

SURVEY OF THE FISH RESOURCES OF ANGOLA

**Survey of the demersal resources
11 March – 09 April 2009**

Preliminary report

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

**Instituto Nacional de Investigação das Pescas
INIP, Luanda
Angola**

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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 2009	(17 surveys)

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

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by

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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 Nacional de Investigação das Pescas (INIP), of Angola, and the responsible from the Institute of Marine Research (IMR), Norway, 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 seabreams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), hakes (Merlucciidae) 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.
- To collect biological data as length, weight, sex and maturity of *Dentex macrophthalmus*, *D. angolensis*, *Pagellus bellottii*, *Pseudotolithus senegalensis*, *Umbrina canariensis*, *Merluccius polli*, *Brachydeuterus auritus*, *A. varidens*, *P. longirostris*, *Chaceon maritae*, *Panulirus regius* and Cephalopods.
- To collect the stomach contents and gonads for some species such as *D. angolensis*, *P. bellottii*, *P. senegalensis*, *U. canariensis* and *B. auritus*, for subsequent analyses in the INIP Lab.
- To monitor the general hydrographical conditions using CTD-Sonde on each trawl station and map the temperature, salinity and oxygen.
- To realize four monitoring lines (Namibe, Lobito, Palmerinhas and Congo River mouth) using new standard INIP hydrographical profiles for collection of temperature, salinity and oxygen, water nutrients, phytoplankton, zooplankton and sediments (Congo River only).

*The Tombua-Benguela region has been excluded in all the demersal surveys as the bottom is very steep and rocky and unsuitable for bottom trawling, however, the abundance of demersal species in the region is low as the shelf and the slope are very narrow. The trends in the time series of the demersal biomass estimates are therefore insignificantly affected by the exclusion of the region.

1.2 Participation

The scientific staff consisted of:

From INIP, Angola: Silvi Nsiangango (11.03-09.04, Local Cruise Leader), Virgílio Estêvão (11.03-09.04), Pedro Tchupalanga (11.03-09.04), Fátima Delicado (11.03-09.04), Mário Fortunato (11.03-09.04), David Kisungo (11.03-09.04), Wsaso André (11.03-30.03), Manuel Domingos (11.03-30.03), Euzébio dos Santos (11.03-30.03), Catarina Ruby (11.03-30.03), Maria Margarida (31.03-09.04), Arsénio Cudivila (31.03-09.04), Domingos Pedro (31.03-09.04), Alberto Filomena (31.03-09.04).

From IMR, Norway: Sigbjørn Mehl, Cruise Leader (11.03-09.04), Diana Zaera (11.03-09.04), Ole Sverre Fossheim (11.03-09.04), Terje Svoren (11.03-09.04)

1.3 Narrative

R/V “Dr Fridtjof Nansen” departed Walvis Bay, Namibia, in the evening 11 March 2009 and steamed northwards to the border between Namibia and Angola, which was reached in the morning 13 March. After a delay to get exemption from new custom legislations, the sampling started in the afternoon 13 March off Cunene River with trawl and hydrographical stations. A standard geographical allocation of the trawl stations to be taken during the Angolan demersal trawl surveys was implemented in 2003, and the station positions in the southern region have been similar in the 2000 and 2003-2009 surveys. The slope off Baía dos Tigres has not been adequately surveyed as the bottom is very steep and rough between 200 and 600 m. In the evening of 15 March the survey of the southern region was finished. A hydrographical monitoring line was done off Namibe. Zooplankton was sampled with a multinet and phytoplankton with the bottles on the CTD. No trawling was carried out in the Tombua–Benguela area as the shelf and slope are very steep and the bottom conditions are therefore not suitable for trawling.

In the early morning 17 March the trawling started in the central region. Two monitoring lines, off Lobito and Pta. das Palmerinhas, were carried out in the central region. The survey of the central region was completed in the late afternoon 25 March and continued to the northern region. The vessel called on Luanda in the morning 29 March to change Angolan scientists. It departed the evening 30 March to continue the survey in the northern region. One monitoring line was done at the Congo River in the northern region. In addition the standard “Nansen” transect off Ambriz was carried out. The survey of the northern region was completed at noon 6 April and R/V “Dr. Fridtjof Nansen” called port in Luanda in the evening 7 April.

The monitoring lines were carried out in accordance with the new standards for monitoring lines run by INIP, see Annex IX. These transects were selected as the Angolan monitoring lines (Namibe, Lobito, Ponta das Palmerinhas and the Congo River) according to the regional requirements. The transects ended further off-shore and the distance between the stations were longer than the standard “Nansen” transects. The depth intervals for plankton sampling were new in 2009. Due to some vagueness in the Angolan survey plan, only the Ambriz standard “Nansen” transect was done during the present survey.

CHAPTER 2 METHODS

2.1 Survey effort

Table 2.1 presents the surveyed 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 total area. The overall average coverage was 1 valid trawl station per 86 square nautical miles (NM²). Figures 2.1-2.3 show the cruise tracks in the southern, central and northern regions, respectively, and the locations of bottom trawl, plankton and hydrographical stations.

Table 2.1 Survey's design and effort for the 2009 demersal survey. 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)									Valid	Failures	CTD	Distance
	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800				
Cunene-Tombua													
Area (NM ²)	507	591	594	100	77	48	39			1956			
# hauls (BT)	9	6	7		2			1	2	27		33	389.5
%area	25.9	30.2	30.4	5.1	3.9	2.5	2			11.83			
%hauls	33.3	22.2	25.9		7.4			3.7	7.4				
Benguela-Luanda													
Area (NM ²)	1068	1586	1439	407	372	343	346	268	357	6186			
# hauls (BT)	16	18	14	1	6	3	4	1	6	69	1	83	968.3
%area	17.3	25.6	23.3	6.6	6	5.5	5.6	4.3	5.8	37.41			
%hauls	23.2	26.1	20.3	1.4	8.7	4.3	5.8	1.4	8.7				
Luanda-Congo River													
Area (NM ²)	1379	1969	1940	601	550	437	409	408	702	8395			
# hauls (BT)	17	20	20	7	5	6	7	6	7	95	2	110	1305.9
%area	16.4	23.5	23.5	7.2	6.6	5.2	4.9	4.9	8.4	50.76			
%hauls	17.9	21.1	21.1	7.4	5.3	6.3	7.4	6.3	7.4				
Grand total													
Area (NM ²)	2954	4146	3973	1108	999	828	794	676	1059	16537			
# hauls (BT)	42	44	41	8	13	9	11	8	15	191	3	226	2663.8
%area	17.9	25.1	24	6.7	6	5	4.8	4.1	6.4				
%hauls	22.0	23.0	21.5	4.2	6.8	4.7	5.8	4.2	7.9	Total hauls: 194			

A stratified semi-random survey design was used with depth and area as stratifying variables. Trawling was carried out along transects perpendicular to the coast, which were approximately 15 NM apart (Figures 2.1-2.3), and the allocation of trawl stations was proportional to stratum size. Trawling shallower than 400 m was mainly done during daytime and deeper than 400 m during dark hours. The planned design is sometimes slightly modified due to unsuitable bottom conditions or, in the northern region, due to non-accessible areas with oil exploitation.

Based on a decision made in 2003 the trawl positions of the 2000 demersal survey should be the standard for future surveys in the southern region as the survey had a reasonable good coverage. Furthermore, it was decided that the trawl positions of the 2002 demersal survey should be used as the standard for future surveys in the central and northern regions, as the survey had a good coverage of these regions. Therefore, the station positions and effort have been similar during the 2000 and 2003-2009 surveys in the southern region and during the 2002-2009 surveys in the central and northern regions (see Annex VIII).

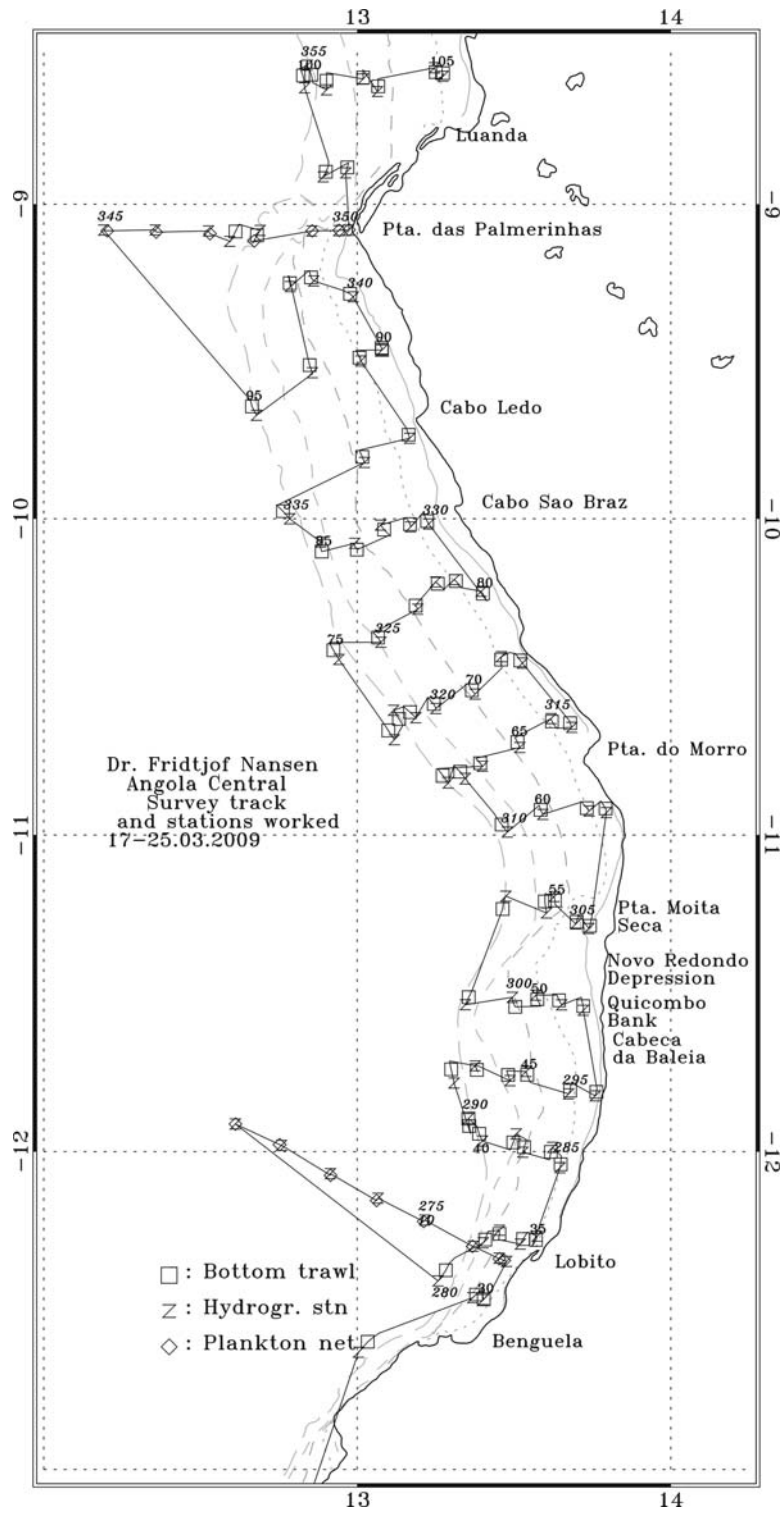


Figure 2.2 Angola central: Benguela - Ponta das Palmerinhas. Course track with trawl stations, plankton stations and hydrographical transects. Hydrographical stations were also taken at every fishing station. Depth contours at 20, 50, 100, 200 and 500 m.

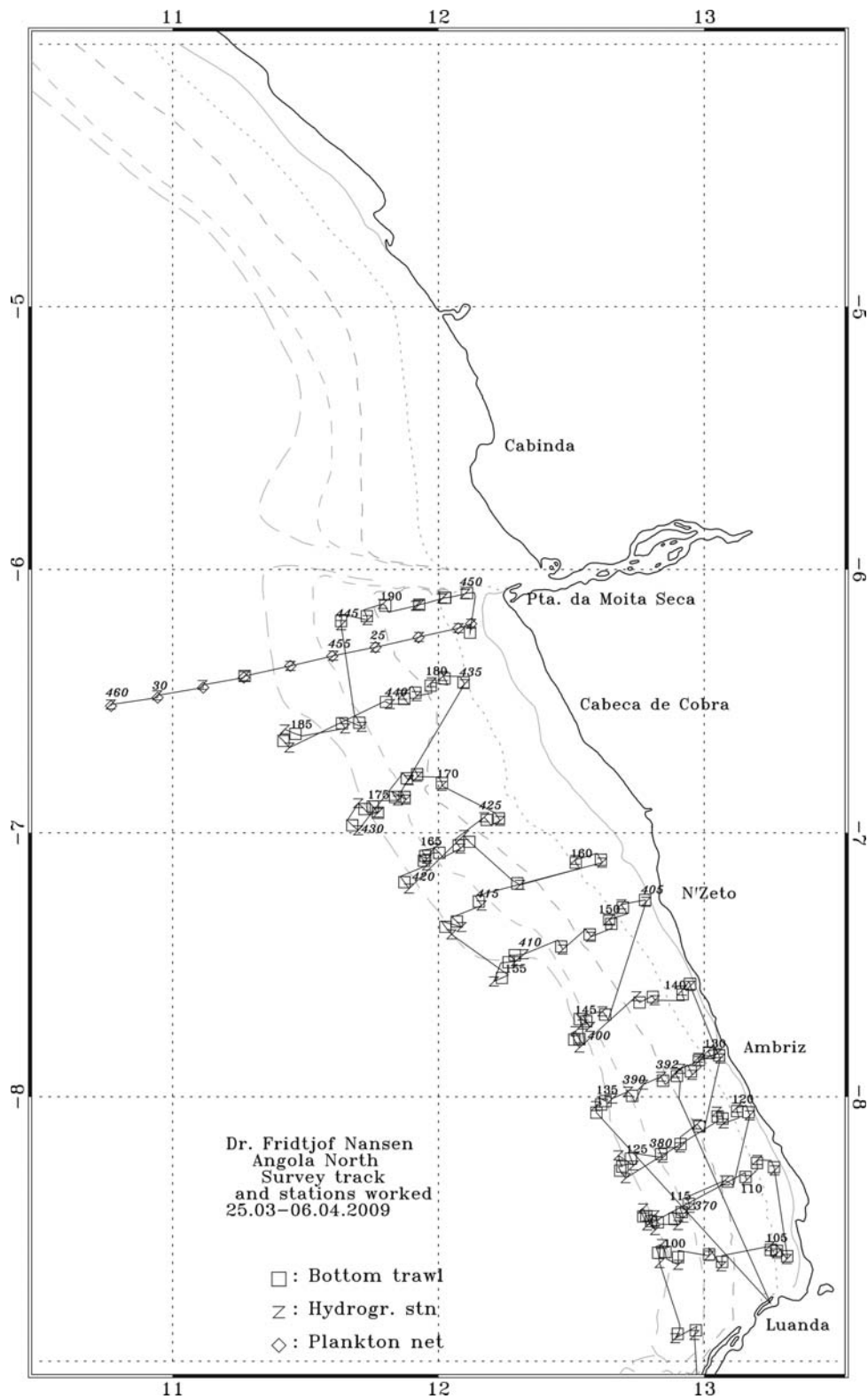


Figure 2.3 Angola north: Luanda - Congo River. Course track with trawl stations, plankton and hydrographical transects. Hydrographical stations were also taken at every fishing station. Depth contours at 20, 50, 100, 200 and 500 m.

2.2 Meteorological and hydrographical sampling

A Seabird 911+ CTD probe was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done with the customised Seabird Seasave software installed on a PC. Profile data were logged down to a few meters above the bottom or to 1 000 m depth at the Angola monitoring lines (Annex IX) and at all trawl stations. Due to lack of standard water and chemicals, calibration of the salinity and oxygen sensors were not carried out. For oxygen calibration data from December 2008 was applied and for salinity data from 17.02.2009. The calibration formulas used were:

$$\text{Oxygen: } Y = 0.9356x + 0.0905, R^2 = 0.996$$

$$\text{Salinity: } Y = 0.9932x + 0.2434, R^2 = 0.9998$$

The SBE 21 Seacat thermosalinograph was running routinely during the survey, obtaining samples of sea surface salinity and relative temperature and fluorescence (5 m depth) every 10 seconds. An attached in-line Turner Design SCUFA Fluorometer continuously measured Chlorophyll A levels [RFU] at 5 m below the sea surface while underway during the entire cruise.

Meteorological observations including wind direction and speed, air temperature, global radiation and sea surface temperature (SST) were automatically logged using a WIMDA meteorological station and averaged by every nautical mile distance sailed.

A vessel-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments logged the current profiles continuously, and was set to ping synchronously with the echo sounders. The frequency of the VMADCP is 150 kHz, and data were averaged and stored in 3 m or 4 m vertical bins.

2.3 Biological sampling

Sampling gear

A Gisund Super bottom trawl with a headline height of about 4.5 m was used during the survey, and the doors are of the Thyborøn' combi type. The distance between the front parts of the wings was about 21 m during deployment at a speed of 3 NM h⁻¹. These settings have been the standard on all swept area surveys with R/V "Dr. Fridtjof Nansen". As in previous surveys, except during the 2002 survey, a 44 m long tickler chain was 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 9 m long constraining rope was attached between the wires 120 m in front of the trawl doors. This kept a constant distance between the doors of about 50 m during the trawling. In shallow stations with depths of less than 80 m, the door-to-door distance varied more, depending on bottom type and currents. Data from the door and depth/trawl-height sensors were logged for all tows and are stored in files with CMG format, which makes it possible to study the trawl performance in more detail.

Trawl duration was standardized to 30 minutes. The trawling start time is controlled by using SCANMAR sensors to detect the landing of the trawl on the bottom, and the stop-time is defined as the time when the wires start to haul the net. In some cases the towing was interrupted before 30 minutes either due to poor bottom conditions or too high catches of fish indicated by the installed catch sensors. If the stations were not trusted to reflect the density of fish on the bottom they were recorded as invalid in the NAN-SIS database. Table 2.1 shows

the numbers of valid and invalid stations. A detailed description of the fishing gear is given in Annex VII.

Sampling the catches

Catches were sampled for species composition by weight and numbers. The total body length of the fish (cm) was measured to the nearest 1 cm below, the carapace length of shrimps and carapace width of crabs to 1 mm below and the mantle length of squids to 1 cm below. The records of fishing stations are presented in Annex I. For commercially important species, pooled length frequency distributions, in which individual samples are raised to total catch, are shown by area in Annex II.

2.4 Acoustic sampling

Acoustic recordings were carried out at four frequencies: 18, 38, 120 and 200 kHz using a SIMRAD ER60 echo sounder. Acoustic data were not processed on board, but all data were stored to files. A detailed description of the acoustic settings is given in Annex VII.

2.5 Plankton sampling

Zooplankton

The sampling was conducted by means of HYDROBIOS Multinet with 5 nets at the monitoring lines (Annex IX). The nets (180 μ m) were remotely opened from the bridge of the vessel. The new depth intervals covered in 2009 were 200-100 m, 100 -75 m, 75-50 m, 50-25 m and from 25 m to the surface. In the case of stations shallower than 25 m, the sample was taken from the bottom and up to the surface. A SCANMAR depth sensor gave real-time information of the depth and a flow meter inside the net was used to estimate the sampling volume. The samples were preserved in 4% formalin to be taken to the INIP for further analysis.

Phytoplankton

Phytoplankton samples were taken at each CTD station of the monitoring lines (Annex XI) at five different standard levels. The new levels used in 2009 were as follows: 5 m, 15 m, 25 m, 50 m and 75 m depth. The samples were preserved in 4% formalin for further analysis in the INIP.

2.6 Areas and depth strata

Table 2.1 shows the areas, in NM^2 , for the southern region (Cunene - Tombua: S17°14'-S16°00'), the central region (Benguela - Ponta das Palmerinhas: S12°40'-S09°00') and the northern region (Ponta das Palmeirinhas - Congo River: S09°00'-S06°00') by depth strata. These strata are used to calculate the swept-area biomass estimates. All valid stations are treated as representative for the relevant depth intervals where the species or group of species were caught.

2.7 Calculations

All equations for the calculations are given in Annex IV. The effective fishing width of trawl gear used by R/V "Dr Fridtjof Nansen" is considered to be 18.5 m. The effective fishing area is the product of the fishing width multiplied by the towing distance measured by the GPS. It is assumed that all fish within the trawling path are 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.

The catchability coefficient is seldom known, but because the coefficient is assumed to be constant between surveys, the swept-area estimates will reflect any change in population abundances between surveys.

The survey design and effort were previously inconsistent, and made any comparison between surveys difficult. Therefore, it was discussed and agreed upon by the responsible of the Demersal Programme of the Instituto Nacional de Investigação das Pescas of Angola, and the responsible for the Angolan Demersal Programme at the Institute of Marine Research, Norway that all biomass estimates since 1985 should be calculated in a standardized procedure.

Data from the NANSIS database were exported to flat ASCII text files. The software R 2.2.1[®] was used to calculate stratified density estimates sorted by survey and stratified by depth and latitude. Biomass estimates by species or species groups were obtained from a stratified mean density estimator using the equations in Annex IV.

[®] R Development Core Team (2005). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL <http://www.R-project.org>.

3.1 Surface distribution

The salient feature of the hydrographical conditions in Angolan waters 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 other rivers along the Angolan coast. The regular demersal surveys carried out by R/V “Dr. Fridtjof Nansen” in March are coincident with the late phase of the wet season and, typically, it is observed low salinity in the surface waters in the shelf off the northern and central Angola regions.

The horizontal distribution of the temperature and salinity in the southern region are shown in Figures 3.1 - 3.2. The temperature and salinity distributions are similar to last year (March 2008). The temperature in the surface varied between 18-24°C and the salinity was between 35.6-36.0. From Cunene River to Namibe the temperature close to the coast presented low values of 18-21 °C, characterizing the signs of presence of coastal upwelling. The lowest values of salinity (35.6) were observed between Cunene River and Baia dos Tigres.

In the central region (Benguela - Pta das Palmerinhas, Figures 3.3-3.4), the temperature and salinity were increasing towards offshore. In the whole region the temperature values ranged between 24°C and 29°C, while salinity values were between 34.7 and 36.2.

In the northern region the temperature was low inshore, around the mouth of the Congo River (about 23.4°C), while the offshore surface water temperature was between 27 and 29°C (Figures 3.5-3.6). The values of salinity were very low reaching 26.9, especially around the river's mouth. The river's plume was observed down to 8.5°S with a salinity of 34.5.

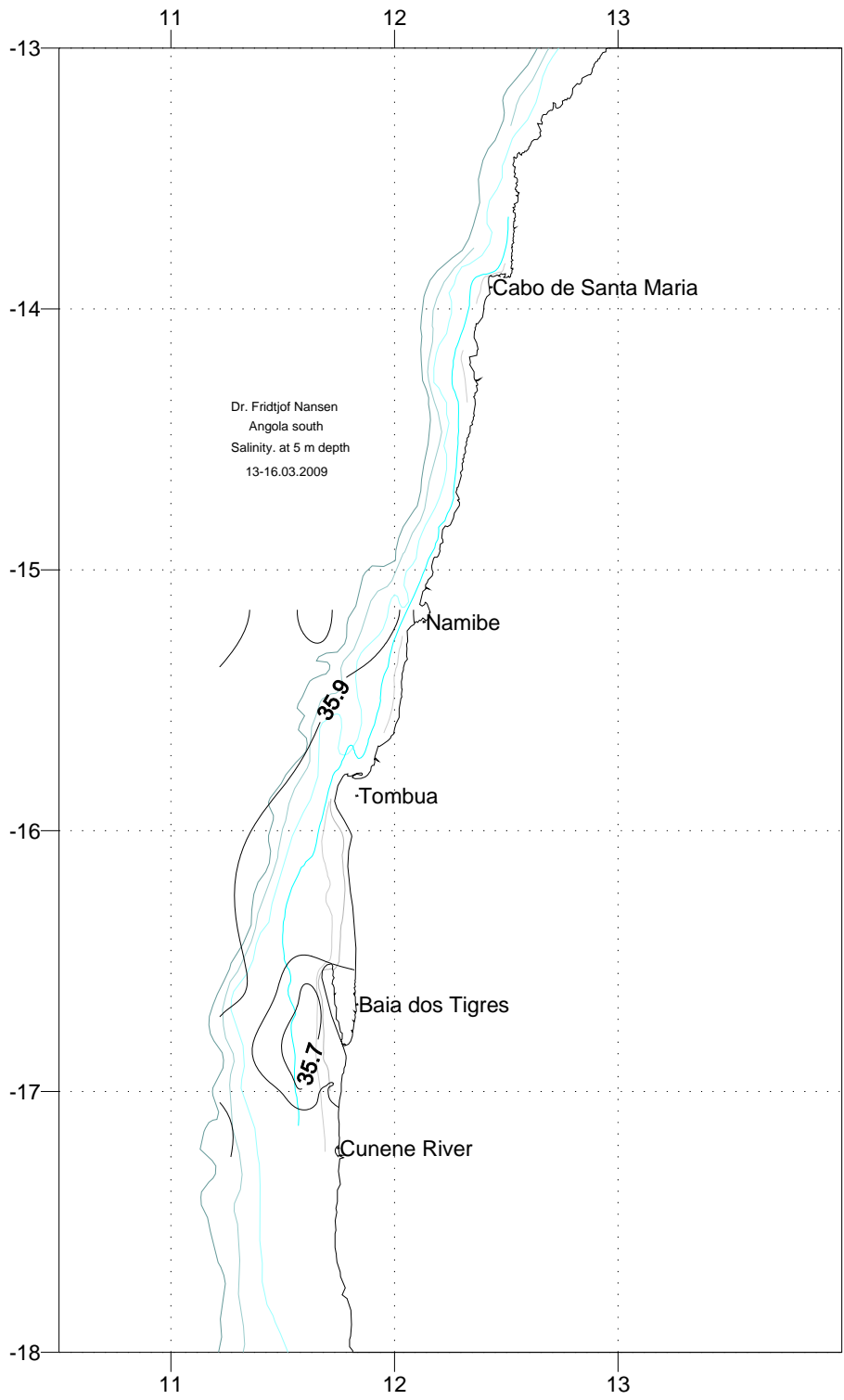


Figure 3.2 Angola south. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

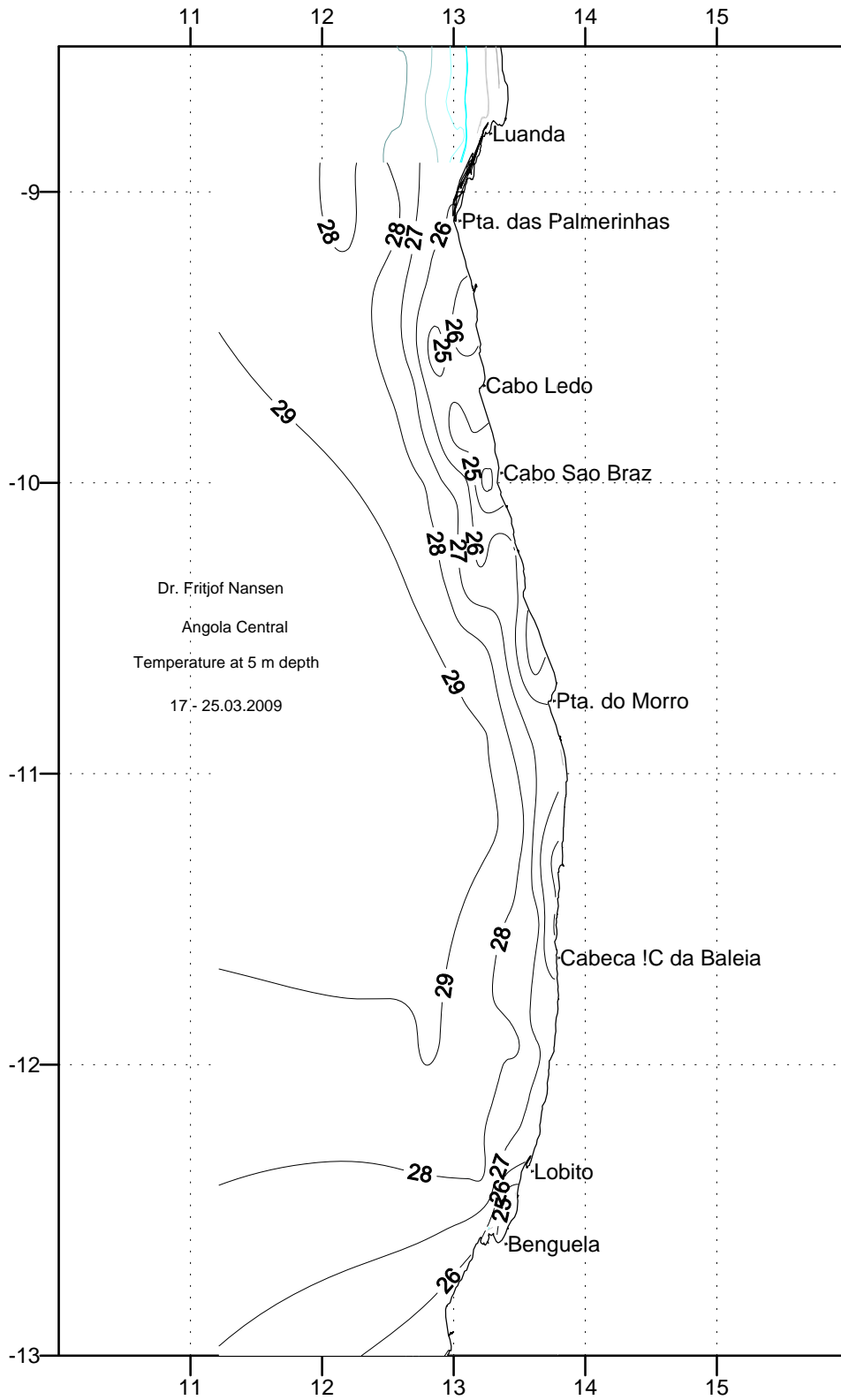


Figure 3.3 Angola central. Horizontal distribution of surface temperatures (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

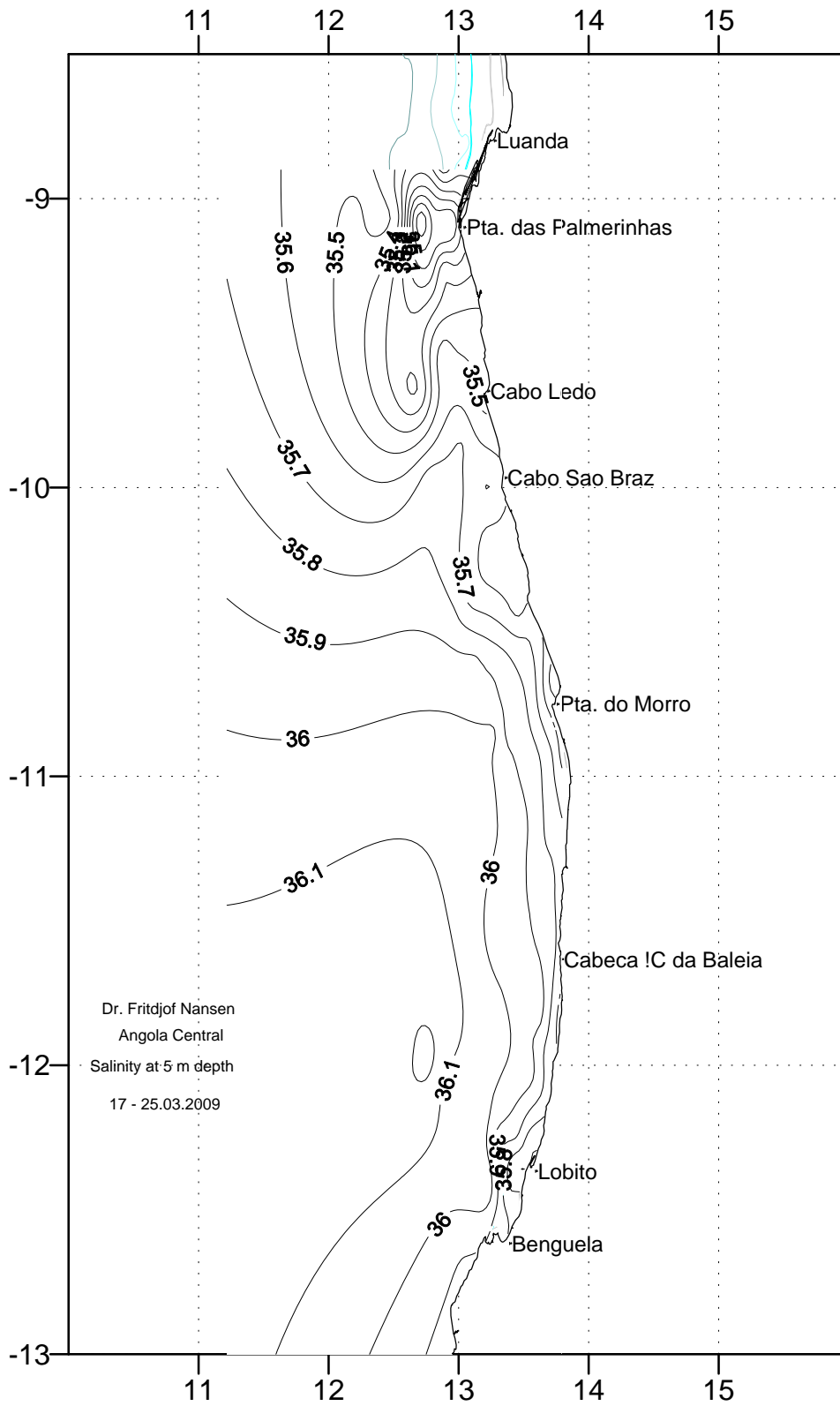


Figure 3.4 Angola central. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

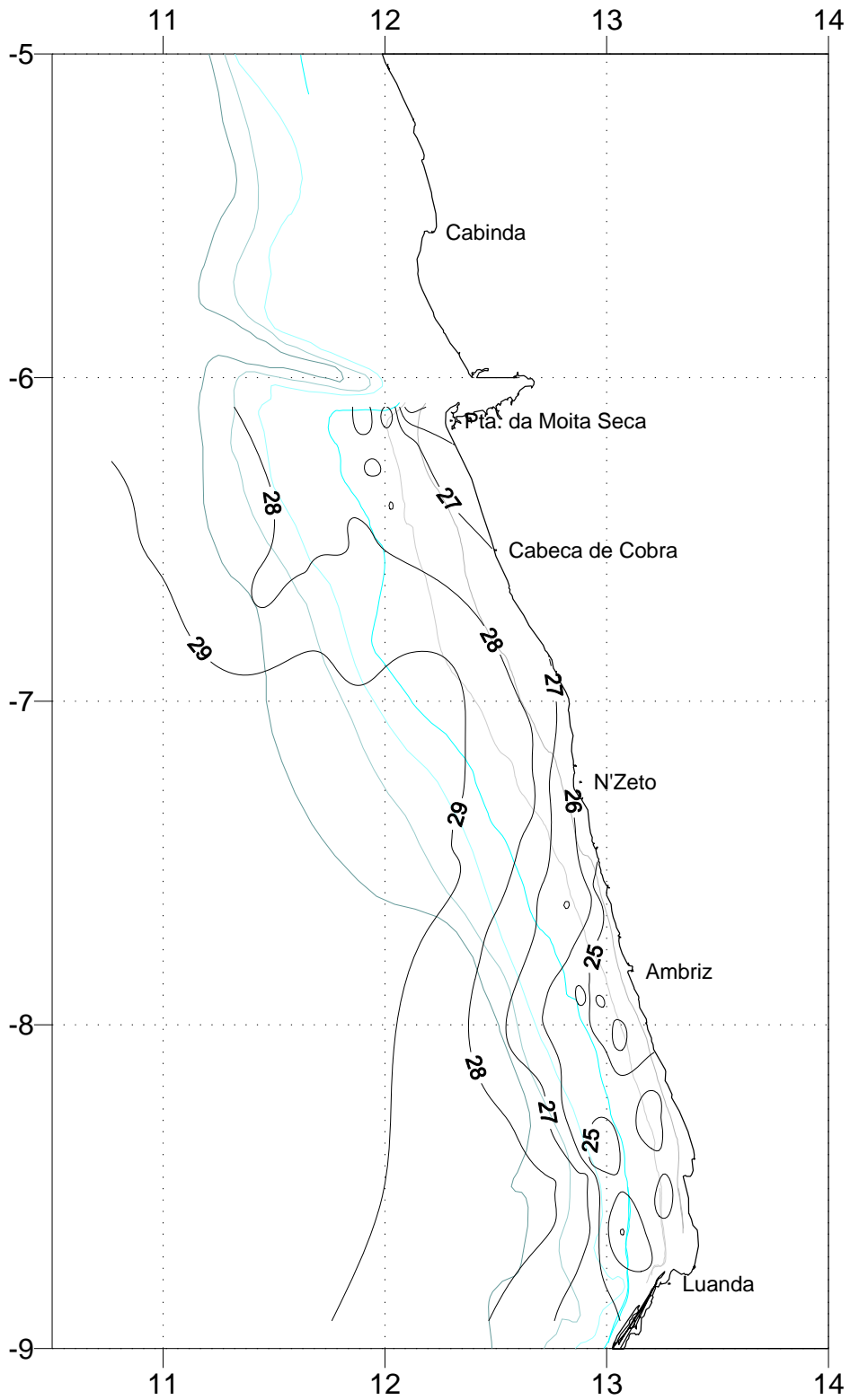


Figure 3.5 Angola north. Horizontal distribution of surface temperature (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m

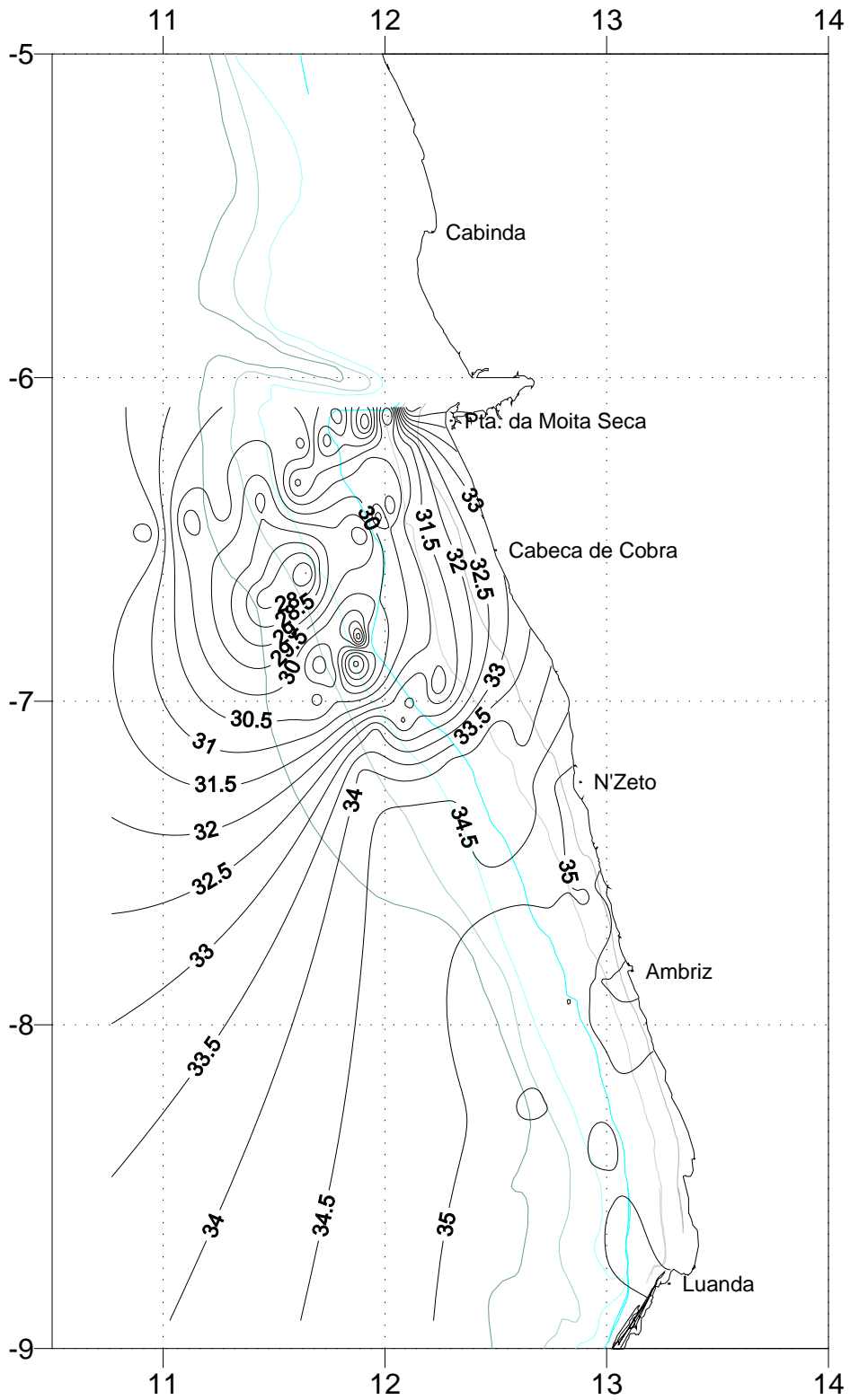


Figure 3.6 Angola north. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m

3.2 Vertical sections

In this cruise four new Angolan monitoring lines and one standard “Nansen” transects were covered in the whole coast of Angola. This new design of the monitoring lines responds the demand of national and regional requirements. These transects extend from the coast towards deep waters, with a distance of approximately 60 nautical miles, and covers depths up to 2000 m. The number of stations varied between 7 and 10. The news transects are located at Namibe (6 stations), Lobito (8 stations), Palmerinhas (7 stations) and Congo River (10 stations). One standard “Nansen” transect was carried out off Ambriz.

The southern region was covered with just one transect (Namibe, Figure 3.7) starting from the coast to the open sea at approximately 60 NM. The temperature in the surface was less than 23.5 °C and the salinity maintained values of 35.9 in the surface and decreasing to 34.7 at the bottom, while the oxygen presented values of 3 ml/l at surface, characterizing the signal of the coastal upwelling. The stratification layer was well pronounced from surface to 80 m depth. The minimum layer of oxygen (< 1 ml/l) was observed between 200 and 500 m.

Two transects were carried out in the central region (Lobito and Pta. das Palmerinhas) and are shown in Figures 3.8-3.9. The two transects present similarity in all parameters distribution. The surface temperature was lower at the coast and increased towards offshore, with values between 24 °C to 29 °C. Clear stratification was observed in the upper layer, with a termocline around 25-30 m. The salinity was lower towards the coast due to influence of river’s discharges, with values of about 34.4 - 35.1. In the stations far from the coast signs of waters with high temperature and salinity (tropical waters) were observed. The oxygen decreased from 4 ml/l at the surface to a minimum (< 1 ml/l) at layers below 200 meters depth.

In the northern region two transects were done; one standard “Nansen” transect off Ambriz and one monitoring line at the Congo River (Pta. da Moita Seca). In addition profiles were made based on CTDs taken at trawl stations off N’zeto (Figures 3.10-3.12). Temperatures were low (24°C) near the coast and increased gradually offshore reaching 29°C. The signal of presence of Congo River water was observed at N’Zeto with a salinity value of 34.5. At monitoring line Pta. da Moita Seca the values of the salinity were below 30.0. The oxygen concentration was up to 3.5 ml/l at the surface and the minimum level (< 1ml/l) was found below 250 m depth.

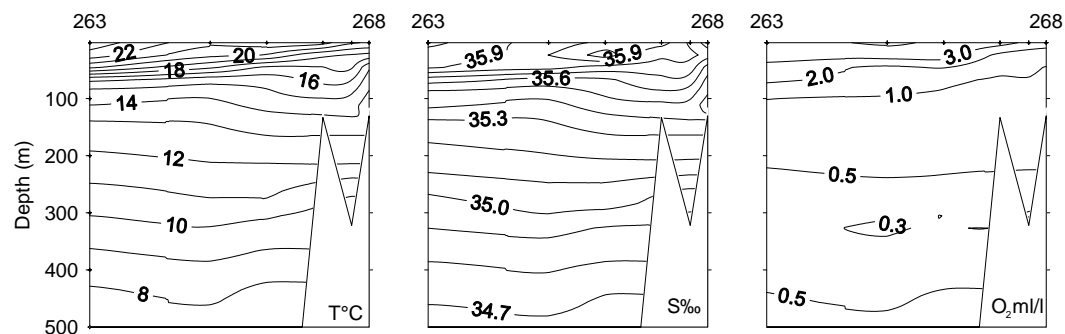


Figure 3.7 Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic monitoring line at Namibe.

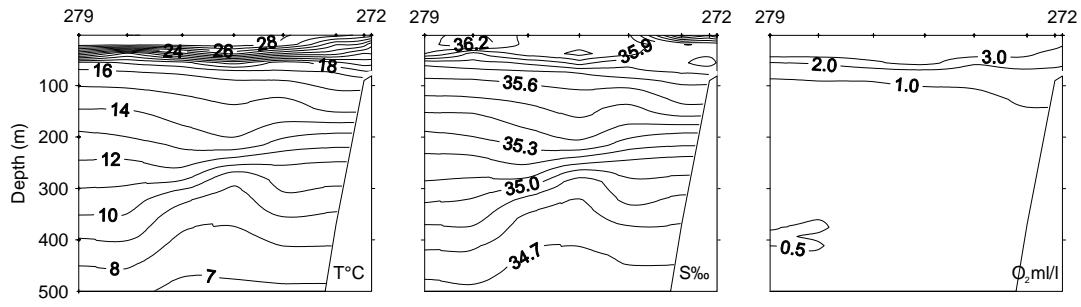


Figure 3.8 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic monitoring line at Lobito.

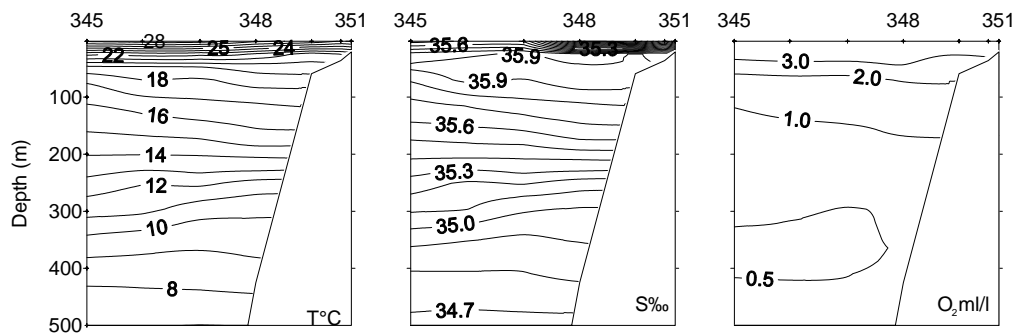


Figure 3.9 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic monitoring line at Pta. das Palmerinhas.

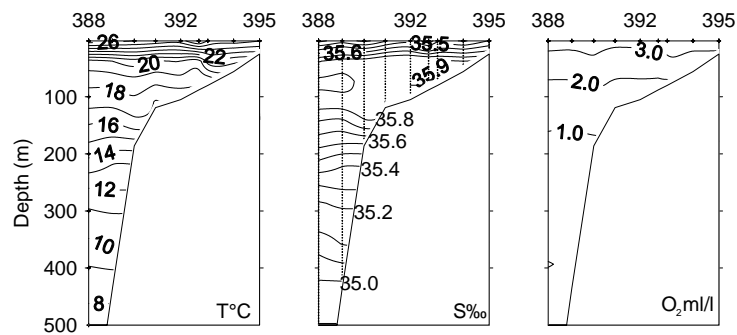


Figure 3.10 Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Ambriz.

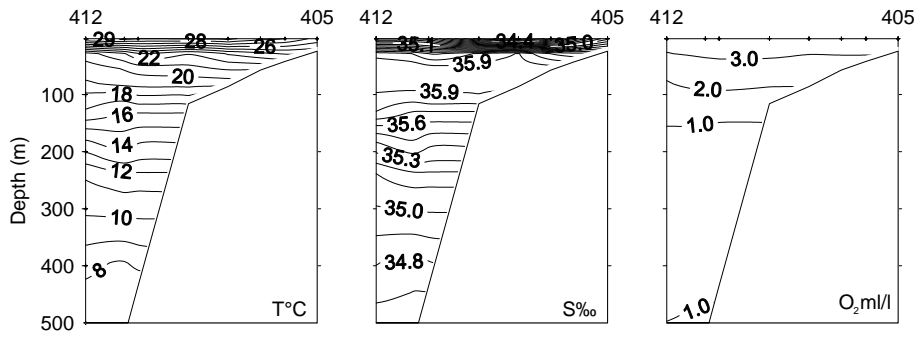


Figure 3.11 Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen on trawl stations off N'zeto.

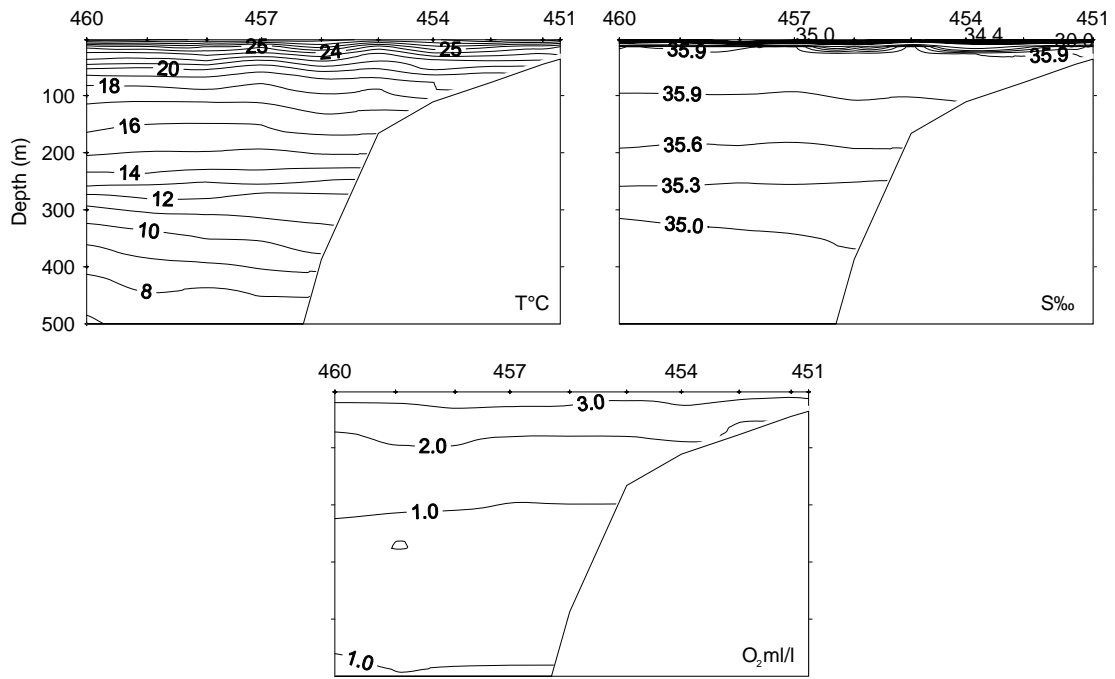


Figure 3.12 Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic monitoring line at Pta. da Moita Seca.

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

The inner shelf is defined to be the area between 20 and 70 m bottom depth, and the outer shelf from 71 to 200 m depth. Several of the species, which inhabit the shelf, particularly the seabreams (Sparidae) and hakes (Merlucciidae), are also found in deeper waters usually in small density. These are presented in Chapter 5.

The trawl positions are mapped in Figures 2.1-2.3, and the station information and catch by species are presented in Annex I. Pooled length distributions, weighted by the catch of the main species by region, are shown in Annex II. Further, the mean densities (tonnes·NM⁻²) and the frequency of occurrence of the most important species are shown in Annex III. Annex V shows the various NAN-SIS species codes used for species and groups of species, and Annex VI presents the catch rates of these species and species groups.

4.1 Cunene-Tombua shelf

During 3 days 27 trawl stations were sampled on the southern shelf. The southern region has not been regularly sampled throughout the years, except for the 2000 and 2003-2009 surveys. Other surveys' results in the time series should therefore be interpreted with caution, as the strategy and design of these surveys were not standardized.

Some trawl stations were interrupted (see Annex I) as high catches of horse mackerel affected the trawl performance, and may have prevented an adequate sampling of the catch.

The average total catches per hour on the inner shelf were 15 364 kg/hour and 2 498 kg/hour on the outer shelf (Annex VI). The 'pelagic' group dominated with 95% of the mean catch rate on the inner shelf and 50% on the outer shelf. The mean catch rates of the 'demersal' group were respectively 109 kg/hour on the inner shelf and 1 156 kg/hour on outer shelf. Shrimps were only caught in low numbers at one station on the outer shelf. The average mean catch rates were 21 kg/hour for cephalopods and 3 kg/hour for sharks on the inner shelf, while on the outer shelf they were 18 kg/hour the cephalopods and 7 kg/hour for sharks. The "other" group of species contributed to 4% of the average mean catch rate on the inner shelf and 3% on the outer shelf. Among the demersal species, Cape hake (*Merluccius capensis*) was the most abundant on the outer shelf and caught at every station with an average catch rate of 879 kg/hour. Seabreams (except *Boops boops*) was abundant in the main demersal group, and was caught in all of the stations on the outer shelf. The average catch rate of seabreams on the inner shelf was 72 kg/hour and 255 kg/hour on the outer shelf. *Dentex macrophthalmus* was the dominant seabream. The average catch rate of croakers (mainly *Umbrina canariensis*) was 4 kg/hour on the inner and 20 kg/hour on the outer shelf. No grunts, snappers or groupers were caught on the shelf in the south. As previously mentioned, the 'pelagic' group dominated the catches on the inner shelf, and the carangids, mainly horse mackerel, was by far the most abundant group with an average catch rate of 14 646 kg/hour. The average catch rate of the carangids on the outer shelf was 1 239 kg/hour.

Biomass estimates

Table 4.1 shows the time series from 1986 to 2009 of swept-area biomass estimates for commercial species in the southern region. The biomass estimates were calculated by

stratifying depth (20-49, 50-99 and 100-199 m). The sampling intensity in the southern region has been variable throughout the years and only surveys that have covered each of the strata with at least two stations are included in Table 4.1. The high coefficient of variations (CV) shown in Table 4.1 indicates that the trends in the time series should be interpreted with care.

The biomass estimate of horse mackerel in 2009 was 322 000 tonnes, which is the highest estimate in the time series, almost 50% higher than last year and three times higher than the 2007 estimate. However, the swept-area estimates of the pelagic stocks are unreliable as the bottom trawl only catches fish close to the seabed. The contribution of *T. trecae* (Cunene horse mackerel) was 93% in 2007, 78% in 2008 and 99.9% in 2009 within the horse mackerel biomass. Small fish or juveniles (<25 cm) dominated the horse mackerel catches.

The seabreams biomass estimate was about 9 800 tonnes in which *D. macrophthalmus* contributed 98% to the catch. This was almost the same as estimated last year, and one of the lowest estimates in the time series.

The biomasses of the croakers have varied considerably during the last surveys. Therefore, no clear trend in the time series can be seen. The 2009 estimate of 700 tonnes is 75% higher than the 2008 estimate, but the fifth lowest in the time series. The 2008 estimate of 400 tonnes was a drastic decrease compared to the 4 200 tonnes estimated in 2007, and the lowest in the time series. The estimate of *U. canariensis*, which is one of the most abundant among croakers, also shows large annual variation and there is no evident trend in the time series.

The biomass estimate of hakes (Benguela and Cape hakes) was 31 000 tonnes. This was the highest in the time series, almost twenty times higher than in 2008. *M. capensis* (Cape hake) dominated the hake catches and Benguela hake (*M. polli*) was only caught in two stations on the southern shelf during the present survey, while it contributed about 65% of the biomass in 2008.

The biomass estimate of the cephalopods in 2009 was 1 000 tonnes, which was only one third of the 2008 estimate and about 30% lower than the 2007 and 2006 estimates.

The biomass estimate of sharks (includes Chimaeriformes) was about 300 tonnes both in 2009 and 2008, and are among the lowest in the time series. This was a considerable reduction from the 2007 estimate of 2 000 tonnes and there has been a decreasing trend since 2006. But this figures should carefully interpreted, as they do not reflect neither the real species composition nor their biomass due to inadequate sampling gear.

The biomass estimates of the pelagic species groups are unreliable, as the bottom trawl is not a very suitable sample tool for these groups. The 2007-2009 biomass estimates of clupeids are considerably smaller than the very high estimate of 2006, and the large fluctuations in the time series do not reflect the true change of abundance of these stocks due to their ecological conditions. Similar, the fluctuations in the scombrids biomass estimates over time are unlikely to represent a reliable reflection of changes in the stock. The biomass trend of the carangids was reflected in the horse mackerel time series as no other carangid species was caught in the southern region in 2009.

The biomass estimate of hairtails (*Trichiurus lepturus*) was about 30 tonnes, ten times lower than the 2005 biomass estimate. As a benthopelagic species, its biomass estimates over time is unlikely to represent a reliable reflection of changes in the stock.

Table 4.1 Biomass estimates (tonnes) of important species on the shelf (20-200m) in the southern region. CV values are indicated in brackets.

Survey	Hake	T.treace	Horse mackerel	Cephalopod	Sharks	Clupeids	Carangids	Scomberids
1986.1	1099 (0.55)	14235 (0.59)	23059 (0.46)	1188 (1.00)	618 (0.65)	51 (1.83)	23059 (0.46)	43 (1.00)
1986.2	3709 (0.81)	69542 (0.49)	78132 (0.53)	1555 (0.47)	2593 (0.92)	0	78165 (0.53)	173 (0.89)
1989.1	349 (0.88)	2883 (1.09)	15681 (0.90)	776 (0.61)	188 (0.88)	0	15681 (0.90)	60 (0.79)
1989.2	1121 (1.30)	979 (0.94)	13706 (0.75)	6114 (0.83)	12200 (1.37)	0	13706 (0.75)	35 (1.11)
1989.3	6739	11636	39225	2087	551	0	39225	155
1991.1	2920 (1.28)	21429 (0.59)	50458 (0.51)	732 (0.42)	4005 (1.48)	6 (1.69)	50459 (0.51)	106 (1.46)
1991.2	4385 (0.68)	25595 (0.60)	62961 (0.58)	2192 (1.71)	957 (0.53)	444 (1.61)	62961 (0.58)	0
1992	6756 (0.46)	8106 (0.91)	95433 (0.41)	744 (0.63)	2220 (0.65)	70 (1.54)	95436 (0.41)	0
1993	4023 (0.40)	52839 (0.91)	64235 (0.75)	2501 (0.81)	2278 (0.71)	8 (1.55)	64235 (0.75)	347 (1.03)
2000	3559 (0.80)	185345 (1.05)	218410 (0.86)	1934 (0.29)	2051 (0.48)	43 (1.76)	218473 (0.86)	28 (0.87)
2002	3779 (0.81)	116985 (1.30)	237050 (0.63)	1937 (0.96)	69 (0.94)	1217 (1.69)	237058 (0.63)	711 (1.76)
2003	7014 (0.64)	76533 (0.80)	113879 (0.74)	1630 (0.86)	1163 (1.16)	3601 (1.55)	114293 (0.75)	546 (1.83)
2004	11860 (0.64)	72982 (0.56)	237659 (0.80)	2547 (0.71)	348 (0.72)	12998 (1.82)	237659 (0.80)	5 (1.83)
2005	5067 (0.65)	114 (1.83)	129070 (0.52)	2309 (0.61)	1067 (0.38)	2410 (0.74)	129088 (0.52)	1 (1.83)
2006	3713 (0.39)	126892 (0.47)	184129 (0.48)	1545 (0.68)	3630 (1.40)	308909 (1.03)	184129 (0.48)	2221 (1.66)
2007	3006 (0.52)	100468 (0.54)	107896 (0.51)	1459 (0.48)	2016 (0.49)	1747 (0.78)	107918 (0.51)	95 (1.35)
2008	1722 (1.04)	169349 (0.57)	215813 (0.48)	3235 (0.57)	278 (1.12)	43 (1.26)	215813 (0.48)	1124 (0.85)
2009	31018 (0.32)	322270 (0.82)	322460 (0.82)	1017 (0.50)	271 (0.61)	2148 (1.82)	322460 (0.82)	50 (1.69)

	Hairtails	Croakers	Seabreams	Ommastrephidae	Sepiidae	D.macrophthalmus	D.angolensis	U.canariensis
1986.1	334 (0.85)	1560 (0.94)	9736 (0.33)	31 (0.64)	138 (0.88)	8304 (0.34)	81 (1.15)	135 (1.26)
1986.2	1694 (1.30)	3960 (0.96)	19201 (0.49)	0	726 (0.74)	17054 (0.54)	5 (1.69)	86 (1.48)
1989.1	965 (1.36)	1492 (0.63)	17853 (0.47)	61 (0.54)	159 (1.08)	17020 (0.47)	139 (1.59)	361 (1.04)
1989.2	510 (0.99)	3601 (0.93)	32669 (0.43)	7 (1.69)	0	31615 (0.44)	16 (1.69)	442 (0.75)
1989.3	1746	1443	15594	192	17	15509	27	86
1991.1	1335 (0.71)	1341 (0.54)	22333 (0.33)	25 (1.09)	20 (1.55)	20180 (0.37)	6 (1.69)	118 (0.93)
1991.2	255 (0.61)	567 (0.51)	22536 (0.43)	25 (0.91)	31 (0.98)	21994 (0.44)	7 (1.69)	102 (1.10)
1992	13 (1.42)	576 (0.91)	32666 (0.54)	428 (1.16)	148 (0.71)	31822 (0.55)	118 (1.69)	30 (0.99)
1993	361 (1.38)	2744 (0.60)	58399 (0.52)	145 (0.40)	126 (1.57)	57722 (0.51)	238 (1.58)	496 (0.87)
2000	1008 (1.45)	3623 (0.61)	61693 (0.95)	9 (1.69)	400 (0.50)	58636 (1.01)	63 (1.29)	305 (0.72)
2002	0	1046 (1.18)	24802 (1.00)	21 (1.69)	1043 (1.64)	23819 (0.98)	0	12 (1.69)
2003	48 (1.16)	1115 (0.39)	15856 (0.39)	397 (0.69)	53 (1.40)	13313 (0.38)	0	172 (0.84)
2004	1 (1.69)	518 (1.18)	26946 (0.69)	549 (0.86)	920 (1.54)	24702 (0.74)	1 (1.69)	8 (1.83)
2005	274 (1.53)	6164 (0.71)	12654 (0.50)	1655 (0.86)	63 (1.43)	12121 (0.50)	221 (1.69)	330 (1.20)
2006	26 (1.74)	923 (0.55)	11470 (0.31)	98 (0.91)	199 (0.90)	11058 (0.32)	0	229 (1.07)
2007	93 (1.25)	4168 (1.21)	15520 (0.36)	555 (1.04)	15 (1.69)	14579 (0.37)	70 (1.69)	563 (0.96)
2008	85 (0.74)	404 (0.94)	9147 (0.38)	6 (1.69)	504 (1.16)	7276 (0.45)	113 (1.69)	44 (0.94)
2009	27 (0.72)	695 (0.68)	9804 (0.52)	371 (0.87)	0 (1.69)	9618 (0.53)	1 (1.69)	118 (1.23)

Distribution

Figure 4.1a shows the distribution of seabreams in the southern survey area. A low concentration of seabreams covered most of survey area shallower than 300 m, and a few denser concentrations were found throughout the whole distribution area between Cunene River and Baía dos Tigres.

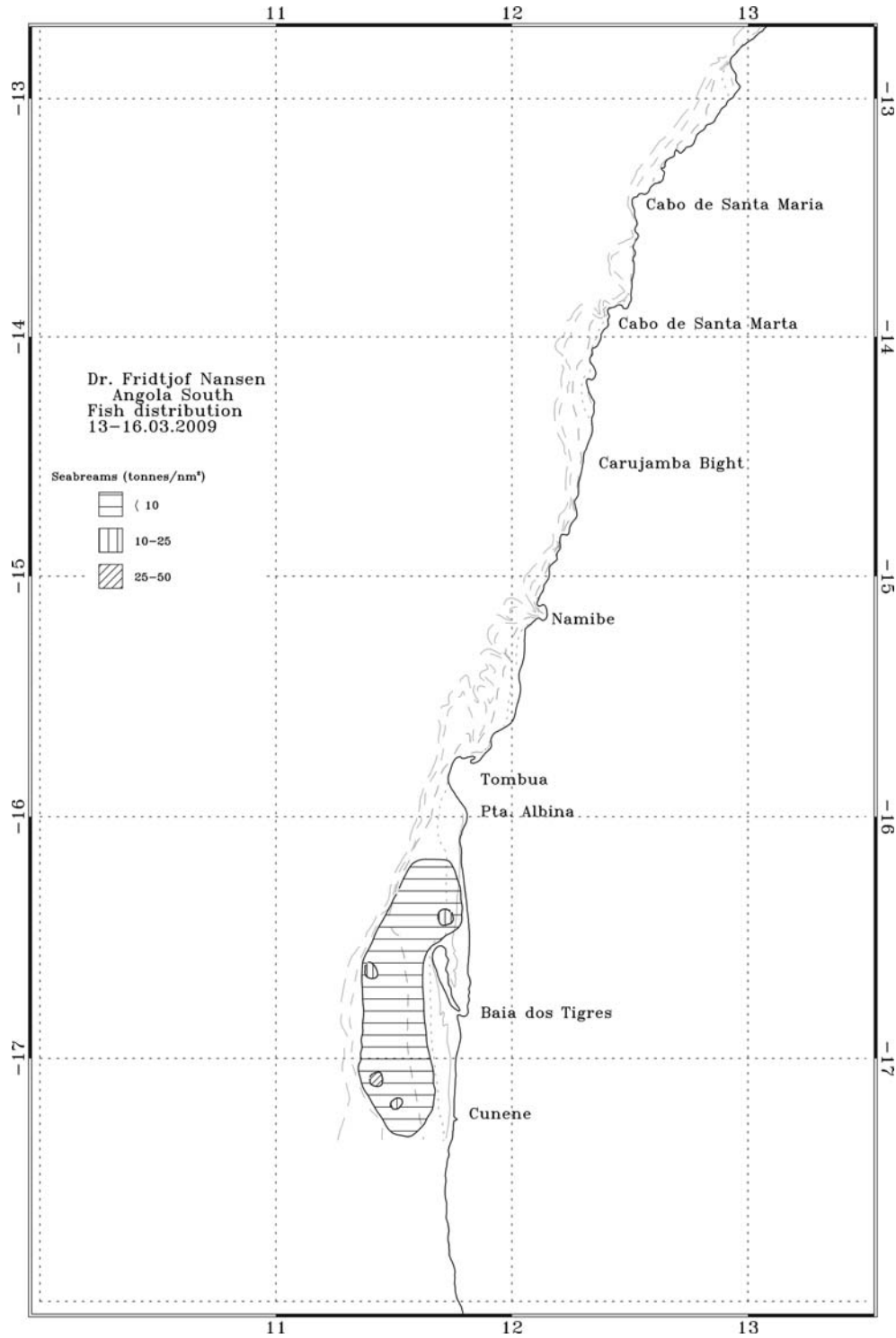


Figure 4.1 Distribution of seabreams (family Sparidae) in the southern region, Cunene-Tombua. Depth contours at 20, 50, 100 and 200 m.

4.2 Benguela - Ponta das Palmerinhas shelf

The central region of Angolan waters covers from Benguela to Ponta das Palmerinhas. A total of 69 successful swept-area trawl stations were accomplished on the central shelf area (Table 2.1).

The average catch per hour on the inner shelf was 876 kg/hour and 893 kg/hour on the outer shelf (Annex VI). The 'demersal' group contributed to 40% of the mean catch rate on the inner shelf whereas 45% was for the 'pelagic' group. Shrimps and sharks contributed to less than 1% in the inner shelf while cephalopods contributed 1 % of the total average catch rate. Pelagic fish were slightly more abundant than demersal fish on the outer shelf contributing to 31% of the average catch rate, whilst the 'demersal' group contributed to 26%. Like on the inner shelf, shrimps and sharks contributed to less than 1%, while cephalopods contributed 1 % of the total average catch rate. Seabreams (except *Boops boops*) were caught in most of the trawl stations on the inner shelf as well as in all stations on the outer shelf, and the average catch rates were 59 kg/hour on the inner and 53 kg/hour outer shelf. The most common seabreams species were *D. macrophthalmus*, *D. angolensis*, *Pagellus bellottii* and *D. barnardi*. Snappers were only caught in one station on the inner shelf, while groupers were frequently caught on the inner shelf with an average catch rate of 3 kg/hour, and were also caught in three stations on the outer shelf. Similar, the grunts (*Pomadysys* spp.) were often caught on the inner shelf and were only found in the shallower part of the outer shelf. The average catch rates of grunts were 71 kg/hour on the inner and 11 kg/hour on outer shelf. Croakers, mainly *U. canariensis* (canary drum), were caught more frequently on the outer shelf than on the inner shelf. The average catch rates of the canary drum were 13 kg/hour on the outer shelf and 18 kg/hour on the inner shelf. The most common pelagic groups on the inner shelf were carangids, caught with an average catch rate of 175 kg/hour, clupeids with an average catch rate of 155 kg/hour and barracudas (*Sphyraena guanchacho* and *S. sphyraena*) with an average catch rate 2 kg/hour. Mainly one station (# 47) contributed to the higher mean catch rate of clupeids compared to 2008, while the catch rates of carangids were in general higher than last year. The average catch rates of the same species groups on the outer shelf were 60 kg/hour of carangids, 6 kg/hour of clupeids and 0.1 kg/hour of barracudas. The hairtail (*Trichiurus lepturus*) was caught on the inner shelf with an average catch rate of 64 kg/hour, whereas on the outer shelf the average catch rate was 214 kg/hour.

Biomass estimates

Table 4.2 shows the time series from 1985 to 2009 of swept-area biomass estimates for commercial species and groups of species on the shelf off central Angola. The biomass estimates were calculated by stratifying by depth (20-49, 50-99 and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of conducted trawls by strata and survey. It must be noted that the biomass estimates presented for the pelagic species may not reflect the true biomass trends, as pelagic species are often unavailable for the bottom trawl. Therefore, the biomass estimates of the pelagic species may more reflect their availability to the trawl than the abundance. Some of the biomass estimates in Table 4.2 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

T. trecae was the only horse mackerel species found in the central and northern regions, and the biomass on the central shelf decreased dramatically from 2002 to 2005. There was a small improvement from 2005 to 2006, a small decrease again in 2007 and the 2008 estimate was

50% lower than the 2007 estimate and the lowest in the time series. The 2009 estimate, however, is almost three times higher than the 2008 estimate and the highest since 2004.

M. polli was the only hake species caught north of Benguela and the 2009 estimate of 4 tonnes was 80% lower than the 2008 estimate of 22 tonnes and the second lowest in the time series. The large decrease from the high 2003 estimate of about 1 800 tonnes still needs further investigation.

Seabreams is the most important commercially demersal fish group in Angola. The survey biomass estimates for the central shelf have fluctuated largely throughout the years. From 1991 to 2002, the total biomass was between 20 000 and 30 000 tonnes with a peak of 63 200 tonnes in 1998. The seabream biomass has declined since 1998 and was estimated to 5 800 tonnes in 2008, the second lowest in the time series. There was a small increase to 7 400 tonnes in 2009, but this still is among the lowest biomass estimates in the time series. In the surveys from 1991/2 to 2002, the estimated biomass of *D. macrophthalmus* made of 30 to 77 % (mean 58%) of the total seabreams estimates, but it has contributed to less than 40% (mean 20%) in the 2003-2009 estimates. The biomass of *D. angolensis* has been relatively stable and fluctuated between 1 000 and 2 000 tonnes in recent years. Other important seabreams which contributed to the total seabreams biomass were *Pagellus bellottii*, *D. canariensis* and *D. barnardi*.

The biomass estimate of croakers increased from 4 850 tonnes in 2006 to about 8 000 tonnes in 2007 which is the highest estimate since 1999, but decreased to 3 600 tonnes in 2008 and further to 2 100 tonnes in 2009. *Umbrina canariensis* is the most abundant croaker, and contributed to about 65% of the total croaker biomass.

The 2009 biomass estimate of grunts (*Pomadasys incisus*, *P. jubelini*, *P. rogeri* and *P. peroteti*) was 5 000 tonnes, which is somewhat lower than what was estimated in 2008 (5 900 tonnes). The estimates have considerably varied between surveys and no clear trend can be seen in the time series.

The snappers are rare in the catches as they inhabit rocky and often untrawlable (bottom trawl) areas. Hence the biomass estimates of snappers do not adequately reflect the state of the stock.

Groupers, mainly *Epinephelus aeneus*, are found on the inner shelf and are coastal rocky and sandy shore dwellers. The high CVs indicates that the biomass estimates of *E. aeneus* should be considered with care. There is no clear trend in the time series as the survey estimates vary largely between years.

The biomass estimate of *P. longirostris* (deep water rose shrimp) was 200 tonnes in 2009, which was almost the same as found in 2008 (230 tonnes). *P. longirostris* is mainly distributed in the deeper parts of the shelf and the slope.

The biomass estimate of Sepiidae was 124 tonnes in 2009, which is a large increase from the 2008 estimate of 38 tonnes. However, the annually variability and the high CVs may indicate that the estimates do not accurately reflect the state of the stock.

The biomass estimate of Ommastrephidae was 100 tonnes in 2009, which was a notable decrease compared to the 2008 estimate of 330 tonnes. The annual variability and CVs are high also for this group.

Table 4.2 Biomass estimates (tonnes) of important species on the shelf (20-200 m) in the central region. CV values are indicated in brackets.

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.4	124 (0.93)	74 892 (0.98)	58 (1.61)	5 372 (0.77)	0	423 (1.33)	75 408 (0.98)	0
1986.1	276 (1.02)	17 875 (0.62)	1 632 (0.92)	1 439 (0.47)	228 (1.47)	717 (0.69)	20 440 (0.54)	34 (1.29)
1986.2	207 (0.97)	22 596 (0.79)	371 (1.12)	1 423 (0.78)	0	328 (0.89)	24 625 (0.72)	16 (1.61)
1989.1	121 (1.62)	6 999 (0.41)	237 (1.05)	1 864 (0.59)	148 (0.94)	560 (1.54)	12 736 (0.49)	155 (0.67)
1989.2	1 013 (0.80)	21 473 (0.51)	677 (0.75)	2 206 (0.33)	105 (1.06)	359 (0.94)	26 453 (0.47)	95 (0.50)
1989.3	480 (1.10)	9 579 (0.94)	453 (1.41)	2 015 (0.79)	285 (1.29)	1 707 (0.81)	12 816 (0.90)	310 (1.21)
1991.1	0 (1.69)	86 136 (0.77)	39 (1.11)	850 (0.31)	746 (1.00)	508 (0.94)	87 396 (0.76)	277 (0.81)
1991.2	618 (1.20)	47 927 (0.85)	125 (1.04)	2 021 (0.50)	115 (1.69)	36 (1.61)	48 814 (0.83)	126 (1.30)
1992	1 641 (0.62)	32 878 (0.46)	106 (1.13)	2 597 (0.30)	483 (1.11)	70 (1.16)	35 314 (0.46)	64 (0.89)
1994	2 393 (1.35)	61 886 (0.53)	292 (0.92)	2 696 (0.41)	269 (0.83)	22 (0.96)	63 569 (0.51)	580 (0.80)
1995.1	167 (0.77)	4 875 (0.99)	323 (0.80)	807 (0.42)	121 (0.88)	245 (0.59)	12 635 (0.51)	213 (1.06)
1996	713 (1.09)	51 220 (0.77)	116 (0.98)	2 402 (0.41)	496 (1.08)	589 (0.89)	55 750 (0.71)	53 (1.77)
1997.1	4 557 (1.20)	27 729 (0.74)	1 088 (0.94)	3 268 (0.44)	208 (0.99)	3 442 (1.89)	38 605 (0.59)	46 (1.61)
1997.2	7 635	68 984	1 391	2 531	149	125	70 873	279
1998	375 (1.45)	4 630 (0.89)	365 (0.82)	2 587 (0.34)	310 (0.96)	2 860 (1.57)	7 606 (0.64)	52 (1.35)
1999	15 (1.69)	12 977 (0.53)	15 (0.74)	890 (0.38)	107 (1.15)	1 961 (0.92)	20 379 (0.43)	34 (1.28)
2000	240 (1.53)	19 114 (0.49)	314 (0.91)	1 744 (0.30)	560 (0.82)	1 594 (0.90)	25 052 (0.41)	275 (1.20)
2001	123 (1.15)	16 510 (0.48)	212 (1.28)	1 374 (1.06)	343 (0.78)	80 (1.01)	20 942 (0.42)	97 (0.77)
2002	1 189 (0.83)	78 646 (0.41)	531 (0.74)	2 930 (0.57)	120 (0.81)	1 625 (0.64)	85 797 (0.38)	745 (1.51)
2003	1 774 (0.85)	25 494 (0.54)	515 (0.70)	1 327 (0.44)	266 (0.78)	1 439 (0.64)	29 369 (0.47)	55 (0.85)
2004	174 (1.53)	12 263 (0.58)	974 (1.11)	1 026 (0.34)	586 (0.85)	2 193 (0.79)	15 324 (0.47)	41 (1.03)
2005	44 (1.42)	7 137 (0.52)	84 (0.71)	1 427 (1.16)	201 (0.66)	1 535 (0.84)	9 357 (0.44)	216 (1.30)
2006	44 (1.07)	9 622 (0.37)	188 (1.01)	1 674 (0.27)	475 (0.72)	2 275 (0.84)	13 434 (0.35)	134 (0.69)
2007	55 (0.84)	7 649 (0.49)	54 (0.59)	1 822 (0.30)	802 (1.19)	2 078 (0.67)	13 485 (0.59)	18 (1.15)
2008	22 (1.17)	3 703 (0.51)	257 (0.90)	1 295 (0.22)	132 (0.68)	945 (1.10)	5 636 (0.38)	17 (1.18)
2009	4 (1.51)	10 073 (0.50)	195 (1.14)	1 678 (0.37)	94 (0.90)	8 854 (1.26)	14 765 (0.44)	21 (1.57)

Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.4	2 568 (1.16)	253 (1.26)	0	1 253 (0.95)	5 706 (1.37)	10 235 (1.45)	18 407 (0.72)	58 (1.61)
1986.1	15 125 (0.67)	1 019 (0.62)	36 (1.96)	411 (0.81)	2 237 (0.73)	4 649 (0.50)	9 161 (0.46)	1 483 (1.01)
1986.2	1 089 (0.70)	1 117 (0.77)	0	518 (1.15)	5 301 (0.66)	4 510 (0.77)	13 819 (0.46)	0
1989.1	9 992 (0.60)	1 936 (1.34)	0	580 (0.78)	3 681 (1.02)	1 395 (0.72)	11 443 (0.48)	235 (1.05)
1989.2	2 128 (0.80)	701 (0.60)	20 (1.96)	3 093 (1.55)	1 126 (0.92)	2 972 (0.72)	12 167 (0.36)	667 (0.76)
1989.3	8 488 (1.45)	704 (0.74)	0	660 (1.62)	82 (1.18)	595 (1.38)	4 531 (0.56)	445 (1.43)
1991.1	7 664 (0.72)	583 (0.72)	106 (1.96)	176 (1.12)	425 (0.51)	2 048 (0.85)	9 068 (0.31)	10 (1.19)
1991.2	3 174 (0.45)	82 (0.85)	0	1 021 (0.93)	1 882 (0.87)	20 081 (1.33)	25 675 (0.36)	117 (1.11)
1992	11 105 (0.58)	89 (1.29)	0	1 140 (0.88)	765 (1.13)	1 546 (0.70)	25 033 (0.44)	106 (1.13)
1994	24 185 (1.44)	4 (1.96)	262 (1.96)	417 (0.62)	68 (0.81)	10 292 (0.99)	29 548 (0.37)	168 (0.70)
1995.1	3 885 (0.43)	2 113 (0.65)	113 (1.96)	376 (0.77)	3 105 (1.12)	15 510 (1.05)	14 161 (0.47)	258 (0.95)
1996	3 443 (0.44)	946 (0.87)	109 (1.96)	690 (0.81)	3 095 (0.65)	5 866 (0.51)	18 323 (0.27)	25 (1.34)
1997.1	21 454 (0.60)	496 (1.80)	0	233 (1.10)	1 592 (1.54)	9 033 (0.60)	21 952 (0.58)	1 087 (0.94)
1997.2	13 839	0	0	1 023	293	7 099	31 763	1 265
1998	29 020 (1.52)	454 (0.82)	0	198 (1.24)	9 117 (0.82)	8 609 (0.86)	63 225 (1.22)	186 (0.84)
1999	8 210 (0.66)	1 605 (0.53)	526 (1.86)	631 (0.77)	3 289 (0.87)	9 891 (0.90)	17 435 (0.39)	9 (0.93)
2000	11 002 (0.41)	3 321 (0.58)	98 (1.50)	882 (0.87)	6 824 (0.51)	5 391 (0.44)	19 310 (0.31)	290 (0.98)
2001	5 595 (0.54)	957 (0.41)	3 (1.96)	64 (1.08)	1 329 (0.60)	1 744 (0.70)	12 617 (0.53)	198 (1.36)
2002	8 190 (0.45)	667 (0.63)	0 (1.96)	233 (1.01)	2 982 (0.57)	6 334 (0.42)	22 198 (0.61)	402 (0.88)
2003	12 067 (0.52)	480 (0.61)	44 (1.96)	702 (0.73)	8 649 (1.12)	5 369 (0.41)	5 595 (0.33)	449 (0.80)
2004	12 405 (1.01)	401 (0.85)	42 (1.96)	175 (0.99)	3 494 (0.95)	6 602 (1.08)	9 583 (0.55)	969 (1.11)
2005	31 672 (0.84)	258 (0.75)	6 (1.96)	608 (0.84)	5 980 (0.77)	5 530 (0.55)	7 752 (0.31)	50 (0.87)
2006	6 453 (0.49)	991 (0.93)	35 (1.96)	446 (0.81)	4 082 (0.85)	4 850 (0.58)	11 187 (0.31)	178 (1.07)
2007	22 472 (0.91)	749 (0.46)	31 (1.73)	491 (0.99)	9 275 (0.86)	8 081 (1.07)	8 013 (0.36)	36 (0.79)
2008	5 098 (0.63)	1 224 (1.26)	11 (1.96)	151 (0.78)	5 926 (0.93)	3 668 (0.72)	5 763 (0.32)	233 (0.98)
2009	20 812 (0.85)	152 (0.93)	124 (1.96)	192 (0.58)	4 983 (0.59)	2 104 (0.56)	7 443 (0.31)	195 (1.15)

Survey	Ommastrephidae	Sepiidae	D.macrophthalmus	D.angolensis	U.canariensis	B.auritus
1985.4	0	0	6 123 (1.31)	2 697 (0.31)	6 271 (1.83)	5 065 (1.03)
1986.1	273 (1.68)	525 (0.64)	220 (1.25)	1 314 (1.16)	2 327 (0.86)	38 045 (0.49)
1986.2	0	1 132 (1.00)	1 268 (1.46)	4 010 (0.39)	2 018 (1.15)	21 342 (0.56)
1989.1	1 236 (0.86)	65 (0.93)	6 498 (0.66)	956 (0.48)	885 (0.88)	15 038 (0.75)
1989.2	750 (0.51)	1 168 (0.41)	1 115 (0.93)	3 628 (0.48)	1 130 (0.82)	50 016 (0.80)
1989.3	1 476 (0.98)	124 (1.12)	1 530 (1.50)	1 667 (0.52)	0	37 091 (0.51)
1991.1	344 (0.63)	235 (0.46)	2 210 (0.88)	1 212 (0.40)	1 160 (1.44)	19 833 (0.57)
1991.2	693 (0.71)	561 (1.00)	17 098 (0.54)	956 (0.39)	18 422 (1.45)	1 862 (0.86)
1992	2 163 (0.35)	159 (1.16)	18 182 (0.58)	1 514 (0.32)	1 023 (0.98)	27 200 (1.32)
1994	1 041 (0.57)	1 192 (0.70)	20 365 (0.52)	2 383 (0.45)	3 280 (1.27)	2 633 (1.10)
1995.1	2 (1.69)	385 (0.70)	7 719 (0.81)	1 877 (0.79)	11 538 (1.16)	27 645 (0.57)
1996	210 (0.52)	28 (1.32)	11 195 (0.43)	1 546 (0.43)	1 077 (0.96)	18 842 (0.70)
1997.1	1 324 (0.47)	1 323 (0.94)	12 220 (1.03)	1 497 (0.37)	4 599 (0.60)	6 964 (0.85)
1997.2	418	1 251	24 404	1 260	4 995	1 953
1998	376 (0.65)	1 295 (0.58)	50 924 (1.50)	1 990 (0.38)	2 239 (0.77)	22 014 (0.95)
1999	201 (1.28)	113 (0.64)	5 178 (0.79)	1 163 (0.40)	7 999 (1.08)	93 522 (0.61)
2000	586 (0.61)	418 (0.71)	6 060 (0.76)	1 639 (0.59)	2 499 (0.51)	56 245 (0.84)
2001	186 (0.96)	178 (0.83)	5 680 (0.72)	1 670 (0.44)	1 076 (1.04)	41 122 (0.69)
2002	2 363 (0.70)	173 (0.91)	11 512 (1.16)	923 (0.47)	3 492 (0.54)	66 053 (0.75)
2003	230 (0.58)	101 (0.82)	557 (0.66)	1 046 (0.50)	1 001 (0.51)	38 312 (0.49)
2004	310 (0.89)	206 (0.65)	3 525 (1.27)	1 015 (0.41)	5 700 (1.21)	26 743 (0.42)
2005	233 (0.61)	565 (0.27)	879 (0.59)	991 (0.39)	2 279 (0.64)	36 621 (0.77)
2006	128 (0.54)	123 (1.00)	2 802 (0.42)	1 982 (0.39)	4 329 (0.65)	33 546 (0.86)
2007	43 (0.53)	245 (1.53)	1 532 (0.86)	1 312 (0.64)	5 224 (1.39)	40 402 (0.53)
2008	327 (0.46)	38 (1.07)	1 496 (0.87)	1 135 (0.34)	1 801 (0.97)	17 736 (0.40)
2009	110 (0.82)	124 (1.41)	699 (0.62)	1 756 (0.56)	1 419 (0.53)	22 188 (0.83)

Distribution

Figure 4.2 shows the distribution of seabreams in the central region between Benguela and Luanda. The distribution was spread out over the whole central shelf.

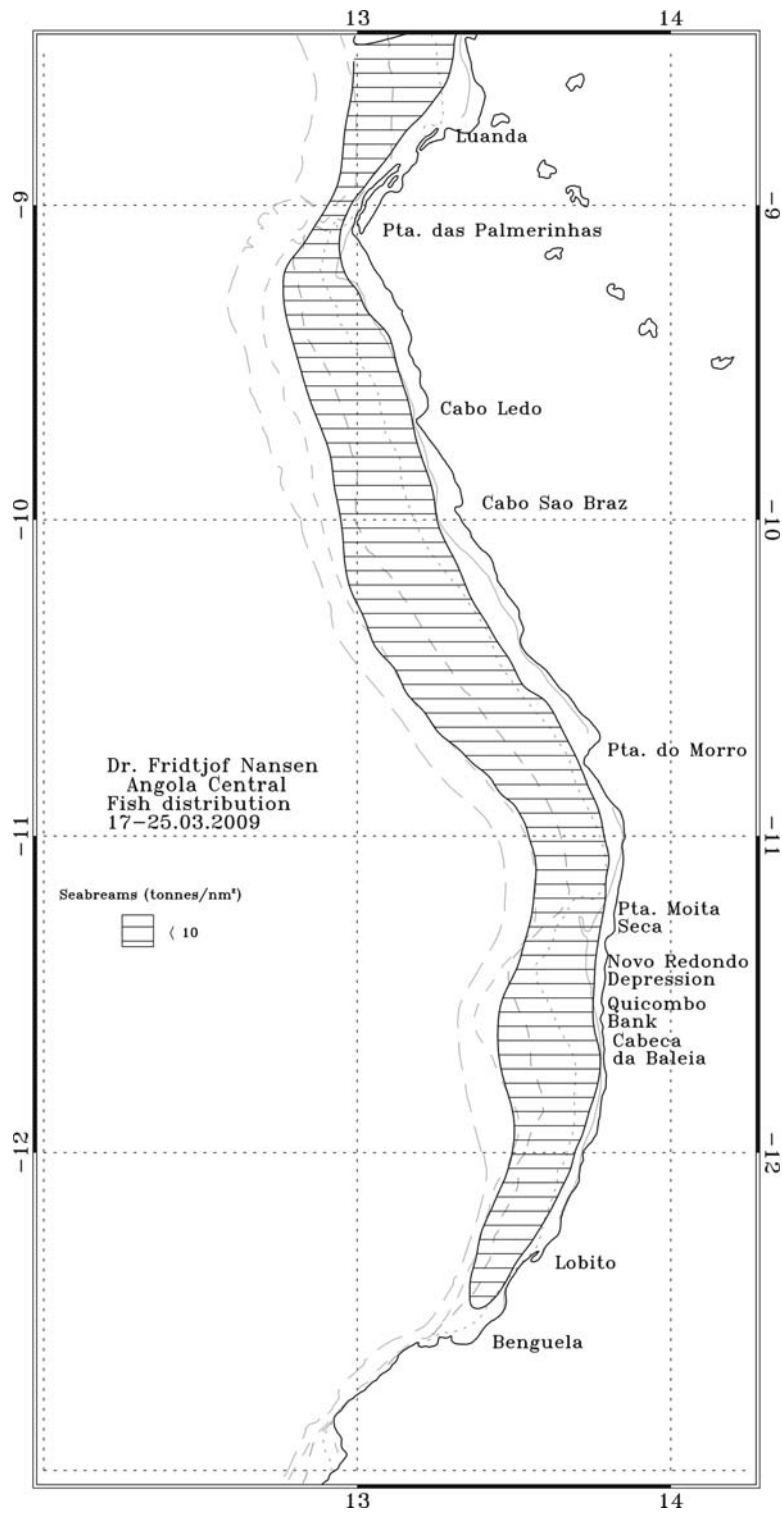


Figure 4.2 Distribution of seabreams (Sparidae) in the central region, Benguela – Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

4.3 Ponta das Palmerinhas – Congo River shelf

The survey covered the northern region of Angolan waters from Ponta das Palmerinhas to Congo River. The area north of Congo River is inaccessible to fisheries surveys due to the restricted oil exploitation areas. During some of the previous surveys the area north of Congo River was covered, but to make plausible comparisons the biomass estimates in Table 4.3 only include trawl stations south of Congo River. A total of 57 successful swept-area trawl stations were accomplished on the shelf area in 2009 (Table 2.1).

The average catch per hour on the inner shelf was 841 kg/hour and 242 kg/hour on the outer shelf (Annex VI). The ‘demersal’ group dominated on the inner shelf with an average catch rate of 514 kg/hour and a relative contribution of 61%. The ‘pelagic’ group contributed 26%, while shrimps, cephalopods and sharks contributed to less than 1% each. On the outer shelf, the demersal fish contributed to 33% of the mean catch rate and the ‘pelagic’ group to 37%. Shrimps and sharks each contributed to less than 1% and the cephalopods to 2% of the mean catch rate. Seabreams (except *B. boops*) were caught in all trawl stations on the outer shelf with 69 kg/hour whereas on the inner shelf it was caught in 78% of the stations with an average catch rate of 52 kg/hour. Snappers were only caught in two stations on the inner shelf and not on the outer shelf. The catch rates of groupers were 2.3 kg/hour on the inner and 4.1 kg/hour on outer shelf, respectively. The grunts (*Pomadsys incisus* and *P. rogeri*) were caught more often on the inner shelf than on the outer shelf. The average catch rate of grunts on the inner shelf was 46 kg/hour while 0.7 kg/hour on the outer shelf. Croakers, mainly *U. canariensis*, were frequently caught on both the inner and outer shelf and the average catch rates were 35 kg/hour on the inner shelf and 15 kg/hour on outer shelf. The most common pelagic groups caught on the inner shelf were carangids (81 kg/hour), clupeids (50) kg/hour for, scombrids (1.2 kg/hour) and barracudas (26 kg/hour). The average catch rates of the same species groups on the outer shelf were 43, 0.1, 0.3 and 0.05 kg/hour, respectively. Hairtails were also caught with an average catch rate of 47 kg/hour on the inner shelf and 35 kg/hour on the outer shelf.

Biomass estimates

Table 4.3 shows swept-area biomass estimates from 1985 to 2009 for the commercial species and groups of species on the shelf off northern Angola. The biomass estimates were calculated by stratifying by depth (20-49m, 50-99m and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of trawls that have been carried out by strata and survey. Again, it must be noted that the biomass estimates presented for the pelagic species cannot be trusted as a good reflection of the true biomass as the species are often unavailable to the bottom trawl. Some of the biomass estimates in Table 4.3 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

The biomass of *T. trecae* was estimated to 4 400 tonnes in 2009, which is more than the double of the 1 900 tonnes estimated in 2008, the lowest in the time series since 1996. In this interval of time, the highest estimate of 37 000 tonnes was registered in 1997.

M. polli was not caught on the northern shelf in 2009 and 2008, while in 2007 the biomass was estimated to 37 tonnes.

The 2009 biomass estimate of seabreams on the northern shelf was 10 000 tonnes in 2009, about 20% lower than the 2008 and 2007 estimates and considerably lower compared to the

very high 2005 estimate of 18 300 tonnes which was the highest estimate since 1996. As in the previous years, *Dentex angolensis* was the dominated seabream species in the north and contributed to about 44% of the total seabream estimate. The biomass of *D. macrophthalmus* was low in the northern region and contributed marginal to the total seabreams estimate. Other important seabreams are *Pagellus bellottii*, *D. canariensis* and *D. barnardi*.

The biomass estimate of croakers, mainly *Umbrina canariensis*, *Atractoscion aequidens* and *Pseudolithus typus*, was 400 tonnes in 2009, which is less than half of the high 2008 estimate. Generally, *U. canariensis* dominates the croakers and in 2009 this species contributed to 25% of the total estimate of croakers.

The biomass estimate of grunts (*Pomadasys incisus*, *P. jubelini* and *P. peroteti*) was 3 200 tonnes in 2009, which is more than the double of the low 2008 estimate but less than half of the 2007 estimate of 8 000 tonnes. However, a fluctuating trend is observed during the five last years.

The snappers are rare in the catch as they inhabit rocky and often unavailable areas, hence the biomass estimates of snappers may not adequately reflect the state of the stock.

As in the previous years, groupers, mainly *Epinephelus aeneus*, are seldom found on the outer shelf, and as the high CVs indicate the biomass estimates should be considered with care. Nevertheless, the biomass estimates since 2000 have been relative stable.

The biomass estimate of *P. longirostris* in 2009 was 80 tonnes on the northern shelf, which is lower in relation to 2006 and 2007, but more than the double of the 2008 estimate.

The 2009 biomass estimate of Sepiidae was 100 tonnes and is considerably lower than the 2008 and 2007 estimates of 270 and 190 tonnes, respectively. Although the fluctuating trend of the biomass since 1999, the abundance of Sepiidae is low on the northern shelf.

The biomass estimate of Ommastrephidae decreased from 230 tonnes in 2008 to 160 tonnes in 2009. The 2007 estimate of 40 tonnes was the lowest estimate of the time series since 1989. The annual biomass estimates vary and no clear trend in the abundance of Ommastrephidae can be seen in Table 4.3, but it seems like the biomass estimates on the central and northern shelves follow the same trends.

The biomass estimate of the sharks in 2009 was 380 tonnes, which considerably lower than the 2000 estimate of 3 300 tonnes. However, there is no clear long time trend in the abundance of sharks. Here again, it should be noted that the estimates presented here for this group, do not reflect neither the real species composition nor its real abundance due to inadequate sampling tool.

Distribution

Seabreams were distributed on the whole northern shelf (Figure 4.3). The densities were <10 tonnes/NM² along most of the area of distribution, with a small area of higher concentrations off N'Zeto.

Table 4.3 Biomass estimates (tonnes) of important species on the shelf (20-200 m) in the northern region. CV values are indicated in brackets.

Survey	M.pollii	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	9 (1.65)	4 496 (1.11)	302 (0.79)	10 463 (1.25)	498 (0.93)	364 (1.16)	9 986 (0.92)	44 (1.96)
1985.2	0	3 324 (1.17)	139 (1.88)	694 (0.57)	451 (0.64)	3 907 (1.91)	3 740 (1.04)	30 (1.64)
1985.3	3 459 (1.65)	16 486 (1.20)	1 448 (1.38)	2 046 (0.67)	870 (1.23)	205 (1.94)	17 742 (1.09)	146 (1.30)
1985.4	7 415 (1.65)	36 044 (1.14)	107 (1.37)	436 (0.72)	78 (1.55)	483 (1.15)	42 506 (1.02)	88 (1.26)
1986.1	56 (1.64)	13 438 (0.81)	1 445 (0.90)	2 853 (0.87)	496 (0.76)	2 053 (0.73)	17 950 (0.62)	30 (1.96)
1986.2	290 (1.21)	8 053 (0.37)	486 (0.72)	1 179 (0.38)	825 (0.56)	1 365 (0.67)	10 364 (0.32)	210 (0.97)
1989.1	62 (1.46)	12 681 (0.90)	92 (1.08)	931 (0.53)	497 (0.97)	1 578 (1.87)	13 264 (0.86)	97 (1.18)
1989.2	250 (1.65)	11 535 (0.66)	509 (0.61)	549 (0.38)	729 (0.85)	1 924 (0.53)	13 966 (0.57)	220 (0.98)
1989.3	1 029 (1.62)	39 959 (0.58)	256 (1.04)	1 715 (0.90)	15 984 (1.10)	5 043 (0.73)	46 704 (0.59)	208 (0.59)
1991.1	0	21 484 (0.57)	381 (1.69)	935 (0.37)	705 (0.67)	1 841 (0.96)	43 605 (0.68)	96 (1.36)
1991.2	312 (1.14)	14 727 (0.71)	2 554 (1.79)	4 225 (0.60)	107 (0.82)	55 (0.78)	14 928 (0.70)	318 (0.74)
1992	1 304 (1.04)	15 520 (0.65)	79 (1.19)	3 114 (0.38)	298 (1.10)	8 (1.96)	17 942 (0.59)	158 (0.87)
1994	51 (1.21)	14 309 (0.81)	478 (1.40)	3 643 (0.48)	52 (1.09)	184 (1.96)	21 225 (0.62)	337 (0.87)
1995.1	127 (1.17)	305 (0.80)	951 (0.98)	451 (0.40)	679 (0.64)	1 369 (0.79)	7 078 (0.69)	181 (0.81)
1996	0	32 155 (0.54)	347 (0.64)	2 203 (0.33)	256 (0.67)	782 (1.62)	33 700 (0.51)	137 (1.14)
1997.1	25 (1.50)	37 094 (0.51)	474 (0.89)	6 218 (0.50)	758 (0.67)	6 391 (1.14)	130 055 (0.87)	288 (1.18)
1999	6 (1.17)	4 106 (0.47)	326 (0.96)	1 202 (0.35)	1 297 (0.54)	6 392 (0.60)	16 570 (0.54)	36 (1.65)
2000	12 (1.65)	6 583 (0.56)	150 (0.92)	609 (0.65)	3 302 (1.70)	619 (1.54)	22 483 (0.88)	69 (1.20)
2001	6 (1.65)	5 502 (0.87)	212 (0.80)	866 (0.88)	391 (0.74)	517 (0.71)	9 560 (0.71)	37 (0.93)
2002	0	9 765 (0.52)	52 (0.52)	956 (0.51)	178 (0.64)	1 442 (0.57)	13 125 (0.41)	75 (0.61)
2003	0	9 995 (0.54)	501 (0.80)	501 (0.57)	250 (0.51)	2 816 (0.60)	28 515 (0.94)	81 (1.64)
2004	0 (1.65)	9 146 (0.49)	196 (1.14)	1 059 (0.26)	492 (0.44)	1 567 (0.70)	12 764 (0.42)	22 (1.00)
2005	0	3 792 (0.52)	146 (0.66)	1 674 (0.31)	734 (0.31)	599 (0.79)	10 292 (0.62)	116 (1.11)
2006	0	5 078 (0.42)	320 (0.99)	1 024 (0.33)	556 (0.84)	2 388 (0.90)	11 445 (0.37)	50 (0.86)
2007	37 (1.63)	2 983 (0.38)	243 (0.71)	703 (0.26)	432 (0.47)	1 797 (0.64)	9 442 (0.47)	195 (0.93)
2008	0 NA	1 938 (0.49)	331 (1.25)	1 204 (0.37)	464 (0.45)	1 754 (0.88)	17 154 (0.71)	151 (0.80)
2009	0 NA	4 412 (0.36)	108 (0.86)	1 010 (0.27)	381 (0.80)	2 961 (1.27)	9 792 (0.73)	100 (0.88)

Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.1	15 711 (0.87)	254 (0.90)	0	479 (1.09)	248 (1.02)	1 519 (1.00)	14 690 (0.57)	117 (1.38)
1985.2	1 200 (1.65)	75 (0.81)	63 (1.26)	1 771 (0.78)	381 (1.31)	1 302 (1.10)	12 881 (0.34)	0
1985.3	2 709 (0.73)	26 (1.65)	62 (1.96)	1 978 (0.84)	3 629 (0.94)	8 695 (0.94)	20 897 (0.67)	0
1985.4	3 608 (0.70)	780 (1.46)	0	3 054 (0.63)	14 806 (1.14)	3 692 (0.93)	31 078 (0.45)	10 (1.65)
1986.1	8 078 (1.11)	2 080 (0.67)	434 (1.96)	676 (0.80)	1 231 (0.98)	2 307 (0.97)	17 193 (0.40)	521 (1.09)
1986.2	8 640 (0.82)	756 (0.51)	0	1 515 (0.51)	1 694 (0.59)	5 049 (0.37)	25 098 (0.28)	0
1989.1	2 277 (0.71)	345 (0.80)	0	989 (1.17)	135 (0.96)	4 469 (0.88)	12 958 (0.37)	60 (1.29)
1989.2	3 712 (0.46)	2 973 (0.89)	33 (1.64)	841 (0.68)	1 102 (0.72)	3 231 (0.34)	7 283 (0.34)	22 (0.90)
1989.3	21 132 (1.13)	364 (1.02)	316 (1.96)	315 (0.73)	1 788 (0.86)	4 214 (0.70)	15 344 (0.58)	31 (1.50)
1991.1	11 448 (0.88)	2 739 (1.40)	0	642 (0.92)	822 (0.85)	3 797 (0.83)	4 769 (0.23)	0
1991.2	4 949 (0.57)	79 (1.27)	0	1 022 (0.69)	860 (1.21)	6 450 (0.93)	15 741 (0.39)	129 (0.94)
1992	4 588 (0.47)	14 (1.29)	0	1 844 (0.80)	932 (0.90)	2 778 (0.59)	14 551 (0.22)	49 (1.65)
1994	4 423 (0.45)	325 (1.03)	0	2 474 (0.75)	612 (0.83)	4 095 (0.80)	19 599 (0.47)	478 (1.40)
1995.1	7 208 (0.58)	2 109 (1.10)	481 (1.50)	807 (0.70)	2 921 (1.08)	2 882 (0.73)	8 341 (0.30)	477 (1.13)
1996	3 939 (0.43)	89 (1.35)	0	2 002 (0.97)	5 161 (0.90)	9 292 (0.49)	19 985 (0.68)	10 (1.60)
1997.1	6 323 (0.41)	57 (1.70)	73 (1.96)	549 (0.76)	4 836 (1.05)	12 451 (0.53)	9 009 (0.28)	124 (1.38)
1999	14 001 (0.39)	2 712 (0.70)	5 (1.64)	1 011 (0.60)	5 600 (0.80)	8 528 (0.91)	13 304 (0.25)	113 (0.79)
2000	4 216 (0.75)	1 231 (1.37)	196 (1.64)	620 (0.48)	388 (0.98)	2 450 (0.66)	13 424 (0.35)	18 (0.91)
2001	17 036 (0.94)	856 (0.86)	723 (1.91)	793 (0.97)	2 271 (1.04)	1 458 (0.80)	8 927 (0.40)	101 (0.86)
2002	19 374 (0.60)	1 651 (0.78)	63 (1.96)	509 (0.88)	241 (0.54)	2 835 (0.53)	9 187 (0.35)	21 (1.00)
2003	6 818 (0.56)	2 345 (1.34)	142 (1.96)	340 (0.68)	1 376 (0.60)	5 571 (0.52)	9 889 (0.29)	65 (1.42)
2004	4 668 (0.47)	1 455 (1.15)	37 (1.87)	502 (0.63)	3 316 (0.86)	5 545 (0.74)	11 924 (0.28)	6 (1.28)
2005	5 632 (0.54)	705 (1.35)	278 (1.27)	568 (0.40)	5 754 (0.96)	7 949 (0.59)	18 282 (0.25)	5 (0.87)
2006	11 299 (0.39)	1 570 (0.61)	16 (1.82)	372 (0.71)	2 839 (0.77)	4 087 (0.57)	10 872 (0.25)	176 (1.42)
2007	9 102 (0.58)	1 587 (1.16)	83 (1.35)	460 (0.47)	7 966 (1.40)	3 901 (0.58)	12 758 (0.25)	135 (1.21)
2008	10 986 (0.53)	428 (0.51)	79 (1.96)	614 (0.54)	1 485 (0.69)	8 771 (0.67)	12 833 (0.28)	40 (0.89)
2009	7 272 (0.64)	1 591 (0.87)	168 (1.34)	586 (0.55)	3 209 (0.92)	3 936 (0.59)	9 974 (0.36)	84 (1.07)

Survey	Ommastrephidae	Sepiidae	D.macrophthalmus	D.dangolensis	U.canariensis	B.auritus
1985.1	10 273 (1.27)	0	200 (1.65)	2 196 (0.55)	1 132 (1.21)	40 729 (1.15)
1985.2	0	0	0	2 495 (0.57)	521 (1.46)	6 842 (1.40)
1985.3	0	154 (0.97)	0	2 949 (0.69)	602 (1.14)	9 182 (1.20)
1985.4	84 (1.34)	215 (1.28)	125 (1.64)	6 371 (0.97)	2 650 (0.95)	64 007 (1.08)
1986.1	1 531 (1.23)	808 (0.72)	2 058 (0.56)	3 814 (0.54)	279 (0.74)	95 679 (0.32)
1986.2	0	696 (0.60)	1 483 (0.48)	11 220 (0.35)	1 350 (0.48)	15 408 (0.45)
1989.1	506 (0.85)	288 (0.93)	0	1 612 (0.34)	542 (0.80)	5 450 (0.97)
1989.2	161 (0.53)	272 (0.72)	222 (0.87)	2 299 (0.57)	172 (0.54)	14 252 (0.46)
1989.3	1 661 (0.93)	45 (1.08)	100 (0.95)	2 614 (0.46)	1 194 (1.37)	51 225 (0.66)
1991.1	368 (0.53)	282 (0.76)	158 (1.06)	1 317 (0.37)	496 (0.72)	28 701 (0.70)
1991.2	2 718 (0.88)	226 (0.74)	690 (0.95)	3 198 (0.41)	4 375 (1.32)	1 661 (1.75)
1992	1 071 (0.40)	901 (0.64)	1 532 (1.10)	5 112 (0.26)	680 (0.65)	7 599 (1.38)
1994	441 (0.35)	1 910 (0.45)	1 740 (0.78)	3 451 (0.37)	2 740 (1.13)	7 572 (1.14)
1995.1	72 (0.58)	236 (0.48)	197 (1.11)	2 143 (0.38)	342 (1.15)	12 801 (0.74)
1996	589 (0.27)	106 (1.19)	2 169 (0.80)	4 303 (0.40)	2 073 (1.15)	26 804 (1.21)
1997.1	1 017 (0.71)	4 468 (0.68)	324 (0.78)	2 837 (0.41)	1 161 (0.79)	39 107 (0.51)
1999	391 (0.45)	254 (0.55)	146 (0.76)	2 881 (0.19)	3 582 (1.45)	37 727 (0.43)
2000	214 (0.83)	46 (0.66)	65 (0.86)	4 053 (0.77)	1 271 (1.08)	23 205 (0.70)
2001	176 (0.51)	196 (0.63)	417 (0.85)	1 228 (0.39)	188 (1.36)	13 842 (0.59)
2002	660 (0.72)	75 (0.59)	102 (1.18)	2 089 (0.52)	835 (0.83)	15 791 (0.65)
2003	121 (0.80)	206 (1.37)	16 (0.80)	3 201 (0.27)	769 (0.67)	66 412 (0.88)
2004	344 (0.42)	185 (0.83)	79 (1.12)	5 214 (0.39)	1 236 (0.53)	24 512 (1.00)
2005	146 (0.33)	427 (0.51)	136 (0.84)	6 727 (0.17)	3 640 (0.76)	52 045 (1.02)
2006	174 (0.77)	94 (0.61)	7 (1.34)	4 630 (0.20)	2 151 (0.93)	61 138 (0.66)
2007	42 (0.57)	190 (0.70)	11 (1.38)	5 980 (0.24)	622 (0.73)	12 523 (0.61)
2008	226 (0.50)	268 (0.87)	0 NA	4 809 (0.28)	3 171 (0.64)	52 481 (0.95)
2009	163 (0.41)	98 (0.83)	8 (1.31)	4 418 (0.28)	985 (0.57)	23 822 (1.20)

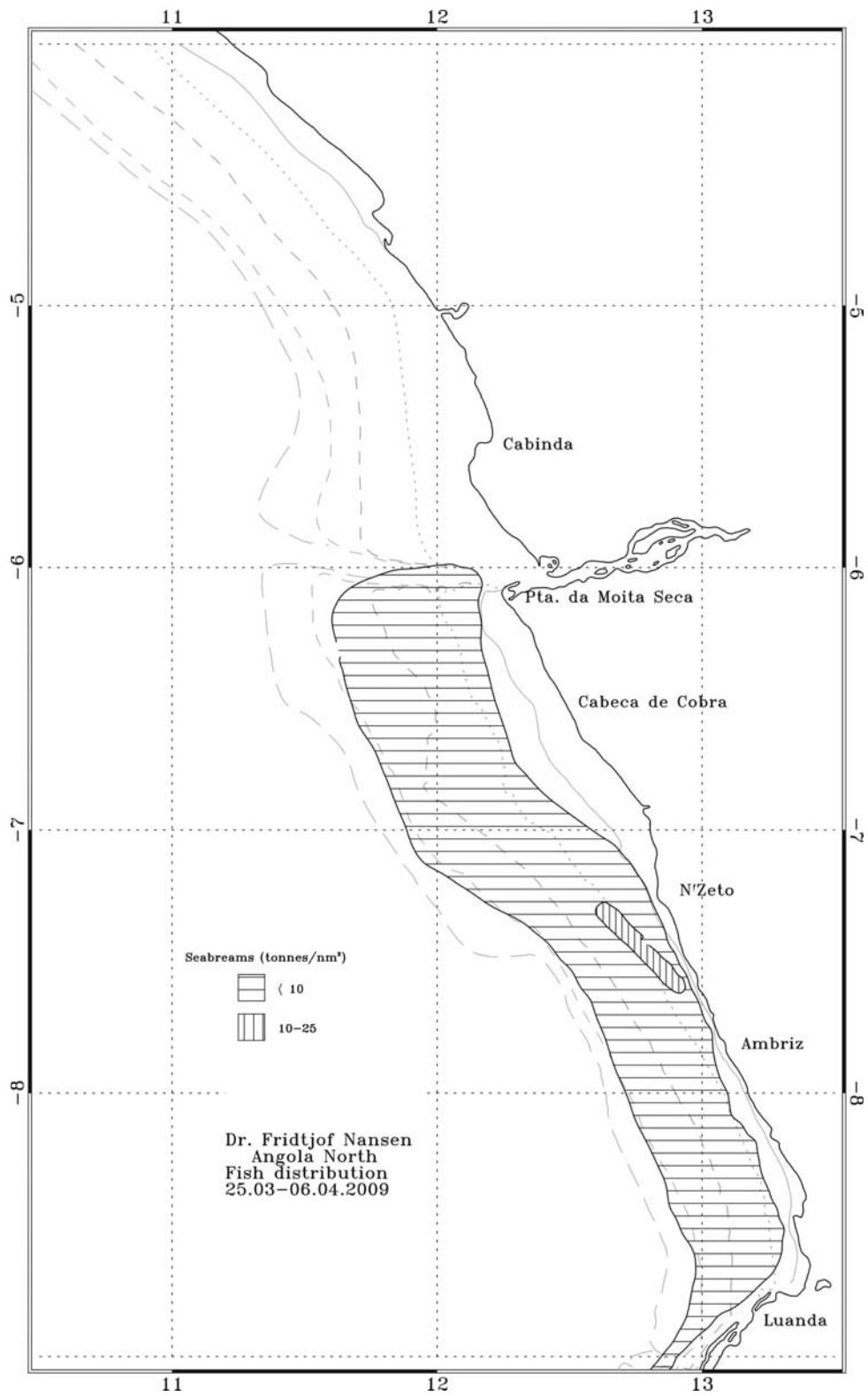


Figure 4.3 Distribution of seabreams (Sparidae) in the northern region, Ponta das Palmerinhas -Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

CHAPTER 5 CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEEP-WATER SHRIMP AND HAKE ON THE SLOPE

The slope is defined in the report, to be between 201 and 800 m bottom depth. The trawl positions are mapped in Figures 2.1-2.3, station information and catch by species are presented in Annex I.

Pooled length distributions weighted by the catch of the main species by sector region are shown in Annex II. Further, the mean densities (tonnes·NM⁻²) and the frequency of occurrence of the most important species are shown in Annex III. Annex V shows the various NAN-SIS species codes used for species and groups of species, and Annex VI presents the catch rates of these species and species groups.

5.1 Cunene – Tombua slope

The slope is very steep and rocky in the south and makes trawling difficult. Five trawl stations were carried on the southern slope in depths between 200 and 800 meters (Annex VI). The average catch per hour was 2 457 kg/hour, and the ‘demersal’ groups contributed 5% while ‘pelagic’ groups contributed 0.2%. The “other” group (non-commercial species) dominated the catches and contributed to 88% to the mean catch rate. This gives a visual representation of the species richness indicating a high diversity, especially on the slope. Cephalopods, shrimps and sharks contributed from 1 to 4% of catches. Seabreams were not caught in the slope area. Cape hake (mainly *Merluccius capensis*) was caught at three stations with an average catch rate of 130 kg/hour. Striped red shrimps (*Aristeus varidens*) were found at all five of the stations and the mean catch was 79 kg/hour.

Table 5.1 shows the time series from 1986 to 2009 of the swept-area biomass estimates for different species and species groups on the southern slope. The numbers of trawl stations on the southern slope is very low due to the difficult trawling conditions caused by untrawlable sea bed. Therefore, no stratifying depth was done for the data. Further, only stations in the depth range 200-600 m are included in the biomass estimates, and in 2009 as in previous years, just two stations were carried out between 200 and 600 meters. The biomass estimates are therefore not reliable.

The biomass estimates of hake have fluctuated over the whole time series (Table 5.1). The 2009 estimate was almost three and two times higher than those of 2008 and 2007, respectively, while 40% lower than the 2005 estimate. The lack of any clear trend in the time series is probably caused by the low sampling effort on the southern slope between 200 and 600 meters. The contribution of the two hake species (*M. capensis* and *M. polli*) has varied through the years, and it is reasonable to believe that, in some surveys, a misidentification of the hakes could have happened. In this present survey, more precaution was taken when identifying to avoid misidentification of the two species. In the two stations between 200 and 600 m only *M. capensis* was caught and therefore make up the whole biomass estimate of 2 750 tonnes. However, in one of the stations between 600 and 800 m there was a small catch (20 kg/hour) of *M. polli*, which is not included in the biomass estimate since the time series only includes depths between 600 and 800 m.

In 2008, there were no catches of seabreams, horse mackerel, or *P. longirostris* on the southern slope (200-600 m), while the biomass estimate for *A. varidens* was 607 tonnes and for cephalopods 51 tonnes. Both are the highest in the time series. However, as earlier mentioned these estimates are highly unreliable since there were only two hauls which were the basis for the estimates.

Table 5.1 Biomass estimates (tonnes) of important species group on the slope (200-600 m) in the southern region. CV values are indicated in brackets.

Survey	Hake	Horse mackerel	Shrimps	Cephalopod	Sharks	Seabreams	P.longirostris	A.varidens
1986.1	2754 (0.84)	26 (1.00)	182 (0.16)	15 (1.00)	66 (0.40)	1261 (0.95)	0	106 (1.00)
1991.1	3285 (0.52)	62 (0.02)	47 (0.43)	43 (0.14)	463 (0.33)	325 (0.83)	21 (0.77)	0
1991.2	19798 (0.62)	549 (0.48)	0	0	506 (0.68)	2669 (0.08)	0	0
1992	10793 (0.82)	58 (1.00)	235 (0.88)	0	49 (0.19)	2035 (1.00)	15 (1.00)	161 (1.00)
1997.2	3411	13	13	0	917	413	13	0
2000	3358 (0.86)	0	44 (0.84)	0	73 (0.47)	0	44 (0.84)	0
2002	1245	0	20	14	104	0	0	0
2003	454 (1.00)	0	156 (0.91)	0	226 (0.34)	0	79 (1.00)	0
2004	5749 (0.53)	50 (0.62)	97 (0.40)	34 (0.93)	40 (0.97)	579 (0.57)	57 (0.75)	30 (1.00)
2005	882 (0.48)	24 (0.84)	134 (0.71)	15 (1.00)	56 (0.62)	0	3 (0.55)	57 (0.87)
2006	4507 (0.96)	169 (0.66)	72 (1.00)	0	5 (1.00)	0	0	0
2007	1528	0	27	0	4323	0	0	0
2008	964 (0.38)	563 (1.00)	280 (0.61)	9 (1.00)	188 (0.42)	232 (1.00)	45 (1.00)	225 (1.00)
2009	2751 (0.69)	0 NA	705 (0.03)	51 (0.38)	192 (0.93)	0	0	607 (0.13)

Distribution

Figure 5.1 shows the distribution of hake (*Merluccius spp.*) in the southern region. The distribution covers large parts of the outer shelf and the slope from Cunene to north of Baía dos Tigres. The distribution area is larger and the concentrations are much higher than in 2008.

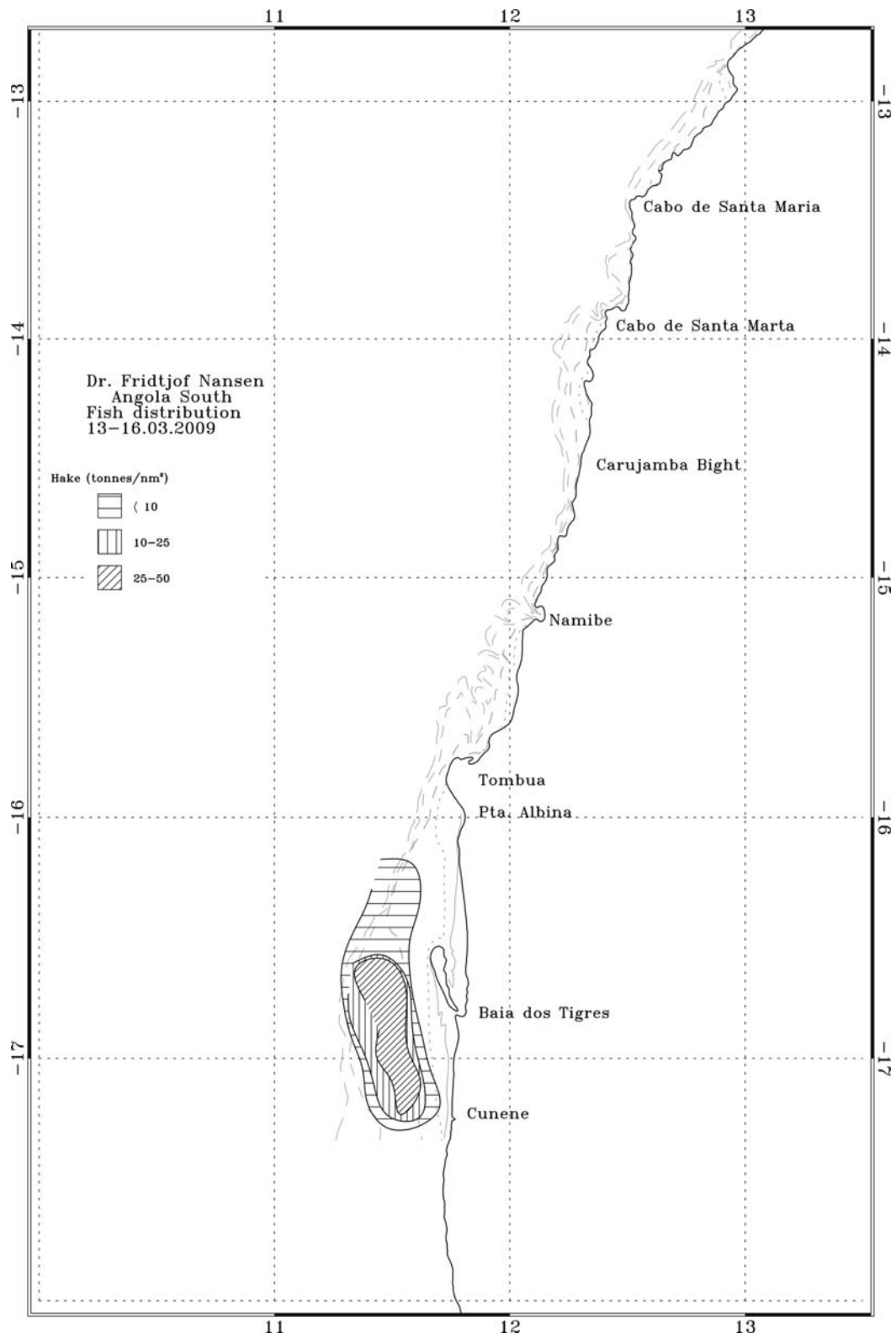


Figure 5.1 Distribution of hake (*Merluccius spp.*) in the southern region, Cunene - Tombua. Depth contours at 20, 50, 100 and 200 m.

5.2 Benguela – Ponta das Palmeirinhas slope

The central region of Angolan waters covers from Benguela to Ponta das Palmerinhas, and a total of 21 successful swept-area trawl stations were accomplished on the central slope (Table 2.1).

The average catch rate on the slope was 780 kg/hour (Annex VI). The ‘demersal’ group contributed to 13% of the mean catch rate and the ‘pelagic’ group to 3.5%, the shrimps contributed to 15%, while cephalopods and sharks contributed to 2 and 3%, respectively. The “other” group of non-commercial species dominated the catches and contributed to 64% of the total mean catch rate. *M. polli* was caught in two third of the stations on the central slope and the average catch rate was 77 kg/hour. Seabreams (*D. macrophthalmus*) were only caught on one station with a catch rate of 12 kg/hour. The average catch rates of *P. longirostris* (deep water rose shrimp) and *A. varidens* (red striped shrimp), which is two of the most commercially important shrimp species, were 3.7 and 20.7 kg/hour, respectively. *Nematocarcinus africana* occurred abundantly with an average catch rate of 83 kg/hour.

Biomass estimates

Biomass estimates, in tonnes, of the most important groups are presented in Table 5.2. The biomasses were calculated by stratifying by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799m). The CVs are weighted by stratum size.

The various strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of trawls that have been carried out by strata and survey. The biomass estimates of the pelagic species may not reflect the true biomass, as pelagic species are often distributed too high in the water column to be available for the bottom trawl. Some of the biomass estimates in Table 5.2 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

The 2009 biomass estimate of hake (*M. polli*) was 5 300 tonnes, that is 700 tonnes lower than the 6 000 tonnes estimated in 2008, which was about 1 000 tonnes lower than the 2007 and 2006 estimates. In 2004, the estimate of *M. polli* was 16 100 tonnes, then decreased 37% from 2004 to 2005, and further with 30% from 2005 to 2006. The reasons for these reductions in biomass are not clear, but the great decline is of concern.

Seabreams were only found in one station in the shallow area of the slope (266m). Thus, care should be taken when comparing the biomass estimates of seabreams on the central slope. The 2009 estimate was 170 tonnes, a drastic reduction compared to the 2 000 tonnes estimated in 2008, and is the second lowest in the time series. Both estimates were lower than the 2004 and 2005 estimates of 10 800 and 6 500 tonnes, respectively. *D. macrophthalmus* was the only seabream species found on the central slope.

P. longirostris is distributed in depths between 200 and 400 m, and the biomass increased from 220 tonnes in 2003 to about 1 300 tonnes in 2006. In 2007 the biomass estimate decreased to 190 tonnes, increased to above 400 tonnes in 2008 to decrease again to 180 tonnes in 2009, which is one of the lowest estimates in the time series. However, the high CV shows that these estimates are imprecise.

The 2009 biomass estimate of *A. varidens* was almost 1 300 tonnes, which is considerably larger than the 2008 and 2007 estimates of 880 and 650 tonnes, respectively, and the highest in the time series. The trends of the biomass estimates show a consecutive increase during the

three last years, and may indicate a certain recovering of this resource after the low estimate of 360 tonnes in 2006.

In contrast to the two previous shrimp species, *N. africana* is not commercially important. Nevertheless, the 2009 biomass estimate of 6 000 tonnes is somewhat higher than the 2008 estimate but lower than the 2007 estimate of 7 900 tonnes, the highest ever recorded.

The biomass estimate of Ommastrephidae on the central slope in 2009 was 40 tonnes, one of the lowest in the time series. The 2008 and 2007 estimates were almost four times higher, but considerably smaller than the 2005 and 2006 estimates of 510 and 460 tonnes, respectively.

Hairtails were mainly caught in the shallower areas of the slope. The 2009 biomass estimate was almost 2 000 tonnes, more than the double of the 2008 estimate which again was four times higher than the 2007 estimate of 185 tonnes.

The biomass estimate of the sharks increased to 1 400 tonnes in 2009 after a decrease from 1 000 tonnes in 2007 to 400 tonnes in 2008. However, the high CV and large variability in biomass between surveys showed that there is no clear trend in the abundance of sharks. Due to an inadequate sampling gear for this groups, the figures here presented may not reflect neither the species composition nor the true biomass trend.

Table 5.2 Biomass estimates (tonnes) of important species on the slope (200-800 m) in the central region. CV values are indicated in brackets.

Survey	M.polli	Shrimps	Cephalopod	Sharks	Hairtails	Seabreams
1985.4	18 790 (1.03)	2 915 (1.20)	301 (1.10)	17 (2.47)	420 (1.56)	253 (1.25)
1986.1	17 757 (0.74)	6 306 (0.70)	1 003 (0.85)	557 (0.88)	16 (2.27)	972 (2.14)
1986.2	24 611 (0.00)	13 247 (0.00)	57 (0.00)	0	498 917 (0.00)	6 446 (0.00)
1989.1	2 803 (1.26)	1 008 (0.95)	39 (0.76)	65 (0.69)	60 (2.06)	804 (2.17)
1989.2	4 940 (0.81)	1 963 (0.84)	277 (1.34)	263 (1.17)	142 (0.59)	58 (1.64)
1989.3	12 633 (1.00)	1 546 (0.57)	410 (0.76)	3 247 (0.34)	35 703 (0.01)	435 (0.98)
1991.1	11 939 (0.33)	4 950 (0.35)	315 (0.45)	732 (0.54)	2 606 (2.13)	780 (2.05)
1991.2	10 540 (0.52)	3 016 (0.55)	114 (0.82)	1 487 (0.88)	395 (1.25)	488 (1.12)
1992	6 999 (0.28)	4 436 (0.60)	189 (0.51)	2 920 (0.88)	410 (1.28)	496 (1.03)
1994	3 803 (0.71)	3 457 (0.69)	219 (0.60)	707 (0.60)	1 213 (0.82)	1 188 (1.50)
1995.1	4 391 (0.41)	4 480 (0.69)	214 (0.79)	1 216 (0.91)	1 145 (0.53)	6 264 (1.24)
1995.2	4 781 (0.38)	4 295 (0.25)	153 (0.46)	1 064 (0.44)	2 234 (1.21)	1 291 (0.66)
1996	6 440 (0.74)	6 457 (0.59)	97 (0.90)	1 581 (0.89)	244 (0.62)	1 016 (0.47)
1997.1	10 375 (0.59)	6 969 (0.37)	538 (0.64)	1 214 (0.87)	902 (1.01)	1 858 (1.14)
1997.2	8 363 (0.34)	2 690 (0.53)	166 (0.28)	42 (1.23)	1 013 (0.21)	5 045 (1.25)
1998	9 991 (0.50)	9 048 (0.39)	428 (0.76)	812 (0.63)	1 840 (1.46)	1 643 (1.06)
1999	2 995 (0.74)	1 806 (0.49)	344 (0.63)	728 (0.91)	728 (0.61)	2 900 (0.82)
2000	5 482 (0.60)	2 445 (0.45)	717 (0.50)	639 (0.74)	871 (0.91)	2 059 (1.01)
2001	4 763 (0.81)	2 575 (0.72)	623 (0.66)	818 (1.77)	297 (1.05)	767 (1.43)
2002	3 012 (0.65)	3 749 (0.60)	469 (0.64)	212 (0.92)	269 (0.57)	2 418 (1.98)
2003	7 155 (0.90)	4 087 (0.83)	420 (0.64)	104 (1.02)	178 (1.33)	606 (1.55)
2004	16 127 (0.77)	7 350 (0.42)	444 (0.85)	476 (1.51)	1 581 (1.06)	10 840 (2.00)
2005	10 074 (0.58)	7 135 (0.37)	578 (1.03)	307 (0.46)	2 655 (1.55)	6 468 (2.11)
2006	6 967 (0.71)	7 180 (0.38)	623 (1.02)	366 (0.85)	954 (0.86)	2 422 (1.85)
2007	6 947 (0.97)	8 939 (0.35)	446 (1.20)	1 054 (0.94)	185 (0.96)	808 (0.42)
2008	6 032 (0.66)	6 490 (0.33)	363 (0.97)	389 (1.34)	762 (0.51)	2 003 (1.39)
2009	5 302 (0.48)	8 079 (0.35)	644 (1.22)	1 382 (1.24)	1 947 (0.83)	168 (0.00)

Survey	P.longirostris	A.varidens	N.africanus	Ommastrephidae	D.macrophthalmus	D.angolensis
1985.4	886 (1.47)	942 (2.08)	714 (1.21)	0	39 (2.37)	215 (1.41)
1986.1	653 (0.89)	492 (0.90)	3 173 (1.25)	74 (1.13)	499 (2.10)	474 (2.18)
1986.2	0	0	0	0	6 446 (0.00)	0
1989.1	181 (1.22)	194 (1.13)	592 (1.86)	39 (0.76)	804 (2.17)	0
1989.2	505 (0.84)	228 (0.74)	1 020 (1.45)	240 (1.66)	26 (2.37)	33 (2.27)
1989.3	375 (0.32)	194 (0.68)	958 (1.01)	409 (0.77)	324 (1.14)	110 (2.13)
1991.1	204 (0.75)	653 (0.21)	3 879 (0.45)	195 (0.75)	706 (2.09)	74 (1.79)
1991.2	190 (0.57)	105 (1.53)	2 659 (0.63)	114 (0.82)	249 (1.79)	239 (1.88)
1992	610 (0.95)	366 (0.63)	3 224 (0.79)	141 (0.61)	358 (1.42)	138 (1.87)
1994	579 (0.85)	647 (0.67)	2 199 (1.07)	168 (0.59)	1 113 (1.55)	40 (2.27)
1995.1	425 (0.95)	753 (0.45)	2 460 (1.32)	30 (1.34)	6 037 (1.30)	226 (0.98)
1995.2	479 (0.45)	698 (0.23)	2 763 (0.37)	85 (0.64)	1 196 (0.73)	95 (1.42)
1996	114 (0.53)	671 (0.37)	4 971 (0.71)	41 (0.67)	974 (0.48)	42 (2.27)
1997.1	685 (0.50)	305 (0.54)	4 093 (0.68)	474 (0.65)	1 700 (1.29)	158 (1.61)
1997.2	2 679 (0.54)	0	11 (2.27)	134 (0.24)	4 864 (1.25)	180 (1.10)
1998	556 (0.63)	1 192 (1.10)	7 000 (0.52)	389 (0.84)	1 549 (1.15)	94 (2.23)
1999	214 (0.87)	337 (1.06)	1 206 (0.75)	315 (0.61)	2 806 (0.87)	94 (1.60)
2000	455 (1.05)	379 (0.35)	1 043 (1.02)	426 (0.57)	1 954 (1.01)	105 (1.44)
2001	186 (0.44)	456 (0.63)	517 (2.35)	339 (1.08)	663 (1.70)	102 (2.27)
2002	341 (1.23)	243 (0.52)	3 039 (0.75)	242 (0.77)	2 307 (2.19)	111 (2.27)
2003	223 (0.44)	498 (1.07)	3 284 (1.02)	409 (0.65)	514 (1.97)	92 (2.27)
2004	419 (1.08)	576 (0.44)	6 204 (0.47)	350 (1.04)	10 265 (2.24)	572 (2.27)
2005	574 (0.71)	792 (0.41)	5 640 (0.46)	510 (1.15)	6 260 (2.19)	208 (1.43)
2006	1 330 (1.36)	359 (0.35)	5 351 (0.38)	457 (1.08)	2 138 (2.23)	284 (2.27)
2007	191 (1.32)	653 (0.17)	7 913 (0.39)	138 (1.51)	612 (1.09)	196 (2.27)
2008	415 (1.35)	880 (0.27)	5 085 (0.44)	138 (0.76)	1 681 (2.09)	322 (2.27)
2009	182 (1.03)	1 290 (0.38)	6 009 (0.51)	37 (1.16)	168 (0.00)	0 NA

Distribution

Figure 5.2 shows the distribution of hake (*M. polli*) in the central region. The distribution covers the whole central slope and is similar to the observations made in previous surveys. A few higher concentrations were found along the whole region at depths between 300 and 400 m.

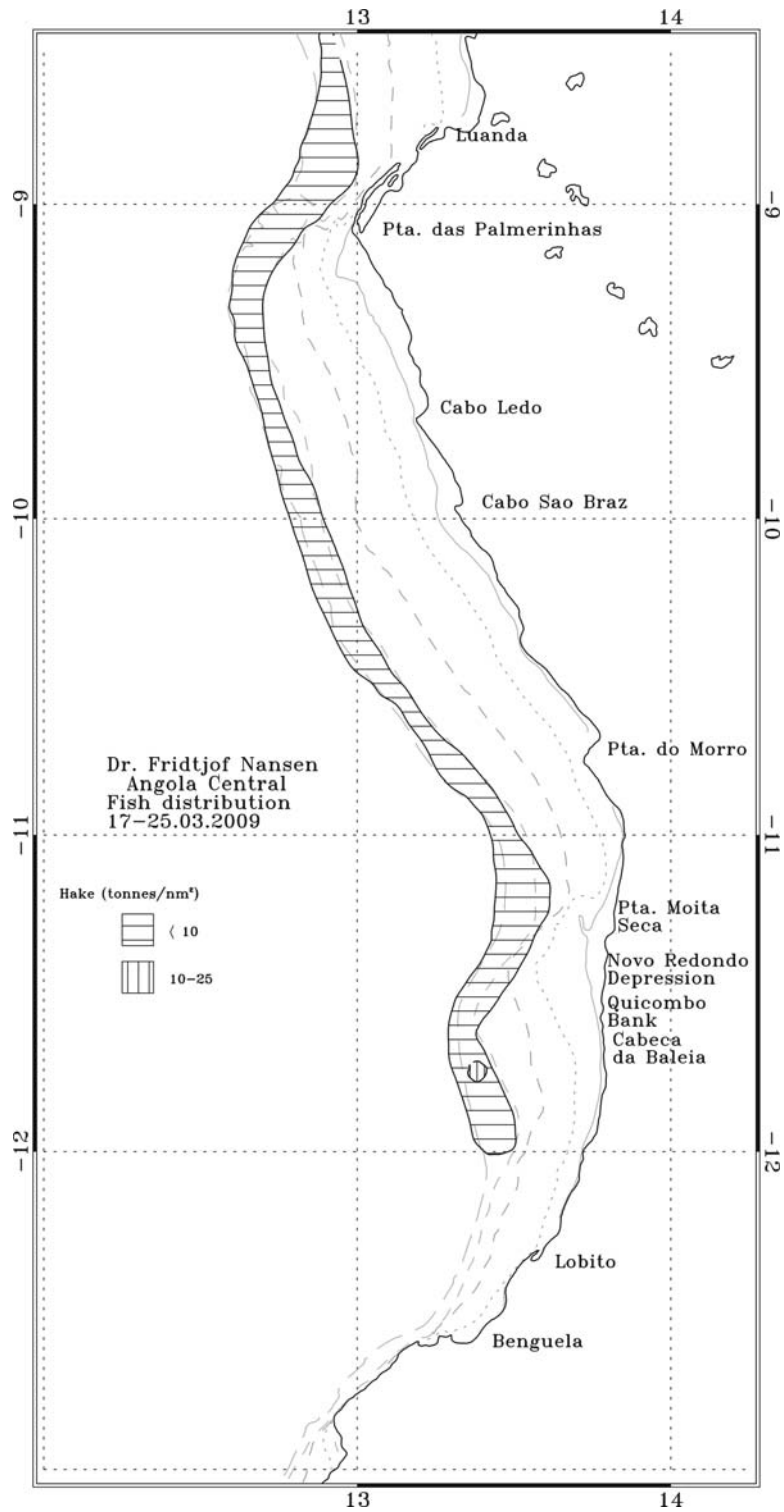


Figure 5.2 Distribution of Benguela hake (*Merluccius polli*) in the central region, Benguela- Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

5.3 Ponta das Palmerinhas – Congo River slope

The survey covered the northern region of Angolan waters from Ponta das Palmerinhas to Congo River, and a total of 38 successful swept-area trawl stations were accomplished on the northern slope (Table 2.1). The area north of Congo River is at present inaccessible to fisheries surveys due to the restricted oil exploitation areas. In previous years, this area was covered by some of the surveys. However, only stations south of the Congo River were included in the time series of biomass presented in Table 5.3. The various strata have been sampled with variable intensity throughout the time series, and Annex VIII shows the numbers of trawls by strata by survey.

The average catch per hour of all species was 626 kg/hour (Annex VI), and the ‘demersal’ group contributed 10% to the mean catch rate, the ‘pelagic’ group 1.8%, and the shrimps, cephalopods and sharks each contributed 26, 1.7 and 1.6%, respectively. The “other” group dominated the catches and contributed 59% to the total mean catch rate. *M. polli* was caught in 68% of the stations, and the average catch rate was 24 kg/hour. Seabreams were only caught in six stations on the northern slope, and the average catch rate (which consisted almost entirely of *D. angolensis*) was 4.6 kg/hour. The averages catch rates of the three shrimp species *P. longirostris*, *A. varidens* and *N. africana* were respectively 8, 10 and 142 kg/hour.

Biomass estimates

Biomass estimates in tonnes of the most important species groups are presented in Table 5.3. The biomasses were calculated by stratifying by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799m).

Pelagic species are often not available for the bottom trawl as the fish swim too high above the seabed and the biomass estimates of the pelagic species may reflect their availability to the trawl and not their abundance. Some of the biomass estimates in Table 8.3 have a high coefficient of variation (CV), which indicates that the trends in the time series should be interpreted with care.

The biomass estimate of seabreams in 2009 was about 500 tonnes, which is lower than the 2008 and 2007 estimates of about 600 tonnes. The slope is not within the main distribution of seabreams, and there is no clear trend in the time series for these estimates. As in previous surveys, *D. angolensis* was the most abundant seabream on the northern slope.

The biomass estimates for *M. polli* showed a decrease in 2009 to 2 800 tonnes, the second lowest estimate in the time series. In 2008 the biomass increased to 5 900 tonnes, after a continuous decrease from 2004 to 2007, with 15 300, 11 000, 7 553 and 4 117 tonnes respectively.

P. longirostris is distributed in depths between 200 and 400m, and the biomass estimates have been between 900 and 1 000 tonnes in the five last surveys. However, the high CVs indicate that the estimates are not very precise.

The 2009 biomass estimate of *A. varidens* was about 900 tonnes, which is almost 50% higher than the 2008 estimate of 600 tonnes. It is the highest estimate since 1986 and the third highest in the time series.

N. africana is not a commercially important species. The 2009 biomass estimate of about

13 000 tonnes, though somewhat lower than the 2008 estimate, but it is the fourth highest in the time series. Compared to the estimates of 2000-2003, the most recent surveys indicate a high and stable abundance of *N. Africana*.

The biomass estimate of Ommastrephidae in 2009 was 130 tonnes, more than 80% lower than the 2008 estimate (205 tonnes) and similar to the 2007 estimate of 125 tonnes, the lowest estimate since 1996.

The 2009 biomass estimate of hairtails was 1 100 tonnes, which is 20% lower than the 2008 estimate (1 365 tonnes). The high CVs and the annual variability in the biomass estimates make it difficult to conclude on the trend in biomass in recent years.

The biomass estimate of the sharks in 2009 was 1 150 tonnes, which is higher than what was found in 2006-2008 and similar to the 2005 estimate of 1 180 tonnes. However, there is no clear long time trend in the abundance of sharks, probably to inadequate sampling gear.

Distribution

Figure 5.3 shows the estimated distribution of hake (*M. polli*) in the northern region. The stock distribution covers the slope from Luanda to Congo River, with densities $<10 \text{ NM}^2$ in all the northern extension of its distribution.

Table 5.3 Biomass estimates (tonnes) of important species on the slope (200-800 m) in the northern region. CV values are indicated in brackets.

Survey	M.polli	Shrimps	Cephalopod	Sharks	Hairtails	Croakers
1985.1	202 (0.00)	21 (0.00)	976 (0.00)	344 (0.00)	0	0
1985.3	3 065 (0.86)	767 (1.27)	251 (0.68)	209 (1.36)	511 (2.38)	285 (0.87)
1985.4	28 753 (0.95)	11 989 (0.48)	260 (1.25)	0	1 342 (0.67)	8 (2.38)
1986.1	11 409 (0.39)	14 960 (0.25)	1 630 (0.81)	3 724 (1.41)	3 383 (0.64)	0
1986.2	27 562 (0.67)	7 854 (0.56)	277 (0.85)	4 431 (0.75)	3 228 (0.61)	19 (2.27)
1989.1	13 518 (0.78)	7 772 (1.34)	1 631 (1.23)	2 376 (1.44)	795 (0.81)	0
1989.2	8 168 (0.42)	4 370 (0.67)	166 (1.11)	375 (1.39)	352 (1.45)	1 624 (1.21)
1989.3	11 265 (0.91)	5 137 (0.36)	657 (1.05)	2 372 (0.57)	1 579 (1.97)	3 (2.27)
1991.1	19 597 (0.65)	8 671 (0.68)	135 (1.45)	1 376 (1.25)	65 (1.03)	3 (2.27)
1991.2	19 498 (0.67)	2 732 (0.34)	991 (1.05)	2 381 (0.80)	699 (0.61)	64 (1.82)
1992	13 290 (0.44)	8 992 (0.74)	209 (0.69)	1 462 (1.01)	1 148 (0.55)	244 (1.41)
1994	4 096 (0.48)	7 529 (0.61)	328 (0.48)	841 (0.66)	1 753 (0.37)	134 (1.36)
1995.1	5 892 (1.01)	9 641 (0.56)	316 (1.55)	1 367 (0.52)	2 284 (0.72)	0
1996	5 065 (0.31)	4 435 (0.43)	566 (1.03)	307 (0.71)	1 627 (0.69)	34 (1.36)
1997.1	6 954 (0.28)	14 107 (0.38)	659 (0.35)	824 (1.12)	3 399 (1.26)	0
1997.2	8 101 (0.39)	5 676 (1.67)	330 (1.80)	10 (2.27)	1 972 (1.37)	35 (2.27)
1999	3 624 (0.52)	11 539 (0.52)	1 142 (1.49)	1 060 (0.43)	3 088 (0.83)	113 (1.07)
2000	4 385 (0.54)	4 683 (0.49)	709 (0.47)	597 (0.89)	1 978 (1.04)	0
2001	4 840 (0.71)	8 283 (0.73)	1 477 (1.55)	1 966 (1.23)	1 531 (0.74)	0
2002	3 479 (0.60)	6 415 (0.74)	625 (0.87)	118 (0.74)	3 022 (1.01)	27 (1.73)
2003	5 310 (0.76)	7 986 (0.38)	421 (0.61)	1 305 (1.29)	1 237 (1.15)	27 (1.70)
2004	15 327 (1.33)	12 343 (0.33)	871 (0.70)	1 571 (0.78)	1 695 (0.57)	49 (1.91)
2005	10 994 (0.60)	10 285 (0.35)	382 (0.53)	1 180 (1.00)	1 468 (0.44)	19 (1.05)
2006	7 553 (0.51)	12 526 (0.37)	407 (0.55)	931 (1.59)	2 143 (0.74)	18 (1.79)
2007	4 117 (0.55)	14 856 (0.47)	316 (0.66)	501 (1.01)	749 (0.49)	9 (2.27)
2008	5 925 (0.37)	16 979 (0.40)	716 (0.76)	846 (0.67)	1 365 (0.79)	246 (1.28)
2009	2 814 (0.76)	15 238 (0.39)	984 (0.63)	1 152 (0.69)	1 077 (0.50)	24 (1.49)

Survey	Seabreams	P.longirostris	A.varidens	N.africanus	Ommastrephidae	D.angolensis
1985.1	0	21 (0.00)	0	0	976 (0.00)	0
1985.3	1 541 (0.00)	0	0	0	0	1 541 (0.00)
1985.4	0	2 108 (0.88)	6 691 (0.69)	2 864 (0.90)	142 (1.78)	0
1986.1	108 (2.02)	1 166 (1.29)	538 (2.09)	12 631 (0.23)	261 (0.33)	98 (2.27)
1986.2	288 (2.27)	0	1 008 (0.48)	4 643 (0.88)	0	269 (2.27)
1989.1	66 (2.27)	419 (1.15)	204 (0.50)	6 953 (1.48)	1 429 (1.40)	0
1989.2	4 061 (2.24)	366 (1.01)	164 (1.14)	3 682 (0.81)	135 (1.37)	4 038 (2.26)
1989.3	497 (1.79)	243 (0.67)	91 (0.40)	4 699 (0.38)	645 (1.07)	496 (1.80)
1991.1	49 (1.66)	88 (1.00)	70 (1.37)	8 315 (0.72)	129 (1.47)	49 (1.66)
1991.2	527 (0.66)	205 (0.98)	15 (2.67)	2 445 (0.37)	619 (1.11)	510 (0.66)
1992	510 (0.90)	170 (1.05)	272 (0.80)	8 439 (0.80)	143 (0.73)	465 (0.85)
1994	1 045 (0.91)	532 (0.58)	370 (0.75)	6 602 (0.69)	281 (0.55)	1 045 (0.91)
1995.1	506 (0.98)	860 (0.88)	326 (0.67)	7 269 (0.73)	61 (1.16)	449 (1.08)
1996	597 (1.43)	162 (0.62)	267 (0.45)	3 859 (0.50)	228 (0.66)	345 (1.50)
1997.1	871 (1.08)	605 (1.14)	333 (0.35)	13 096 (0.40)	622 (0.37)	826 (1.13)
1997.2	878 (2.27)	1 317 (1.41)	0	4 088 (1.92)	317 (1.85)	876 (2.27)
1999	389 (0.58)	542 (0.43)	237 (0.42)	10 540 (0.58)	1 121 (1.52)	339 (0.69)
2000	1 650 (2.05)	497 (0.44)	222 (0.50)	3 777 (0.63)	509 (0.64)	1 588 (2.14)
2001	494 (2.27)	535 (0.53)	243 (0.47)	6 746 (0.90)	1 001 (2.17)	481 (2.27)
2002	213 (1.45)	800 (1.04)	127 (0.57)	5 337 (0.89)	364 (1.27)	200 (1.54)
2003	141 (1.10)	629 (1.01)	383 (0.83)	6 873 (0.42)	216 (0.83)	135 (1.08)
2004	299 (0.69)	749 (0.98)	359 (0.39)	10 930 (0.37)	316 (0.56)	284 (0.71)
2005	562 (0.81)	984 (0.63)	639 (0.51)	8 535 (0.42)	330 (0.53)	547 (0.85)
2006	343 (0.95)	923 (0.67)	391 (0.39)	11 073 (0.43)	184 (0.49)	340 (0.95)
2007	612 (0.73)	981 (0.78)	373 (0.31)	13 285 (0.52)	125 (0.89)	595 (0.77)
2008	629 (0.66)	933 (0.71)	615 (0.30)	15 267 (0.45)	205 (0.78)	593 (0.64)
2009	523 (0.87)	971 (0.68)	914 (0.32)	13 121 (0.45)	131 (0.92)	523 (0.87)

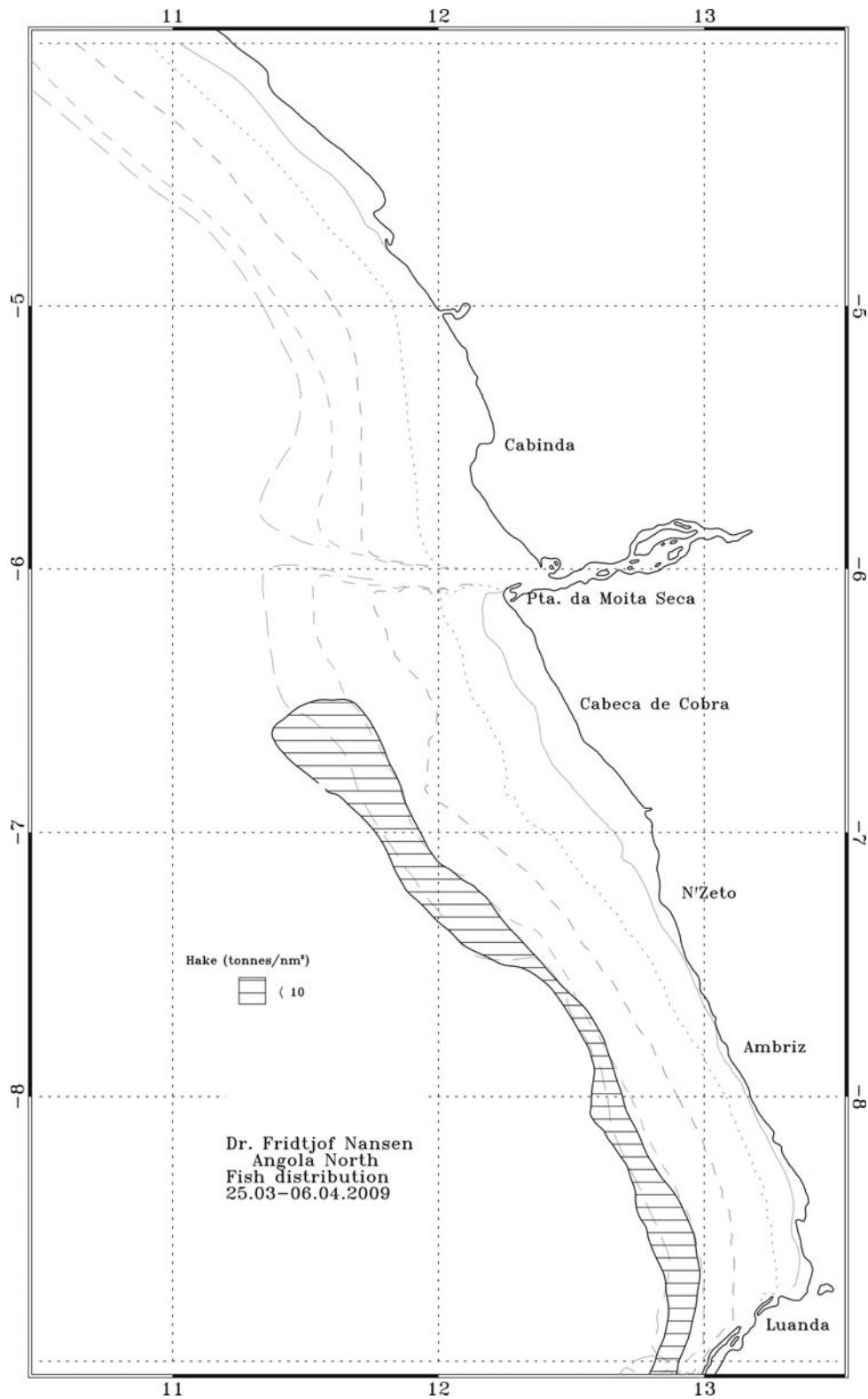


Figure 5.3 Distribution of hake (*Merluccius polli*) in the northern region, Ponta das Palmerinhas – Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

CHAPTER 6 SUMMARY

From 11 March to 09 April the 2009 demersal resource survey off Angola was successfully carried out using R/V “Dr. Fridtjof Nansen”. Except from the area between Tombua and Benguela, which is unsuitable for trawling due to poor bottom conditions, the shelf and upper slope (20-800m) from Cunene River to Congo River was covered.

In total, 194 trawl stations were carried out, of which 191 were valid and used in the biomass estimation of the demersal stocks. To map the oceanographic conditions 226 CTD stations were taken.

6.1 Hydrographical conditions

The demersal surveys in March are coincident with the late phase of the wet season, which causes low salinity in the surface waters on the shelf off northern and central Angola due to the freshwater coming from the coastal rivers. Clear signal of upwelling was observed in the southern region, where the temperature was between 18 – 22°C, salinity ranged between 35.06 and 35.92 and oxygen values were high (below 3.5 ml/l).

Focus of cold water were also observed in the central and northern regions, in coastal areas close to the mouth rivers where the temperature varied between 23 to 24°C and salinity between 35.00 – 35.90. The values of the oceanographic parameters were high offshore, around 27- 29 °C for temperature and 35.60 – 36.60 for salinity. Inshore waters presented low salinity values, particularly around the Congo River’s mouth (26.9) and its plume was observed down to 8.5°S with a salinity of 34.5.

6.2 Biomass estimates

Table 6.1 presents the time series from 1985 to 2009 of the biomass estimates for the most important species on the shelf and slope in the central and northern regions of Angola. The southern region is not included, as the surveys in this region have not been properly standardized throughout the years. However, the effort, *i.e.* the number of stations by stratum on the southern shelf, is relatively similar from 2000 to 2009 (Annex VIII) and the estimates in this period are comparable. The estimates on the southern slope are very unreliable as the number of tows is very low due to difficult trawling conditions. Tables 4.1 and 5.1 show the biomass estimates of the important species on the southern shelf and slope, respectively.

Seabreams

The seabreams biomass estimate in the southern region was about 9 800 tonnes and consisted almost entirely of *D. macrophthalmus*. This was lower than the 2008 estimate, and was a marked decrease from 2007 and the lowest in the time series. In the central and northern regions, the biomass estimate of seabreams in 2009 was about 18 000 tonnes, which is a 14% reduction from 2008. *D. macrophthalmus* and *D. angolensis* comprised 5% and 37% of the 2009 estimate, respectively. Other abundant seabreams were *P. bellottii*, *D. canariensis* and *D. barnardi*. The biomass estimates of seabreams have fluctuated in most of the time series, and there was no clear long-term trend.

Hakes

M. capensis is generally the dominating hake species in the south, and Angola shares this stock with Namibia. However, whilst no Benguela hake (*M. polli*) was caught on the southern shelf during the 2006 survey the species contributed to about 65% of the biomass in 2008. In 2009 *M. capensis* dominated, while *M. polli* was only caught in two stations on the southern shelf and in one station on the slope. The total biomass estimates of hake (*M. capensis* and *M. polli*) on the southern shelf and slope in 2009 were 31 000 and 2 750 tonnes, respectively. Only two valid stations were carried out on the slope between 200 and 600 meters, which makes the estimate for the slope unreliable. On the shelf the hake abundance has annually declined between 2003 and 2008, while the 2009 estimate is the highest in the time series, almost twenty times higher than in 2008. In the central and northern regions, *M. polli* is the only hake species found. Here, the estimated biomass of hake (*M. polli*) was 8 100 tonnes, which is a 40% decrease from the 2008 estimate (12 000 tonnes), and one of the lowest in the time series. The 2008 estimate was about 27% lower than the 2004 estimate.

Shrimps

The two commercially important shrimp species *P. longirostris* and *A. varidens* are never found in high densities south of Tombua, and they were not caught neither in 2006 nor 2007. However, in 2008 both *P. longirostris* and *A. varidens* were caught in small quantities in the southern region. In 2009 no *P. longirostris* was caught, while the 600 tonnes estimated of *A. varidens* is the highest in the time series. The biomass estimate of *P. longirostris* for the central and northern regions in 2009 was 1 400 tonnes, which is a 12% decrease from the 2008 estimate (1 600 tonnes). The high CV value indicates that the estimate is relatively uncertain. The 2009 estimate for *A. varidens* was 2 200 tonnes, representing a 46% increase from 2008 (1 500 tonnes) and the second highest in the time series.

Grunts

Commercially important grunt species are *P. incisus* and *P. rogeri*, but no grunts were caught in the southern region. The biomass estimate of grunts in the central and northern regions in 2009 was 8 200 tonnes, a 10% increase compared to last year but much lower than the 2007 estimate (17 000 tonnes), which is the highest biomass estimate registered since 1985.

Croakers

South of Tombua, the biomasses of the croakers have varied considerably between surveys during the last years, therefore, no clear trend in the time series can be seen. However, the 2009 and 2008 estimates (700 and 400 tonnes respectively) represent a large decrease from the 2007 estimate of 4 200 tonnes and are the two lowest in the time series. The biomass estimate of croakers, mainly *U. canariensis*, *A. aequidens*, *P. senegalensis* and *P. typus*, in the central and northern regions was about 6 000 tonnes in 2009, which is less than half of the 2008 estimate (12 600 tonnes). Generally, the biomass of *U. canariensis* has contributed to about 30% of the total biomass of croakers and has fluctuated in a similar way as the total biomass of croakers.

Groupers and snappers

Groupers and snappers were not caught in the region south of Tombua. In the central and northern regions the biomass estimates for these groups are relatively imprecise as shown by the high CVs values. The biomass estimate of groupers decreased from 1 200 in 2008 to 800 tonnes in 2009, while the biomass estimate of snappers increased from 90 tonnes in 2008 to 290 tonnes in 2009. The estimates in the time series show large fluctuations, making it difficult to identify any trend and conclude on the current state of these stocks.

Pelagic species

For the pelagic species, the estimates of the biomass are characterized by the high 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. However, the increasing and high biomass estimates of horse mackerel in 2008 (215 000 tonnes) and 2009 (322 000 tonnes) show increased presence in later years. More adequate results are achieved from the acoustic surveys conducted later in the year.

Table 6.1 Biomass estimates (tonnes) of important species in the central and northern regions. CVs are in brackets.

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	211 (0.12)	4 496 (1.85)	323 (1.22)	11 438 (1.90)	841 (0.92)	364 (1.93)	9 986 (1.52)	44 (3.25)
1985.2	0	3 324 (1.94)	139 (3.12)	694 (0.95)	451 (1.06)	3 907 (3.17)	3 740 (1.73)	30 (2.72)
1985.3	6 524 (1.70)	16 486 (1.99)	2 215 (1.77)	2 297 (1.00)	1 079 (1.74)	205 (3.23)	17 742 (1.81)	146 (2.16)
1985.4	55 083 (1.46)	110 950 (1.39)	15 069 (1.04)	6 369 (1.24)	96 (2.42)	906 (1.55)	117 929 (1.33)	88 (2.09)
1986.1	29 498 (1.21)	31 313 (0.88)	24 342 (0.60)	6 925 (0.81)	5 004 (2.30)	2 770 (0.96)	38 390 (0.72)	64 (2.00)
1986.2	52 670 (0.76)	30 649 (1.11)	21 957 (0.43)	2 935 (0.78)	5 256 (1.38)	1 693 (0.95)	34 989 (0.97)	226 (1.51)
1989.1	16 503 (1.50)	19 681 (1.00)	9 110 (2.48)	4 465 (1.10)	3 086 (2.42)	2 137 (2.42)	26 000 (0.85)	252 (1.08)
1989.2	14 371 (0.90)	33 008 (0.74)	7 519 (1.03)	3 198 (0.56)	1 472 (1.18)	2 282 (0.79)	40 419 (0.66)	333 (1.16)
1989.3	25 407 (1.58)	49 538 (0.85)	7 393 (0.65)	4 797 (0.90)	21 887 (1.35)	6 749 (0.99)	59 519 (0.85)	518 (1.43)
1991.1	31 536 (0.93)	107 626 (1.18)	14 041 (0.97)	2 235 (0.43)	3 559 (1.18)	2 349 (1.31)	131 007 (1.03)	373 (1.28)
1991.2	30 968 (1.03)	62 772 (1.25)	8 426 (1.07)	7 351 (0.70)	4 090 (1.31)	91 (1.43)	63 901 (1.23)	444 (1.13)
1992	23 233 (0.60)	48 453 (0.69)	13 613 (1.17)	6 109 (0.41)	5 163 (1.47)	82 (1.92)	53 311 (0.67)	223 (1.14)
1994	10 343 (1.00)	77 944 (0.83)	11 756 (1.00)	6 886 (0.52)	1 869 (0.91)	206 (2.91)	86 549 (0.75)	926 (1.08)
1995.1	10 577 (1.30)	5 224 (1.74)	15 395 (0.93)	1 789 (0.76)	3 382 (1.00)	1 679 (1.09)	19 756 (0.74)	393 (1.24)
1995.2	6 880 (0.81)	11 258 (1.17)	4 499 (0.65)	979 (1.08)	1 289 (1.01)	0	11 370 (1.15)	201 (1.88)
1996	12 219 (1.08)	83 774 (0.95)	11 356 (0.96)	5 268 (0.49)	2 641 (1.47)	1 371 (1.69)	89 864 (0.89)	190 (1.65)
1997.1	21 911 (0.90)	64 832 (0.77)	22 638 (0.60)	10 684 (0.56)	3 004 (1.18)	9 833 (1.75)	168 669 (1.14)	335 (1.74)
1997.2	25 581 (0.71)	97 858 (0.58)	9 977 (2.10)	6 260 (0.42)	500 (1.73)	132 (2.45)	99 747 (0.56)	289 (2.20)
1998	10 366 (1.27)	4 630 (1.67)	9 412 (0.98)	3 016 (0.62)	1 122 (1.30)	2 860 (2.97)	7 606 (1.20)	52 (2.54)
1999	6 640 (1.08)	17 083 (0.78)	13 687 (0.97)	3 577 (1.08)	3 192 (0.73)	8 353 (0.87)	36 949 (0.60)	69 (1.84)
2000	10 118 (1.00)	25 701 (0.72)	7 592 (0.76)	3 778 (0.44)	5 098 (1.86)	2 215 (1.41)	47 540 (0.80)	349 (1.83)
2001	9 732 (1.30)	22 012 (0.77)	11 282 (1.23)	4 340 (1.36)	3 519 (1.85)	598 (1.06)	30 501 (0.66)	139 (1.11)
2002	7 680 (0.93)	88 411 (0.70)	10 747 (1.11)	4 980 (0.71)	629 (0.97)	3 067 (0.78)	98 922 (0.63)	820 (2.58)
2003	14 240 (1.35)	35 489 (0.77)	13 089 (0.85)	2 668 (0.56)	1 925 (1.92)	4 255 (0.78)	57 888 (0.89)	137 (1.75)
2004	31 628 (1.73)	21 409 (0.71)	20 863 (0.59)	3 400 (0.54)	3 125 (1.09)	3 760 (1.00)	28 088 (0.58)	63 (1.39)
2005	21 112 (0.99)	10 931 (0.70)	17 650 (0.59)	4 061 (0.47)	2 421 (1.08)	2 134 (1.19)	20 025 (0.67)	332 (1.72)
2006	14 563 (1.06)	14 925 (0.52)	20 214 (0.61)	3 728 (0.54)	2 328 (1.48)	4 663 (1.09)	25 200 (0.45)	183 (1.03)
2007	11 157 (1.66)	10 633 (0.69)	24 092 (0.71)	3 287 (0.56)	2 789 (1.21)	3 875 (0.84)	22 928 (0.73)	214 (1.42)
2008	11 979 (0.96)	5 640 (0.69)	24 057 (0.65)	3 577 (0.49)	1 831 (1.03)	2 700 (1.20)	22 856 (0.91)	168 (1.22)
2009	8 120 (1.00)	14 485 (0.68)	23 619 (0.63)	4 317 (0.64)	3 009 (1.61)	11 816 (1.85)	24 557 (0.69)	121 (1.31)

Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.1	15 711 (1.45)	254 (1.50)	0	479 (1.81)	248 (1.69)	1 519 (1.67)	14 690 (0.94)	138 (1.93)
1985.2	1 200 (2.75)	75 (1.35)	63 (2.09)	1 771 (1.30)	381 (2.18)	1 302 (1.82)	12 881 (0.57)	0
1985.3	3 219 (1.31)	26 (2.74)	62 (3.25)	1 978 (1.39)	3 629 (1.56)	8 979 (1.52)	22 438 (1.03)	0
1985.4	7 937 (0.94)	1 033 (1.93)	0 NA	4 307 (0.91)	20 511 (1.54)	13 935 (2.05)	49 738 (0.69)	3 062 (1.72)
1986.1	26 602 (0.92)	3 099 (0.84)	470 (3.02)	1 087 (1.01)	3 468 (1.06)	6 956 (0.82)	27 435 (0.54)	3 823 (1.22)
1986.2	511 874 (0.02)	1 874 (0.93)	0	2 033 (0.84)	6 995 (0.98)	9 578 (0.76)	45 651 (0.36)	0
1989.1	13 125 (0.89)	2 281 (2.15)	0	1 569 (1.34)	3 816 (1.85)	5 864 (1.15)	25 271 (0.55)	895 (1.44)
1989.2	6 333 (0.70)	3 674 (1.21)	53 (2.19)	3 937 (2.31)	2 228 (1.06)	7 826 (0.78)	23 569 (0.92)	1 559 (1.07)
1989.3	66 901 (0.69)	1 068 (1.09)	316 (3.25)	1 107 (1.95)	1 870 (1.37)	4 812 (1.06)	20 807 (0.76)	1 094 (1.18)
1991.1	21 783 (1.13)	3 322 (1.93)	106 (3.69)	817 (1.28)	1 247 (0.99)	5 848 (1.05)	14 666 (0.48)	302 (1.48)
1991.2	9 218 (0.61)	161 (1.32)	0	2 043 (1.05)	2 742 (1.29)	26 595 (1.93)	42 431 (0.47)	640 (0.95)
1992	17 251 (0.74)	103 (2.12)	0	3 359 (1.08)	1 698 (1.27)	4 772 (0.76)	40 589 (0.52)	935 (1.71)
1994	31 574 (2.09)	329 (1.69)	262 (3.69)	2 908 (1.07)	680 (1.25)	18 320 (1.46)	51 379 (0.51)	1 757 (1.05)
1995.1	14 521 (0.59)	4 222 (1.10)	594 (2.14)	1 397 (1.05)	6 027 (1.40)	18 472 (1.67)	29 271 (0.83)	2 020 (1.09)
1995.2	5 112 (1.63)	0	45 (3.18)	348 (3.18)	0	245 (1.89)	11 363 (0.86)	680 (1.02)
1996	9 254 (0.51)	1 035 (1.51)	109 (3.69)	2 692 (1.26)	8 256 (1.04)	15 215 (0.62)	39 921 (0.62)	310 (0.89)
1997.1	32 077 (0.82)	554 (3.05)	73 (3.25)	781 (1.08)	6 427 (1.49)	21 483 (0.69)	33 690 (0.75)	2 501 (1.05)
1997.2	23 555 (0.55)	0	0	2 840 (1.33)	500 (0.84)	36 999 (1.82)	49 236 (0.63)	5 481 (1.07)
1998	30 861 (2.71)	454 (1.54)	0	198 (2.33)	9 117 (1.56)	8 609 (1.62)	64 867 (2.24)	742 (1.32)
1999	26 027 (0.57)	4 317 (0.82)	531 (3.49)	1 642 (0.83)	8 888 (1.03)	18 534 (1.14)	34 029 (0.45)	878 (0.82)
2000	18 068 (0.62)	4 556 (1.00)	294 (2.04)	1 647 (1.01)	7 213 (0.91)	7 842 (0.67)	36 443 (0.45)	1 259 (1.15)
2001	24 459 (1.12)	1 818 (0.79)	726 (3.16)	859 (1.50)	3 600 (1.17)	3 203 (0.94)	22 805 (0.64)	1 020 (0.83)
2002	30 855 (0.70)	2 318 (0.99)	251 (4.74)	742 (1.17)	3 223 (0.99)	9 196 (0.61)	34 016 (0.85)	1 565 (1.41)
2003	20 301 (0.67)	2 825 (1.86)	186 (2.63)	1 043 (0.99)	10 025 (1.83)	10 967 (0.58)	16 230 (0.39)	1 366 (1.14)
2004	20 349 (1.20)	1 856 (1.54)	79 (2.44)	681 (0.91)	6 810 (1.15)	12 196 (1.24)	32 647 (1.79)	2 143 (1.33)
2005	41 427 (1.25)	963 (1.68)	284 (2.07)	1 176 (0.88)	11 735 (1.08)	13 501 (0.72)	33 064 (1.12)	1 613 (1.07)
2006	20 849 (0.49)	2 561 (0.92)	51 (2.69)	819 (0.99)	6 921 (1.09)	8 956 (0.73)	24 824 (0.57)	2 607 (1.92)
2007	32 508 (1.22)	2 336 (1.34)	113 (1.86)	950 (1.04)	17 242 (1.38)	11 991 (1.40)	22 191 (0.35)	1 342 (1.35)
2008	18 211 (0.64)	1 652 (1.78)	90 (2.88)	1 187 (1.53)	7 411 (1.43)	12 684 (0.87)	21 227 (0.48)	1 622 (1.30)
2009	31 108 (1.11)	1 743 (1.33)	292 (2.03)	779 (0.73)	8 192 (0.90)	6 064 (0.74)	18 108 (0.41)	1 432 (1.10)

Survey	A.varidens	N.africanus	Ommastrephidae	Sepiidae	B.auritus	D.angolensis	U.canariensis	D.macrophthalmus
1985.1	0	0	11 249 (1.93)	0	40 729 (1.90)	2 196 (0.92)	1 132 (2.01)	200 (2.74)
1985.2	0	0	0	0	6 842 (2.33)	2 495 (0.94)	521 (2.43)	0
1985.3	0	0	0	154 (1.61)	9 182 (1.99)	4 490 (0.75)	602 (1.89)	0
1985.4	7 633 (1.47)	3 578 (1.69)	225 (2.56)	215 (2.12)	69 072 (1.67)	9 283 (1.12)	8 921 (2.47)	6 286 (2.41)
1986.1	1 030 (2.63)	15 804 (0.77)	2 140 (1.52)	1 334 (0.86)	133 723 (0.46)	5 700 (0.92)	2 606 (1.45)	2 787 (1.22)
1986.2	1 485 (0.90)	4 643 (1.90)	0	1 828 (1.23)	36 750 (0.69)	15 499 (0.47)	3 387 (1.33)	9 215 (0.40)
1989.1	397 (1.56)	7 545 (2.98)	3 209 (1.51)	356 (1.29)	20 488 (1.13)	2 568 (0.49)	1 427 (1.14)	7 302 (1.28)
1989.2	400 (1.50)	4 702 (1.61)	1 286 (1.04)	1 440 (0.67)	64 268 (1.18)	9 997 (2.01)	1 302 (1.34)	1 386 (1.44)
1989.3	285 (1.25)	5 657 (0.81)	4 191 (0.98)	169 (1.63)	88 316 (0.76)	4 888 (0.68)	1 194 (2.28)	1 956 (2.27)
1991.1	723 (0.58)	12 194 (1.13)	1 036 (0.74)	522 (0.79)	48 534 (0.82)	2 651 (0.49)	1 657 (1.94)	3 075 (1.74)
1991.2	119 (3.61)	5 104 (0.95)	4 144 (1.05)	793 (1.38)	3 524 (1.62)	4 903 (0.54)	22 849 (2.25)	18 054 (0.97)
1992	638 (1.21)	11 662 (1.38)	3 519 (0.46)	1 074 (0.95)	34 799 (2.01)	7 229 (0.37)	1 719 (1.18)	20 117 (0.99)
1994	1 017 (1.28)	8 801 (1.33)	1 931 (0.63)	3 167 (0.67)	10 205 (1.51)	6 918 (0.52)	6 075 (1.55)	23 219 (0.88)
1995.1	1 078 (0.95)	9 729 (1.47)	164 (1.21)	637 (0.86)	40 468 (0.83)	4 695 (0.71)	11 929 (2.11)	14 010 (1.70)
1995.2	698 (0.62)	2 763 (0.97)	730 (0.84)	219 (2.48)	0	1 280 (0.74)	209 (2.22)	10 083 (0.99)
1996	938 (0.76)	8 830 (1.16)	1 069 (0.45)	143 (1.55)	45 646 (1.30)	6 236 (0.54)	3 150 (1.40)	14 591 (0.66)
1997.1	639 (0.79)	17 189 (0.79)	3 437 (0.56)	5 824 (0.95)	46 071 (0.75)	5 318 (0.57)	5 760 (0.94)	14 289 (1.72)
1997.2	0	4 098 (4.15)	2 491 (0.88)	1 885 (0.33)	1 966 (0.64)	5 712 (0.90)	33 214 (2.03)	31 595 (0.96)
1998	1 192 (2.89)	7 000 (1.37)	765 (1.28)	1 300 (1.09)	22 014 (1.79)	2 084 (0.74)	2 239 (1.46)	52 473 (2.75)
1999	574 (1.68)	11 746 (1.14)	2 028 (1.86)	375 (0.72)	131 249 (0.85)	4 476 (0.32)	11 581 (1.59)	8 181 (1.23)
2000	601 (0.71)	4 820 (1.21)	1 735 (0.69)	501 (1.14)	79 452 (1.18)	7 385 (1.25)	3 771 (0.88)	8 086 (1.25)
2001	699 (1.14)	7 263 (1.87)	1 702 (2.83)	376 (0.92)	54 964 (1.01)	3 482 (0.84)	1 264 (1.70)	6 772 (1.22)
2002	371 (0.99)	8 375 (1.42)	3 629 (0.94)	248 (1.23)	81 844 (1.16)	3 323 (0.66)	4 326 (0.86)	13 935 (2.04)
2003	881 (1.78)	10 157 (1.06)	975 (0.88)	307 (1.61)	104 724 (0.99)	4 474 (0.42)	1 791 (0.72)	1 092 (2.52)
2004	935 (0.78)	17 133 (0.68)	1 319 (0.89)	394 (0.92)	51 255 (0.90)	7 084 (0.69)	6 977 (1.87)	13 884 (4.41)
2005	1 431 (0.77)	14 188 (0.73)	1 219 (1.33)	992 (0.46)	88 667 (1.17)	8 473 (0.29)	5 933 (0.91)	7 290 (4.97)
2006	750 (0.63)	16 424 (0.71)	943 (1.43)	217 (1.16)	94 684 (0.91)	7 236 (0.39)	6 483 (0.96)	4 950 (2.58)
2007	1 026 (0.38)	21 198 (0.81)	347 (1.74)	435 (1.70)	52 925 (0.80)	8 083 (0.41)	5 846 (2.35)	2 157 (1.41)
2008	1 508 (0.49)	20 352 (0.78)	896 (0.62)	306 (1.29)	70 217 (1.19)	6 860 (0.46)	5 058 (0.93)	3 176 (3.01)
2009	2 204 (0.66)	19 130 (0.79)	441 (0.79)	222 (1.60)	46 010 (1.28)	6 697 (0.44)	2 409 (0.71)	876 (0.93)

ANNEX I Records of fishing stations

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 1
 DATE :13.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°12.44
 start stop duration Lon E 11°43.83
 TIME :13:37:19 13:54:43 17.4 (min) Purpose : 3
 LOG : 8261.58 8262.58 1.0 Region : 4000
 FDEPTH: 26 27 Gear cond.: 0
 BDEPTH: 26 27 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.5 km
 Sorted : 177 Total catch: 4577.42 Catch/hour: 15784.21

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 6
 DATE :13.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°11.46
 start stop duration Lon E 11°24.91
 TIME :20:58:18 21:28:41 30.4 (min) Purpose : 3
 LOG : 8295.77 8297.36 1.6 Region : 4000
 FDEPTH: 173 180 Gear cond.: 0
 BDEPTH: 173 180 Validity : 0
 Towing dir: 0° Wire out : 450 m Speed : 3.1 km
 Sorted : 107 Total catch: 452.92 Catch/hour: 894.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	13570.34	367907	85.97	1
Engraulis encrasicolus	1308.28	100948	8.29	
J E L Y F I S H	677.79	0	4.29	
Merluccius capensis	129.38	483	0.82	2
Umbriina canariensis	30.90	579	0.20	3
Chelidonichthys capensis	30.86	45	0.07	
Raja miraletus	11.03	14	0.07	
Loligo vulgaris	10.62	386	0.07	
Pomatomus saltatrix	6.31	14	0.04	
Dicologlossa cuneata	5.79	193	0.04	
Atractoscion aequidens	2.90	97	0.02	
Total	15784.21		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	538.56	2794	60.23	14
Chlorophthalmus atlanticus	111.08	6312	12.42	
Trigla lyra	64.86	857	7.25	
Dicologlossa cuneata	45.69	1003	5.11	
Pterothrissus belloci	40.43	363	4.52	
Octopus vulgaris	22.53	69	2.52	
Pontinus kuhlii	16.60	456	1.86	
Trachurus capensis	16.33	111	1.83	15
Raja miraletus	15.06	22	1.68	
Squilla mantis	4.88	257	0.55	
Bembrops heterurus	4.40	126	0.49	
Zeus faber	3.32	16	0.37	
Chatrabus melanurus	3.10	10	0.35	
Callinectes sp.	2.69	184	0.30	
Brotula barbata	1.62	6	0.18	
Synagrops microlepis	0.97	89	0.11	
Parapandalus narval	0.85	168	0.09	
Dentex angolensis	0.41	6	0.05	
Parapenaeus longirostris, femal	0.38	79	0.04	
GALATHEIDAE *	0.26	32	0.03	
Parapenaeus longirostris, male	0.22	53	0.02	
Total	894.22		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 2
 DATE :13.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°9.90
 start stop duration Lon E 11°41.68
 TIME :14:55:54 15:03:11 7.3 (min) Purpose : 3
 LOG : 8266.54 8266.91 0.4 Region : 4000
 FDEPTH: 44 44 Gear cond.: 0
 BDEPTH: 44 44 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.0 km
 Sorted : 33 Total catch: 1977.60 Catch/hour: 16298.90

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 7
 DATE :13.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 17°15.07
 start stop duration Lon E 11°21.89
 TIME :23:05:16 23:27:17 22.0 (min) Purpose : 3
 LOG : 8305.20 8306.42 1.2 Region : 4000
 FDEPTH: 322 355 Gear cond.: 0
 BDEPTH: 322 355 Validity : 0
 Towing dir: 0° Wire out : 820 m Speed : 3.3 km
 Sorted : 34 Total catch: 1029.71 Catch/hour: 2807.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	16244.51	503951	99.67	4
Chelidonichthys capensis	54.40	495	0.33	
Total	16298.90		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Helicolenus dactylopterus	1047.89	20028	37.33	
Chlorophthalmus atlanticus	629.58	15718	22.43	
Nezumia aequalis	625.35	7183	22.28	
Laemonema laureysi	108.17	2535	3.85	
Merluccius capensis	107.32	338	1.82	
Aristeus varidens, female	65.07	3803	2.32	16
Malacocephalus laevis	49.01	1268	1.75	
Galeus polli	46.48	507	1.66	
Hoplostethus cadenati	43.10	1606	1.54	
Callinectes sp.	38.03	1099	1.35	
Epigonus telescopus	21.97	1099	0.78	
S H R I M P S	19.44	3127	0.69	
OMMASTREPHIDAE	3.93	254	0.14	
Aristeus varidens, male	1.69	592	0.06	
Total	2807.02		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 3
 DATE :13.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°11.00
 start stop duration Lon E 11°37.63
 TIME :16:07:20 16:37:10 29.8 (min) Purpose : 3
 LOG : 8273.92 8275.50 1.6 Region : 4000
 FDEPTH: 87 85 Gear cond.: 0
 BDEPTH: 87 85 Validity : 0
 Towing dir: 0° Wire out : 225 m Speed : 3.2 km
 Sorted : 155 Total catch: 756.24 Catch/hour: 1521.10

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 8
 DATE :14.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 17°14.27
 start stop duration Lon E 11°13.19
 TIME :01:52:22 02:23:01 30.6 (min) Purpose : 3
 LOG : 8318.89 8320.64 1.8 Region : 4000
 FDEPTH: 729 734 Gear cond.: 0
 BDEPTH: 729 734 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 3.4 km
 Sorted : 67 Total catch: 1644.61 Catch/hour: 3220.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	1097.52	10709	72.15	7
Trachurus trecae	282.70	3667	18.59	6
Dentex macrocephthalmus	120.46	4037	7.92	5
Sepia orbignyana	9.59	20	0.63	
Trigla lyra	7.00	20	0.46	
Zenopsis conchifer	1.45	4	0.10	
Pteroscion peli	1.27	28	0.08	
Raja miraletus	0.72	2	0.05	
Dicologlossa cuneata	0.38	10	0.03	
Total	1521.10		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia micronychodon	1055.48	229770	32.77	
Bathygadus melanobranchus	534.93	13866	16.61	
Trachyrincus scabrurus	434.18	1727	13.48	
Caelorinchus sp.	296.01	7580	9.19	
Aristeus varidens	222.61	16600	6.91	
Holothuria sp.	158.32	480	4.92	
Bajaacalifornia magalops	98.83	672	3.07	
Synaphobranchus kaupii	82.99	721	2.58	
Raja alba	76.76	288	2.38	
CHIMAERIDAE	47.51	49	1.48	
OMMASTREPHIDAE	37.89	96	1.18	
Ebinania costaecanarie	35.99	49	1.12	
Yarella blackfordi *	32.15	1151	1.00	
S H R I M P S	23.50	3119	0.73	
Bassanago albescens	20.15	145	0.63	
Heterocarpus grimaldii	20.15	1584	0.63	
Gonostoma denudata	11.04	1776	0.34	
Chaceon maritae, male	9.58	22	0.30	
Hoplostethus cadenati	8.17	192	0.25	
Notacanthus sexspinis	4.80	49	0.15	
J E L Y F I S H	2.88	96	0.09	
PORTUNIDAE	2.88	96	0.09	
Nemichthys scolopaceus	1.92	96	0.06	
Chaceon maritae, female	1.80	8	0.06	
Total	3220.52		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 4
 DATE :13.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°12.60
 start stop duration Lon E 11°30.84
 TIME :18:00:53 18:31:11 30.3 (min) Purpose : 3
 LOG : 8284.29 8285.62 1.3 Region : 4000
 FDEPTH: 133 135 Gear cond.: 0
 BDEPTH: 133 135 Validity : 0
 Towing dir: 0° Wire out : 330 m Speed : 2.6 km
 Sorted : 181 Total catch: 873.10 Catch/hour: 1728.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	1240.09	10709	71.75	8
Dentex macrocephthalmus	356.63	4112	20.63	10
Atractoscion aequidens	44.94	28	2.60	
Trachurus trecae	37.18	307	2.15	9
Zenopsis conchifer	17.68	77	1.02	
Dicologlossa cuneata	9.36	325	0.54	
Brotula barbata	7.64	77	0.44	
Trigla lyra	5.27	77	0.30	
Squalus megalops	5.27	20	0.30	
Octopus vulgaris	3.92	10	0.23	
Pontinus accraensis	0.38	10	0.02	
Total	1728.34		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	1026.74	5639	63.68	11
Dentex macrocephthalmus	285.17	2654	17.69	13
Pteroscion peli	118.55	1191	7.35	
Trigla lyra	50.53	705	3.13	
Dicologlossa cuneata	41.73	1181	2.59	
Trachurus trecae	21.41	147	1.33	12
Chelidonichthys capensis	12.99	28	0.81	
Brotula barbata	10.98	65	0.68	
Octopus vulgaris	10.94	24	0.68	
Pontinus accraensis	9.33	220	0.58	
Lophiodes kempii	7.13	10	0.44	
Zeus faber	4.66	37	0.29	
Squilla mantis	4.30	138	0.27	
Raja miraletus	3.56	10	0.22	
Sepia orbignyana	2.83	10	0.18	
Squalus megalops	0.79	2	0.05	
UNIDENTIFIED FISH	0.63	55	0.04	
GOBIIDAE	0.18	16	0.01	
Total	1612.44		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 9
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°4.92
 start stop duration Lon E 11°25.30
 TIME :05:21:15 05:42:44 21.5 (min) Purpose : 3
 LOG : 8335.53 8336.65 1.1 Region : 4000
 FDEPTH: 136 138 Gear cond.: 0
 BDEPTH: 136 138 Validity : 0
 Towing dir: 0° Wire out : 325 m Speed : 3.1 km
 Sorted : 186 Total catch: 966.96 Catch/hour: 2699.75

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 5
 DATE :13.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°13.13
 start stop duration Lon E 11°28.82
 TIME :19:26:21 19:56:53 30.5 (min) Purpose : 3
 LOG : 8289.12 8291.05 1.9 Region : 4000
 FDEPTH: 150 143 Gear cond.: 0
 BDEPTH: 150 143 Validity : 0
 Towing dir: 0° Wire out : 400 m Speed : 3.8 km
 Sorted : 181 Total catch: 820.73 Catch/hour: 1612.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	1354.56	12586	50.17	17
Dentex macrocephthalmus	1157.84	9233	42.89	18
Synagrops microlepis	67.85	17204	2.51	
Trachurus capensis	53.72	391	1.99	19
Scomber japonicus	18.43	45	0.68	
Anthias anthias	16.42	276	0.61	
Trigla lyra	9.88	117	0.37	
Pteroscion peli	6.25	45	0.23	
Squalus megalops	5.67	14	0.21	
Dicologlossa cuneata	4.63	87	0.17	
Trichiurus lepturus	2.90	28	0.11	
Zeus faber	1.59	14	0.06	
Total	2699.75		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 10
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°1.42
 start stop duration Lon E 11°28.19
 TIME :06:41:54 06:59:50 17.9 (min) Purpose : 3
 LOG : 8341.81 8342.80 1.0 Region : 4000
 FDEPTH: 114 112 Gear cond.: 0
 BDEPTH: 114 112 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.3 kn
 Sorted : 187 Total catch: 485.42 Catch/hour: 1623.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	963.04	9749	59.32	20
Merluccius capensis	456.09	4565	28.09	22
Dentex macropthalmus	155.65	1381	9.59	21
Zeus faber	16.35	97	1.01	
Squalus megalops	10.77	33	0.66	
Arius parkii	5.75	17	0.35	
Loligo vulgaris	4.78	33	0.29	
Trichiurus lepturus	3.81	33	0.23	
Engraulis encrasicolus	3.38	43	0.21	
Pteroscion peli	2.44	17	0.15	
Todarodes sagittatus	1.40	17	0.09	
Total	1623.48		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 11
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°59.35
 start stop duration Lon E 11°34.54
 TIME :08:10:36 08:40:36 30.0 (min) Purpose : 3
 LOG : 8350.69 8352.39 1.7 Region : 4000
 FDEPTH: 94 91 Gear cond.: 0
 BDEPTH: 94 91 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.4 kn
 Sorted : 123 Total catch: 833.37 Catch/hour: 1667.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	1286.99	11142	77.19	24
Dentex macropthalmus	166.78	4091	10.00	23
Trachurus trecae	131.00	1567	7.86	25
Pteroscion peli	20.93	244	1.26	
Zeus faber	17.15	40	1.03	
Squalus megalops	12.70	14	0.76	
J E L L Y F I S H	8.38	68	0.50	
Dicologlossa cuneata	6.88	256	0.41	
Trigla lyra	6.62	28	0.40	
Chelidonichthys capensis	4.72	28	0.28	
Sepia orbignyana	3.78	28	0.23	
Trichiurus lepturus	1.36	54	0.08	
Total	1667.30		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 12
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°1.51
 start stop duration Lon E 11°39.37
 TIME :09:33:25 10:04:09 30.7 (min) Purpose : 3
 LOG : 8357.49 8359.12 1.6 Region : 4000
 FDEPTH: 59 60 Gear cond.: 0
 BDEPTH: 59 60 Validity : 0
 Towing dir: 0° Wire out : 170 m Speed : 3.2 kn
 Sorted : 66 Total catch: 779.06 Catch/hour: 1520.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1234.55	22805	81.19	26
Merluccius capensis	110.67	1122	7.28	28
J E L L Y F I S H	99.21	1392	6.52	
Dentex macropthalmus	25.82	943	1.70	27
Zeus faber	15.36	57	1.01	
Sepia orbignyana	13.47	31	0.89	
Illex coindetii	13.25	1729	0.87	
Starfish	4.49	718	0.30	
Dicologlossa cuneata	1.80	68	0.12	
Trigla lyra	0.88	10	0.06	
Raja miraletus	0.88	2	0.06	
Synagrops microlepis	0.23	113	0.02	
Total	1520.61		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 13
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°0.01
 start stop duration Lon E 11°40.95
 TIME :10:44:33 11:15:11 30.6 (min) Purpose : 3
 LOG : 8362.93 8364.45 1.5 Region : 4000
 FDEPTH: 36 34 Gear cond.: 0
 BDEPTH: 36 34 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
 Sorted : 122 Total catch: 430.30 Catch/hour: 842.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	780.22	16811	92.56	29
J E L L Y F I S H	53.14	515	6.30	
Sepia orbignyana	5.13	12	0.61	
Zeus faber	2.14	8	0.25	
Merluccius capensis	1.31	22	0.16	
Starfish	0.55	118	0.07	
Illex coindetii	0.41	76	0.05	
Total	842.90		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 14
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°0.38
 start stop duration Lon E 11°42.93
 TIME :12:04:05 12:13:27 9.4 (min) Purpose : 3
 LOG : 8369.04 8369.50 0.5 Region : 4000
 FDEPTH: 23 21 Gear cond.: 0
 BDEPTH: 23 21 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
 Sorted : 161 Total catch: 807.35 Catch/hour: 5169.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	5111.53	126051	98.87	30
J E L L Y F I S H	30.10	192	0.58	
Sepia orbignyana	26.89	32	0.52	
Illex coindetii	1.28	64	0.02	
Total	5169.80		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 15
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°58.32
 start stop duration Lon E 11°43.08
 TIME :13:04:48 13:10:41 5.9 (min) Purpose : 3
 LOG : 8371.89 8372.17 0.3 Region : 4000
 FDEPTH: 23 22 Gear cond.: 0
 BDEPTH: 23 22 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
 Sorted : 67 Total catch: 7050.06 Catch/hour: 71939.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	71441.84	1930714	99.31	31
Raja miraletus	400.20	1082	0.56	
J E L L Y F I S H	75.71	1082	0.11	
Illex coindetii	21.63	1082	0.03	
Total	71939.39		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 16
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°49.17
 start stop duration Lon E 11°41.23
 TIME :14:24:37 14:37:16 12.7 (min) Purpose : 3
 LOG : 8380.83 8381.43 0.6 Region : 4000
 FDEPTH: 24 25 Gear cond.: 0
 BDEPTH: 24 25 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 2.9 kn
 Sorted : 316 Total catch: 536.50 Catch/hour: 2542.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L L Y F I S H	2223.27	10275	87.44	
Trachurus trecae	258.25	55697	10.16	32
Sepia orbignyana	57.68	128	2.27	
Illex coindetii	3.46	460	0.14	
Total	2542.65		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 17
 DATE :14.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°49.16
 start stop duration Lon E 11°34.87
 TIME :15:48:27 16:07:20 18.9 (min) Purpose : 3
 LOG : 8389.43 8390.36 0.9 Region : 4000
 FDEPTH: 95 96 Gear cond.: 0
 BDEPTH: 95 96 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
 Sorted : 121 Total catch: 726.90 Catch/hour: 2310.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	1206.99	11212	52.25	33
Trachurus trecae	1055.40	13576	45.69	35
Dentex macropthalmus	40.23	1201	1.74	34
Zeus faber	5.72	38	0.25	
Loligo vulgaris	1.72	19	0.07	
Total	2310.06		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 18
 DATE :14.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 17°1.44
 start stop duration Lon E 11°15.24
 TIME :19:54:19 20:17:28 23.1 (min) Purpose : 3
 LOG : 8418.76 8419.91 1.1 Region : 4000
 FDEPTH: 736 773 Gear cond.: 0
 BDEPTH: 736 773 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.0 kn
 Sorted : 57 Total catch: 343.68 Catch/hour: 891.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Malacocephalus occidentalis	430.16	13379	48.27	
Trachyrincus scabrus	170.35	638	19.12	
Alepocephalus sp.	129.90	513	14.58	
Unidentified invertebrate	38.27	124	4.29	
Bathyrcoonger vicinus	21.62	187	2.43	
Aristeus varidens, female	20.22	1602	2.27	
Chaceon maritae, female	14.16	31	1.59	
GONOSTOMATIDAE	12.13	249	1.36	
Melanostomias sp.	7.31	529	0.82	
Cruiriraja varruculata	7.16	78	0.80	
Allocyttus verrucosus	5.76	78	0.65	
Maja squinado	4.20	31	0.47	
Deania calcea	3.89	16	0.44	
OMMASTREPHIDAE	3.89	31	0.44	
Lamprogrammus exultus	2.96	16	0.33	
Synaphobranchus kaupii	2.64	31	0.30	
Hoplostethus cadenati	2.64	62	0.30	
Neoraja stehmanni	2.18	31	0.24	
S H R I M P S	2.02	576	0.23	
Diaphus sp.	1.40	109	0.16	
ALEPOCEPHALIDAE	1.40	218	0.16	
Nemichthys scolopaceus	1.40	467	0.16	
Halosaurus ovenii	1.24	156	0.14	
Yarella blackfordi *	1.09	109	0.12	
Gadella imberbis	0.78	16	0.09	
Heterocephalus grimaldii	0.62	31	0.07	
Triplophos hemingi	0.62	93	0.07	
Melanocetus johnsoni	0.62	16	0.07	
MYCTOPHIDAE	0.47	47	0.05	
Total	891.13		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 19
 DATE :14.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 16°49.97
 start stop duration Lon E 11°17.91
 TIME :22:19:02 22:49:26 30.4 (min) Purpose : 3
 LOG : 8430.80 8432.31 1.5 Region : 4000
 FDEPTH: 345 347 Gear cond.: 0
 BDEPTH: 345 347 Validity : 0
 Towing dir: 0° Wire out : 850 m Speed : 3.0 kn
 Sorted : 128 Total catch: 2066.30 Catch/hour: 4076.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Helicolenus dactylopterus	2287.14	29075	56.10	
Chlorophthalmus atlanticus	748.17	21688	18.35	
Merluccius capensis	524.04	3283	12.85	36
Laemonea laureysi	169.52	2273	4.16	
Caelorinchus coelorrhincus	99.44	2557	2.44	
Aristeus varidens, female	65.03	10354	1.60	
Unidentified invertebrate	61.87	410	1.52	
Lophius vaillanti	44.99	16	1.10	
Callinectes sp.	22.41	442	0.55	
Aristeus varidens, male	12.00	2115	0.29	
Hoplostethus cadenati	9.79	379	0.24	
OMMASTREPHIDAE	7.89	32	0.19	
TRIGLIDAE	5.68	32	0.14	
Plesionika sp.	4.10	1294	0.10	
Unidentified invertebrate	3.47	95	0.09	
Malacocephalus occidentalis	2.53	32	0.06	
Yarella blackfordi *	2.53	189	0.06	
MYCTOPHIDAE	2.21	410	0.05	
Galeus polli	1.54	14	0.04	
G A S T R O P O D S	1.26	221	0.03	
Nemichthys scolopaceus	0.63	189	0.02	
Acanthephyra sp.	0.63	316	0.02	
Total	4076.88		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 20
 DATE :15.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 16°34.34
 start stop duration Lon E 11°19.02
 TIME :01:18:33 01:41:43 23.2 (min) Purpose : 3
 LOG : 8447.48 8448.63 1.2 Region : 4000
 FDEPTH: 621 731 Gear cond.: 0
 BDEPTH: 621 731 Validity : 0
 Towing dir: 0° Wire out : 1550 m Speed : 3.0 km
 Sorted : 55 Total catch: 498.69 Catch/hour: 1291.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachyrincus scabrus	367.59	2092	28.46	
Caelorhynchus coelorhynchus	147.92	3726	11.45	
Hoplostethus cadenati	143.07	9312	11.08	
OMMASTREPHIDAE	113.34	176	8.78	
Talismania longifilis	104.98	992	8.13	
UNIDOOD	66.24	243	5.13	
Yarella blackfordi *	53.71	2641	4.16	
Malacocephalus occidentalis	46.90	420	3.63	
S H R I M P S	34.10	4894	2.64	
Chaceon maritae, male	31.33	47	2.43	
Octopus sp.	29.73	23	2.30	
Lophius vaillanti	24.47	8	1.89	
Benthodesmus tenuis	24.42	352	1.89	
Helicolenus dactylopterus	20.90	220	1.62	
Merluccius polli	20.59	0	1.59	
Laemonema laureysi	7.04	264	0.55	
Emopterus pusillus	7.04	23	0.55	
Raja sp.	6.40	44	0.50	
CONGRIDAE	6.40	197	0.50	
Paramola cuvieri	6.16	21	0.48	
Aristeus varidens, female	5.72	508	0.44	
Synphobranchius kaupii	4.84	44	0.37	
Chaceon maritae, female	4.40	23	0.34	
ALEPOCEPHALIDAE	3.75	505	0.29	
Melanostomias sp.	2.64	264	0.20	
Bathyroconger vicinus	2.20	65	0.17	
Halosaurus ovenii	1.99	21	0.15	
MYCTOPHIDAE	1.09	163	0.08	
Nemichthys scolopaceus	0.88	111	0.07	
Lamprogrammus exutus	0.88	65	0.07	
Aristeus varidens, male	0.44	88	0.03	
Acanthephyra sp.	0.21	21	0.02	
Total	1291.39		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 21
 DATE :15.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 16°38.45
 start stop duration Lon E 11°23.89
 TIME :05:26:54 05:56:22 29.5 (min) Purpose : 3
 LOG : 8463.71 8465.21 1.5 Region : 4000
 FDEPTH: 126 125 Gear cond.: 0
 BDEPTH: 126 125 Validity : 0
 Towing dir: 0° Wire out : 330 m Speed : 3.1 km
 Sorted : 192 Total catch: 670.78 Catch/hour: 1366.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	800.88	4890	58.62	37
Dentex macrophthalmus	361.41	2737	26.45	38
Pterothrissus belloei	88.39	749	6.47	
Squalus megalops	31.79	79	2.33	
Umrina canariensis	24.18	61	1.77	
Trachurus trecae	19.67	100	1.44	
Atractoscion aequidens	18.90	14	1.38	
Trigla lyra	11.34	94	0.83	
Scorpaena normani	3.42	43	0.25	
Zeus faber	2.79	8	0.20	
Todaropsis eblanae	1.08	22	0.08	
Trichiurus lepturus	0.94	8	0.07	
Citharus linguatula	0.57	29	0.04	
Illex coindetii	0.43	8	0.03	
Arnoglossus imperialis	0.37	8	0.03	
Total	1366.15		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 22
 DATE :15.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 16°35.77
 start stop duration Lon E 11°26.10
 TIME :06:47:59 07:18:11 30.2 (min) Purpose : 3
 LOG : 8469.16 8470.88 1.7 Region : 4000
 FDEPTH: 120 118 Gear cond.: 0
 BDEPTH: 120 118 Validity : 0
 Towing dir: 0° Wire out : 320 m Speed : 3.4 km
 Sorted : 17 Total catch: 163.55 Catch/hour: 324.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	196.62	2312	60.53	40
Trachurus trecae	54.92	465	16.91	41
Merluccius capensis	37.64	197	11.59	39
Squalus megalops	11.52	26	3.55	
Zeus faber	6.43	14	1.98	
Pterothrissus belloei	3.65	30	1.13	
Atractoscion aequidens	3.22	4	0.99	
Chelidonichthys capensis	2.72	22	0.84	
Loligo vulgaris	2.46	10	0.76	
Trigla lyra	2.16	20	0.67	
Todaropsis eblanae	1.35	24	0.42	
Trichiurus lepturus	0.99	10	0.31	
Lagocephalus laevigatus	0.46	2	0.14	
Pagellus bellottii	0.38	2	0.12	
Umrina canariensis	0.26	2	0.08	
Sepia officinalis hierredda	0.04	2	0.01	
Total	324.83		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 23
 DATE :15.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°35.47
 start stop duration Lon E 11°36.24
 TIME :08:56:05 09:02:55 6.8 (min) Purpose : 3
 LOG : 8483.06 8483.45 0.4 Region : 4000
 FDEPTH: 89 89 Gear cond.: 0
 BDEPTH: 89 89 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.5 km
 Sorted : 196 Total catch: 1604.16 Catch/hour: 14112.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	12227.86	204229	86.64	44
Merluccius capensis	1475.28	13416	10.45	43
Dentex macrophthalmus	217.87	6853	1.54	42
Zeus faber	49.78	70	0.35	
Todarodes sagittatus	40.40	361	0.29	
Chelidonichthys capensis	37.51	70	0.27	
Loligo vulgaris	35.35	70	0.25	
Todaropsis eblanae	28.86	141	0.20	
Total	14112.90		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 24
 DATE :15.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°24.53
 start stop duration Lon E 11°45.82
 TIME :10:51:25 11:22:35 31.2 (min) Purpose : 3
 LOG : 8498.29 8500.04 1.8 Region : 4000
 FDEPTH: 20 22 Gear cond.: 0
 BDEPTH: 20 22 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.4 km
 Sorted : 72 Total catch: 608.52 Catch/hour: 1171.73

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L L Y F I S H	586.91	3404	50.09	
Trachurus trecae	478.31	4252	40.82	46
Gymnura micrura	30.13	2	2.57	
Dasyatis marmorata	16.85	2	1.44	
Loligo vulgaris	15.25	77	1.30	
Pagellus bellottii	13.56	246	1.16	45
Sepia orbignyana	12.80	40	1.09	
Boops boops	4.62	123	0.39	
Mobula rochebrunei	3.79	4	0.32	
Ommastrephes pteropus	2.46	15	0.21	
Spondyliosoma cantharus	2.31	46	0.20	
Starfish	2.00	447	0.17	
Zeus faber	1.23	2	0.11	
Dicologlossa cuneata	0.77	15	0.07	
Raja miraletus	0.73	2	0.06	
Total	1171.73		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 25
 DATE :15.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°24.89
 start stop duration Lon E 11°43.34
 TIME :12:14:07 12:22:37 8.5 (min) Purpose : 3
 LOG : 8504.84 8505.25 0.4 Region : 4000
 FDEPTH: 51 48 Gear cond.: 0
 BDEPTH: 51 48 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.0 km
 Sorted : 161 Total catch: 5309.37 Catch/hour: 37522.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	36708.13	725067	97.83	47
Dentex macrophthalmus	578.37	28919	1.54	48
J E L L Y F I S H	184.24	1399	0.49	
Merluccius polli	51.31	466	0.14	
Total	37522.05		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 26
 DATE :15.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°12.50
 start stop duration Lon E 11°36.20
 TIME :14:06:58 14:37:32 30.6 (min) Purpose : 3
 LOG : 8519.23 8520.86 1.6 Region : 4000
 FDEPTH: 73 72 Gear cond.: 0
 BDEPTH: 73 72 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.2 km
 Sorted : 57 Total catch: 57.24 Catch/hour: 112.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	24.05	94	21.40	49
Illex coindetii	23.25	6450	20.68	
Zeus faber	17.28	41	15.37	
Sepia orbignyana	9.37	35	8.33	
Trachurus trecae	8.62	171	7.67	51
Saurida brasiliensis	6.93	1280	6.17	
Loligo vulgaris	5.89	24	5.24	
Squalus megalops	5.10	6	4.54	
Chelidonichthys gabonensis	4.85	80	4.32	
Dentex macrophthalmus	3.04	296	2.71	50
Atractoscion aequidens	2.71	4	2.41	
Scorpaena stephanica	0.53	4	0.47	
Dentex barnardi	0.53	2	0.47	
Citharus linguatula	0.24	4	0.21	
Total	112.38		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 27
 DATE :15.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°12.11
 start stop duration Lon E 11°43.58
 TIME :15:49:55 16:18:48 28.9 (min) Purpose : 3
 LOG : 8529.38 8531.13 1.8 Region : 4000
 FDEPTH: 49 49 Gear cond.: 0
 BDEPTH: 49 49 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.6 km
 Sorted : 97 Total catch: 409.78 Catch/hour: 851.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	633.85	15693	74.48	54
Lithognathus mormyrus	55.66	216	6.54	
Pagellus bellottii	44.20	631	5.19	53
Merluccius capensis	34.39	199	4.04	52
Loligo vulgaris	28.66	457	3.37	
Mustelus mustelus	25.34	27	2.98	
Dasyatis marmorata	12.98	4	1.53	
Pomatomus saltatrix	6.15	2	0.72	
Myliobatis aquila	3.51	2	0.41	
Zeus faber	3.32	8	0.39	
Atractoscion aequidens	2.99	8	0.35	
Total	851.05		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 28
 DATE :17.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 12°35.93
 start stop duration Lon E 13°22.01
 TIME :04:52:41 05:22:23 29.7 (min) Purpose : 3
 LOG : 8822.45 8823.90 1.5 Region : 4000
 FDEPTH: 737 727 Gear cond.: 0
 BDEPTH: 737 727 Validity : 0
 Towing dir: 0° Wire out : 1750 m Speed : 2.9 kn
 Sorted : 58 Total catch: 162.64 Catch/hour: 328.57

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 31
 DATE :18.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 12°22.44
 start stop duration Lon E 13°16.95
 TIME :05:17:05 05:47:07 30.0 (min) Purpose : 3
 LOG : 8976.53 8977.99 1.5 Region : 4000
 FDEPTH: 725 728 Gear cond.: 0
 BDEPTH: 725 728 Validity : 0
 Towing dir: 0° Wire out : 1700 m Speed : 2.9 kn
 Sorted : 75 Total catch: 226.47 Catch/hour: 452.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Talismania oregonia	58.34	572	17.76	
Yarella blackfordi *	45.72	1147	13.91	
Glyphus marsupialis	41.41	1804	12.60	
Malacocephalus laevis	27.78	455	8.45	
Chaceon maritae, male	25.35	107	7.72	
Lophiodes kempi	18.79	2	5.72	
Nezumia micronychodon	13.94	374	4.24	
Bathyroconger vicinus	11.62	719	3.54	
Chaceon maritae, female	10.20	57	3.11	
L O B S T E R S	9.90	697	3.01	
Dicrolene intronigra	9.90	299	3.01	
MYCTOPHIDAE	9.13	6	2.78	
Aristeus varidens, female	7.07	451	2.15	
Raja confundens	5.21	10	1.59	
Hoplostethus cadenati	5.15	111	1.57	
Halosaurus ovenii	5.15	91	1.57	
Ijmaia lopesi	4.46	2	1.36	
Stomias boa boa	4.10	97	1.25	
Raja doutrei	3.54	6	1.08	
Ebinania costaecanarie	3.33	16	1.01	
Dibranchius atlanticus	2.79	107	0.85	
SEPIIDAE	1.62	10	0.49	
Aristeus varidens, male	1.21	168	0.37	
Deania profundorum	0.85	4	0.26	
GALATHEIDAE *	0.81	1097	0.25	
Triplophos hemingi	0.77	97	0.23	
SYNAPHOBRANCHIDAE	0.36	6	0.11	
Nemichthys scolopaceus	0.06	6	0.02	
Total	328.57		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chaceon maritae	77.32	342	17.09	
Yarella blackfordi *	67.13	1696	14.84	
Maloprogrammus exitus	64.44	228	14.24	
Malacocephalus laevis	45.49	1151	10.05	
Talismania longifiliis	35.72	857	7.90	
Hoplostethus cadenati	33.39	755	7.38	
Chaceon maritae, male	17.80	66	3.93	
Aristeus varidens, female	14.57	1009	3.22	
L O B S T E R S	12.35	1121	2.73	
Bathyroconger vicinus	10.43	186	2.30	
Triplophos hemingi	9.83	456	2.17	
Halosaurus ovenii	9.71	174	2.15	
Stomias boa boa	9.53	222	2.11	
Etmopterus polli	7.37	72	1.63	
Raja alba	6.05	54	1.34	
Todaropsis eblanae	5.87	24	1.30	
Aristeus varidens, male	5.45	767	1.21	
Dicrolene intronigra	4.74	396	1.05	
Dibranchius atlanticus	4.14	234	0.91	
Opisthoteuthis agassizi	2.70	6	0.60	
J E L L Y F I S H	2.40	12	0.53	
Ebinania costaecanarie	1.86	12	0.41	
Glyphus marsupialis	1.62	168	0.36	
OCTOPOTEUTHIDAE	1.14	6	0.25	
GALATHEIDAE *	0.90	719	0.20	
SYNAPHOBRANCHIDAE	0.48	18	0.11	
Nemichthys scolopaceus	0.06	12	0.01	
Total	452.49		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 29
 DATE :17.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°27.02
 start stop duration Lon E 13°22.75
 TIME :08:31:53 08:58:35 26.7 (min) Purpose : 3
 LOG : 8845.62 8846.99 1.4 Region : 4000
 FDEPTH: 95 91 Gear cond.: 0
 BDEPTH: 95 91 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.1 kn
 Sorted : 135 Total catch: 217.68 Catch/hour: 489.17

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 32
 DATE :18.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 12°16.65
 start stop duration Lon E 13°24.49
 TIME :07:31:43 08:01:24 29.7 (min) Purpose : 3
 LOG : 8987.28 8988.94 1.7 Region : 4000
 FDEPTH: 109 109 Gear cond.: 0
 BDEPTH: 109 109 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.4 kn
 Sorted : 22 Total catch: 22.17 Catch/hour: 44.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	144.61	1483	29.56	
Dentex macrophthalmus	48.04	357	9.82	56
Umbrina canariensis	46.52	108	9.51	58
Citharus linguatula	37.64	631	7.69	
Selene dorsalis	36.40	106	7.44	
Pagellus bellottii	19.99	106	3.96	55
Stromateus fiatola	17.71	20	3.62	
Trachurus trecae	16.04	348	3.28	59
Sepia orbignyana	14.54	13	2.97	
Zeus faber	13.66	47	2.79	
Pterothrissus belloci	12.85	169	2.63	
Brotula barbata	10.72	34	2.19	
Raja miraletus	9.01	18	1.84	
Chelidonichthys capensis	8.90	72	1.82	
Cynoponticus ferox	7.19	2	1.47	
Uranoscopus cadenati	6.88	20	1.41	
Miracorvina angolensis	6.25	25	1.28	
Scorpaena normani	6.11	67	1.25	
Rhinobatos albomaculatus	6.07	2	1.24	
Dentex angolensis	5.80	81	1.19	57
Lophius sp.	3.10	11	0.63	
Chaetodon hoefleri	3.01	18	0.67	
Octopus vulgaris	2.88	2	0.59	
Octopus macropus	1.82	2	0.37	
Dentex barnardi	0.99	4	0.20	
Torpedo torpedo	0.88	4	0.18	
Boops boops	0.61	7	0.12	
Pteroscion peli	0.61	119	0.12	
Parapanaeus longirostris	0.38	74	0.08	
Monolene microstoma	0.31	4	0.06	
Saurida brasiliensis	0.25	58	0.05	
Total	489.17		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Anthias anthias	19.91	150	44.43	
Dentex barnardi	5.36	18	11.95	
Chelidonichthys capensis	4.89	42	10.92	
Zeus faber	4.65	61	10.37	
Dentex angolensis	3.35	18	7.49	
Raja miraletus	2.34	4	5.23	
Umbrina canariensis	1.68	8	3.74	
Dentex macrophthalmus	0.63	2	1.40	
Pagellus bellottii	0.59	6	1.31	
Lophius vaillanti	0.57	4	1.26	
Pontinus sp.	0.53	4	1.17	
Chaetodon hoefleri	0.32	2	0.72	
Total	44.80		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 30
 DATE :17.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°27.92
 start stop duration Lon E 13°24.21
 TIME :09:42:25 10:12:54 30.0 (min) Purpose : 3
 LOG : 8850.47 8851.97 1.5 Region : 4000
 FDEPTH: 67 69 Gear cond.: 0
 BDEPTH: 67 69 Validity : 0
 Towing dir: 0° Wire out : 180 m Speed : 3.0 kn
 Sorted : 200 Total catch: 800.88 Catch/hour: 1601.76

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 33
 DATE :18.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 12°15.56
 start stop duration Lon E 13°27.21
 TIME :08:44:56 09:05:45 20.8 (min) Purpose : 3
 LOG : 8992.25 8993.32 1.1 Region : 4000
 FDEPTH: 98 98 Gear cond.: 0
 BDEPTH: 98 98 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.1 kn
 Sorted : 19 Total catch: 84.35 Catch/hour: 243.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	832.80	6512	51.99	62
Pomadasyis jubelini	156.00	1200	9.74	
Pagellus bellottii	96.80	3808	6.04	63
Umbrina canariensis	92.40	336	5.77	60
Pomadasyis incisus	74.80	432	4.67	64
Trachurus trecae	67.20	2432	4.20	65
Trichiurus lepturus	50.08	584	3.13	
Citharus linguatula	45.20	1336	2.82	
Selene dorsalis	26.40	88	1.65	
Brotula barbata	25.44	264	1.59	
Raja miraletus	25.04	32	1.56	
Lithognathus mormyrus	15.60	32	0.97	
Torpedo torpedo	12.96	24	0.81	
Sepia orbignyana	11.68	40	0.73	
Chelidonichthys capensis	11.04	96	0.69	
Grammolites gruvelli	9.60	152	0.60	
Epinephelus guaza ?	8.88	8	0.55	
Argyrosomus hololepidotus	7.76	8	0.48	
Serranus cabrilla	6.80	72	0.42	
Stromateus fiatola	6.16	8	0.38	
Pseudupeneus prayensis	4.48	32	0.28	
Dentex angolensis	3.44	56	0.21	66
Parapanaeus longirostris,femal	3.44	1304	0.21	
GOBIIDAE	1.84	304	0.11	
Miracorvina angolensis	1.52	16	0.09	
Scorpaena normani	1.44	64	0.09	
Dentex barnardi	1.36	16	0.08	
Spondylisoma cantharus	0.48	8	0.03	
Parapanaeus longirostris, male	0.32	64	0.02	
ANTENNARIIDAE	0.32	8	0.02	
Boops boops	0.32	8	0.02	
Chlorophthalmus atlanticus	0.16	16	0.01	
Total	1601.76		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	51.75	395	21.28	69
Boops boops	50.46	900	20.75	
Umbrina canariensis	48.58	164	19.98	70
Trachurus trecae	44.11	1793	18.14	67
Dentex barnardi	18.45	58	7.59	
Pagellus bellottii	17.88	141	7.35	71
Dentex angolensis	11.97	110	4.92	68
Total	243.20		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 34
 DATE :18.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°16.54
 start stop duration Lon E 13°31.72
 TIME :10:11:59 10:41:51 29.9 (min) Purpose : 3
 LOG : 8998.82 9000.37 1.6 Region : 4000
 FDEPTH: 75 71 Gear cond.: 0
 BDEPTH: 75 71 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.1 kn
 Sorted : 157 Total catch: 485.35 Catch/hour: 974.92

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 34
 DATE :18.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°16.54
 start stop duration Lon E 13°31.72
 TIME :10:11:59 10:41:51 29.9 (min) Purpose : 3
 LOG : 8998.82 9000.37 1.6 Region : 4000
 FDEPTH: 75 71 Gear cond.: 0
 BDEPTH: 75 71 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.1 kn
 Sorted : 157 Total catch: 485.35 Catch/hour: 974.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	421.53	3122	43.24	
Pomadasyis incisus	173.85	1241	17.83	
Pagellus bellottii	88.28	934	9.06	73
Trachurus trecae	49.72	2196	5.10	75
Brachydeuterus auritus	45.20	416	4.64	72
Dentex angolensis	23.20	380	2.38	74
Raja miraletus	16.51	24	1.69	
Rhinobatos albomaculatus	15.97	6	1.64	
Sepia orbignyana	13.66	14	1.40	
Zeus faber	12.72	30	1.30	
Chelidonichthys capensis	12.35	121	1.27	
Trichiurus lepturus	11.81	229	1.21	
Citharus linguatula	11.09	434	1.14	
Dentex macrophthalmus	9.88	145	1.01	
Pseudupeneus prayensis	9.88	78	1.01	
Umbrina canariensis	9.40	36	0.96	
Ephippion guttifer	7.89	6	0.81	
Octopus vulgaris	7.65	6	0.79	
Dentex barnardi	7.47	48	0.77	
Torpedo torpedo	5.42	24	0.56	
Chaetodon hoefleri	3.80	24	0.39	
Alloteuthis africana	2.59	1464	0.27	
Lithognathus mormyrus	2.53	6	0.26	
Sphoeroides pachgaster	2.29	6	0.23	
Brotula barbata	2.05	6	0.21	
Pterothrissus belloci	1.81	24	0.19	
Sardinella aurita	1.81	30	0.19	
Serranus accraensis	1.21	18	0.12	
Fistularia petimba	1.06	2	0.11	
Scomber japonicus	1.02	6	0.11	
Boops boops	0.90	18	0.09	
Chlorophthalmus atlanticus	0.18	30	0.02	
Saurida brasiliensis	0.18	24	0.02	
Total	974.92		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 35
 DATE :18.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°16.70
 start stop duration Lon E 13°34.20
 TIME :11:22:37 11:51:05 28.5 (min) Purpose : 3
 LOG : 9003.34 9004.82 1.5 Region : 4000
 FDEPTH: 53 56 Gear cond.: 0
 BDEPTH: 53 56 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.1 kn
 Sorted : 122 Total catch: 741.97 Catch/hour: 1563.69

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 38
 DATE :18.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°59.16
 start stop duration Lon E 13°31.92
 TIME :16:38:03 17:06:02 28.0 (min) Purpose : 3
 LOG : 9035.74 9037.17 1.4 Region : 4000
 FDEPTH: 102 102 Gear cond.: 0
 BDEPTH: 102 102 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.1 kn
 Sorted : 106 Total catch: 424.96 Catch/hour: 911.28

SPECIES	CATCH/HOUR	weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	999.58	4046	63.92		
Selene dorsalis	179.56	670	11.48		
Pomadasy peroteti	128.35	190	8.21		
Pomadasy incisus	121.39	961	7.76		
Chloroscombrus chrysurus	50.45	316	3.23		
Brachydeuterus auritus	32.62	443	2.09		
Lithognathus mormyrus	22.00	51	1.41		
Rhinobatos albomaculatus	5.80	2	0.37		
Pseudotolithus senegalensis	5.37	6	0.34		
Sepia orbignyana	3.69	4	0.24		
Epinephelus aeneus	3.27	2	0.21		
Sardinella aurita	2.02	13	0.13		
Raja miraletus	1.94	2	0.12		
Citharus linguatula	1.90	42	0.12		
Dentex barnardi	1.83	8	0.12		
Trachurus trecae	1.64	63	0.11		
Umbrina canariensis	1.64	13	0.11		
Pagellus bellottii	0.63	4	0.04		
Total	1563.69		100.00		

SPECIES	CATCH/HOUR	weight	numbers	% OF TOT. C	SAMP
Boops boops	345.68	5352	37.93		
Anthias anthias	131.24	1012	14.40		
Dentex barnardi	111.94	326	12.28		
Umbrina canariensis	92.64	317	10.17		85
Plectorhynchus macrolepis	46.23	60	5.07		
Trachurus trecae	45.29	2719	4.97		86
Erythrocles monodi	33.11	60	3.63		
Pagrus africanus	23.85	34	2.62		
Sphoeroides pachgaster	15.87	9	1.74		
Dentex angolensis	13.90	69	1.52		
Spondyliosoma cantharus	12.87	17	1.41		
Pagellus bellottii	12.01	43	1.32		
Pagrus caeruleostictus	11.41	9	1.25		
Zenopsis conchifer	9.35	9	1.03		
Atractoscion aeguidens	4.55	2	0.50		
Pontinus sp.	0.86	9	0.09		
Chaetodon marcellae	0.51	9	0.06		
Total	911.28		100.00		

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 36
 DATE :18.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°2.42
 start stop duration Lon E 13°38.94
 TIME :13:45:38 14:14:02 28.4 (min) Purpose : 3
 LOG : 9022.07 9023.61 1.6 Region : 4000
 FDEPTH: 53 59 Gear cond.: 0
 BDEPTH: 53 59 Validity : 0
 Towing dir: 0° Wire out : 145 m Speed : 3.3 kn
 Sorted : 124 Total catch: 743.40 Catch/hour: 1570.01

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 39
 DATE :18.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°58.26
 start stop duration Lon E 13°29.84
 TIME :18:17:31 18:47:23 29.9 (min) Purpose : 3
 LOG : 9042.21 9043.71 1.5 Region : 4000
 FDEPTH: 262 271 Gear cond.: 0
 BDEPTH: 262 271 Validity : 0
 Towing dir: 0° Wire out : 625 m Speed : 3.0 kn
 Sorted : 65 Total catch: 227.79 Catch/hour: 457.56

SPECIES	CATCH/HOUR	weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	696.94	9561	44.39		76
Trichiurus lepturus	360.51	1356	22.96		
Pomadasy incisus	140.65	1204	8.96		
Trachurus trecae	117.85	3489	7.51		78
Sardinella aurita	86.80	1457	5.53		79
Pagellus bellottii	79.83	760	5.08		77
Dentex barnardi	19.77	139	1.26		
Sphyrna sphyraena	9.76	38	0.62		
Raja miraletus	9.38	13	0.60		
Sepia orbignyana	6.08	13	0.39		
Umbrina canariensis	6.08	38	0.39		
Pseudupeneus prayensis	5.83	63	0.37		
Lithognathus mormyrus	5.83	13	0.37		
Selene dorsalis	5.70	51	0.36		
Fistularia tabacaria	4.69	13	0.30		
Lagocephalus laevigatus	4.31	13	0.27		
Boops boops	3.93	25	0.25		
Argyrosomus hololepidotus	2.41	13	0.15		
Citharus linguatula	1.90	63	0.12		
Chelidonichthys gabonensis	1.52	13	0.10		
Alloteuthis africana	0.25	139	0.02		
Total	1570.01		100.00		

SPECIES	CATCH/HOUR	weight	numbers	% OF TOT. C	SAMP
Saurida brasiliensis	158.19	5450	34.57		
Merluccius polli	129.00	506	28.19		87
Nezumia aequalis	42.89	633	9.37		
Synagrops microlepis	33.89	2348	7.41		
Hoplostethus atlanticus	20.81	36	4.55		
Pterothrissus belloci	14.20	84	3.10		
Brotula barbata	13.36	14	2.92		
Dentex macrophthalmus	12.45	56	2.72		
Raja alba	9.28	8	2.03		88
Pontinus sp.	6.75	127	1.48		
Dirolene inronigra	5.28	169	1.15		
Bembrops greyi	4.22	64	0.92		
Zenopsis conchifer	2.95	14	0.65		
Parapenaeus longirostris,femal	1.83	239	0.40		
Bathyrcongiger vicinus	0.98	36	0.22		
Calappa sp.	0.56	14	0.12		
Peristedion cataphractum	0.56	92	0.12		
MYCTOPHIDAE	0.22	177	0.05		
Parapenaeus longirostris, male	0.14	28	0.03		

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 37
 DATE :18.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°0.04
 start stop duration Lon E 13°37.05
 TIME :15:00:08 15:30:15 30.1 (min) Purpose : 3
 LOG : 9027.08 9028.59 1.5 Region : 4000
 FDEPTH: 72 70 Gear cond.: 0
 BDEPTH: 72 70 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.0 kn
 Sorted : 227 Total catch: 226.86 Catch/hour: 451.76

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 40
 DATE :18.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°56.64
 start stop duration Lon E 13°23.33
 TIME :20:34:35 21:04:06 29.5 (min) Purpose : 3
 LOG : 9051.87 9053.36 1.5 Region : 4000
 FDEPTH: 483 484 Gear cond.: 0
 BDEPTH: 483 484 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 3.0 kn
 Sorted : 35 Total catch: 243.39 Catch/hour: 494.86

SPECIES	CATCH/HOUR	weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	111.82	1981	24.75		84
Pseudupeneus prayensis	64.32	613	14.24		
Trachurus trecae	63.03	3116	13.95		82
Umbrina canariensis	40.13	135	8.88		83
Pagellus bellottii	34.95	587	7.74		80
Dentex barnardi	28.08	165	6.22		
Raja miraletus	24.69	40	5.47		
Pomadasy incisus	21.51	201	4.76		
Sepia orbignyana	20.91	22	4.63		
Zeus faber	9.86	20	2.18		
Rhinobatos albomaculatus	5.87	2	1.30		
Octopus vulgaris	4.36	2	0.97		
Chelidonichthys gabonensis	4.30	36	0.95		
Fistularia tabacaria	3.07	8	0.68		
Pseudotolithus senegalensis	2.89	2	0.64		
Alloteuthis africana	2.87	1211	0.63		
Torpedo torpedo	1.85	2	0.41		
Trichiurus lepturus	1.61	4	0.36		
Dentex angolensis	1.53	26	0.34		81
Sphyrna guachancho	1.43	6	0.32		
Citharus linguatula	1.08	28	0.24		
Chaetodon hoefleri	1.02	6	0.22		
Boops boops	0.32	6	0.07		
Serranus cabrilla	0.16	2	0.04		
Arnoglossus imperialis	0.12	8	0.03		
Total	451.76		100.00		

SPECIES	CATCH/HOUR	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	206.37	5217	41.70		
Chaceon maritae, male	93.65	356	18.92		
Hoplostethus atlanticus	29.32	100	5.92		
Aristeus varidens, female	27.04	1608	5.46		
Trichiurus lepturus	19.64	740	3.97		
Yarrella blackfordi	18.64	655	3.77		
Stomias boa boa	17.51	470	3.54		
Triplophos hemingi	13.66	1708	2.76		
Aristeus varidens, male	11.81	1381	2.39		
Laemonema laureysi	11.10	854	2.24		
Chlorophthalmus atlanticus	10.67	285	2.16		
Merluccius polli	10.39	14	2.10		
Etmopterus polli	5.55	85	1.12		
Gadella imberbis	3.56	171	0.72		
Malacocephalus occidentalis	3.42	28	0.69		
Calappa sp.	2.99	57	0.60		
Chaceon maritae	1.99	14	0.40		
L O B S T E R S	1.42	28	0.29		
Halosaurus ovenii	1.42	57	0.29		
Glyphus marsupialis	1.14	260	0.23		
Lamprogrammus exutus	1.00	28	0.20		
Photonetes braueri	1.00	71	0.20		
Talismania longifilis	0.71	43	0.14		
Chaunax pictus	0.71	28	0.14		
Nemichthys scolopaceus	0.14	14	0.03		
Total	494.86		100.00		

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 41
 DATE :18.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°55.15
 start stop duration Lon E 13°21.44
 TIME :22:28:04 22:58:13 30.0 (min) Purpose : 3
 LOG : 9058.02 9059.47 1.5 Region : 4000
 FDEPTH: 576 580 Gear cond.: 0
 BDEPTH: 576 580 Validity : 0
 Towing dir: 0° Wire out : 0 m Speed : 3.0 kn
 Sorted : 66 Total catch: 398.52 Catch/hour: 13.28

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 44
 DATE :19.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°45.48
 start stop duration Lon E 13°28.86
 TIME :07:03:55 07:18:57 15.0 (min) Purpose : 3
 LOG : 9097.56 9098.36 0.8 Region : 4000
 FDEPTH: 164 162 Gear cond.: 0
 BDEPTH: 164 162 Validity : 0
 Towing dir: 0° Wire out : 420 m Speed : 3.2 kn
 Sorted : 64 Total catch: 1166.66 Catch/hour: 77.79

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	209.40	8042	26.27
Yarella blackfordi	114.60	4176	14.38
Nematocarcinus africanus	100.20	22972	12.57
Chaceon maritae, female	94.20	372	11.82
Triplophos hemingi	75.84	9480	9.52
Lamprogrammus exutus	34.44	1280	4.32
Merluccius polli	32.40	48	4.07
Aristeus varidens, female	30.96	1572	3.88
Chaceon maritae, male	23.52	72	2.95
Gonostoma elongatum	21.24	580	2.66
Benthodesmus sp.	13.56	552	1.70
Aristeus varidens, male	8.76	1152	1.10
Nezumia micronychodon	7.44	348	0.93
Bathueroconger vicinus	7.32	468	0.92
Stereomastis sp.	3.84	504	0.48
Glyphus marsupialis	3.72	852	0.47
Plesiopenaeus edwardsianus	3.24	324	0.41
Laemonema laureysi	2.64	24	0.33
OMMASTREPHIDAE	1.80	12	0.23
Xenodermichthys copei	1.56	168	0.20
Cataetix laticeps	1.56	264	0.20
Chlorophthalmus atlanticus	1.32	36	0.17
ALEPOCEPHALIDAE	1.08	132	0.14
Deania profundorum	1.08	24	0.14
Nemichthys scolopaceus	0.60	24	0.08
Melanocetus johnsoni	0.48	12	0.06
Halosaurus ovenii	0.24	12	0.03
Total	797.04		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	4394.68	551130	94.42
Citharus linguatula	52.42	862	1.13
Brotula barbata	49.07	48	1.05
Torpedo torpedo	47.39	72	1.02
Dentex macrophthalmus	32.67	156	0.70
Trachurus trecae	28.72	1652	0.62
Bembrops greyi	16.52	144	0.35
Dentex angolensis	11.93	32	0.26
Loligo vulgaris	9.34	215	0.20
Saurida brasiliensis	5.03	503	0.11
Octopus macropus	3.59	72	0.08
Parapenaeus longirostris	2.87	934	0.06
Total	4654.23		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 45
 DATE :19.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°45.46
 start stop duration Lon E 13°32.53
 TIME :08:21:38 08:51:40 30.0 (min) Purpose : 3
 LOG : 9103.50 9105.03 1.5 Region : 4000
 FDEPTH: 111 111 Gear cond.: 0
 BDEPTH: 111 111 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.1 kn
 Sorted : 83 Total catch: 83.14 Catch/hour: 166.17

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	42.47	422	25.56
Dentex macrophthalmus	40.97	238	24.66
Trigla lyra	13.39	132	8.06
Brachydeuterus auritus	10.95	50	6.59
Raja miraletus	9.59	12	5.77
Citharus linguatula	7.67	216	4.62
Pagellus bellottii	5.32	44	3.20
Octopus macropus	5.06	14	3.04
Lagocephalus laevigatus	4.84	12	2.91
Zeus faber	4.06	8	2.44
Trachurus trecae	3.64	160	2.19
Branchiostegus semifasciatus *	3.58	8	2.15
Chaetabrus melanurus	3.52	16	2.12
Torpedo sp.	2.86	2	1.72
Torpedo marmorata	1.98	2	1.19
Chaetodipterus gorenensis	1.34	8	0.81
Loligo vulgaris	1.18	56	0.71
Uranoscopus cadenati	1.12	4	0.67
Sepia officinalis hierredda	0.96	6	0.58
Zenopsis conchifer	0.72	2	0.43
Todarodes sagittatus	0.54	2	0.32
Boops boops	0.28	6	0.17
Dicologlossa cuneata	0.14	2	0.08
Total	166.17		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 42
 DATE :19.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°44.45
 start stop duration Lon E 13°17.98
 TIME :01:31:32 02:02:52 31.4 (min) Purpose : 3
 LOG : 9073.79 9075.39 1.6 Region : 4000
 FDEPTH: 700 706 Gear cond.: 0
 BDEPTH: 700 706 Validity : 0
 Towing dir: 0° Wire out : 1540 m Speed : 3.1 kn
 Sorted : 31 Total catch: 220.83 Catch/hour: 7.03

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Melanostomias sp.	99.54	1969	23.55
Triplophos hemingi	73.01	6605	17.40
Nematocarcinus africanus	73.01	19761	17.28
Yarella blackfordi	57.34	1701	13.57
Hoplostethus cadenati	57.07	1849	13.50
Benthodesmus tenuis	16.21	509	3.84
Plesiopenaeus edwardsianus	5.76	482	1.36
Aristeus varidens, female	5.09	281	1.20
Nezumia micronychodon	4.69	134	1.11
Merluccius polli	4.59	6	1.09
Neonesthes capensis	3.62	228	0.86
Stereomastis sp.	2.95	549	0.70
Bajacalifornia magalops	2.28	67	0.54
APOGONIDAE	2.01	40	0.48
Bathueroconger vicinus	1.88	46	0.44
Acanthephyra sp.	1.74	335	0.41
Chaceon maritae, female	1.47	6	0.35
Malacocephalus occidentalis	1.34	13	0.32
Aristeus varidens, male	1.34	174	0.32
Nemichthys scolopaceus	1.21	54	0.29
Solenocera africana	1.21	201	0.29
Scopelosaurus herwigi	0.94	13	0.22
Lamprogrammus exutus	0.94	27	0.22
Xenodermichthys copei	0.94	54	0.22
Cataetix laticeps	0.67	54	0.16
Phrynichthys wedli	0.54	13	0.13
MYCTOPHIDAE	0.40	415	0.10
Argyropolecus aculeatus	0.27	27	0.06
Chaceon maritae, female	0.06	2	0.01
Total	422.64		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 46
 DATE :19.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°48.47
 start stop duration Lon E 13°40.74
 TIME :10:04:54 10:34:54 30.0 (min) Purpose : 3
 LOG : 9113.64 9115.17 1.5 Region : 4000
 FDEPTH: 65 64 Gear cond.: 0
 BDEPTH: 65 64 Validity : 0
 Towing dir: 0° Wire out : 185 m Speed : 3.1 kn
 Sorted : 65 Total catch: 572.02 Catch/hour: 1144.04

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	674.56	0	58.96
Pagellus bellottii	124.86	1718	10.91
Raja miraletus	56.10	102	4.90
Zeus faber	37.24	68	3.26
Pistularia petimba	34.86	50	3.05
Pseudopenaeus prayensis	33.84	782	2.96
Sepia orbignyana	27.50	2	2.40
Citharus linguatula	21.42	1580	1.87
Boops boops	20.24	188	1.77
Octopus sp.	17.18	18	1.50
Grammolites gruvelli	16.50	340	1.44
Brachydeuterus auritus	13.78	120	1.20
Dentex angolensis	11.56	204	1.01
Chelidonichthys gabonensis	11.06	102	0.97
Trichiurus lepturus	10.54	34	0.92
Rhinobatos albomaculatus	7.80	2	0.68
Chilomycterus spinosus mauret.	7.48	50	0.65
Serranus cabrilla	4.26	68	0.37
Dentex barnardi	3.58	18	0.31
Arnoslossus imperialis	2.72	204	0.24
Torpedo torpedo	1.70	18	0.15
Sepia orbignyana	1.36	68	0.12
Sardinella aurita	1.02	18	0.09
Antennarius striatus	1.02	18	0.09
Alloteuthis africana	0.84	50	0.07
Saurida brasiliensis	0.68	188	0.06
Sea urchins (waek spines)	0.34	18	0.03
Total	1144.04		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 43
 DATE :19.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°44.52
 start stop duration Lon E 13°22.89
 TIME :05:06:44 05:27:08 20.4 (min) Purpose : 3
 LOG : 9086.70 9087.71 1.0 Region : 4000
 FDEPTH: 354 358 Gear cond.: 0
 BDEPTH: 354 358 Validity : 0
 Towing dir: 0° Wire out : 875 m Speed : 3.0 kn
 Sorted : 62 Total catch: 680.24 Catch/hour: 33.35

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hymenocephalus italicus	532.21	51506	26.60
Chlorophthalmus atlanticus	465.88	10029	23.29
Merluccius polli	440.00	2976	21.99
Lophiodes kemp	152.38	32	7.62
Laemonema laureysi	132.65	1424	6.63
Synagrops microlepis	110.32	7991	5.51
Parapenaeus longirostris	42.38	5856	2.12
Emtopterus polli	35.91	906	1.79
Chaunax cf. pictus	21.35	1359	1.07
Gadella imberbis	15.85	453	0.79
PARALEPIDIDAE	11.97	453	0.60
MYCTOPHIDAE	7.76	5176	0.39
Helicolenus dactylopterus	7.44	162	0.37
Caelorinchus braueri	6.79	226	0.34
Malacocephalus occidentalis	5.18	32	0.26
PORTUNIDAE	5.18	97	0.26
Nemichthys sp.	3.56	65	0.18
Bathueroconger vicinus	3.56	65	0.18
Peristedion cataphractum	0.32	97	0.02
Total	2000.71		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 47
 DATE :19.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°48.69
 start stop duration Lon E 13°45.77
 TIME :11:29:47 11:40:51 11.1 (min) Purpose : 3
 LOG : 9121.74 9122.32 0.6 Region : 4000
 FDEPTH: 25 24 Gear cond.: 0
 BDEPTH: 25 24 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 162 Total catch: 1208.78 Catch/hour: 6551.65

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 50
 DATE :19.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°31.18
 start stop duration Lon E 13°34.47
 TIME :16:13:22 16:42:44 29.4 (min) Purpose : 3
 LOG : 9152.13 9153.58 1.5 Region : 4000
 FDEPTH: 62 62 Gear cond.: 0
 BDEPTH: 62 62 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.0 kn
 Sorted : 80 Total catch: 283.16 Catch/hour: 578.27

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sardinella maderensis	1718.70	99653	26.23
Brachydeuterus auritus	1453.12	3458	22.18
Sardinella aurita	931.44	33344	14.22
Trachurus trecae	781.57	32114	11.93
Pseudupeneus prayensis	521.41	1404	7.96
Chloroscombrus chrysurus	426.83	7344	6.51
Galeoides decadactylus	314.91	2520	4.81
Pagellus bellottii	168.08	1783	2.57
Selene dorsalis	44.77	341	0.68
Dentex barnardi	40.22	569	0.61
Gymnura micrura	34.15	38	0.52
Raja miraletus	30.73	38	0.47
Torpedo nobiliana	21.25	190	0.32
Citharus linguatula	14.42	304	0.22
Grammolites gruvelli	14.04	266	0.21
Lithognathus mormyrus	11.38	38	0.17
Pomadasy inciscus	10.24	152	0.16
Lagocephalus laevigatus	8.73	38	0.13
Trachinotus ovatus	4.17	38	0.06
Dicologlossa cuneata	1.52	38	0.02
Total	6551.65		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	336.31	16820	58.16
Pagellus bellottii	49.69	558	8.59
Sepia orbignyana	48.40	51	8.37
Sepia officinalis hierredda	36.25	22	6.27
Raja miraletus	17.67	43	3.05
Pomadasy inciscus	16.15	86	2.79
Dentex barnardi	14.87	123	2.57
Zeus faber	10.95	8	1.89
Pseudupeneus prayensis	10.66	80	1.84
Lagocephalus laevigatus	10.37	8	1.79
Octopus macropus	6.04	6	1.05
Torpedo torpedo	3.57	8	0.62
Trichiurus lepturus	3.43	8	0.59
Sardinella aurita	3.29	37	0.57
Pomadasy rogeri	2.57	8	0.44
Citharus linguatula	2.23	78	0.38
Sardinella maderensis	1.94	14	0.34
Illex coindetii	1.43	380	0.25
Branchiostegus semifasciatus *	1.29	8	0.22
Bembrops greyi	1.08	14	0.19
Saurida brasiliensis	0.08	0	0.01
Total	578.27		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 48
 DATE :19.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°32.45
 start stop duration Lon E 13°43.26
 TIME :13:23:45 13:53:47 30.0 (min) Purpose : 3
 LOG : 9138.14 9139.84 1.7 Region : 4000
 FDEPTH: 29 28 Gear cond.: 0
 BDEPTH: 29 28 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.4 kn
 Sorted : 48 Total catch: 388.28 Catch/hour: 775.78

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 51
 DATE :19.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°32.59
 start stop duration Lon E 13°30.25
 TIME :17:31:44 17:51:13 19.5 (min) Purpose : 3
 LOG : 9159.58 9160.56 1.0 Region : 4000
 FDEPTH: 104 104 Gear cond.: 0
 BDEPTH: 104 104 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
 Sorted : 115 Total catch: 115.35 Catch/hour: 355.11

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sardinella aurita	397.20	10470	51.20
Raja miraletus	121.48	240	15.66
Sardinella maderensis	53.55	2286	6.90
Ephippion guttifer	32.93	32	4.24
Torpedo macmorata	23.66	80	3.05
Octopus vulgaris	20.94	32	2.70
Citharus linguatula	19.18	160	2.47
Pagellus bellottii	18.06	240	2.33
Trichiurus lepturus	15.02	48	1.94
Balistes sp.	13.75	16	1.77
Trachurus trecae	12.63	559	1.63
Dasyatis margarita	12.15	16	1.57
Chloroscombrus chrysurus	9.75	96	1.26
Sepia orbignyana	9.07	28	1.17
Rhinobatos albomaculatus	6.55	16	0.84
Pseudupeneus prayensis	3.04	32	0.39
Selene dorsalis	1.60	16	0.21
Grammolites gruvelli	1.28	16	0.16
Brachydeuterus auritus	1.28	16	0.16
Sphyræna sphyraena	1.12	16	0.14
Cynoglossus senegalensis	0.96	16	0.12
Fistularia petimba	0.60	2	0.08
Total	775.78		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trigla lyra	72.81	610	20.50
Brotula barbata	52.18	52	14.69
Pteroscion pelli	38.17	222	10.75
Pontinus accraensis	29.25	194	8.24
Citharus linguatula	27.86	228	7.85
Dentex macrophthalmus	24.87	215	7.00
Dentex angolensis	22.01	289	6.20
Pagellus bellottii	21.40	120	6.03
Trichiurus lepturus	18.93	80	5.33
Umbria canariensis	7.05	12	1.99
Lagocephalus laevigatus	6.59	15	1.86
Saurida brasiliensis	5.30	1142	1.49
Trachurus trecae	5.23	203	1.47
Zeus faber	5.14	28	1.45
Brachydeuterus auritus	4.56	22	1.28
Raja miraletus	4.49	12	1.27
Sepia officinalis hierredda	3.69	3	1.04
Chatrabus melanurus	1.79	6	0.50
Bathyrcongiger vicinus	1.35	9	0.38
Uranoscopus cadenati	1.14	6	0.32
Bembrops greyi	0.68	6	0.19
Peristedion cataphractum	0.31	6	0.09
Loligo vulgaris	0.31	31	0.09
Total	355.11		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 49
 DATE :19.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°31.38
 start stop duration Lon E 13°38.61
 TIME :15:00:01 15:20:02 20.0 (min) Purpose : 3
 LOG : 9145.81 9146.93 1.1 Region : 4000
 FDEPTH: 41 42 Gear cond.: 0
 BDEPTH: 41 42 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.4 kn
 Sorted : 79 Total catch: 279.88 Catch/hour: 839.63

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 52
 DATE :19.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°30.77
 start stop duration Lon E 13°21.34
 TIME :19:49:53 20:19:57 30.1 (min) Purpose : 3
 LOG : 9172.43 9173.99 1.6 Region : 4000
 FDEPTH: 382 391 Gear cond.: 0
 BDEPTH: 382 391 Validity : 0
 Towing dir: 0° Wire out : 950 m Speed : 3.1 kn
 Sorted : 31 Total catch: 365.72 Catch/hour: 729.49

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
trachurus trecae, Juvenile	262.50	1524	31.26
Pagellus bellottii	101.63	954	12.10
Dentex barnardi	93.75	360	11.17
Pomadasy inciscus	84.75	480	10.09
Pseudupeneus prayensis	76.13	600	9.07
Trachurus trecae	55.88	114	6.65
Pomadasy peroteti	50.25	105	5.98
Lithognathus mormyrus	24.00	69	2.86
Galeoides decadactylus	18.53	54	2.21
Epinephelus aeneus	17.25	6	2.05
Sepia orbignyana	13.65	6	1.63
Plectorhynchus mediterraneus	9.00	24	1.07
Scomber japonicus	8.55	39	1.02
Boops boops	6.38	210	0.76
Chloroscombrus chrysurus	5.03	24	0.60
Fistularia petimba	3.60	6	0.43
Chaetodon hoefleri	1.88	15	0.22
Citharus linguatula	1.73	9	0.21
BOTHIDAE	1.43	9	0.17
Sphyraena sphyraena	1.43	9	0.17
Selene dorsalis	1.43	9	0.17
Sardinella aurita	0.90	15	0.11
Total	839.62		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	222.61	108766	30.52
Merluccius polli	96.46	311	13.22
Hymenocephalus italicus	82.58	9215	11.32
Laemonema laureysi	66.78	1484	9.15
Chlorophthalmus atlanticus	60.08	1604	8.24
Etmopterus polli	52.66	4763	7.22
Raja miraletus	26.57	48	3.64
Aristeus varidens, female	23.22	1412	3.18
Chaunax pictus	16.76	910	2.30
Bathyrcongiger vicinus	15.08	96	2.07
Parapenaeus longirostris,femal	12.45	1484	1.71
Hoplostethus cadenati	10.29	383	1.41
Aristeus varidens, male	8.86	1388	1.21
Halosaurus ovenii	6.70	670	0.92
MYCTOPHIDAE	6.22	3423	0.85
Bathynectes piperitus	5.27	72	0.72
Caelorinchus coelorrhinc. polli	4.79	335	0.66
Lophius sp.	2.87	24	0.39
Malacocephalus occidentalis	2.63	24	0.36
Gadella imberbis	2.15	48	0.30
PARALEPIDIDAE	1.44	48	0.20
Peristedion cataphractum	1.20	72	0.16
Galeus polli	0.72	24	0.10
Triplophos hemingi	0.72	48	0.10
Squilla mantis	0.40	215	0.05
Total	729.49		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 53
 DATE :19.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°14.05
 start stop duration Lon E 13°27.83
 TIME :22:32:19 23:03:57 31.6 (min) Purpose : 3
 LOG : 9190.41 9192.07 1.7 Region : 4000
 FDEPTH: 522 519 Gear cond.: 0
 BDEPTH: 522 519 Validity : 0
 Towing dir: 0° Wire out : 1270 m Speed : 3.1 kn
 Sorted : 31 Total catch: 465.18 Catch/hour: 882.14

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 57
 DATE :20.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°17.24
 start stop duration Lon E 13°44.53
 TIME :08:58:35 09:24:59 26.4 (min) Purpose : 3
 LOG : 9224.08 9225.47 1.4 Region : 4000
 FDEPTH: 22 24 Gear cond.: 0
 BDEPTH: 22 24 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.1 kn
 Sorted : 68 Total catch: 1599.67 Catch/hour: 3634.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	354.14	87753	40.15	
Hoplostethus cadenati	162.71	5888	18.44	
Yarellia blackfordi	107.24	4068	12.16	
Aristeus varidens, female	73.39	4352	8.32	
Benthodesmus tenuis	62.86	1820	7.13	
Triplophos hemingi	29.58	3556	3.35	
Merluccius polli	24.46	28	2.77	
Aristeus varidens, male	19.91	3186	2.26	
Chaceon maritae, female	7.93	30	0.90	
Gadella imberbis	7.68	199	0.87	
Melanostomias sp.	7.40	256	0.84	
Laemonema laureysi	7.11	284	0.81	
Lamprogrammus exutus	3.41	171	0.39	
Chanaux pictus	2.84	57	0.32	
Emopterus polli	2.28	256	0.26	
Stereomastis sp.	1.99	455	0.23	
Nezumia micronychodon	1.71	142	0.19	
Nemichthys scolopaceus	1.42	28	0.16	
Xenodermichthys copei	1.42	256	0.16	
Chaceon maritae, male	0.95	2	0.11	
Caristius sp	0.57	28	0.06	
Chlorophthalmus atlanticus	0.57	28	0.06	
Trigla sp.	0.28	28	0.03	
Bathyrcocongus vicinus	0.28	28	0.03	
Total	882.14		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1396.13	20074	38.42	121
Sardinella aurita	319.79	7422	8.80	119
Pomadasy incisus	241.86	3151	6.66	
Trachurus trecae	215.69	10571	5.93	120
Pteroscion pelli	153.76	2190	4.23	
Pseudupeneus prayensis	145.76	2404	4.01	
Lithognathus mormyrus	129.75	320	3.57	
Ephippion guttifer	124.93	55	3.44	
Sardinella maderensis	118.52	2990	3.26	118
Dentex barnardi	106.78	2083	2.94	116
Plectorhynchus mediterraneus	97.17	320	2.67	
Selene dorsalis	88.10	906	2.42	
Chloroscombrus chrysurus	88.10	1215	2.42	
Galeoides decadactylus	74.22	695	2.04	
Trichiurus lepturus	59.80	214	1.65	
Pageallus bellottii	58.73	695	1.62	117
Pomadasy rogeri	48.05	107	1.32	
Pseudotolithus typus	45.91	107	1.26	
Lagocephalus laevigatus	37.92	107	1.04	
Aluterus heudelotii	30.42	55	0.84	
Sphyræna sphyraena	17.08	55	0.47	
Ilisha africana	13.88	214	0.38	
Umbrina canariensis	9.06	107	0.25	
Eucinostomus melanopterus	8.54	55	0.24	
Trachinotus ovatus	4.27	55	0.12	
Total	3634.24		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 54
 DATE :20.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°12.62
 start stop duration Lon E 13°35.89
 TIME :05:15:20 05:45:14 29.9 (min) Purpose : 3
 LOG : 9206.06 9207.57 1.5 Region : 4000
 FDEPTH: 150 152 Gear cond.: 0
 BDEPTH: 150 152 Validity : 0
 Towing dir: 0° Wire out : 365 m Speed : 3.0 kn
 Sorted : 57 Total catch: 239.49 Catch/hour: 480.74

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 58
 DATE :20.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°54.99
 start stop duration Lon E 13°47.53
 TIME :11:44:42 12:13:17 28.6 (min) Purpose : 3
 LOG : 9246.49 9248.15 1.7 Region : 4000
 FDEPTH: 34 35 Gear cond.: 0
 BDEPTH: 34 35 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.5 kn
 Sorted : 67 Total catch: 67.33 Catch/hour: 141.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	344.06	554	71.57	
Synagrops microlepis	59.82	7058	12.44	
Parapenaeus longirostris	38.94	13578	8.10	
Protula barbata	13.15	12	2.73	
Pterothrissus bellocci	5.70	32	1.19	
Atractoscion aequidens	5.32	2	1.11	
Zeus faber	5.22	16	1.09	
Dentex angolensis	2.91	10	0.61	
Octopus macropus	1.37	2	0.28	
Merluccius polli	1.12	24	0.23	
Bembrops greyi	0.88	8	0.18	
Pontinus accraensis	0.88	8	0.18	
Perestedium cataphractum *	0.56	8	0.12	
Saurida brasiliensis	0.32	72	0.07	
Todaropsis eblanae	0.32	24	0.07	
GOBIIDAE	0.16	177	0.03	
Total	480.74		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	83.95	1356	59.41	
Brachydeuterus auritus	31.48	535	22.28	122
Selene dorsalis	7.87	88	5.57	
Chloroscombrus chrysurus	4.11	25	2.91	
J E L L Y F I S H	3.29	6	2.33	
Galeoides decadactylus	2.60	10	1.84	
Balistes capricus	2.12	2	1.50	
Stromateus fiatola	1.47	6	1.04	
Pteroscion pelli	1.18	15	0.83	
Sardinella maderensis	0.84	15	0.59	
Sardinella aurita	0.73	13	0.52	
Trachinotus ovatus	0.57	4	0.40	
Pomadasy incisus	0.36	2	0.25	
Ilisha africana	0.19	2	0.13	
Trachurus trecae	0.17	2	0.12	
Grammolites gruvelli	0.15	2	0.10	
Sepiella ornata	0.13	15	0.09	
Dicologlossa cuneata	0.10	2	0.07	
Total	141.30		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 55
 DATE :20.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°12.43
 start stop duration Lon E 13°37.84
 TIME :06:31:53 06:48:07 16.2 (min) Purpose : 3
 LOG : 9210.91 9211.71 0.8 Region : 4000
 FDEPTH: 116 115 Gear cond.: 0
 BDEPTH: 116 115 Validity : 0
 Towing dir: 0° Wire out : 285 m Speed : 3.0 kn
 Sorted : 58 Total catch: 758.07 Catch/hour: 2800.75

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 59
 DATE :20.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°54.89
 start stop duration Lon E 13°43.93
 TIME :12:56:52 13:26:42 29.8 (min) Purpose : 3
 LOG : 9252.62 9254.12 1.5 Region : 4000
 FDEPTH: 51 53 Gear cond.: 0
 BDEPTH: 51 53 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.0 kn
 Sorted : 95 Total catch: 95.11 Catch/hour: 191.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	2756.90	12296	98.43	
Umbrina canariensis	14.41	48	0.51	
Dentex angolensis	8.31	85	0.30	115
Octopus vulgaris	7.20	7	0.26	
Scorpaena normani	5.76	48	0.21	
Pterothrissus bellocci	5.76	96	0.21	
Citharus linguatula	1.44	48	0.05	
Saurida brasiliensis	0.96	192	0.03	
Total	2800.75		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	49.77	2916	26.02	124
Pomadasy peroteti	29.05	36	15.19	
Trachurus trecae	26.14	1170	13.67	123
Galeoides decadactylus	22.42	44	11.72	
Zeus faber	10.19	24	5.33	
Octopus vulgaris	6.84	2	3.57	
Trichiurus lepturus	6.47	72	3.39	
Pomadasy incisus	5.59	36	2.92	
Dentex barnardi	5.57	107	2.91	
Raja miraletus	5.49	8	2.87	
Sepia orbignyana	4.26	22	2.23	
Rhinobatos albomaculatus	4.02	2	2.10	
Stromateus fiatola	3.50	4	1.83	
Epinephelus aeneus	1.69	2	0.88	
Torpedo marmorata	1.45	6	0.76	
Fistularia petimba	1.43	4	0.75	
Pageallus bellottii	1.33	10	0.69	125
Lagocephalus laevigatus	1.23	2	0.64	
Alloteuthis africana	1.17	277	0.61	
Citharus linguatula	0.74	18	0.39	
Sardinella aurita	0.74	10	0.39	
Chloroscombrus chrysurus	0.72	4	0.38	
Torpedo torpedo	0.40	2	0.21	
GOBIIDAE	0.32	129	0.17	
Grammolites gruvelli	0.26	2	0.14	
Pseudupeneus prayensis	0.20	6	0.11	
Pterothrissus bellocci	0.12	2	0.06	
Sardinella maderensis	0.12	2	0.06	
Total	191.24		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 56
 DATE :20.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°16.48
 start stop duration Lon E 13°41.99
 TIME :07:44:43 08:10:20 25.6 (min) Purpose : 3
 LOG : 9217.80 9219.25 1.5 Region : 4000
 FDEPTH: 22 21 Gear cond.: 0
 BDEPTH: 22 21 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.4 kn
 Sorted : 31 Total catch: 31.02 Catch/hour: 72.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachinotus ovatus	24.94	66	34.33	
Balistes capricus	24.12	52	33.20	
Aluterus heudelotii	5.18	16	7.12	
Ephippion guttifer	4.22	2	5.80	
Decapterus punctatus	3.47	28	4.77	
Raja miraletus	2.15	2	2.97	
Xyrichtys novacula	2.08	14	2.87	
Pageallus bellottii	1.15	7	1.58	
Chilomycterus spinosus mauret.	1.12	5	1.55	
Trachinocephalus myops	1.08	28	1.48	
Pseudupeneus prayensis	0.75	5	1.03	
Lagocephalus laevigatus	0.75	2	1.03	
Scorpaena stephanica	0.56	2	0.77	
Bothus sp.	0.42	5	0.58	
Epinephelus goreensis	0.42	7	0.58	
Scomber japonicus	0.23	2	0.32	
Total	72.65		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 60
 DATE :20.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°55.25
 start stop duration Lon E 13°35.10
 TIME :14:45:21 15:01:50 16.5 (min) Purpose : 3
 LOG : 9263.42 9264.32 0.9 Region : 4000
 FDEPTH: 117 116 Gear cond.: 0
 BDEPTH: 117 116 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.3 kn
 Sorted : 26 Total catch: 392.53 Catch/hour: 1428.25

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 64
 DATE :21.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°46.49
 start stop duration Lon E 13°23.51
 TIME :04:39:31 05:05:42 26.2 (min) Purpose : 3
 LOG : 9320.91 9322.15 1.2 Region : 4000
 FDEPTH: 148 147 Gear cond.: 0
 BDEPTH: 148 147 Validity : 0
 Towing dir: 0° Wire out : 375 m Speed : 2.8 kn
 Sorted : 26 Total catch: 81.79 Catch/hour: 187.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	1394.48	9224	97.64	
Raja miraletus	12.70	18	0.89	
Brotula barbata	6.55	4	0.46	
Zeus faber	4.26	22	0.30	
Dentex angolensis	4.22	18	0.30	126
Torpedo torpedo	2.47	4	0.17	
Pomadasyus rogeri	2.04	7	0.14	
Pterothrissus belloci	1.06	11	0.07	
Citharus linguatula	0.47	7	0.03	
Total	1428.25		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	89.38	13653	47.67	
Trichiurus lepturus	17.54	96	9.35	
Pterothrissus belloci	14.45	105	7.71	
Todaropsis eblanae	14.24	426	7.59	
Brotula barbata	12.50	16	6.66	
Dentex macrophthalmus	11.10	69	5.92	129
Dentex angolensis	9.17	50	4.89	130
Bembrops greyi	6.75	101	3.60	
Parapenaeus longirostris	2.95	1940	1.57	
Spicara alta	1.21	11	0.65	
Monolele microstoma	1.16	41	0.62	
Pontinus accraensis	1.11	11	0.59	
Citharus linguatula	1.11	16	0.59	
Saurida brasiliensis	1.00	101	0.53	
Trigla lyra	0.84	0	0.45	
Uranoscopus cadenati	0.79	5	0.42	
Zeus faber	0.79	5	0.42	
Chatrabus melanurus	0.37	5	0.20	
Zenopsis conchifer	0.37	5	0.20	
Peristedion cataphractum	0.21	5	0.11	
GOBIIDAE	0.16	158	0.08	
Calappa sp.	0.16	5	0.08	
Sepia officinalis hierreda	0.16	5	0.08	
Total	187.51		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 61
 DATE :20.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°58.02
 start stop duration Lon E 13°27.65
 TIME :16:47:00 17:17:11 30.2 (min) Purpose : 3
 LOG : 9275.45 9277.02 1.6 Region : 4000
 FDEPTH: 375 375 Gear cond.: 0
 BDEPTH: 375 375 Validity : 0
 Towing dir: 0° Wire out : 850 m Speed : 3.1 kn
 Sorted : 29 Total catch: 173.82 Catch/hour: 345.57

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 65
 DATE :21.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°42.48
 start stop duration Lon E 13°30.66
 TIME :06:33:08 06:53:18 20.2 (min) Purpose : 3
 LOG : 9332.53 9333.50 1.0 Region : 4000
 FDEPTH: 90 90 Gear cond.: 0
 BDEPTH: 90 90 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 2.9 kn
 Sorted : 35 Total catch: 34.69 Catch/hour: 103.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	64.29	20612	18.61	
Hymenocephalus italicus	50.10	7264	14.50	
Trichiurus lepturus	42.35	644	12.25	
Merluccius polli	39.24	215	11.36	127
Chlorophthalmus atlanticus	35.07	775	10.15	
Chaunax pictus	25.88	1396	7.49	
Laemonema laureysi	22.43	728	6.49	
Synagrops microlepis	21.59	1336	6.25	
Etmopterus polli	8.23	119	2.38	
Bathynectes piperitus	8.23	24	2.38	
Gadella imberbis	7.87	346	2.28	
Bathyroconger vicinus	3.34	95	0.97	
Lophiodes sp.	2.98	60	0.86	
Caelorinchus coelorhincus	2.98	167	0.86	
Malacocephalus occidentalis	2.27	24	0.66	
MYCTOPHIDAE	1.67	1288	0.48	
Dibranchius atlanticus	1.55	107	0.45	
Peristedion cataphractum	1.31	179	0.38	
Aristeus varidens, male	1.07	48	0.31	
PARALEPIDIDAE	1.07	60	0.31	
Parapenaeus longirostris, female	0.95	72	0.28	
Aristeus varidens, female	0.83	60	0.24	
Setarches guentheri	0.24	24	0.07	
Total	345.57		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zeus faber	27.81	140	26.95	
Raja miraletus	18.74	24	18.16	
Dentex angolensis	14.16	164	13.72	131
Citharus linguatula	10.56	178	10.23	
Octopus vulgaris	5.74	9	5.56	
Illex coindetii	5.18	116	5.02	
Scorpaena normani	4.43	39	4.30	
Torpedo torpedo	3.78	12	3.66	
Trigla lyra	3.51	21	3.40	
Scorpaena stephanica	2.50	3	2.42	
Alloteuthis africana	1.16	408	1.12	
Dentex barnardi	0.86	9	0.84	
Chaetodon hoefleri	0.77	3	0.75	
Brachydeuterus auritus	0.74	6	0.72	
Sepia orbignyana	0.71	3	0.69	
Pagellus bellottii	0.71	6	0.69	
Saurida brasiliensis	0.57	83	0.55	
Trachurus trecae	0.33	9	0.32	
Antennarius occidentalis	0.33	9	0.32	
Bembrops greyi	0.30	6	0.29	
Antennarius sp.	0.15	6	0.14	
GOBIIDAE	0.15	59	0.14	
Total	103.19		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 62
 DATE :20.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°48.12
 start stop duration Lon E 13°19.70
 TIME :19:10:43 19:41:12 30.5 (min) Purpose : 3
 LOG : 9288.47 9290.08 1.6 Region : 4000
 FDEPTH: 323 324 Gear cond.: 0
 BDEPTH: 323 324 Validity : 0
 Towing dir: 0° Wire out : 850 m Speed : 3.2 kn
 Sorted : 34 Total catch: 538.08 Catch/hour: 1059.21

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 66
 DATE :21.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°38.56
 start stop duration Lon E 13°37.27
 TIME :08:05:15 08:35:24 30.1 (min) Purpose : 3
 LOG : 9342.25 9343.81 1.6 Region : 4000
 FDEPTH: 46 46 Gear cond.: 0
 BDEPTH: 46 46 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.1 kn
 Sorted : 70 Total catch: 521.36 Catch/hour: 1037.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	782.68	16157	73.89	
Merluccius polli	125.98	1890	11.89	128
Synagrops microlepis	46.93	2961	4.43	
Gadella imberbis	22.68	346	2.14	
Scorpaena normani	22.36	189	2.11	
Lophiodes sp.	21.42	220	2.02	
L O B S T E R S	12.91	1827	1.22	
Epigonus telescopus	10.71	315	1.01	
Parapenaeus longirostris, female	6.61	1228	0.62	
Bathynectes piperitus	5.35	94	0.51	
Peristedion cataphractum	1.57	126	0.15	
Total	1059.21		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	456.87	28324	44.02	132
Brachydeuterus auritus	452.39	57139	43.59	133
Ephippion guttifer	40.17	16	3.87	
Raja miraletus	22.10	74	2.13	
Lagocephalus laevigatus	21.96	16	2.12	
Pomadasyus jubelini	13.30	16	1.28	
Pagellus bellottii	12.54	119	1.21	
Octopus vulgaris	7.03	16	0.68	
Dentex barnardi	3.88	104	0.37	
Sepia orbignyana	3.44	16	0.33	
Alloteuthis africana	1.79	492	0.17	
Citharus linguatula	1.19	30	0.12	
Pseudupeneus prayensis	0.60	30	0.06	
Fistularia petimba	0.46	16	0.04	
GOBIIDAE	0.16	60	0.02	
Total	1037.88		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 63
 DATE :20.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°48.80
 start stop duration Lon E 13°16.34
 TIME :21:10:24 21:40:56 30.5 (min) Purpose : 3
 LOG : 9296.21 9297.79 1.6 Region : 4000
 FDEPTH: 484 469 Gear cond.: 0
 BDEPTH: 484 469 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 3.1 kn
 Sorted : 56 Total catch: 394.94 Catch/hour: 775.91

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 67
 DATE :21.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°38.89
 start stop duration Lon E 13°40.74
 TIME :09:20:28 09:29:29 9.0 (min) Purpose : 3
 LOG : 9348.00 9348.46 0.5 Region : 4000
 FDEPTH: 32 31 Gear cond.: 0
 BDEPTH: 32 31 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn
 Sorted : 10 Total catch: 9.94 Catch/hour: 66.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	233.10	58283	30.04	
Benthodesmus tenuis	198.04	6601	25.52	
Yarellia blackfordi	124.46	4126	16.04	
Hoplostethus cadenati	85.82	2984	11.06	
Merluccius polli	30.26	83	3.90	
Aristeus varidens, female	25.72	1306	3.31	
Gadella imberbis	20.08	1857	2.59	
Triplphos hemingi	18.43	5996	2.38	
Chaceon maritae, male	13.34	28	1.72	
Melanostomias sp.	11.96	275	1.54	
Aristeus varidens, male	3.58	536	0.46	
Todarodes sagittatus	2.20	14	0.28	
Lamprogrammus exutus	1.51	14	0.19	
Opisthoteuthis agassizi	0.96	14	0.12	
Chaunax pictus	0.83	55	0.11	
Bathynectes piperitus	0.83	14	0.11	
Stereomastis sp.	0.69	69	0.09	
Peristedion cataphractum	0.55	83	0.07	
Dicrolene intronigra	0.55	28	0.07	
GALATHEIDAE *	0.55	124	0.07	
Chlorophthalmus atlanticus	0.55	14	0.07	
Halosaurus ovenii	0.41	41	0.05	
Nemichthys scolopaceus	0.41	28	0.05	
Etmopterus polli	0.41	14	0.05	
Plesiopeanaeus edwardsianus	0.28	14	0.04	
Bathyroconger vicinus	0.14	14	0.02	
Solenocera africana	0.14	55	0.02	
Acanthephyra sp.	0.14	14	0.02	
Total	775.91		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Rhinobatos albomaculatus	27.94	13	42.25	
Raja miraletus	21.29	40	32.19	
Ephippion guttifer	5.25	7	7.95	
Lagocephalus laevigatus	3.73	7	5.63	
Trichiurus lepturus	3.33	7	5.03	
Alectis alexandrinus	2.39	7	3.62	
Torpedo marmorata	2.20	7	3.32	
Total	66.12		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 68
 DATE :22.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°26.97
 start stop duration Lon E 13°31.20
 TIME :09:45:07 10:15:32 30.4 (min) Purpose : 3
 LOG : 9372.11 9373.69 1.6 Region : 4000
 FDEPTH: 29 30 Gear cond.: 0
 BDEPTH: 29 30 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 km
 Sorted : 32 Total catch: 32.26 Catch/hour: 63.65

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 72
 DATE :22.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°36.80
 start stop duration Lon E 13°10.08
 TIME :16:12:05 16:42:30 30.4 (min) Purpose : 3
 LOG : 9406.92 9408.47 1.6 Region : 4000
 FDEPTH: 344 354 Gear cond.: 0
 BDEPTH: 344 354 Validity : 0
 Towing dir: 0° Wire out : 875 m Speed : 3.1 km
 Sorted : 60 Total catch: 390.59 Catch/hour: 770.39

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Alectis alexandrinus	20.03	24	31.46
Epinephelus aeneus	11.05	16	17.36
Ephippion guttifer	10.46	6	16.43
Engraulis encrasicolus	7.66	5148	12.03
Raja miraletus	5.94	8	9.33
Dasyatis marmorata	2.88	2	4.53
Stromateus fiatola	1.80	22	2.82
Lagocephalus laevigatus	1.48	10	2.32
Sepia orbignyana	0.51	2	0.81
Citharus linguatula	0.41	2	0.65
Brachydeuterus auritus	0.39	4	0.62
Alloteuthis africana	0.30	116	0.46
Aluterus heudelotii	0.30	2	0.46
Pseudupeneus prayensis	0.28	2	0.43
Dicologlossa cuneata	0.10	2	0.15
Dentex barnardi	0.08	2	0.12
Total	63.65	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	239.74	5475	31.12
Merluccius polli	189.74	1296	24.63
Nematocarcinus africanus	80.91	49834	10.50
Gadella imberbis	61.03	1450	7.92
Trichiurus lepturus	46.80	3245	6.08
Synagrops microlepis	42.56	2897	5.52
Hymenocephalus italicus	35.64	5168	4.63
Chaunax pictus	10.14	424	1.32
Parapenaeus longirostris,femal	9.88	1769	1.28
PARALEPIDIDAE	9.37	475	1.22
Lophiodes sp.	6.04	116	0.78
Laemonema laureysi	5.52	256	0.72
Benthodesmus tenuis	5.13	205	0.67
Aristeus varidens, male	4.87	615	0.63
Aristeus varidens, female	4.36	219	0.57
Bathynectes piperitus	3.98	103	0.52
MYCTOPHIDAE	3.85	2462	0.50
Nezumia aequalis	2.96	77	0.38
Solenocera africana	2.31	487	0.30
Malacocephalus occidentalis	1.93	39	0.25
Perestedium cataphractum *	1.16	385	0.15
Styisculus huloti	0.91	26	0.12
Stomias boa boa	0.65	14	0.08
L O B S T E R S	0.39	1051	0.05
Chascanopsetta lugubris	0.26	14	0.03
Calappa sa	0.26	14	0.03
Total	770.39	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 69
 DATE :22.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°26.82
 start stop duration Lon E 13°27.54
 TIME :10:54:43 11:24:42 30.0 (min) Purpose : 3
 LOG : 9377.28 9378.88 1.6 Region : 4000
 FDEPTH: 48 51 Gear cond.: 0
 BDEPTH: 48 51 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.2 km
 Sorted : 303 Total catch: 303.01 Catch/hour: 606.22

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 73
 DATE :22.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°38.10
 start stop duration Lon E 13°7.97
 TIME :18:01:11 18:30:46 29.6 (min) Purpose : 3
 LOG : 9413.28 9414.65 1.4 Region : 4000
 FDEPTH: 510 516 Gear cond.: 0
 BDEPTH: 510 516 Validity : 0
 Towing dir: 0° Wire out : 1175 m Speed : 2.8 km
 Sorted : 32 Total catch: 225.79 Catch/hour: 458.15

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pomadasyus peroteti	462.01	822	76.21
Raja miraletus	43.21	70	7.13
Pseudupeneus prayensis	14.64	134	2.42
Squatina oculata	12.00	2	1.98
Octopus vulgaris	11.58	6	1.91
Pagellus bellottii	11.18	132	1.84
Dentex barnardi	7.98	100	1.32
Chilomycterus spinosus mauret.	7.00	10	1.16
Caranx crysos	6.50	8	1.07
Epinephelus aeneus	6.50	4	1.07
Plectorhinchus mediterraneus	3.82	6	0.63
Chloroscombrus chrysurus	3.70	14	0.61
Citharus linguatula	3.38	32	0.56
Dentex gibbosus	2.54	6	0.42
Alectis alexandrinus	1.88	2	0.31
Torpedo torpedo	1.76	2	0.29
Fistularia petimba	1.66	6	0.27
Trachurus trecae	1.08	56	0.18
Chaetodon hoefleri	0.76	6	0.13
Selene dorsalis	0.66	2	0.11
Sepia orbignyana	0.54	6	0.09
Alloteuthis africana	0.50	86	0.08
Boops boops	0.46	14	0.08
Grammolites gruvelli	0.44	8	0.07
Scorpaena angolensis	0.24	4	0.04
Chelidonichthys capensis	0.12	2	0.02
Engraulis encrasicolus	0.02	4	0.00
Dicologlossa cuneata	0.02	2	0.00
Total	606.22	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	194.59	61047	42.47
Hoplostethus cadenati	60.51	1861	13.21
Lamprogrammus exultus	42.61	739	9.30
Benthodesmus tenuis	31.39	1506	6.85
Aristeus varidens, female	20.74	1136	4.53
Yarellia blackfordi	18.18	369	3.97
Gadella imberbis	17.75	412	3.88
Aristeus varidens, male	10.51	1719	2.29
Laemonema laureysi	9.37	469	2.05
Stomias boa boa	9.09	256	1.98
Chaceon maritae, male	8.81	28	1.92
Centropristis striata	7.61	2	1.66
L O B S T E R S	5.40	639	1.18
Etmopterus polli	2.98	43	0.65
Todaropsis eblanae	2.41	14	0.53
Centroscymnus crepidater	2.41	14	0.53
Chaceon maritae, female	1.99	14	0.43
Bathynectes piperitus	1.85	57	0.40
Malacocephalus occidentalis	1.85	14	0.40
Chlorophthalmus atlanticus	1.70	43	0.37
Arionna bondi	0.99	43	0.22
Diplophos sp.	0.85	114	0.19
S H R I M P S	0.85	57	0.19
Perestedium cataphractum *	0.85	170	0.19
MYCTOPHIDAE	0.85	682	0.19
Talismania longifilis	0.71	28	0.16
Glyphus marsupialis	0.71	142	0.16
Bathuroconger vicinus	0.28	14	0.06
Nemichthys scolopaceus	0.14	28	0.03
Dibranchus atlanticus	0.14	14	0.03
Total	458.15	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 70
 DATE :22.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°32.64
 start stop duration Lon E 13°21.94
 TIME :12:33:49 13:03:17 29.5 (min) Purpose : 3
 LOG : 9387.13 9388.65 1.5 Region : 4000
 FDEPTH: 96 95 Gear cond.: 0
 BDEPTH: 96 95 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.1 km
 Sorted : 102 Total catch: 101.51 Catch/hour: 206.67

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 74
 DATE :22.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°40.27
 start stop duration Lon E 13°5.95
 TIME :20:15:26 20:45:27 30.0 (min) Purpose : 3
 LOG : 9421.29 9422.92 1.6 Region : 4000
 FDEPTH: 731 741 Gear cond.: 0
 BDEPTH: 731 741 Validity : 0
 Towing dir: 0° Wire out : 1700 m Speed : 3.2 km
 Sorted : 31 Total catch: 497.60 Catch/hour: 994.21

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	176.82	12531	85.56
Sardinella aurita	9.53	193	4.61
Raja miraletus	4.70	12	2.28
Zeus faber	4.23	18	2.05
Dentex angolensis	3.12	41	1.51
Fistularia petimba	2.18	4	1.05
Carcharias signatus	1.63	2	0.79
Sphoeroides pachygaster	1.45	2	0.70
Trichiurus lepturus	1.14	2	0.55
Chelidonichthys capensis	0.71	4	0.34
Scomber japonicus	0.35	2	0.17
Chilomycterus spinosus mauret.	0.31	2	0.15
Alloteuthis africana	0.20	37	0.10
Brachydeuterus auritus	0.18	2	0.09
Illex coindetii	0.08	2	0.04
SYNGNATHIDAE	0.02	2	0.01
Starfish (large)	0.02	2	0.01
Total	206.67	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sea urchins (weak spines)	281.96	607	28.36
Yarellia blackfordi *	192.77	4987	19.39
Caellorinchus coelorrhincus	104.54	2206	10.51
Stomias boa boa	84.40	2014	8.49
Lamprogrammus exultus	57.54	192	5.79
L O B S T E R S	39.64	3389	3.99
Hoplostethus cadenati	37.40	991	3.76
Chaceon maritae, male	32.93	96	3.31
Aristeus varidens, female	29.73	1311	2.99
Dibranchus atlanticus	22.38	959	2.25
Glyphus marsupialis	22.06	1918	2.22
Triplophos hemingi	20.78	2334	2.09
Bathuroconger vicinus	17.90	256	1.80
Talismania longifilis	14.39	392	1.45
Chaceon maritae, female	11.83	64	1.19
Centroscymnus crepidater	9.91	64	1.00
Dicrolene intronigra	6.71	416	0.68
Benthodesmus tenuis	4.48	64	0.45
Aristeus varidens, male	2.88	348	0.29
Total	994.21	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 71
 DATE :22.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°35.26
 start stop duration Lon E 13°14.66
 TIME :14:22:35 14:52:43 30.1 (min) Purpose : 3
 LOG : 9398.06 9399.73 1.7 Region : 4000
 FDEPTH: 132 131 Gear cond.: 0
 BDEPTH: 132 131 Validity : 0
 Towing dir: 0° Wire out : 340 m Speed : 3.3 km
 Sorted : 21 Total catch: 20.74 Catch/hour: 41.29

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	23.99	121	58.10
Zenopsis conchifer	5.87	4	14.22
Atractoscion aequidens	4.76	2	11.52
Illex coindetii	1.91	2	4.63
Raja miraletus	1.73	2	4.19
Brotula barbata	1.15	2	2.80
Chelidonichthys capensis	0.88	8	2.12
Dentex macropthalmus	0.54	2	1.30
Zeus faber	0.28	2	0.68
Citharus linguatula	0.18	2	0.43
Total	41.29	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 75
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°25.01
 start stop duration Lon E 12°55.43
 TIME :23:42:27 00:13:30 31.0 (min) Purpose : 3
 LOG : 9440.24 9441.91 1.7 Region : 4000
 FDEPTH: 607 602 Gear cond.: 0
 BDEPTH: 607 602 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 3.2 kn
 Sorted : 28 Total catch: 316.85 Catch/hour: 612.47

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 78
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°12.36
 start stop duration Lon E 13°15.39
 TIME :08:11:47 08:41:48 30.0 (min) Purpose : 3
 LOG : 9475.38 9476.97 1.6 Region : 4000
 FDEPTH: 68 66 Gear cond.: 0
 BDEPTH: 68 66 Validity : 0
 Towing dir: 0° Wire out : 190 m Speed : 3.2 kn
 Sorted : 47 Total catch: 47.41 Catch/hour: 94.76

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	187.11 43036	30.55	
Lamprogrammus exutus	103.76 532	16.94	
Yarella blackfordi *	62.73 1659	10.24	
Hoplostethus cadenati	45.08 1467	7.36	
Benthodesmus tenuis	42.53 1340	6.94	
Stomias boa boa	35.51 787	5.80	
Dicrolene intronigra	15.10 1063	2.46	
Chaceon maritae, male	14.88 15	2.43	
Stereomastis sp.	13.40 1382	2.19	
Aristeus varidens, female	12.12 553	1.98	
Thysanoteuthis rhombus	10.21 64	1.67	
Scymnodon squamulosus	9.99 43	1.63	
Hymenocephalus italicus	9.57 234	1.56	
Triplophos hemingi	8.72 1148	1.42	
Bathyrcoconger vicinus	6.59 191	1.08	
Malacocephalus occidentalis	6.38 64	1.04	
Chaceon maritae, female	4.74 58	0.77	
Dibranchius atlanticus	4.25 298	0.69	
Merluccius polli	3.23 4	0.53	
GALATHEIDAE *	2.76 2296	0.45	
Bassanago albescens	2.34 64	0.38	
Ebinania costaecanarie	1.70 21	0.28	
Aristeus varidens, male	1.49 191	0.24	
Halosaurus ovenii	1.28 43	0.21	
Conger conger	1.28 8	0.21	
ALEPOCEPHALIDAE	1.28 85	0.21	
Chlorophthalmus atlanticus	0.85 21	0.14	
Nemichthys scolopaceus	0.64 8	0.10	
Caristius sp	0.64 43	0.10	
Dicolloglossa sp.	0.64 21	0.10	
Starfish (large)	0.64 21	0.10	
Glyphus marsupialis	0.21 21	0.03	
Acanthephyra sp	0.21 21	0.03	
Catactyx laticeps	0.21 64	0.03	
Xenodermichthys copei	0.21 21	0.03	
Callinectes sp.	0.21 21	0.03	
Total	612.47	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chelidonichthys capensis	27.08 322	28.58	
Raja miraletus	19.99 36	21.09	
Sepia orbignyana	6.42 34	6.77	
Serranus accraensis	5.94 96	6.26	
Lagocephalus laevigatus	4.28 8	4.51	
Dentex angolensis	3.40 72	3.59	143
Trachurus trecae	3.20 184	3.37	144
Pseudupeneus prayensis	3.16 76	3.33	
Dentex barnardi	3.14 116	3.31	
Caranx crysos	2.44 2	2.57	
Pagellus bellottii	2.28 44	2.40	
Citharus linguatula	2.16 162	2.28	
Chaetodon hoefleri	2.14 12	2.26	
Zeus faber	1.90 2	2.00	
Dicolloglossa cuneata	1.46 8	1.54	
Saurida brasiliensis	0.94 140	0.99	
Brachydeuterus auritus	0.86 10	0.91	
Octopus macropus	0.86 6	0.91	
Fistularia petimba	0.82 4	0.86	
Alloteuthis africana	0.80 372	0.84	
Chilomycterus spinosus mauret.	0.60 2	0.63	
Arnoglossus imperialis	0.32 30	0.34	
Epinephelus guaza ?	0.22 2	0.23	
Scorpaena stephanica	0.18 2	0.19	
Ephippion guttifer	0.12 8	0.13	
Boops boops	0.04 2	0.04	
Raja confundens	0.04 2	0.04	
Total	94.76	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 79
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°11.84
 start stop duration Lon E 13°18.86
 TIME :09:25:45 09:56:13 30.5 (min) Purpose : 3
 LOG : 9480.99 9482.66 1.7 Region : 4000
 FDEPTH: 47 47 Gear cond.: 0
 BDEPTH: 47 47 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.3 kn
 Sorted : 29 Total catch: 28.80 Catch/hour: 56.75

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Squatina oculata	12.22 2	21.53	
Sardinella aurita	8.39 122	14.79	
Raja miraletus	6.96 18	12.26	
Bembrops greyi	6.15 106	10.83	
Citharus linguatula	4.24 77	7.47	
Caranx crysos	2.82 4	4.97	
Torpedo torpedo	2.19 26	3.85	
Alloteuthis africana	2.15 881	3.78	
Dicolloglossa cuneata	1.83 26	3.23	
Brachydeuterus auritus	1.60 41	2.81	
Torpedo marmorata	1.22 4	2.15	
Sepia orbignyana	1.18 10	2.08	
Cynoglossus canariensis	1.12 6	1.98	
Lagocephalus laevigatus	1.12 2	1.98	
Pomadasys peroteti	0.97 2	1.70	
Cynoponticus ferox	0.71 2	1.25	
BOTHIDAE	0.35 2	0.63	
Dentex barnardi	0.32 6	0.56	
GOBIIDAE	0.30 225	0.52	
Saurida brasiliensis	0.20 33	0.35	
Brotula barbata	0.18 2	0.31	
Calappa sp.	0.16 16	0.28	
Pagellus bellottii	0.14 4	0.24	
Serranus accraensis	0.08 10	0.14	
Pseudupeneus prayensis	0.06 2	0.10	
Uranoscopus cadenati	0.06 2	0.10	
Ephippion guttifer	0.06 2	0.10	
Total	56.75	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 76
 DATE :23.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°22.60
 start stop duration Lon E 13°3.98
 TIME :04:47:32 05:11:04 23.5 (min) Purpose : 3
 LOG : 9455.25 9456.50 1.3 Region : 4000
 FDEPTH: 175 178 Gear cond.: 0
 BDEPTH: 175 178 Validity : 0
 Towing dir: 0° Wire out : 465 m Speed : 3.2 kn
 Sorted : 36 Total catch: 266.25 Catch/hour: 679.21

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	544.72 74153	80.20	
Hoplostethus atlanticus	41.96 48	6.18	
Trichurus lepturus	31.02 117	4.57	
Umbrina canariensis	27.81 51	4.09	141
Brotula barbata	15.41 15	2.27	
Pterochissus belloci	5.48 33	0.81	
Dentex macrophthalmus	4.69 10	0.69	
Uranoscopus cadenati	4.16 18	0.61	
Citharus linguatula	1.51 18	0.22	
Bathyrcoconger vicinus	0.84 18	0.12	
Todaropsis eblanae	0.84 18	0.12	
Dentex angolensis	0.43 3	0.06	
Saurida brasiliensis	0.33 829	0.05	
Total	679.21	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 80
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°14.26
 start stop duration Lon E 13°24.04
 TIME :10:43:49 11:14:08 30.3 (min) Purpose : 3
 LOG : 9487.38 9489.00 1.6 Region : 4000
 FDEPTH: 32 34 Gear cond.: 0
 BDEPTH: 32 34 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn
 Sorted : 31 Total catch: 31.15 Catch/hour: 61.66

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pomadasys peroteti	17.82 30	28.89	
Caranx crysos	15.64 24	25.36	
Unidentified invertebrate	7.23 631	11.72	
Raja miraletus	6.85 12	11.11	
Citharus linguatula	4.57 55	7.42	
Torpedo marmorata	2.95 22	4.78	
Grammolites gruvelli	2.26 40	3.66	
Dicolloglossa cuneata	0.89 12	1.44	
Sepia orbignyana	0.85 6	1.38	
Cynoglossus canariensis	0.79 4	1.28	
Antennarius sp.	0.77 12	1.25	
Unidentified invertebrate	0.73 242	1.19	
Alloteuthis africana	0.14 111	0.22	
Penaeus notialis	0.10 4	0.16	
GOBIIDAE	0.08 48	0.13	
Total	61.66	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 77
 DATE :23.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°16.53
 start stop duration Lon E 13°11.17
 TIME :06:46:07 06:47:07 1.0 (min) Purpose : 3
 LOG : 9467.49 9467.54 0.1 Region : 4000
 FDEPTH: 96 97 Gear cond.: 8
 BDEPTH: 96 97 Validity : 9
 Towing dir: 0° Wire out : 250 m Speed : 1.8 kn
 Sorted : 3 Total catch: 3.35 Catch/hour: 201.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Raja clavata	108.00 60	53.73	
Erythrocles monodi	31.80 10080	15.82	
Zenopsis conchifer	23.40 60	11.64	
Boops boops	13.20 1500	6.57	
Citharus linguatula	9.00 120	4.48	
Serranus cabrilla	7.20 60	3.58	
Ommastrephes pteropus	6.00 180	2.99	
Todaropsis eblanae	2.40 60	1.19	
Total	201.00	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 81
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°0.45
 start stop duration Lon E 13°13.38
 TIME :13:34:15 14:09:00 34.8 (min) Purpose : 3
 LOG : 9509.07 9510.84 1.8 Region : 4000
 FDEPTH: 34 36 Gear cond.: 0
 BDEPTH: 34 36 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 km
 Sorted : 21 Total catch: 20.72 Catch/hour: 35.78

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 84
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°5.88
 start stop duration Lon E 12°59.94
 TIME :18:08:14 18:28:24 20.2 (min) Purpose : 3
 LOG : 9534.45 9535.35 0.9 Region : 4000
 FDEPTH: 106 107 Gear cond.: 0
 BDEPTH: 106 107 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 2.7 km
 Sorted : 31 Total catch: 161.12 Catch/hour: 479.29

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Raja miraletus	5.66	10	15.83
Citharus linguatula	5.53	48	15.44
Caranx crysos	4.59	7	12.84
Stromateus fiatola	3.30	3	9.22
Pagellus bellottii	2.81	24	7.87
Lagocephalus laevigatus	2.50	7	7.00
Pomadasy peroteti	1.67	3	4.68
Torpedo marmorata	1.66	14	4.63
Grammolites gruvelli	1.40	29	3.91
Pomadasy jubelini	1.38	5	3.86
Dicologlossa cuneata	1.35	19	3.76
Aluterus heudelotii	0.79	2	2.22
Sepia orbignyana	0.79	5	2.22
Chelidonichthys capensis	0.55	3	1.54
Unidentified invertebrate	0.52	9	1.45
Cynoglossus senegalensis	0.40	3	1.11
Fistularia petimba	0.36	2	1.01
Alloteuthis africana	0.35	10	0.97
Dentex barnardi	0.10	2	0.29
Penaeus notialis	0.05	2	0.14
Total	35.78	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	145.76	2142	30.41
Chelidonichthys capensis	133.12	2172	27.77
Pagellus bellottii	41.20	848	8.60
Scorpaena normani	34.95	461	7.29
Citharus linguatula	24.39	907	5.09
Uranoscopus cadenati	19.63	119	4.10
Boops boops	16.96	491	3.54
Umbrina canariensis	10.41	12	2.17
Sepia orbignyana	9.22	149	1.92
Trachurus trecae	7.73	372	1.61
Raja miraletus	5.95	45	1.24
Lagocephalus laevigatus	4.61	15	0.96
Brotula barbata	4.46	253	0.93
Brachydeuterus auritus	3.72	30	0.78
Dicologlossa hexophthalma	3.42	59	0.71
NETTASTOMATIDAE	3.12	149	0.65
Squatina oculata	2.32	3	0.48
Pseudupeneus prayensis	2.08	15	0.43
Illex coindetii	1.49	15	0.31
Octopus vulgaris	1.34	15	0.28
Mystriophis rostellatus	1.16	3	0.24
Blennius normani	0.89	15	0.19
Arnoglossus imperialis	0.74	74	0.16
Squilla mantis	0.45	30	0.09
Spicara alta	0.15	15	0.03
Total	479.29	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 82
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°1.02
 start stop duration Lon E 13°10.08
 TIME :14:58:31 15:28:15 29.7 (min) Purpose : 3
 LOG : 9515.86 9517.28 1.4 Region : 4000
 FDEPTH: 61 62 Gear cond.: 0
 BDEPTH: 61 62 Validity : 0
 Towing dir: 0° Wire out : 180 m Speed : 2.9 km
 Sorted : 259 Total catch: 259.33 Catch/hour: 523.37

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 85
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°6.26
 start stop duration Lon E 12°53.20
 TIME :21:01:55 21:32:02 30.1 (min) Purpose : 3
 LOG : 9544.95 9546.46 1.5 Region : 4000
 FDEPTH: 304 302 Gear cond.: 0
 BDEPTH: 304 302 Validity : 0
 Towing dir: 0° Wire out : 750 m Speed : 3.0 km
 Sorted : 88 Total catch: 819.61 Catch/hour: 1632.69

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sardinella aurita	218.77	2301	41.80
Selene dorsalis	66.80	553	12.76
Pseudupeneus prayensis	52.88	642	10.10
Pomadasy jubelini	49.75	236	9.51
Trachurus trecae	29.06	767	5.55
Chelidonichthys gabonensis	26.74	230	5.11
Trachinotus ovatus	19.88	65	3.80
Raja miraletus	15.84	46	3.03
Pagellus bellottii	7.14	145	1.37
Grammolites gruvelli	5.25	113	1.00
Alloteuthis africana	4.70	1328	0.90
Caranx crysos	4.68	4	0.89
Brachydeuterus auritus	4.40	42	0.84
Citharus linguatula	3.57	155	0.68
Dentex barnardi	3.03	77	0.58
Psettodes belcheri	2.36	12	0.45
Serranus cabrilla	2.08	34	0.40
Dentex angolensis	1.70	119	0.32
Lagocephalus laevigatus	1.01	2	0.19
Saurida brasiliensis	0.99	155	0.19
Trichiurus lepturus	0.69	2	0.13
Brotula barbata	0.48	4	0.09
Sardinella maderensis	0.40	2	0.08
Chaetodon hoefleri	0.38	2	0.07
Scorpaena angolensis	0.24	4	0.05
Chilomycterus spinosus mauret.	0.14	2	0.03
FORTUNIDAE	0.12	8	0.02
Sepia orbignyana	0.02	6	0.02
Arnoglossus imperialis	0.12	26	0.02
Squilla mantis	0.02	2	0.00
Lagocephalus laevigatus	0.02	2	0.00
Total	523.37	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	783.65	15859	48.00
Merluccius polli	267.70	1112	16.40
Centrophorus granulosus	145.43	38	8.91
Hoplostethus atlanticus	96.33	129	5.90
Zenopsis conchifer	90.41	129	5.54
Torpedo nobiliana	75.22	56	4.61
Scorpaena normani	49.46	388	3.03
Nematocarcinus africanus	19.08	10319	1.17
Synagrops microlepis	13.52	759	0.83
Raja miraletus	11.86	18	0.73
Trigla lyra	8.52	18	0.52
Chaceon maritae	4.63	18	0.28
Bhathynectes piperitus	4.08	112	0.25
Pterothrissus belloci	4.08	18	0.25
Gadella imberbis	3.94	62	0.24
Hymenocephalus italicus	3.89	779	0.24
Aristeus varidens, male	3.71	464	0.23
MYCTOPHIDAE	3.15	3817	0.19
Parapanaeus longirostris	3.15	408	0.19
Calappa sp.	2.96	38	0.18
Aristeus varidens, female	1.30	147	0.08
Lophiodes sp.	0.74	18	0.05
Solenocera africana	0.74	112	0.05
Laemonema laureysi	0.74	38	0.05
Benthodesmus tenuis	0.74	56	0.05
Caelorinchus coelochincus	0.37	18	0.02
Bathyrcongus vicinus	0.37	18	0.02
Raja confundens	0.19	18	0.01
Total	1599.95	97.99	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 83
 DATE :23.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°2.06
 start stop duration Lon E 13°95.16
 TIME :16:32:41 16:59:29 26.8 (min) Purpose : 3
 LOG : 9524.38 9525.82 1.4 Region : 4000
 FDEPTH: 86 86 Gear cond.: 0
 BDEPTH: 86 86 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.2 km
 Sorted : 68 Total catch: 315.20 Catch/hour: 705.94

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 86
 DATE :24.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°58.56
 start stop duration Lon E 12°45.79
 TIME :00:01:46 00:32:50 31.1 (min) Purpose : 3
 LOG : 9557.83 9559.43 1.6 Region : 4000
 FDEPTH: 760 755 Gear cond.: 0
 BDEPTH: 760 755 Validity : 0
 Towing dir: 0° Wire out : 1700 m Speed : 3.1 km
 Sorted : 23 Total catch: 347.53 Catch/hour: 671.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	208.13	12529	29.48
Chelidonichthys capensis	165.80	1845	23.49
Dentex angolensis	40.11	665	5.68
Brachydeuterus auritus	35.48	334	5.03
Pseudupeneus prayensis	34.78	555	4.93
Pagellus bellottii	33.46	515	4.74
Zeus faber	22.69	92	3.21
Octopus vulgaris	21.16	20	3.00
Raja miraletus	20.16	52	2.86
Citharus linguatula	19.06	697	2.70
Trichiurus lepturus	17.94	31	2.54
Sardinella aurita	17.45	314	2.47
Sepia orbignyana	14.11	52	2.00
Rhinobatos albomaculatus	11.20	4	1.59
Squatina oculata	11.09	11	1.57
Saurida brasiliensis	7.26	1109	1.03
Fistularia petimba	6.76	11	0.96
Bembrops greyi	4.34	81	0.62
Ephippion guttifer	3.54	11	0.50
Dentex barnardi	3.23	81	0.46
Torpedo torpedo	3.14	11	0.44
Boops boops	1.52	92	0.22
Selene dorsalis	1.41	11	0.20
Illex coindetii	1.01	11	0.14
Serranus cabrilla	0.60	11	0.09
Antennarius striatus	0.31	11	0.04
Pontinus sp.	0.20	11	0.03
Total	705.94	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Yarella blackfordi *	107.20	3088	15.97
Opisthoteuthis agassizi	96.15	75	14.33
Nezumia micronychodon	61.00	1305	9.09
Raja confundens	49.21	151	7.33
Stereomastis sp.	46.95	2008	7.00
Unidentified invertebrate	41.67	126	6.21
Lophius vailanti	34.76	19	5.18
Benthodesmus tenuis	28.87	1029	4.30
Chaceon maritae, female	28.19	89	4.20
Talimania longifilis	26.86	603	4.00
Stomias boa	23.35	427	3.48
Merluccius polli	18.25	23	2.72
Chaceon maritae, male	10.81	23	1.61
Hoplostethus cadenati	10.79	326	1.61
Triplophos hemingi	10.04	155	1.50
S H R I M P S	9.79	1933	1.46
Aristeus varidens, female	9.04	427	1.35
Torpedo sp.	8.98	2	1.34
Gadella imberbis	7.53	301	1.12
Lamprogrammus exutus	6.28	50	0.94
GALATHEIDAE *	5.77	3967	0.86
Dibranchius atlanticus	5.02	326	0.75
Bathypterois phenax	4.27	351	0.64
ALEPOCEPHALIDAE	4.27	176	0.64
Etmopterus spinax	3.77	50	0.56
Centrophorus squamosus	2.76	25	0.41
Plesionopaneus edwardsianus	2.01	176	0.30
Acanthephyra sp.	2.01	402	0.30
Bassanago albescens	1.76	50	0.26
DICERATIIDAE	1.26	25	0.19
Trichiurus lepturus	1.26	25	0.19
Aristeus varidens, male	0.75	75	0.11
Xenodermichthys copei	0.50	50	0.07
Total	671.12	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 87
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°48.19
 start stop duration Lon E 13°0.96
 TIME :04:45:20 05:20:03 34.7 (min) Purpose : 3
 LOG : 9580.75 9582.16 1.4 Region : 4000
 FDEPTH: 94 95 Gear cond.: 0
 BDEPTH: 94 95 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 2.4 kn
 Sorted : 104 Total catch: 1930.83 Catch/hour: 3336.69

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 90
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°27.43
 start stop duration Lon E 13°4.66
 TIME :10:28:28 10:59:26 30.6 (min) Purpose : 3
 LOG : 9618.11 9619.80 1.7 Region : 4000
 FDEPTH: 25 25 Gear cond.: 0
 BDEPTH: 25 25 Validity : 0
 Towing dir: 0° Wire out : 0 m Speed : 3.3 kn
 Sorted : 153 Total catch: 152.93 Catch/hour: 300.06

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	2790.00	20411	83.62 160
Trachurus trecae	143.68	5528	4.31 162
Sepia orbignyana	76.50	64	2.29
Dentex angolensis	68.14	868	2.04 161
Selene dorsalis	61.07	128	1.83
Umbrina canariensis	43.06	128	1.29
Chelidonichthys capensis	27.63	64	0.83
Scorpaena angolensis	21.53	33	0.65
Citharus linguatula	17.04	515	0.51
Raja miraletus	15.74	33	0.47
Brotula barbata	15.43	33	0.46
Zeus faber	12.86	64	0.39
Uranoscopus cadenati	11.58	33	0.35
Boops boops	8.68	289	0.26
Dentex barnardi	3.21	33	0.10
Illex coindetii	3.21	33	0.10
Trichiurus lepturus	3.21	33	0.10
Saurida brasiliensis	2.89	515	0.09
Chaetodon hoefleri	2.89	33	0.09
Dicologlossa hexophthalma	2.89	33	0.09
Alloteuthis africana	2.89	610	0.09
Arnoglossus imperialis	1.28	64	0.04
Bathycoronger vicinus	1.28	33	0.04
Total	3336.69	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sparus caeruleostictus *	52.58	139	17.52
Dentex barnardi	40.52	165	13.50
Lutjanus agennes	38.46	4	12.82
Acanthurus monroviae	37.67	59	12.55
Lutjanus fulgens	23.05	75	7.68
Pagellus bellottii	19.91	57	6.64
Bodianus speciosus	15.99	10	5.33
Dentex canariensis	14.52	29	4.84
Pseudupeneus prayensis	9.42	90	3.14
Balistes capricus	7.20	8	2.40
Aluterus heudelotii	6.69	12	2.23
Mycteroperca rubra	5.20	2	1.73
Octopus vulgaris	5.12	2	1.71
Balistes punctatus	3.79	6	1.26
Fistularia tabacaria	3.34	4	1.11
Dasyatis margarita	2.71	2	0.90
Unidentified invertebrate	2.63	4	0.88
Fistularia petimba	2.51	18	0.84
Pomadasy rogeri	2.28	2	0.76
Caranx crysos	1.71	2	0.57
Lagocephalus laevigatus	1.31	2	0.44
Epinephelus costae	1.26	2	0.42
Chaetodon hoefleri	0.77	16	0.26
Sphyræna guachancho	0.61	4	0.20
B I V A L V E S	0.53	67	0.18
Alloteuthis africana	0.22	67	0.07
Rypticus saponaceus	0.08	2	0.03
Total	300.06	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 88
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°43.98
 start stop duration Lon E 13°9.83
 TIME :06:41:40 07:10:49 29.2 (min) Purpose : 3
 LOG : 9593.08 9594.50 1.4 Region : 4000
 FDEPTH: 31 31 Gear cond.: 0
 BDEPTH: 31 31 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 2.9 kn
 Sorted : 112 Total catch: 112.30 Catch/hour: 231.15

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 91
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°17.12
 start stop duration Lon E 12°58.64
 TIME :12:15:37 12:45:50 30.2 (min) Purpose : 3
 LOG : 9630.15 9631.88 1.7 Region : 4000
 FDEPTH: 27 33 Gear cond.: 0
 BDEPTH: 27 33 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.4 kn
 Sorted : 35 Total catch: 35.13 Catch/hour: 69.77

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chloroscombrus chrysurus	164.56	1408	71.19
Pagellus bellottii	27.89	226	12.07 163
Raja miraletus	8.34	14	3.61
Aluterus heudelotii	5.21	8	2.25
Balistes capricus	5.17	6	2.24
Pseudupeneus prayensis	4.08	21	1.76
Pomadasy peroteti	3.93	4	1.70
Epinephelus aeneus	2.39	4	1.03
Caranx crysos	2.10	2	0.91
Alloteuthis africana	2.10	482	0.91
Octopus vulgaris	1.48	2	0.64
Chilomycterus spinosus mauret.	1.15	6	0.50
Syacium micrurum	0.72	10	0.31
Chelidonichthys capensis	0.64	4	0.28
Sepia orbignyana	0.56	2	0.24
Lagocephalus laevigatus	0.45	2	0.20
Trachinocephalus myops	0.21	2	0.09
Citharus linguatula	0.14	6	0.06
Arnoglossus imperialis	0.04	2	0.02
Total	231.15	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Alectis alexandrinus	35.55	40	50.95
Pagellus bellottii	16.19	109	23.20 166
Ephippion guttifer	7.57	4	10.85
Pomadasy rogeri	3.14	2	4.50
Caranx crysos	2.70	2	3.87
Sphyræna guachancho	2.64	10	3.79
Aluterus heudelotii	1.15	2	1.65
Scorpaena stephanica	0.26	2	0.37
Pseudupeneus prayensis	0.24	6	0.34
Sepia orbignyana	0.20	2	0.28
Chaetodon hoefleri	0.14	2	0.20
Total	69.77	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 89
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°29.29
 start stop duration Lon E 13°0.43
 TIME :09:03:47 09:34:30 30.7 (min) Purpose : 3
 LOG : 9610.61 9612.15 1.5 Region : 4000
 FDEPTH: 50 51 Gear cond.: 0
 BDEPTH: 50 51 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.0 kn
 Sorted : 45 Total catch: 44.77 Catch/hour: 87.44

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 92
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°13.99
 start stop duration Lon E 12°51.15
 TIME :13:43:25 14:11:37 28.2 (min) Purpose : 3
 LOG : 9638.53 9639.92 1.4 Region : 4000
 FDEPTH: 76 80 Gear cond.: 0
 BDEPTH: 76 80 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.0 kn
 Sorted : 93 Total catch: 93.13 Catch/hour: 198.15

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sphyræna guachancho	24.80	113	28.37
Pagellus bellottii	22.36	195	25.58 164
Alloteuthis africana	18.26	6021	20.88
Alectis alexandrinus	6.48	8	7.42
Sepia orbignyana	4.65	4	5.32
Caranx crysos	3.42	4	3.91
Seriola carpenteri	1.82	2	2.08
Brachydeuterus auritus	1.54	10	1.76
Trichiurus lepturus	1.45	2	1.65
Balistes capricus	1.25	2	1.43
Chloroscombrus chrysurus	1.00	8	1.14
Decapterus rhonchus	0.16	2	0.18
Bembrops greyi	0.14	4	0.16
Citharus linguatula	0.06	2	0.07
Arnoglossus imperialis	0.06	2	0.07
Total	87.44	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	161.06	319	81.28
Trachurus trecae	9.72	428	4.91 171
Dentex angolensis	6.79	55	3.43 170
Umbrina canariensis	4.21	38	2.13 169
Lagocephalus laevigatus	3.87	2	1.95
Brachydeuterus auritus	2.74	19	1.39 167
Pagellus bellottii	2.53	17	1.28 168
Brotula barbata	2.49	2	1.26
Atractoscion aequidens	1.51	4	0.76
Alloteuthis africana	1.36	398	0.69
Dentex barnardi	1.06	4	0.54
Sphyræna guachancho	0.30	2	0.15
Gobiidae	0.23	277	0.12
Boops boops	0.06	4	0.03
Parapenaeus longirostris	0.06	17	0.03
Engraulis encrasicolus	0.04	4	0.02
PORTUNIDAE	0.04	4	0.02
Chlorophthalmus atlanticus	0.04	6	0.02
Total	198.15	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 93
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°15.06
 start stop duration Lon E 12°47.09
 TIME :15:14:07 15:42:29 28.4 (min) Purpose : 3
 LOG : 9646.21 9647.56 1.4 Region : 4000
 FDEPTH: 115 115 Gear cond.: 0
 BDEPTH: 115 115 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 2.9 kn
 Sorted : 34 Total catch: 618.02 Catch/hour: 1306.60

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 96
 DATE :25.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°5.23
 start stop duration Lon E 12°36.69
 TIME :07:39:02 08:09:26 30.4 (min) Purpose : 3
 LOG : 9755.76 9757.29 1.5 Region : 4000
 FDEPTH: 727 735 Gear cond.: 0
 BDEPTH: 727 735 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.0 kn
 Sorted : 72 Total catch: 565.94 Catch/hour: 1116.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1142.92	159326	87.47	
Trachurus trecae	69.01	3342	5.28	173
Zeus faber	27.91	104	2.14	
Trichiurus lepturus	21.25	38	1.63	
Dentex angolensis	17.67	106	1.35	172
Brotula barbata	6.28	4	0.48	
Raja miraletus	3.97	19	0.30	
Saurida brasiliensis	3.95	863	0.30	
Uranoscopus polli	3.30	11	0.25	
Branchiostegus semifasciatus *	2.14	2	0.16	
Selene dorsalis	2.07	4	0.16	
Brachydeuterus auritus	1.71	13	0.13	174
Octopus vulgaris	1.33	2	0.10	
Pterothrissus belloci	0.97	4	0.07	
Chelidonichthys gabonensis	0.59	4	0.05	
Scorpaena stephanica	0.47	2	0.04	
Dentex angolensis	0.38	4	0.03	
Parapanaeus longirostris, female	0.36	36	0.03	
Dicologlossa hexophthalma	0.13	2	0.01	
Illex coindetii	0.11	13	0.01	
Boops boops	0.04	2	0.00	
Citharus linguatula	0.04	2	0.00	
Total	1306.60		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
G A S T R O P O D S	377.88	5473	33.84	
Nezumia sp.	203.18	4003	18.20	
Opisthoteuthis agassizi	150.70	45	13.50	
Yarella blackfordi *	79.32	2159	7.10	
Talismania longifilis	54.73	345	4.90	
Lamprogrammus exutus	46.19	89	4.14	
L O B S T E R S	27.29	148	2.44	
Ebinania costaecanarie	23.99	16	2.15	
Chaceon maritae, female	20.82	51	1.86	
Raja confundens	19.49	134	1.75	
Dibranchius atlanticus	19.04	809	1.71	
Lophiodes kempi	14.09	16	1.26	
Starfish	13.95	584	1.25	
Chaceon maritae, male	10.06	18	0.90	
Aristeus varidens, female	7.69	359	0.69	
Uroconger lepturus	6.75	75	0.60	
Dicrolene inronigra	6.45	225	0.58	
Todaropsis eblanae	4.66	16	0.42	
Ariomma bondi	4.20	75	0.38	
Brotula sp.	4.04	16	0.36	
Bathyroconger vicinus	4.04	75	0.36	
Etmopterus lucifer	3.91	30	0.35	
Halosaurus ovenii	3.45	180	0.31	
SEPIOLIDAE	3.00	16	0.27	
Triplophos hemingi	2.55	300	0.23	
Epigonus sp.	1.50	16	0.13	
Paramola cuvieri	0.97	2	0.09	
Phrynichthys wedli	0.91	16	0.08	
Lampadena pontifex	0.59	45	0.05	
Pnotoctes braueri	0.45	30	0.04	
Aristeus varidens, male	0.43	71	0.04	
Stomias boa boa	0.30	30	0.03	
Total	1116.62		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 94
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°30.72
 start stop duration Lon E 12°50.89
 TIME :17:39:37 17:59:12 19.6 (min) Purpose : 3
 LOG : 9665.76 9666.69 0.9 Region : 4000
 FDEPTH: 111 112 Gear cond.: 0
 BDEPTH: 111 112 Validity : 0
 Towing dir: 0° Wire out : 295 m Speed : 2.8 kn
 Sorted : 97 Total catch: 97.44 Catch/hour: 298.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	62.36	9745	20.88	
Pterothrissus belloci	37.69	309	12.62	
Brotula barbata	35.55	28	11.90	
Chelidonichthys gabonensis	30.64	162	10.26	
Zeus faber	25.13	144	8.42	
Citharus linguatula	19.34	377	6.48	
Dentex angolensis	14.95	169	5.01	175
Trichiurus lepturus	8.46	34	2.83	
GOBIIDAE	8.06	6944	2.70	
Parapanaeus longirostris	7.97	2936	2.67	
Uranoscopus cadenati	7.60	31	2.55	
Torpedo torpedo	6.40	15	2.14	
Bathyroconger vicinus	6.37	46	2.13	
Branchiostegus semifasciatus *	3.71	3	1.24	
Octopus macropus	3.62	6	1.21	
Trachurus trecae	2.39	104	0.80	176
Saurida brasiliensis	2.36	355	0.79	
Pontinus accraensis	2.21	25	0.74	
Pagellus bellottii	2.21	6	0.74	
Raja miraletus	2.02	3	0.68	
Fistularia petimba	1.84	3	0.62	
Illex coindetii	1.69	49	0.56	
Scorpaena normani	1.26	9	0.42	
Umbrina canariensis	1.10	3	0.37	
Spherooides pachgaster	0.98	3	0.33	
GOBIIDAE	0.74	67	0.25	
Sepia orbigynana	0.67	21	0.23	
CONGRIDAE	0.59	3	0.17	
NETTASTOMATIDAE	0.40	31	0.13	
Physiculus huloti	0.25	15	0.08	
Merluccius polli	0.12	9	0.04	
Total	298.59		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 97
 DATE :25.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°5.94
 start stop duration Lon E 12°40.81
 TIME :09:54:05 10:26:20 32.3 (min) Purpose : 3
 LOG : 9764.11 9765.82 1.7 Region : 4000
 FDEPTH: 439 440 Gear cond.: 0
 BDEPTH: 439 440 Validity : 0
 Towing dir: 0° Wire out : 1070 m Speed : 3.2 kn
 Sorted : 74 Total catch: 550.32 Catch/hour: 1023.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	218.33	553	21.32	177
Lophys vaillantii	202.98	54	19.82	
Centrophorus uyato	106.70	28	10.42	
Shrimps, small, non comm.	100.60	45607	9.83	
Etmopterus pusillus	72.28	2208	7.06	
Gadella imberbis	53.07	2000	5.18	
Aristeus varidens, female	36.07	1388	3.52	
Laemonema laureysi	34.19	333	3.34	
Trichiurus lepturus	33.53	52	3.28	
Dibranchius atlanticus	29.17	1693	2.85	
Holothuria sp.	28.91	255	2.82	
Chaunax pictus	25.72	372	2.51	
B I V A L V E S	11.92	60	1.16	
Malacocephalus laevis	9.44	78	0.92	
Torpedo sp.	7.52	2	0.73	
Yarella blackfordi *	5.99	164	0.59	
Starfish (large)	5.40	195	0.53	
Aristeus varidens, male	4.62	560	0.45	
Raja clavata	4.37	2	0.43	
Loligo vulgaris	3.71	78	0.36	
Hymenocephalus italicus	3.58	593	0.35	
Caelorinchus braueri	3.32	78	0.32	
Halosaurus ovenii	3.13	164	0.31	
Plesiopanaeus edwardsianus	3.00	125	0.29	
Chaceon maritae, male	2.88	2	0.28	
Synagrops microlepis	1.82	91	0.18	
Xenodermichthys copei	1.76	326	0.17	
Melanostomias sp.	1.37	52	0.13	
Bathypterois sp.	0.85	26	0.08	
Bassanago albescens	0.85	60	0.08	
Heptranchias perlo	0.80	2	0.08	
Chlorophthalmus atlanticus	0.78	86	0.08	
Stereomastis sp.	0.72	91	0.07	
Benthodesmus tenuis	0.65	20	0.06	
Bathyroconger vicinus	0.59	47	0.06	
Raja alba	0.46	7	0.04	
Helicolenus dactylopterus	0.46	7	0.04	
Peristedion cataphractum	0.46	86	0.04	
Chaceon maritae, female	0.37	2	0.04	
Promethichthys prometheus	0.20	33	0.02	
Ectreposebastes imus	0.20	7	0.02	
Triplophos hemingi	0.20	26	0.02	
MCTOPHIDAE	0.13	7	0.01	
GALATHEIDAE *	0.13	20	0.01	
Setarches guentheri	0.13	7	0.01	
Lampadena sp.	0.13	7	0.01	
OPHIDIIDAE	0.13	2	0.01	
Unidentified fish	0.13	7	0.01	
Ectreposebastes sp.	0.07	7	0.01	
G A S T R O P O D S	0.07	33	0.01	
Total	1023.85		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 95
 DATE :24.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 9°38.59
 start stop duration Lon E 12°39.85
 TIME :20:32:20 20:55:25 23.1 (min) Purpose : 3
 LOG : 9683.21 9684.34 1.1 Region : 4000
 FDEPTH: 538 536 Gear cond.: 0
 BDEPTH: 538 536 Validity : 0
 Towing dir: 0° Wire out : 1350 m Speed : 3.0 kn
 Sorted : 23 Total catch: 151.87 Catch/hour: 394.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Laemonema laureysi	132.02	889	33.42	
Yarella blackfordi *	47.59	1389	12.05	
Benthodesmus tenuis	23.88	671	6.04	
Bathynectes piperitus	20.75	375	5.25	
Chaceon maritae, male	18.99	44	4.81	
Chaceon maritae, female	18.34	78	4.64	
Chaunax pictus	15.45	62	3.91	
Stomias boa boa	15.14	281	3.83	
Aristeus varidens, female	12.95	593	3.28	
Dibranchius atlanticus	11.55	0	2.92	
L O B S T E R S	11.55	936	2.92	
Caelorinchus caelorhinc. polli	8.27	109	2.09	
Hoplostethus cadenati	8.27	312	2.09	
Etmopterus polli	7.96	62	2.01	
B I V A L V E S	7.49	2871	1.90	
Nezumia aequalis	6.71	312	1.70	
Lamprogrammus exutus	6.71	265	1.70	
Nematocarcinus africanus	6.24	2824	1.58	
Plesiopanaeus edwardsianus	3.75	47	0.95	
Buglossidium luteum	2.18	47	0.55	
Trachyrincus scabrus	1.56	94	0.40	
Halosaurus ovenii	1.40	16	0.36	
Aristeus varidens, male	1.25	140	0.32	
Bathyroconger vicinus	1.25	62	0.32	
Bathygadus melanobranchus	0.94	16	0.24	
NETTASTOMATIDAE	0.94	16	0.24	
Talismania longifilis	0.78	47	0.20	
Triplophos hemingi	0.62	31	0.16	
OPHIDIIDAE	0.47	16	0.12	
Total	394.98		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 98
 DATE :25.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°52.98
 start stop duration Lon E 12°58.11
 TIME :15:43:30 16:02:48 19.3 (min) Purpose : 3
 LOG : 9798.86 9799.77 0.9 Region : 4000
 FDEPTH: 215 216 Gear cond.: 0
 BDEPTH: 215 216 Validity : 0
 Towing dir: 0° Wire out : 530 m Speed : 2.8 km
 Sorted : 67 Total catch: 398.67 Catch/hour: 1238.75

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 101
 DATE :25.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°35.24
 start stop duration Lon E 12°51.22
 TIME :22:46:38 23:17:27 30.8 (min) Purpose : 3
 LOG : 9833.06 9834.63 1.6 Region : 4000
 FDEPTH: 529 535 Gear cond.: 0
 BDEPTH: 529 535 Validity : 0
 Towing dir: 0° Wire out : 1300 m Speed : 3.0 km
 Sorted : 49 Total catch: 350.08 Catch/hour: 681.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	436.65	16937	35.25	
Pterothrissus belloci	248.67	1401	20.07	
Merluccius polli	136.72	497	11.04	178
MYCTOPHIDAE	104.25	68495	8.42	
Dentex angolensis	63.39	227	5.12	179
Parapenaeus longirostris	59.81	17689	4.83	
Bembrops greyi	37.78	342	3.05	
Brotula barbata	30.30	25	2.45	
Caelorinchus coelorhincus	28.71	752	2.32	
Trichiurus lepturus	23.43	137	1.89	
Raja leopardus	21.53	19	1.74	
Gephyroberyx darwini	19.48	410	1.57	
Uranoscopus cadenati	10.04	34	0.81	
Zenopsis conchifer	7.02	19	0.57	
Cynoglossus cadenati	6.15	87	0.50	
Saurida brasiliensis	2.24	155	0.18	
Syacium micrurum	1.71	87	0.14	
Trachinocephalus myops	0.87	68	0.07	
Total	1238.75		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	438.81	112631	64.39	
Lamprogrammus exutus	59.42	2330	8.72	
Hoplostethus cadenati	38.29	1417	5.62	
Stomias boa boa	21.12	504	3.10	
Aristeus varidens, female	20.71	1158	3.04	
Yarrella blackfordi	18.81	531	2.76	
Stereomastix sp.	15.94	2426	2.34	
Gadella imberbis	8.59	477	1.26	
Chaunax pictus	6.68	55	0.98	
Chaceon maritae, male	6.62	10	0.97	
Aristeus varidens, male	6.13	845	0.90	
OMMASTREPHIDAE	5.72	55	0.84	
Triplophos hemingi	4.22	681	0.62	
Xenodermichthys copei	3.68	368	0.54	
Bassanago albescens	2.73	150	0.40	
Malacocephalus laevis	2.45	27	0.36	
Dibranchus atlanticus	2.45	164	0.36	
Dicrolene intronigra	2.18	409	0.32	
Lithodes ferox	2.04	2	0.30	
Chlorophthalmus atlanticus	1.77	41	0.26	
TRACHICHTHYIDAE	1.64	136	0.24	
Nezumia aequalis	1.50	191	0.22	
Bathynectes piperitus	1.36	150	0.20	
Dicologlossa cuneata	1.36	41	0.20	
Cataetx laticeps	1.23	232	0.18	
Caelorinchus sp.	1.23	95	0.18	
Glyphus marsupialis	0.95	327	0.14	
MYCTOPHIDAE	0.82	1063	0.12	
Synaphobranchus kaupii	0.68	14	0.10	
Trichiurus lepturus	0.55	14	0.08	
Hymenocephalus italicus	0.41	68	0.06	
Sergestes sp.	0.41	82	0.06	
Halosaurus ovenii	0.27	14	0.04	
MELANOCETIDAE	0.27	14	0.04	
Galeus polli	0.27	14	0.04	
Chaceon maritae, female	0.21	2	0.03	
Total	681.53		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 99
 DATE :25.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°53.80
 start stop duration Lon E 12°54.01
 TIME :17:28:09 17:48:58 20.8 (min) Purpose : 3
 LOG : 9807.86 9808.86 1.0 Region : 4000
 FDEPTH: 322 316 Gear cond.: 0
 BDEPTH: 322 316 Validity : 0
 Towing dir: 0° Wire out : 760 m Speed : 2.9 km
 Sorted : 18 Total catch: 380.52 Catch/hour: 1096.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Starfish	354.03	2481	32.28	
Merluccius polli	211.82	1392	19.32	180
Gephyroberyx darwini	116.20	121	10.60	
Laemonema laureysi	110.75	2118	10.10	
Caelorinchus coelorhinc. polli	108.33	3873	9.88	
Malacocephalus laevis	53.26	545	4.86	
NETTASTOMATIDAE	44.18	182	4.03	
Pontinus accraensis	21.79	363	1.99	
Mystriophis rostellatus	19.97	61	1.82	
Dibranchus atlanticus	15.73	1089	1.43	
Gadella imberbis	10.89	484	0.99	
Synagrops microlepis	8.47	303	0.77	
Pterothrissus belloci	7.26	61	0.66	
Bembrops greyi	4.24	121	0.39	
Bathyroconger vicinus	2.42	121	0.22	
CONGRIDAE	2.42	61	0.22	
Lophiodes kempfi	1.82	61	0.17	
Trichiurus lepturus	1.82	61	0.17	
Hymenocephalus italicus	1.21	303	0.11	
Total	1096.60		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 102
 DATE :26.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°36.40
 start stop duration Lon E 12°54.11
 TIME :00:43:24 01:13:26 30.0 (min) Purpose : 3
 LOG : 9839.80 9841.33 1.5 Region : 4000
 FDEPTH: 417 413 Gear cond.: 0
 BDEPTH: 417 413 Validity : 0
 Towing dir: 0° Wire out : 900 m Speed : 3.1 km
 Sorted : 23 Total catch: 300.43 Catch/hour: 600.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	324.07	8910	54.01	
Merluccius polli	97.37	262	16.23	
Laemonema laureysi	44.16	681	7.36	
Yarrella blackfordi	17.80	527	2.97	
Chaunax pictus	16.92	945	2.82	
Benthodesmus tenuis	15.82	22	2.64	
Etmopterus polli	12.96	439	2.16	
Dibranchus atlanticus	12.74	1274	2.12	
Hymenocephalus italicus	12.30	1758	2.05	
Malacocephalus laevis	8.57	66	1.43	
Bathyroconger vicinus	7.25	88	1.21	
Nezumia cyrano	5.71	176	0.95	
Triplophos hemingi	4.17	747	0.70	
Aristeus varidens, female	3.30	198	0.55	
Stomias boa boa	2.64	88	0.44	
J E L V F I S H	2.64	44	0.44	
Halosaurus ovenii	2.64	1011	0.44	
Gadella imberbis	2.20	66	0.37	
Aristeus varidens, male	1.76	220	0.29	
Lophiodes kempfi	1.54	22	0.26	
Solenocera africana	0.88	66	0.15	
Parapenaeus longirostris,femal	0.66	66	0.11	
L O B S T E R S	0.44	88	0.07	
Plesiopenaeus edwardsianus	0.44	88	0.07	
Galeus polli	0.44	22	0.07	
Trigla lyra	0.44	22	0.07	
Nemichthys scolopaceus	0.22	22	0.04	
Total	600.06		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 100
 DATE :25.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°35.42
 start stop duration Lon E 12°49.62
 TIME :20:37:59 21:08:01 30.0 (min) Purpose : 3
 LOG : 9827.33 9828.81 1.5 Region : 4000
 FDEPTH: 712 691 Gear cond.: 0
 BDEPTH: 712 691 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 3.0 km
 Sorted : 29 Total catch: 394.41 Catch/hour: 787.77

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	222.00	60811	28.18	
L O B S T E R S	89.58	8075	11.37	
Lamprogrammus exutus	67.51	130	8.57	
Nezumia aequalis	62.32	571	7.91	
Talsmania longifilis	39.73	364	5.04	
Centroscymnus crepidater	31.16	26	3.96	
Hoplostethus cadenati	30.90	831	3.92	
SEPTOLIDAE	22.85	130	2.90	
Sea cucumbers	22.33	182	2.83	
Dicrolene intronigra	18.95	935	2.41	
Scymnodon squamulosus	18.18	78	2.31	
Etmopterus polli	15.58	78	1.98	
Aristeus varidens, female	12.46	519	1.58	
UNIDENTIFIED FISH	12.46	364	1.58	
Todaropsis eblanae	12.20	52	1.55	
Dibranchus atlanticus	11.68	779	1.48	
Chaceon maritae, female	11.38	24	1.45	
Centrohorus squamosus	10.39	26	1.32	
Stomias boa boa	9.61	182	1.22	
Chlamydoselachus anguineus	9.49	2	1.20	
Bathyroconger vicinus	8.57	78	1.09	
Ateleopus natalensis	7.09	2	0.90	
Xenodermichthys copei	6.75	467	0.86	
CONGRIDAE	5.71	52	0.73	
Lophiodes kempfi	5.39	2	0.68	
Triplophos hemingi	4.41	493	0.56	
B I V A L V E S	3.64	1532	0.46	
L O B S T E R S	2.60	1506	0.33	
Aristeus varidens, male	1.82	130	0.23	
Halosaurus ovenii	1.56	26	0.20	
Glyphus marsupialis	1.56	130	0.20	
Starfish (large)	1.30	78	0.16	
Bathynectes piperitus	1.30	26	0.16	
Cynoglossus sp.	1.30	104	0.16	
Paramola cuvieri	1.08	2	0.14	
Plesiopenaeus edwardsianus	1.04	104	0.13	
Nemichthys scolopaceus	0.78	26	0.10	
Chaceon maritae, male	0.60	2	0.08	
Lampadena sp.	0.52	26	0.07	
Total	787.77		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 103
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°35.78
 start stop duration Lon E 13°1.11
 TIME :04:49:05 05:19:31 30.4 (min) Purpose : 3
 LOG : 9852.42 9853.90 1.5 Region : 4000
 FDEPTH: 148 145 Gear cond.: 0
 BDEPTH: 148 145 Validity : 0
 Towing dir: 0° Wire out : 400 m Speed : 2.9 km
 Sorted : 62 Total catch: 188.45 Catch/hour: 371.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	152.56	21903	41.05	
Pterothrissus belloci	47.79	288	12.86	
Spicara alta	29.03	67	7.81	
Dentex angolensis	18.74	69	5.04	182
Brotula barbata	15.88	14	4.27	
Raja leopardus	15.58	6	4.19	
Umbria canariensis	14.40	28	3.87	183
Miracoerina angolensis	12.82	51	3.45	
Zeus faber	12.15	36	3.27	
Parapenaeus longirostris	10.83	2750	2.91	
Trigla lyra	8.46	51	2.28	
Octopus vulgaris	6.51	6	1.75	
Citharus linguatula	3.75	71	1.01	
Todaropsis eblanae	3.18	71	0.85	
Uranoscopus cadenati	2.98	16	0.80	
Trichiurus lepturus	2.78	6	0.75	
Scorpaena normani	2.37	16	0.64	
Dentex macrophthalmus	1.99	6	0.54	
Atractoscion aequidens	1.95	6	0.53	
OCTOPODIDAE	1.79	10	0.48	
Pteroscion pelli	0.83	6	0.22	
Zenopsis conchifer	0.77	6	0.21	
Bathyroconger vicinus	0.71	6	0.19	
Chatrabus melanurus	0.71	6	0.19	
Syacium micrurum	0.57	10	0.15	
Saurida brasiliensis	0.57	16	0.15	
GOBIIDAE	0.51	71	0.14	
Trachinocephalus myops	0.51	10	0.14	
Scorpaena stephanica	0.51	6	0.14	
Sepia officinalis hierreda	0.45	6	0.12	
Total	371.70		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 104
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°37.48
 start stop duration Lon E 13°4.00
 TIME :06:32:38 07:02:44 30.1 (min) Purpose : 3
 LOG : 9861.13 9862.55 1.4 Region : 4000
 FDEPTH: 113 112 Gear cond.: 0
 BDEPTH: 113 112 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 2.8 kn
 Sorted : 143 Total catch: 143.05 Catch/hour: 285.05

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 107
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°36.17
 start stop duration Lon E 13°18.69
 TIME :11:10:11 11:20:07 9.9 (min) Purpose : 3
 LOG : 9886.42 9887.00 0.6 Region : 4000
 FDEPTH: 32 31 Gear cond.: 0
 BDEPTH: 32 31 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.4 kn
 Sorted : 93 Total catch: 93.31 Catch/hour: 563.81

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	150.65	1339	52.85	185
Dentex angolensis	101.33	434	35.55	184
Trichiurus lepturus	8.47	16	2.97	
Zeus faber	6.76	26	2.37	
Dentex congoensis	4.20	50	1.48	
Pterothrissus bellocci	3.91	24	1.37	
Octopus vulgaris	3.39	6	1.19	
Illex coindetii	1.95	88	0.69	
Scorpaena stephanica	1.34	2	0.47	
Umrina canariensis	1.02	2	0.36	
Citharus linguatula	0.42	8	0.15	
Chelidonichthys capensis	0.30	4	0.10	
Chaetodon hoefleri	0.28	2	0.10	
Spicara alta	0.24	2	0.08	
Bembrops greyi	0.22	2	0.08	
B I V A L V E S	0.20	36	0.07	
Boops boops	0.20	6	0.07	
Erythrocles monodi	0.18	2	0.06	
Syacium micrurum	0.02	2	0.01	
Total	285.05		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	203.32	2489	36.06	188
Galeoides decadactylus	93.05	193	16.50	
Stromateus fiatola	78.55	236	13.93	
Carcharhinus signatus	57.40	18	10.18	
Trichiurus lepturus	24.05	127	4.27	
Raja miraletus	20.18	30	3.58	
Sepia orbignyana	18.01	48	3.19	
Chloroscombrus chrysurus	13.35	97	2.37	
Pomadasy peroteti	9.85	18	1.75	
Pseudotolithus senegalensis	9.61	12	1.70	
Selene dorsalis	8.40	73	1.49	
Sphyraena guanchancho	6.28	18	1.11	
Penaeus notialis	3.63	48	0.64	
Trachurus trecae	3.44	42	0.61	
Alloteuthis africana	3.20	840	0.57	
Dicologlossa cuneata	3.08	12	0.55	
Sardinella aurita	2.78	12	0.49	
Decapterus rhonchus	2.30	6	0.41	
Sardinella maderensis	2.24	6	0.40	
Sepiella sp.	0.73	350	0.13	
Grammolites gruvelli	0.36	6	0.06	
Total	563.81		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 105
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°34.74
 start stop duration Lon E 13°15.04
 TIME :08:43:28 09:10:47 27.3 (min) Purpose : 3
 LOG : 9874.86 9876.29 1.4 Region : 4000
 FDEPTH: 53 54 Gear cond.: 0
 BDEPTH: 53 54 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.1 kn
 Sorted : 53 Total catch: 53.25 Catch/hour: 116.95

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 108
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°15.98
 start stop duration Lon E 13°15.75
 TIME :13:30:36 14:00:38 30.0 (min) Purpose : 3
 LOG : 9906.86 9908.49 1.6 Region : 4000
 FDEPTH: 30 29 Gear cond.: 0
 BDEPTH: 30 29 Validity : 0
 Towing dir: 0° Wire out : 1 m Speed : 3.3 kn
 Sorted : 489 Total catch: 488.84 Catch/hour: 977.03

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zeus faber	21.52	57	18.40	
Alectis alexandrinus	16.14	15	13.80	
Torpedo torpedo	14.93	35	12.77	
Epinephelus aeneus	14.28	2	12.21	
Galeoides decadactylus	14.06	33	12.02	
Sepia orbignyana	8.35	11	7.14	
Pagellus bellottii	5.31	26	4.54	
Stromateus fiatola	4.74	7	4.06	
Brachydeuterus auritus	3.16	51	2.70	186
Trichiurus lepturus	2.90	147	2.48	
Lagocephalus laevigatus	2.55	4	2.18	
Raja miraletus	1.93	2	1.65	
Decapterus punctatus	1.78	2	1.52	
Pseudotolithus typus	1.65	2	1.41	
Lithognathus mormyrus	1.23	2	1.05	
Todaropsis eblanae	0.92	83	0.79	
Alloteuthis africana	0.44	347	0.38	
Citharus linguatula	0.37	15	0.32	
Selene dorsalis	0.15	2	0.13	
Dentex barnardi	0.13	2	0.11	
Grammolites gruvelli	0.11	2	0.09	
Penaeus notialis	0.11	4	0.09	
Trachinocephalus myops	0.11	11	0.09	
Engraulis encrasicolus	0.07	11	0.06	
Total	116.95		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	218.35	3803	22.35	189
Chloroscombrus chrysurus	168.19	1375	17.21	
Sphyraena guanchancho	137.61	314	14.08	
Trichiurus lepturus	120.92	791	12.38	
Galeoides decadactylus	115.02	352	11.77	192
Ilisha africana	80.55	2326	8.24	
Pseudotolithus senegalensis	43.27	162	4.43	190
Stromateus fiatola	33.28	64	3.41	
Pteroscion peli	12.13	178	1.24	
Selene dorsalis	9.09	178	0.93	
Sepia orbignyana	8.79	12	0.90	
Pomadasy peroteti	7.87	36	0.81	
Raja miraletus	5.20	10	0.53	
Pomadasy incisus	3.88	42	0.40	
penaeus notialis,female	3.08	64	0.32	
Sardinella maderensis	2.80	22	0.29	191
Cynoponticus ferox	1.90	2	0.19	
penaeus notialis,male	1.82	88	0.19	
Dicologlossa cuneata	1.50	24	0.15	
Lagocephalus laevigatus	0.62	2	0.06	
Sardinella aurita	0.40	2	0.04	
Atractoscion aequidens	0.32	2	0.03	
Sepiella sp.	0.20	70	0.02	
Umrina canariensis	0.14	2	0.01	
Trichiurus lepturus	0.10	2	0.01	
Total	977.03		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 106
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°34.96
 start stop duration Lon E 13°16.41
 TIME :09:46:44 10:16:48 30.1 (min) Purpose : 3
 LOG : 9879.10 9880.66 1.6 Region : 4000
 FDEPTH: 44 44 Gear cond.: 0
 BDEPTH: 44 44 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.1 kn
 Sorted : 78 Total catch: 77.66 Catch/hour: 154.96

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 109
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°15.02
 start stop duration Lon E 13°11.91
 TIME :14:42:51 15:13:06 30.3 (min) Purpose : 3
 LOG : 9912.66 9914.08 1.4 Region : 4000
 FDEPTH: 45 48 Gear cond.: 0
 BDEPTH: 45 48 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 2.8 kn
 Sorted : 195 Total catch: 353.24 Catch/hour: 700.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	105.45	247	68.05	187
Alectis alexandrinus	21.95	30	14.16	
Arius parkii	4.59	4	2.96	
Sepia orbignyana	4.09	4	2.64	
Zeus faber	3.89	18	2.51	
Trichiurus lepturus	2.06	146	1.33	
Octopus vulgaris	1.98	2	1.27	
Lithognathus mormyrus	1.80	4	1.16	
Pomadasy jubelini	1.70	2	1.09	
Pseudotolithus typus	1.52	2	0.98	
Lagocephalus laevigatus	1.32	2	0.85	
Epinephelus aeneus	1.22	2	0.79	
Pagrus caeruleostictus	0.82	2	0.53	
Grammolites gruvelli	0.80	18	0.52	
Chaetodon hoefleri	0.40	2	0.26	
Dicologlossa cuneata	0.32	6	0.21	
Alloteuthis africana	0.28	186	0.18	
Citharus linguatula	0.24	6	0.15	
GOBIIDAE	0.16	106	0.10	
Selene dorsalis	0.14	2	0.09	
Trachinocephalus myops	0.12	14	0.08	
Penaeus notialis	0.10	2	0.06	
Antennarius occidentalis	0.04	2	0.03	
Total	154.96		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy peroteti	319.74	135	45.63	
Brachydeuterus auritus	157.88	2590	22.53	193
Pomadasy incisus	79.54	492	11.35	
Galeoides decadactylus	64.86	182	9.26	
Selene dorsalis	16.50	321	2.36	
Alectis alexandrinus	10.79	12	1.54	
Sphyraena guanchancho	8.93	56	1.27	
Chloroscombrus chrysurus	7.78	56	1.11	
Pagellus bellottii	7.70	36	1.10	198
Sepia officinalis hierredda	6.78	12	0.97	
Epinephion guttifer	6.11	4	0.87	
Dentex barnardi	4.68	20	0.67	
Trachurus trecae	4.20	119	0.60	194
Trichiurus lepturus	2.94	16	0.42	
Pteroscion peli	0.56	4	0.08	
Penaeus notialis	0.36	4	0.05	
Eucinostomus melanopterus	0.28	4	0.04	
Citharus linguatula	0.28	4	0.04	
Engraulis encrasicolus	0.20	12	0.03	
Grammolites gruvelli	0.20	4	0.03	
Antennarius occidentalis	0.20	4	0.03	
Torpedo torpedo	0.16	4	0.02	
Total	700.64		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 110
 DATE :26.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°18.18
 start stop duration Lon E 13°9.34
 TIME :15:59:17 16:20:20 21.1 (min) Purpose : 3
 LOG : 9918.58 9919.57 1.0 Region : 4000
 FDEPTH: 64 64 Gear cond.: 0
 BDEPTH: 64 64 Validity : 0
 Towing dir: 0° Wire out : 170 m Speed : 2.8 km
 Sorted : 190 Total catch: 391.71 Catch/hour: 1115.98

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 113
 DATE :27.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°28.23
 start stop duration Lon E 12°48.03
 TIME :00:14:31 00:44:36 30.1 (min) Purpose : 3
 LOG : 9961.77 9963.29 1.5 Region : 4000
 FDEPTH: 542 530 Gear cond.: 0
 BDEPTH: 542 530 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 3.0 km
 Sorted : 26 Total catch: 374.99 Catch/hour: 747.74

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	764.10	2758	68.47
Brachydeuterus auritus	125.93	1487	11.28
Miracorvina angolensis	71.51	405	6.41
Stromateus fiatola	60.40	188	5.41
Dentex angolensis	15.67	83	1.40
Raja miraletus	11.45	28	1.03
Pagellus bellottii	10.09	71	0.90
Epinephelus aeneus	7.83	3	0.70
Pseudolithus typus	6.21	6	0.56
Pomadasy peroteti	5.70	11	0.51
Sepia officinalis hierredda	4.73	6	0.42
Sphyrana guachancho	4.56	6	0.41
Pomadasy incisus	4.05	17	0.36
Brotula barbata	3.99	6	0.36
Torpedo torpedo	3.70	6	0.33
Trachurus trachurus	2.96	57	0.27
Engraulis encrasicolus	2.79	490	0.25
Branchiostegus semifasciatus *	1.94	3	0.17
Zeus faber	1.77	11	0.16
Selene dorsalis	1.48	11	0.13
Galeoides decadactylus	1.48	6	0.13
Umbrina canariensis	1.20	11	0.11
Ilisha africana	1.14	11	0.10
Alloteuthis africana	0.97	256	0.09
Citharus linguatula	0.34	6	0.03
Total	1115.98	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	392.22	95111	52.45
Lamprogrammus exutus	67.00	4411	8.96
Hoplostethus cadenati	60.58	2233	8.10
Yarrella blackfordi	59.74	1731	7.99
Stomias boa boa	42.43	893	5.67
Stereomastis sp.	38.25	4132	5.11
Aristeus varidens, female	31.55	1340	4.22
Gadella imberbis	12.56	586	1.68
Aristeus varidens, male	7.82	1061	1.05
OMMASTREPHIDAE	5.30	84	0.71
Raja confundens	4.19	28	0.56
Sergestes sp.	3.91	530	0.52
Triplophos hemingi	3.07	586	0.41
Lophodes kempii	3.05	2	0.41
Rhinochimera atlantica	2.81	2	0.38
Chaceon maritae	1.79	8	0.24
Trichiurus lepturus	1.58	2	0.21
MYCTOPHIDAE	1.40	1759	0.19
Bathynectes piperitus	1.40	167	0.19
Bathyroconger vicinus	1.40	84	0.19
Chlorophthalmus atlanticus	1.12	28	0.15
Benthodesmus tenuis	1.12	28	0.15
Hirundichthys affinis	0.68	2	0.09
Caristius sp	0.56	28	0.07
Cataetx laticeps	0.56	140	0.07
Dibranchus atlanticus	0.56	28	0.07
Acanthephyra sp.	0.56	391	0.07
Xenodermichthys copei	0.56	56	0.07
Total	747.74	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 111
 DATE :26.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°27.15
 start stop duration Lon E 12°46.22
 TIME :20:00:58 20:31:23 30.4 (min) Purpose : 3
 LOG : 9948.15 9949.74 1.6 Region : 4000
 FDEPTH: 686 690 Gear cond.: 0
 BDEPTH: 686 690 Validity : 0
 Towing dir: 0° Wire out : 1550 m Speed : 3.1 km
 Sorted : 51 Total catch: 387.98 Catch/hour: 765.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Yarrella blackfordi	258.69	8202	33.82
Nematocarcinus africanus	204.27	21105	26.70
Stereomastis sp.	89.91	4906	11.75
Lamprogrammus exutus	57.26	237	7.48
Hoplostethus cadenati	34.23	1151	4.47
Bathyroconger vicinus	22.24	726	2.91
Aristeus varidens, female	12.78	568	1.67
Stomias boa boa	11.79	931	1.54
Nezumia aequalis	11.20	221	1.46
Chaceon maritae, male	10.73	32	1.40
Dibranchus atlanticus	10.73	915	1.40
Triplophos hemingi	10.57	1435	1.38
Xenodermichthys copei	6.47	631	0.85
Loligo vulgaris	4.73	16	0.62
SEPIIDAE	4.73	32	0.62
Chaceon maritae, female	4.42	32	0.58
Dicrolene intronigra	3.31	268	0.43
Talismaania longifilis	2.37	126	0.31
Lampadena sp.	0.95	32	0.12
L O B S T E R S	0.95	599	0.12
Glyphus marsupialis	0.79	95	0.10
Aristeus varidens, male	0.79	79	0.10
Phrynichthys wedli	0.47	16	0.06
NETTASTOMATIDAE	0.32	16	0.04
Halosaurus ovenii	0.32	16	0.04
Total	765.00	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 114
 DATE :27.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°28.51
 start stop duration Lon E 12°49.53
 TIME :02:09:58 02:17:56 8.0 (min) Purpose : 3
 LOG : 9968.63 9969.04 0.4 Region : 4000
 FDEPTH: 455 455 Gear cond.: 0
 BDEPTH: 455 455 Validity : 0
 Towing dir: 0° Wire out : 1000 m Speed : 3.1 km
 Sorted : 29 Total catch: 117.12 Catch/hour: 881.71

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
J E L L Y F I S H	520.95	14213	59.08
Nematocarcinus africanus	225.85	60647	25.61
Trichiurus lepturus	23.49	60	2.66
Laemonema laureysi	20.78	211	2.36
Yarrella blackfordi	19.27	693	2.19
Stomias boa boa	16.56	693	1.88
Stereomastis sp.	6.93	1144	0.79
Hoplostethus cadenati	6.02	241	0.68
Aristeus varidens, female	5.72	271	0.65
Triplophos hemingi	5.12	1325	0.58
Dibranchus atlanticus	4.82	256	0.55
Chaunax pictus	4.82	60	0.55
Hymenocephalus italicus	4.22	542	0.48
Gadella imberbis	3.61	151	0.41
Bathynectes piperitus	3.31	90	0.38
Malacocephalus laevis	2.41	30	0.27
MYCTOPHIDAE	2.41	2048	0.27
Lamprogrammus exutus	2.11	271	0.24
Aristeus varidens, male	1.20	120	0.14
Plesiopteneus edwardsianus	0.90	30	0.10
Bathyroconger vicinus	0.60	30	0.07
Nezumia aequalis	0.60	60	0.07
Total	881.71	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 112
 DATE :26.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°27.08
 start stop duration Lon E 12°46.94
 TIME :22:07:10 22:37:10 30.0 (min) Purpose : 3
 LOG : 9954.16 9955.64 1.5 Region : 4000
 FDEPTH: 597 602 Gear cond.: 0
 BDEPTH: 597 602 Validity : 0
 Towing dir: 0° Wire out : 1350 m Speed : 3.0 km
 Sorted : 32 Total catch: 420.56 Catch/hour: 841.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	284.70	67938	33.85
Yarrella blackfordi	99.32	806	11.81
Hoplostethus cadenati	79.04	2912	9.40
Lamprogrammus exutus	75.14	1352	8.93
Chaceon maritae, male	65.00	130	7.73
Stomias boa boa	36.40	208	4.33
Merluccius polli	32.50	52	3.86
Stereomastis sp.	31.98	182	3.80
Chaceon maritae, female	27.30	130	3.25
Triplophos hemingi	11.44	1664	1.36
Aristeus varidens, female	10.92	364	1.30
Gadella imberbis	9.88	416	1.17
Bathyroconger vicinus	8.84	364	1.05
Ommastrephes bartrami	6.50	78	0.77
Chlamydoselachus anguineus	5.50	2	0.65
Acanthephyra sp.	5.20	286	0.62
Xenodermichthys copei	4.94	546	0.59
G A S T R O P O D S	4.94	52	0.59
Raja confundens	4.68	104	0.56
Dicrolene intronigra	4.68	494	0.56
Centrophorus squamosus	4.40	2	0.52
Chlorophthalmus agassizi	4.16	104	0.49
Ebinania costaecanarie	4.16	52	0.49
Aristeus varidens, male	3.90	468	0.46
Dibranchus atlanticus	2.34	182	0.28
Cataetx laticeps	2.08	364	0.25
Chaunax pictus	2.08	52	0.25
MYCTOPHIDAE	2.08	1508	0.25
Benthodesmus tenuis	1.82	52	0.22
Bathynectes piperitus	1.56	338	0.19
Sergestes sp.	1.04	130	0.12
Gonostoma elongatum	0.52	52	0.06
GALATHEIDAE *	0.52	390	0.06
Plesionika sp.	0.52	78	0.06
Ommastrephes bartrami	0.26	52	0.03
Caristius sp	0.26	26	0.03
Melanocetus johnsoni	0.26	26	0.03
CYNGLOSSIDAE	0.26	26	0.03
Total	841.12	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 115
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°27.65
 start stop duration Lon E 12°53.28
 TIME :04:57:56 05:28:26 30.5 (min) Purpose : 3
 LOG : 9977.02 9978.62 1.6 Region : 4000
 FDEPTH: 315 304 Gear cond.: 0
 BDEPTH: 315 304 Validity : 0
 Towing dir: 0° Wire out : 765 m Speed : 3.1 km
 Sorted : 54 Total catch: 53.65 Catch/hour: 105.54

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	42.79	2428	40.54
Merluccius polli	17.31	140	16.40
Trichiurus lepturus	13.32	20	12.62
J E L L Y F I S H	9.42	260	8.93
Chlorophthalmus atlanticus	7.77	175	7.36
Gephyroberyx darwini	4.27	8	4.04
MYCTOPHIDAE	3.56	3456	3.37
Laemonema laureysi	2.71	30	2.57
Parapeneus longirostris	2.20	344	2.09
Malacocephalus laevis	0.87	10	0.82
Scorpaena normani	0.41	4	0.39
Hymenocephalus italicus	0.31	83	0.30
Gadella imberbis	0.28	12	0.26
Bembrops greyi	0.20	2	0.19
PARALEPIDIDAE	0.06	2	0.06
Solenocera africana	0.04	2	0.04
ArgoGLOSSUS sp.	0.02	4	0.02
Total	105.54	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 116
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°26.19
 start stop duration Lon E 12°54.93
 TIME :06:43:46 07:03:18 19.5 (min) Purpose : 3
 LOG : 9984.55 9985.51 1.0 Region : 4000
 FDEPTH: 229 229 Gear cond.: 0
 BDEPTH: 229 229 Validity : 0
 Towing dir: 0° Wire out : 570 m Speed : 2.9 kn
 Sorted : 88 Total catch: 308.76 Catch/hour: 948.09

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 120
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°3.25
 start stop duration Lon E 13°7.41
 TIME :13:42:23 14:12:26 30.1 (min) Purpose : 3
 LOG : 26.86 28.41 1.6 Region : 4000
 FDEPTH: 42 44 Gear cond.: 0
 BDEPTH: 42 44 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 190 Total catch: 190.26 Catch/hour: 379.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	521.94	29165	55.05	
Brotula barbata	123.90	89	13.07	
Merluccius polli	80.60	424	8.50	199
Zeus faber	50.02	101	5.28	
Chlorophthalmus atlanticus	49.93	1382	5.27	
Pterothrissus bellocci	37.77	258	3.98	
Caelorinchus coelorrhinc. polli	17.87	415	1.88	
Dentex angolensis	17.50	46	1.85	200
Bembrops greyi	16.12	111	1.70	
Parapenaeus longirostris	12.62	2386	1.33	
Trichiurus lepturus	11.33	18	1.20	
Todaropsis eblanae	4.33	46	0.46	
Bathystrogon vicinus	1.66	28	0.17	
Hoplostethus atlanticus	1.38	37	0.15	
Monolele microstoma	1.11	37	0.12	
Total	948.09		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	194.81	399	51.30	209
Pseudotolithus senegalensis	112.18	34	29.54	210
Dasyatis marmorata	18.46	14	4.86	
Brachydeuterus auritus	10.40	144	2.74	211
Trichiurus lepturus	10.34	24	2.72	
Stromateus fiatola	9.00	20	2.37	
Ephippion guttifer	8.98	2	2.37	
Pomadasy peroteti	4.89	6	1.29	
Selene dorsalis	3.65	48	0.96	
Sphyræna guachancho	1.74	14	0.46	
Lagocephalus laevigatus	1.58	2	0.42	
Chloroscombrus chrysurus	1.00	8	0.26	
Atractoscion aequidens	0.66	2	0.17	
Alloteuthis africana	0.52	136	0.14	
Pomadasy incisus	0.50	2	0.13	
Alectis alexandrinus	0.48	2	0.13	
Sardinella maderensis	0.18	4	0.05	
Ilisha africana	0.18	4	0.05	
Torpedo torpedo	0.16	2	0.04	
Decapterus rhonchus	0.06	2	0.02	
Total	379.76		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 117
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°24.29
 start stop duration Lon E 12°56.54
 TIME :08:05:16 08:35:26 30.2 (min) Purpose : 3
 LOG : 9989.83 9991.41 1.6 Region : 4000
 FDEPTH: 168 162 Gear cond.: 0
 BDEPTH: 168 162 Validity : 0
 Towing dir: 0° Wire out : 450 m Speed : 3.1 kn
 Sorted : 111 Total catch: 110.63 Catch/hour: 219.94

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 121
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°4.96
 start stop duration Lon E 13°4.12
 TIME :16:11:55 16:43:44 31.8 (min) Purpose : 3
 LOG : 34.47 36.06 1.6 Region : 4000
 FDEPTH: 67 65 Gear cond.: 0
 BDEPTH: 67 65 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.0 kn
 Sorted : 84 Total catch: 292.39 Catch/hour: 551.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	103.38	340	47.00	202
Trichiurus lepturus	40.56	38	18.44	
Brotula barbata	17.99	18	8.18	
Umbrina canariensis	15.11	32	6.87	201
Zeus faber	10.44	52	4.75	
Todarodes sagittatus	8.27	215	3.76	
Spicara alta	7.16	38	3.25	
Zenopsis conchifer	5.94	14	2.70	
Squatina oculata	4.37	2	1.99	
Pterothrissus bellocci	2.60	82	1.18	
Bembrops greyi	1.21	10	0.55	
Octopus vulgaris	1.07	4	0.49	
Monolele microstoma	0.89	34	0.41	
Todaropsis eblanae	0.60	12	0.27	
Dentex macropthalmus	0.18	2	0.08	
Citharus linguatula	0.16	2	0.07	
Total	219.94		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	156.27	2007	28.34	216
Pomadasy peroteti	114.87	200	20.83	
Pseudotolithus senegalensis	63.66	81	11.54	213
Trichiurus lepturus	40.40	106	7.33	
Galeoides decadactylus	34.59	91	6.27	
Trachurus trecae	30.37	290	5.51	215
Dentex angolensis	20.75	104	3.76	212
Torpedo torpedo	15.05	58	2.73	
Octopus vulgaris	15.05	11	2.73	
Brotula barbata	8.58	11	1.56	
Sardinella maderensis	8.51	47	1.54	
Pomadasy incisus	6.02	43	1.09	
Atractoscion aequidens	5.22	11	0.95	
Dasyatis marmorata	5.00	4	0.91	
Pagellus bellottii	4.26	23	0.77	214
Stromateus fiatola	3.55	6	0.64	
Sepia orbignyana	3.11	11	0.56	
Umbrina canariensis	2.53	21	0.46	
Raja miraletus	2.53	6	0.46	
Miraocorvina angolensis	2.38	15	0.43	
Ilisha africana	2.17	26	0.39	
Cynoglossus canariensis	1.70	11	0.31	
Citharus linguatula	1.47	26	0.27	
Bembrops greyi	1.32	15	0.24	
Branchiostegus semifasciatus *	0.98	2	0.18	
Epinephelus goreensis	0.64	6	0.12	
Alloteuthis africana	0.47	11	0.09	
Engraulis encrasicolus	0.06	11	0.01	
Total	551.51		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 118
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°19.28
 start stop duration Lon E 13°5.29
 TIME :10:07:48 10:37:48 30.0 (min) Purpose : 3
 LOG : 2.33 3.86 1.5 Region : 4000
 FDEPTH: 88 83 Gear cond.: 0
 BDEPTH: 88 83 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.1 kn
 Sorted : 79 Total catch: 367.44 Catch/hour: 734.89

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 122
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°4.48
 start stop duration Lon E 13°3.01
 TIME :17:23:02 17:43:05 20.0 (min) Purpose : 3
 LOG : 38.61 39.57 1.0 Region : 4000
 FDEPTH: 71 72 Gear cond.: 0
 BDEPTH: 71 72 Validity : 0
 Towing dir: 0° Wire out : 205 m Speed : 2.9 kn
 Sorted : 121 Total catch: 120.83 Catch/hour: 361.77

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Stromateus fiatola	356.60	448	48.52	
Trichiurus lepturus	283.92	576	38.63	
Dentex angolensis	31.20	134	4.25	203
Zeus faber	21.55	44	2.93	
Selene dorsalis	10.56	76	1.44	
Decapterus rhonchus	7.20	4	0.98	
Atractoscion aequidens	7.20	4	0.98	
Raja miraletus	4.80	4	0.65	
Trachurus trecae	3.94	230	0.54	204
Brachydeuterus auritus	3.02	14	0.41	
Fistularia petimba	2.06	10	0.28	
Umbrina canariensis	1.06	10	0.14	
Alloteuthis africana	0.58	268	0.08	
Dicologlossa cuneata	0.53	4	0.07	
Pterothrissus bellocci	0.43	10	0.06	
Todarodes sagittatus	0.10	10	0.01	
GOBIIDAE	0.05	4	0.01	
Saurida brasiliensis	0.05	14	0.01	
Citharus linguatula	0.05	10	0.01	
Total	734.89		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	95.36	539	26.36	220
Pagellus bellottii	51.65	701	14.28	219
Trachurus trecae	47.16	1769	13.03	217
Trichiurus lepturus	25.60	60	7.08	
Brachydeuterus auritus	14.37	147	3.97	218
Brotula barbata	13.62	30	3.77	
Citharus linguatula	13.23	159	3.66	
Sepia orbignyana	13.20	84	3.65	
Pomadasy incisus	12.93	90	3.58	
Chelidonichthys gabonensis	11.56	51	3.19	
Alloteuthis africana	11.05	3195	3.05	
Umbrina canariensis	7.84	81	2.17	221
Torpedo torpedo	5.66	30	1.56	
Pseudotolithus senegalensis	4.79	6	1.32	
Raja miraletus	4.22	6	1.17	
Octopus vulgaris	4.19	9	1.16	
Stromateus fiatola	3.80	3	1.05	
Pegusa lascaris	3.56	24	0.98	
Saurida brasiliensis	3.35	868	0.93	
Branchiostegus semifasciatus *	2.93	6	0.81	
Zeus faber	2.40	21	0.66	
Fistularia petimba	2.22	9	0.61	
Chaetodon hoefleri	1.68	12	0.46	
Bembrops greyi	1.41	18	0.39	
Dentex barnardi	1.11	6	0.31	
GOBIIDAE	0.99	1371	0.27	
Sardinella maderensis	0.81	6	0.22	
Bathystrogon vicinus	0.39	3	0.11	
Pseudupeneus prayensis	0.24	6	0.07	
Engraulis encrasicolus	0.18	24	0.05	
Ephippion guttifer	0.15	3	0.04	
Antennarius occidentalis	0.09	3	0.02	
Lagocephalus laevigatus	0.03	3	0.01	
Total	361.77		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 119
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°3.50
 start stop duration Lon E 13°10.00
 TIME :12:29:20 12:59:15 30.0 (min) Purpose : 3
 LOG : 21.71 23.36 1.6 Region : 4000
 FDEPTH: 28 27 Gear cond.: 0
 BDEPTH: 28 27 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.3 kn
 Sorted : 139 Total catch: 340.63 Catch/hour: 681.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ilisha africana	188.16	8468	27.62	
Brachydeuterus auritus	92.64	1680	13.60	208
Galeoides decadactylus	81.12	220	11.91	207
Trichiurus lepturus	66.48	116	9.76	
Pseudotolithus senegalensis	60.72	158	8.91	205
Sphyræna guachancho	53.52	134	7.86	
Stromateus fiatola	30.00	44	4.40	
Pteroscion peli	26.40	412	3.88	
Chloroscombrus chrysurus	26.21	236	3.85	
Pseudotolithus typus	22.56	24	3.31	206
Arius parkii	5.18	10	0.76	
Gymnura micrura	4.80	2	0.70	
Selene dorsalis	4.66	96	0.68	
Dasyatis marmorata	4.20	2	0.62	
G A S T R O P O D S	3.41	10	0.50	
Drepane africana	2.74	2	0.40	
Pomadasy peroteti	2.64	4	0.39	
Pentaneum quinquarius	2.26	24	0.33	
Raja miraletus	1.06	4	0.16	
Dicologlossa cuneata	0.67	10	0.10	
Trachurus trecae	0.67	34	0.10	
Umbrina canariensis	0.53	4	0.08	
Cynoglossus senegalensis	0.39	4	0.06	
Sardinella maderensis	0.14	4	0.02	
Penaeus notialis	0.10	10	0.01	
Total	681.25		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 123
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°16.78
 start stop duration Lon E 12°41.04
 TIME :21:19:39 21:40:15 20.6 (min) Purpose : 3
 LOG : 67.63 68.65 1.0 Region : 4000
 FDEPTH: 713 707 Gear cond.: 0
 BDEPTH: 713 707 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 3.0 km
 Sorted : 49 Total catch: 295.14 Catch/hour: 860.05

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	241.28	6399	28.05
Yarella blackfordi	146.87	4284	17.08
Lamprogrammus exutus	101.93	507	11.85
Stereomastis sp.	93.54	4598	10.88
Hoplostethus cadenati	53.33	1644	6.20
Nezumia micronychodon	50.88	1119	5.92
OMMASTREPHIDAE	32.00	157	3.72
Bassanago albescens	26.23	525	3.05
Aristeus varidens, female	20.63	822	2.40
Holothuria sp.	16.09	52	1.87
Stomias boa boa	15.91	402	1.85
Dicrolene intronigra	11.02	804	1.28
Dibranchius atlanticus	7.52	472	0.87
Triplophos hemingi	6.64	787	0.77
Etmopterus polli	5.94	87	0.69
Xenodermichthys copei	3.85	350	0.45
Bajacalifornia magalops	3.85	175	0.45
Chaceon maritae	3.85	12	0.45
Trichiurus lepturus	3.67	17	0.43
Halosaurus ovenii	2.97	35	0.35
Lophiodes kempii	2.62	17	0.30
GALATHEIDAE	1.92	927	0.22
Aristeus varidens, male	1.92	157	0.22
Brotula sp.	1.40	17	0.16
ALEPOCEPHALIDAE	0.87	17	0.10
Malacocephalus laevis	0.70	17	0.08
Caristius sp.	0.52	17	0.06
Synaphobranchus kaupii	0.52	17	0.06
Cataetx laticeps	0.52	140	0.06
Lampadena sp.	0.52	17	0.06
OPHIDIIDAE	0.52	17	0.06
Total	860.05		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 124
 DATE :27.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°15.84
 start stop duration Lon E 12°41.48
 TIME :23:02:12 23:32:28 30.3 (min) Purpose : 3
 LOG : 74.62 76.19 1.6 Region : 4000
 FDEPTH: 625 612 Gear cond.: 0
 BDEPTH: 625 612 Validity : 0
 Towing dir: 0° Wire out : 1440 m Speed : 3.1 km
 Sorted : 32 Total catch: 443.42 Catch/hour: 878.93

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	255.30	61994	29.05
Yarella blackfordi *	251.14	7715	28.57
Hoplostethus cadenati	108.78	3857	12.38
Lamprogrammus exutus	66.32	916	7.95
Stereomastis sp.	44.40	7132	5.05
Stomias boa boa	36.08	888	4.10
OMMASTREPHIDAE	31.64	1526	3.60
Nezumia micronychodon	13.88	278	1.58
Aristeus varidens, male	11.38	527	1.29
Xenodermichthys copei	11.10	944	1.26
Trichiurus lepturus	9.71	28	1.11
Bathyroconger vicinus	7.77	361	0.88
Chlorophthalmus atlanticus	5.83	139	0.66
Chaceon maritae	3.96	10	0.45
ALEPOCEPHALIDAE	2.50	222	0.28
Laemonema laureysi	2.50	28	0.28
Unidentified invertebrate	1.94	28	0.22
Triplophos hemingi	1.67	222	0.19
Dicrolene intronigra	1.39	194	0.16
Dibranchius atlanticus	1.39	83	0.16
Gonostoma elongatum	1.39	83	0.16
Scopelosaurus meadi	1.39	28	0.16
Sepiella sp.	1.11	28	0.13
Melanocetus johnsoni	1.11	56	0.13
Lophiodes kempii	0.83	28	0.09
Raja confundens	0.83	28	0.09
Shrimps, small, non comm.	0.83	111	0.09
Aristeus varidens, female	0.83	111	0.09
Caristius sp.	0.56	28	0.06
Cataetx laticeps	0.56	167	0.06
Starfish (large)	0.56	28	0.06
MYCTOPHIDAE	0.28	167	0.03
Total	878.93		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 125
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°14.03
 start stop duration Lon E 12°43.47
 TIME :01:31:41 02:01:43 30.0 (min) Purpose : 3
 LOG : 83.66 85.16 1.5 Region : 4000
 FDEPTH: 429 427 Gear cond.: 0
 BDEPTH: 429 427 Validity : 0
 Towing dir: 0° Wire out : 1000 m Speed : 3.0 km
 Sorted : 21 Total catch: 248.10 Catch/hour: 495.54

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	275.73	2988	55.64
Hymenocephalus italicus	29.44	2658	5.94
Merluccius polli	28.66	112	5.78
J E L L Y F I S H	21.53	615	4.35
Trichiurus lepturus	17.14	44	3.46
Chaunax pictus	16.92	330	3.41
Laemonema laureysi	16.92	395	3.41
Dibranchius atlanticus	14.28	1142	2.88
B I V A L V E S	9.01	44	1.82
OMMASTREPHIDAE	8.79	44	1.77
Stereomastis sp.	7.47	813	1.51
Stomias boa boa	6.59	154	1.33
Plesiopeneus edwardsianus	6.37	352	1.29
Conger conger	6.15	44	1.24
Yarella blackfordi	5.49	220	1.11
Triplophos hemingi	4.39	659	0.89
Gadella imberbis	3.30	110	0.67
Malacocephalus occidentalis	2.64	110	0.53
Chlorophthalmus atlanticus	2.64	66	0.53
Solenocera africana	2.20	176	0.44
Malacocephalus laevis	1.76	22	0.35
Benthodesmus tenuis	1.76	66	0.35
Aristeus varidens, female	1.54	176	0.31
Parapeneus longirostris	1.10	132	0.22
MYCTOPHIDAE	0.88	945	0.18
Callinectes amnicola	0.88	66	0.18
Halosaurus ovenii	0.88	44	0.18
Bathyroconger vicinus	0.66	22	0.13
Peristedion cataphractum	0.22	22	0.04
GALATHEIDAE *	0.22	22	0.04
Total	495.54		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 126
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°13.01
 start stop duration Lon E 12°50.25
 TIME :04:46:34 05:16:57 30.4 (min) Purpose : 3
 LOG : 95.43 96.93 1.5 Region : 4000
 FDEPTH: 141 136 Gear cond.: 0
 BDEPTH: 141 136 Validity : 0
 Towing dir: 0° Wire out : 375 m Speed : 3.0 km
 Sorted : 69 Total catch: 240.07 Catch/hour: 473.98

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	354.49	23945	74.79
Dentex angolensis	45.33	276	9.56
Trichiurus lepturus	22.05	97	4.65
Zenopsis conchifer	15.14	8	3.19
Pterothrissus bellocci	8.51	97	1.80
Zeus faber	8.23	49	1.74
Citharus linguatula	6.71	221	1.42
Brotula barbata	4.56	8	0.96
Chelidonichthyes capensis	3.04	91	0.64
Illex coindetii	2.63	91	0.55
Dentex congoensis	2.07	36	0.44
Trachinocephalus sp.	0.41	8	0.09
Dicologlossa cuneata	0.36	8	0.07
Siacium micrum	0.22	8	0.05
Arnoslossus imperialis	0.14	14	0.03
Saurida brasiliensis	0.08	14	0.02
Total	473.98		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 127
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°10.74
 start stop duration Lon E 12°54.62
 TIME :06:19:00 06:49:15 30.3 (min) Purpose : 3
 LOG : 103.10 104.66 1.6 Region : 4000
 FDEPTH: 117 117 Gear cond.: 0
 BDEPTH: 117 117 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.1 km
 Sorted : 110 Total catch: 109.83 Catch/hour: 217.77

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	131.26	559	60.27
Trachurus trecae	31.53	1844	14.48
Trichiurus lepturus	24.88	71	11.43
Umbrina canariensis	11.60	30	5.33
Zeus faber	4.94	16	2.27
Octopus vulgaris	3.63	2	1.67
Dentex congoensis	3.25	52	1.49
Dentex barnardi	3.05	10	1.40
Illex coindetii	1.82	85	0.84
Chelidonichthyes capensis	1.31	10	0.60
Citharus linguatula	0.50	10	0.23
Total	217.77		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 128
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°6.75
 start stop duration Lon E 12°58.91
 TIME :07:47:02 08:17:48 30.8 (min) Purpose : 3
 LOG : 110.48 112.11 1.6 Region : 4000
 FDEPTH: 96 94 Gear cond.: 0
 BDEPTH: 96 94 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.2 km
 Sorted : 92 Total catch: 91.80 Catch/hour: 179.06

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	88.46	5249	49.40
Dentex angolensis	22.72	178	12.69
Sepia orbignyana	10.71	12	5.98
Umbrina canariensis	9.11	20	5.09
Dentex barnardi	6.63	20	3.70
Brachydeuterus auritus	6.51	37	3.64
Trichiurus lepturus	5.81	10	3.25
Octopus vulgaris	5.75	4	3.21
Alloteuthis africana	5.54	1861	3.09
Zeus faber	4.82	18	2.69
Fistularia petimba	3.45	10	1.93
Brotula barbata	3.36	2	1.87
Branchiostegus semifasciatus *	2.11	2	1.18
Pagellus bellottii	1.70	20	0.95
Uranoscopus polli	0.98	6	0.54
Citharus linguatula	0.43	8	0.24
Dicologlossa cuneata	0.35	2	0.20
Todaropsis eblanae	0.31	8	0.17
Saurida brasiliensis	0.23	68	0.13
Pterothrissus bellocci	0.08	2	0.04
Total	179.06		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 129
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°50.61
 start stop duration Lon E 13°33.38
 TIME :10:26:55 10:57:06 30.2 (min) Purpose : 3
 LOG : 130.59 132.22 1.6 Region : 4000
 FDEPTH: 23 24 Gear cond.: 0
 BDEPTH: 23 24 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.2 km
 Sorted : 100 Total catch: 558.26 Catch/hour: 1109.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sardinella maderensis	673.89	36594	60.74
Galeoides decadactylus	200.89	1491	18.11
Sardinella aurita	64.44	2727	5.81
Chloroscombrus chrysurus	58.76	3228	5.30
Trichiurus lepturus	29.49	78	2.66
Ilisha africana	15.14	702	1.36
Alectis alexandrinus	10.68	68	0.96
Ephippion guttifer	9.13	14	0.82
Sepia orbignyana	9.13	14	0.82
Sphyræna guachancho	8.35	22	0.75
Pomadasys peroteti	7.68	44	0.69
Pomadasys pelli	6.01	123	0.54
Brachydeuterus auritus	5.56	155	0.50
Sepia officinalis hierredda	4.01	14	0.36
Selene dorsalis	3.56	89	0.32
Eucinostomus melanopterus	2.78	34	0.25
Total	1109.50		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 130
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°50.06
 start stop duration Lon E 13°1.12
 TIME :11:37:41 12:07:22 29.7 (min) Purpose : 3
 LOG : 135.26 136.81 1.6 Region : 4000
 FDEPTH: 41 39 Gear cond.: 0
 BDEPTH: 41 39 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 63 Total catch: 62.64 Catch/hour: 126.59

SPECIES	weight	numbers	% OF TOT. C	SAMP
Galeoides decadactylus	34.96	73	27.62	238
Alectis alexandrinus	33.45	73	26.42	
Stromateus fiatola	21.83	34	17.24	
Sardinella maderensis	20.21	1025	15.96	236
Trichiurus lepturus	9.17	14	7.25	
Rhinobatos albomaculatus	2.55	2	2.01	
Pomadasy peroteti	1.13	2	0.89	
Pseudotolithus senegalensis	0.75	2	0.59	
Chloroscombrus chrysurus	0.69	34	0.54	
Epinephelus aeneus	0.46	2	0.37	
Cynoglossus canariensis	0.40	2	0.32	
Sardinella aurita	0.34	30	0.27	237
Pagellus bellottii	0.26	2	0.21	
Ilisha africana	0.20	10	0.16	
Illex coindetii	0.10	24	0.08	
Torpedo torpedo	0.06	2	0.05	
Grammolites gruvelli	0.02	2	0.02	
Total	126.59		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 131
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°51.72
 start stop duration Lon E 12°58.81
 TIME :12:54:32 13:24:45 30.2 (min) Purpose : 3
 LOG : 141.34 142.95 1.6 Region : 4000
 FDEPTH: 57 60 Gear cond.: 0
 BDEPTH: 57 60 Validity : 0
 Towing dir: 0° Wire out : 165 m Speed : 3.2 kn
 Sorted : 226 Total catch: 225.53 Catch/hour: 447.78

SPECIES	weight	numbers	% OF TOT. C	SAMP
Pomadasy jubelini	372.67	975	83.23	239
Pagellus bellottii	30.58	254	6.83	
Decapterus rhonchus	17.77	441	3.97	
Stromateus fiatola	8.54	6	1.91	
Caranx crysos	4.94	6	1.10	
Alectis alexandrinus	1.97	2	0.44	
Alloteuthis africana	1.79	389	0.40	
Fistularia petimba	1.71	4	0.38	
Trachurus trecae	1.45	38	0.32	240
Pseudupeneus prayensis	1.43	8	0.32	
Dentex barnardi	1.33	10	0.30	
Sphyraena guachancho	0.91	4	0.20	
Pagrus caeruleostictus	0.75	2	0.17	
Torpedo torpedo	0.66	4	0.15	
Selene dorsalis	0.56	4	0.12	
Zeus faber	0.30	2	0.07	
Grammolites gruvelli	0.26	4	0.06	
Chloroscombrus chrysurus	0.18	10	0.04	
Total	447.78		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 132
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°54.24
 start stop duration Lon E 12°56.99
 TIME :14:21:33 14:51:37 30.1 (min) Purpose : 3
 LOG : 147.38 149.01 1.6 Region : 4000
 FDEPTH: 73 72 Gear cond.: 0
 BDEPTH: 73 72 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.2 kn
 Sorted : 54 Total catch: 54.46 Catch/hour: 108.67

SPECIES	weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	33.72	347	31.03	241
Trachurus trecae	21.15	1058	19.46	242
Raja miraletus	13.29	2	12.23	
Alloteuthis africana	7.02	2233	6.46	
Dentex congoensis	6.18	78	6.15	
Pomadasy jubelini	5.17	12	4.76	
Zeus faber	4.37	12	4.02	
Decapterus rhonchus	3.67	86	3.38	
J E L L Y F I S H	3.31	2	3.05	
Chelidonichthys capensis	2.43	22	2.24	
Pseudupeneus prayensis	2.41	16	2.22	
Dentex barnardi	1.64	20	1.51	
Dentex angolensis	0.72	10	0.66	
Selene dorsalis	0.60	2	0.55	
Sepia orbignyana	0.52	8	0.48	
Citharus linguatula	0.52	18	0.48	
Fistularia petimba	0.42	4	0.39	
Sphyraena guachancho	0.30	2	0.28	
Sardinella aurita	0.28	6	0.26	
Grammolites gruvelli	0.26	4	0.24	
Sardinella maderensis	0.10	2	0.09	
Saurida brasiliensis	0.08	6	0.07	
Total	108.67		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 133
 DATE :28.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°55.30
 start stop duration Lon E 12°53.83
 TIME :15:42:22 16:12:05 29.7 (min) Purpose : 3
 LOG : 153.93 155.41 1.5 Region : 4000
 FDEPTH: 88 88 Gear cond.: 0
 BDEPTH: 88 88 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.0 kn
 Sorted : 173 Total catch: 173.07 Catch/hour: 349.40

SPECIES	weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	159.89	311	45.76	245
Pagrus caeruleostictus	103.16	6199	29.53	
Zeus faber	18.47	52	5.29	
Zeus faber	10.86	48	3.11	
Alloteuthis africana	10.42	335	2.98	
Umbrina canariensis	7.97	36	2.28	244
Dentex angolensis	6.54	83	1.87	243
Fistularia petimba	6.16	16	1.76	
Raja miraletus	5.49	10	1.57	
Pagellus bellottii	5.21	44	1.49	246
Sepia orbignyana	4.02	6	1.15	
Dentex congoensis	2.87	44	0.82	
Chelidonichthys capensis	1.96	12	0.56	
Pagrus africanus	1.76	2	0.50	
Octopus vulgaris	1.53	2	0.44	
J E L L Y F I S H	0.99	2	0.28	
Dicologlossa cuneata	0.63	4	0.18	
Torpedo torpedo	0.57	2	0.16	
Uranoscopus cadenati	0.28	2	0.08	
Grammolites gruvelli	0.20	2	0.06	
Citharus linguatula	0.18	4	0.05	
Todaropsis eblanae	0.14	2	0.04	
Boops boops	0.10	2	0.03	
Total	349.40		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 134
 DATE :31.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°3.62
 start stop duration Lon E 12°35.68
 TIME :00:23:26 00:53:31 30.1 (min) Purpose : 3
 LOG : 282.23 283.80 1.6 Region : 4000
 FDEPTH: 739 734 Gear cond.: 0
 BDEPTH: 739 734 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.1 kn
 Sorted : 25 Total catch: 376.07 Catch/hour: 750.14

SPECIES	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	206.45	6582	27.52	
Yarella blackfordi	92.75	2693	12.36	
Lamprogrammus exutus	70.61	209	9.41	
Stereomastis sp.	68.82	2962	9.17	
Trachyrincus scabrus	52.06	269	6.94	
Bathygadus melanobranchus	31.72	987	4.23	
Dibranchius atlanticus	29.98	1257	4.00	
Hoplostethus cadenati	27.53	987	3.67	
Bassanago albescens	26.03	419	3.47	
Holothuria sp.	26.03	120	3.47	
Aristeus varidens, female	25.43	987	3.39	
Xenodermichthys copei	21.24	1705	2.83	
Talismaania longifilis	19.45	479	2.59	
Stomias boa boa	11.97	329	1.60	
Caristius sp.	5.68	30	0.76	
Halosaurus ovenii	4.79	60	0.64	
Dicrolene intronigra	3.59	150	0.48	
Chaceon maritae	3.55	14	0.47	
Starfish (large)	3.29	150	0.44	
GALATHEIDAE *	2.99	1855	0.40	
Triplophos hemingi	2.69	449	0.36	
Merluccius polli	1.97	2	0.26	
ALPECOCEPHALIDAE	1.80	120	0.24	
Etmopterus polli	1.50	30	0.20	
Nemichthys scolopaceus	1.50	60	0.20	
Glyphus marsupialis	1.20	209	0.16	
Raja confundens	1.20	30	0.16	
Aristeus varidens, male	0.90	90	0.12	
Nephropsis atlantica	0.90	30	0.12	
Chascanopsetta lugubris	0.90	60	0.12	
MYCTOPHIDAE	0.90	449	0.12	
Trichiurus lepturus	0.60	30	0.08	
Synaphobranchus kaupii	0.14	60	0.02	
Total	750.14		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 135
 DATE :31.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°1.76
 start stop duration Lon E 12°36.76
 TIME :02:42:27 03:16:30 34.1 (min) Purpose : 3
 LOG : 290.64 292.35 1.7 Region : 4000
 FDEPTH: 632 671 Gear cond.: 0
 BDEPTH: 632 671 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 3.0 kn
 Sorted : 26 Total catch: 352.13 Catch/hour: 620.49

SPECIES	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	237.78	56307	38.32	
Yarella blackfordi *	93.23	2886	15.03	
Opisthoteuthis agassizi	47.19	23	7.61	
Hoplostethus cadenati	43.98	1558	7.09	
Lamprogrammus exutus	24.51	183	3.95	
Stereomastis sp.	23.14	3917	3.73	
OMASTREPHIDAE	22.22	92	3.58	
SEPIOLIDAE	15.15	69	2.44	
Xenodermichthys copei	12.83	1031	2.07	
Stomias boa boa	11.91	298	1.92	
Nezumia micronychodon	11.00	252	1.77	
Chaunax pictus	9.16	23	1.48	
Bassanago albescens	9.16	229	1.48	
Aristeus varidens, female	7.10	298	1.14	
TORPEDINIDAE	7.05	2	1.14	
Aristeus varidens, male	6.41	825	1.03	
Starfish	5.50	389	0.89	
Dibranchius atlanticus	5.04	358	0.81	
THYSANOTEUTHIDAE	4.35	23	0.70	
Triplophos hemingi	3.67	367	0.59	
GALATHEIDAE *	2.52	1443	0.41	
Melanostomias sp.	2.52	183	0.41	
Alepocephalus sp.	2.29	115	0.37	
Dicrolene intronigra	2.29	92	0.37	
Gadella imberbis	2.06	46	0.33	
Synaphobranchus kaupii	1.60	23	0.26	
Scopelosaurus meadi	1.37	23	0.22	
Merluccius polli	1.16	2	0.19	
Acanthephyra sp.	1.15	69	0.18	
Chaceon maritae	1.07	4	0.17	
Cataetx laticeps	0.92	69	0.15	
Bathyrcongus vicinus	0.69	229	0.11	
Bathynectes piperitus	0.46	46	0.07	
Total	620.49		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 136
 DATE :31.03.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 8°0.99
 start stop duration Lon E 12°37.70
 TIME :04:44:59 05:15:13 30.2 (min) Purpose : 3
 LOG : 299.55 301.00 1.5 Region : 4000
 FDEPTH: 545 537 Gear cond.: 0
 BDEPTH: 545 537 Validity : 0
 Towing dir: 0° Wire out : 1310 m Speed : 2.9 kn
 Sorted : 55 Total catch: 383.67 Catch/hour: 761.50

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 139
 DATE :31.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°34.36
 start stop duration Lon E 12°56.79
 TIME :13:24:14 13:35:06 10.9 (min) Purpose : 3
 LOG : 354.94 355.48 0.5 Region : 4000
 FDEPTH: 27 27 Gear cond.: 0
 BDEPTH: 27 27 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
 Sorted : 268 Total catch: 803.43 Catch/hour: 4434.76

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	360.54	95323	47.35
Hoplostethus cadenati	103.23	3793	13.56
Yarellia blackfordi	76.28	2390	10.02
Lamprogrammus exutus	63.63	2126	8.36
Gadella imberbis	36.12	1237	4.74
Stomias boa boa	15.28	361	2.01
Bajacalifornia magalops	14.73	28	1.93
Stereomastis sp.	13.34	2167	1.75
Dalatias licha *	12.92	83	1.70
Chaunax pictus	12.92	56	1.70
Chaceon maritae	6.67	28	0.88
Bathyroconger vicinus	4.45	208	0.58
Dicrolene intronigra	4.03	42	0.53
Malacocephalus occidentalis	3.61	28	0.47
SEPIOLIDAE	3.33	28	0.44
Xenodermichthys copei	3.06	195	0.40
Opiathoteuthis agassizi	2.92	14	0.38
Aristeus varidens, female	2.64	167	0.35
Triplophos hemingi	2.50	361	0.33
Aristeus varidens, male	2.36	347	0.31
Halosaurus ovenii	2.22	28	0.29
Benthodesmus tenuis	2.22	56	0.29
Photonectes braueri	2.08	181	0.27
Bathynectes piperitus	1.67	264	0.22
Dibranchius atlanticus	1.53	97	0.20
Nezumia micronychodon	1.39	625	0.18
Laemonema laureysi	1.25	42	0.16
Austroglossus microlepis	0.97	42	0.13
Glyphus marsupialis	0.69	14	0.09
Chlorophthalmus atlanticus	0.56	14	0.07
DICERATIIDAE	0.56	14	0.07
Nemichthys scolopaceus	0.28	42	0.04
Ectreposestes imus	0.28	14	0.04
Caelorinchus coelorhincus	0.28	14	0.04
Notacanthus sexspinis	0.28	14	0.04
Raja confundens	0.28	14	0.04
Nettastoma sp.	0.28	14	0.04
GALATHEIDAE *	0.14	56	0.02
Total	761.50	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	1516.17	49446	34.19
Chloroscombrus chrysurus	1140.94	14688	25.73
Galeoides decadactylus	803.13	4868	18.11
Pseudotolithus senegalensis	249.22	397	5.62
Sphyræna guachancho	223.55	1126	5.04
Selene dorsalis	120.88	1855	2.73
Pseudotolithus typus	110.95	331	2.50
Stromateus fiatola	74.02	99	1.67
Decapterus rhonchus	48.35	2020	1.09
Pomadasy jubelini	39.41	116	0.89
Gymnura altavela	20.86	17	0.47
Pomadasy incisus	16.06	182	0.36
Pomadasy peroteti	16.06	50	0.36
Pagellus bellottii	15.73	66	0.35
Pteroscion pelli	7.12	99	0.16
Pseudupeneus prayensis	5.46	66	0.12
Cynoglossus canariensis	5.13	17	0.12
Trichiurus lepturus	4.64	17	0.10
Sardinella maderensis	3.81	33	0.09
Sparus caeruleostictus *	3.64	17	0.08
Sardinella maderensis	3.15	33	0.07
Eucinostomus melanopterus	2.32	33	0.05
Alectis alexandrinus	1.82	17	0.04
Trachurus trachurus	0.99	66	0.02
Ilisha africana	0.66	99	0.01
Dentex congoensis	0.66	17	0.01
Total	4434.76	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 140
 DATE :31.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°36.75
 start stop duration Lon E 12°55.12
 TIME :14:17:32 14:44:41 27.1 (min) Purpose : 3
 LOG : 359.31 360.76 1.5 Region : 4000
 FDEPTH: 38 40 Gear cond.: 0
 BDEPTH: 38 40 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
 Sorted : 319 Total catch: 319.14 Catch/hour: 705.54

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pagellus bellottii	490.68	33027	69.55
Sphyræna sphyraena	69.53	248	9.85
Lutjanus agennes	33.60	2	4.76
Stromateus fiatola	24.65	24	3.49
Pomadasy peroteti	12.93	11	1.83
Decapterus rhonchus	11.30	296	1.60
Arius parkii	7.72	11	1.09
Dentex barnardi	5.35	15	0.76
Selene dorsalis	5.02	40	0.71
Pagrus caeruleostictus	4.60	13	0.65
Gymnura altavela	4.55	4	0.65
Sphyræna guachancho	4.42	4	0.63
Epinephelus aeneus	3.76	2	0.53
Chloroscombrus chrysurus	3.65	42	0.52
Dentex gibbosus	3.52	4	0.50
Aluterus heudelotii	2.21	2	0.31
Alectis alexandrinus	1.95	2	0.28
Raja miraleteris	1.88	4	0.27
Chilomycterus spinosus mauret.	1.77	4	0.25
Boops boops	1.57	93	0.22
Pomadasy rogeri	1.55	2	0.22
Trichiurus lepturus	1.44	2	0.20
Galeoides decadactylus	1.06	4	0.15
Balistes capricus	1.04	2	0.15
Lagocephalus laevigatus	1.02	4	0.14
Bodianus speciosus	0.97	2	0.14
Sardinella maderensis	0.88	11	0.13
Pomadasy incisus	0.73	27	0.10
Dasyatis marmorata	0.53	2	0.08
Cynoglossus canariensis	0.49	2	0.07
Fistularia petimba	0.49	2	0.07
Sardinella maderensis	0.49	2	0.07
Chaetodon hoefleri	0.22	2	0.03
Total	705.54	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 137
 DATE :31.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°59.78
 start stop duration Lon E 12°43.74
 TIME :07:13:44 07:43:52 30.1 (min) Purpose : 3
 LOG : 309.33 310.93 1.6 Region : 4000
 FDEPTH: 163 168 Gear cond.: 0
 BDEPTH: 163 168 Validity : 0
 Towing dir: 0° Wire out : 420 m Speed : 3.2 kn
 Sorted : 44 Total catch: 44.48 Catch/hour: 88.55

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Zenopsis conchifer	27.37	32	30.91
Synagrops microlepis	19.81	2857	22.37
Dentex angolensis	18.91	68	21.36
Todaropsis eblanae	6.27	199	7.08
Zeus faber	6.05	20	6.83
Trichiurus lepturus	2.75	6	3.10
Pterochirusus belloci	1.75	14	1.98
Branchiostegus semifasciatus *	1.61	2	1.82
Uranoscopus cadenati	1.11	8	1.26
Torpedo torpedo	0.94	2	1.06
J E L Y F I S H	0.88	28	0.99
Citharus linguatula	0.56	14	0.63
Miracorvina angolensis	0.48	2	0.54
Parapanaeus longirostris	0.04	4	0.04
Saurida brasiliensis	0.02	12	0.02
Total	88.55	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 141
 DATE :31.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°37.31
 start stop duration Lon E 12°48.39
 TIME :16:06:18 16:12:26 6.1 (min) Purpose : 3
 LOG : 369.39 369.62 0.2 Region : 4000
 FDEPTH: 71 71 Gear cond.: 9
 BDEPTH: 71 71 Validity : 4
 Towing dir: 0° Wire out : 190 m Speed : 2.2 kn
 Sorted : 57 Total catch: 56.97 Catch/hour: 556.71

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	474.92	4798	85.31
Sardinella aurita	22.18	293	3.98
Trachurus trecae	22.08	938	3.97
Pagellus bellottii	20.03	293	3.60
Decapterus rhonchus	5.77	107	1.04
Alloteuthis africana	4.89	2951	0.88
Chloroscombrus chrysurus	2.25	10	0.40
Pseudupeneus prayensis	2.05	10	0.37
Sphyræna sphyraena	1.66	10	0.30
Brotula barbata	0.88	10	0.16
Total	556.71	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 138
 DATE :31.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°56.38
 start stop duration Lon E 12°50.69
 TIME :09:24:41 09:44:53 20.2 (min) Purpose : 3
 LOG : 321.75 322.78 1.0 Region : 4000
 FDEPTH: 106 105 Gear cond.: 0
 BDEPTH: 106 105 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.1 kn
 Sorted : 93 Total catch: 92.75 Catch/hour: 275.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Umbrina canariensis	91.78	134	33.32
Trachurus trecae	68.17	4108	24.74
Selene dorsalis	44.55	270	16.17
Dentex angolensis	26.14	306	9.49
Zeus faber	9.48	33	3.44
Alloteuthis africana	8.85	1654	3.21
Dentex congoensis	4.72	86	1.71
Todaropsis eblanae	4.69	95	1.70
Illex coindetii	4.69	149	1.70
Dentex barnardi	3.53	21	1.28
J E L Y F I S H	2.52	131	0.92
Raja leopardus	2.47	3	0.89
Fistularia petimba	1.22	3	0.44
Trigla lyra	1.19	3	0.43
Citharus linguatula	0.59	71	0.22
Sepia orbignyana	0.45	3	0.16
Octopus macropus	0.42	3	0.15
Saurida brasiliensis	0.03	15	0.01
Total	275.50	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 142
 DATE :31.03.2009 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°38.57
 start stop duration Lon E 12°45.42
 TIME :16:52:51 17:23:18 30.4 (min) Purpose : 3
 LOG : 373.83 375.31 1.5 Region : 4000
 FDEPTH: 88 90 Gear cond.: 0
 BDEPTH: 88 90 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 2.9 kn
 Sorted : 61 Total catch: 61.16 Catch/hour: 120.55

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 145
 DATE :01.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°42.36
 start stop duration Lon E 12°31.92
 TIME :00:58:30 01:28:47 30.3 (min) Purpose : 3
 LOG : 411.79 413.38 1.6 Region : 4000
 FDEPTH: 363 361 Gear cond.: 0
 BDEPTH: 363 361 Validity : 0
 Towing dir: 0° Wire out : 800 m Speed : 3.1 kn
 Sorted : 25 Total catch: 721.09 Catch/hour: 1428.37

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	22.47	335	18.64	
Trichurus lepturus	22.27	51	18.48	
Trachurus trecae	17.44	889	14.47	261
Alloteuthis africana	11.77	3244	9.76	
Fistularia petimba	10.55	20	8.75	
Dentex angolensis	8.48	112	7.03	260
Zeus faber	6.50	24	5.40	
Brachydeuterus auritus	3.75	39	3.11	259
Octopus vulgaris	3.13	2	2.60	
J E L Y F I S H	2.82	2	2.34	
Uranoscopus cadenati	2.66	99	2.21	
Raja miraletus	2.21	6	1.83	
Sepia orbignyana	2.07	12	1.72	
Chelidonichthys capensis	1.44	10	1.19	
Arius parkii	0.87	2	0.72	
Pagellus bellottii	0.47	4	0.39	
Saurida brasiliensis	0.45	118	0.38	
Dentex barnardi	0.43	2	0.36	
Citharus linguatula	0.26	6	0.21	
Serranus cabrilla	0.22	2	0.18	
Sardinops ocellatus	0.18	2	0.15	
Boops boops	0.12	2	0.10	
Total	120.55		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Centrophorus squamosus	693.30	2	48.54	
Nematocarcinus africanus	536.32	144137	37.55	
Laemonema laureysi	38.63	535	2.70	
Ophichthus serpens	38.03	446	2.66	
Dibranchius atlanticus	30.01	3595	2.10	
Chaunax pictus	18.12	1070	1.27	
Caelorinchus coelorhincus	13.67	475	0.96	
Zenopsis conchifer	10.70	30	0.75	
Parapenaeus longirostris, femal	10.10	1307	0.71	
Malacocephalus laevis	7.43	89	0.52	
Lophiodes kemp	7.13	119	0.50	
Hymenocephalus italicus	5.05	832	0.35	
Trigla lyra	4.46	30	0.31	
Bathynectes piperitus	2.97	30	0.21	
Bembrops sp.	2.67	30	0.19	
Parapenaeus longirostris, male	1.78	267	0.12	
Illex coindetii	1.78	30	0.12	
Aristeus varidens	1.49	178	0.10	
Stereomastis sp.	1.49	178	0.10	
Calappa pelii	1.19	30	0.08	
Synagrops microlepis	1.19	59	0.08	
Solenocera africana	0.89	178	0.06	
Merluccius polli	0.52	2	0.04	
MYCTOPHIDAE	0.30	386	0.02	
Total	1429.20		100.06	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 143
 DATE :31.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°47.02
 start stop duration Lon E 12°30.66
 TIME :20:36:48 21:07:14 30.4 (min) Purpose : 3
 LOG : 396.38 398.00 1.6 Region : 4000
 FDEPTH: 739 750 Gear cond.: 0
 BDEPTH: 739 750 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.2 kn
 Sorted : 55 Total catch: 332.28 Catch/hour: 654.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sea cucumbers	181.54	414	27.72	
Nematocarcinus africanus	115.31	31754	17.61	
Nezumia micronychodon	71.31	1668	10.89	
Hoplostethus cadenati	59.84	1727	9.14	
Stereomastis sp.	48.02	4033	7.33	
Yarella blackfordi *	43.76	1289	6.68	
Bathyroconger vicinus	23.30	260	3.56	
Aristeus varidens, female	21.41	887	3.27	
Talismania longifilis	18.21	213	2.78	
Dibranchius atlanticus	8.99	438	1.37	
Stomias boa boa	8.63	225	1.32	
Xenodermichthys copei	7.57	473	1.16	
Chaceon maritae	6.39	0	0.98	
Gadella imberbis	5.68	414	0.87	
SEPIOLIDAE	4.97	24	0.76	
Bathypterois phenax	4.85	272	0.74	
Triplophos hemingi	4.38	591	0.67	
Dicrolene intronigra	4.26	71	0.65	
Halosaurus ovenii	3.43	47	0.52	
Dalatias licha	2.96	12	0.45	
GALATHEIDAE *	1.54	804	0.23	
Aristaeomorpha foliacea	1.54	201	0.23	
Raja confundens	1.18	12	0.18	
ALEPOCEPHALIDAE	1.06	154	0.16	
Glyphus marsupialis	0.95	118	0.14	
MYCTOPHIDAE	0.83	461	0.13	
Synagrops microlepis	0.59	24	0.09	
Centrophorus squamosus	0.59	12	0.09	
Photomnetes braueri	0.59	35	0.09	
DICERATIIDAE	0.47	12	0.07	
Lophiodes kemp	0.47	12	0.07	
Thysanoteuthis rhombus	0.24	12	0.04	
Chascanopsetta lugubris	0.12	12	0.02	
Total	654.96		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 146
 DATE :01.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°42.89
 start stop duration Lon E 12°33.38
 TIME :04:49:09 05:19:11 30.0 (min) Purpose : 3
 LOG : 420.46 422.00 1.5 Region : 4000
 FDEPTH: 256 259 Gear cond.: 0
 BDEPTH: 256 259 Validity : 0
 Towing dir: 0° Wire out : 620 m Speed : 3.1 kn
 Sorted : 92 Total catch: 212.38 Catch/hour: 424.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	126.57	7300	29.84	
Chlorophthalmus atlanticus	117.38	3258	27.67	
Parapenaeus longirostris	80.39	19514	18.95	
Merluccius polli	32.40	427	7.64	262
Trichurus lepturus	29.58	78	6.97	
Zenopsis conchifer	14.28	32	3.37	
Fistularia petimba	4.95	10	1.17	
MYCTOPHIDAE	4.63	4466	1.09	
GALATHEIDAE *	4.27	1424	1.01	
Illex coindetii	3.54	56	0.83	
Chascanopsetta lugubris	2.12	32	0.50	
Gadella imberbis	0.78	32	0.18	
Lophiodes sp.	0.70	18	0.16	
Pterothrissus belloci	0.64	4	0.15	
Bathyroconger vicinus	0.64	4	0.15	
Scorpaena normani	0.42	32	0.10	
Gephyroberyx darwini	0.24	4	0.06	
Peristedion cataphractum	0.24	60	0.06	
Hymenocephalus italicus	0.18	4	0.04	
Calappa sp.	0.14	46	0.03	
PARALEPIDIDAE	0.10	10	0.02	
Total	424.19		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 144
 DATE :31.03.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°46.90
 start stop duration Lon E 12°31.83
 TIME :22:43:02 23:13:32 30.5 (min) Purpose : 3
 LOG : 401.87 403.54 1.7 Region : 4000
 FDEPTH: 619 632 Gear cond.: 0
 BDEPTH: 619 632 Validity : 0
 Towing dir: 0° Wire out : 1500 m Speed : 3.3 kn
 Sorted : 22 Total catch: 247.85 Catch/hour: 487.57

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	199.08	42024	40.83	
Hoplostethus cadenati	72.71	2164	14.91	
Yarella blackfordi *	50.64	1277	10.39	
Lamprogrammum exutus	37.65	108	7.72	
Chaceon maritae, male	20.34	87	4.17	
L O B S T E R S	19.04	2856	3.91	
Nezumia aequalis	12.12	325	2.49	
Todaropsis eblanae	11.90	65	2.44	
SEPIOLIDAE	10.17	43	2.09	
Aristeus varidens, female	7.57	368	1.55	
Dicrolene intronigra	6.49	346	1.33	
Malacocephalus laevis	6.06	43	1.24	
Centrophorus squamosus	5.02	2	1.03	
Stomias boa boa	4.11	130	0.84	
Scymnodon squamulosus	3.46	22	0.71	
Aristeus varidens, male	3.25	390	0.67	
Triplophos hemingi	3.25	563	0.67	
Bassanago albescens	2.60	108	0.53	
Xenodermichthys copei	2.38	173	0.49	
Lampadena pontifex	2.16	22	0.44	
Dibranchius atlanticus	1.73	173	0.36	
Lophius vaillanti	1.51	22	0.31	
Etmopterus polli	1.08	22	0.22	
Starfish	0.87	65	0.18	
MYCTOPHIDAE	0.87	1277	0.18	
GALATHEIDAE *	0.65	692	0.13	
Bathynectes piperitus	0.43	43	0.09	
DICERATIIDAE	0.22	22	0.04	
Gadella imberbis	0.22	22	0.04	
Total	487.57		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 147
 DATE :01.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°41.34
 start stop duration Lon E 12°37.62
 TIME :06:20:34 06:50:21 29.8 (min) Purpose : 3
 LOG : 427.81 429.18 1.4 Region : 4000
 FDEPTH: 116 117 Gear cond.: 0
 BDEPTH: 116 117 Validity : 0
 Towing dir: 0° Wire out : 320 m Speed : 2.8 kn
 Sorted : 56 Total catch: 56.03 Catch/hour: 112.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	47.73	2518	42.30	264
Dentex angolensis	36.25	302	32.13	263
Dentex congoensis	10.98	181	9.73	
Trigla lyra	4.61	34	4.09	
Branchiostegus semifasciatus *	2.48	2	2.20	
Trichurus lepturus	2.46	4	2.18	
Spicara alta	2.26	79	2.00	
Brotula barbata	1.61	2	1.43	
Raja miraletus	1.45	2	1.29	
Zeus faber	1.05	8	0.93	
Illex coindetii	0.77	34	0.68	
Citharus linguatula	0.70	12	0.62	
Boops boops	0.24	6	0.21	
Ariomma bondi	0.16	2	0.14	
Sepia orbignyana	0.10	2	0.09	
Total	112.85		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 148
 DATE :01.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°15.28
 start stop duration Lon E 12°46.63
 TIME :10:05:43 11:35:43 30.0 (min) Purpose : 3
 LOG : 458.59 460.09 1.5 Region : 4000
 FDEPTH: 24 41 Gear cond.: 0
 BDEPTH: 24 41 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.0 kn
 Sorted : 107 Total catch: 214.06
 CATCH/HOUR % OF TOT. C SAMP

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 152
 DATE :01.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°25.87
 start stop duration Lon E 12°27.72
 TIME :16:10:20 16:42:30 32.2 (min) Purpose : 3
 LOG : 491.19 492.80 1.6 Region : 4000
 FDEPTH: 116 117 Gear cond.: 0
 BDEPTH: 116 117 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.0 kn
 Sorted : 135 Total catch: 252.44
 CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Pagrus caeruleostictus	72.40	244	33.82	
Lutjanus agennes	30.50	4	14.25	
Rhinobatos albomaculatus	13.50	4	6.31	
Scomberomorus tritor	11.70	8	5.47	
Dentex canariensis	11.52	30	5.38	
Fistularia tabacaria	10.40	12	4.86	
Dasyatis centroura	9.30	2	4.34	
Alectis alexandrinus	7.60	2	3.55	
Pseudupeneus prayensis	6.32	166	2.95	
Dasyatis marmorata	5.60	2	2.62	
Chaetodipterus sp.	5.22	8	2.44	
Ephippion guttifer	4.28	2	2.00	
Aluterus heudelotii	4.20	8	1.96	
Balistes punctatus	3.58	4	1.67	
Lethrinus atlanticus	3.18	6	1.49	
Fistularia petimba	2.70	22	1.26	
Sepia orbignyana	1.86	4	0.87	
Chaetodon hoefleri	1.86	38	0.87	
Chilomycterus spinosus mauret.	1.10	2	0.51	
Torpedo marmorata	1.08	2	0.50	
Chloroscombrus chrysurus	1.06	6	0.50	
Serranus cabrilla	1.04	10	0.49	
Dentex barnardi	1.02	36	0.48	
Dentex gibbosus	0.98	6	0.46	
Elops lacerta	0.80	2	0.37	
Pagellus bellottii	0.78	2	0.36	
Rypticus saponaceus	0.24	2	0.11	
Acanthurus monroviae	0.18	2	0.08	
Peristedion cataphractum	0.06	8	0.03	
Total	214.06		100.00	

SPECIES	weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	129.85	6681	51.44	273
Dentex angolensis	56.42	228	22.35	272
Spicara alta	26.40	433	10.46	
Dentex congoensis	4.38	52	1.74	
Pontinus accraensis	4.27	9	1.69	
Ephippion guttifer	3.77	4	1.49	
Fistularia petimba	3.38	7	1.34	
Zeus faber	3.12	9	1.23	
Umbrina canariensis	3.08	7	1.22	
Dentex barnardi	2.99	6	1.18	
Brotula barbata	2.80	2	1.11	
Trichiurus lepturus	2.16	4	0.86	
Sepia orbignyana	2.09	6	0.83	
Raja miraletus	2.03	4	0.81	
Boops boops	1.64	47	0.65	
Illex coindetii	1.38	112	0.55	
Pagellus bellottii	1.08	4	0.43	
Brachydeuterus auritus	0.41	2	0.16	
Alloteuthis africana	0.35	125	0.14	
Trigla lyra	0.28	2	0.11	
Saurida brasiliensis	0.26	88	0.10	
Antennarius occidentalis	0.09	2	0.04	
B I V A L V E S	0.09	7	0.04	
Citharus linguatula	0.06	2	0.02	
Squilla mantis	0.04	2	0.01	
Arnoglossus imperialis	0.02	2	0.01	
Total	252.44		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 149
 DATE :01.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°16.97
 start stop duration Lon E 12°41.63
 TIME :11:29:54 12:00:51 31.0 (min) Purpose : 3
 LOG : 466.13 467.85 1.7 Region : 4000
 FDEPTH: 42 41 Gear cond.: 0
 BDEPTH: 42 41 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.3 kn
 Sorted : 141 Total catch: 273.29
 CATCH/HOUR % OF TOT. C SAMP

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 153
 DATE :01.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°27.83
 start stop duration Lon E 12°17.25
 TIME :18:35:59 19:02:40 26.7 (min) Purpose : 3
 LOG : 504.09 505.32 1.2 Region : 4000
 FDEPTH: 424 431 Gear cond.: 0
 BDEPTH: 424 431 Validity : 0
 Towing dir: 0° Wire out : 1080 m Speed : 2.8 kn
 Sorted : 52 Total catch: 322.45
 CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Pagrus caeruleostictus	138.90	394	50.83	
Dentex canariensis	58.74	149	21.49	
Pseudupeneus prayensis	22.39	388	8.19	
Epinephelus aeneus	11.92	4	4.36	
Pomadasyus rogeri	10.49	10	3.84	
Aluterus heudelotii	6.71	6	2.45	
Pagellus bellottii	5.14	23	1.88	265
Seriola carpenteri	3.39	2	1.24	
Sepia orbignyana	3.16	2	1.16	
Unidentified invertebrate	2.42	2	0.89	
Pagrus auriga	2.13	2	0.78	
Albula vulpes	1.78	2	0.65	
Balistes punctatus	1.40	2	0.51	
Raja miraletus	1.32	2	0.48	
Fistularia petimba	1.03	8	0.38	
Trachinus armatus	0.74	4	0.27	
Chaetodon hoefleri	0.64	10	0.23	
Chelidonichthys gabonensis	0.45	2	0.16	
Chromis cadenati	0.39	16	0.14	
Boops boops	0.16	4	0.06	
Total	273.29		100.00	

SPECIES	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	193.22	57967	26.65	
Yarella blackfordi	136.28	4588	18.79	
Laemonema laureysi	89.73	1201	12.37	
Dibranchius atlanticus	36.70	3927	5.06	
Lamprogrammus exitus	31.30	67	4.32	
Stomias boa boa	24.96	432	3.44	
Plesionepaeus edwardsianus	24.96	621	3.44	
Merluccius polli	23.21	40	3.20	
Hoplostethus cadenati	22.26	837	3.07	
Chaunax pictus	19.57	148	2.70	
Lophiodes kempi	19.00	11	2.62	
Thysanoteuthis rhombus	15.79	81	2.18	
Caelorinchus coelorhincus	14.98	540	2.07	
Triphophos hemingi	12.10	2024	1.67	
Bathyrcooconger vicinus	11.74	877	1.62	
Aristeus varidens, female	9.04	715	1.25	
Benthodesmus tenuis	7.96	243	1.10	
Hymenocephalus italicus	5.13	445	0.71	
Centrophorus granulosus	4.72	2	0.65	
Stereomastis sp.	4.05	432	0.56	
Aristeus varidens, male	3.78	486	0.52	
Etmopterus pusillus	2.83	27	0.39	
Gadella imberbis	2.29	81	0.32	
Raja leoparden	1.98	2	0.27	
Conger conger	1.89	13	0.26	
Cynoponticus ferox	1.75	27	0.24	
Etmopterus polli	1.75	40	0.24	
Halosaurus ovenii	1.35	81	0.19	
Bassanago albescens	0.81	13	0.11	
Total	725.15		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 150
 DATE :01.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°20.71
 start stop duration Lon E 12°39.04
 TIME :12:59:20 13:16:45 17.3 (min) Purpose : 3
 LOG : 473.75 474.72 1.0 Region : 4000
 FDEPTH: 56 57 Gear cond.: 0
 BDEPTH: 56 57 Validity : 0
 Towing dir: 0° Wire out : 111 m Speed : 3.4 kn
 Sorted : 153 Total catch: 1837.80
 CATCH/HOUR % OF TOT. C SAMP

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 154
 DATE :01.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°29.43
 start stop duration Lon E 12°15.82
 TIME :20:26:10 20:58:26 32.3 (min) Purpose : 3
 LOG : 510.51 512.22 1.7 Region : 4000
 FDEPTH: 535 525 Gear cond.: 0
 BDEPTH: 535 525 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 3.2 kn
 Sorted : 53 Total catch: 423.60
 CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	5730.78	38734	89.65	266
Pagellus bellottii	425.74	4967	6.66	267
Sardinella aurita	83.90	292	1.31	268
Sphyraena guachancho	79.30	501	1.24	
Raja miraletus	46.33	83	0.72	
Sepia orbignyana	10.02	42	0.16	
Fistularia petimba	7.51	42	0.12	
Trachurus trecae	6.26	42	0.10	
Decapterus rhonchus	2.50	42	0.04	
Total	6392.35		100.00	

SPECIES	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	258.15	84528	32.77	
Yarella blackfordi	139.86	3958	17.75	
Stomias boa boa	88.23	1696	11.20	
Hoplostethus cadenati	78.56	3303	9.97	
Triphophos hemingi	43.00	5223	5.46	
Stereomastis sp.	39.58	3869	5.02	
Merluccius polli	35.71	60	4.53	
Lamprogrammus exitus	27.82	640	3.53	
Benthodesmus tenuis	14.14	431	1.79	
Thysanoteuthis rhombus	12.35	60	1.57	
Dibranchius atlanticus	10.86	893	1.38	
Halosaurus ovenii	8.93	45	1.13	
Aristeus varidens, female	7.74	461	0.98	
Chaceon maritae	4.31	15	0.55	
Xenodermichthys copei	3.87	223	0.49	
Hymenocephalus italicus	3.72	74	0.47	
Bathynectes piperitus	2.68	74	0.34	
Chaunax pictus	2.38	60	0.30	
Dicrolene intronigra	1.19	179	0.15	
Bathyrcooconger vicinus	1.19	15	0.15	
Aristeus varidens, male	1.19	89	0.15	
Lampadina sp.	1.19	15	0.15	
Raja confundens	1.19	15	0.15	
Total	787.85		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 151
 DATE :01.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°23.10
 start stop duration Lon E 12°34.15
 TIME :14:19:16 14:48:51 29.6 (min) Purpose : 3
 LOG : 481.19 482.67 1.5 Region : 4000
 FDEPTH: 86 87 Gear cond.: 0
 BDEPTH: 86 87 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
 Sorted : 43 Total catch: 87.94
 CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	17.54	118	19.94	271
Dentex congoensis	9.90	168	11.25	
Zeus faber	8.39	30	9.55	
Fistularia petimba	7.81	22	8.88	
Alloteuthis africana	6.63	1977	7.54	
Brachydeuterus auritus	5.50	43	6.25	270
Scomberomorus tritor	5.17	2	5.88	
Trigla lyra	4.87	30	5.53	
Trichiurus lepturus	4.72	8	5.37	
Sepia orbignyana	3.24	6	3.69	
Squatina oculata	3.20	2	3.64	
Mustelus mustelus	2.84	2	3.23	
Pagellus bellottii	2.41	16	2.74	269
Sphyraena sphyraena	1.34	8	1.52	
Raja miraletus	1.18	2	1.34	
Pagrus caeruleostictus	1.05	2	1.20	
Uranoscopus cadenati	0.75	2	0.85	
Trachurus trecae	0.61	18	0.69	
Chaetodon hoefleri	0.30	2	0.35	
Citharus linguatula	0.26	8	0.30	
Decapterus rhonchus	0.20	4	0.23	
Saurida brasiliensis	0.02	4	0.02	
Total	87.94		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 155
 DATE :01.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°33.02
 start stop duration Lon E 12°14.32
 TIME :22:52:03 23:22:58 30.9 (min) Purpose : 3
 LOG : 520.71 522.24 1.5 Region : 4000
 FDEPTH: 711 701 Gear cond.: 0
 BDEPTH: 711 701 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.0 kn
 Sorted : 28 Total catch: 365.82 Catch/hour: 710.10

SPECIES	weight	numbers	% OF TOT. C	SAMP
Chaceon maritae, male	155.19	280	21.86	
Yarella blackfordi	144.09	3785	20.29	
Malacocephalus occidentalis	74.44	1691	10.48	
Stereomastis sp.	55.01	5905	7.75	
Hoplostethus cadenati	53.75	1766	7.57	
Triplophos hemingi	50.72	5829	7.14	
Lamprogrammus exutus	24.48	25	3.45	
Talsmania longifilis	19.43	278	2.74	
Chaceon maritae, female	19.18	76	2.70	
Nezumia microrynchodon	16.40	404	2.31	
Dibranchus atlanticus	14.64	883	2.06	
BYTTIDAE	12.11	732	1.71	
Stomias boa boa	8.08	151	1.14	
GALATHEIDAE *	7.57	3508	1.07	
Halosaurus ovenii	6.81	76	0.96	
Starfish (large)	6.81	25	0.96	
Aristeus varidens, female	6.56	303	0.92	
Raja confundens	6.31	151	0.89	
Etmopterus polli	4.79	101	0.68	
HISTIOTEUTHIDAE	4.54	25	0.64	
Bathyrcooconger vicinus	4.54	76	0.64	
Bathygadus sp.	4.54	76	0.64	
Todaropsis eblanae	4.04	25	0.57	
Xenodermichthys copei	3.28	252	0.46	
Nephropsis atlantica	0.50	101	0.07	
Nezumia leonis	0.50	25	0.07	
STOMIIDAE	0.50	25	0.07	
Dicrolene intronigra	0.50	76	0.07	
Aristeus varidens, male	0.50	101	0.07	
GONOSTOMATIDAE	0.25	25	0.04	
Total	710.10		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 156
 DATE :02.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°21.39
 start stop duration Lon E 12°1.56
 TIME :02:05:50 02:35:57 30.1 (min) Purpose : 3
 LOG : 556.89 558.48 1.6 Region : 4000
 FDEPTH: 523 530 Gear cond.: 0
 BDEPTH: 523 530 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 3.2 kn
 Sorted : 25 Total catch: 374.99 Catch/hour: 746.99

SPECIES	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	258.47	69801	34.60	
Yarella blackfordi *	151.20	4064	20.24	
Hoplostethus cadenati	68.73	2749	9.20	
Melanostomias sp.	52.89	1046	7.08	
Benthodesmus tenuis	41.53	1195	5.56	
OMMASTREPHIDAE	41.53	209	5.56	
Stereomastis sp.	24.20	2361	3.24	
Triplophos hemingi	18.82	2689	2.52	
Gadella imberbis	12.25	627	1.64	
THYSANOTEUTHIDAE	10.46	60	1.40	
Chaunax pictus	9.26	30	1.24	
Lophius vaillanti	8.37	30	1.12	
Lamprogrammus exutus	8.07	90	1.08	
Aristeus varidens, female	8.07	538	1.08	
Chaceon maritae, male	4.98	10	0.67	
Merluccius polli	4.62	8	0.62	
Starfish (large)	4.48	149	0.60	
Xenodermichthys copei	3.88	299	0.52	
GALATHEIDAE *	3.29	2480	0.44	
Plesiopeneus edwardsianus	2.39	30	0.32	
Aristeus varidens, male	1.79	299	0.24	
Raja confundens	1.49	60	0.20	
Dicrolene intronigra	1.49	179	0.20	
Chaceon maritae, female	1.43	8	0.19	
Conger conger	0.90	120	0.12	
Gonostoma elongatum	0.90	90	0.12	
Malacocephalus laevis	0.90	30	0.12	
Chlorophthalmus atlanticus	0.60	30	0.08	
Total	746.99		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 157
 DATE :02.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°20.17
 start stop duration Lon E 12°4.16
 TIME :04:19:20 04:49:24 30.1 (min) Purpose : 3
 LOG : 567.00 568.44 1.5 Region : 4000
 FDEPTH: 416 427 Gear cond.: 0
 BDEPTH: 416 427 Validity : 0
 Towing dir: 0° Wire out : 1050 m Speed : 2.9 kn
 Sorted : 40 Total catch: 170.82 Catch/hour: 340.73

SPECIES	weight	numbers	% OF TOT. C	SAMP
Benthodesmus tenuis	75.40	2354	22.13	
Hymenocephalus italicus	41.01	4005	12.04	
Yarella blackfordi *	26.57	830	7.80	
Laemonema laureysi	25.13	487	7.38	
Lophiodes kemp	19.55	48	5.74	
Nematocarcinus africanus	18.11	4460	5.32	
Chaunax pictus	15.88	303	4.66	
Dibranchus atlanticus	14.92	1061	4.38	
Merluccius polli	10.27	30	3.01	
Stereomastis sp.	9.89	910	2.90	
Bathynectes piperitus	9.02	168	2.65	
Chaceon maritae, female	6.66	32	1.96	
Aristeus varidens, female	6.54	598	1.92	
B I V A L V E S	6.14	32	1.80	
Pontinus accraensis	5.11	8	1.50	
Halosaurus ovenii	5.03	279	1.48	
Thysanoteuthis rhombus	5.03	32	1.48	
Chaceon maritae, male	4.73	10	1.39	
Plesiopeneus edwardsianus	4.55	152	1.33	
Aristeus varidens, male	4.15	519	1.22	
Parapeneus longirostris	3.83	375	1.12	
Nezumia aequalis	3.75	271	1.10	
Caelorinchus coelorhincus	3.75	88	1.10	
Triplophos hemingi	2.55	391	0.75	
Gadella imberbis	2.39	88	0.70	
Malacocephalus occidentalis	2.15	32	0.63	
Conger wilsoni	1.99	40	0.59	
PARALEPIDIDAE	1.68	96	0.49	
Raja leopardus	1.28	8	0.37	
Plesionika martia	1.28	199	0.37	
Stomias affinis	0.96	24	0.28	
Peristedion cataphractum	0.72	136	0.21	
Gephyroberyx darwini	0.32	8	0.09	
Coloconger cadenati	0.16	8	0.05	
Cynoglossus sp.	0.16	8	0.05	
Lestrolepis intermedia	0.08	8	0.02	
Total	340.73		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 158
 DATE :02.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°15.61
 start stop duration Lon E 12°9.10
 TIME :06:35:10 07:05:14 30.1 (min) Purpose : 3
 LOG : 578.43 579.89 1.5 Region : 4000
 FDEPTH: 237 229 Gear cond.: 0
 BDEPTH: 237 229 Validity : 0
 Towing dir: 0° Wire out : 610 m Speed : 2.9 kn
 Sorted : 46 Total catch: 167.03 Catch/hour: 333.39

SPECIES	weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	195.93	335	58.77	
Dentex angolensis	56.19	148	16.85	275
Zenopsis conchifer	24.55	60	7.36	
Brotula barbata	21.66	18	6.50	
Raja miraletus	7.66	14	2.30	
Merluccius polli	7.58	42	2.28	276
Pterothrissus belloci	6.95	68	2.08	
Caelorinchus coelorhincus	3.97	110	1.19	
Trichiurus lepturus	3.37	6	1.01	
Ariomma bondi	2.77	72	0.83	
Illex coindetii	1.30	20	0.39	
Chlorophthalmus atlanticus	0.44	58	0.13	
Bathyrcooconger vicinus	0.34	10	0.10	
Gephyroberyx darwini	0.24	4	0.07	
Citharus linguatula	0.20	14	0.06	
Calappa sp.	0.20	4	0.06	
Sufflogobius bibarbat	0.04	4	0.01	
Total	333.39		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 159
 DATE :02.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°6.12
 start stop duration Lon E 12°36.69
 TIME :10:40:14 11:13:32 33.3 (min) Purpose : 3
 LOG : 613.74 615.42 1.7 Region : 4000
 FDEPTH: 37 37 Gear cond.: 0
 BDEPTH: 37 37 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
 Sorted : 5 Total catch: 5.03 Catch/hour: 9.06

SPECIES	weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	2.00	2	22.07	
Xyrichtys novacula	1.51	11	16.70	
Trachinus armatus	1.23	7	13.52	
Zenopsis conchifer	1.08	11	11.93	
Lagocephalus laevigatus	0.70	2	7.75	
Vanstraelenia chirophthalmus	0.67	2	7.36	
Pagellus bellottii	0.63	4	6.96	
Juvenile flatfish	0.43	2	4.77	
Illex coindetii	0.41	7	4.57	
Bothus podas africanus	0.27	4	2.98	
Bembrops heterurus	0.13	2	1.39	
Total	9.06		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 160
 DATE :02.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°6.78
 start stop duration Lon E 12°31.00
 TIME :12:05:30 12:35:57 30.5 (min) Purpose : 3
 LOG : 621.58 623.20 1.6 Region : 4000
 FDEPTH: 49 48 Gear cond.: 0
 BDEPTH: 49 48 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.2 kn
 Sorted : 147 Total catch: 146.75 Catch/hour: 289.16

SPECIES	weight	numbers	% OF TOT. C	SAMP
Sparus caeruleostictus *	148.08	384	51.21	
Dentex canariensis	27.00	87	9.34	
Dentex barnardi	20.79	43	7.19	
Plectorhynchus mediterraneus	19.21	33	6.64	
Sepia officinalis hierredda	13.60	8	4.70	
Pseudupeneus prayensis	12.89	69	4.46	
Pagellus bellottii	12.81	57	4.43	277
Decapterus rhonchus	7.00	8	2.42	
Epinephelus alexandrinus *	5.62	2	1.94	
Fistularia petimba	5.22	43	1.81	
Sparus auriga *	4.04	2	1.40	
Mustelus mustelus	3.55	4	1.23	
Trachinotus goreensis	2.80	4	0.97	
Zeus faber	2.29	6	0.79	
Aluterus heudelotii	1.85	2	0.64	
Dactylopterus volitans	0.91	2	0.31	
Dentex angolensis	0.65	2	0.22	
Xyrichtys novacula	0.45	390	0.16	
Alouteuthis africana	0.32	2	0.11	
Boops boops	0.06	4	0.02	
Chaetodon hoefleri	0.04	2	0.01	
Boops boops	0.02	2	0.01	
Total	289.16		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 160
 DATE :02.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°6.78
 start stop duration Lon E 12°31.00
 TIME :12:05:30 12:35:57 30.5 (min) Purpose : 3
 LOG : 621.58 623.20 1.6 Region : 4000
 FDEPTH: 49 48 Gear cond.: 0
 BDEPTH: 49 48 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.2 kn
 Sorted : 147 Total catch: 146.75 Catch/hour: 289.16

SPECIES	weight	numbers	% OF TOT. C	SAMP
Pagrus caeruleostictus	148.08	384	51.21	
Dentex canariensis	27.00	87	9.34	
Dentex barnardi	20.79	43	7.19	
Plectorhynchus mediterraneus	19.21	33	6.64	
Sepia officinalis hierredda	13.60	8	4.70	
Pseudupeneus prayensis	12.89	69	4.46	
Pagellus bellottii	12.81	57	4.43	277
Decapterus rhonchus	7.00	8	2.42	
Epinephelus costae	5.62	2	1.94	
Fistularia petimba	5.22	43	1.81	
Sparus auriga	4.04	2	1.40	
Mustelus mustelus	3.55	4	1.23	
Trachinotus goreensis	2.80	4	0.97	
Zeus faber	2.29	6	0.79	
Aluterus heudelotii	1.85	2	0.64	
Dactylopterus volitans	0.91	2	0.31	
Dentex angolensis	0.65	2	0.22	
Alloteuthis africana	0.45	390	0.16	
LABRIDAE	0.32	2	0.11	
Decapterus sp. juvenile	0.06	4	0.02	
Chaetodon hoefleri	0.04	2	0.01	
Boops boops	0.02	2	0.01	
Total	289.16		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 161
 DATE :02.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°11.50
 start stop duration Lon E 12°17.81
 TIME :15:03:27 15:33:05 29.7 (min) Purpose : 3
 LOG : 642.81 644.31 1.5 Region : 4000
 FDEPTH: 119 120 Gear cond.: 0
 BDEPTH: 119 120 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.0 kn
 Sorted : 116 Total catch: 115.76 Catch/hour: 234.25

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 164
 DATE :02.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°6.35
 start stop duration Lon E 11°56.76
 TIME :22:58:50 23:28:47 30.0 (min) Purpose : 3
 LOG : 690.13 691.73 1.6 Region : 4000
 FDEPTH: 312 320 Gear cond.: 0
 BDEPTH: 312 320 Validity : 0
 Towing dir: 0° Wire out : 760 m Speed : 3.2 kn
 Sorted : 31 Total catch: 346.83 Catch/hour: 694.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	170.99	528	73.00	
Dentex angolensis	15.48	121	6.61	278
Fistularia petimba	9.61	20	4.10	
Trachurus trecae	7.59	212	3.24	279
Zeus faber	4.74	18	2.02	
Raja clavata	3.54	2	1.51	
Mustelus mustelus	3.34	2	1.43	
Raja leoparden	3.08	2	1.31	
Sparus auriga *	2.53	2	1.08	
Decapterus rhonchus	2.17	2	0.92	
Sepia orbignyana	1.58	2	0.67	
Plectorhinchus mediterraneus	1.54	2	0.66	
Squatina oculata	1.52	2	0.65	
Raja miraletus	1.44	2	0.61	
Pseudupeneus prayensis	1.17	6	0.50	
Umbrina canariensis	0.95	2	0.41	
Dentex congoensis	0.75	16	0.32	
Uranoscopus polli	0.73	2	0.31	
Chelidonichthys gabonensis	0.53	4	0.22	
Pagellus bellottii	0.47	2	0.20	
Illex coindetii	0.24	22	0.10	
Citharus linguatula	0.12	6	0.05	
Arnoglossus imperialis	0.12	2	0.05	
Saurida brasiliensis	0.04	12	0.02	
Total	234.25		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	287.58	6831	41.39	
Synagrops microlepis	168.58	7735	24.26	
Merluccius polli	83.74	881	12.05	282
Munidopsis sp.	19.17	1741	2.76	
Laemonema laureysi	17.41	264	2.51	
Helicolenus dactylopterus	16.53	220	2.38	
Malacocephalus laevis	15.87	154	2.28	
Neoharriotta pinnata	13.22	2	1.90	
Pterothrissus belloci	11.90	88	1.71	
Parapenaeus longirostris,femal	11.02	0	1.59	
Scylliorhinus cervigoni	11.02	22	1.59	
Trigla lyra	7.49	66	1.08	
Parasudis sp.	7.05	176	1.01	
Gadella imberbis	5.51	198	0.79	
MYCTOPHIDAE	4.63	4099	0.67	
Nezumia aequalis	3.97	88	0.57	
Calappa pelii	1.98	22	0.29	
Callinectes amnicola	1.76	66	0.25	
Stereomastis sp.	1.76	242	0.25	
PARALEPIDIDAE	1.54	22	0.22	
Peristedion cataphractum	1.32	44	0.19	
APOGONIDAE	0.88	66	0.13	
Dibranchus atlanticus	0.22	44	0.03	
Nephropsis atlantica	0.22	22	0.03	
Dicologlossa cuneata	0.22	22	0.03	
Raja sp.	0.22	22	0.03	
Total	694.82		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 162
 DATE :02.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°2.06
 start stop duration Lon E 12°7.01
 TIME :17:01:16 17:31:06 29.8 (min) Purpose : 3
 LOG : 657.29 658.74 1.5 Region : 4000
 FDEPTH: 113 112 Gear cond.: 0
 BDEPTH: 113 112 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 2.9 kn
 Sorted : 117 Total catch: 234.96 Catch/hour: 472.44

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 165
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°5.25
 start stop duration Lon E 11°57.03
 TIME :04:48:29 05:19:03 30.6 (min) Purpose : 3
 LOG : 701.58 703.08 1.5 Region : 4000
 FDEPTH: 267 262 Gear cond.: 0
 BDEPTH: 267 262 Validity : 0
 Towing dir: 0° Wire out : 650 m Speed : 3.0 kn
 Sorted : 79 Total catch: 337.26 Catch/hour: 662.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	194.03	11948	41.07	280
Dentex angolensis	94.50	732	20.00	281
Trichiurus lepturus	84.05	145	17.79	
Brotula barbata	23.12	24	4.89	
Sepia orbignyana	10.86	20	2.30	
Dentex congoensis	9.61	92	2.03	
Squatina oculata	8.45	4	1.79	
Rhinobatos albomaculatus	7.84	4	1.66	
Trigla lyra	6.43	36	1.36	
Fistularia petimba	6.23	12	1.32	
Lagocephalus laevigatus	4.95	4	1.05	
Illex coindetii	4.71	30	1.00	
Decapterus rhonchus	4.22	4	0.89	
Zeus faber	4.14	20	0.88	
Priacanthus arenatus	2.61	4	0.55	
Citharus linguatula	2.25	129	0.48	
Saurida brasiliensis	1.73	495	0.37	
Dentex barnardi	0.88	4	0.19	
Brachydeuterus auritus	0.60	4	0.13	
Illex coindetii	0.60	44	0.13	
Spicara alta	0.32	24	0.07	
Arnoglossus imperialis	0.28	44	0.06	
Total	472.44		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	380.26	22596	57.43	
Parapenaeus longirostris	92.59	15430	13.98	
Squatina oculata	68.72	2	10.38	
Chlorophthalmus atlanticus	42.19	1117	6.37	
Dentex angolensis	22.28	57	3.37	284
Merluccius polli	13.35	240	2.02	283
Pontinus accraensis	13.15	92	1.99	
Trichiurus lepturus	6.77	12	1.02	
Brotula barbata	4.81	4	0.73	
Peristedion cataphractum	4.38	141	0.66	
Bembrops greyi	2.96	35	0.45	
Pterothrissus belloci	2.26	22	0.34	
MYCTOPHIDAE	2.12	1188	0.32	
Umbrina canariensis	1.65	2	0.25	
J E L Y F I S H	0.84	22	0.13	
Illex coindetii	0.84	14	0.13	
Caelorinchus sp.	0.84	27	0.13	
Lestrolepis intermedia	0.71	35	0.11	
Gadella imberbis	0.49	22	0.07	
Epigonus telescopus	0.27	27	0.04	
Dicologlossa cuneata	0.22	22	0.03	
Calappa sp.	0.22	22	0.03	
B I V A L V E S	0.14	14	0.02	
Nettastoma parviceps	0.08	8	0.01	
Total	662.16		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 163
 DATE :02.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°11.23
 start stop duration Lon E 11°52.32
 TIME :20:39:51 21:09:53 30.0 (min) Purpose : 3
 LOG : 679.52 681.09 1.6 Region : 4000
 FDEPTH: 620 623 Gear cond.: 0
 BDEPTH: 620 623 Validity : 0
 Towing dir: 0° Wire out : 1450 m Speed : 3.1 kn
 Sorted : 151 Total catch: 150.92 Catch/hour: 301.64

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 166
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°4.55
 start stop duration Lon E 12°0.21
 TIME :06:17:59 06:48:28 30.5 (min) Purpose : 3
 LOG : 707.75 709.08 1.3 Region : 4000
 FDEPTH: 151 151 Gear cond.: 0
 BDEPTH: 151 151 Validity : 0
 Towing dir: 0° Wire out : 400 m Speed : 2.6 kn
 Sorted : 56 Total catch: 55.78 Catch/hour: 109.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia sp.	32.38	728	10.73	
Chaceon maritae, male	30.14	64	9.99	
Lamprogrammus exutus	29.26	72	9.70	
Yarellia blackfordi	29.18	592	9.67	
Stereomastis sp.	25.66	1975	8.51	
Centroscymnus crepidater	19.59	8	6.49	
Hoplostethus cadenati	18.55	408	6.15	
Lophius vaillanti	17.43	16	5.78	
Plesiopeneus edwardsianus	17.27	4701	5.72	
Chaceon maritae, female	12.87	40	4.27	
Thysanoteuthis rhombus	10.15	40	3.37	
Triplophos hemingi	8.63	1119	2.86	
Aristeus varidens, female	7.12	304	2.36	
Echeneis naucrates	6.00	8	1.99	
Dicrolene intronigra	5.68	1111	1.88	
Merluccius polli	4.72	8	1.56	
Stomias boa boa	4.64	88	1.54	
Scymnodon squamulosus	3.20	16	1.06	
Aristeus varidens, male	3.04	360	1.01	
Bathyroconger vicinus	2.64	56	0.87	
Synaphobranchus kaupii	2.08	24	0.69	
Malacocephalus occidentalis	2.08	16	0.69	
Raja confundens	1.52	32	0.50	
Halosaurus ovenii	1.44	48	0.48	
Nezumia micronychodon	1.12	8	0.37	
Deania profundorum	1.12	8	0.37	
Chaunax cf. pictus	1.04	8	0.34	
Calappa sp.	0.64	16	0.21	
Gadella imberbis	0.64	80	0.21	
Dibranchus atlanticus	0.64	64	0.21	
Bathymectes piperitus	0.56	16	0.19	
Nettenchelys sp.	0.40	8	0.13	
MYCTOPHIDAE	0.24	368	0.08	
Total	301.64		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	31.59	116	28.77	285
Trichiurus lepturus	20.87	35	19.00	
Zenopsis conchifer	11.81	16	10.76	
Squatina oculata	11.52	8	10.49	
Spicara alta	8.90	163	8.10	
Brotula barbata	7.22	8	6.58	
Zeus faber	2.34	16	2.13	
Pterothrissus belloci	2.28	16	2.08	
Raja leoparden	2.13	2	1.94	
Illex coindetii	1.87	35	1.70	
Trachurus trecae	1.40	67	1.27	
Saurida brasiliensis	1.36	301	1.24	286
Citharus linguatula	1.36	26	1.24	
Trigla lyra	1.26	30	1.15	
Peristedion cataphractum	0.77	30	0.70	
Uranoscopus cadenati	0.77	2	0.70	
Boops boops	0.69	20	0.63	
Miracorvina angolensis	0.49	2	0.45	
Lophiodes kempii	0.47	2	0.43	
Ariomma bondi	0.24	4	0.22	
Bembrops greyi	0.22	2	0.20	
Sepia orbignyana	0.20	2	0.18	
Callionymus sp.	0.06	2	0.05	
Total	109.80		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 167
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 7°2.88
 start stop duration Lon E 12°4.58
 TIME :07:47:54 08:17:53 30.0 (min) Purpose : 3
 LOG : 715.28 716.86 1.6 Region : 4000
 FDEPTH: 120 119 Gear cond.: 0
 BDEPTH: 120 119 Validity : 0
 Towing dir: 0° Wire out : 340 m Speed : 3.2 kn
 Sorted : 121 Total catch: 241.12 Catch/hour: 241.12
 SPECIES CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	72.92	138	30.24	
Trachurus trecae	61.42	4025	25.47	288
Dentex angolensis	26.61	202	11.04	287
Dentex congoensis	16.81	188	6.97	
Brotula barbata	15.91	14	6.60	
Lagocephalus laevisgatus	12.86	10	5.34	
Zeus faber	8.54	40	3.54	
Fistularia petimba	8.10	14	3.36	
Squatina oculata	4.34	2	1.80	
Illex coindetii	3.30	146	1.37	
Branchiostegus semifasciatus *	2.98	2	1.24	
Pterothrissus belloci	2.18	20	0.90	
Spicara alta	0.98	40	0.41	
Citharus linguatula	0.94	26	0.39	
Brachydeuterus auritus	0.70	4	0.29	
Ariomma bondi	0.66	8	0.27	
Umbrina canariensis	0.64	2	0.27	
Saurida brasiliensis	0.56	158	0.23	
Peristedion cataphractum	0.32	8	0.13	
Trigla lyra	0.22	2	0.09	
Boops boops	0.12	4	0.05	
Total	241.12		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 168
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°57.06
 start stop duration Lon E 12°10.91
 TIME :09:34:44 10:04:46 30.0 (min) Purpose : 3
 LOG : 726.28 727.80 1.5 Region : 4000
 FDEPTH: 87 87 Gear cond.: 0
 BDEPTH: 87 87 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.0 kn
 Sorted : 108 Total catch: 107.62 Catch/hour: 214.95
 SPECIES CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Lagocephalus laevisgatus	46.14	38	21.46	
Trachurus trecae	32.36	1674	15.05	291
Dentex congoensis	31.96	887	14.87	
Trichiurus lepturus	25.37	42	11.80	
Squatina oculata	19.37	8	9.01	
Dentex angolensis	19.17	182	8.92	290
Stromateus fiatola	8.63	8	4.01	
Dentex barnardi	7.27	34	3.38	
Pagellus bellottii	6.25	48	2.91	289
Pseudupeneus prayensis	3.72	26	1.73	
Raja miraletus	3.62	6	1.68	
Mustelus mustelus	2.84	2	1.32	
Branchiostegus semifasciatus *	1.60	2	0.74	
Zeus faber	0.94	2	0.44	
Dentex gibbosus	0.88	2	0.41	
Chaetodon hoefleri	0.68	6	0.41	
Epinephelus aeneus	0.74	2	0.34	
Sparus caeruleostictus *	0.72	2	0.33	
Chelidonichthys gabonensis	0.68	4	0.32	
Fistularia petimba	0.46	2	0.21	
Trigla lyra	0.44	4	0.20	
Spicara alta	0.32	70	0.15	
Alloteuthis africana	0.22	56	0.10	
Peristedion cataphractum	0.12	2	0.06	
Citharus linguatula	0.12	4	0.06	
Arnoglossus imperialis	0.08	4	0.04	
Boops boops	0.06	4	0.03	
Saurida brasiliensis	0.02	8	0.01	
Total	214.95		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 169
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°56.70
 start stop duration Lon E 12°13.66
 TIME :10:45:17 11:15:42 30.4 (min) Purpose : 3
 LOG : 731.09 732.64 1.6 Region : 4000
 FDEPTH: 82 81 Gear cond.: 0
 BDEPTH: 82 81 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.1 kn
 Sorted : 63 Total catch: 62.72 Catch/hour: 123.75
 SPECIES CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Lagocephalus laevisgatus	34.82	24	28.14	
Dentex angolensis	32.75	148	26.47	292
Epinephelus aeneus	24.56	6	19.85	
Mustelus mustelus	6.12	4	4.94	
Trachurus trecae	3.85	180	3.11	294
Pomadasy incisus	2.90	10	2.34	
Pagellus bellottii	2.64	14	2.14	293
Fistularia petimba	2.43	10	1.46	
Priacanthus arenatus	2.41	4	1.95	
Pagrus auriga	2.21	2	1.79	
Alloteuthis africana	2.07	805	1.67	
Dentex barnardi	1.48	8	1.20	
Dentex congoensis	1.14	12	0.92	
Chaetodon hoefleri	1.05	6	0.85	
Trichiurus lepturus	1.03	2	0.83	
Zeus faber	0.79	2	0.64	
Raja miraletus	0.77	2	0.62	
Pseudupeneus prayensis	0.53	2	0.43	
Illex coindetii	0.20	4	0.16	
Total	123.75		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 170
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°48.65
 start stop duration Lon E 12°0.80
 TIME :13:08:57 13:38:57 30.0 (min) Purpose : 3
 LOG : 747.26 748.73 1.5 Region : 4000
 FDEPTH: 90 90 Gear cond.: 0
 BDEPTH: 90 90 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 2.9 kn
 Sorted : 7 Total catch: 6.51 Catch/hour: 13.02
 SPECIES CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Raja miraletus	2.50	4	19.20	
Lagocephalus laevisgatus	2.30	2	17.67	
Trachurus trecae	1.68	66	12.90	295
Pomadasy incisus	1.24	4	9.52	
Trichiurus lepturus	1.24	2	9.52	
Pagellus bellottii	1.02	4	7.83	
Chelidonichthys capensis	0.78	4	5.99	
Lepidotrigla cadmani	0.54	4	4.15	
Dentex angolensis	0.48	2	3.69	
Pseudupeneus prayensis	0.44	2	3.38	
Dentex congoensis	0.42	6	3.23	
Dentex barnardi	0.38	2	2.92	
Total	13.02		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 171
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°46.64
 start stop duration Lon E 11°55.23
 TIME :14:45:14 15:16:31 31.3 (min) Purpose : 3
 LOG : 755.27 756.69 1.4 Region : 4000
 FDEPTH: 113 118 Gear cond.: 0
 BDEPTH: 113 118 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 2.7 kn
 Sorted : 71 Total catch: 70.64 Catch/hour: 135.46
 SPECIES CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	43.91	169	32.42	296
Trachurus trecae	27.61	1774	20.39	297
Selene dorsalis	13.25	44	9.78	
Ariomma bondi	12.87	280	9.50	
Dentex congoensis	7.98	75	5.89	
Umbrina canariensis	7.92	21	5.85	298
Zeus faber	5.93	19	4.37	
Fistularia petimba	2.82	6	2.08	
Branchiostegus semifasciatus *	2.65	2	1.95	
Raja miraletus	2.44	4	1.80	
Pagellus bellottii	1.96	15	1.44	299
Brotula barbata	1.96	2	1.44	
Trichiurus lepturus	1.80	8	1.33	
Dentex barnardi	1.13	4	0.84	
Boops boops	0.52	15	0.38	
Chelidonichthys gabonensis	0.29	2	0.21	
Illex coindetii	0.27	15	0.20	
Citharus linguatula	0.10	2	0.07	
Spicara alta	0.04	6	0.03	
Arnoglossus imperialis	0.02	4	0.01	
Sepia orbignyana	0.02	2	0.01	
Total	135.46		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 172
 DATE :03.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°47.60
 start stop duration Lon E 11°52.88
 TIME :16:11:51 16:42:37 30.8 (min) Purpose : 3
 LOG : 761.43 762.95 1.5 Region : 4000
 FDEPTH: 139 147 Gear cond.: 0
 BDEPTH: 139 147 Validity : 0
 Towing dir: 0° Wire out : 370 m Speed : 3.0 kn
 Sorted : 59 Total catch: 253.41 Catch/hour: 494.46
 SPECIES CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	400.00	28823	80.90	
Trichiurus lepturus	25.21	152	5.10	
Dentex angolensis	13.76	60	2.78	300
Brotula barbata	11.12	6	2.25	
Pterothrissus belloci	10.32	80	2.09	
Pteroscion pelli	6.81	80	1.38	
Portunus acuminatus	4.96	8	1.00	
Zeus faber	4.96	23	1.00	
Umbrina canariensis	3.69	8	0.75	
Selene dorsalis	3.12	8	0.63	
Spicara alta	2.24	23	0.45	
MYCTOPHIDAE	2.09	1001	0.42	
Citharus linguatula	1.60	41	0.32	
Sardinella aurita	1.37	8	0.28	
Parapenaeus longirostris,femal	1.29	232	0.26	
Plesiopeanaeus edwardsianus	0.64	160	0.13	
Saurida brasiliensis	0.49	111	0.10	
Dentex macropthalmus	0.37	2	0.07	
Syacium micrurum	0.16	8	0.03	
Illex coindetii	0.16	8	0.03	
Dentex congoensis	0.12	2	0.02	
Total	494.46		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 173
 DATE :03.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°58.27
 start stop duration Lon E 11°40.56
 TIME :19:44:02 20:14:15 30.2 (min) Purpose : 3
 LOG : 783.32 784.87 1.5 Region : 4000
 FDEPTH: 721 722 Gear cond.: 0
 BDEPTH: 721 722 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.1 kn
 Sorted : 47 Total catch: 343.86 Catch/hour: 682.94
 SPECIES CATCH/HOUR % OF TOT. C SAMP

SPECIES	weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	262.56	5839	38.45	
Nezumia micronychodon	155.71	3392	22.80	
Yarella blackfordi *	41.71	723	6.11	
Stereomastis sp.	38.37	2350	5.62	
Sea cucumbers	31.42	125	4.60	
Bathyracoconger vicinus	27.25	181	3.99	
Deania calcea	25.30	56	3.70	
Triplophos hemingi	20.02	2475	2.93	
Hydrolagus sp.	9.45	14	1.38	
Etmopterus sp.	8.20	28	1.20	
Lamprogrammus exutus	8.06	0	1.18	
Nematocarcinus africanus	6.12	820	0.90	
Dibranchius atlanticus	5.70	222	0.83	
Raja confundens	5.56	70	0.81	
Halosaurus ovenii	5.28	125	0.77	
Aristeuthis varidens, female	3.30	135	0.48	
GALATHEIDAE *	3.06	1362	0.45	
Caristius sp	2.92	14	0.43	
Synaphobranchius kaupii	2.78	28	0.41	
Chaceon maritae, male	2.66	8	0.39	
Lophodes lempi	2.50	2	0.37	
Benthodesmus tenuis	2.26	14	0.35	
Talismania longifilis	1.95	42	0.28	
OCTOPODIDAE	1.67	28	0.24	
Malacocephalus occidentalis	1.53	14	0.22	
Opistotheutis rossi	1.25	14	0.18	
Thysanoteuthis rhombus	1.25	14	0.18	
Xenodermichthys copei	0.97	28	0.14	
Chaceon maritae, female	0.91	4	0.13	
Trichiurus lepturus	0.83	28	0.12	
Glypihus marsupialis	0.83	42	0.12	
Stomias boa boa	0.70	42	0.10	
Paramola cuvieri	0.52	2	0.08	
Gadella imberbis	0.14	14	0.02	
Aristeuthis varidens, male	0.08	8	0.01	
Total	682.94		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 174
 DATE :03.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°54.60
 start stop duration Lon E 11°43.31
 TIME :22:03:22 22:33:23 30.0 (min) Purpose : 3
 LOG : 792.39 794.00 1.6 Region : 4000
 FDEPTH: 521 512 Gear cond.: 0
 BDEPTH: 521 512 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 3.2 kn
 Sorted : 25 Total catch: 157.81 Catch/hour: 315.41

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Lamprogrammus exutus	47.37	108	15.02
Yarella blackfordi	33.94	923	10.76
Aristeus varidens, female	32.62	2087	10.34
Stereomastis sp.	30.82	2590	9.77
Hoplostethus cadenati	30.46	2135	9.66
Nematocarcinus africanus	27.34	9642	8.67
Triplophos hemingi	20.15	0	6.39
Benthodesmus tenuis	16.55	444	5.25
Merluccius polli	10.79	20	3.42
OMMASTREPHIDAE	9.11	72	2.89
Stomias boa boa	8.63	168	2.74
Chaunax pictus	6.48	72	2.05
Callinectes amnicola	4.92	120	1.56
Aristeus varidens, male	4.92	612	1.56
Chaceon maritae	4.34	14	1.38
GALATHEIDAE *	3.24	2302	1.03
Laemonema laureysi	3.00	180	0.95
Malacocephalus laevis	2.88	48	0.91
Halosaurus ovenii	2.40	60	0.76
Chlorophthalmus atlanticus	2.04	48	0.65
Gadella imberbis	1.80	60	0.57
Nezumia sp.	1.80	60	0.57
Brotula sp.	1.44	12	0.46
Synaphobranchus kaupii	1.32	60	0.42
Dibranchius atlanticus	1.32	84	0.42
Plesiopeneus edwardsianus	1.20	12	0.38
NETTASTOMATIDAE	0.84	12	0.27
Gonostoma elongatum	0.60	48	0.19
Xenodermichthys copei	0.60	36	0.19
Neoscopelus sp.	0.60	12	0.19
MYCTOPHIDAE	0.48	204	0.15
Munidopsis sp.	0.48	120	0.15
Raja sp.	0.48	12	0.15
Bassanago albescens	0.36	12	0.11
Dicrolene intronigra	0.12	24	0.04
Total	315.41		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 176
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°51.83
 start stop duration Lon E 11°50.23
 TIME :04:49:24 05:19:24 30.0 (min) Purpose : 3
 LOG : 809.41 810.89 1.5 Region : 4000
 FDEPTH: 270 273 Gear cond.: 0
 BDEPTH: 270 273 Validity : 0
 Towing dir: 0° Wire out : 670 m Speed : 3.0 kn
 Sorted : 67 Total catch: 160.35 Catch/hour: 320.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	106.04	2120	33.07
Synagrops microlepis	98.34	3412	30.66
Pterothrissus belloci	31.90	96	9.95
Grammolites gruvelli	21.78	524	6.79
Pontinus accraensis	15.84	8	4.94
Trichiurus lepturus	14.50	44	4.52
Brotula barbata	7.20	4	2.25
Parapeneus longirostris, femal	4.98	730	1.55
Bassanago albescens	4.52	62	1.41
Bembrops greyi	3.08	40	0.96
Merluccius polli	3.00	52	0.94
Dentex angolensis	3.00	10	0.94
Munidopsis sp.	1.48	140	0.46
Miracorvina angolensis	1.06	4	0.33
Parapeneus longirostris, male	0.88	184	0.27
Gadella imberbis	0.74	26	0.23
MYCTOPHIDAE	0.62	484	0.19
Peristedion cataphractum	0.36	66	0.11
Malacocephalus occidentalis	0.30	4	0.09
Chascanopsetta lugubris	0.26	4	0.08
Laemonema laureysi	0.22	4	0.07
Todaropsis eblanae	0.18	4	0.06
Nezumia sp.	0.14	4	0.04
Bathyrcoconger vicinus	0.08	4	0.02
Lophiodes kempi	0.08	4	0.02
Callionymus sp.	0.08	4	0.02
Nettenchelys sp.	0.04	4	0.01
Total	320.70		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 177
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°51.84
 start stop duration Lon E 11°52.36
 TIME :06:20:14 06:50:58 30.7 (min) Purpose : 3
 LOG : 816.30 817.83 1.5 Region : 4000
 FDEPTH: 182 197 Gear cond.: 0
 BDEPTH: 182 197 Validity : 0
 Towing dir: 0° Wire out : 500 m Speed : 3.0 kn
 Sorted : 58 Total catch: 185.39 Catch/hour: 361.85

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	209.65	10339	57.94
Brotula barbata	46.06	37	12.73
Trichiurus lepturus	31.13	209	8.60
Dentex congoensis	26.35	86	7.28
Parapeneus longirostris, femal	12.02	1823	3.32
Umbrina canariensis	9.92	10	2.74
Zenopsis conchifer	6.60	10	1.82
Torpedo torpedo	5.35	10	1.48
Scorpaena angolensis	2.48	4	0.69
MYCTOPHIDAE	2.34	1440	0.65
Miracorvina angolensis	2.11	14	0.58
Pterothrissus belloci	1.89	18	0.52
Chlorophthalmus atlanticus	1.66	23	0.46
Parapeneus longirostris, male	1.13	234	0.31
Coloconger sp.	0.90	62	0.25
Peristedion cataphractum	0.72	62	0.20
Bembrops greyi	0.35	234	0.10
Caelorinchus coelorhincus	0.27	4	0.08
Saurida brasiliensis	0.27	27	0.08
Bassanago albescens	0.27	10	0.08
Illex coindetii	0.18	4	0.05
Alloteuthis africana	0.10	27	0.03
Nettastoma sp.	0.10	4	0.03
Total	361.85		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 175
 DATE :03.04.2009 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°54.03
 start stop duration Lon E 11°45.18
 TIME :00:04:24 00:35:26 31.0 (min) Purpose : 3
 LOG : 798.75 800.37 1.6 Region : 4000
 FDEPTH: 426 426 Gear cond.: 0
 BDEPTH: 426 426 Validity : 0
 Towing dir: 0° Wire out : 0 m Speed : 3.6 kn
 Sorted : 63 Total catch: 112.57 Catch/hour: 217.88

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Benthodesmus tenuis	63.79	2034	29.28
Laemonema laureysi	27.38	335	12.56
Aristeus varidens, female	14.03	1506	6.44
Lamprogrammus exutus	12.98	37	5.96
Stereomastis sp.	10.65	734	4.89
Merluccius polli	10.55	35	4.84
Chaunax pictus	10.47	151	4.80
Yarella blackfordi	8.95	257	4.11
Hymenocephalus italicus	7.59	784	3.48
CHIMAERIDAE	7.26	2	3.33
Dibranchius atlanticus	6.32	548	2.90
Todaropsis eblanae	5.48	35	2.52
Callinectes amnicola	4.43	74	2.03
Chaceon maritae, female	2.83	19	1.30
Coloconger cadenati	2.60	12	1.19
Aristeus varidens, male	2.57	335	1.18
Chaceon maritae, male	2.40	8	1.10
Dicrolene intronigra	2.32	180	1.07
Nezumia sp.	2.17	124	0.99
Nematocarcinus africanus	1.98	625	0.91
Caelorinchus coelorhincus	1.42	31	0.65
Etmopterus pusillus	1.42	12	0.65
Zenopsis conchifer	1.39	4	0.64
Parapeneus longirostris, femal	1.21	108	0.55
Stomias boa boa	0.84	15	0.38
Hoplostethus cadenati	0.84	12	0.38
Trichiurus lepturus	0.77	4	0.36
Chlorophthalmus atlanticus	0.71	19	0.33
Halosaurus ovenii	0.65	25	0.30
Lophiodes kempi	0.59	4	0.27
Plesiopeneus edwardsianus	0.37	15	0.17
Deania calcea	0.34	10	0.16
Gadella imberbis	0.31	10	0.14
Dicologlossa cuneata	0.15	4	0.07
NETTASTOMATIDAE	0.12	6	0.06
Total	217.88		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 178
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°25.70
 start stop duration Lon E 12°05.69
 TIME :10:01:07 10:31:09 30.0 (min) Purpose : 3
 LOG : 846.69 848.26 1.6 Region : 4000
 FDEPTH: 54 56 Gear cond.: 0
 BDEPTH: 54 56 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.1 kn
 Sorted : 22 Total catch: 22.21 Catch/hour: 44.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Lagocephalus laevigatus	31.86	56	71.81
Caxanx crysos	4.87	4	10.99
Pagrus caeruleostictus	2.40	4	5.40
Balistes capricus	2.02	2	4.55
Dentex angolensis	1.38	4	3.11
Pagellus bellottii	1.22	28	2.75
Dentex barnardi	0.62	2	1.40
Total	44.36		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 179
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°24.87
 start stop duration Lon E 12°1.37
 TIME :11:19:56 11:50:48 30.9 (min) Purpose : 3
 LOG : 853.03 854.67 1.6 Region : 4000
 FDEPTH: 82 82 Gear cond.: 0
 BDEPTH: 82 82 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.2 kn
 Sorted : 207 Total catch: 207.04 Catch/hour: 402.41

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 182
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°29.50
 start stop duration Lon E 11°52.28
 TIME :15:22:04 15:52:06 30.0 (min) Purpose : 3
 LOG : 872.31 873.92 1.6 Region : 4000
 FDEPTH: 116 115 Gear cond.: 0
 BDEPTH: 116 115 Validity : 0
 Towing dir: 0° Wire out : 285 m Speed : 3.2 kn
 Sorted : 46 Total catch: 46.24 Catch/hour: 92.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	158.79	546	39.46
Umbrina canariensis	42.47	159	10.55
Dentex angolensis	39.94	181	9.93
Selene dorsalis	38.78	140	9.64
Trachurus trecae	26.63	1998	6.62
Stromateus fiatola	24.30	25	6.04
Brachydeuterus auritus	17.88	183	4.44
Epinephelus aeneus	17.20	4	4.27
Dentex barnardi	13.02	45	3.24
Octopus vulgaris	4.31	2	1.07
Fistularia petimba	4.14	10	1.03
Zeus faber	3.56	12	0.88
Lagocephalus laevisgatus	3.36	4	0.84
Sepia officinalis hierredda	2.20	2	0.55
Pagellus bellottii	1.94	14	0.48
Torpedo torpedo	1.24	4	0.31
Sardinella maderensis	0.99	4	0.25
Pagrus pagrus	0.89	2	0.22
Dentex congoensis	0.31	6	0.08
Brotula barbata	0.25	4	0.06
Boops boops	0.19	8	0.05
Total	402.41	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	17.58	1009	19.03
Dentex angolensis	16.68	80	18.06
Epinephelus aeneus	13.98	2	15.14
Trichiurus lepturus	13.08	24	14.17
Umbrina canariensis	7.41	16	8.02
Ariomma bondi	5.99	142	6.49
Dentex congoensis	4.91	48	5.32
Saurida brasiliensis	2.80	693	3.03
Fistularia petimba	2.36	6	2.55
Zeus faber	2.34	12	2.53
Trigla lyra	1.32	10	1.43
Raja miraletus	1.18	2	1.28
Pterothrissus belloci	0.92	6	0.99
Illex coindetii	0.60	18	0.65
Boops boops	0.52	18	0.56
Citharus linguatula	0.46	14	0.50
Parapagurus dimorphus	0.10	2	0.11
Parapanaeus longirostris	0.06	22	0.06
Pagellus bellottii	0.06	2	0.06
Arnoglossus imperialis	0.02	2	0.02
Total	92.36	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 180
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°26.49
 start stop duration Lon E 11°58.26
 TIME :12:42:12 13:12:07 29.9 (min) Purpose : 3
 LOG : 859.89 861.60 1.7 Region : 4000
 FDEPTH: 96 98 Gear cond.: 0
 BDEPTH: 96 98 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.4 kn
 Sorted : 55 Total catch: 54.92 Catch/hour: 110.13

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 183
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°30.18
 start stop duration Lon E 11°48.18
 TIME :16:48:33 16:53:55 5.4 (min) Purpose : 3
 LOG : 879.74 880.01 0.3 Region : 4000
 FDEPTH: 125 125 Gear cond.: 9
 BDEPTH: 125 125 Validity : 4
 Towing dir: 0° Wire out : 340 m Speed : 3.0 kn
 Sorted : 3 Total catch: 3.17 Catch/hour: 35.42

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	21.46	40	19.48
Lagocephalus laevisgatus	19.35	16	17.57
Brachydeuterus auritus	19.05	0	17.30
Dentex angolensis	19.05	84	17.30
Trachurus trecae	9.10	0	8.27
Fistularia petimba	5.11	12	4.64
Stromateus fiatola	4.57	4	4.15
Dentex congoensis	3.39	32	3.08
Zeus faber	2.51	10	2.28
Selene dorsalis	1.66	6	1.51
Uranoscopus albesca	1.22	6	1.11
Umbrina canariensis	1.04	2	0.95
Raja miraletus	1.00	2	0.91
Scorpaena stephanica	0.62	2	0.56
Pterothrissus belloci	0.32	2	0.29
Dentex canariensis	0.30	2	0.27
Citharus linguatula	0.26	4	0.24
Boops boops	0.08	2	0.07
Saurida brasiliensis	0.02	2	0.02
Total	110.13	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	18.66	34	52.68
Trachurus trecae	6.59	0	18.61
Ariomma bondi	5.03	101	14.20
Raja miraletus	4.13	11	11.67
Saurida brasiliensis	1.01	156	2.84
Total	35.42	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 181
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°28.06
 start stop duration Lon E 11°54.78
 TIME :14:02:09 14:32:18 30.2 (min) Purpose : 3
 LOG : 866.15 867.78 1.6 Region : 4000
 FDEPTH: 110 109 Gear cond.: 0
 BDEPTH: 110 109 Validity : 0
 Towing dir: 0° Wire out : 310 m Speed : 3.2 kn
 Sorted : 95 Total catch: 94.83 Catch/hour: 188.72

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 184
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°39.07
 start stop duration Lon E 11°25.05
 TIME :20:25:35 20:53:37 28.0 (min) Purpose : 3
 LOG : 906.53 907.94 1.4 Region : 4000
 FDEPTH: 721 718 Gear cond.: 0
 BDEPTH: 721 718 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.0 kn
 Sorted : 51 Total catch: 389.32 Catch/hour: 833.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Umbrina canariensis	52.04	0	27.58
Trichiurus lepturus	48.36	10316	25.62
Dentex angolensis	25.97	0	13.76
Trachurus trecae	19.20	0	10.18
Saurida brasiliensis	7.50	1626	3.98
Brachydeuterus auritus	6.61	50	3.50
Raja miraletus	6.33	10	3.35
Dentex congoensis	3.40	36	1.80
Stromateus fiatola	2.61	2	1.38
Zeus faber	2.61	12	1.38
Brotula barbata	2.45	2	1.30
Fistularia petimba	2.39	4	1.27
Uranoscopus cadenati	2.15	18	1.14
Octopus vulgaris	1.87	2	0.99
Citharus linguatula	1.79	34	0.95
Pterothrissus belloci	1.09	6	0.58
Miracorvina angolensis	0.56	4	0.30
Torpedo sp.	0.48	2	0.25
Boops boops	0.40	16	0.21
Ariomma bondi	0.38	8	0.20
Parapanaeus longirostris, female	0.20	46	0.11
Illex coindetii	0.16	6	0.08
Starfish	0.06	2	0.03
Laemonema sp.	0.06	2	0.03
Parapanaeus longirostris, male	0.04	18	0.02
Unidentified fish	0.02	4	0.01
Total	188.72	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nezumia aequalis	227.17	4880	27.26
Hoplostethus cadenati	171.78	1284	20.61
Trachyrincus scabrurus	113.18	210	13.58
Uroconger lepturus	75.94	32	9.11
Merluccius polli	56.99	81	6.84
Caelorinchus coelorrhincus	53.78	210	6.45
Chaceon maritae, male	14.13	32	1.70
Halosaurus ovenii	12.52	225	1.50
Unidentified invertebrate	12.52	49	1.50
Stereomastix sp.	12.36	499	1.48
Etmopterus pusillus	11.56	49	1.39
Deania calcea	9.95	17	1.19
Dicrolene intronigra	9.31	642	1.12
Hydrolagus sp.	8.82	2	1.06
Lopholodes kempi	8.51	17	1.02
Synaphobranchus kaupii	8.35	64	1.00
Raja confundens	5.94	32	0.71
Yarrella blackfordi	5.46	161	0.65
Glyphus marsupialis	5.30	210	0.64
Dibranchius atlanticus	2.89	210	0.35
Aristeus varidens, female	2.41	146	0.29
Triplophos hemingi	1.61	178	0.19
Unidentified invertebrate	1.44	49	0.17
Sicyonia galeata	0.48	17	0.06
Xenodermichthys copei	0.48	32	0.06
Stomias boa boa	0.32	17	0.04
Nettastoma sp.	0.16	17	0.02
Total	833.36	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 185
 DATE :04.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°37.44
 start stop duration Lon E 11°27.75
 TIME :22:46:41 23:17:53 31.2 (min) Purpose : 3
 LOG : 914.42 916.03 1.6 Region : 4000
 FDEPTH: 660 656 Gear cond.: 0
 BDEPTH: 660 656 Validity : 0
 Towing dir: 0° Wire out : 1500 m Speed : 3.1 kn
 Sorted : 23 Total catch: 196.82 Catch/hour: 378.38

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Nematocarcinus africanus	117.65	25069	31.09
Hoplostethus cadenati	51.52	954	13.62
Bathyrcongery vicinus	28.14	231	7.44
Aristeus varidens, female	21.99	984	5.81
Nezumia micronychodon	21.84	523	5.77
Stereomastix sp.	18.92	1799	5.00
Centrophorus granulosus	13.65	4	3.61
Trachyrincus scabrurus	13.38	62	3.54
Deania calcea	11.53	46	3.05
Merluccius polli	9.13	12	2.41
Lepidopus caudatus	8.77	31	2.32
Dicrolene intronigra	8.61	631	2.28
Yarrella blackfordi	8.46	169	2.24
Synaphobranchus kaupii	7.23	92	1.91
Chaceon maritae	6.31	13	1.67
Halosaurus ovenii	5.23	62	1.38
Triplophos hemingi	4.92	646	1.30
Stomias boa boa	3.08	46	0.81
OMMASTREPHIDAE	2.92	15	0.77
GALATHEIDAE *	2.92	1707	0.77
Raja sp.	2.77	77	0.73
Lamprogrammus exutus	2.61	31	0.69
Xenodermichthys copei	2.15	62	0.57
Aristeus varidens, male	1.69	169	0.45
Glyphus marsupialis	1.23	92	0.33
Dibranchius atlanticus	0.62	46	0.16
Lithodes ferox	0.48	2	0.13
Lampadena pontifex	0.46	15	0.12
Chaunax pictus	0.15	15	0.04
Total	378.38		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 186
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°35.04
 start stop duration Lon E 11°38.26
 TIME :01:34:12 02:04:07 29.9 (min) Purpose : 3
 LOG : 929.33 930.81 1.5 Region : 4000
 FDEPTH: 345 322 Gear cond.: 0
 BDEPTH: 345 322 Validity : 0
 Towing dir: 0° Wire out : 800 m Speed : 3.0 kn
 Sorted : 24 Total catch: 127.20 Catch/hour: 255.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Chlorophthalmus punctatus	73.20	1725	28.69
Parasudis fraser-bruenneri	34.09	80	13.36
Malacocephalus occidentalis	28.58	150	11.20
Munidopsis sp.	22.26	2226	8.73
Laemonema laureysi	20.55	341	8.06
Merluccius polli	12.23	52	4.80
Parapenaeus longirostris, female	8.72	1183	3.42
Synagrops microlepis	5.92	521	2.32
Bassanago albescens	5.31	40	2.08
Benthodesmus tenuis	5.01	150	1.97
Dibranchius atlanticus	5.01	672	1.97
MELANONIDAE	4.91	10	1.93
Trichiurus lepturus	4.61	10	1.81
OMMASTREPHIDAE	4.21	10	1.65
Epigonus pandionis	3.01	90	1.18
Raja clavata	2.01	30	0.79
Etmopterus pusillus	1.60	10	0.63
Bathynectes piperitus	1.60	20	0.63
Lophiodes kempfi	1.50	30	0.59
Gadella imberbis	1.50	48	0.59
Chaunax pictus	1.50	80	0.59
Helicolenus dactylopterus	1.10	10	0.43
Raja caudaspinosa	1.00	40	0.39
MYCTOPHIDAE	0.90	511	0.35
Caelorinchus coelorhincus	0.80	60	0.31
Illex coindetii	0.70	10	0.28
Hymenocephalus italicus	0.70	80	0.28
GALATHEIDAE	0.60	261	0.24
Parapenaeus longirostris, male	0.50	100	0.20
Bembrops heterurus	0.50	20	0.20
Parapandalus narval	0.40	120	0.16
OREOSOMATIDAE	0.30	40	0.12
Solenocera africana	0.20	40	0.08
Total	255.08		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 187
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°34.94
 start stop duration Lon E 11°42.17
 TIME :04:44:33 05:15:14 30.7 (min) Purpose : 3
 LOG : 939.04 940.61 1.6 Region : 4000
 FDEPTH: 0 237 229 Gear cond.: 0
 BDEPTH: 237 229 Validity : 0
 Towing dir: 0° Wire out : 600 m Speed : 3.1 kn
 Sorted : 67 Total catch: 66.54 Catch/hour: 130.05

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Brotula barbata	26.58	23	20.44
Parapenaeus longirostris, female	21.58	3465	16.59
Synagrops microlepis	17.79	956	13.68
Parapenaeus longirostris, male	14.38	3270	11.06
Dentex angolensis	13.49	35	10.37
Parasudis fraser-bruenneri	8.64	627	6.64
Trichiurus lepturus	5.98	94	4.60
Miracorvina angolensis	5.77	6	4.28
Coloconger cadenati	2.54	154	1.95
Grammoplites gruvelli	2.46	35	1.89
Uranoscopus cadenati	2.09	16	1.61
Alloteuthis africana	1.92	12	1.47
Pontinus accraensis	1.84	20	1.41
MYCTOPHIDAE	1.27	1073	0.98
Solenocera africana	0.84	98	0.65
Caelorinchus coelorhincus	0.64	18	0.50
Spicara alta	0.31	2	0.24
Zenopsis conchifer	0.29	6	0.23
Mystriophis rostellatus	0.29	2	0.23
Syacium micrurum	0.27	21	0.21
Pteroscion peli	0.25	20	0.20
J E L L Y F I S H	0.25	6	0.20
Nettenchelys sp.	0.18	10	0.14
Merluccius polli	0.16	8	0.12
Peristedion cataphractum	0.12	4	0.09
Gadella imberbis	0.12	6	0.09
Illex coindetii	0.10	2	0.08
Alloteuthis africana	0.02	8	0.02
Antigonina sp.	0.02	2	0.02
B I V A L V E S	0.02	2	0.02
Epigonus sp.	0.02	8	0.02
Lestrolepis intermedia	0.02	2	0.02
Total	130.05		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 188
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°11.76
 start stop duration Lon E 11°38.05
 TIME :07:38:19 08:09:39 31.3 (min) Purpose : 3
 LOG : 962.78 964.36 1.6 Region : 4000
 FDEPTH: 124 122 Gear cond.: 0
 BDEPTH: 124 122 Validity : 0
 Towing dir: 0° Wire out : 340 m Speed : 3.0 kn
 Sorted : 96 Total catch: 95.77 Catch/hour: 183.41

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Trachurus trecae	45.89	657	25.02
Trichiurus lepturus	27.96	44	15.24
Spicara alta	27.96	316	15.24
Dentex angolensis	19.92	107	10.86
Umbrina canariensis	18.71	57	10.20
Dentex congoensis	14.21	201	7.75
Miracorvina angolensis	9.98	15	5.44
Branchiostegus semifasciatus *	4.14	6	2.26
Mustelus mustelus	3.62	2	1.97
Zeus faber	3.20	10	1.74
Ariomma bondi	2.70	50	1.47
Brotula barbata	1.67	2	0.91
Raja miraletus	1.13	2	0.62
Dentex gibbosus	0.73	2	0.40
Boops boops	0.67	17	0.37
Trigla lyra	0.29	4	0.16
Peristedion cataphractum	0.19	8	0.10
Illex coindetii	0.11	4	0.06
Bembrops greyi	0.10	2	0.05
Dicologlossa hexophthalma	0.10	2	0.05
Citharus linguatula	0.08	4	0.04
Coloconger cadenati	0.06	4	0.03
Arnoglossus imperialis	0.02	2	0.01
Total	183.41		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 189
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°10.65
 start stop duration Lon E 11°43.84
 TIME :09:16:56 09:47:00 30.1 (min) Purpose : 3
 LOG : 971.74 973.31 1.6 Region : 4000
 FDEPTH: 109 111 Gear cond.: 0
 BDEPTH: 109 111 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.1 kn
 Sorted : 61 Total catch: 60.77 Catch/hour: 121.30

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Trachurus trecae	55.51	888	45.76
Trichiurus lepturus	16.97	24	13.99
Dentex congoensis	15.87	184	13.08
Dentex angolensis	14.37	86	11.85
Brotula barbata	5.47	6	4.51
Zeus faber	3.61	10	2.98
Epinephelus aeneus	2.46	184	2.02
Ariomma bondi	2.34	48	1.93
Dentex gibbosus	1.48	2	1.22
Raja miraletus	1.04	2	0.86
Uranoscopus cadenati	0.42	2	0.35
Spicara alta	0.40	6	0.33
Illex coindetii	0.38	6	0.31
Boops boops	0.32	10	0.26
Citharus linguatula	0.28	8	0.23
Peristedion cataphractum	0.20	4	0.16
Saurida brasiliensis	0.10	20	0.08
Dicologlossa hexophthalma	0.08	2	0.07
Coloconger cadenati	0.02	4	0.02
Total	121.30		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 190
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°8.24
 start stop duration Lon E 11°48.03
 TIME :10:46:25 11:18:51 32.5 (min) Purpose : 3
 LOG : 979.52 981.18 1.7 Region : 4000
 FDEPTH: 92 92 Gear cond.: 0
 BDEPTH: 92 92 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.1 kn
 Sorted : 141 Total catch: 141.23 Catch/hour: 261.13

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Dentex angolensis	156.15	910	59.80
Dentex congoensis	42.25	444	16.18
Epinephelus aeneus	34.76	7	13.31
Dentex barnardi	5.90	22	2.26
Trachurus trecae	3.83	50	1.47
Sarda sarda	3.75	2	1.44
Lagocephalus laevigatus	3.70	2	1.42
Chelidonichthys gambonensis	3.35	31	1.28
Branchiostegus semifasciatus *	1.85	2	0.71
Zeus faber	1.83	6	0.70
Pagellus bellottii	1.79	9	0.69
Raja miraletus	1.00	2	0.38
Fistularia petimba	0.41	2	0.16
Chaetodon hoefleri	0.31	2	0.12
Ariomma bondi	0.17	4	0.06
Boops boops	0.06	2	0.02
CONGRIDAE	0.02	2	0.01
Saurida brasiliensis	0.02	4	0.01
Total	261.13		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 191
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°8.04
 start stop duration Lon E 11°55.68
 TIME :12:29:31 12:59:46 30.2 (min) Purpose : 3
 LOG : 989.38 991.00 1.6 Region : 4000
 FDEPTH: 72 69 Gear cond.: 0
 BDEPTH: 72 69 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.2 kn
 Sorted : 109 Total catch: 110.29 Catch/hour: 218.83

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Trachurus trecae	91.27	5339	41.71
Epinephelus aeneus	45.34	12	20.72
Dentex angolensis	30.06	171	13.74
Selene dorsalis	22.72	89	10.38
Trichiurus lepturus	14.78	28	6.75
Lagocephalus laevigatus	6.94	2	3.17
Zeus faber	3.02	8	1.38
Branchiostegus semifasciatus *	2.08	2	0.95
Dentex congoensis	1.15	14	0.53
Dentex barnardi	0.44	2	0.20
Sardinella aurita	0.24	2	0.11
Pseudupeneus prayensis	0.22	2	0.10
Chelidonichthys capensis	0.20	2	0.09
Boops boops	0.18	6	0.08
Pagellus bellottii	0.10	2	0.05
Ariomma bondi	0.10	2	0.05
Total	218.83		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 192
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°6.47
 start stop duration Lon E 12°1.56
 TIME :13:47:19 14:17:10 29.9 (min) Purpose : 3
 LOG : 995.53 997.08 1.6 Region : 4000
 FDEPTH: 44 44 Gear cond.: 0
 BDEPTH: 44 44 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 11 Total catch: 11.07 Catch/hour: 22.24

R/V "DR. FRIDTJOF NANSEN" SURVEY:2009403 STATION: 194
 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°14.38
 start stop duration Lon E 12°7.14
 TIME :16:43:36 17:13:27 29.8 (min) Purpose : 3
 LOG : 1014.03 1015.59 1.6 Region : 4000
 FDEPTH: 39 37 Gear cond.: 0
 BDEPTH: 39 37 Validity : 0
 Towing dir: 0° Wire out : 115 m Speed : 3.1 kn
 Sorted : 14 Total catch: 13.85 Catch/hour: 27.86

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Scomberomorus tritor	10.65 4	47.88	
Epinephelus aeneus	2.69 2	12.10	
Trachurus trecae	2.47 143	11.11	332
Raja miraletus	1.93 2	8.67	
Lagocephalus laevigatus	1.91 2	8.58	
Pagellus bellottii	1.33 4	5.96	
Pagrus caeruleostictus	0.66 2	2.98	
Uranoscopus polli	0.52 2	2.35	
Citharus linguatula	0.04 2	0.18	
CONGRIDAE	0.04 4	0.18	
Total	22.24	100.00	

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Alectis alexandrinus	9.05 10	32.49	
Priacanthus arenatus	3.62 8	13.00	
Lagocephalus laevigatus	3.50 10	12.56	
Epinephelus aeneus	3.42 4	12.27	
Raja miraletus	2.78 4	9.96	
Rhinobatos albomaculatus	1.91 2	6.86	
Pagellus bellottii	1.65 14	5.92	
Chelidonichthys gabonensis	0.70 2	2.53	
Decapterus rhonchus	0.58 12	2.09	
Cynoglossus canariensis	0.56 2	2.02	
Syacium micrurum	0.04 2	0.14	
Alloteuthis africana	0.04 18	0.14	
Total	27.86	100.00	

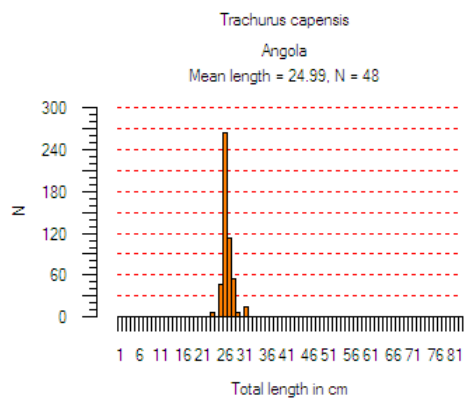
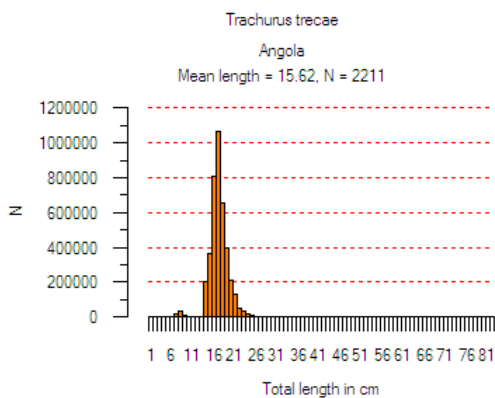
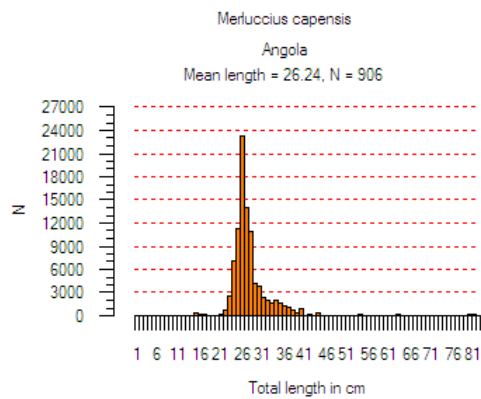
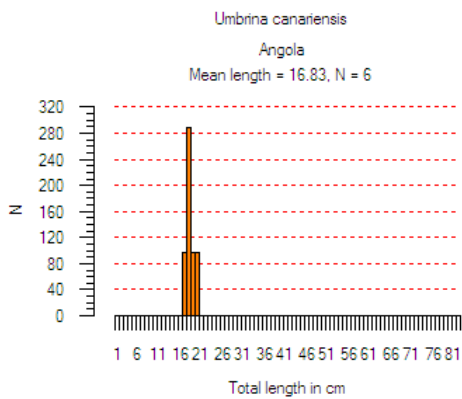
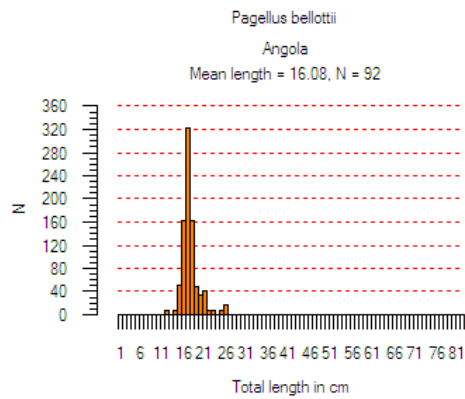
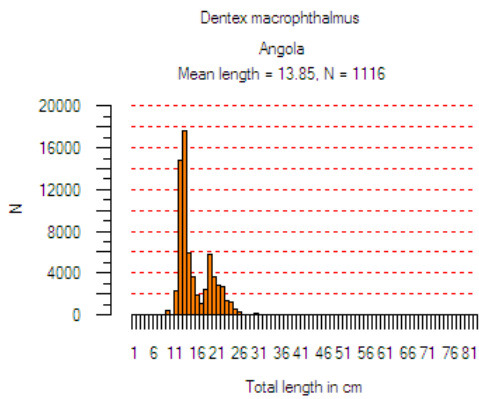
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 DATE :05.04.2009 GEAR TYPE: BT NO: 6 POSITION:Lat S 6°5.40
 start stop duration Lon E 12°6.48
 TIME :14:57:13 15:27:10 29.9 (min) Purpose : 3
 LOG : 1000.95 1002.56 1.6 Region : 4000
 FDEPTH: 36 30 Gear cond.: 0
 BDEPTH: 36 30 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 3.2 kn
 Sorted : 8 Total catch: 8.03 Catch/hour: 16.09

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Pagellus bellottii	7.90 26	49.07	333
Scomberomorus tritor	4.51 4	28.02	
Caranx crysos	1.82 2	11.33	
Sepia officinalis hierredda	1.30 2	8.09	
Lagocephalus laevigatus	0.48 2	2.99	
Alloteuthis africana	0.04 12	0.25	
Bothus podas africanus	0.04 2	0.25	
Total	16.09	100.00	

ANNEX II. Length distribution of main species.

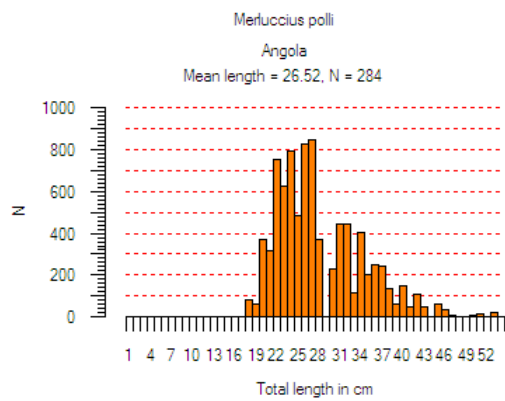
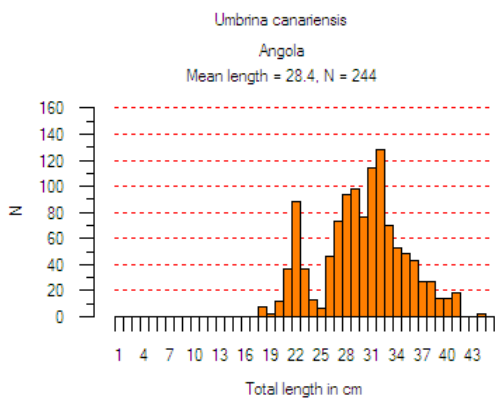
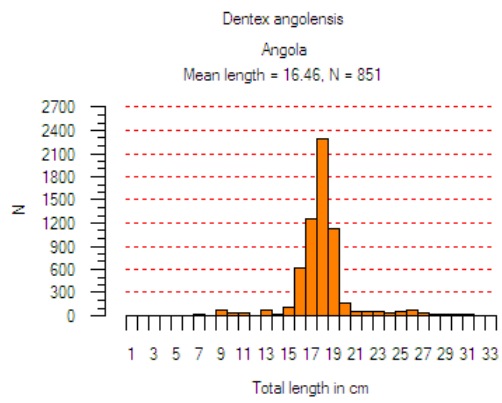
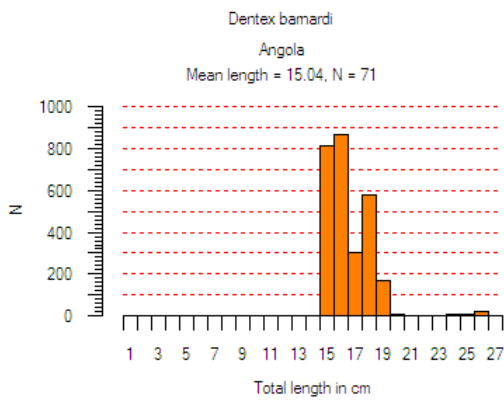
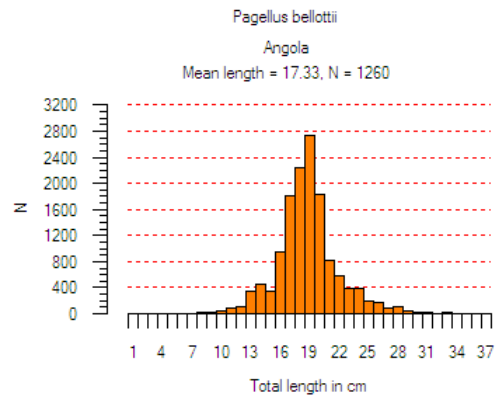
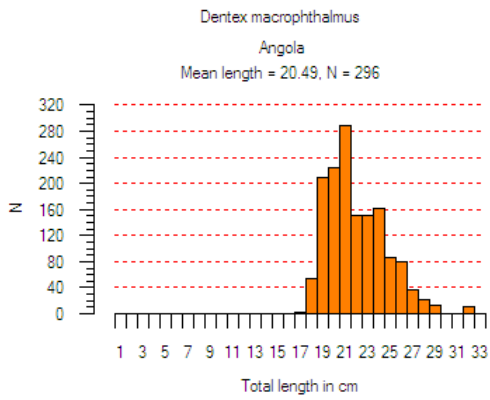
Southern Angola

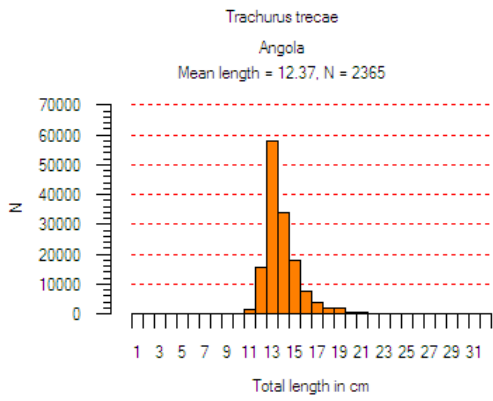
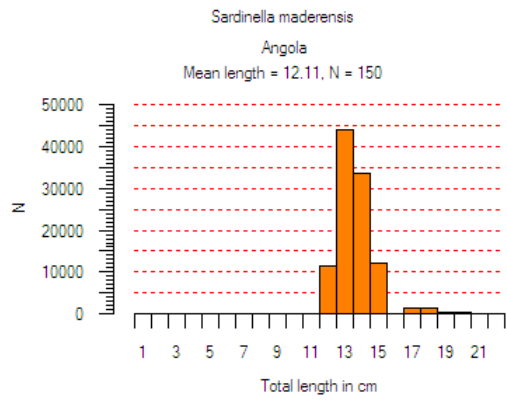
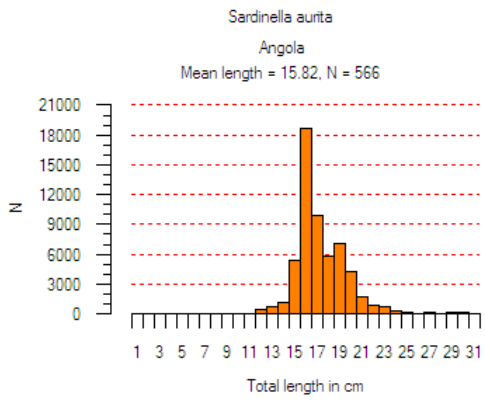
Pooled length frequency distribution of the main species weighted by the catch



Central Angola

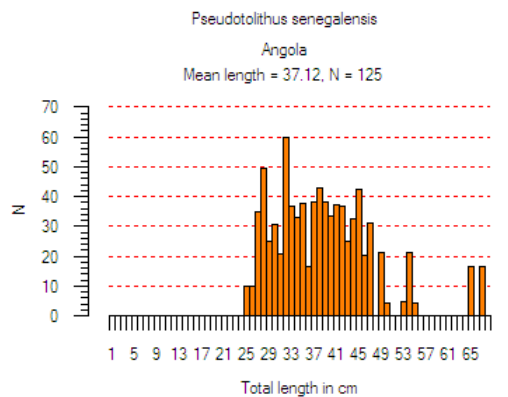
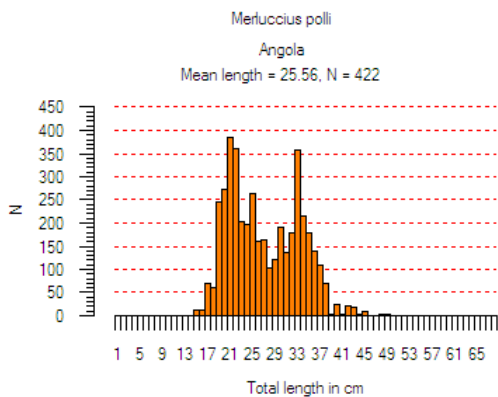
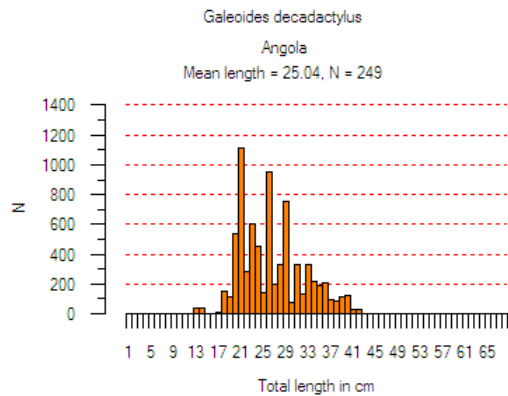
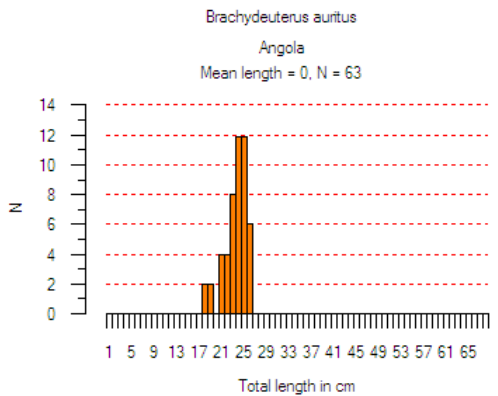
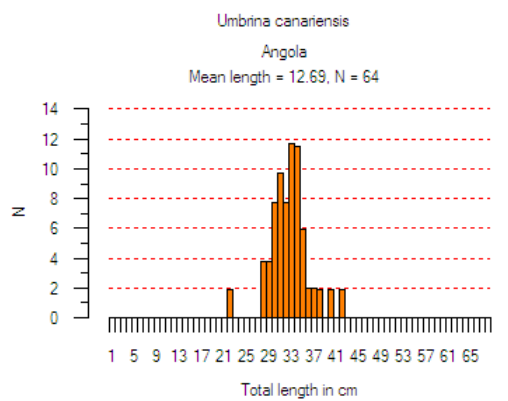
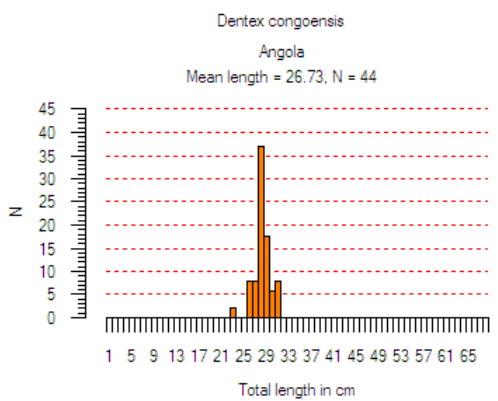
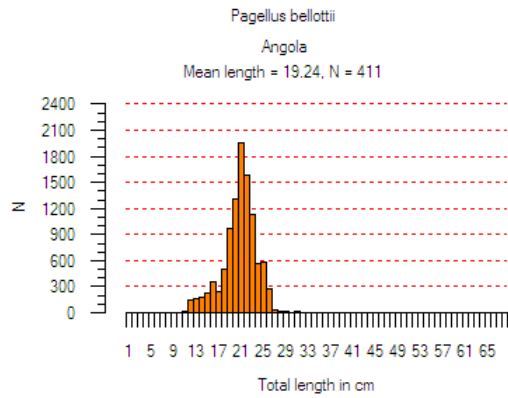
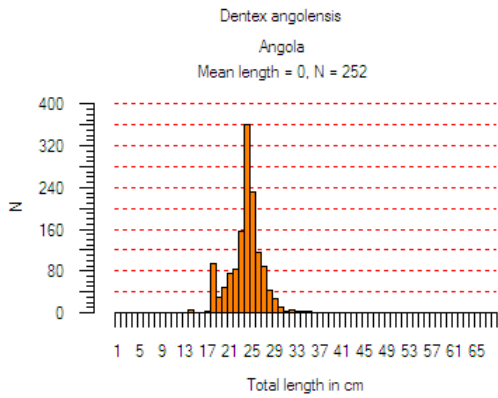
Pooled length frequency distribution of the main species weighted by the catch

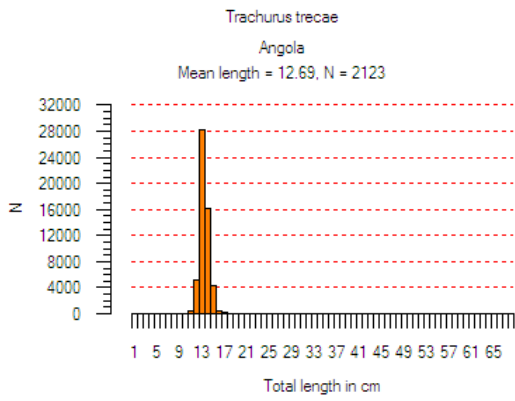
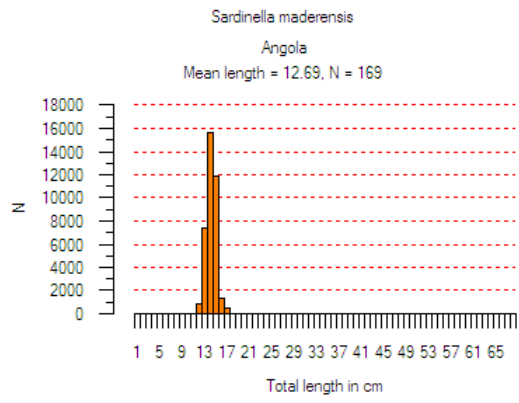
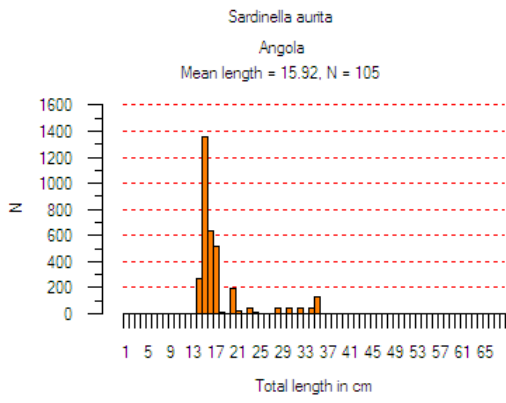




Northern Angola

Pooled length frequency distribution of the main species weighted by the catch





ANNEX III. Swept area estimates

CUNENE - TOMBUA
A. Shelf

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	Lower limits, Kg/nm								20-50m	50-100m	100-200m	
	>0	10	30	100	300	1000						
Trachurus trecae	3	2	3	4	2	6	90.91	244.187	544.866	72.501	4.759	
Merluccius capensis	3	1	2	4	6		72.73	15.453	0.527	26.561	25.122	
J E L L Y F I S H	1	3	2	2	1		40.91	5.918	14.091	0.561		
Dentex macrophthalmus	2	1	6	3	1		59.09	5.319	2.165	2.859	11.483	
Engraulis encrasicolus	1				1		9.09	1.729	4.216		0.015	
Raja miraletus	6			1			31.82	0.681	1.594	0.008	0.082	
Trigla lyra	7	2					40.91	0.218		0.074	0.623	
Sepia orbignyana	8	1					40.91	0.213	0.388	0.188	0.011	
Zeus faber	13	1					63.64	0.199	0.022	0.522	0.151	
Chelidonichthys capensis	4	2					27.27	0.196	0.298	0.201	0.06	
Pterothrissus belloci	1	2					13.64	0.195			0.614	
Pteroscion peli	4		1				22.73	0.184		0.109	0.486	
Chlorophthalmus atlanticus			1				4.55	0.162			0.509	
Dicologlossa cuneata	7	2					40.91	0.16	0.021	0.045	0.438	
Loligo vulgaris	7	1					36.36	0.137	0.172	0.208	0.031	
Atractoscion aequidens	5	1					27.27	0.121	0.018	0.014	0.346	
Squalus megalops	7	1					36.36	0.12		0.089	0.301	
Trachurus capensis	1	1					9.09	0.102			0.32	
Synagrops microlepis	2	1					13.64	0.1		0.001	0.314	
Illex coindetii	7						31.82	0.095	0.104	0.19	0.002	
Merluccius polli		1					4.55	0.079	0.192			
Umbrina canariensis	3						13.64	0.077	0.1		0.114	
Pagellus bellottii	2	1					13.64	0.074	0.18		0.002	
Lithognathus mormyrus		1					4.55	0.07	0.17			
Todarodes sagittatus	1	1					9.09	0.054		0.191	0.006	
Octopus vulgaris	3						13.64	0.053			0.166	
Todaropsis eblanae	3						13.64	0.041		0.137	0.011	
Gymnura micrura	1						4.55	0.04	0.099			
Dasyatis marmorata	2						9.09	0.039	0.095			
Zenopsis conchifer	2						9.09	0.033		0.008	0.096	
Mustelus mustelus	1						4.55	0.032	0.077			
Brotula barbata	3						13.64	0.029			0.09	
Scomber japonicus	1						4.55	0.027			0.084	
Pontinus kuhlii	1						4.55	0.024			0.076	
Anthias anthias	1						4.55	0.024			0.075	
Pomatomus saltatrix	2						9.09	0.016	0.039			
Trichiurus lepturus	5						22.73	0.014		0.007	0.038	
Squilla mantis	2						9.09	0.012			0.039	
Pontinus accraensis	2						9.09	0.012			0.037	
Parapandalus narval	1						4.55	0.001			0.004	
Parapenaeus longirostris, femal	1						4.55	0.001			0.002	
Parapenaeus longirostris, male	1						4.55				0.001	
Other fish								0.085	0.047	0.092	0.127	
Sum all species								276.326	569.482	104.566	46.633	
Sum SNAPPERS, JOBFISHES												
Sum GROUPERS, SEABASSES												
Sum GRUNTS, SWEETLIPS												
Sum CROAKERS, DRUMS, WEAKF., KOBS								0.383	0.118	0.123	0.946	
Sum PANDORAS, PORGIES, SEABREAMS,								5.467	2.522	2.862	11.486	
Sum SHARKS, CHIMAERAS								0.152	0.077	0.089	0.301	
Sum BATOID FISHES, RAYS								0.769	1.811	0.008	0.082	
Sum CEPHALOPODS								0.596	0.672	0.914	0.226	
Numbers of stations included in analysis, total and by depth strata								22	9	6	7	

CUNENE TOMBUA
B. Slope 200-500 m

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata		
	Lower limits, Kg/nm							200-300m	300-400m	400-500m
	>0	10	30	100	300	1000				
Helicolenus dactylopterus					2		100	54.138		54.138
Chlorophthalmus atlanticus				2			100	22.021		22.021
Merluccius capensis			1	1			100	10.408		10.408
Nezumia aequalis				1			50	9.402		9.402
Laemonema laureysi			2				100	4.471		4.471
Aristeus varidens, female		2					100	2.07		2.07
Caelorinchus coelorhincus			1				50	1.669		1.669
Unidentified invertebrate	1	1					100	1.097		1.097
Callinectes sp.	1	1					100	0.948		0.948
Hoplostethus cadenati	1	1					100	0.812		0.812
Lophius vaillanti		1					50	0.755		0.755
Malacocephalus laevis		1					50	0.737		0.737
Galeus polli	1	1					100	0.725		0.725
Epigonus telescopus	1						50	0.33		0.33
S H R I M P S	1						50	0.292		0.292
Aristeus varidens, male	2						100	0.227		0.227
OMMASTREPHIDAE	2						100	0.191		0.191
TRIGLIDAE	1						50	0.095		0.095
Plesionika sp.	1						50	0.069		0.069
Yarella blackfordi *	1						50	0.042		0.042
Malacocephalus occidentalis	1						50	0.042		0.042
MYCTOPHIDAE	1						50	0.037		0.037
G A S T R O P O D S	1						50	0.021		0.021
Nemichthys scolopaceus	1						50	0.011		0.011
AcanthePHYRA sp.	1						50	0.011		0.011
Other fish								0	0	0
Sum all species								110.622	0	110.622
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKF., KOBBS										
Sum PANDORAS, PORGIES, SEABREAMS,										
Sum SHARKS, CHIMAERAS								0.725		0.725
Sum BATOID FISHES, RAYS										
Sum CEPHALOPODS								0.191		0.191
Numbers of stations included in analysis, total and by depth strata								2	0	2

CUNENE - TOMBUA
C. Slope 500-800 m

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata		
	Lower limits, Kg/nm							500-600m	600-700m	700-800m
	>0	10	30	100	300	1000				
Nezumia micronychodon					1		33.33	10.267		15.4
Trachyrincus scabrus			1	2			100	10.207	12.237	9.191
Malaccocephalus occidentalis	1			1			66.67	5.329	1.561	7.213
Bathygadus melanobranchus				1			33.33	5.203		7.805
Caelorinchus sp.			1				33.33	2.879		4.319
Aristeus varidens			1				33.33	2.165		3.248
Hoplostethus cadenati	2		1				100	1.697	4.763	0.163
OMMASTREPHIDAE	1	1	1				100	1.67	3.773	0.618
Caelorinchus caelorhincus			1				33.33	1.641	4.924	
Holothuria sp.			1				33.33	1.54		2.31
Alepocephalus sp.			1				33.33	1.452		2.178
Talismania longifilis			1				33.33	1.165	3.495	
Bajacalifornia magalops		1					33.33	0.961		1.442
Yarella blackfordi *	2	1					100	0.921	1.788	0.487
Synaphobranchus kaupii	2	1					100	0.891	0.161	1.255
Raja alba		1					33.33	0.747		1.12
Unidentified invertebrate		1					33.33	0.735	2.205	
S H R I M P S	2	1					100	0.63	1.135	0.377
CHIMAERIDAE		1					33.33	0.462		0.693
Chaceon maritae, male	1	1					66.67	0.441	1.043	0.14
Unidentified invertebrate		1					33.33	0.428		0.642
Ebinania costaecanarie		1					33.33	0.35		0.525
Octopus sp.	1						33.33	0.33	0.99	
Aristeus varidens, female	2						66.67	0.29	0.191	0.339
Lophius vaillanti	1						33.33	0.272	0.815	
Benthodesmus tenuis	1						33.33	0.271	0.813	
Bathyyroconger vicinus	2						66.67	0.266	0.073	0.363
Helicolenus dactylopterus	1						33.33	0.232	0.696	
Merluccius polli	1						33.33	0.228	0.685	
Chaceon maritae, female	3						100	0.225	0.147	0.264
Heterocarpus grimaldii	2						66.67	0.203		0.304
Bassanago albescens	1						33.33	0.196		0.294
GONOSTOMATIDAE	1						33.33	0.136		0.203
Melanostomias sp.	2						66.67	0.111	0.088	0.123
Gonostoma denudata	1						33.33	0.107		0.161
Cruriraja parcomaculata	1						33.33	0.08		0.12
Etmopterus pusillus	1						33.33	0.078	0.234	
Laemonema laureysi	1						33.33	0.078	0.234	
CONGRIDAE	1						33.33	0.071	0.213	
Raja sp.	1						33.33	0.071	0.213	
Paramola cuvieri	1						33.33	0.068	0.205	
Allocyttus verrucosus	1						33.33	0.064		0.097
ALEPOCEPHALIDAE	2						66.67	0.057	0.125	0.023
Maja squinado	1						33.33	0.047		0.07
Notacanthus sexspinis	1						33.33	0.047		0.07
Nemichthys scolopaceus	3						100	0.044	0.029	0.051
Deania calcea	1						33.33	0.043		0.065
Lamprogrammus exutus	2						66.67	0.043	0.029	0.05
Halosaurus ovenii	2						66.67	0.036	0.066	0.021
J E L L Y F I S H	1						33.33	0.028		0.042
PORTUNIDAE	1						33.33	0.028		0.042
Neoraja stehmanni	1						33.33	0.024		0.037
MYCTOPHIDAE	2						66.67	0.017	0.036	0.008
Diaphus sp.	1						33.33	0.016		0.023
Aristeus varidens, male	1						33.33	0.005	0.015	
AcanthePHYRA sp.	1						33.33	0.002	0.007	
Other fish								0.023	0	0.034
Sum all species								55.618	0	61.931
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKE., KOBES										
Sum PANDORAS, PORGIES, SEABREAMS,										
Sum SHARKS, CHIMAERAS								0.584	0.234	0.758
Sum BATOID FISHES, RAYS								0.922	0.213	1.277
Sum CEPHALOPODS								2	4.763	0.618
Numbers of stations included in analysis, total and by depth strata								3	0	2

BENGUELA - PALMERINHAS

A. shelf

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	Lower limits, Kg/nm								20-50m	50-100m	100-200m	
	>0	10	30	100	300	1000						
Brachydeuterus auritus	15	4		3	2	1	52.08	5.774	6.625	9.468	0.05	
Trichiurus lepturus	17	3	2	2	3		56.25	4.418	0.303	3.152	10.748	
Synagrops microlepis		2	1	1	1	1	12.5	4.176			14.318	
Trachurus trecae	14	8	6	4			66.67	2.645	3.518	3.623	0.388	
Sardinella aurita	10	1	2	3			33.33	1.393	3.235	0.838		
Sardinella maderensis	4	1	1		1		14.58	1.252	3.752	0.005		
Pagellus bellottii	23	7	4				70.83	0.738	0.854	1.049	0.206	
Pseudupeneus prayensis	16	5	1	1			47.92	0.663	1.531	0.403	0.005	
Selene dorsalis	8	5	1	1			31.25	0.647	0.284	1.467	0.005	
Pomadasy s incisus	5	2	4				22.92	0.588	0.657	0.984		
Chloroscombrus chrysurus	6	2	1	1			20.83	0.507	1.417	0.093		
Pomadasy s peroteti	5	1	1	1			16.67	0.454	1.044	0.282		
Raja miraletus	31	2	1				70.83	0.386	0.529	0.482	0.1	
Dentex angolensis	23	3	1				56.25	0.376		0.384	0.796	
Dentex barnardi	22	3	2				56.25	0.347	0.566	0.212	0.27	
Umbri na canariensis	11	4	2				35.42	0.319	0.018	0.553	0.362	
Galeoides decadactylus	3	1		1			10.42	0.286	0.812	0.041		
Citharus linguatula	33	3					75	0.252	0.106	0.327	0.324	
Sepia orbignyana	25	1	1				56.25	0.214	0.058	0.5	0.026	
Brotula barbata	14	3					35.42	0.177		0.111	0.463	
Zeus faber	19	1					41.67	0.17		0.305	0.189	
Ephippion guttifer	9	1	1				22.92	0.155	0.442	0.02		
Pomadasy s jubelini	2	1	1				8.33	0.154	0.03	0.385		
Dentex macropthalmus	6	4					20.83	0.152		0.198	0.268	
Chelidonichthys capensis	10		1				22.92	0.147	0.003	0.107	0.364	
Lithognathus mormyrus	6		1				14.58	0.139	0.324	0.082		
Chelidonichthys capensis		1	1				4.17	0.131		0.349		
Pteroscion peli	2	1	1				8.33	0.129	0.306	0.001	0.09	
Anthias anthias	1		1				4.17	0.101			0.346	
Lagocephalus laevigatus	18	1					39.58	0.082	0.159	0.046	0.039	
Octopus vulgaris	19						39.58	0.081	0.088	0.1	0.047	
Plectorhinchus mediterraneus	2		1				6.25	0.072	0.217			
Torpedo torpedo	13	1					29.17	0.063	0.008	0.062	0.126	
Trigla lyra	3	1					8.33	0.063		0.007	0.206	
Pterothrissus belloci	9	1					20.83	0.061		0.027	0.176	
Rhinobatos albomaculatus	9						18.75	0.061	0.069	0.101		
Chelidonichthys gabonensis	5	1					12.5	0.054		0.082	0.079	
Alectis alexandrinus	4	1					10.42	0.042	0.113	0.012		
Aluterus heudelotii	8						16.67	0.041	0.123			
Pagrus caeruleostictus	1	1					4.17	0.041	0.099		0.026	
Uranoscopus cadenati	9						18.75	0.04		0.039	0.088	
Scorpaena normani	5	1					12.5	0.04		0.022	0.109	
Fistularia petimba	12	1					27.08	0.039	0.017	0.084	0.005	
Pomadasy s rogeri	4	1					10.42	0.038	0.105	0.005	0.004	
Parapenaeus longirostris	5	1					12.5	0.037		0.001	0.126	
Trachinotus ovatus	5						10.42	0.035	0.063	0.038		
Grammoplites gruveli	10						20.83	0.035	0.039	0.058		
Alloteuthis africana	20						41.67	0.031	0.015	0.07		
Plectorhinchus macrolepis			1				2.08	0.031			0.107	
Caranx crysos	10						20.83	0.031	0.07	0.02		
Pseudotolithus typus		1					2.08	0.03	0.091			
Sepia officinalis hierredda	3	1					8.33	0.029		0.068	0.011	
Hoplostethus atlanticus		1					2.08	0.027			0.094	
Epinephelus aeneus	6						12.5	0.027	0.072	0.009		
Balistes capriscus	5						10.42	0.025	0.073	0.002		
Squatina oculata	4						8.33	0.024	0.047	0.019	0.006	
Bembrops greyi	9						18.75	0.024	0.012	0.01	0.057	
Lutjanus agennes		1					2.08	0.024	0.072			
Acanthurus monroviae		1					2.08	0.024	0.071			
Pontinus accraensis	4						8.33	0.023			0.08	
Saurida brasiliensis	18						37.5	0.023		0.026	0.046	
Stromateus fiatola	6						12.5	0.023	0.013	0.05		
Gymnura micrura		1					2.08	0.023	0.068			
Erythrodes monodi		1					2.08	0.022			0.077	
Torpedo marmorata	7						14.58	0.022	0.059	0.003	0.005	
Sphyræna guachancho	5						10.42	0.02	0.006	0.049		
Sphyræna sphyræna	4						8.33	0.019	0.039	0.017		
Scorpaena angolensis	3						6.25	0.019		0.05		
Pagrus africanus	1						2.08	0.016			0.055	

Benguela - Palmerinhas shelf cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							20-50m	50-100m	100-200m
	>0	10	30	100	300					
Lutjanus fulgens	1					2.08	0.014	0.043		
Torpedo nobiliana	1					2.08	0.014	0.042		
Sphoeroides pachgaster	4					8.33	0.014		0.007	0.039
Chaetodon hoefleri	12					25	0.012	0.007	0.027	0.001
Illex coindetii	9					18.75	0.012		0.022	0.013
Chilomycterus spinosus mauret.	7					14.58	0.012	0.018	0.015	
Octopus sp.	1					2.08	0.012		0.031	
Todaropsis eblanae	3					6.25	0.011			0.038
Atractoscion aequidens	4					8.33	0.011		0.003	0.033
Zenopsis conchifer	4					8.33	0.011			0.037
Bodianus speciosus	1					2.08	0.01	0.03		
Parapenaeus longirostris, femal	2					4.17	0.003		0.006	0.001
Parapenaeus longirostris, male	1					2.08			0.001	
Penaeus notialis	2					4.17				
Other fish							0.213	0.239	0.192	0.212
Sum all species							28.704	28.603	26.803	31.264
Sum SNAPPERS, JOBFISHES							0.039	0.116		
Sum GROUPERS, SEABASSES							0.052	0.085	0.064	
Sum GRUNTS, SWEETLIPS							7.111	8.678	11.123	0.162
Sum CROAKERS, DRUMS, WEAKF., KOBBS							0.507	0.415	0.605	0.486
Sum PANDORAS, PORGIES, SEABREAMS,							1.829	1.876	1.926	1.652
Sum SHARKS, CHIMAERAS							0.026	0.047	0.022	0.006
Sum BATOID FISHES, RAYS							0.582	0.808	0.648	0.238
Sum CEPHALOPODS							0.401	0.162	0.794	0.17
Numbers of stations included in analysis, total and by depth strata							48	16	18	14

BENGUELA - PALMERINHAS
B. Slope 200-500 m.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							200-300m	300-400m	400-500m
	>0	10	30	100	300					
Chlorophthalmus atlanticus	3	2	1	3		90	7.805		12.943	0.132
Merluccius polli	2	1	6	1		100	5.091	4.281	6.41	2.725
Nematocarcinus africanus	1	2	3			60	2.677		2.083	4.758
Hymenocephalus italicus	2	3		1		60	2.376		3.942	0.038
Laemonema laureysi	4	2	1			70	0.902		1.263	0.48
Synagrops microlepis	3	3	1			70	0.895	1.125	1.295	0.019
Centrophorus granulosus			2			20	0.822		0.811	1.118
Benthodesmus tenuis	3		1			40	0.655		0.032	2.12
Lophius vaillanti			1			10	0.638			2.127
Gadella imberbis	7	2				90	0.613		0.617	0.809
Etmopterus polli	3	3				60	0.565		0.53	0.823
Saurida brasiliensis			1			10	0.525	5.25		
Lophiodes kempfi			1			10	0.518		0.864	
Hoplostethus atlanticus	2		1			30	0.488	0.691	0.537	0.323
Yarrella blackfordi	2		1			30	0.479			1.596
Trichiurus lepturus	1	3				40	0.459		0.481	0.567
Aristeus varidens, female	6	1				70	0.381		0.16	0.95
Chaceon maritae, male	2		1			30	0.361			1.203
Shrimps, small, non comm.			1			10	0.316			1.054
Zenopsis conchifer	1		1			20	0.312	0.098	0.504	
Hoplostethus cadenati	1	1				20	0.308		0.055	0.916
Chaunax pictus	6					60	0.256		0.283	0.286
Torpedo nobiliana		1				10	0.252		0.42	
Scorpaena normani	1	1				20	0.236		0.393	
Parapenaeus longirostris	1	1				20	0.155		0.258	
Nezumia aequalis	1	1				20	0.152	1.423	0.016	
Aristeus varidens, male	7					70	0.125		0.1	0.217
Raja miraletus	2					20	0.125		0.208	
Triplophos hemingi	4					40	0.107		0.004	0.349
Parapenaeus longirostris, femal	5					50	0.102	0.061	0.16	
Lophiodes sp.	4					40	0.099		0.166	
Dibranchius atlanticus	2					20	0.097		0.008	0.306
Holothuria sp.	1					10	0.091			0.303
Bathynectes piperitus	6					60	0.09		0.145	0.009
PARALEPIDIDAE	4					40	0.079		0.132	
BathYROCONGER vicinus	7					70	0.078	0.033	0.121	0.008
MYCTOPHIDAE	7					70	0.076	0.007	0.125	0.001
Chaunax cf. pictus	1					10	0.073		0.121	
Pterothrissus bellocci	2					20	0.061	0.471	0.023	
Stomias boa boa	2					20	0.06		0.004	0.193
Malacocephalus occidentalis	5					50	0.051		0.066	0.038
LOBSTERS	3					30	0.047		0.07	0.016
Brotula barbata	1					10	0.044	0.443		
Melanostomias sp.	2					20	0.043			0.142
Dentex macrophthalmus	1					10	0.041	0.413		
BIVALVES	1					10	0.037			0.125
Halosaurus ovenii	4					40	0.037		0.036	0.053
Epigonus telescopus	1					10	0.034		0.056	
Caelorinchus braueri	2					20	0.034		0.038	0.035
Raja alba	2					20	0.032	0.308		0.005
Malacocephalus laevis	1					10	0.03			0.099
Trigla lyra	1					10	0.029		0.048	
Helicolenus dactylopterus	2					20	0.027		0.042	0.005
Torpedo sp.	1					10	0.024			0.079
Peristedion cataphractum	8					80	0.023	0.019	0.03	0.011
Calappa sp.	4					40	0.022	0.019	0.018	0.033
Pontinus sp.	1					10	0.022	0.224		
Dicrolene intronigra	2					20	0.019	0.175		0.006
PORTUNIDAE	1					10	0.018		0.029	
Starfish (large)	1					10	0.017			0.057
Chaceon maritae	1					10	0.016		0.026	
Caelorinchus coelorhinc. polli	1					10	0.015		0.026	
Bembrops greyi	1					10	0.014	0.14		
Raja clavata	1					10	0.014			0.046
Nemichthys sp.	1					10	0.012		0.02	
Loligo vulgaris	1					10	0.012			0.039
Caelorinchus coelorhincus	2					20	0.011		0.018	

Benguela - Palmerinhas slope 200-500 m cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							200-300m	300-400m	400-500m
	>0	10	30	100	300					
Solenocera africana	3					30	0.01	0.017	0.001	
Plesiopenaeus edwardsianus	2					20	0.01		0.034	
Glyphus marsupialis	1					10	0.004		0.013	
Parapenaeus longirostris, male	1					10		0.005		
Acanthephyra sp.	1					10			0.001	
Other fish							0.075	0	0.03	
Sum all species							30.325	15.186	35.784	
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKF., KOBBS										
Sum PANDORAS, PORGIES, SEABREAMS,							0.041	0.413		
Sum SHARKS, CHIMAERAS							1.391		1.345	
Sum BATOID FISHES, RAYS							0.447	0.308	0.629	
Sum CEPHALOPODS							0.022		0.073	
Numbers of stations included in analysis, total and by depth strata							10	1	6	

BENGUELA - PALMERINHAS

C. Slope 500-800 m.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							500-600m	600-700m	700-800m
	>0	10	30	100	300					
Nematocarcinus africanus	1	1	3	1		54.55	2.741	5.492	5.796	0.397
Yarella blackfordi	1	6	4			100	2.667	2.406	1.943	2.961
Hoplostethus cadenati	3	5	2			90.91	1.904	3.715	1.396	0.782
G A S T R O P O D S				1		9.09	1.138			2.086
Lamprogrammus exutus	4	5	1			90.91	1.094	0.767	3.214	0.959
Sea urchins (weak spines)			1			9.09	0.787			1.443
Opisthoteuthis agassizi	1		2			27.27	0.745			1.366
Triplophos hemingi	8	2				90.91	0.696	0.894	0.27	0.636
Aristeus varidens, female	9	2				100	0.667	1.147	0.375	0.395
Benthodesmus tenuis	4	3				63.64	0.623	0.985	1.317	0.267
Nezumia sp.			1			9.09	0.612			1.122
Chaceon maritae, female	9		1			90.91	0.609	1.048	0.147	0.394
Stomias boa boa	6	2				72.73	0.524	0.21	1.1	0.638
Chaceon maritae, male	9	1				90.91	0.494	0.45	0.461	0.529
Laemonema laureysi	3		1			36.36	0.464	1.277		
Talismaania longifilis	4	2				54.55	0.401	0.013		0.726
Melanostomias sp.	1		1			18.18	0.317	0.059		0.542
L O B S T E R S	5	1				54.55	0.315	0.146		0.481
Caelorinchus coelorhincus			1			9.09	0.292			0.535
Nezumia micronychodon	4	1				45.45	0.265	0.078		0.434
Merluccius polli	4	1				45.45	0.249	0.474	0.1	0.123
Chaceon maritae		1				9.09	0.243			0.445
Malacocephalus laevis	1	1				18.18	0.229			0.42
Raja confundens	2	1				27.27	0.22			0.403
Glyphus marsupialis	5	1				54.55	0.21	0.039	0.007	0.358
Dibranchius atlanticus	8					72.73	0.204	0.099	0.132	0.286
Stereomastis sp.	4	1				45.45	0.202	0.049	0.415	0.269
Bathyroconger vicinus	10					90.91	0.184	0.078	0.204	0.25
Talismaania oregonia		1				9.09	0.181			0.332
Aristeus varidens, male	11					100	0.164	0.339	0.046	0.067
Dicrolene intronigra	5					45.45	0.126		0.468	0.154
Unidentified invertebrate		1				9.09	0.123			0.225
Gadella imberbis	3					27.27	0.103	0.222		0.041
Lophius vaillanti		1				9.09	0.102			0.188
Lophiodes kempfi	2					18.18	0.101			0.185
Ebinania costaecanarie	4					36.36	0.093		0.053	0.162
Etmopterus polli	5					45.45	0.076	0.112		0.064
Bathynectes piperitus	2					18.18	0.07	0.192		
Gonostoma elongatum	1					9.09	0.067	0.183		
Halosaurus ovenii	6					54.55	0.066	0.014	0.04	0.104
Scymnodon squamulosus	3					27.27	0.064	0.022	0.31	0.051
Chaunax pictus	2					18.18	0.056	0.153		
Plesiopenaeus edwardsianus	4					36.36	0.045	0.06		0.042
Benthodesmus sp.	1					9.09	0.043	0.117		
Starfish	1					9.09	0.042			0.077
Todaropsis eblanae	3					27.27	0.04	0.022		0.06
MYCTOPHIDAE	4					36.36	0.034	0.008		0.057
S H R I M P S	2					18.18	0.032	0.008		0.053
GALATHEIDAE *	4					36.36	0.03		0.086	0.041
Thysanoteuthis rhombus	1					9.09	0.029		0.316	
Malacocephalus occidentalis	3					27.27	0.028	0.017	0.198	0.007
Hymenocephalus italicus	1					9.09	0.027		0.296	
Torpedo sp.	1					9.09	0.026			0.048
Caelorinchus coelorhinc. polli	1					9.09	0.025	0.07		
Centropristis striata	1					9.09	0.025	0.069		
B I V A L V E S	1					9.09	0.023	0.063		
Nezumia aequalis	1					9.09	0.021	0.057		
CONGRIDAE	1					9.09	0.02			0.037
ALEPOCEPHALIDAE	3					27.27	0.02	0.009	0.04	0.023
Raja alba	1					9.09	0.019			0.035
Ariomma bondi	2					18.18	0.016	0.009		0.023
Xenodermichthys copei	5					45.45	0.014	0.025	0.007	0.008
Ijimaia loppei	1					9.09	0.014			0.025
Chlorophthalmus atlanticus	4					36.36	0.014	0.031	0.026	
Bathypterois phenax	1					9.09	0.013			0.023
Nemichthys scolopaceus	7					63.64	0.012	0.018	0.02	0.007
Brotula sp.	1					9.09	0.012			0.022
Bassanago albescens	2					18.18	0.012		0.072	0.009

Benguela - Palmerinhas slope 500-800 m cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							500-600m	600-700m	700-800m
	>0	10	30	100	300					
Acanthephyra sp.	3					27.27	0.012		0.007	0.02
Etmopterus spinax	1					9.09	0.011			0.02
Raja doutrei	1					9.09	0.011			0.02
Neonesthes capensis	1					9.09	0.011			0.02
Solenocera africana	1					9.09	0.004			0.007
Other fish							0.13	0.116	0.112	0.142
Sum all species							21.298	21.358	18.973	21.646
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKF., KOBBS										
Sum PANDORAS, PORGIES, SEABREAMS,										
Sum SHARKS, CHIMAERAS							0.19	0.212	0.31	0.155
Sum BATOID FISHES, RAYS							0.276			0.506
Sum CEPHALOPODS							0.838	0.037	0.316	1.458
Numbers of stations included in analysis, total and by depth strata							11	4	1	6

PALMERINHAS - CONGO RIVER
A. Shelf 20-200 m.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								20-50m	50-100m	100-200m
	>0	10	30	100	300	1000					
Brachydeuterus auritus	14	1	5		1	1	38.6	4.464	4.255	9.093	0.013
Trichiurus lepturus	32	7	4	1			77.19	1.325	0.49	2.34	1.021
Galeoides decadactylus	3	5	4	1			22.81	0.993	3.232	0.083	
Chloroscombrus chrysurus	8	1	1		1		19.3	0.823	2.758		
Trachurus trecae	21	12	4				64.91	0.794	0.022	0.797	1.447
Dentex angolensis	23	8	6				64.91	0.794	0.001	0.849	1.412
Synagrops microlepis	1		2	2			8.77	0.671			1.914
Pagellus bellottii	29	2		2			57.89	0.615	1.003	0.894	0.006
Stromateus fiatola	12	4		1			29.82	0.424	0.497	0.782	0.004
Sardinella maderensis	11			1			21.05	0.39	1.287	0.017	
Pseudotolithus senegalensis	3	3	2				14.04	0.311	0.909	0.114	
Pomadasys peroteti	9		1	1			19.3	0.303	0.78	0.202	
Sphyaena guachancho	8	2	2				21.05	0.295	0.84	0.127	
Pomadasys jubelini	2	1		1			7.02	0.231	0.081	0.591	
Pagrus caeruleostictus	9	1	2				21.05	0.216	0.677	0.039	
Selene dorsalis	17	2	1				35.09	0.178	0.335	0.121	0.102
Umbrina canariensis	21	3					42.11	0.177	0.001	0.118	0.387
Ilisha africana	6	1	1				14.04	0.155	0.512	0.006	
Dentex congoensis	26	2					49.12	0.147	0.001	0.201	0.216
Zeus faber	37						64.91	0.119	0.012	0.155	0.174
Brotula barbata	18	1					33.33	0.11		0.051	0.264
Atractoscion aequidens	5		1				10.53	0.103	0.002	0.29	0.003
Epinephelus aeneus	13	2					26.32	0.103	0.042	0.232	0.026
Lagocephalus laevigatus	17	3					35.09	0.101	0.021	0.242	0.029
Raja miraletus	29	1					52.63	0.084	0.06	0.161	0.028
Pseudotolithus typus	4		1				8.77	0.083	0.262	0.014	
Sardinella aurita	6	2					14.04	0.081	0.123	0.125	0.002
Pomadasys incisus	9	1					17.54	0.078	0.206	0.046	
Alectis alexandrinus	10	1					19.3	0.066	0.186	0.029	
Sepia orbignyana	22						38.6	0.064	0.08	0.089	0.026
Spicara alta	13						22.81	0.063		0.001	0.179
Miracorvina angolensis	7	1					14.04	0.061		0.131	0.045
Decapterus rhonchus	12	1					22.81	0.061	0.134	0.049	0.011
Fistularia petimba	26						45.61	0.057	0.018	0.088	0.059
Dentex canariensis	3	1					7.02	0.052	0.175		
Pterothrissus belloci	13	1					24.56	0.05		0.001	0.142
Dentex barnardi	22						38.6	0.047	0.06	0.065	0.019
Alloteuthis africana	22						38.6	0.042	0.008	0.098	0.015
Zenopsis conchifer	7						12.28	0.04	0.002		0.113
Sphyaena sphyaena	1	1					3.51	0.039	0.128	0.002	
Lutjanus agennes		2					3.51	0.036	0.121		
Pteroscion peli	7						12.28	0.033	0.095		0.013
Squatina oculata	7						12.28	0.032		0.037	0.053
Pseudupeneus prayensis	12						21.05	0.031	0.086	0.014	0.002
Octopus vulgaris	13						22.81	0.031	0.004	0.056	0.028
Carcharhinus signatus		1					1.75	0.029	0.098		
Torpedo torpedo	12						21.05	0.028	0.001	0.069	0.01
Citharus linguatula	34						59.65	0.024	0.001	0.03	0.038
Sepia officinalis hierredda	8						14.04	0.02	0.053	0.012	0.001
Dasyatis marmorata	5						8.77	0.019	0.055	0.008	
Ephippion guttifer	6						10.53	0.019	0.055		0.006
Scomberomorus tritor	4						7.02	0.018	0.051	0.009	
Trigla lyra	11						19.3	0.018		0.009	0.042
Branchiostegus semifasciatus *	12						21.05	0.016		0.022	0.023
Illex coindetii	20						35.09	0.016	0.001		0.044
Ariomma bondi	10						17.54	0.015			0.043
Rhinobatos albomaculatus	4						7.02	0.015	0.035		0.013
Gymnura altavela	2						3.51	0.015	0.05		
Raja leopardus	4						7.02	0.014			0.04
Mustelus mustelus	6						10.53	0.013	0.007	0.019	0.011
Saurida brasiliensis	23						40.35	0.011		0.007	0.025
Plectorhinchus mediterraneus	2						3.51	0.011	0.035		0.003
Chelidonichthys gabonensis	7						12.28	0.01	0.002	0.026	0.001
Arius parkii	4						7.02	0.01	0.032	0.001	

Palmerinhas – Congo River shelf 20-200 m cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	Lower limits, Kg/nm							20-50m	50-100m	100-200m	
	>0	10	30	100	300	1000					
Parapenaeus longirostris, femal	3						5.26	0.008		0.022	
Parapenaeus longirostris	3						5.26	0.007		0.019	
Penaeus notialis	5						8.77	0.002	0.007		
penaeus notialis, female	1						1.75	0.002	0.006		
penaeus notialis, male	1						1.75	0.001	0.003		
Parapenaeus longirostris, male	2						3.51	0.001		0.002	
Plesiopenaeus edwardsianus	1						1.75			0.001	
Other fish								0.175	0.277	0.114	0.15
Sum all species								15.495	20.275	18.68	8.248
Sum SNAPPERS, JOBFISHES								0.036	0.121		
Sum GROUPERS, SEABASSES								0.107	0.055	0.234	0.026
Sum GRUNTS, SWEETLIPS								5.094	5.378	9.932	0.016
Sum CROAKERS, DRUMS, WEAKF., KOBBS								0.77	1.27	0.666	0.448
Sum PANDORAS, PORGIES, SEABREAMS,								1.886	1.941	2.06	1.665
Sum SHARKS, CHIMAERAS								0.074	0.105	0.057	0.064
Sum BATOID FISHES, RAYS								0.187	0.229	0.239	0.098
Sum CEPHALOPODS								0.188	0.147	0.258	0.154
Numbers of stations included in analysis, total and by depth strata								57	17	20	20

PALMERINHAS - CONGO RIVER
B. Slope 200-500 m.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							200-300m	300-400m	400-500m
	>0	10	30	100	300					
Synagrops microlepis	4	1	4	3		66.67	3.784	8.707	1.431	
Nematocarcinus africanus	2		3	2		38.89	2.87		3.406	5.771
Merluccius polli	11	3	3			94.44	1.447	1.357	2.175	0.946
Chlorophthalmus atlanticus	4	2	3			50	1.103	1.502	1.844	0.018
J E L L Y F I S H	5			1		33.33	0.979	0.005	0.06	2.88
Laemonema laureysi	8	2	2			66.67	0.779	0.001	1.271	1.275
Pterothrissus bellocci	5	2	1			44.44	0.678	1.654	0.124	
Starfish				1		5.56	0.676		2.433	
Parapenaeus longirostris	3	2	1			33.33	0.468	1.189	0.014	0.006
Yarrella blackfordi	5		1			33.33	0.417			1.251
Brotula barbata	4	1	1			33.33	0.406	1.043		
Dentex angolensis	4	2				33.33	0.338	0.869		
Benthodesmus tenuis	3	2				27.78	0.286		0.034	0.831
Gephyroberyx darwini	5		1			33.33	0.27	0.102	0.826	0.002
Dibranchius atlanticus	9	1				55.56	0.264		0.334	0.515
MYCTOPHIDAE	10		1			61.11	0.245	0.573	0.06	0.018
Caelorinchus coelorhinc. polli	1		1			11.11	0.24	0.087	0.744	
Trichiurus lepturus	9					50	0.206	0.459	0.098	
Hymenocephalus italicus	10	1				61.11	0.2	0.001	0.047	0.561
Chaunax pictus	8					44.44	0.194		0.125	0.477
Malacocephalus laevis	6	1				38.89	0.167		0.518	0.069
Chlorophthalmus punctatus		1				5.56	0.137		0.493	
Caelorinchus coelorhincus	7	1				44.44	0.131	0.169	0.092	0.119
Squatina oculata		1				5.56	0.13	0.333		
Bembrops greyi	5	1				33.33	0.125	0.3	0.03	
Parapenaeus longirostris, femal	8					44.44	0.112	0.124	0.192	0.032
Lepidopus caudatus	5					27.78	0.112		0.031	0.31
Pontinus accraensis	5					27.78	0.109	0.148	0.15	0.029
Zenopsis conchifer	6					33.33	0.108	0.224	0.068	0.007
Stomias boa boa	5					27.78	0.098			0.293
Zeus faber		1				5.56	0.094	0.242		
Parasudis sp.	2	1				16.67	0.092	0.04	0.274	
Lamprogrammus exutus	2	1				16.67	0.09			0.269
Lophiodes kempfi	7					38.89	0.086		0.023	0.239
NETTASTOMATIDAE	1	1				11.11	0.085		0.304	0.001
Stereomastis sp.	7					38.89	0.078		0.02	0.216
Munidopsis sp.	3					16.67	0.078	0.007	0.27	
Aristeus varidens, female	6					33.33	0.074			0.223
Plesiopenaeus edwardsianus	6					33.33	0.074			0.221
Ophisurus serpens		1				5.56	0.067		0.242	
Gadella imberbis	14					77.78	0.064	0.01	0.121	0.079
Malacocephalus occidentalis	4					22.22	0.063	0.001	0.193	0.027
Hoplostethus cadenati	3					16.67	0.057			0.17
Triplophos hemingi	5					27.78	0.054			0.162
Raja leopardus	3					16.67	0.049	0.11		0.019
Bathyroconger vicinus	9					50	0.049	0.013	0.017	0.117
Grammoplites grueli	2					11.11	0.045	0.116		
Thysanoteuthis rhombus	2					11.11	0.041			0.124
Mystriophis rostellatus	2					11.11	0.039	0.001	0.137	
Parapenaeus longirostris, male	4					22.22	0.032	0.071	0.015	
Helicolenus dactylopterus	2					11.11	0.031		0.111	
Bathynectes piperitus	4					22.22	0.03		0.024	0.069
B I V A L V E S	4					22.22	0.029	0.001		0.086
Etmopterus polli	2					11.11	0.027			0.081
Aristeus varidens, male	5					27.78	0.025			0.076
OMMASTREPHIDAE	2					11.11	0.024		0.028	0.049
Uranoscopus cadenati	2					11.11	0.024	0.061		
Neoharriotta pinnata	1					5.56	0.023		0.082	
Trigla lyra	3					16.67	0.022		0.075	0.002
Bassanago albescens	3					16.67	0.02	0.022	0.036	0.005
Halosaurus ovenii	5					27.78	0.02			0.06
Scyliorhinus cervigoni	1					5.56	0.019		0.069	
Todaropsis eblanae	3					16.67	0.018	0.022		0.029
Chaceon maritae, female	2					11.11	0.018			0.053
Conger conger	2					11.11	0.015			0.046
Nezumia aequalis	3					16.67	0.015		0.025	0.025
Illex coindetii	6					33.33	0.015	0.027	0.016	

Palmerinhas – Congo River slope 200-500 m cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm	10	30	100	300			200-300m	300-400m	400-500m
Raja miraletus	>0	1				5.56	0.015	0.038		
Peristedion cataphractum		7				38.89	0.014	0.025	0.008	0.005
Chaceon maritae, male		2				11.11	0.013			0.04
CHIMAERIDAE		1				5.56	0.013			0.039
Lophiodes caularis		1				5.56	0.013		0.045	
Callinectes amnicola		3				16.67	0.013		0.011	0.028
Centrophorus squamosus		1				5.56	0.012		0.044	
Cynoglossus cadenati		1				5.56	0.012	0.031		
Miracorvina angolensis		2				11.11	0.012	0.031		
Etmopterus pusillus		3				16.67	0.011		0.011	0.025
Nezumia cyrano		1				5.56	0.01			0.031
Solenocera africana		6				33.33	0.009	0.004	0.007	0.017
Aristeus varidens		1				5.56	0.003		0.009	
Plesionika martia		1				5.56	0.002			0.007
Parapandalus narval		1				5.56	0.001		0.003	
Other fish							0.145	0.159	0.159	0.116
Sum all species							19.059	19.882	18.976	18.168
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKF., KOBS							0.016	0.04		
Sum PANDORAS, PORGIES, SEABREAMS,							0.338	0.869		
Sum SHARKS, CHIMAERAS							0.246	0.333	0.206	0.177
Sum BATOID FISHES, RAYS							0.07	0.148	0.022	0.019
Sum CEPHALOPODS							0.102	0.058	0.044	0.202
Numbers of stations included in analysis, total and by depth strata							18	7	5	6

PALMERINHAS - CONGO RIVER slope
C. Slope 500-800 m.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							500-600m	600-700m	700-800m
	>0	10	30	100	300					
Nematocarcinus africanus	2		12	3		85	6.256	9.51	5.421	3.719
Yarella blackfordi	4	7	8			95	2.835	2.688	3.702	2.238
Hoplostethus cadenati	3	13	4			100	2.366	2.156	1.756	3.097
Lamprogrammus exutus	7	10	1			90	1.375	1.644	1.158	1.294
Stereomastis sp.	8	9	1			90	1.158	0.899	1.083	1.481
Nezumia micronychodon	6	2	1			45	0.56	0.007	0.259	1.37
Stomias boa boa	15	4				95	0.551	0.985	0.385	0.26
Nezumia aequalis	3	1	1			25	0.52	0.007	0.121	1.376
Chaceon maritae, male	9	1	1			55	0.52	0.367	0.32	0.845
Aristeus varidens, female	18	2				100	0.427	0.527	0.306	0.43
Sea cucumbers	1	1	1			15	0.373			1.067
Triplophos hemingi	18	2				100	0.367	0.469	0.174	0.43
Trachyrincus scabrus	1	1	1			15	0.292		0.072	0.773
Merluccius polli	6	3				45	0.257	0.386	0.081	0.279
OMMASTREPHIDAE	5	3				40	0.244	0.28	0.309	0.154
BathYROCONGER vicinus	13					65	0.229	0.077	0.329	0.295
Dibranchus atlanticus	19					95	0.196	0.088	0.108	0.38
L O B S T E R S	3		1			20	0.186		0.102	0.445
Talismania longifilis	5	1				30	0.166		0.013	0.465
Xenodermichthys copei	19					95	0.162	0.096	0.189	0.204
Gadella imberbis	10	1				55	0.15	0.39	0.016	0.026
Dicrolene intronigra	18					90	0.146	0.065	0.147	0.226
Malacocephalus occidentalis	3	1				20	0.137	0.018	0.011	0.365
CONGRIDAE	1	1				10	0.135			0.387
Chaceon maritae, female	8					40	0.129	0.139	0.092	0.152
Benthodesmus tenuis	7	1				40	0.127	0.349		0.014
Bassanago albescens	6					30	0.11	0.014	0.064	0.245
Aristeus varidens, male	19					95	0.1	0.131	0.143	0.032
Halosaurus ovenii	14					70	0.095	0.063	0.037	0.176
SEPIOLIDAE	5					25	0.093	0.017	0.135	0.133
Caelorinchus coelorhincus	1	1				10	0.09	0.001		0.255
Melanostomias sp.	1	1				10	0.088	0.239	0.014	
Centrophorus granulosus	6					30	0.087	0.021	0.203	0.053
Opisthoteuthis agassizi	1	1				10	0.083	0.014	0.261	
Chaunax pictus	8					40	0.081	0.187	0.052	
Deania calcea	4					20	0.078		0.068	0.165
Holothuria sp.	2					10	0.069			0.196
Lophius vaillanti	8					40	0.068	0.038	0.105	0.067
Etmopterus polli	7					35	0.066		0.005	0.185
Scymnodon squamulosus	4					20	0.064	0.064	0.035	0.088
Chaceon maritae	9					45	0.063	0.08	0.061	0.047
Raja confundens	12					60	0.057	0.056	0.013	0.095
Nezumia sp.	2	1				15	0.055	0.008	0.172	0.002
Centroscyminus crepidater		1				5	0.053			0.151
Bathygadus melanobranchus		1				5	0.051			0.145
GALATHEIDAE *	11					55	0.046	0.032	0.033	0.071
Todaropsis eblanae	3					15	0.046		0.06	0.078
Synaphobranchus kaupii	10					50	0.041	0.009	0.059	0.058
Lepidopus caudatus	6					30	0.041	0.01	0.1	0.022
Thysanoteuthis rhombus	3					15	0.038	0.055	0.054	0.006
Plesiopenaeus edwardsianus	4					20	0.035	0.016	0.092	0.005
Bajacalifornia magalops	2					10	0.032	0.073		0.018
Hydrolagus sp.	2					10	0.03			0.086
Starfish (large)	5					25	0.027	0.02	0.003	0.054
Unidentified invertebrate	2					10	0.026		0.01	0.066
Chlamydoselachus anguineus	2					10	0.025	0.027		0.046
THYSANOTEUTHIDAE	3					15	0.024	0.047	0.024	0.001
Glyphus marsupialis	9					45	0.022	0.008	0.011	0.046
UNIDENTIFIED FISH	1					5	0.021			0.06
BYTIIDAE	1					5	0.02			0.058
Malacocephalus laevis	5					25	0.02	0.028	0.031	0.003
Chlorophthalmus atlanticus	6					30	0.019	0.028	0.031	
Etmopterus pusillus	1					5	0.019			0.055
Bathynectes piperitus	9					45	0.019	0.041	0.008	0.006
Caristius sp	6					30	0.017	0.004	0.003	0.042
Lophiodes kempii	2					10	0.014	0.014		0.026

Palmerinhas – Congo River slope 500-800 m cont

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth			
	Lower limits, Kg/nm								strata t/nm ²			
	>0	10	30	100	300	1000			500-600m	600-700m	700-800m	
MYCTOPHIDAE	10						50	0.014	0.023	0.01	0.008	
Ateleopus natalensis	1						5	0.012			0.034	
TORPEDINIDAE	1						5	0.012		0.039		
Acanthephyra sp.	3						15	0.012	0.028	0.006		
Ommastrephes bartrami	1						5	0.011	0.033			
Laemonema laureysi	3						15	0.011	0.02	0.013		
Starfish	2						10	0.01		0.035		
ALEPOCEPHALIDAE	4						20	0.01		0.013	0.017	
Sergestes sp.	3						15	0.009	0.025			
Shrimps, small, non comm.	1						5	0.001		0.004		
Plesionika sp.	1						5	0.001	0.003			
Sicyonia galeata	1						5	0.001			0.002	
Other fish								0.196	0.233	0.187	0.167	
Sum all species								22.2	22.858	18.349	24.843	
Sum SNAPPERS, JOBFISHES												
Sum GROUPERS, SEABASSES												
Sum GRUNTS, SWEETLIPS												
Sum CROAKERS, DRUMS, WEAKF., KOBBS												
Sum PANDORAS, PORGIES, SEABREAMS,												
Sum SHARKS, CHIMAERAS								0.427	0.126	0.311	0.828	
Sum BATOID FISHES, RAYS								0.074	0.058	0.066	0.095	
Sum CEPHALOPODS								0.569	0.446	0.9	0.407	
Numbers of stations included in analysis, total and by depth strata								20	7	6	7	

ANNEX IV Equations

1. Biomass estimates

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 i^{th} stratum of the total survey area,

$\bar{y}_i = \frac{\sum_{k=1}^{n_i} y_{i,k}}{n_i}$ is the average density in the i^{th} stratum

$y_{i,k}$ is the density [tonnes/NM²] by the k^{th} tow in stratum i

n_i is the number of tows in the i^{th} stratum.

The total biomass in the area is calculated by

$$B = \bar{y}_{st} \cdot total\ area \quad (2)$$

The estimated variance of the biomass (var(biomass)) was calculated by:

$$\text{var}(biomass) = \left(\sum \frac{W_i^2 s_i^2}{n_i} \right) A^2 \quad (3)$$

where

$$s_i^2 = \frac{\sum_{k=1}^{n_i} (y_{i,k} - \bar{y}_i)^2}{n_i - 1}, \text{ and } A \text{ is total area}$$

The standard error (SE) of the stratified mean was calculated as (Cochran 1977):

$$SE = \sqrt{\text{var}(biomass)} \quad (4)$$

The precision for the estimates (CV) was calculated by (Zar 1999¹):

$$CV = \frac{SE}{biomass} \quad (5)$$

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 is in the interval (see Cochran², 1977)

$$biomass \pm t_{(n-1)}SE \quad (6)$$

where t is from Students t-table with $(n-1)$ degrees of freedom and $\alpha = 0.025$.

¹ Zar JH, 1999, Biostatistical analysis. Prentice Hall, New Jersey, 4. ed., 663 pp.

² Cochran, W.G.1977. Sampling Techniques, 3rd ed. John Wiley and Sons, N.Y. 228 pp.

ANNEX V Species codes

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-WATER	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africanus</i>
	SPADE00	MERME03	SHRPE31	SHRAR22	SHRNE21
	SPADI00	MERME04	SHRPEP1	SHRARA1	
	SPALI00	MERME12	SHRPEP2	SHRARA2	
	SPAPA00	MERME13			
	SPAPR00	MERME92			
	SPASA00				
	SPASP00				

ANNEX VI. Catch rates

Families included under each group:

Demersal: Sciaenidae, Sparidae, Pomadasyidae, Ariidae, Serranidae, Lutjanidae, Merlucciidae, Ophidiidae, Lethrinidae.

Pelagic: Scombridae, Sphyrnidae, Trichiuridae, Clupeidae, Engraulidae, Carangidae.

Cephalopods: squids and octopuses.

Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m). C: Slope (201-800 m).

A. Inner shelf (20-70 m).

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Sharks	Other	Total
1	26.5	163.2	13570.3		10.6		2040.1	15784.2
2	44.0		16244.5				54.4	16298.9
12	59.5	136.5	1234.5			26.7	122.8	1520.6
13	35.0	1.3	780.2			5.5	55.8	842.9
14	22.0		5111.5			28.2	30.1	5169.8
15	22.5		71441.8			21.6	475.9	71939.4
16	24.5		258.2			61.1	2223.3	2542.7
24	21.0	20.5	478.3			30.5	642.4	1171.7
25	49.5	629.7	36708.1				184.2	37522.0
27	49.0	137.2	633.9			28.7	25.3	851.0
Mean	35.4	108.8	14646.2			2.5	585.5	15364.3
SD		195.1	23053.9			8.0	841.5	23035.4
%Catch		0.7	95.3			0.1	3.8	

B. Outer shelf (71-200 m).

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Sharks	Other	Total
3	86.0	1219.2	282.7				9.6	1521.1
4	134.0	1649.3	37.2			5.3	32.7	1728.3
5	146.5	1441.4	21.4			0.8	135.0	1612.4
6	176.5	540.6	16.3	1.4			313.3	894.2
9	137.0	2518.7	75.0			5.7	100.4	2699.7
10	113.0	619.9	966.9			6.2	10.8	1623.5
11	92.5	1474.7	132.4			3.8	12.7	1667.3
17	95.5	1247.2	1055.4			1.7	5.7	2310.1
21	125.5	1205.4	20.6			1.5	31.8	1366.2
22	119.0	238.1	55.9			3.9	11.5	324.8
23	89.0	1693.1	12227.9			104.6	87.3	14112.9
26	72.5	30.3	8.6			38.5	5.1	112.4
Mean	115.6	1156.5	1241.7	0.1		17.5	7.0	2497.7
SD		698.2	3479.5	0.4		29.6	9.2	3729.9
%Catch		46.3	49.7	0.0		0.7	0.3	

C. Slope (201-800 m).

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Sharks	Other	Total
7	338.5	107.3		86.2	3.9	46.5	2563.1	2807.0
8	731.5			266.3	37.9	47.5	2868.9	3220.5
18	754.5	3.0		22.9	3.9	3.9	857.5	891.1
19	346.0	524.0		81.8	7.9	1.5	3461.7	4076.9
20	676.0	21.5	24.4	40.5	143.1	7.0	1054.9	1291.4
Mean	569.3	131.2	4.9	99.5	39.3	21.3	2161.2	2457.4
SD	209.2	223.9	10.9	97.0	59.7	23.5	1148.6	1336.0
%Catch		5.3	0.2	4.0	1.6	0.9	87.9	

Catch rates (kg/hour) by main demersal groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m).

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
1	26.5					33.8	15750.4	15784.2
2	44.0						16298.9	16298.9
12	59.5	25.8					1494.8	1520.6
13	35.0						842.9	842.9
14	22.0						5169.8	5169.8
15	22.5						71939.4	71939.4
16	24.5						2542.7	2542.7
24	21.0	15.9					1155.9	1171.7
25	49.5	578.4					36943.7	37522.0
27	49.0	99.9				3.0	748.2	851.0
Mean	35.4	72.0				3.7	15288.7	15364.3
SD		180.6				10.6	22984.2	23035.4
%Catch		0.5				0.0	99.5	

B. Outer shelf (71-200 m)

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
3	86.0	120.5				1.3	1399.4	1521.1
4	134.0	356.6				44.9	1326.8	1728.3
5	146.5	285.2				118.5	1208.7	1612.4
6	176.5	0.4					893.8	894.2
9	137.0	1157.8				6.3	1535.7	2699.7
10	113.0	155.7				2.4	1465.4	1623.5
11	92.5	166.8				20.9	1479.6	1667.3
17	95.5	40.2					2269.8	2310.1
21	125.5	361.4				43.1	961.7	1366.2
22	119.0	197.0				3.5	124.3	324.8
23	89.0	217.9					13895.0	14112.9
26	72.5	3.6				2.7	106.1	112.4
Mean	115.6	255.3				20.3	2222.2	2497.7
SD		309.3				35.0	3724.5	3729.9
%Catch		10.2				0.8	89.0	

Catch rates (kg/hour) by main pelagic groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m).

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracuda	Other	Total
1	26.5	1308.3	13570.3				905.6	15784.2
2	44.0		16244.5				54.4	16298.9
12	59.5		1234.5				286.1	1520.6
13	35.0		780.2				62.7	842.9
14	22.0		5111.5				58.3	5169.8
15	22.5		71441.8				497.6	71939.4
16	24.5		258.2				2284.4	2542.7
24	21.0		478.3				693.4	1171.7
25	49.5		36708.1				813.9	37522.0
27	49.0		633.9				217.2	851.0
Mean	35.4	130.8	14646.2				587.4	15364.3
SD		413.7	23053.9				676.5	23035.4
%Catch		0.9	95.3				3.8	

B. Outer shelf (71-200 m).

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracuda	Other	Total
3	86.0		282.7				1238.4	1521.1
4	134.0		37.2				1691.2	1728.3
5	146.5		21.4				1591.0	1612.4
6	176.5		16.3				877.9	894.2
9	137.0		53.7	18.4	2.9		2624.7	2699.7
10	113.0	3.4	963.0		3.8		653.2	1623.5
11	92.5		131.0		1.4		1534.9	1667.3
17	95.5		1055.4				1254.7	2310.1
21	125.5		19.7		0.9		1345.5	1366.2
22	119.0		54.9		1.0		268.9	324.8
23	89.0		12227.9				1885.0	14112.9
26	72.5		8.6				103.8	112.4
Mean	115.6	0.3	1239.3	1.5	0.8		1255.8	2497.7
SD		1.0	3480.3	5.3	1.3		704.9	3729.9
%Catch		0.0	49.6	0.1	0.0		50.3	

Catch rates (kg/hour) by main deep-water groups caught in valid swept area bottom trawl hauls on the shelf. Southern region. Slope (201-800 m).

Slope (201-800 m)

Station	Depth	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africana</i>	Other	Total
7	338.5		107.3		66.8		2632.9	2807.0
8	731.5				222.6		2997.9	3220.5
18	754.5				20.2		870.9	891.1
19	346.0		524.0		77.0		3475.8	4076.9
20	676.0		20.6		6.2		1264.6	1291.4
Mean	569.3		130.4		78.6		2248.4	2457.4
SD	209.2		224.5		85.9		1127.1	1336.0
%Catch			5.3		3.2		91.5	

Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls on the shelf. Central region.
 A: Inner shelf (20-70 m), B: Outer shelf (71-200 m), C: Slope (201-800 m).

A. Inner shelf (20-70 m).

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
30	68.0	1324.4	149.8	3.8	11.7		112.1	1601.8
35	54.5	317.1	1233.3		3.7		9.6	1563.7
36	56.0	955.4	580.6		6.3		27.6	1570.0
46	64.5	178.3	686.1		46.9		232.8	1144.0
47	24.5	1683.0	3907.5				961.1	6551.7
48	28.5	19.3	490.9		30.0		235.6	775.8
49	41.5	387.0	335.7		13.6		103.3	839.6
50	62.0	83.3	345.0		92.1		57.9	578.3
56	21.5	1.6	28.6				42.4	72.6
57	23.0	2287.2	925.2				421.8	3634.2
58	34.5	33.0	99.9		0.1		8.3	141.3
59	52.0	93.0	37.7		12.3		48.3	191.2
66	46.0	482.1	456.9		12.3		86.6	1037.9
67	31.5		5.7				60.4	66.1
68	29.5	11.5	21.8		0.8		29.5	63.7
69	49.5	494.5	13.8		12.6	12.0	73.3	606.2
78	67.0	15.9	5.6		8.1		65.2	94.8
79	47.0	3.3	11.2		3.3	12.2	26.7	56.7
80	33.0	17.8	15.6	0.1	1.0		27.1	61.7
81	35.0	6.0	7.9	0.1	1.1		20.7	35.8
82	61.5	68.6	340.3		4.8		109.7	523.4
88	31.0	34.2	166.7		4.1		26.1	231.1
89	50.5	23.9	39.1		22.9		1.5	87.4
90	25.0	197.8	2.3		5.3		94.6	300.1
91	30.0	19.3	40.9		0.2		9.4	69.8
Mean	42.7	349.5	397.9	0.2	11.7	1.0	115.7	876.0
Std dev		595.1	800.0	0.8	20.1	3.4	199.4	1433.8
%Catch		39.9	45.4	0.0	1.3	0.1	13.2	

B. Outer shelf (71-200 m).

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
29	93.0	138.9	214.8	0.4	19.2		115.9	489.2
32	109.0	11.6	0.0				33.2	44.8
33	98.0	199.1	44.1					243.2
34	73.0	364.0	485.9		23.9		101.2	974.9
37	71.0	129.6	177.9		28.1		116.2	451.8
38	102.0	675.1	45.3				190.9	911.3
44	163.0	93.7	28.7	2.9	12.9		4516.0	4654.2
45	111.0	100.0	3.6		7.7		54.8	166.2
51	104.0	170.2	24.2		4.0		156.7	355.1
54	151.0	22.5	344.1	38.9	1.7		73.5	480.7
55	115.5	22.7	2756.9		7.2		13.9	2800.8
60	116.5	12.8	1394.5				21.0	1428.2
64	147.5	32.8	17.5	3.0	14.4		119.9	187.5
65	90.0	16.5	0.3		12.8		73.6	103.2
70	95.5	3.3	187.8		0.3	1.6	13.6	206.7
71	131.5	30.4			1.9		8.9	41.3
76	176.5	48.3	31.0		0.8		599.0	679.2
83	86.0	114.4	244.9		36.3	11.1	299.2	705.9
84	106.5	222.5	7.7		12.0	2.3	234.7	479.3
87	94.5	2928.5	208.0		82.6		117.6	3336.7
92	78.0	21.4	171.1	0.1	1.4		4.2	198.1
93	115.0	26.1	92.3	0.4	1.4		1186.4	1306.6
94	111.5	53.9	10.8	8.0	6.0		219.9	298.6
Mean	110.4	236.4	282.2	2.3	11.9	0.7	359.6	893.2
Std dev		605.8	615.3	8.2	18.4	2.3	942.0	1170.0
%Catch		26.5	31.6	0.3	1.3	0.1	40.3	

C. Slope (201-800 m).

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
28	732.0	9.9		49.7	1.6	0.8	266.5	328.6
31	726.5	69.2		21.6	9.7	7.4	344.6	452.5
39	266.5	160.1		2.0			295.5	457.6
40	483.5	11.4	19.6	246.4		5.6	211.9	494.9
41	578.0	66.8	13.6	146.9	1.8	1.1	566.9	797.0
42	703.0	5.5	16.2	88.2			312.7	422.6
43	356.0	440.0		42.4		35.9	1482.4	2000.7
52	386.5	96.5		267.1		53.4	312.5	729.5
53	520.5	27.9	62.9	447.4		2.3	341.7	882.1
61	375.0	39.2	42.3	67.2		8.2	188.6	345.6
62	323.5	126.0		6.6			926.6	1059.2
63	476.5	32.3	198.0	262.9	3.2	0.4	279.0	775.9
72	349.0	189.7	51.9	102.3			426.4	770.4
73	513.0	42.6	31.4	227.4	2.4	13.0	141.3	458.1
74	736.0	64.3	4.5	54.7		9.9	860.9	994.2
75	604.5	122.1	42.5	201.1	10.2	10.0	226.5	612.5
85	303.0	267.7	0.7	28.0		145.4	1158.1	1600.0
86	757.5	24.5	30.1	23.6	96.2	6.5	490.2	671.1
95	537.0	7.2	23.9	24.2		8.0	331.8	395.0
96	731.0	56.7		8.1	158.4	3.9	889.5	1116.6
97	439.5	218.5	34.2	144.3	3.7	179.8	443.4	1023.9
Mean	519.0	99.0	27.2	117.2	13.7	23.4	499.9	780.4
Std dev		107.6	43.8	118.3	39.1	48.3	357.2	422.9
%Catch		12.7	3.5	15.0	1.8	3.0	64.1	

Catch rates (kg/hour) by main demersal groups caught in valid 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	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
30	68.0	117.7		15.7	230.8	101.7	1135.9	1601.8
35	54.5	24.5		3.3	249.7	7.0	1279.2	1563.7
36	56.0	105.4			140.7	8.5	1315.4	1570.0
46	64.5	140.0		4.3			999.8	1144.0
47	24.5	219.7			10.2		6321.7	6551.7
48	28.5	18.1					757.7	775.8
49	41.5	219.4		17.2	144.0		459.0	839.6
50	62.0	64.6			18.7		495.0	578.3
56	21.5	1.1		0.4			71.1	72.6
57	23.0	295.3			387.1	208.7	2743.2	3634.2
58	34.5				0.4	1.2	139.8	141.3
59	52.0	6.9		1.7	34.6		148.0	191.2
66	46.0	16.4			13.3		1008.2	1037.9
67	31.5						66.1	66.1
68	29.5	0.1		11.0			52.5	63.7
69	49.5	21.7		6.5	465.8		112.2	606.2
78	67.0	8.8		6.2			79.8	94.8
79	47.0	0.5		0.1			55.3	56.7
80	33.0				17.8		43.8	61.7
81	35.0	2.9			3.1		29.8	35.8
82	61.5	11.9		2.1	49.7		459.7	523.4
88	31.0	27.9		2.4	3.9		196.9	231.1
89	50.5	22.4					65.1	87.4
90	25.0	127.5	61.5	6.5	2.3		102.3	300.1
91	30.0	16.2			3.1		50.4	69.8
Mean	42.7	58.8	2.5	3.1	71.1	13.1	727.5	876.0
SD		83.1	12.3	5.0	129.3	45.5	1327.7	1433.8
%Catch		6.7	0.3	0.4	8.1	1.5	83.0	

B. Outer shelf (71-200 m).

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
29	93.0	74.2				53.4	361.6	489.2
32	109.0	9.9				1.7	33.2	44.8
33	98.0	100.0				48.6	94.6	243.2
34	73.0	131.4		1.2	173.9	9.4	659.1	974.9
37	71.0	64.6		0.2	21.5	43.0	322.5	451.8
38	102.0	186.0			46.2	97.2	581.9	911.3
44	163.0	44.6					4609.6	4654.2
45	111.0	88.8					77.4	166.2
51	104.0	68.3				45.2	241.6	355.1
54	151.0	2.9				5.3	472.5	480.7
55	115.5	8.3				14.4	2778.0	2800.8
60	116.5	4.2			2.0		1422.0	1428.2
64	147.5	20.3					167.2	187.5
65	90.0	15.7					87.5	103.2
70	95.5	3.1					203.6	206.7
71	131.5	24.5				4.8	12.0	41.3
76	176.5	5.1				27.8	646.3	679.2
83	86.0	76.8		0.6			628.5	705.9
84	106.5	187.0				10.4	281.9	479.3
87	94.5	71.4				43.1	3222.3	3336.7
92	78.0	10.4				5.7	182.0	198.1
93	115.0	18.1					1288.5	1306.6
94	111.5	17.2				1.1	280.3	298.6
Mean	110.4	53.6		0.1	10.6	17.9	811.1	893.2
Std dev	27.6	55.7		0.3	37.1	25.5	1173.4	1170.0
%Catch		6.0		0.0	1.2	2.0	90.8	

Catch rates (kg/hour) by main pelagic groups caught in valid 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	Clupeids	Carangids	Scombrids	Hairtails	Barracuda	Other	Total
30	68.0		93.6		50.1		1458.1	1601.8
35	54.5	2.0	231.7		999.6		330.4	1563.7
36	56.0	86.8	123.5		360.5	9.8	989.4	1570.0
46	64.5	1.0	674.6		10.5		457.9	1144.0
47	24.5	2650.1	1257.3				2644.2	6551.7
48	28.5	450.7	24.0		15.0	1.1	284.9	775.8
49	41.5	0.9	324.8	8.6		1.4	503.9	839.6
50	62.0	5.2	336.3		3.4		233.3	578.3
56	21.5		28.4	0.2			44.0	72.6
57	23.0	452.2	396.2		59.8	17.1	2709.0	3634.2
58	34.5	1.8	12.7		83.9		42.9	141.3
59	52.0	0.9	26.9		6.5		157.0	191.2
66	46.0		456.9				581.0	1037.9
67	31.5		2.4		3.3		60.4	66.1
68	29.5	7.7	20.0				36.0	63.7
69	49.5		13.8				592.4	606.2
78	67.0		5.6				89.1	94.8
79	47.0	8.4	2.8				45.5	56.7
80	33.0		15.6				46.0	61.7
81	35.0		4.6				31.2	35.8
82	61.5	219.2	120.4		0.7		183.1	523.4
88	31.0		166.7				64.5	231.1
89	50.5		12.9		1.4	24.8	48.3	87.4
90	25.0		1.7			0.6	297.7	300.1
91	30.0		38.3			2.6	28.9	69.8
Mean	42.7	155.5	175.7	0.4	63.8	2.3	478.4	876.0
Std dev		535.5	286.8	1.7	208.3	6.1	744.1	1433.8
%Catch		17.8	20.1	0.0	7.3	0.3	54.6	

B. Outer shelf (71-200 m).

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracuda	Other	Total
29	93.0		52.4		144.6		292.1	489.2
32	109.0						44.8	44.8
33	98.0		44.1				199.1	243.2
34	73.0	1.8	471.2	1.0	11.8		489.0	974.9
37	71.0	111.8	63.0		1.6	1.4	273.9	451.8
38	102.0		45.3				866.0	911.3
44	163.0		28.7				4625.5	4654.2
45	111.0		3.6				162.5	166.2
51	104.0		5.2		18.9		330.9	355.1
54	151.0				344.1		136.7	480.7
55	115.5				2756.9		43.9	2800.8
60	116.5				1394.5		33.8	1428.2
64	147.5				17.5		170.0	187.5
65	90.0		0.3				102.9	103.2
70	95.5	9.5	176.8	0.3	1.1		18.8	206.7
71	131.5						41.3	41.3
76	176.5				31.0		648.2	679.2
83	86.0	17.4	209.5		17.9		461.0	705.9
84	106.5		7.7				471.6	479.3
87	94.5		204.7		3.2		3128.7	3336.7
92	78.0		9.7		161.1	0.3	27.0	198.1
93	115.0		71.1		21.2		1214.3	1306.6
94	111.5		2.4		8.5		287.7	298.6
Mean	110.4	6.1	60.7	0.1	214.5	0.1	611.7	893.2
Std dev		23.4	111.0	0.2	627.2	0.3	1095.0	1170.0
%Catch		0.7	6.8	0.0	24.0	0.0	68.5	

Catch rates (kg/hour) by main deep-water groups caught in valid swept area bottom trawl hauls on the shelf. Central region. Slope (201-800 m).

Slope (201-800 m).

Station	Depth	Seabream	Hake	P.longirostris	A.varidens	N.africana	Other	Total
28	732.0				8.3		320.3	328.6
31	726.5				20.0		432.5	452.5
39	266.5	12.5	129.0	2.0			314.1	457.6
40	483.5		10.4		38.9	206.4	239.2	494.9
41	578.0		32.4		39.7	100.2	624.7	797.0
42	703.0		4.6		6.4	73.0	338.6	422.6
43	356.0		440.0	42.4			1518.3	2000.7
52	386.5		96.5	12.4	32.1	222.6	365.9	729.5
53	520.5		24.5		93.3	354.1	410.2	882.1
61	375.0		39.2	1.0	1.9	64.3	239.2	345.6
62	323.5		126.0	6.6			926.6	1059.2
63	476.5		30.3		29.3	233.1	483.3	775.9
72	349.0		189.7	9.9	9.2	80.9	480.6	770.4
73	513.0				31.2	194.6	232.3	458.1
74	736.0				32.6		961.6	994.2
75	604.5		3.2		13.6	187.1	408.5	612.5
85	303.0		267.7	3.1	5.0	19.1	1305.0	1600.0
86	757.5		18.2		9.8		643.1	671.1
95	537.0				14.2	6.2	374.5	395.0
96	731.0				8.1		1108.5	1116.6
97	439.5		218.3		40.7		764.8	1023.9
Mean	519.0	0.6	77.6	3.7	20.7	82.9	594.9	780.4
Std dev		2.7	115.9	9.5	21.9	106.5	369.0	422.9
%Catch		0.1	9.9	0.5	2.7	10.6	76.2	

Catch rates (kg/hour) by main groups caught in valid swept area bottom trawl hauls on the shelf. Northern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m), C: Slope (201-800 m).

A. Inner shelf (20-70 m).

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
105	53.5	25.8	25.7	0.1	9.7		55.7	116.9
106	44.0	11.6	24.1	0.1	6.3		112.7	155.0
107	31.5	222.8	141.4	3.6	21.9	57.4	116.7	563.8
108	29.5	286.0	552.9	4.9	9.0		124.2	977.0
109	46.5	570.1	51.1	0.4	6.8		72.3	700.6
110	64.0	252.2	834.6		5.7		23.5	1116.0
119	27.5	210.7	369.8	0.1			100.6	681.3
120	43.0	128.6	26.6		0.5		224.0	379.8
121	66.0	385.2	85.0		18.6		62.7	551.5
129	23.5	19.3	864.3		13.1		212.8	1109.5
130	40.0	2.6	85.9		0.1		38.0	126.6
131	58.5	405.3	36.3		1.8		4.3	447.8
139	27.0	1975.0	1622.8				836.9	4434.8
140	39.0	566.0	123.3				16.2	705.5
148	32.5	118.2	20.4		1.9		73.6	214.1
149	41.5	227.5	3.4		3.2		39.3	273.3
150	56.5	6156.5	172.0		10.0		53.8	6392.3
159	37.0	0.6			2.4		6.0	9.1
160	48.5	238.2	9.9		14.0	3.5	23.5	289.2
178	55.0	5.6	4.9				33.9	44.4
192	44.0	4.7	13.1				4.4	22.2
193	33.0	7.9	6.3		1.3		0.5	16.1
194	38.0	5.1	9.6				13.1	27.9
Mean	42.6	514.1	221.0	0.4	5.5	2.6	97.8	841.5
Std dev		1297.9	397.8	1.2	6.5	12.0	172.4	1512.9
%Catch		61.1	26.3	0.0	0.7	0.3	11.6	

B. Outer shelf (71-200 m).

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
103	146.5	66.6	2.8	10.8	11.9		279.5	371.7
104	112.5	106.7	159.1		5.3		13.8	285.1
117	165.0	136.7	40.6		9.9	4.4	28.4	219.9
118	85.5	42.5	662.2		0.7		29.5	734.9
122	71.5	201.7	77.4		28.4		54.3	361.8
126	138.5	52.0	22.1		2.6		397.3	474.0
127	117.0	149.2	56.4		5.5		6.7	217.8
128	95.0	50.0	94.3		22.3		12.4	179.1
132	72.5	47.9	26.1		7.5		27.1	108.7
133	88.0	202.8	103.2		16.1		27.3	349.4
137	165.5	19.4	2.7		6.3		60.1	88.5
138	105.5	126.2	112.7		19.1		17.5	275.5
142	89.0	36.8	39.9		17.0		26.9	120.6
147	116.5	49.1	50.2		0.9		12.7	112.8
151	86.5	36.4	12.0		9.9	6.0	23.6	87.9
152	116.5	72.8	132.0		3.8		43.8	252.4
161	119.5	21.7	180.7		1.8	4.9	25.1	234.3
162	112.5	128.7	282.3		16.2	8.4	36.8	472.4
166	151.0	40.0	22.3		2.1	11.5	34.0	109.8
167	119.5	60.8	134.3		3.3	4.3	38.4	241.1
168	87.0	67.1	66.4		0.2	22.2	59.1	215.0
169	81.5	67.7	4.9		2.3	6.1	42.8	123.7
170	90.0	3.5	2.9				6.6	13.0
171	115.5	65.4	42.7		0.3		27.1	135.5
172	143.0	35.9	29.7	1.9	0.2		426.8	494.5
177	189.5	84.4	31.1	13.2	0.3		232.9	361.9
179	82.0	134.1	249.5		6.5		12.3	402.4
180	97.0	42.9	36.8				30.4	110.1
181	109.5	91.4	70.2	0.2	2.0		24.9	188.7
182	115.5	43.6	30.7	0.1	0.6		17.5	92.4
188	123.0	65.9	73.8		0.1	3.6	39.9	183.4
189	110.0	40.0	72.5		0.4		8.5	121.3
190	92.0	240.9	7.6				12.6	261.1
191	70.5	77.3	129.0				12.6	218.8
Mean	111.2	79.6	90.0	0.8	6.0	2.1	63.2	241.7
Std dev	28.9	55.9	121.9	2.9	7.5	4.6	105.2	151.6
%Catch		32.9	37.2	0.3	2.5	0.9	26.1	

C. Slope (201-800 m).

Station	Depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
98	215.5	230.4	23.4	59.8			925.1	1238.7
99	319.0	211.8	1.8	0.0			883.0	1096.6
100	701.5	86.5		238.9	35.1	84.8	342.6	787.8
101	532.0	61.6	0.5	467.0	5.7	0.3	146.4	681.5
102	415.0	97.4	15.8	331.1		13.4	142.4	600.1
111	688.0	60.6		218.6	9.5		476.3	765.0
112	599.5	112.3	1.8	306.3	6.8	9.9	404.0	841.1
113	536.0	67.0	2.7	436.1	5.3	2.8	233.9	747.7
114	455.0	2.1	23.5	233.7			622.4	881.7
115	309.5	17.3	13.3	2.2			72.7	105.5
116	229.0	222.0	11.3	12.6	4.3		697.8	948.1
123	710.0	114.9	3.7	263.8	32.0	5.9	439.7	860.0
124	618.5	67.7	9.7	268.3	32.7		500.4	878.9
125	428.0	28.7	18.9	286.9	8.8		152.3	495.5
134	736.5	76.2	0.6	234.0		1.5	437.9	750.1
135	651.5	28.0		252.4	88.9		251.2	620.5
136	541.0	67.7	2.2	366.2	6.3	12.9	306.2	761.5
143	744.5	4.3		139.2	5.2	3.5	502.7	655.0
144	625.5	44.1		209.9	22.1	9.6	201.9	487.6
145	362.0	0.6		550.6	1.8	6.9	182.1	742.0
146	257.5	32.4	29.6	80.4	3.5		278.3	424.2
153	427.5	54.5	8.0	231.0	15.8	9.3	406.6	725.1
154	530.0	64.7	14.1	267.1	12.3		429.6	787.8
155	706.0	25.0		7.1	8.6	4.8	664.7	710.1
156	526.5	14.2	41.5	270.7	52.0		368.6	747.0
157	421.5	10.3	75.4	38.5	5.0		211.6	340.7
158	233.0	85.4	3.4		1.3		243.3	333.4
163	621.5	39.7		27.4	10.2	23.9	200.5	301.6
164	316.0	83.7		11.0		24.2	575.8	694.8
165	264.5	42.1	6.8	92.6	0.8	68.7	451.1	662.2
173	721.5	8.1	3.2	10.3	4.2	43.0	614.2	682.9
174	516.5	59.7	16.5	66.1	9.1		164.0	315.4
175	426.0	25.8	64.6	20.2	5.5	9.0	92.8	217.9
176	271.5	14.3	14.5	5.9	0.2		285.9	320.7
184	719.5	66.3		8.2		30.3	728.5	833.4
185	658.0	20.4	8.8	142.6	2.9	25.2	178.6	378.4
186	333.5	12.2	9.6	9.8	4.9	1.6	216.9	255.1
187	233.0	46.0	6.0	36.8	2.0		39.2	130.0
Mean	489.5	60.7	11.4	163.2	10.6	10.3	370.3	626.5
Std dev		56.8	17.0	151.3	17.5	18.9	223.0	263.8
%Catch		9.7	1.8	26.0	1.7	1.6	59.1	

Catch rates (kg/hour) by main demersal groups caught in valid swept area bottom trawl hauls on the shelf. Northern region. A: Inner shelf (20-70 m), B: Outer shelf (71-200 m).

A. Inner shelf (20-70 m)

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
105	53.5	6.7		14.3		1.6	94.3	116.9
106	44.0	2.6		1.2	1.7	1.5	147.9	155.0
107	31.5				9.8	9.6	544.4	563.8
108	29.5				11.8	55.9	909.4	977.0
109	46.5	12.4			399.3	0.6	288.4	700.6
110	64.0	25.8		7.8	9.7	78.9	993.7	1116.0
119	27.5				2.6	110.2	568.4	681.3
120	43.0				5.4	112.8	261.5	379.8
121	66.0	25.0		0.6	120.9	73.8	331.2	551.5
129	23.5				7.7	6.0	1095.8	1109.5
130	40.0	0.3		0.5	1.1	0.7	124.0	126.6
131	58.5	32.7			372.7		42.4	447.8
139	27.0	20.0			71.5	367.3	3975.9	4434.8
140	39.0	504.1	33.6	3.8	15.2		148.8	705.5
148	32.5	86.7	30.5	1.0			95.8	214.1
149	41.5	204.9		11.9	10.5		46.0	273.3
150	56.5	425.7					5966.6	6392.3
159	37.0	0.6					8.4	9.1
160	48.5	213.4		5.6	19.2		51.0	289.2
178	55.0	5.6					38.7	44.4
192	44.0	2.0		2.7			17.6	22.2
193	33.0	7.9					8.2	16.1
194	38.0	1.6		3.4			22.8	27.9
Mean	42.6	68.6	2.8	2.3	46.1	35.6	686.1	841.5
SD	12.0	139.0	9.2	4.0	110.9	81.3	1423.2	1512.9
%Catch		8.2	0.3	0.3	5.5	4.2	81.5	

B. Outer shelf (71-200 m)

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
103	146.5	20.7				30.0	321.0	371.7
104	112.5	105.5				1.0	178.5	285.1
117	165.0	103.6				15.1	101.3	219.9
118	85.5	31.2				8.3	695.4	734.9
122	71.5	148.1			12.9	12.6	188.1	361.8
126	138.5	47.4					426.6	474.0
127	117.0	137.6				11.6	68.6	217.8
128	95.0	31.1				9.1	138.9	179.1
132	72.5	42.8			5.2		60.7	108.7
133	88.0	34.8				167.9	146.7	349.4
137	165.5	18.9				0.5	69.2	88.5
138	105.5	34.4				91.8	149.3	275.5
142	89.0	31.9		0.2			88.5	120.6
147	116.5	47.2					65.6	112.8
151	86.5	30.9					57.0	87.9
152	116.5	64.9				3.1	184.5	252.4
161	119.5	16.7			1.5	1.0	215.1	234.3
162	112.5	105.0					367.4	472.4
166	151.0	31.6				0.5	77.7	109.8
167	119.5	43.4				0.6	197.1	241.1
168	87.0	66.3		0.7			148.0	215.0
169	81.5	40.2		24.6	2.9		56.1	123.7
170	90.0	2.3			1.2		9.5	13.0
171	115.5	55.0				7.9	72.6	135.5
172	143.0	14.2				10.5	469.7	494.5
177	189.5	26.4				12.0	323.5	361.9
179	82.0	56.1		17.2		42.5	286.6	402.4
180	97.0	22.7				1.0	86.4	110.1
181	109.5	29.4				52.6	106.7	188.7
182	115.5	21.7		14.0		7.4	49.3	92.4
188	123.0	34.9				28.7	119.9	183.4
189	110.0	31.7		2.5			87.1	121.3
190	92.0	206.1		34.8			20.3	261.1
191	70.5	31.7		45.3			141.7	218.8
Mean	111.2	51.9		4.1	0.7	15.2	169.8	241.7
Std dev	28.9	43.8		10.7	2.4	33.1	147.6	151.6
%Catch		21.5		1.7	0.3	6.3	70.3	

Catch rates (kg/hour) by main pelagic groups caught in valid swept area bottom trawl hauls on the shelf. 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	Hairtails	Barracuda	Other	Total
105	53.5	0.1	18.1		2.9		95.9	116.9
106	44.0		22.1		2.1		130.8	155.0
107	31.5	5.0	27.5		24.0	6.3	501.0	563.8
108	29.5	83.7	177.3		121.0	137.6	457.4	977.0
109	46.5	0.2	39.3		2.9	8.9	649.3	700.6
110	64.0	3.9	4.4		764.1	4.6	338.9	1116.0
119	27.5	188.3	31.5		66.5	53.5	341.4	681.3
120	43.0	0.4	5.2		10.3	1.7	362.1	379.8
121	66.0	10.7	30.4		40.4		470.0	551.5
129	23.5	753.5	73.0		29.5	8.3	245.2	1109.5
130	40.0	20.8	34.1		9.2		62.5	126.6
131	58.5	0.0	26.9			0.9	420.0	447.8
139	27.0	7.6	1313.0		4.6	223.6	2886.0	4434.8
140	39.0	1.4	21.9		1.4	73.9	606.9	705.5
148	32.5		8.7	11.7			193.7	214.1
149	41.5		3.4				269.9	273.3
150	56.5	83.9	8.8			79.3	6220.4	6392.3
159	37.0						9.1	9.1
160	48.5		9.9				279.3	289.2
178	55.0		4.9				39.5	44.4
192	44.0		2.5	10.6			9.1	22.2
193	33.0		1.8	4.5			9.8	16.1
194	38.0		9.6				18.2	27.9
Mean	42.6	50.4	81.5	1.2	46.9	26.0	635.5	841.5
Std dev		159.5	271.0	3.3	158.9	55.7	1348.8	1512.9
%Catch		6.0	9.7	0.1	5.6	3.1	75.5	

B: Outer shelf (71-200 m).

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracuda	Other	Total
103	146.5				2.8		368.9	371.7
104	112.5		150.6		8.5		125.9	285.1
117	165.0				40.6		179.4	219.9
118	85.5		21.7		283.9		429.3	734.9
122	71.5	1.0	47.2		25.6		288.0	361.8
126	138.5				22.1		451.9	474.0
127	117.0		31.5		24.9		161.4	217.8
128	95.0		88.5		5.8		84.8	179.1
132	72.5	0.4	25.4			0.3	82.6	108.7
133	88.0		103.2				246.2	349.4
137	165.5				2.7		85.8	88.5
138	105.5		112.7				162.8	275.5
142	89.0	0.2	17.4		22.3		80.7	120.6
147	116.5		47.7		2.5		62.7	112.8
151	86.5		0.8	5.2	4.7	1.3	75.9	87.9
152	116.5		129.9		2.2		120.4	252.4
161	119.5		9.8		171.0		53.5	234.3
162	112.5		198.3		84.0		190.1	472.4
166	151.0		1.4		20.9		87.5	109.8
167	119.5		61.4		72.9		106.8	241.1
168	87.0		32.4		25.4		157.2	215.0
169	81.5		3.8		1.0		118.9	123.7
170	90.0		1.7		1.2		10.1	13.0
171	115.5		40.9		1.8		92.8	135.5
172	143.0	1.4	3.1		25.2		464.8	494.5
177	189.5				31.1		330.7	361.9
179	82.0	1.0	65.4		158.8		177.2	402.4
180	97.0		10.8		21.5		77.9	110.1
181	109.5		19.2		48.4		121.2	188.7
182	115.5		17.6		13.1		61.7	92.4
188	123.0		45.9		28.0		109.6	183.4
189	110.0		55.5		17.0		48.8	121.3
190	92.0		3.8	3.8			253.6	261.1
191	70.5	0.2	114.0		14.8		89.8	218.8
Mean	111.2	0.1	43.0	0.3	34.8	0.0	163.5	241.7
Std dev		0.3	50.5	1.1	59.6	0.2	121.3	151.6
%Catch		0.0	17.8	0.1	14.4	0.0	67.6	

Catch rates (kg/hour) by main deep-water groups caught in valid swept area bottom trawl hauls on the shelf.
Northern region. Slope (201-800 m).

Station	Depth	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africana</i>	Other	Total
98	215.5	63.4	136.7	59.8			978.8	1238.7
99	319.0		211.8				884.8	1096.6
100	701.5				14.3	222.0	551.5	787.8
101	532.0				26.8	438.8	215.9	681.5
102	415.0		97.4	0.7	5.1	324.1	172.9	600.1
111	688.0				13.6	204.3	547.2	765.0
112	599.5		32.5		14.8	284.7	509.1	841.1
113	536.0				39.4	392.2	316.2	747.7
114	455.0				6.9	225.8	648.9	881.7
115	309.5		17.3	2.2			86.0	105.5
116	229.0	17.5	80.6	12.6			837.4	948.1
123	710.0				22.6	241.3	596.2	860.0
124	618.5				12.2	255.3	611.4	878.9
125	428.0		28.7	1.1	1.5	275.7	188.5	495.5
134	736.5		2.0		26.3	206.4	515.4	750.1
135	651.5		1.2		13.5	237.8	368.0	620.5
136	541.0				5.0	360.5	396.0	761.5
143	744.5				22.9	115.3	516.7	655.0
144	625.5				10.8	199.1	277.7	487.6
145	362.0		0.6	11.9	1.5	536.3	191.7	742.0
146	257.5		32.4	80.4			311.4	424.2
153	427.5		23.2		12.8	193.2	495.9	725.1
154	530.0		35.7		8.9	258.2	485.1	787.8
155	706.0				7.1		703.0	710.1
156	526.5		4.6		9.9	258.5	474.0	747.0
157	421.5		10.3	3.8	10.7	18.1	297.8	340.7
158	233.0	56.2	7.6				269.6	333.4
163	621.5		4.7		10.2		286.8	301.6
164	316.0		83.7	11.0			600.1	694.8
165	264.5	22.3	13.4	92.6			533.9	662.2
173	721.5				3.4	6.1	673.4	682.9
174	516.5		10.8		37.5	27.3	239.7	315.4
175	426.0		10.5	1.2	16.6	2.0	187.5	217.9
176	271.5	3.0	3.0	5.9			308.8	320.7
184	719.5		57.0		2.4		774.0	833.4
185	658.0		9.1		23.7	117.7	227.9	378.4
186	333.5		12.2	9.2			233.6	255.1
187	233.0	13.5	0.2	36.0			80.4	130.0
Mean	489.5	4.6	24.4	8.6	10.0	142.1	436.7	626.5
Std dev		14.1	44.4	21.8	10.7	152.6	227.0	263.8
%Catch		0.7	3.9	1.4	1.6	22.7	69.7	

ANNEX VII Instruments and fishing gear used

The Simrad ER-60/18, 38, 120 and 200 kHz scientific sounder was run during the survey only for observation of fish and bottom conditions. No scrutinizing of the recordings was done.

Last standard sphere calibrations were carried out 23.06.2008 in Baia dos Elefantes using Cu-64, Cu-60, WC-38.1 add WC-38.1 spheres for 18, 38, 120 and 200 kHz, respectively. The details of the settings of the 38 kHz echo sounder where as follows:

Transceiver-2 menu (38 kHz)

Transducer depth	5.50 m
Absorbtion coeff.	6,7 dB/km
Pulse length	medium (1,024ms)
Bandwidth	2,43 kHz
Max power	2000 Watt
2-way beam angle	-20,6dB
gain	25,04 dB
SA correction	-0,46 dB
Angle sensitivity	21.9
3 dB beamwidth	7,76° along ship 7,86° athwardship
Alongship offset	-0.12°
Athwardship offset	0.06°

Bottom detection menu Minimum level -40 dB

Fishing gear

The vessel has two different sized "Åkrahamn" 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 mesh size in the codend with an inner net of 10 mm mesh size. The trawl height was about 4.5 m and distance between wings during towing about 21 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. Since 19.02.08 new and heavier "Thyborøn" combi trawl doors (7.41 m², 1720 kg) have been in used. During the present survey the door distance was kept nearly constant at about 50 m at all depths by the use of a 9 m strap between the wires at 120 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 improves 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 the trawl was equipped with a trawl eye that provides information about the trawl opening. A catch sensor on the cod-end indicated the size of the catch.

ANNEX VIII Station allocation by survey and depth strata

Numbers of valid bottom trawl stations by depth strata. Angolan demersal surveys 1985-2009.

	1985.1	1985.2	1985.3	1985.4	1986.1	1986.2	1989.1	1989.2	1989.3	1991.1	1991.2	1992	1993	1994	1995.1	1995.2	1996	1997.1	1997.2	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
OUTSIDE	11	13	13	11	28	24	31	23	10	30	56	55	1	17	16	0	5	1	62	0	0	1	0	0	1	0	3	0	1	0	0	
20-50south	0	2	0	0	6	3	5	2	3	6	2	4	3	0	0	0	0	0	0	0	0	8	0	2	4	8	7	8	5	6	9	
50-100south	0	1	0	0	8	6	8	8	1	14	12	20	11	0	0	0	0	0	4	0	0	9	0	5	7	7	5	5	8	8	6	
100-200south	0	0	0	0	8	3	9	8	6	10	12	7	9	0	0	0	0	0	6	0	0	7	0	3	7	5	7	7	7	7	7	
200-300south	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	
300-400south	0	0	0	0	1	0	0	0	0	2	0	1	0	0	0	0	0	0	1	0	0	1	0	1	2	2	1	1	1	2	2	
400-500south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
500-600south	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	
600-700south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	2	3	1	2	2	1	1	
700-800south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	2	2	
20-50central	0	0	0	3	8	11	17	24	5	17	13	15	0	9	14	0	10	6	1	9	14	23	12	16	16	17	16	16	15	17	16	
50-100central	0	0	0	4	15	14	21	29	4	26	13	16	0	12	13	0	12	9	10	17	19	27	18	18	19	18	20	18	20	18	18	
100-200central	0	0	0	2	2	4	13	11	3	15	10	12	0	14	15	12	12	8	13	12	14	22	16	15	13	14	14	16	15	14	14	
200-300central	0	0	0	4	3	1	4	3	3	10	6	8	0	8	9	21	9	7	11	8	8	12	4	2	3	2	6	3	2	2	1	
300-400central	0	0	0	2	4	1	0	7	1	7	3	9	0	9	11	15	10	7	1	6	6	10	4	6	4	6	6	6	6	6	6	
400-500central	0	0	0	4	5	0	3	4	3	6	3	7	0	8	9	18	9	7	0	4	6	8	6	2	3	3	4	3	2	3	3	
500-600central	0	0	0	1	2	0	1	2	4	1	0	9	0	5	7	14	8	7	0	7	5	9	3	5	3	3	5	4	5	4	4	
600-700central	0	0	0	0	0	0	0	0	0	0	0	6	0	1	3	10	3	0	0	5	1	6	3	4	4	4	6	4	4	3	1	
700-800central	0	0	0	0	0	0	0	0	0	0	0	4	0	2	4	1	4	0	0	3	0	7	4	4	4	4	4	6	4	5	5	6
20-50north	5	4	7	6	14	13	3	14	3	7	8	12	0	9	9	0	9	8	0	0	14	11	11	16	13	15	14	14	17	17	17	
50-100north	9	8	7	7	25	28	19	33	14	20	19	17	0	9	12	0	12	10	4	0	24	24	14	23	20	24	20	18	21	19	20	
100-200north	5	5	3	6	5	20	6	6	4	11	12	10	0	11	11	0	12	11	8	0	29	24	18	23	20	21	21	17	23	23	20	
200-300north	1	0	1	5	5	6	8	6	4	4	14	9	0	8	7	0	10	9	3	0	12	11	7	7	7	8	7	6	7	7	7	
300-400north	0	0	5	6	15	4	2	4	4	6	6	5	0	9	8	0	9	8	2	0	12	10	11	6	6	6	6	5	5	4	5	
400-500north	0	0	1	2	3	6	5	4	4	6	2	6	0	6	4	0	8	7	0	0	7	8	5	6	6	6	6	5	6	6	6	
500-600north	0	0	3	3	3	3	3	6	0	1	0	5	0	5	5	0	10	8	0	0	6	7	8	6	6	6	7	4	6	6	7	
600-700north	0	0	0	0	1	0	0	1	0	0	3	0	2	3	0	0	0	0	0	0	1	7	5	6	6	7	8	4	8	6	6	
700-800north	0	0	0	0	0	0	1	0	0	0	0	4	0	3	2	0	5	5	0	0	0	8	3	9	9	8	9	7	6	7	7	
TOTAL	31	33	40	66	161	148	159	194	77	200	193	245	24	147	162	91	157	118	126	71	178	264	152	186	185	200	208	179	198	193	191	

ANNEX IX Angolan Monitoring Lines

#	Location	Estação	Latitude (S)	Longitude (E)	Depth (multinet)	Depth (bottles)
1	Namibe	NML002	15°09.381'	12°07.827'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Namibe	NML003	15°09.381'	12°04.725'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Namibe	NML004	15°09.381'	11°59.554'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Namibe	NML005	15°09.381'	11°49.216'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Namibe	NML006	15°09.381'	11°39.000'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Namibe	NML007	15°09.381'	11°17.360'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
1	Lobito	LBML	12°20.91'	13°28.60'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Lobito	LBML	12°20.15'	13°27.16'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Lobito	LBML	12°17.90'	13°22.20'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Lobito	LBML	12°13.00'	13°13.02'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Lobito	LBML	12°08.80'	13°04.00'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Lobito	LBML	12°04.10'	12°54.80'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
7	Lobito	LBML	11°58.75'	12°45.45'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
8	Lobito	LBML	11°54.80'	12°36.66'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
1	Luanda	LDML	9°05.00'	12°58.314'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Luanda	LDML	9°05.00'	12°56.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Luanda	LDML	9°05.00'	12°51.26'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Luanda	LDML	9°05.00'	12°41.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Luanda	LDML	9°05.00'	12°31.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Luanda	LDML	9°05.00'	12°21.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
7	Luanda	LDML	9°05.00'	12°11.52'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
1	Congo River	CRML	6°12.453'	12°07.976'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
2	Congo River	CRML	06°13.359'	12°04.536'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
3	Congo River	CRML	06°15.434'	11°55.580'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
4	Congo River	CRML	06°17.712'	11°45.802'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
5	Congo River	CRML	06°19.670'	11°36.265'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
6	Congo River	CRML	06°21.922'	11°26.555'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
7	Congo River	CRML	06°24.195'	11°16.470'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
8	Congo River	CRML	06°26.254'	11°06.790'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
9	Congo River	CRML	06°28.65'	10°56.55'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75
10	Congo River	CRML	06°30.59'	10°46.12'	0-25; 25-50; 50-75; 75-100; 100-200	5; 15; 25; 50; 75

ANNEX X. Shark sampling

This is the continuation of a sampling program presented to the direction of the INIP in Luanda, which started in 2002. We have followed the same methodology and pursuing the same objectives described in previous reports: improve the available information on bathymetric distribution of sharks in Angolan waters, with especial emphasis on deepwater sharks. Deepwater sharks are here defined as those whose distribution is predominantly at depths below 200m.

The preliminary results by region are presented below.

Southern region (Cunene River - Tombua): sharks were found in 14 out of the 27 (51.8%) trawl stations worked out in this region, mainly in deep waters. A total of 326 individuals were sampled, belonging to 10 different species, with *Galeus polli* as the most abundant species. The depth interval where they were found ranged from 49 to 773 m.

Central region (Benguela – Ponta das Palmerinhas): sharks were found in 23 (32,9%) out of the 70 trawl stations worked out in this region. A total of 555 individuals were sampled, belonging to 10 different species, with *Etmopterus polli* as the most abundant species. The depth interval where they were found ranged from 47 to 760 m.

Northern region (Ponta das Palmerinhas – Congo River): sharks were found in 27 (27.8%) out of the 97 trawl stations worked out in this region. A total of 455 individuals were sampled belonging to 14 different species. *Etmopterus polli* as the most abundant species. The depth interval where found ranged from 31 to 755 m.

Due to time constraints, not all specimens caught were measured and data were not introduced in the data base, therefore they have not been analyzed yet.

It is important to note that sharks hasn't been a target group during the surveys and that bottom trawl is not the best tool for catching the more pelagic species. Therefore the results don't truly reflect neither the species composition nor their abundance in Angolan waters, and the biomass estimates presented for this group may not reflect the true biomass trends figures.