops microlepis	3.36	12	0.39	
Chelidonichthys capensis	2.40	12	0.28	
Total	851.16		99.99	

PROJECT STATION:1760

DATE: 9/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 1021
start stop duration Long E 1322
TIME :13:50:02 14:09:57 20 (min) Purpose code: 1
LOG :7113.25 7114.35 1.08 Area code : 2
FDEPTH: 64 70 GearCond.code:
BDEPTH: 64 70 Validity code:
Towing dir: 259° Wire out: 260 m Speed: 30 kn*10

Sorted: 94 Kg Total catch: 278.00 CATCH/HOUR: 834.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	576.90	2187	69.17	4228
Dentex barnardi	120.60	297	14.46	
Stromateus fiatola	55.35	81	6.64	
Pagellus bellottii	31.05	324	3.72	
Alloteuthis africana	11.70		1.40	
Raja miraletus	9.90	18	1.19	
Selene dorsalis	9.45	18	1.13	
Umbrina canariensis	5.85	45	0.70	
Atractoscion aequidens	4.20	3	0.50	
Pseudupeneus prayensis	3.60	36	0.43	
Chaetodon hoefleri	3.15	18	0.38	
Priacanthus arenatus	1.35	9	0.16	
Todaropsis eblanae	0.45	54	0.05	
Grammoplites gruveli	0.45	18	0.05	
Total	834.00		99.98	

PROJECT STATION:1761

DATE: 9/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1022
start stop duration Long E 1259
TIME :19:14:19 19:36:35 22 (min) Purpose code: 1
LOG :7159.66 7161.05 1.36 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 370 278 Validity code:
Towing dir: 78° Wire out: 150 m Speed: 35 kn*10

Sorted: 16 Kg Total catch: 122.85 CATCH/HOUR: 335.05

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	328.36	254482	98.00	
Ariomma bondi	3.82	19	1.14	
Trachipterus sp.	2.86	19	0.85	
Total	335.04		99.99	

PROJECT STATION:1762

DATE: 9/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 1011
start stop duration Long E 1324
TIME :23:19:38 23:43:57 24 (min) Purpose code: 1
LOG :7198.51 7200.13 1.58 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 23 29 Validity code:
Towing dir: 260° Wire out: 150 m Speed: 40 kn*10

Sorted: 103 Kg Total catch: 408.60 CATCH/HOUR: 1021.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	636.00	12720	62.26	
Sardinella maderensis	178.00	780	17.43	4230
Sardinella aurita	112.50	320	11.01	4229
Trichiurus lepturus	26.00	60	2.55	
Trachurus trecae	18.50	190	1.81	4231
Sphyraena guachancho	18.00	30	1.76	
Pomadasys jubelini	13.50	20	1.32	
Galeoides decadactylus	10.50	30	1.03	
Selene dorsalis	4.00	20	0.39	
Rhizoprionodon acutus	2.50	3	0.24	
Ilisha africana	2.00	20	0.20	
Total	1021.50		100.00	

PROJECT STATION:1763

DATE:10/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 1007
start stop duration Long E 1311
TIME :02:10:39 02:25:42 15 (min) Purpose code: 1
LOG :7223.26 7224.34 1.07 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 76 76 Validity code:
Towing dir: 358° Wire out: 120 m Speed: 40 kn*10

Sorted: 25 Kg Total catch: 96.20 CATCH/HOUR: 384.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	380.80	992	98.96	
Trachurus trecae	2.00	4	0.52	
Selene dorsalis	2.00	4	0.52	
Total	384.80		100.00	

PROJECT STATION:1764

DATE:10/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 1003
start stop duration Long E 1315
TIME :07:23:10 07:37:09 14 (min) Purpose code: 1
LOG :7270.08 7270.99 0.89 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 32 40 Validity code:
Towing dir: 260° Wire out: 150 m Speed: 35 kn*10

Sorted: 140 Kg Total catch: 421.38 CATCH/HOUR: 1805.91

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	918.64	7316	50.87	4233
Chloroscombrus chrysurus	498.21	3296	27.59	
Sphyraena guachancho	95.79	167	5.30	
Brachydeuterus auritus	73.93	1864	4.09	
Pomadasys jubelini	44.36	39	2.46	
Trichiurus lepturus	43.84	193	2.43	
Sardinella aurita	41.79	206	2.31	4232
Selene dorsalis	34.71	334	1.92	
Sepia orbignyana	33.43	26	1.85	
Sarda sarda	10.29	13	0.57	
Galeoides decadactylus	7.71	13	0.43	
Alloteuthis africana	1.29	219	0.07	
Trachurus trecae	1.29	13	0.07	
Sepia officinalis hierredda	0.64	116	0.04	
Total	1805.92		100.00	

PROJECT STATION:1765

DATE:10/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 959
start stop duration Long E 1308
TIME :10:01:43 10:21:26 20 (min) Purpose code: 1
LOG :7289.88 7290.90 1.00 Area code : 2
FDEPTH: 68 60 GearCond.code:
BDEPTH: 68 60 Validity code:
Towing dir: 73° Wire out: 250 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 289.79 CATCH/HOUR: 869.37

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	691.20	11664	79.51	
Trachurus trecae	69.90	189	8.04	4234
Decapterus rhonchus	51.30	54	5.90	
Pagellus bellottii	20.52	243	2.36	
Atractoscion aequidens	18.90	27	2.17	
Umbrina canariensis	6.75	27	0.78	
Pegusa lascaris	2.70	27	0.31	
Boops boops	2.70	27	0.31	
Dentex barnardi	2.70	27	0.31	
Alloteuthis africana	1.35	783	0.16	
Trachurus trecae, juvenile	1.35	270	0.16	
Total	869.37		100.01	

PROJECT STATION:1766

DATE:10/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 956
start stop duration Long E 1251
TIME :13:12:40 13:31:39 19 (min) Purpose code: 1
LOG :7318.85 7320.24 1.35 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 279 331 Validity code:
Towing dir: 233° Wire out: 170 m Speed: 40 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
N O C A T C H	0.00			

PROJECT STATION:1767

DATE:10/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 954
start stop duration Long E 1303
TIME :15:29:55 15:59:55 30 (min) Purpose code: 1
LOG :7337.30 7339.20 1.85 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 85 93 Validity code:
Towing dir: 260° Wire out: 150 m Speed: 40 kn*10

Sorted: 42 Kg Total catch: 41.53 CATCH/HOUR: 83.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	63.10	210	75.97	4236
Sardinella aurita	17.80	56	21.43	4235
Uraspis secunda	2.04	4	2.46	
Lagocephalus laevigatus	0.04	6	0.05	
Sepia sp.	0.02	8	0.02	
Total	83.00		99.93	

PROJECT STATION:1768

DATE:11/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 944
start stop duration Long E 1308
TIME :23:55:13 00:24:47 30 (min) Purpose code: 1
LOG :7411.38 7412.99 1.60 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 41 47 Validity code:
Towing dir: 260° Wire out: 150 m Speed: 40 kn*10

Sorted: 42 Kg Total catch: 787.90 CATCH/HOUR: 1575.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	724.00	43440	45.94	4238
Sardinella aurita	376.00	14288	23.86	4239
Trachurus trecae	140.00	480	8.88	
Trichiurus lepturus	120.00	120	7.62	
Sardinella maderensis	104.00	400	6.60	4237
Brachydeuterus auritus	92.00	640	5.84	
Euthynnus alletteratus	14.00	40	0.89	
Sepia officinalis hierredda	5.80	2	0.37	
Total	1575.80		100.00	

PROJECT STATION:1769

DATE:11/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 934
start stop duration Long E 1306
TIME :08:23:10 08:36:02 13 (min) Purpose code: 1
LOG :7484.24 7485.07 0.81 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 36 41 Validity code:
Towing dir: 270° Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 0.72 CATCH/HOUR: 3.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Caranx crysos	3.32	5	100.00	
Total	3.32		100.00	

PROJECT STATION:1770

DATE:11/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 930
start stop duration Long E 1251
TIME :11:51:53 12:20:42 29 (min) Purpose code: 1
LOG :7513.23 7514.90 1.68 Area code : 2
FDEPTH: 110 104 GearCond.code:
BDEPTH: 110 104 Validity code:
Towing dir: 85° Wire out: 440 m Speed: 30 kn*10

Sorted: 73 Kg Total catch: 435.00 CATCH/HOUR: 900.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	574.76	1262	63.86	4240
Umbrina canariensis	121.66	199	13.52	
Trichiurus lepturus	101.79	124	11.31	
Dentex macrophthalmus	63.31	248	7.03	4241
Illex coindetii	21.72	1506	2.41	
Pterothrissus belloci	6.21	62	0.69	
Uranoscopus polli	5.59	37	0.62	
Saurida brasiliensis	2.48	646	0.28	
Dentex angolensis	1.86	12	0.21	
Boops boops	0.62	37	0.07	
Total	900.00		100.00	

PROJECT STATION:1771

DATE:11/ 8/98 GEAR TYPE: PT No: 5 POSITION:Lat S 931
start stop duration Long E 1244
TIME :13:42:45 14:12:11 29 (min) Purpose code: 1
LOG :7526.28 7528.28 1.94 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 198 169 Validity code:
Towing dir: 90° Wire out: 120 m Speed: 40 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
N O C A T C H	0.00			

PROJECT STATION:1772

DATE:11/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 920
start stop duration Long E 1247
TIME :20:57:41 21:17:40 20 (min) Purpose code: 1
LOG :7588.49 7589.74 1.23 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 117 110 Validity code:
Towing dir: 86° Wire out: 150 m Speed: 40 kn*10

Sorted: 100 Kg Total catch: 404.05 CATCH/HOUR: 1212.15

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	924.09	3264	76.24	4242
Trichiurus lepturus	111.57	1122	9.20	
Euthynnus alletteratus	87.45	45	7.21	
Sardinella aurita	43.29	123	3.57	4243
Sarda sarda	12.00	9	0.99	
Trachurus trecae	11.67	21	0.96	
MYCTOPHIDAE	11.10	510	0.92	
Trachinotus ovatus	5.55	21	0.46	
Synagrops microlepis	5.43	1722	0.45	
Total	1212.15		100.00	

PROJECT STATION:1773

DATE:12/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 915
start stop duration Long E 1241
TIME :23:48:56 00:12:45 24 (min) Purpose code: 1
LOG :7610.57 7611.99 1.41 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 268 223 Validity code:
Towing dir: 87° Wire out: 150 m Speed: 40 kn*10

Sorted: 163 Kg Total catch: 162.70 CATCH/HOUR: 406.75

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	375.00		92.19	
Trichiurus lepturus	30.00	68	7.38	
Trachurus trecae	1.75	3	0.43	
Total	406.75		100.00	

PROJECT STATION:1774

DATE:12/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 913
start stop duration Long E 1255
TIME :02:01:18 02:22:37 21 (min) Purpose code: 1
LOG :7627.73 7629.06 1.30 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 25 40 Validity code:
Towing dir: 270° Wire out: 150 m Speed: 40 kn*10

Sorted: 99 Kg Total catch: 393.30 CATCH/HOUR: 1123.71

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	812.57	11800	72.31	
Brachydeuterus auritus	193.14	4254	17.19	
Trachurus trecae	39.43	389	3.51	4245
Selene dorsalis	36.00	331	3.20	
Sardinella maderensis	14.29	137	1.27	4244
Trichiurus lepturus	13.14	34	1.17	
Decapterus rhonchus	7.43	23	0.66	
Trachurus trecae, juvenile	3.43	1211	0.31	
Sardinella aurita	2.29	23	0.20	
Sepia officinalis hierredda	2.00	3	0.18	
Total	1123.72		100.00	

PROJECT STATION:1775

DATE:12/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 845
start stop duration Long E 1258
TIME :20:43:33 21:03:20 20 (min) Purpose code: 1
LOG :7798.12 7799.34 1.20 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 240 207 Validity code:
Towing dir: 89° Wire out: 150 m Speed: 40 kn*10

Sorted: 150 Kg Total catch: 300.90 CATCH/HOUR: 902.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	675.00	2304	74.78	4246
MYCTOPHIDAE	158.70	59034	17.58	
Trichiurus lepturus	57.00	15	6.31	
Trachurus trecae	9.30	18	1.03	
Trachinotus ovatus	2.70	6	0.30	
Total	902.70		100.00	

PROJECT STATION:1776

DATE:13/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 837
start stop duration Long E 1254
TIME :01:38:50 01:54:49 16 (min) Purpose code: 1
LOG :7843.17 7844.21 1.03 Area code : 2
FDEPTH: 1 1 GearCond.code:
BDEPTH: 414 417 Validity code:
Towing dir: 352° Wire out: 150 m Speed: 40 kn*10

Sorted: 75 Kg Total catch: 187.10 CATCH/HOUR: 701.63

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	420.00	1425	59.86	4248
MYCTOPHIDAE	162.75	109856	23.20	
Sardinella aurita	77.25	236	11.01	4247
Trichiurus lepturus	41.63	105	5.93	
Total	701.63		100.00	

PROJECT STATION:1777

DATE:13/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 831
start stop duration Long E 1258
TIME :09:22:36 09:37:24 15 (min) Purpose code: 1
LOG :7907.88 7908.57 0.69 Area code : 2
FDEPTH: 190 188 GearCond.code:
BDEPTH: 190 188 Validity code:
Towing dir: 160° Wire out: 600 m Speed: 30 kn*10

Sorted: 4 Kg Total catch: 58.05 CATCH/HOUR: 232.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	126.40	75840	54.44	
Dentex macrophthalmus	52.80	248	22.74	
Merluccius polli	9.80	72	4.22	
Trichiurus lepturus	9.60	36	4.13	
Pterothrissus belloci	9.00	60	3.88	
Pteroscion peli	7.40	24	3.19	
Dentex angolensis	5.20	20	2.24	
Brotula barbata	5.20	8	2.24	
Trachurus trecae	4.40	4	1.89	
Zenopsis conchifer	2.00	36	0.86	
Bembrops heterurus	0.40	4	0.17	
Total	232.20		100.00	

PROJECT STATION:1778

DATE:13/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 822
start stop duration Long E 1319
TIME :13:43:22 14:04:08 21 (min) Purpose code: 1
LOG :7950.50 7951.55 1.04 Area code : 2
FDEPTH: 23 25 GearCond.code:
BDEPTH: 23 25 Validity code:
Towing dir: 328° Wire out: 100 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 454.85 CATCH/HOUR: 1299.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ilisha africana	649.00	25769	49.94	
Brachydeuterus auritus	279.00	14580	21.47	
Pomadasys jubelini	134.00	380	10.31	
Trichiurus lepturus	90.00	1463	6.93	
Pteroscion peli	78.00	2200	6.00	
Galeoides decadactylus	26.00	280	2.00	
Pseudotolithus senegalensis	20.00	120	1.54	
Stromateus fiatola	7.00	20	0.54	
Selene dorsalis	6.00	320	0.46	
Dicologoglossa cuneata	3.00	120	0.23	
Trachurus trecae	3.00	120	0.23	
Sepia sp.	2.00	20	0.15	
Arius parkii	1.14	3	0.09	
Cynoglossus canariensis	1.00	3	0.08	
Penaeus notialis	0.29	6	0.02	
Epinephelus aeneus	0.14	3	0.01	
Total	1299.57		100.00	

PROJECT STATION:1779

DATE:13/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 820
start stop duration Long E 1253
TIME :17:40:05 18:09:04 29 (min) Purpose code: 1
LOG :7983.23 7984.89 1.64 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 213 161 Validity code:
Towing dir: 80° Wire out: 150 m Speed: 35 kn*10

Sorted: 96 Kg Total catch: 322.20 CATCH/HOUR: 666.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	256.72	867	38.51	4250
Auxis thazard	237.60	854	35.64	
Sardinella aurita	80.57	240	12.09	4249
Synagrops microlepis	24.79	3346	3.72	
MYCTOPHIDAE	18.58	8297	2.79	
Scomber japonicus	15.70	35	2.36	
Sarda sarda	13.55	10	2.03	
Trachurus trecae	10.92	21	1.64	
Trichiurus lepturus	8.19	83	1.23	
Total	666.62		100.01	

PROJECT STATION:1780

DATE:13/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 818
start stop duration Long E 1248
TIME :19:45:04 20:05:26 20 (min) Purpose code: 1
LOG :7995.83 7996.98 1.14 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 319 313 Validity code:
Towing dir: 155° Wire out: 150 m Speed: 35 kn*10

Sorted: 37 Kg Total catch: 182.50 CATCH/HOUR: 547.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	276.00	99600	50.41	
Trichiurus lepturus	55.50	90	10.14	
NOTOSUDIDAE	54.90	2205	10.03	
Small squids	51.90	2205	9.48	
Sardinella aurita	42.30	135	7.73	4251
Sardinella maderensis	18.60	66	3.40	4252
Trachurus trecae	16.80	27	3.07	4253
Euthynnus alletteratus	10.50	9	1.92	
Sarda sarda	7.65	6	1.40	
Argyrosomus hololepidotus	7.35	3	1.34	
Trachinotus ovatus	6.00	15	1.10	
Total	547.50		100.02	

PROJECT STATION:1781

DATE:13/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 815
start stop duration Long E 1254
TIME :21:18:01 21:38:05 20 (min) Purpose code: 1
LOG :8006.06 8007.22 1.14 Area code : 2
FDEPTH: 5 5 GearCond.code: 1
BDEPTH: 120 117 Validity code: 1
Towing dir: 74° Wire out: 150 m Speed: 35 kn*10

Sorted: Kg Total catch: 36.35 CATCH/HOUR: 109.05

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	45.00	22140	41.27	
Trichiurus lepturus	31.65	66	29.02	
Synagrops microlepis	25.20	43380	23.11	
Small squids	4.50	1440	4.13	
Trachurus trecae	2.70	9	2.48	
Total	109.05		100.01	

PROJECT STATION:1782

DATE:14/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 810
start stop duration Long E 1312
TIME :23:49:06 00:14:48 26 (min) Purpose code: 1
LOG :8026.80 8028.32 1.47 Area code : 2
FDEPTH: 5 5 GearCond.code: 1
BDEPTH: 31 40 Validity code: 1
Towing dir: 261° Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 340.60 CATCH/HOUR: 786.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	458.08	2804	58.28	4255
Brachydeuterus auritus	114.23		14.53	
Sphyraena afra	61.15	2	7.78	
Pteroscion peli	38.08	1177	4.84	
Trichiurus lepturus	35.19	969	4.48	
Pomadasys jubelini	19.62	46	2.50	
Ilisha africana	13.85	208	1.76	
Sardinella aurita	13.85	162	1.76	4254
Pomadasys rogeri	11.54	23	1.47	
Pomadasys incisus	4.62	23	0.59	
Hyperoglyphe moselii	4.04	12	0.51	
Penaeus notialis	3.46	1015	0.44	
Sphyraena sphyraena	3.46	12	0.44	
Penaeus notialis	1.96	74	0.25	
Trachurus trecae	1.73	127	0.22	4256
Sepia sp.	1.15	58	0.15	
Total	786.01		100.00	

PROJECT STATION:1783

DATE:14/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 809
start stop duration Long E 1259
TIME :02:41:30 03:02:49 21 (min) Purpose code: 1
LOG :8051.37 8052.65 1.27 Area code : 2
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 98 91 Validity code: 1
Towing dir: 73° Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 93.00 CATCH/HOUR: 265.71

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	221.14	677	83.23	
Decapterus rhonchus	21.43	17	8.07	
Trachurus trecae	16.00	20	6.02	4257
Euthynnus alletteratus	5.14	3	1.93	
Illex coindetii	1.00	34	0.38	
Trachinotus ovatus	1.00	3	0.38	
Total	265.71		100.01	

PROJECT STATION:1784

DATE:14/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 804
start stop duration Long E 1255
TIME :07:35:41 07:38:31 3 (min) Purpose code: 1
LOG :8094.39 8094.56 0.17 Area code : 2
FDEPTH: 107 107 GearCond.code:
BDEPTH: 107 107 Validity code:
Towing dir: 258° Wire out: 330 m Speed: 30 kn*10

Sorted: Kg Total catch: 12.32 CATCH/HOUR: 246.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	182.00	360	73.86	4258
Raja miraletus	32.00	40	12.99	
Dentex angolensis	21.60	160	8.77	
Loligo vulgaris	5.00	300	2.03	
Dentex canariensis	5.00	20	2.03	
Syacium micrurum	0.80	20	0.32	
Total	246.40		100.00	

PROJECT STATION:1785

DATE:14/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 802
start stop duration Long E 1302
TIME :08:49:18 09:09:10 20 (min) Purpose code: 1
LOG :8103.56 8104.59 1.01 Area code : 2
FDEPTH: 72 77 GearCond.code:
BDEPTH: 72 77 Validity code:
Towing dir: 255° Wire out: 250 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 375.55 CATCH/HOUR: 1126.65

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	742.50	3054	65.90	4260
Trachurus trecae	221.25	525	19.64	4259
Alloteuthis africana	58.50		5.19	
Stromateus fiatola	29.25	9	2.60	
Trichiurus lepturus	19.50	6	1.73	
Torpedo sp.	10.50	6	0.93	
Pagellus bellottii	8.25	3	0.73	
Dentex barnardi	7.50	9	0.67	
Raja miraletus	6.75	3	0.60	
Zenopsis conchifer	6.75	3	0.60	
Dentex angolensis	5.25	24	0.47	
Argyrosomus hololepidotus	4.05	3	0.36	
Decapterus rhonchus	3.00	3	0.27	
Sepia officinalis hierredda	2.40	3	0.21	
Chelidonichthys capensis	2.25	3	0.20	
Chaetodon hoefleri	2.25	3	0.20	
Loligo vulgaris	0.75	3	0.07	
Total	1130.70		100.37	

PROJECT STATION:1786

DATE:14/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 801
start stop duration Long E 1306
TIME :10:20:25 10:44:04 24 (min) Purpose code: 1
LOG :8113.83 8115.30 1.46 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 42 43 Validity code:
Towing dir: 160° Wire out: 150 m Speed: 40 kn*10

Sorted: 72 Kg Total catch: 2188.45 CATCH/HOUR: 5471.13

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	4867.50	29095	88.97	4261
Sarda sarda	187.50	150	3.43	
Caranx crysos	165.00	150	3.02	
Euthynnus alletteratus	142.50	225	2.60	
Trichiurus lepturus	97.50	150	1.78	
Sphyraena afra	11.13	3	0.20	
Total	5471.13		100.00	

PROJECT STATION:1787

DATE:14/ 8/98 GEAR TYPE: PT No: 2 POSITION:Lat S 803
start stop duration Long E 1231
TIME :15:59:27 16:30:43 31 (min) Purpose code: 1
LOG :8167.47 8169.50 1.98 Area code : 1
FDEPTH: 200 200 GearCond.code:
BDEPTH: 1059 9229 Validity code:
Towing dir: 100° Wire out: 800 m Speed: 40 kn*10

Sorted: 30 Kg Total catch: 250.00 CATCH/HOUR: 483.87

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	483.87		100.00	
Total	483.87		100.00	

PROJECT STATION:1788

DATE:14/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 754
start stop duration Long E 1252
TIME :20:43:32 21:13:15 30 (min) Purpose code: 1
LOG :8197.59 8199.42 1.80 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 93 83 Validity code:
Towing dir: 67° Wire out: 150 m Speed: 36 kn*10

Sorted: Kg Total catch: 126.70 CATCH/HOUR: 253.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	116.70	268	46.05	4262
Trichiurus lepturus	52.50	84	20.72	
Sardinella maderensis	34.60	112	13.65	4263
Decapterus rhonchus	15.50	16	6.12	
Sarda sarda	15.40	8	6.08	
Auxis thazard	10.60	4	4.18	
Sardinella aurita	3.60	12	1.42	
Scomber japonicus	2.70	6	1.07	
Trachinotus ovatus	1.80	4	0.71	
Total	253.40		100.00	

PROJECT STATION:1789

DATE:15/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 746
start stop duration Long E 1300
TIME :23:58:30 00:20:23 22 (min) Purpose code: 1
LOG :8218.73 8219.93 1.17 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 36 36 Validity code:
Towing dir: 165° Wire out: 150 m Speed: 40 kn*10

Sorted: 87 Kg Total catch: 995.40 CATCH/HOUR: 2714.73

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	2130.55	46574	78.48	
Sardinella maderensis	402.55	2520	14.83	4264
Pomadasys jubelini	49.09	65	1.81	
Rhizoprionodon acutus	40.91	8	1.51	
Trichiurus lepturus	39.27	2553	1.45	
Stromateus fiatola	13.09	33	0.48	
Penaeus notialis	9.82	458	0.36	
Pteroscion peli	9.82	196	0.36	
Pomadasys incisus	9.82	33	0.36	
Trachurus trecae	9.82	327	0.36	4265
Total	2714.74		100.00	

PROJECT STATION:1790

DATE:15/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 753
start stop duration Long E 1240
TIME :03:00:26 03:20:12 20 (min) Purpose code: 1
LOG :8245.06 8246.28 1.20 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 192 136 Validity code:
Towing dir: 33° Wire out: 150 m Speed: 40 kn*10

Sorted: 64 Kg Total catch: 187.70 CATCH/HOUR: 563.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	264.60	846	46.99	
MYCTOPHIDAE	180.00		31.97	
Sardinella maderensis	52.80	213	9.38	4267
Sardinella aurita	48.00	156	8.52	4266
Trachurus trecae	17.70	36	3.14	4268
Total	563.10		100.00	

PROJECT STATION:1791

DATE:15/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 744
start stop duration Long E 1234
TIME :11:25:06 11:25:28 (min) Purpose code: 1
LOG :8321.53 8321.57 0.09 Area code : 1
FDEPTH: 278 284 GearCond.code: 8
BDEPTH: 278 284 Validity code: 9
Towing dir: 249° Wire out: 900 m Speed: 25 kn*10

Sorted: 18 Kg Total catch: 17.60 CATCH/HOUR: 1056.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenopsis conchifer	528.00	1320	50.00	
Merluccius polli	159.00	900	15.06	
Synagrops microlepis	96.00	4620	9.09	
MYCTOPHIDAE	90.00	61140	8.52	
Trichiurus lepturus	66.00	780	6.25	
Todaropsis eblanae	39.00	300	3.69	
Chlorophthalmus atlanticus	27.00	480	2.56	
Pterothrissus belloci	24.00	120	2.27	
Laemonema laureysi	9.00	120	0.85	
Lophius vaillanti	7.80	60	0.74	
Coelorinchus coelorhincus	6.00	120	0.57	
Lepidotrigla cadmani	3.00	60	0.28	
Parapenaeus longirostris	1.20	180	0.11	
Total	1056.00		99.99	

PROJECT STATION:1792

DATE:15/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 735
start stop duration Long E 1242
TIME :14:47:04 14:56:58 10 (min) Purpose code: 1
LOG :8351.79 8352.37 0.58 Area code : 1
FDEPTH: 90 93 GearCond.code: 9
BDEPTH: 90 93 Validity code: 3
Towing dir: 245° Wire out: 360 m Speed: 35 kn*10

Sorted: 37 Kg Total catch: 37.40 CATCH/HOUR: 224.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	130.80	252	58.29	4269
Zenopsis conchifer	32.40	54	14.44	
Dentex gibbosus	30.30	48	13.50	
Dentex angolensis	11.70	150	5.21	
Pagrus caeruleostictus	4.20	6	1.87	
Dentex barnardi	4.20	18	1.87	
Illex coindetii	2.40	90	1.07	
Alloteuthis africana	1.80	756	0.80	
Pagellus bellottii	1.80	18	0.80	
Trichiurus lepturus	1.80	6	0.80	
Dentex congoensis	1.50	18	0.67	
Lepidotrigla cadmani	1.20	12	0.53	
Trachurus trecae, juvenile	0.30	6	0.13	
Total	224.40		99.98	

PROJECT STATION:1793

DATE:15/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 728
start stop duration Long E 1247
TIME :17:59:32 18:19:24 20 (min) Purpose code: 1
LOG :8380.53 8381.86 1.29 Area code : 1
FDEPTH: 5 5 GearCond.code: 1
BDEPTH: 48 56 Validity code: 1
Towing dir: 248° Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 56.45 CATCH/HOUR: 169.35

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	67.95	117	40.12	4270
Caranx crysos	20.55	21	12.13	
Alloteuthis africana	18.60		10.98	
Decapterus rhonchus	18.60	24	10.98	
Trichiurus lepturus	12.90	18	7.62	
Sphyraena guachancho	8.40	6	4.96	
Trachinotus goreensis	7.20	12	4.25	
Boops boops	5.40	570	3.19	
Stromateus fiatola	4.50	6	2.66	
Alectis alexandrinus	2.40	3	1.42	
Sepia orbignyana	2.10	9	1.24	
Selene dorsalis	0.75	3	0.44	
Total	169.35		99.99	

PROJECT STATION:1794

DATE:15/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 734
start stop duration Long E 1231
TIME :20:17:57 20:47:20 29 (min) Purpose code: 1
LOG :8399.62 8401.45 1.80 Area code : 1
FDEPTH: 5 5 GearCond.code: 1
BDEPTH: 135 118 Validity code: 1
Towing dir: 65° Wire out: 150 m Speed: 37 kn*10

Sorted: Kg Total catch: 287.40 CATCH/HOUR: 594.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	151.14		25.42	
Sardinella maderensis	141.83	528	23.85	4272
Trichiurus lepturus	127.86	304	21.50	
Trachurus trecae	105.52	230	17.75	4273
Sardinella aurita	36.93	118	6.21	4271
Euthynnus alletteratus	15.52	12	2.61	
Sarda sarda	6.52	6	1.10	
Trachinotus ovatus	5.59	19	0.94	
Scomber japonicus	3.72	12	0.63	
Total	594.63		100.01	

PROJECT STATION:1795

DATE:16/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 726
start stop duration Long E 1237
TIME :00:09:40 00:30:08 20 (min) Purpose code: 1
LOG :8429.73 8431.04 1.30 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 86 92 Validity code: 3
Towing dir: 250° Wire out: 150 m Speed: 40 kn*10

Sorted: 29 Kg Total catch: 29.40 CATCH/HOUR: 88.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	65.40	234	74.15	4275
Trichiurus lepturus	18.75	30	21.26	
Sardinella aurita	4.05	15	4.59	4274
Total	88.20		100.00	

PROJECT STATION:1796

DATE:16/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 721
start stop duration Long E 1249
TIME :02:50:16 03:10:51 21 (min) Purpose code: 1
LOG :8448.62 8449.75 1.12 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 22 25 Validity code:
Towing dir: 323° Wire out: 150 m Speed: 40 kn*10

Sorted: 11 Kg Total catch: 11.40 CATCH/HOUR: 32.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Stromateus fiatola	10.57	26	32.45	
Brachydeuterus auritus	6.86	109	21.06	
Sphyraena guachancho	6.00	11	18.42	
Sphyraena sphyraena	4.29	11	13.17	
Engraulis encrasicolus	2.43	446	7.46	
Trichiurus lepturus	2.00	14	6.14	
Galeoides decadactylus	0.43	3	1.32	
Total	32.58		100.02	

PROJECT STATION:1797

DATE:16/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 723
start stop duration Long E 1233
TIME :05:35:44 05:55:23 20 (min) Purpose code: 1
LOG :8472.38 8473.63 1.19 Area code : 1
FDEPTH: 5 5 GearCond.code: 1
BDEPTH: 93 87 Validity code: 1
Towing dir: 75° Wire out: 150 m Speed: 37 kn*10

Sorted: Kg Total catch: 69.21 CATCH/HOUR: 207.63

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	88.50	246	42.62	4277
Sardinella maderensis	52.35	192	25.21	4276
Stromateus fiatola	29.40	36	14.16	
Trichiurus lepturus	19.95	48	9.61	
Scomberomorus tritor	6.75	3	3.25	
Sardinella aurita	4.65	15	2.24	
Decapterus rhonchus	2.85	3	1.37	
Naucrates ductor	1.95	6	0.94	
Trachinotus ovatus	0.93	3	0.45	
Trachurus trecae	0.30	3	0.14	
CARUA01	0.00			
Total	207.63		99.99	

PROJECT STATION:1798

DATE:16/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 711
start stop duration Long E 1246
TIME :13:01:09 13:31:31 30 (min) Purpose code: 1
LOG :8546.36 8548.53 2.02 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 20 23 Validity code:
Towing dir: 130° Wire out: 150 m Speed: 40 kn*10

Sorted: 147 Kg Total catch: 147.10 CATCH/HOUR: 294.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	273.00	1016	92.79	4279
Sardinella aurita	8.10	22	2.75	4278
Sphyraena guachancho	5.10	10	1.73	
Scomberomorus tritor	4.00	6	1.36	
Stromateus fiatola	2.80	4	0.95	
Sphyraena sphyraena	1.20	4	0.41	
Total	294.20		99.99	

PROJECT STATION:1799

DATE:16/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 715
start stop duration Long E 1213
TIME :17:48:07 18:03:50 16 (min) Purpose code: 1
LOG :8587.92 8588.84 0.90 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 179 168 Validity code:
Towing dir: 78° Wire out: 150 m Speed: 37 kn*10

Sorted: 23 Kg Total catch: 211.60 CATCH/HOUR: 793.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	783.00	3173	98.68	
Trachurus trecae	10.50	8	1.32	
Total	793.50		100.00	

PROJECT STATION:1800

DATE:16/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 715
start stop duration Long E 1203
TIME :20:00:59 20:15:13 14 (min) Purpose code: 1
LOG :8603.13 8603.99 0.84 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 361 363 Validity code:
Towing dir: 148° Wire out: 150 m Speed: 37 kn*10

Sorted: Kg Total catch: 80.55 CATCH/HOUR: 345.21

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	282.21		81.75	
Auxis thazard	44.36	9	12.85	
Trichiurus lepturus	14.79	51	4.28	
Trachurus trecae	3.86	9	1.12	
Total	345.22		100.00	

PROJECT STATION:1801

DATE:17/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 702
start stop duration Long E 1215
TIME :23:53:34 00:19:29 26 (min) Purpose code: 1
LOG :8638.66 8640.45 1.77 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 90 84 Validity code:
Towing dir: 75° Wire out: 150 m Speed: 40 kn*10

Sorted: 108 Kg Total catch: 108.30 CATCH/HOUR: 249.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	75.00	88	30.01	
Trachurus trecae	72.92	138	29.18	4281
Sardinella maderensis	62.77	242	25.12	4280
Trachinotus ovatus	11.77	30	4.71	
Sphyraena afra	9.00	2	3.60	
Decapterus rhonchus	7.38	7	2.95	
Alloteuthis africana	4.15		1.66	
Scomber japonicus	2.54	7	1.02	
MYCTOPHIDAE	2.31		0.92	
Sepiella ornata	0.69	28	0.28	
Sardinella aurita	0.69	2	0.28	
Echeneis naucrates	0.62	2	0.25	
Saurida brasiliensis	0.07	14	0.03	
Total	249.91		100.01	

PROJECT STATION:1802

DATE:17/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 647
start stop duration Long E 1208
TIME :13:40:38 14:00:35 20 (min) Purpose code: 1
LOG :8773.82 8774.88 1.04 Area code : 1
FDEPTH: 78 81 GearCond.code:
BDEPTH: 78 81 Validity code:
Towing dir: 255° Wire out: 300 m Speed: 35 kn*10
Sorted: 73 Kg Total catch: 72.65 CATCH/HOUR: 217.95

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	168.90	2268	77.49	4282
Dentex gibbosus	17.70	33	8.12	
Mustelus mustelus	7.20	3	3.30	
Pagrus caeruleostictus	6.90	6	3.17	
Fistularia petimba	6.00	18	2.75	
Alloteuthis africana	4.50		2.06	
Sepia officinalis hierredda	2.10	3	0.96	
Chelidonichthys gabonensis	1.35	9	0.62	
Dentex angolensis	0.90	6	0.41	
Boops boops	0.60	18	0.28	
Scomber japonicus	0.60	60	0.28	
Raja miraletus	0.45	3	0.21	
Dentex barnardi	0.45	3	0.21	
Illex coindetii	0.30	6	0.14	
Total	217.95		100.00	

PROJECT STATION:1803

DATE:17/ 8/98 GEAR TYPE: PT No: 7 POSITION:Lat S 639
start stop duration Long E 1222
TIME :16:50:28 17:10:31 20 (min) Purpose code: 1
LOG :8800.15 8801.56 1.40 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 25 23 Validity code:
Towing dir: 150° Wire out: 150 m Speed: 37 kn*10

Sorted: Kg Total catch: 13.70 CATCH/HOUR: 41.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	30.90	162	75.18	4283
Sphyraena sphyraena	5.40	3	13.14	
Trichiurus lepturus	3.60	12	8.76	
Raja miraletus	1.20	3	2.92	
Total	41.10		100.00	

PROJECT STATION:1804

DATE:18/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 638
start stop duration Long E 1154
TIME :23:48:04 00:08:45 21 (min) Purpose code: 1
LOG :8866.95 8868.23 1.26 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 120 117 Validity code:
Towing dir: 75° Wire out: 150 m Speed: 35 kn*10

Sorted: 107 Kg Total catch: 107.30 CATCH/HOUR: 306.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	266.14	600	86.81	
Trachurus trecae	26.00	60	8.48	4285
Sardinella maderensis	13.43	46	4.38	4284
Sardinella aurita	1.00	3	0.33	
Total	306.57		100.00	

PROJECT STATION:1805

DATE:18/ 8/98 GEAR TYPE: PT No: 4 POSITION:Lat S 627
start stop duration Long E 1207
TIME :03:06:00 03:25:51 20 (min) Purpose code: 1
LOG :8894.17 8895.39 1.20 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 48 53 Validity code:
Towing dir: 254° Wire out: 150 m Speed: 40 kn*10

Sorted: 100 Kg Total catch: 199.80 CATCH/HOUR: 599.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	203.40	882	33.93	4287
Trachurus trecae	180.60	504	30.13	4288
Sardinella aurita	72.00	252	12.01	4286
Trichiurus lepturus	66.00	90	11.01	
Decapterus rhonchus	63.60	72	10.61	
Caranx senegallus	9.60	12	1.60	
Scomber japonicus	2.40	6	0.40	
Sepia officinalis hierredda	1.80	3	0.30	
Total	599.40		99.99	

PROJECT STATION:1806

DATE:18/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 627
start stop duration Long E 1142
TIME :09:18:42 09:38:25 20 (min) Purpose code: 1
LOG :8950.16 8951.12 0.93 Area code : 1
FDEPTH: 139 147 GearCond.code:
BDEPTH: 139 147 Validity code:
Towing dir: 260° Wire out: 456 m Speed: 30 kn*10

Sorted: Kg Total catch: 106.90 CATCH/HOUR: 320.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	292.05	1029	91.07	
Dentex angolensis	10.05	54	3.13	
Dentex congoensis	8.85	93	2.76	
Sarda sarda	5.55	3	1.73	
Todaropsis eblanae	3.45	108	1.08	
Spicara alta	0.75	6	0.23	
Total	320.70		100.00	

PROJECT STATION:1807

DATE:18/ 8/98 GEAR TYPE: BT No: 3 POSITION:Lat S 621
start stop duration Long E 1202
TIME :12:47:06 13:07:02 20 (min) Purpose code: 1
LOG :8976.59 8977.73 1.13 Area code : 1
FDEPTH: 69 74 GearCond.code:
BDEPTH: 69 74 Validity code:
Towing dir: 255° Wire out: 280 m Speed: 35 kn*10

Sorted: 100 Kg Total catch: 4020.00 CATCH/HOUR: 12060.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	4884.00	19341	40.50	4289
Selene dorsalis	3696.00	9642	30.65	
Decapterus rhonchus	3288.00	3480	27.26	
Epinephelus aeneus	120.00	120	1.00	
Dentex angolensis	48.00	240	0.40	
Chaetodon hoefleri	24.00	120	0.20	
Total	12060.00		100.01	

PROJECT STATION:1808

DATE:18/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 621
start stop duration Long E 1130
TIME :18:57:29 19:13:16 16 (min) Purpose code: 1
LOG :9038.99 9039.91 0.92 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 327 348 Validity code:
Towing dir: 254° Wire out: 150 m Speed: 35 kn*10

Sorted: 34 Kg Total catch: 101.55 CATCH/HOUR: 380.81

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	237.94	2453	62.48	
MYCTOPHIDAE	142.88		37.52	
Total	380.82		100.00	

PROJECT STATION:1809

DATE:18/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 613
start stop duration Long E 1133
TIME :22:35:35 22:56:42 21 (min) Purpose code: 1
LOG :9068.24 9069.47 1.21 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 179 161 Validity code:
Towing dir: 74° Wire out: 150 m Speed: 35 kn*10

Sorted: 62 Kg Total catch: 109.72 CATCH/HOUR: 313.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	268.00	577	85.49	
Trachurus trecae	42.00	97	13.40	4290
Scomber japonicus	3.43	6	1.09	
Naucrates ductor	0.06	6	0.02	
Total	313.49		100.00	

PROJECT STATION:1810

DATE:19/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 605

	start	stop	duration				
						Long	E 1206
TIME	:03:06:00	03:15:54	10 (min)	Purpose code:	1		
LOG	:9103.58	9104.14	0.55	Area code	: 1		
FDEPTH:	5	5		GearCond.code:			
BDEPTH:	40	39		Validity code:			

Towing dir: 177° Wire out: 150 m Speed: 35 kn*10

Sorted: 50 Kg Total catch: 49.60 CATCH/HOUR: 297.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	183.00	2784	61.49	
Trichiurus lepturus	60.60	1482	20.36	
Ilisha africana	22.20	246	7.46	
Pentheroscion mbizi	15.60	204	5.24	
Lolliguncula mercatoris	14.40		4.84	
Sepia bertheloti	1.20	18	0.40	
Trachurus trecae	0.60	6	0.20	
Total	297.60		99.99	

PROJECT STATION:1811

DATE:19/ 8/98 GEAR TYPE: PT No: 1 POSITION:Lat S 902

	start	stop	duration				
						Long	E 1256
TIME	:19:55:01	20:20:38	26 (min)	Purpose code:	1		
LOG	:9303.97	9305.74	1.74	Area code	: 1		
FDEPTH:	10	10		GearCond.code:			
BDEPTH:	173	263		Validity code:			

Towing dir: 165° Wire out: 150 m Speed: 36 kn*10

Sorted: 23 Kg Total catch: 228.55 CATCH/HOUR: 527.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	270.58		51.30	
Trachurus trecae	93.58	192	17.74	4291
Sardinella maderensis	82.27	252	15.60	4292
Trichiurus lepturus	77.54	372	14.70	
Brachydeuterus auritus	3.23	65	0.61	
Sardinella aurita	0.23	2	0.04	
Total	527.43		99.99	