

## **SURVEY OF THE FISH RESOURCES OF ANGOLA**

**Survey of the Demersal Resources  
28 February – 1 April 2003**

**Institute of Marine Research  
IMR, Bergen  
Norway**

**Instituto de Investigação Marinha  
IIM, Luanda  
Angola**

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

**SURVEYS OF THE FISH RESOURCES OF ANGOLA**

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**28 February – 1 April 2003**

by

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The programme has previously conducted the following demersal surveys in the area:

January 1985	-	June 1986	(6 surveys)
January 1989	-	December 1989	(3 surveys)
May 1991	-	September 1992	(3 surveys)
January 1994	-	March 2003	(10 surveys)

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## CHAPTER 1 INTRODUCTION

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### 1.1 Objectives

The objectives of the cruise had been previously discussed and agreed upon by the responsible of the Demersal Programme of the Instituto de Investigação Marinha (IIM), of Angola, and the responsible from the Institute of Marine Research, Bergen (IMR) for the Angolan Demersal Programme, and were the following:

- To survey, map, and describe the distribution, composition and abundance of the main demersal species, with special emphasis on sea breams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), hakes (Merluccidae) and shrimps (*Parapenaeus longirostris* and *Aristeus varidens*) on the Angolan shelf and slope (down to 800 m), from Cunene River (17°14' S) to Tombua (15°40' S), and from Benguela (12°35' S) to Congo River (06°00' S) using bottom trawl and the swept-area method.
- Collect biological data (length, weight, sex and maturity) of *Dentex macrophthalmus*, *D. angolensis*, *Pagellus bellottii*, *Pseudolithus typus*, *Merluccius polli*, commercially important flatfish (Citharidae, Soleidae, Cynoglossidae and Bothidae), *Aristeus varidens*, *Parapenaeus longirostris* and *Chaceon maritae* for future analyses.
- To monitor the general hydrographic conditions using a CTD-sonde on each trawl stations all over the survey area, and map the temperature, salinity and oxygen along standard IIM hydrographic profiles.
- To continue to build up a collection of the different species, with tissue samples for future genetic studies and to build on the vessel's digital photographic reference collection. A brief report on the taxonomy work is provided in Annex VIII.

### 1.2 Participation

The scientific staff consisted of:

From IIM, Angola: Kumbi KILONGO (28/2-1/4, Local Cruise Leader), Paulo BRINCA (28/2-13/3), Tania MANDINGA (28/2-13/3), Nilsa Alves (28/2-13/3), Virgilio ESTEVÃO (28/2-13/3), Domingos PEDRO (28/2-13/3), Alberto FILOMENA (28/2-13/3), António BUCO (28/2-13/3), Mario FURTUNADO (28/2-13/3), Pedro PANZO (15/3-1/4), Guillermo CAMARADA (15/3-1/4), Francisco de ALMEIDA (15/3-1/4), Bernardo FERNANDES (15/3-1/4), Marcelo TCHICULUPITI (15/3-1/4), David KISSUNGU (15/3-1/4), Geraldina DE ASSUNÇÃO (15/3-1/4), Esperanza SILVA (15/3-1/4).

From IMR, Norway: Espen JOHNSEN (28/2-1/4, Cruise Leader), Diana ZAERA (28/2-1/4), Thor Egil JOHANSSON (28/2-1/4) and Magne OLSEN (27/2-12/3).

From University of Innsbruck, Austria:

Reinhold HANEL (28/2-1/4),.

### 1.3 Narrative

The vessel left Walvis Bay, Namibia, in the afternoon of 28 February and deployed a satellite tracking current drifter at 22°S where the bottom depth was 54 meters. The sampling started in the morning of 2<sup>nd</sup> March with trawl and hydrographic stations off the mouth of Cunene River. The station positions in the southern region were similar to the positions of the demersal survey in 2000. The southern region was finished surveyed in the late afternoon of the 4<sup>th</sup> of March. A hydrographic transect, using the same sample positions as during the 2002 pelagic survey, was conducted west off Baía dos Tigres. The slope off Baía dos Tigres is very steep and has a rough bottom between 200 and 600 m, hence the area was not adequately sampled. The area between Tombua and Benguela has very narrow shelf and slope and the bottom is also very rough, which make it unsuitable for bottom trawling.

During the steaming northwards to the central region another satellite tracking current drifter was deployed at 14°S and bottom depth of about 500 meters. On request from Dr. Hanel a tow was conducted in the afternoon on the 5<sup>th</sup> of March at Baía dos Elephantes to trawl for seldom fish species reported from that region. In the evening of the 5<sup>th</sup> the vessel reached the first station in the central region. The station positions for both the central and the northern regions were the same as during the demersal survey of 2002. The third and fourth drifters were deployed at 12°S and 10°S, respectively, with a bottom depth of 500 meters. In the central region, five standard hydrographic transects were conducted at Lobito, Cabeça da Baleia, Pta. do Morro, Cabo Ledo and Pta. das Palmerinhas. The vessel called port in Luanda the 12<sup>th</sup> of March for crew change and departed the 14<sup>th</sup> in the afternoon to finish the central region. In the morning of the 17<sup>th</sup> the sampling started in northern region and the region was finish the 28<sup>th</sup> of March. The 29<sup>th</sup> of March a 24 hours station was conducted to investigate the difference between day and night catch rates in shallow waters. The cruise finished the 31<sup>st</sup> of March when 'Dr. Fridtjof Nansen' called at Luanda. In the northern region, three standard hydrographic transects were conducted at Ambriz, Ambrizete and Ponta da Moita Seca.

## CHAPTER 2 METHODS

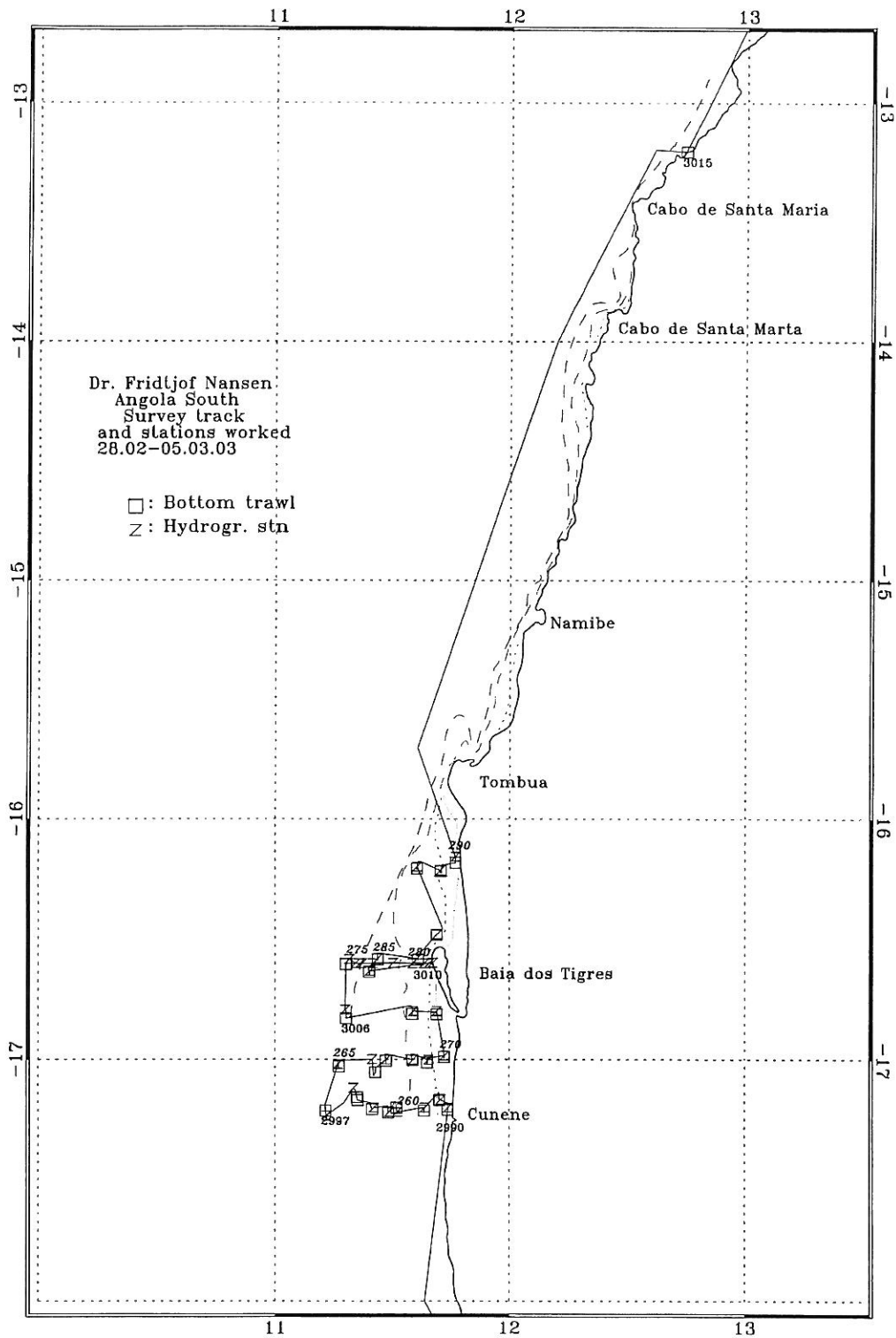
### 2.1 Survey effort

Table 2.1 presents the survey area by depth strata, allocation of trawl stations, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed. Table 2.1 also shows the allocation of effort relative to the stratum size as percentage hauls versus percentage area, by depth, by region, and by the total area. The overall average coverage was 1 trawl station per 87 square nautical miles (NM<sup>2</sup>). Figure 2.1-2.3 show the cruise tracks in the southern, central and northern regions, respectively, and the locations of bottom trawl stations and hydrographic transects.

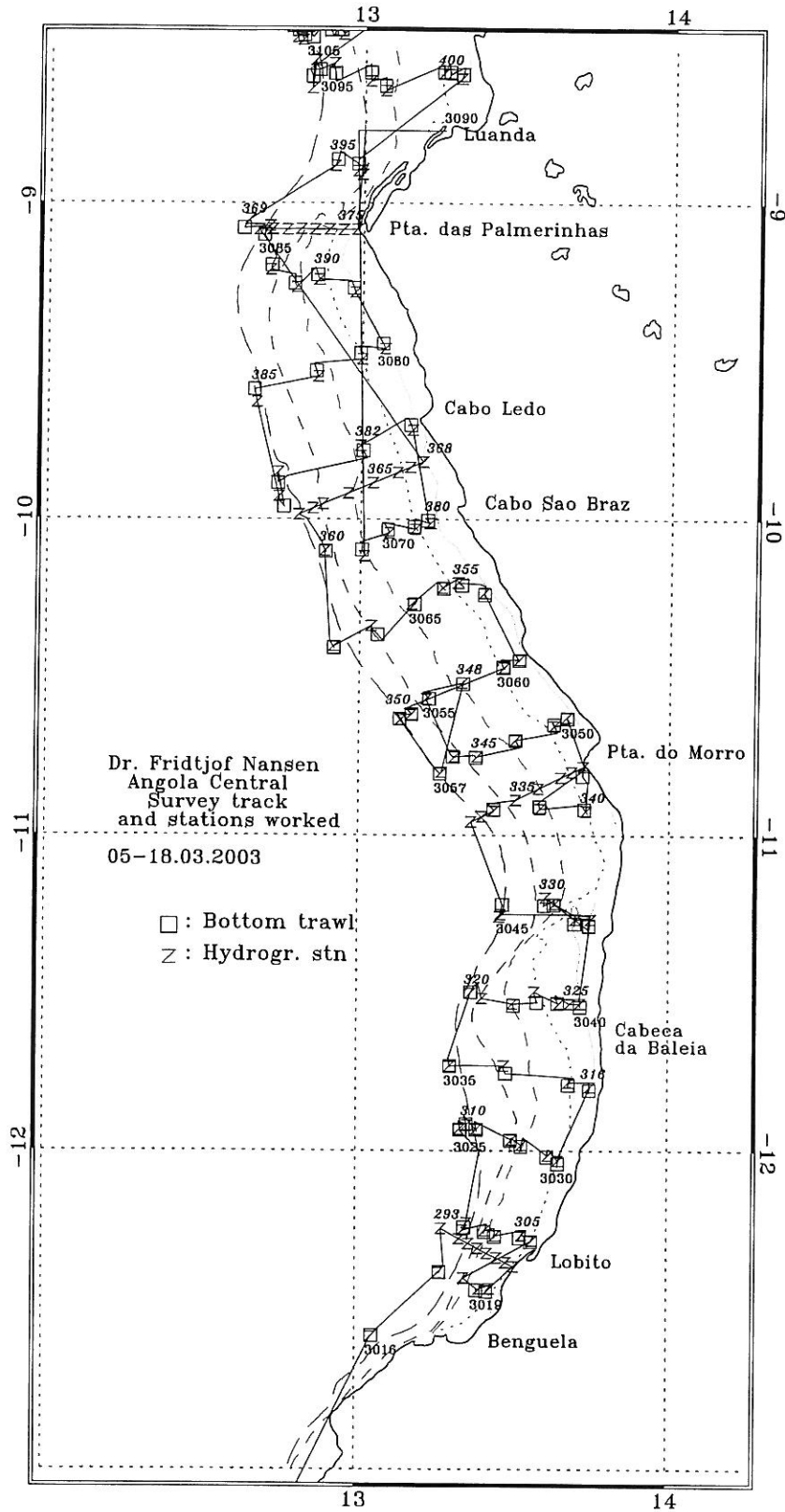
**Table 2.1** Survey design and effort. Size of the survey area by depth stratum, allocation of trawl stations, proportion of stations relative to stratum size, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed, divided in to: southern region (Cunene to Tombua), central region (Benguela to Luanda) and northern region (Luanda to Congo River).

Region	Depth strata (m)									Total	Failures	CTD	Distance
	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800				
<b>Cunene-Tombua</b>													
Area (NM <sup>2</sup> )	507	591	594	100	77	48	39			<b>1956</b>		34	995
# hauls (BT)	5	7	7		2			2	1	<b>24</b>	2		
%area	25.9	30.2	30.4	5.1	3.9	2.5	2.0	0.0	0.0	11.8			
%hauls	20.8	29.2	29.2	0.0	8.3	0.0	0.0	8.3	4.2	25.8			
<b>Benguela-Luanda</b>													
Area (NM <sup>2</sup> )	1068	1586	1439	407	372	343	346	268	357	<b>6186</b>		103	1226
# hauls (BT)	16	18	14	3	4	3	3	4	4	<b>69</b>	2		
%area	17.3	25.6	23.3	6.6	6.0	5.5	5.6	4.3	5.8	37.4			
%hauls	23.2	26.1	20.3	4.3	5.8	4.3	4.3	5.8	5.8	74.2			
<b>Luanda-Congo River</b>													
Area (NM <sup>2</sup> )	1379	1969	1940	601	550	437	409	408	702	<b>8395</b>		125	1748
# hauls (BT)	13	20	21	7	5	6	6	6	9	<b>93</b>			
%area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4	50.8			
%hauls	14.0	21.5	22.6	7.5	5.4	6.5	6.5	6.5	9.7	50.0			
<b>Grand total</b>													
Area (NM <sup>2</sup> )	2954	4146	3973	1108	999	828	794	676	1059	<b>16537</b>		262	3969
# hauls (BT)	34	45	42	10	11	9	9	12	14	<b>186</b>	4		
%area	17.9	25.1	24.0	6.7	6.0	5.0	4.8	4.1	6.4				
%hauls	18.3	24.2	22.6	5.4	5.9	4.8	4.8	6.5	7.5		<b>380</b>	Total hauls	

A stratified semi-random survey design was adopted during the survey (see Table 2.1) with depth and area as stratifying variables. Trawl hauls were taken along transects perpendicular to the coast and with a distance of approximately 15 NM apart (see Figure 2.1-2.3). Allocation of trawl effort was approximately proportional to stratum size of 100 m depth intervals by region (see Table 2.1). The planned design was sometimes slightly modified due to adverse conditions such as unsuitable bottom conditions, or non-accessible areas due to oil exploitation in the northern region. The positions of the stations in the southern region were the same as during the demersal survey 2000, which had an acceptable coverage of the area. The station positions in the central and northern part were about the same as during the 2002 demersal survey, which had a good coverage of the regions.



**Figure 2.1** Angola south: Cunene to Tombua. Course track with fishing stations and hydrographic transects. Hydrographic stations were also taken at all the fishing stations. Depth contours at 20, 50, 100 and 200 m.



**Figure 2.2** Angola central: Benguela to Luanda. Course track with fishing stations and hydrographic transects. Hydrographic stations were also taken at all the fishing stations. Depth contours at 20, 50, 100, 200 and 500 m.





## 2.2 Meteorological and hydrographic sampling

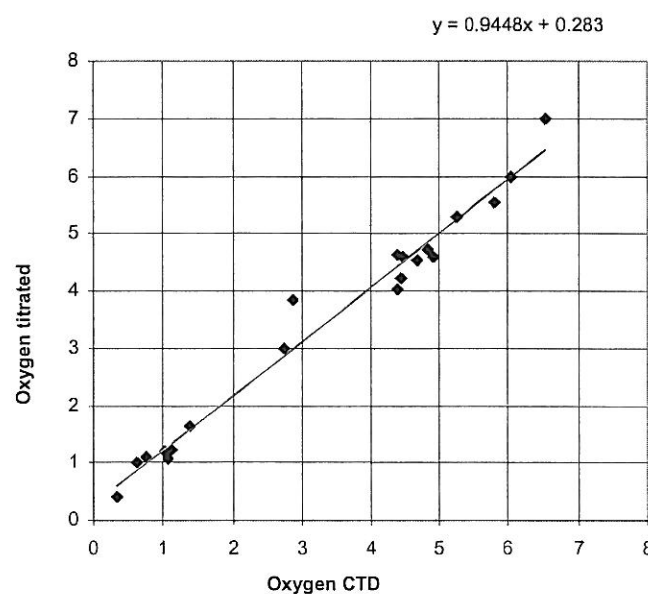
Meteorological observations including wind direction and speed, air temperature, global radiation and sea surface temperature (SST) were automatically logged every nautical mile using an Aanderaa meteorological station. CTD-stations and current profiles with ADCP were recorded at all of the trawl stations, and at the standard hydrographic transects.

### *ADCP current measurements*

A ship-born Acoustic Doppler Current Profiler (ADCP) from RD Instruments was activated on every CTD station. The ADCP was set to ping every 4 seconds, the depth cell interval set to 8 m and the number of cells was set to 40. The data were routinely averaged over 300 seconds and averaged data stored on files. The data have not been analysed in this report, but this can be done by e.g. the PC software UMS (Underway Mapping System), supported by Marine and Coastal Management in Cape Town, South Africa.

### *Conductivity, salinity and oxygen measurements and water 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 customised Seabird Seasave software installed on a PC. Profile data were logged down to a few meters above the bottom or, in deep stations, until 700 m. At each station on the standard hydrographic transects two Niskin bottles were triggered for water samples, one near the surface and one near the bottom, in order to calibrate the oxygen sensor. The water samples were analysed for dissolved oxygen using the Winkler method (Carrit and Carpenter, 1966). A total of 217 samples were taken for oxygen calibration. A linear regression of the Winkler determinations on the CTD values that was done in the central region produced the result shown in Figure 2.4.



**Figure 2.4** A regression of the Winkler determined oxygen concentrations from the Niskin bottles against linear the CTD values obtained from hydrographic stations 268-283.

## 2.3 Biological sampling

### *Sampling gear*

A Gisund Super bottom trawl was used during the survey. The trawl has a headline height of 4.5-4.8 m and a distance between the front part of the wings of about 21 m during deployment at a speed of 3 NM/h. Thyborøn' Kombi 6.7 m<sup>2</sup> trawl doors weighing 1 670 kg were used throughout the survey (this setting is standard on all swept area surveys with the Nansen). As in previous surveys, except during the 2002 survey, a 44 m long tickler chain has been routinely attached to the footrope on depths of more than 300 m in order to catch more of the bottom dwelling deep-water shrimps. During all tows deeper than 80 m, a 10 m long constraining rope was attached between the wires 125 m in front of the trawl doors. This kept a constant distance between the doors of about 50 m during the trawling. For shallower stations, with depth of less than 80 m, the door-to-door distance varied more, depending of bottom type and currents. Data from the door and depth/trawl height sensors were logged for all tows and are stored in files in CMG format, which makes it possible to study the trawl performance in more detail.

Trawl duration was standardized to 30 minutes and trawling speed to 3 nautical miles per hour. In some cases the towing was terminated early due to either indications of bad trawling performance or because the catch sensor went off. Some of these tows were rejected as valid stations because they were not trusted to reflect the density of fish on the bottom. Table 2.1 shows the numbers of valid and rejected stations. A detailed description of the fishing gear is given in Annex VII.

Acoustic recordings were carried out at four frequencies: 18, 38, 120 and 200 kHz using a SIMRAD EK500 Echosounder. Acoustic data were not processed on board, but all data were stored to files using the Bergen Echo Integrator (BEI). From the 15<sup>th</sup> of March the 38 kHz frequency was in addition stored using Echo View.

### *Sampling the catches*

Catches were sampled (or sub-sampled for large catches) for species composition by weight and numbers. Length measurements were taken as follows: for fish, total body length (cm) was measured to the nearest 1 cm below the longest lobe of caudal fin, and for shrimp carapace length to 1 mm below was recorded. The records of fishing stations are presented in Annex I. A total of 416 length samples were measured during the cruise. For commercially important species, pooled length frequency distributions, in which individual samples are raised to total catch, are shown by area in Annex II.

Most of the sharks caught were sexed, measured and weighted. Annex IX shows both the species caught and the measurements taken.

## 2.4 Areas and depth strata

Table 2.1 shows the areas (NM<sup>2</sup>) in the southern region (Cunene-Tombua: 17°15'S -16°00'S), in the central region (Benguela-Luanda: 12°40'S -09°00'S), and the northern region (Luanda-Congo River: 09°00'S-06°00'S) by depth strata. These strata are used in the swept-area biomass estimates in the time series. All samples are treated as representative for the relevant depth intervals where the species, or groups, were found.

## 2.5 Calculations

All equations for the calculations, including some theoretical background, are given in Annex V.

In the swept-area time series estimates of the Nansen, the effective fishing width of the gear is considered to be 18.5 m, which is used to calculate the area swept by the trawl. The effective fishing area is product of the 18.5 meters (or 0.01 NM) and the towing distance, which is measured by GPS as the distance (NM) the trawl has been towed on the bottom. In the Nansen time series the assumption has been that all fish within the trawling path have been caught, which gives a catchability coefficient ( $q$ ), i.e. the fraction of the fish encountered by the trawl that was actually caught, equal to 1.

Due to problems with inconsistency in the biomass estimation throughout the time series, it was decided to recalculate all the biomass and density estimates from 1994. Data from the project A4 in NAN-SIS were exported using the "Export to flat ASCII file" and "GRSPEC" functions and hence imported to MS-ACCES. The stations were sorted out by survey, depth and latitude, before new stratified density estimates were calculated. The decision to sort the data in ACCESS instead of in NAN-SIS was made because the sorting in NAN-SIS is only by area code, which may bias the results since the coverage in the southern and northern regions have not been consistent between surveys, i.e. the area north of Congo River and the area between Tombua and Benguela has only been surveyed during a few of the surveys. Biomass estimates by species or species groups were obtained from a stratified mean density estimator using equations in Annex V.

The NAN-SIS module WinGrafer has earlier been used to calculate and plot mean and confidence intervals of the time series, but because this module is only able to handle a maximum of 10 different surveys, a script was written in MatLab to make similar plots of the time series 1994-2003 (12 surveys). Still, WinGrafer was used to calculate the arithmetic mean and Pennington's estimator and theirs confidence intervals.

## CHAPTER 3 OCEANOGRAPHIC CONDITIONS

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### 3.1 Surface distribution

The salient feature of the hydrographic conditions off Angola between December and March is the drop in the salinity at the surface, associated to the seasonal rise in the precipitation over the continent and the consequent increase in the discharge of freshwater carried to the ocean by the Congo River and by smaller rivers along the Angolan coast. The regular surveys carried out with 'Dr. Fridtjof Nansen' in March are coincident with the late phase of the wet season and, typically, observe low salinity in the surface waters in the shelf off the northern and central Angola regions. No salinity decrease has been observed off the southern Angola (15°-16°S), except of one survey done during the anomalous "Benguela Niño" event in February-March 1995.

The salinities and temperatures observed at the surface during this survey were typical for March. The three main regions (south, central and north) displayed the usual, distribution patterns with respect to these parameters (Figure 3.1-3.3). In the southern region (Figure 3.1 and

Figure 3.2), the offshore temperature was 21°C and salinity was 35.8 psu, which was colder than the typical range for the tropical surface water, characterizing the mid-oceanic conditions in the South East Atlantic. The inshore temperature and salinity were, off Cunene River, 18°C and 35.4 psu, respectively. No strong winds were observed during the survey in this region.

In the central Angola region, the surface salinities were in the range between 30.6 and 34.0 psu and temperatures were in the range between 28 and 30 °C. The warmest and the least saline surface waters were typically observed offshore. The narrow bands of the markedly colder and more saline water ( $T < 28^{\circ}\text{C}$  and  $S > 34.1$  psu) were observed inshore off Cabeça da Baleia and between Pta do Morro and Pta. das Palmerinhas (Figure 3.3-

Figure 3.4). Since in these regions, the calm conditions with a varying wind direction prevailed, it is unlikely that the observed, obvious surface upwelling signature was related to a typical, wind-induced coastal upwelling process. It is more likely that the upwelling was coupled with the seasonal intensification of the Equatorial Counter Current (ECC), which during March assumes its southernmost position located off Angola at approximately 9°S.

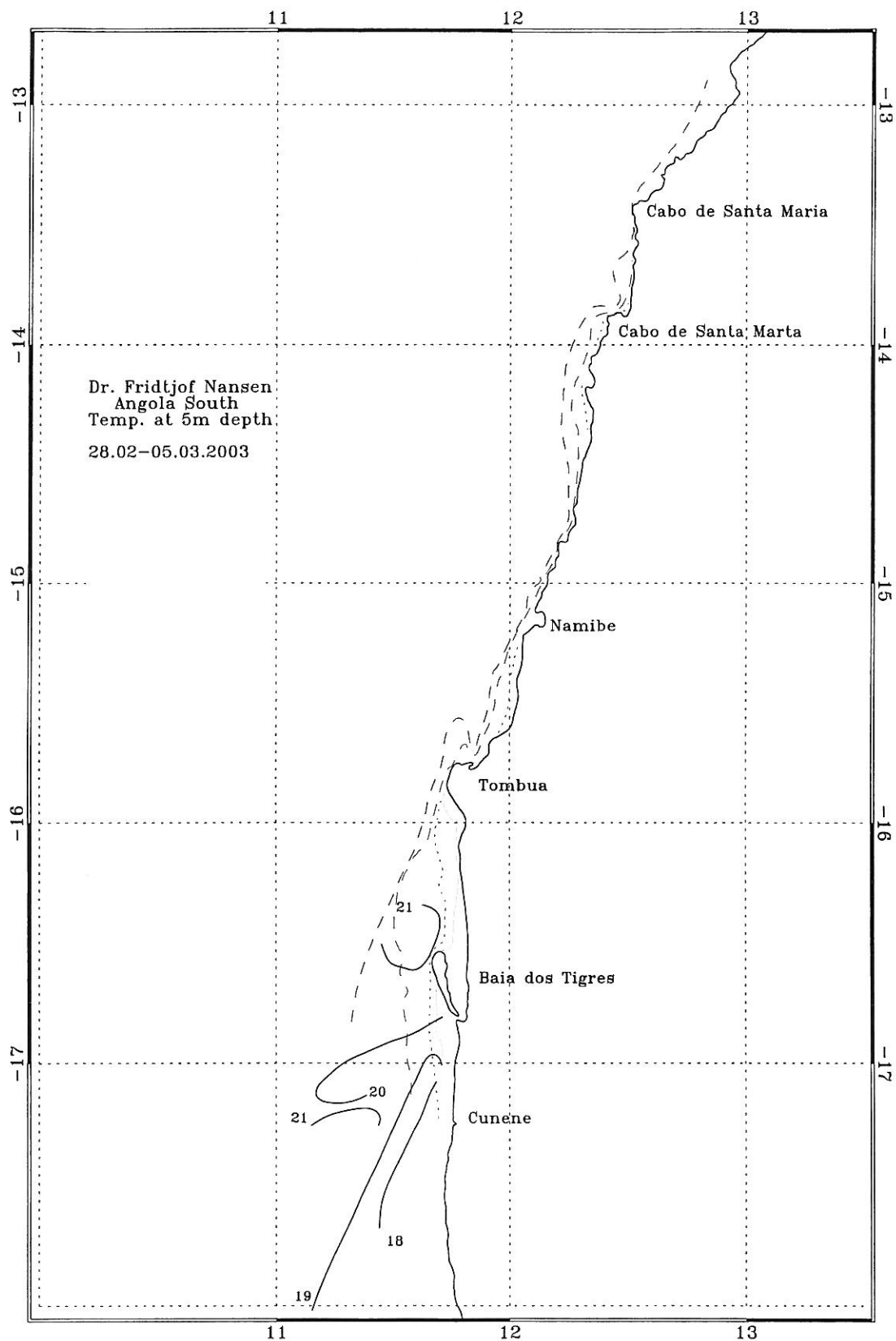
In the northern Angola, the surface temperature and salinity in the regions deeper than 100 m were characterized by nearly constant values. The average value was about 33.1 psu and 29°C for the surface salinity and temperature, respectively.

### 3.2 Vertical sections

The vertical section off Baía dos Tigres (Figure 3.7) indicates the conditions typical to the Angola-Benguela frontal region. The offshore surface layers were dominated by Tropical Surface Water (TSW), characterized by  $T > 23^{\circ}\text{C}$ ,  $S > 35.8$  psu and  $\text{O}_2 > 5\text{ml/l}$ . This layer is separated from the underlying Atlantic Central Water mass. Inshore, the distributions in the surface water were characterized by the up sloping isolines, revealing a shallow the coastal upwelling pattern.

The five sections off the central Angola, presented in Figure 3.8-Figure 3.12, reveal the distribution patterns in temperature, salinity and oxygen, which are very distinct from those observed in the south. At the surface, the layer of the brackish water with salinity around 34 psu coupled to the seasonal rainfall maximum occupied the entire extent of the section. The bottom shelf layers were rather well saturated in oxygen, which decreased gradually from 4 ml/l at the surface reaching 2 ml/l at a depth between 90 and 100 m.

The three sections located in Angola north are shown in Figure 3.13-Figure 3.15. The vertical structure was similar to that observed off the central Angola. The brackish water layer dominated the surface layer with salinity around 34 psu. The main pycnocline persisted between 20 and 40 meters, and the bottom layers in the shelf were well saturated with oxygen.



**Figure 3.1** Angola south. Horizontal distribution of surface temperatures (5 m depth). Depth contours at 20, 50, 100 and 200 m.

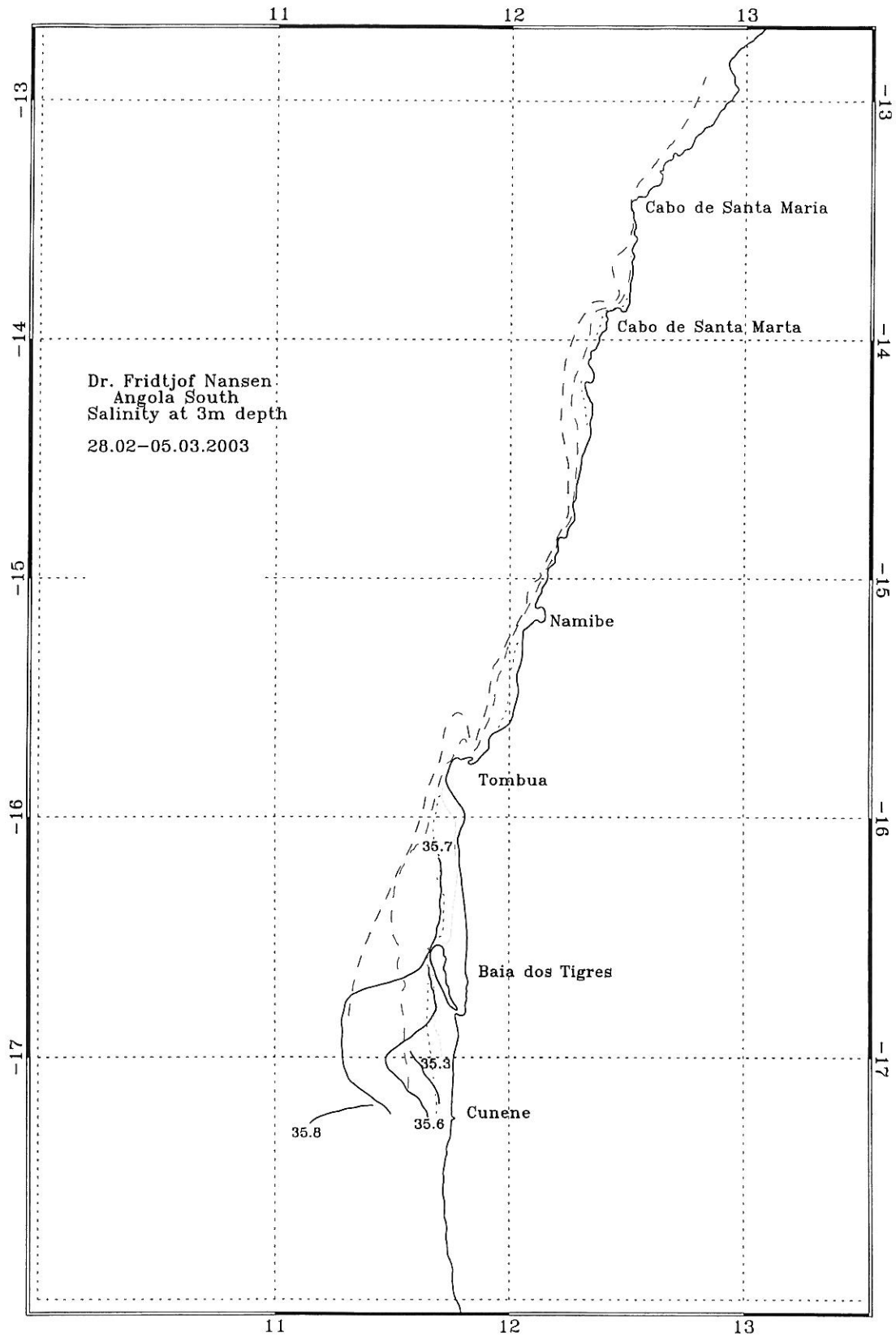
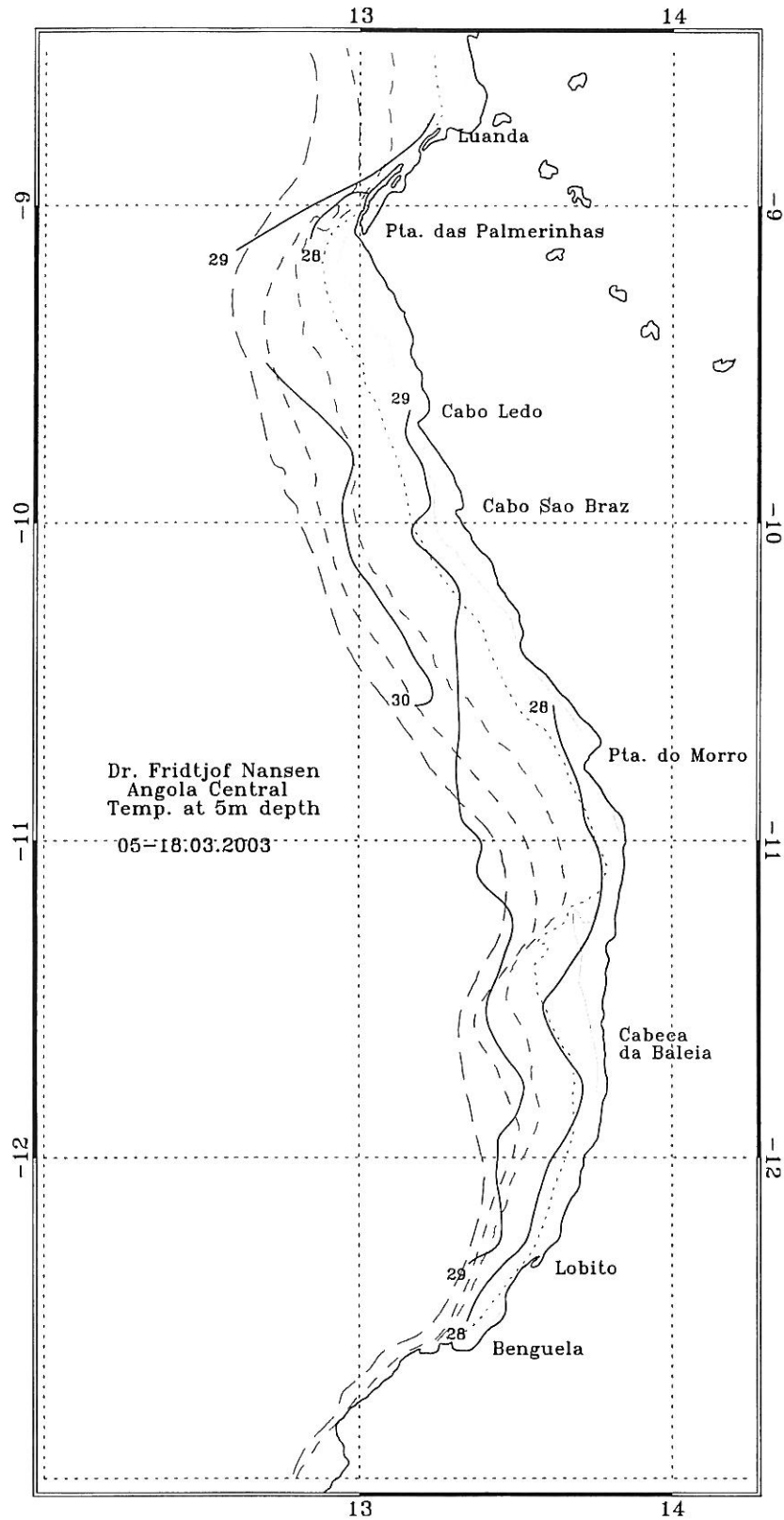


Figure 3.2 Angola south. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100 and 200 m.



**Figure 3.3** Angola central. Horizontal distribution of surface temperatures (5 m depth). Depth contours at 20, 50, 100, 200 and 500 m.



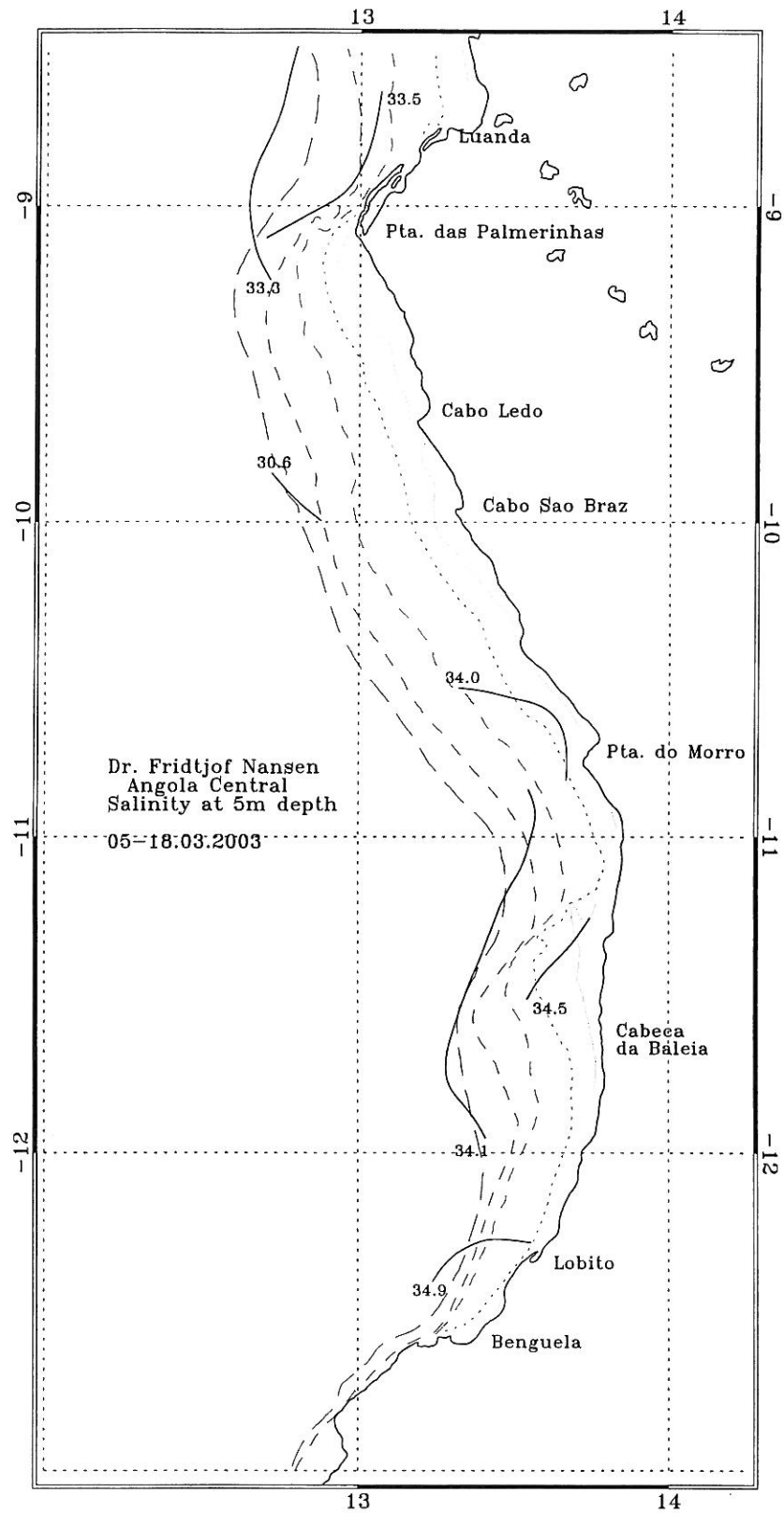
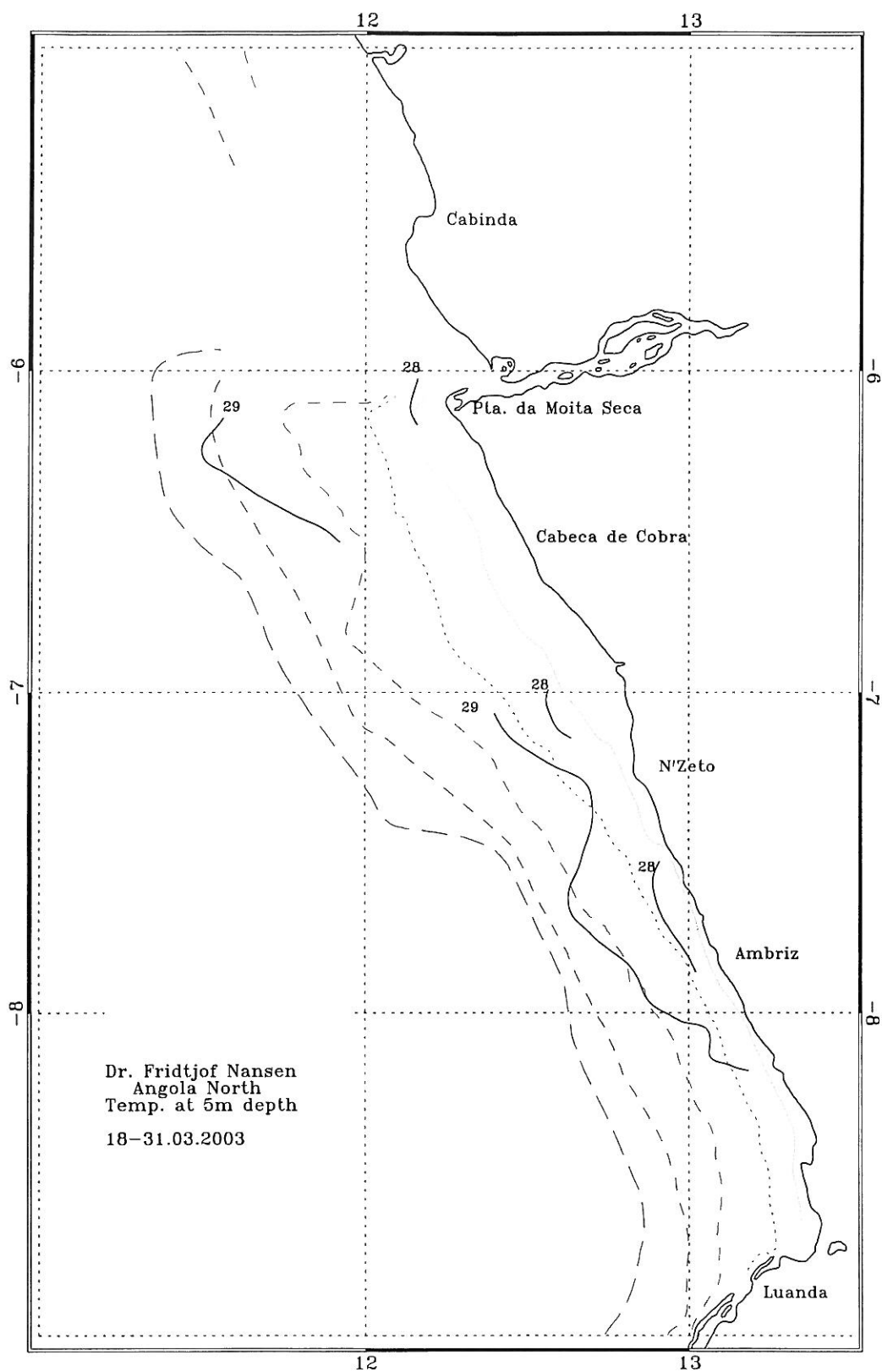


Figure 3.4 Angola central. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100, 200 and 500 m.



**Figure 3.5** Angola north. Horizontal distribution of surface temperature (5 m depth). Depth contours at 20, 50, 100 and 200 m.

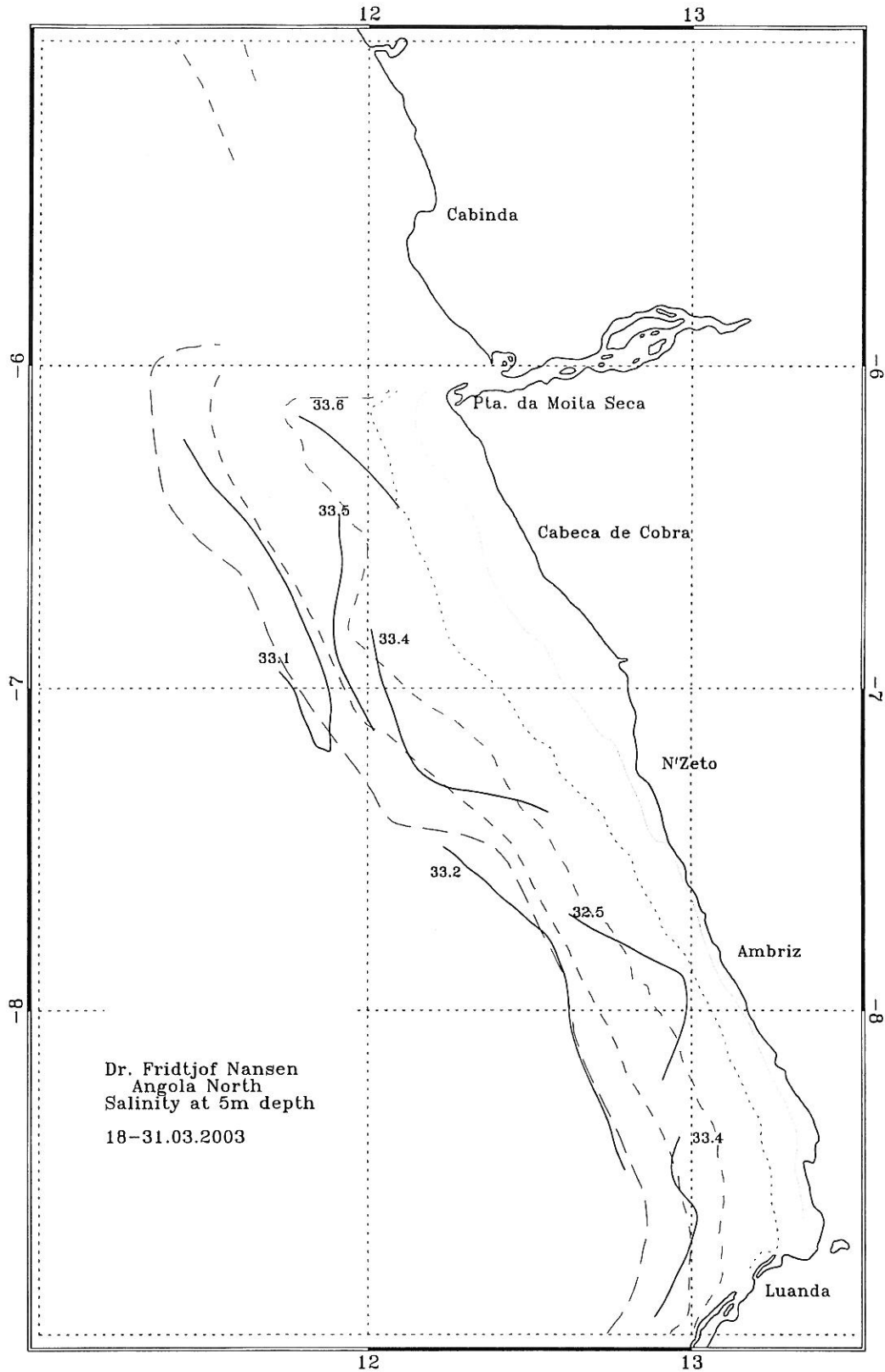


Figure 3.6 Angola north. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100 and 200 m.

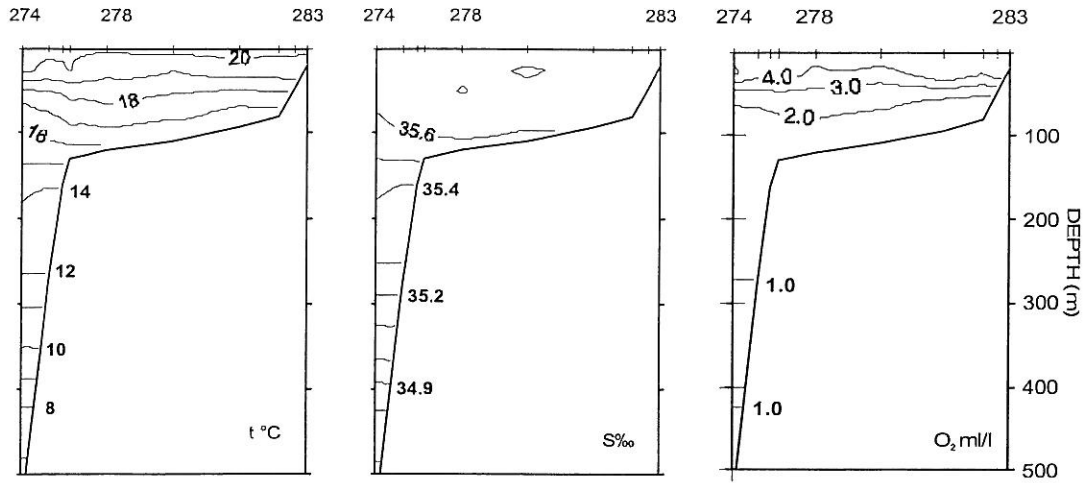


Figure 3.7 Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Baía dos Tigres.

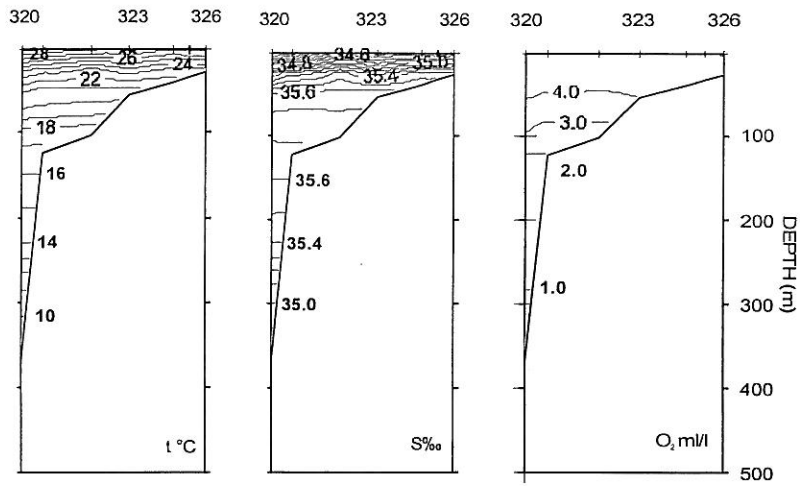


Figure 3.8 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Lobito.

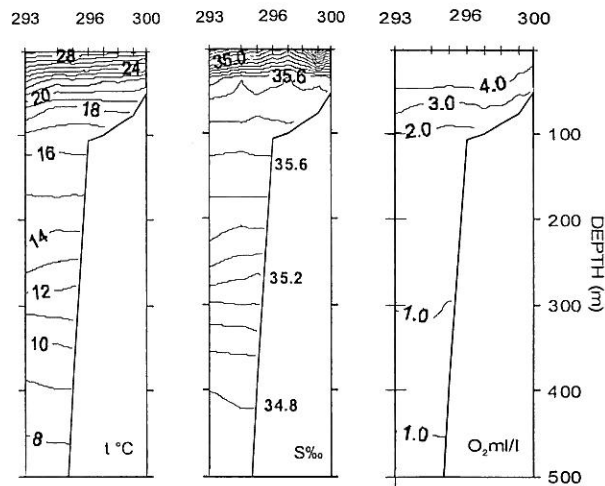
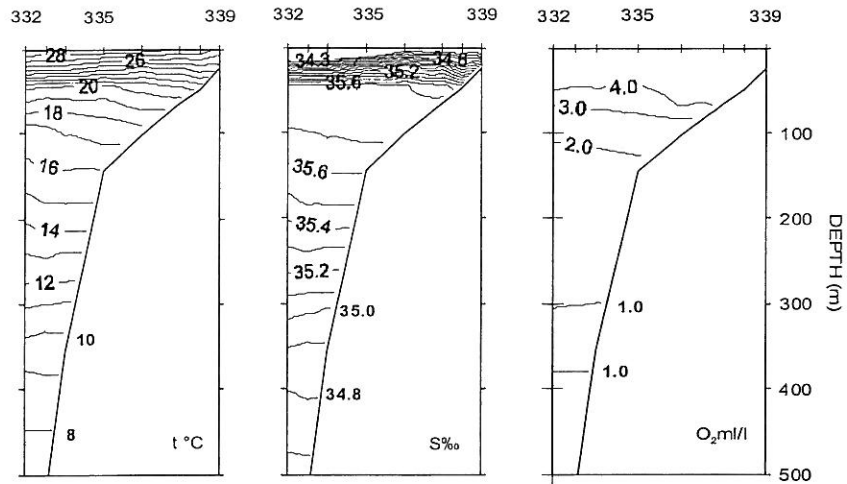
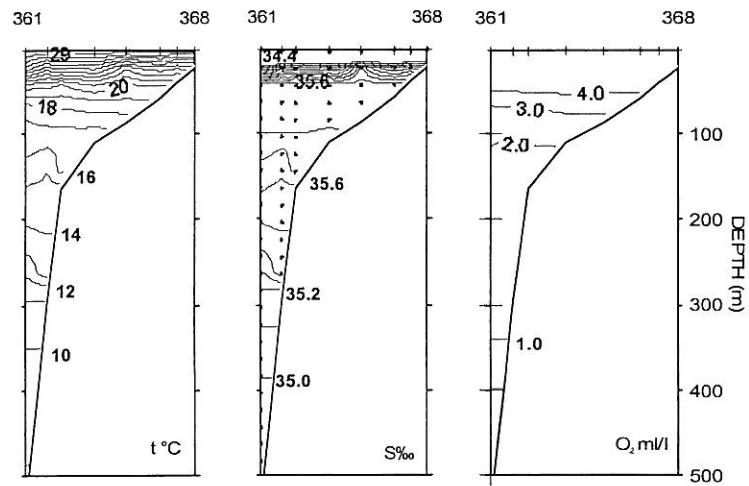


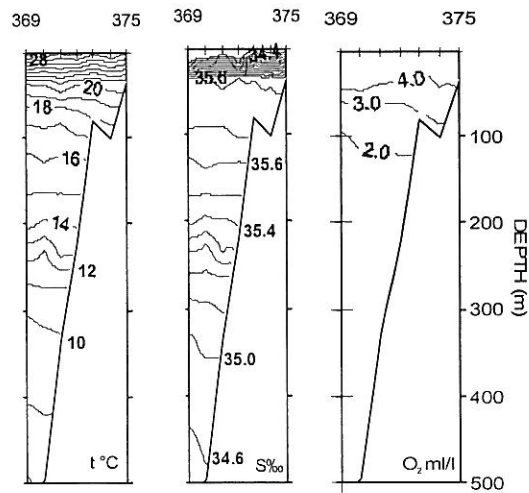
Figure 3.9 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Cabeça de Baleia.



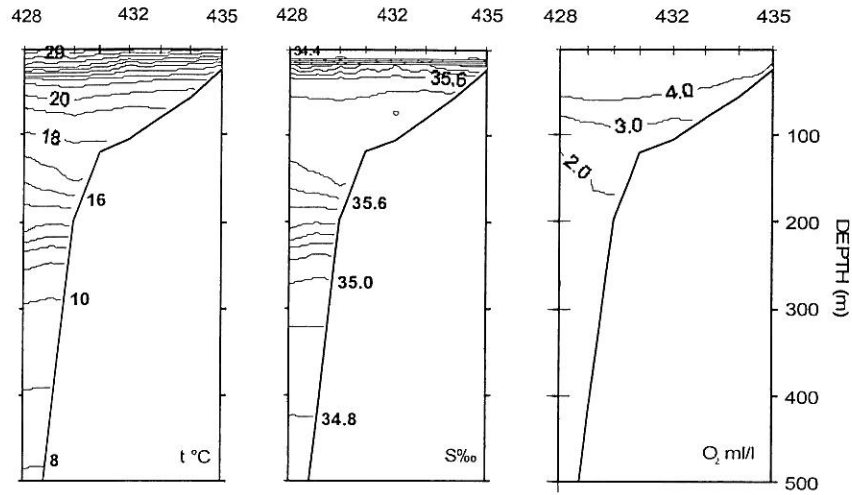
**Figure 3.10** Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Ponta do Morro.



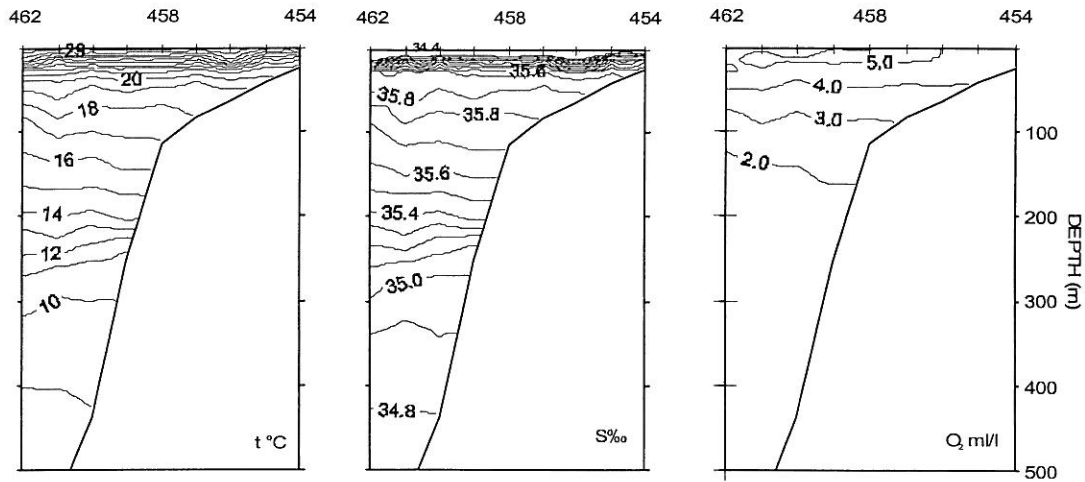
**Figure 3.11** Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Cabo Ledo.



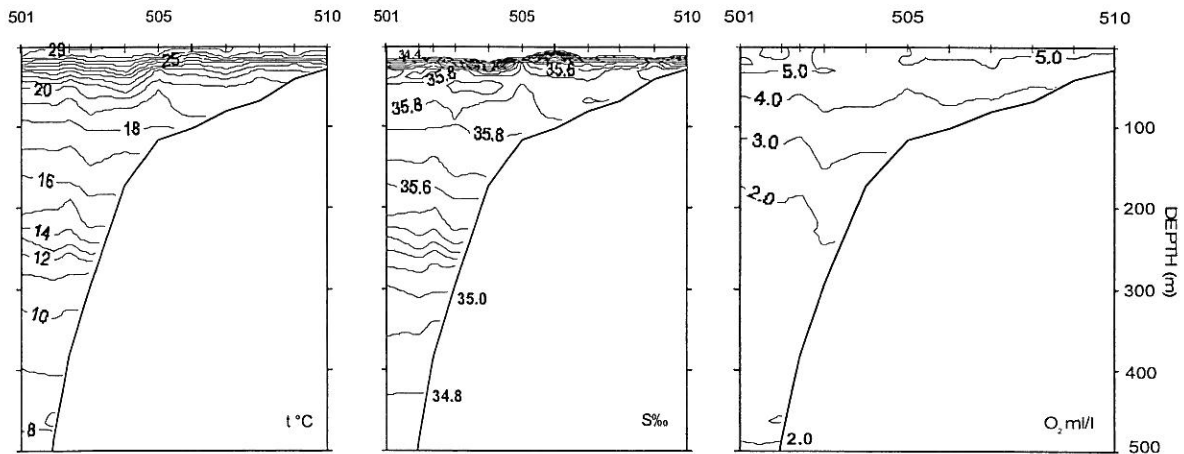
**Figure 3.12** Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Pta. das Palmerinhas.



**Figure 3.13** Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Ambriz.



**Figure 3.14** Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Ambrizete.



**Figure 3.15** Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen along the oceanographic transect at Pta. da Moita Seca.

## CHAPTER 4 CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEMERSAL RESOURCES ON THE SHELF

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The total catches and species compositions on the Angolan shelf are presented in this chapter. The inner shelf is defined to be the area between 20 and 70 m bottom depth while the outer shelf to be from 71 to 200 m depth. Several of the species which inhabit the shelf, particularly the seabreams (Sparidae), are also found in deeper waters, and Chapter 5 presents the catches on the slope beyond the 200 m isobath.

The trawl positions are mapped in Figure 2.1-2.3, and catch and station information by tow are presented in Annex I. Pooled length distributions weighted by the catch of the main species by sector region are shown in Annex II. Mean densities (t/NM<sup>2</sup>) of the main species sorted by abundance and depth strata, the frequency of occurrence and the catch distributions are shown in Annex III. Annex VI shows the NAN-SIS species codes used to extract the information in the various tables.

### 4.1 Cunene-Tombua shelf

During 3 days 26 trawl stations were sampled in the south region (24 were successfully accomplished). Compared to the 2002 survey more stations were sampled in 2003. The southern region has not been regularly sampled throughout the years, which make comparisons over the years difficult. Therefore, the time series of biomass estimates should be interpreted with caution since the survey strategies have not been standardized.

Table 4.1 shows the catch rates of five different fish groups for the inner and the outer shelf, respectively. The group 'Demersal' comprises the commercially important families Sparidae, Sciaenidae, Haemulidae (=Pomadasyidae), Serranidae, Lutjanidae, Merluccidae, Ophidiidae, and Ariidae, while the group 'Pelagic' includes the families Engraulidae, Clupeidae, Carangidae, Scombridae, Sphyraenidae, Stromateidae, and the benthopelagic family Trichiuridae.

On the inner shelf (see Table 4.1a) the 'Pelagic' group dominated the catches with a contribution of 64% of the total catch, which is less than last year. As last year, horse mackerel *Trachurus trecae* dominated the pelagic group. The 'Demersal' group contributed with about 5%, while cephalopods constituted 2.5% of the total. More sharks were caught this year compared to 2002 and this group contributed 2% of the total catch. The total catches were in average smaller in 2003 on the shelf, but as mentioned above care should be taken when the numbers are compared due to large changes in the sample effort between the surveys.

The 'Pelagic' group also dominated on the outer shelf (see Table 4.1b) with a relative contribution of 71%, and is mostly ascribed to high catch rates of both species of horse mackerel, *T. capensis* and *T. trecae*. The 'Demersal' group made up 24%, while cephalopods

and sharks contributed less than 1%, which is about the same relative abundance as last year. No shrimps were caught neither on the inner nor on the outer shelf.

**Table 4.1** Southern region, March 2003. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the shelf. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a. Inner shelf 20-70 m

STAT	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other*	Total
2990	25.0	22.0	819.0		4.4	12.4	1 413.7	2 259.1
2991	43.0	5.6	2 167.3		65.0	6.5	37.8	2 282.2
3002	64.0	3.4	265.3		59.1	3.4	163.3	494.5
3003	23.0	19.8	739.6			34.4	31.3	825.1
3013	54.0	276.1	102.4		32.8	57.1	6.4	474.8
MEAN	41.8	65.4	818.7		32.3	25.4	330.5	1 267.4
SE		52.8	363.6		13.4	11.3	304.3	414.4
% CATCH		5.1	64.4		2.5	2.0	25.8	

b. Outer shelf 71-200 m

STAT	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other*	Total
2992	87.0	149.4	13 857.2					14 006.6
2993	129.0	1 516.9	593.4				184.4	2 294.7
2994	147.0	1 956.1	1 740.4		0.1	5.0	22.0	3 723.6
2995	184.0	1 384.8	31.4		13.5		113.2	1 542.9
2999	132.0	777.9	1 882.8				114.3	2 775.0
3000	114.0	3.5	504.7		0.17		1.6	509.9
3001	94.0						1.0	1.0
3005	95.0							
3008	124.0	1 236.0	230.1		12.6		802.2	2 280.9
3009	116.0	1 029.5	113.6		4.0	296.7	29.0	1 472.8
3010	88.0	159.2	2 883.0		30.3		222.0	3 294.5
3012	73.0	21.9	2 428.0		48.4		17.7	2 516.0
MEAN	115.2	686.3	2 022.1		9.1	25.1	125.6	2 868.2
SE		206.6	1 116.0		4.5	24.7	65.4	1 071.3
% CATCH		23.9	70.5		0.3	0.9	4.2	

\* Other includes also non-demersal groups

### *Pelagic groups*

Catch rates of the most important pelagic fish families caught during this survey are presented in Table 4.2. Carangids, with horse mackerel (*T. trecae* and *T. capensis*) as the dominating species, dominated both the inner (60%) and outer (71%) shelf. Only a single catch of clupeids and scombrids were obtained on the inner shelf, each constituting 2% of the total. These families were not caught on the outer shelf as was also the case last year. No barracudas were caught in the south, while hairtails were caught in small quantities on both the inner and outer shelf, 0.1% and 0.2%, respectively.



**Table 4.2** Southern region, March 2003. Catch rates (kg/hour) of main pelagic families on the shelf obtained with bottom trawl hauls. Other a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a. Inner shelf 20-70 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other*	Total
2990	25.0	115.8	694.8		8.4		1 452.6	2 263.2
2991	43.0		2 164.0		3.3		114.9	2 282.2
3002	64.0		265.3				229.3	494.6
3003	23.0		600.1	139.5			85.5	825.1
3013	54.0		102.4				372.5	474.9
MEAN	41.8	23.2	765.3	27.9	0.8		451.0	1 268.0
SE			365.9				255.4	414.9
% CATCH		1.8	60.3	2.2	0.1		35.6	

b. Outer shelf 71-200 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other*	Total
2992	87.0		13 857.2				149.4	14 006.6
2993	129.0		593.4				1 701.3	2 294.7
2994	147.0		1 740.4				1 983.2	3 723.6
2995	184.0		31.4				1 511.6	1 543.0
2999	132.0		1 881.0		1.8		892.2	2 775.0
3000	114.0		504.7				5.3	510.0
3001	94.0						1.0	1.0
3005	95.0							
3008	124.0		230.1				2 050.8	2 280.9
3009	116.0		113.6				1 359.2	1 472.8
3010	88.0		2 883.0				411.6	3 294.6
3012	73.0		2 428.0				88.1	2 516.1
MEAN	115.2		2 021.9		0.2		846.1	2 868.2
SE			1 116.0				239.5	1 071.3
% CATCH			70.5				29.5	

\* Other includes also non-pelagic groups

*Demersal groups*

Table 4.3 presents catch rates of the most valuable demersal species grouped into families: seabreams (Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *Brachydeuterus auritus*), and croakers (Sciaenidae). Seabreams and croakers were caught on the whole shelf, while the other demersal families were not found in the south. Seabreams contributed with about 4% of the total on the inner and about 16% on the outer shelf, while croakers contributed with about 1% on both inner and outer.

Several species of seabreams were caught, and highest catch on the inner shelf was of *Pagellus bellottii*. While no *Dentex macrophthalmus* was caught on the inner shelf this species dominated the seabreams caught on the outer shelf. Three tows had catch rates of *D. macrophthalmus* of around 1000 kg/hour. The croakers were much less abundant, and like in previous years, species caught included *Umbrina canariensis* and *Atractoscion aequidens*. *Argyrosomus hololepidotus* was caught in one occasion.

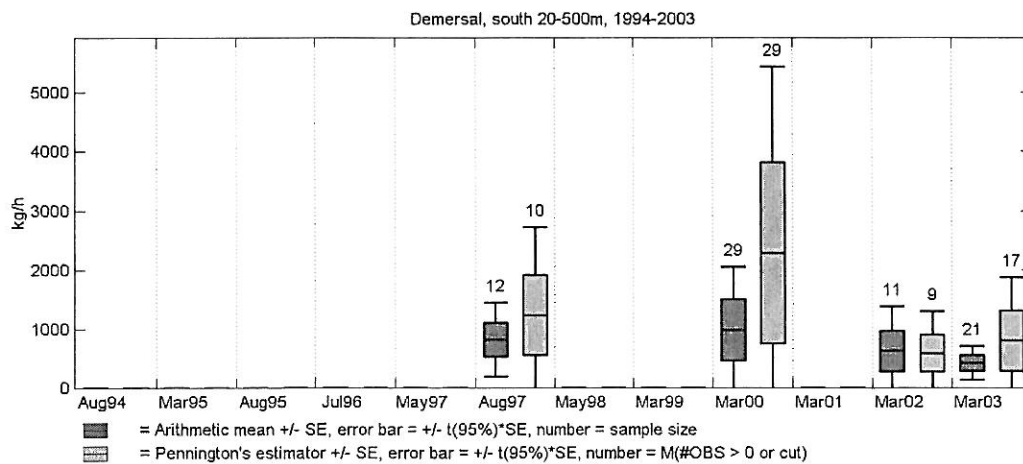
**Table 4.3** Southern region, March 2003. Catch rates (kg/hour) of valuable demersal species grouped by families.  
a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a. Inner shelf 20-70 m

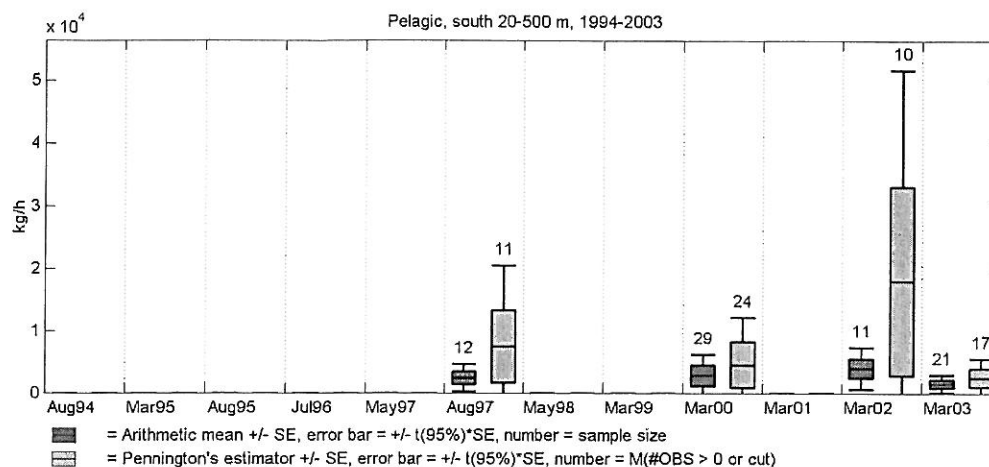
STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2990	25.0					11.2	2 260.4	2 271.6
2991	43.0						2 282.2	2 282.2
3002	64.0					3.4	491.2	494.6
3003	23.0	2.0				17.8	805.3	825.1
3013	54.0	242.4				29.3	203.1	474.8
MEAN	41.8	48.9				12.3	1 208.4	1 269.7
SE		48.4				5.2	444.3	415.9
% CATCH		3.8				1.0	95.2	

b. Outer shelf 71-200 m

STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2992	87.0	32.2				16.0	13 958.4	14 006.6
2993	129.0	1 382.8				56.0	855.9	2 294.7
2994	147.0	1 050.0				19.6	2 654.1	3 723.6
2995	184.0	588.9				57.9	896.1	1 543.0
2999	132.0	573.0				50.4	2 151.6	2 775.0
3000	114.0	3.5					506.5	510.0
3001	94.0						1.0	1.0
3005	95.0							
3008	124.0	507.8				18.4	1 754.7	2 280.9
3009	116.0	877.4				101.1	494.3	1 472.8
3010	88.0	141.3					3 253.3	3 394.6
3012	73.0	17.04				4.9	2 494.2	2 516.1
MEAN	99.2	308.7				24.9	1 599.3	1 932.9
SE		169.0				19.4	605.8	572.1
% CATCH		16.0				1.3	82.4	



**Figure 4.1** A time series of the mean catch rates [kg/h] of demersal fish in the southern region off Angola (from 20 to 500 m depth). Abundance and variance estimates are calculated by using both arithmetic mean and Pennington's estimator in Annex V.



**Figure 4.2** A time series of the mean catch rates [kg/h] of pelagic fish in the southern region off Angola (from 20 to 500 m depth). Abundance and variance estimates are calculated by using both arithmetic mean and Pennington's estimator in Annex V.

### *Biomass estimates*

Table 4.4 shows the time series from 1997 to 2003 of swept-area biomass estimates for valuable demersal and pelagic groups of the southern region. The biomasses were calculated by stratifying by depth (20-50 m, 51-100 m and 101-200 m). The estimates from before 1994, which are given in Angolan demersal survey report 2002 (Axelsen *et al.*, 2002), are not included in Table 4.4 because those estimates are likely to be positive biased due to a larger survey area. It is recommended that all survey estimates of the time series are recalculated with a standardised method.

Due to variable and low sampling intensity in the southern region, the numbers presented in Table 4.4 should be interpreted with caution. As seen from Figure 4.1 and Figure 4.2 the confidence intervals of the mean catches are wide for many of the surveys, and hence the biomass estimates in Table 4.4 should be regarded as rather imprecise estimates. This year survey used the same trawl positions as in 2000 in the south, and by comparing these two years' estimates it seems like that the demersal stocks presented in Table 4.4 and Figure 4.1 have declined. The seabream estimate, which has been stable above 25 000 tonnes during the years 1997-2002, shows a reduction on about 40% from 2000. This is mainly due to a huge reduction of *Dentex macrophthalmus*. The croakers show a similar reduction, and compared to the estimate of 2000, it has been a 60% reduction in the biomass this year. The pelagic species show a reduction from last year survey, but due to the different sampling effort, it is hard to conclude anything about the trend. However, the estimates of the 2000 survey are almost identical to the estimates of the 2003 survey.

**Table 4.4** Biomass estimates (tonnes) of important species group on the shelf (20-200 m) in the southern region.

	Seabreams	Grunts	Croakers	Groupers	Demersal	<i>T.teacae</i>	Carangids	Hairtails	Barracudas	Pelagic
Aug 97	25 144		901		36 908	12 080	127 026			127 123
Mar 00	26 684		2 825	4	35 119	75 235	114 066	1 165		115 302
Mar 02	28 772		1 306		34 955	144 844	217 606			218 349
Mar 03	15 881		1 112		24 269	76 127	113 472	47		117 632

### Distribution

Figure 4.3 shows the distribution of seabreams in the region between Cunene and Tombua. The main concentrations were found on the outer shelf off Baía dos Tigres, as was also the case in 2002, and from Cunene and up to 17°S. In the 2000 survey were the highest concentration was found from Cunene to north of Baía dos Tigres.

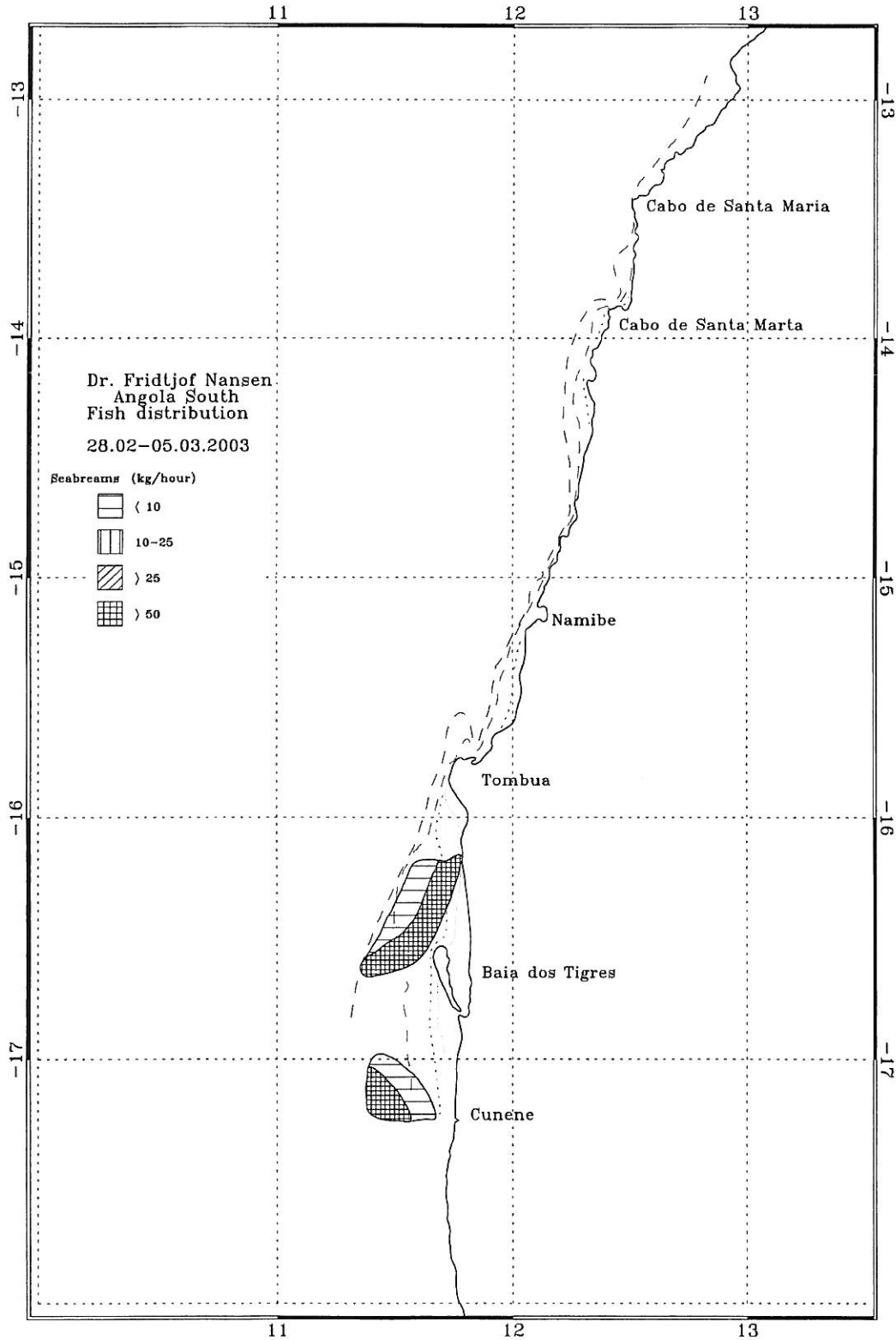


Figure 4.3 Distribution of seabreams (family Sparidae) in the southern region, Cunene-Tombua. Depth contours at 20, 50, 100 and 200 m.

## 4.2 Benguela - Luanda shelf

A total of 69 successful swept-area trawl stations were accomplished on the shelf area (Table 2.1). Table 4.5 presents the catch rates by main species groups on the inner and outer shelf. The 'demersal' group dominated on the inner shelf with an average catch rate of 840 kg/hour and a relative contribution of 73%. The relative contribution of demersal fish is the same as last year, but the mean catch rate is about 35% less than in 2002. The 'pelagic' group contributed about 16%, while shrimps, cephalopods and sharks each contributed less than 1%.

Pelagic fish were more abundant than demersal fish on the outer shelf, constituting some 24% of the catches. This is a reduction of pelagic fish compared to last year. Shrimps, cephalopods and sharks each contributed with less than 1% each. As last year the most abundant species was *Trachurus trecae*.

**Table 4.5** Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the shelf. Central region. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a. Inner shelf (20-70 m)								
Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other*	Total
3018	70	311.9	47.7				343.7	703.3
3020	55	2 911.2	687.8		15.1		317.6	3 931.7
3030	70	83.9	211.9		37.9		25.3	359.0
3031	55	246.1	372.3		7.1		46.1	671.6
3032	29	264.7	67.1		9.8		24.2	365.8
3033	64	526.1	167.2		0.5			693.8
3038	63	67.8	141.0		20.5		6.1	235.4
3039	42	51.0	1.3		7.0		2.7	62.0
3040	28	367.2	32.4				3.6	403.2
3041	23	119.2	282.2		1.0	4.6	164.9	571.9
3042	21	1.0	29.4				22.1	52.5
3047	36	1 521.4	312.4				187.8	2 021.6
3048	53	3 536.1	230.9	7.5			167.8	3 942.3
3050	31	2 529.6	362.4	5.8	6.5		180.9	3 085.2
3051	46	586.8	302.5		7.3	37.5	362.4	1 296.5
3060	48	400.4	47.2		1.1		211.4	660.1
3061	31	639.2	160.8	6.9	2.2		166.4	975.5
3062	31	1 538.9	280.0	1.7	5.4	1.4	162.0	1 989.4
3063	45	820.1	39.8	1.6	0.7	1.6	93.0	956.8
3064	67	862.4	401.0					1 263.4
3071	57	12.8	42.6	0.1	1.3		14.3	71.1
3072	35	14.8	28.4	0.3	0.5		1.1	45.1
3073	31	773.3	77.2	5.2	2.7		316.8	1 175.2
3079	51	434.5	83.1				74.3	591.9
3080	25	418.3	62.2		3.3		106.7	590.5
3081	25	2 715.1	134.4	0.9		4.1	114.6	2 969.1
MEAN	43.5	836.7	177.1	1.2	5.0	1.9	119.8	1 141.7
SE		196.9		0.5	1.7	1.4	22.9	226.7
% CATCH		73.3	15.5	0.1	0.4	0.2	10.5	

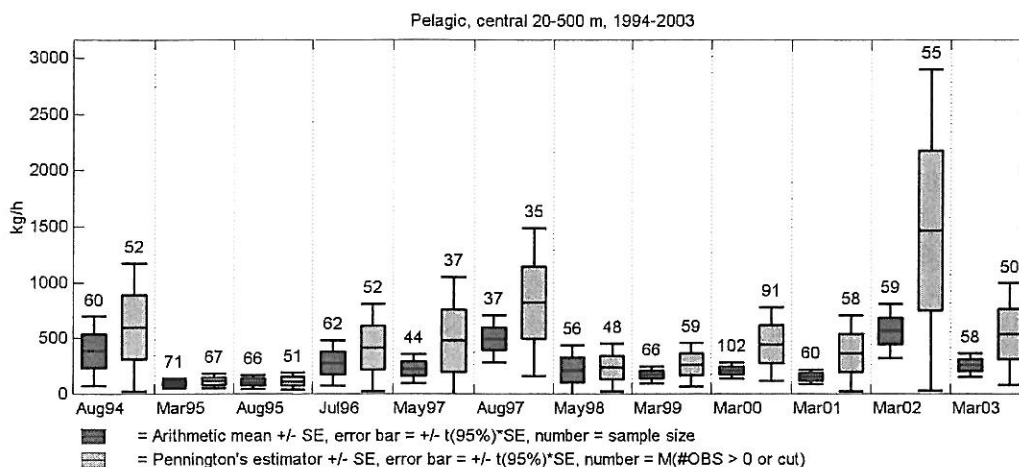
\* Also includes non-pelagic groups

## b. Outer shelf (71-200 m)

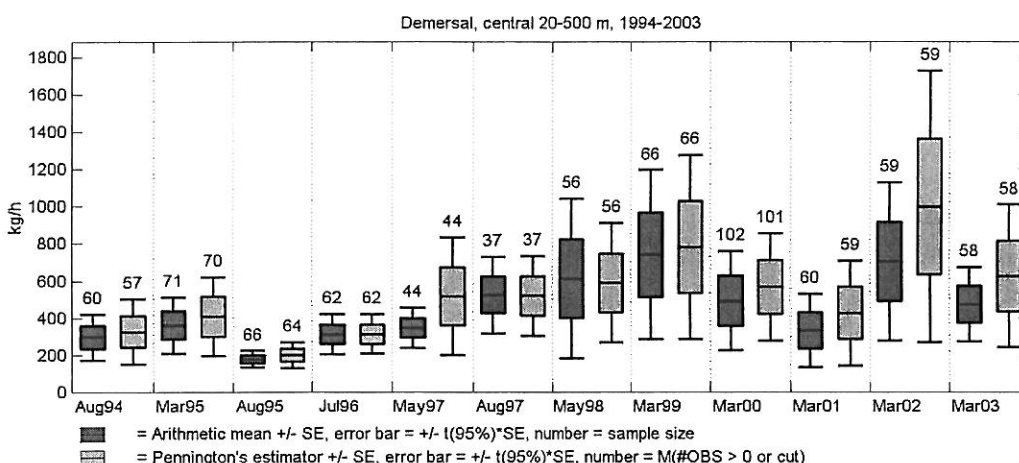
Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other*	Total
3019	94	155.4	807.0		11.0		5 731.0	6 704.4
3021	74	225.7	178.2		5.6		29.9	439.4
3022	99	246.4	3.0		1.1		29.4	279.9
3023	108	7.8	2.1				11.2	21.1
3029	103	272.5			24.3		38.2	335.0
3034	162	135.0	20.8	35.0	19.8		1 094.1	1 304.7
3037	103	97.4	109.5			2.8	4 633.8	4 843.5
3043	114	185.0	185.2	19.6	0.6		1 949.6	2 340.0
3044	147	277.0	30.0	55.5	2.2		543.4	908.1
3049	114	240.4	818.5	6.8			1 238.8	2 304.5
3052	91	78.8	605.6		13.8		4.7	702.9
3053	141	32.2	1 064.7		3.6		3 404.5	4 505.0
3055	129	87.9	180.5				76.9	345.3
3056	97	791.8	135.2		1.6		336.0	1 264.6
3065	96	83.7	72.5		83.8		9.9	249.9
3066	167	59.5			83.0		7 229.2	7 371.7
3069	103	105.0	1 550.8		38.7	14.8	200.7	1 910.0
3070	85	25.4	1 075.0		58.2	16.4	37.7	1 212.7
3074	95	46.5	1 916.4		11.6		52.9	2 027.4
3078	113	130.6	268.8	12.0	15.6		1 687.8	2 114.8
3082	79	268.7	1 312.6	0.8	2.5		23.5	1 608.1
3083	116	43.7	54.4		4.3	16.0	72.5	190.9
MEAN	110.5	163.5	472.3	5.9	17.3	2.3	1 292.5	1 953.8
SE		35.3	123.8	3.0	5.5	1.2	444.5	444.7
% CATCH		8.4	24.2	0.3	0.9	0.1	66.2	

\* Also includes non-pelagic groups

Figure 4.4 and Figure 4.5 show the time series of the mean catch rates of 'Pelagic' and 'Demersal' groups. The catch rates of the 'pelagic' group increased from 1995 to 1998 and from 1995 to 1999 for the 'Demersal' group. From 1998 to 2003 the mean catch rates have been relative stable for the 'Pelagic' group except for the 2002 survey where the mean catch rates estimated represented one of the highest of the time series. *Trachurus trecae* is the species which contributed most to the 'Pelagic' group, and the variation in the mean catch rates between years is mainly due to variable catch rates of *T. trecae* (see Figure 4.6). It should be noted that the August 1995 survey was specifically aimed at the deep-water shrimp and hake resources with sampling only deeper than 150 m, and that the August 1997 survey was specifically aimed at the large-eye dentex (*Dentex macrophthalmus*) with sampling between 50 and 300 m only. The 'Demersal' group does not show any clear trend after 2000, but the mean catches of the 2000 and 2003 surveys are on the same level, while the mean catches of the 2002 survey are some higher and the 2001 survey estimates are some lower.



**Figure 4.4** A time series of the mean catch rates [kg/h] of pelagic fish in the central region off Angola (from 20 to 500 m depth). Abundance and variance estimates are calculated by using both arithmetic mean and Pennington's estimator in Annex V.



**Figure 4.5** A time series of the mean catch rates [kg/h] of demersal fish in the central region off Angola (from 20 to 500 m depth). Abundance and variance estimates are calculated by using both arithmetic mean and Pennington's estimator in Annex V.

### *Pelagic groups*

Catch rates of the most important pelagic fish groups are presented in Table 4.6. Carangids dominated the catches on both the inner (9%) and outer shelf (17%) and like earlier years the most abundant species were Cunene horse mackerel (*Trachurus trecae*), Atlantic bumper (*Chloroscombrus chrysurus*) and African lookdown (*Selene dorsalis*). The clupeids were mainly found on the inner shelf where they contributed with about 2% of the catches and consisted mainly of *Ilisha africana*. The two species of sardinella (*Sardinella aurita* and *S. maderensis*) were also found, but only in low densities. Barracudas were only caught on the inner shelf and in one shallow station on the outer shelf. They contributed with 1.3% of the overall catch on the inner shelf. Hairtails were found on both the inner (3%) and outer (8%) shelf.



**Table 4.6** Catch rates (Kg/hour) of main pelagic families on the shelf in swept-area bottom trawl hauls. Central region. a: Inner shelf (20–70 m), b: Outer shelf (71-200 m)

## a. Inner shelf (20-70 m)

Station	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other*	Total
3018	70		28.0		19.7		655.7	703.4
3020	55		662.0		13.2	12.6	3 143.6	3 831.4
3030	70	2.7	209.2				147.3	359.3
3031	55	32.7	328.6		11.0		299.3	671.6
3032	29	21.1	31.9		8.1	6.0	298.8	365.9
3033	64		159.8		7.4		526.7	694.0
3038	63	50.9	79.3	0.5		10.4	94.5	235.6
3039	42		0.9			0.4	60.9	62.2
3040	28	1.7	8.8	1.4		20.5	370.9	403.3
3041	23	6.5	207.6	1.0	0.2	67.0	289.7	572.0
3042	21		29.4				23.1	52.6
3047	36	71.8	207.8		32.8		1 709.2	2 021.6
3048	53	11.1	44.2		175.7		3 711.6	3 942.5
3050	31	13.8	252.4		73.8	22.6	2 723.0	3 085.5
3051	46	13.4	81.6		195.5	12.0	994.2	1 296.7
3060	48	12.3			34.9		612.9	660.1
3061	31	60.4			100.4		814.9	975.7
3062	31	230.4	4.6		28.6	16.5	1 709.5	1 989.6
3063	45	13.2	9.5		17.1		917.2	957.0
3064	67	2.2	306.0		84.5	8.4	862.4	1 263.5
3071	57	1.2	38.2		0.9	2.4	28.7	71.3
3072	35		19.8			8.7	16.9	45.4
3073	31	32.4	3.3		41.6		1 098.2	1 175.4
3079	51	1.1	2.0		67.0	13.0	508.8	591.9
3080	25	27.2	10.2		24.9		528.3	590.6
3081	25	68.5	6.2		45.6	14.2	2 835.0	2 969.4
MEAN	43.5	25.9	105.1	0.1	37.8	8.3	960.8	1 138.0
SE		9.3	30.2	0.1	10.2	2.7	205.5	224.8
% CATCH		2.3	9.2		3.3	0.7	84.4	

\* Also includes non-pelagic groups

Figure 4.6, Figure 4.7 and Figure 4.8 show the time series of the mean catch rates of *Cunene* horse mackerel, Atlantic bumper and all “other carangids”, respectively, on the shelf (20-200 m) back to 1995. Figure 4.9 and Figure 4.10 show the mean catch rates of barracudas, mainly *Sphyrna guachancho*, on the shelf, and the hairtails, mainly *Trichiurus lepturus*, down to 600 m as this group is found at all depths. The abundance indices of Atlantic bumper and hairtails show a small increase since 2001, while barracudas show a small decline. Both *T. trecae* and other carangids show a very variable mean catch rates over the last surveys. It must be stressed that all the confidence intervals for the last surveys show an overlap for all the pelagic groups, which indicates that the trends mentioned above are not statistical significant.

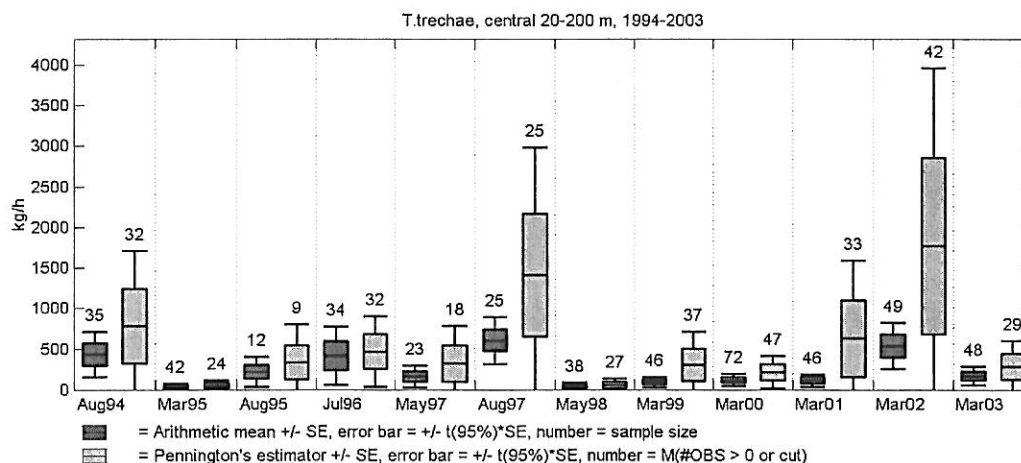
Note that the sample number given in the figures above the Pennington’s estimator indicates the number of observations above zero (or above the truncate level of very small catches, see Annex V for explanation). In other words this number, compared with sample number given above the arithmetic mean estimator, provides an indication of the encounter rate relative to the total number of samples (i.e. frequency of occurrence). For many of the previous cruises (not taking into account the August 1995 and August 1997 surveys) the frequency of occurrence of both, other carangids and barracudas seems very low.



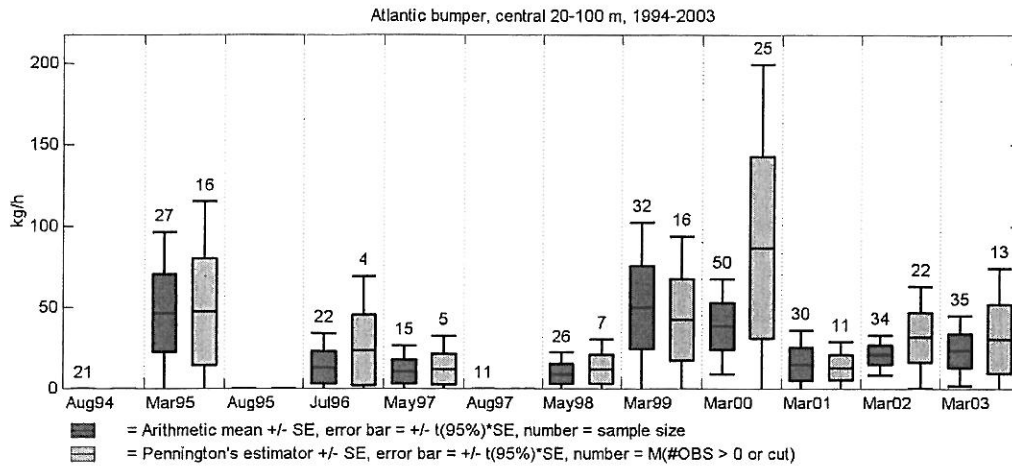
## b. Outer shelf (71-200 m)

Station	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other*	Total
3019	94				807.0		5 886.5	6 693.5
3021	74		168.4		9.8		266.7	444.9
3022	99		1.9	1.1			281.5	284.6
3023	108		0.1		2.1		20.2	22.4
3029	103						310.8	310.8
3034	162		17.6		3.3		1 288.6	1 309.4
3037	103		19.5		90.0		4 751.1	4 860.6
3043	114		85.2		100.0		2 157.0	2 342.2
3044	147				30.0		876.6	906.6
3049	114		362.5		456.0		1 488.3	2 306.8
3052	91		93.2		512.4		83.5	689.1
3053	141		1 064.7				3 450.6	4 515.3
3055	129		173.5	7.0			168.5	349.0
3056	97		96.0		39.2		1 127.9	1 263.1
3065	96		72.5				95.2	167.7
3066	167						7 371.8	7 371.8
3069	103		1 514.1	3.2	33.6		359.3	1 910.2
3070	85	3.4	1 060.8		9.3	1.6	137.8	1 212.8
3074	95		1 912.7	3.8			111.1	2 027.6
3078	113				268.8		1 846.1	2 114.9
3082	79		472.6		840.0		295.6	1 608.2
3083	116		45.6		8.8		136.6	191.1
MEAN	110.5	0.2	325.5	0.7	145.9	0.1	1 477.8	1 950.1
SE			117.0	0.4	56.1		441.3	445.7
% CATCH			16.7		7.5		75.8	

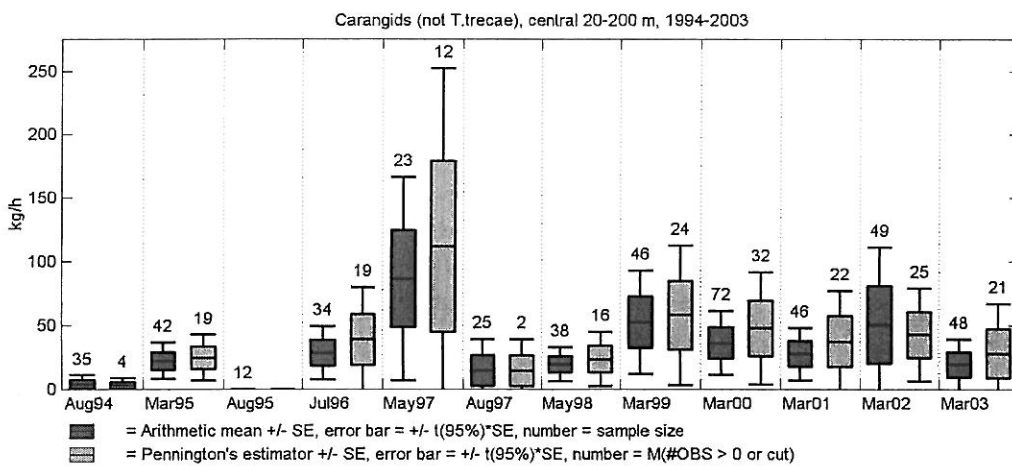
\* Also includes non-pelagic groups



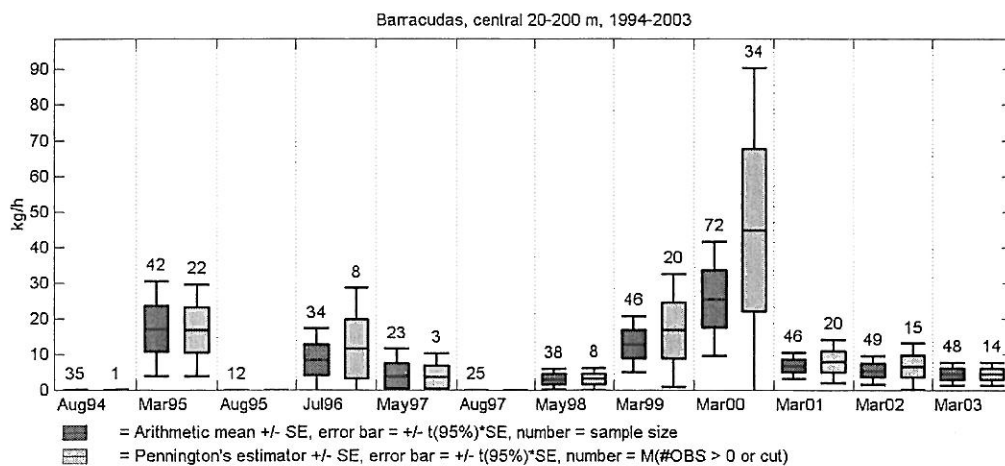
**Figure 4.6** A time series of the mean catch rates [kg/h] of *Trachurus trecae* in the central region off Angola (from 20 to 200 m depth). Abundance and variance estimates are calculated by both arithmetic and Pennington's estimator methods described in Annex V.



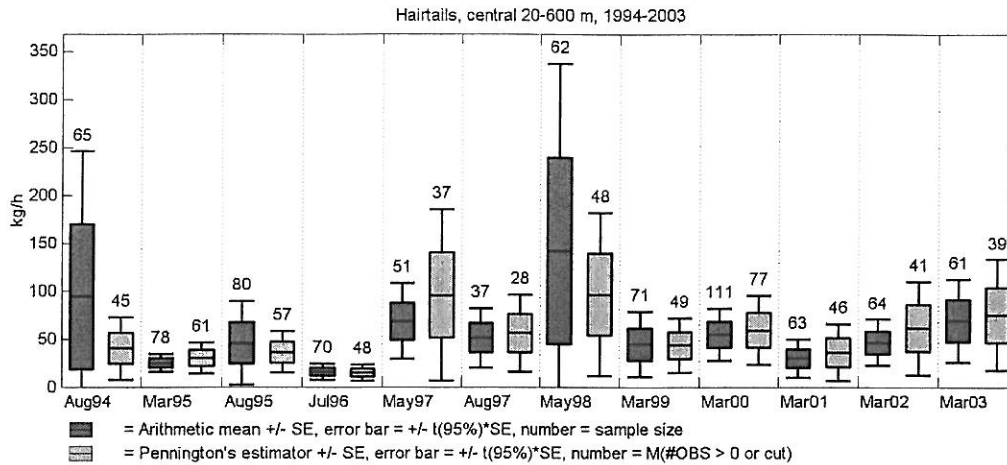
**Figure 4.7** A time series of the mean catch rates [kg/h] of Atlantic bumper in the central region off Angola (from 20 to 100 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.8** A time series of the mean catch rates [kg/h] of carangids (except *Trachurus trecae*) in the central region off Angola (from 20 to 200 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.9** A time series of the mean catch rates [kg/h] of barracudas in the central region off Angola (from 20 to 200 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.10** A time series of the mean catch rates [kg/h] of hairtails in the central region off Angola (from 20 to 600 m depth). Abundance and variance estimates are calculated using equations in Annex V.

### Demersal groups

Table 4.7 presents the catch rates of the most valuable demersal species on the shelf down to 200 m grouped into 'families': seabreams (Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *Brachydeuterus auritus*), and croakers (Sciaenidae).

In previous surveys seabreams was the main demersal group on both the inner and outer shelf, but during this year's survey the seabreams contributed with only about 3% and 2% of the overall catch rates in the inner and outer shelf, respectively. The average catch rates have declined with 40% and 83% on the inner and outer shelf compared to the 2002 survey. The huge decline is mainly due to the large reduction of *Dentex macrophthalmus* in the catches. Other seabreams in the catches were *Pagellus bellottii*, *Dentex congoensis*, *D. angolensis* and *D. barnardi*. Both croakers (mainly *Umbrina canariensis*, *Atractoscion aequidens*, *Pseudotolithus senegalensis* and *P. typus*) and grunts (*Pomadasys incisus*, *P. jubelini* and *P. peroteti*) were more abundant on the inner shelf during this survey compared to last year and the mean catch rates have increased with 108% and 143%, respectively. On the outer shelf the mean catches of croakers decreased from an average in 2002 on about 57 to about 14 kg/h in 2003, while the mean catch rate increased from 0.8 to 4.6 kg/h from 2002 to 2003. Like in previous surveys snappers were rare on the shelf, found only in one station on the inner shelf. Groupers, mainly *Epinephelus aeneus*, were more abundant compared to 2002, especially on the outer shelf.

**Table 4.7** Catch rates (kg/hour) of commercial demersal species grouped by families in swept-area bottom trawl hauls. Central region. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

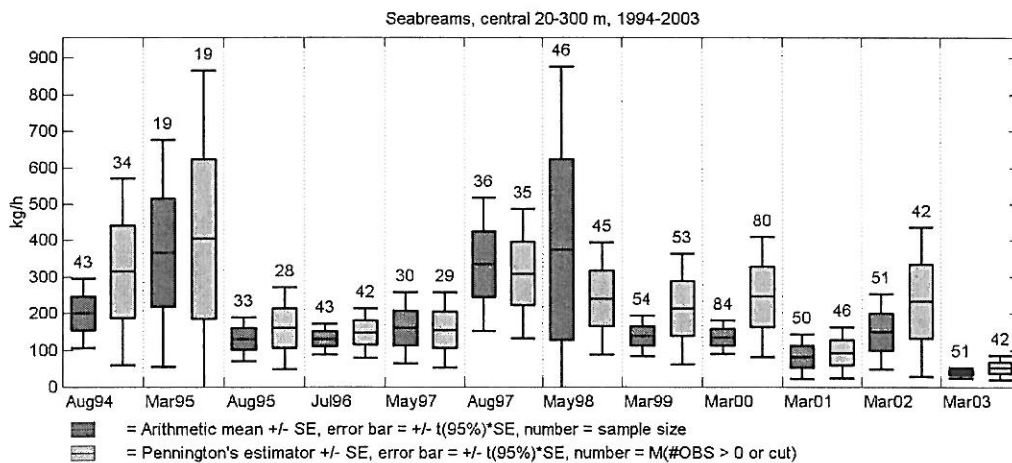
a. Inner shelf (20-70 m)

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
3018	70	130.3			69.6	40.4	463.0	703.3
3020	55	94.1		93.3	2 408.7	20.4	1 215.0	3 831.5
3030	70	45.7			32.4	2.1	279.0	359.2
3031	55	44.5			1.6	6.6	618.9	671.6
3032	29	2.5		1.2	2.4		359.7	365.8
3033	64	65.1				2.8	625.9	693.8
3038	63	35.7		0.1	5.8		193.8	235.4
3039	42	19.0		23.0	9.0		11.1	62.1
3040	28			3.2			400.0	403.2
3041	23	9.0		0.9	52.3	25.9	483.8	571.9
3042	21						52.5	52.5
3047	36				92.2	382.8	1 546.6	2 021.6
3048	53	146.3				86.8	3 709.3	3 942.4
3050	31	1.4			40.0	370.5	2 673.4	3 085.3
3051	46	32.0		7.0	66.8	20.1	1 170.6	1 296.5
3060	48	87.0		6.7	77.8	180.4	308.2	660.1
3061	31				68.0	113.2	794.4	975.6
3062	31				98.9	248.7	1 641.8	1 989.4
3063	45	16.4			73.4	69.4	797.6	956.8
3064	67	12.3			33.8		1 217.2	1 263.3
3071	57	0.8					70.5	71.3
3072	35	0.6		0.4	3.1	10.1	31.0	45.2
3073	31			0.2	73.7	186.8	914.6	1 175.3
3079	51	56.7			46.5	40.7	448.0	591.9
3080	25	95.2	19.8	20.9	186.4	72.1	195.9	590.3
3081	25	3.9		0.4	24.7	239.0	2 701.2	2 969.2
MEAN	43.5	34.6	0.8	6.1	133.4	81.5	881.7	1 137.9
SE		8.6		3.7	91.4	22.6	181.8	224.8
% CATCH		3.0	0.1	0.5	11.7	7.2	77.5	

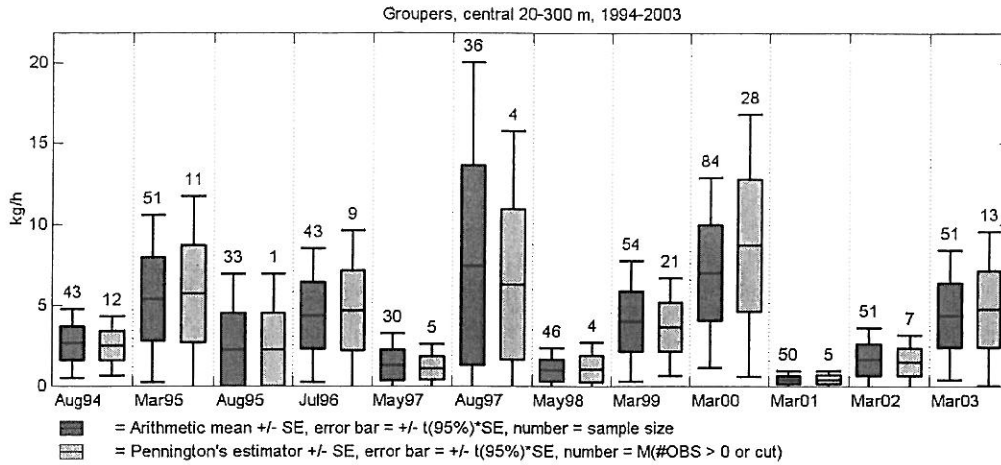
Figure 4.11 to Figure 4.14 show the time series of the mean catch rates of the demersal groups seabreams, groupers, grunts and croakers for the period 1994 to 2003 in the central Angolan region. The seabreams that have had a relative constant mean catch throughout the years show a huge decline in 2003, and in fact the mean catch of 2003 is the lowest ever. The mean catch rates of groupers and grunts show an increase since 2001, and the 2003 abundance indices are among the highest in the time series. Croakers show little fluctuation on the abundance, and with exception of the surveys before 1996 and the low 2001 estimate, the mean catch rate has been stable around 50 kg/h.

## b. Outer shelf (71-200 m)

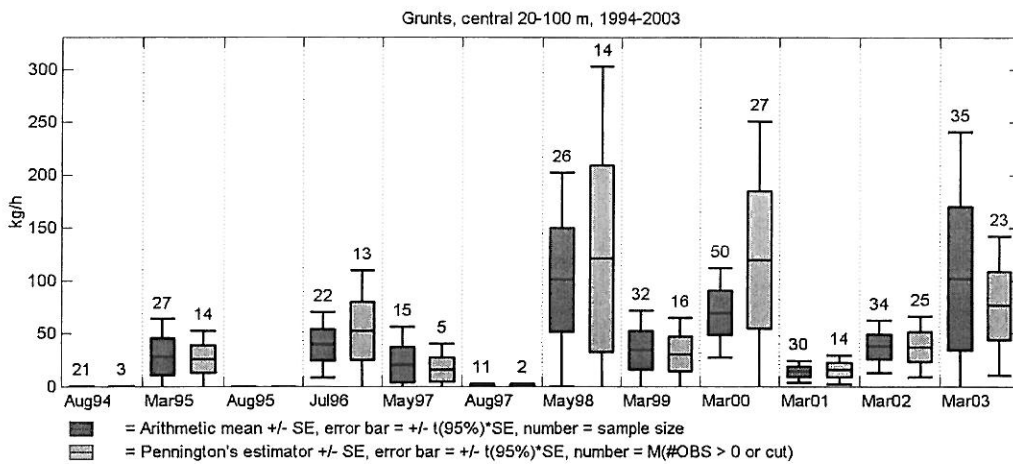
Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
3019	94	77.4			18.9	59.0	6 538.0	6 693.3
3021	74	41.0		0.6	88.0	35.6	279.6	444.8
3022	99	133.3		16.3		96.2	38.7	284.5
3023	108	7.0				0.8	14.5	22.3
3029	103	253.3		19.1			38.2	310.6
3034	162	20.3					1 289.0	1 309.3
3037	103	2.4				35.9	4 822.2	4 860.5
3043	114	9.0					2 293.0	2 302.0
3044	147						897.5	897.5
3049	114						2 306.8	2 306.8
3052	91					17.6	671.4	689.0
3053	141	17.5					4 497.7	4 515.2
3055	129	83.2					265.7	348.9
3056	97	6.2				2.4	1 254.4	1 263.0
3065	96	56.7		27.0			84.0	167.7
3066	167	59.5					7 312.2	7 371.7
3069	103	84.5					1 825.6	1 910.1
3070	85	10.5					1 202.2	1 212.7
3074	95	19.5		6.3			2 001.7	2 027.5
3078	113	4.4				22.9	2 087.5	2 114.8
3082	79	2.4				15.9	1 589.8	1 608.1
3083	116	21.6				12.3	157.2	191.1
MEAN	110.5	41.4		3.2	4.9	13.6	1 884.9	1 947.8
SE	5.3	12.7		1.6	4.19	5.2	447.4	445.6
% CATCH		2.1		0.2	0.2	0.7	96.89	



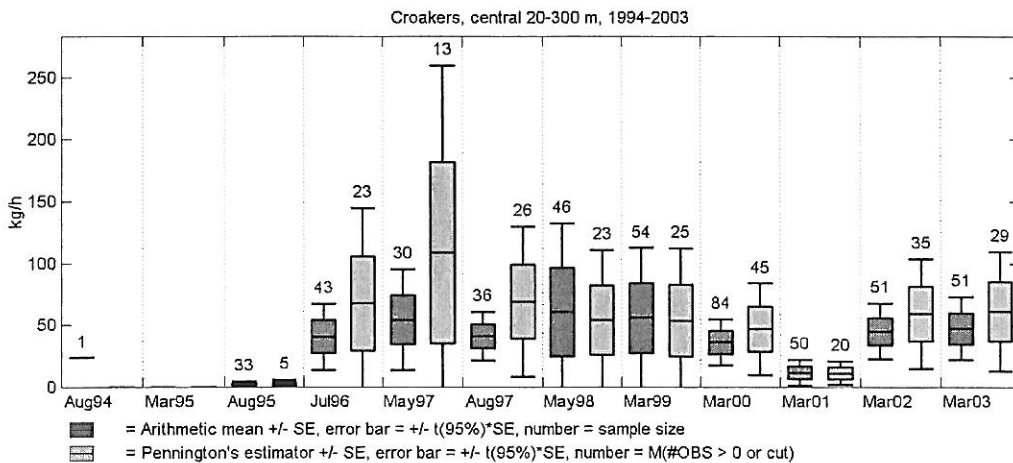
**Figure 4.11** A time series of the mean catch rates [kg/h] of seabreams in the central region off Angola (from 20 to 300 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.12** A time series of the mean catch rates [kg/h] of groupers in the central region off Angola (from 20 to 300 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.13** A time series of the mean catch rates [kg/h] of grunts in the central region off Angola (from 20 to 100 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.14** A time series of the mean catch rates [kg/h] of croakers in the central region off Angola (from 20 to 300 m depth). Abundance and variance estimates are calculated using equations in Annex V.

### Biomass estimates

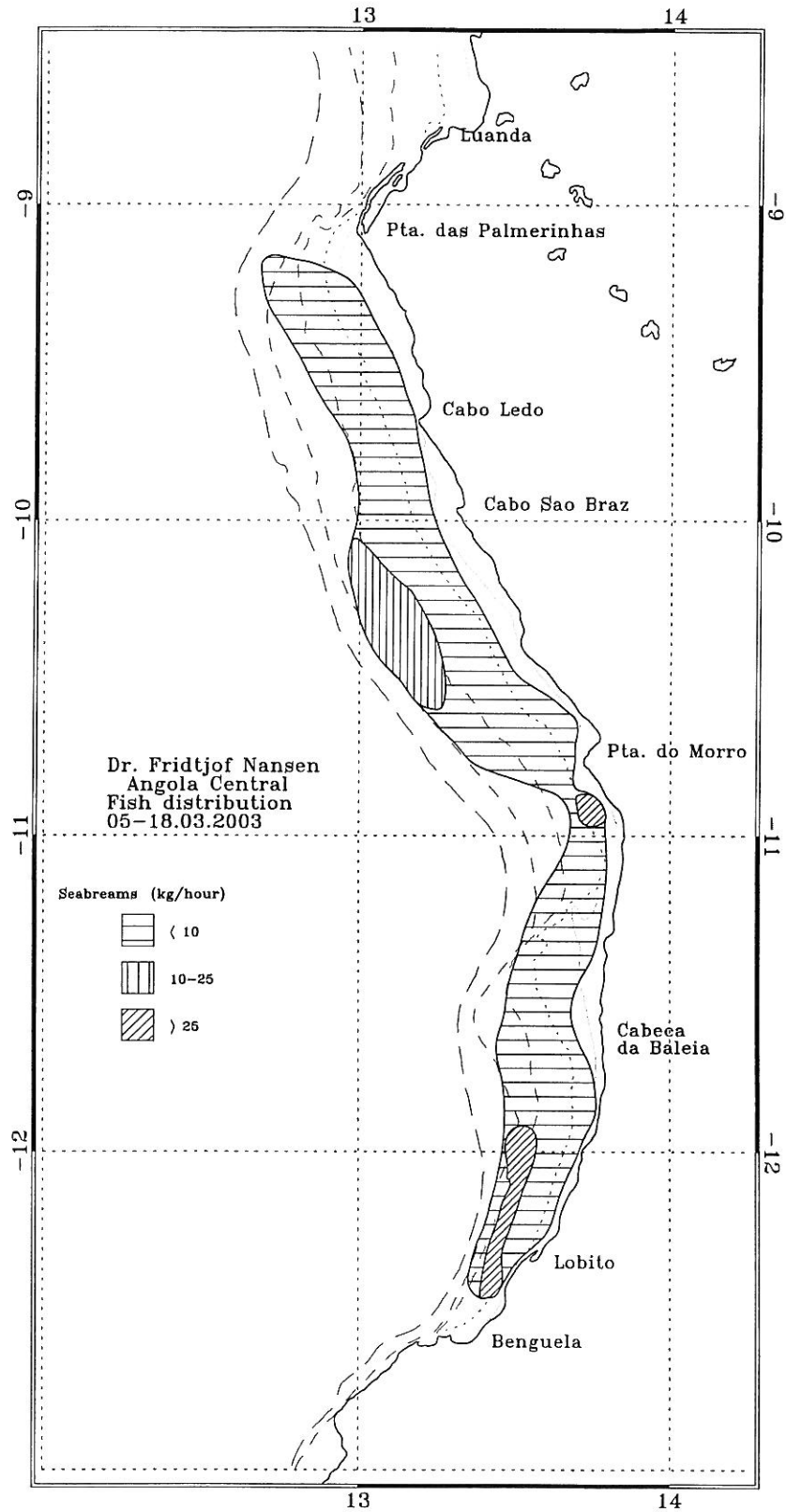
Table 4.8 shows the time series from 1994 to 2003 of swept-area biomass estimates for valuable demersal and pelagic groups of the shelf off central Angola. The biomass estimates were calculated by stratifying by depth (20-50 m, 50-100 m and 100-200 m). The estimates from before 1994 are given in Angolan demersal survey report 2002 (Axelsen *et al.*, 2002), but are not included in this report. It is recommended that all survey estimates of the whole time series are recalculated with a standardised method. The biomass estimates show the same trend as the mean catch rates figures, and the most important change since the 2002 demersal survey is the large reduction of seabreams. The 2002 estimate was 23 000 tonnes while the 2003 was only about 6 000 tonnes, which is the lowest estimate ever recorded since the 1994 survey.

**Table 4.8** Biomass estimates (tonnes) of important species group on the shelf (20-200 m) in the central region.

	Seabreams	Grunts	Croakers	Groupers	Demersal	<i>T. trecae</i>	Carangids	Hairtails	Barracudas	Pelagic
Aug 94	32 473	47	10 686	436	51 110	72 992	74 300	31 719	3	106 678
Mar 95	13 969	2 933	14 952	386	60 135	4 784	12 632	3 774	2 204	19 089
Aug 95										
Jul 96	19 159	2 636	5 305	670	45 565	50 697	55 246	3 286	793	59 866
May 97	27 382	1 091	9 965	289	53 198	36 972	51 821	28 422	350	82 922
Aug 97	108 476	320	42 090	2 979	179 771	302 967	321 717	44 570		367 598
May 98	68 537	11 099	13 890	116	115 002	7 423	10 476	19 783	309	32 175
Mar 99	21 121	4 134	10 634	696	163 231	16 499	25 188	10 638	1 710	39 405
Mar 00	20 604	7 246	5 291	805	101 232	20 833	26 516	12 217	3 394	43 801
Mar 01	12 436	1 426	1 686	85	73 082	20 180	24 536	7 118	1 191	33 027
Mar 02	23 076	2 815	6 638	249	103 219	83 031	90 545	8 446	654	101 868
Mar 03	6 135	9 708	4 950	801	62 666	27 908	31 866	13 676	444	47 337

### Distribution

Figure 4.15 shows the distribution of seabreams in the central region between Benguela and Luanda. The main concentrations were found off Lobito and between Pta. do Morro and Cabo São Braz. These are the same areas where the highest densities of seabreams were found during last year's survey. However, the densities of seabreams were higher during the 2002 survey, mainly due to high catches of *Dentex macrophthalmus*, which was only found in low densities during 2003.



**Figure 4.15** Distribution of seabreams (Sparidae) in the central region, Benguela – Luanda. Depth contours at 20, 50, 100, 200 and 500 m.



### 4.3 Luanda – Congo River shelf

This year survey covered the northern region of Angolan waters from Luanda to Congo River. The area north of Congo River is inaccessible to fisheries surveys due to the restricted oil exploitation areas. During many of the previous surveys this area was covered and thereby making abundance estimates difficult to compare. As mentioned above, the mean catch rates and biomass estimates of the northern region were hence recalculated without including stations north of Congo River. A total of 54 successful swept-area trawl stations were accomplished on the shelf area (Table 2.1). Table 4.9 presents the catch rates by main species groups on the inner and outer shelf. The 'Demersal' group dominated on the inner shelf with an average catch rate of 1 160 kg/hour and a relative contribution of 68%. Both the relative contribution and the mean catch rate of demersal fish have increased since last year and the mean catch rate is about 4 times higher than last year. The 'Pelagic' group contributed about 30%, while shrimps, cephalopods and sharks each contributed less than 0.5%. The mean catch rate of pelagic fish was about 3 times higher in 2003 than in 2002 on the inner shelf. Demersal fish were also more abundant than pelagic fish on the outer shelf, constituting some 44% of the catches. The mean catch rate of demersal fish on the outer shelf was 166 kg/h, which is an increase of 70% from the 2002 survey. The mean catch rate of pelagic fish declined with 54% for the same period. Shrimps contributed to 0.2% of the overall mean catch rate, while cephalopods and sharks each contributed to about 1% of the total.

**Table 4.9** Catch rates (kg/h) by main groups caught in valid swept-area hauls. Northern region. a. Inner shelf (20-70 m), b. Outer shelf (71-200 m).

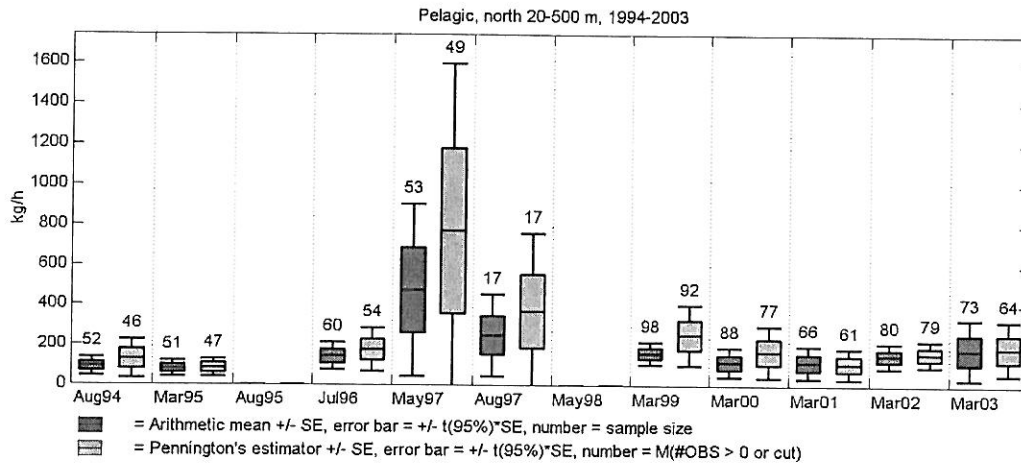
a. Inner shelf (20-70 m)								
Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
3089	29	467.3	944.4	43.6		1.8	268.5	1 725.6
3090	45	545.4	126.0	44.2			165.2	880.9
3091	53	1 886.0	96.5	11.5			252.0	2 246.0
3097	27	281.8	202.3	4.9			101.5	590.5
3109	26	91.8	117.3	0.4	0.1	9.0	68.4	286.9
3110	41	126.9	74.5	3.7	3.1	2.1	323.3	533.7
3111	65	325.0	135.7		0.1		60.4	521.1
3112	70	9 488.0	443.3		0.7		3.1	9 935.1
3119	24	134.8	464.9	3.2			178.5	781.4
3120	43	490.4	676.4	1.7			121.0	1 289.4
3121	56	7 426.0	5 316.5				34.1	12 776.6
3130	28	1 654.7	255.3	10.3			63.7	1 984.0
3138	26	100.5	27.4			3.6	24.0	155.5
3140	63	54.0	4.3		2.7		1.8	62.8
3146	38	11.2			1.6		3.9	16.8
3147	48	22.0	3.8			4.0	14.6	44.4
3178	55	3.1	31.7				1.6	36.4
3179	41	26.9	15.3	0.2			48.8	91.1
3180	44	2.1	6.3		0.2	1.8	9.9	20.2
3181	69	47.5	20.0	0.1	1.0		3.5	72.2
MEAN	44.6	1 159.3	448.1	6.2	0.5	1.1	87.4	1 702.5
SE		574.9	262.5	3.0	0.2	0.5	22.3	760.9
% CATCH		68.1	26.3	0.4	0.0	0.1	5.1	

## b. Outer Shelf (71-200 m)

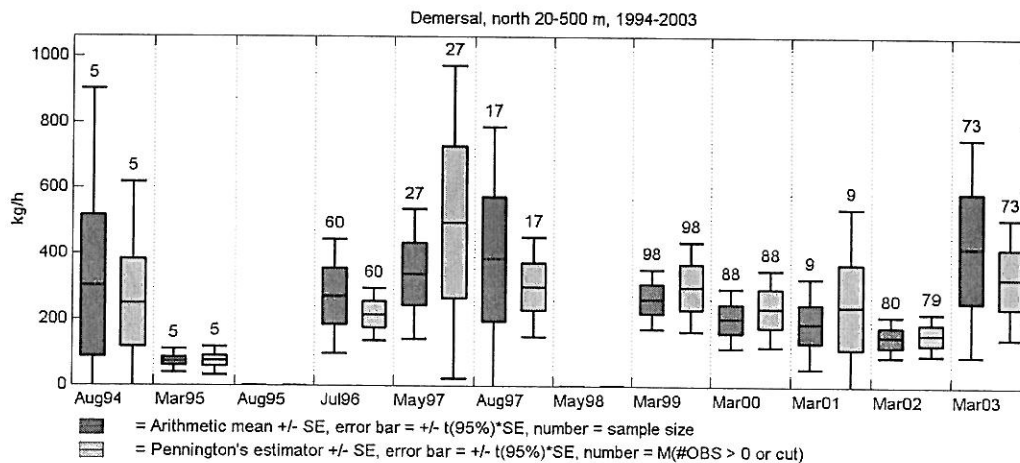
Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Shark	Other	Total
3092	113	56.7	19.7		1.3		62.8	140.6
3093	146	30.2	52.4	18.1	9.8		274.7	385.2
3100	90	72.0	121.9	0.3	8.8		52.7	255.6
3101	112	40.3	254.5		9.0		35.5	339.3
3102	165	48.0	6.7	2.5	3.5	4.1	124.0	188.7
3113	96	28.3	165.9		3.6		13.9	211.8
3114	117	170.3	910.3		4.4		33.3	1 118.3
3115	140	48.3	102.1		8.5		368.2	527.1
3122	71	11.5	42.2		0.6		7.2	61.5
3123	88	16.5	265.5		0.7		9.3	292.1
3124	106	43.7	376.8		54.6		31.8	506.8
3125	165	174.0	263.4		18.0		1 820.4	2 275.8
3132	72	12.9	276.9		4.3		0.4	294.5
3133	88	91.9	12.9		2.5	1.0	11.4	119.7
3134	116	1 567.8	20.9				41.5	1 630.2
3141	87	24.6	1.6		1.2		8.5	36.0
3142	114	68.0	7.8	4.0	3.6		160.3	243.6
3148	76	455.4	42.6		3.0		7.5	508.5
3149	120	28.5	10.8		10.1	3.6	31.5	84.5
3155	81	164.3	2.4		2.8		34.0	203.5
3156	87	295.1			1.9	3.8	12.1	312.8
3157	110	68.0	0.4		5.4	18.0	21.1	112.9
3158	119	93.2	523.9		6.6	8.0	62.6	694.3
3159	151	57.9	95.2		0.9	1.0	19.6	174.5
3165	91	21.1	5.8		0.5		16.1	43.5
3166	115	184.7	4.1		0.6		13.0	202.4
3167	150	58.0	41.6	0.5	0.8		42.6	143.5
3168	132	96.0	15.2		0.2	7.0	16.9	135.3
3169	115	212.2	88.5				22.4	323.2
3170	124	77.3	84.6				30.7	192.6
3175	108	122.7	12.5		0.3	9.3	27.7	172.5
3176	96	244.0	265.3		0.4		24.2	533.8
3177	80	308.7	26.9		0.2		19.6	355.5
3182	92	28.3	130.2				10.3	168.7
3186	109	82.7	16.6		0.8		5.8	106.0
3187	122	239.7	11.5	0.4	0.6		130.9	383.1
MEAN	110.1	148.4	118.9	0.7	4.7	1.6	100.1	374.4
SE		43.9	30.8	0.5	1.6	0.6	50.8	74.7
%CATCH		39.6	31.8	0.2	1.3	0.4	26.7	

Figure 4.16 and Figure 4.17 show the time series of catch rates (20-500 m) for the two main groups: 'Demersal' and 'Pelagic' in the northern region for the bottom trawl surveys back to 1994. There was no demersal survey in 1998, and it should be noted that the August 1997 survey was specifically aimed at the large-eye dentex (*Dentex macrophthalmus*) with sampling between 50 and 300 m only. The two figures show approximately the same pattern, i.e. a slightly increasing trend over time with somewhat higher catch rates in 1997 and a stable situation from 2000 although with lower catch rates. Both figures show that the mean catches

of 2003 are higher than the in 2002. In previous surveys the catch rates of the northern region have been lower than in the central, but during this year's survey the mean catch rate of both the 'Pelagic' and the 'Demersal' groups were higher in the northern region on the inner shelf due to high catches of the demersal species *Brachydeuterus auritus* and the pelagic species *Chloroscombrus chrysurus* (see Table 5.1).



**Figure 4.16** A time series of the mean catch rates [kg/h] of 'Pelagic' groups in the northern region off Angola (from 20 to 500 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.17** A time series of the mean catch rates [kg/h] of 'Demersal' groups in the northern region off Angola (from 20 to 500 m depth). Abundance and variance estimates are calculated using equations in Annex V.

### Pelagic groups

Catch rates of the most important pelagic fish families, caught with bottom trawls during this survey, are presented in Table 4.10. Like in the central region, carangids dominated both on the inner (19%) and outer shelf (19%) and as previous years the most abundant species were Cunene horse mackerel (*Trachurus trecae*), Atlantic bumper (*Chloroscombrus chrysurus*) and African lookdown (*Selene dorsalis*). The clupeids were mainly found on the inner shelf where they contributed to about 2% of the catches and consisted mainly of *Ilisha africana*. The two species of sardinella (*Sardinella aurita* and *S. maderensis*) were also found, but only in low densities. Barracudas, mainly *Sphyraena guachancho*, were most frequently caught on the inner shelf, but were also found on the outer shelf. They contributed to 1.8% of the overall catch on the inner shelf and to 0.4% on the outer shelf. Hairtails were found on both the inner (2.4%) and outer (10.3%) shelf.

**Table 4.10** Catch rates (kg/h) of main pelagic species grouped by families caught in valid swept-area hauls. Northern region. a. Inner shelf (20-70 m), b. Outer shelf (71-200 m).

#### a. Inner shelf (20-70 m)

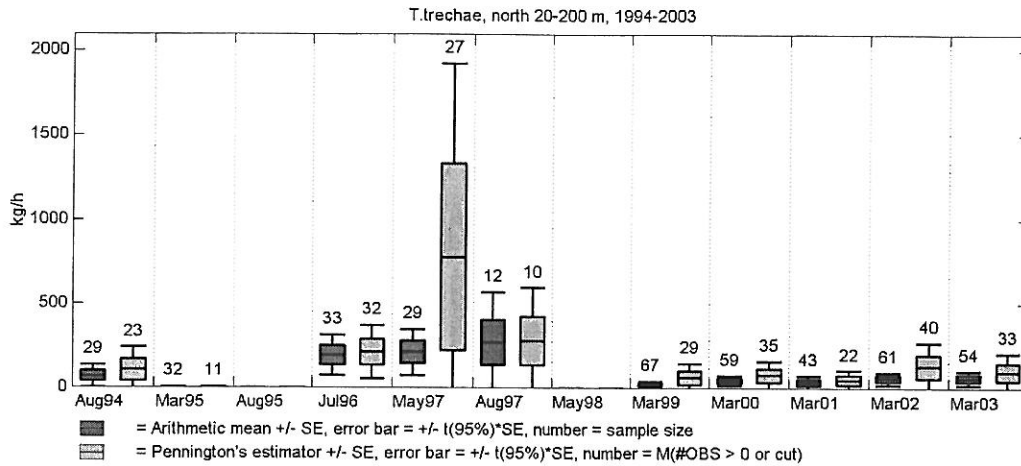
Station	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other	Total
3089	29	85.4	351.4		45.4	462.2	781.2	1 725.6
3090	45	55.7	24.1		46.2		754.9	880.9
3091	53	33.8	5.8		56.9		2 149.6	2 246.0
3097	27	64.5	43.1		82.0	12.7	388.2	590.5
3109	26	64.8	16.8	3.9	17.0	14.8	169.6	286.9
3110	41	10.0	15.6		18.3	30.6	459.1	533.7
3111	65	0.3	126.6		2.2	6.6	385.4	521.1
3112	70	0.0	443.3				9 491.8	9 935.1
3119	24	205.1	189.4		2.3	68.1	316.5	781.4
3120	43	90.3	95.3		467.2	23.5	613.1	1 289.4
3121	56	7.8	5 308.8		0.0		7 460.1	12 776.6
3130	28	183.7	42.5		29.1		1 728.7	1 984.0
3138	26		3.4	19.4		4.6	128.1	155.5
3140	63		2.2		2.2		58.5	62.8
3146	38						16.8	16.8
3147	48		3.8				40.6	44.4
3178	55		12.6		19.1		4.7	36.4
3179	41	3.2	6.3		2.7	3.1	75.9	91.1
3180	44		6.3				13.9	20.2
3181	69		0.3		19.7		52.1	72.2
MEAN	44.6	40.2	334.9	1.2	40.5	31.3	1 254.4	1 702.5
SE		13.7	263.2	1.0	23.0	23.0	571.5	760.9
% CATCH		2.4	19.7	0.1	2.4	1.8	73.7	

Figure 4.18, Figure 4.19 and Figure 4.20 show the time series of the mean catch rates of Cunene horse mackerel, Atlantic bumper and all “other carangids”, respectively, on the shelf (20-200 m) back to 1994. The time series of the mean catches of barracudas, mainly *S. guachancho*, on the shelf, and the hairtails, mainly *Trichiurus lepturus*, down to 600 m, are shown in Figure 4.21 and Figure 4.22, respectively. The time series of Atlantic bumper show a decline from 2000 to 2002, but a large increase from 2002 to 2003. High catches of *T. trecae* and other Carangids during the May 1997 survey create difficulties to follow the trend of the other surveys. However, the 2003 mean catch rate of both other carangids and

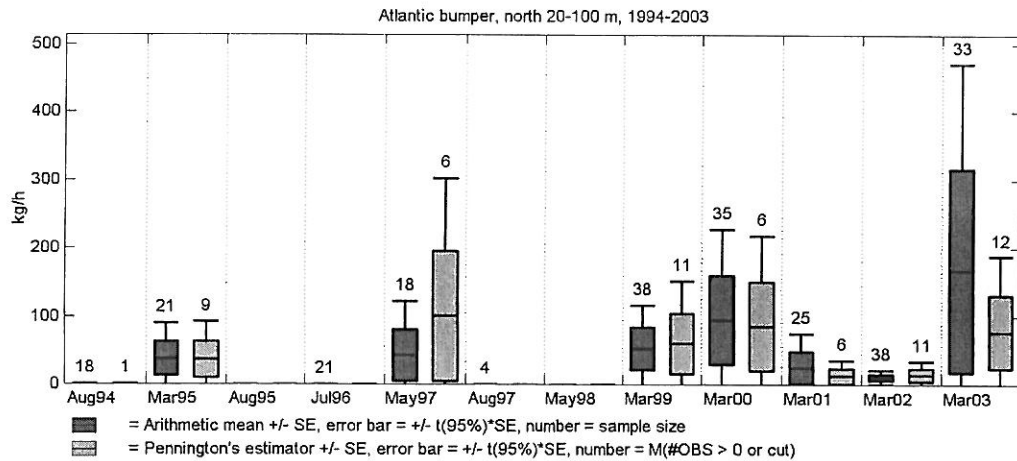
*T. trecae* are the second highest in the time series. Except for the March 1995 survey the mean catch rates of barracudas are very low until the 1999 survey. Thereafter, the mean catch rate decreased until 2001 and then increased in both 2002 and 2003. The mean catch rates of hairtails have fluctuated considerably between surveys, maybe as a result of variable catchability of this fish group. The confidence intervals are wide for all the pelagic groups, which indicates that the trends mentioned above are not statistically significant. There is a tendency, the pattern in catches rates of the pelagic groups over time in the northern and central region are similar, but the similarities may become less clear due to the fact that the different species are included in many of the pelagic groups.

## b. Outer shelf (71-200 m)

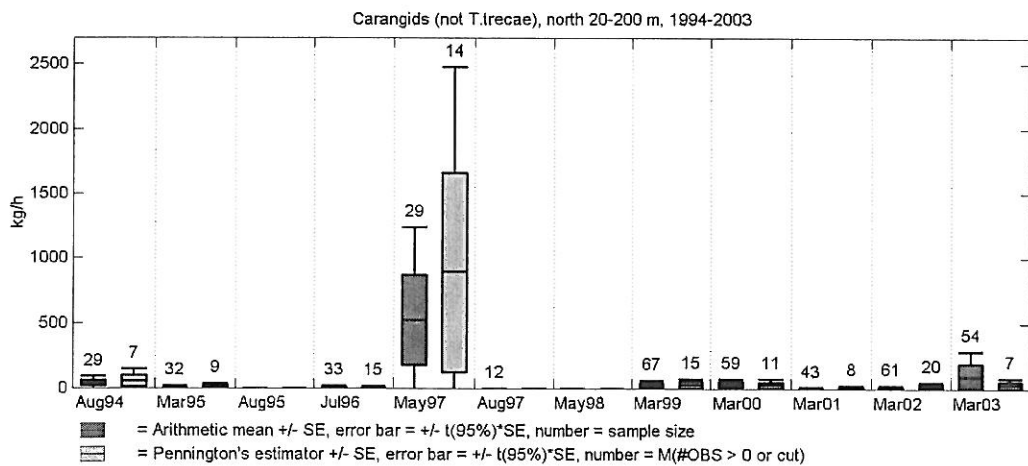
Station	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other	Total
3092	113		16.6		3.1		120.8	140.6
3093	146		46.8		5.6		332.8	385.2
3102	165		0.0		6.6		182.1	188.7
3113	96	0.4	159.2		6.3		45.9	211.8
3114	117		754.3		156.0		208.1	1 118.3
3115	140		0.0		102.1		425.0	527.1
3122	71		10.6		31.1	0.5	19.3	61.5
3123	88		265.5				26.6	292.1
3124	106		346.4		30.4		130.0	506.8
3125	165				263.4		2 012.4	2 275.8
3132	72	18.1	86.9		171.9		17.6	294.5
3133	88	0.8	8.1		4.0		106.8	119.7
3134	116		20.9				1 609.3	1 630.2
3141	87				1.6		34.4	36.0
3142	114		7.8				235.8	243.6
3148	76					42.6	465.9	508.5
3149	120		5.8		2.3	2.7	73.7	84.5
3155	81		0.4		1.9		201.1	203.5
3156	87						312.8	312.8
3157	110		0.4				112.5	112.9
3158	119		523.9				242.4	766.3
3159	151		95.2				79.3	174.5
3165	91		5.2			0.7	37.7	43.5
3166	115		4.1				198.3	202.4
3167	150		21.0		20.6		101.9	143.5
3168	132		15.2				120.1	135.3
3169	115		11.7		76.8		234.7	323.2
3170	124		78.2		6.4		108.0	192.6
3175	108		7.6		4.9		160.0	172.5
3176	96		7.1		258.2		268.5	533.8
3177	80	0.1	23.1		3.7		328.6	355.5
3182	92		3.3		126.2	0.7	38.5	168.7
3186	109		2.7		13.9		89.4	106.0
3187	122		11.5				344.6	356.1
MEAN	110.6	0.6	74.7		39.3	1.4	265.4	380.2
SE		0.5	28.7		12.6	1.3	71.8	79.4
% CATCH		0.2	19.6		10.3	0.4	69.6	



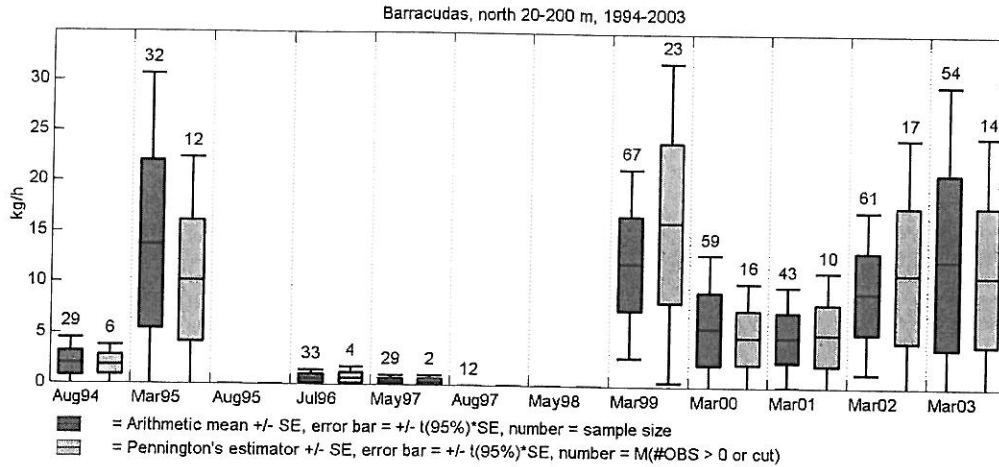
**Figure 4.18** A time series of the mean catch rates [kg/h] of *T. trecae* in the northern region off Angola (from 20 to 200 m depth). Abundance and variance estimates are calculated using equations in Annex V.



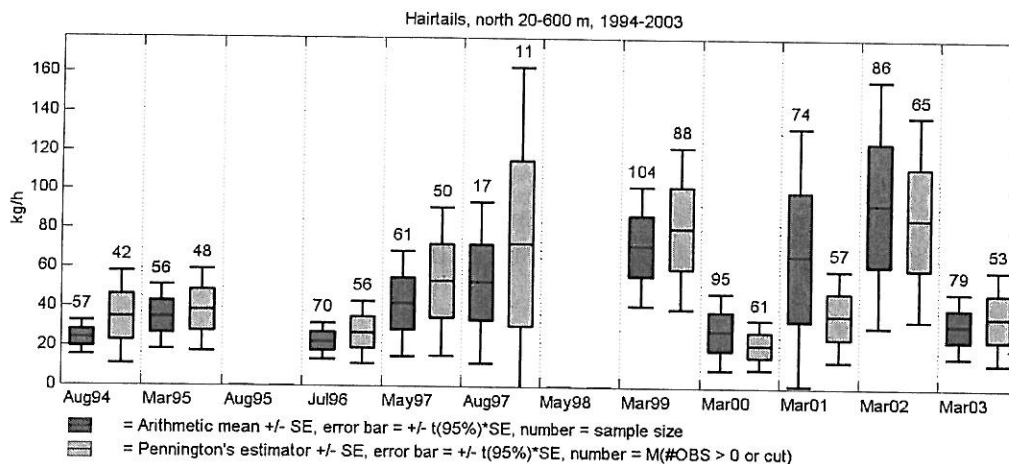
**Figure 4.19** A time series of the mean catch rates [kg/h] of Atlantic bumper in the northern region off Angola (20 to 200 m). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.20** A time series of the mean catch rates [kg/h] of carangids (*T. trecae* not included) in the northern region off Angola (20 to 200 m). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.21** A time series of the mean catch rates [kg/h] of barracudas in the northern region off Angola (from 20 to 200 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.22** A time series of the mean catch rates [kg/h] of hairtails in the northern region off Angola (from 20 to 600 m depth). Abundance and variance estimates are calculated using equations in Annex V.

### Demersal groups

Table 4.11 presents the catch rates of the most valuable demersal species on the shelf down to 200 m grouped into 'families': seabreams (Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *Brachydeuterus auritus*) and croakers (Sciaenidae).

Among the seabreams, *Pagellus bellottii*, *Dentex congoensis* and *D. angolensis* were the dominating species in the north (Annex III). *D. macrophthalmus*, which is the most important seabream species in the central region, was only found in 5 stations and in low densities on the outer shelf in the north. The mean catch rate of seabreams on the inner shelf was about 19 kg/h, which is about the half of the mean last year's survey. The seabreams contributed to 26% of the total on the outer shelf and the mean catch rate of 97 kg/h was similar to the mean of last year. As obtained last year the non-commercial bigeye grunt (*B. auritus*) was the



overall most abundant species among the grunts. The commercially important grunts, e.g. *Pomadasyus incisus* and *P. peroteti*, were caught with a mean catch rate of about 19 kg/h. The average density of groupers, mainly *Epinephelus aeneus*, was the same as in the central region. Croakers, mainly *Umbrina canariensis* and *Pseudotolithus typus*, were still common in the north and with the same mean densities as in the central region. As in the central region, the snappers were rare on the shelf, and were only caught in one station on the shelf.

**Table 4.11** Catch rates (kg/h) of commercial demersal fish species grouped by families caught in valid swept-area hauls. Northern region. a. Inner shelf (20-70 m), b. Outer shelf (71-200 m).

a. Inner shelf (20-71m)

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
3089	29				68.0	221.8	1 435.8	1 725.6
3090	45	7.0			20.2	160.2	693.6	880.9
3091	53	17.3			87.8	119.2	2 021.8	2 246.0
3097	27				19.0	239.5	332.0	590.5
3109	26				10.8	64.0	212.1	286.9
3110	41				62.1	50.4	421.2	533.7
3111	65	31.4			1.3	3.1	485.3	521.1
3112	70	33.2		7.8	75.4	8.9	9 809.8	9 935.1
3119	24					26.2	755.2	781.4
3120	43				10.2	84.2	1 195.1	1 289.4
3121	56	94.5					12 682.1	12 776.6
3130	28			24.2	31.4	329.3	1 599.1	1 984.0
3138	26	60.0	40.5				55.0	155.5
3140	63	54.0					8.9	62.8
3146	38	11.2					5.5	16.8
3147	48	17.5		4.3			22.6	44.4
3178	55	3.1					33.3	36.4
3179	41	2.3		7.6		6.7	74.6	91.1
3180	44	1.9					18.3	20.2
3181	69	38.6		8.9			24.7	72.2
MEAN	44.6	18.6	2.0	2.6	19.3	65.7	1 594.3	1 702.5
SE		5.8		1.3	6.6	22.0	757.4	760.9
% CATCH		1.1	0.1	0.2	1.1	3.9	93.6	

Figure 4.23 to Figure 4.26 show the time series of the mean catch rates of the demersal groups seabreams, groupers, grunts and croakers for the period 1994 to 2003 in the northern Angolan region. The seabreams that have had a relative constant mean catch throughout the years show a small annual increase since 2001 in the northern region, but the mean of 2003 is still considerably lower than the means of the surveys in 1994, 1996, 1997 and 2000. The mean catch rates of groupers have declined since 2000 and it is now on the lowest ever level since 1994. The catch rates of grunts have fluctuated throughout the years, but as seen from Figure 4.25 the mean value is higher in 2003 than in 2002. From 1994 to 1997 the mean catch rates of croakers increased, thereafter the mean decreased until 2001. The last two years it has been a small annual increase of the mean catch rate.



## b. Outer shelf (71-200 m)

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
3092	113	27.4				20.4	92.8	140.6
3093	146	22.8				3.3	359.1	385.2
3102	165	42.1				5.9	140.7	188.7
3113	96	12.0				12.3	187.5	211.8
3114	117	33.7				136.6	948.0	1 118.3
3115	140	48.3					478.8	527.1
3122	71	10.2					51.3	61.5
3123	88	16.5					275.5	292.1
3124	106	6.5		25.0		9.0	466.4	506.8
3125	165	174.0					2 101.8	2 275.8
3132	72	11.8					282.6	294.5
3133	88	90.8					28.9	119.7
3134	116	606.6				907.5	116.1	1 630.2
3141	87	22.1				2.5	11.3	36.0
3142	114	68.0					175.6	243.6
3148	76	422.4			27.0	6.0	53.1	508.5
3149	120	22.5			3.0		56.0	81.5
3155	81	148.2		6.1			49.2	203.5
3156	87	221.8				71.3	19.7	312.8
3157	110	67.5					45.4	112.9
3158	119	93.2					673.1	766.3
3159	151	57.9					116.6	174.5
3165	91	18.7		2.4			22.4	43.5
3166	115	184.7					17.7	202.4
3167	150	58.0					85.5	143.5
3168	132	96.0					39.3	135.3
3169	115	207.3					115.9	323.2
3170	124	77.3					115.3	192.6
3175	108	48.4		15.6		57.5	51.0	172.4
3176	96	101.1				1.1	431.7	533.8
3177	80	41.4				13.2	300.9	355.5
3182	92	19.8		3.5		0.5	114.9	138.7
3186	109	76.3				6.0	23.7	106.0
3187	122	234.0				5.7	116.4	356.1
MEAN	110.6	99.7		1.6	0.9	37.0	240.1	379.3
SE		21.5		0.9	0.8	26.8	67.9	80.7
% CATCH		26.3		0.4	0.2	9.8	63.3	

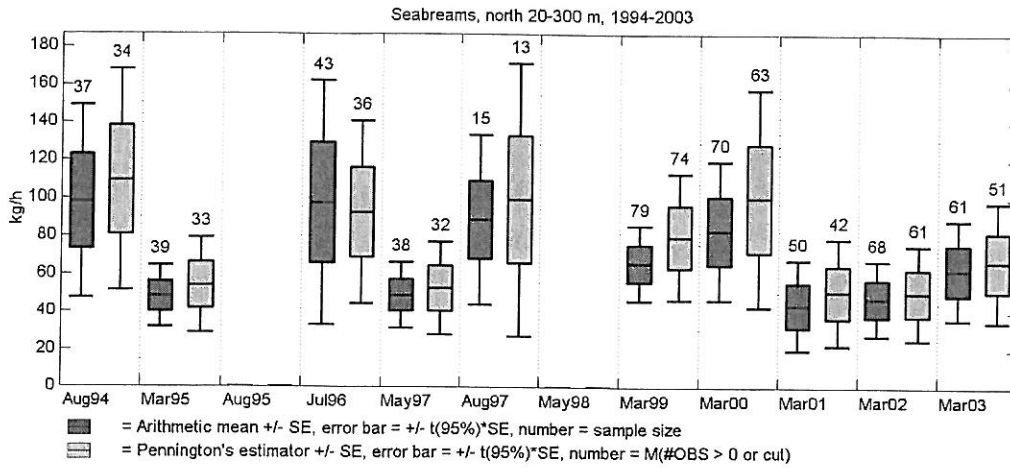


Figure 4.23 A time series of the mean catch rates [kg/h] of seabreams in the northern region off Angola (from 20 to 300 m depth). Abundance and variance estimates are calculated using equations in Annex V.

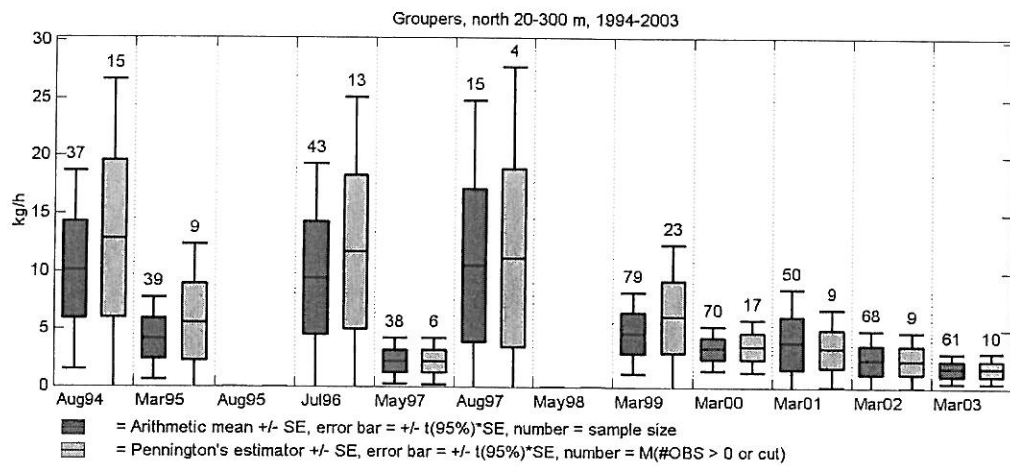


Figure 4.24 A time series of the mean catch rates [kg/h] of groupers in the northern region off Angola (from 20 to 300 m depth). Abundance and variance estimates are calculated using equations in Annex V.

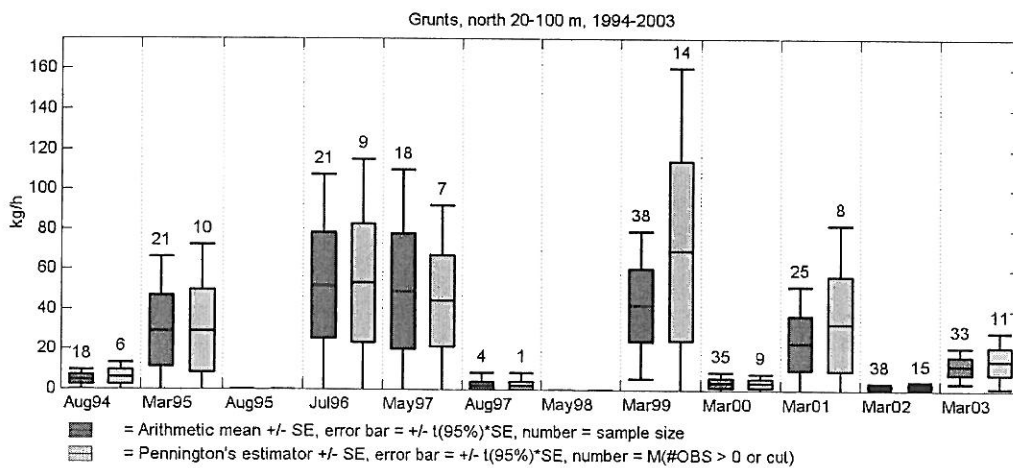
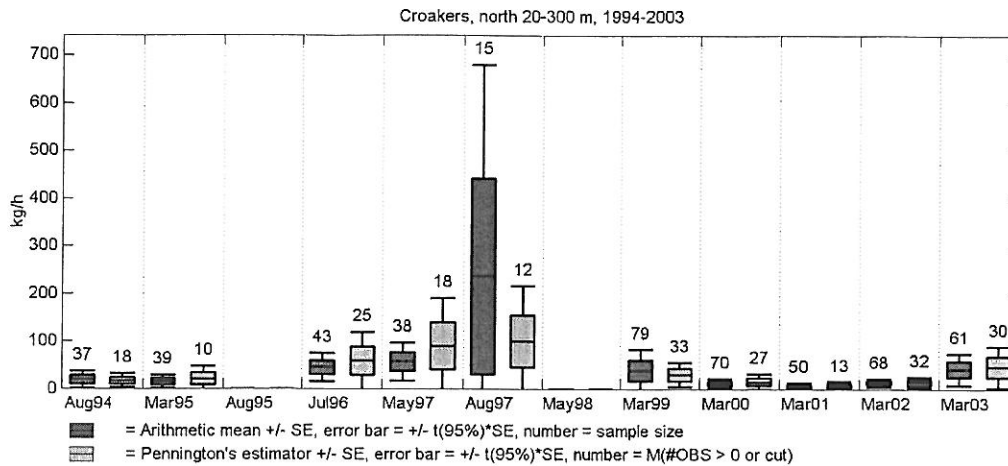


Figure 4.25 A time series of the mean catch rates [kg/h] of grunts in the northern region off Angola (from 20 to 100 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 4.26** A time series of the mean catch rates [kg/h] of croakers in the northern region off Angola (from 20 to 300 m depth). Abundance and variance estimates are calculated using equations in Annex V.

### Biomass estimates

Table 4.12 presents the swept area biomass estimates for the different groups: seabreams, grunts, croakers, groupers, ‘demersal’, *T. trecae*, carangids (*T. trecae* not included), hairtails, barracudas and ‘pelagic’ for the years 1994-2003. The estimates are calculated by using equations given in Annex V. The estimates include the stations from the shelf (20-50 m, 50-100 m and 100-200 m). The estimates from before 1994 are given in Angolan demersal survey report 2002 (Axelsen *et al.*, 2002), but are not included in this report. It is recommended that all survey estimates of the whole time series should be recalculated with a standardised method. The estimates show a similar trend to the trends presented in the mean catch figures.

**Table 4.12** Biomass estimates (tonnes) of important species group on the shelf (20-200 m) in the northern region.

	Seabreams	Grunts	Croakers	Groupers	Demersal	<i>T. trecae</i>	Carangids	Hairtails	Barracudas	Pelagic
Aug 94	19 599	576	4 095	2 474	37 395	14 309	21 225	4 423	325	26 494
Mar 95	8 341	2 921	2 882	807	28 874	305	7 078	7 208	2 109	17 944
Aug 95										
Jul 96	19 985	5 161	9 292	2 002	64 702	32 155	33 700	3 939	89	38 647
May 97	8 961	4 754	12 412	537	68 503	37 248	131 512	6 323	55	144 437
Aug 97										
May 98										
Mar 99	13 359	6 063	8 700	1 010	68 839	4 052	16 499	14 103	2 874	40 080
Mar 00	13 285	373	2 362	614	40 351	6 540	20 880	4 161	1 086	26 733
Mar 01	7 864	2 202	1 430	768	28 416	5 472	9 474	16 644	838	27 498
Mar 02	9 113	235	2 744	510	29 404	9 611	13 068	19 284	1 715	35 348
Mar 03	11 233	1 385	8 020	333	87 686	9 623	27 052	6 735	2 356	39 045

### Distribution

Seabreams was the main demersal group both in the inner and outer shelf. The catch rates of seabreams in the northern sector (Fig 4.23) were generally lower than those found in the central region. Otherwise, apart from the apparently distinct seasonal variation in the north,

the time series indicate, like in the central sector, a remarkable stable situation. Also the distribution pattern (Fig. 4.27) showing three main concentration areas off Cabeça de Cobra, N'zeto and Ambriz, seems consistent with previous surveys.

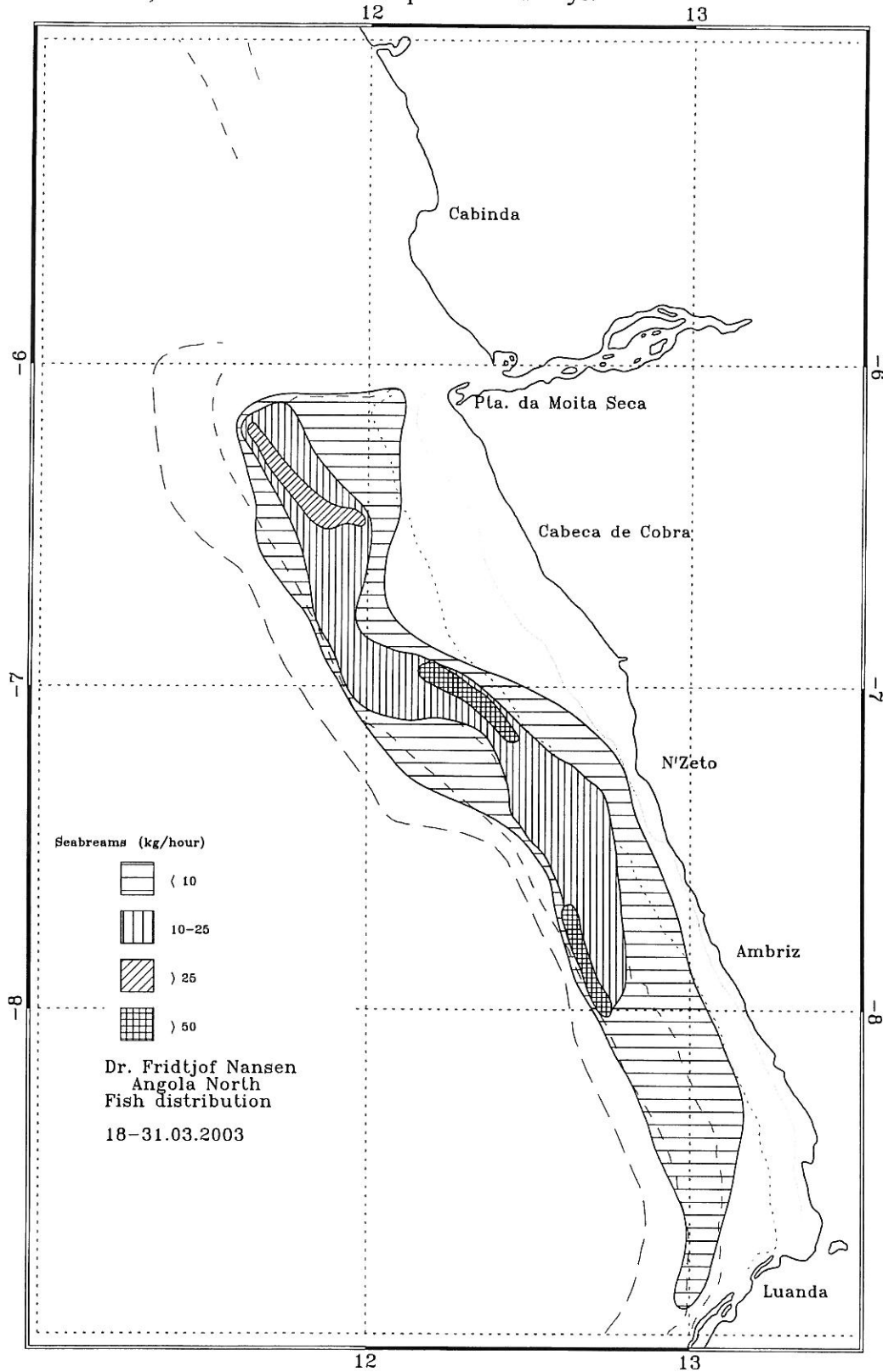


Figure 4.27 Distribution of seabreams (Sparidae) in the northern region, Luanda-Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

## CHAPTER 5 CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEEP-WATER SHRIMP AND HAKE (SLOPE)

The slope (from 201 to 800 m) of the southern region (Cunene-Tombua) was covered with only with 5 trawl stations, while the central region (Benguela-Luanda) was covered with 21 swept-area hauls, and the slope of the northern region (Luanda-Congo River) was covered with 39 hauls. The distribution of the hauls by region, position and depth intervals are shown in Table 2.1 and Figures 2.2 and 2.3. The results from the swept-area analysis by region and depth intervals are presented in Annex III.

### 5.1 Cunene – Tombua slope

Table 5.1 presents the catch rates by main species groups on the slope off southern Angola. The 'Other' group (i.e. by-catch) dominated on the slope with an average catch rate of 580 kg/hour and a relative contribution of 89%. The relative contribution of demersal fish was 6%, while shrimps and cephalopods each contributed with about 1.5%. Sharks contributed with about 2% of the overall catches. The definitions of the species groups are given in Annex VI.

**Table 5.1** Catch rates (kg/h) by main groups in swept area bottom trawl hauls on the slope (201-800 m) in southern Angola.

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Others	Total
2996	325			1.7		34.7	842.6	878.9
2998	662	30.0		0.4	21.2	3.7	155.4	210.7
3006	331	111.5	4.1	36.4		18.3	1 237.7	1 408.0
3007	618	21.9		1.4	13.0		91.7	127.9
MEAN	484	40.8	1.0	10.0	8.6	14.2	581.8	656.4
SE		24.4		8.8	5.2	7.9	276.9	301.7
%CATCH		6.2	0.2	1.5	1.3	2.2	88.6	

Table 5.2 shows the mean catch rates of the main commercial species seabreams, hake (*Merluccius polli*), the most important shrimp species (*Parapenaeus longirostris*, *Aristeus varidens*, and *Nematocarcinus africanus*), and other by-catch species on the slope of southern region. Seabreams were not found on the southern slope, probably because no trawls were done in the shallow part of the slope (200-300 m). Mean catch rate of hake was 40 kg/h, while the catch rates for the two shrimps species *P. longirostris* and *A. varidens* were 4.8 and 0.4 kg/h, respectively. Because the southern slope has not been surveyed in a standardised way during previous surveys it is difficult to compare the present situation of the species (Table 5.2) with previous surveys.

**Table 5.2** Catch rates (kg/h) by main commercial groups in swept area bottom trawl hauls on the slope (201-800 m) in southern Angola.

Station	Depth	Seabreams	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africanus</i>	Others	Total
2996	325						878.9	878.9
2998	662		30.0		0.4		180.3	210.7
3006	331		111.5	19.3			1 277.2	1 408.0
3007	618		19.45		1.4		110.4	131.1
MEAN	484		40.2	4.8	0.4		611.7	657.2
SE			24.6				281.6	301.2
%CATCH			6.1	0.7	0.1		93.1	

### Biomass

The biomass estimates presented in Table 5.3 are estimated by multiplying the mean density [t/NM<sup>2</sup>] of each depth stratum with the area, and then add the strata. The southern region has not been systematic surveyed during the years and due to low sampling effort in this region the estimates are very imprecise, which makes any biomass comparison difficult. However, the trawl station positions of the 2000 and the 2003 surveys were the same, and by comparing the numbers of these two years it seems like the *M. polli* stock had a huge decline from 2000 to 2003 by more than 99%.

**Table 5.3** Biomass estimates (tonnes) of important species group on the slope (200-600 m) in the southern region.

	Seabreams	Demersal	Pelagic	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africanus</i>	<i>M.polli</i>
Aug 97	117	1 081	4	4			
Mar 00		2 626		26	6		2 504
Mar 02		562					
Mar 03		173	5	22	1		7

### Distribution

Figure 5.1 shows the distribution of the two hake species found in the southern region, *Merluccius polli* and *M. capensis*. The distribution covers the slope deeper than 200 m from Cunene to Baía dos Tigres. In previous surveys the hake has also been found to cover the area north of Baía dos Tigres, but no hake was found in that area this year. The highest densities were found in the shallow part of the slope, and west off the Cunene and Baía dos Tigres.

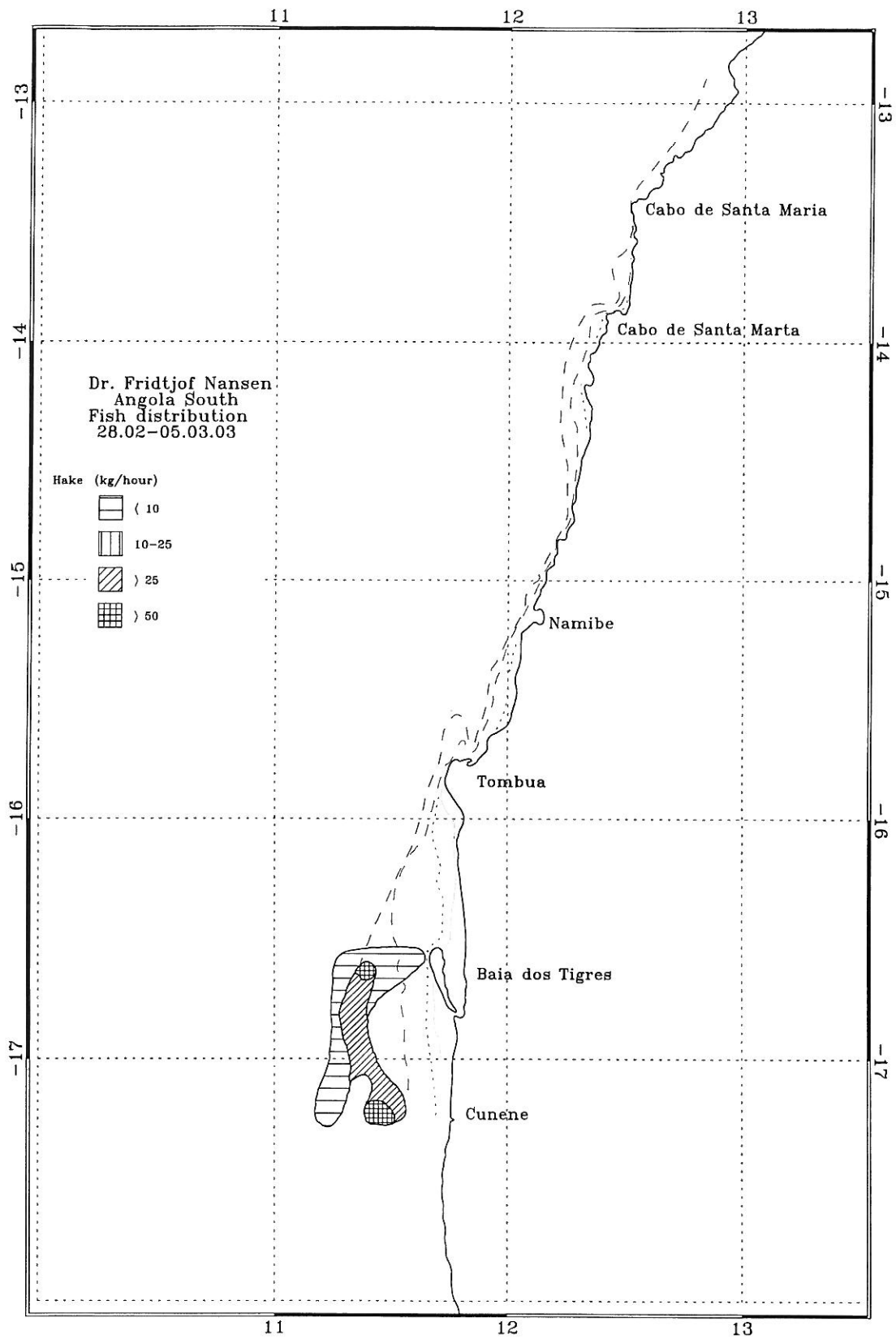


Figure 5.1 Distribution of hake (*Merluccius spp.*) in the southern region, Cunene - Tombua. Depth contours at 20, 50, 100, 200 and 500 m.

## 5.2 Benguela – Luanda slope

Table 5.4 presents the catch rates by main species groups on the slope off central Angola. The ‘Other’ group (i.e. by-catch species) dominated on the slope with an average catch rate of 548 kg/hour and a relative contribution of 76%. The relative contribution of demersal fish was 15%, while pelagic, cephalopods and sharks each contributed less than 1%. In this region shrimps contributed with about 8% of the overall catches and had an average catch rate of 56.2 kg/h. The definitions of the species groups are given in Annex VI. The catches of the ‘Demersal’ and ‘Other’ groups were larger than during the 2002 survey, while the mean catch rates of the ‘Pelagic’ group, shrimps, cephalopods and sharks were more similar with the rates of last year.

**Table 5.4** Catch rates (kg/hour) by main groups in swept-area bottom trawl hauls on the slope (201-800 m). Central region.

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
3016	746	94.5		14.6			493.8	602.9
3024	720	13.9		12.8			401.2	427.9
3025	659	6.7	0.7	1.2	1.3	0.7	251.1	261.7
3026	575	8.4	1.5	27.8		0.6	182.2	220.5
3027	470	2.7	0.6	102.1	1.4	0.6	28.8	136.2
3028	265	662.8		16.9	12.2		3 673.7	4 365.6
3035	678	8.5	0.2	53.2	2.2	13.0	62.1	139.1
3036	375	113.8	0.4	95.4		0.8	33.8	244.2
3045	532	17.9	14.2	14.7			233.5	280.3
3046	347	770.0	1.2	167.8		2.0	47.2	988.2
3054	259	231.0		6.6	27.7		3 806.9	4 072.2
3057	490	13.4		196.0		2.6	94.3	306.4
3058	511	8.1	5.9	334.4		3.6	82.1	434.1
3059	342	208.0		12.1			69.1	289.2
3067	611		1.2	91.9	4.3		321.6	419.0
3068	305	27.0		2.9			454.5	484.4
3075	655	14.9	0.8	25.4		15.7	111.0	167.8
3076	745	2.3		1.0	14.5	0.7	158.7	177.2
3084	259	56.0		11.7	40.0		1 102.1	1 209.8
3085	463	56.3	22.7	34.1		0.6	85.1	198.9
3086	744	35.5		6.7	3.2		205.4	250.8
3087	313	89.0		7.0			166.4	262.4
MEAN	502.9	110.9	2.2	56.2	4.9	1.9	548.4	724.5
SE		44.1	1.2	17.6	2.2	0.9	226.0	247.8
% CATCH		15.3	0.3	7.8	0.7	0.3	75.7	

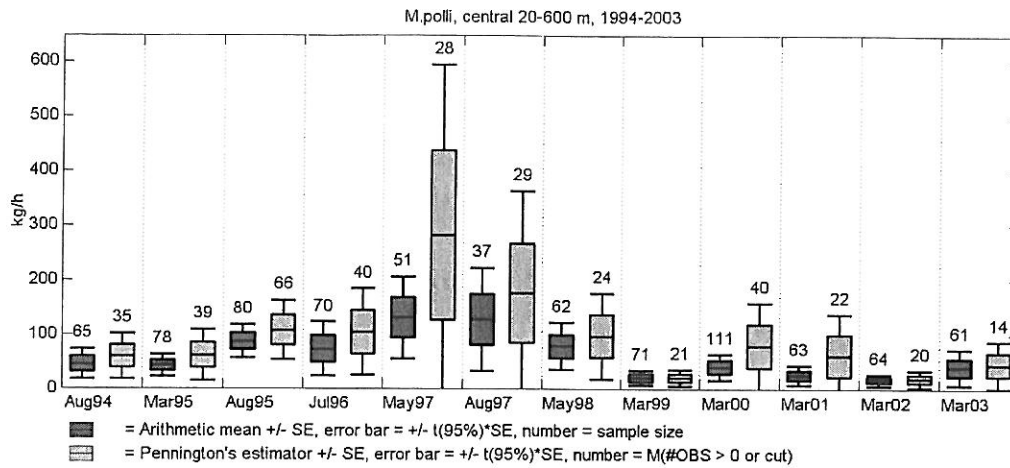
Table 5.5 shows the mean catch rates of the main commercial species seabreams, hake (*M. polli*), the most important shrimp species (*P. longirostris*, *A. varidens*, and *N. africanus*), and other by-catch species on the slope of the central region. Seabreams were only caught on two stations at depths of about 260 m with a mean catch rate of 6.7 kg/h., which is a reduction from last year when the mean catch rate was 14.4 kg/h. Hake was found mainly concentrated in the area between ‘Cabeça de Baleia’ and the north of ‘Ponta do Morro’, with a mean catch rate of 98.2 kg/h, which is an increase since last year when the mean catch rate was 36.9 kg/h. The decrease in the abundance of the seabreams group may be related to the diminution in the catch rates of *D. macrophthalmus*, the most important seabream species in the region. The



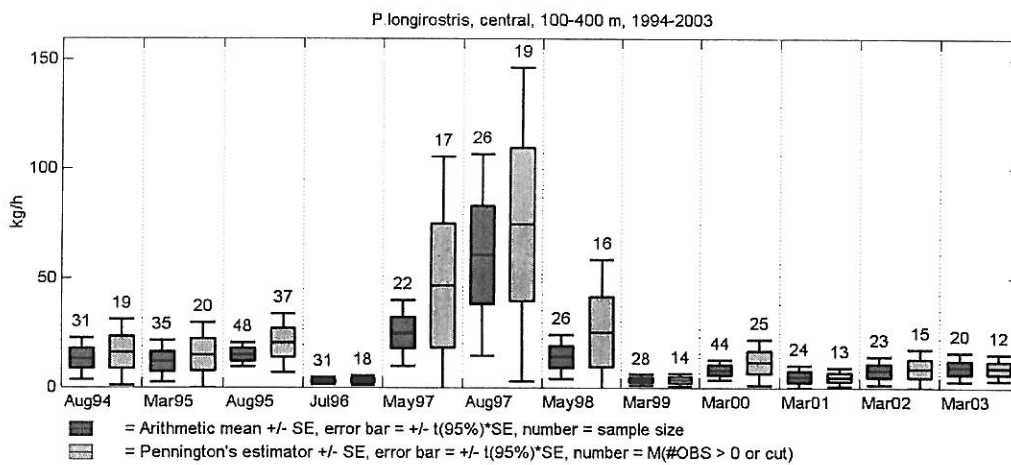
catch rates of the shrimp *N. africanus* was 45.4.kg/h., with a relative contribution of 6.3%, while the relative contribution of the other shrimps, *P. longirostris* and *A. varidens*, were less than 1%. The mean catch rate of *P. longirostris* was 3.1 kg/h and 0.5 kg/h higher than during the 2002 survey. The mean catch rate of *A. varidens*, which was 6.5 kg/h, was about the double of the catch rate during the 2002 survey. The definitions of the species groups are given in Annex VI. The mean catch rates of *P. longirostris* and *N. africanus* were similar to of the last year, while a relative increase was observed for *A. varidens*.

**Table 5.5** Catch rates (kg/hour) by main commercial groups in swept-area bottom trawl hauls on the slope (201-800 m). Central region.

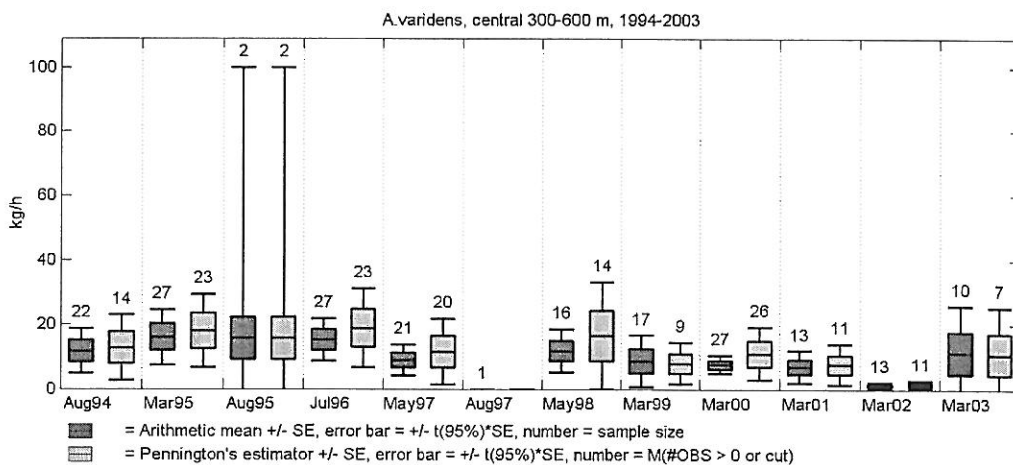
Station	Depth	Seabreams	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africanus</i>	Other	Total
3016	746		67.7		10.2		525.0	602.9
3024	720				0.7		427.4	428.1
3025	659				1.2		260.6	261.8
3026	575				17.8	8.8	194.0	220.6
3027	470				2.5	98.3	35.6	136.4
3028	265	114.6	548.2	16.9			3 685.9	4 365.7
3035	678		5.6		8.6	44.1	81.0	139.3
3036	375		113.8	4.5	0.6	90.4	35.0	244.2
3045	532				3.1	11.6	265.7	280.4
3046	347		770.0	6.8		161.0	50.4	988.2
3054	259		231.0	6.6			3 834.6	4 072.2
3057	490		9.8		65.3	130.8	100.6	306.5
3058	511				3.2	331.2	99.7	434.2
3059	342		208.0	12.2			69.1	289.3
3067	611				2.9	89.0	327.2	419.1
3068	305		27.1	2.9			454.5	484.5
3075	655		6.1		2.0	21.6	138.2	167.9
3076	745		2.3		1.1		173.9	177.3
3084	259	31.7	9.4	10.3			1 158.5	1 209.8
3085	463		56.3		20.9	12.8	109.0	199.0
3086	744		15.6		3.8		231.5	250.9
3087	313		89.0	7.0			166.4	262.4
MEAN	502.9	6.7	98.2	3.1	6.5	45.4	564.7	724.6
SE		5.3	41.8	1.0	3.1	17.1	226.7	247.8
% CATCH		0.9	13.6	0.4	0.9	6.3	77.9	



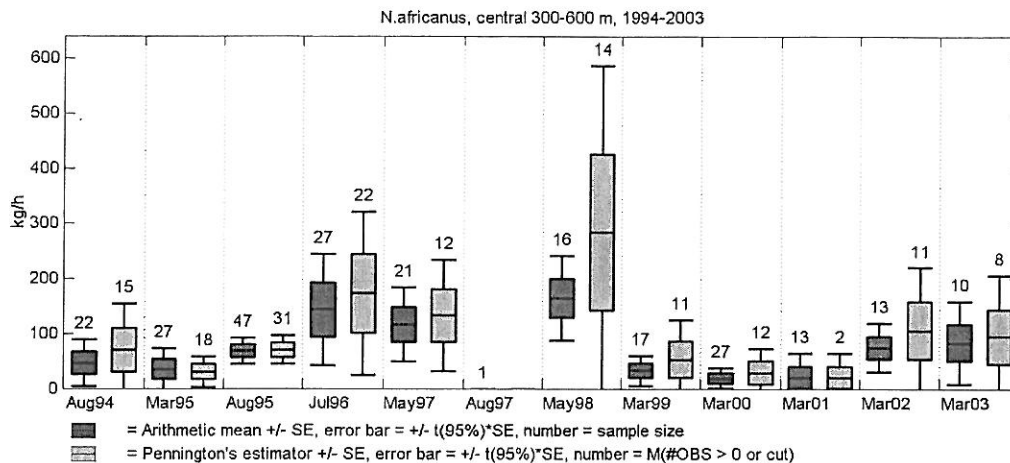
**Figure 5.2** A time series of the mean catch rates [kg/h] of *Merluccius polli* in the central region off Angola (from 20 to 600 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 5.3** A time series of the mean catch rates [kg/h] of *P. longirostris* in the central region off Angola (from 100 to 400 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 5.4** A time series of the mean catch rates [kg/h] of *A. varidens* in the central region off Angola (from 300 to 600 m depth). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 5.5** A time series of the mean catch rates [kg/h] of *N. africanus* in the central region off Angola (from 300 to 600 m depth). Abundance and variance estimates are calculated using equations in Annex V.

### Biomass

Biomass estimates, in tonnes, of the most important species groups on the slope in the central region are presented in Table 5.6. The biomass estimates show similar trends to the time series of the mean catches. Compared to the 2002 survey estimates the largest differences are found among the seabreams, *A. varidens* and *M. polli*. Both *M. polli* and *A. varidens* have increased in abundance since last year, while seabreams show a large decline since last year.

**Table 5.6** Biomass estimates (tonnes) of important species group on the slope (200-800 m) in the central region.

	Seabreams	Demersal	Pelagic <i>P. longirostris</i>	<i>A. varidens</i>	<i>N. africanus</i>	<i>M. polli</i>	
Aug 94	1 188	8 985	2 968	579	647	2 199	3 803
Mar 95	6 264	11 935	1 253	425	753	2 460	4 391
Aug 95	1 291	6 567	2 657	479	698	2 763	4 781
Jul 96	1 016	8 276	386	114	671	4 971	6 440
May 97	1 860	12 744	912	680	307	4 047	10 372
Aug 97	5 046	13 602	1 872	2 639		10	8 169
May 98	1 610	12 059	1 788	552	1 188	7 198	9 815
Mar 99	2 876	7 497	729	215	331	1 203	3 019
Mar 00	2 055	8 321	878	457	375	1 032	5 473
Mar 01	767	6 499	304	187	449	524	4 754
Mar 02	2 407	6 034	270	341	243	3 034	3 002
Mar 03	602	8 140	180	222	506	3 318	7 101

### Distribution

Figure 5.6 shows the estimated distribution of hake (*M. polli*) in the central region. The distribution covers a similar area as last year, but the densities seem to be in general higher. The hake stock covers the depths deeper than 200 m, and the highest densities were in the region between Cabeça da Baleia and Pta. do Morro, and from 200 to 500 m depth.

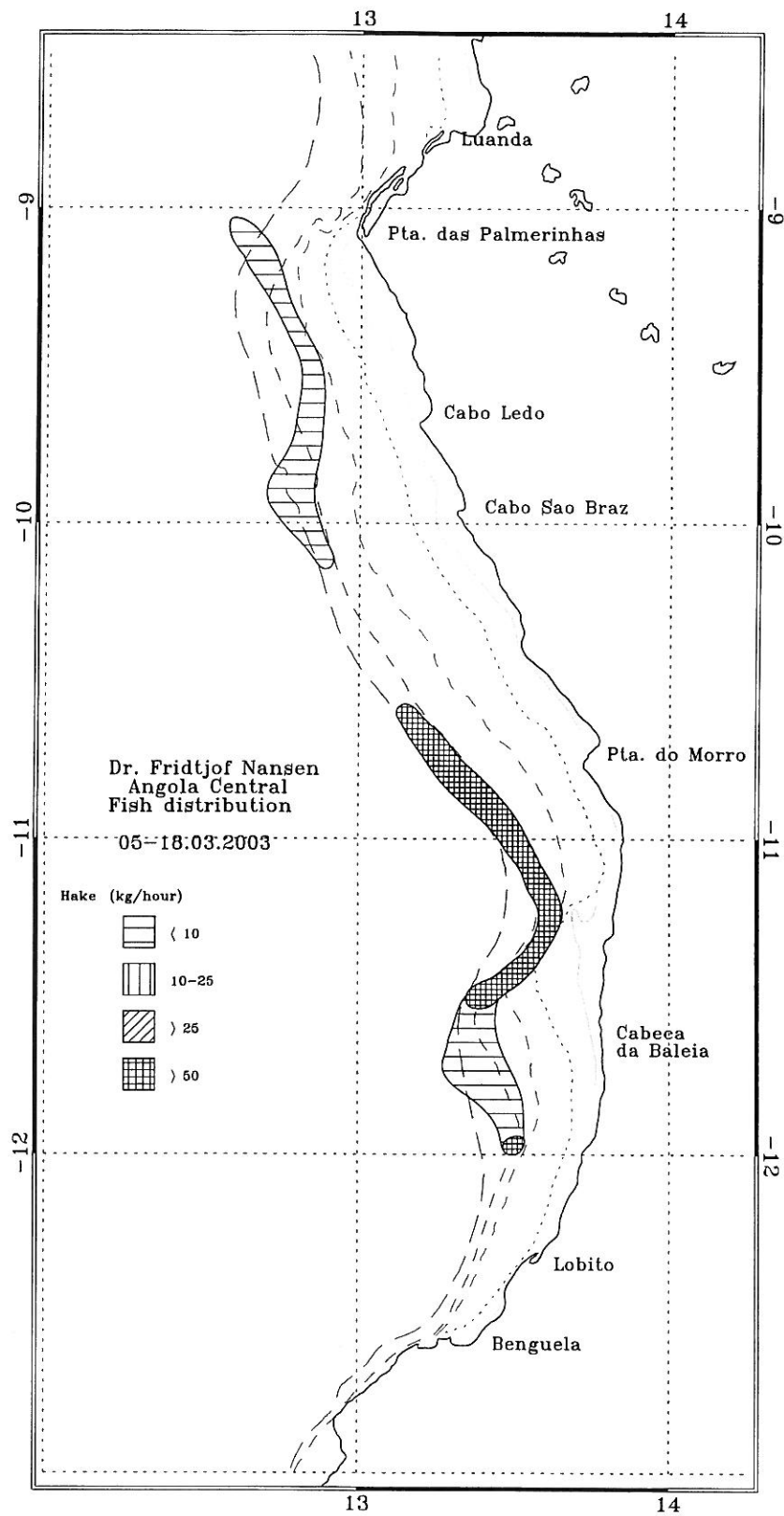


Figure 5.6 Distribution of hake (*Merluccius spp.*) in the central region, Benguela-Luanda. Depth contours at 20, 50, 100, 200 and 500 m.

### 5.3 Luanda – Congo River slope

Table 5.7 presents the catch rates by main species groups on the slope off central Angola. As in the central area, the 'Other' group (i.e. by-catch species) dominated on the slope with an average catch rate of 674.1 kg/hour and a relative contribution of 80.2%.

**Table 5.7** Catch rates (kg/hour) by main groups in swept-area bottom trawl hauls on the slope (201-800 m). Northern region.

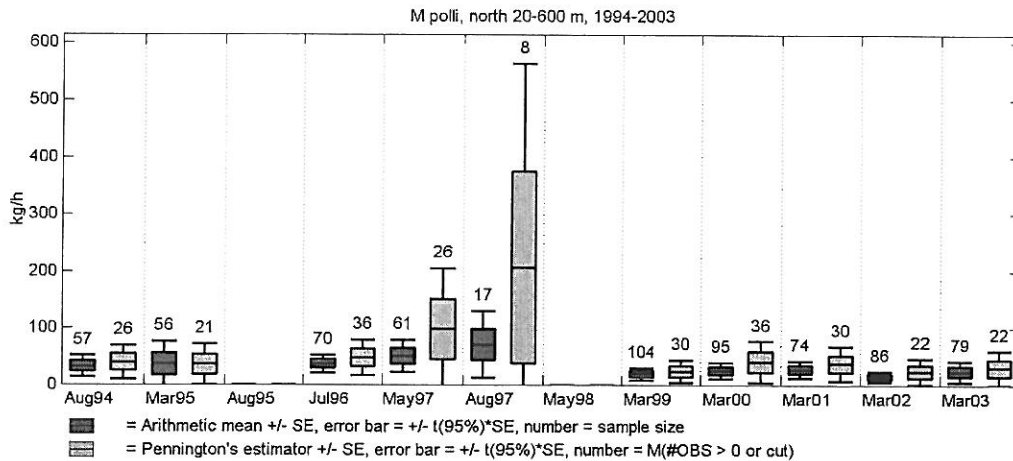
Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
3088	217	51.1		21.8			1 973.2	2 046.0
3094	412	604.5	6.2	144.7	1.5		45.4	802.2
3095	535		20.6	156.1	5.6	28.6	134.0	344.9
3096	710	6.0	1.7	167.9	7.4	4.6	188.4	375.9
3103	233	73.0	37.0	4.4	23.5		839.8	977.6
3104	311	67.0		6.7	0.9		70.4	144.9
3105	448	105.4	2.6	139.6	3.4	67.6	46.9	365.4
3106	543	15.2	0.7	247.7		0.8	68.5	332.9
3107	601	27.4	6.4	217.1	9.6		229.0	489.4
3108	703	2.7		153.8	7.5	3.2	230.1	397.2
3116	428	168.2	12.6	294.5	5.0		40.6	520.9
3117	626	25.8		173.1	5.0	5.0	303.4	512.2
3118	703	5.0	0.4	133.8	3.2	0.6	200.4	343.4
3126	530	6.2		147.4		185.2	51.3	390.2
3127	636	20.9	0.4	225.7		8.0	101.6	356.6
3128	735	5.5	5.1	35.8	12.0	1.2	2 197.7	2 257.2
3129	734	4.3		131.0	4.3	100.8	225.1	465.5
3135	265	30.7		96.0			14 923.2	15 049.9
3136	379	317.7	183.5	24.8	3.4		44.0	573.4
3137	647	18.0		277.2		5.7	134.8	435.7
3143	426	198.0	20.8	33.5	2.3		24.1	278.8
3144	522	1.9	22.4	138.7		23.8	79.7	266.5
3145	727	11.2		1.7		1.6	297.3	311.8
3150	236	15.6		1.0	0.8		63.3	80.7
3151	430	123.5	68.9	37.6	17.8	15.1	137.7	400.6
3152	528	21.8	11.8	41.6	8.3		55.9	139.3
3153	640	9.4	0.6	0.2		10.2	292.1	312.5
3154	319	2.1	0.9	8.0	0.6		266.9	278.5
3160	274	1.3		2.8			124.2	128.3
3161	268	1.8	32.8	56.3			1 637.7	1 728.5
3162	448	15.6	16.4	19.7	2.7	2.2	65.4	122.0
3163	534	5.1	2.1	23.7	29.0	0.9	78.6	139.3
3164	729			13.4	2.8	1.8	166.2	184.1
3171	221	10.2	2.4	2.3	2.5		195.9	213.2
3172	332	30.9		18.3	4.3		165.4	219.0
3173	659	1.2	5.8	55.7	12.6	1.9	174.7	251.8
3174	719	4.6		4.2		10.8	106.2	125.8
3183	386	18.2	4.6	48.2		3.9	68.3	143.2
3184	749	5.56	3.8	10.1		2.4	243.1	264.9
MEAN		52.1	12.1	85.0	4.6	12.5	674.1	840.3
SE		17.9	5.0	14.0	1.1	5.5	383.5	
%CATCH		6.2	1.4	10.1	0.6	1.5	80.2	

The relative contribution of demersal fish was 5.7%, while pelagic and cephalopods contributed with only 1.4 and 0.6% respectively. In this region, shrimps contributed with 10% of the overall catches and had an average catch rate of 85.0 kg/h. The definitions of the species groups are given in Annex VI. The catch rates of the 'Other' groups, sharks, shrimps and cephalopods were larger than during the 2002 survey and the 'Demersal' and 'Pelagic' group were less than the rates of last year.

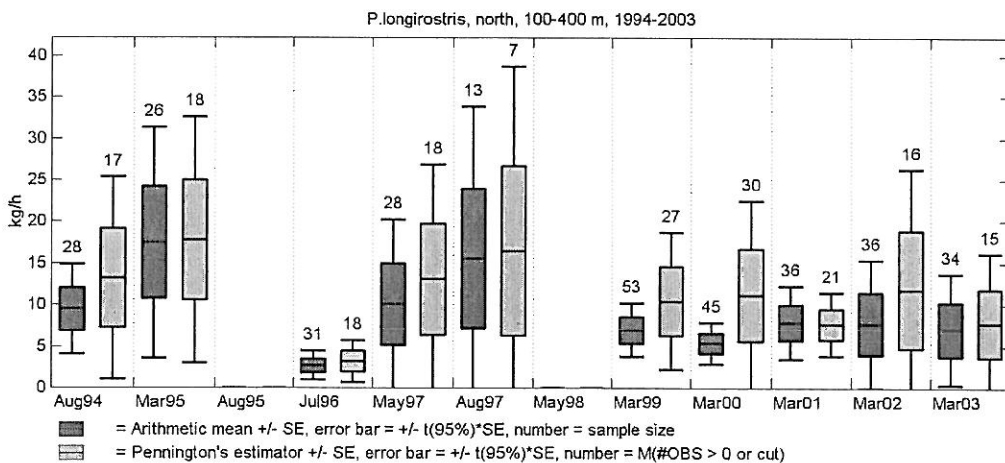
**Table 5.8** Catch rates (kg/hour) by main commercial groups in swept-area bottom trawl hauls on the slope (201-800 m). Northern region.

Station	Depth	Seabreams	Hake	<i>P. longirostris</i>	<i>A. varidens</i>	<i>N. africanus</i>	Other	Total
3088	217	23.1	20.8	21.8			1980.4	2046.0
3094	412		604.5	0.6	1.3	134.7	61.2	802.2
3095	535				8.6	144.0	192.3	344.9
3096	710		6.0		4.2	163.7	202.1	375.9
3103	233	3.5	69.5	4.4			900.2	977.6
3104	311		67.0	0.2		6.1	71.6	144.9
3105	448		105.4		2.1	132.8	125.1	365.4
3106	543		14.2		15.7	230.4	72.6	332.9
3107	601		27.4		2.7	214.4	245.0	489.4
3108	703		2.7		2.9	149.6	242.1	397.2
3116	428		168.2		1.7	291.4	59.5	520.9
3117	626		25.8		5.5	167.6	313.3	512.2
3118	703		5.0		2.4	130.8	205.2	343.4
3126	530		6.2		40.8	106.6	236.5	390.2
3127	636		20.9		2.4	223.2	110.1	356.6
3128	735		4.6		3.3	32.2	2 217.1	2257.2
3129	734		4.3		1.3	128.8	331.2	465.5
3135	265		30.7	96.0			14 923.2	15 049.9
3136	379		317.7		3.8	21.0	230.9	573.4
3137	647		14.0		2.0	275.2	12 340.4	12 631.6
3143	426		198.0	0.9	10.7	21.2	48.0	278.8
3144	522		1.9		4.7	134.0	125.9	266.5
3145	727		11.2		1.0		299.6	311.8
3150	236	15.6		1.0			64.1	80.7
3151	430		123.5	1.7	6.4	28.9	240.2	400.6
3152	528		21.8		5.5	35.8	76.3	139.3
3153	640		4.1				308.4	312.5
3154	319		2.1	7.8			268.7	278.5
3160	274		1.3	2.8			124.2	128.3
3161	268		1.8	56.3			1 670.4	1728.5
3162	448		15.6		7.8	11.8	86.8	122.0
3163	534		5.1		6.6	16.0	111.6	139.3
3164	729				0.1	12.8	171.2	184.1
3171	221	7.7		2.2			203.3	213.2
3172	332		30.9	17.0			171.1	219.0
3173	659		1.2		2.7	52.2	195.7	251.8
3174	719		4.6		1.0		120.2	125.8
3183	386		18.2	2.9	1.7	43.5	76.9	143.2
3184	749		5.6		1.7		257.7	264.9
MEAN	501.1	1.3	50.3	5.5	3.9	74.6	1 017.4	1 153.0
SE		0.7	17.9	2.9	1.1	14.2	484.8	487.0
% CATCH		0.2	9.6	1.1	0.7	14.3	195.1	

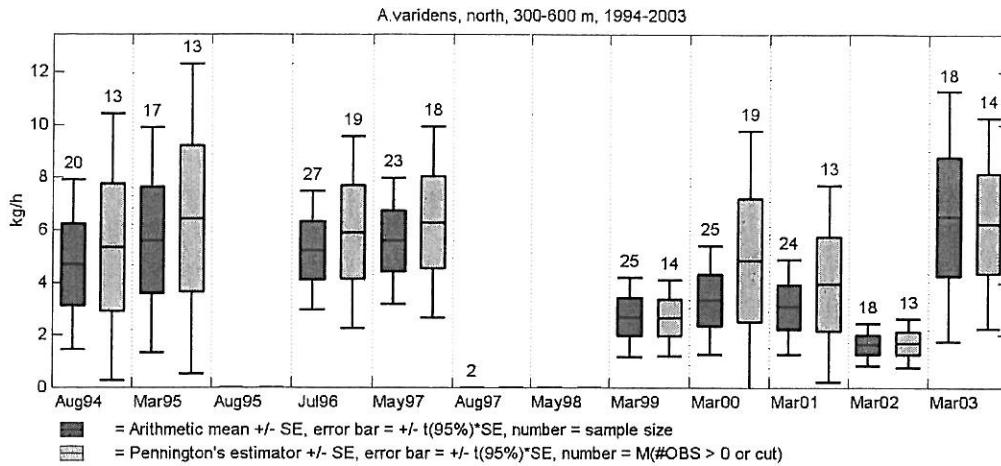
Table 5.8 shows the mean catch rates of the main commercial species of seabreams, hake (*M. polli*) and the most important shrimp species (*P. longirostris*, *A. varidens* and *N. africanus*) and other by-catch species on the slope of the central region. Seabreams were only caught on stations shallower than 250 m and the mean catch rate was 1.3 kg/h, which is a slight reduction from 2002. Hake was found on the whole northern slope, and the mean catch rate was 50.3 kg/h, which is a 50 % higher than during the 2002 survey. The mean catch rate of *P. longirostris* was 5.5 kg/h, which is 1.4 kg/h less than the catch rate of 2002. *A. varidens* had mean catch rate of 3.9 kg/h, which is three times higher than the catch rate of the 2002 survey. The most common shrimp was *N. africanus*, which had a mean catch rate of about 75 kg/h. The species contributed with about 14% of the total catch in the northern region. The catch rate of *N. africanus* during 2003 was about 43% higher than during the 2002 survey.



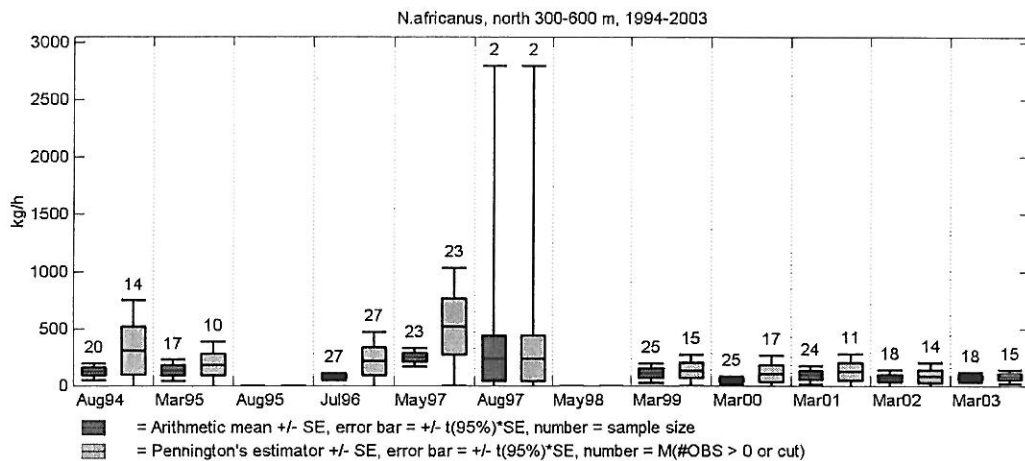
**Figure 5.7** A time series of the mean catch rates [kg/h] of *Merluccius polli* in the northern region off Angola (from 20 to 600 m). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 5.8** A time series of the mean catch rates [kg/h] of *P. longirostris* in the northern region off Angola (from 100 to 400 m). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 5.9** A time series of the mean catch rates [kg/h] of *A. varidens* in the northern region off Angola (from 300 to 600 m). Abundance and variance estimates are calculated using equations in Annex V.



**Figure 5.10** A time series of the mean catch rates [kg/h] of *N. africanus* in the northern region off Angola (from 300 to 600 m). Abundance and variance estimates are calculated using equations in Annex V.

### Biomass

Table 5.9 shows the biomass estimates of the surveys from 1994 to 2003. The trend is similar to the trends presented in the mean catch figures. Compared to the 2002 survey the estimate of *A. varidens* in 2003 show an increase of about 200%. A similar increase is found for the *M. polli*. It should be noted that during the 2002 survey the tickler chain was not used during trawling of the deep-water stations which may created a negative bias for the biomass estimates of shrimps.



**Table 5.9** Biomass estimates (tonnes) of important species group on the slope (200-800 m) in the northern region.

	Seabreams	Demersal	Pelagic <i>P. longirostris</i>	<i>A. varidens</i>	<i>N. africanus</i>	<i>M. polli</i>	
Aug 94	1 045	5 418	1 762	532	370	6 602	4 096
Mar 95	506	8 377	2 284	860	326	7 269	5 892
Aug 95							
Jul 96	597	6 755	1 898	162	267	3 859	5 065
May 97	860	8 785	3 420	612	332	13 074	6 878
Aug 97	849	9 179	2 548	1 329		4 090	8 137
May 98							
Mar 99	389	4 703	3 099	545	235	10 456	3 624
Mar 00	1 610	7 307	1 967	490	221	3 711	4 348
Mar 01	487	6 478	1 522	530	240	6 671	4 813
Mar 02	211	5 299	3 013	797	127	5 334	3 481
Mar 03	138	6 665	1 222	577	383	6 850	5 284

### Distribution

Figure 5.11 shows the estimated distribution of hake (*M. polli*) in the northern region. The stock distribution covers the slope from Luanda to the Congo River deeper than about 200 m. This distribution pattern is similar with previous surveys, but the density was higher during the 2003 survey than during the 2002 survey. Highest densities were found between Ambriz and N'zeto on depths between 200 and 500 m.

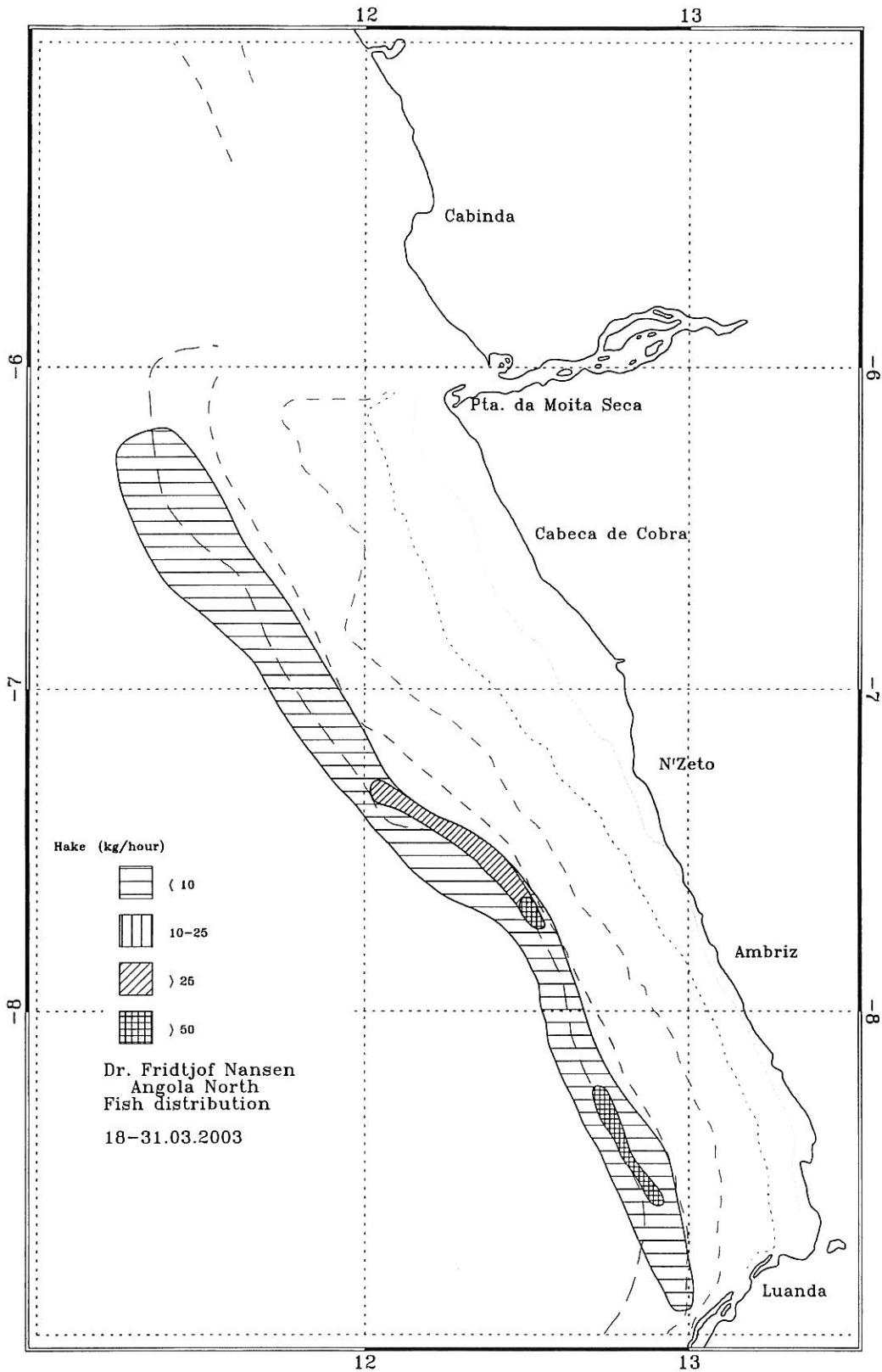


Figure 5.11 Distribution of hake (*Merluccius spp.*) in the northern region. Luanda – Congo River. Depth contours at 20, 50, 100, 200, and 500 m.

## CONCLUSION

Table 6.1 gives the time series of the biomass of the most important species on the shelf for the central and northern regions. The southern region was not included because it has not been regularly sampled throughout the years, which make the comparisons over the years difficult. However, an important 64% of reduction on the seabreams stock was observed in the southern region during the 2003 survey, as result of the decrease of the biomass estimates of the most important demersal species, the big-eye dentex, *D. macrophthalmus* (see table 4.4).

The total biomass estimates of the demersal species in the central and northern areas in 2003 was about 20% higher than the average of the 3 last years, but it was only 65% of the 1999 estimate. In the main demersal groups, the important changes in the estimates were observed in the seabreams and grunts groups. An important decrease of 45% (the highest of the time series) in relation to last year was registered in the estimates of seabreams, caused by the very low contribution in the catch of the most important demersal species, the big-eye dentex, mainly in the central zone of the coast. On contrary, an important increase (250%) was observed in the biomass estimates of grunts, compared to the last year, as result of the increase in the contribution in the catch of the big-eye grunt *B. auritus*. The biomass estimates of the other demersal groups have remained stable during the 4 last years except the decrease observed during 2001 in the croakers group.

Taking into consideration that the hydrographical conditions off Angola during the 2003 were typical for this time of the year, the observed changes in the biomass estimates of some of the main groups are not likely to be related to hydrographical conditions.

For the pelagic species, the estimates of biomass are characterised by the successive variability throughout the years, particularly for horse mackerel, hairtail and barracuda. The bottom trawl is not an adequate sampling gear for the pelagic fish species; therefore no certain conclusion may be drawn for these resources. More adequate conclusion may be drawn after the forthcoming pelagic survey.

Table 6.2 gives the time series of the most important species on the slope for the central and northern areas. All the demersal fish species are included in the total estimates. The rose shrimp (*P. longirostris*) shows a cyclical fluctuation since 1999. The 2003 biomass estimates are lower than those of 2002, but at about on the same level as the average of the last five years. The species is considered as a short-lived species and its abundance is related to a strong dependence on the recruitment. The striped shrimp (*A. varidens*) biomass estimates show an increase during the year 2003, comparing to the 4 last years. The tickler chain was not used during the 2002 survey, which may reduced the catchability of the shrimps and may have caused the low biomass observed during that survey.

For the demersal fish on the slope in the central and northern areas of the coast, a relative stable biomass has been observed during the six last years. However, an important decrease (78%) was observed in the seabreams estimates compared to 2002, while the Benguela hake (*M. polli*) estimates show an important increase of 66%. Considering the increasing commercial interest of the Benguela hake, it is important to follow the state of this resource in the future.

**Table 6.1.** Biomass time series of the most important species (northern and central region) off the Angolan shelf (20 – 200 m)

Region	Species	Aug 94	Mar 95	Aug 95	Jul 96	May 97	Aug 97	May 98	Mar 99	Mar 00	Mar 01	Mar 02	Mar 03	
Central	Seabreams	32 473	13 969	19 159	27 382	108 476	68 537	21 121	20 604	12 436	23 076	6 135	6 135	
	Grunts	47	2 933	2 636	1 091	320	11 099	4 134	7 246	1 426	2 815	9 708	9 708	
	Croakers	10 686	14 952	5 305	9 965	42 090	13 890	10 634	5 291	1 686	6 638	4 950	4 950	
	Groupers	436	386	670	289	2 979	116	696	805	85	249	801	801	
	<i>T. trecae</i>	72 992	4 784	50 697	36 972	302 967	7 423	16 499	20 833	20 180	83 031	27 908	27 908	
	Carangids	74 300	12 632	55 246	51 821	321 717	10 476	25 188	26 516	24 536	90 545	31 866	31 866	
	Hairtails	31 719	3 774	3 286	28 422	44 570	19 783	10 638	12 217	7 118	8 446	13 676	13 676	
	Barracudas	3	2 204	793	350	309	1 710	3 394	1 191	654	444	444	444	
	Demersal	51 110	60 135	45 565	53 198	179 771	115 002	163 231	101 232	73 082	103 219	62 666	62 666	
	Pelagic	106 678	19 089	59 866	82 922	367 598	32 175	39 405	43 801	33 027	101 868	47 337	47 337	
	North	Seabreams	19 599	8 341	19 985	8 961	13 359	13 285	7 864	9 113	11 233	1 385	1 385	1 385
		Grunts	576	2 921	5 161	4 754	6 063	373	2 202	235	2 744	8 020	8 020	8 020
		Croakers	4 095	2 882	9 292	12 412	8 700	2 362	1 430	768	510	333	333	333
		Groupers	2 474	807	2 002	537	4 052	6 540	5 472	9 611	13 068	27 052	27 052	27 052
<i>T. trecae</i>		14 309	305	32 155	37 248	16 499	20 880	9 474	16 644	19 284	6 735	6 735	6 735	
Carangids		21 225	7 078	33 700	131 512	14 103	4 161	1 086	838	1 715	2 356	2 356	2 356	
Hairtails		4 423	7 208	3 939	6 323	68 839	40 351	28 416	29 404	87 686	39 045	39 045	39 045	
Barracudas		325	2 109	89	55	40 080	26 733	27 498	35 348	32 189	17 368	17 368	17 368	
Demersal		37 395	28 874	64 702	68 503	108 476	68 537	34 480	33 889	20 300	32 189	17 368	17 368	
Pelagic		26 494	17 944	38 647	144 437	320	11 099	10 197	7 619	3 628	3 050	11 093	11 093	
Total		Seabreams	52 072	22 310	39 144	36 343	108 476	68 537	34 480	33 889	20 300	32 189	17 368	17 368
		Grunts	623	5 854	7 797	5 845	320	11 099	10 197	7 619	3 628	3 050	11 093	11 093
		Croakers	14 781	17 834	14 597	22 377	42 090	13 890	19 334	7 653	3 116	9 382	12 970	12 970
		Groupers	2 910	1 193	2 672	826	2 979	116	1 706	1 419	853	759	1 134	1 134
	<i>T. trecae</i>	87 301	5 089	82 852	74 220	302 967	7 423	20 551	27 373	25 652	92 642	37 531	37 531	
	Carangids	95 525	19 710	88 946	183 333	321 717	10 476	41 687	47 396	34 010	103 613	58 918	58 918	
	Hairtails	36 142	10 982	7 225	34 745	44 570	19 783	24 741	16 378	23 762	27 730	20 411	20 411	
	Barracudas	328	4 313	882	405	309	4 584	4 480	2 029	2 369	2 800	2 800	2 800	
	Demersal	88 505	89 009	110 267	121 701	179 771	115 002	232 070	141 583	101 498	132 623	150 352	150 352	
	Pelagic	133 172	37 033	98 513	227 359	367 598	32 175	79 485	70 534	60 525	137 216	86 382	86 382	

**Table 6.2. Biomass time series of the most important species (northern and central region) off the Angolan slope (201 – 800 m)**

Region	Species	Aug 94	Mar 95	Aug 95	Jul 96	May 97	Aug 97	May 98	Mar 99	Mar 00	Mar 01	Mar 02	Mar 03	
Central	Seabreams	1 188	6 264	1 291	1 016	1 860	5 046	1 610	2 876	2 055	767	2 407	602	
	<i>P. longirostris</i>	579	425	479	114	680	2 639	552	215	457	187	341	222	
	<i>A. varidens</i>	647	753	698	671	307		1 188	331	375	449	243	506	
	<i>N. africanus</i>	2 199	2 460	2 763	4 971	4 047	10	7 198	1 203	1 032	524	3 034	3 318	
	<i>M. polli</i>	3 803	4 391	4 781	6 440	10 372	8 169	9 815	3 019	5 473	4 754	3 002	7 101	
	Demersal	8 985	11 935	6 567	8 276	13 602	13 602	12 059	7 497	8 321	6 499	6 034	8 140	
	Pelagic	2 968	1 253	2 657	386	912	1 872	1 788	729	878	304	270	180	
	North	Seabreams	1 045	506	597	860	860	849	860	389	1 610	487	211	138
		<i>P. longirostris</i>	532	860	162	612	612	1 329		545	490	530	797	577
		<i>A. varidens</i>	370	326	267	332	332			235	221	240	127	383
<i>N. africanus</i>		6 602	7 269	3 859	13 074	13 074	4 090		10 456	3 711	6 671	5 334	6 850	
<i>M. polli</i>		4 096	5 892	5 065	6 878	6 878	8 137		3 624	4 348	4 813	3 481	5 284	
Demersal		5 418	8 377	6 755	8 785	8 785	9 179		4 703	7 307	6 478	5 299	6 665	
Pelagic		1 762	2 284	1 898	3 420	3 420	2 548		3 099	1 967	1 522	3 013	1 222	
Total		Seabreams	2 233	6 770	1 291	1 613	2 720	5 895	1 610	3 265	3 665	1 254	2 618	740
		<i>P. longirostris</i>	1 111	1 285	479	276	1 292	3 968	552	760	947	717	1 138	799
		<i>A. varidens</i>	1 017	1 079	698	938	639		1 188	566	596	689	370	889
	<i>N. africanus</i>	8 801	9 729	2 763	8 830	17 121	4 100	7 198	11 659	4 743	7 195	8 368	10 168	
	<i>M. polli</i>	7 899	10 283	4 781	11 505	17 250	16 306	9 821	6 643	9 821	9 567	6 483	12 385	
	Demersal	14 403	20 312	6 567	15 031	21 529	22 781	12 059	12 200	15 628	12 977	11 333	14 805	
	Pelagic	4 730	3 537	2 657	2 284	4 332	4 420	1 788	3 828	2 845	1 826	3 283	1 402	

## REFERENCES

- Axelsen, B. E., Zaera, D., Olsen, M., and Ostrowski, M. Surveys of the Fish Resources of Angola. Survey of the Demersal Resources 27 Feb. – 27 March 2002. Cruise Reports “Dr. Fridtjof Nansen”, Bergen 2002, 88 p.
- Carrit, D. E. and Carpenter, J. H. 1966. Comparison and Evaluation of Currently Employed Modifications of the Winkler Method for Determining Dissolved Oxygen in Sea Water, NASCO Report J. Mar. Res. 24:286-310.

# ANNEX I Records of fishing stations

PROJECT STATION: 2990  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1713  
 start stop duration Long E 1144  
 TIME 07:01:30 07:31:37 30 (min) Purpose code: 3  
 LOG 1476.05 1477.74 1.68 Area code : 1  
 FDEPTH: 25 24 GearCond.code:  
 BDEPTH: 25 24 Validity code:  
 Towing dir: 360° Wire out: 125 m Speed: 33 kn\*10  
 Sorted: 182 Kg Total catch: 1135.84 CATCH/HOUR: 2271.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Myliobatis aquila	1191.60	674	52.45	
Trachurus trecae	694.80	21314	30.59	6397
Raja miraletus	131.40	180	5.78	
Sardinella maderensis	103.80	252	4.57	6398
Dasyatis centroura	50.90	4	2.24	
Chelidonichthys gabonensis	22.24	34	0.98	
Sardinops ocellatus	12.00	336	0.53	
Cynoglossus browni	11.52	804	0.51	
Argyrosomus hololepidotus	11.00	2	0.48	
Arius parkii	10.80	72	0.48	
Callorhynchus capensis	10.30	4	0.45	
Trichiurus lepturus	8.40	972	0.37	
Maja squinado	6.12	468	0.27	
Sepia officinalis hierredda	2.76	12	0.12	
Leptocharias smithii	2.10	2	0.09	
Todaropsis eblanae	1.68	72	0.07	
Atractoscion aequidens	0.26	2	0.01	
<b>Total</b>	<b>2271.68</b>		<b>99.99</b>	

PROJECT STATION: 2991  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1710  
 start stop duration Long E 1142  
 TIME 08:22:59 08:52:34 30 (min) Purpose code: 3  
 LOG 1482.15 1484.04 1.89 Area code : 1  
 FDEPTH: 43 42 GearCond.code:  
 BDEPTH: 43 42 Validity code:  
 Towing dir: 360° Wire out: 150 m Speed: 35 kn\*10  
 Sorted: 89 Kg Total catch: 1141.14 CATCH/HOUR: 2282.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2164.00	51588	94.82	6399
Sepia orbignyana	62.48	192	2.74	
Raja miraletus	22.86	26	1.00	
Myliobatis aquila	15.00	8	0.66	
Callorhynchus capensis	6.50	2	0.28	
Galeichthys feliceps	5.60	26	0.25	
Trichiurus lepturus	3.30	432	0.14	
Todaropsis eblanae	2.54	76	0.11	
<b>Total</b>	<b>2282.28</b>		<b>100.00</b>	

PROJECT STATION: 2992  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1713  
 start stop duration Long E 1138  
 TIME 10:16:35 10:31:23 15 (min) Purpose code: 3  
 LOG 1492.48 1493.29 0.79 Area code : 1  
 FDEPTH: 87 86 GearCond.code:  
 BDEPTH: 87 86 Validity code:  
 Towing dir: 360° Wire out: 290 m Speed: 31 kn\*10  
 Sorted: 61 Kg Total catch: 3501.67 CATCH/HOUR: 14006.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis, juvenile	12834.00	242148	91.63	6400
Trachurus trecae	1023.20	26680	7.31	6401
Merluccius sp	101.20	460	0.72	
Dentex macrophthalmus	32.20	692	0.23	
Atractoscion aequidens	16.08	4140	0.11	
<b>Total</b>	<b>14006.68</b>		<b>100.00</b>	

PROJECT STATION: 2993  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1712  
 start stop duration Long E 1131  
 TIME 12:05:32 12:35:31 30 (min) Purpose code: 3  
 LOG 1503.23 1504.92 1.69 Area code : 1  
 FDEPTH: 130 128 GearCond.code:  
 BDEPTH: 130 128 Validity code:  
 Towing dir: 360° Wire out: 410 m Speed: 30 kn\*10  
 Sorted: 80 Kg Total catch: 1147.37 CATCH/HOUR: 2294.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	1382.80	11604	60.26	6402
Trachurus capensis	593.44	7208	25.86	6437
Pterothrissus belloci	122.98	2402	5.36	
Merluccius capensis	78.06	314	3.40	6403
Atractoscion aequidens	28.32	56	1.23	
Atractoscion aequidens	27.74	5318	1.21	
Dicologlossa cuneata	18.58	772	0.81	
Zeus faber	17.10	28	0.75	
Chelidonichthys capensis	11.72	56	0.51	
Trigla lyra	11.16	84	0.49	
Squilla cadenati	2.86	84	0.12	
<b>Total</b>	<b>2294.76</b>		<b>100.00</b>	

PROJECT STATION: 2994  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1713  
 start stop duration Long E 1129  
 TIME 13:54:58 14:24:35 30 (min) Purpose code: 3  
 LOG 1511.97 1513.61 1.63 Area code : 1  
 FDEPTH: 151 143 GearCond.code:  
 BDEPTH: 151 143 Validity code:  
 Towing dir: 360° Wire out: 460 m Speed: 30 kn\*10  
 Sorted: 79 Kg Total catch: 1862.00 CATCH/HOUR: 3724.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1187.50	12692	31.89	6404
Dentex macrophthalmus	1050.00	7438	28.20	6407
Merluccius capensis	866.54	2790	23.81	6406
Trachurus capensis	552.92	3750	14.85	6408
Pterothrissus belloci	21.60	164	0.58	
Atractoscion aequidens	14.70	14	0.39	6405
Atractoscion aequidens	4.90	314	0.13	
Callorhynchus capensis	3.44	2	0.09	
Squalus megalops	1.60	2	0.04	
Trigla lyra	0.40	6	0.01	
Sepia officinalis hierredda	0.10	2		
<b>Total</b>	<b>3723.70</b>		<b>99.99</b>	

PROJECT STATION: 2995  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1712  
 start stop duration Long E 1125  
 TIME 15:37:49 16:08:42 31 (min) Purpose code: 3  
 LOG 1520.80 1522.58 1.79 Area code : 1  
 FDEPTH: 186 181 GearCond.code:  
 BDEPTH: 186 181 Validity code:  
 Towing dir: 360° Wire out: 560 m Speed: 34 kn\*10  
 Sorted: 108 Kg Total catch: 797.26 CATCH/HOUR: 1543.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	734.52	2448	47.60	6410
Dentex macrophthalmus	588.97	4535	38.17	6411
Atractoscion aequidens	57.97	31	3.76	
Trigla lyra	34.97	304	2.27	
Trachurus capensis	31.45	368	2.04	6409
Synagrops microlepis	26.34	8735	1.71	
Pterothrissus belloci	17.09	128	1.11	
Scorpaena stephanica	14.21	319	0.92	
Octopus vulgaris	13.57	15	0.88	
Chelidonichthys gabonensis	8.94	15	0.58	
Dicologlossa cuneata	5.11	112	0.33	
Vanstraelenia chirophthalms	4.32	97	0.28	
Brotula barbata	3.35	15	0.22	
Chlorophthalmus atlanticus	2.28	1086	0.15	
<b>Total</b>	<b>1543.09</b>		<b>100.02</b>	

PROJECT STATION: 2996  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1709  
 start stop duration Long E 1121  
 TIME 17:17:09 17:49:53 30 (min) Purpose code: 3  
 LOG 1528.15 1529.76 1.51 Area code : 1  
 FDEPTH: 353 296 GearCond.code:  
 BDEPTH: 353 296 Validity code:  
 Towing dir: 360° Wire out: 850 m Speed: 30 kn\*10  
 Sorted: 59 Kg Total catch: 439.46 CATCH/HOUR: 878.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Helicolenus dactylopterus	702.00	21060	79.87	
Chlorophthalmus atlanticus	111.76	4166	12.72	
Centroscymnus crepidater	34.66	316	3.94	
Nezumia aequalis	24.30	870	2.76	
Callinectes pallidus	2.26	76	0.26	
Solenocera africana	1.66	300	0.19	
Callinectes amnicola	0.76	46	0.09	
GOBIIDAE	0.76	16	0.09	
Gephyroberyx darwini	0.76	16	0.09	
<b>Total</b>	<b>878.92</b>		<b>100.01</b>	

PROJECT STATION: 2997  
 DATE: 2/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 1713  
 start stop duration Long E 1113  
 TIME 20:01:27 20:01:34 30 (min) Purpose code: 3  
 LOG 1546.12 1547.68 1.56 Area code : 1  
 FDEPTH: 785 846 GearCond.code:  
 BDEPTH: 785 846 Validity code:  
 Towing dir: 360° Wire out: 2000 m Speed: 30 kn\*10  
 Sorted: 30 Kg Total catch: 388.18 CATCH/HOUR: 776.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia sp.	514.80	16728	66.31	
Merluccius capensis	47.10	38	6.07	6412
Xenodermichthys copei	42.96	1584	5.53	
Neoharriotta pinnata	34.80	24	4.48	
Todaropsis eblanae	32.64	48	4.20	
Lamprogrammus exutus	15.60	72	2.01	
Aristeus varidens, female	11.52	1608	1.48	6413
Deania calcea	11.50	2	1.48	
Yarrella blackfordi	9.12	72	1.17	
Malacocephalus laevis	8.16	864	1.05	
Coelorrinchus coelorrinchus	8.16	1128	1.05	
Ebania costaecanaria	7.68	96	0.99	
Necocyttus rhomboidalis	6.24	24	0.80	
Talismania bifurcata	5.76	24	0.74	
OPHIDIIDAE	4.08	48	0.53	
STOMIIDAE	3.84	240	0.49	
Halosaurus oventi	2.40	312	0.31	
Gonostoma denudata	2.40	48	0.31	
Notacanthus sexspinis	2.16	24	0.28	
Nematocarcinus africanus	1.68	504	0.22	
Bathyrcongus vicinus	1.44	24	0.19	
Aristeus varidens, male	0.96	408	0.12	6414
Apristurus sp.	0.80	2	0.10	
Nemichthys scolopaceus	0.72	48	0.09	
<b>Total</b>	<b>776.52</b>		<b>100.00</b>	

PROJECT STATION:2998  
 DATE: 3/ 3/03 GEAR TYPE: BT No.15 POSITION:Lat S 1702  
 start stop duration Long E 1116  
 TIME :00:00:05 00:01:34 30 (min) Purpose code: 3  
 LOG :1565.30 1566.85 1.55 Area code : 1  
 FDEPTH: 643 680 GearCond.code:  
 BDEPTH: 643 680 Validity code:  
 Towing dir: 350ø Wire out:1600 m Speed: 31 kn\*10

PROJECT STATION:3003  
 DATE: 3/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1659  
 start stop duration Long E 1143  
 TIME :12:20:49 12:50:32 30 (min) Purpose code: 3  
 LOG :1618.60 1620.22 1.62 Area code : 1  
 FDEPTH: 22 23 GearCond.code:  
 BDEPTH: 22 23 Validity code:  
 Towing dir: 360ø Wire out: 130 m Speed: 30 kn\*10

Sorted: 24 Kg Total catch: 105.37 CATCH/HOUR: 210.74

Sorted: 43 Kg Total catch: 412.58 CATCH/HOUR: 825.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachyrincus scabrus	70.80	288	33.60	
Malacocephalus occidentalis	46.00	560	21.83	
Merluccius capensis	30.00	26	14.24	6417
Todaropsis eblanae	21.20	42	10.06	
Helicolenus dactylopterus	10.40	80	4.93	
Talsmania bifurcata	6.88	1120	3.26	
Hoplostethus atlanticus	6.24	112	2.96	
ODPLA02	5.68	280	2.70	
CONOSTOMATIDAE	3.04	168	1.44	
Laemonema laureysi	2.48	24	1.18	
Neoharriotta pinnata	2.40	2	1.14	
Yarellia blackfordi	1.84	120	0.87	
Ebinania costaecanarie	1.44	32	0.68	
Squalus sp.	1.30	4	0.62	
Gonostoma denudata	0.56	24	0.27	
Aristeus varidens, male	0.32	64	0.15	6416
Aristeus varidens, female	0.08	16	0.04	6415
Nemichthys scolopaceus	0.08	8	0.04	
Total	210.74		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	599.00	6680	72.59	6423
Scomber japonicus	139.50	410	16.91	
Mustelus mustelus	34.40	2	4.17	
Stromateus fiatola	28.84	56	3.50	
Ubrina canariensis	15.00	242	1.82	
Atractoscion aequidens	2.80	18	0.34	
Dicologlossa cuneata	2.46	56	0.30	
Dentex canariensis	1.30	38	0.16	
Trachinotus ovatus	1.12	56	0.14	
Pagellus bellottii	0.74	18	0.09	
Total	825.16		100.02	

PROJECT STATION:2999  
 DATE: 3/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1703  
 start stop duration Long E 1125  
 TIME :05:40:49 06:00:30 20 (min) Purpose code: 3  
 LOG :1583.64 1584.71 1.07 Area code : 1  
 FDEPTH: 136 127 GearCond.code:  
 BDEPTH: 136 127 Validity code:  
 Towing dir: 360ø Wire out: 400 m Speed: 30 kn\*10

PROJECT STATION:3004  
 DATE: 3/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1649  
 start stop duration Long E 1141  
 TIME :14:21:05 14:30:41 10 (min) Purpose code: 3  
 LOG :1632.21 1632.70 0.49 Area code : 1  
 FDEPTH: 26 26 GearCond.code: 8  
 BDEPTH: 26 26 Validity code: 4  
 Towing dir: 355ø Wire out: 150 m Speed: 30 kn\*10

Sorted: 93 Kg Total catch: 925.00 CATCH/HOUR: 2775.00

Sorted: 24 Kg Total catch: 877.32 CATCH/HOUR: 5263.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	1881.00	22620	67.78	6418
Dentex macrophthalmus	573.00	5580	20.65	6419
Merluccius capensis	154.50	630	5.57	6420
Pterothrissus belloci	66.90	780	2.41	
Atractoscion aequidens	50.40	90	1.82	
Dicologlossa cuneata	29.40	810	1.06	
Helicolenus dactylopterus	9.60	90	0.35	
Trigla lyra	8.40	90	0.30	
Trichurus lepturus	1.80	120	0.06	
Total	2775.00		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	2570.40	60588	48.83	6421
Engraulis encrasicolus	2116.80	108966	40.21	
Myliobatis aquila	280.80	216	5.33	
Atractoscion aequidens	211.68	1080	4.02	
Sardinops ocellatus	47.52	3456	0.90	
Decapterus rhonchus	36.72	216	0.70	
Total	5263.92		99.99	

PROJECT STATION:3000  
 DATE: 3/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1700  
 start stop duration Long E 1128  
 TIME :07:25:03 07:55:40 31 (min) Purpose code: 3  
 LOG :1590.74 1592.44 1.69 Area code : 1  
 FDEPTH: 111 116 GearCond.code:  
 BDEPTH: 111 116 Validity code:  
 Towing dir: 360ø Wire out: 335 m Speed: 35 kn\*10

PROJECT STATION:3005  
 DATE: 3/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1649  
 start stop duration Long E 1135  
 TIME :15:53:08 16:22:44 30 (min) Purpose code: 3  
 LOG :1641.78 1643.39 1.62 Area code : 1  
 FDEPTH: 95 95 GearCond.code: 1  
 BDEPTH: 95 95 Validity code: 1  
 Towing dir: 360ø Wire out: 300 m Speed: 30 kn\*10

Sorted: 59 Kg Total catch: 263.55 CATCH/HOUR: 510.10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	504.72	8715	98.95	6421
Dentex macrophthalmus	3.56	60	0.70	
Anthias anthias	1.65	17	0.32	
Todaropsis eblanae	0.17	12	0.03	
Total	510.10		100.00	

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

PROJECT STATION:3001  
 DATE: 3/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1700  
 start stop duration Long E 1135  
 TIME :09:23:25 09:53:07 30 (min) Purpose code: 3  
 LOG :1602.27 1603.96 1.69 Area code : 1  
 FDEPTH: 93 94 GearCond.code: 1  
 BDEPTH: 93 94 Validity code: 1  
 Towing dir: 360ø Wire out: 30 m Speed: 3 kn\*10

PROJECT STATION:3006  
 DATE: 3/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1650  
 start stop duration Long E 1118  
 TIME :19:03:15 19:29:59 27 (min) Purpose code: 3  
 LOG :1665.36 1666.83 1.46 Area code : 1  
 FDEPTH: 342 320 GearCond.code: 1  
 BDEPTH: 342 320 Validity code: 1  
 Towing dir: 360ø Wire out: 900 m Speed: 30 kn\*10

Sorted: 27 Kg Total catch: 0.53 CATCH/HOUR: 1.06

Sorted: 53 Kg Total catch: 633.66 CATCH/HOUR: 1408.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dicologlossa cuneata	0.54	38	50.94	
MOLIDAE	0.46	6	43.40	
GOBIIDAE	0.06	10	5.66	
Total	1.06		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Helicolenus dactylopterus	672.22	10831	47.74	
Chlorophthalmus atlanticus	292.22	8104	20.75	
Hoplostethus cadenati	195.56	12176	13.89	
Merluccius capensis	105.33	253	7.48	6427
Pterothrissus belloci	34.47	171	2.45	
Laemonema laureysi	22.00	636	1.56	
Parapenaeus longirostris, fem.	19.31	3438	1.37	6425
Solenocera africana	17.11	820	1.22	
Leptocharias smithii	12.71	73	0.90	
Nezumia aequalis	11.24	293	0.80	
Merluccius polli	6.22	9	0.44	6426
Neoharriotta pinnata	5.56	2	0.39	
Dicologlossa cuneata	4.89	98	0.35	
Decapterus rhonchus	4.16	24	0.30	
Gonostoma denudata	3.18	196	0.23	
MYCTOPHIDAE	1.96	1222	0.14	
Total	1408.14		100.01	

PROJECT STATION:3002  
 DATE: 3/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1701  
 start stop duration Long E 1139  
 TIME :11:03:29 11:24:05 21 (min) Purpose code: 3  
 LOG :1611.08 1612.14 0.76 Area code : 1  
 FDEPTH: 64 64 GearCond.code:  
 BDEPTH: 64 64 Validity code:  
 Towing dir: 360ø Wire out: 220 m Speed: 30 kn\*10

Sorted: 55 Kg Total catch: 173.12 CATCH/HOUR: 494.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	265.29	13500	53.63	6422
C R A B S	64.29	4249	13.00	
Dicologlossa cuneata	60.00	4154	12.13	
Todaropsis eblanae	40.11	134	8.11	
Myliobatis aquila	33.43	17	6.76	
Sepia orbignyana	19.00	51	3.84	
Mustelus mustelus	3.43	3	0.69	
Ubrina canariensis	3.43	51	0.65	
HETERENCHELYIDAE	2.31	51	0.47	
Trigla lyra	2.06	9	0.42	
Pterothrissus belloci	0.77	77	0.16	
GOBIIDAE	0.51	120	0.10	
Total	494.63		100.00	



PROJECT STATION:3007  
 DATE: 3/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1636  
 start stop duration Long E 1118  
 TIME :21:56:04 22:26:40 31 (min) Purpose code: 3  
 LOG :1683.92 1685.51 1.58 Area code : 1  
 FDEPTH: 615 620 GearCond code:  
 BDEPTH: 615 620 Validity code:  
 Towing dir: 360ø Wire out:1600 m Speed: 30 kn\*10  
 Sorted: 47 Kg Total catch: 67.85 CATCH/HOUR: 131.32

PROJECT STATION:3011  
 DATE: 4/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1629  
 start stop duration Long E 1141  
 TIME :11:35:00 11:45:44 10 (min) Purpose code: 3  
 LOG :1759.90 1760.28 0.38 Area code : 1  
 FDEPTH: 66 68 GearCond code: 8  
 BDEPTH: 66 68 Validity code: 4  
 Towing dir: 45ø Wire out: 200 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Malacocephalus sp	55.45	1802	42.23	
Merluccius capensis	19.45	23	14.81	
Trachyrincus scabrus	15.39	81	11.72	
Todarodes angolensis	13.05	15	9.94	
Hoplostethus atlanticus	11.15	302	8.49	
Talismania bifurcata	3.45	15	2.63	
Melanostomias sp	3.11	290	2.52	
Etmopterus princeps	2.23	4	1.70	
Brotula sp.	1.92	21	1.46	
Yarellia blackfordi	1.30	58	0.99	
Aristeus varidens, female	1.16	126	0.88	6428
Etmopterus pusillus	1.16	4	0.88	
Helicolenus dactylopterus	0.66	10	0.50	
Lamprogrammus exutus	0.48	23	0.37	
Laemonema laureysi	0.29	4	0.22	
Aristeus varidens, male	0.25	46	0.19	6429
Ehinania costaeacanarie	0.23	6	0.18	
Notacanthus sexspinis	0.14	6	0.11	
CONGRIDAE	0.12	6	0.09	
STOMIIDAE	0.08	10	0.06	
Nemichthys scolopaceus	0.06	6	0.05	
Chlorophthalmus punctatus	0.02	4	0.02	
Total	131.35		100.04	

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

PROJECT STATION:3012  
 DATE: 4/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1613  
 start stop duration Long E 1136  
 TIME :14:21:34 14:51:18 30 (min) Purpose code: 3  
 LOG :1781.94 1783.54 1.59 Area code : 1  
 FDEPTH: 74 71 GearCond code:  
 BDEPTH: 74 71 Validity code:  
 Towing dir: 10ø Wire out: 220 m Speed: 30 kn\*10  
 Sorted: 68 Kg Total catch: 1258.08 CATCH/HOUR: 2516.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	2428.00	94168	96.50	6438
Illex coindetii	37.74	1740	1.50	
Zenopsis conchifer	17.02	38	0.68	
Pagellus bellottii	12.96	38	0.52	
Sepia orbignyana	10.72	38	0.43	
Atractoscion aequidens	4.90	6	0.19	
Dentex macrophthalmus	4.08	334	0.16	
Gobiidae	0.74	186	0.03	
Total	2516.16		100.01	

PROJECT STATION:3008  
 DATE: 4/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1638  
 start stop duration Long E 1124  
 TIME :06:03:33 06:17:54 14 (min) Purpose code: 3  
 LOG :1728.84 1729.58 0.73 Area code : 1  
 FDEPTH: 124 124 GearCond code: 9  
 BDEPTH: 124 124 Validity code: 1  
 Towing dir: 360ø Wire out: 375 m Speed: 30 kn\*10  
 Sorted: 88 Kg Total catch: 532.24 CATCH/HOUR: 2281.03

PROJECT STATION:3013  
 DATE: 4/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1613  
 start stop duration Long E 1142  
 TIME :16:06:15 16:34:28 28 (min) Purpose code: 3  
 LOG :1792.10 1793.56 1.45 Area code : 1  
 FDEPTH: 55 53 GearCond code:  
 BDEPTH: 55 53 Validity code:  
 Towing dir: 10ø Wire out: 165 m Speed: 30 kn\*10  
 Sorted: 60 Kg Total catch: 221.64 CATCH/HOUR: 474.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	699.43	2417	30.66	6430
Synagrops microlepis	671.14	140323	29.42	
Dentex macrophthalmus	507.86	7971	22.26	
Trachurus trecae	230.14	3163	10.09	
Pterothrissus belloci	96.94	926	4.25	
Chelidonichthys gabonensis	20.06	51	0.88	
Loligo vulgaris	12.60	257	0.55	
Umbrina canariensis	11.31	77	0.50	
Brotula barbata	10.29	26	0.45	
Trigla lyra	8.74	77	0.38	
Atractoscion aequidens	7.11	9	0.31	
Citharus linguatula	3.60	17	0.16	
Dicologlossa cuneata	1.80	51	0.08	
Total	2281.02		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	210.75	1909	44.37	6440
Trachurus trecae, juvenile	102.39	2871	21.56	6441
Squalus megalops	57.09	9	12.02	
Illex coindetii	28.65	3840	6.03	
Atractoscion aequidens	21.43	45	4.51	6439
Lithognathus mormyrus	16.59	54	3.49	
Dentex barnardi	15.11	105	3.18	
Umbrina canariensis	7.95	84	1.67	
Raja miraletus	6.45	9	1.36	
Spondyliosoma cantharus	4.35	24	0.92	
Sepia orbignyana	4.20	15	0.88	
Total	474.96		99.99	

PROJECT STATION:3009  
 DATE: 4/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1635  
 start stop duration Long E 1126  
 TIME :07:19:36 07:49:43 30 (min) Purpose code: 3  
 LOG :1735.47 1737.09 1.62 Area code : 1  
 FDEPTH: 116 115 GearCond code:  
 BDEPTH: 116 115 Validity code:  
 Towing dir: 360ø Wire out: 360 m Speed: 30 kn\*10  
 Sorted: 69 Kg Total catch: 736.40 CATCH/HOUR: 1472.80

PROJECT STATION:3014  
 DATE: 4/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1611  
 start stop duration Long E 1146  
 TIME :17:18:05 17:33:11 15 (min) Purpose code: 3  
 LOG :1798.22 1799.11 0.89 Area code : 1  
 FDEPTH: 35 35 GearCond code:  
 BDEPTH: 35 35 Validity code:  
 Towing dir: 360ø Wire out: 120 m Speed: 32 kn\*10  
 Sorted: 133 Kg Total catch: 3009.24 CATCH/HOUR: 12036.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	873.00	13102	59.27	6433
Squalus megalops	293.00	140	19.89	
Trachurus trecae	110.00	1620	7.47	6432
Atractoscion aequidens	83.10	114	5.64	6431
Merluccius capensis	31.20	120	2.12	
Pterothrissus belloci	27.80	260	1.89	
Arius parkii	19.80	80	1.34	
Umbrina canariensis	18.00	20	1.22	
Pagellus bellottii	4.40	20	0.30	
Neoharriotta pinnata	3.70	2	0.25	
Trachurus capensis	3.60	20	0.24	
Todaropsis eblanae	2.00	8	0.14	
Illex coindetii	2.00	120	0.14	
Chelidonichthys capensis	1.20	20	0.08	
Total	1472.80		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	10103.20	126292	83.93	6442
Sardinella maderensis	741.24	2132	6.16	
Pagellus bellottii	474.28	3692	3.94	
Sepia orbignyana	221.52	428	1.84	
Gymnura altavela	180.00	8	1.50	
Sardinella aurita	146.24	428	1.21	
Decapterus rhonchus	59.64	144	0.50	
Seriola carpenteri	55.36	144	0.46	
Lithognathus mormyrus	35.48	144	0.29	
Atractoscion aequidens	19.96	60	0.17	6443
Total	12036.92		100.00	

PROJECT STATION:3010  
 DATE: 4/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1635  
 start stop duration Long E 1136  
 TIME :09:48:15 10:07:35 19 (min) Purpose code: 3  
 LOG :1749.54 1750.58 1.03 Area code : 1  
 FDEPTH: 88 88 GearCond code:  
 BDEPTH: 88 88 Validity code:  
 Towing dir: 360ø Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 56 Kg Total catch: 1043.31 CATCH/HOUR: 3294.66

PROJECT STATION:3015  
 DATE: 5/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1312  
 start stop duration Long E 1244  
 TIME :11:34:39 11:46:59 12 (min) Purpose code: 1  
 LOG :1994.90 1995.59 0.67 Area code : 1  
 FDEPTH: 73 68 GearCond code:  
 BDEPTH: 73 68 Validity code: 4  
 Towing dir: 240ø Wire out: 200 m Speed: 30 kn\*10  
 Sorted: 54 Kg Total catch: 356.66 CATCH/HOUR: 1783.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2883.03	230646	87.51	6435
Synagrops microlepis	177.60	36606	5.39	
Dentex macrophthalmus	141.38	6894	4.29	6436
Chelidonichthys gabonensis	26.31	6369	0.80	
Merluccius capensis	17.84	133	0.54	6434
Sepia officinalis hierredda	16.36	411	0.50	
Illex coindetii	14.02	527	0.43	
Dicologlossa cuneata	11.12	878	0.34	
Gobiidae	7.01	60	0.21	
Total	3294.67		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadourus incisus	772.20	6930	43.30	
Umbrina canariensis	397.65	1355	22.30	6445
Trachurus trecae	211.20	16600	11.84	6444
Spondyliosoma cantharus	115.20	365	6.46	
Dentex barnardi	66.30	165	3.72	
Zeus faber	54.75	65	3.07	
Torpedo torpedo	43.55	30	2.44	
Pomatodus saltatrix	38.90	30	2.18	
Atractoscion aequidens	33.50	30	1.88	
Lithognathus mormyrus	24.75	130	1.39	
Pagellus bellottii	7.90	30	0.44	
Trichiurus lepturus	7.55	200	0.42	
Pseudupeneus prayvensis	5.25	30	0.29	
Chaetodon hoefleri	4.60	30	0.26	
Total	1783.30		99.99	

PROJECT STATION:3016  
 DATE: 5/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1235  
 start stop duration Long E 1303  
 TIME :17:49:45 18:19:36 30 (min) Purpose code: 3  
 LOG :2045.23 2046.76 1.54 Area code : 2  
 FDEPTH: 733 758 GearCond.code: 1  
 BDEPTH: 733 758 Validity code: 1  
 Towing dir: 40ø Wire out:2000 m Speed: 30 kn\*10  
 Sorted: 55 Kg Total catch: 301.44 CATCH/HOUR: 602.88

PROJECT STATION:3020  
 DATE: 6/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1217  
 start stop duration Long E 1334  
 TIME :09:51:36 10:11:58 20 (min) Purpose code: 3  
 LOG :2133.19 2134.31 1.11 Area code : 2  
 FDEPTH: 56 53 GearCond.code: 2  
 BDEPTH: 56 53 Validity code: 2  
 Towing dir: 40ø Wire out: 180 m Speed: 30 kn\*10  
 Sorted: 118 Kg Total catch: 1277.32 CATCH/HOUR: 3831.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	424.06	10242	70.34	
Merluccius polli	67.66	78	11.22	6446
Gonostoma elongatum	27.06	2540	4.49	
Lamprogrammus exultus	26.84	110	4.45	
Nezumia aequalis	12.32	264	2.04	
Synbranchus afer	7.26	210	1.20	
Talismania bifurcata	7.26	210	1.20	
Triplophus hemingi	6.70	836	1.11	
Aristeus varidens, female	5.94	396	0.99	
MACROURIDAE	4.50	88	0.75	
Aristeus varidens, male	4.28	594	0.71	
Solenocera africana	3.40	980	0.56	
Melanostomias sp.	3.30	100	0.55	
Ebinania costaecanarie	1.10	22	0.18	
Plesionopaeus edwardsianus	1.00	22	0.17	
MYCTOPHIDAE	0.22	66	0.04	
Total	602.90		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasyus jubelini	2112.69	2079	55.13	
Trachurus trecae	468.00	41436	12.21	6445
Pomadasyus incisus	296.10	1278	7.73	
Brachydeuterus auritus	294.51	1164	7.69	
Chloroscombrus chrysurus	181.11	1479	4.73	
Galeodes decadactylus	158.43	1197	4.13	
Spinephelus aeneus	93.30	9	2.43	
Lithognathus mormyrus	68.34	189	1.78	
Torpedo marmorata	30.57	30	0.80	
Pagellus bellottii	25.83	252	0.67	
Sepia orbignyana	15.12	30	0.39	
Trichiurus lepturus	13.23	567	0.35	
Selene dorsalis	12.90	222	0.34	
Sphyræna sphyraena	12.60	63	0.33	
Umbrina canariensis	11.01	189	0.29	
Atractoscion aequidens	9.45	63	0.25	
Pseudupeneus prayensis	6.93	30	0.18	
Synagrops microlepis	6.30	1638	0.16	
Dicologlossa cuneata	5.04	96	0.13	
Citharus linguatula	4.71	126	0.12	
Chaetodon hoefleri	4.08	33	0.11	
Scorpaena angolensis	1.56	30	0.04	
Total	3831.81		99.99	

PROJECT STATION:3017  
 DATE: 5/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1223  
 start stop duration Long E 1316  
 TIME :21:45:40 22:15:27 30 (min) Purpose code: 3  
 LOG :2067.99 2069.52 1.52 Area code : 2  
 FDEPTH: 750 734 GearCond.code: 7  
 BDEPTH: 750 734 Validity code: 9  
 Towing dir: 30ø Wire out: 700 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

PROJECT STATION:3021  
 DATE: 6/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1216  
 start stop duration Long E 1332  
 TIME :11:07:59 11:38:00 30 (min) Purpose code: 3  
 LOG :2139.24 2140.92 1.68 Area code : 2  
 FDEPTH: 75 73 GearCond.code: 2  
 BDEPTH: 75 73 Validity code: 2  
 Towing dir: 30ø Wire out: 210 m Speed: 30 kn\*10  
 Sorted: 55 Kg Total catch: 222.46 CATCH/HOUR: 444.92

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

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	166.80	7554	37.49	6450
Pomadasyus incisus	86.80	816	19.51	
Brachydeuterus auritus	60.40	520	13.58	
Umbrina canariensis	27.44	472	6.17	6451
Dentex barnardi	19.76	224	4.44	
Pagellus bellottii	17.20	160	3.87	6452
Sepia orbignyana	11.04	16	2.48	
Trichiurus lepturus	9.84	168	2.21	
Stromateus fiatola	8.16	16	1.83	
Atractoscion aequidens	8.16	72	1.83	
Citharus linguatula	8.08	200	1.82	
Pseudupeneus prayensis	5.84	32	1.31	
Chelidonichthys gabonensis	3.60	32	0.81	
Lithognathus mormyrus	2.40	16	0.54	
Dentex macrophthalmus	1.68	8	0.38	
Zeus faber	1.60	24	0.36	
Pomadasyus rogeri	1.20	8	0.27	
Fistularia petimba	1.20	4	0.27	
Chaetodon hoefleri	1.04	8	0.23	
Chloroscombrus chrysurus	0.80	8	0.18	
Selene dorsalis	0.80	8	0.18	
Spinephelus haifensis	0.60	2	0.13	
Pterothrissus belloci	0.40	8	0.09	
Serranus cabrilla	0.08	8	0.02	
Total	444.92		100.00	

PROJECT STATION:3018  
 DATE: 6/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1227  
 start stop duration Long E 1325  
 TIME :05:02:58 05:04:02 31 (min) Purpose code: 3  
 LOG :2102.15 2103.81 1.65 Area code : 2  
 FDEPTH: 69 71 GearCond.code: 2  
 BDEPTH: 69 71 Validity code: 3  
 Towing dir: 45ø Wire out: 280 m Speed: 30 kn\*10  
 Sorted: 61 Kg Total catch: 363.42 CATCH/HOUR: 703.39

PROJECT STATION:3022  
 DATE: 6/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1216  
 start stop duration Long E 1327  
 TIME :12:52:06 13:22:09 30 (min) Purpose code: 3  
 LOG :2149.55 2151.13 1.58 Area code : 2  
 FDEPTH: 98 100 GearCond.code: 2  
 BDEPTH: 98 100 Validity code: 2  
 Towing dir: 10ø Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 51 Kg Total catch: 142.29 CATCH/HOUR: 284.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	312.39	9962	44.41	
Pagellus bellottii	123.10	975	17.50	6447
Pomadasyus incisus	69.68	441	9.91	
Brachydeuterus auritus	59.92	430	8.52	
Trachurus trecae	27.99	418	3.98	6448
Argyrosomus hololepidotus	22.65	93	3.22	
Trichiurus lepturus	19.74	871	2.81	
Umbrina canariensis	17.77	325	2.53	
Citharus linguatula	13.82	314	1.96	
Brotula barbata	11.61	70	1.65	
Dentex barnardi	7.20	58	1.02	
Stromateus fiatola	6.74	12	0.96	
Pterothrissus belloci	5.92	139	0.84	
Bembrops heterurus	2.67	35	0.38	
Zeus faber	1.16	12	0.16	
Lepidotrigla cadmani	1.05	12	0.15	
Total	703.41		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	96.24	296	33.82	6453
Pagellus bellottii	49.24	290	17.30	6455
Dentex barnardi	47.50	220	16.69	
Dentex angolensis	28.10	166	9.87	6454
Spinephelus aeneus	16.30	2	5.73	
Dentex macrophthalmus	8.50	46	2.99	
Chelidonichthys gabonensis	7.40	80	2.60	
Chaetodon hoefleri	7.14	50	2.51	
Zeus faber	6.54	20	2.30	
Octopus vulgaris	5.60	2	1.97	
Raja miraletus	3.76	6	1.32	
Trachurus trecae	1.94	26	0.68	
Torpedo torpedo	1.58	2	0.56	
Perulibatrachus rosignoli	1.10	6	0.39	
Scomber japonicus	1.10	6	0.39	
Branchiostegus semifasciatus	1.00	4	0.35	
Brachydeuterus auritus	0.60	6	0.21	
Sphoeroides pachgaster	0.60	2	0.21	
Citharus linguatula	0.30	10	0.11	
Illex coindetii	0.04	6	0.01	
Total	284.58		100.01	

PROJECT STATION:3019  
 DATE: 6/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1226  
 start stop duration Long E 1323  
 TIME :07:04:53 07:09:33 5 (min) Purpose code: 3  
 LOG :2109.77 2110.02 0.24 Area code : 2  
 FDEPTH: 94 93 GearCond.code: 9  
 BDEPTH: 94 93 Validity code: 1  
 Towing dir: 45ø Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 32 Kg Total catch: 557.79 CATCH/HOUR: 6693.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	5400.00	1966152	80.68	
Trichiurus lepturus	807.00	1680	12.06	
Torpedo torpedo	178.20	360	2.66	
Citharus linguatula	82.80	1440	1.24	
Umbrina canariensis	54.96	108	0.82	
Dentex macrophthalmus	43.20	360	0.65	
Dentex barnardi	34.20	180	0.51	
Trigla lyra	27.00	180	0.40	
Scorpaena normani	23.40	180	0.35	
Stromateus fiatola	19.68	24	0.29	
Pomadasyus jubelini	18.96	24	0.28	
Argyrosomus regius	4.08	180	0.06	
Total	6693.48		100.00	

PROJECT STATION:3023  
 DATE: 6/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1215  
 start stop duration Long E 1325  
 TIME :14:24:28 14:54:17 30 (min) Purpose code: 3  
 LOG :2156.50 2158.15 1.64 Area code : 2  
 FDEPTH: 108 108 GearCond.code:  
 BDEPTH: 108 108 Validity code:  
 Towing dir: 200 Wire out: 310 m Speed: 30 kn\*10

PROJECT STATION:3027  
 DATE: 7/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1156  
 start stop duration Long E 1323  
 TIME :01:25:03 01:55:53 31 (min) Purpose code: 3  
 LOG :2215.97 2217.58 1.61 Area code : 2  
 FDEPTH: 473 467 GearCond.code:  
 BDEPTH: 473 467 Validity code:  
 Towing dir: 3400 Wire out:1300 m Speed: 30 kn\*10

Sorted: Kg Total catch: 11.19 CATCH/HOUR: 22.38

Sorted: 9 Kg Total catch: 70.48 CATCH/HOUR: 136.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	7.58	12	33.87	
Dentex barnardi	4.52	16	20.20	
Zeus faber	2.88	10	12.87	
Trichiurus lepturus	2.12	2	9.47	
Pagellus bellottii	1.34	6	5.99	
Illex coindetii	1.16	90	5.18	
Dentex angolensis	1.16	6	5.18	
Ubrina canariensis	0.82	4	3.66	
Branchiostegus semifasciatus	0.62	2	2.77	
Chelidonichthys gabonensis	0.14	2	0.63	
Trachurus traciae	0.04	2	0.18	
Total	22.38		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	98.32	33414	72.09	
Yarella blackfordi	13.94	480	10.22	
Hoplostethus cadenati	7.74	325	5.67	
STOMIIDAE	3.87	124	2.84	
Lamprogrammus exutus	2.79	217	2.05	
Aristeus varidens, female	1.70	139	1.25	6460
MYCTOPHIDAE	1.70	1146	1.25	
Plesiopeanaeus edwardsianus	1.39	635	1.02	
SEPIOLIDAE	1.39	15	1.02	
Aristeus varidens, male	0.77	155	0.56	6461
Etmopterus pusillus	0.62	15	0.45	
Trachinotus ovatus	0.62	31	0.45	
Talismania bifurcata	0.46	81	0.34	
Gadella imberbis	0.46	15	0.34	
Gonostoma elongatum	0.46	62	0.34	
Chlorophthalmus atlanticus	0.15	108	0.11	
Total	136.38		99.99	

PROJECT STATION:3024  
 DATE: 6/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1214  
 start stop duration Long E 1321  
 TIME :16:27:32 16:50:12 23 (min) Purpose code: 3  
 LOG :2168.80 2169.94 1.13 Area code : 2  
 FDEPTH: 730 710 GearCond.code:  
 BDEPTH: 730 710 Validity code:  
 Towing dir: 300 Wire out:2000 m Speed: 30 kn\*10

PROJECT STATION:3028  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1158  
 start stop duration Long E 1330  
 TIME :05:41:51 05:51:01 9 (min) Purpose code: 3  
 LOG :2236.52 2237.02 0.50 Area code : 2  
 FDEPTH: 266 264 GearCond.code: 9  
 BDEPTH: 266 264 Validity code: 1  
 Towing dir: 200 Wire out: 750 m Speed: 30 kn\*10

Sorted: 47 Kg Total catch: 164.11 CATCH/HOUR: 428.11

Sorted: 55 Kg Total catch: 654.86 CATCH/HOUR: 4365.73

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	290.35	13422	67.82	
Gonostoma denudata	59.45	1910	13.89	
Triplophus hemingi	33.05	1727	7.72	
Lamprogrammus exutus	13.98	102	3.27	
Solenocera africana	11.50	4544	2.69	
Talismania bifurcata	6.86	211	1.60	
Melanostomias sp.	5.66	183	1.32	
Nezumia aequalis	3.21	102	0.75	
Symbranchus afer	1.83	18	0.43	
Aristeus varidens	0.73	83	0.17	
Xenodermichthys copei	0.65	10	0.15	
Plesiopeanaeus edwardsianus	0.65	29	0.15	
Halosaurus ovenii	0.18	10	0.04	
Total	428.10		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops macrolepis	3488.33	370607	79.90	
Merluccius polli	548.20	8053	12.56	6463
Chlorophthalmus atlanticus	321.93	3447	2.79	
Dentex macrophthalmus	114.67	500	2.63	6462
Zenopsis conchifer	41.80	153	0.96	
COMGRIDAE	15.33	153	0.35	
Todaropsis eblanae	12.27	80	0.28	
Parapanaeus longirostris, fem	10.00	1687	0.23	
Parapanaeus longirostris, male	6.93	1380	0.16	
Ariomma bondi	4.60	153	0.11	
Hoplostethus mediterraneus	1.67	7	0.04	
Total	4365.73		100.01	

PROJECT STATION:3025  
 DATE: 6/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1156  
 start stop duration Long E 1320  
 TIME :20:45:15 21:18:57 34 (min) Purpose code: 3  
 LOG :2195.95 2197.70 1.76 Area code : 2  
 FDEPTH: 658 660 GearCond.code:  
 BDEPTH: 658 660 Validity code: 1  
 Towing dir: 3450 Wire out:1800 m Speed: 30 kn\*10

PROJECT STATION:3029  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1159  
 start stop duration Long E 1332  
 TIME :07:32:31 08:04:03 32 (min) Purpose code: 3  
 LOG :2242.38 2244.09 1.71 Area code : 2  
 FDEPTH: 102 103 GearCond.code:  
 BDEPTH: 102 103 Validity code: 1  
 Towing dir: 200 Wire out: m Speed: 30 kn\*10

Sorted: 37 Kg Total catch: 148.32 CATCH/HOUR: 261.74

Sorted: Kg Total catch: 165.73 CATCH/HOUR: 310.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	127.06	2329	48.54	
Bathyrcongus vicinus	91.76	4	35.06	
Melanostomias sp.	10.94	289	4.18	
Yarella blackfordi	6.35	713	2.43	
Lamprogrammus exutus	6.35	28	2.43	
Gonostoma elongatum	4.94	148	1.89	
Nezumia aequalis	3.88	205	1.48	
Triplophus hemingi	1.84	367	0.70	
Ariomma melanum	1.69	7	0.65	
SEPIOLIDAE	1.31	7	0.50	
Ebinania costaecanarie	0.85	21	0.32	
Lepidopus caudatus	0.78	49	0.30	
Centroscyllium crepidater	0.71	5	0.27	
Aristeus varidens, female	0.71	56	0.27	6456
SYNAPHOBRAANCHIDAE	0.64	7	0.24	
Talismania bifurcata	0.56	28	0.21	
Aristeus varidens, male	0.49	71	0.19	6457
OPHIDIIDAE	0.35	49	0.13	
MYCTOPHIDAE	0.28	162	0.11	
Xenodermichthys copei	0.21	14	0.08	
Halosaurus ovenii	0.07	7	0.03	
Total	261.77		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex barnardi	120.47	71	38.77	6466
Dentex angolensis	48.66	186	15.66	6467
Pagellus bellottii	37.88	206	12.19	
Dentex macrophthalmus	37.41	111	12.04	6465
Zeus faber	16.22	49	5.22	
Epinephelus aeneus	15.00	2	4.83	
Lagocephalus laevigatus	6.68	6	2.15	
Zenopsis conchifer	6.38	47	2.05	
Sparus pagrus africanus	5.63	9	1.81	
Branchiostegus semifasciatus	4.89	6	1.57	
Centrarchops chapini	4.16	26	1.34	
Dentex gibbosus	3.30	6	1.06	
Trigla lyra	2.10	21	0.68	
Raja miraletus	1.99	4	0.64	
Total	310.77		100.01	

PROJECT STATION:3026  
 DATE: 6/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1155  
 start stop duration Long E 1321  
 TIME :23:12:35 23:42:27 30 (min) Purpose code: 3  
 LOG :2205.53 2207.15 1.61 Area code : 2  
 FDEPTH: 573 576 GearCond.code:  
 BDEPTH: 573 576 Validity code: 1  
 Towing dir: 3450 Wire out:1550 m Speed: 30 kn\*10

PROJECT STATION:3030  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1201  
 start stop duration Long E 1337  
 TIME :09:42:26 10:12:13 30 (min) Purpose code: 3  
 LOG :2252.96 2254.55 1.24 Area code : 2  
 FDEPTH: 70 70 GearCond.code:  
 BDEPTH: 70 70 Validity code: 1  
 Towing dir: 200 Wire out: 210 m Speed: 30 kn\*10

Sorted: 28 Kg Total catch: 110.30 CATCH/HOUR: 220.60

Sorted: 70 Kg Total catch: 179.66 CATCH/HOUR: 359.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	148.00	3056	67.09	
Aristeus varidens, male	8.88	1312	4.03	6459
Aristeus varidens, female	8.88	648	4.03	6458
Nematocarcinus africanus	8.80	3960	3.99	
Yarella blackfordi	8.64	272	3.92	
Lamprogrammus exutus	8.48	112	3.84	
Gadella imberbis	8.08	72	3.66	
Gonostoma denudata	7.04	184	3.19	
Ariomma melanum	5.60	112	2.54	
Lagocephalus laevigatus	1.60	64	0.73	
Lepidopus caudatus	1.52	48	0.69	
Plesiopeanaeus edwardsianus	1.28	488	0.58	
MYCTOPHIDAE	1.20	784	0.54	
STOMIIDAE	1.12	16	0.51	
Bathyrcongus vicinus	0.56	24	0.25	
Etmopterus lucifer	0.40	4	0.18	
Chaunax pictus	0.24	8	0.11	
Etmopterus pusillus	0.20	2	0.09	
Ebinania costaecanarie	0.08	8	0.04	
Total	220.60		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus traciae	209.24	11040	58.23	6468
Pagellus bellottii	41.24	306	11.48	6469
Sepia orbignyana	35.54	30	9.89	
Pomadoury incisivus	31.50	230	8.77	
Pseudupeneus prayensis	14.24	84	3.96	
Dentex barnardi	4.50	20	1.25	
Raja miraletus	4.40	6	1.22	
Torpedo torpedo	3.60	4	1.00	
Citharus linguatula	3.14	850	0.87	
Sardinella aurita	2.74	40	0.76	
Octopus vulgaris	2.44	50	0.68	
Ubrina canariensis	2.10	50	0.58	
Boops boops	2.00	10	0.47	
Brotula barbata	1.70	10	0.47	
Plectorhynchus mediterraneus	0.94	6	0.26	
Total	359.32		99.98	

PROJECT STATION: 3031  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1202 Long E 1339  
 start stop duration  
 TIME :11:05:02 11:35:05 30 (min) Purpose code: 3  
 LOG :2259.95 2261.55 1.60 Area code : 2  
 FDEPTH: 53 56 GearCond code: 2  
 BDEPTH: 53 56 Validity code: 1  
 Towing dir: 360° Wire out: 180 m Speed: 30 kn\*10  
 Sorted: 67 Kg Total catch: 335.80 CATCH/HOUR: 671.60

PROJECT STATION: 3035  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 1144 Long E 1318  
 start stop duration  
 TIME :20:22:10 20:52:03 30 (min) Purpose code: 3  
 LOG :2320.97 2322.53 1.61 Area code : 2  
 FDEPTH: 678 678 GearCond code: 2  
 BDEPTH: 678 678 Validity code: 1  
 Towing dir: 355° Wire out: 1800 m Speed: 30 kn\*10  
 Sorted: 53 Kg Total catch: 69.67 CATCH/HOUR: 139.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	320.50	11568	47.72	6470
Brachydeuterus auritus	192.50	1412	28.66	
Pagellus bellottii	35.10	306	5.23	6471
Sardinella aurita	32.70	2664	4.87	
Rhinobatos albomaculatus	17.50	10	2.61	
Stromateus fiatola	13.20	20	1.97	
Trichiurus lepturus	11.00	780	1.64	
Lithognathus mormyrus	9.40	30	1.40	
Selene dorsalis	8.10	60	1.21	
Dicologlossa cuneata	7.30	170	1.09	
Pseudupeneus prayensis	7.20	50	1.07	
Sepia orbignyana	7.10	10	1.06	
Atractoscion aequidens	4.70	20	0.70	
Pomadasy jubelini	1.60	10	0.24	
Pentheroscion mbizi	1.00	10	0.15	
Boops boops	0.90	20	0.13	
Pseudotolithus typus	0.90	10	0.13	
Citharus linguatula	0.90	30	0.13	
Total	671.60		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	44.10	11760	31.65	
Hoplostethus cadenati	38.60	930	27.70	
Etmopterus princeps	12.80	10	9.19	
Yarrella blackfordi	11.02	268	7.91	
Merluccius polli	5.64	8	4.05	
Aristeus varidens, male	4.32	582	3.10	6479
Aristeus varidens, female	4.32	266	3.10	6478
Stomias boa boa	3.78	104	2.71	
Lamprogrammus sp.	2.94	10	2.11	
Nezumia aequalis	1.94	88	1.39	
Gonostoma sp.	1.30	186	0.93	
CNYCHOTEUTHIDAE	1.20	2	0.86	
Talismania sp.	0.84	26	0.60	
Ebinania costaecanarie	0.78	14	0.56	
MELANOCETIDAE	0.72	2	0.52	
Coloconger cadenati	0.62	68	0.44	
Todaropsis eblanae	0.58	2	0.42	
Squilla sp.	0.52	78	0.37	
Bathyrcoconger vicinus	0.46	14	0.33	
Malacocephalus occidentalis	0.40	2	0.29	
SEPIOLIDAE	0.38	2	0.27	
Plesioconger edwardsianus	0.36	102	0.26	
Scopelosaurus sp.	0.34	4	0.24	
Halosaurus ovenii	0.30	6	0.22	
Lepidopus caudatus	0.24	10	0.17	
MYCTOPHIDAE	0.20	8	0.14	
Centrophorus squamosus	0.20	2	0.14	
Glyphis marsupialis	0.18	10	0.13	
Synaphobranchus kaupii	0.18	8	0.13	
NEMICHTHYIDAE	0.04	2	0.03	
CONGRIDAE	0.04	2	0.03	
Total	139.34		99.99	

PROJECT STATION: 3032  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1149 Long E 1345  
 start stop duration  
 TIME :13:36:52 14:06:42 30 (min) Purpose code: 3  
 LOG :2278.27 2279.83 1.56 Area code : 2  
 FDEPTH: 29 28 GearCond code: 2  
 BDEPTH: 29 28 Validity code: 1  
 Towing dir: 360° Wire out: 140 m Speed: 31 kn\*10  
 Sorted: 61 Kg Total catch: 182.97 CATCH/HOUR: 365.94

PROJECT STATION: 3036  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 1130 Long E 1322  
 start stop duration  
 TIME :23:38:19 00:08:11 30 (min) Purpose code: 3  
 LOG :2338.93 2340.53 1.59 Area code : 2  
 FDEPTH: 370 379 GearCond code: 1  
 BDEPTH: 370 379 Validity code: 1  
 Towing dir: 20° Wire out: 1000 m Speed: 30 kn\*10  
 Sorted: 16 Kg Total catch: 122.10 CATCH/HOUR: 244.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	258.60	19508	70.67	
Sardinella maderensis	21.12	1908	5.77	
Galeoides decadactylus	13.68	348	3.74	
Selene dorsalis	13.56	826	3.71	
Chloroscombrus chrysurus	11.60	768	3.17	
Sepia orbignyana	9.84	30	2.69	
Trichiurus lepturus	8.10	186	2.21	
Trachurus trecae	6.72	720	1.84	
Sphyraena sphyraena	6.00	96	1.64	
Raja miraletus	4.74	18	1.30	
Pseudupeneus prayensis	4.20	72	1.15	
Pagellus bellottii	2.52	336	0.69	
Pomadasy jubelini	2.40	6	0.66	
Lagocephalus laevigatus	1.62	18	0.44	
Epinephelus aeneus	1.20	2	0.33	
Total	365.90		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	113.80	318	46.60	6480
Nematocarcinus africanus	90.40	20546	37.02	
Laemonema laureysi	26.16	646	10.71	
Parapenaeus longirostris, fem.	4.24	1416	1.74	6482
MACROURIDAE	2.56	432	1.05	
Hoplostethus cadenati	1.52	56	0.62	
Malacocephalus occidentalis	1.44	8	0.59	
Chauanax pictus	1.12	88	0.46	
Etmopterus princeps	0.80	176	0.33	
Aristeus varidens, female	0.56	56	0.23	6483
TRICHIURIDAE	0.40	16	0.16	
Synagrops microlepis	0.40	24	0.16	
Bathyrcoconger vicinus	0.32	32	0.13	
Parapenaeus longirostris, male	0.24	80	0.10	6481
MYCTOPHIDAE	0.24	56	0.10	
Total	244.20		100.00	

PROJECT STATION: 3033  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1148 Long E 1341  
 start stop duration  
 TIME :15:20:11 15:50:08 30 (min) Purpose code: 3  
 LOG :2287.03 2288.58 1.54 Area code : 2  
 FDEPTH: 64 63 GearCond code: 2  
 BDEPTH: 64 63 Validity code: 1  
 Towing dir: 360° Wire out: 200 m Speed: 30 kn\*10  
 Sorted: 63 Kg Total catch: 346.98 CATCH/HOUR: 693.96

PROJECT STATION: 3037  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1132 Long E 1330  
 start stop duration  
 TIME :05:47:44 05:54:30 7 (min) Purpose code: 3  
 LOG :2358.77 2359.16 0.38 Area code : 2  
 FDEPTH: 103 103 GearCond code: 2  
 BDEPTH: 103 103 Validity code: 1  
 Towing dir: 340° Wire out: 310 m Speed: 30 kn\*10  
 Sorted: 57 Kg Total catch: 567.08 CATCH/HOUR: 4860.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	458.20	5924	66.03	6472
Trachurus trecae, juvenile	137.50	4476	19.81	6473
Pagellus bellottii	64.90	232	9.35	
Decapterus rhonchus	16.28	66	2.35	
Trichiurus lepturus	7.38	56	1.06	
Selene dorsalis	4.52	44	0.65	
Arygroscomus hololepidotus	1.76	12	0.25	
Chloroscombrus chrysurus	1.54	22	0.22	
Umbrina canariensis	1.10	22	0.16	
Sepia officinalis hierredda	0.56	22	0.08	
Dentex barnardi	0.22	12	0.03	
Total	693.96		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	4547.74	41778	93.56	
Trichiurus lepturus	90.00	120	1.85	
Lagocephalus laevigatus	52.11	86	1.07	
Umbrina canariensis	35.91	51	0.74	
Brachydeuterus auritus	30.09	163	0.62	
Brotula barbata	29.06	26	0.60	
Trigla lyra	24.43	163	0.50	
Trachurus trecae, juvenile	19.54	1063	0.40	
Sepia officinalis hierredda	12.60	17	0.26	
Zeus faber	8.83	17	0.18	
Octopus vulgaris	7.20	9	0.15	
Pagellus bellottii	2.40	9	0.05	
Citharus linguatula	0.69	9	0.01	
Total	4860.60		99.99	

PROJECT STATION: 3034  
 DATE: 7/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1145 Long E 1329  
 start stop duration  
 TIME :17:29:31 17:45:36 16 (min) Purpose code: 3  
 LOG :2304.33 2305.13 0.80 Area code : 2  
 FDEPTH: 162 162 GearCond code: 2  
 BDEPTH: 162 162 Validity code: 1  
 Towing dir: 335° Wire out: 480 m Speed: 30 kn\*10  
 Sorted: 60 Kg Total catch: 345.33 CATCH/HOUR: 1294.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	894.75	120825	69.09	
Zenopsis conchifer	71.63	514	5.53	
Merluccius polli	66.00	1279	5.10	6476
Pterothrissus belloci	56.10	353	4.33	
Brotula barbata	48.68	56	3.76	
Helicolenus dactylopterus	26.21	124	2.02	
Dentex angolensis	17.70	56	1.37	6477
Lagocephalus laevigatus	15.49	23	1.20	
Parapenaeus longirostris, male	15.26	5835	1.18	6474
Illex coindetii	14.03	371	1.08	
Trigla lyra	13.61	124	1.05	
Decapterus rhonchus	12.75	64	0.99	
Octopus vulgaris	10.31	23	0.80	
Parapenaeus longirostris, fem.	5.36	7444	0.41	6475
Bembrops heterurus	5.18	64	0.40	
Trachurus trecae	4.76	64	0.37	
Citharus linguatula	3.94	229	0.30	
Trichiurus lepturus	3.30	23	0.25	
Saurida brasiliensis	3.11	413	0.24	
MYCTOPHIDAE	2.89	495	0.22	
Dentex macrophthalmus	2.66	15	0.21	
Cynoglossus canariensis	1.24	23	0.10	
Total	1295.00		100.00	

PROJECT STATION: 3038  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1132 Long E 1335  
 start stop duration  
 TIME :06:48:46 07:18:49 30 (min) Purpose code: 3  
 LOG :2365.73 2367.42 1.68 Area code : 2  
 FDEPTH: 62 63 GearCond.code:  
 BDEPTH: 62 63 Validity code: 1  
 Towing dir: 340ø Wire out: 210 m Speed: 30 kn\*10

PROJECT STATION: 3041  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1117 Long E 1345  
 start stop duration  
 TIME :12:55:43 13:25:27 30 (min) Purpose code: 3  
 LOG :2403.10 2404.71 1.60 Area code : 2  
 FDEPTH: 21 24 GearCond.code:  
 BDEPTH: 21 24 Validity code:  
 Towing dir: 360ø Wire out: 140 m Speed: 30 kn\*10

Sorted: Kg Total catch: 117.78 CATCH/HOUR: 235.56

Sorted: Kg Total catch: 286.01 CATCH/HOUR: 572.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella maderensis	45.60	184	19.36	6489
Trachurus trecae	35.80	150	15.20	6485
Trachurus trecae, juvenile	32.80	2150	13.92	6484
Brachydeuterus auritus	26.10	166	11.08	6486
Pagellus bellottii	15.34	198	6.51	6488
Lithognathus mormyrus	15.10	24	6.41	
Sepia orbignyana	12.08	14	5.13	
Decapterus rhonchus	10.70	40	4.54	
Sphyraena sphyraena	10.36	102	4.40	
Alloteuthis subulata	7.56	1832	3.21	
Pomadasyus incisus	5.86	24	2.49	
Dentex barnardi	5.34	70	2.27	6487
Sardinella aurita	5.30	164	2.25	
Fistularia petimba	2.08	4	0.88	
Raja miraletus	1.88	2	0.80	
Torpedo torpedo	1.08	2	0.46	
Octopus sp.	0.88	2	0.37	
Pseudupeneus prayensis	0.76	10	0.32	
Scomber japonicus	0.52	2	0.22	
Citharus linguatula	0.20	6	0.08	
Chelidonichthys capensis	0.12	2	0.05	
Serranus accraensis	0.10	2	0.04	
Total	235.56		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	132.40	516	23.15	
Galeoides decadactylus	129.10	2124	22.57	
Selene dorsalis	68.50	356	11.98	
Sphyraena sphyraena	66.60	100	11.64	
Pomadasyus rogeri	42.90	56	7.50	
Pseudotolithus senegalensis	25.90	24	4.53	6491
Panulirus regius	15.20	42	2.66	
Arius parkii	14.22	24	2.49	
Brachydeuterus auritus Juv.	11.76	2332	2.06	
Pomadasyus peroteti	9.40	10	1.64	
Elops lacerta	8.04	16	1.41	
Lithognathus mormyrus	6.22	14	1.09	
Lagocephalus laevigatus	5.62	14	0.98	
Brachydeuterus auritus	5.08	48	0.89	
Stromateus fiatola	4.52	8	0.79	
Sardinella aurita	3.74	20	0.65	
Sphyraena lewini	3.20	2	0.56	
Trachurus trecae, juvenile	3.08	264	0.54	6490
Dentex barnardi	2.82	6	0.49	
Alectis alexandrinus	2.72	4	0.48	
Sardinella aurita - Juveniles	2.52	166	0.44	
Rhizoprionodon acutus	1.40	2	0.24	
Balistes punctatus	1.00	2	0.17	
Euthynnus alletteratus	1.00	8	0.17	
Sepia orbignyana	0.94	6	0.16	
Epinephelus alexandrinus *	0.90	2	0.16	
Trachurus trecae	0.90	26	0.16	
Cynoglossus browni	0.62	2	0.11	
Citharus linguatula	0.42	6	0.07	
Sphyraena juveniles	0.38	26	0.07	
Ilisha africana	0.26	4	0.05	
Pseudupeneus prayensis	0.20	4	0.03	
Trichiurus lepturus	0.18	4	0.03	
Pomatus kuhlii	0.18	2	0.03	
Sepiella ornata	0.10	4	0.02	
Total	572.02		100.01	

PROJECT STATION: 3039  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1132 Long E 1339  
 start stop duration  
 TIME :08:29:10 08:59:04 30 (min) Purpose code: 3  
 LOG :2374.38 2376.08 1.69 Area code : 2  
 FDEPTH: 42 42 GearCond.code:  
 BDEPTH: 42 42 Validity code: 1  
 Towing dir: 350ø Wire out: 155 m Speed: 30 kn\*10

Sorted: Kg Total catch: 31.09 CATCH/HOUR: 62.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Epinephelus aeneus	22.00	4	35.38	
Lithognathus mormyrus	16.10	32	25.89	
Plectorhynchus mediterraneus	5.22	6	8.39	
Sepia officinalis hierredda	4.58	8	7.37	
Pomadasyus incisus	3.80	20	6.11	
Octopus sp.	2.46	6	3.96	
Pseudupeneus prayensis	2.18	8	3.51	
Pagellus bellottii	1.80	8	2.89	
Dentex barnardi	1.10	10	1.77	
Centarchops chapini	1.04	6	1.67	
Trachurus trecae	0.48	2	0.77	
Decapterus rhonchus	0.42	10	0.68	
Sphyraena sphyraena	0.40	6	0.64	
Lagocephalus laevigatus	0.32	2	0.51	
Citharus linguatula	0.28	6	0.45	
Total	62.18		99.99	

PROJECT STATION: 3042  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1117 Long E 1342  
 start stop duration  
 TIME :14:15:08 14:45:04 30 (min) Purpose code: 3  
 LOG :2409.84 2411.32 1.48 Area code : 2  
 FDEPTH: 21 21 GearCond.code:  
 BDEPTH: 21 21 Validity code:  
 Towing dir: 360ø Wire out: 120 m Speed: 30 kn\*10

Sorted: Kg Total catch: 26.28 CATCH/HOUR: 52.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrinus	28.70	16	54.60	
Balistes capricus	11.96	20	22.75	
Fistularia petimba	4.36	30	8.30	
Lagocephalus laevigatus	2.38	10	4.53	
Panulirus regius	1.52	6	2.89	
Raja miraletus	1.28	2	2.44	
Arius parkii	1.00	2	1.90	
Chloroscombrus chrysurus	0.72	4	1.37	
Aluterus sp.	0.64	4	1.22	
Total	52.56		100.00	

PROJECT STATION: 3040  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1133 Long E 1343  
 start stop duration  
 TIME :10:27:54 10:57:48 30 (min) Purpose code: 3  
 LOG :2384.06 2385.54 1.46 Area code : 2  
 FDEPTH: 29 27 GearCond.code:  
 BDEPTH: 29 27 Validity code: 1  
 Towing dir: 360ø Wire out: 150 m Speed: 30 kn\*10

Sorted: 37 Kg Total catch: 201.63 CATCH/HOUR: 403.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	364.00	82176	90.26	
Sphyraena sphyraena	20.50	62	5.08	
Trachurus trecae	7.28	812	1.81	
Epinephelus aeneus	3.22	14	0.80	
Rhinobatos albomaculatus	2.80	4	0.69	
Sardinella maderensis	1.68	126	0.42	
Selene dorsalis	1.54	56	0.38	
Scomberomorus tritor	1.40	2	0.35	
Dicologlossa cuneata	0.56	14	0.14	
Citharus linguatula	0.28	14	0.07	
Total	403.26		100.00	

PROJECT STATION: 3043  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1113 Long E 1338  
 start stop duration  
 TIME :15:50:21 16:05:07 35 (min) Purpose code: 3  
 LOG :2418.51 2419.34 0.83 Area code : 2  
 FDEPTH: 114 114 GearCond.code:  
 BDEPTH: 114 114 Validity code:  
 Towing dir: 360ø Wire out: 340 m Speed: 30 kn\*10

Sorted: 57 Kg Total catch: 585.55 CATCH/HOUR: 2342.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1786.00	248640	76.25	
Pterothrissus belloci	138.80	2640	5.93	
Trichiurus lepturus	100.00	3440	4.27	
Trachurus trecae, juvenile	85.20	3880	3.64	6492
Brotula barthata	73.00	116	3.12	
Merluccius polli	42.00	1600	1.79	6493
Dentex angolensis	36.40	120	1.55	
Brachydeuterus auritus	20.80	120	0.89	
Citharus linguatula	15.60	240	0.67	
Parapanaeus longirostris, fem.	15.20	1800	0.65	
Dentex macrophthalmus	12.80	80	0.55	
Scorpaena normani	9.20	80	0.39	
Parapanaeus longirostris, male	4.40	1400	0.19	
Squatina oculata	2.80	4	0.12	
Total	2342.20		100.01	

PROJECT STATION:3044  
 DATE: 8/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1113 Long E 1336  
 start stop duration  
 TIME :16:47:14 17:07:07 20 (min) Purpose code: 3  
 LOG :2423.86 2424.99 1.12 Area code : 2  
 FDEPTH: 146 147 GearCond.code:  
 BDEPTH: 146 147 Validity code:  
 Towing dir: 360ø Wire out: 440 m Speed: 30 kn\*10  
 Sorted: 28 Kg Total catch: 302.20 CATCH/HOUR: 906.60

PROJECT STATION:3048  
 DATE: 9/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1055 Long E 1344  
 start stop duration  
 TIME :06:41:31 06:41:35 18 (min) Purpose code: 3  
 LOG :2519.97 2520.95 0.97 Area code : 2  
 FDEPTH: 53 52 GearCond.code:  
 BDEPTH: 53 52 Validity code:  
 Towing dir: 340ø Wire out: 200 m Speed: 30 kn\*10  
 Sorted: 89 Kg Total catch: 1182.75 CATCH/HOUR: 3942.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	423.00	34830	46.66	
Merluccius polli	224.70	7680	24.78	
Pterothrissus bellotti	57.30	600	6.32	
Brotula barbata	43.35	72	4.78	
Parapenaeus longirostris, fem.	42.90	11070	4.73	6495
Gobiidae	34.50	18060	3.81	
Trichiurus lepturus	30.00	1170	3.31	
Parapenaeus longirostris, male	12.60	5040	1.39	6494
Chlorophthalmus atlanticus	7.20	1170	0.79	
Citharus linguatula	6.90	270	0.76	
Dentex angolensis	5.70	30	0.63	
Bembrops heterurus	5.40	60	0.60	
Branchiostegus semifasciatus	5.22	6	0.58	
Dentex macropthalmus	3.33	51	0.37	
MYCTOPHIDAE	1.20	450	0.13	
Laemonema laureysi	1.20	30	0.13	
Zenopsis conchifer	0.90	30	0.10	
Todaropsis eblanai	0.60	30	0.07	
Pontinus accraensis	0.60	30	0.07	
Total	906.60		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	3303.00	43553	83.78	
Trichiurus lepturus	175.67	2837	4.46	
Pagellus bellottii	138.33	797	3.51	6501
Galeoides decadactylus	86.67	223	2.20	
Stromateus fiatola	49.33	90	1.25	
Pteroscion pelli	38.00	797	0.96	
Trachurus trecae	34.00	2703	0.86	6500
Pseudolithus senegalensis	30.13	43	0.76	
Umbrina canariensis	18.67	90	0.47	
Torpedo marmorata	16.83	43	0.43	
Ilisha africana	11.07	133	0.28	
Chloroscombrus chrysurus	10.20	133	0.26	
Citharus linguatula	9.73	353	0.25	
Dentex barnardi	8.00	267	0.20	
Penaeus notialis	7.53	267	0.19	
Gobiidae	3.10	533	0.08	
Dicologlossa cuneata	2.23	43	0.06	
Total	3942.49		100.00	

PROJECT STATION:3045  
 DATE: 8/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 1115 Long E 1327  
 start stop duration  
 TIME :22:06:00 22:36:00 30 (min) Purpose code: 3  
 LOG :2460.60 2462.20 1.60 Area code : 2  
 FDEPTH: 527 536 GearCond.code:  
 BDEPTH: 527 536 Validity code: 1  
 Towing dir: 340ø Wire out: 1500 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 140.21 CATCH/HOUR: 280.42

PROJECT STATION:3049  
 DATE: 9/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1055 Long E 1335  
 start stop duration  
 TIME :09:19:19 09:34:04 15 (min) Purpose code: 3  
 LOG :2530.82 2531.62 0.79 Area code : 2  
 FDEPTH: 114 114 GearCond.code:  
 BDEPTH: 114 114 Validity code: 1  
 Towing dir: 340ø Wire out: 350 m Speed: 30 kn\*10  
 Sorted: 36 Kg Total catch: 576.71 CATCH/HOUR: 2306.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	114.10	5362	40.69	
Yarrella blackfordi	84.70	2548	30.20	
Lamprogrammus exotus	17.92	630	6.39	
Lepidopus caudatus	14.28	336	5.09	
Nematocarcinus africanus	11.62	35742	4.14	
Trachyrincus scabrus	9.80	28	3.49	
Gonostoma denudata	9.80	126	3.49	
Talismania bifurcata	6.58	700	2.35	
Triplophus hemingi	5.32	644	1.90	
Malacocephalus occidentalis	2.38	280	0.85	
Aristeus varidens, female	2.10	140	0.75	
Aristeus varidens, male	0.98	98	0.35	
Bathyrhoconger vicinus	0.56	28	0.20	
Ophisurus serpens	0.28	14	0.10	
Total	280.42		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1178.00	257792	51.07	
Trichiurus lepturus	456.00	13984	19.77	
Trachurus trecae	362.52	19912	15.72	6502
Merluccius polli, juveniles	170.24	836	7.38	
Brotula barbata	54.20	56	2.35	
Uranoscopus cadenati	42.56	304	1.84	
Pterothrissus bellotti	18.24	228	0.79	
Brachydeuterus auritus	14.44	76	0.63	
Parapenaeus longirostris	6.84	1292	0.30	
Sepiella ornata	2.28	76	0.10	
Boops boops	1.52	152	0.07	
Total	2306.84		100.02	

PROJECT STATION:3050  
 DATE:10/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1038 Long E 1340  
 start stop duration  
 TIME :06:30:03 06:47:12 17 (min) Purpose code: 3  
 LOG :2559.06 2559.96 0.90 Area code : 2  
 FDEPTH: 30 31 GearCond.code:  
 BDEPTH: 30 31 Validity code:  
 Towing dir: 145ø Wire out: 150 m Speed: 30 kn\*10  
 Sorted: 84 Kg Total catch: 874.23 CATCH/HOUR: 3085.52

PROJECT STATION:3046  
 DATE: 9/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1055 Long E 1326  
 start stop duration  
 TIME :02:20:19 02:50:12 30 (min) Purpose code: 3  
 LOG :2487.36 2488.95 1.57 Area code : 2  
 FDEPTH: 342 352 GearCond.code:  
 BDEPTH: 342 352 Validity code:  
 Towing dir: 320ø Wire out: 995 m Speed: 31 kn\*10  
 Sorted: 50 Kg Total catch: 494.10 CATCH/HOUR: 988.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	2117.65	27184	68.63	6504
Pteroscion pelli	316.24	24851	10.25	
Chloroscombrus chrysurus	252.35	3004	8.18	
Galeoides decadactylus	174.85	872	5.67	
Trichiurus lepturus	73.76	328	2.39	
Pseudolithus typus	43.76	88	1.42	6503
Pomadasys incisus	34.55	254	1.12	
Sphyræna guachancho	22.55	74	0.73	
Umbrina canariensis	10.55	145	0.34	
Ilisha africana	10.55	145	0.34	
Sepia officinalis hierredda	6.53	364	0.21	
Penaeus notialis	5.82	35	0.19	
Pomadasys jubelini	5.47	35	0.18	
Sardinella maderensis	3.28	109	0.11	
Stromateus fiatola	3.28	35	0.11	
Cynoglossus canariensis	2.86	35	0.09	
Dentex barnardi	1.45	35	0.05	
Total	3085.50		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	770.00	3560	77.92	6496
Nematocarcinus africanus	161.00	74640	16.29	
Laemonema laureysi	30.40	460	3.08	
Parapenaeus longirostris, fem.	6.40	1240	0.65	6497
Chlorophthalmus atlanticus	4.00	60	0.40	
Hoplostethus cadenati	4.00	120	0.40	
Chaunax pictus	2.80	120	0.28	
Gonostoma denudata	2.00	80	0.20	
Etmopterus spinax	2.00	100	0.20	
Callinectes pallidus	1.60	4	0.16	
Peristedion cataphractum	1.40	120	0.14	
Trichiurus lepturus	1.20	40	0.12	
Melanostomias sp.	0.80	20	0.08	
Parapenaeus longirostris, male	0.40	80	0.04	6498
MYCTOPHIDAE	0.20	180	0.02	
Total	988.20		99.98	

PROJECT STATION:3051  
 DATE:10/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1039 Long E 1338  
 start stop duration  
 TIME :07:38:51 08:08:37 30 (min) Purpose code: 3  
 LOG :2565.21 2566.85 1.63 Area code : 2  
 FDEPTH: 45 47 GearCond.code:  
 BDEPTH: 45 47 Validity code: 1  
 Towing dir: 155ø Wire out: 180 m Speed: 30 kn\*10  
 Sorted: 78 Kg Total catch: 648.33 CATCH/HOUR: 1296.66

PROJECT STATION:3047  
 DATE: 9/ 3/03 GEAR TYPE: BT No: 9 POSITION: Lat S 1049 Long E 1343  
 start stop duration  
 TIME :05:00:54 06:40:56 30 (min) Purpose code: 3  
 LOG :2512.12 2513.85 1.72 Area code : 2  
 FDEPTH: 36 35 GearCond.code:  
 BDEPTH: 36 35 Validity code:  
 Towing dir: 140ø Wire out: 60 m Speed: 30 kn\*10  
 Sorted: 101 Kg Total catch: 1010.80 CATCH/HOUR: 2021.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	460.80	10512	35.54	
Galeoides decadactylus	269.60	748	20.79	
Trichiurus lepturus	195.52	1312	15.08	
Stromateus fiatola	64.00	272	4.94	
Pomadasys incisus	56.00	288	4.32	
Selene dorsalis	44.80	320	3.46	
Carcharhinus signatus	37.48	12	2.89	
Chloroscombrus chrysurus	36.80	336	2.84	
Pagellus bellottii	27.52	96	2.12	
Pteroscion pelli	20.16	304	1.55	
Dicologlossa cuneata	19.84	384	1.53	
Ilisha africana	13.44	192	1.04	
Sphyræna guachancho	12.00	32	0.93	
Pomadasys jubelini	10.88	16	0.84	
Sepia officinalis hierredda	7.36	544	0.57	
Epinephelus aeneus	7.00	4	0.54	
Dentex barnardi	4.48	16	0.35	
Torpedo marmorata	3.04	16	0.23	
Raja miraletus	2.24	16	0.17	
Ehippion guttifer	2.00	2	0.15	
Citharus linguatula	1.12	32	0.09	
Gobiidae	0.64	80	0.05	
Total	1296.72		100.02	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1046.40	15360	51.76	
Pseudolithus typus	354.00	240	17.51	6499
Chloroscombrus chrysurus	189.00	2300	9.35	
Galeoides decadactylus	177.00	740	8.76	
Ilisha africana	71.80	1500	3.55	
Pomadasys incisus	71.40	380	3.53	
Trichiurus lepturus	32.80	260	1.62	
Pteroscion pelli	28.80	1180	1.42	
Pomadasys peroteti	20.80	40	1.03	
Selene dorsalis	18.80	320	0.93	
Dicologlossa cuneata	10.80	160	0.53	
Total	2021.60		99.99	



PROJECT STATION:3052  
 DATE:10/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1042  
 start stop duration Long E 1330  
 TIME :09:31:22 10:01:15 30 (min) Purpose code: 3  
 LOG :2577.30 2578.82 1.51 Area code : 2  
 FDEPTH: 90 91 GearCond.code: 2  
 BDEPTH: 90 91 Validity code: 1  
 Towing dir: 150ø Wire out: 270 m Speed: 30 kn\*10

Sorted: 86 Kg Total catch: 344.56 CATCH/HOUR: 689.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	512.40	1032	74.36	
Selene dorsalis	91.60	216	13.29	
Brachydeuterus auritus	36.56	240	5.31	
Brotula barbata	24.56	16	3.56	
Umbrina canariensis	17.68	56	2.57	6505
Synagrops microlepis	1.76	504	0.55	
Chloroscobrus chrysurus	1.60	8	0.23	
Citharus linguatula	0.96	16	0.14	
Total	689.12		100.01	

PROJECT STATION:3053  
 DATE:10/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1045  
 start stop duration Long E 1323  
 TIME 11:33:26 11:43:14 10 (min) Purpose code: 3  
 LOG :2590.48 2591.00 0.52 Area code : 2  
 FDEPTH: 142 140 GearCond.code: 2  
 BDEPTH: 142 140 Validity code: 1  
 Towing dir: 330ø Wire out: 420 m Speed: 30 kn\*10

Sorted: 35 Kg Total catch: 752.55 CATCH/HOUR: 4515.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	3213.00	507276	71.16	
Trachurus trecae, juvenile	1064.70	79380	23.58	6506
Zenopsis conchifer	122.22	1008	2.71	
Zeus faber	23.94	252	0.53	
Dentex angolensis	16.38	66	0.36	
Chelidonichthys gabonensis	16.38	126	0.36	
Pterothrissus belloci	15.12	126	0.33	
Brotula barbata	14.64	12	0.32	
Citharus linguatula	13.86	126	0.31	
Illex coindetii	13.86	252	0.31	
Dentex macrophthalmus	1.20	18	0.03	
Total	4515.30		100.00	

PROJECT STATION:3054  
 DATE:10/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1045  
 start stop duration Long E 1318  
 TIME :12:56:30 13:11:24 15 (min) Purpose code: 3  
 LOG :2597.80 2598.60 0.78 Area code : 2  
 FDEPTH: 259 259 GearCond.code: 2  
 BDEPTH: 259 259 Validity code: 1  
 Towing dir: 330ø Wire out: 7509 m Speed: 31 kn\*10

Sorted: 31 Kg Total catch: 1018.05 CATCH/HOUR: 4072.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1933.80	111644	47.49	
Chlorophthalmus sp.	1768.80	40464	43.44	
Merluccius polli	231.00	3564	5.67	6507
Pterothrissus belloci	40.92	264	1.00	
Myxtriopsis rostellatus	39.60	132	0.97	
Todaropsis eblanae	27.72	264	0.68	
Necunema aequalis	18.48	528	0.45	
Laemonema laureysi	3.96	132	0.10	
Parapenaeus longirostris, fem.	3.96	924	0.10	
Parapenaeus longirostris, male	2.64	1452	0.06	
Lestidiopus sp.	1.32	132	0.03	
Total	4072.20		99.99	

PROJECT STATION:3055  
 DATE:10/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1034  
 start stop duration Long E 1314  
 TIME :14:58:14 15:28:08 30 (min) Purpose code: 3  
 LOG :2612.32 2613.96 1.63 Area code : 2  
 FDEPTH: 129 129 GearCond.code: 2  
 BDEPTH: 129 129 Validity code: 1  
 Towing dir: 320ø Wire out: 410 m Speed: 30 kn\*10

Sorted: 25 Kg Total catch: 174.51 CATCH/HOUR: 349.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	173.50	2328	49.71	6509
Dentex angolensis	74.90	300	21.46	6508
Zeus faber	62.50	260	17.91	
Trigla lyra	9.60	80	2.75	
Dentex macrophthalmus	8.38	28	2.40	6510
Sarda sarda	7.00	6	2.01	
Brotula barbata	4.68	4	1.34	
Pterothrissus belloci	3.20	20	0.92	
Todaropsis eblanae	2.70	40	0.77	
Spicara alta	1.16	24	0.33	
Illex coindetii	0.90	10	0.26	
Citharus linguatula	0.50	10	0.14	
Total	349.02		100.00	

PROJECT STATION:3056  
 DATE:10/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1031  
 start stop duration Long E 1320  
 TIME :16:46:06 16:54:59 9 (min) Purpose code: 3  
 LOG :2623.87 2624.31 0.35 Area code : 2  
 FDEPTH: 97 97 GearCond.code: 8  
 BDEPTH: 97 97 Validity code: 1  
 Towing dir: 350ø Wire out: 300 m Speed: 30 kn\*10

Sorted: 31 Kg Total catch: 189.46 CATCH/HOUR: 1263.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	782.00	5327	61.91	6511
Synagrops microlepis	316.00	57247	26.60	
Trachurus trecae, juvenile	96.00	8620	7.60	6512
Trichiurus lepturus	39.20	160	3.10	
Dentex angolensis	4.47	13	0.35	
Umbrina canariensis	2.47	7	0.20	
Dentex barnardi	1.73	13	0.14	
Boops boops	1.20	40	0.10	
Total	1263.07		100.00	

PROJECT STATION:3057  
 DATE:10/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1048  
 start stop duration Long E 1316  
 TIME :20:43:29 21:13:12 30 (min) Purpose code: 3  
 LOG :2647.60 2649.10 1.54 Area code : 2  
 FDEPTH: 490 490 GearCond.code: 2  
 BDEPTH: 490 490 Validity code: 1  
 Towing dir: 315ø Wire out: 1400 m Speed: 30 kn\*10

Sorted: 26 Kg Total catch: 153.24 CATCH/HOUR: 306.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	130.80	25860	42.68	
Gonostoma genudata	57.60	2244	18.79	
Aristeus varidens, female	50.16	3564	16.37	
Aristeus varidens, male	15.12	2460	4.93	
Malacocephalus laevis	12.24	2424	3.99	
Hoplostethus cadenati	10.56	480	3.45	
Merluccius polli	9.84	24	3.21	
Chlorophthalmus atlanticus	4.56	120	1.49	
Lamprogrammus exutus	3.60	288	1.17	
Etmopterus spinax	2.64	48	0.86	
Triptophus hemingi	2.40	336	0.78	
Bathyrcoconger vicinus	1.92	120	0.63	
MYCTOPHIDAE	1.92	144	0.63	
Hymenocephalus italicus	1.92	72	0.63	
Trachyrincus scabratus	0.72	48	0.23	
MELANOCETIDAE	0.24	24	0.08	
Nemichthys scolopaceus	0.24	24	0.08	
Total	306.48		100.00	

PROJECT STATION:3058  
 DATE:11/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1038  
 start stop duration Long E 1308  
 TIME :00:29:43 00:59:31 30 (min) Purpose code: 3  
 LOG :2664.19 2665.75 1.54 Area code : 2  
 FDEPTH: 511 510 GearCond.code: 2  
 BDEPTH: 511 510 Validity code: 1  
 Towing dir: 330ø Wire out: 1350 m Speed: 30 kn\*10

Sorted: 24 Kg Total catch: 217.08 CATCH/HOUR: 434.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	331.20	46656	76.29	
Yarella blackfordi	28.44	1026	6.55	
Hoplostethus cadenati	15.66	720	3.61	
Stomias boa boa	14.40	252	3.32	
Triptophus hemingi	13.14	1620	3.03	
Lamprogrammus exutus	7.38	540	1.70	
Lepidopus caudatus	5.94	216	1.37	
Laemonema laureysi	3.96	36	0.91	
Etmopterus spinax	3.60	36	0.83	
Chaunax pictus	2.70	36	0.62	
Aristeus varidens, male	2.52	144	0.58	
C R U S T A C E A N S	1.26	126	0.29	
Gonostoma genudata	0.90	36	0.21	
OPHIDIIDAE	0.72	72	0.17	
Aristeus varidens, female	0.72	108	0.17	
Talismania bifurcata	0.54	72	0.12	
Malacocephalus laevis	0.54	126	0.12	
MYCTOPHIDAE	0.36	288	0.08	
Dibranchius atlanticus	0.18	18	0.04	
Total	434.16		100.01	

PROJECT STATION:3059  
 DATE:11/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1037  
 start stop duration Long E 1310  
 TIME :02:19:58 02:49:56 30 (min) Purpose code: 3  
 LOG :2672.32 2673.85 1.52 Area code : 2  
 FDEPTH: 344 340 GearCond.code: 2  
 BDEPTH: 344 340 Validity code: 1  
 Towing dir: 325ø Wire out: 995 m Speed: 30 kn\*10

Sorted: 18 Kg Total catch: 144.64 CATCH/HOUR: 289.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	208.00	1690	71.90	6513
Laemonema laureysi	57.28	1200	19.80	
Parapenaeus longirostris, fem.	9.12	1568	3.15	
Hymenocephalus italicus	4.00	208	1.38	
Pterothrissus belloci	3.52	16	1.22	
Parapenaeus longirostris, male	3.04	640	1.05	
Helicolenus dactylopterus	1.76	32	0.61	
Lophus vaillanti	1.76	48	0.61	
Chlorophthalmus atlanticus	0.80	336	0.28	
Total	289.28		100.00	

PROJECT STATION:3060  
 DATE:11/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1028  
 start stop duration Long E 1328  
 TIME :05:54:10 06:24:03 30 (min) Purpose code: 3  
 LOG :2696.98 2698.59 1.61 Area code : 2  
 FDEPTH: 49 47 GearCond.code: 2  
 BDEPTH: 49 47 Validity code: 1  
 Towing dir: 345ø Wire out: 200 m Speed: 30 kn\*10

Sorted: 65 Kg Total catch: 330.05 CATCH/HOUR: 660.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	198.00	570	30.00	
Pseudotolithus typus	104.50	110	15.83	6514
Pomadourus incisus	77.80	694	11.79	
Pseudotolithus senegalensis	54.00	110	8.18	6516
Brachydeuterus auritus	47.90	1992	7.26	
Trichiurus lepturus	34.90	110	5.29	
Pagellus bellottii	33.70	150	5.11	6515
Dentex barnardi	31.40	170	4.76	
Pagrus caeruleostictus	21.90	30	3.32	
Umbrina canariensis	15.00	30	2.27	
Ilisha africana	12.30	170	1.86	
Pteroscion pelli	6.90	70	1.05	
Epinephelus aeneus	6.70	2	1.01	
Pseudupeneus prayensis	6.20	50	0.94	
Stromateus fiatola	4.40	20	0.67	
Chaetodon hoefleri	1.80	10	0.27	
Chelidonichthys gabonensis	1.00	10	0.15	
Octopus sp.	0.80	10	0.12	
Brotula barbata	0.60	10	0.09	
Sepia officinalis hierredda	0.30	10	0.05	
Total	660.10		100.02	

PROJECT STATION:3061  
 DATE:11/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1027 Long E 1031  
 start stop duration  
 TIME :07:12:57 07:42:49 30 (min) Purpose code: 3  
 LOG :2704.02 2705.81 1.77 Area code : 2  
 FDEPTH: 30 32 GearCond.code:  
 BDEPTH: 30 32 Validity code:  
 Towing dir: 320ø Wire out: 160 m Speed: 33 kn\*10  
 Sorted: 54 Kg Total catch: 487.83 CATCH/HOUR: 975.66

PROJECT STATION:3065  
 DATE:11/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1016 Long E 1311  
 start stop duration  
 TIME :14:29:42 14:35:33 6 (min) Purpose code: 3  
 LOG :2747.19 2747.37 0.11 Area code : 2  
 FDEPTH: 96 96 GearCond.code: 8  
 BDEPTH: 96 96 Validity code: 1  
 Towing dir: 330ø Wire out: 310 m Speed: 30 kn\*10  
 Sorted: 17 Kg Total catch: 16.77 CATCH/HOUR: 167.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	458.00	3894	46.94	6517
Galeoides decadactylus	159.12	530	16.31	
Trichiurus lepturus	100.40	290	10.29	
Pseudotolithus typus	67.20	170	6.89	6518
Ilisha africana	60.40	1030	6.19	
Pomadasy jubelini	51.00	102	5.23	
Pteroscion pelli	45.00	910	4.61	
Pomadasy incisus	17.00	170	1.74	
Penaeus notialis	6.98	3268	0.72	
Dicolloglossa cuneata	5.28	86	0.54	
Sepia officinalis hierredda	2.22	102	0.23	
Bembrops heterurus	2.04	34	0.21	
Umbrina canariensis	1.02	18	0.10	
Total	975.66		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	72.50	950	43.23	6525
Dentex barnardi	55.50	130	33.09	6526
Epinephelus aeneus	27.00	10	16.10	
Citharus linguatula	5.40	100	3.22	
Alloteuthis africana	1.60	130	0.95	
Chelidonicichthys gabonensis	1.60	10	0.95	
Zeus faber	1.30	10	0.78	
Pagellus bellottii	1.20	40	0.72	
Saurida brasiliensis	0.80	160	0.48	
Lagocephalus laevigatus	0.50	10	0.30	
Gobiidae	0.30	40	0.18	
Total	167.70		100.00	

PROJECT STATION:3062  
 DATE:11/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1014 Long E 1324  
 start stop duration  
 TIME :09:17:20 09:47:33 30 (min) Purpose code: 3  
 LOG :2720.33 2722.02 1.69 Area code : 2  
 FDEPTH: 32 29 GearCond.code:  
 BDEPTH: 32 29 Validity code:  
 Towing dir: 340ø Wire out: 160 m Speed: 30 kn\*10  
 Sorted: 117 Kg Total catch: 994.78 CATCH/HOUR: 1989.56

PROJECT STATION:3066  
 DATE:11/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1022 Long E 1303  
 start stop duration  
 TIME :16:24:21 16:54:06 30 (min) Purpose code: 3  
 LOG :2761.11 2762.72 1.59 Area code : 2  
 FDEPTH: 167 166 GearCond.code:  
 BDEPTH: 167 166 Validity code:  
 Towing dir: 315ø Wire out: 500 m Speed: 30 kn\*10  
 Sorted: 59 Kg Total catch: 3685.90 CATCH/HOUR: 7371.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1185.72	11986	59.60	
Ilisha africana	230.40	2704	11.58	
Pseudotolithus senegalensis	139.40	256	7.01	6520
Galeoides decadactylus	110.50	374	5.55	
Pteroscion pelli	97.24	3366	4.89	
Pomadasy incisus	50.50	408	2.54	
Pomadasy olivaceum	48.46	68	2.44	
Dicolloglossa cuneata	34.18	562	1.72	
Trichiurus lepturus	28.56	238	1.44	
Sphyræna sphyraena	16.46	34	0.83	
Umbrina canariensis	12.08	170	0.61	6519
Torpedo torpedo	11.56	18	0.58	
Dasyatis margarita	5.78	18	0.29	
Arius parkii	5.58	6	0.28	
Sepiella ornata	5.44	222	0.27	
Selene dorsalis	4.60	68	0.23	
Penaeus notialis	1.70	34	0.09	
Carcharhinus signatus	1.40	2	0.07	
Total	1989.56		100.02	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	7111.40	801732	96.47	
Zeus faber	86.80	248	1.18	
Todarodes angolensis	74.40	992	1.01	
Dentex angolensis	52.08	248	0.71	
Pterothrissus belloci	18.60	124	0.25	
Citharus linguatula	11.16	248	0.15	
Illex coindetii	8.68	124	0.12	
Dentex macrophthalmus	7.44	124	0.10	
Saurida brasiliensis	1.24	124	0.02	
Total	7371.80		100.01	

PROJECT STATION:3063  
 DATE:11/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1013 Long E 1320  
 start stop duration  
 TIME :10:51:26 11:21:11 30 (min) Purpose code: 3  
 LOG :2729.07 2730.65 1.55 Area code : 2  
 FDEPTH: 45 45 GearCond.code:  
 BDEPTH: 45 45 Validity code:  
 Towing dir: 320ø Wire out: 170 m Speed: 30 kn\*10  
 Sorted: 85 Kg Total catch: 478.50 CATCH/HOUR: 957.00

PROJECT STATION:3067  
 DATE:11/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1024 Long E 1255  
 start stop duration  
 TIME :19:30:24 20:00:14 30 (min) Purpose code: 3  
 LOG :2776.10 2777.67 1.56 Area code : 2  
 FDEPTH: 607 614 GearCond.code:  
 BDEPTH: 607 614 Validity code:  
 Towing dir: 315ø Wire out:1600 m Speed: 30 kn\*10  
 Sorted: 30 Kg Total catch: 209.56 CATCH/HOUR: 419.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	658.00	370	68.76	
Galeoides decadactylus	84.56	314	8.84	
Pomadasy incisus	47.14	212	4.93	
Pseudotolithus senegalensis	39.20	44	4.10	6521
Argyrosomus hololepidotus	26.88	44	2.81	
Pomadasy jubelini	26.32	34	2.75	
Trichiurus lepturus	17.12	258	1.79	
Pagellus bellottii	13.88	56	1.45	6522
Ilisha africana	10.64	146	1.11	
Selene dorsalis	6.94	44	0.73	
Pteroscion pelli	3.36	100	0.35	
Torpedo marmorata	2.90	12	0.30	
Citharus linguatula	2.80	56	0.29	
Arius parkii	2.78	4	0.29	
Sardinella maderensis	2.56	12	0.27	
Dentex barnardi	2.56	12	0.27	
Dicolloglossa cuneata	2.12	44	0.22	
Chloroscombrus chrysurus	1.90	12	0.20	
Penaeus notialis	1.68	78	0.18	6523
Carcharhinus signatus	1.60	2	0.17	
Sepiella ornata	0.78	34	0.08	
Trachurus trecae, juvenile	0.66	34	0.07	
Gobiidae	0.62	258	0.06	
Total	957.00		100.02	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadonati	226.80	8640	54.11	
Nematocarcinus africanus	89.00	2336	21.23	
Triplphos hemingi	50.40	5908	12.03	
Gonostoma denudata	19.32	476	4.61	
Melanostomias sp.	10.08	294	2.41	
Zenopsis conchifer	7.14	14	1.70	
Todaropsis eblanae	4.34	42	1.04	
GALATHEIDAE *	2.38	196	0.57	
Aristeus varidens, female	2.38	112	0.57	
Phrynichthys wedli	1.40	14	0.33	
Xenodermichthys copei	1.26	70	0.30	
Trichiurus lepturus	1.26	42	0.30	
Laemonema laureysi	0.98	70	0.23	
Talismania bifurcata	0.98	14	0.23	
Nezumia aequalis	0.84	56	0.20	
Aristeus varidens, male	0.56	56	0.13	
Total	419.12		99.99	

PROJECT STATION:3064  
 DATE:11/ 3/03 GEAR TYPE: BT No: 9 POSITION:Lat S 1013 Long E 1316  
 start stop duration  
 TIME :12:14:26 12:44:10 30 (min) Purpose code: 3  
 LOG :2735.97 2737.68 1.71 Area code : 2  
 FDEPTH: 66 68 GearCond.code:  
 BDEPTH: 66 68 Validity code:  
 Towing dir: 320ø Wire out: 210 m Speed: 30 kn\*10  
 Sorted: 57 Kg Total catch: 631.73 CATCH/HOUR: 1263.46

PROJECT STATION:3068  
 DATE:11/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 1006 Long E 1253  
 start stop duration  
 TIME :22:40:31 23:08:34 28 (min) Purpose code: 3  
 LOG :2797.54 2799.00 1.23 Area code : 2  
 FDEPTH: 295 315 GearCond.code:  
 BDEPTH: 295 315 Validity code: 1  
 Towing dir: 340ø Wire out: 880 m Speed: 30 kn\*10  
 Sorted: 28 Kg Total catch: 226.08 CATCH/HOUR: 484.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	816.20	7370	64.60	
Trachurus trecae, juvenile	302.50	4400	23.94	6524
Trichiurus lepturus	84.48	308	6.59	
Pomadasy incisus	33.88	330	2.68	
Dentex barnardi	12.32	88	0.98	
Sphyræna sp.	8.36	44	0.66	
Selene dorsalis	3.52	44	0.28	
Engraulis encrasicolus	1.32	154	0.10	
Sardinella maderensis	0.88	22	0.07	
Total	1263.46		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	331.71	823	68.47	
Synagrops microlepis	66.00	3497	13.62	
Merluccius polli	27.09	257	5.59	6527
Gephyroberyx darwini	19.20	17	3.96	
Zenopsis conchifer	10.97	34	2.56	
Hyperoglyphe moselli	9.94	17	2.05	
Laemonema laureysi	9.09	120	1.88	
Scorpaena normani	5.49	69	1.13	
Parapenaeus longirostris, fem.	2.57	343	0.53	
Hoplostethus cadonati	1.03	34	0.21	
MYCTOPHIDAE	0.69	189	0.14	
Schedophilus pamarco	0.34	17	0.07	
Parapenaeus longirostris, male	0.34	69	0.07	
Total	484.46		99.98	



PROJECT STATION:3069  
 DATE:15/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 1006 Long E 1300  
 start stop duration  
 TIME :05:55:05 06:25:42 31 (min) Purpose code: 3  
 LOG :3042.04 3043.63 1.56 Area code : 2  
 FDEPTH: 104 102 GearCond.code:  
 BDEPTH: 104 102 Validity code:  
 Towing dir: 330° Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 66 Kg Total catch: 986.93 CATCH/HOUR: 1910.19

PROJECT STATION:3072  
 DATE:15/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 1000 Long E 1313  
 start stop duration  
 TIME :10:27:31 10:58:16 31 (min) Purpose code: 3  
 LOG :3066.64 3068.24 1.57 Area code : 2  
 FDEPTH: 36 34 GearCond.code:  
 BDEPTH: 36 34 Validity code:  
 Towing dir: 310° Wire out: 130 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 23.43 CATCH/HOUR: 45.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	1514.09	110348	79.26	6528
Trigla lyra	54.74	730	2.87	
Raja miraletus	48.83	85	2.56	
Fistularia petimba	43.51	112	2.28	
Dentex macropthalmus	40.97	815	2.14	6529
Trichiurus lepturus	33.58	41	1.76	
Pagellus bellottii	28.63	1347	1.50	6530
Octopus vulgaris	26.11	29	1.37	
Zenopsis conchifer	21.62	29	1.13	
Boops boops	20.52	871	1.07	
Citharus linguatula	15.45	478	0.81	
Squatina oculata	14.81	4	0.78	
Illex coindetii	12.64	281	0.66	
Dentex barnardi	9.87	56	0.52	
Saurida brasiliensis	9.83	1994	0.51	
Scorpaena normani	5.34	85	0.28	
Dentex congolensis	5.05	112	0.26	
Euthynnus alletteratus	3.19	2	0.17	
Zeus faber	1.41	29	0.07	
Total	1910.19		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrinus	18.58	15	40.97	
Pseudotolithus senegalensis	10.16	10	22.40	6535
Sphyræna guachancho	8.73	17	19.25	
Pomadasya peroteti	3.10	2	6.84	
Trachurus trecae, juvenile	1.03	10	2.27	
Lithognathus mormyrus	0.60	2	1.32	
Brachydeuterus auritus	0.54	8	1.19	
Alloteuthis africana	0.48	176	1.06	
Epinephelus aeneus	0.45	2	0.99	
Pseudupeneus prayensis	0.45	2	0.99	
Penaeus notialis	0.39	12	0.86	
Torpedo marmorata	0.27	2	0.60	
Psettodes belcheri	0.17	2	0.37	
Citharus linguatula	0.12	4	0.26	
Decapterus rhonchus	0.08	2	0.18	
Sepiella ornata	0.06	6	0.13	
Torpedo torpedo	0.04	2	0.09	
Gobiidae	0.04	4	0.09	
Selene dorsalis	0.04	2	0.09	
CARPS01	0.02	2	0.04	
Bembrops greyi	0.02	2	0.04	
Total	45.37		100.03	

PROJECT STATION:3070  
 DATE:15/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 1002 Long E 1305  
 start stop duration  
 TIME :07:37:33 08:07:35 30 (min) Purpose code: 3  
 LOG :3050.85 3052.41 1.55 Area code : 2  
 FDEPTH: 85 85 GearCond.code:  
 BDEPTH: 85 85 Validity code:  
 Towing dir: 310° Wire out: 260 m Speed: 30 kn\*10  
 Sorted: 75 Kg Total catch: 606.41 CATCH/HOUR: 1212.82

PROJECT STATION:3073  
 DATE:15/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 942 Long E 1310  
 start stop duration  
 TIME :12:54:30 13:24:23 30 (min) Purpose code: 3  
 LOG :3085.28 3086.84 1.55 Area code : 2  
 FDEPTH: 30 31 GearCond.code:  
 BDEPTH: 30 31 Validity code:  
 Towing dir: 345° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 129 Kg Total catch: 587.72 CATCH/HOUR: 1175.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	1060.80	83048	87.47	6532
Octopus vulgaris	52.32	32	4.31	
Raja miraletus	20.80	32	1.72	
Squatina oculata	16.40	6	1.35	
Brachydeuterus auritus	13.44	64	1.11	
Trichiurus lepturus	9.28	16	0.77	
Trigla lyra	8.80	96	0.73	
Pagellus bellottii	8.80	256	0.73	6531
Uranoscopus polli	6.40	32	0.53	
Sepia orbignyana	4.64	32	0.38	
Sardinella aurita	2.08	96	0.17	
Sphyræna sphyraena	1.60	16	0.13	
Pseudupeneus prayensis	1.60	64	0.13	
Dentex barnardi	1.44	64	0.12	
Boops boops	1.44	80	0.12	
Illex coindetii	1.28	16	0.11	
Sardinella maderensis	1.28	256	0.11	
Dentex angolensis	0.32	16	0.03	
Citharus linguatula	0.10	48	0.01	
Total	1212.82		100.03	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	488.00	6216	41.52	6537
Galeoides decadactylus	168.40	1032	14.33	
Pteroscion peli	82.40	1760	7.01	
Pseudotolithus senegalensis	74.40	64	6.33	6539
Gymnura micrura	60.00	4	5.10	
Pteromylaeus bovanus	60.00	2	5.10	
Trichiurus lepturus	41.60	424	3.54	
Pomadasya rogeri	37.76	184	3.21	6536
Pomadasya incisus	36.00	392	3.06	6538
Ilisha africana	29.60	472	2.52	
Umbrina canariensis	23.84	48	2.03	
Arius parkii	21.04	8	1.79	
Stromateus fiatola	7.36	16	0.63	
Argyrosomus hololepidotus	6.16	8	0.52	
Penaeus kerathurus	5.20	160	0.44	
Dasyatis marmorata	5.00	2	0.43	
Dicologlossa cuneata	3.84	64	0.33	
Brachydeuterus auritus Juv.	3.52	656	0.30	
Sardinella aurita	2.80	16	0.24	
Sepia officinalis hierredda	2.72	24	0.23	
Selene dorsalis	2.64	80	0.22	
Trachinocephalus myops	2.60	32	0.22	
Torpedo torpedo	2.56	16	0.22	
Bothus podas africanus	1.52	56	0.13	
Syacium micrum	1.44	8	0.12	
Branchiostegus semifasciatus	1.28	4	0.11	
Bembrops greyi	1.04	16	0.09	
Balistes capricus	0.96	16	0.08	
Lagocephalus laevigatus	0.80	8	0.07	
Chloroscombrus chrysurus	0.64	8	0.05	
Epinephelus aeneus	0.24	8	0.02	
Penaeus notialis	0.08	8	0.01	
Total	1175.44		100.00	

PROJECT STATION:3071  
 DATE:15/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 1001 Long E 1310  
 start stop duration  
 TIME :09:10:33 09:40:21 30 (min) Purpose code: 3  
 LOG :3060.34 3061.85 1.43 Area code : 2  
 FDEPTH: 59 54 GearCond.code:  
 BDEPTH: 59 54 Validity code:  
 Towing dir: 325° Wire out: 180 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 35.65 CATCH/HOUR: 71.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	24.00	226	33.66	6533
Brachydeuterus auritus	11.40	194	15.99	
Trachurus trecae, juvenile	11.20	494	15.71	6534
Galeoides decadactylus	5.64	38	7.91	
Raja miraletus	2.98	4	4.18	
Selene dorsalis	1.86	22	2.61	
Pseudupeneus prayensis	1.66	10	2.33	
Sphyræna guachancho	1.64	4	2.30	
Stromateus fiatola	1.60	2	2.24	
Alloteuthis africana	0.94	276	1.32	
Citharus linguatula	0.90	22	1.26	
Trichiurus lepturus	0.86	8	1.21	
Decapterus rhonchus	0.74	22	1.04	
Sphyræna sphyraena	0.74	8	1.04	
Sardinella maderensis	0.62	4	0.87	
Brotula barbata	0.54	2	0.76	
Bembrops heterurus	0.50	8	0.70	
Octopus vulgaris	0.44	2	0.62	
Chloroscombrus chrysurus	0.44	4	0.62	
Ilisha africana	0.42	4	0.59	
Dentex barnardi	0.42	6	0.59	
Fistularia petimba	0.40	2	0.56	
Pagellus bellottii	0.38	10	0.53	
Scorpaena angolensis	0.28	4	0.39	
Chaetodon hoefleri	0.18	2	0.25	
Pontinus accraensis	0.16	2	0.22	
Sardinella aurita	0.12	12	0.17	
Boops boops	0.10	4	0.14	
Parapenaeus longirostris, fem.	0.10	16	0.14	
Parapenaeus longirostris, male	0.04	14	0.06	
Total	71.30		100.01	

PROJECT STATION:3074  
 DATE:15/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 947 Long E 1300  
 start stop duration  
 TIME :15:05:16 15:35:31 30 (min) Purpose code: 3  
 LOG :3099.29 3100.86 1.57 Area code : 2  
 FDEPTH: 95 94 GearCond.code:  
 BDEPTH: 95 94 Validity code:  
 Towing dir: 160° Wire out: 270 m Speed: 30 kn\*10  
 Sorted: 64 Kg Total catch: 1013.80 CATCH/HOUR: 2027.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	1912.70	46382	94.33	6564
Dasyatis marmorata	24.00	2	1.18	
Dasyatis centroura	16.00	4	0.79	
Pagellus bellottii	13.32	186	0.66	6565
Brotula barbata	10.78	8	0.53	
Boops boops	9.92	714	0.49	
Illex coindetii	9.60	124	0.47	
Epinephelus goreensis	6.34	2	0.31	
Dentex barnardi	4.96	32	0.24	
Chelidichthys capensis	4.64	32	0.23	
Trigla lyra	4.34	62	0.21	
Sarda sarda	3.78	4	0.19	
Sphoeroides pachgaster	2.06	4	0.10	
Loligo vulgaris	2.00	2	0.10	
Stromateus fiatola	1.88	2	0.09	
Dentex angolensis	1.24	32	0.06	
Total	2027.56		99.98	

PROJECT STATION:3075  
 DATE:15/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 953  
 start stop duration Long E 1244  
 TIME :18:14:52 18:44:55 30 (min) Purpose code: 3  
 LOG :3124.41 3126.01 1.53 Area code : 2  
 FDEPTH: 629 681 GearCond code:  
 BDEPTH: 629 681 Validity code:  
 Towing dir: 330ø Wire out:1600 m Speed: 30 kn\*10

Sorted: 27 Kg Total catch: 83.95 CATCH/HOUR: 167.90

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	66.60 3154	39.67	
Nematocarcinus africanus	21.60 7070	12.86	
Gonostoma denudata	19.20 582	11.44	
Squalus megalops	14.70 6	8.76	
Lamprogrammus exutus	8.76 72	5.22	
Ebinania costaecarnarie	6.66 24	3.97	
Merluccius polli	6.14 12	3.66	
Melanostomias sp	6.00 132	3.57	
GALATHEIDAE *	4.08 360	2.43	
Hymenocephalus italicus	2.46 147	1.47	
Triplophus hemingi	2.34 258	1.39	
Plesionika martia	1.86 526	1.11	
Aristeus varidens, female	1.50 62	0.89	6540
Talismania bifurcata	1.26 108	0.75	
Deania profundorum	1.00 2	0.60	
Trichiurus lepturus	0.84 30	0.50	
Laemonema laureysi	0.54 6	0.32	
Nezumia aequalis	0.54 24	0.32	
Aristeus varidens, male	0.50 60	0.30	6566
MACROURIDAE	0.42 78	0.25	
CONGRIDAE	0.36 12	0.21	
Chlorophthalmus atlanticus	0.36 6	0.21	
Xenodermichthys copei	0.18 198	0.11	
ZOARCIDAE	0.00		
Total	167.90	100.01	

PROJECT STATION:3079  
 DATE:16/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 928  
 start stop duration Long E 1300  
 TIME :07:59:30 08:29:18 30 (min) Purpose code: 3  
 LOG :3195.56 3197.05 1.57 Area code : 2  
 FDEPTH: 52 50 GearCond code:  
 BDEPTH: 52 50 Validity code:  
 Towing dir: 5ø Wire out: 150 m Speed: 30 kn\*10

Sorted: 60 Kg Total catch: 295.95 CATCH/HOUR: 591.90

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	283.70 2090	47.93	6542
Trichiurus lepturus	67.00 1050	11.32	
Galeoides decadactylus	64.00 300	10.81	
Pagellus bellottii	48.20 270	8.14	6544
Pomadasys incinus	46.50 300	7.86	6545
Argyrosomus hololepidotus	15.80 30	2.67	
Umbrina canariensis	13.00 50	2.20	
Sphyræna guachancho	13.00 80	2.20	
Pseudotolithus senegalensis	9.40 20	1.59	
Lithognathus mormyrus	8.50 20	1.44	
Brachydeuterus auritus Juv.	6.90 1040	1.17	6543
Chelidonichthys capensis	3.60 30	0.61	
Pteroscion pelli	2.50 20	0.42	
Citharus linguatula	2.40 80	0.41	
Decapterus rhonchus	2.00 30	0.34	
COBIDAE	1.80 570	0.30	
Grammolites gruvelli	1.10 10	0.19	
Ilisha africana	1.10 20	0.19	
Pontinus accraensis	0.70 10	0.12	
Dicologlossa cuneata	0.70 10	0.12	
Total	591.90	100.03	

PROJECT STATION:3076  
 DATE:15/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 958  
 start stop duration Long E 1245  
 TIME :20:57:03 21:28:20 31 (min) Purpose code: 3  
 LOG :3138.52 3140.11 1.55 Area code : 2  
 FDEPTH: 733 756 GearCond code:  
 BDEPTH: 733 756 Validity code:  
 Towing dir: 300ø Wire out:1850 m Speed: 30 kn\*10

Sorted: 42 Kg Total catch: 91.57 CATCH/HOUR: 177.23

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Nezumia aequalis	37.03 813	20.89	
Gonostoma denudata	33.39 546	18.84	
Talismania bifurcata	28.65 383	16.17	
Hoplostethus cadenati	16.45 606	9.28	
Todaropsis eblanæ	14.48 39	8.17	
GALATHEIDAE *	13.16 356	7.43	
MELMEOL	9.48 232	5.35	
Triplophus hemingi	7.78 825	4.39	
Lophius sp.	2.77 6	1.56	
Raja alba	2.38 15	1.34	
Merluccius polli	2.32 6	1.31	
Laemonema laureysi	1.99 116	1.12	
Bathypterois sp	1.90 135	1.07	
Dibranchius atlanticus	1.06 29	0.60	
Aristeus varidens, female	0.91 29	0.51	
Etmopterus lucifer	0.72 15	0.41	
Malacocephalus occidentalis	0.68 6	0.38	
Ebinania sp	0.68 10	0.38	
NECNEO2	0.64 29	0.36	
Xenodermichthys copei	0.39 19	0.22	
Epigonus telescopus	0.25 6	0.14	
Aristeus varidens, male	0.14 15	0.08	
Total	177.25	100.00	

PROJECT STATION:3080  
 DATE:16/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 928  
 start stop duration Long E 1304  
 TIME :09:34:40 10:04:17 30 (min) Purpose code: 3  
 LOG :3204.60 3205.98 1.50 Area code : 2  
 FDEPTH: 25 25 GearCond code:  
 BDEPTH: 25 25 Validity code:  
 Towing dir: 340ø Wire out: 125 m Speed: 30 kn\*10

Sorted: 54 Kg Total catch: 295.30 CATCH/HOUR: 590.60

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Pomadasys jubelini	117.15 100	19.84	
Pagrus caeruleostictus	59.74 132	10.12	
Plectorhynchus mediterraneus	54.46 198	9.22	
Pseudotolithus senegalensis	33.00 122	5.59	
Galeoides decadactylus	30.80 44	5.22	
Trichiurus lepturus	24.86 298	4.21	
Engraulis encrasicolus	21.56 15522	3.65	
Epinephelus alexandrinus *	20.90 78	3.54	
Pteroscion pelli	19.92 694	3.67	
Lutjanus fulgens	19.80 78	3.35	
Argyrosomus hololepidotus	19.26 34	3.26	
Brachydeuterus auritus	18.16 528	3.07	
Raja miraletus	18.04 44	3.05	
Pomadasys incinus	14.86 88	2.52	
Dentex canariensis	13.86 56	2.35	
Lithognathus mormyrus	13.76 22	2.33	
Acanthurus monroviae	13.42 22	2.27	
Pseudupeneus prayensis	12.22 704	2.07	
Drepane africana	11.78 12	1.99	
Selene dorsalis	9.58 110	1.62	
Chaetodon hoefleri	9.36 122	1.58	
Dentex barnardi	7.92 110	1.34	
Lethrinus atlanticus	5.50 12	0.93	
Bodianus speciosus	3.74 22	0.63	
SCRSC19	3.42 66	0.58	
Sepia officinalis hierredda	3.30 12	0.56	
Ilisha africana	3.30 484	0.56	
Syacium micrurum	2.54 12	0.43	
Sardinella maderensis	2.32 110	0.39	
TETSP15	0.76 34	0.13	
Alectis alexandrinus	0.66 12	0.11	
Rypticus saponaceus	0.66 12	0.11	
Total	590.62	99.99	

PROJECT STATION:3077  
 DATE:16/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 935  
 start stop duration Long E 1239  
 TIME :00:55:23 01:00:15 5 (min) Purpose code: 3  
 LOG :3162.84 3162.94 0.09 Area code : 2  
 FDEPTH: 536 0 GearCond code: 9  
 BDEPTH: 536 Validity code: 9  
 Towing dir: 348ø Wire out:1370 m Speed: kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
NOCCATCH	0.00		
Total			

PROJECT STATION:3081  
 DATE:16/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 916  
 start stop duration Long E 1258  
 TIME :11:21:01 11:51:18 30 (min) Purpose code: 3  
 LOG :3216.04 3217.51 1.47 Area code : 2  
 FDEPTH: 27 23 GearCond code:  
 BDEPTH: 27 23 Validity code:  
 Towing dir: 335ø Wire out: 120 m Speed: 30 kn\*10

Sorted: 95 Kg Total catch: 1484.72 CATCH/HOUR: 2969.44

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	2410.80 27964	81.19	6547
Pseudotolithus senegalensis	122.24 424	4.12	6548
Pteroscion pelli	116.80 5934	3.93	
Galeoides decadactylus	105.20 880	3.54	
Ilisha africana	68.46 1042	2.31	
Trichiurus lepturus	45.60 1020	1.54	
Arius parkii	36.18 32	1.22	
Pomadasys rogeri	24.78 32	0.83	
Sphyræna guachancho	14.20 98	0.48	
Selene dorsalis	6.18 130	0.21	
Stromateus fiatola	5.86 32	0.20	
SHACA13	4.18 2	0.14	
Lithognathus mormyrus	3.92 32	0.13	
Portunus validus	3.00 8	0.10	
Penaeus notialis	0.98 66	0.03	
Calappa rubroguttata	0.60 2	0.02	
Epinephelus aeneus	0.46 2	0.02	
Total	2969.44	100.01	

PROJECT STATION:3078  
 DATE:16/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 932  
 start stop duration Long E 1251  
 TIME :05:39:32 06:09:25 30 (min) Purpose code: 3  
 LOG :3181.05 3182.57 1.51 Area code : 2  
 FDEPTH: 114 112 GearCond code:  
 BDEPTH: 114 112 Validity code:  
 Towing dir: 350ø Wire out: 320 m Speed: 30 kn\*10

Sorted: 73 Kg Total catch: 1057.50 CATCH/HOUR: 2115.00

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Synagrops microlepis	1352.40 191316	63.94	
Trichiurus lepturus	268.80 448	12.71	
COBIDAE	75.04 63034	3.55	
Raja straeleni	74.20 28	3.51	
Brotula barbata	63.70 70	3.01	
Chelidonichthys gabonensis	31.08 140	1.47	
Pterothrissus belloci	30.52 224	1.44	
Torpedo torpedo	28.56 56	1.35	
Brachydeuterus auritus	25.20 168	1.19	
Atractoscion aequidens	22.96 140	1.09	
Citharus linguatula	22.68 420	1.07	
Zeus faber	22.12 56	1.05	
Raja miraletus	18.48 28	0.87	
Octopus vulgaris	15.68 28	0.74	
Bembrops heterurus	15.40 140	0.73	
Merluccius polli	14.28 476	0.68	6541
Helicolenus dactylopterus	9.52 28	0.45	
Parapenaeus longirostris, fem.	7.28 2044	0.34	
Parapenaeus longirostris, male	4.76 1708	0.23	
Dentex congoensis	3.70 16	0.17	
Uranoscopus cadenati	3.36 28	0.16	
Saurida brasiliensis	2.24 728	0.11	
Conger conger	2.20 4	0.10	
Dentex macrophthalmus	0.76 2	0.04	
Total	2114.92	100.00	

PROJECT STATION: 3082  
 DATE: 16/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 914  
 start stop duration Long E 1251  
 TIME :12:56:08 13:26:17 30 (min) Purpose code: 3  
 LOG :3224.96 3226.43 1.46 Area code : 2  
 FDEPTH: 76 81 GearCond.code:  
 BDEPTH: 76 81 Validity code:  
 Towing dir: 335ø Wire out: 200 m Speed: 30 kn\*10

Sorted: 57 Kg Total catch: 804.10 CATCH/HOUR: 1608.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	840.00	4858	52.23	
Selene dorsalis	404.00	4462	25.12	
Brachydeuterus auritus	245.00	1708	15.23	
Trachurus trecae, juvenile	68.60	3080	4.27	
Pterothrissus belloci	13.72	392	0.85	
Umbrina canariensis	11.76	224	0.73	
Citharus linguatula	7.28	140	0.45	
Argyrosomus hololepidotus	4.20	28	0.26	
Arius parkii	2.86	2	0.18	
Alloteuthis africana	2.52	644	0.16	
Brotula barbata	2.42	4	0.15	
Dentex angolensis	1.80	10	0.11	
Torpedo torpedo	1.00	2	0.06	
Priacanthus arenatus	1.00	2	0.06	
Parapenaeus longirostris	0.84	168	0.05	
Dicologlossa cuneata	0.56	28	0.03	
Dentex barnardi	0.44	4	0.03	
Pagellus bellottii	0.22	2	0.01	
Total	1608.22		99.98	

PROJECT STATION: 3085  
 DATE: 16/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 906  
 start stop duration Long E 1241  
 TIME :18:13:03 18:42:36 30 (min) Purpose code: 3  
 LOG :3252.38 3253.87 1.49 Area code : 2  
 FDEPTH: 436 490 GearCond.code:  
 BDEPTH: 436 490 Validity code:  
 Towing dir: 30ø Wire out: 1160 m Speed: 30 kn\*10

Sorted: 17 Kg Total catch: 99.48 CATCH/HOUR: 198.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	56.30	150	28.30	6556
Gonostoma demudata	32.96	886	16.57	
Trichurus lepturus	22.72	1380	11.42	
Aristeus varidens, female	19.12	960	9.64	6577
Malacocephalus occidentalis	15.20	128	7.64	
Nematocarcinus africanus	12.80	5462	6.43	
Dibranchius atlanticus	10.64	516	5.35	
Raja alba	8.20	4	4.12	
Melanostomias sp.	7.60	128	3.82	
Chaunax sp.	6.16	120	3.10	
Laemonema laureysi	2.16	72	1.09	
Aristeus varidens, male	1.76	240	0.88	6557
Scorpaena normani	0.94	2	0.47	
Etmopterus lucifer	0.64	24	0.32	
Plesionopaeus edwardsianus	0.48	48	0.24	
Hymenocephalus italicus	0.40	40	0.20	
Halosaurus ovenii	0.40	8	0.20	
CONGRIDAE	0.24	8	0.12	
Nezumia aequalis	0.24	8	0.12	
Total	198.96		100.00	

PROJECT STATION: 3086  
 DATE: 16/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 905  
 start stop duration Long E 1237  
 TIME :20:37:31 21:07:17 30 (min) Purpose code: 3  
 LOG :3264.01 3265.55 1.54 Area code : 2  
 FDEPTH: 743 745 GearCond.code:  
 BDEPTH: 743 745 Validity code:  
 Towing dir: 30ø Wire out: 1850 m Speed: 30 kn\*10

Sorted: 42 Kg Total catch: 125.46 CATCH/HOUR: 250.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia aequalis	72.72	1454	28.98	
Talismania bifurcata	54.96	186	21.90	
Gonostoma demudata	28.20	584	11.24	
Lamprogrammus exutus	19.92	48	7.94	
Merluccius polli	15.60	24	6.22	
Laemonema laureysi	10.92	738	4.35	
GALATHEIDAE	8.62	384	3.52	
Melanostomias sp.	7.56	162	3.01	
Ebinania costaecanarie	7.38	12	2.94	
Dibranchius atlanticus	5.04	270	2.01	
Raja alba	4.44	12	1.77	
Aristeus varidens, male	3.60	144	1.43	
Todaropsis eblanae	3.24	12	1.29	
Shrimps, small, non comm.	2.16	426	0.86	
Halosaurus ovenii	1.98	102	0.79	
Hoplostethus cadonati	1.62	54	0.65	
Triplophus hemingi	1.62	246	0.65	
Plesionika martia	0.78	42	0.31	
Aristeus varidens, female	0.24	18	0.10	
Xenodermichthys copei	0.12	4	0.05	
Total	250.92		100.01	

PROJECT STATION: 3087  
 DATE: 17/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 852  
 start stop duration Long E 1255  
 TIME :01:14:03 01:44:10 30 (min) Purpose code: 3  
 LOG :3292.74 3294.29 1.53 Area code : 3  
 FDEPTH: 313 313 GearCond.code:  
 BDEPTH: 313 313 Validity code:  
 Towing dir: 20ø Wire out: 850 m Speed: 30 kn\*10

Sorted: 26 Kg Total catch: 131.22 CATCH/HOUR: 262.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	89.00	1310	33.91	6558
Synagrops microlepis	63.50	3260	24.20	
Laemonema laureysi	43.10	400	16.42	
Bembrops greyi	39.80	750	15.17	
Parapenaeus longirostris	7.00	1090	2.67	
Pontinus accraensis	5.60	60	2.13	
Pterothrissus belloci	5.20	40	1.98	
Epigonus sp.	3.00	20	1.14	
Gephyroberyx darwini	2.42	2	0.92	
Bassanago albescens	1.40	60	0.53	
Helicolenus dactylopterus	1.22	2	0.46	
Dibranchius atlanticus	0.60	20	0.23	
Lophius vaillanti	0.50	10	0.19	
Peristedion cataphractum	0.10	10	0.04	
Total	262.44		99.99	

PROJECT STATION: 3088  
 DATE: 17/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 853  
 start stop duration Long E 1259  
 TIME :07:43:33 07:58:33 15 (min) Purpose code: 3  
 LOG :3318.16 3318.92 0.76 Area code : 3  
 FDEPTH: 216 217 GearCond.code:  
 BDEPTH: 216 217 Validity code:  
 Towing dir: 360ø Wire out: 585 m Speed: 30 kn\*10

Sorted: 56 Kg Total catch: 511.51 CATCH/HOUR: 2046.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1414.80	117900	69.15	
Pterothrissus belloci	363.20	2700	17.75	
Nezumia aequalis	43.84	1496	2.14	
Brotula barbata	39.60	40	1.94	
Bembrops heterurus	31.68	256	1.55	
Raja clavata	28.20	24	1.38	
Dentex angolensis	21.20	84	1.04	6559
Merluccius polli	20.80	320	1.02	6562
Chelidonicichthys gabonensis	17.28	96	0.84	
Zeus faber	11.84	32	0.58	
Parapenaeus longirostris, male	11.52	3808	0.56	6560
Parapenaeus longirostris, fem.	10.24	2720	0.50	6561
Zenopsis conchifer	10.24	32	0.50	
Dicologlossa cuneata	8.64	64	0.42	
Umbrina canariensis	7.24	8	0.35	
Peristedion cataphractum	3.84	64	0.19	
Dentex macrophthalmus	1.88	4	0.09	
Total	2046.04		100.00	

PROJECT STATION: 3084  
 DATE: 16/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 912  
 start stop duration Long E 1242  
 TIME :16:13:32 16:43:36 30 (min) Purpose code: 3  
 LOG :3241.63 3243.19 1.55 Area code : 2  
 FDEPTH: 261 257 GearCond.code:  
 BDEPTH: 261 257 Validity code:  
 Towing dir: 335ø Wire out: 720 m Speed: 30 kn\*10

Sorted: 63 Kg Total catch: 604.91 CATCH/HOUR: 1209.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	888.30	77130	73.42	
Zeus faber	111.24	162	9.19	
Pterothrissus belloci	32.04	306	2.65	
Illex coindeti	26.28	270	2.17	
Dentex angolensis	21.00	48	1.74	6552
Brotula barbata	15.00	16	1.24	
Nezumia aequalis	14.40	324	1.19	
Todaropsis eblanae	13.68	126	1.13	
Bembrops heterurus	13.14	108	1.09	
Hoplostethus mediterraneus	13.10	16	1.08	
Chlorophthalmus atlanticus	12.42	684	1.03	
Dentex macrophthalmus	10.70	30	0.88	6551
Merluccius polli	9.36	324	0.77	6553
Parapenaeus longirostris, fem.	7.02	1278	0.58	6555
Epigonus telescopus	6.30	72	0.52	
Malacocephalus occidentalis	5.40	90	0.45	
Helicolenus dactylopterus	5.40	18	0.45	
Parapenaeus longirostris, male	3.24	756	0.27	6554
S H R I M P S	1.44	486	0.12	
Scorpaena stephanica	0.36	18	0.03	
Total	1209.82		100.00	

PROJECT STATION:3089  
 DATE:17/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 836  
 start stop duration Long E 1319  
 TIME :10:50:42 11:20:29 30 (min) Purpose code: 3  
 LOG :3345.32 3346.84 1.51 Area code : 3  
 FDEPTH: 30 27 GearCond code:  
 BDEPTH: 30 27 Validity code:  
 Towing dir: 10ø Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 43 Kg Total catch: 862.79 CATCH/HOUR: 1725.58

PROJECT STATION:3092  
 DATE:17/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 838  
 start stop duration Long E 1304  
 TIME :15:39:56 16:10:08 30 (min) Purpose code: 3  
 LOG :3372.43 3374.01 1.57 Area code : 3  
 FDEPTH: 114 112 GearCond code:  
 BDEPTH: 114 112 Validity code:  
 Towing dir: 355ø Wire out: 320 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 70.28 CATCH/HOUR: 140.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sphyræna guachancho	462.20	1008	26.79	
Chloroscombrus chrysurus	282.80	3724	16.39	
Galeoides decadactylus	193.20	1148	11.20	
Brachydeuterus auritus	177.50	5852	10.29	6593
Pteroscion pelli	121.80	5012	7.06	
Pseudotolithus senegalensis	98.56	504	5.71	6563
Ilisha africana	68.60	1876	3.98	
Alectis alexandrinus	67.48	56	3.91	
Pomadasy rogeri	58.24	140	3.38	
Ephippion guttifer	49.84	28	2.89	
Trichiurus lepturus	45.36	140	2.63	
Penaeus notialis	43.60	1064	2.53	
Sardinella maderensis	16.80	28	0.97	
Dicologlossa cuneata	13.72	364	0.80	
Pomadasy incisus	9.80	196	0.57	
Zenopsis conchifer	7.00	28	0.41	
Eucinostomus melanopterus	3.08	56	0.18	
Carcharhinus signatus	1.80	2	0.10	
Pentanezum quinquarius	1.68	28	0.10	
Umbrina canariensis	1.40	28	0.08	
Selene dorsalis	1.12	56	0.06	
Total	1725.58		100.03	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brotula barbata	30.70	30	21.84	
Dentex angolensis	25.32	160	18.01	6572
Trachurus trecae	16.60	932	11.81	6569
Attractoscion aequidens	14.02	78	9.97	6570
Pterothrissus belloci	10.68	94	7.60	
Brachydeuterus auritus	8.90	60	6.33	6571
Umbrina canariensis	6.38	92	4.54	
Zeus faber	5.26	38	3.74	
Raja miraletus	3.52	4	2.50	
Scorpaena normani	3.48	20	2.48	
Trichiurus lepturus	3.14	28	2.23	
Dentex congoensis	2.06	18	1.47	6568
Chaetodon hoefleri	1.34	10	0.95	
Citharus linguatula	1.32	26	0.94	
Fistularia petimba	1.26	2	0.90	
Dicologlossa cuneata	1.18	66	0.84	
Torpedo torpedo	1.04	2	0.74	
Trigla lyra	1.00	8	0.71	
Sepiella ornata	0.92	2	0.65	
Scorpaena stephanica	0.66	2	0.47	
Pegusa lascaris	0.52	2	0.37	
Illex coindetii	0.40	6	0.28	
Chelidonichthys capensis	0.32	2	0.23	
Saurida brasiliensis	0.28	44	0.20	
Spicara alta	0.26	4	0.18	
Total	140.56		99.98	

PROJECT STATION:3090  
 DATE:17/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 835  
 start stop duration Long E 1316  
 TIME :12:13:45 12:43:48 30 (min) Purpose code: 3  
 LOG :3351.67 3353.26 1.58 Area code : 3  
 FDEPTH: 45 45 GearCond code:  
 BDEPTH: 45 45 Validity code:  
 Towing dir: 345ø Wire out: 130 m Speed: 30 kn\*10  
 Sorted: 31 Kg Total catch: 440.44 CATCH/HOUR: 880.88

PROJECT STATION:3093  
 DATE:17/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 835  
 start stop duration Long E 1301  
 TIME :17:22:53 17:52:03 29 (min) Purpose code: 3  
 LOG :3380.13 3381.64 1.53 Area code : 3  
 FDEPTH: 147 145 GearCond code:  
 BDEPTH: 147 145 Validity code:  
 Towing dir: 360ø Wire out: 420 m Speed: 30 kn\*10  
 Sorted: 36 Kg Total catch: 186.20 CATCH/HOUR: 385.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	319.20	140	36.24	
Galeoides decadactylus	117.04	1736	13.29	
Pseudotolithus senegalensis	83.44	112	9.47	
Pteroscion pelli	67.20	5180	7.63	
Ilisha africana	55.72	1064	6.33	
Trichiurus lepturus	46.20	1260	5.24	
Penaeus notialis	44.24	2744	5.02	
Dicologlossa cuneata	38.92	1120	4.42	
Arius parkii	37.80	28	4.29	
Chloroscombrus chrysurus	21.28	252	2.42	
Pomadasy peroteti	15.40	28	1.75	
Argyroscopus hololepidotus	9.52	112	1.08	
Lithognathus mormyrus	7.00	28	0.79	
Pomadasy incisus	4.76	28	0.54	
Eucinostomus melanopterus	3.36	28	0.38	
Arnoglossus capensis	3.08	28	0.35	
Bembrops heterurus	2.80	56	0.32	
Selene dorsalis	2.80	84	0.32	
Brotula barbata	1.12	28	0.13	
Total	880.88		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus belloci	159.31	1421	41.35	
Brotula barbata	62.07	46	16.11	
Trachurus trecae	46.76	2541	12.14	6574
Dentex angolensis	22.14	91	5.75	6573
Parapenaeus longirostris, fem.	18.12	3052	4.70	6575
Bembrops heterurus	8.77	91	2.28	
Citharus linguatula	7.78	232	2.02	
Raja miraletus	7.70	8	2.00	
Scorpaena stephanica	7.53	50	1.95	
Uranoscopus cadenati	7.12	41	1.85	
Spicara alta	6.29	50	1.63	
Trichiurus lepturus	5.63	41	1.46	
Octopus sp	4.22	8	1.16	
Brachydeuterus auritus	4.06	25	1.05	
Saurida brasiliensis	3.72	571	0.97	
Illex coindetii	3.39	41	0.88	
Chelidonichthys gabonensis	2.81	25	0.73	
Sepia orbignyana	2.23	8	0.58	
Pentheroscion mbizi	1.99	8	0.52	
Umbrina canariensis	1.32	2	0.34	
Cynoponticus ferox	1.16	8	0.30	
Dentex macrophthalmus	0.64	2	0.17	
GOBIIDAE	0.41	211	0.11	
Total	385.17		99.99	

PROJECT STATION:3091  
 DATE:17/ 3/03 GEAR TYPE: BT No: 8 POSITION:Lat S 835  
 start stop duration Long E 1315  
 TIME :13:28:03 13:53:09 25 (min) Purpose code: 3  
 LOG :3357.17 3358.50 1.33 Area code : 3  
 FDEPTH: 53 53 GearCond code:  
 BDEPTH: 53 53 Validity code:  
 Towing dir: 355ø Wire out: 150 m Speed: 30 kn\*10  
 Sorted: 30 Kg Total catch: 935.85 CATCH/HOUR: 2246.04

PROJECT STATION:3094  
 DATE:17/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 825  
 start stop duration Long E 1254  
 TIME :19:21:17 19:51:51 31 (min) Purpose code: 3  
 LOG :3392.93 3394.45 1.52 Area code : 3  
 FDEPTH: 415 408 GearCond code:  
 BDEPTH: 415 408 Validity code:  
 Towing dir: 345ø Wire out:1120 m Speed: 30 kn\*10  
 Sorted: 69 Kg Total catch: 414.48 CATCH/HOUR: 802.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1656.00	186696	73.73	
Dicologlossa cuneata	100.80	4824	4.49	
Raja miraletus	69.84	72	3.11	
Pseudotolithus senegalensis	61.56	50	2.74	6567
Pomadasy peroteti	56.88	72	2.53	
Trichiurus lepturus	56.88	2088	2.53	
Pteroscion pelli	54.72	5688	2.44	
Galeoides decadactylus	45.36	2088	2.02	
Ilisha africana	33.84	576	1.51	
Pomadasy incisus	30.96	144	1.38	
Torpedo torpedo	18.00	72	0.80	
Lithognathus mormyrus	17.28	72	0.77	
Penaeus notialis	11.52	864	0.51	
Citharus linguatula	9.36	360	0.42	
Bembrops greyi	7.20	144	0.32	
Brotula barbata	5.76	144	0.25	
Selene dorsalis	5.04	144	0.22	
Attractoscion aequidens	2.88	144	0.13	
COBSS00	0.72	72	0.03	
Trachurus trecae	0.72	432	0.03	
GOBIIDAE	0.72	432	0.03	
Total	2246.04		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius pollii	604.45	778	75.35	6576
Nematocarcinus africanus	134.71	34771	16.79	
Laemonema laureysi	29.50	267	3.68	
Solenocera africana	8.13	12	1.01	
Dibranchius atlanticus	6.27	430	0.78	
Trichiurus lepturus	6.15	209	0.77	
Hymenoccephalus italicus	4.88	511	0.61	
Chaunax pictus	2.90	23	0.36	
Illex coindetii	1.51	12	0.19	
Aristeus varidens	1.28	151	0.16	
Nezumia aequalis	0.81	12	0.10	
Halosaurus ovenii	0.58	12	0.07	
Parapenaeus longirostris, fem.	0.58	46	0.07	
Nezumia aequalis	0.46	23	0.06	
Total	802.21		100.00	

PROJECT STATION: 3095  
 DATE: 17/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 835  
 start stop duration Long E 1251  
 TIME :21:25:14 21:55:51 31 (min) Purpose code: 3  
 LOG :3401.52 3403.08 1.55 Area code : 3  
 FDEPTH: 521 548 GearCond.code :  
 BDEPTH: 521 548 Validity code:  
 Towing dir: 310ø Wire out: 1400 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 178.18 CATCH/HOUR: 344.86

PROJECT STATION: 3098  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 816  
 start stop duration Long E 1312  
 TIME :07:39:31 08:08:53 29 (min) Purpose code: 1  
 LOG :3462.03 3463.53 1.50 Area code :  
 FDEPTH: 45 42 GearCond.code :  
 BDEPTH: 45 42 Validity code:  
 Towing dir: 360ø Wire out: 140 m Speed: 30 kn\*10  
 Sorted: 63 Kg Total catch: 387.84 CATCH/HOUR: 802.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	144.00	50400	41.76	
Hoplostethus codenati	82.45	4088	23.91	
Yarella blackfordi	21.60	720	6.26	
Benthodesmus tenuis	20.55	801	5.96	
Chlamydoselachus anguineus	17.03	2	4.94	
Neoharriotta pinnata	9.29	2	2.69	
Aristeus varidens	8.59	743	2.49	
Triplophus hemingi	7.43	1649	2.15	
Trachinocephalus myops	6.39	1254	1.85	
Stomias boa boa	5.81	151	1.68	
Ommastrephes pteropus	4.06	23	1.18	
Parapandalus narval	2.32	1010	0.67	
Etmopterus spinax	2.32	23	0.67	
Dibranchius atlanticus	1.97	105	0.57	
Lamprogrammus exutus	1.74	23	0.50	
Malacocephalus occidentalis	1.63	186	0.47	
MYCTOPHIDAE	1.51	488	0.44	
filex coindetii	1.51	12	0.44	
Plesionika martia	1.16	105	0.34	
Malacocephalus laevis	0.93	116	0.27	
Bassanago albescens	0.93	23	0.27	
Trachyrincus scabrus	0.70	12	0.20	
Chlorophthalmus atlanticus	0.58	12	0.17	
Nemichthys scolopaceus	0.12	12	0.03	
Bathyroconger vicinus	0.12	35	0.03	
MELANOCETIDAE	0.12	12	0.03	
Total	344.86		99.97	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Stromateus fiatola	156.21	310	19.47	
Brachydeuterus auritus	132.83	4324	16.55	
Pteroscion pelli	112.34	8328	14.00	
Galeoides decadactylus	104.28	335	13.00	
Trichiurus lepturus	67.28	832	8.38	
Ilisha africana	54.74	1177	6.82	
Pomadasya jubelini	44.69	99	5.57	
Selene dorsalis	31.16	372	3.88	
Sphyræna guachancho	25.08	62	3.13	
Pseudotolithus typus	11.38	21	1.42	
Sepia officinalis hierredda	10.06	646	1.25	
Penaeus notialis	8.57	298	1.07	
Chloroscombrus chrysurus	8.07	137	1.01	
Dicologlossa cuneata	7.82	199	0.97	
Pomadasya incisus	6.95	37	0.87	
Argyrosomus hololepidotus	5.61	50	0.70	
Conger conger	5.59	12	0.70	
Raja miraletus	5.46	12	0.68	
Cynoglossus canariensis	1.61	12	0.20	
Bembrops greyi	1.24	25	0.15	
Erotula barbata	0.87	25	0.11	
Torpedo torpedo	0.50	12	0.06	
Total	802.34		99.99	

PROJECT STATION: 3096  
 DATE: 18/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 836  
 start stop duration Long E 1250  
 TIME :00:23:56 00:53:17 29 (min) Purpose code: 3  
 LOG :3414.80 3416.29 1.48 Area code : 3  
 FDEPTH: 720 700 GearCond.code:  
 BDEPTH: 720 700 Validity code:  
 Towing dir: 350ø Wire out: 1800 m Speed: 30 kn\*10  
 Sorted: 25 Kg Total catch: 181.71 CATCH/HOUR: 375.95

PROJECT STATION: 3099  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 818  
 start stop duration Long E 1309  
 TIME :09:08:55 09:38:55 30 (min) Purpose code: 1  
 LOG :3470.07 3471.63 1.54 Area code :  
 FDEPTH: 62 60 GearCond.code:  
 BDEPTH: 62 60 Validity code:  
 Towing dir: 360ø Wire out: 180 m Speed: 30 kn\*10  
 Sorted: 60 Kg Total catch: 329.42 CATCH/HOUR: 658.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	163.66	36830	43.53	
Hoplostethus mediterraneus	77.05	3302	20.49	
Lamprogrammus exutus	30.41	87	8.09	
SQUILLIDAE	30.12	1723	8.01	
Yarella blackfordi	12.60	710	3.35	
Gonostoma denudata	6.95	174	1.85	
Nezumia aequalis	6.95	159	1.85	
Stomias boa boa	6.37	579	1.69	
Merluccius pollii	6.00	8	1.60	
OCTOPODIDAE	5.07	29	1.35	
Centroscyllium crepidater	4.55	17	1.21	
Aristeus varidens	4.20	203	1.12	
Talismania bifurcata	3.77	29	1.00	
Gadella imberbis	2.75	43	0.73	
C E P H A L O P O D A	2.32	14	0.62	
Ebinania costaecanarie	2.03	14	0.54	
Benthodesmus tenuis	1.74	43	0.46	
Physiculus sp.	1.59	43	0.42	
MELANOSTOMIATIDAE	1.30	174	0.35	
Triplophus hemingi	1.30	87	0.35	
Bassanago albescens	1.16	14	0.31	
Epigonus sp.	1.16	43	0.31	
MELANOCETIDAE	1.01	14	0.27	
Bathyroconger vicinus	0.87	14	0.23	
Dibranchius atlanticus	0.72	14	0.19	
Coelorhynchus coelorhynchus	0.29	29	0.08	
Total	375.94		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	264.00	4628	40.07	6582
Trachurus trecae	194.70	606	29.55	6580
Trichiurus lepturus	57.76	496	8.77	
Brachydeuterus auritus Juv.	30.92	4842	4.69	6581
Pteroscion pelli	22.56	1890	3.42	
Galeoides decadactylus	12.66	220	1.92	
Raja miraletus	12.60	22	1.91	
Stromateus fiatola	9.14	10	1.39	
Pentheroscion mbizi	8.68	66	1.32	
Sphyræna guachancho	8.36	12	1.27	
Umbrina canariensis	7.48	188	1.14	6579
Dentex angolensis	5.70	34	0.87	
Epinephelus aeneus	3.90	4	0.59	
Pomadasya incisus	3.20	34	0.49	
Penaeus notialis	2.86	78	0.43	
Bembrops greyi	2.74	56	0.42	
Citharus linguatula	2.54	56	0.39	
Selene dorsalis	2.32	34	0.35	
Parapenaeus longirostris, fem.	1.54	396	0.23	
Erotula barbata	1.32	22	0.20	
Argyrosomus hololepidotus	1.20	22	0.18	
Ilisha africana	0.88	12	0.13	
Pterothrissus belloci	0.56	22	0.08	
Sepia orbignyana	0.44	550	0.07	
Dentex barnardi	0.44	44	0.07	
Scorpaena normani	0.34	12	0.05	
Total	658.84		100.00	

PROJECT STATION: 3097  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 814  
 start stop duration Long E 1315  
 TIME :06:02:32 06:32:29 30 (min) Purpose code: 3  
 LOG :3453.88 3455.40 1.52 Area code : 3  
 FDEPTH: 27 27 GearCond.code:  
 BDEPTH: 27 27 Validity code:  
 Towing dir: 355ø Wire out: 125 m Speed: 30 kn\*10  
 Sorted: 59 Kg Total catch: 295.25 CATCH/HOUR: 590.50

PROJECT STATION: 3100  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 820  
 start stop duration Long E 1306  
 TIME :10:51:31 11:22:03 31 (min) Purpose code: 1  
 LOG :3480.29 3481.87 1.57 Area code :  
 FDEPTH: 86 93 GearCond.code:  
 BDEPTH: 86 93 Validity code:  
 Towing dir: 300ø Wire out: 250 m Speed: 30 kn\*10  
 Sorted: 66 Kg Total catch: 132.04 CATCH/HOUR: 255.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudotolithus typus	181.00	400	30.65	6578
Galeoides decadactylus	88.50	310	14.99	
Trichiurus lepturus	82.00	1500	13.89	
Ilisha africana	62.00	610	10.50	
Pteroscion pelli	58.50	4800	9.91	
Chloroscombrus chrysurus	41.60	410	7.04	
Brachydeuterus auritus	23.30	782	3.95	
Pomadasya peroteti	19.00	60	3.22	
Sphyræna sphyraena	12.70	30	2.15	
Stromateus fiatola	6.40	50	1.08	
Penaeus notialis	4.90	1260	0.83	
Dicologlossa cuneata	4.30	70	0.73	
Sardinella maderensis	2.50	20	0.42	
Dasyatis margarita	1.90	10	0.32	
Selene dorsalis	1.50	70	0.25	
Torpedo marmorata	0.40	20	0.07	
Total	590.50		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	52.45	526	20.52	
Trachurus trecae	42.19	2710	16.51	6583
Brachydeuterus auritus	24.39	387	9.54	
Pentheroscion mbizi	22.26	143	8.71	
Trichiurus lepturus	14.63	124	5.72	
Stromateus fiatola	12.15	15	4.75	
Torpedo torpedo	10.80	35	4.23	
Dentex angolensis	10.30	66	4.03	6584
Zeus faber	10.22	43	4.00	
Octopus vulgaris	8.83	8	3.46	
Raja miraletus	8.09	12	3.17	
Sarda sarda	7.63	8	2.99	
Pterothrissus belloci	5.73	139	2.24	
Umbrina canariensis	5.23	89	2.05	
Pagellus bellottii	4.76	93	1.86	6585
Sphyræna guachancho	4.65	8	1.82	
Atractoscion aequidens	2.01	12	0.79	
Pomadasya peroteti	1.94	4	0.76	
Lepidotrigla carolae	1.55	12	0.61	
Citharus linguatula	1.39	23	0.54	
Dentex barnardi	1.08	19	0.42	
Galeoides decadactylus	1.05	15	0.41	
Chelidonichthys lucerna	0.62	4	0.24	
Uranoscopus cadenati	0.39	4	0.15	
Bembrops greyi	0.35	4	0.14	
Sardinella aurita	0.31	12	0.12	
Saurida brasiliensis	0.31	31	0.12	
Parapenaeus longirostris	0.27	19	0.11	
Total	255.58		100.01	



PROJECT STATION: 3101  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 818 Long E 1300  
 start stop duration  
 TIME :12:44:13 13:14:17 30 (min) Purpose code: 1  
 LOG :3487.48 3489.08 1.60 Area code :  
 FDEPTH: 113 110 GearCond code:  
 BDEPTH: 113 110 Validity code:  
 Towing dir: 360° Wire out: 330 m Speed: 30 kn\*10  
 Sorted: 45 Kg Total catch: 169.64 CATCH/HOUR: 339.28

PROJECT STATION: 3104  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 827 Long E 1253  
 start stop duration  
 TIME :18:17:48 18:47:26 30 (min) Purpose code: 3  
 LOG :3519.94 3521.49 1.55 Area code : 3  
 FDEPTH: 308 313 GearCond code:  
 BDEPTH: 308 313 Validity code:  
 Towing dir: 330° Wire out: 830 m Speed: 30 kn\*10  
 Sorted: 46 Kg Total catch: 72.47 CATCH/HOUR: 144.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	241.20	21872	71.09	6586
Umbrina canariensis	15.20	8	4.48	
Pteroscion peli	12.72	72	3.75	
Sarda sarda	10.96	8	3.23	
Sepia officinalis hierredda	7.60	72	2.24	
Pterothrissus belloci	7.44	80	2.19	
Raja miraletus	6.64	8	1.96	
Merluccius polli	6.48	168	1.91	
Zeus faber	6.48	40	1.91	
Fistularia petimba	3.36	8	0.99	
Uranoscopus cadenati	2.96	8	0.87	
Atractoscion aequidens	2.80	16	0.83	
Citharus linguatula	2.72	64	0.80	
Trichiurus lepturus	2.32	40	0.68	
Brotula barbata	1.92	16	0.57	
Epinephelus alexandrinus *	1.60	8	0.47	
Illex coindetii	1.36	32	0.40	
SCRSCL9	1.28	8	0.38	
Trigla lyra	1.20	8	0.35	
Dentex barnardi	1.20	8	0.35	
Saurida brasiliensis	0.80	144	0.24	
Monolepis mertensii	0.72	24	0.21	
Dentex angolensis	0.32	8	0.09	
Total	339.28		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	67.04	570	46.25	6590
Laemonema laureysi	23.28	258	16.06	
Hoplostethus mediterraneus	15.90	24	10.97	
Synagrops microlepis	9.78	466	6.75	
Chlorophthalmus atlanticus	9.00	144	6.21	
Nematocarcinus africanus	6.12	5876	4.22	
Pterothrissus belloci	5.00	28	3.45	
Pontinus kuhlii	4.28	40	2.95	
Malacocephalus laevis	0.92	12	0.63	
Illex coindetii	0.54	4	0.37	
MYCTOPHIDAE	0.44	354	0.30	
Solenocera africana	0.36	84	0.25	
Todaropsis eblanae	0.32	4	0.22	
Nezumia aequalis	0.32	12	0.22	
Hymenocephalus italicus	0.30	12	0.21	
CONGRIDAE	0.26	6	0.18	
Lophius sp.	0.24	4	0.17	
Parapenaeus longirostris, fem.	0.20	10	0.14	
Epigonus telescopus	0.20	4	0.14	
Peristodion cataphractum	0.20	6	0.14	
GALATHEIDAE *	0.18	6	0.12	
Gadella imberbis	0.06	10	0.04	
Total	144.94		99.99	

PROJECT STATION: 3102  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 825 Long E 1257  
 start stop duration  
 TIME :14:56:00 15:26:00 30 (min) Purpose code: 3  
 LOG :3502.00 3503.60 1.60 Area code : 3  
 FDEPTH: 165 164 GearCond code:  
 BDEPTH: 165 164 Validity code:  
 Towing dir: 335° Wire out: 470 m Speed: 30 kn\*10  
 Sorted: 94 Kg Total catch: 94.36 CATCH/HOUR: 188.72

PROJECT STATION: 3105  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 829 Long E 1250  
 start stop duration  
 TIME :20:25:53 20:55:48 30 (min) Purpose code: 3  
 LOG :3529.90 3531.41 1.51 Area code : 3  
 FDEPTH: 450 446 GearCond code:  
 BDEPTH: 450 446 Validity code:  
 Towing dir: 335° Wire out: 1200 m Speed: 30 kn\*10  
 Sorted: 49 Kg Total catch: 182.72 CATCH/HOUR: 365.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus belloci	71.50	692	37.89	
Dentex angolensis	42.10	166	22.31	6587
Brotula barbata	20.90	12	11.07	
Zenopsis conchifer	8.58	14	4.55	
Trichiurus lepturus	6.66	6	3.53	
Bembrops heterurus	6.56	60	3.48	
Mustelus mustelus	4.10	2	2.17	
Umbrina canariensis	3.86	6	2.05	
Monolepis microstoma	3.54	152	1.88	
Uranoscopus albesca	3.10	12	1.64	
Illex coindetii	2.86	42	1.52	
Parapenaeus longirostris, fem.	2.46	402	1.30	6588
Atractoscion aequidens	2.04	10	1.08	
Lepidotrigla cadmani	1.94	18	1.03	
Spicara alta	1.70	10	0.90	
Helicolenus dactylopterus	1.66	6	0.88	
Zeus faber	1.66	14	0.88	
Saurida brasiliensis	1.38	210	0.73	
Pontinus accraensis	0.66	6	0.35	
Octopus vulgaris	0.64	2	0.34	
Aulopus cadenati	0.40	2	0.21	
Physiculus sp.	0.22	6	0.12	
Citharus linguatula	0.16	2	0.08	
Trachinus armatus	0.04	2	0.02	
Total	188.72		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	132.80	38660	36.34	
Merluccius polli	105.40	308	28.84	6591
Squalus megalops	45.40	16	12.42	
Neoharriotta pinnata	22.20	8	6.07	
Laemonema laureysi	18.98	472	5.15	
Helicolenus dactylopterus	6.46	8	1.77	
Solenocera africana	4.68	52	1.28	
Dibranchius atlanticus	3.90	188	1.07	
Illex coindetii	3.38	22	0.92	
Hymenocephalus italicus	3.22	292	0.88	
CONGRIDAE	2.86	30	0.78	
Trichiurus lepturus	2.56	84	0.70	
Gadella imberbis	2.26	16	0.62	
Nezumia aequalis	2.10	76	0.57	
Malacocephalus occidentalis	1.36	8	0.37	
Aristeus varidensis, female	1.28	60	0.35	
Gonostoma denuata	1.28	30	0.35	
Halosaurus ovensis	1.20	52	0.33	
Triplopus hemingi	1.04	172	0.28	
Chaunax pictus	0.90	8	0.25	
Aristeus varidensis, male	0.82	142	0.22	
Callinectes amnicola	0.76	8	0.21	
GALATHEIDAE *	0.60	22	0.16	
Total	365.44		99.97	

PROJECT STATION: 3103  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 827 Long E 1255  
 start stop duration  
 TIME :16:49:31 17:14:48 25 (min) Purpose code: 3  
 LOG :3512.24 3513.59 1.35 Area code : 3  
 FDEPTH: 234 231 GearCond code:  
 BDEPTH: 234 231 Validity code:  
 Towing dir: 340° Wire out: 650 m Speed: 30 kn\*10  
 Sorted: 44 Kg Total catch: 407.40 CATCH/HOUR: 977.76

PROJECT STATION: 3106  
 DATE: 18/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 828 Long E 1248  
 start stop duration  
 TIME :22:30:08 22:59:49 30 (min) Purpose code: 3  
 LOG :3538.26 3539.80 1.53 Area code : 3  
 FDEPTH: 537 548 GearCond code:  
 BDEPTH: 537 548 Validity code:  
 Towing dir: 335° Wire out: 1450 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 166.45 CATCH/HOUR: 332.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	558.72	37567	57.14	
Zenopsis conchifer	170.11	336	17.40	
Merluccius polli	69.50	1723	7.11	6589
Pterothrissus belloci	66.98	631	6.85	
Trichiurus lepturus	36.96	38	3.78	
Nezumia aequalis	20.38	588	2.08	
Brotula barbata	17.04	17	1.74	
Todaropsis eblanae	15.96	146	1.63	
Illex coindetii	7.56	62	0.77	
Dentex angolensis	3.48	12	0.36	
Parapenaeus longirostris, fem.	2.52	610	0.26	
Bembrops heterurus	2.11	84	0.22	
Parapenaeus longirostris, male	1.90	398	0.19	
Chlorophthalmus atlanticus	1.68	168	0.17	
Syacium micrurum	1.06	62	0.11	
CONGRIDAE	1.06	22	0.11	
MYCTOPHIDAE	0.62	230	0.06	
Total	977.64		99.98	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	230.40	56376	69.21	
Hoplostethus cadenati	26.64	1044	8.00	
Yarella blackfordi	25.20	720	7.57	
Aristeus varidensis	15.72	1224	4.72	
Merluccius polli	14.20	30	4.27	6592
Stomias boa boa	6.60	132	1.98	
Triplopus hemingi	3.60	36	1.08	
C R U S T A C E A N S	1.80	216	0.54	
Malacocephalus laevis	1.68	12	0.50	
PANDALIDAE	1.56	376	0.47	
MELANOSTOMIATIDAE	1.20	300	0.36	
Dibranchius atlanticus	1.08	48	0.32	
Benthodesmus tenuis	0.72	36	0.22	
Isistius brasiliensis	0.60	2	0.18	
SERRANIDAE	0.60	60	0.18	
OPHIDIIDAE	0.36	60	0.11	
Nemichthys scolopaceus	0.36	36	0.11	
Bathyrroconger vicinus	0.24	12	0.07	
Galeus polli	0.20	6	0.06	
Nezumia sp.	0.12	12	0.04	
Etmopterus spinax	0.02	4	0.01	
Total	332.90		100.00	

PROJECT STATION 3107  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 827  
 start stop duration Long E 1247  
 TIME 01:01:58 01:32:11 30 (min) Purpose code: 3  
 LOG 3546.28 3547.84 1.56 Area code: 3  
 FDEPTH: 602 600 GearCond code:  
 BDEPTH: 602 600 Validity code:  
 Towing dir: 340ø Wire out: 1500 m Speed: 30 kn\*10

Sorted: 30 Kg Total catch: 244.72 CATCH/HOUR: 489.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	214.40	51456	43.81	
Hoplostethus cadenati	108.80	3888	22.23	
Lamprogrammus exutus	33.92	608	6.93	
Yarella blackfordi	28.00	672	5.72	
Merluccius polli	27.36	16	5.59	
Talismania bifurcata	11.84	640	2.42	
Stomias boa boa	10.88	160	2.22	
Nezumia aequalis	8.80	416	1.80	
Gadella maraldi	8.00	128	1.63	
Selachophidium guentheri	7.52	288	1.54	
Triplophus hemingi	6.88	336	1.41	
Illex coindetii	6.56	16	1.34	
Benthodesmus tenuis	6.40	48	1.31	
OCTOPOTEUTHIDAE	3.04	16	0.62	
Aristeus varidens	2.72	208	0.56	
C R U S T A C E A N S	2.08	224	0.42	
Ebinania costaeacanarie	0.64	16	0.13	
Bathyrhoconger vicinus	0.64	32	0.13	
Macroparalepis macrogeneion	0.48	16	0.10	
Nemichthys scolopaceus	0.48	32	0.10	
Total	489.44		100.01	

PROJECT STATION 3110  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 804  
 start stop duration Long E 1308  
 TIME 08:48:00 09:19:31 32 (min) Purpose code: 3  
 LOG 3598.26 3599.89 1.61 Area code: 3  
 FDEPTH: 42 39 GearCond code:  
 BDEPTH: 42 39 Validity code:  
 Towing dir: 350ø Wire out: 150 m Speed: 30 kn\*10

Sorted: 60 Kg Total catch: 284.61 CATCH/HOUR: 533.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Stromateus fiatola	177.30	326	33.22	
Conger conger	71.63	69	13.42	
Dasyatis margarita	33.86	32	6.35	
Pseudotolithus typus	33.79	398	6.33	6596
Sphyræna guachancho	30.60	71	5.73	
Pomadasys peroteti	29.63	103	5.55	
Pomadasys jubelini	27.17	64	5.09	
Galeoides decadactylus	21.04	39	3.94	
Trichiurus lepturus	18.34	390	3.44	
Pteroscion pelli	16.65	868	3.12	
Brachydeuterus auritus	14.42	120	2.70	6595
Chloroscombrus chrysurus	11.01	120	2.06	
Ilisha africana	9.96	184	1.87	
Torpedo nobiliana	9.17	8	1.72	
Pomadasys incisus	5.25	8	0.98	
Selene dorsalis	4.63	71	0.87	
Bembrops greyi	4.22	24	0.79	
Penaeus notialis	3.73	358	0.70	
Dicologlossa cuneata	3.26	39	0.61	
Sepia orbignyana	3.11	103	0.58	
Torpedo torpedo	2.78	8	0.52	
Leptocharias smithii	2.12	2	0.40	
Total	533.67		99.99	

PROJECT STATION 3108  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 826  
 start stop duration Long E 1246  
 TIME 03:10:09 03:40:06 30 (min) Purpose code: 3  
 LOG 3554.67 3556.30 1.63 Area code: 3  
 FDEPTH: 698 708 GearCond code:  
 BDEPTH: 698 708 Validity code:  
 Towing dir: 335ø Wire out: 1800 m Speed: 30 kn\*10

Sorted: 24 Kg Total catch: 198.62 CATCH/HOUR: 397.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	149.60	33650	37.66	
Hoplostethus mediterraneus	92.00	3726	23.16	
C R U S T A C E A N S	28.00	1400	7.05	
Laemonema laureysi	23.84	96	6.00	
Stomias boa boa	16.48	494	4.15	
Yarella blackfordi	16.48	496	4.15	
Triplophus hemingi	12.80	1860	3.22	
ZOARCIDAE	11.52	80	2.90	
Physiculus sp.	11.36	1008	2.86	
Nezumia leonis	9.76	256	2.46	
Illex coindetii	7.52	32	1.89	
Scymnodon obscurus	3.22	6	0.81	
Aristeus varidens	2.88	112	0.73	
Merluccius polli	2.66	4	0.67	
Lamprogrammus exutus	1.92	16	0.48	
Ebinania sp.	1.44	16	0.36	
Bathyrhoconger vicinus	1.28	48	0.32	
Talismania bifurcata	1.12	32	0.28	
GONOSTOMATIDAE	0.64	16	0.16	
Gonostoma denudata	0.32	16	0.08	
DICERATIIDAE	0.32	32	0.08	
MACRORHAMPHOSIDAE	0.16	16	0.04	
Physiculus sp.	0.00			
Total	397.24		99.99	

PROJECT STATION 3111  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 805  
 start stop duration Long E 1304  
 TIME 10:16:09 10:46:44 31 (min) Purpose code: 3  
 LOG 3606.40 3607.97 1.57 Area code: 3  
 FDEPTH: 65 64 GearCond code:  
 BDEPTH: 65 64 Validity code:  
 Towing dir: 355ø Wire out: 195 m Speed: 30 kn\*10

Sorted: 59 Kg Total catch: 269.25 CATCH/HOUR: 521.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	289.16	15877	55.49	
Trachurus trecae	115.84	3728	22.23	6597
Galeoides decadactylus	52.68	271	10.11	
Dentex angolensis	15.06	114	2.89	6600
Dentex barnardi	9.75	244	1.87	6599
Selene dorsalis	7.84	87	1.50	
Raja miraletus	6.72	10	1.29	
Pagellus bellottii	6.62	435	1.27	6598
Sphyræna guachancho	6.62	35	1.27	
Chloroscombrus chrysurus	2.88	27	0.55	
Pteroscion pelli	2.61	17	0.50	
Trichiurus lepturus	2.17	10	0.42	
Pomadasys incisus	1.32	62	0.25	
Saurida brasiliensis	0.52	79	0.10	
Umbrina canariensis	0.45	10	0.09	
Pterothrissus belloci	0.25	10	0.05	
Sardinella aurita	0.17	10	0.03	
Engraulis encrasicolus	0.17	52	0.03	
Alloteuthis africana	0.10	45	0.02	
Pseudupeneus prayensis	0.10	10	0.02	
GOBIIDAE	0.10	10	0.02	
Total	521.13		100.00	

PROJECT STATION 3109  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 803  
 start stop duration Long E 1310  
 TIME 07:22:32 07:52:26 30 (min) Purpose code: 3  
 LOG 3591.01 3592.56 1.56 Area code: 3  
 FDEPTH: 27 25 GearCond code:  
 BDEPTH: 27 25 Validity code:  
 Towing dir: 350ø Wire out: 120 m Speed: 30 kn\*10

Sorted: 55 Kg Total catch: 143.44 CATCH/HOUR: 286.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ilisha africana	64.76	4132	22.57	
Pseudotolithus typus	52.76	180	18.39	6594
Galeoides decadactylus	45.00	136	15.69	
Pentanezum quinquarius	17.46	386	6.09	
Trichiurus lepturus	16.96	226	5.91	
Arius parkii	15.40	30	5.37	
Sphyræna guachancho	14.84	46	5.17	
Chloroscombrus chrysurus	14.10	220	4.91	
Pomadasys jubelini	10.80	40	3.76	
Carcharhinus sp.	9.00	4	3.14	
Pteroscion pelli	7.20	420	2.51	
Panulirus regius	4.10	20	1.43	
Pseudotolithus epipercus	4.00	6	1.39	
Scomberomorus tritor	3.90	6	1.36	
Caranx crysos	2.00	16	0.70	
Brachydeuterus auritus	1.60	286	0.56	
Torpedo nobiliana	0.90	6	0.31	
Selene dorsalis	0.70	40	0.24	
Cynoglossus canariensis	0.60	6	0.21	
Penaeus notialis	0.40	86	0.14	
Dicologlossa cuneata	0.30	6	0.10	
Sepia officinalis hierreda	0.10	150	0.03	
Total	286.88		99.98	

PROJECT STATION 3112  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 803  
 start stop duration Long E 1303  
 TIME 11:38:35 12:08:33 30 (min) Purpose code: 3  
 LOG 3612.90 3614.51 1.60 Area code: 3  
 FDEPTH: 71 69 GearCond code:  
 BDEPTH: 71 69 Validity code:  
 Towing dir: 355ø Wire out: 210 m Speed: 30 kn\*10

Sorted: 412 Kg Total catch: 4967.54 CATCH/HOUR: 9935.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	9360.00	104304	94.21	
Trachurus trecae	368.40	3192	3.71	6601
Pomadasys incisus	75.36	840	0.76	
Trachurus trecae, juvenile	39.84	5112	0.40	6602
Dentex angolensis	32.10	132	0.32	6603
Selene dorsalis	18.00	96	0.18	
Chloroscombrus chrysurus	17.04	192	0.17	
Umbrina canariensis	7.92	96	0.08	
Epinephelus aeneus	7.82	2	0.08	
Brotula barbata	2.70	4	0.03	
Chaetodon hoefleri	2.64	24	0.03	
Atractoscion aequidens	0.96	2	0.01	
Alloteuthis africana	0.72	72	0.01	
Dentex barnardi	0.70	20	0.01	
Pagellus bellottii	0.40	6		
Saurida brasiliensis	0.24	24		
Citharus linguatula	0.24	24		
Total	9935.08		100.00	

PROJECT STATION: 3113  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 808 Long E 1300  
 start stop duration  
 TIME 13:28:21 13:58:24 30 (min) Purpose code: 3  
 LOG 3623.78 3625.35 1.75 Area code : 3  
 FDEPTH: 95 96 GearCond.code:  
 BDEPTH: 95 96 Validity code:  
 Towing dir: 330° Wire out: 270 m Speed: 30 kn\*10

Sorted: 23 Kg Total catch: 105.90 CATCH/HOUR: 211.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	159.20	10212	75.17	6604
Umbrina canariensis	12.32	184	5.82	
Dentex angolensis	11.36	54	5.36	6605
Trichiurus lepturus	6.30	8	2.97	
Raja miraletus	4.64	8	2.19	
Brachydeuterus auritus	4.00	24	1.89	
Zeus faber	2.34	8	1.10	
Sepiella ornata	1.64	4	0.77	
Lepidotrigla cadmani	1.44	8	0.68	
Chelidonichthys lucerna	1.36	8	0.64	
Pterothrissus belloci	1.12	16	0.53	
Citharus linguatula	1.12	24	0.53	
Octopus vulgaris	1.00	2	0.47	
Uranoscopus albesca	0.88	8	0.42	
Sepia officinalis hierredda	0.70	8	0.33	
Chaetodon hoefleri	0.64	8	0.30	
Dentex barnardi	0.42	4	0.20	
Sardinella aurita	0.40	16	0.19	
Saurida brasiliensis	0.40	48	0.19	
Illex coindetii	0.28	4	0.13	
Pagellus bellottii	0.24	4	0.11	
Total	211.80		99.99	

PROJECT STATION: 3117  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 815 Long E 1241  
 start stop duration  
 TIME 21:29:41 21:59:10 29 (min) Purpose code: 3  
 LOG 3666.60 3668.12 1.51 Area code : 3  
 FDEPTH: 626 626 GearCond.code:  
 BDEPTH: 626 626 Validity code:  
 Towing dir: 320° Wire out: 1590 m Speed: 30 kn\*10

Sorted: 21 Kg Total catch: 247.54 CATCH/HOUR: 512.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	167.59	39103	32.72	
Hoplostethus cadenati	146.48	6654	28.60	
Lamprogrammus exutus	53.59	1192	10.46	
Gonostoma denudata	43.20	1192	8.44	
Merluccius polli	25.82	50	5.04	
Melanostomias sp.	19.12	571	3.73	
Xenodermichthys copei	18.37	1440	3.59	
Triplophus hemingi	7.70	993	1.50	
Todaropsis eblanae	4.97	25	0.97	
Etmopterus sp.	4.97	25	0.97	
Laemonema laureysi	3.48	273	0.68	
GALATHEIDAE *	3.48	596	0.68	
Nemichthys scolopaceus	3.23	50	0.63	
Aristeus varidens, female	2.73	74	0.53	
Aristeus varidens, male	2.73	223	0.53	
Nezumia aequalis	1.74	74	0.34	
Dibranchus atlanticus	1.74	149	0.34	
Lophius sp.	1.24	74	0.24	
Total	512.18		99.99	

PROJECT STATION: 3114  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 810 Long E 1255  
 start stop duration  
 TIME 15:16:48 15:46:52 30 (min) Purpose code: 3  
 LOG 3634.37 3635.95 1.57 Area code : 3  
 FDEPTH: 117 117 GearCond.code:  
 BDEPTH: 117 117 Validity code:  
 Towing dir: 360° Wire out: 325 m Speed: 30 kn\*10

Sorted: 39 Kg Total catch: 559.17 CATCH/HOUR: 1118.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	742.30	45500	66.38	6607
Trichiurus lepturus	156.00	234	13.95	
Atractoscion aequidens	91.00	286	8.14	
Umbrina canariensis	45.60	246	4.08	6608
Dentex angolensis	26.40	116	2.36	6609
Brotula barbata	17.40	18	1.56	
Trachurus trecae	11.96	26	1.07	
Spicara alta	5.84	114	0.52	
Dentex barnardi	5.52	16	0.49	6606
Zeus faber	5.20	26	0.46	
Illex coindetii	4.42	52	0.40	
Lepidotrigla cadmani	2.72	22	0.24	
Anthias anthias	1.76	10	0.16	
Dentex macrophthalmus	1.14	2	0.10	
Pagellus bellottii	0.66	6	0.06	
Scorpaena stephanica	0.42	2	0.04	
Total	1118.34		100.01	

PROJECT STATION: 3118  
 DATE: 20/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 815 Long E 1240  
 start stop duration  
 TIME 23:50:20 00:20:23 30 (min) Purpose code: 3  
 LOG 3676.02 3677.66 1.64 Area code : 3  
 FDEPTH: 694 711 GearCond.code:  
 BDEPTH: 694 711 Validity code:  
 Towing dir: 340° Wire out: 1760 m Speed: 30 kn\*10

Sorted: 28 Kg Total catch: 171.68 CATCH/HOUR: 343.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	130.80	35244	38.09	
Yarellia blackfordi	40.68	1176	11.85	
Hoplostethus atlanticus	35.88	1392	10.45	
Stomias boa boa	26.40	2340	7.65	
Gonostoma denudata	24.84	504	7.23	
Triplophus hemingi	19.80	2352	5.77	
C R U S T A C E A N S	17.28	960	5.03	
Lamprogrammus exutus	15.24	120	4.44	
Merluccius polli	4.96	8	1.44	
Nezumia aequalis	3.72	72	1.08	
OCTOPOTEUTHIDAE	3.24	12	0.94	
Physiculus sp.	2.64	336	0.77	
Aristeus varidens	2.40	84	0.70	
MELANOSTOMIATIDAE	2.04	48	0.59	
Laemonema laureysi	1.80	60	0.52	
CHILODIPTERIDAE	1.68	48	0.49	
Nemichthys scolopaceus	1.56	60	0.45	
Lampadena sp.	1.08	12	0.31	
Bassanago albescens	0.96	12	0.28	
Coelorhynchus coelorhynchus	0.84	108	0.24	
Epigonus sp.	0.84	24	0.24	
Dibranchus atlanticus	0.84	96	0.24	
Solenocera africana	0.60	48	0.17	
Scymnodon obscurus	0.60	2	0.17	
CAICA00	0.48	12	0.14	
Bathygadus melanobranchus	0.48	36	0.14	
MELANOCETIDAE	0.48	24	0.14	
Raja sp.	0.36	12	0.10	
Benthodesmus tenuis	0.36	24	0.10	
Bathyracoconger vicinus	0.24	12	0.07	
SYNAPHOBANCHIDAE	0.12	12	0.03	
Talismania sp.	0.12	12	0.03	
Total	343.36		99.93	

PROJECT STATION: 3115  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 814 Long E 1251  
 start stop duration  
 TIME 17:06:36 17:36:26 30 (min) Purpose code: 3  
 LOG 3645.27 3646.84 1.56 Area code : 3  
 FDEPTH: 138 141 GearCond.code:  
 BDEPTH: 138 141 Validity code:  
 Towing dir: 330° Wire out: 390 m Speed: 30 kn\*10

Sorted: 26 Kg Total catch: 263.54 CATCH/HOUR: 527.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	276.80	17684	52.52	
Trichiurus lepturus	102.10	96	19.37	
Dentex angolensis	47.36	192	8.99	6610
Zenopsis conchifer	42.40	32	8.04	
Pterothrissus belloci	17.92	176	3.40	
Bembrops greyi	7.36	64	1.40	
Illex coindetii	6.40	80	1.21	
Citharus linguatula	5.44	144	1.03	
Brotula barbata	4.66	4	0.88	
Zeus faber	4.64	48	0.88	
Uranoscopus polli	4.00	32	0.76	
Trigla lyra	3.84	96	0.73	
Octopus sp.	2.08	16	0.39	
Dentex congensis	0.96	32	0.18	
Pseudupeneus prayensis	0.80	16	0.15	
MYCTOPHIDAE	0.32	176	0.06	
Total	527.08		99.99	

PROJECT STATION: 3119  
 DATE: 20/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 751 Long E 1303  
 start stop duration  
 TIME 06:38:22 07:08:53 31 (min) Purpose code: 3  
 LOG 3721.28 3722.87 1.59 Area code : 3  
 FDEPTH: 23 25 GearCond.code:  
 BDEPTH: 23 25 Validity code:  
 Towing dir: 330° Wire out: 120 m Speed: 30 kn\*10

Sorted: 64 Kg Total catch: 403.74 CATCH/HOUR: 781.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ilisha africana	202.26	13316	25.88	
Galeoides decadactylus	147.45	3190	18.87	
Brachydeuterus auritus	108.58	8321	13.90	
Lichia amia	104.03	10	13.31	
Chloroscombrus chrysurus	68.13	1343	8.72	
Sphyrna guachancho	68.13	106	8.72	
Pteroscion pelli	22.05	1757	2.82	
Stromateus fiatola	18.83	43	2.41	
Selene dorsalis	17.25	501	2.21	
Gymnura altavela	12.25	12	1.57	
Pseudotolithus typus	4.16	12	0.53	
Penaeus notialis	3.19	75	0.41	
Sardinella maderensis	2.88	43	0.37	
Trichiurus lepturus	2.25	106	0.29	
Total	781.44		100.01	

PROJECT STATION: 3116  
 DATE: 19/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 815 Long E 1244  
 start stop duration  
 TIME 19:23:08 19:53:57 31 (min) Purpose code: 3  
 LOG 3657.71 3659.27 1.55 Area code : 3  
 FDEPTH: 426 429 GearCond.code:  
 BDEPTH: 426 429 Validity code:  
 Towing dir: 335° Wire out: 1110 m Speed: 30 kn\*10

Sorted: 21 Kg Total catch: 269.12 CATCH/HOUR: 520.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	291.43	69945	55.95	
Merluccius polli	168.23	681	32.30	6611
Trichiurus lepturus	12.58	331	2.42	
Dibranchus atlanticus	9.87	699	1.89	
Chaunax pictus	7.74	37	1.49	
Laemonema laureysi	7.16	166	1.37	
Illex coindetii	5.03	37	0.97	
Gadella imberbis	4.26	110	0.82	
Hymenocephalus italicus	4.06	314	0.78	
Melanostomias sp.	3.29	56	0.63	
Triplophus hemingi	1.55	331	0.30	
GALATHEIDAE *	1.35	56	0.26	
Solenocera africana	1.35	56	0.26	
Hoplostethus cadenati	1.10	37	0.21	
Aristeus varidens, female	0.93	19	0.18	
Aristeus varidens, male	0.74	56	0.14	
Peristedion cataphractum	0.19	19	0.04	
Total	520.86		100.01	



PROJECT STATION: 3120  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 751 Long E 1301  
 start stop duration  
 TIME : 07:56:19 08:18:06 22 (min) Purpose code: 3  
 LOG : 3727.49 3728.64 1.14 Area code : 3  
 FDEPTH: 43 42 GearCond code:  
 BDEPTH: 43 42 Validity code:  
 Towing dir: 350° Wire out: 150 m Speed: 30 kn\*10  
 Sorted: 82 Kg Total catch: 472.80 CATCH/HOUR: 1289.45

PROJECT STATION: 3124  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 757 Long E 1251  
 start stop duration  
 TIME : 14:08:44 14:38:47 30 (min) Purpose code: 3  
 LOG : 3756.18 3757.75 1.56 Area code : 3  
 FDEPTH: 106 106 GearCond code:  
 BDEPTH: 106 106 Validity code:  
 Towing dir: 325° Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 28 Kg Total catch: 253.42 CATCH/HOUR: 506.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	467.18	1353	36.23	
Brachydeuterus auritus	396.00	27142	30.71	6612
Chloroscombrus chrysurus	94.09	1505	7.30	
Ilisba africana	79.96	1931	6.20	
Pteroscion pelli	63.35	3592	4.91	
Galoides decadactylus	49.91	142	3.87	
Stromateus fiatola	33.25	63	2.58	
Raja miraletus	30.74	79	2.38	
Sphyræna guachancho	23.54	63	1.83	
Pseudotolithus typus	20.86	158	1.62	
Sardinella aurita	10.36	46	0.80	
Pomadasy s incisus	10.17	33	0.79	
Cynoglossus canariensis	5.48	46	0.42	
Pemæus notialis	1.72	46	0.13	
Dicologlossa cuneata	1.58	33	0.12	
Selene dorsalis	1.25	33	0.10	
Total	1289.44		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	346.40	25840	68.35	6621
Sepia officinalis hierredda	54.56	80	10.76	
Trichiurus lepturus	30.40	40	6.00	
Brotula barbata	28.96	32	5.71	
Epinephelus aeneus	25.00	2	4.93	
Umbriina canariensis	7.20	144	1.42	
Brachydeuterus auritus	3.20	32	0.63	
Dentex congoensis	2.56	24	0.51	
Dentex barnardi	2.52	10	0.50	
Zeus faber	2.24	32	0.44	
Pentheroscion mbizi	1.76	16	0.35	
Dentex macrophthalmus	0.84	4	0.17	
Lepidotrigla cadmani	0.62	4	0.12	
Dentex angolensis	0.58	6	0.11	
Total	506.84		100.00	

PROJECT STATION: 3121  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 752 Long E 1259  
 start stop duration  
 TIME : 09:48:22 10:00:25 12 (min) Purpose code: 3  
 LOG : 3734.47 3735.13 0.65 Area code : 3  
 FDEPTH: 56 55 GearCond code: 9  
 BDEPTH: 56 55 Validity code: 1  
 Towing dir: 345° Wire out: 180 m Speed: 30 kn\*10  
 Sorted: 82 Kg Total catch: 2555.32 CATCH/HOUR: 12776.60

PROJECT STATION: 3125  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 759 Long E 1244  
 start stop duration  
 TIME : 16:07:56 16:23:17 15 (min) Purpose code: 3  
 LOG : 3767.53 3768.33 0.78 Area code : 3  
 FDEPTH: 165 164 GearCond code:  
 BDEPTH: 165 164 Validity code:  
 Towing dir: 335° Wire out: 450 m Speed: 30 kn\*10  
 Sorted: 38 Kg Total catch: 568.95 CATCH/HOUR: 2275.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	7331.50	81685	57.38	6613
Chloroscombrus chrysurus	4936.75	57595	38.64	
Trachurus trecae	203.00	6820	1.59	6614
Selene dorsalis	155.00	1240	1.21	
Pagellus bellottii	94.50	1195	0.74	
Cynoglossus canariensis	34.10	155	0.27	
Decapterus punctatus	14.00	465	0.11	
Sardinella maderensis	7.75	155	0.06	
Total	12776.60		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1479.60	85236	65.01	
Trichiurus lepturus	263.40	1080	11.57	
Dentex angolensis	174.00	960	7.65	6622
Brotula barbata	143.40	180	6.30	
MYCTOPHIDAE	140.40	98984	6.17	
Illex coadactia	18.00	240	0.79	
Zeus faber	14.40	120	0.63	
Trigla lyra	12.00	120	0.53	
Bembrops greyi	9.60	60	0.42	
Pterothrissus belloci	7.80	60	0.34	
Saurida brasiliensis	7.20	180	0.32	
Zenopsis conchifer	6.00	120	0.26	
Total	2275.80		99.99	

PROJECT STATION: 3122  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 754 Long E 1257  
 start stop duration  
 TIME : 10:01:08 10:01:22 30 (min) Purpose code: 3  
 LOG : 3740.67 3742.28 1.60 Area code : 3  
 FDEPTH: 71 71 GearCond code:  
 BDEPTH: 71 71 Validity code:  
 Towing dir: 340° Wire out: 210 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 30.77 CATCH/HOUR: 61.54

PROJECT STATION: 3126  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 801 Long E 1238  
 start stop duration  
 TIME : 18:06:46 18:36:41 30 (min) Purpose code: 3  
 LOG : 3778.85 3780.42 1.09 Area code : 3  
 FDEPTH: 534 525 GearCond code:  
 BDEPTH: 534 525 Validity code:  
 Towing dir: 360° Wire out: 1460 m Speed: 30 kn\*10  
 Sorted: 19 Kg Total catch: 195.08 CATCH/HOUR: 390.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	31.10	42	50.54	
Seriola carpenteri	9.20	8	14.95	
Pagellus bellottii	8.08	158	13.13	6615
Raja miraletus	5.60	8	9.10	
Dentex barnardi	1.70	12	2.76	
Brachydeuterus auritus	1.28	20	2.08	
Chloroscombrus chrysurus	1.00	12	1.62	
Sepiella ornata	0.58	2	0.94	
Pseudupeneus prayensis	0.56	16	0.91	
Lepidotrigla cadmani	0.50	4	0.81	
Sphyræna guachancho	0.50	4	0.81	
Trachurus trecae	0.44	38	0.71	
Zeus faber	0.34	2	0.55	
Dentex congoensis	0.32	26	0.52	6616
Dentex angolensis	0.14	12	0.23	
Bembrops heterurus	0.10	2	0.16	
Saurida brasiliensis	0.04	6	0.06	
Citharus linguatula	0.04	2	0.06	
Alloteuthis africana	0.02	334	0.03	
Total	61.54		99.97	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	106.60	25620	27.32	
Carcharhinus sp.	100.00	2	25.63	
Centrophorus granulosus	57.30	14	14.69	
Aristeus varidens, female	40.00	66	10.25	
Centrophorus uyato	27.94	14	7.16	
Hoplostethus mediterraneus	15.74	754	4.03	
Gadella imberbis	8.32	300	2.13	
Merluccius polli	6.24	40	1.60	
Stomias boa boa	6.24	130	1.60	
Gonostoma denudata	5.84	170	1.50	
Triplophus hemingi	5.34	844	1.37	
Lamprogrammus exutus	3.12	182	0.80	
Laemonema laureysi	2.60	26	0.67	
Xenodermichthys copei	2.08	92	0.53	
Aristeus varidens, male	0.78	40	0.20	
Halosaurus ovenii	0.66	14	0.17	
Nemichthys scolopaceus	0.52	26	0.13	
CONGRIDAE	0.40	14	0.10	
Hymenocephalus italicus	0.26	78	0.07	
GALATHEIDAE *	0.18	28	0.05	
Total	390.16		100.00	

PROJECT STATION: 3123  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 756 Long E 1254  
 start stop duration  
 TIME : 12:38:33 13:08:31 30 (min) Purpose code: 3  
 LOG : 3749.08 3750.63 1.55 Area code : 3  
 FDEPTH: 88 88 GearCond code:  
 BDEPTH: 88 88 Validity code:  
 Towing dir: 340° Wire out: 240 m Speed: 30 kn\*10  
 Sorted: 55 Kg Total catch: 146.03 CATCH/HOUR: 292.06

PROJECT STATION: 3127  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 803 Long E 1237  
 start stop duration  
 TIME : 20:20:51 20:50:55 30 (min) Purpose code: 3  
 LOG : 3789.14 3790.72 1.58 Area code : 3  
 FDEPTH: 637 635 GearCond code:  
 BDEPTH: 637 635 Validity code:  
 Towing dir: 10° Wire out: 1620 m Speed: 30 kn\*10  
 Sorted: 29 Kg Total catch: 178.29 CATCH/HOUR: 356.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	265.50	23370	90.91	6620
Dentex congoensis	9.22	198	3.16	6618
Zeus faber	7.54	50	2.58	
Pagellus bellottii	4.24	58	1.45	6619
Dentex barnardi	2.80	20	0.96	6617
Fistularia petimba	1.00	6	0.34	
Sepia officinalis hierredda	0.74	6	0.25	
Lepidotrigla cadmani	0.70	10	0.24	
Dentex angolensis	0.28	14	0.10	
Pseudupeneus prayensis	0.04	6	0.01	
Total	292.06		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	223.20	45136	62.59	
Lamprogrammus exutus	36.60	240	10.26	
Merluccius polli	20.88	36	5.86	
Hoplostethus mediterraneus	17.40	732	4.88	
SCUILLIDAE	11.52	48	3.23	
Stomias boa boa	10.44	278	2.93	
Centrophorus granulosus	8.00	2	2.24	
Gonostoma denudata	6.60	144	1.85	
Gadella imberbis	6.36	792	1.78	
Triplophus hemingi	4.80	768	1.35	
GALATHEIDAE *	3.84	612	1.08	
Aristeus varidens, female	2.16	48	0.61	
Xenodermichthys copei	1.56	108	0.44	
Halosaurus ovenii	0.72	12	0.20	
Epigonus telescopus	0.72	24	0.20	
MYCTOPHIDAE	0.36	96	0.10	
Trichiurus lepturus	0.36	24	0.10	
Nemichthys scolopaceus	0.24	24	0.07	
Nezumia aequalis	0.24	12	0.07	
Aristeus varidens, male	0.24	24	0.07	
CONGRIDAE	0.22	12	0.06	
Plesionika martia	0.12	132	0.03	
Total	356.58		100.00	

PROJECT STATION: 3128  
 DATE: 20/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 803 Long E 1236  
 start stop duration  
 TIME :22:36:44 23:06:11 29 (min) Purpose code: 3  
 LOG :3798.86 3800.35 1.49 Area code : 3  
 FDEPTH: 735 734 GearCond code:  
 BDEPTH: 735 734 Validity code:  
 Towing dir: 360° Wire out: 1850 m Speed: 30 kn\*10  
 Sorted: 38 Kg Total catch: 1090.94 CATCH/HOUR: 2257.12

PROJECT STATION: 3131  
 DATE: 21/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 737 Long E 1255  
 start stop duration  
 TIME :07:27:59 07:57:38 30 (min) Purpose code: 3  
 LOG :3859.56 3861.11 1.54 Area code : 3  
 FDEPTH: 39 38 GearCond code: 8  
 BDEPTH: 39 38 Validity code: 9  
 Towing dir: 345° Wire out: 150 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 29.09 CATCH/HOUR: 58.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
C R U S T A C E A N S	2027.59	67001	89.83	
Yarella blackfordi	43.12	199	1.91	
Lamprogrammus exutus	36.00	83	1.59	
Nematocarcinus africanus	32.19	7349	1.43	
Hoplostethus mediterraneus	30.70	1051	1.36	
Nezumia leonis	25.32	596	1.12	
Trachyrincus scabrurus	16.22	83	0.72	
OCTOPODIDAE	12.00	66	0.53	
STROMATEIDAE	5.05	339	0.22	
Merluccius polli	4.57	6	0.20	
Stomias boa boa	4.39	74	0.19	
Aristeus varidens	3.31	116	0.15	
Triplophus hemingi	2.50	314	0.11	
Hoplostethus cadenati	2.48	8	0.11	
Physiculus sp	2.32	281	0.10	
Trachinocephalus myops	2.07	25	0.09	
Deania calcea	0.95	4	0.04	
OPHIDIIDAE	0.91	17	0.04	
Gonostoma sp	0.91	8	0.04	
MELANOSTOMIATIDAE	0.83	8	0.04	
Dibranchius atlanticus	0.83	25	0.04	
Bathyroconger vicinus	0.66	17	0.03	
Talismania bifurcata	0.66	17	0.03	
MELANOCETIDAE	0.50	8	0.02	
Nemichthys scolopaceus	0.33	8	0.01	
Solenocera africana	0.25	25	0.01	
OPHICHTHIDAE	0.25	8	0.01	
Etmopterus spinax	0.25	2	0.01	
Total	2257.16		99.98	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lutjanus agennes	16.90	2	29.05	
Pagrus africanus	6.72	12	11.55	
Epinephelus guaza ?	6.40	2	11.00	
Pomadasy incisus	6.08	96	10.45	
Sphyrana quachancho	5.46	10	9.38	
Pagellus bellottii	4.66	16	8.01	
Pagrus caeruleostictus	3.56	8	6.12	
Raja miraletus	2.76	4	4.74	
Boops boops	1.36	254	2.34	
Cephalopholis taeniope	1.12	2	1.93	
Zeus faber	0.92	2	1.58	
Chaetodon hoeferi	0.82	8	1.41	
Dentex barnardi	0.52	4	0.89	
Alloteuthis africana	0.42	108	0.72	
Fistularia petimba	0.34	2	0.58	
Pseudotolithus typus	0.14	2	0.24	
Total	58.18		99.99	

PROJECT STATION: 3132  
 DATE: 21/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 745 Long E 1248  
 start stop duration  
 TIME :09:31:20 10:01:56 31 (min) Purpose code: 3  
 LOG :3871.44 3873.02 1.56 Area code : 3  
 FDEPTH: 71 73 GearCond code:  
 BDEPTH: 71 73 Validity code:  
 Towing dir: 330° Wire out: 210 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 152.15 CATCH/HOUR: 294.48

PROJECT STATION: 3129  
 DATE: 21/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 745 Long E 1230  
 start stop duration  
 TIME :01:43:33 02:13:33 30 (min) Purpose code: 3  
 LOG :3817.78 3819.34 1.51 Area code : 3  
 FDEPTH: 738 730 GearCond code:  
 BDEPTH: 738 730 Validity code:  
 Towing dir: 350° Wire out: 1850 m Speed: 30 kn\*10  
 Sorted: 23 Kg Total catch: 232.77 CATCH/HOUR: 465.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	128.80	28560	27.67	
Carcharhinus limbatus	100.00	2	21.48	
Yarella blackfordi	53.12	1456	11.41	
Hoplostethus mediterraneus	40.48	1440	8.70	
Talismania bifurcata	28.96	1456	6.22	
C R U S T A C E A N S	28.16	1264	6.05	
Triplophus hemingi	16.64	2640	3.57	
Lamprogrammus exutus	16.12	96	3.51	
Physiculus sp	16.00	608	3.44	
Nezumia aequalis	15.20	320	3.27	
Dicrolene sp.	6.08	368	1.31	
Merluccius polli	4.26	6	0.92	
OCTOPOTEUTHIDAE	2.56	16	0.55	
Illex coindetii	1.76	16	0.38	
Aristeus varidens	1.28	48	0.27	
Solenocera africana	0.80	32	0.17	
Stomias boa boa	0.80	32	0.17	
Bathyroconger vicinus	0.80	32	0.17	
Etmopterus spinax	0.80	4	0.17	
MELANOSTOMIATIDAE	0.64	16	0.14	
Bathygadus macrops	0.64	32	0.14	
Dibranchius atlanticus	0.64	48	0.14	
Synaphobranchus kaupii	0.48	16	0.10	
Heterocarpus ensifer	0.16	16	0.03	
Nemichthys scolopaceus	0.16	16	0.03	
Total	465.54		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	171.87	281	58.36	
Trachurus trecae, juvenile	78.19	5025	26.55	6624
Sardinella aurita	18.10	207	6.15	6627
Pagellus bellottii	10.99	122	3.73	6625
Decapterus rhonchus	8.71	281	2.96	6626
Sepia officinalis hierredda	4.18	4	1.42	
Brachydeuterus auritus	1.03	8	0.35	
Dentex congoensis	0.85	19	0.29	
Chelidonichthys gabonensis	0.39	2	0.13	
Illex coindetii	0.15	2	0.05	
Total	294.48		99.99	

PROJECT STATION: 3133  
 DATE: 21/ 3/03 GEAR TYPE: BT No:15 POSITION: Lat S 739 Long E 1246  
 start stop duration  
 TIME :11:05:26 11:35:53 30 (min) Purpose code: 3  
 LOG :3880.22 3881.87 1.64 Area code : 3  
 FDEPTH: 87 88 GearCond code:  
 BDEPTH: 87 88 Validity code:  
 Towing dir: 320° Wire out: 240 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 59.87 CATCH/HOUR: 119.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	68.00	1102	56.79	6629
Dentex angolensis	15.20	288	12.69	6632
Trachurus trecae, juvenile	8.08	628	6.75	6631
Pagellus bellottii	7.60	96	6.35	6628
Fistularia petimba	7.00	16	5.85	
Trichiurus lepturus	3.98	6	3.32	
Raja miraletus	3.94	8	3.29	
Sepiella ornata	1.62	4	1.35	
Brachydeuterus auritus	1.12	8	0.94	
Mustelus mustelus	1.04	2	0.87	
Illex coindetii	0.88	16	0.73	
Sardinella aurita	0.84	52	0.70	6630
Lepidotrigla cadmani	0.34	10	0.28	
Citharus linguatula	0.10	2	0.08	
Total	119.74		99.99	

PROJECT STATION: 3130  
 DATE: 21/ 3/03 GEAR TYPE: BT No: 8 POSITION: Lat S 734 Long E 1256  
 start stop duration  
 TIME :05:48:28 06:17:43 29 (min) Purpose code: 3  
 LOG :3850.55 3852.04 1.50 Area code : 3  
 FDEPTH: 28 28 GearCond code:  
 BDEPTH: 28 28 Validity code:  
 Towing dir: 340° Wire out: 130 m Speed: 30 kn\*10  
 Sorted: 102 Kg Total catch: 958.94 CATCH/HOUR: 1984.01

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1269.81	13171	64.00	6623
Pseudotolithus typus	287.07	230	14.47	
Ilisha africana	183.72	5979	9.26	
Pteroscion pelli	32.92	2274	1.66	
Selene dorsalis	31.78	422	1.60	
Trichiurus lepturus	29.09	383	1.47	
Pomadasy incisus	20.69	116	1.04	
Epinephelus aeneus	18.83	2	0.95	
Galeoides decadactylus	17.61	95	0.89	
Dasyatis margarita	15.31	21	0.77	
Dasyatis marmorata	11.48	21	0.58	
Chloroscombrus chrysurus	10.72	401	0.54	
Pomadasy peroteti	10.72	21	0.54	
Penaeus notialis	10.34	383	0.52	
Pseudotolithus epiperus	9.31	19	0.47	
Cymoglossus canariensis	8.23	39	0.41	
Fanulirus regius	5.59	12	0.28	
Centrarchops chapini	5.36	21	0.27	
Drepane africana	3.64	21	0.18	
Scyllarides hecklotzii	1.80	4	0.09	
Total	1984.02		99.99	

PROJECT STATION: 3134  
 DATE: 21/ 3/03 GEAR TYPE: 1T No:15 POSITION: Lat S 742 Long E 1238  
 start stop duration  
 TIME :13:08:30 13:38:59 30 (min) Purpose code: 3  
 LOG :3891.29 3892.94 1.65 Area code : 3  
 FDEPTH: 116 116 GearCond code: 8  
 BDEPTH: 116 116 Validity code: 1  
 Towing dir: 330° Wire out: 325 m Speed: 30 kn\*10  
 Sorted: 96 Kg Total catch: 815.11 CATCH/HOUR: 1630.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	888.26	2840	54.49	6637
Dentex barnardi	225.26	630	13.82	6636
Pagellus bellottii	175.96	16082	10.79	6635
Dentex angolensis	145.36	562	8.92	6634
Dentex gibbosus	56.28	52	3.45	
Boops boops	53.72	2058	3.30	
Trachurus trecae, juvenile	20.92	1020	1.28	6633
Atractoscion aequidens	19.22	18	1.12	
Spicara alta	18.20	392	1.12	
Anthias anthias	18.02	52	1.11	
Zeus faber	5.28	18	0.32	
Dentex congoensis	3.74	34	0.23	
Total	1630.22		100.01	

PROJECT STATION: 3135  
 DATE: 22/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 744 Long E 1234  
 start stop duration  
 TIME 09:14:39 09:19:38 5 (min) Purpose code: 3  
 LOG 4026.16 4026.42 0.25 Area code : 3  
 FDEPTH: 264 265 GearCond code:  
 BDEPTH: 264 265 Validity code:  
 Towing dir: 330ø Wire out: 710 m Speed: 30 kn\*10

Sorted: 78 Kg Total catch: 1254.16 CATCH/HOUR: 15049.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	14304.00	1237848	95.04	
Zenopsis conchifer	368.64	384	2.45	
MYCTOPHIDAE	155.52	39588	1.03	
Pterothrissus belloci	77.76	768	0.52	
Parapenaeus longirostris, fem.	51.84	8064	0.34	6639
Parapenaeus longirostris, male	44.16	8832	0.29	6638
Merluccius polli	30.72	768	0.20	
Chlorophthalmus atlanticus	17.28	1344	0.11	
Total	15049.92		99.98	

PROJECT STATION: 3139  
 DATE: 23/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 718 Long E 1242  
 start stop duration  
 TIME 10:00:51 11:40:48 30 (min) Purpose code: 3  
 LOG 4096.47 4098.00 1.51 Area code : 3  
 FDEPTH: 42 42 GearCond code:  
 BDEPTH: 42 42 Validity code:  
 Towing dir: 330ø Wire out: 130 m Speed: 30 kn\*10

Sorted: Kg Total catch: 95.25 CATCH/HOUR: 190.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex canariensis	61.30	182	32.18	6641
Pagrus caeruleostictus	37.50	76	19.69	6642
Lutjanus agennes	24.90	8	13.07	
Seriola lalandi	15.20	2	7.98	
Alectis ciliaris	9.56	2	5.02	
Balistes punctatus	7.52	8	3.95	
Sparus pagrus africanus *	7.30	4	3.83	
Bodianus speciosus	4.64	2	2.44	
Sepiella ornata	3.02	2	1.59	
Raja miraletus	3.00	4	1.57	
Rhinobatos albomaculatus	2.40	2	1.26	
Pagellus bellottii	1.64	16	0.86	
Pseudupeneus prayensis	1.62	16	0.85	
Boops boops	1.56	700	0.82	
Chilomycterus spinosus mauret.	1.50	4	0.79	
Dentex barnardi	1.08	6	0.57	
Epinephelus alexandrinus *	1.04	2	0.55	
Zeus faber	0.92	2	0.48	
Scyllarides herklotsii	0.92	2	0.48	
Sphyrna guachancho	0.90	2	0.47	
Citharus stymphlicus	0.80	6	0.42	
Fistularia petimba	0.72	8	0.38	
Cephalopholis taeniops	0.62	2	0.33	
Torpedo torpedo	0.52	2	0.27	
Chaetodon robustus	0.22	4	0.12	
Decapterus rhonchus	0.10	8	0.05	
Total	190.50		100.02	

PROJECT STATION: 3140  
 DATE: 23/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 721 Long E 1235  
 start stop duration  
 TIME 11:40:19 13:21:28 29 (min) Purpose code: 3  
 LOG 4106.28 4108.04 1.77 Area code : 3  
 FDEPTH: 65 60 GearCond code:  
 BDEPTH: 65 60 Validity code:  
 Towing dir: 355ø Wire out: 180 m Speed: 30 kn\*10

Sorted: Kg Total catch: 30.37 CATCH/HOUR: 62.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	49.76	768	79.20	6643
Sparus pagrus africanus *	3.04	2	4.84	
Sepiella ornata	2.59	2	4.12	
Trichiurus lepturus	2.19	4	3.49	
Caranx hippos	2.09	2	3.33	
Dentex barnardi	1.18	8	1.88	
Zeus faber	0.62	2	0.99	
Hemibrops greyi	0.58	27	0.92	
Fistularia petimba	0.46	2	0.73	
Arnoglossus capensis	0.40	21	0.16	
Saurida brasiliensis	0.08	19	0.13	
Sepia officinalis hierredda	0.08	2	0.13	
Decapterus rhonchus	0.06	2	0.10	
Total	62.81		100.02	

PROJECT STATION: 3141  
 DATE: 23/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 723 Long E 1234  
 start stop duration  
 TIME 15:54:43 16:24:43 30 (min) Purpose code: 3  
 LOG 4117.75 4119.40 1.70 Area code : 3  
 FDEPTH: 87 86 GearCond code:  
 BDEPTH: 87 86 Validity code:  
 Towing dir: 87ø Wire out: 240 m Speed: 30 kn\*10

Sorted: Kg Total catch: 17.98 CATCH/HOUR: 35.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus pagrus	8.80	16	24.47	
Zeus faber	4.02	16	11.18	
Dentex barnardi	3.76	20	10.46	
Pagrus caeruleostictus	3.62	4	10.07	
Dentex angolensis	2.82	12	7.84	
Atractoscion aequidens	2.52	2	7.01	
Fistularia petimba	1.60	6	4.45	
Trichiurus lepturus	1.58	2	4.39	
Pagellus bellottii	1.22	10	3.67	
Pagrus africanus	1.22	2	3.39	
Octopus vulgaris	1.20	2	3.34	
Scorpaena stephanica	1.20	2	3.34	
Citharus linguatula	0.86	16	2.39	
Dentex congoensis	0.58	6	1.61	
Chelidonicichthys gabonensis	0.56	8	1.56	
Chelidonicichthys capensis	0.28	2	0.78	
Anthias anthias	0.02	2	0.06	
Total	35.96		100.01	

PROJECT STATION: 3137  
 DATE: 22/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 747 Long E 1232  
 start stop duration  
 TIME 11:41:34 13:20:04 30 (min) Purpose code: 3  
 LOG 4045.19 4046.72 1.51 Area code : 3  
 FDEPTH: 648 646 GearCond code:  
 BDEPTH: 648 646 Validity code:  
 Towing dir: 325ø Wire out: 1650 m Speed: 30 kn\*10

Sorted: 633 Kg Total catch: 6315.00 CATCH/HOUR: 12630.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	317.70	15576	55.41	
Trichiurus lepturus	169.10	240	29.53	
Laemonema laureysi	21.80	340	3.80	
Nematocarcinus africanus	21.00	4420	3.66	
Benthodesmus tenuis	14.20	640	2.48	
Pterothrissus belloci	12.00	60	2.09	
CHAUNACIDAE	4.20	40	0.73	
Aristeus varidens	3.80	360	0.66	
Illex coindetii	3.40	20	0.59	
Triplophus hemingi	3.20	640	0.56	
MYCTOPHIDAE	1.60	420	0.28	
Chlorophthalmus atlanticus	1.20	20	0.21	
Total	573.40		100.00	

PROJECT STATION: 3138  
 DATE: 23/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 715 Long E 1246  
 start stop duration  
 TIME 09:43:02 10:12:53 30 (min) Purpose code: 3  
 LOG 4085.37 4086.89 1.51 Area code : 3  
 FDEPTH: 25 26 GearCond code:  
 BDEPTH: 25 26 Validity code:  
 Towing dir: 330ø Wire out: 120 m Speed: 30 kn\*10

Sorted: Kg Total catch: 77.75 CATCH/HOUR: 155.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	55.50	116	35.69	6640
Lutjanus agennes	38.00	6	24.44	
Scomberomorus tritor	19.40	22	12.48	
Zanobatus schoenleinii	12.10	10	7.78	
Balistes capricornis	5.22	6	3.36	
Sphyrna guachancho	4.56	6	2.93	
Selene dorsalis	3.40	56	2.19	
Rhinobatos albomaculatus	2.80	2	1.80	
Lutjanus gorensis	2.46	2	1.58	
Leptocharias smithii	2.40	2	1.54	
Fistularia petimba	1.96	4	1.26	
Dentex canariensis	1.74	4	1.12	
Pagellus bellottii	1.42	2	0.91	
Dentex gibbosus	1.38	4	0.89	
Scyllarides herklotsii	1.36	4	0.87	
Sphyrna sp.	1.22	554	0.78	
Chaetodipterus gorensis	0.58	2	0.37	
Total	155.50		99.99	

PROJECT STATION:3142  
 DATE:23/ 3/03 GEAR TYPE: BT No: 2 POSITION:Lat S 724  
 start stop duration Long E 1228  
 TIME :18:05:32 18:35:10 30 (min) Purpose code: 3  
 LOG :4129.22 4130.74 1.51 Area code : 3  
 FDEPTH: 114 113 GearCond.code:  
 BDEPTH: 114 113 Validity code:  
 Towing dir: 340ø Wire out: 320 m Speed: 30 kn\*10

Sorted: 29 Kg Total catch: 121.82 CATCH/HOUR: 243.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chelidomichthys capensis	78.06	1182	32.04	
Pagellus bellottii	42.08	988	17.27	6645
Rhinobatos albomaculatus	24.50	6	10.06	
CONGRIDAE	14.40	1434	5.91	
Dentex congoensis	13.72	442	5.63	6644
Citharus linguatula	13.16	584	5.40	
Dentex angolensis	12.20	162	5.01	6647
Brotula barbata	11.50	12	4.72	
Trachurus trecae, juvenile	7.80	540	3.20	6646
Arnoglossus imperialis	6.36	932	2.61	
Parapandalus narval	4.00	2554	1.64	
Spicara alta	3.86	532	1.58	
Uranoscopus cadenati	3.36	36	1.38	
Sepia orbignyana	3.08	36	1.26	
Raja miraletus	2.28	4	0.94	
Scorpaena stephanica	2.00	6	0.82	
Pterothrissus belloci	0.50	8	0.21	
Octopus vulgaris	0.50	8	0.21	
Vanstraelenia chirophthalmus	0.28	8	0.11	
Total	243.64		100.00	

PROJECT STATION:3145  
 DATE:24/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 734  
 start stop duration Long E 1213  
 TIME :02:18:12 02:48:17 30 (min) Purpose code: 3  
 LOG :4172.05 4173.68 1.61 Area code : 3  
 FDEPTH: 726 727 GearCond.code:  
 BDEPTH: 726 727 Validity code:  
 Towing dir: 85ø Wire out:1850 m Speed: 30 kn\*10

Sorted: 13 Kg Total catch: 155.89 CATCH/HOUR: 311.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus atlanticus	144.60	5040	46.38	
Lamprogrammus exutus	39.72	108	12.74	
Yarella blackfordi	32.04	804	10.28	
Talismania longifilis	28.80	768	9.24	
C R U S T A C E A N S	23.76	1572	7.62	
Coelorhynchus coelorhynchus	12.84	264	4.12	
Merluccius polli	11.20	20	3.59	6652
Triplophus hemingi	5.28	648	1.69	
Stomias sp.	3.00	72	0.96	
Halosaurus ovenii	1.44	12	0.46	
Gadella maraldi	1.32	24	0.42	
Deania calcea	1.20	6	0.38	
Lophodes kempi	1.10	2	0.35	
Physiculus sp.	0.96	72	0.31	
Aristeus varidens	0.96	48	0.31	
Bassanago albescens	0.72	24	0.23	
Solenocera africana	0.72	84	0.23	
Bathyrcoongor vacinus	0.60	12	0.19	
GONOSTOMATIDAE	0.48	12	0.15	
Etmopterus pusillus	0.40	2	0.13	
Ectreposebastes imus	0.36	12	0.12	
MELANOSTOMATIDAE	0.12	12	0.04	
Dibranchus atlanticus	0.12	12	0.04	
Etmopterus spinax	0.04	2	0.01	
Total	311.78		99.99	

PROJECT STATION:3143  
 DATE:23/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 728  
 start stop duration Long E 1219  
 TIME :21:19:22 21:49:24 30 (min) Purpose code: 3  
 LOG :4147.79 4149.33 1.52 Area code : 3  
 FDEPTH: 429 422 GearCond.code:  
 BDEPTH: 429 422 Validity code:  
 Towing dir: 255ø Wire out:1150 m Speed: 30 kn\*10

Sorted: 20 Kg Total catch: 139.40 CATCH/HOUR: 278.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	198.00	864	71.02	6648
Nematocarcinus africanus	21.24	32634	7.62	
Trichurus lepturus	20.80	728	7.46	
Aristeus varidens, female	7.26	774	2.60	6650
GALATHEIDAE *	5.04	396	1.81	
Dibranchus atlanticus	4.86	342	1.74	
Laemonema laureysi	3.60	144	1.29	
Pterothrissus belloci	3.60	18	1.29	
Aristeus varidens, male	3.42	378	1.23	6649
Gadella imberbis	3.06	144	1.10	
Hymenocephalus italicus	3.06	396	1.10	
Illex coindetii	2.34	36	0.84	
Parapenaeus longirostris	0.90	90	0.32	
Halosaurus ovenii	0.72	18	0.26	
Solenocera africana	0.72	54	0.26	
MYCTOPHIDAE	0.18	504	0.06	
Total	278.80		100.00	

PROJECT STATION:3146  
 DATE:24/ 3/03 GEAR TYPE: BT No: 2 POSITION:Lat S 705  
 start stop duration Long E 1236  
 TIME :07:03:22 07:32:57 30 (min) Purpose code: 3  
 LOG :4212.52 4214.05 1.50 Area code : 3  
 FDEPTH: 38 38 GearCond.code:  
 BDEPTH: 38 38 Validity code:  
 Towing dir: 330ø Wire out: 120 m Speed: 30 kn\*10

Sorted: Kg Total catch: 8.38 CATCH/HOUR: 16.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus auriga	6.16	18	36.75	
Dentex gibbosus	2.82	10	16.83	
Pseudupeneus prayensis	2.66	12	15.87	
Pagellus bellottii	2.24	14	13.37	
Sepia officinalis hierredda	1.64	2	9.79	
Xyrichtys novacula	0.80	8	4.77	
Psettodes belcheri	0.44	4	2.63	
Total	16.76		100.01	

PROJECT STATION:3147  
 DATE:24/ 3/03 GEAR TYPE: BT No: POSITION:Lat S 707  
 start stop duration Long E 1232  
 TIME :08:50:54 09:09:40 19 (min) Purpose code: 3  
 LOG :4222.86 4223.81 0.95 Area code : 3  
 FDEPTH: 48 48 GearCond.code:  
 BDEPTH: 48 48 Validity code:  
 Towing dir: 330ø Wire out: 150 m Speed: 30 kn\*10

Sorted: Kg Total catch: 14.06 CATCH/HOUR: 44.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	15.82	16	35.63	
Rhinobatos albomaculatus	7.61	3	17.14	
Epinephelus alexandrinus *	4.29	6	9.66	
Fistularia petimba	4.07	3	9.17	
Leptocharias smithii	4.01	3	9.03	
Seriola carpenteri	3.79	3	8.54	
Raja miraletus	1.80	3	4.05	
Dentex barnardi	1.71	6	3.85	
Anthias anthias	1.07	57	2.41	
Boops boops	0.22	44	0.50	
Total	44.39		99.98	

PROJECT STATION:3144  
 DATE:24/ 3/03 GEAR TYPE: BT No:15 POSITION:Lat S 729  
 start stop duration Long E 1216  
 TIME :23:45:30 00:15:32 30 (min) Purpose code: 3  
 LOG :4159.24 4160.88 1.59 Area code : 3  
 FDEPTH: 519 525 GearCond.code:  
 BDEPTH: 519 525 Validity code:  
 Towing dir: 265ø Wire out:1370 m Speed: 30 kn\*10

Sorted: 26 Kg Total catch: 133.25 CATCH/HOUR: 266.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	134.00	48960	50.28	
Centrophorus granulosus	23.50	10	8.82	
Benthodesmus tenuis	22.40	810	8.41	
Stomias boa boa	16.70	330	6.27	
Triplophus hemingi	14.10	1340	5.29	
Lamprogrammus exutus	12.40	40	4.65	
C R U S T A C E A N S	11.60	860	4.35	
Yarella blackfordi	9.60	250	3.60	
Physiculus sp.	6.70	260	2.51	
Aristeus varidens, female	4.70	270	1.76	6651
Hoplostethus mediterraneus	3.00	130	1.13	
Merluccius polli	1.90	10	0.71	
Dibranchus atlanticus	1.80	170	0.68	
MELANOSTOMATIDAE	0.70	20	0.26	
Gonostoma elongatum	0.70	50	0.26	
Bathygadus sp.	0.60	10	0.23	
Talismania bifurcata	0.60	80	0.23	
GONOSTOMATIDAE	0.30	10	0.11	
Alepocephalus sp.	0.30	10	0.11	
Coelorhynchus coelorhynchus	0.30	20	0.11	
Nemichthys scolopaceus	0.30	10	0.11	
Etmopterus princeps	0.30	10	0.11	
Total	266.50		99.99	

PROJECT STATION:3148  
 DATE:24/ 3/03 GEAR TYPE: BT No: 2 POSITION:Lat S 709  
 start stop duration Long E 1227  
 TIME :10:19:11 10:48:57 30 (min) Purpose code: 3  
 LOG :4232.06 4233.57 1.50 Area code : 3  
 FDEPTH: 75 77 GearCond.code:  
 BDEPTH: 75 77 Validity code:  
 Towing dir: 330ø Wire out: 220 m Speed: 30 kn\*10

Sorted: 126 Kg Total catch: 254.26 CATCH/HOUR: 508.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	285.60	2572	56.16	6654
Dentex barnardi	60.00	304	11.80	6656
Dentex congoensis	53.40	792	10.50	6653
Sphyræna sphyraena	42.64	184	8.39	
Pomadoury incisivus	27.00	192	5.11	6655
Dentex gibbosus	22.40	84	4.40	
Umbrina canariensis	6.00	16	1.18	
Octopus vulgaris	3.00	2	0.59	
Zeus faber	2.84	8	0.56	
Raja miraletus	2.40	4	0.47	
Pseudupeneus prayensis	1.24	20	0.24	
Pagrus caeruleostictus	1.00	8	0.20	
Chelidomichthys gabonensis	0.96	8	0.19	
Anthias anthias	0.04	4	0.01	
Total	508.52		100.00	

PROJECT STATION: 3149  
 DATE: 24/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 711 Long E 1217  
 start stop duration  
 TIME : 12:21:26 12:51:42 30 (min) Purpose code: 3  
 LOG : 4245.24 4246.91 1.65 Area code : 3  
 FDEPTH: 120 119 GearCond code:  
 BDEPTH: 120 119 Validity code:  
 Towing dir: 315ø Wire out: 340 m Speed: 30 kn\*10

Sorted: Kg Total catch: 42.25 CATCH/HOUR: 84.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	22.20	138	26.27	6658
Chelidonichthys gabonensis	18.40	168	21.78	
Sepiella ornata	9.58	16	11.34	
Trachurus trecae, juvenile	5.82	390	6.89	6659
Citharus linguatula	1.92	88	4.64	
Leptocharias smithii	3.60	2	4.26	
Brotula barbata	3.06	2	3.62	
Pomadasys incisus	3.00	20	3.55	
Pagellus bellottii	2.88	14	3.41	
Sphyræna sphyraena	2.68	10	3.17	
Zeus faber	2.60	12	3.08	
Trichiurus lepturus	2.30	4	2.72	
Fistularia petimba	0.90	2	1.07	
Raja miraletus	0.64	2	0.76	
Saurida brasiliensis	0.64	78	0.76	
Dentex congoensis	0.42	6	0.50	
Peristedion cataphractum	0.40	10	0.47	
Pterothrissus belloci	0.38	2	0.45	
Cetopus vulgaris	0.36	2	0.43	
Syacium micrurum	0.32	20	0.38	
Illex coindetii	0.14	4	0.17	
Scorpaena stephanica	0.08	2	0.09	
Monolepis microstoma	0.08	6	0.09	
Anthias anthias	0.06	4	0.07	
Uranoscopus polli	0.04	2	0.05	
Total	84.50		100.02	

PROJECT STATION: 3152  
 DATE: 24/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 721 Long E 1202  
 start stop duration  
 TIME : 19:05:48 19:36:00 30 (min) Purpose code: 3  
 LOG : 4280.90 4282.50 1.60 Area code : 3  
 FDEPTH: 527 529 GearCond code:  
 BDEPTH: 527 529 Validity code:  
 Towing dir: 330ø Wire out: 1360 m Speed: 30 kn\*10

Sorted: 28 Kg Total catch: 69.67 CATCH/HOUR: 139.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	35.76	8938	25.66	
Merluccius polli	21.76	56	15.62	6664
GALATHEIDAE *	16.30	1438	11.70	
Triplophus hemingi	15.10	2904	10.84	
Trichiurus lepturus	11.76	402	8.44	
Ommastrephes bartrami	6.76	40	4.85	
Gonostoma denudata	6.16	150	4.42	
Melanostomias sp.	4.80	80	3.44	
Aristeus varidens, female	4.36	240	3.13	6663
Lamprogrammus exutus	4.00	16	2.87	
Chaunax pictus	2.80	16	2.01	
Gadella imberbis	1.96	56	1.41	
Laemonema laureysi	1.76	110	1.26	
Todaropsis eblanae	1.56	10	1.12	
Aristeus varidens, male	1.16	140	0.83	6662
Hoplostethus cadenati	0.96	46	0.69	
Malacocephalus laevis	0.96	6	0.69	
MYCTOPHIDAE	0.64	586	0.46	
Fleisopeneus edwardsianus	0.36	6	0.26	
CONGRIDAE	0.26	6	0.19	
Xenodermichthys copei	0.16	10	0.11	
Total	139.34		100.00	

PROJECT STATION: 3153  
 DATE: 24/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 709 Long E 1151  
 start stop duration  
 TIME : 22:09:24 22:39:05 30 (min) Purpose code: 3  
 LOG : 4300.44 4302.01 1.57 Area code : 3  
 FDEPTH: 636 644 GearCond code:  
 BDEPTH: 636 644 Validity code:  
 Towing dir: 325ø Wire out: 1640 m Speed: 30 kn\*10

Sorted: 29 Kg Total catch: 156.27 CATCH/HOUR: 312.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus atlanticus	106.50	4470	34.08	
Coelorrhinchus coelorrhinchus	40.60	11040	12.99	
Lamprogrammus exutus	35.10	130	11.23	
Talismania bifurcata	31.60	1090	10.11	
Triplophus hemingi	22.50	3100	7.20	
C R U S T A C E A N S	15.40	910	4.93	
Lophysus vailanti	13.10	4	4.19	
Yarella blackfordi	9.70	270	3.10	
Centrophorus granulosus	7.64	2	2.44	
Physiculus sp.	6.40	620	2.05	
Stomias boa boa	6.40	110	2.05	
OPHIDIIDAE	5.30	30	1.70	
Merluccius polli	4.10	8	1.31	
Gonostoma denudata	2.30	30	0.74	
Bassanago albacoreus	1.30	10	0.42	
Chlamydogelachus anguineus	1.20	2	0.38	
Etmopterus pusillus	1.20	8	0.38	
Bathyrroconger vicinus	0.90	20	0.29	
Benthodesmus tenuis	0.60	10	0.19	
Etmopterus spinax	0.20	4	0.06	
Solenocera africana	0.20	10	0.06	
MELANOCETIDAE	0.20	30	0.06	
Dibranchius atlanticus	0.10	10	0.03	
Total	312.54		99.99	

PROJECT STATION: 3150  
 DATE: 24/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 715 Long E 1209  
 start stop duration  
 TIME : 14:28:01 14:57:59 30 (min) Purpose code: 3  
 LOG : 4258.29 4259.79 1.50 Area code : 3  
 FDEPTH: 236 235 GearCond code:  
 BDEPTH: 236 235 Validity code:  
 Towing dir: 320ø Wire out: 650 m Speed: 30 kn\*10

Sorted: Kg Total catch: 40.37 CATCH/HOUR: 80.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	51.60	152	63.91	
Dentex angolensis	15.60	52	19.32	6660
Brotula barbata	10.90	10	13.50	
Parapeneus longirostris	1.04	178	1.29	
Illex coindetii	0.84	8	1.04	
Pterothrissus belloci	0.64	6	0.79	
Nephropsis atlantica	0.12	10	0.15	
Total	80.74		100.00	

PROJECT STATION: 3151  
 DATE: 24/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 719 Long E 1203  
 start stop duration  
 TIME : 16:49:58 17:21:29 30 (min) Purpose code: 3  
 LOG : 4270.91 4272.58 1.67 Area code : 3  
 FDEPTH: 430 430 GearCond code:  
 BDEPTH: 430 430 Validity code:  
 Towing dir: 250ø Wire out: 1170 m Speed: 30 kn\*10

Sorted: 30 Kg Total catch: 200.32 CATCH/HOUR: 400.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	123.50	612	30.83	6661
Trichiurus lepturus	68.90	234	17.20	
Chaunax pictus	40.56	494	10.12	
Hymenocephalus italicus	30.68	1680	7.66	
Nematocarcinus africanus	28.86	8898	7.20	
Laemonema laureysi	21.84	260	5.45	
GALATHEIDAE *	18.72	1326	4.67	
Leptocharias smithii	15.10	4	3.77	
Gadella imberbis	12.62	390	3.15	
Illex coindetii	12.36	130	3.09	
Aristeus varidens, male	5.98	624	1.49	
Synagrops microlepis	5.72	234	1.43	
Todaropsis eblanae	5.46	40	1.36	
Parapeneus longirostris	1.70	182	0.42	
Dibranchius atlanticus	1.30	170	0.32	
Hoplostethus cadenati	1.18	18	0.29	
Epigonus telescopus	1.18	14	0.29	
CONGRIDAE	1.04	26	0.26	
Scorpaena sp.	0.92	92	0.23	
Halosaurus ovenii	0.78	14	0.19	
Peristedion cataphractum	0.66	14	0.16	
Solenocera africana	0.66	326	0.16	
Nezumia aequalis	0.52	26	0.13	
Aristeus varidens, female	0.40	40	0.10	
Total	400.64		99.97	

PROJECT STATION: 3154  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 706 Long E 1156  
 start stop duration  
 TIME : 00:24:05 00:48:32 24 (min) Purpose code: 3  
 LOG : 4311.58 4312.86 1.26 Area code : 3  
 FDEPTH: 318 320 GearCond code:  
 BDEPTH: 318 320 Validity code:  
 Towing dir: 330ø Wire out: 830 m Speed: 30 kn\*10

Sorted: 22 Kg Total catch: 111.38 CATCH/HOUR: 278.45

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	171.25	363	61.50	
Chlorophthalmus agassizii	76.88	92963	27.61	
Parapeneus longirostris	7.75	1025	2.78	
Pterothrissus belloci	7.75	50	2.78	
Laemonema laureysi	4.88	63	1.75	
Merluccius polli	2.08	15	0.75	
Malacocephalus laevis	1.63	25	0.59	
C R U S T A C E A N S	1.50	163	0.54	
Peristedion cataphractum	1.25	63	0.45	
Nezumia aequalis	0.75	38	0.27	
Illex coindetii	0.63	13	0.23	
Caranx hippos	0.63	13	0.23	
Scorpaena normani	0.50	13	0.18	
MYCTOPHIDAE	0.50	225	0.18	
Benthodesmus tenuis	0.25	25	0.09	
Parapandalus narval	0.25	63	0.09	
Total	278.48		100.02	

PROJECT STATION: 3155  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 656 Long E 1213  
 start stop duration  
 TIME :05:45:21 06:14:58 30 (min) Purpose code: 3  
 LOG :4336.78 4338.32 1.53 Area code : 3  
 FDEPTH: 81 81 GearCond.code:  
 BDEPTH: 81 81 Validity code:  
 Towing dir: 320° Wire out: 240 m Speed: 30 kn\*10

Sorted: Kg Total catch: 101.76 CATCH/HOUR: 203.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	68.50	808	33.66	6668
Dentex angolensis	50.30	262	24.72	6665
Pagellus bellottii	27.80	360	13.66	6667
Rhinobatos albomaculatus	21.80	2	10.71	
Brachydeuterus auritus	10.00	72	4.91	6666
Epiplatys aeneus	6.10	4	3.00	
Trigla lyra	3.14	34	1.54	
Sepia officinalis hierredda	2.82	2	1.39	
Zeus faber	2.48	2	1.22	
Fistularia petimba	2.26	8	1.11	
Trichurus lepturus	1.94	2	0.95	
Pseudupeneus prayensis	1.50	8	0.74	
Citharus linguatula	1.46	34	0.72	
Dentex gibbosus	1.14	4	0.56	
Priacanthus arenatus	0.54	2	0.27	
Dentex barnardi	0.50	6	0.25	
Trachurus trecae	0.44	4	0.22	
Cynoglossus canariensis	0.42	2	0.21	
Chelidonichthys gabonensis	0.38	4	0.19	
Total		203.52	100.03	

PROJECT STATION: 3159  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 704 Long E 1200  
 start stop duration  
 TIME :12:50:43 13:21:03 30 (min) Purpose code: 3  
 LOG :4374.57 4376.22 1.81 Area code : 3  
 FDEPTH: 151 151 GearCond.code:  
 BDEPTH: 151 151 Validity code:  
 Towing dir: 330° Wire out: 420 m Speed: 30 kn\*10

Sorted: 87 Kg Total catch: 87.25 CATCH/HOUR: 174.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	95.20	3106	54.56	6682
Dentex angolensis	48.30	214	27.68	6681
Dentex congoensis	6.98	80	4.00	6680
Spicara alta	6.56	118	3.76	
Zeus faber	4.82	2	2.76	
Citharus linguatula	2.58	50	1.48	
Dentex macrocephalus	2.58	12	1.48	
Chelidonichthys gabonensis	2.32	34	1.33	
Squatina oculata	1.00	2	0.57	
Torpedo torpedo	1.00	2	0.57	
Fistularia petimba	1.00	2	0.57	
Pterothrissus belloci	0.74	8	0.42	
Illex coindetii	0.68	18	0.39	
Peristedion cataphractum	0.36	8	0.21	
Saurida brasiliensis	0.20	30	0.11	
Sepia officinalis hierredda	0.18	2	0.10	
Total		174.50	99.99	

PROJECT STATION: 3156  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 658 Long E 1212  
 start stop duration  
 TIME :07:11:23 08:01:17 30 (min) Purpose code: 3  
 LOG :4345.64 4347.24 1.59 Area code : 3  
 FDEPTH: 87 87 GearCond.code:  
 BDEPTH: 87 87 Validity code:  
 Towing dir: 330° Wire out: 260 m Speed: 30 kn\*10

Sorted: Kg Total catch: 156.41 CATCH/HOUR: 312.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	157.00	874	50.19	6670
Umbrina canariensis	71.30	142	22.79	6669
Dentex canariensis	16.92	102	5.41	6674
Dentex congoensis	12.80	184	4.09	6671
Dentex angolensis	12.50	92	4.00	6672
Dentex barnardi	12.26	44	3.92	6673
Dentex gibbosus	8.92	28	2.85	6675
Leptochthys smithii	3.80	2	1.21	
Rhinobatos albomaculatus	3.20	2	1.02	
Chelidonichthys gabonensis	2.22	22	0.71	
Brachydeuterus auritus	1.92	4	0.61	
Sepia orbignyana	1.88	6	0.60	
Fistularia petimba	1.58	6	0.51	
Pagrus caeruleostictus	1.44	2	0.46	
Pseudupeneus prayensis	1.42	10	0.45	
Zeus faber	1.36	4	0.43	
Chaetodon hoeferi	0.88	6	0.28	
Priacanthus arenatus	0.84	14	0.27	
Citharus linguatula	0.58	20	0.19	
Total		312.82	99.99	

PROJECT STATION: 3160  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 705 Long E 1157  
 start stop duration  
 TIME :14:36:15 14:51:18 15 (min) Purpose code: 3  
 LOG :4382.63 4383.40 0.77 Area code : 3  
 FDEPTH: 276 271 GearCond.code:  
 BDEPTH: 276 271 Validity code:  
 Towing dir: 335° Wire out: 740 m Speed: 30 kn\*10

Sorted: Kg Total catch: 32.08 CATCH/HOUR: 128.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	82.64	3236	64.40	
Bembrops heterurus	20.32	388	15.84	
Pterothrissus belloci	20.32	4	15.84	
Parapenaeus longirostris	2.80	488	2.18	
Merluccius polli	1.28	20	1.00	
Ariomma bondi	0.64	8	0.50	
C R U S T A C E A N S	0.24	64	0.19	
Dicologlossa cuneata	0.08	4	0.06	
Total		128.32	100.01	

PROJECT STATION: 3161  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 652 Long E 1150  
 start stop duration  
 TIME :16:56:17 17:22:03 26 (min) Purpose code: 3  
 LOG :4399.23 4400.60 1.37 Area code : 3  
 FDEPTH: 268 267 GearCond.code:  
 BDEPTH: 268 267 Validity code:  
 Towing dir: 330° Wire out: 720 m Speed: 30 kn\*10

Sorted: 93 Kg Total catch: 749.02 CATCH/HOUR: 1728.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	803.54	1020	46.49	
Synagrops microlepis	763.15	53352	44.15	
Parapenaeus longirostris, fem.	34.13	5225	1.97	6684
Trichurus lepturus	32.77	178	1.90	
Parapenaeus longirostris, male	22.18	4433	1.28	6683
Faronoma cuvieri	16.29	18	0.94	
Pterothrissus belloci	15.51	138	0.90	
Scorpaena stephanica	12.95	157	0.95	
Epigonus telescopus	7.27	118	0.42	
MYCTOPHIDAE	6.67	7316	0.39	
Brotula barbata	4.59	2	0.27	
GALATHEIDAE *	3.35	256	0.19	
Merluccius polli	1.78	39	0.10	
Callinectes amnicola	1.18	18	0.07	
Lophius sp	0.99	18	0.06	
Hymenocephalus italicus	0.99	39	0.06	
Halosaurus ovenii	0.78	18	0.05	
Nezumia aequalis	0.39	21	0.02	
Total		1728.51	100.01	

PROJECT STATION: 3157  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 701 Long E 1206  
 start stop duration  
 TIME :09:28:43 09:58:40 30 (min) Purpose code: 3  
 LOG :4357.11 4358.71 1.59 Area code : 3  
 FDEPTH: 111 109 GearCond.code:  
 BDEPTH: 111 109 Validity code:  
 Towing dir: 330° Wire out: 310 m Speed: 30 kn\*10

Sorted: Kg Total catch: 56.45 CATCH/HOUR: 112.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	41.30	240	36.58	6676
Dentex congoensis	24.60	78	21.79	
Squatina oculata	18.00	12	15.94	
Chelidonichthys capensis	10.06	94	8.91	
Brotula barbata	5.60	4	4.96	
Sepia orbignyana	5.38	8	4.77	
Citharus linguatula	1.72	30	1.52	
Fistularia petimba	1.44	4	1.28	
Torpedo torpedo	1.26	2	1.12	
Pagellus bellottii	0.92	8	0.81	
Zeus faber	0.90	4	0.80	
Dentex barnardi	0.64	2	0.57	
Brachydeuterus auritus	0.54	4	0.48	
Trachurus trecae, juvenile	0.38	26	0.34	
Scorpaena sp.	0.10	2	0.09	
Arnoglossus imperialis	0.06	22	0.05	
Total		112.90	100.01	

PROJECT STATION: 3162  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 694 Long E 1145  
 start stop duration  
 TIME :19:09:33 19:39:18 30 (min) Purpose code: 3  
 LOG :4410.90 4412.45 1.54 Area code : 3  
 FDEPTH: 448 447 GearCond.code:  
 BDEPTH: 448 447 Validity code:  
 Towing dir: 330° Wire out: 1160 m Speed: 30 kn\*10

Sorted: 24 Kg Total catch: 61.00 CATCH/HOUR: 122.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	16.40	692	13.44	
Merluccius polli	15.60	500	12.79	
Hymenocephalus italicus	12.60	1476	10.33	
GALATHEIDAE *	12.06	860	9.85	
Nematocarcinus africanus	11.80	3114	9.67	
Lamprogrammus exutus	11.80	36	9.67	
Laemonema laureysi	9.60	448	7.87	
Chausax pictus	7.00	66	5.74	
Aristeus varidens, female	6.40	416	5.25	6686
Gadella imberbis	1.70	174	3.03	
CONGRIDAE	2.76	36	2.26	
Gonostoma denudata	2.20	66	1.80	
Galeus polli	2.06	30	1.69	
Ommastrephes pteropus	1.36	10	1.11	
Aristeus varidens, male	1.36	170	1.11	6685
Illex coindetii	1.30	6	1.07	
Dibranchius atlanticus	1.30	100	1.07	
Nezumia aequalis	0.50	20	0.41	
Peristedion cataphractum	0.40	16	0.33	
Halosaurus ovenii	0.36	20	0.30	
Hoplostethus cadematii	0.30	6	0.25	
Callinectes amnicola	0.26	6	0.21	
Chlorophthalmus atlanticus	0.20	6	0.16	
Triplophus hemingi	0.20	80	0.16	
Plesionopaeus edwardsianus	0.16	10	0.13	
Etmopterus lucifer	0.16	10	0.13	
MYCTOPHIDAE	0.16	116	0.13	
Total		122.00	100.00	

PROJECT STATION: 3158  
 DATE: 25/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 703 Long E 1204  
 start stop duration  
 TIME :11:03:13 11:33:29 30 (min) Purpose code: 3  
 LOG :4365.09 4366.63 1.52 Area code : 3  
 FDEPTH: 120 117 GearCond.code:  
 BDEPTH: 120 117 Validity code:  
 Towing dir: 340° Wire out: 350 m Speed: 30 kn\*10

Sorted: 22 Kg Total catch: 383.17 CATCH/HOUR: 766.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	523.90	35906	68.36	6678
Squatina oculata	80.00	16	10.44	
Dentex angolensis	50.50	340	6.59	6677
Dentex congoensis	41.50	518	5.42	6679
Chelidonichthys gabonensis	29.38	260	3.83	
Priacanthus arenatus	10.44	32	1.36	
Sepiella ornata	6.60	6	0.86	
Zeus faber	5.72	26	0.75	
Citharus linguatula	5.20	104	0.68	
Uranoscopus polli	5.20	26	0.68	
Ariomma bondi	2.60	26	0.34	
Brotula barbata	2.38	2	0.31	
Spicara alta	1.68	186	0.22	
Pagellus bellottii	1.24	12	0.16	
Total		766.34	100.00	



PROJECT STATION: 3163  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 655  
 start stop duration Long E 1143  
 TIME : 21:19:46 21:49:05 29 (min) Purpose code: 3  
 LOG : 4420.31 4421.83 1.51 Area code : 3  
 FDEPTH: 530 537 GearCond. code:  
 BDEPTH: 530 537 Validity code:  
 Towing dir: 330° Wire out: 1360 m Speed: 30 kn\*10  
 Sorted: 45 Kg Total catch: 67.41 CATCH/HOUR: 139.47

PROJECT STATION: 3166  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 647  
 start stop duration Long E 1155  
 TIME : 07:45:33 08:15:04 30 (min) Purpose code: 3  
 LOG : 4468.73 4470.29 1.56 Area code : 3  
 FDEPTH: 113 116 GearCond. code:  
 BDEPTH: 113 116 Validity code:  
 Towing dir: 335° Wire out: 310 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 101.20 CATCH/HOUR: 202.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lamprogrammus exutus	34.76	99	24.92	
Ommastrephes pteropus	28.97	35	20.77	
Nematocarcinus africanus	15.97	391	11.45	
Triplophus hemingi	14.71	1961	10.55	
GALATHEIDAE *	11.73	650	8.41	
Merluccius polli	5.11	10	3.66	
Hoplostethus sp.	4.66	159	3.34	
Aristeus varidens, female	4.34	321	3.11	
Stomias boa boa	3.31	292	2.37	
Xenodermichthys copei	2.32	72	1.66	
Aristeus varidens, male	2.26	286	1.62	
Trichiurus lepturus	2.09	66	1.50	
Yarella blackfordi	1.86	43	1.33	
Chaunax pictus	1.32	12	0.95	
Gadella imberbis	1.24	48	0.89	
Plesionika martia	1.14	718	0.82	
Laemonema laureysi	1.06	97	0.76	
CONGRIDAE	0.70	19	0.50	
Etmopterus lucifer	0.50	6	0.36	
Dibranchius atlanticus	0.46	35	0.33	
Malacocephalus occidentalis	0.43	6	0.31	
Galeus polli	0.37	4	0.27	
Total	139.31		99.88	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	142.30	1318	70.31	6689
Dentex angolensis	36.20	162	17.89	6690
Pagellus bellottii	5.60	50	2.77	6691
Trachurus trecae, juvenile	4.12	224	2.04	6692
Chelidonichthys gabonensis	3.58	36	1.77	
Zeus faber	3.42	10	1.63	
Arnoglossus imperialis	1.80	14	0.89	
Rhinobatos albomaculatus	1.50	2	0.74	
Scorpaena stephanica	1.22	2	0.60	
Sepia orbignyana	0.64	12	0.32	
Chelidonichthys capensis	0.64	4	0.32	
Dentex barnardi	0.58	2	0.29	
Citharus linguatula	0.52	12	0.26	
Uranoscopus polli	0.28	2	0.14	
Total	202.40		100.03	

PROJECT STATION: 3167  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 647  
 start stop duration Long E 1153  
 TIME : 09:14:33 09:44:28 30 (min) Purpose code: 3  
 LOG : 4475.38 4476.93 1.54 Area code : 3  
 FDEPTH: 143 157 GearCond. code:  
 BDEPTH: 143 157 Validity code:  
 Towing dir: 315° Wire out: 420 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 71.75 CATCH/HOUR: 143.50

PROJECT STATION: 3164  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 657  
 start stop duration Long E 1140  
 TIME : 23:41:54 00:11:57 30 (min) Purpose code: 3  
 LOG : 4431.34 4432.91 1.56 Area code : 3  
 FDEPTH: 729 728 GearCond. code:  
 BDEPTH: 729 728 Validity code:  
 Towing dir: 310° Wire out: 1800 m Speed: 30 kn\*10  
 Sorted: 31 Kg Total catch: 92.07 CATCH/HOUR: 184.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	47.20	184	32.89	6695
Spicara alta	21.90	202	15.26	
Trachurus trecae	21.00	582	14.63	6694
Trichiurus lepturus	20.60	30	14.36	
Dentex congoensis	10.40	70	7.25	6693
Pterothrissus helloci	4.10	34	2.86	
Chelidonichthys gabonensis	4.04	50	2.82	
Zeus faber	3.58	18	2.49	
Citharus linguatula	2.74	54	1.91	
Brotula barbata	2.70	4	1.88	
Lagocephalus laevigatus	1.20	2	0.84	
Rhinobatos albomaculatus	0.80	2	0.56	
Parapenaeus longirostris	0.52	24	0.36	
Sepia orbignyana	0.50	8	0.35	
Priacanthus arenatus	0.48	2	0.33	
Uranoscopus polli	0.40	2	0.28	
Dentex macropthalmus	0.40	2	0.28	
Bembrops heterurus	0.36	6	0.25	
Todaropsis eblanae	0.28	24	0.20	
Saurida brasiliensis	0.14	46	0.10	
Peristedion cataphractum	0.10	4	0.07	
Arnoglossus imperialis	0.06	12	0.04	
Total	143.50		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia aequalis	39.42	630	21.41	
Talismania bifurcata	38.22	1098	20.76	
Hoplostethus mediterraneus	34.50	264	18.74	
Nematocarcinus africanus	12.78	2646	6.94	
C R U S T A C E A N S	11.94	726	6.48	
Stomias boa boa	7.44	114	4.04	
Coelorinchus sp.	7.32	156	3.98	
Yarella blackfordi	6.60	192	3.58	
Triplophus hemingi	4.02	522	2.18	
Conger conger	2.94	12	1.60	
OCTOPTERYGIDAE	2.76	12	1.50	
Physiculus sp.	2.70	156	1.47	
Lamprogrammus exutus	2.34	6	1.27	
Halosaurus ovenii	2.28	60	1.24	
Hymenocephalus italicus	2.22	6	1.21	
Symbranchus afer	1.92	30	1.04	
Etmopterus pusillus	1.80	6	0.98	
Gonostoma denudata	0.78	12	0.42	
Bathygadus melanobranchus	0.72	18	0.39	
Malacocephalus laevis	0.66	14	0.36	
Plesionika martia	0.24	12	0.13	
Solenocera africana	0.24	12	0.13	
Bathyrcongus vicinus	0.18	6	0.10	
Aristeus varidens	0.12	6	0.07	
Total	184.14		100.02	

PROJECT STATION: 3168  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 650  
 start stop duration Long E 1154  
 TIME : 10:58:43 11:28:43 30 (min) Purpose code: 3  
 LOG : 4484.65 4486.22 1.55 Area code : 3  
 FDEPTH: 131 133 GearCond. code:  
 BDEPTH: 131 133 Validity code:  
 Towing dir: 355° Wire out: 380 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 67.66 CATCH/HOUR: 135.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	52.90	660	39.09	6697
Dentex angolensis	42.40	274	31.33	6696
Trachurus trecae, juvenile	15.20	750	11.23	6698
Spicara alta	10.32	132	7.63	
Centrophorus squamosus	7.00	2	5.17	
Zeus faber	3.78	18	2.79	
Citharus linguatula	1.80	46	1.33	
Lepidotrigla cadmani	0.72	12	0.53	
Pagellus bellottii	0.72	22	0.53	
Sepia officinalis hierredda	0.22	4	0.16	
Ariomola bondi	0.18	2	0.13	
Monolene mertensi	0.06	8	0.04	
Saurida brasiliensis	0.02	6	0.01	
Total	135.32		99.97	

PROJECT STATION: 3165  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 648  
 start stop duration Long E 1200  
 TIME : 05:47:45 06:17:07 29 (min) Purpose code: 3  
 LOG : 4458.48 4460.01 1.47 Area code : 3  
 FDEPTH: 91 90 GearCond. code:  
 BDEPTH: 91 90 Validity code:  
 Towing dir: 335° Wire out: 270 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 21.02 CATCH/HOUR: 43.49

PROJECT STATION: 3169  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 630  
 start stop duration Long E 1152  
 TIME : 13:36:30 14:06:33 30 (min) Purpose code: 3  
 LOG : 4505.26 4506.88 1.60 Area code : 3  
 FDEPTH: 115 114 GearCond. code:  
 BDEPTH: 115 114 Validity code:  
 Towing dir: 300° Wire out: 320 m Speed: 30 kn\*10  
 Sorted: 54 Kg Total catch: 161.58 CATCH/HOUR: 323.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	13.66	168	31.41	6688
Chelidonichthys gabonensis	7.55	81	17.36	
Trachurus trecae, juvenile	5.15	102	11.84	6687
Torpedo torpedo	3.95	8	9.08	
Dentex barnardi	3.64	23	8.37	
Fistularia petamba	3.31	10	7.61	
Epinephelus aeneus	2.38	2	5.47	
Dentex gibbosus	0.77	2	1.77	
Sphyraena sphyraena	0.68	2	1.56	
Priacanthus arenatus	0.64	2	1.47	
Dentex congoensis	0.60	12	1.38	
Sepia orbignyana	0.52	14	1.20	
CONGRIDAE	0.35	2	0.80	
Citharus linguatula	0.29	12	0.67	
Total	43.49		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	171.00	2190	52.91	6700
Trichiurus lepturus	76.80	1900	23.77	
Dentex angolensis	31.50	156	9.75	6699
Trachurus trecae, juvenile	11.70	1860	3.62	6701
Brotula barbata	10.86	6	3.36	
Priacanthus arenatus	5.40	12	1.67	
Boops boops	4.92	186	1.52	
Dentex barnardi	3.66	12	1.13	
Zeus faber	2.28	12	0.71	
Raja miraletus	1.98	6	0.61	
Pagellus bellottii	1.14	78	0.35	
Citharus linguatula	0.60	18	0.19	
Chelidonichthys gabonensis	0.48	6	0.15	
Spicara alta	0.42	12	0.13	
Peristedion cataphractum	0.36	6	0.11	
Erythrocles monodi	0.06	6	0.02	
Total	323.16		100.00	

PROJECT STATION: 3170  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 631  
 start stop duration Long E 1149  
 TIME :15:20:20 15:50:24 30 (min) Purpose code: 3  
 LOG :4514.64 4516.22 1.58 Area code : 3  
 FDEPTH: 124 124 GearCond.code:  
 BDEPTH: 124 124 Validity code:  
 Towing dir: 330° Wire out: 340 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 96.31 CATCH/HOUR: 192.62

PROJECT STATION: 3173  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 639  
 start stop duration Long E 1127  
 TIME :21:46:52 22:16:17 29 (min) Purpose code: 3  
 LOG :4548.05 4549.54 1.49 Area code : 3  
 FDEPTH: 659 658 GearCond.code:  
 BDEPTH: 659 658 Validity code:  
 Towing dir: 285° Wire out: 1650 m Speed: 30 kn\*10  
 Sorted: 24 Kg Total catch: 121.71 CATCH/HOUR: 251.81

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae, juvenile	77.70 5488	40.34	6704
Dentex congolensis	49.60 672	25.75	6703
Dentex angolensis	27.70 146	14.38	6702
Pterothrissus belloci	9.04 94	4.69	
Spicara alta	6.98 178	3.62	
Trichiurus lepturus	6.36 12	3.30	
Brotula barbata	4.90 4	2.54	
Zeus faber	4.56 18	2.37	
Priacanthus arenatus	2.20 6	1.14	
Lepidotrigla cadmani	0.92 4	0.48	
Uranoscopus polli	0.76 4	0.39	
Ariomma bondi	0.76 12	0.39	
Seriola fasciata	0.52 6	0.27	
Raja miraletus	0.32 2	0.17	
Scorpaena notata	0.16 2	0.08	
Citharus linguatula	0.14 4	0.07	
Total	192.62	99.98	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus atlanticus	90.00 1841	35.74	
Nematocarcinus africanus	52.24 12134	20.75	
Talismania bifurcata	19.45 631	7.72	
C R U S T A C E A N S	16.14 859	6.41	
Triplophus hemingi	15.10 1831	6.00	
Lamprogrammus exotus	12.21 41	4.85	
OCTOPTHEUTIDAE	8.07 41	3.20	
Trichiurus lepturus	5.79 10	2.30	
Hymenocephalus italicus	5.28 10	2.10	
Illex coindetii	4.55 31	1.81	
Nezumia aequalis	4.24 83	1.68	
Physiculus sp.	3.21 166	1.27	
Aristeus varidens, female	2.69 114	1.07	
Yarella blackfordi	2.69 41	1.07	
Halosaurus ovenii	2.17 31	0.86	
Ectreposebastes amus	1.45 10	0.58	
Stomias boa boa	1.24 21	0.49	
Merluccius polli	1.16 2	0.46	
Synbranchus afer	1.03 21	0.41	
Deania calcea	1.03 4	0.41	
Solenocera africana	0.62 31	0.25	
Etmopterus lucifer	0.62 6	0.25	
Gonostoma denuclata	0.41 10	0.16	
Etmopterus princeps	0.21 2	0.08	
Dibranchius atlanticus	0.10 10	0.04	
Plesionika martia	0.10 10	0.04	
Total	251.80	100.00	

PROJECT STATION: 3171  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 634  
 start stop duration Long E 1142  
 TIME :17:18:22 17:48:14 30 (min) Purpose code: 3  
 LOG :4525.87 4527.42 1.54 Area code : 3  
 FDEPTH: 222 220 GearCond.code:  
 BDEPTH: 222 220 Validity code:  
 Towing dir: 320° Wire out: 610 m Speed: 30 kn\*10  
 Sorted: 53 Kg Total catch: 106.60 CATCH/HOUR: 213.20

PROJECT STATION: 3174  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 639  
 start stop duration Long E 1125  
 TIME :00:04:49 00:34:52 30 (min) Purpose code: 3  
 LOG :4557.74 4559.35 1.59 Area code : 3  
 FDEPTH: 721 717 GearCond.code:  
 BDEPTH: 721 717 Validity code:  
 Towing dir: 310° Wire out: 1800 m Speed: 30 kn\*10  
 Sorted: 28 Kg Total catch: 62.89 CATCH/HOUR: 125.78

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	122.60 7016	57.50	
Pterothrissus belloci	24.60 264	11.54	
Brotula barbata	24.36 28	11.43	
Dentex angolensis	7.68 24	3.60	
Peristedion cataphractum	5.96 144	2.80	
Ariomma bondi	3.44 64	1.61	
Bembrops greyi	3.24 48	1.52	
Zenopsis conchifer	2.88 8	1.35	
CONGRIDAE	2.76 144	1.29	
Pentheroscion mbizi	2.48 20	1.16	
Trichiurus lepturus	2.36 8	1.11	
MYCTOPHIDAE	1.92 3936	0.90	
Parapenaeus longirostris, fem.	1.68 288	0.79	6706
Uranoscopus cadenati	1.40 8	0.66	
Todarodes sp.	1.36 16	0.64	
Illex sp.	1.16 12	0.54	
Gadella imberbis	1.08 8	0.51	
Priacanthus arenatus	1.08 4	0.51	
Parapenaeus longirostris, male	0.52 176	0.24	6705
Cynoglossus browni	0.40 48	0.19	
Chlorophthalmus atlanticus	0.36 24	0.08	
Solenocera africana	0.08 32	0.04	
Total	213.20	100.01	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Talismania bifurcata	43.20 1120	34.35	
C R U S T A C E A N S	13.40 672	10.65	
Coelorrhinus coelorrhinus	13.12 212	10.43	
Yarella blackfordi	12.04 248	9.57	
Hoplostethus atlanticus	9.52 64	7.57	
Centrophorus granulosus	8.00 2	6.36	
Merluccius polli	4.62 6	3.67	
Physiculus sp.	3.60 160	2.86	
Synbranchus afer	3.28 32	2.61	
Glyphus marsupialis	2.32 312	1.84	
Stomias boa boa	2.24 28	1.78	
Deania calcea	2.00 8	1.59	
Halosaurus ovenii	2.00 60	1.59	
Hymenocephalus italicus	1.56 8	1.24	
Aristeus varidens	1.00 40	0.80	
Triplophus hemingi	0.96 92	0.76	
Solenocera africana	0.88 28	0.70	
Etmopterus lucifer	0.80 4	0.64	
RAJIDAE	0.64 4	0.51	
Trachyrhynchus scabratus	0.60 4	0.48	
Total	125.78	100.00	

PROJECT STATION: 3172  
 DATE: 26/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 635  
 start stop duration Long E 1138  
 TIME :19:14:20 19:44:15 30 (min) Purpose code: 3  
 LOG :4534.71 4536.25 1.53 Area code : 3  
 FDEPTH: 339 324 GearCond.code:  
 BDEPTH: 339 324 Validity code:  
 Towing dir: 330° Wire out: 940 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 109.48 CATCH/HOUR: 218.96

PROJECT STATION: 3175  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 627  
 start stop duration Long E 1155  
 TIME :05:36:01 06:06:06 30 (min) Purpose code: 3  
 LOG :4594.95 4596.47 1.53 Area code : 3  
 FDEPTH: 109 107 GearCond.code:  
 BDEPTH: 109 107 Validity code:  
 Towing dir: 345° Wire out: 320 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 86.24 CATCH/HOUR: 172.48

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	68.40 1296	31.24	
Merluccius polli	30.88 304	14.10	6707
Synagrops microlepis	30.40 928	13.88	
Laemonema laureysi	21.20 296	9.68	
Bembrops greyi	18.32 296	8.37	
Parapenaeus longirostris	11.20 1280	5.12	
Pterothrissus belloci	7.52 96	3.43	
Epigonus sp.	6.40 16	2.92	
Illex sp.	4.32 40	1.97	
Parapenaeus longirostris, fem.	3.36 280	1.53	
Malacocephalus laevis	2.40 24	1.28	
Parapenaeus longirostris, male	2.40 32	1.10	
GALATHEIDAE *	2.40 304	1.10	
Hymenocephalus italicus	2.16 368	0.99	
Cyttopsis roseus	1.60 48	0.73	
Solenocera africana	1.36 196	0.62	
C R U S T A C E A N S	1.20 336	0.55	
Ariomma bondi	0.72 8	0.33	
Gadella imberbis	0.64 24	0.29	
MYCTOPHIDAE	0.48 328	0.22	
Dibranchius atlanticus	0.48 64	0.22	
Nezumia aequalis	0.32 16	0.15	
Scyllarides herklotsii	0.24 32	0.11	
Peristedion cataphractum	0.16 24	0.07	
Total	218.96	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Umbrina canariensis	57.20 188	33.16	6711
Dentex angolensis	33.20 144	19.25	6710
Epinephelus aeneus	15.60 2	9.04	
Dentex congolensis	14.40 138	8.35	6709
Squatina oculata	9.30 2	5.39	
Trachurus trecae, juvenile	7.58 500	4.39	6708
Trichiurus lepturus	4.88 8	2.83	
Saurida brasiliensis	3.08 986	1.79	
Torpedo torpedo	2.84 6	1.65	
Zeus faber	2.46 6	1.43	
Raja miraletus	2.40 6	1.39	
Trigla lyra	2.38 20	1.38	
Brotula barbata	2.22 2	1.29	
Uranoscopus polli	2.20 28	1.28	
Pontinus accraensis	1.90 2	1.10	
Priacanthus arenatus	1.46 6	0.85	
Peristedion cataphractum	1.40 48	0.81	
Fistularia petimba	1.34 4	0.78	
Brachydeuterus auritus	1.18 8	0.68	
Citharus linguatula	1.08 30	0.63	
Scorpaena normani	1.08 6	0.63	
Pagellus bellottii	0.84 6	0.49	
Pterothrissus belloci	0.70 6	0.41	
Raja alba	0.42 4	0.24	
Todaropsis eblanæ	0.32 12	0.19	
Chaetodon hoefleri	0.28 4	0.16	
Pentheroscion mbizi	0.26 2	0.15	
Pegusa lascaris	0.20 6	0.12	
Arnoglossus imperialis	0.16 12	0.09	
Bembrops heterurus	0.12 2	0.07	
Total	172.48	100.02	



PROJECT STATION: 3176  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 628  
 start stop duration Long E 1159  
 TIME 07:16:53 07:46:07 29 (min) Purpose code: 3  
 LOG 4603.64 4605.14 1.49 Area code : 3  
 FDEPTH: 96 95 GearCond.code: 3  
 BDEPTH: 96 95 Validity code:  
 Towing dir: 350ø Wire out: 300 m Speed: 30 kn\*10

Sorted: 104 Kg Total catch: 258.01 CATCH/HOUR: 533.81

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Trichiurus lepturus	258.21	695	48.37		
Brachydeuterus auritus	141.81	1194	26.57	6714	
Dentex congoensis	51.14	99	9.58		
Dentex angolensis	49.97	228	9.36	6712	
Priacanthus arenatus	10.32	33	1.93		
Trachurus trecae, juvenile	7.10	565	1.33	6713	
Zeus faber	5.81	19	1.09		
Raja miraletus	2.86	4	0.54		
Uranoscopus polli	1.32	37	0.25		
Saurida brasiliensis	1.32	381	0.25		
Pterothrissus bellotti	1.10	10	0.21		
Umbrina canariensis	1.06	10	0.20		
Citharus linguatula	0.81	23	0.15		
Scorpaena normani	0.43	4	0.08		
Sepia orbignyana	0.37	4	0.07		
Peristedion cataphractum	0.19	10	0.04		
Total	533.82		100.02		

PROJECT STATION: 3176  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 606  
 start stop duration Long E 1205  
 TIME 13:30:46 14:00:38 30 (min) Purpose code: 3  
 LOG 4639.29 4640.87 1.57 Area code : 3  
 FDEPTH: 41 47 GearCond.code:  
 BDEPTH: 41 47 Validity code:  
 Towing dir: 260ø Wire out: 120 m Speed: 30 kn\*10

Sorted: Kg Total catch: 10.10 CATCH/HOUR: 20.20

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Stromateus fiatola	7.60	8	37.62		
Selene dorsalis	6.10	16	30.20		
Leptocharias smithii	1.84	2	9.11		
Sparus pagrus africanus *	1.62	2	8.02		
Uranoscopus polli	1.34	2	6.63		
Raja miraletus	0.72	2	3.56		
Pagellus bellottii	0.30	2	1.49		
Rypticus saponaceus	0.20	2	0.99		
Decapterus rhonchus	0.18	4	0.89		
Brachydeuterus auritus Juv.	0.14	22	0.69		
LOLIGINIDAE	0.08	52	0.40		
Alloteuthis africana	0.08	22	0.40		
Total	20.20		100.00		

PROJECT STATION: 3177  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 626  
 start stop duration Long E 1202  
 TIME 08:42:53 09:12:06 29 (min) Purpose code: 3  
 LOG 4610.69 4612.23 1.53 Area code : 3  
 FDEPTH: 80 79 GearCond.code: 1  
 BDEPTH: 80 79 Validity code: 1  
 Towing dir: 330ø Wire out: 240 m Speed: 30 kn\*10

Sorted: 74 Kg Total catch: 171.81 CATCH/HOUR: 355.47

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Brachydeuterus auritus Juv.	254.11	2404	71.49	6715	
Trachurus trecae, juvenile	23.09	1413	6.50	6716	
Umbrina canariensis	13.22	52	3.72		
Brotula barbata	10.99	14	3.09		
Pagrus caeruleostictus	9.33	10	2.62		
Dentex canariensis	9.23	19	2.60		
Pagellus bellottii	7.74	33	2.18		
Dentex angolensis	7.61	29	2.14		
Trichiurus lepturus	3.70	10	1.04		
Raja miraletus	2.90	4	0.82		
Dentex barmardi	2.86	14	0.80		
Priacanthus arenatus	2.86	10	0.80		
Dentex congoensis	2.61	29	0.73		
Dentex gibbosus	2.03	4	0.57		
Chaetodon hoefleri	0.99	4	0.28		
Bembrops heterurus	0.85	14	0.24		
Uranoscopus polli	0.85	10	0.24		
Sepia orbignyana	0.23	4	0.06		
Sardinella aurita	0.12	4	0.03		
Citharus linguatula	0.08	4	0.02		
Arnoglossus imperialis	0.08	14	0.02		
Total	355.48		99.99		

PROJECT STATION: 3181  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 608  
 start stop duration Long E 1158  
 TIME 15:04:30 15:34:35 30 (min) Purpose code: 3  
 LOG 4647.58 4649.20 1.61 Area code : 3  
 FDEPTH: 68 70 GearCond.code:  
 BDEPTH: 68 70 Validity code:  
 Towing dir: 260ø Wire out: 200 m Speed: 30 kn\*10

Sorted: Kg Total catch: 36.08 CATCH/HOUR: 72.16

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Dentex angolensis	30.90	150	42.82	6717	
Trichiurus lepturus	19.60	30	27.16		
Epinephelus aeneus	8.90	4	12.33		
Pagellus bellottii	4.32	28	5.99	6719	
Dentex congoensis	3.36	38	4.66	6718	
Zeus faber	2.18	4	3.02		
Alloteuthis africana	0.56	276	0.78		
Sepia officinalis hierredda	0.46	6	0.64		
Raja miraletus	0.44	2	0.61		
Bembrops heterurus	0.36	8	0.50		
Chaetodon hoefleri	0.36	2	0.50		
Trachurus trecae, juvenile	0.26	16	0.36		
Trichiurus sp.	0.12	14	0.17		
Citharus linguatula	0.10	2	0.14		
Parapeneus longirostris	0.06	6	0.08		
Brachydeuterus auritus Juv.	0.06	10	0.08		
Monolene macrostoma	0.04	4	0.06		
Sardinella aurita	0.04	2	0.06		
Saurida brasiliensis	0.04	8	0.06		
Total	72.16		100.02		

PROJECT STATION: 3178  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 625  
 start stop duration Long E 1205  
 TIME 10:10:22 10:40:04 30 (min) Purpose code: 3  
 LOG 4618.24 4619.80 1.54 Area code : 3  
 FDEPTH: 54 56 GearCond.code: 1  
 BDEPTH: 54 56 Validity code: 1  
 Towing dir: 330ø Wire out: 150 m Speed: 30 kn\*10

Sorted: 18 Kg Total catch: 18.19 CATCH/HOUR: 36.38

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Trichiurus lepturus	19.10	42	52.50		
Caranx crysos	12.60	12	34.63		
Pagellus bellottii	2.12	24	5.83		
Lagocephalus laevigatus	1.60	6	4.40		
Pagrus caeruleostictus	0.96	2	2.64		
Total	36.38		100.00		

PROJECT STATION: 3182  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 609  
 start stop duration Long E 1148  
 TIME 17:06:42 17:35:53 29 (min) Purpose code: 3  
 LOG 4661.28 4662.82 1.53 Area code : 3  
 FDEPTH: 91 92 GearCond.code:  
 BDEPTH: 91 92 Validity code:  
 Towing dir: 330ø Wire out: 250 m Speed: 30 kn\*10

Sorted: Kg Total catch: 81.54 CATCH/HOUR: 168.70

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Trichiurus lepturus	126.21	209	74.81		
Dentex congoensis	11.07	93	6.56	6722	
Dentex angolensis	8.21	41	4.87	6721	
Arius sp.	4.39	2	2.60		
Epinephelus aeneus	3.52	2	2.09		
Zeus faber	3.33	10	1.97		
Trachurus trecae, juvenile	3.31	163	1.96	6720	
Brotula barbata	2.86	4	1.70		
Raja miraletus	1.68	2	1.00		
Saurida brasiliensis	1.61	383	0.95		
Sphyræna sphyraena	0.68	2	0.40		
Pagellus bellottii	0.56	4	0.33		
Umbrina canariensis	0.50	4	0.30		
Scorpaena stephanica	0.39	2	0.23		
Citharus linguatula	0.27	4	0.16		
Bembrops heterurus	0.12	2	0.07		
Total	168.71		100.00		

PROJECT STATION: 3179  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 615  
 start stop duration Long E 1206  
 TIME 11:49:37 12:19:34 30 (min) Purpose code: 3  
 LOG 4628.87 4630.47 1.63 Area code : 3  
 FDEPTH: 42 40 GearCond.code:  
 BDEPTH: 42 40 Validity code:  
 Towing dir: 14ø Wire out: 120 m Speed: 30 kn\*10

Sorted: Kg Total catch: 45.57 CATCH/HOUR: 91.14

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Galeoides decadactylus	34.30	418	37.63		
Stromateus fiatola	9.20	10	10.09		
Epinephelus aeneus	7.58	4	8.32		
Pseudoclichthys tybus	5.38	4	5.90		
Brachydeuterus auritus Juv.	5.18	848	5.68		
Brachydeuterus auritus	5.14	68	5.64		
Caranx hippos	4.10	2	4.50		
Ilisha africana	2.74	70	3.01		
Trichiurus lepturus	2.74	4	3.01		
Pagrus caeruleostictus	2.26	4	2.48		
Caranx crysos	2.18	2	2.39		
Panulirus regius	1.80	4	1.97		
Sphyræna guachancho	1.56	12	1.71		
Sphyræna sphyraena	1.52	6	1.67		
Pteroscion pelli	1.34	2	1.47		
Uranoscopus polli	1.00	4	1.10		
Zeus faber	1.00	2	0.88		
Cynoglossus canariensis	0.66	2	0.72		
Sardinella aurita	0.44	34	0.48		
Citharus linguatula	0.40	2	0.44		
Chilomycterus spinosus mauret.	0.40	2	0.44		
Trichiurus armatus	0.20	4	0.22		
Penaeus notialis	0.20	10	0.22		
Bembrops heterurus	0.02	2	0.02		
Total	91.14		99.99		

PROJECT STATION: 3180

PROJECT STATION: 3183  
 DATE: 27/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 614 Long E 1125  
 start stop duration  
 TIME : 20:53:53 21:23:12 29 (min) Purpose code: 3  
 LOG : 4690.14 4691.64 1.50 Area code : 3  
 FDEPTH: 388 383 GearCond.code:  
 BDEPTH: 388 383 Validity code:  
 Towing dir: 360° Wire out: 1000 m Speed: 30 kn\*10  
 Sorted: 25 Kg Total catch: 69.21 CATCH/HOUR: 143.19

PROJECT STATION: 3186  
 DATE: 28/ 3/03 GEAR TYPE: BT No: POSITION: Lat S 611 Long E 1144  
 start stop duration  
 TIME : 16:23:17 16:53:18 30 (min) Purpose code: 3  
 LOG : 4826.33 4827.88 1.53 Area code : 3  
 FDEPTH: 108 110 GearCond.code:  
 BDEPTH: 108 110 Validity code:  
 Towing dir: 250° Wire out: 300 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 52.98 CATCH/HOUR: 105.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	43.51	8394	30.39	
Merluccius polli	18.21	52	12.72	
Laemonema laureysi	16.86	246	11.77	
Guantherus altivela	12.00	2	8.38	
Zenopsis conchifer	8.03	6	5.61	
Chaunax pictus	7.97	120	5.57	
Hymenocephalus italicus	7.14	842	4.99	
Trichiurus lepturus	4.55	186	3.18	
GALATHEIDAE *	4.34	275	3.03	
Epigonus telescopus	4.20	37	2.93	
Etmopterus pusillus	3.89	6	2.72	
Parapenaeus longirostris, fem.	2.86	327	2.00	6725
Gadella imberbis	2.54	83	1.77	
Aristeus varidens, male	1.34	103	0.94	6723
Malacocephalus laevis	0.99	10	0.69	
Raja alba	0.93	6	0.65	
Scorpaena sp.	0.83	10	0.58	
Malacocephalus occidentalis	0.68		0.47	
Nezumia aequalis	0.58	21	0.41	
MYCTOPHIDAE	0.41	182	0.29	
Halosaurus ovenii	0.37	10	0.26	
Aristeus varidens, female	0.37	21	0.26	6724
Dibranchius atlanticus	0.17	37	0.12	
Solenocera africana	0.10	10	0.07	
CONGRIDAE	0.10	6	0.07	
Synagrops microlepis	0.10	10	0.07	
Hoplostethus cadenati	0.10	6	0.07	
Total	143.17		100.01	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	57.40	540	54.17	6727
Dentex angolensis	17.10	92	16.14	6726
Trichiurus lepturus	13.90	24	13.12	
Umbrina canariensis	5.98	26	5.64	
Trachurus trecae, juvenile	2.70	124	2.55	
Branchiostegus semifasciatus	1.58	2	1.45	
Brotula barbata	1.54	2	1.45	
Dentex gibbosus	0.94	2	0.89	
Raja miraletus	0.88	2	0.83	
Pagellus bellottii	0.84	4	0.79	
Illex coindetii	0.80	40	0.76	
Zeus faber	0.68	2	0.64	
Spicara alta	0.66	6	0.62	
Boops boops	0.46	12	0.43	
Scorpaena stephanica	0.24	2	0.23	
Saurida brasiliensis	0.22	58	0.21	
Arnoglossus imperialis	0.04	6	0.04	
Total	105.96		100.00	

PROJECT STATION: 3184  
 DATE: 28/ 3/03 GEAR TYPE: BT No: 15 POSITION: Lat S 617 Long E 1116  
 start stop duration  
 TIME : 23:30:02 00:00:06 30 (min) Purpose code: 3  
 LOG : 4705.89 4707.47 1.59 Area code : 3  
 FDEPTH: 745 752 GearCond.code:  
 BDEPTH: 745 752 Validity code:  
 Towing dir: 360° Wire out: 1800 m Speed: 30 kn\*10  
 Sorted: 25 Kg Total catch: 132.47 CATCH/HOUR: 264.94

PROJECT STATION: 3187  
 DATE: 28/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 612 Long E 1138  
 start stop duration  
 TIME : 17:53:15 18:23:19 30 (min) Purpose code: 3  
 LOG : 4833.54 4835.09 1.56 Area code : 3  
 FDEPTH: 122 121 GearCond.code:  
 BDEPTH: 122 121 Validity code:  
 Towing dir: 360° Wire out: 350 m Speed: 30 kn\*10  
 Sorted: 65 Kg Total catch: 178.05 CATCH/HOUR: 356.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Talismania bifurcata	132.50	3660	50.01	
Hoplostethus atlanticus	52.50	890	19.82	
Coelorhynchus coelorhynchus	15.70	320	5.93	
C R U S T A C E A N S	10.60	420	4.00	
Triplophus hemingi	10.20	2170	3.85	
GONYA02	9.50	200	3.59	
Shrimps, small, non comm.	6.30	1110	2.38	
Merluccius polli	5.56	8	2.10	
Physiculus sp	3.78	260	1.43	
Synphobranchius kaupii	2.80	20	1.06	
Solenocera africana	2.10	100	0.79	
Benthodesmus tenuis	2.00	10	0.75	
TRIAP01	1.80	10	0.68	
Aristeus varidens	1.70	80	0.64	
Stomias boa boa	1.50	30	0.57	
Etmopterus pusillus	1.40	10	0.53	
RAYRA50	1.10	10	0.42	
Deania calcea	1.00	4	0.38	
Halosaurus ovenii	0.90	20	0.34	
BAHBA03	0.60	4	0.23	
Gonostoma denudata	0.60	10	0.23	
MELANOCETIDAE	0.50	10	0.19	
Laemonema laureysi	0.10	30	0.04	
Dibranchius atlanticus	0.10	10	0.04	
Cubiceps sp	0.10	20	0.04	
Total	264.94		100.04	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	178.40	1794	50.10	6729
Dentex angolensis	51.26	286	14.39	6728
Brotula barbata	48.96	60	13.75	
Spicara alta	22.06	286	6.19	
Trigla lyra	20.36	446	5.72	
Trachurus trecae, juvenile	11.50	226	3.23	6730
Umbrina canariensis	5.72	22	1.61	
CONGRIDAE	3.86	6	1.08	
Pagellus bellottii	3.80	44	1.07	
Zeus faber	2.14	6	0.60	
Raja miraletus	2.10	6	0.59	
Uranoscopus polli	1.10	12	0.31	
Scorpaena normani	0.78	6	0.22	
Arnoglossus imperialis	0.56	88	0.16	
Citharus linguatula	0.56	16	0.16	
Dentex canariensis	0.56	6	0.16	
Sepia orbignyana	0.56	6	0.16	
Torpedo torpedo	0.56	6	0.16	
Solenocera africana	0.44	100	0.12	
Gadella imberbis	0.44	16	0.12	
Peristedion cataphractum	0.22	6	0.06	
Vanstraelenia chirophthalmus	0.16	6	0.04	
Total	356.10		100.00	

PROJECT STATION: 3185  
 DATE: 28/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 607 Long E 1211  
 start stop duration  
 TIME : 13:15:23 13:30:43 15 (min) Purpose code: 1  
 LOG : 4796.87 4797.72 0.85 Area code : 3  
 FDEPTH: 17 18 GearCond.code:  
 BDEPTH: 17 18 Validity code:  
 Towing dir: 50° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: 21.56 CATCH/HOUR: 86.24

PROJECT STATION: 3188  
 DATE: 29/ 3/03 GEAR TYPE: OT No: 2 POSITION: Lat S 814 Long E 1315  
 start stop duration  
 TIME : 10:07:11 10:37:05 30 (min) Purpose code: 2  
 LOG : 4995.80 4997.36 1.54 Area code : 3  
 FDEPTH: 27 28 GearCond.code:  
 BDEPTH: 27 28 Validity code:  
 Towing dir: 335° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 59 Kg Total catch: 161.09 CATCH/HOUR: 322.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Elops lacerta	23.00	52	26.67	
Pomadasy peroteti	10.12	20	11.73	
Arius parkii	10.00	4	11.60	
Stromateus fiatola	9.96	12	11.55	
Galeoides decadactylus	9.36	28	10.85	
Drepane africana	7.80	12	9.04	
Portunus validus	4.00	8	4.64	
Caranx hippos	3.00	4	3.48	
Brachydeuterus auritus	2.92	372	3.39	
Selene dorsalis	2.72	52	3.15	
Chloroscombrus chrysurus	0.96	92	1.11	
Sphyræna sphyraena	0.92	12	1.07	
Sardinella maderensis	0.72	52	0.83	
Trichiurus lepturus	0.52	84	0.60	
Alloteuthis africana	0.24	140	0.28	
Total	86.24		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	77.82	286	24.15	
Ilisha africana	60.78	2568	18.87	
Pseudotolithus senegalensis	54.16	226	16.81	6731
Brachydeuterus auritus	30.58	826	9.49	
Trichiurus lepturus	18.80	1794	5.84	
Pomadasy peroteti	15.88	56	4.93	
Sphyræna guachancho	15.66	38	4.86	
Chloroscombrus chrysurus	15.52	342	4.82	
Selene dorsalis	10.12	148	3.14	
Pteroscion pelli	6.42	110	1.99	
Stromateus fiatola	4.44	22	1.38	
Arius parkii	3.30	6	1.02	
Shrimps, small, non comm.	2.90	1078	0.90	
Cynoglossus canariensis	2.36	12	0.73	
Dasyatis margarita	1.98	6	0.61	
Dicologlossa cuneata	0.54	12	0.17	
Peristedion cataphractum	0.38	6	0.12	
Paraconger notialis	0.22	6	0.07	
Raja miraletus	0.16	6	0.05	
Torpedo torpedo	0.16	6	0.05	
Total	322.18		100.00	

PROJECT STATION: 3189  
 DATE: 29/ 3/03 GEAR TYPE: OT No: 2 POSITION: Lat S 815  
 start stop duration Long E 1309  
 TIME 11:55:27 12:25:28 30 (min) Purpose code: 2  
 LOG 5006.56 5008.15 1.60 Area code: 3  
 FDEPTH: 60 58 GearCond.code:  
 BDEPTH: 60 58 Validity code:  
 Towing dir: 350° Wire out: 170 m Speed: 30 kn\*10  
 Sorted: 72 Kg Total catch: 285.88 CATCH/HOUR: 571.76

PROJECT STATION: 3192  
 DATE: 29/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 815  
 start stop duration Long E 1309  
 TIME 19:13:42 19:42:59 29 (min) Purpose code: 2  
 LOG 5033.98 5035.48 1.51 Area code: 3  
 FDEPTH: 59 57 GearCond.code:  
 BDEPTH: 59 57 Validity code:  
 Towing dir: 340° Wire out: 270 m Speed: 30 kn\*10  
 Sorted: 73 Kg Total catch: 101.90 CATCH/HOUR: 210.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasys jubelini	225.34	2948	39.41	
Selene dorsalis	154.66	122	27.05	
Chloroscombrus chrysurus	64.50	486	11.28	
Trachurus trecae, juvenile	31.98	3366	5.59	6733
Trachurus trecae	25.98	198	4.54	6732
Torpedo torpedo	12.68	38	2.22	
Trichiurus lepturus	10.26	130	1.79	
Dicologlossa cuneata	7.86	8	1.37	
Sphyræna sphyraena	7.10	84	1.24	
Dentex angolensis	6.76	54	1.18	
Sphyræna guachancho	6.68	22	1.17	
Atractoscion aequidens	4.86	16	0.85	
Sardinella aurita	4.48	84	0.78	
Scomber japonicus	3.94	8	0.69	
Citharus linguatula	1.82	48	0.32	
Bembrops heterurus	1.06	16	0.19	
Trachinus armatus	0.98	16	0.17	
Serranus accraensis	0.44	8	0.08	
Chelidonichthys gabonensis	0.38	24	0.07	
Total	571.76		99.99	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	50.63	1506	24.01	6736
Umbrina canariensis	20.69	54	9.81	
Dentex angolensis	18.97	348	9.00	6737
Brachydeuterus auritus	10.30	149	4.89	
Atractoscion aequidens	9.77	58	4.63	
Bembrops heterurus	9.62	304	4.56	
Pterochirissus bellocci	9.62	151	4.56	
Citharus linguatula	8.36	557	3.97	
Sepia orbignyana	7.78	244	3.69	
Raja miraletus	7.06	19	3.35	
Dasyatis marmorata	5.79	2	2.75	
Pomadasys incisus	5.73	72	2.72	
Brotula barbata	5.03	81	2.39	
Torpedo torpedo	4.39	14	2.08	
Pentheroscion mbizi	4.06	27	1.93	
Trachurus trecae	3.81	157	1.81	
Trichiurus lepturus	3.60	48	1.71	
Chelidonichthys capensis	3.56	166	1.69	
Vanstraelenia chirophthalmus	2.90	19	1.38	
Dentex canariensis	2.88	68	1.37	
Sepia officinalis hierredda	1.86	2	0.88	
Parapenaeus longirostris	1.84	443	0.87	
Branchiostegus semifasciatus	1.72	6	0.82	
Octopus sp	1.45	8	0.69	
Serranus accraensis	1.37	43	0.65	
COMBRIDAE	1.01	97	0.48	
GOBIIDAE	0.95	277	0.45	
Zeus faber	0.95	8	0.45	
Pseudupeneus prayensis	0.95	43	0.45	
Scorpaena sp.	0.89	72	0.42	
Sardinella aurita	0.79	6	0.37	
Epinephelus aeneus	0.79	2	0.37	
Arnoglossus imperialis	0.62	58	0.29	
ANRAN00	0.43	8	0.20	
Dicologlossa cuneata	0.41	2	0.19	
Chloroscombrus chrysurus	0.27	2	0.13	
Total	210.85		100.01	

PROJECT STATION: 3190  
 DATE: 29/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 814  
 start stop duration Long E 1315  
 TIME 13:58:37 14:28:39 30 (min) Purpose code: 2  
 LOG 5016.91 5018.44 1.53 Area code: 3  
 FDEPTH: 27 28 GearCond.code:  
 BDEPTH: 27 28 Validity code:  
 Towing dir: 330° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 78 Kg Total catch: 107.87 CATCH/HOUR: 215.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudolithus senegalensis	80.46	146	37.29	6734
Galeoides decadactylus	55.46	106	25.71	
Ilisha africana	25.56	852	11.85	
Trichiurus lepturus	12.42	494	5.76	
Panulirus regius	8.06	28	3.74	
Brachydeuterus auritus	6.50	160	3.01	
Shrimps, small, non comm.	4.94	1016	2.29	
Chloroscombrus chrysurus	4.28	50	1.98	
Pteroscion pelli	4.28	74	1.98	
Arius parkii	4.06	6	1.88	
Stromateus fiatola	3.50	16	1.62	
Raja miraletus	2.20	2	1.02	
Selene dorsalis	1.72	30	0.80	
Cynoglossus canariensis	0.92	6	0.43	
Pomadasys peroteti	0.90	6	0.42	
Pentaneus quinquarius	0.28	2	0.13	
Dicologlossa cuneata	0.20	2	0.09	
Total	215.74		100.00	

PROJECT STATION: 3193  
 DATE: 29/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 815  
 start stop duration Long E 1315  
 TIME 20:55:14 21:26:44 32 (min) Purpose code: 2  
 LOG 5043.90 5045.52 1.62 Area code: 3  
 FDEPTH: 27 28 GearCond.code:  
 BDEPTH: 27 28 Validity code:  
 Towing dir: 330° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 123 Kg Total catch: 456.44 CATCH/HOUR: 855.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	318.38	887	37.20	
Pseudolithus typus	234.19	416	27.36	6738
Pteroscion pelli	142.91	4172	16.70	
Penaeus notialis	49.31	4196	5.76	
Dicologlossa cuneata	27.81	645	3.25	
Dasyatis margarita	25.31	83	2.96	
Brachydeuterus auritus	24.41	714	2.85	
Pomadasys peroteti	13.59	41	1.59	
Sphyræna guachancho	5.61	13	0.66	
Stromateus fiatola	4.86	8	0.57	
Torpedo nobiliana	3.53	8	0.41	
Sardinella maderensis	3.04	21	0.36	
Ilisha africana	1.24	111	0.14	
Selene dorsalis	1.11	41	0.13	
Trichiurus lepturus	0.54	13	0.06	
Total	855.84		100.00	

PROJECT STATION: 3191  
 DATE: 29/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 815  
 start stop duration Long E 1309  
 TIME 15:21:30 15:51:34 30 (min) Purpose code: 2  
 LOG 5025.40 5026.96 1.55 Area code: 3  
 FDEPTH: 59 58 GearCond.code:  
 BDEPTH: 59 58 Validity code:  
 Towing dir: 345° Wire out: 170 m Speed: 30 kn\*10  
 Sorted: 61 Kg Total catch: 227.37 CATCH/HOUR: 454.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	279.34	4210	61.43	
Trichiurus lepturus	38.48	458	8.46	
Trachurus trecae	27.88	272	6.13	6735
Chloroscombrus chrysurus	27.60	280	6.07	
Trachurus trecae, juvenile	18.72	2116	4.12	
Selene dorsalis	17.52	132	3.85	
Torpedo torpedo	11.38	28	2.50	
Atractoscion aequidens	7.32	36	1.61	
Dentex angolensis	4.58	28	1.01	
Brotula barbata	4.44	28	0.98	
Pagellus bellottii	4.14	66	0.91	
Sphyræna guachancho	3.76	22	0.83	
Zeus faber	1.92	14	0.42	
Dentex congoensis	1.24	36	0.27	
Pentheroscion mbizi	1.18	6	0.26	
Citharus linguatula	1.10	36	0.24	
Pomadasys incisus	1.10	22	0.24	
Bembrops heterurus	0.74	14	0.16	
Umbrina canariensis	0.66	28	0.15	
Dicologlossa cuneata	0.50	8	0.11	
Pteroscion pelli	0.28	14	0.06	
Sepia officinalis hierredda	0.22	6	0.05	
Chelidonichthys gabonensis	0.22	14	0.05	
Boops boops	0.22	6	0.05	
Sardinella aurita	0.14	8	0.03	
Engraulis encrasicolus	0.06	6	0.01	
Total	454.74		100.00	

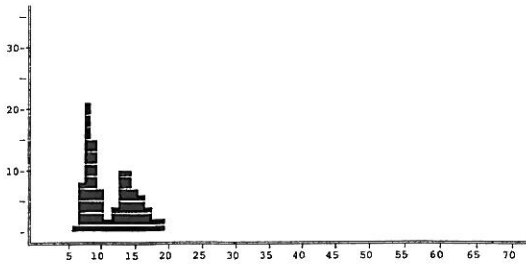
PROJECT STATION: 3194  
 DATE: 29/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 815  
 start stop duration Long E 1309  
 TIME 22:33:00 23:02:41 30 (min) Purpose code: 2  
 LOG 5052.69 5054.22 1.52 Area code: 3  
 FDEPTH: 59 58 GearCond.code:  
 BDEPTH: 59 58 Validity code:  
 Towing dir: 245° Wire out: 170 m Speed: 30 kn\*10  
 Sorted: 41 Kg Total catch: 165.12 CATCH/HOUR: 330.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	109.20	2368	33.07	6740
Brachydeuterus auritus	44.40	400	13.44	
Pomadasys incisus	21.20	248	6.42	
Sardinella maderensis	17.36	128	5.26	
Torpedo torpedo	16.88	48	5.11	
Dentex angolensis	15.36	656	4.65	6739
Umbrina canariensis	11.92	248	3.61	
Bembrops heterurus	11.36	312	3.44	
Sepia officinalis hierredda	8.96	208	2.71	
Sepiella ornata	7.04	24	2.13	
Raja miraletus	6.80	8	2.06	
Citharus linguatula	6.16	240	1.87	
Pterochirissus bellocci	6.08	168	1.84	
Atractoscion aequidens	6.00	40	1.82	
Pentheroscion mbizi	6.00	32	1.82	
Trichiurus lepturus	4.56	152	1.38	
Brotula barbata	4.24	88	1.28	
Trachurus trecae	3.92	56	1.19	
Lepidotrigla cadmani	3.68	248	1.11	
Chelidonichthys gabonensis	3.60	40	1.09	
Sardinella aurita	3.60	16	1.09	
Dentex barnardi	2.56	104	0.78	
Parapenaeus longirostris	2.24	560	0.68	
Branchiostegus semifasciatus	1.12	8	0.34	
Cephalopholis taeniodon	0.96	16	0.29	
ANRAN05	0.88	16	0.27	
Pseudupeneus prayensis	0.72	24	0.22	
Monolene microstoma	0.72	80	0.22	
GOBIIDAE	0.64	152	0.19	
Physiculus sp	0.64	16	0.19	
Scorpaena stephanica	0.56	56	0.17	
Myxtriopha rostellatus	0.48	24	0.15	
Galeoides decadactylus	0.40	8	0.12	
Total	330.24		100.01	

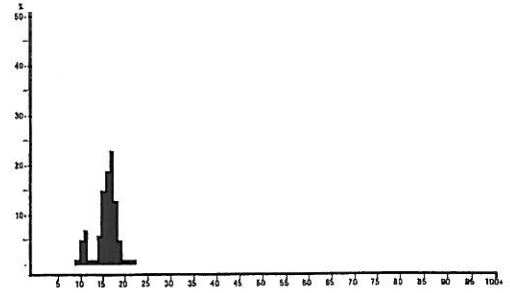
PROJECT STATION: 3195  
 DATE: 30/ 3/03 GEAR TYPE: BT No: 2 POSITION: Lat S 815  
 start stop duration Long E 1315  
 TIME : 00:16:37 00:47:25 31 (min) Purpose code: 2  
 LOG : 5062.74 5064.29 1.56 Area code : 3  
 FDEPTH: 28 28 GearCond.code:  
 BDEPTH: 28 28 Validity code:  
 Towing dir: 330° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 36 Kg Total catch: 214.83 CATCH/HOUR: 415.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	98.71	453	23.74	
Pteroscion peli	92.32	6817	22.20	
Pseudolithus senegalensis	69.68	302	16.76	6741
Shrimps, small, non comm	37.51	15004	9.02	
Brachydeuterus auritus	21.37	1637	5.14	
Ilisha africana	15.79	917	3.80	
Dasyatis marmorata	15.10	12	3.63	
Dicologlossa cuneata	14.52	360	3.49	
Cynoglossus canariensis	9.17	58	2.21	
Citharus linguatula	6.97	35	1.68	
Sphyræna guachancho	5.69	12	1.37	
Dasyatis margarita	5.46	23	1.31	
Pomadasy peroteti	4.99	23	1.20	
Trichiurus lepturus	4.18	348	1.01	
Cynoponticus ferox	3.48	12	0.84	
Chloroscombrus chrysurus	2.90	58	0.70	
Raja miraletus	2.32	12	0.56	
Pomadasy incisus	1.86	12	0.45	
Peneus notialis	1.34	37	0.32	
Sepia officinalis hierreda	0.81	12	0.19	
COBLIDAE	0.70	441	0.17	
Selene dorsalis	0.58	12	0.14	
Monolene microstoma	0.35	12	0.08	
<b>Total</b>	<b>415.80</b>		<b>100.01</b>	

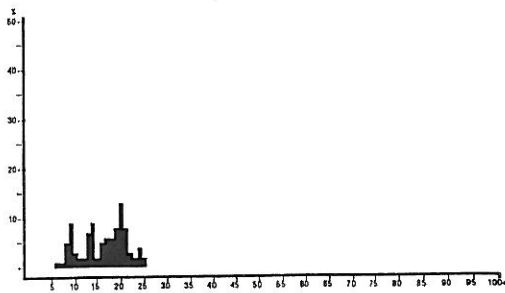
## ANNEX II. Length distribution of main species



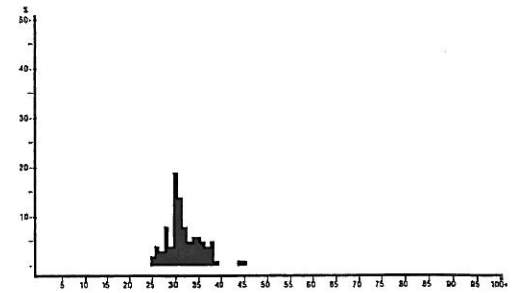
*Trachurus trachea*  
Angola south  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 11.79cm N= 848  
NUMBER OF SUBSAMPLES = 7  
SAMPLES FOUND BETWEEN ST. NO.2992 AND 3010.  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3015.



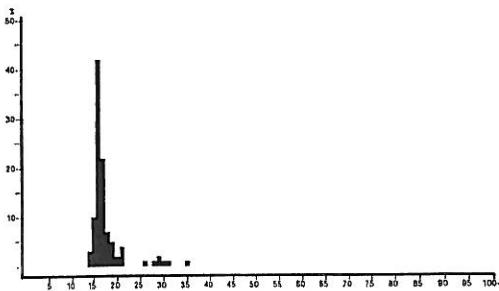
*Dentex macrophthalmus*  
Angola south  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 16.28cm N= 483  
NUMBER OF SUBSAMPLES = 5  
SAMPLES FOUND BETWEEN ST. NO.2992 AND 3010  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3015.



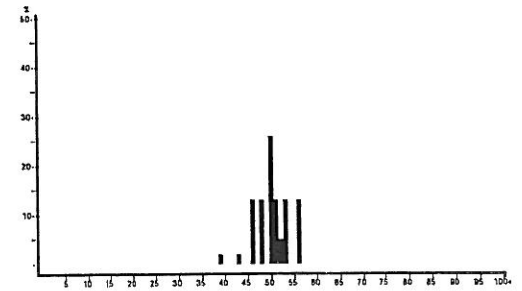
*Trachurus trachea, juvenile*  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 16.82cm N= 785  
NUMBER OF SUBSAMPLES = 7  
SAMPLES FOUND BETWEEN ST. NO.2998 AND 3014.  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3016.



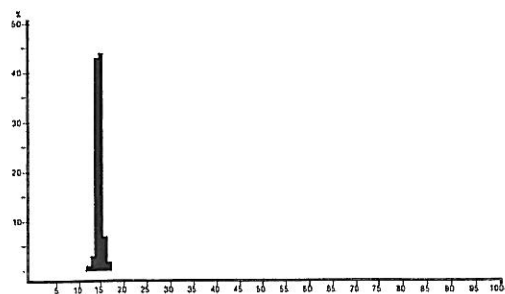
*Merluccius capensis*  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 21.22cm N= 197  
NUMBER OF SUBSAMPLES = 9  
SAMPLES FOUND BETWEEN ST. NO.2992 AND 3010.  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3015.



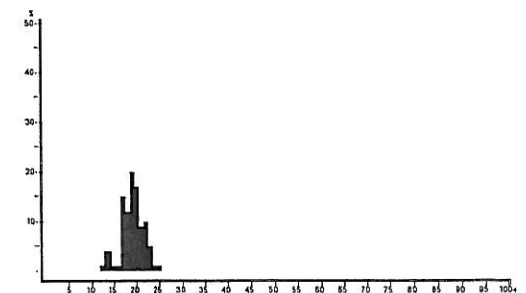
*Trachurus capensis*  
Angola south  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 17.25cm N= 128  
NUMBER OF SUBSAMPLES = 3  
SAMPLES FOUND BETWEEN ST. NO.2992 AND 2995.  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3015.



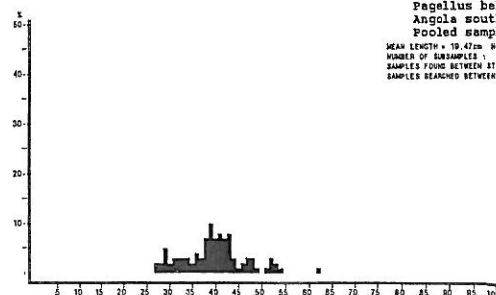
*Merluccius polli*  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 43.85cm N= 11  
NUMBER OF SUBSAMPLES = 2  
SAMPLES FOUND BETWEEN ST. NO.3006 AND 3016.  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3016.



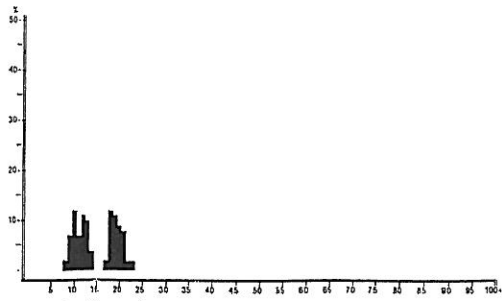
*Trachurus capensis, juvenile*  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 15.00cm N= 100  
NUMBER OF SUBSAMPLES = 1  
SAMPLES FOUND BETWEEN ST. NO.2992 AND 2992.  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3016.



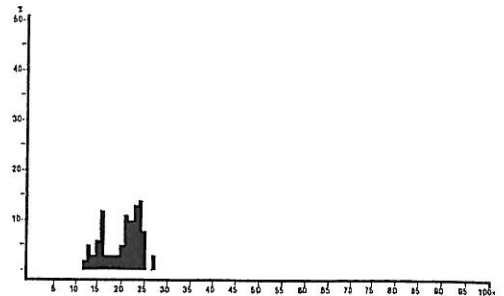
*Pagellus bellottii*  
Angola south  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 18.42cm N= 82  
NUMBER OF SUBSAMPLES = 1  
SAMPLES FOUND BETWEEN ST. NO.3013 AND 3013.  
SAMPLES SEARCHED BETWEEN ST. NO.2990 AND 3015.



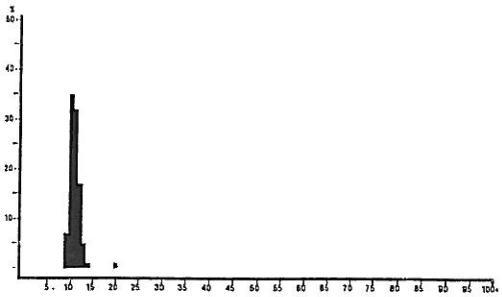
*Atractoscion aequidens*  
Angola south  
Pooled sample ( weighted by catch).  
MEAN LENGTH = 39.84cm N= 100  
NUMBER OF SUBSAMPLES = 2



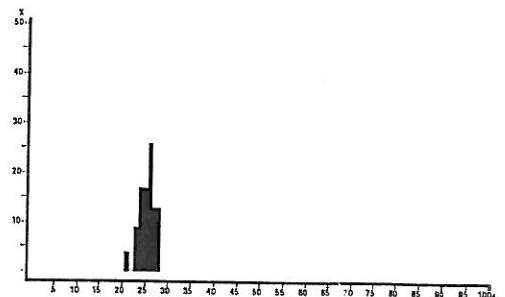
*Trachurus trecae*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 15.68cm N= 1284  
NUMBER OF SUBSAMPLES = 9  
SAMPLES FOUND BETWEEN ST. NO.3018 AND 3071.  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



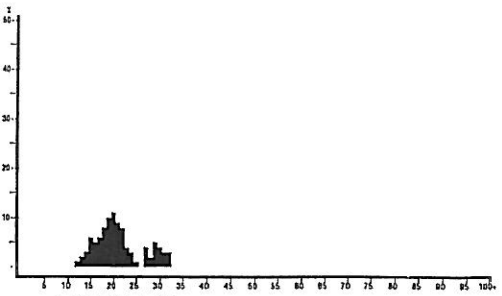
*Pomadasys incisus*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 20.65cm N= 79  
NUMBER OF SUBSAMPLES = 2  
SAMPLES FOUND BETWEEN ST. NO.3073 AND 3076.  
SAMPLES SEARCHED BETWEEN ST. NO.3018 AND 3087.



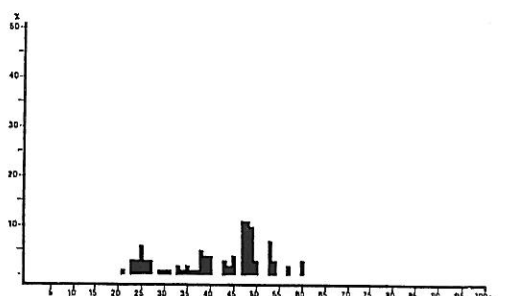
*Trachurus trecae, juvenile*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 11.53cm N= 1414  
NUMBER OF SUBSAMPLES = 14  
SAMPLES FOUND BETWEEN ST. NO.3033 AND 3083  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



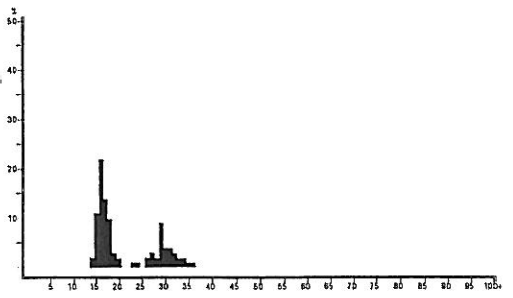
*Pomadasys rogeri*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 25.86cm N= 23  
NUMBER OF SUBSAMPLES = 1  
SAMPLES FOUND BETWEEN ST. NO.3073 AND 3073.  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



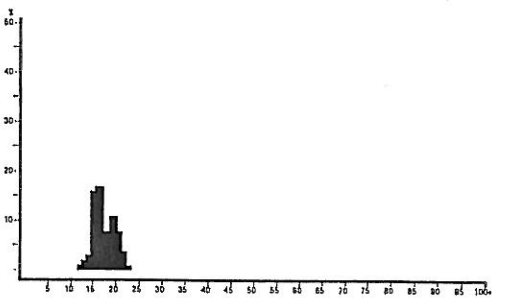
*Merluccius polli*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 21.79cm N= 597  
NUMBER OF SUBSAMPLES = 13  
SAMPLES FOUND BETWEEN ST. NO.3016 AND 3087.  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



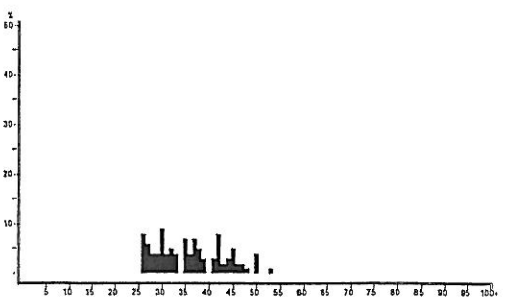
*Pseudotolithus typus*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 47.62cm N= 58  
NUMBER OF SUBSAMPLES = 4  
SAMPLES FOUND BETWEEN ST. NO.3047 AND 3081.  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



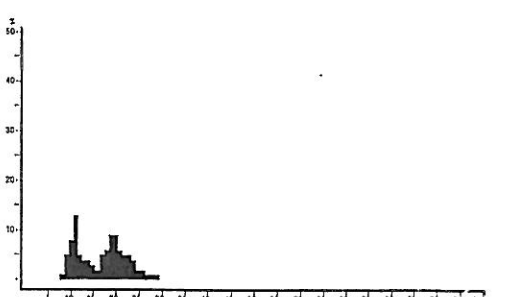
*Umbrina canariensis*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 21.72cm N= 103  
NUMBER OF SUBSAMPLES = 4  
SAMPLES FOUND BETWEEN ST. NO.3021 AND 3082.  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



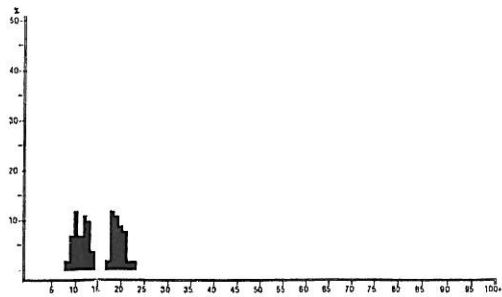
*Brachydeuterus auritus*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 18.08cm N= 527  
NUMBER OF SUBSAMPLES = 8  
SAMPLES FOUND BETWEEN ST. NO.3055 AND 3081.  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



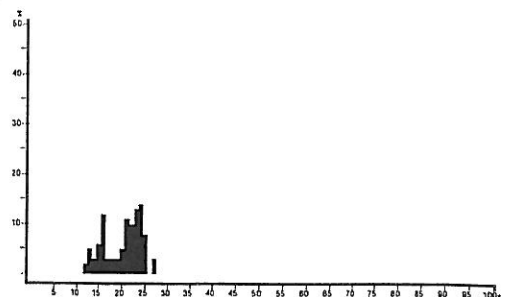
*Pseudotolithus senegalensis*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 36.68cm N= 88  
NUMBER OF SUBSAMPLES = 7  
SAMPLES FOUND BETWEEN ST. NO.3041 AND 3081.  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



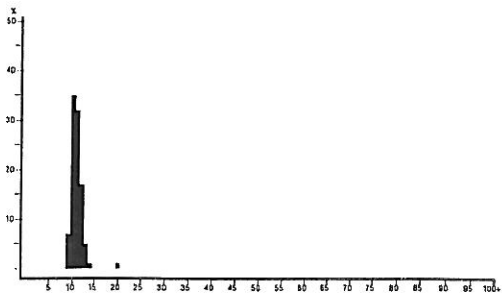
*Pagellus bellottii*  
Pooled sample (weighted by catch).  
MEAN LENGTH = 17.31cm N= 387  
NUMBER OF SUBSAMPLES = 14  
SAMPLES FOUND BETWEEN ST. NO.3016 AND 3076  
SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087.



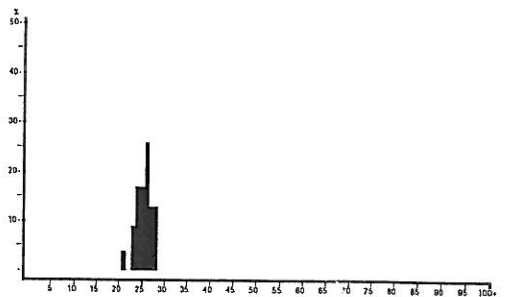
*Trachurus trcaae*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 15.89cm N= 1284  
 NUMBER OF SUBSAMPLES = 9  
 SAMPLES FOUND BETWEEN ST. NO 3018 AND 3071  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



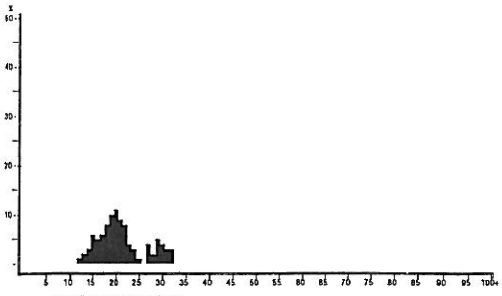
*Pomadasys incisus*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 20.65cm N= 76  
 NUMBER OF SUBSAMPLES = 7  
 SAMPLES FOUND BETWEEN ST. NO 3073 AND 3078  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



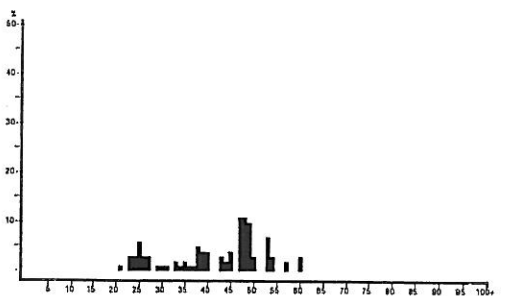
*Trachurus trcaae, juvenile*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 11.53cm N= 1414  
 NUMBER OF SUBSAMPLES = 14  
 SAMPLES FOUND BETWEEN ST. NO 3033 AND 3083  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



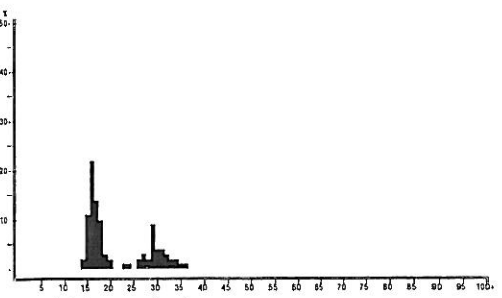
*Pomadasys rogeri*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 25.89cm N= 23  
 NUMBER OF SUBSAMPLES = 7  
 SAMPLES FOUND BETWEEN ST. NO 3075 AND 3078  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



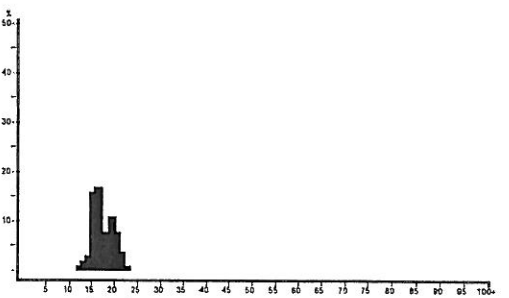
*Merluccius polli*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 21.78cm N= 597  
 NUMBER OF SUBSAMPLES = 13  
 SAMPLES FOUND BETWEEN ST. NO 3018 AND 3087  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



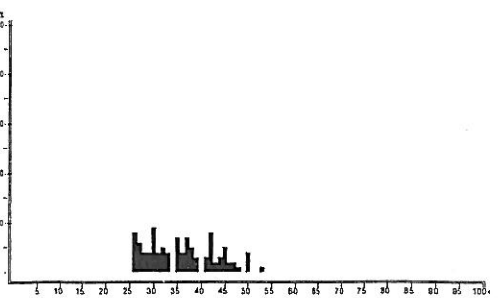
*Pseudotolithus typus*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 42.62cm N= 58  
 NUMBER OF SUBSAMPLES = 4  
 SAMPLES FOUND BETWEEN ST. NO 3047 AND 3061  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



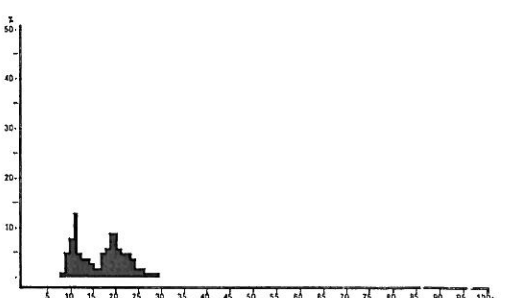
*Umbrina canariensis*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 21.72cm N= 103  
 NUMBER OF SUBSAMPLES = 4  
 SAMPLES FOUND BETWEEN ST. NO 3021 AND 3082  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



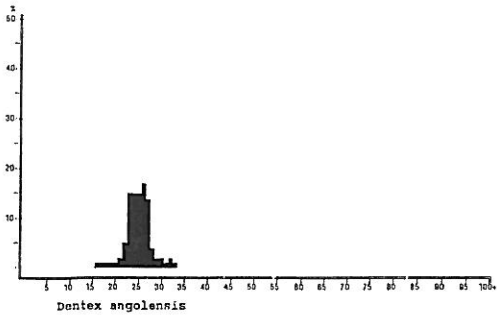
*Brechdeuterus auritus*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 18.08cm N= 527  
 NUMBER OF SUBSAMPLES = 8  
 SAMPLES FOUND BETWEEN ST. NO 3033 AND 3081  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



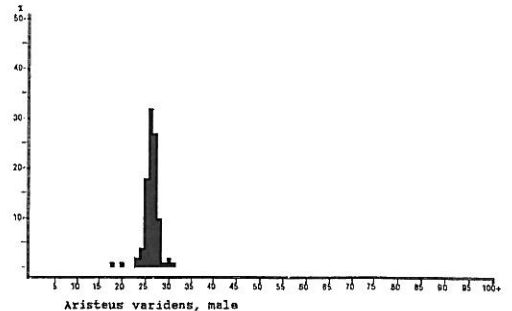
*Pseudotolithus senegalensis*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 36.88cm N= 88  
 NUMBER OF SUBSAMPLES = 7  
 SAMPLES FOUND BETWEEN ST. NO 3041 AND 3081  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



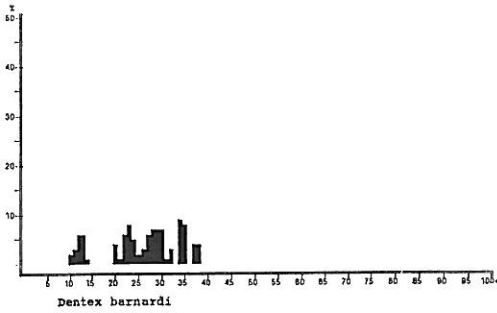
*Pagellus bellottii*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 17.31cm N= 387  
 NUMBER OF SUBSAMPLES = 14  
 SAMPLES FOUND BETWEEN ST. NO 3018 AND 3078  
 SAMPLES SEARCHED BETWEEN ST. NO 3018 AND 3087 .



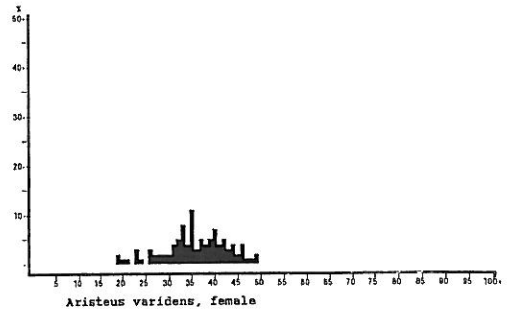
*Dentex angolensis*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 25.18cm N= 232  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3029 AND 3084  
 SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087 .



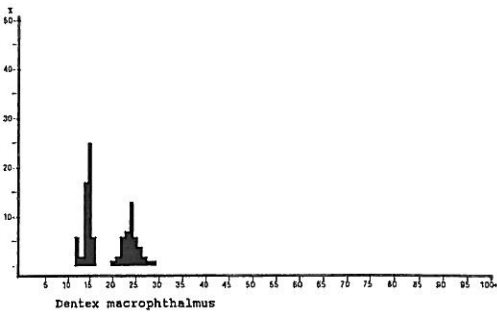
*Aristeus varidens, male*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 28.85cm N= 142  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3025 AND 3085  
 SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087 .



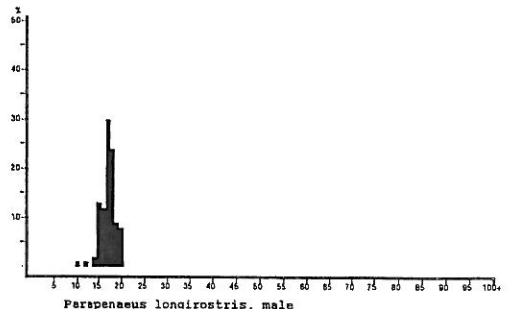
*Dentex barnardi*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 28.24cm N= 88  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3029 AND 3085  
 SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087 .



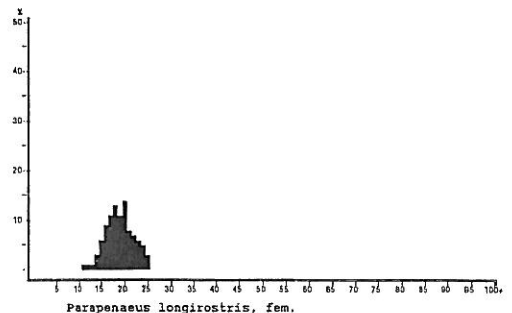
*Aristeus varidens, female*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 35.41cm N= 173  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3025 AND 3085  
 SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087 .



*Dentex macrophthalmus*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 19.20cm N= 192  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3028 AND 3084  
 SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087 .

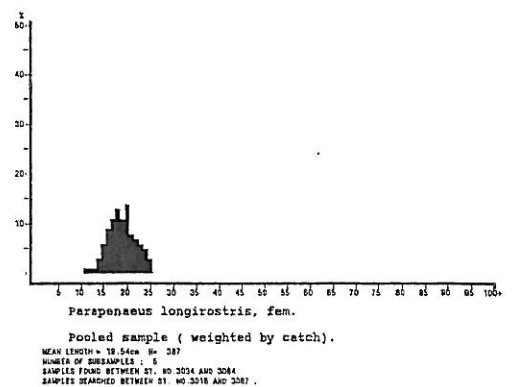
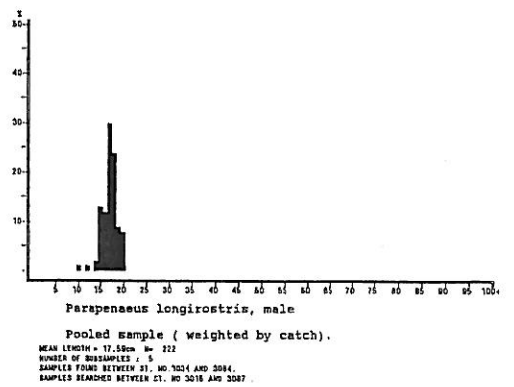
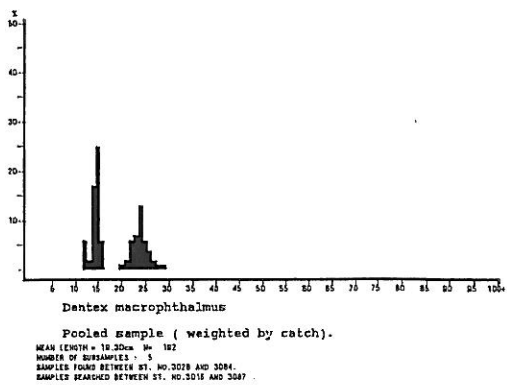
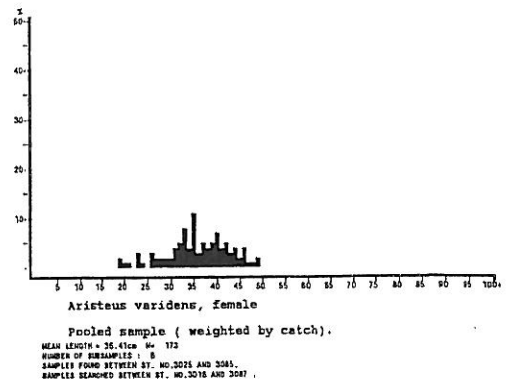
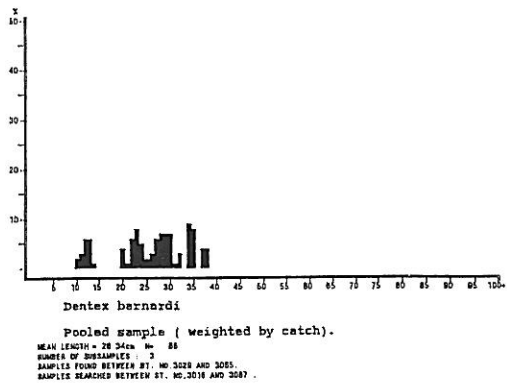
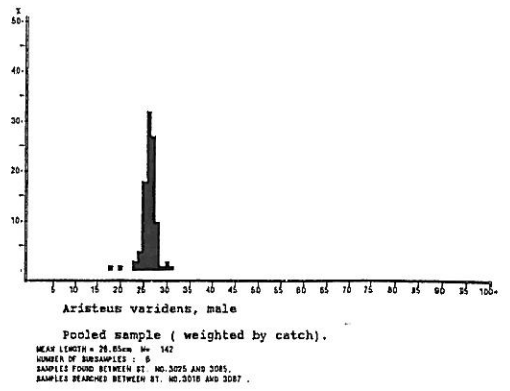
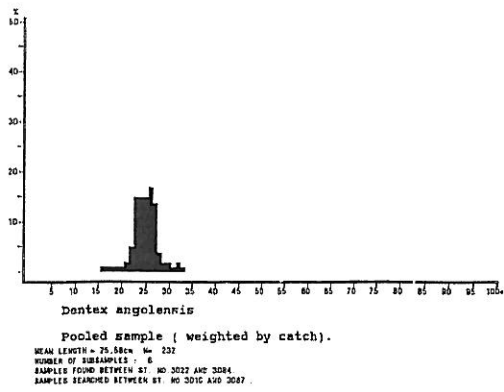


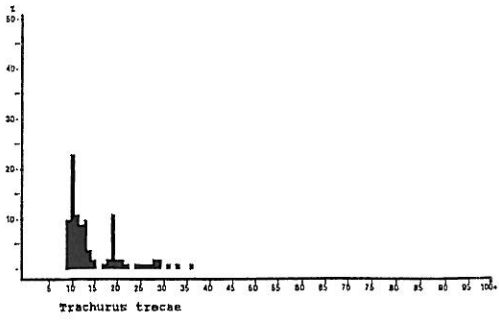
*Parapeneus longirostris, male*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 17.59cm N= 222  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3034 AND 3084  
 SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087 .



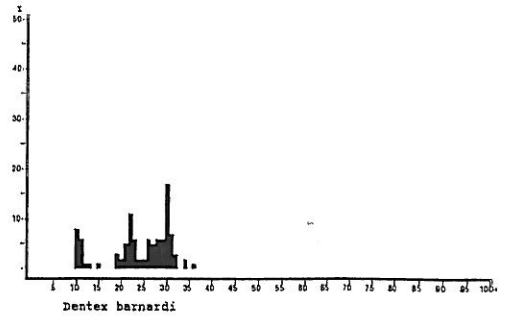
*Parapeneus longirostris, fem.*  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 18.54cm N= 387  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3034 AND 3084  
 SAMPLES SEARCHED BETWEEN ST. NO.3016 AND 3087 .



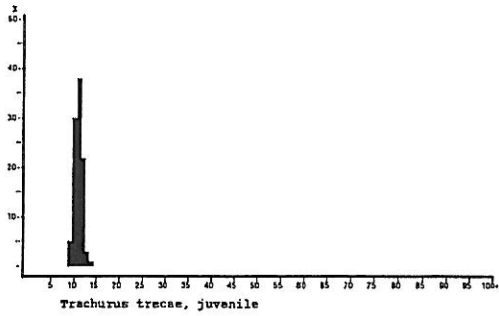




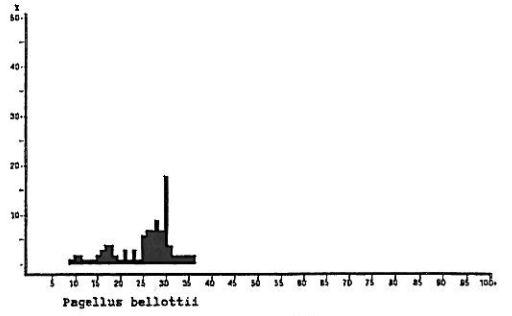
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 15.24cm N= 805  
 NUMBER OF SUBSAMPLES : 7  
 SAMPLES FOUND BETWEEN ST. NO 3282 AND 3187  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



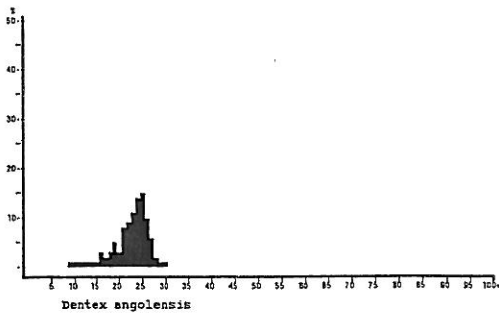
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 24.64cm N= 138  
 NUMBER OF SUBSAMPLES : 8  
 SAMPLES FOUND BETWEEN ST. NO 3111 AND 3156  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



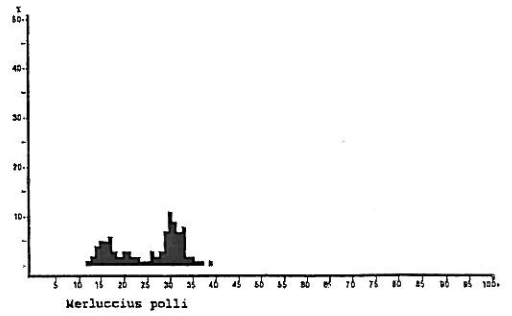
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 11.46cm N= 2428  
 NUMBER OF SUBSAMPLES : 23  
 SAMPLES FOUND BETWEEN ST. NO 3101 AND 3187  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



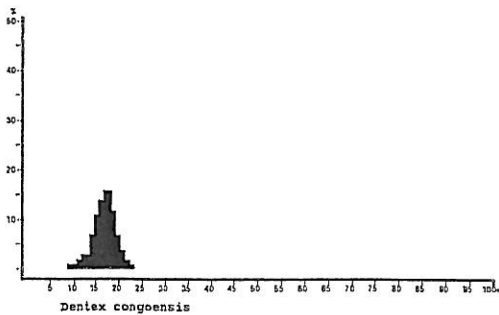
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 25.86cm N= 882  
 NUMBER OF SUBSAMPLES : 18  
 SAMPLES FOUND BETWEEN ST. NO 3100 AND 3181  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



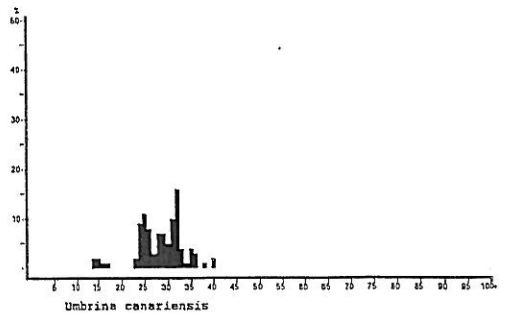
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 23.08cm N= 1588  
 NUMBER OF SUBSAMPLES : 32  
 SAMPLES FOUND BETWEEN ST. NO 3088 AND 3187  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



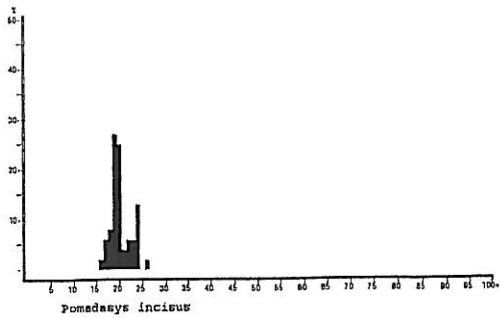
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 28.30cm N= 451  
 NUMBER OF SUBSAMPLES : 11  
 SAMPLES FOUND BETWEEN ST. NO 3098 AND 3172  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



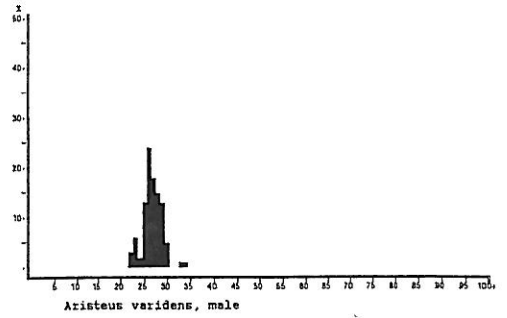
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 17.35cm N= 1302  
 NUMBER OF SUBSAMPLES : 20  
 SAMPLES FOUND BETWEEN ST. NO 3087 AND 3187  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



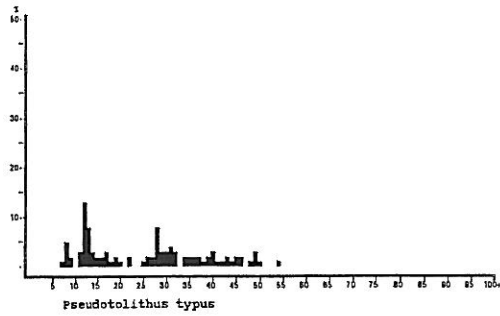
Pooled sample ( weighted by catch).  
 MEAN LENGTH = 28.08cm N= 288  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO 3098 AND 3175  
 SAMPLES SEARCHED BETWEEN ST. NO 3088 AND 3187



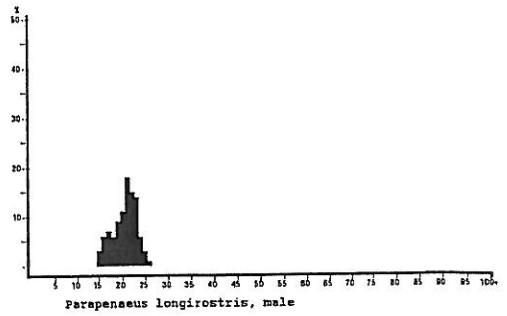
Pooled sample (weighted by catch).  
 MEAN LENGTH = 20.77cm N= 48  
 NUMBER OF SUBSAMPLES : 1  
 SAMPLES FOUND BETWEEN ST. NO.3148 AND 3148  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



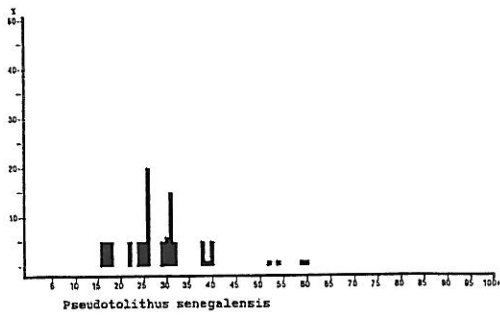
Pooled sample (weighted by catch).  
 MEAN LENGTH = 27.22cm N= 76  
 NUMBER OF SUBSAMPLES : 3  
 SAMPLES FOUND BETWEEN ST. NO.3143 AND 3183.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



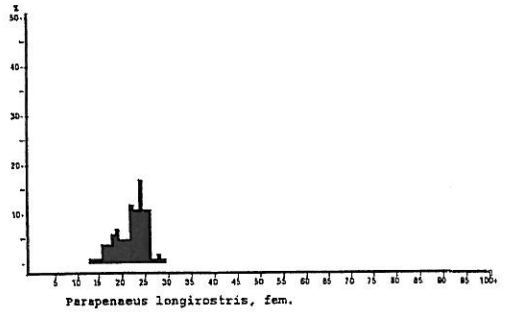
Pooled sample (weighted by catch).  
 MEAN LENGTH = 21.35cm N= 126  
 NUMBER OF SUBSAMPLES : 3  
 SAMPLES FOUND BETWEEN ST. NO.3097 AND 3110.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



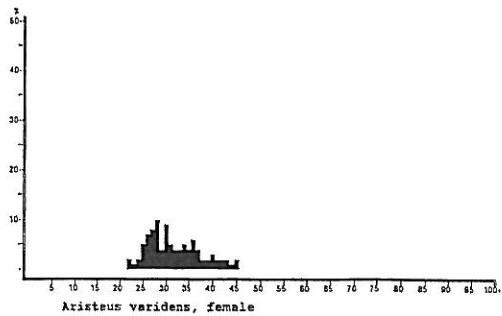
Pooled sample (weighted by catch).  
 MEAN LENGTH = 20.88cm N= 274  
 NUMBER OF SUBSAMPLES : 4  
 SAMPLES FOUND BETWEEN ST. NO.3088 AND 3171.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



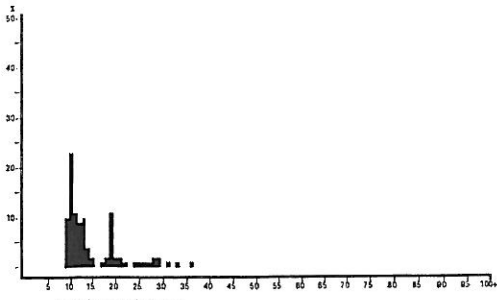
Pooled sample (weighted by catch).  
 MEAN LENGTH = 26.43cm N= 39  
 NUMBER OF SUBSAMPLES : 2  
 SAMPLES FOUND BETWEEN ST. NO.3088 AND 3091.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



Pooled sample (weighted by catch).  
 MEAN LENGTH = 22.77cm N= 624  
 NUMBER OF SUBSAMPLES : 7  
 SAMPLES FOUND BETWEEN ST. NO.3088 AND 3183.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



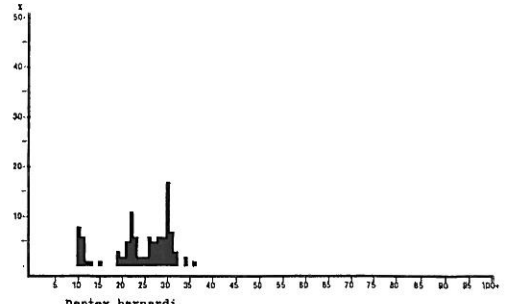
Pooled sample (weighted by catch).  
 MEAN LENGTH = 32.41cm N= 178  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3143 AND 3183  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Trachurus trecae*

Pooled sample ( weighted by catch).

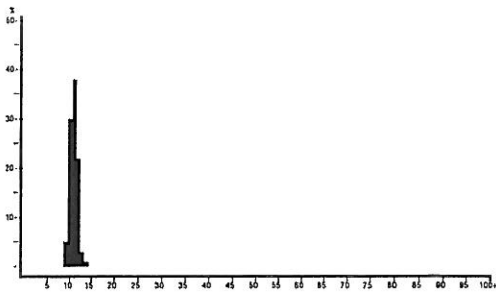
MEAN LENGTH = 15.74cm N= 805  
 NUMBER OF SUBSAMPLES : 7  
 SAMPLES FOUND BETWEEN ST. NO.3082 AND 3187.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Dentex barnardi*

Pooled sample ( weighted by catch).

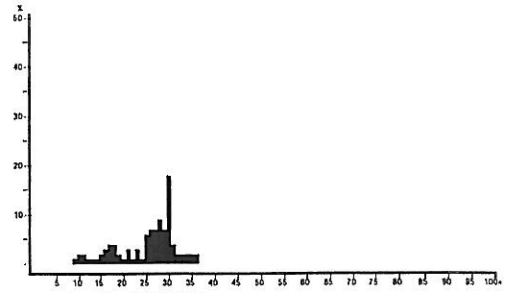
MEAN LENGTH = 24.84cm N= 138  
 NUMBER OF SUBSAMPLES : 8  
 SAMPLES FOUND BETWEEN ST. NO.3111 AND 3168.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Trachurus trecae, juvenile*

Pooled sample ( weighted by catch).

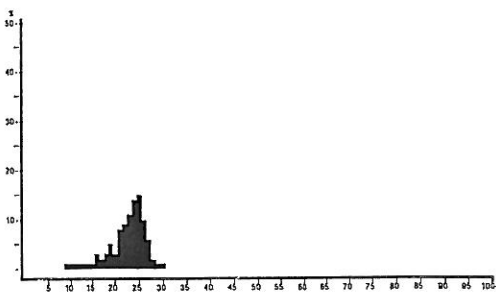
MEAN LENGTH = 11.48cm N= 2428  
 NUMBER OF SUBSAMPLES : 33  
 SAMPLES FOUND BETWEEN ST. NO.3101 AND 3187.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Pagellus bellottii*

Pooled sample ( weighted by catch).

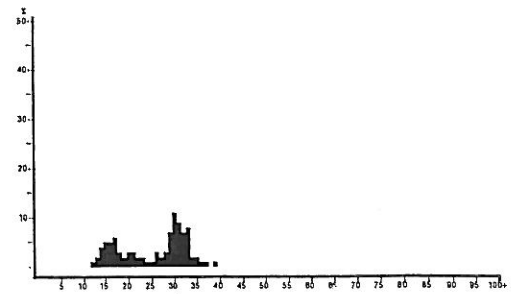
MEAN LENGTH = 25.06cm N= 882  
 NUMBER OF SUBSAMPLES : 15  
 SAMPLES FOUND BETWEEN ST. NO.3100 AND 3181.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Dentex angolensis*

Pooled sample ( weighted by catch).

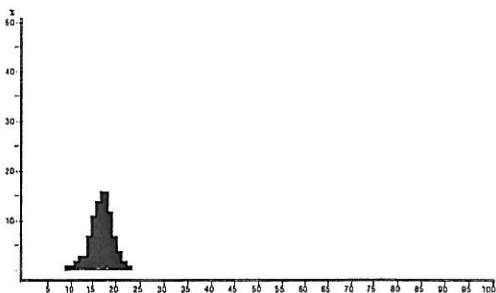
MEAN LENGTH = 23.08cm N= 1586  
 NUMBER OF SUBSAMPLES : 32  
 SAMPLES FOUND BETWEEN ST. NO.3088 AND 3187.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Merluccius polli*

Pooled sample ( weighted by catch).

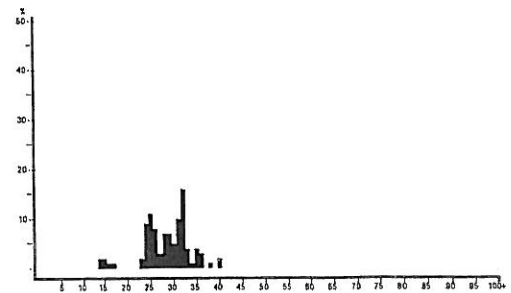
MEAN LENGTH = 25.35cm N= 451  
 NUMBER OF SUBSAMPLES : 12  
 SAMPLES FOUND BETWEEN ST. NO.3088 AND 3172.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Dentex congolensis*

Pooled sample ( weighted by catch).

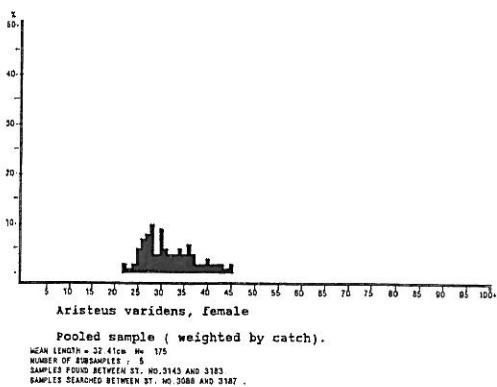
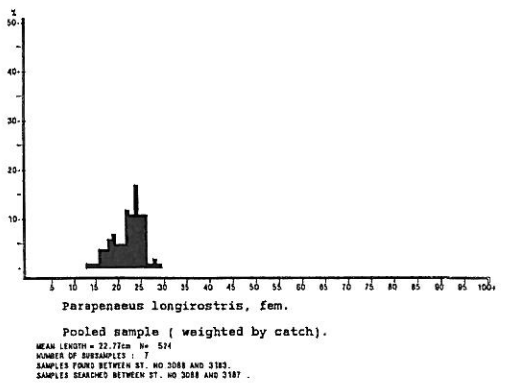
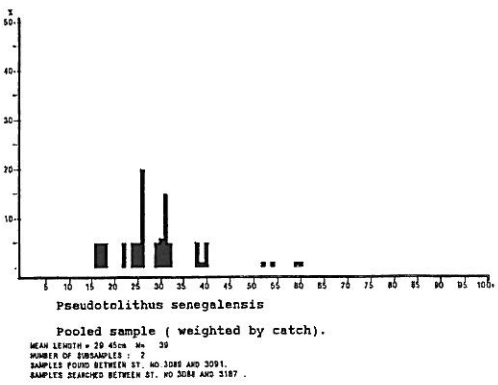
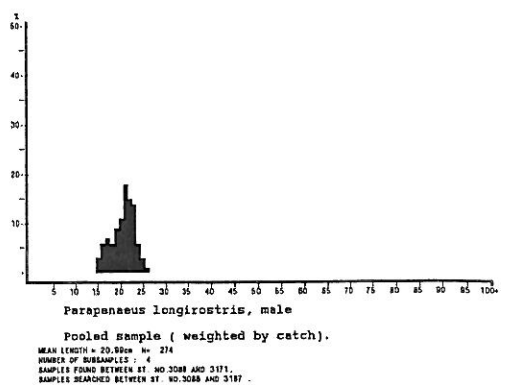
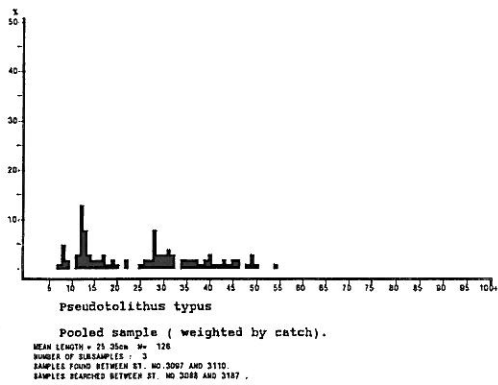
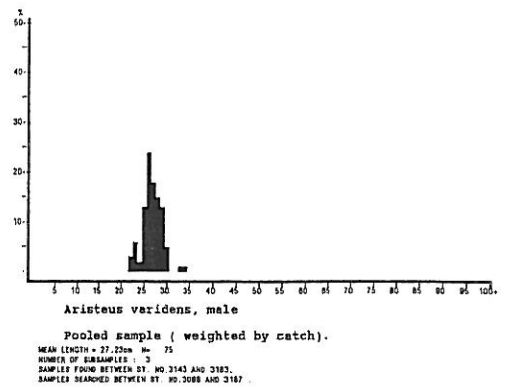
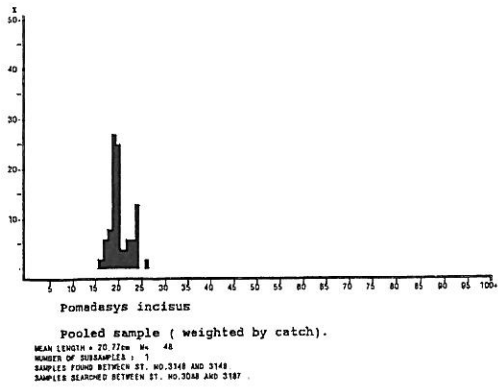
MEAN LENGTH = 17.35cm N= 1007  
 NUMBER OF SUBSAMPLES : 20  
 SAMPLES FOUND BETWEEN ST. NO.3082 AND 3187.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



*Umbrina canariensis*

Pooled sample ( weighted by catch).

MEAN LENGTH = 28.08cm N= 284  
 NUMBER OF SUBSAMPLES : 5  
 SAMPLES FOUND BETWEEN ST. NO.3090 AND 3175.  
 SAMPLES SEARCHED BETWEEN ST. NO.3088 AND 3187 .



## ANNEX III. Swept area estimates

SWEPT AREA ANALYSIS FROM STATION 2990 TO STATION 3016

A. Cunene - Tombua. Shelf

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>				
	Lower limits, Kg/nm							20- 50m	50-100m	100-200m	200-200m	
	>0	10	30	100	300	1000						
Trachurus trecae, juvenile			1	2	2	1	33	25.33	75.57	11.38	10.58	
Trachurus capensis, juvenile						1	6	22.56		58.02		
Trachurus trecae			2	2	4		44	14.35	19.48	19.03	6.74	
Dentex macrophthalmus	2	1	1	4	2		56	8.71		0.79	21.61	
Merluccius capensis	2	1	1	3			39	4.41		0.08	11.26	
Myliobatis aquila	1	1			1		17	2.08	8.97	0.22		
Trachurus capensis	2			2			22	1.97			5.08	
Synagrops microlepis	1		1	1			17	1.54		0.78	3.17	
Sardinella maderensis			1	1			11	1.33	5.98			
Pagellus bellottii	3		1	1			28	1.15	3.34	1.03	0.02	
Squalus megalops	1	1	1				17	0.61		0.26	1.30	
Pterothrissus belloci	4	1	2				39	0.60		0.01	1.55	
Atractoscion aequidens	11	3					61	0.57	0.16	0.19	1.19	
Sepia orbignyana	3	1	1				28	0.51	1.97	0.19		
Gymnura altavela			1				6	0.28	1.26			
Dicologlossa cuneata	7	1					44	0.27	0.02	0.45	0.24	
Raja miraletus	2		1				17	0.26	1.13	0.03		
Scomber japonicus			1				6	0.24	1.08			
Sardinella aurita			1				6	0.23	1.03			
Merluccius sp.			1				6	0.18		0.46		
C R A B S		1					6	0.17		0.42		
Illex coindetii	3	1					22	0.15		0.36	0.01	
Chelidonichthys gabonensis	4						22	0.13	0.17	0.12	0.13	
Trigla lyra	5	1					33	0.11		0.01	0.27	
Todaropsis eblanae	4	1					28	0.11	0.03	0.26	0.01	
Umbrina canariensis	5						28	0.10	0.12	0.06	0.13	
Lithognathus mormyrus	2						6	0.09	0.25	0.08		
Seriola carpenteri		1						0.09	0.39			
Decapterus rhonchus		1					6	0.09	0.42			
Dasyatis centroura		1					6	0.08	0.38			
Mustelus mustelus	1	1					11	0.07	0.27	0.02		
Stromateus fiatola	1						6	0.05	0.22			
Arius parkii	2						11	0.05	0.08		0.09	
Other fish								0.45	0.61	0.30	0.53	
Sum all species								88.92	122.93	94.55	63.91	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers								0.69	0.36	0.25	1.32	
Sum Seabreams								9.99	3.60	1.99	21.63	
Sum Sharks								0.72	0.41	0.28	1.34	
Sum Rays								2.70	11.74	0.25		
Sum Squids								0.84	2.02	0.88	0.14	
Sum												

Number of stations included in analysis, total and by depth strata

18

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SWEPT AREA ANALYSIS FROM STATION 2990 TO STATION 3016

B. Cunene - Tombua slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>				
	Lower limits, Kg/nm							200-300m	300-400m	400-500m	500-500m	
	>0	10	30	100	300	1000						
<i>Helicolenus dactylopterus</i>				2			100	21.98		21.98		
<i>Chlorophthalmus atlanticus</i>			2				100	6.35		6.35		
<i>Hoplostethus cadenati</i>			1				50	3.01		3.01		
<i>Merluccius capensis</i>			1					1.62		1.62		
<i>Nezumia aequalis</i>	2						100	0.58		0.58		
<i>Centroscymnus crepidater</i>			1				50	0.57		0.57		
<i>Pterothrissus belloci</i>			1				50	0.53		0.53		
<i>Laemonema laureysi</i>	1							0.34		0.34		
<i>Parapenaeus longirostris, fem.</i>	1						50	0.30		0.30		
<i>Solenocera africana</i>	2						100	0.29		0.29		
<i>Leptocharias smithii</i>	1							0.20		0.20		
<i>Merluccius polli</i>	1							0.10		0.10		
<i>Neoharriotta pinnata</i>	1							0.09		0.09		
<i>Dicologlossa cuneata</i>	1							0.08		0.08		
<i>Decapterus rhonchus</i>	1							0.06		0.06		
<i>Gonostoma denudata</i>	1						50	0.05		0.05		
Other fish								0.10		0.10		
Sum all species								36.25		36.25		
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks								0.86		0.86		
Sum Rays												
Sum Squids												
Sum												
0.59												

Number of stations included in analysis, total and by depth strata

2

2

SWEPT AREA ANALYSIS FROM STATION 2990 TO STATION 3016

C. Cunene - Tombua slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower limits, Kg/nm							500-600m	600-700m	700-800m	800-800m
	>0	10	30	100	300	1000					
Hoplostethus cadenati			1				4.59			13.77	
Trachyrincus scabrus	1	1				67	0.93		1.39		
Merluccius polli			1				0.73			2.20	
Malacocephalus sp.			1			33	0.60		0.91		
Merluccius capensis	2					67	0.54		0.80		
Malacocephalus occidentalis			1			33	0.50		0.74		
Lamprogrammus exutus	2					33	0.30		0.01	0.87	
Gonostoma elongatum	1					33	0.29			0.88	
Todaropsis eblanae	1					33	0.23		0.34		
Hoplostethus atlanticus	2					67	0.19		0.28		
Talismania bifurcata	3					100	0.19		0.17	0.24	
Todarodes angolensis	1					33	0.14		0.21		
Nezumia aequalis	1					33	0.13			0.40	
Helicolenus dactylopterus	2					67	0.12		0.18		
Synbranchus afer	1					33	0.08			0.24	
Aristeus varidens, female	3					100	0.08		0.02	0.19	
Melanostomias sp.	2					33	0.07		0.05	0.11	
Triplophus hemingi	1					33	0.07			0.22	
ODPLA02	1					33	0.06		0.09		
Aristeus varidens, male	3					100	0.05		0.01	0.14	
MACROURIDAE	1						0.05			0.15	
Solenocera africana	1						0.04			0.11	
Plesiopenaeus edwardsianus	1					33	0.01			0.03	
Other fish							0.22		0.34	0.05	
Sum all species							10.21		5.54	19.60	
Sum Snappers											
Sum Groupers											
Sum Grunts											
Sum Croakers											
Sum Seabreams											
Sum Sharks							0.07		0.12		
Sum Rays											
Sum Squids							0.37		0.55		
Sum											
0.03											

Number of stations included in analysis, total and by depth strata

3

2

1



SWEPT AREA ANALYSIS FROM STATION 3016 TO STATION 3087

A. Benguela- Luanda. shelf

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	>0	10	30	100	300	1000			20- 50m	50-100m	100-200m	200-200m
Synagrops microlepis	2		1	3	3	4	27	17.84		11.16	49.58	
Brachydeuterus auritus	12	4	5	7	5	1	71	10.78	18.83	11.22	0.22	
Trachurus trecae, juvenile	6	3	5		4		38	4.53	0.01	6.47	7.25	
Trichiurus lepturus	17	10	4	4			73	2.87	1.16	4.62	2.43	
Pomadasys jubelini	6	1	1		1		19	1.48	0.42	3.38		
Galeoides decadactylus	2	4	10				33	1.25	3.13	0.51		
Trachurus trecae	9	2	2	3			33	1.12	0.03	2.18	0.90	
Pomadasys incisus	5	11	1				35	0.63	0.79	0.93		
Pteroscion peli	7	4	2				27	0.52	1.45	0.07	0.03	
Chloroscombrus chrysurus	9	1	4				29	0.52	1.20	0.31		
Pagellus bellottii	15	7	2				50	0.49	0.16	0.98	0.17	
Selene dorsalis	16	2	1	1			42	0.49	0.35	0.94		
Pseudotolithus senegalensis	4	4	2				21	0.36	0.99	0.07		
Pseudotolithus typus	1	2	1	1			10	0.35	1.05			
Dentex barnardi	22	2	2				54	0.33	0.10	0.52	0.33	
Ilisha africana	10	3	1				29	0.33	0.97	0.02		
Brotula barbata	11	5					33	0.26		0.09	0.83	
Umbrina canariensis	17	2	1				42	0.25	0.12	0.47	0.09	
Pterothrissus bellocci	7	3	1				23	0.23		0.04	0.81	
Merluccius polli	1	2	1				8	0.22			0.82	
Dentex angolensis	10	4					29	0.20		0.06	0.66	
Zeus faber	11	2					27	0.17		0.02	0.59	
Citharus linguatula	30	1					65	0.17	0.01	0.27	0.23	
Zenopsis conchifer	4	1	1				13	0.16			0.59	
Epinephelus aeneus	10	2					25	0.16	0.08	0.30	0.04	
Torpedo torpedo	8		1				19	0.16	0.03	0.34	0.07	
Stromateus fiatola	11	2					27	0.12	0.17	0.17		
Dentex macrophthalmus	9	3					25	0.11		0.10	0.28	
Merluccius polli, juveniles				1			2	0.11			0.41	
Trigla lyra	7	1					17	0.10		0.07	0.26	
Raja miraletus	13	1					29	0.10	0.05	0.06	0.21	
Sphyræna sphyræna	8	1					19	0.09	0.22	0.04		
Lithognathus mormyrus	9	1					21	0.09	0.08	0.17		
Octopus vulgaris	7	1					17	0.08		0.10	0.15	
GOBIIDAE	6	2					17	0.08		0.01	0.27	
Sepia orbignyana	7	1					17	0.07	0.02	0.16		
Argyrosomus hololepidotus	7						15	0.07	0.11	0.07		
Pomadasys rogeri	2	2					8	0.07	0.21			
Lagocephalus laevigatus	8	1					19	0.06	0.02		0.18	
Pagrus caeruleostictus	1	1					4	0.06	0.17			
Dicologlossa cuneata	11	1					25	0.06	0.14	0.03		
Parapenaeus longirostris, fem.	4	1					10	0.06			0.20	
Raja straeleni	1	1					4	0.06			0.22	
Arius parkii	6	1					15	0.06	0.17	0.01		
Chelidonichthys gabonensis	7	1					17	0.05		0.03	0.15	
Todarodes angolensis		1					2	0.05			0.18	
Sphyræna guachancho	6						13	0.05	0.12	0.03		
Sardinella maderensis	8	1					19	0.05	0.06	0.08		
Parapenaeus longirostris, male	5						10	0.03			0.09	
Penaeus notialis	8						17	0.02	0.03	0.01		
Parapenaeus longirostris	2						4	0.01			0.02	
Penaeus kerathurus	1						2		0.01			
Other fish								0.97	1.34	0.66	1.06	
Sum all species								48.55	33.80	46.77	69.32	
Sum Snappers								0.01	0.04			
Sum Groupers								0.18	0.13	0.31	0.05	
Sum Grunts								13.07	20.55	15.54	0.22	
Sum Croakers								1.58	3.72	0.73	0.18	
Sum Seabreams								1.33	0.54	1.86	1.54	
Sum Sharks								0.06	0.10	0.03	0.08	
Sum Rays								0.47	0.36	0.58	0.50	

Sum Squids					
Sum	0.30	0.09	0.30	0.52	
0.01					

Number of stations included in analysis, total and by depth strata

	48	16	19	13
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SWEPT AREA ANALYSIS FROM STATION 3016 TO STATION 3087

B. Benguela- Luanda. Slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower limits, Kg/nm								200-300m	300-400m	400-500m	500-500m
	>0	10	30	100	300	1000						
Synagrops microlepis	1	2		1	1	1	55	18.17	65.10	0.92		
Merluccius polli	2	3	3	2			91	5.93	8.05	7.78	0.74	
Chlorophthalmus sp.					1		9	5.15	18.90			
Chlorophthalmus atlanticus	5		1	1			64	1.54	1.35	2.55	0.05	
Nematocarcinus africanus	1	1	3				45	1.44		1.59	2.61	
Laemonema laureysi	5	2					64	0.51	0.04	1.09	0.02	
Dentex macrophthalmus	1		1				18	0.34	1.26			
Zeus faber			1				9	0.33	1.20			
Gonostoma denudata	1	2					27	0.28		0.01	0.99	
Pterothrissus belloci	2	2					36	0.24	0.78	0.06		
Aristeus varidens, female	2	1					27	0.21			0.78	
Zenopsis conchifer	1	1					18	0.15	0.42	0.08		
Todaropsis eblanae	3						27	0.15	0.57			
Parapenaeus longirostris, fem.	7						64	0.13	0.22	0.15		
Bembrops greyi		1					9	0.12		0.26		
Mystriophis rostellatus		1					9	0.12	0.42			
Nezumia aequalis	3						27	0.10	0.35			
Illex coindetii	1							0.08	0.28			
Trichiurus lepturus	2						18	0.07		0.01	0.25	
Hoplostethus cadenati	5						45	0.07		0.04	0.20	
Gephyroberyx darwini	2						18	0.07		0.16		
Malacocephalus occidentalis	3						27	0.07	0.06	0.01	0.17	
Dentex angolensis	1							0.06	0.23			
Parapenaeus longirostris, male	7						64	0.05	0.13	0.03		
Aristeus varidens, male	3						27	0.05			0.19	
Parapenaeus longirostris	1						9	0.02		0.05		
Plesiopenaeus edwardsianus	2						18	0.01			0.02	
Aristeus varidens	1						9					
S H R I M P S	1						9		0.02			
Other fish								0.62	0.80	0.37	1.01	
Sum all species								36.08	100.18	15.16	7.03	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams								0.40	1.49			
Sum Sharks								0.01		0.02	0.05	
Sum Rays								0.03			0.09	
Sum Squids								0.23	0.85		0.02	
Sum												
1.82												

Number of stations included in analysis, total and by depth strata

11

3

5

3

SWEPT AREA ANALYSIS FROM STATION 3016 TO STATION 3087

C. Benguela- Luanda. Slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower limits, Kg/nm >0 10 30 100 300 1000							500-600m	600-700m	700-800m	800-800m
<i>Hoplostethus cadenati</i>	3	2	5	1		100	4.33	2.89	3.68	6.06	
<i>Nematocarcinus africanus</i>	3	2		1		55	1.48	3.80	1.23		
<i>Gonostoma denudata</i>	6	2				73	0.53	0.19	0.31	1.01	
<i>Yarella blackfordi</i>	4	1				45	0.40	1.28	0.14		
<i>Nezumia aequalis</i>	6	2				73	0.39		0.06	1.03	
<i>Lamprogrammus exutus</i>	8					73	0.32	0.35	0.12	0.50	
<i>Talismania bifurcata</i>	8	1				82	0.32	0.08	0.02	0.80	
<i>Merluccius polli</i>	4	1				45	0.29		0.09	0.70	
<i>Bathuroconger vicinus</i>	3	1				36	0.27	0.01	0.74		
<i>Triplophus hemingi</i>	7	1				73	0.22	0.20	0.03	0.41	
<i>Triplophos hemingi</i>		1				9	0.15		0.40		
<i>Melanostomias</i> sp.	6					55	0.13		0.22	0.14	
GALATHEIDAE *	4					36	0.09		0.05	0.18	
<i>Gonostoma elongatum</i>	2					18	0.09		0.04	0.22	
<i>Aristeus varidens</i> , female	10					91	0.08	0.12	0.07	0.06	
<i>Aristeus varidens</i> , male	10					91	0.08	0.13	0.05	0.07	
<i>Lepidopus caudatus</i>	5					45	0.07	0.23	0.01		
<i>Todaropsis eblanae</i>	4					36	0.07		0.04	0.15	
<i>Stomias boa boa</i>	2					18	0.05	0.16	0.03		
<i>Solenocera africana</i>	2					18	0.05			0.13	
<i>Ebinania costaecanarie</i>	6					55	0.05		0.07	0.07	
<i>Laemonema laureysi</i>	5					45	0.05	0.04	0.01	0.11	
<i>Plesionika martia</i>	2					9	0.01		0.02	0.01	
<i>Plesiopenaeus edwardsianus</i>	4					36	0.01	0.01		0.01	
Shrimps, small, non comm.	1					9	0.01			0.02	
<i>Glyphus marsupialis</i>	1					9					
<i>Aristeus varidens</i>	1					9				0.01	
Other fish							0.42	0.42	0.46	0.42	
Sum all species							9.96	9.91	7.89	12.11	
Sum Snappers											
Sum Groupers											
Sum Grunts											
Sum Croakers											
Sum Seabreams											
Sum Sharks							0.09	0.04	0.24	0.01	
Sum Rays							0.02			0.06	
Sum Squids							0.08		0.06	0.15	
Sum											
1.37											

Number of stations included in analysis, total and by depth strata

11

3

4

4

SWEPT AREA ANALYSIS FROM STATION 3088 TO STATION 3187

A. Luanda - Congo River. Shelf

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>				
	Lower limits, Kg/nm >0	10	30	100	300			1000	20- 50m	50-100m	100-200m	200-200m
Brachydeuterus auritus	15		4	2	2	2	46	12.22	5.74	29.24	0.03	
Chloroscombrus chrysurus	7	2	2			1	22	3.16	1.37	7.63		
Trachurus trecae, juvenile	16	4	2	3			46	1.45		0.92	2.85	
Trichiurus lepturus	24	5	6	1			67	1.25	1.76	1.14	1.05	
Synagrops microlepis			1		1		4	1.04			2.68	
Dentex angolensis	19	13	2				63	0.69		0.38	1.42	
Umbrina canariensis	14	3		1			33	0.64		0.18	1.49	
Dentex congoensis	19	8	3				56	0.63		0.45	1.18	
Pagellus bellottii	27	3	3				61	0.54	0.01	1.09	0.35	
Galeoides decadactylus	2	6	3				20	0.49	1.78	0.16		
Ilisha africana	2	6	2				19	0.46	1.82	0.05		
Trachurus trecae	6	1	2	1			19	0.46		1.08	0.15	
Sphyaena guachancho	6	2		1			17	0.37	1.54	0.01		
Pseudolithus typus	3	2	2				13	0.35	1.46			
Pteroscion peli	5	5	1				20	0.27	0.98	0.09		
Brotula barbata	19	2	1				41	0.25		0.04	0.61	
Dentex barnardi	17	1	1				35	0.20		0.16	0.35	
Pterothrissus belloci	12	1	1				26	0.17			0.43	
Stromateus fiatola	4	1	1				11	0.15	0.64			
Pseudolithus senegalensis		2	1				6	0.15	0.45	0.10		
Brachydeuterus auritus Juv.	3		1				7	0.15	0.01	0.40		
Selene dorsalis	12	1	1				26	0.15	0.18	0.29		
Pomadasys incisus	9	1					19	0.11	0.13	0.21		
Dicologlossa cuneata	6	1	1				15	0.10	0.15	0.16		
Raja miraletus	21	1					41	0.09	0.08	0.16	0.03	
Atractoscion aequidens	6	1					13	0.08		0.01	0.19	
Pomadasys peroteti	4	1					9	0.08	0.19	0.09		
MYCTOPHIDAE	1		1				4	0.08			0.22	
Penaeus notialis	8	2					19	0.07	0.28	0.02		
Squatina oculata	3	1					7	0.07			0.17	
Zeus faber	31						57	0.06		0.05	0.11	
Pagrus caeruleostictus	7	1					15	0.06	0.19	0.03		
Dentex gibbosus	8	1					17	0.06	0.01	0.06	0.08	
Epinephelus aeneus	9						17	0.06	0.07	0.05	0.06	
Spicara alta	14						26	0.06			0.16	
Lichia amia			1				2	0.06	0.26			
Chelidonichthys capensis	4	1					9	0.05			0.14	
Parapenaeus longirostris, fem.	2						4	0.01			0.03	
Solenocera africana	1						2					
Parapenaeus longirostris	2						4					
Parapandalus narval	1						2				0.01	
Other fish								1.03	1.92	0.62	1.00	
Sum all species								27.37	21.02	44.87	14.79	
Sum Snappers								0.02	0.11			
Sum Groupers								0.06	0.09	0.05	0.06	
Sum Grunts								12.62	6.32	29.94	0.03	
Sum Croakers								1.51	2.94	0.38	1.69	
Sum Seabreams								2.25	0.25	2.25	3.48	
Sum Sharks								0.09	0.06	0.01	0.20	
Sum Rays								0.22	0.37	0.24	0.08	
Sum Squids								0.08	0.01	0.05	0.20	
Sum								0.02				

Number of stations included in analysis, total and by depth strata

54

13

20

21

SWEPT AREA ANALYSIS FROM STATION 3088 TO STATION 3187

B. Luanda - Congo River. Slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	>0	10	30	100	300	1000			200-300m	300-400m	400-500m	500-500m
Synagrops microlepis	4	2	2	2	1	1	67	32.22	81.87	1.35	0.03	
Merluccius polli	6	4	4	2			89	3.27	0.56	2.91	6.73	
Chlorophthalmus atlanticus	6	1		1			44	1.59	3.72	0.51		
Nematoctocarcinus africanus	5	1	3				50	1.28		0.46	3.44	
Pterothrissus bellocci	9	2		1			67	1.10	2.65	0.21	0.02	
Zenopsis conchifer	3		1	1			22	1.01	2.57	0.05		
Trichiurus lepturus	7	3	1				61	0.67	0.32	1.17	0.67	
Laemonema laureysi	10	1					61	0.32		0.58	0.49	
MYCTOPHIDAE	10		1				61	0.31	0.78	0.02		
Parapenaeus longirostris, fem.	7	2					50	0.20	0.47	0.04		
Brotula barbata	4	1					28	0.17	0.45			
Parapenaeus longirostris, male	5	1					33	0.15	0.38	0.02		
Chlorophthalmus agassizi			1				6	0.14		0.49		
Nezumia aequalis	11	1					61	0.13	0.30	0.01	0.02	
Hymenocephalus italicus	10						56	0.12		0.06	0.31	
Chaunax pictus	5	1					33	0.12		0.05	0.31	
Bembrops heterurus	2	1					17	0.10	0.25			
Dentex angolensis	4						22	0.09	0.23			
Squalus megalops			1				6	0.08			0.25	
GALATHEIDAE *	9						50	0.08	0.02	0.05	0.20	
Illex coindetii	11						61	0.07	0.04	0.03	0.14	
Parapenaeus longirostris	6						33	0.05	0.02	0.12	0.01	
Raja clavata	1						6	0.05	0.13			
Dibranchius atlanticus	8						44	0.05			0.15	
Gadella imberbis	9						50	0.05	0.01	0.02	0.14	
Solenocera africana	9						50	0.03		0.01	0.09	
Aristeus varidens, female	6						33	0.03			0.09	
Aristeus varidens, male	6						33	0.02		0.01	0.07	
Aristeus varidens	2						11	0.01		0.03	0.01	
Parapandalus narval	1						6					
Plesiopenaeus edwardsianus	1						6					
Other fish								0.59	0.63	0.72	0.53	
Sum all species								44.10	95.40	8.92	13.70	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers								0.02	0.04			
Sum Seabreams								0.09	0.24			
Sum Sharks								0.16		0.03	0.46	
Sum Rays								0.05	0.13	0.01		
Sum Squids								0.12	0.13	0.06	0.18	
Sum												
0.69												

Number of stations included in analysis, total and by depth strata

18

7

5

6

SWEPT AREA ANALYSIS FROM STATION 3088 TO STATION 3187

C. Luanda - Congo River. Slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower limits, Kg/nm >0 10 30 100 300 1000							500-600m	600-700m	700-800m	800-800m
Deania calcea	5				1	29	11.36		39.74	0.02	
Centrophorus granulosus	4	1			1	24	8.08	0.56	27.68	0.03	
Nematocarcinus africanus	2	3	12			81	3.47	3.84	5.02	2.18	
<b>C R U S T A C E A N S</b>	13				1	67	3.42	0.07	0.25	7.77	
Hoplostethus atlanticus	1	3	2			29	0.66		1.05	0.84	
Hoplostethus cadenati	3	2	2			33	0.64	0.61	1.62	0.01	
Lamprogrammus exutus	11	7				86	0.58	0.31	0.95	0.50	
Hoplostethus mediterraneus	4	4				38	0.48	0.14	0.09	0.98	
Yarrella blackfordi	13	3				76	0.48	0.32	0.22	0.77	
Talismania bifurcata	8	3	1			57	0.48		0.36	0.88	
Triplophus hemingi	21					100	0.31	0.33	0.35	0.26	
Merluccius polli	19					90	0.29	0.28	0.50	0.15	
Stomias boa boa	18					86	0.22	0.22	0.20	0.23	
Carcharhinus sp.			1			5	0.22	0.77			
Carcharhinus limbatus			1			5	0.16			0.37	
Gonostoma denudata	11	1				57	0.15	0.08	0.29	0.12	
Coelorinchus coelorhincus	6	1				33	0.13		0.22	0.15	
Aristeus varidens, female	6	1				33	0.12	0.38	0.04		
Nezumia aequalis	7	1				38	0.12		0.08	0.23	
Physiculus sp.	13					57	0.09	0.04	0.05	0.16	
Benthodesmus tenuis	8					38	0.08	0.24	0.04	0.02	
Aristeus varidens	13					62	0.07	0.13	0.03	0.06	
Centrophorus uyato		1				5	0.06	0.21			
<b>SQUILLIDAE</b>	2					10	0.06		0.06	0.11	
Ommastrephes pteropus	2					10	0.05	0.18			
Laemonema laureysi	7					33	0.05	0.04	0.02	0.09	
Nezumia leonis	2					10	0.05			0.12	
Lophius vaillanti	2					10	0.05		0.17		
<b>GALATHEIDAE *</b>	5					24	0.05	0.15	0.04		
Solenocera africana	10					48	0.01			0.02	
Aristeus varidens, male	5					24	0.01	0.02	0.02		
Shrimps, small, non comm.	1					5	0.01			0.02	
Glyphus marsupialis	1					5				0.01	
Plesionika martia	5					19		0.01			
Parapandalus narval	1					5		0.01			
Heterocarpus ensifer	1					5					
<b>PANDALIDAE</b>	1					5		0.01			
Plesiopenaeus edwardsianus	1					5					
Other fish							0.72	0.64	0.89	0.71	
Sum all species							32.73	9.59	79.98	16.81	
Sum Snappers											
Sum Groupers											
Sum Grunts											
Sum Croakers											
Sum Seabreams											
Sum Sharks							19.98	1.70	67.47	0.46	
Sum Rays											
Sum Squids							0.16	0.24	0.15	0.13	
Sum											
5.11											

Number of stations included in analysis, total and by depth strata

21

6

6

9

# ANNEX IV Excel Sheet used for calculations of biomass and confidence intervals

Survey March 2002

This sheet is used to calculate stratified mean density, total biomass, and 95% confidence limits on the total biomass. Inputs are only required in the yellow fields and optionally the Student's t-value can be set.

The underlying assumption is that the CV from the catch rates (kg/hour) is equal for for the density (t/nm<sup>2</sup>) Equation numbers (1) and (2) refers to Appendix in report

Use Incl (=1 or 0) to select-deselect strata

Depth (m)	Incl	Area (NM <sup>2</sup> )	No Obs	Density (t/NM <sup>2</sup> )	CV (kg/hour)	Equation(1)=	SD	st. Variance	Equation (2)=
20-200	1	1692	10	61,880	1,736	53,53	107,409	11536,779	863,272
20-50	1	507				0,00	0,000	0,000	0,000
50-100	1	591				0,00	0,000	0,000	0,000
100-200	1	594				0,00	0,000	0,000	0,000
200-300	1	100				0,00	0,000	0,000	0,000
300-400	1	77				0,00	0,000	0,000	0,000
400-500	1	48				0,00	0,000	0,000	0,000
500-600	1	39				0,00	0,000	0,000	0,000
600-700	1					0,00	0,000	0,000	0,000
700-800	1					0,00	0,000	0,000	0,000
Total								Var(strat-mean)=	863,27

t-value =

Stratified mean =

SE(strat-mean)=

95% Confidence limits:

Total biomass=	104 701	-10 239	219 641
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## ANNEX V

### 1. Stratified mean density and confidence intervals

The stratified estimator of mean density in the entire area is calculated as (Cochran, 1977)

$$\bar{y}_{st} = \sum_{i=1}^L W_i \bar{y}_i, \quad (1)$$

where

$L$  is the number of strata,

$W_i = \frac{area_i}{total\ area}$  is the proportion of the survey area in the  $i^{\text{th}}$  stratum,

$\bar{y}_i = \frac{\sum_{k=1}^{n_i} y_{i,k}}{n_i}$  is the average catch in the  $i^{\text{th}}$  stratum

$n_i$  is the number of tows in the  $i^{\text{th}}$  stratum, and

$y_{i,k}$  is the catch by the  $k^{\text{th}}$  tow in stratum  $i$  (normalized to either kg/hour or  $t/NM_i^2 = \frac{y_{ik}}{area\ swept_{ik}}$  for biomass estimates).

The estimated variance of the stratified mean,  $\bar{y}_{st}$ , is

$$\text{var}(\bar{y}_{st}) = \sum_{i=1}^L W_i^2 \frac{s_i^2}{n_i}, \quad (2)$$

where

$$s_i^2 = \frac{\sum_{k=1}^{n_i} (y_{i,k} - \bar{y}_i)^2}{n_i - 1}. \quad (3)$$

When  $\bar{y}_{st}$  is estimated in  $t/NM_i^2$  then an estimate of the total biomass in the area is calculated by

$$B = \bar{y}_{st} \cdot total\ area \quad (4)$$

## 2. Precision of the estimates of mean density

### 2.1. Estimates based on the sample mean

The estimate of the standard error for each stratum mean is given by

$$se(\bar{y}_i) = \sqrt{\frac{s_i^2}{n_i}}, \quad (5)$$

where  $s_i^2$  is from equation (3).

The standard error of the stratified mean ( $\bar{y}_{st}$ , equation 1), i.e. the square root of the variance of  $\bar{y}_{st}$ , is calculated as

$$se(\bar{y}_{st}) = \sqrt{\text{var}(\bar{y}_{st})}, \quad (6)$$

where  $\text{var}(\bar{y}_{st})$  is defined by equation (2).

If the sample size is “large” enough, then the Central Limit Theorem states that each time a survey is conducted there is a 95% chance that the true mean lies in the interval (see Cochran, 1977)

$$\bar{y}_{st} \pm t_{(n-1)} se(\bar{y}_{st}), \quad (7)$$

where  $t$  is from Students t-table with  $(n-1)$  degrees of freedom and  $\alpha = 0.025$ .

### 2.2. Estimates of the mean based on lognormal theory - The Pennington estimator

Since abundance data from marine surveys usually have a large variance (much higher than the mean) and are highly skewed to the right, the sample sizes are typically not large enough so that equation (2) is a valid 95% confidence interval. In fact, the confidence associated with the interval given by equation (7) is usually much lower than 95% (McConnaughey and Conquest, 1992; Conquest *et al.*, 1996; Pennington, 1996). A major problem to the degree of skewness is due to the high proportion of zero tows often observed. Development of confidence intervals is complicated by the asymmetric distribution, and the occurrence of zero catches confounds an effective normalization transformation. Logarithmic transformation will

stabilize the variance but data will still not be normally distributed and interpretation of re-transformed means is difficult (Pennington and Grosslein 1978).

One way to generate more precise estimates of the mean and more accurate confidence statements for skewed marine data is to base the estimators on the lognormal Delta distribution (Pennington, 1983, 1996; Conquest *et al.*, 1996), in which catches are divided into zero and non-zero units, followed by transformation of the non-zero values to natural logarithms. When it is found that the transformed non-zero data are approximated by a lognormal distribution (*i.e.* the logged values are normally distributed), then a more efficient estimator of mean density,  $c_i$ , within each stratum is given by (Pennington, 1983, 1996)

$$c_i = \frac{m_i}{n_i} \exp(\bar{x}_i) G_{m_i}(s_{x,i}^2 / 2), \quad (8)$$

where

$m_i$  is the number of sample values greater than 0 in stratum  $i$ ,

$\bar{x}_i$  and  $s_{x,i}^2$  are the mean and variance, respectively, of the log transformed values of catches greater than 0, and

$G_m(f)$  is an infinite series function of  $m$  and  $f$  [for example,  $m = m_i$  and  $f = s_{x,i}^2 / 2$  in equation (8)] which is used to correct for bias in re-transformation from log to arithmetic scale and is defined by

$$G_m(f) = 1 + \frac{m-1}{m} f + \sum_{j=2}^{\infty} \frac{(m-1)^{2j-1} f^j}{m^j (m+1)(m+3) \cdots (m+2j-3)j!} \quad (9)$$

The variance of  $c_i$  is given by

$$\text{var}(c_i) = \frac{m_i}{n_i} \exp(2\bar{x}_i) \left\{ \frac{m_i}{n_i} G_{m_i}^2(s_{x,i}^2 / 2) - \frac{(m_i-1)}{(n_i-1)} G_{m_i} \left( \frac{m_i-2}{m_i-1} s_{x,i}^2 \right) \right\} \quad (10)$$

### 2.3. The modified Pennington estimator

In contrast to estimates based on the sample mean (equation 1 and 2), which are highly sensitive to a single or a few isolated high catch rates that may account for more than 50% of the total catch, Pennington's estimator (equations 8 and 10) is sensitive to low catch rates which contribute little to the total catch, but when log-transformed may give large negative values resulting in a distribution skewed to the left. In such a case a more precise estimator of mean density within each stratum,  $\hat{\mu}_i$ , is given by (modified from Pennington, 1983, 1996)

$$\hat{\mu}_i = \frac{(n_i - m_i)}{n_i} \bar{y}'_i + \frac{m_i}{n_i} \exp(\bar{x}_i) G_{m_i}(s_{x,i}^2 / 2), \quad (11)$$

where

$m_i$  is the number of sample values greater than a defined 'cut-level' (rather than 0 as in equation 8) in stratum  $i$ ,

$\bar{y}'_i$  denotes the arithmetic mean of the non-transformed values less than the cut-level,

and

$\bar{x}_i$  and  $s_{x,i}^2$  are the mean and variance, respectively, of the logged values of catches greater than the cut-level.

The variance of  $\hat{\mu}_i$  is given by

$$\text{var}(\hat{\mu}_i) = \text{var}(c_i) + \left( \frac{n_i - m_i - 1}{n_i(n_i - 1)} \right) s_i'^2 + \left( \frac{m_i(n_i - m_i)}{n_i^2(n_i - 1)} \right) \bar{y}'_i'^2 - 2 \left( \frac{n_i - m_i}{n_i(n_i - 1)} \right) \bar{y}'_i \times c_i, \quad (12)$$

where

$s_i'^2$  is the variance of the values less than the cut-level (equation 3), and

$c_i$  and  $\text{var}(c_i)$  are equations (8) and (10) with  $m_i$  bigger than the cut-level.

There is no single objective criterion upon which to define a cut-level bigger than zero. Basically the logged Delta distribution should be viewed (e.g. in GRAFER) in order to determine if it is skewed to the left and/or contains isolated small catches. As a 'rule of thumb' (Pennington pers. com.) the cut-level should be set =  $(2\bar{x}_i - x_{\max})$ , where  $\bar{x}_i$  and  $x_{\max}$  are the mean and the largest value, respectively, of the log transformed values of catches greater than 0.

## 2.4. Stratified mean and confidence interval based on lognormal theory

The stratified estimate of mean density (denoted by  $\hat{\mu}_{st}$ ) in the entire area is calculated by replacing  $\bar{y}_i$  with  $\hat{\mu}_i$  for each stratum in equation (1). The standard error of  $\hat{\mu}_{st}$  is obtained by substituting  $\text{var}(\hat{\mu}_i)$  for  $s_i^2 / n_i$  (which equals  $\text{var}(\bar{y}_i)$ ) in equation (2) and then

$$\text{se}(\hat{\mu}_{st}) = \sqrt{\text{var}(\hat{\mu}_{st})} \quad (13)$$

Sometimes the  $\hat{\mu}_{st}$ -estimator is higher than the one based on the sample mean. This is because, given the sample sizes typical for marine surveys, the sample mean tends to underestimate the true mean most of the time for these highly skewed distributions (Pennington, 1983, 1996; Conquest *et al.*, 1996).

An approximate 95% confidence interval for  $\hat{\mu}_{st}$  is given by

$$\hat{\mu}_{st} \pm t_{(n-1)} \text{se}(\hat{\mu}_{st}) \quad (14)$$

## ANNEX VI

### NAN-SIS species codes used in defining the 'grouped species' tables

MAIN GROUP	Demersal	Pelagic	Shrimp	Cephalopod	Sharks
	SPA0000	ENG0000	SHR0000	SQU0000	SHA0000
	POD0000	CLU0000			
	SCI0000	CAR0000			
	ARD0000	SCM0000			
	SER0000	SPH0000			
	LUT0000	TRI0000			
	OPDAA00	STRAA00			
	MERME00				

PELAGIC	Clupeids	Carangids	Scombrids	Hairtails	Barracudas
	ENG0000	CAR0000	SCM0000	TRI0000	SPH0000
	CLU0000				

DEMERSAL	Seabream	Snappers	Groupers	Grunts	Croakers
	SPADE00	LUT0000	SER0000	PODPO00	SCI0000
	SPADI00				
	SPALI00				
	SPAPA00				
	SPAPR00				
	SPASP00				

DEEP 1	Seabream	Hake	P.longirostris	A.varidens	N.africanus
	SPADE00	MERME03	SHRPE31	SHRAR22	SHRNE21
	SPADI00	MERME12	SHRPEP1	SHRARA1	
	SPALI00	MERME13	SHRPEP2	SHRARA2	
	SPAPA00	MERME92			
	SPAPR00				
	SPASP00				

DEEP 2	Hake	Ommastrephidae	Sepiidae	A.varidens	P.longirostris
	MERME03	SQUOM21	SQUSE10	SHRAR22	SHRPE31
	MERME12	SQUOM31	SQUSE11	SHRARA1	SHRPEP1
	MERME13	SQUOM51	SQUSE12	SHRARA2	SHRPEP2
	MERME92		SQUSE13		
			SQUSE15		

#### NAN-SIS sectors in Angola

Latitude	Sector	Region
17°14' - 13° S	1	Cunene River – Benguela
13° - 9° S	2	Benguela – Pta. das Palmerinhas
9° - 6° S	3	Pta. das Palmerinhas – Congo River
6° - 5° S	4	Cabinda
17°14' >> S	5	South of Cunene River (Namibia)

## ANNEX VII Instruments and fishing gear used

The Simrad EK-500/38kHz scientific sounder was run during the survey only for observation of fish and bottom conditions.

The details of the settings of the 38kHz echo sounder where as follows:

### Transceiver-1 menu (38 kHz lowering keel)

Transducer depth	5.50 m
Absorbtion coeff.	10 dB/km
Pulse length	medium (1ms)
Bandwidth	wide
Max power	2000 Watt
2-way beam angle	-21.0 dB
SV transducer gain	27.39 dB
TS transducer gain	27.52 dB
Angle sensitivity	21.9
3 dB beamwidth	6.8 dg along / athwardship: 6.7 dg
Alongship offset	-0.03 "
Athwardship offset	0.06 "

### Display menu

Echogram	1 (38 kHz)
Sv colour min	-67 dB

### Printer- menu

Echogram	1 (38 kHz)
Range	50, 100, 250, 500, 750 and 1000 m
Range start	0
Bottom range	15 m
Bottom range start	10 m
Sv colour min	-67 dB
TVG	20 log R

**Bottom detection menu**      Minimum level -40 dB

## **Fishing gear**

The vessel has two different sized "Åkrahavn" pelagic trawls and one "Gisund super bottom trawl". During the present survey only the bottom trawl was used.

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm meshsize in the codend with an innernet of 10 mm meshsize. The estimated opening is 6 m (observed 5.7) and distance between wings during towing about 18 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. The doors are of 'Thyborøn' combi type, 7.81 m<sup>2</sup>, 1670 kg, their distance while trawling about 45 - 55 m in average, depending on the depth (least distance at low depths). During the present survey this distance was kept nearly constant (about 50 m) at all depths by the use of a 9.5 m strap between the wires at 130 m distance from the doors (normally applied at depths greater than 80 m). At depths greater than 300 m the trawl was equipped with a tickler chain which is supposed to improve the catchability of bottom living and borrowing species, particularly shrimps.

The SCANMAR system was used on all trawl hauls. This equipment consists of sensors, a hydrophone, a receiver, a display unit and a battery charger. Communication between sensors and ship is based on acoustic transmission. The doors are fitted with sensors to provide information on their distance and a height sensor is fitted to the bottom trawl to measure the trawl opening and provide information on clearance and bottom contact.



## ANNEX VIII

### Report of taxonomist-on-board R/V “Dr Fridtjof Nansen” Angola Demersal Cruise – 29<sup>th</sup> February to 31<sup>th</sup> March 2002

Dr. Reinhold Hanel, Department of Zoology and Limnology, University of Innsbruck, Technikerstrasse 25, A-6020 Innsbruck, Austria.

#### Objectives

1. To assist fisheries scientists on the demersal cruise in the identification of problem species caught in the trawl.
2. To collect tissue samples to be preserved in 95% ethanol of species of interest for future scientific use in molecular phylogenetics, with special focus on the families Scorpaenidae and Trachinidae.
3. To preserve voucher specimens in 4% formaldehyd solution in order to guarantee the proper identity of the corresponding tissues.
4. To preserve specimens of species which it was not possible to identify with certainty on board for later study at the “Zoologische Staatssammlung”, Munich, Germany.
5. To make a representative collection of the fishes caught for deposition in the reference collection of the “Zoologische Staatssammlung”, Munich, Germany. Following the successful collection focussing mainly on seabreams and wrasses of 2002, this year’s collecting is more general, aiming to act as a reference collection for the R/V “Dr. Fridtjof Nansen” research programme and the upgrading of the Angolan Field Guide.
6. To make a representative collection of invertebrates (mainly gastropods, cephalopods, crabs and echinoderms) caught for later study at the “Zoologische Staatssammlung”, Munich, Germany.

#### Methods

Samples were taken from each trawl by the fisheries scientists on board for sorting, weighing and length measurement. The fishes in this sample were checked and if there was any uncertainty over identification, the fishes were examined further in the vessel’s laboratory, using available identification keys on board. In addition to the sample taken, each trawl haul was examined on deck for any unusual species present which were not represented in the sample.

In addition, specimens were collected of any species which could not be positively identified to species level, for later study at the “Zoologische Staatssammlung”, Munich, Germany. Specimens were also collected of rare or unusual species not included in the FAO Angolan guide. Each fish kept was labelled with a code number written in pencil on plastic paper, which was inserted in the mouth or gillcover, cross-referenced with the field notes and station number, so full collection details could be added later. Photos on slide film were taken of almost all preserved specimens.

#### Results

*To assist fisheries scientists on the demersal cruise in the identification of problem species caught in the trawl.* Assistance was given in identification throughout the cruise.

*To collect tissue samples to be preserved in 95% ethanol of all species found for scientific use in molecular phylogenetics. 400 tissue samples were collected from approximately 280 fish species.*

*To preserve specimens of species which it was not possible to identify with certainty on board for later study at the "Zoologische Staatssammlung", Munich, Germany. Proper species identification on board was especially difficult for the families Rajidae, Torpedinidae, Caristiidae, Congridae, Gobiidae and Zoarcidae due to missing or incomplete identification keys for the region.*

*To make a representative collection of the fishes caught for deposition in the reference collection of the "Zoologische Staatssammlung", Munich, Germany. Following the successful collection focussing mainly on seabreams and wrasses of 2002, this year's collecting is more general, aiming to act as a reference collection for the R.V Dr Fridtjof Nansen's research programme and the upgrading of the Angolan Field Guide. Over 500 specimens from more than 280 species have been collected this year. These will be accessioned into the collection of the "Zoologische Staatssammlung", Munich with identification verified.*

*To make a representative collection of invertebrates (mainly gastropods, cephalopods, crabs and echinoderms) caught for later study at the "Zoologische Staatssammlung", Munich, Germany. Probably due to this years use of tickling chains the absolute number of benthic invertebrates in the trawls was apparently higher compared to last year. Over 200 specimens from more than 80 invertebrate species including prosobranch and opisthobranch gastropods, bivalves, cephalopods, crabs and echinoderms have been collected this year. These will be accessioned into the collection of the "Zoologische Staatssammlung", Munich with identification verified.*

## **Future plans**

In order to make the findings from the two surveys fully available for both Angolan and Norwegian scientists, a MS-Access database will be prepared in the next few months documenting the complete collection. The data presented will include the species and number of specimens of each, the collection catalogue numbers, and the corresponding trawl number each specimen stems from.

## ANNEX IX Sharks sampling report

Diana Zaera

### **Shark sampling**

In order to improve the available information on biology and bathymetric distribution of sharks in Angolan waters, and especially deep-water sharks, several samplings were taken during the Angolan demersal surveys in 2002 and 2003.

During the 2003 survey a total of 285 individuals were measured from 24 different species and 133 individuals from 23 different species in 2002.

### **Methodology**

*Identification.* The sharks caught were identified using Compagno (1984; 1989; 2001), Elst (1981), Bianchi (1986) and Fischer *et. al.* (1981).

*Morphometric measurements.* All specimens caught were measured, weighed (g) and sexed. For the purpose of morphometric analyses we followed Hubbs and Lager criteria. All fish length data are given as total lengths, since this is the measurement most often used as an independent variable and it is a standard measurement in the shark literature. The following morphometric parameters were taken:

- Total length (TL, cm) taken as the length from the snout tip to the upper tip of the upper caudal fin lobe, measured to nearest centimetre below; taken in the natural position without depressing the tail to place it in line with body axis
- Trunk height at pectoral fin insertion
- Snout length taken from outer nostrils
- Preoral length
- Eye's diameter
- Mouth's width
- Mouth's height
- Minimum internasal distance
- 1<sup>st</sup> gill opening's length
- 2<sup>nd</sup> gill opening's length
- 3<sup>rd</sup> gill opening's length
- 4<sup>th</sup> gill opening's length
- 5<sup>th</sup> gill opening's length
- 6<sup>th</sup> gill opening's length
- 7<sup>th</sup> gill opening's length
- 1<sup>st</sup> dorsal fin height
- 1<sup>st</sup> dorsal fin's base length
- 1<sup>st</sup> dorsal fin's inner margin length
- Upper caudal lobe's length
- Lower caudal lobe's length
- Pectoral fin length
- Pectoral fin inner margin length
- Pectoral's rear margin length
- Distance from tip of snout to 1<sup>st</sup> dorsal fin's origin
- Distance from tip of snout to upper caudal lobe origin (precaudal length)

- Distance from tip of snout to pectoral fin's origin
- Distance from tip of snout to pelvic fin's origin
- Distance from tip of snout to anal fin's origin
- Distance between dorsal and upper lobe of caudal fins' origins
- Distance between anal and lower lobe of caudal fins' origins
- Distance between pectoral and pelvic fins' origins
- Distance between pelvic and anal fins' origins

*Reproductive information related to fecundity and size at maturity.* Maturity was assessed using the scale shown below as suggested by Stehmann (1987).

***Male***

Stage 1	Juvenile	Claspers undeveloped, gonads tiny, thread-like, whitish, sperm ducts straight
Stage 2	Sub-adult	Claspers soft, gonads enlarged, sperm ducts meandering
Stage 3	Adult	Claspers stiff, gonads rounded, sperm ducts tightly coiled, sperm flowing freely

***Female***

Stage 1	Juvenile	Ovaries small, oocytes not differentiated, evenly small, uteri thread-like
Stage 2	Ripening	Ovaries enlarged, wall transparent, oocytes of various sizes, uteri similar to stage 1
Stage 3	Ripe	Ovaries large, oocytes larger and of similar size, can be counted easily
Stage 4	Early gravid	Uteri filled with nonsegmented yolky matter
Stage 5	Mid-term gravid	Uteri filled with yolk sacs of small non pigmented embryos, easily counted
Stage 6	Late gravid	Embryos fully formed, easily counted, yolk sac reduced
Stage 7	Post-natal	Ovaries similar to stage 1, uteri dilated

*Information related to feeding habits.* The determination of stomach content was made macroscopically on board the vessel. The prey was identified to the lowest taxa possible. The data were quantified using the frequency of occurrence method (percentage of stomachs containing food with a particular prey item). To describe the stomach fullness, the following scale was used:

*Empty* (except for some water)

*Very little content* (the stomach has to be opened)

*Some content* (content appears clearly)

*Full* (filled, but not expanded)

*Expanded* (stomach very expanded and tight)

*Everted* (turned inside out)

While to register the degree of digestion:

*Digestion not started* (content seems rather fresh)

*Digestion just started* (the species still can be identified)

*Digestion advanced* (the species cannot be identified, but systematic groups may be discriminated)

*Digestion advanced considerably* (bones, eyes and other hard parts of prey can be distinguished)

*Digestion nearly terminated* (content cannot be identified. Liquid or jelly like content)

Liver weight was recorded to calculate hepatosomatic (HSI) index.

*About their distribution and ecology.* To get a better understanding of the shark's ecology, data on salinity, oxygen content and specific temperature of the water in which they occur, will be used together with data on catch rates and frequency of occurrence with other species.

List of species measured:

Species	2002	2003	Total
<i>Apristus spp</i>		1	1
<i>Centrophorus granulosus</i>	1	11	12
<i>Centrophorus uyato</i>	2	1	3
<i>Centroscymnus cryptacanthus</i>	1	1	2
<i>Centrophorus squamosus</i>	1	10	11
<i>Centroscyllum fabricii</i>	5		5
<i>Centroscymnus crepidater</i>	4	3	7
<i>Carcharhinus signatus</i>	1	19	20
<i>Clamydoselachus anguineus</i>		2	2
<i>Deania calcea</i>	6	12	18
<i>Deania profundorum</i>	4	2	6
<i>Etmopterus spinax</i>	6	63	69
<i>Etmopterus princeps</i>	23	7	30
<i>Etmopterus pusillus</i>	18	41	59
<i>Etmopterus polli</i>	1	5	6
<i>Galeus polli</i>	16	28	44
<i>Isitus brasiliensis</i>	1	2	3
<i>Leptocharias smithii</i>	4	9	13
<i>Mustelus mustelus</i>	6	19	25
<i>Rhizoprionodon acutus</i>	21	1	22
<i>Scyliorhinus cervigoni</i>	10	1	11
<i>Scylorhynchus canicula</i>	1		1
<i>Scymnodon obscurus (Zameus aquamulosus)</i>	4	30	34
<i>Sphyrna lewini</i>		1	1
<i>Squalus megalops</i>	3	14	17
<i>Squalus acanthias</i>		2	2
<i>Squatina oculata</i>	10		10
<b>TOTAL</b>	133	285	418

Shark heads of *Leptocharias smithii* were frozen and at the end of the survey, thawed and packed in salt. They will be sent to Dr. Mark Harris in F.S.C., USA. Personnel from both the IIM in Luanda, and the IMR in Bergen, has previously collaborated with Dr. Harris.

## Annex X Day and night catch experiment

At the end of the survey a trawl experiment was carried out to compare the pelagic catches during day and night time. Two shallow stations were chosen (see Table below) and trawled during day and nighttime. The results show a clear reduction of the pelagic catches during night hours. One explanation could possible be that pelagic species school during the day, while forming looser and deeper aggregations at night.

Nevertheless, the situation is different when it comes to sardinella, with the highest catches during nighttime. Sardinella usually schools near the surface during the day, while at night often is found dispersed in less defined shoals. They also show a strong horizontal and vertical avoidance reaction both to the vessel and the trawl gear. This behaviour does it hard to sample this species during dense schooling and therefore, most samples are obtained during night hours.

Station	Depth	Time	Demersal	Pelagic	Shrimp	Cephalopod	Other	Total
3188	28	10:15	110,3	120,9	2,9		88,1	322,2
3189	59	12:15	237,4	309,6			24,8	571,8
3190	28	14:15	96,2	44,0	4,9		70,6	215,7
3191	59	15:30	300,1	134,2		0,2	20,3	454,7
3192	59	19:30	125,2	8,5	1,8	11,1	64,3	210,9
3193	28	21:15	415,1	11,5	49,3		379,9	855,8
3194	59	22:45	217,6	29,4	2,2	16,0	65,0	330,2
3195	28	00:30	190,0	29,0	38,0		156,0	413,0
Day mean			186,0	152,2	2,0	0,1	50,9	391,1
Night mean			237,0	19,6	22,8	6,8	166,3	452,5