

SURVEY OF THE FISH RESOURCES OF ANGOLA

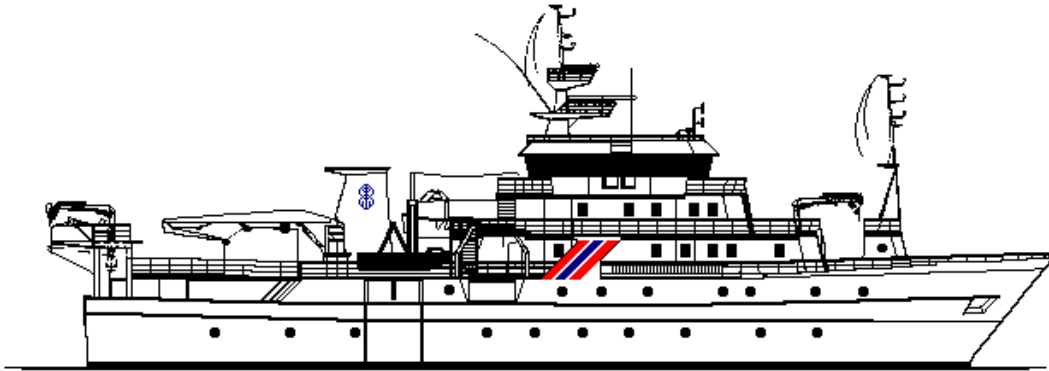
Survey of the demersal resources
10 March – 13 April 2008

Institute of Marine Research
IMR, Bergen
Norway

Instituto Nacional de Investigação das Pescas
INIP, Luanda
Angola

Bergen April 2008





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The DR FRIDTJOF NANSEN RESEARCH PROGRAMME is sponsored by the Norwegian Agency for Development Cooperation (NORAD). The Food and Agriculture Organization of the United Nations (FAO) provides support to the Programme through Project GCP/INT/003/NOR: International Cooperation with the Nansen Programme: Fisheries Management and Marine Environment. This project is the follow-up to the Project NORAD/FAO/UNDP GLO/92/013. The Institute of Marine Research (IMR), Bergen, Norway is responsible for the implementation of the Programme in cooperation with FAO Fisheries Department and the local fisheries administrations. The aim of the Nansen Programme is to assist developing countries in fisheries research, management and institutional strengthening.

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 2008	(16 surveys)

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF ANGOLA

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10 March – 13 April 2008**

by

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CHAPTER 1 INTRODUCTION

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, Bergen (IMR) for the Angolan Demersal Programme, and were the following:

- To survey, map and describe the distribution, composition and abundance of the main demersal species, with special emphasis on 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*, *Pseudolithus typus*, *Merluccius polli*, *A. varidens*, *P. longirostris*, *Chaceon maritae* and *Panulirus regius*, and to collect the stomach contents and gonads for some species such as *Dentex angolensis*, *Pagellus bellottii*, *Pseudolithus senegalensis*, *Umbrina canariensis* and *Brachydeuterus auritus*, for future analyses in the INIP Lab.
- To monitor the general hydrographic conditions using a CTD-sonde on each trawl station and map the temperature, salinity and oxygen along standard INIP hydrographic profiles.

From February 2008, INIP has decided to conduct four monitoring hydrographic transects located in Namibe, Lobito, Pta das Palmerinhas and Moita Seca (Congo River). These transects are based on INIP standard profiles but modified and updated according to regional requirements as advised by Dr. Larry Hutching.

*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, Silvi Nsiangango (10/3-26/3, Local Cruise Leader), Kumbi Kilongo (26/3-13/4, Local Cruise Leader), Virgílio Estêvão (10/3-13/4), Domingos Pedro (10/3-13/4), Pedro Panzo (10/3-26/3), Erikson Saquenía (10/3-13/4, Namibe), Vanaquissa Jonico (10/3-26/3, Benguela), Eusébio dos Santos (10/3-13/4), Paula Fária (10/3-26/3), Filipe Vianda (10/3-13/4), Henriette Lutuba (26/3-13/4), Gisela Ramos (26/3-13/4), David Kisungo (26/3-13/4, Benguela), Fátima Delicado (10/3-26/3),

From IMR, Norway: Åge Høines (10/3-26/3, Cruise Leader), Else Torstensen (26/3-13/4, Cruise leader), Magne Olsen (10/3-26/3), Diana Zaera (26/3-13/4), Jan Frode Wilhelmsen (10/3-13/4), Andreas Nieuwejaar (10/3-13/4)

1.3 Narrative

R/V “Dr Fridtjof Nansen” departed Walvis Bay, Namibia, the afternoon 11 March 2008 and steamed northwards, one day later. This was caused by delayed equipment necessary for the environmental survey on the Angolan shelf starting April 15th. The sampling started in the morning March 13th with trawl and hydrographic stations off Cunene River. 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 2003-2008 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 March 18th the survey of the southern region was finished. Standard hydrographic transects were sampled west off Baía dos Tigres, Pta. Albina and Cabo de Santa Marta, while off Namibe it was a monitoring line. Zooplankton was sampled with a multinet and phytoplankton with the bottles on the CTD at the Namibe transect. 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 evening March 18th the trawling started in the central region. The vessel called Luanda in the afternoon of March 24th to change Norwegian and Angolan scientists. It departed the afternoon of March 27th to continue the survey in the central region. The survey of the central region was completed on March 29th at 18:21 UTC and continued to the northern region. Three standard hydrographic transects (Salinas, Pta. do Morro and Cabo São Braz) and two monitoring lines (Lobito, and Pta. das Palmerinhas, both with plankton sampling) were carried out in the central region. Transects off Lobito and Pta. das Palmerinhas were carried out in accordance with the standards for monitoring lines run by INIP. This was somewhat different than the standard transects run by Dr. Fridtjof Nansen in earlier years, but it was decided by INIP that it was necessary to cover these transects in this manner to maintain their time series on these monitoring lines. The transects ended further off-shore and the distance between the stations were longer than the standard “Nansen” transects run earlier. These “Nansen” transects were selected as the Angolan monitoring lines (Namibe, Lobito, Ponta das Palmerinhas and the Congo River) according to the regional requirements. They were updated and modified as follows: the first station located at 2.5 nautical miles away from the coast, the second at 5 n.miles away from the first station and the third at 10 n.miles away from the second until reaching the isobaths of 2000 m. These principles allow avoiding stations too close from each other which contain almost the same information, therefore reduce the number of stations and allow access to information from deeper areas.

A standard hydrographic transect was carried out at Ambriz and one monitoring line at Ponta da Moita Seca (Congo River) in the northern region. The survey finished in the afternoon of April 11th when R/V “Dr. Fridtjof Nansen” called port in Luanda.

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 84 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 hydrographic stations.

Table 2.1 Survey's design and effort for the 2008 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)	6	8	7		2			1	2	26	2	69	590
% area	25.9	30.2	30.4	5.1	3.9	2.5	2	0	0	11.83			
% hauls	23.08	30.77	26.92	0.00	7.69	0.00	0.00	3.85	7.69				
Benguela-Luanda													
Area (NM ²)	1068	1586	1439	407	372	343	346	268	357	6186			
# hauls (BT)	17	18	14	2	6	3	4	3	5	72		129	1292.4
% area	17.3	25.6	23.3	6.6	6	5.5	5.6	4.3	5.8	37.41			
% hauls	23.6	25.0	19.4	2.8	8.3	4.2	5.6	4.2	6.9				
Luanda-Congo River													
Area (NM ²)	1379	1969	1940	601	550	437	409	408	702	8395			
# hauls (BT)	17	19	23	7	4	6	6	6	7	95	4		
% area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4	50.76		112	1301.3
% hauls	17.9	20.0	24.2	7.4	4.2	6.3	6.3	6.3	7.4				
Grand total													
Area (NM ²)	2954	4146	3973	1108	999	828	794	676	1059	16537			
# hauls (BT)	40	45	44	9	12	9	10	10	14	193	6		
% area	17.9	25.1	24	6.7	6	5	4.8	4.1	6.4				
% hauls	20.7	23.3	22.8	4.7	6.2	4.7	5.2	5.2	7.3	Total hauls: 199			

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. The planned design was 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 the regions. Therefore, the station positions and effort have been similar during the 2000, 2003-2008 surveys in the southern region, and during the 2002-2008 surveys in the central and northern regions (see Annex VIII).

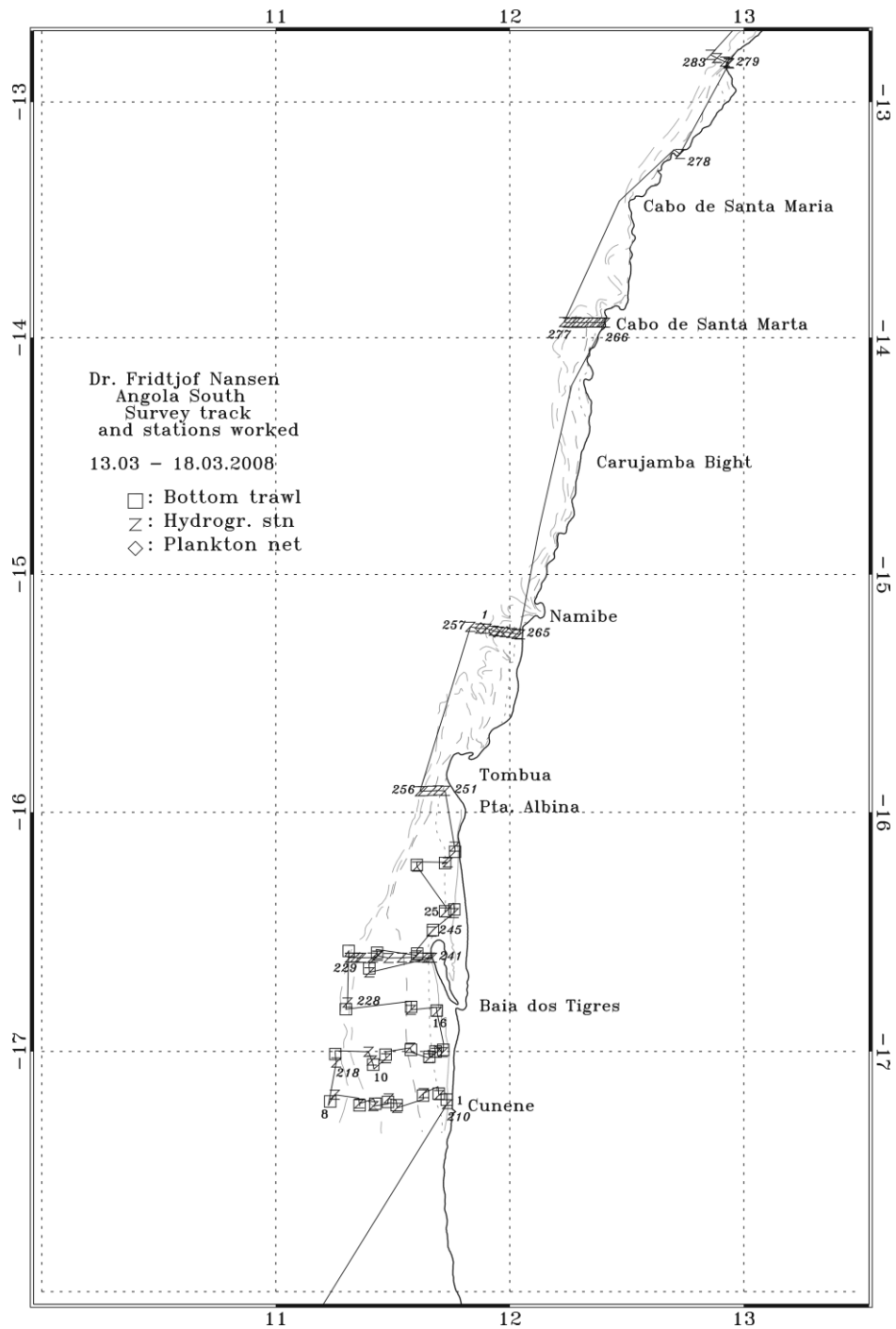


Figure 2.1 Angola south: Cunene - Tombua. Course track with trawl stations, plankton stations and hydrographic transects. Hydrographic stations were also taken at every fishing station. Depth contours at 20, 50, 100 and 200 m.

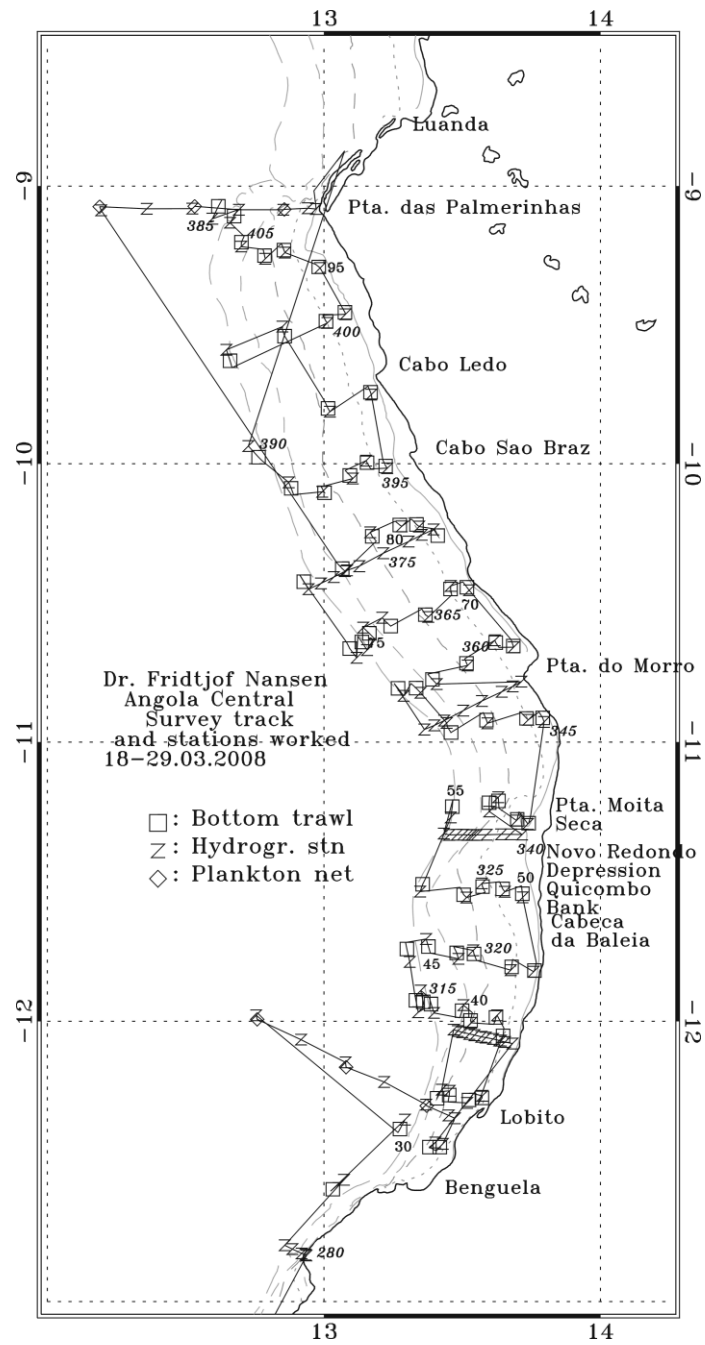


Figure 2.2 Angola central: Benguela - Luanda. Course track with trawl stations, plankton stations and hydrographic transects. Hydrographic stations were also taken at every fishing station. Depth contours at 20, 50, 100, 200 and 500 m.

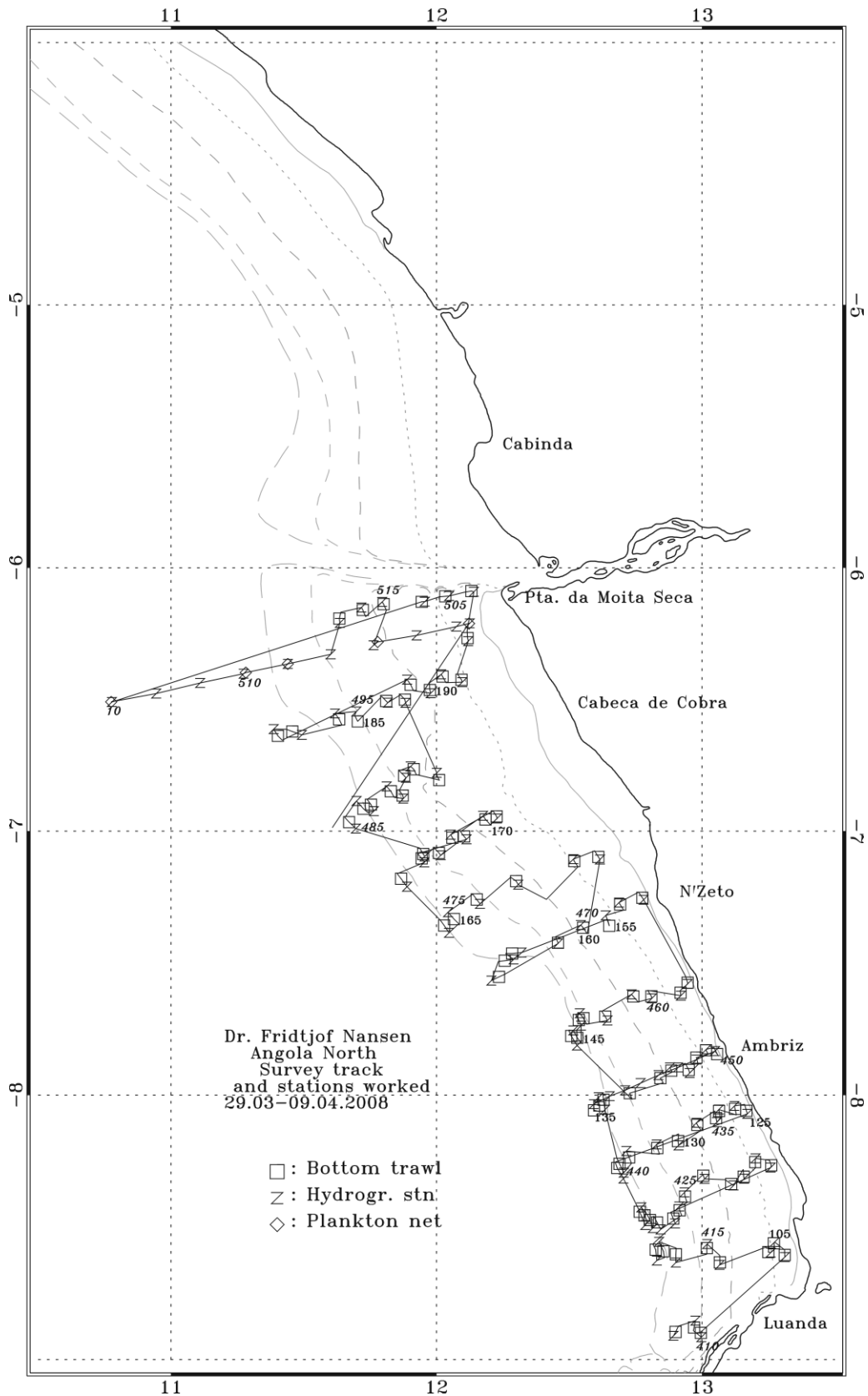


Figure 2.3 Angola north: Luanda - Congo River. Course track with trawl stations, plankton and hydrographic transects. Hydrographic stations were also taken at every fishing station. Depth contours at 20, 50, 100, 200 and 500 m.

2.2 Meteorological and hydrographic sampling

Hydrographic transects modify as recommended by INIP are shown in the table below:

Transects	Classification	Number of stations	
		BEFORE	NOW
CUNENE	STANDARD INIP TRANSECT	8	8
BAIA DOS TIGRES	STANDARD INIP TRANSECT	3	3
PTA ALBINA	STANDARD INIP TRANSECT	5	5
NAMIBE	INIP MONITORING TRANSECT	8	8
CABO DE SANTA MARTA	STANDARD INIP TRANSECT	11	11
LOBITO	INIP MONITORING TRANSECT	11	9
CABEÇA DE BALEIA	STANDARD INIP TRANSECT	5	5
PONTA DO MORRO	STANDARD INIP TRANSECT	9	9
CABO LEDO	STANDARD INIP TRANSECT	4	4
CABO SÃO BRAZ	STANDARD INIP TRANSECT	5	5
PTA DAS PALMEIRINHAS	INIP MONITORING TRANSECT	9	7
AMBRIZ	STANDARD INIP TRANSECT	11	11
NZETO	STANDARD INIP TRANSECT	8	8
CABEÇA DE COBRA	STANDARD INIP TRANSECT	10	10
PTA DA MOITA SECA	INIP MONITORING TRANSECT	13	10

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 at all trawl stations. Calibration of the oxygen sensor was carried out but the data were considered unreliable. It was thus decided to use the calibration data from February 2008 (survey 2008401) The calibration formula used was:

$$cOx_{winkler} = 1.04 \pm 0.01 cOx_{CTD} + 0.031 \pm 0.03, \quad R^2 = 0.99$$

Meteorological observations including wind direction and speed, air temperature, global radiation and sea surface temperature (SST) were automatically logged using an Aanderaa 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. New, and heavier Thyborøn doors than last year, were used (see Annex VII). 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 130 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 echosounder. Acoustic data were not processed on board, but all data were stored to files using the EchoLog (SonarData). 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. The nets (180 μm) were remotely opened from the bridge of the vessel. The depth intervals covered were 200 - 150 m, 150 -100 m, 100 -75 m, 75 m-50 m and from 50 m to the surface. In the case of stations shallower than 50 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 flowmeter inside the net was used to estimate the sampling volume. The samples were preserved in formalin 4% to be taken to the INIP for further analysis.

Phytoplankton

Phytoplankton samples were taken at each CTD station of the Angola monitoring lines at seven different standard levels. They were defined as follows: 5 m, 25 m, 50 m, 75 m, 100 m, 150 and 200 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: $\text{S}17^{\circ}14'$ - $\text{S}16^{\circ}00'$), the central region (Benguela-Luanda: $\text{S}12^{\circ}40'$ - $\text{S}09^{\circ}00'$), and the northern region (Luanda-Congo River: $\text{S}09^{\circ}00'$ - $\text{S}06^{\circ}00'$) by depth strata. These strata are used to calculate the swept-area biomass estimates. All valid samples 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 hydrographic 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. No salinity decrease has been observed off the southern Angola (15–17°S), except of one survey conducted during the anomalous “Benguela Niño” event in February-March 1995.

The horizontal distributions of temperature and salinity in the southern region (March 2008) are depicted in Figures 3.1 – 3.2. The temperature varied between 17–24°C and the salinity was about 35.4–36.0. The temperature off Cunene and Baía dos Tigres was approx. 10 degrees colder in 2008 in comparison with last year; further north the differences were smaller. This gradual and steady increase of temperature from the coast to offshore (17°C–23°C) with a $\Delta T = 4^\circ\text{C}$ was probably due to the seasonal coastal upwelling occurring in this area. The salinity (35.4) also featured the upwelled cold water inshore compared to the surrounding waters with higher salinity (35.9–36). The temperature and salinity distributions indicate the typically features of the presence of the Angola-Benguela Front (ABF).

The horizontal distributions of temperature and salinity in the central region are shown in Figures 3.3 – 3.4. Temperature varies between 25–29°C in the whole region. The salinity values were normal in the whole region and ranged between 34.8 – 35.9, increasing offshore.

In the northern region the temperature was low inshore, around the mouth of the Congo River (about 24.4°C), while the offshore surface water temperature was between 28.5 and 29°C (Figures 3.5 – 3.6). Inshore waters presented very low salinity values, especially around the river’s mouth (29) and increasing at the same latitude to 33 further offshore (Figure 3.6). The river’s plume was observed down to 8.5°S with a salinity of 33.5, while further south there was no sign of freshwater.

Because of high density of oil rigs, supply and seismic vessels, the transect off Pta. De Moita Seca was moved 7 NM south, parallel to the former transect.

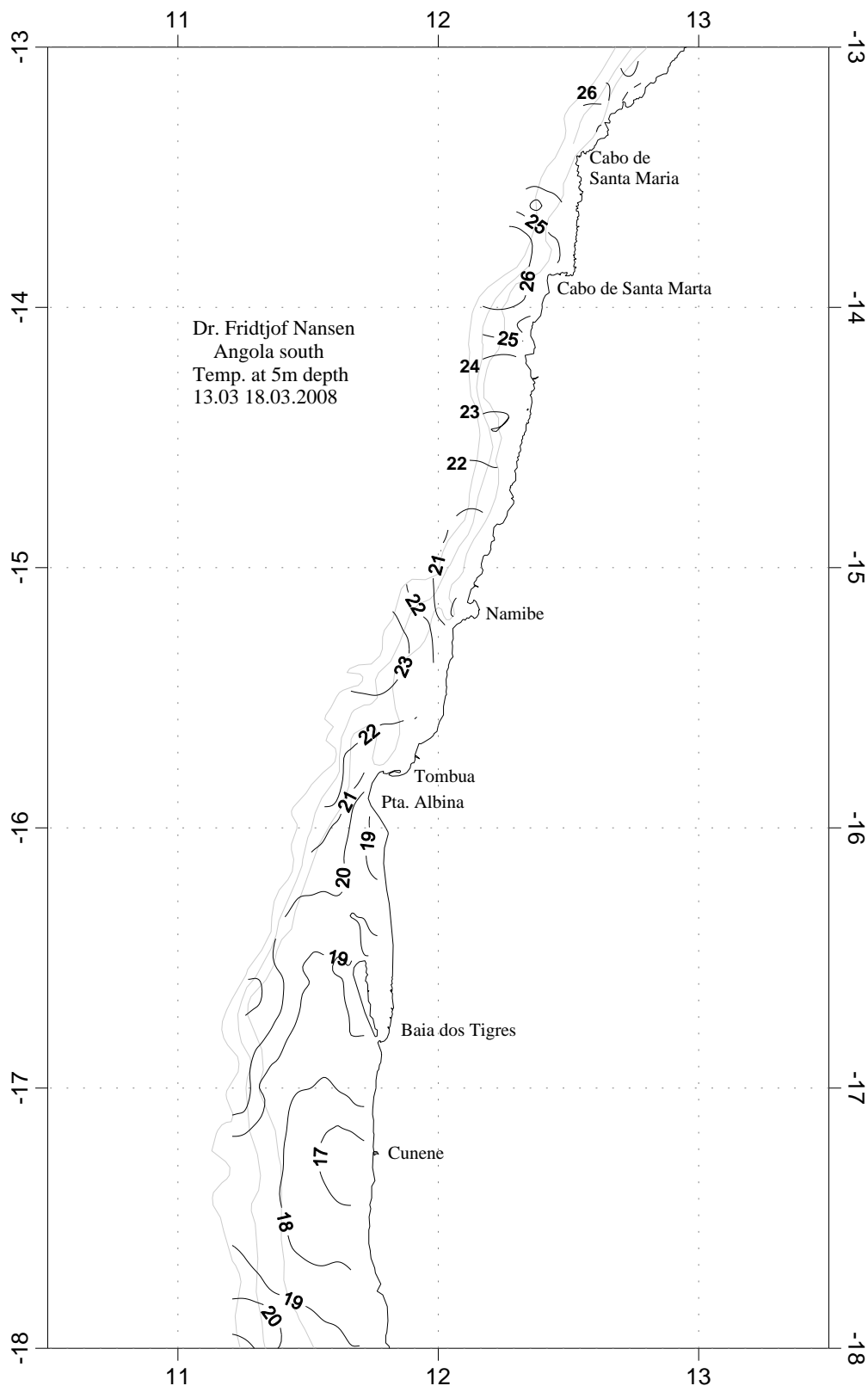


Figure 3.1 Angola south. Horizontal distribution of surface temperatures (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

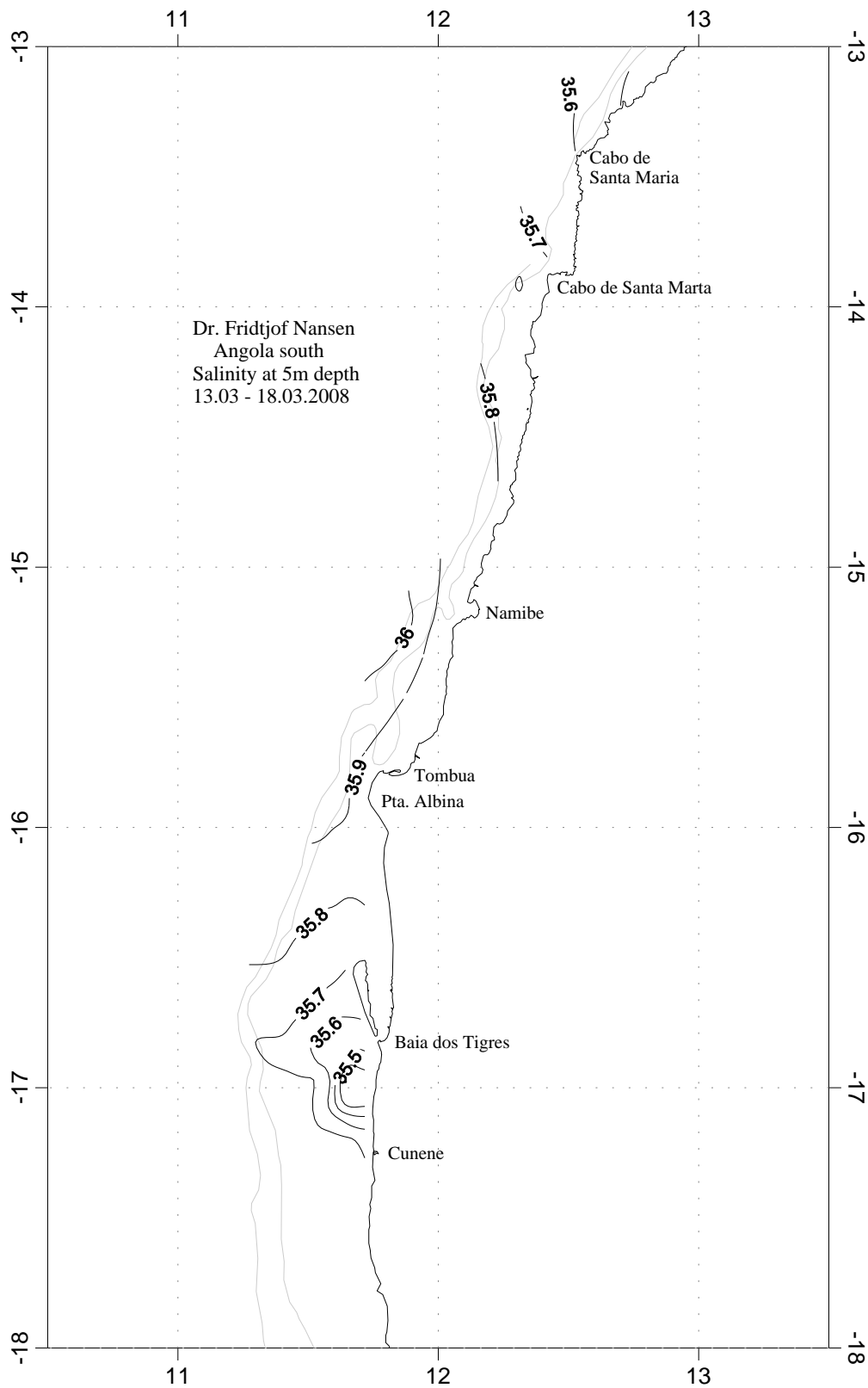


Figure 3.2 Angola south. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

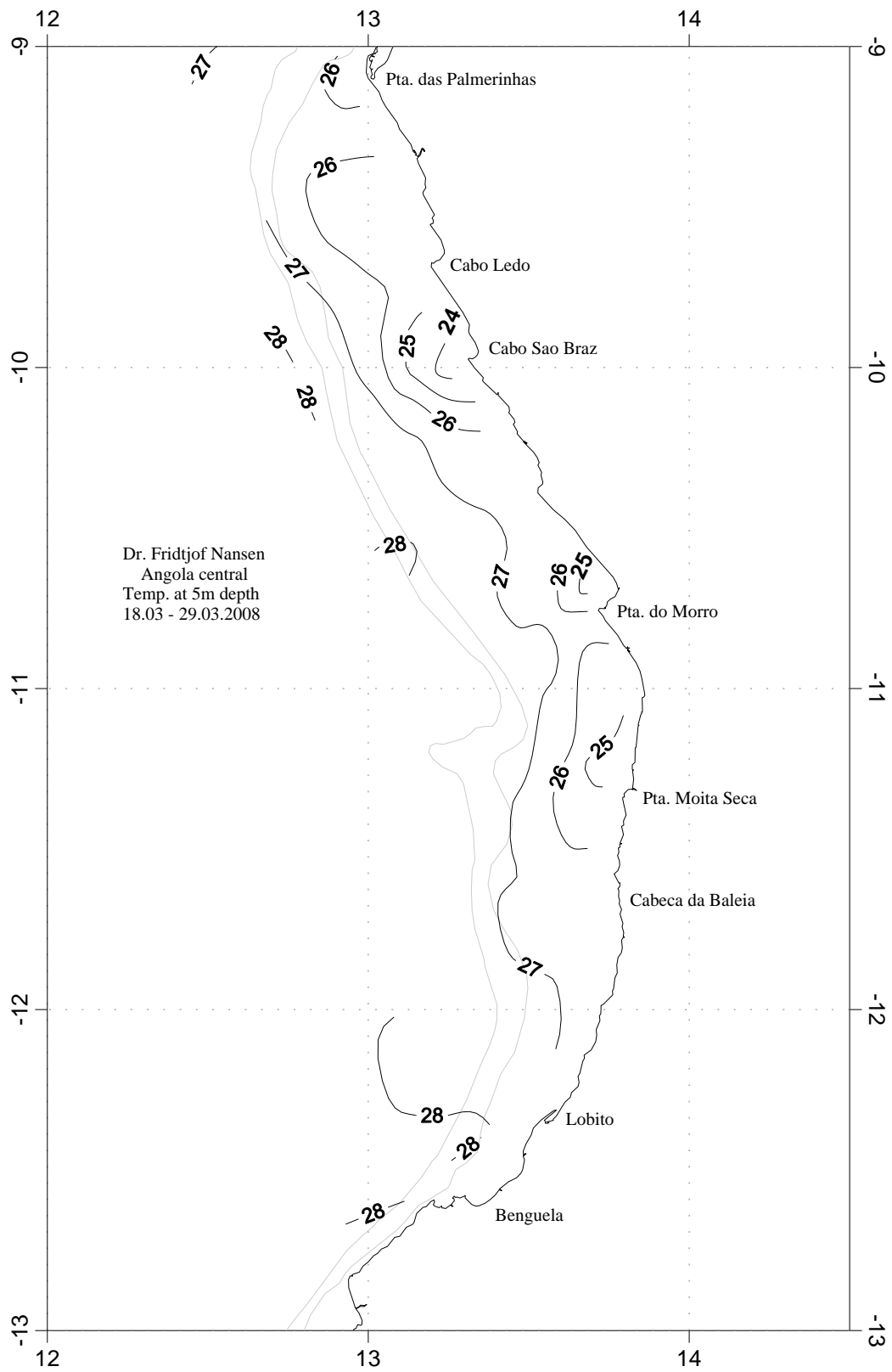


Figure 3.3 Angola central. Horizontal distribution of surface temperatures (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

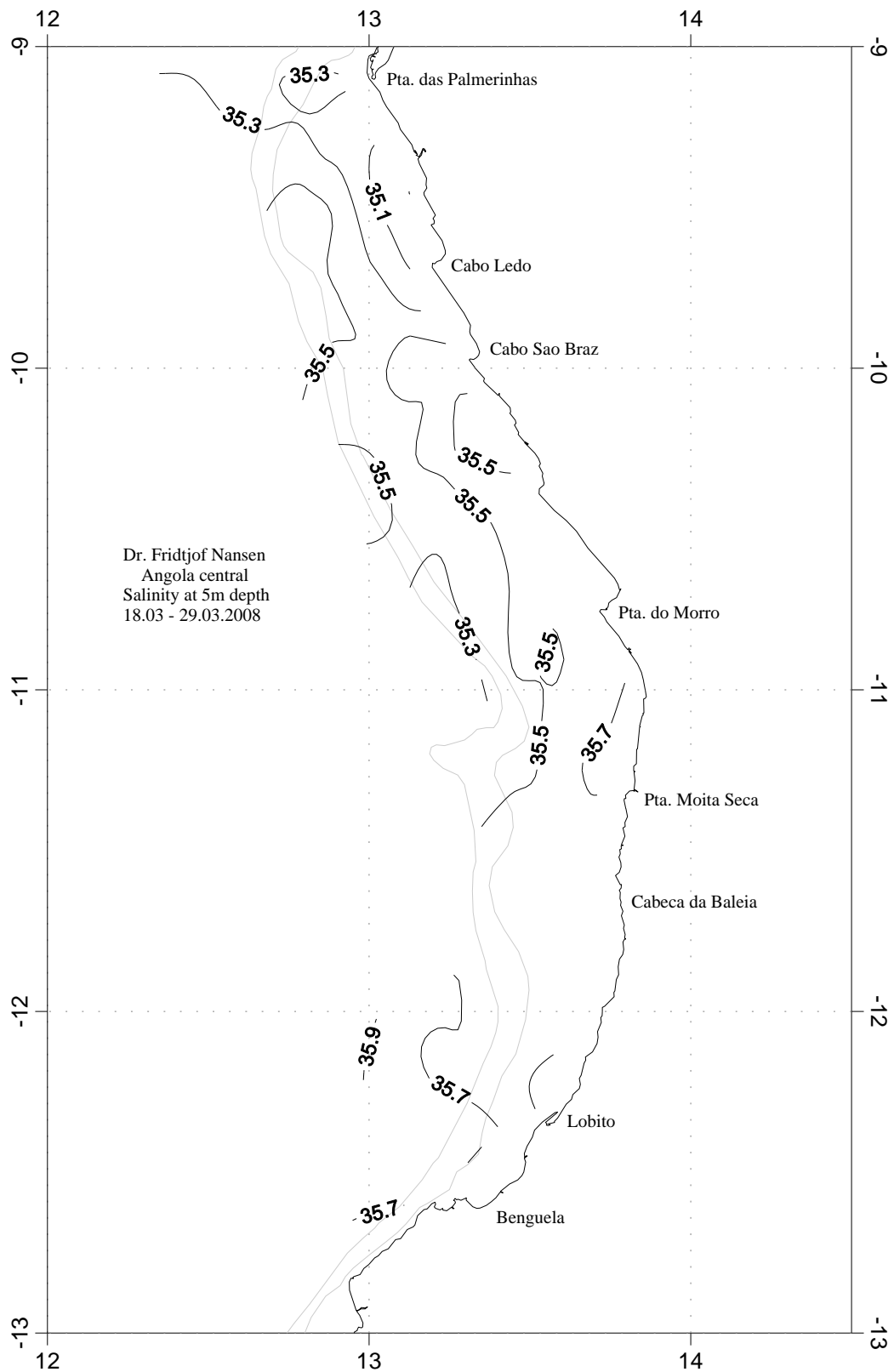


Figure 3.4 Angola central. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

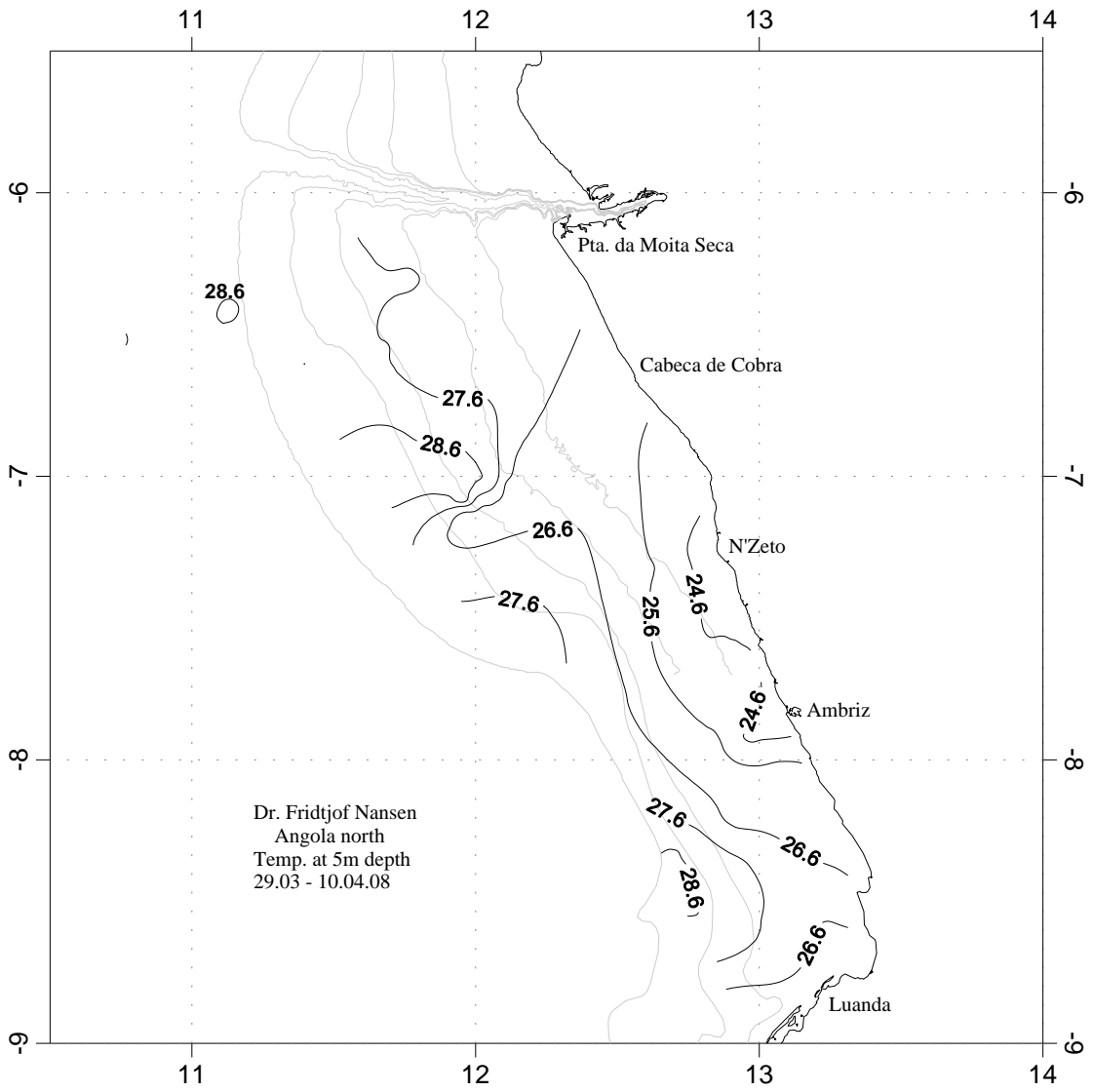


Figure 3.5 Angola north. Horizontal distribution of surface temperature (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m

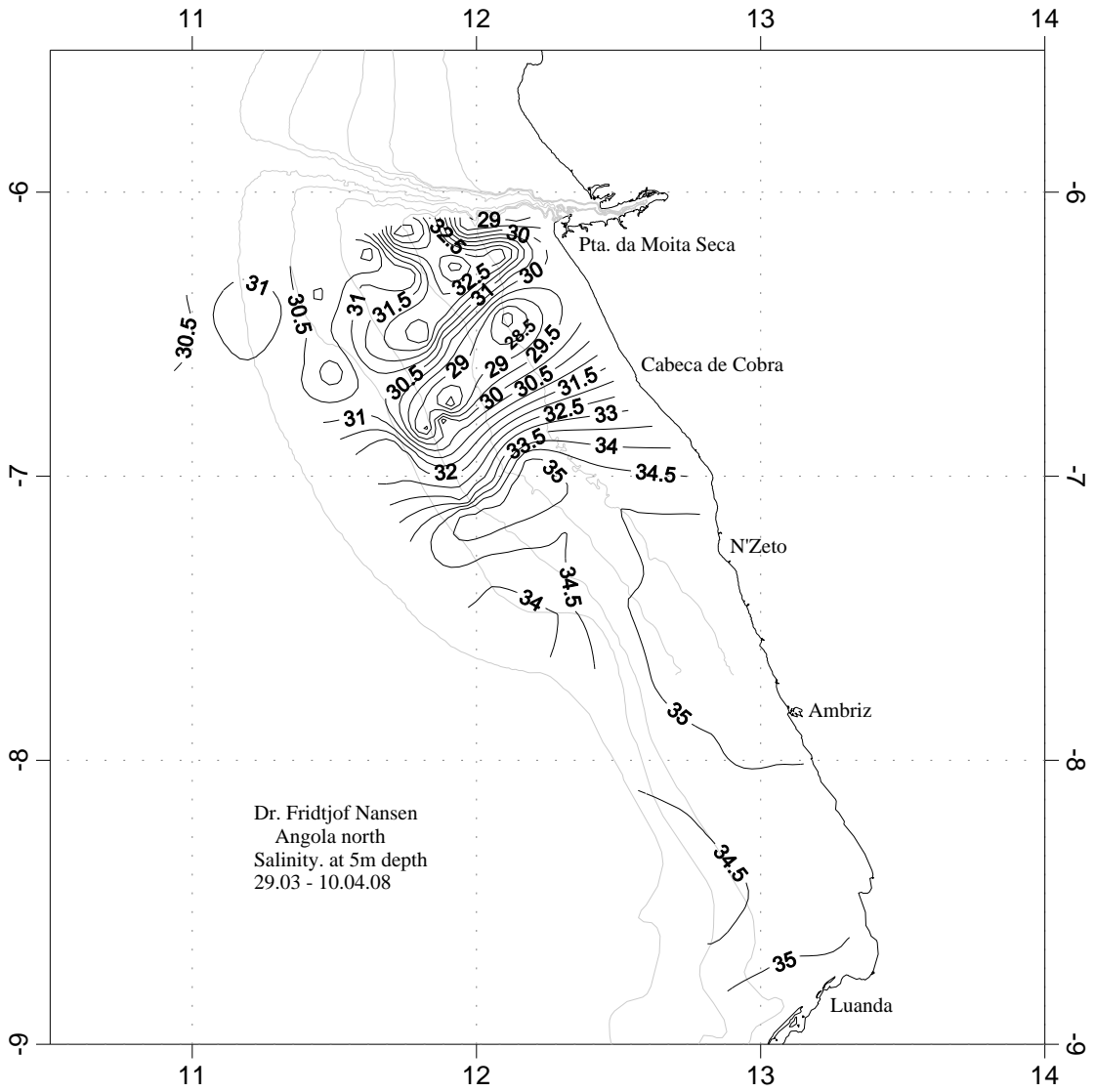


Figure 3.6 Angola north. Horizontal distribution of surface salinity (5 m depth). Depth contours at 20, 50, 100, 200, 500 and 1000 m

3.2 Vertical sections

The vertical transects off Baía dos Tigres, Pta. Albina, Namibe and Cabo de Santa Marta were taken in southern region (Figures 3.7-3.10). By mistake the Namibe transect was taken as a standard instead of as monitoring. In most of the southern transects, it was observed an increase of temperature, salinity and oxygen from the coast to offshore and a decrease with the depth. Off Baía dos Tigres surface temperatures were between 5 and 10°C lower than what was observed last year in the same transect. As reported earlier, this may indicate coastal upwelling.

Especially off Namibe, surface temperatures were lower (23°C) compared to other areas of Angola. It is believed that the origin of cold water off Namibe is due to the intrusion of the Benguela water. Meanwhile cold water observed in Namibe, does not feature high salinity (35.9-36.0). The stratification layer was well pronounced from the surface to below 100 m depth. The temperature in this layer varied between 27°C at the surface to 16°C at the edge of the layer. Salinity was lower at the coast (35.8) than in offshore (36.0) and decreased gradually with depth at the rate of 0.1 per 50m. The oxygen values decreased with depth, the maximum was observed at the surface (4-5 ml/l) and the lower (<1ml/l) below 200m depth.

Five transects were carried out in the central region (Salinas, Lobito, Pta. do Morro, São Braz and Pta. das Palmerinhas, Figures 3.11-3.15). Lobito transect was taken as an Angolan monitoring line. Temperature was high offshore (29 °C) and lower at the coast (27 °C). High stratification was observed in the upper layer with the thermocline at around 30 m. Salinity was very high at the surface (36.0) and decreases at the rate of 0.1 every 50 m depth. Off Lobito, Ponta de Morro and Ponta das Palmerinhas, salinity was between 35.8 and 35.9. Oxygen was around 4 ml/l at the surface reaching a minimum at 100m depth.

The surface temperature in Palmerinhas was between 27°C to 29°C, and decreased to below 8°C at depths below 400 m. The surface salinity was generally high (about 35.8), the upper layers were well stratified and the halocline was located at 25 m depth.

The vertical sections off Ambriz and Pta. da Moita Seca were taken in the northern region (Figures 3.16-3.17). The temperature profile off Ambriz is highly stratified. Surface temperature was around 26°C. Salinity was lower at the surface (35.0) compared to the lower layers (35.9). This low salinity at the surface shows the extension of the Congo River's plume down to 8°30'S.

The profile off the Congo River (Pta. da Moita Seca, Figure 2.3) is one of the Monitoring Lines modified and updated according to regional requirements. The original thirteen stations were reduced to ten, and the transect was extended up to 2000 m depth.

Temperatures were low (25°C) near the coast and increased gradually offshore reaching 27°C. At the river's mouth salinity was 31.0. Salinity values of 33.0 were maintained offshore at the same latitude. Oxygen concentration was normal with 4 ml/l at the surface and the minimum (< 1ml/l) below 250 m depth.

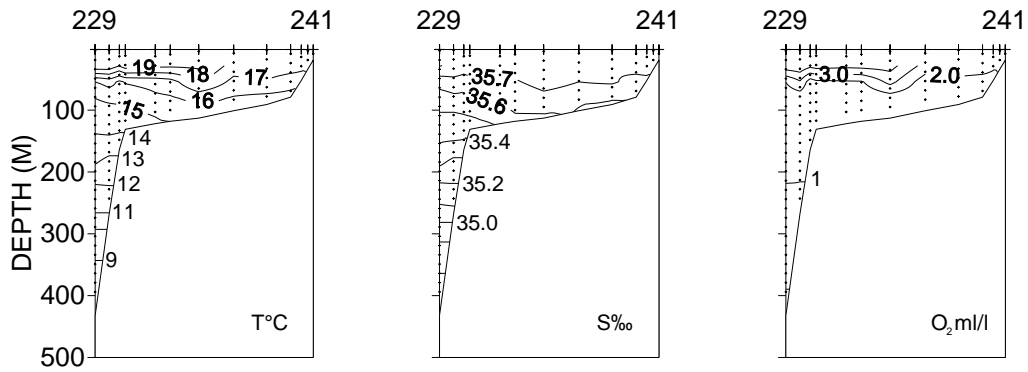


Figure 3.7 Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Baía dos Tigres.

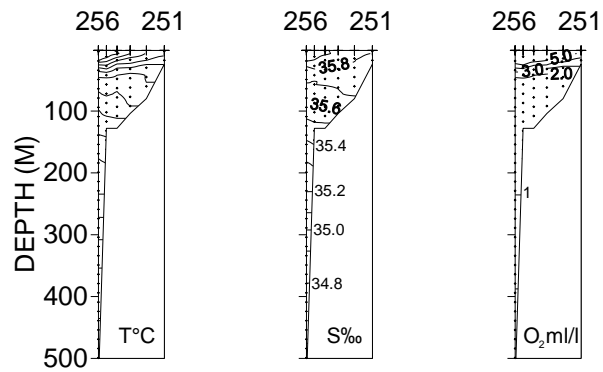


Figure 3.8 Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Pta. Albina.

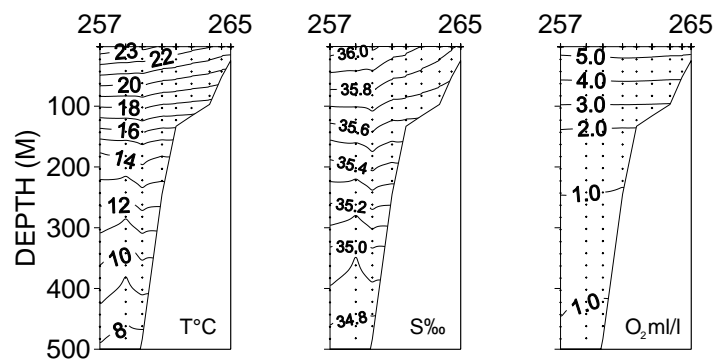


Figure 3.9 Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Namibe.

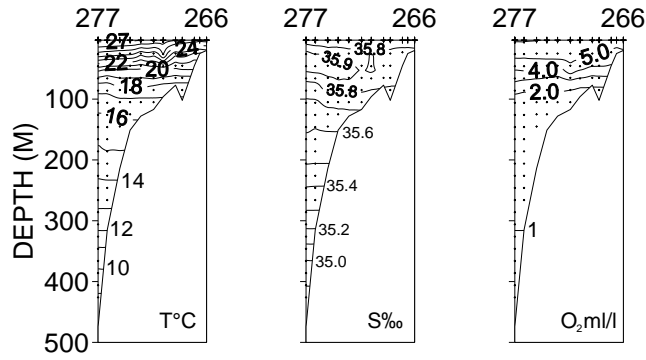


Figure 3.10 Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Cabo de Santa Marta.

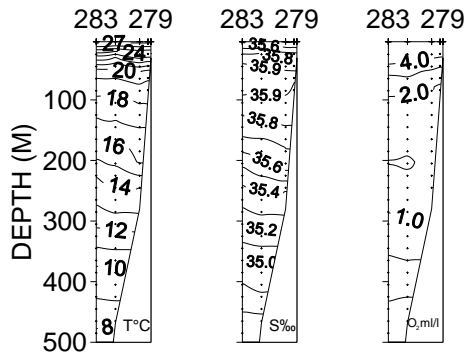


Figure 3.11 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Salinas.

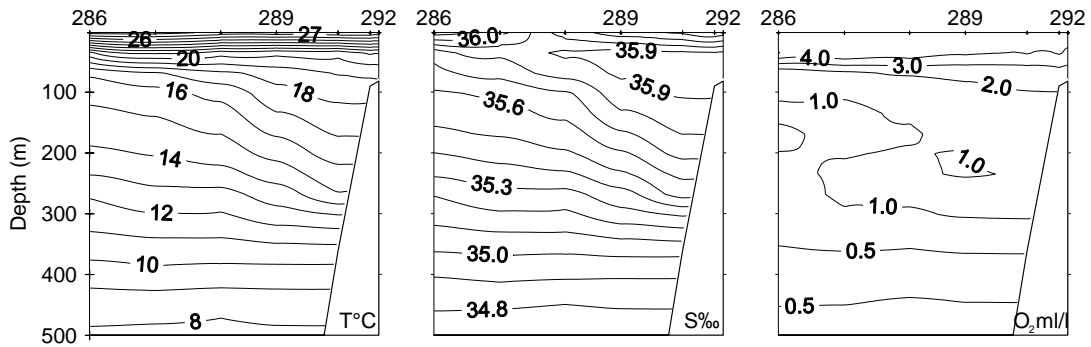


Figure 3.12 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Lobito.

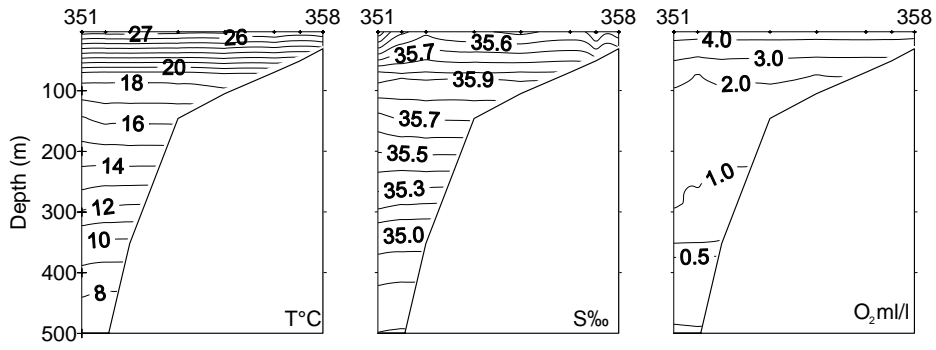


Figure 3.13 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Pta. do Morro.

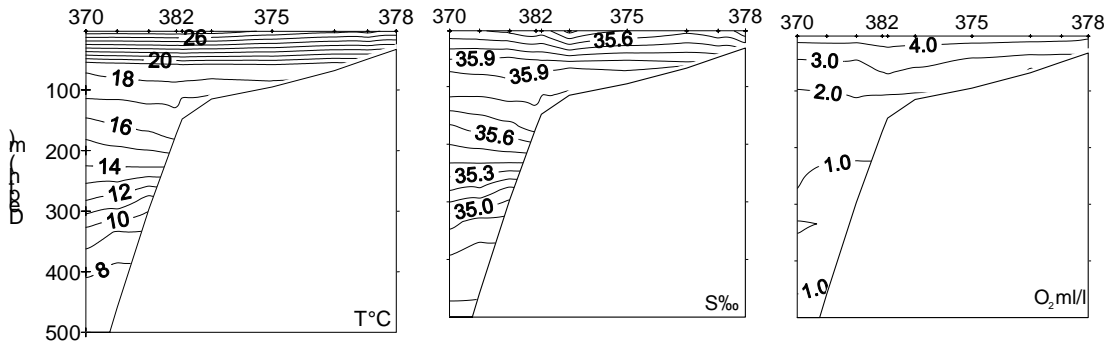


Figure 3.14 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at São Braz.

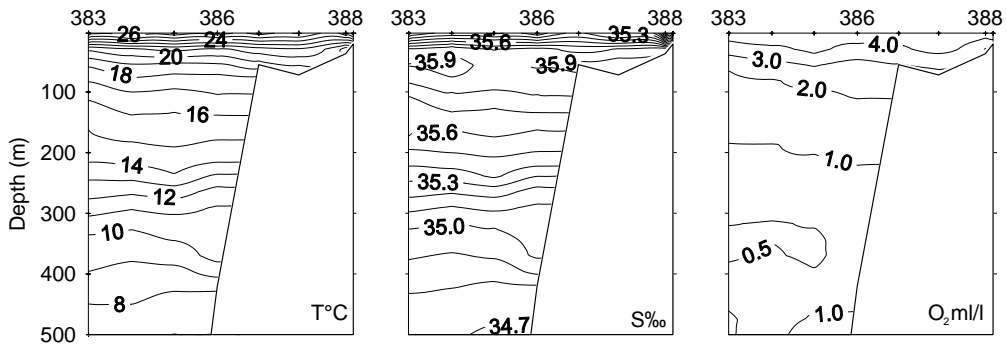


Figure 3.15 Angola central. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Pta. das Palmerinhas.

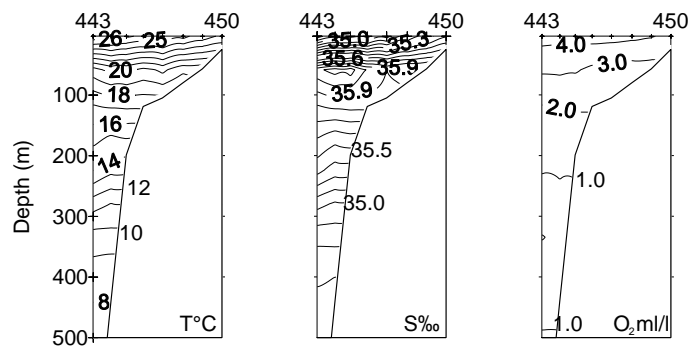


Figure 3.16 Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Ambriz.

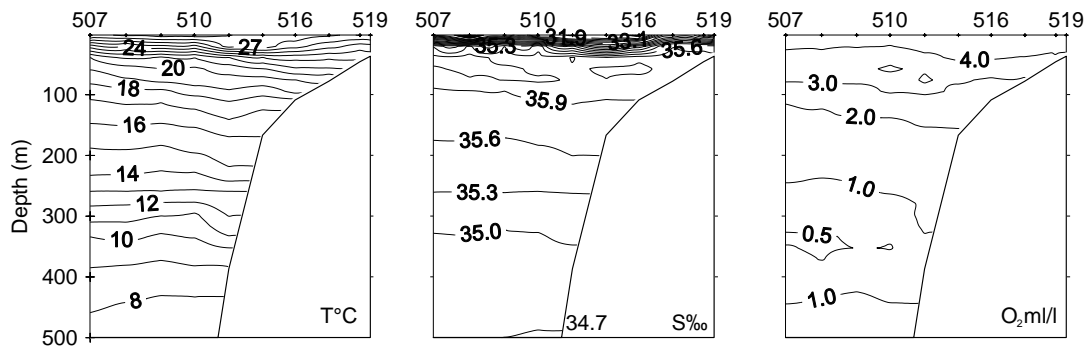


Figure 3.17 Angola north. Vertical sections of a) temperature, b) salinity and c) oxygen on the oceanographic transect at Pta. da Moita Seca.

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 to be from 71 to 200 m depth. Several of the species, which inhabit the shelf, particularly the seabreams (Sparidae), are also found in deeper waters. 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 sector region are shown in Annex II. Further, the mean densities (tonnes·n.mi.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 28 trawl stations were sampled on the southern shelf, where 26 were successfully accomplished. The southern region has not been regularly sampled throughout the years, except for the 2000 and 2003-2008 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 catch per hour on the inner shelf was 2 864 kg/hour and 7 328 kg/hour on the outer shelf (Annex VI). The 'pelagic' group dominated on the shelf with 34% and 90% of the mean catch rates on the inner and outer shelf, respectively. The mean catch rates of the 'demersal' group were respectively 76 and 312 kg/hour on the inner and outer shelf. Shrimps were only caught in low numbers at one station on the outer shelf, and the average mean catch rates of the cephalopods and sharks were 70 and 1 kg/hour on the inner shelf, and 60 and 8 kg/hour on the outer shelf, respectively. The "other" group contributed to 61% of the average mean catch rate on the inner shelf and 5% on the outer shelf. The high proportion of "other" on the inner shelf was caused by one large haul of Jellyfish. Seabreams (except *Boops boops*) was the most abundant demersal group, and was caught in most of the stations on the shelf. The average catch rate of seabreams on the inner shelf was 70 kg/hour and 249 kg/hour on the outer shelf. *Dentex macrophthalmus* was the dominating seabream. The average catch rates of croakers (mainly *Umbrina canariensis*) on the inner and outer shelf were 5 and 9 kg/hour. No grunts 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 (*Trachurus capensis* and *T. trecae*), was by far the most abundant group with an average catch rate of 954 kg/hour. The average catch rate of the carangids on the outer shelf was 6 572 kg/hour.

Biomass estimates

Table 4.1 shows the time series from 1985 to 2008 of swept-area biomass estimates for commercial species in the southern region. The biomass estimates were calculated by stratifying by 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 2008 was 216 000 tonnes, which is the highest estimate since 2004 and the estimate is doubled since last year. However, the swept-area estimates of the pelagic stocks are unreliable as the bottom trawl is only catching fish close to the seabed. In 2005, the *T. trecae* contributed to less than 1% of the horse mackerel biomass estimate on the southern shelf and to 31 and 67%, respectively, in 2003 and 2004. The contribution of *T. trecae* was 93% in 2007 and 78% in 2008 of the horse mackerel biomass. Small fish (<25 cm) dominated the horse mackerel catches and a large proportion of this was juveniles.

The seabream biomass estimate was about 9 150 tonnes and 80% of this was *Dentex macrophthalmus*. This is a marked decrease from last year, and the lowest in the time series.

The biomass estimate of hake (*Merluccius capensis* and *M. polli*) was 1 700 tonnes. No Benguela hake (*M. polli*) was caught in the southern region during the 2005 survey, while it contributed to about 65% of the biomass in 2008. The hake abundance has declined annually since 2003, and the 2008 estimate is the lowest observed since 1989.

The biomass estimate of the cephalopods in 2008 was 3 250 tonnes, which is more than two times the estimate of 1 450 tonnes in 2007. This is the highest estimate since 1989. It is mainly a considerable increase in the biomass of the Sepiidae, which contribute to the increase in the biomass of cephalopods.

During the last years surveys the biomasses of the croakers have varied considerably between surveys. Therefore, no clear trend in the time series can be seen. However, the 2008 estimate of 400 tonnes is a large decrease from last year's estimate of 4 200 tonnes and it is the lowest in the time series. The estimates of *Umbrina canariensis*, which is one of the most important croakers, also show large annual variation and there is no evident trend in the time series.

The biomass estimate of sharks (includes Chimaeriformes) in 2008 was about 300 tonnes which is a considerable reduction from last years estimate and there has been a decreasing trend since 2006. The 2008 estimate is one of the lowest in the time series.

The biomass estimates of the pelagic species groups are unreliable, as the bottom trawl is not a very suitable sample tool for these groups. However, the 2008 biomass estimates of clupeids and scombrids 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. Similar, the fluctuations in the hairtails biomass estimates over time are unlikely to represent a reliable reflection of changes in the stock. The biomass trend of the carangids is reflected in the horse mackerel time series as no other carangid species was caught in the southern region in 2008.

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	Horsemackerel	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
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)

	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)

Distribution

Figure 4.1 shows the distribution of seabreams in the southern survey area. The seabream distribution covered most of survey area shallower than 300 m, and the highest concentrations were scattered throughout the whole distribution area between Cunene River and Baía dos Tigres.

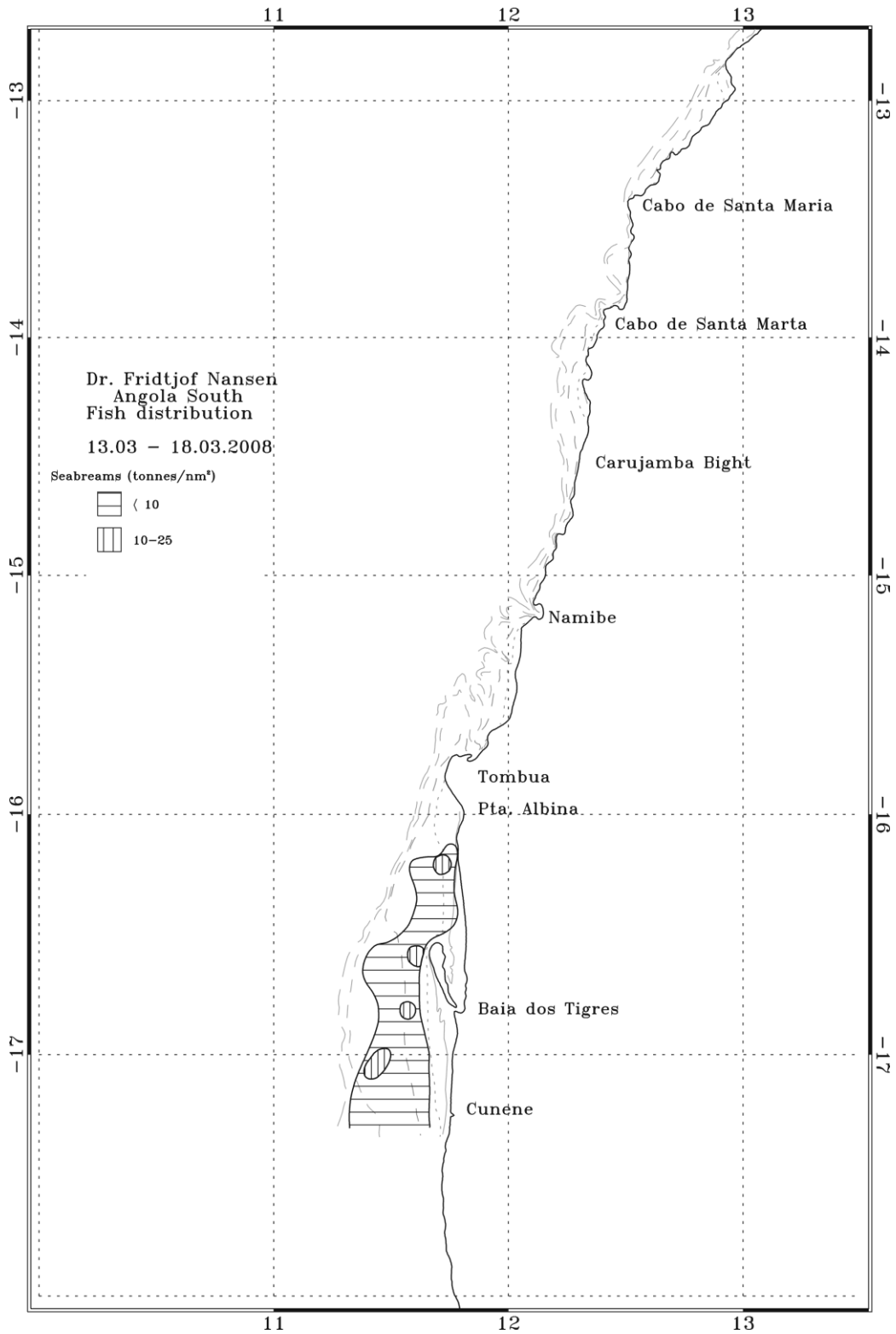


Figure 4.1 Distribution of seabreams (family Sparidae) in the southern region, Cunene-Tombua. Depth contours at 20, 50, 100 and 200 m.

4.2 Benguela - Luanda shelf

The central region of Angolan waters is from Benguela to Luanda. A total of 72 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 607kg/hour and 415 kg/hour on the outer shelf (Annex VI). The 'demersal' group contributed to 58% of the mean catch rate on the inner shelf and the 'pelagic' group to 25%. Shrimps contributed to less than 1% in the inner shelf, and the cephalopods and the sharks contributed each to 1 % and less of the total average catch rate. Demersal fish were also more abundant than pelagic fish on the outer shelf contributing to 52% of the average catch rate, whilst the 'pelagic' group contributed to 14%. Shrimps contributed to 1% in the outer shelf, and sharks and cephalopods contributed to less than 1% and 3%, respectively. Seabreams (except *Boops boops*) were caught in most of the trawl stations on the shelf, and the average catch rates were 29 and 52 kg/hour on the inner and outer shelf, respectively. The most common seabream species were *D. macrophthalmus*, *D. angolensis*, *Pagellus bellottii*, *D. canariensis* and *D. barnardi*. Snappers were only caught in one station on the inner shelf, but groupers were frequently caught on the inner shelf with an average catch rate of 3 kg/hour. It was not caught on the outer shelf. Similar, the grunts (*Pomadys incisus* and *P. rogeri*) were often caught on the inner shelf but only found in the shallow part of the outer shelf. The average catch rate of grunts on the inner shelf was 82 kg/hour. Croakers, mainly *Umbrina canariensis*, were frequently caught on both the inner and outer shelf, and the average catch rates were 41 and 23 kg/hour, respectively. The most common pelagic groups on the inner shelf were clupeids, carangids, hairtails and barracudas and the average catch rates of these groups were 16, 58, 52 and 20 kg/hour, respectively. The average catch rates of the same species groups on the outer shelf were 0.3, 28, 28 and 0.1 kg/hour, respectively.

Biomass estimates

Table 4.2 shows the time series from 1985 to 2008 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. Although the small improvement from 2005 to 2006 of 7 137 and 9 622 tonnes respectively, the 2008 estimate of 3 703 tonnes is 50% lower than the estimate of 7 600 tonnes registered in 2007. The 2008 estimate is the lowest of the time series since 1985.

North of Benguela, *M. polli* was the only hake species caught, and the 2008 estimate of 22 tonnes was 60% lower than the 2007 estimate of 55 tonnes. 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. In 1991-2002 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. This is among the lowest estimates in the time series. All the recent estimates are lower than the 2002 estimate of 22 200 tonnes. In the survey from 1991-2 to 2002, the estimated biomass of *Dentex macrophthalmus* made 30-77 % (mean 58%) of the total seabreams estimate, but has contributed to less than 40% (mean 21%) in the 2003-2008 estimates. The biomass of *D. angolensis* has been relatively stable and fluctuated between 1 000 and 2 000 tonnes in recent years. Nevertheless, the biomass of *D. angolensis* decreased from 1 900 tonnes in 2006 to about 1 100 tonnes in 2008. 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. *Umbrina canariensis* is the most abundant croaker, and contributed to about 49% of the total croakers biomass.

The 2008 biomass estimate of grunts (*Pomadasyus incisus*, *P. jubelini* and *P. peroteti*) was 5 900 tonnes. This value was lower than what was estimated in 2007 (9 200 tonnes), the highest in the time series. However, the estimates have varied considerably 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 seldom found on the outer shelf, and as the high CVs indicate the biomass estimates 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* in 2008 was 230 tonnes, which is a large increase from the 2007 estimate of 36 tonnes. *P. longirostris* is mainly distributed in the deeper parts of the shelf and the slope.

The biomass estimate of Sepiidae was 38 tonnes in 2008, which is a large decrease from the 2007 estimate of 245 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 330 tonnes in 2008, which is a large increase from the 2007 estimate of 43 tonnes, the lowest estimate in the time series since 1996.

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 (0.16)	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)

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)

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)

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 with some higher concentrations off Benguela and Lobito.

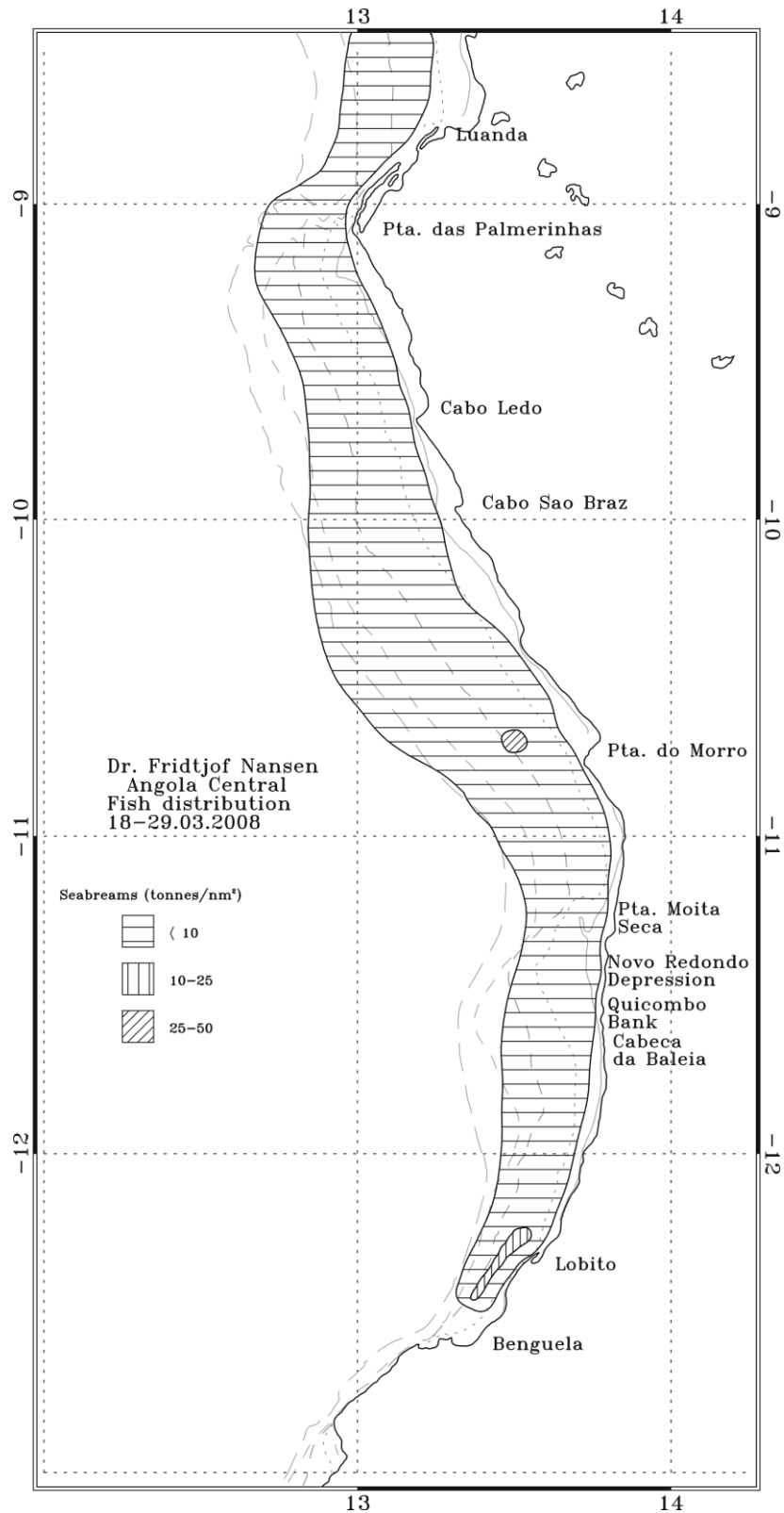


Figure 4.2 Distribution of seabreams (Sparidae) in the central region, Benguela – Luanda. Depth contours at 20, 50, 100, 200 and 500 m.

4.3 Luanda – Congo River shelf

The survey covered the northern region of Angolan waters from Luanda to Congo River. The area north of Congo River is inaccessible to fisheries surveys due to the restricted oil exploitation areas. During 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 59 successful swept-area trawl stations were accomplished on the shelf area in 2008 (Table 2.1).

The average catch per hour on the inner shelf was 1440 kg/hour and 340 kg/hour on the outer shelf (Annex VI). The ‘demersal’ group dominated on the inner shelf with an average catch rate of 920 kg/hour and a relative contribution of 64%. The ‘pelagic’ group contributed about 24%, shrimps and sharks to 0.3% each, while cephalopods to 0.5%. On the outer shelf, the demersal fish contributed to 47% of the mean catch rate and the ‘pelagic’ group to about 28%. 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 at the outer shelf and in about 79% of the stations at the inner shelf, and the average catch rates were 41 and 92 kg/hour on the inner and outer shelf, respectively. Snappers were only caught in one stations on the inner shelf and was not caught in the outer shelf. The catch rates of groupers were 6.4 and 1.6 kg/hour on the inner and outer shelf, respectively. The grunts (*Pomadasys 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 17 kg/hour, and 3.4 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 90 and 30 kg/hour, respectively. The most common pelagic groups on the inner shelf were clupeids, carangids, scombrids, hairtails and barracudas and the average catch rates of these groups were 29, 232, 1.7, 40 and 6 kg/hour, respectively. The average catch rates of the same species groups on the outer shelf were 0.0, 18, 0.4, 74 and 0.3 kg/hour, respectively.

Biomass estimates

Table 4.3 shows swept-area biomass estimates from 1985 to 2008 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 1 938 tonnes in 2008, which is the lowest estimate of the biomass registered in the time series since 1996. In this interval of time, the highest estimates of 37 094 tonnes was registered in 1997.

In contrast with the 37 tonnes registered in 2007, *M. polli* was not caught on the northern shelf in 2008.

The 2008 biomass estimate of seabreams on the northern shelf was on the same level as in 2007, 12 800 tonnes, but is still considerably lower than the very high 2005 estimate of 18 300 tonnes which was the highest estimate since 1996. As in the previous years, *Dentex angolensis* is the dominating seabream species in the north and contributes to about 37% of

the total seabream estimate. The biomass of *Dentex macrophthalmus* is low in the northern region and contributes marginal to the total seabream estimate and in 2008 no *D. macrophthalmus* was caught in this region. Other important seabreams are *Pagellus bellottii*, *D. canariensis* and *D. barnardi*. The biomass estimate of croakers, mainly *Umbrina canariensis*, *Atractoscion aequidens* and *Pseudotolithus typus*, was 8 771 tonnes in 2008, which is considerably higher than last year and the highest biomass estimate since 1997. Generally, *Umbrina canariensis* dominates the croakers and in 2008 this species contributes to 36% of the total estimate of croakers.

The biomass estimate of grunts (*Pomadasyss incisus*, *P. jubelini* and *P. peroteti*) was 1 485 tonnes in 2008, which is a dramatic decrease from the estimate in 2007 of 7 966 tonnes. However, a fluctuating trend is observed during the 4 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, with a slightly increasing trend the last 3 years.

The biomass estimate of *P. longirostris* in 2008 was 40 tonnes on the northern shelf, which is lower in relation to 2006 and 2007, but still higher than the 2005 estimate of only 5 tonnes. Further investigations are needed to explain the large variation in biomass of *P. longirostris* between surveys.

The 2008 biomass estimate of Sepiidae was 268 tonnes and is considerably higher than the 2006 estimate of 94 tonnes. Although the fluctuating trend of the biomass since 1999, the abundance of Sepiidae is low on the northern shelf.

The biomass estimate of Ommastrephidae increased to 226 tonnes in 2008, from a very low level in 2007, which 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.

Distribution

Seabreams were distributed on the whole northern shelf (Figure 4.3). The densities were <10 tonnes/NM² along all the area of distribution.

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	Scomberids
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)	1 077 (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 (0.63)	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)

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)

Survey	Ommastrephidae	Sepiidae	D.macrophthalmus	D.angolensis	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)

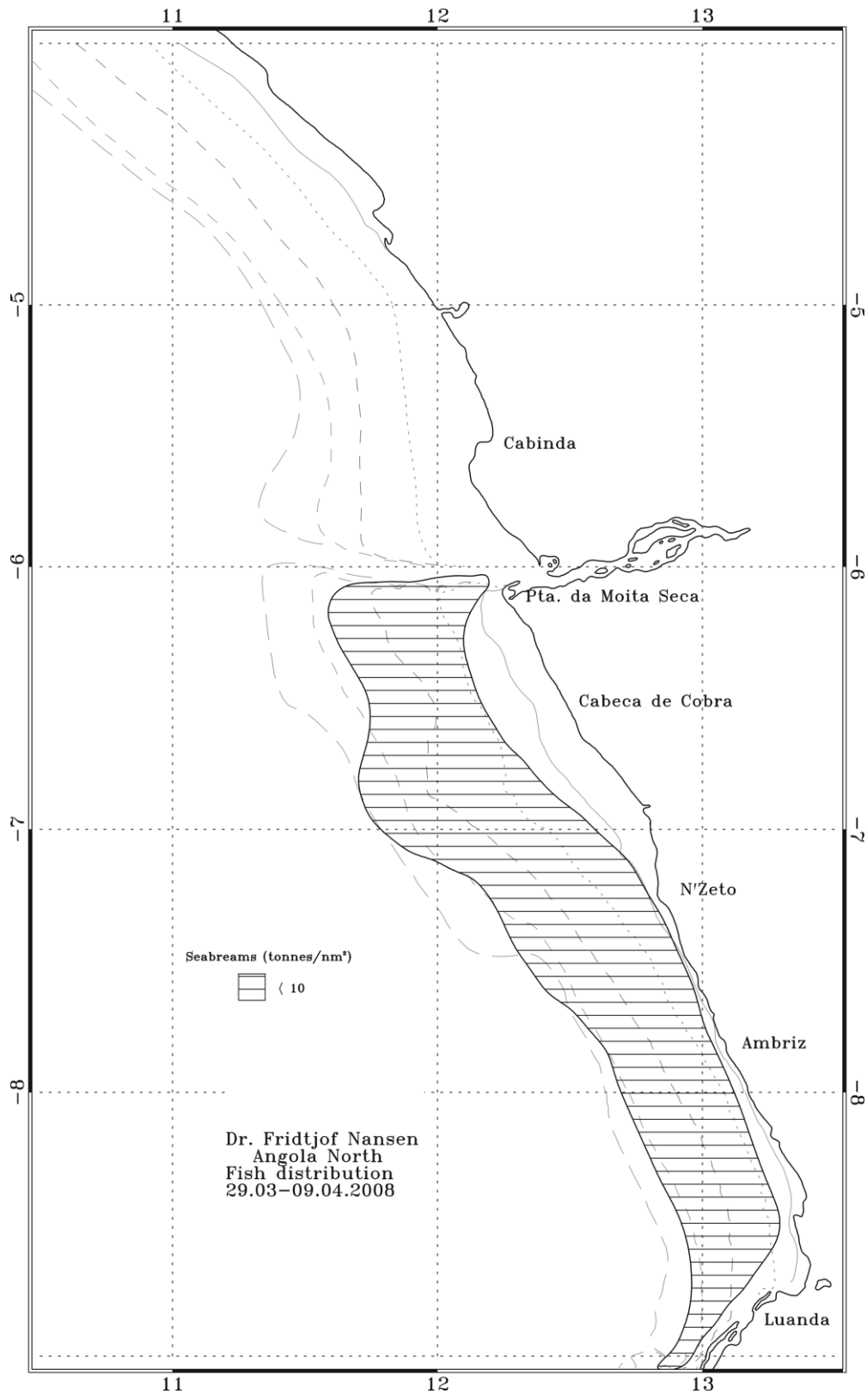


Figure 4.3 Distribution of seabreams (Sparidae) in the northern region, Luanda-Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

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

The slope is in the report defined to be between 201 and 800 m bottom depth. The trawl positions are mapped in Figures 2.1–2.3, and 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 realized on the southern slope in the depths between 200 and 800 meters (Annex VI). The average catch per hour was 2 175 kg/hour, and the ‘demersal’ and ‘pelagic’ groups contributed to 4% and 2%, respectively. The “other” group (non-commercial species) dominated the catches and contributed to 92% of the mean catch rate. Cephalopods, shrimps and sharks contributed to between 1 and 2%. Seabreams were only caught in one trawl haul and this catch contributed to less than 1% of the mean catch of the slope area. Hake (*Merluccius spp.*) was caught at all five stations with an average catch rate of 66 kg/hour. *Aristeus varidens* was found in four of the stations and the mean catch was 14 kg/hour.

Table 5.1 shows the time series from 1986 to 2008 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. Therefore, no stratifying by depth is done for the data. Further, only stations in the depth range 200-600m are included in the biomass estimates, and in 2008 as in 2007, just one station was successfully carried out between 200 and 600 meters. The 2008 biomass estimates are therefore not reliable.

The biomass estimates of hake have fluctuated since 2000 (Table 5.1). The 2008 estimate was down from 2007 and with exception of 2005, which was very low, there has been a downward trend in the biomass of hake in the southern area. 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 2008 there were catches of seabreams, commercially important shrimp species, horse mackerel, and cephalopods on the southern slope (200-600 m), and the biomass estimates were 230, 280, 560 and 9 tonnes, respectively. However, as earlier mentioned these estimates are highly unreliable for the reason that there was only one haul which was the basis for these 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)

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 Baía Dos Tigres. The distribution area is somewhat smaller than in 2007.

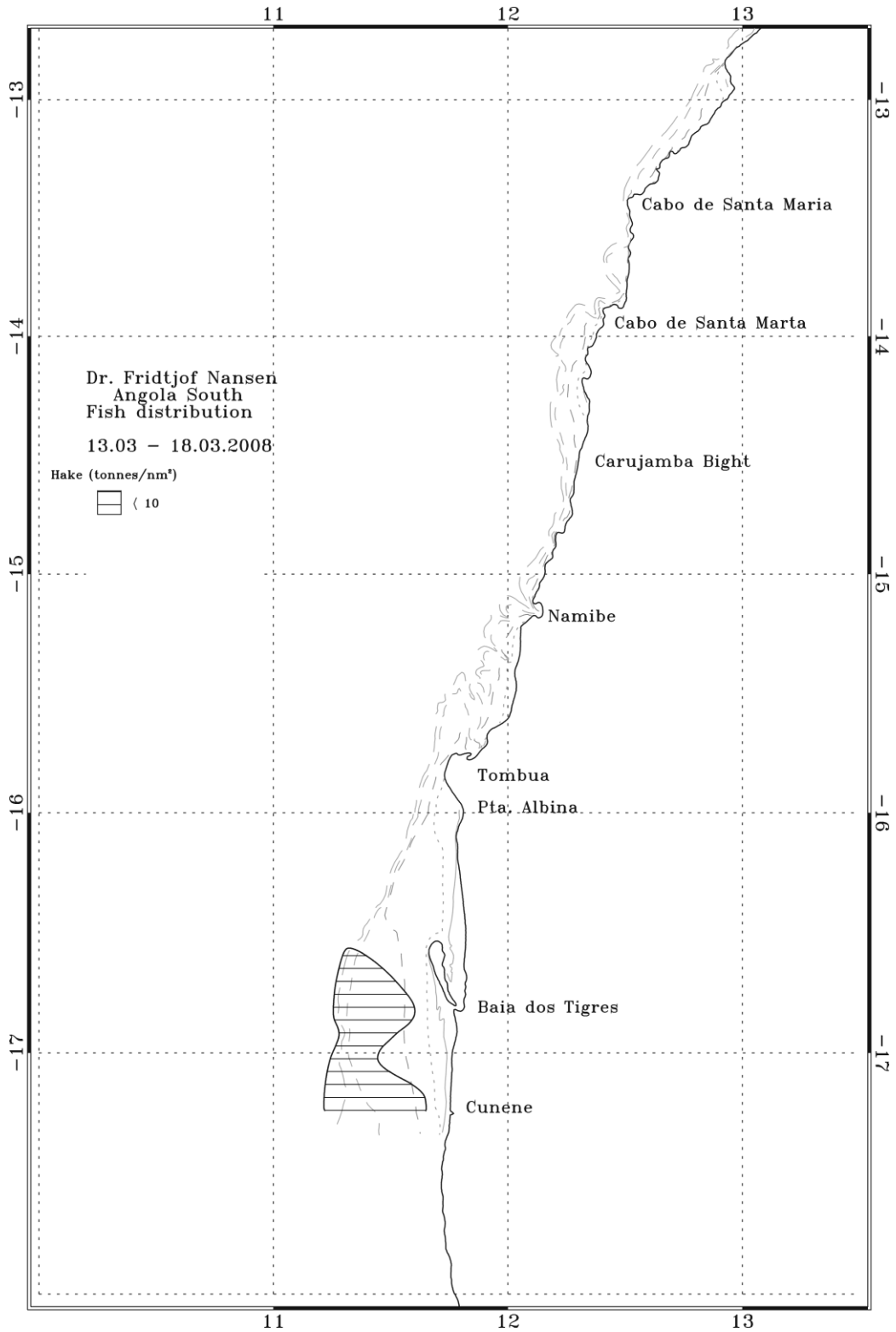


Figure 5.1 Distribution of hake (*Merluccius spp.*) in the southern region, Cunene - Tombua. Depth contours at 20, 50, 100 and 200 m.

5.2 Benguela – Luanda slope

The central region of Angolan waters is from Benguela to Luanda, and a total of 23 successful swept-area trawl stations were accomplished on the central slope (Table 2.1).

The average catch rate on the slope was 463 kg/hour (Annex VI). The ‘demersal’ group contributed to 25% of the mean catch rate and the ‘pelagic’ group to 2%, the shrimps contributed to 20%, while cephalopods and sharks contributed to 1 and 2%, respectively. The “other” group dominated the catches and contributed to 51% of the total mean catch rate. *M. polli* was caught in almost every station on the central slope and the average catch rate was 92.1 kg/hour. The average catch rate of seabreams was 13.2 kg/hour, but the group was only caught at two stations with *D. macrophthalmus* and *D. angolensis* as the only seabreams. The averages catch rates of the three shrimp species *P. longirostris*, *A. varidens* and *Nematocarcinus africana* were respectively 3.8, 13.4 and 72 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 done 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 2008 biomass estimate of hake was 6 000 tonnes, that is 1 000 tonnes lower than the 2007 biomass estimate of 7 000 tonnes, which was almost identical to the 2006 estimate. In 2004, the estimate of *M. polli* was 16 100 tonnes, but decreased with 37% from 2004 to 2005, and further with 30% from 2005 to 2006. The reasons of these reductions in biomass are not clear, but the large decline is of concern.

Seabreams were only found in a few stations in the shallow area of the slope (<280m). Thus care should be taken when comparing the biomass estimates of seabreams on the central slope. The 2008 estimate was 2 000 tonnes, 150% higher than the 2007 estimate of only about 800 tonnes. Both estimates were lower than the 2004 and 2005 estimates of 10 800 and 6 500 tonnes, respectively. As in previous surveys, the *D. macrophthalmus* was the most abundant seabream species on the central slope.

P. longirostris is distributed in depths between 200 and 400 m, and the biomass has increased from 340 tonnes in 2002 to about 1 300 tonnes in 2006 on the central slope. In 2008, the biomass estimate was 400 tonnes, which is higher than the 2007 biomass estimate of 191 tonnes and indicates a substantial increase in the abundance. However, the high CV shows that the estimates are imprecise.

The 2008 biomass estimate of *A. varidens* was 880 tonnes, which is considerably larger than the 2007 estimate of 650 tonnes. The trends of the biomass estimates show a consecutive increase during the 3 last years, that may indicate a certain recovering of this resource after the high estimate of 790 tonnes in 2005.

In contrast to the two previous shrimp species, the *N. africana* is not commercially important. Nevertheless, the 2008 biomass estimate of 5 000 tonnes was lower than the 2007 estimate of 7 900 tonnes, the highest ever recorded. The survey time series shows that the 2008 estimate is lower than the 2004, 2005 and 2006 estimates of 6 200, 5 600 and 5 300 tonnes respectively.

The biomass estimate of Ommastrephidae on the central slope in 2008 was 140 tonnes. This was the same as estimated in 2007, but considerably smaller than the 2005 and 2006 estimates of 510 and 460 tonnes, respectively. The biomass increased from 2001 to 2006, but the huge decrease in 2007 and 2008 suggests that the present abundance is still relatively low.

Hairtails were mainly caught in the shallower areas of the slope. The 2008 biomass estimate was 760 tonnes, more than three times the 2007 estimate of 185 tonnes. Both biomass were lower than estimates from the 2004, 2005 and 2006.

The biomass estimate of the sharks dropped to 390 tonnes in 2008 after the increase of 1000 tonnes in 2007, which was a large increase from previous surveys. However, the high CV and large variability in biomass between surveys show that there is no clear trend in the abundance of sharks.

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.poli	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)

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)

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 of last year survey. The highest densities were found off Pta. do Morro and Cabeça de Baleia at depths between 300 and 500 m.

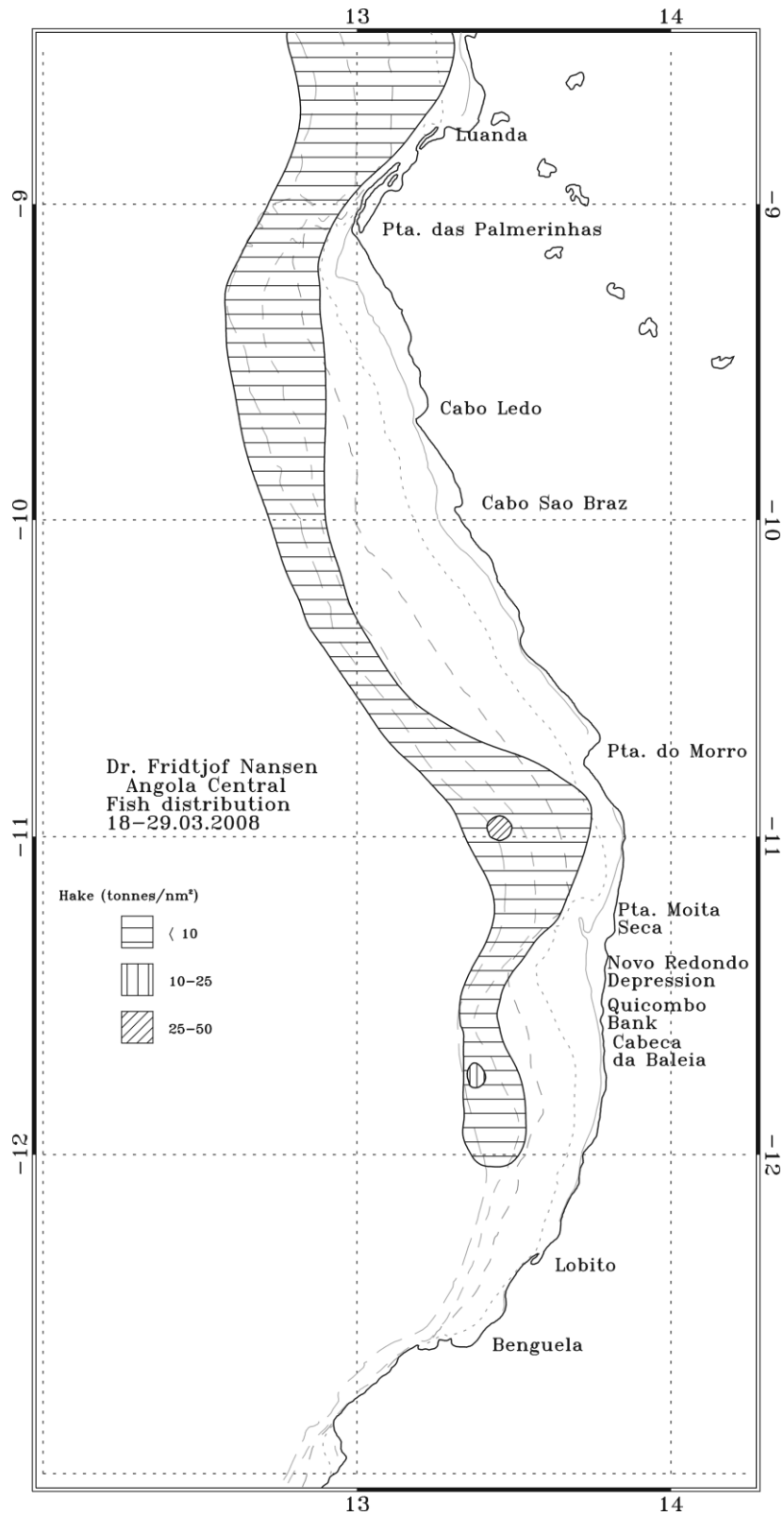


Figure 5.2 Distribution of Benguela hake (*Merluccius polli*) in the central region, Benguela-Luanda. Depth contours at 20, 50, 100, 200 and 500 m.

5.3 Luanda – Congo River slope

The survey covered the northern region of Angolan waters from Luanda to Congo River, and a total of 36 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 673 kg/hour (Annex VI), and the ‘demersal’ group contributed 13% to the mean catch rate, the ‘pelagic’ group 2%, and the shrimps, cephalopods and sharks each contributed 24, 1 and about 1%, respectively. The “other” group dominated the catches and contributed 58% to the total mean catch rate. *M. polli* was caught in 83% of the stations, and the average catch rate was 53 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 5.6 kg/hour. The averages catch rates of the three shrimp species *P. longirostris*, *A. varidens* and *N. africana* were respectively 8, 6 and 148 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 only 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.

Figure 8.3 shows the estimated distribution area of hake (*M. polli*) in the northern region. The stock distribution covers the slope from Luanda to Congo River with densities <10 tons/NM².

The biomass estimate of seabreams in 2008 was about 629 tonnes, which is similar to the 2007 estimate of 612 tonnes. The slope is not within the main distribution of seabreams, and there is no clear trend in the time series of this biomass estimates. As in previous surveys, the *D. angolensis* was the most abundant seabream on the northern slope.

The biomass estimates of *M. polli* increased to 5 925 tonnes after the decrease registered 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 400 m, and the biomass shows a small decrease from 981 tonnes in 2007 to about 933 tonnes in 2008 on the northern slope. However, the high CVs indicate that the estimates are not very precise.

The 2008 biomass estimate of *A. varidens* was 615 tonnes, which is 65% higher than the 2007 estimate of 373 tonnes, and considerably higher than the 2002 estimate of 127 tonnes. There are no clear trend after the low estimate in 2002.

The *N. africana* is not a commercially important species, however, the 2008 biomass of about 15 267 tonnes is the highest estimate 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 2008 was 205 tonnes, which is 64% higher than the 2007 estimate of 125 tonnes, the lowest estimate since 1996.

The 2008 biomass estimate of hairtails was 1 365 tonnes, which is 82% higher than the 2007 estimate of 749 tonnes, the lowest of the time series from 1992 to 2008. 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 2008 was 846 tonnes, which still is a decrease from the 2005 estimate of 1 180 tonnes. However, there is no clear long time trend in the abundance of sharks.

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 the Congo River with densities $<10 \text{ NM}^2$ in all the northern extension of 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)

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)

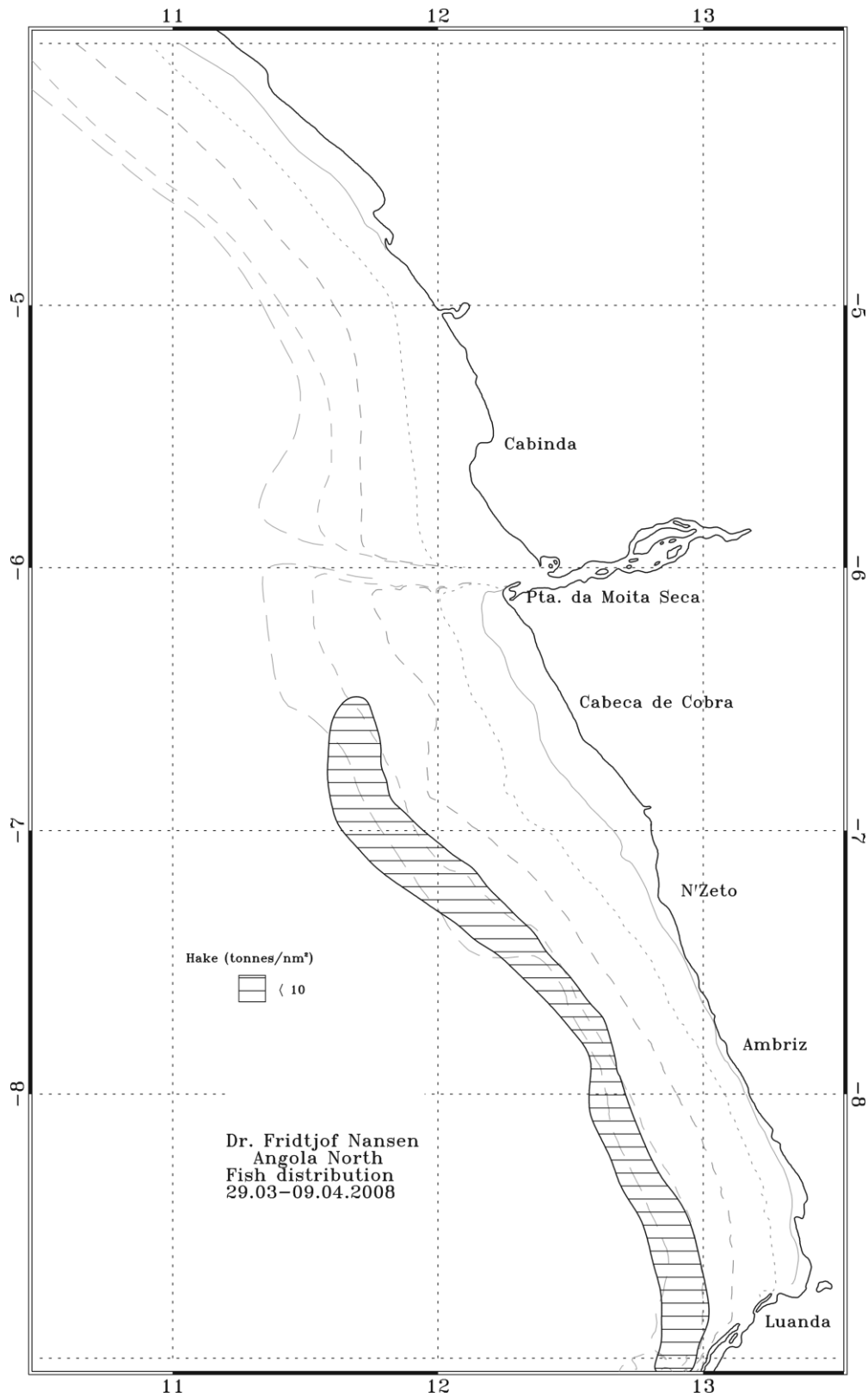


Figure 5.3 Distribution of hake (*Merluccius polli*) in the northern region, Luanda – Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

CHAPTER 6 SUMMARY

From 10 March to 13 April the 2008 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 (20-800 m) from Cunene River to Congo River was covered.

In total, 199 trawl stations were conducted of which 193 were valid and used in biomass estimation of the demersal stocks. To map the oceanographic conditions 310 CTD samples were carried out.

6.1 Hydrographic 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. Signal of upwelling was observed in the southern region. In the central region, the temperature varied between 24–28°C, and the lowest temperature (24°C) was observed around Cabo Ledo. The salinity values ranged between 35.1 and 35.7, maybe related to an upwelling situation. In the northern region the temperature was lowest close to the river’s mouth (about 24°C), while offshore it was around 29 °C. Inshore waters presented low salinity values, particularly around the river’s mouth (29) and increasing at the same latitude to 33 further offshore. The influence of the river’s plume was observed down to 8.5°S with a salinity of 33.5, while further south there was no sign of freshwater.

6.2 Biomass estimates

Table 6.1 presents the time series from 1985 to 2008 of the biomass estimates of the most important species on the shelf and slope in the central and northern regions in 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 2008 (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. Table 4.1 and Table 5.1 show the biomass estimates of the important species on the southern shelf and slope, respectively.

Seabreams

The seabream biomass estimate in the southern region was about 9 150 tonnes and consisted almost entirely of *D. macrophthalmus*. This is a marked decrease from last year, and the lowest in the timeseries. In the central and northern regions, the biomass estimate of seabreams in 2008 was about 21 227 tonnes, which is a 14% reduction from 2007. *D. macrophthalmus* and *D. angolensis* comprised 15% and 32%, respectively, of the 2008 estimate. Other abundant seabreams are *P. bellottii*, *D. canariensis* and *D. barnardi*. The biomass estimates of seabreams have fluctuated since 2000, and there is no clear long-term trend in the time series.

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. The total biomass estimate of hake (*M. capensis* and *M. polli*) on the southern shelf and slope in 2008 were 1 700 and 950 tonnes, respectively. Only one valid station was carried out on the slope between 200 and 600 meters which make the 2008 estimate for the slope unreliable. On the shelf the hake abundance has declined annually since 2003, and the 2008 estimate is the lowest observed since 2000. The decrease is a reason for concern. In the central and northern regions, *M. polli* is the only hake species. Here, the estimated biomass of hake (*M. polli*) was 11 979 tonnes, which is a 7% increase from the 2007 estimate. Furthermore, the 2008 estimate is about 62% 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 in 2006 or 2007. However, in 2008 both *P. longirostris* and *A. varidens* were caught in small quantities in the southern region. In 2008, the biomass estimate of *P. longirostris* for the central and northern regions was 1 622 tonnes, which is a 21% increase from the 2007 estimate. The high CV indicates that the estimate is relatively uncertain,. The 2008 estimate of *A. varidens* was 1 508 tonnes, which is a 47% increase from 2007.

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 2008 was 7 411 tonnes, which is a 57% reduction from 2007 (17 242 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 2008 estimate of 400 tonnes is a large decrease from last year's estimate of 4 200 tonnes and it is the lowest in the timeseries. The estimates of *Umbrina canariensis*, which is one of the most important croakers, also show large annual variation and there is no evident trend 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 12 684 tonnes in 2008, which is a 6% increase from 2007.

Groupers and snappers

Groupers and snappers are not distributed 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 2008 biomass estimate of groupers increased from 950 in 2007 to 1 187 tonnes, while the biomass estimate of snappers dropped to 90 tonnes from 113 tonnes in 2007. 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. More adequate results are achieved from the acoustic surveys conducted in July and August.

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

Survey	M.poli	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 (1.01)	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 (0.70)	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)

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 (1.44)
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 (1.52)
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 (1.07)
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 (1.05)
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)

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 (1.00)
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)

ANNEX I Records of fishing stations

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 1
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°12.08
 Lon E 11°43.82
 start stop duration Purpose : 3
 TIME :05:46:14 06:16:10 29.4 (min) Region : 4050
 LOG : 4370.61 4372.18 1.6 Gear cond.: 0
 FDEPTH: 27 27 Validity : 0
 BDEPTH: 27 27 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn
 Sorted : 68 Total catch: 668.80 Catch/hour: 1363.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dicolloglossa cuneata	607.95	24532	44.60	
B I V A L V E S	230.50	6526	16.91	
Trachurus trecae	227.51	7048	16.69	
Trigla lyra	190.72	387	13.99	
Argyrosomus hololepidotus	33.12	6	2.43	
Raja miraletus	21.68	59	1.59	
Myliobatis aquila	11.05	4	0.81	
Argyrosomus hololepidotus, juvenile	9.10	232	0.67	
Callorhynchus capensis	8.97	4	0.66	
Trichurus lepturus	7.74	774	0.57	
Etrumeus whiteheadi	5.81	310	0.43	
Arius parkii	5.23	20	0.38	
C R A B S	1.94	137	0.14	
Octopus vulgaris	1.14	2	0.08	
Lagocephalus laevigatus	0.59	20	0.04	
Total	1363.04		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 2
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°10.56
 Lon E 11°41.77
 start stop duration Purpose : 3
 TIME :07:04:25 07:34:25 30.0 (min) Region : 4050
 LOG : 4375.42 4377.12 1.7 Gear cond.: 0
 FDEPTH: 44 44 Validity : 0
 BDEPTH: 44 44 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.4 kn
 Sorted : 46 Total catch: 294.71 Catch/hour: 589.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	403.20	28140	68.41	1
Loligo vulgaris	100.20	10164	17.00	
Trigla lyra	41.04	252	6.96	
Sepia officinalis hierredda	20.70	26	3.51	
Sepia orbignyana	19.52	66	3.31	
Octopus vulgaris	2.00	2	0.34	
Dicolloglossa cuneata	1.56	60	0.26	
C R A B S	1.20	144	0.20	
Total	589.42		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 3
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°11.05
 Lon E 11°37.74
 start stop duration Purpose : 3
 TIME :08:29:01 08:49:34 20.6 (min) Region : 4050
 LOG : 4382.18 4383.10 0.9 Gear cond.: 0
 FDEPTH: 86 87 Validity : 0
 BDEPTH: 86 87 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 2.7 kn
 Sorted : 102 Total catch: 1862.17 Catch/hour: 5434.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	5145.55	162403	94.69	2
Dentex macrophthalmus	167.16	4380	3.08	3
Pterothrissus belloci	64.46	2084	1.19	
Raja miraletus	33.12	53	0.61	
Dicolloglossa cuneata	22.44	1176	0.41	
Merluccius capensis	1.61	53	0.03	
Total	5434.35		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 4
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°13.48
 Lon E 11°31.00
 start stop duration Purpose : 3
 TIME :10:08:39 10:29:43 21.1 (min) Region : 4050
 LOG : 4391.31 4392.50 1.2 Gear cond.: 0
 FDEPTH: 134 131 Validity : 0
 BDEPTH: 134 131 Validity : 0
 Towing dir: 0° Wire out : 320 m Speed : 3.4 kn
 Sorted : 95 Total catch: 5337.80 Catch/hour: 15200.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	14990.18	468783	98.62	4
Synagrops microlepis	125.04	16995	0.82	
Dentex macrophthalmus	41.69	481	0.27	
Pterothrissus belloci	22.44	481	0.15	
Dicolloglossa cuneata	14.44	803	0.09	
Merluccius capensis	6.41	159	0.04	
Total	15200.19		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 5
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°12.65
 Lon E 11°28.74
 start stop duration Purpose : 3
 TIME :11:29:15 11:39:31 10.3 (min) Region : 4050
 LOG : 4396.13 4396.65 0.5 Gear cond.: 0
 FDEPTH: 149 150 Validity : 0
 BDEPTH: 149 150 Validity : 0
 Towing dir: 0° Wire out : 350 m Speed : 3.0 kn
 Sorted : 165 Total catch: 764.99 Catch/hour: 4473.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1767.72	35357	39.51	5
Trachurus capensis	1469.24	28246	32.84	6
Synagrops microlepis	949.47	196175	21.22	
Dentex macrophthalmus	201.99	2211	4.52	7
Merluccius capensis	33.22	111	0.74	8
Pterothrissus belloci	31.93	462	0.71	
Brotula barbata	9.53	53	0.21	
Zeus faber	4.62	23	0.10	
Squalus megalops	1.81	6	0.04	
Trichurus lepturus	1.52	23	0.03	
Dicolloglossa cuneata	1.52	76	0.03	
Trigla lyra	1.05	53	0.02	
Total	4473.63		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 6
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°13.11
 Lon E 11°25.52
 start stop duration Purpose : 3
 TIME :13:16:37 13:41:16 24.7 (min) Region : 4050
 LOG : 4403.35 4404.65 1.3 Gear cond.: 0
 FDEPTH: 181 176 Validity : 0
 BDEPTH: 181 176 Validity : 0
 Towing dir: 0° Wire out : 410 m Speed : 3.2 kn
 Sorted : 127 Total catch: 761.94 Catch/hour: 1853.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	802.19	8518	43.27	12
Merluccius polli	415.33	1255	22.40	9
Synagrops microlepis	284.67	31460	15.36	
Trachurus trecae	105.11	1620	5.67	10
Squalus megalops	67.74	190	3.65	
Chlorophthalmus atlanticus	67.45	9170	3.64	
Dentex macrophthalmus	53.14	350	2.87	11
Raja miraletus	21.61	29	1.17	
Pontinus kuhlii	11.68	555	0.63	
Scomber japonicus	7.01	44	0.38	
Pterothrissus belloci	6.13	88	0.33	
Trigla lyra	3.80	29	0.20	
Dicolloglossa cuneata	2.92	44	0.16	
Zenopsis conchifer	2.48	15	0.13	
Brotula barbata	2.48	15	0.13	
Parapenaeus longirostris	0.15	29	0.01	
Total	1853.87		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 7
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°13.52
 Lon E 11°21.49
 start stop duration Purpose : 3
 TIME :15:12:47 15:43:45 31.0 (min) Region : 4050
 LOG : 4412.34 4414.10 1.8 Gear cond.: 0
 FDEPTH: 326 318 Validity : 0
 BDEPTH: 326 318 Validity : 0
 Towing dir: 0° Wire out : 750 m Speed : 3.4 kn
 Sorted : 99 Total catch: 987.40 Catch/hour: 1912.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	897.00	27356	46.89	
Scorpaena normani	364.22	963	15.04	
Merluccius capensis	171.46	1376	8.96	
Trachurus capensis	145.30	756	7.60	13
Caelorinchus coelorhincus	95.12	3139	4.97	
Dentex macrophthalmus	59.86	213	3.13	14
Synagrops microlepis	59.67	4611	3.12	
MYCTOPHIDAE	43.78	1782	2.29	
Galeus polli	24.99	291	1.31	
Gadella mairaldi	13.56	484	0.71	
Parapenaeus longirostris	11.62	1763	0.61	
Squalus sp.	9.49	19	0.50	
Trichurus lepturus	8.72	101	0.46	
Callinectes amnicola	2.71	155	0.14	
Nematocarcinus africanus	2.52	891	0.13	
Octopus vulgaris	2.32	19	0.12	
Nezumia sp.	0.58	19	0.03	
Total	1912.95		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 8
 DATE :13/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°12.54
 Lon E 11°13.96
 start stop duration Purpose : 3
 TIME :19:16:54 19:40:43 23.8 (min) Region : 4050
 LOG : 4431.81 4432.94 1.1 Gear cond.: 0
 FDEPTH: 726 725 Validity : 0
 BDEPTH: 726 725 Validity : 0
 Towing dir: 0° Wire out : 1620 m Speed : 2.8 kn
 Sorted : 82 Total catch: 1194.67 Catch/hour: 3010.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Malacocephalus occidentalis	1645.02	30990	54.64	
Trachyrhynchus scabrus	625.22	2810	20.77	
B I V A L V E S	264.87	756	8.80	
Alepocephalus rostratus	125.77	2379	4.18	
Raja alba	117.48	144	3.90	
Bathyrhoconger vicinus	49.72	756	1.65	
Heterocarpus ensifer	41.45	2522	1.38	
Ebinania costaecanarie	29.91	35	0.99	
Paramola cuvieri	16.28	25	0.54	
Chaceon maritae, male	14.24	23	0.47	
Todarodes sagittatus	11.24	23	0.37	
Neoharriotta pinnata	10.08	3	0.33	
Etmopterus polli	9.37	35	0.31	
Aristeus varidens, female	7.94	1154	0.26	
Yarella blackfordi	7.56	252	0.25	
Neocyttus rhomboidalis	6.48	73	0.22	
Fleisloppeneus edwardsianus	5.77	217	0.19	
Merluccius capensis	4.56	5	0.15	
Chaceon maritae, female	3.28	10	0.11	
Centroscymnus crepidater	3.10	3	0.10	
Lamprogrammus exutus	2.87	35	0.10	
Hoplostethus cadenati	2.52	35	0.08	
Octopus vulgaris	2.52	35	0.08	
Tomias boa boa	1.81	108	0.06	
Triphos hemingi	1.08	144	0.04	
Aristeus varidens, male	0.35	73	0.01	
Total	3010.51		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 9
 DATE :14/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°0.69
 start stop duration Lon E 11°15.23
 TIME :00:27:48 00:46:11 18.4 (min) Purpose : 3
 LOG : 4461.26 4462.07 0.8 Region : 4050
 FDEPTH: 749 770 Gear cond.: 5
 BDEPTH: 749 770 Validity : 0
 Towing dir: 0° Wire out : 1560 m Speed : 2.7 kn
 Sorted : 52 Total catch: 578.46 Catch/hour: 1888.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Malacocephalus laevis	594.65	17559	31.49
Hymenoccephalus italicus	366.63	8079	19.42
Ebinania costaecanarie	309.53	395	16.39
Paramola cuvieri	171.64	108	9.09
Talismania longifilis	134.66	1472	7.13
Trachyrincus scabrus	76.84	359	4.07
Chaceon maritae	59.97	144	3.18
Centrophorus squamosus	34.11	36	1.81
Illex coindetii	32.68	108	1.73
Raja confundens	31.24	72	1.65
Merluccius capensis	26.12	26	1.38
Bathyrcongus vicinus	13.65	251	0.72
Etmopterus spinax	7.18	36	0.38
Hoplostethus cadenati	5.75	108	0.30
Yareella blackfordi *	5.39	395	0.29
Stomias boa boa	5.03	251	0.27
Pseudocyttus maculatus	3.95	72	0.21
MYCTOPHIDAE	2.51	72	0.13
Notacanthus sexspinis	1.80	36	0.10
Bassanago albescens	1.44	36	0.08
Trichiurus lepturus	1.08	36	0.06
Chaunax pictus	1.08	36	0.06
Glyphus marsupialis	0.72	287	0.04
Aristeus varidens	0.36	108	0.02
Cataetx laticeps	0.36	72	0.02
Total	1888.34	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 10
 DATE :14/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°3.33
 start stop duration Lon E 11°24.97
 TIME :06:22:13 06:45:35 23.4 (min) Purpose : 3
 LOG : 4496.30 4497.37 1.1 Region : 4050
 FDEPTH: 138 139 Gear cond.: 0
 BDEPTH: 138 139 Validity : 0
 Towing dir: 0° Wire out : 330 m Speed : 2.7 kn
 Sorted : 119 Total catch: 830.06 Catch/hour: 2131.09

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Synagrops microlepis	1593.20	243751	74.76
Dentex macrocephalus	283.95	3127	13.32
Pterothrissus belloci	70.45	899	3.31
Merluccius capensis	44.57	234	2.09
B I V A L V E S	25.16	198	1.18
Sepia orbignyana	23.72	126	1.11
Octopus vulgaris	15.46	54	0.73
Trigla lyra	14.38	180	0.67
Zeus faber	13.84	72	0.65
Dicologlossa cuneata	13.48	413	0.63
Trachurus trecae	13.12	162	0.62
Brotula barbata	9.88	108	0.46
Squalus megalops	6.29	18	0.30
Zenopsis conchifer	2.34	3	0.11
Trichiurus lepturus	1.26	18	0.06
Total	2131.09	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 11
 DATE :14/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°0.84
 start stop duration Lon E 11°28.15
 TIME :07:45:37 07:57:22 11.8 (min) Purpose : 3
 LOG : 4502.92 4503.60 0.7 Region : 4050
 FDEPTH: 114 115 Gear cond.: 0
 BDEPTH: 114 115 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.5 kn
 Sorted : 95 Total catch: 2061.72 Catch/hour: 10527.93

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trachurus trecae	9926.81	171074	94.29
Dentex macrocephalus	452.22	3860	4.30
Octopus vulgaris	71.69	107	0.68
Dentex angolensis	46.31	107	0.44
Zeus faber	30.89	107	0.29
Total	10527.93	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 12
 DATE :14/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°59.62
 start stop duration Lon E 11°34.64
 TIME :09:04:42 09:14:58 10.3 (min) Purpose : 3
 LOG : 4511.04 4511.63 0.6 Region : 4050
 FDEPTH: 95 94 Gear cond.: 0
 BDEPTH: 95 94 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.5 kn
 Sorted : 92 Total catch: 4255.44 Catch/hour: 24885.61

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trachurus trecae	24571.52	1171041	98.74
Sepia officinalis hierredda	159.77	269	0.64
Sepia orbignyana	135.38	269	0.54
Dentex macrocephalus	18.95	544	0.08
Total	24885.61	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 13
 DATE :14/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 17°1.71
 start stop duration Lon E 11°39.60
 TIME :10:07:26 10:37:52 30.4 (min) Purpose : 3
 LOG : 4516.83 4518.45 1.6 Region : 4050
 FDEPTH: 61 61 Gear cond.: 0
 BDEPTH: 61 61 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn
 Sorted : 80 Total catch: 79.58 Catch/hour: 157.07

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trachurus trecae	120.89	2955	76.97
Sepia officinalis hierredda	24.77	67	15.77
Octopus vulgaris	3.75	6	2.39
JELLYFISH	2.43	6	1.55
Illex coindetii	2.43	657	1.55
Scomber japonicus	2.39	2	1.52
Dentex macrocephalus	0.26	8	0.16
Dicologlossa cuneata	0.08	4	0.05
Squilla mantis	0.04	2	0.03
GOBIIDAE	0.04	28	0.03
Total	157.07	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 14
 DATE :11:16:46 11:47:40 30.9 (min) Purpose : 3
 LOG : 4521.71 4523.29 1.6 Region : 4050
 FDEPTH: 37 36 Gear cond.: 0
 BDEPTH: 37 36 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn
 Sorted : 79 Total catch: 393.80 Catch/hour: 764.66

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
JELLYFISH	732.52	2835	95.80
Sepia officinalis hierredda	15.34	19	2.01
Trachurus trecae	14.27	2087	1.87
Starfish	0.87	136	0.11
Calappa pelii	0.78	10	0.10
Paramola cuvieri	0.49	29	0.06
Loligo vulgaris	0.39	58	0.05
Total	764.66	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 15
 DATE :12:34:35 13:04:47 30.2 (min) Purpose : 3
 LOG : 4527.60 4529.15 1.6 Region : 4050
 FDEPTH: 23 22 Gear cond.: 0
 BDEPTH: 23 22 Validity : 0
 Towing dir: 0° Wire out : 95 m Speed : 3.1 kn
 Sorted : 78 Total catch: 542.57 Catch/hour: 1077.95

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
JELLYFISH	643.21	2382	59.67
Trachurus trecae	388.29	15270	36.02
Scomber japonicus	13.07	70	1.21
Chelidichthys gabonensis	10.29	14	0.95
Loligo vulgaris	5.28	668	0.49
Sepia officinalis hierredda	3.89	14	0.36
Octopus vulgaris	2.50	14	0.23
Starfish	1.95	195	0.18
B I V A L V E S	1.95	515	0.18
Raja miraletus	1.67	14	0.15
Calappa rubroguttata	1.67	14	0.15
G A S T R O P O D S	1.25	153	0.12
Dicologlossa cuneata	1.25	42	0.12
Trachinocephalus myops	0.70	28	0.06
Trichiurus lepturus	0.56	56	0.05
Schedophilus pamarco	0.42	14	0.04
Total	1077.95	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 16
 DATE :14:03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°49.77
 start stop duration Lon E 11°41.26
 TIME :14:14:06 14:29:26 15.4 (min) Purpose : 3
 LOG : 4538.22 4539.02 0.8 Region : 4050
 FDEPTH: 23 24 Gear cond.: 0
 BDEPTH: 23 24 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.2 kn
 Sorted : 203 Total catch: 4272.24 Catch/hour: 16699.31

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
JELLYFISH	12899.61	52206	77.25
Trachurus trecae	3443.45	224912	20.62
Loligo vulgaris	302.89	8783	1.81
Sarda sarda	53.36	82	0.32
Total	16699.31	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 17
 DATE :15:43/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°48.85
 start stop duration Lon E 11°34.72
 TIME :15:43:02 16:06:19 23.3 (min) Purpose : 3
 LOG : 4546.73 4548.07 1.3 Region : 4050
 FDEPTH: 95 95 Gear cond.: 0
 BDEPTH: 95 95 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.4 kn
 Sorted : 147 Total catch: 588.48 Catch/hour: 1516.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trachurus trecae	609.28	26392	40.17
Dentex macrocephalus	493.81	6825	32.56
Sepia orbignyana	191.75	340	12.64
Dasyatis centroura	117.01	10	7.71
Pterothrissus belloci	19.79	515	1.31
Zeus faber	19.07	82	1.26
Chelidichthys capensis	17.11	72	1.13
Merluccius capensis	15.36	175	1.01
Loligo vulgaris	14.95	237	0.99
Trichiurus lepturus	10.41	268	0.69
Arius parkii	3.30	10	0.22
Lagocephalus laevis	2.27	10	0.15
Brotula barbata	1.96	10	0.13
Ubrina canariensis	0.31	10	0.02
Dicologlossa cuneata	0.31	10	0.02
Total	1516.70	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 18
 DATE :14/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°49.43
 start stop duration Lon E 11°17.97
 TIME :18:43:02 19:05:47 22.8 (min) Purpose : 3
 LOG : 4568.83 4569.98 1.2 Region : 4050
 FDEPTH: 348 339 Gear cond.: 0
 BDEPTH: 348 339 Validity : 0
 Towing dir: 0° Wire out : 840 m Speed : 3.1 kn
 Sorted : 94 Total catch: 1178.22 Catch/hour: 3107.39

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Scorpaena normani	1927.38	29942	62.03
Chlorophthalmus atlanticus	501.78	14521	16.15
Hoplostethus cadenati	237.60	11596	7.65
Gadella maraldi	155.53	2426	5.01
Yarella blackfordi	84.40	4552	2.72
Merluccius capensis	69.44	630	2.23
Aristeus varidens, female	49.19	5383	1.58
Pterothrissus bellocci	35.89	200	1.16
Malacocephalus laevis	20.28	599	0.65
Galeus polli	12.63	132	0.41
Dicologlossa cuneata	4.98	132	0.16
MYCTOPHIDAE	2.98	1928	0.10
Aristeus varidens, male	2.98	564	0.10
Callinectes amnicola	2.32	34	0.07
Total	3107.39	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 22
 DATE :15/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°35.51
 start stop duration Lon E 11°36.22
 TIME :08:47:37 09:07:44 20.1 (min) Purpose : 3
 LOG : 4653.38 4654.41 1.0 Region : 4050
 FDEPTH: 90 90 Gear cond.: 0
 BDEPTH: 90 90 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.1 kn
 Sorted : 94 Total catch: 1159.67 Catch/hour: 3458.26

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	2669.58	105710	77.19
Dentex macrophthalmus	620.87	15746	17.95
Sepia orbignyana	72.02	149	2.08
Chelidonichthys capensis	21.47	107	0.62
Loligo vulgaris	20.40	179	0.59
Atractoscion aequidens	16.82	72	0.49
Myliobatis aquila	11.81	6	0.34
Zeus faber	10.74	72	0.31
Pterothrissus bellocci	6.08	107	0.18
Pagellus bellottii	2.86	36	0.08
Paragaleus pectoralis	2.39	6	0.07
Umbrina canariensis	1.79	36	0.05
Citharus linguatula	1.43	72	0.04
Total	3458.26	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 19
 DATE :14/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°34.83
 start stop duration Lon E 11°18.66
 TIME :21:53:08 22:23:16 30.1 (min) Purpose : 3
 LOG : 4588.64 4590.08 1.4 Region : 4050
 FDEPTH: 612 655 Gear cond.: 0
 BDEPTH: 612 655 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 2.9 kn
 Sorted : 105 Total catch: 480.85 Catch/hour: 957.55

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachyrincus scabrus	232.31	1388	24.26
Malacocephalus sp.	120.18	3174	12.55
Bajacalifornia magalops	81.25	1091	8.48
Hoplostethus cadenati	76.17	2878	7.95
Lophius vomerinus	60.94	18	6.36
Merluccius capensis	59.54	60	6.22
Yarella blackfordi *	59.16	3513	6.18
Helicolenus dactylopterus	55.42	305	5.79
HOLUTHUROIDEA	50.52	237	5.28
Lamprogrammus exutus	38.85	1016	4.06
Todaropsis eblanae	14.06	42	1.47
Bassanago albescens	11.77	195	1.23
Ebinania costaeacanarie	9.82	18	1.03
Chaceon maritae, male	9.60	14	1.00
Aristeus varidens, female	9.56	914	1.00
SQUALIDAE	7.87	8	0.82
Raja confundens	7.53	8	0.79
Glyphus macropialis	7.19	1151	0.75
Symphobranchius kaupii	6.95	177	0.73
Benthodesmus tenuis	6.77	119	0.71
Stomias boa boa	6.43	279	0.67
Gadella imberbis	5.60	323	0.58
Centroporus sp.	3.90	8	0.41
Scymnodon squamulosus	3.90	18	0.41
MYCTOPHIDAE	2.97	888	0.31
Epigonus telescopus	2.13	94	0.22
Hymenocephalus italicus	2.03	229	0.21
Chlorophthalmus atlanticus	1.43	42	0.15
Etmopterus sp.	1.27	8	0.13
Chaceon maritae, female	1.06	6	0.11
Halosaurus ovenii	0.86	8	0.09
Aristeus varidens, male	0.34	52	0.04
Nemichthys scolopaceus	0.18	26	0.02
Total	957.55	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 24
 DATE :15/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°24.42
 start stop duration Lon E 11°45.77
 TIME :12:05:08 12:35:05 30.0 (min) Purpose : 3
 LOG : 4670.85 4672.44 1.6 Region : 4050
 FDEPTH: 21 23 Gear cond.: 0
 BDEPTH: 21 23 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.2 kn
 Sorted : 106 Total catch: 923.68 Catch/hour: 1849.83

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	1535.43	45072	83.00
J E L L Y F I S H	135.88	689	7.35
Pagellus bellottii	116.07	4220	6.27
Scomber japonicus	40.81	190	2.21
Myliobatis aquila	13.82	6	0.75
Loligo vulgaris	4.13	52	0.22
Carcharhinus leucas	1.46	4	0.08
Sepia orbignyana	1.18	2	0.06
Dentex barnardi	1.04	14	0.06
Total	1849.83	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 25
 DATE :15/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°24.84
 start stop duration Lon E 11°43.41
 TIME :13:36:01 13:54:47 18.8 (min) Purpose : 3
 LOG : 4678.26 4679.29 1.0 Region : 4050
 FDEPTH: 51 49 Gear cond.: 0
 BDEPTH: 51 49 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.3 kn
 Sorted : 132 Total catch: 162.30 Catch/hour: 518.81

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	299.84	20586	57.79
Loligo vulgaris	87.71	1298	16.91
Myliobatis aquila	39.96	26	7.70
Zeus faber	29.09	45	5.61
Trigla lyra	25.51	45	4.92
Scomber japonicus	22.38	45	4.31
Sepia orbignyana	11.19	45	2.16
Dentex macrophthalmus	1.79	45	0.35
Pagellus bellottii	1.34	45	0.26
Total	518.81	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 20
 DATE :15/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°39.21
 start stop duration Lon E 11°23.95
 TIME :05:44:03 06:04:18 20.3 (min) Purpose : 3
 LOG : 4632.48 4633.48 1.0 Region : 4050
 FDEPTH: 126 125 Gear cond.: 0
 BDEPTH: 126 125 Validity : 0
 Towing dir: 0° Wire out : 310 m Speed : 2.9 kn
 Sorted : 95 Total catch: 3153.30 Catch/hour: 9343.11

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	7787.56	110717	83.35
Trachurus capensis	720.89	6913	7.72
Dentex macrophthalmus	229.04	3754	2.45
Pterothrissus bellocci	157.04	1481	1.68
Merluccius capensis	112.59	199	1.21
Zeus faber	106.67	394	1.14
Chelidonichthys capensis	92.74	98	0.99
Atractoscion aequidens	56.30	98	0.60
Paramola cuvieri	50.37	98	0.54
Umbrina canariensis	7.91	98	0.08
Trigla lyra	6.90	98	0.07
Trichiurus lepturus	6.81	98	0.07
Scorpaena normani	5.93	98	0.06
Dicologlossa cuneata	2.07	98	0.02
Total	9342.81	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 26
 DATE :15/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°13.22
 start stop duration Lon E 11°36.17
 TIME :15:26:33 15:41:46 15.2 (min) Purpose : 3
 LOG : 4692.50 4693.22 0.7 Region : 4050
 FDEPTH: 74 73 Gear cond.: 0
 BDEPTH: 74 73 Validity : 0
 Towing dir: 0° Wire out : 185 m Speed : 2.9 kn
 Sorted : 134 Total catch: 1243.76 Catch/hour: 4903.13

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	4587.32	120993	93.56
Scomber japonicus	131.27	875	2.68
Spondyllosoma cantharus	65.28	146	1.33
Zeus faber	46.32	110	0.94
Pagellus bellottii	20.78	110	0.42
Carcharhinus leucas	14.94	35	0.30
Atractoscion aequidens	12.02	35	0.25
Dentex macrophthalmus	12.02	146	0.25
Sepia orbignyana	9.50	35	0.19
Loligo vulgaris	3.67	438	0.07
Total	4903.13	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 21
 DATE :15/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°35.28
 start stop duration Lon E 11°25.97
 TIME :06:55:25 07:11:11 15.8 (min) Purpose : 3
 LOG : 4641.00 4641.86 0.9 Region : 4050
 FDEPTH: 118 118 Gear cond.: 0
 BDEPTH: 118 118 Validity : 0
 Towing dir: 0° Wire out : 305 m Speed : 3.3 kn
 Sorted : 76 Total catch: 1107.50 Catch/hour: 4213.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	3477.34	54049	82.52
Dentex macrophthalmus	277.17	3055	6.58
Trachurus capensis	216.07	1556	5.13
Scomber japonicus	163.87	666	3.89
Pterothrissus bellocci	27.20	221	0.65
Zeus faber	26.10	57	0.62
Etrumeus whiteheadi	10.54	167	0.25
Atractoscion aequidens	5.97	8	0.14
Trichiurus lepturus	4.98	57	0.12
Umbrina canariensis	4.45	57	0.11
Total	4213.70	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 27
 DATE :15/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 16°12.72
 start stop duration Lon E 11°43.39
 TIME :17:09:48 17:24:43 14.9 (min) Purpose : 3
 LOG : 4703.55 4704.33 0.8 Region : 4050
 FDEPTH: 49 53 Gear cond.: 0
 BDEPTH: 49 53 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn
 Sorted : 103 Total catch: 684.78 Catch/hour: 2753.81

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	2155.17	28532	78.26
Pagellus bellottii	510.92	10512	18.55
Chelidonichthys capensis	49.10	133	1.78
Loligo vulgaris	20.43	237	0.74
Myliobatis aquila	8.85	4	0.32
Lithognathus momyrus	4.79	28	0.17
Sepia orbignyana	2.69	4	0.10
Umbrina canariensis	1.85	28	0.07
Total	2753.81	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 29
 DATE :18/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°35.97
 start stop duration Lon E 13°1.94
 TIME :20:02:58 20:14:24 11.4 (min) Purpose : 3
 LOG : 5002.25 5002.84 0.6 Region : 4040
 FDEPTH: 744 750 Gear cond.: 0
 BDEPTH: 744 750 Validity : 0
 Towing dir: 0° Wire out : 1680 m Speed : 3.1 kn
 Sorted : 47 Total catch: 46.76 Catch/hour: 245.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	73.23	1501	29.83	
Yarella blackfordi	28.87	651	11.76	
Nezumia aequalis	22.83	604	9.30	
Merluccius polli	15.59	21	6.35	
Alepocephalus rostratus	15.28	310	6.22	
Stereomastis sp.	14.96	562	6.09	
Halosaurus ovenii	12.81	168	5.22	
Stomias boa boa	11.60	273	4.73	
Aristeus variidens, female	10.92	499	4.45	42
Gadella imberbis	7.24	1129	2.95	
Chaceon maritae, male	6.88	26	2.80	
Lamprogrammus exutus	5.04	5	2.05	
Cryptosaras couesii	4.83	31	1.97	
Ebinania costaeacanaria	2.94	5	1.20	
Plesiopeneus edwardsianus	2.89	299	1.18	
Bathyrhynchus vicinus	2.73	26	1.11	
Aristeus variidens, male	1.94	247	0.79	43
Todaropsis eblanae	0.89	5	0.36	
Todarodes sagittatus	0.89	5	0.36	
Dibranchius atlanticus	0.89	37	0.36	
Gadella maraldi	0.58	5	0.24	
ZOARCIDAE	0.47	5	0.19	
L O B S T E R S	0.42	147	0.17	
Raja alba	0.21	5	0.09	
Centrophorus uyato	0.21	5	0.09	
Heterocarpus ensifer	0.16	16	0.06	
Solenocera africana	0.16	16	0.06	
Total	245.46		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 32
 DATE :19/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°26.95
 start stop duration Lon E 13°22.90
 TIME :17:29:38 17:49:20 19.7 (min) Purpose : 3
 LOG : 5133.12 5134.15 1.0 Region : 4040
 FDEPTH: 93 90 Gear cond.: 0
 BDEPTH: 93 90 Validity : 0
 Towing dir: 0° Wire out : 225 m Speed : 3.1 kn
 Sorted : 77 Total catch: 292.15 Catch/hour: 889.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	216.55	2205	24.34	49
Dentex macrophthalmus	91.55	603	10.29	50
Trigla lyra	77.30	679	8.69	
Scorpaena normani	74.56	789	8.38	
Citharus linguatula	67.43	1194	7.58	
Umbrina canariensis	48.12	207	5.41	51
Pomadasys jubelini	42.18	79	4.74	
Chelidonichthys gabonensis	41.12	286	4.62	
Parapeneus longirostris, femal, female	33.78	7882	3.80	53
Trichiurus lepturus	28.17	295	3.17	
Brotula barbata	25.10	76	2.82	
Pterothrissus belloci	24.34	219	2.73	
Sepia orbignyana	22.69	34	2.55	
Parapeneus longirostris, male, male	15.02	5823	1.69	52
Pagellus bellottii	14.80	88	1.66	
Raja miraletus	13.37	21	1.50	
Zeus faber	12.18	67	1.37	
Uranoscopus polli	10.75	43	1.21	
Octopus vulgaris	7.25	12	0.81	
Merluccius polli	5.27	439	0.59	
Miracorvina angolensis	4.26	21	0.48	
Torpedo torpedo	4.05	34	0.46	
Branchiostegus semifasciatus *	2.53	12	0.28	
Boops boops	2.19	12	0.25	
Microchirus frechkopi	1.52	21	0.17	
Conger conger	1.43	12	0.16	
Sardinella aurita	1.31	12	0.15	
Saurida brasiliensis	0.55	67	0.06	
GOBIIDAE	0.43	12	0.05	
Total	889.80		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 30
 DATE :19/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°23.10
 start stop duration Lon E 13°16.50
 TIME :00:26:24 00:43:45 17.4 (min) Purpose : 3
 LOG : 5030.19 5031.01 0.8 Region : 4040
 FDEPTH: 747 744 Gear cond.: 0
 BDEPTH: 747 744 Validity : 0
 Towing dir: 0° Wire out : 1500 m Speed : 2.8 kn
 Sorted : 29 Total catch: 145.90 Catch/hour: 504.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	115.85	3562	22.96	
Yarella blackfordi	69.16	1712	13.71	
Nezumia micromychodon	66.05	2300	13.09	
Opisthoteuthis agassizii	51.35	52	10.18	
Malacocephalus occidentalis	46.17	1159	9.15	
Stomias boa boa	27.15	640	5.38	
Bajacalifornia magalops	23.52	588	4.66	
Bathyrhynchus vicinus	19.54	329	3.87	
POLYCHAETIDAE	19.02	1297	3.77	
Aristeus variidens, female	10.72	622	2.12	44
Glyphus marsupialis	7.26	899	1.44	
Chaceon maritae, female	7.09	24	1.41	
Halosaurus ovenii	6.57	207	1.30	
Gadella imberbis	6.40	536	1.27	
Trachipterus trachipterus	5.36	17	1.06	
LYCOTEUTHIDAE	5.01	17	0.99	
Lamprogrammus exutus	4.67	35	0.93	
Dibranchius atlanticus	2.59	104	0.51	
Trichiurus lepturus	1.73	35	0.34	
THYSANOTEUTHIDAE	1.73	17	0.34	
Aristeus variidens, male	1.56	225	0.31	45
SQUALIDAE	1.38	17	0.27	
Gonostoma denudata	1.38	104	0.27	
SEPIOLIDAE	1.38	35	0.27	
Cataetx laticeps	0.69	86	0.14	
Triplophos hemingi	0.69	104	0.14	
GALATHEIDAE *	0.52	605	0.10	
Total	504.55		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 33
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°16.50
 start stop duration Lon E 13°24.54
 TIME :05:15:05 05:44:31 29.5 (min) Purpose : 3
 LOG : 5203.37 5204.82 1.5 Region : 4040
 FDEPTH: 107 106 Gear cond.: 0
 BDEPTH: 107 106 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.0 kn
 Sorted : 95 Total catch: 436.35 Catch/hour: 889.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Boops boops	345.35	3402	38.85	
Umbrina canariensis	282.09	927	31.73	54
Dentex macrophthalmus	82.47	469	9.28	55
Anthias anthias	58.94	552	6.63	
Trachurus trecae	38.89	619	4.37	56
Dentex barnardi	24.00	75	2.70	
Brotula barbata	13.96	10	1.57	
Epigonus telescopus	8.25	18	0.93	
Erythrocles monodi	6.38	47	0.72	
Pagellus bellottii	6.28	57	0.71	
Gephyroberyx darwini	4.79	10	0.54	
Zeus faber	4.58	10	0.52	
Chaetodon hoeferli	4.40	29	0.50	
Illex coindetii	2.34	151	0.26	
Raja miraletus	2.16	10	0.24	
Dentex angolensis	1.87	10	0.21	
Trigla lyra	1.59	10	0.18	
Citharus linguatula	0.65	10	0.07	
Total	889.00		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 31
 DATE :19/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°26.97
 start stop duration Lon E 13°25.14
 TIME :16:30:45 16:50:52 20.1 (min) Purpose : 3
 LOG : 5128.91 5129.99 1.1 Region : 4040
 FDEPTH: 66 67 Gear cond.: 0
 BDEPTH: 66 67 Validity : 0
 Towing dir: 0° Wire out : 170 m Speed : 3.2 kn
 Sorted : 80 Total catch: 330.05 Catch/hour: 984.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	427.99	5839	43.48	46
Trichiurus lepturus	159.84	2511	16.24	
Dasyatis centroura	119.28	3	12.12	
Pomadasys incisus	66.80	412	6.79	
Stromateus fiatola	58.75	51	5.97	
Trachurus trecae, juvenile	24.81	3322	2.52	48
Pomadasys jubelini	21.62	45	2.20	
Torpedo torpedo	21.08	78	2.14	
Pagellus bellottii	17.18	104	1.75	47
Citharus linguatula	15.83	447	1.61	
Sepia orbignyana	12.73	9	1.29	
Fistularia petimba	10.88	21	1.11	
Raja miraletus	9.45	9	0.96	
Umbrina canariensis	4.68	81	0.48	
Sphyrna guachancho	3.91	9	0.40	
Lithognathus mormyrus	2.56	9	0.26	
Zeus faber	2.18	6	0.22	
Grammolites gruvelli	1.43	30	0.15	
Illex coindetii	1.34	611	0.14	
Epigonus telescopus	1.13	18	0.12	
GOBIIDAE	0.48	78	0.05	
Pseudupeneus prayensis	0.18	9	0.02	
Saurida brasiliensis	0.09	9	0.01	
Total	984.24		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 34
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°15.81
 start stop duration Lon E 13°27.17
 TIME :06:32:53 07:03:02 30.2 (min) Purpose : 3
 LOG : 5208.24 5209.74 1.5 Region : 4040
 FDEPTH: 96 96 Gear cond.: 0
 BDEPTH: 96 96 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.0 kn
 Sorted : 93 Total catch: 186.54 Catch/hour: 371.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	223.08	1278	60.09	57
Dentex angolensis	26.87	151	7.24	58
Illex coindetii	24.28	9795	6.54	
Pagellus bellottii	23.40	135	6.30	59
Branchiostegus semifasciatus *	17.71	16	4.77	
Dentex macrophthalmus	16.64	119	4.48	60
Dentex barnardi	16.44	52	4.43	
Umbrina canariensis	6.77	16	1.82	
Raja miraletus	5.81	8	1.57	
Zeus faber	4.78	12	1.29	
Chaetodon hoeferli	3.90	24	1.05	
Trigla lyra	1.55	16	0.42	
Total	371.22		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 35
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°16.86
 start stop duration Lon E 13°31.50
 TIME :08:02:41 08:33:19 30.6 (min) Purpose : 3
 LOG : 5215.11 5216.73 1.6 Region : 4040
 FDEPTH: 74 72 Gear cond.: 0
 BDEPTH: 74 72 Validity : 0
 Towing dir: 0° Wire out : 195 m Speed : 3.2 kn
 Sorted : 96 Total catch: 261.17 Catch/hour: 511.43

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Trichiurus lepturus	97.50	19.06	
Brachydeuterus auritus	97.50	19.06	64
Pomadasy jubelini	47.86	9.36	
Pomadasy incisus	43.79	8.56	
Pagellus bellottii	28.92	5.66	62
Trachurus trecae	27.75	5.43	61
Chloroscombrus chrysurus	23.67	4.63	
Citharus linguatula	22.66	4.43	
Umbrina canariensis	20.05	3.92	63
Sepia orbignyana	12.73	2.49	
Dasyatis centroura	11.16	2.18	
Rhinobatos albomaculatus	9.89	1.93	
Dentex barnardi	9.07	1.77	
Trigla lyra	8.81	1.72	
Pseudupeneus prayensis	7.13	1.39	
Illex coindetii	6.87	1.34	
Selene dorsalis	5.76	1.13	
Zeus faber	5.60	1.10	
Dentex macropthalmus	4.93	0.96	
Stromateus fiatola	4.78	0.93	
Miracorvina angolensis	3.25	0.64	
Epigonus telescopus	2.49	0.49	
Sardinella maderensis	2.19	0.43	
Grammolites gruvelli	1.63	0.32	
Dentex angolensis	1.43	0.28	
Lithognathus mormyrus	1.12	0.22	
Chaetodon hoefleri	0.92	0.18	
Torpedo torpedo	0.92	0.18	
Microchirus frechkopi	0.61	0.12	
Saurida brasiliensis	0.45	0.09	
Total	511.43	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 36
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°16.42
 start stop duration Lon E 13°34.30
 TIME :09:09:38 09:40:38 31.0 (min) Purpose : 3
 LOG : 5219.52 5221.07 1.6 Region : 4040
 FDEPTH: 53 56 Gear cond.: 0
 BDEPTH: 53 56 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.0 kn
 Sorted : 112 Total catch: 1172.55 Catch/hour: 2269.44

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Pomadasy incisus	711.70	31.36	
Brachydeuterus auritus	539.23	23.76	65
Pomadasy jubelini	435.54	19.19	
Trachurus trecae	162.47	7.16	67
Chloroscombrus chrysurus	80.74	3.56	
Galeoides decadactylus	65.99	2.91	
Umbrina canariensis	44.26	1.95	66
Raja miraletus	26.91	1.19	
Rhinobatos albomaculatus	24.58	1.08	
Citharus linguatula	20.53	0.90	
Pagellus bellottii	20.13	0.89	
Trichiurus lepturus	15.75	0.69	
Argyrosomus hololepidotus	13.94	0.61	
Dentex barnardi	13.16	0.58	68
Lithognathus mormyrus	12.36	0.54	
Torpedo torpedo	11.96	0.53	
Trachinotus ovatus	10.57	0.47	
Sardinella maderensis	8.37	0.37	
Chaetodon hoefleri	7.58	0.33	
Epinephelus aeneus	6.58	0.29	
Selene dorsalis	6.58	0.29	
Sphyræna guachancho	5.58	0.25	
Lagocephalus laevigatus	5.38	0.24	
Pteroscion peli	4.78	0.21	
Pseudupeneus prayensis	3.59	0.16	
Atractoscion aequidens	3.19	0.14	
Sardinella aurita	2.59	0.11	
Grammolites gruvelli	2.59	0.11	
Epigonus telescopus	2.39	0.11	
Pontinus accraensis	1.20	0.05	
Sepia orbignyana	0.66	0.03	
Calappa sp.	0.27	0.01	
Engraulis encrasicolus	0.19	0.01	
Total	2271.34	100.08	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 37
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 12°3.11
 start stop duration Lon E 13°38.85
 TIME :11:24:19 11:54:23 30.1 (min) Purpose : 3
 LOG : 5237.20 5238.85 1.7 Region : 4040
 FDEPTH: 46 57 Gear cond.: 0
 BDEPTH: 46 57 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.3 kn
 Sorted : 192 Total catch: 585.60 Catch/hour: 1168.47

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Brachydeuterus auritus	391.49	33.50	
Trachurus trecae	358.50	30.68	71
Pomadasy incisus	138.88	11.89	69
Raja miraletus	50.58	4.33	
Lithognathus mormyrus	36.81	3.15	
Pagellus bellottii	36.51	3.13	72
Trichiurus lepturus	28.73	2.46	
Pseudupeneus prayensis	28.01	2.40	
Sphyræna sphyræna	23.35	2.00	
Dentex barnardi	14.55	1.24	70
Boops boops	12.33	1.06	
Rhinobatos albomaculatus	10.87	0.93	
Selene dorsalis	4.43	0.38	
Chloroscombrus chrysurus	4.31	0.37	
Chaetodon hoefleri	4.19	0.36	
Atractoscion aequidens	3.95	0.34	
Galeoides decadactylus	3.95	0.34	
Dasyatis marmorata	3.77	0.32	
Pseudotolithus typus	2.89	0.25	
Pomadasy jubelini	2.87	0.25	
Lagocephalus laevigatus	2.75	0.24	
Sardinella aurita	2.57	0.22	
Alloteuthis subulata	1.14	0.10	
Sardinella maderensis	0.60	0.05	
Citharus linguatula	0.42	0.04	
Total	1168.47	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 38
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°59.16
 start stop duration Lon E 13°37.35
 TIME :12:43:25 13:16:21 32.9 (min) Purpose : 3
 LOG : 5242.88 5244.44 1.6 Region : 4040
 FDEPTH: 70 71 Gear cond.: 0
 BDEPTH: 70 71 Validity : 0
 Towing dir: 0° Wire out : 185 m Speed : 2.8 kn
 Sorted : 41 Total catch: 40.79 Catch/hour: 74.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Trachurus trecae	20.32	2053	27.34
Pseudupeneus prayensis	19.59	213	26.35
Alloteuthis africana	9.09	3945	12.23
Raja miraletus	9.00	16	12.11
Pagellus bellottii	4.83	38	6.50
Octopus vulgaris	4.65	4	6.25
Sphyræna sphyræna	1.66	5	2.23
Dentex barnardi	1.64	11	2.21
Trichiurus lepturus	1.08	2	1.45
Zeus faber	0.93	2	1.25
Lithognathus mormyrus	0.82	4	1.10
Citharus linguatula	0.31	11	0.42
Boops boops	0.24	9	0.32
Anthias anthias	0.13	2	0.17
Saurida brasiliensis	0.05	9	0.07
Total	74.32	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 39
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°59.83
 start stop duration Lon E 13°31.82
 TIME :14:16:53 14:47:07 30.2 (min) Purpose : 3
 LOG : 5250.52 5252.24 1.7 Region : 4040
 FDEPTH: 102 103 Gear cond.: 0
 BDEPTH: 102 103 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.4 kn
 Sorted : 66 Total catch: 66.41 Catch/hour: 131.85

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Dentex canariensis	29.48	105	22.36
Dentex angolensis	28.99	139	21.98
Pagellus bellottii	14.79	83	11.22
Dentex barnardi	12.11	42	9.19
Rhinobatos albomaculatus	7.54	2	5.72
Atractoscion aequidens	7.13	4	5.41
Raja miraletus	6.12	8	4.64
Dentex macropthalmus	4.75	26	3.60
Zeus faber	4.27	8	3.24
Sparus auriga *	3.73	6	2.83
TETRAODONTIDAE	2.80	2	2.12
Dentex gibbosus	2.62	2	1.99
Chaetodon hoefleri	1.99	14	1.51
Anthias anthias	1.95	18	1.48
Chelidonichthys capensis	1.61	14	1.22
Fistularia petimba	0.71	2	0.54
Sepia orbignyana	0.34	2	0.26
Alloteuthis africana	0.24	83	0.18
Parapanulax narval	0.24	117	0.18
G A S P R O P O D S	0.16	26	0.12
Citharus linguatula	0.14	4	0.11
Arnoglossus imperialis	0.10	4	0.08
BOTHIDAE	0.06	2	0.05
Total	131.85	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 40
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°57.72
 start stop duration Lon E 13°29.98
 TIME :15:48:56 16:19:01 30.1 (min) Purpose : 3
 LOG : 5256.97 5258.56 1.6 Region : 4040
 FDEPTH: 259 258 Gear cond.: 0
 BDEPTH: 259 258 Validity : 0
 Towing dir: 0° Wire out : 630 m Speed : 3.2 kn
 Sorted : 93 Total catch: 307.36 Catch/hour: 613.09

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Dentex macropthalmus	251.17	1137	40.97
Chlorophthalmus atlanticus	103.40	2457	16.87
Merluccius polli	94.79	453	15.46
Synagrops microlepis	75.96	7340	12.39
Trichiurus lepturus	22.14	28	3.61
Pterothrissus belloci	14.04	76	2.29
Zenopsis conchifer	13.92	32	2.27
Scorpaena normani	6.90	281	1.13
Todarodes sagittatus	5.11	38	0.83
Bembrops greyi	4.27	122	0.70
Gadella maraldi	4.21	197	0.69
Parapenaeus longirostris, femal	3.89	415	0.63
Pontinus accraensis	3.07	6	0.50
Parapenaeus longirostris, male	2.81	409	0.46
Conger conger	2.11	12	0.34
MYCTOPHIDAE	1.80	1743	0.29
Malacocephalus laevis	1.72	20	0.28
Illex coindetii	0.70	38	0.11
Nezumia aequalis	0.70	20	0.11
Calappa sp.	0.38	6	0.06
Total	613.09	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 41
 DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°56.30
 start stop duration Lon E 13°23.24
 TIME :17:59:05 18:29:10 30.1 (min) Purpose : 3
 LOG : 5267.43 5268.90 1.5 Region : 4040
 FDEPTH: 474 477 Gear cond.: 0
 BDEPTH: 474 477 Validity : 0
 Towing dir: 0° Wire out : 1050 m Speed : 2.9 kn
 Sorted : 50 Total catch: 174.26 Catch/hour: 347.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Nematocarcinus africanus	229.57	63624	66.09
Yarellia blackfordi	28.88	895	8.32
Merluccius polli	19.24	32	5.54
Stomias boa boa	17.76	429	5.11
Aristeus varidens, female	12.04	494	3.47
Gadella maraldi	10.78	692	3.10
Malacocephalus occidentalis	4.41	40	1.27
Lamprogrammus exutus	3.43	106	0.99
Triplophos hemingi	3.35	389	0.96
Aristeus varidens, male	3.09	363	0.89
Trichiurus lepturus	2.63	106	0.76
Centrophorus squamosus	2.37	60	0.68
Stereomastix sp.	1.97	203	0.57
Chaceon maritae	1.91	6	0.55
Haploblepharus pictus	1.46	46	0.42
Hoplostethus cadonati	1.38	80	0.40
Halosaurus ovemii	1.26	106	0.36
Chlorophthalmus atlanticus	0.80	20	0.23
Nezumia aequalis	0.52	14	0.15
Cryptopsaras couesii	0.26	6	0.07
Raja alba	0.26	14	0.07
Total	347.36	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 42
DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°55.84
E 13°21.57
start stop duration
TIME :20:06:28 20:35:37 29.1 (min) Purpose : 3
LOG : 5273.75 5275.18 1.4 Region : 4040
FDEPTH: 568 569 Gear cond.: 0
BDEPTH: 568 569 Validity : 0
Towing dir: 0° Wire out : 1300 m Speed : 2.9 kn
Sorted : 31 Total catch: 116.72 Catch/hour: 240.33

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 45
DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°43.95
E 13°22.68
start stop duration
TIME :03:22:28 03:52:23 29.9 (min) Purpose : 3
LOG : 5300.85 5302.31 1.5 Region : 4040
FDEPTH: 352 349 Gear cond.: 0
BDEPTH: 352 349 Validity : 0
Towing dir: 0° Wire out : 800 m Speed : 2.9 kn
Sorted : 31 Total catch: 431.90 Catch/hour: 866.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	85.61	24173	35.62	
Yarella blackfordi	35.72	1289	14.86	
Stomias boa boa	26.68	585	11.10	
Chaceon maritae, female	23.43	103	9.75	84
Hoplostethus cadenati	14.23	585	5.92	
Merluccius polli	14.10	23	5.87	
Aristeus varidens, female	11.72	408	4.87	86
Lamprogrammus exutus	4.37	51	1.82	
Stereomastix sp.	3.79	371	1.58	
Triplophos hemingi	3.42	342	1.42	
Chaceon maritae, male	3.34	8	1.39	
Trichiurus lepturus	3.11	97	1.29	
Aristeus varidens, male	2.51	163	1.05	85
Melanonus zugmayeri	1.63	37	0.68	
Nezumia sp.	1.40	89	0.58	
Centrophorus squamosus	0.82	14	0.34	
Chlorophthalmus atlanticus	0.82	14	0.34	
Xenodermichthys copei	0.74	74	0.31	
Gadella maraldi	0.66	74	0.27	
Talismania longifilis	0.60	29	0.25	
Plesiopeneus edwardsianus	0.60	97	0.25	
Halosaurus ovenii	0.37	14	0.15	
Bathyroconger vicinus	0.29	14	0.12	
MYCTOPHIDAE	0.29	288	0.12	
Gadella imberbis	0.08	14	0.03	
Total	240.33		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	320.05	983	36.95	88
Hymenocephalus italicus	200.74	21898	23.18	
Centrophorus squamosus	103.32	2246	11.93	
Nematocarcinus africanus	89.84	3060	10.37	
Gadella imberbis	57.83	674	6.68	
Lophius sp.	30.60	56	3.53	
MYCTOPHIDAE	10.39	9967	1.20	
Todarodes sagittatus	10.11	56	1.17	
Aristeus varidens, female	8.42	365	0.97	89
Parapeneus longirostris	7.58	1235	0.88	
Aristeus varidens, male	6.46	1179	0.75	90
Nezumia sp.	5.90	168	0.68	
Bathyroconger vicinus	3.09	56	0.36	
Chlorophthalmus atlanticus	2.53	56	0.29	
Dibranchius atlanticus	2.25	421	0.26	
Pontinus accraensis	1.97	84	0.23	
Callinectes sp.	1.68	28	0.19	
Chaunax pictus	0.84	84	0.10	
Gadella maraldi	0.84	168	0.10	
Trichiurus lepturus	0.56	28	0.06	
Yarella blackfordi	0.56	28	0.06	
Stereomastix sp.	0.28	84	0.03	
L O B S T E R S	0.28	281	0.03	
Total	866.11		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 43
DATE :20/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°55.51
E 13°19.96
start stop duration
TIME :22:21:09 22:51:15 30.1 (min) Purpose : 3
LOG : 5280.45 5281.98 1.5 Region : 4040
FDEPTH: 661 662 Gear cond.: 0
BDEPTH: 661 662 Validity : 0
Towing dir: 0° Wire out : 1400 m Speed : 3.1 kn
Sorted : 29 Total catch: 119.65 Catch/hour: 238.58

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 46
DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°45.33
E 13°28.81
start stop duration
TIME :05:18:45 05:48:34 29.8 (min) Purpose : 3
LOG : 5310.35 5311.87 1.5 Region : 4040
FDEPTH: 160 160 Gear cond.: 0
BDEPTH: 160 160 Validity : 0
Towing dir: 0° Wire out : 400 m Speed : 3.1 kn
Sorted : 79 Total catch: 408.70 Catch/hour: 822.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	96.11	19509	40.28	
Yarella blackfordi	43.87	1212	18.39	
Hoplostethus cadenati	20.10	726	8.42	
Lamprogrammus exutus	15.31	40	6.42	
Stomias boa boa	10.13	383	4.25	
MACROURIDAE	9.57	255	4.01	
Stereomastix sculpta	8.85	909	3.71	
J E L L Y F I S H	5.34	56	2.24	
Gadella imberbis	4.39	295	1.84	
Triplophos hemingi	3.51	463	1.47	
Aristeus varidens, female	2.87	183	1.20	
SQUALIDAE	2.23	32	0.94	
Merluccius polli	2.19	4	0.92	
Bathyroconger vicinus	1.83	32	0.77	
Chaceon maritae, female	1.73	6	0.73	
MYCTOPHIDAE	1.60	1675	0.67	
Halosaurus ovenii	1.52	40	0.64	
Bajacalifornia magalops	1.36	40	0.57	
Trichiurus lepturus	1.36	40	0.57	
Glyphus marsupialis	1.12	64	0.47	
Cataetys laticeps	0.80	144	0.33	
Benthodesmus tenuis	0.72	8	0.30	
Plesiopeneus edwardsianus	0.64	64	0.27	
Aristeus varidens, male	0.40	80	0.17	
Chlorophthalmus atlanticus	0.32	8	0.13	
Melanocetus johnsoni	0.32	8	0.13	
Dibranchius atlanticus	0.24	8	0.10	
Nemichthys scolopaceus	0.16	8	0.07	
Total	238.58		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	439.18	68272	53.39	
Brotula barbata	109.90	113	13.36	
Dentex angolensis	58.07	137	7.06	91
Trichiurus lepturus	51.12	129	6.21	
Scorpaena normani	35.91	129	4.37	
Pterothrissus belloci	25.84	250	3.14	
Bembrops greyi	15.78	773	1.92	
Syacium micurum	14.09	370	1.71	
Umbrina canariensis	10.77	16	1.31	93
Citharus linguatula	9.18	129	1.12	
Raja straeleni	8.53	6	1.04	
Parapeneus longirostris	7.57	2584	0.92	
Illex coindetii	6.20	274	0.75	
Branchiostegus semifasciatus *	5.80	6	0.70	
Dentex macrophthalmus	5.43	26	0.66	92
Todaropsis eblanae	4.35	137	0.53	
Uranoscopus polli	3.62	16	0.44	
Zeus faber	3.14	6	0.38	
Trigla lyra	3.14	18	0.38	
Scylliorhinus stellaris	1.93	6	0.23	
Peristedion cataphractum	1.53	18	0.19	
Zenopsis conchifer	0.81	18	0.10	
Conger conger	0.72	6	0.09	
Total	822.61		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 44
DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°44.50
E 13°18.01
start stop duration
TIME :01:03:45 01:34:14 30.5 (min) Purpose : 3
LOG : 5292.13 5293.55 1.4 Region : 4040
FDEPTH: 691 696 Gear cond.: 0
BDEPTH: 691 696 Validity : 0
Towing dir: 0° Wire out : 1410 m Speed : 2.8 kn
Sorted : 30 Total catch: 125.83 Catch/hour: 247.62

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 47
DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°45.55
E 13°32.58
start stop duration
TIME :06:57:47 07:28:24 30.6 (min) Purpose : 3
LOG : 5317.83 5319.29 1.5 Region : 4040
FDEPTH: 108 108 Gear cond.: 0
BDEPTH: 108 108 Validity : 0
Towing dir: 0° Wire out : 275 m Speed : 2.9 kn
Sorted : 60 Total catch: 156.03 Catch/hour: 305.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	67.69	14956	27.34	
Yarella blackfordi	38.33	1110	15.48	
Lamprogrammus exutus	25.19	63	10.17	
Malacocephalus laevis	21.17	685	8.55	
Stomias boa boa	18.26	472	7.38	
Hoplostethus cadenati	18.18	645	7.34	
Merluccius polli	8.95	12	3.62	87
Lophius vaillanti	8.34	24	3.37	
Stereomastix sculpta	6.85	842	2.77	
Aristeus varidens, female	6.38	331	2.57	
Dicrolene intronigra	4.88	535	1.97	
Bajacalifornia magalops	3.78	134	1.53	
Bathyroconger vicinus	3.78	55	1.53	
Aristeus varidens, male	3.15	394	1.27	
Benthodesmus tenuis	2.91	79	1.18	
Triplophos hemingi	1.73	228	0.70	
Halosaurus ovenii	1.65	24	0.67	
Plesiopeneus edwardsianus	1.26	134	0.51	
Gadella imberbis	1.26	47	0.51	
Trichiurus lepturus	0.87	31	0.35	
MYCTOPHIDAE	0.63	386	0.25	
Melanocetus johnsoni	0.63	24	0.25	
Glyphus marsupialis	0.55	31	0.22	
Chaceon maritae, female	0.47	2	0.19	
SQUALIDAE	0.24	8	0.10	
Cataetys laticeps	0.16	31	0.06	
GALATHEIDAE *	0.16	118	0.06	
Nemichthys scolopaceus	0.08	16	0.03	
Acanthephyra sp.	0.08	8	0.03	
Total	247.62		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	197.97	1143	64.73	94
Dentex angolensis	35.67	196	11.66	95
Pagellus bellottii	18.19	114	5.95	96
Hyperoglyphe mosellii	14.02	2	4.58	
Dentex barnardi	11.92	74	3.90	
Trigla lyra	8.33	78	2.72	
Lagocephalus laevigatus	4.90	10	1.60	
Branchiostegus semifasciatus *	4.08	6	1.33	
Sepla orbignyana	3.53	20	1.15	
Octopus vulgaris	3.00	6	0.98	
Citharus linguatula	2.31	49	0.76	
Chelidonichthys gabonensis	0.69	6	0.22	
Syacium micurum	0.45	10	0.15	
Microchirus frechopki	0.39	6	0.13	
Trachurus trecae	0.39	10	0.13	
Total	305.84		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 48
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°48.33
 start stop duration Lon E 13°40.74
 TIME :08:42:50 09:12:29 29.6 (min) Purpose : 3
 LOG : 5327.83 5329.43 1.6 Region : 4040
 FDEPTH: 64 63 Gear cond.: 0
 BDEPTH: 64 63 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.2 kn
 Sorted : 77 Total catch: 77.13 Catch/hour: 156.13

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 51
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°31.58
 start stop duration Lon E 13°38.78
 TIME :13:33:36 14:04:03 30.5 (min) Purpose : 3
 LOG : 5359.94 5361.58 1.6 Region : 4040
 FDEPTH: 42 43 Gear cond.: 0
 BDEPTH: 42 43 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
 Sorted : 143 Total catch: 143.00 Catch/hour: 281.77

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Trachurus trecae	28.24	18.89	97
Alloteuthis africana	21.86	6490	14.00
Raja miraletus	14.86	36	9.52
Boops boops	14.27	117	9.14
Torpedo torpedo	12.02	18	7.70
Pseudupeneus prayensis	9.45	134	6.05
Rhinobatos albomaculatus	6.48	2	4.15
Trichiurus lepturus	5.57	12	3.57
Brachydeuterus auritus	5.57	91	3.57
Selene dorsalis	5.30	34	3.40
Citharus linguatula	5.14	192	3.29
Dentex barnardi	4.70	40	3.01
Zeus faber	4.43	10	2.84
Pagellus bellottii	4.15	47	2.66
Lithognathus mormyrus	2.87	8	1.84
Epigonus telescopus	2.57	51	1.65
Octopus vulgaris	2.37	2	1.52
Trigla lyra	2.31	18	1.48
Grammolites gruvelli	1.68	12	1.08
Saurida brasiliensis	1.11	182	0.71
Sepia orbignyana	0.59	6	0.38
Lagocephalus laevigatus	0.38	4	0.25
Epinephelus goreensis	0.12	2	0.08
Monolene microstoma	0.08	4	0.05
Total	156.13	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Pseudupeneus prayensis	95.76	1277	33.99
Raja miraletus	25.67	43	9.11
Pagellus bellottii	24.43	3892	8.67
Epinephelus aeneus	23.84	6	8.46
Dentex barnardi	20.49	221	7.27
Acanthurus monroviae	16.35	20	5.80
Lithognathus mormyrus	10.70	33	3.80
Balistes punctatus	8.97	16	3.18
Chaetodon hoefleri	5.91	49	2.10
Alloteuthis africana	5.81	1602	2.06
Pomadasy incisus	5.62	20	1.99
Seriola carpenteri	5.58	2	1.98
Rhinobatos albomaculatus	4.73	8	1.68
Ephippion guttifer	4.49	28	1.59
Argyrosomus hololepidotus	4.18	4	1.48
Plectrochinchus mediterraneus	4.06	12	1.44
Lagocephalus laevigatus	3.21	14	1.14
Dasyatis marmorata	2.36	2	0.84
Sphyrna guachancho	1.95	8	0.69
Alectis alexandrinus	1.73	2	0.62
Fistularia petimba	1.34	8	0.48
Boops boops	1.06	28	0.38
Citharus linguatula	0.99	32	0.35
Diplodus cervinus cervinus	0.83	2	0.29
Torpedo torpedo	0.49	2	0.17
Bodianus speciosus	0.41	4	0.15
Chromis cadenati	0.37	79	0.13
Cynoglossus canariensis	0.33	2	0.12
Chromis sp.	0.06	2	0.02
Arnoglossus imperialis	0.02	2	0.01
Total	281.77	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 49
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°49.11
 start stop duration Lon E 13°45.69
 TIME :10:08:20 10:39:59 31.7 (min) Purpose : 3
 LOG : 5335.85 5337.52 1.7 Region : 4040
 FDEPTH: 24 23 Gear cond.: 0
 BDEPTH: 24 23 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 3.1 kn
 Sorted : 101 Total catch: 567.62 Catch/hour: 1075.72

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 52
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°31.11
 start stop duration Lon E 13°34.43
 TIME :14:54:36 15:23:25 28.8 (min) Purpose : 3
 LOG : 5366.76 5368.10 1.3 Region : 4040
 FDEPTH: 62 62 Gear cond.: 0
 BDEPTH: 62 62 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 2.8 kn
 Sorted : 61 Total catch: 61.17 Catch/hour: 127.35

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Brachydeuterus auritus	664.36	21957	61.76
Sardinella maderensis	216.50	21184	20.13
Chloroscombrus chrysurus	47.97	436	4.46
Galeoides decadactylus	25.68	191	2.39
Sphyrna sphyraena	18.57	478	1.73
Epinephelus aeneus	14.65	32	1.36
Pomadasy jubelini	14.12	32	1.31
Saurida brasiliensis	13.15	2102	1.22
Selene dorsalis	8.38	224	0.78
Pseudupeneus prayensis	8.17	191	0.76
Arius parkii	7.96	21	0.74
Rhinobatos albomaculatus	7.85	11	0.73
Pagellus bellottii	4.78	171	0.44
Pomadasy incisus	3.71	32	0.35
Lithognathus mormyrus	3.07	11	0.29
Pseudolithotus typus	2.98	11	0.28
Trichiurus lepturus	2.77	21	0.26
Drepane africana	2.65	11	0.25
Dicologlossa cuneata	2.33	32	0.22
Trachurus trecae	2.24	95	0.21
Lagocephalus laevigatus	1.38	11	0.13
Ilisha africana	1.17	11	0.11
Alloteuthis africana	0.64	201	0.06
Dentex barnardi	0.64	11	0.06
Total	1075.72	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Pagellus bellottii	28.63	173	22.48
Dentex barnardi	19.47	90	15.29
Lithognathus mormyrus	15.45	35	12.13
Raja miraletus	15.09	29	11.85
Seriola carpenteri	9.99	4	7.85
Trachurus trecae	8.43	131	6.62
Sepia orbignyana	5.68	6	4.46
Alloteuthis africana	4.68	1291	3.68
Citharus linguatula	3.04	69	2.39
Sphyrna sphyraena	3.04	10	2.39
Torpedo torpedo	2.98	6	2.34
Zeus faber	2.94	6	2.31
Pseudupeneus prayensis	1.79	44	1.41
Epinephelus goreensis	1.23	2	0.96
Chelidonichthys capensis	1.15	15	0.90
Trichiurus lepturus	1.12	2	0.88
Grammolites gruvelli	0.71	10	0.56
Anthias anthias	0.56	10	0.44
Octopus vulgaris	0.56	2	0.44
Lagocephalus laevigatus	0.42	2	0.33
Chaetodon hoefleri	0.40	2	0.31
Total	127.35	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 50
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°32.62
 start stop duration Lon E 13°43.07
 TIME :12:12:33 12:42:51 30.3 (min) Purpose : 3
 LOG : 5352.68 5354.35 1.7 Region : 4040
 FDEPTH: 30 28 Gear cond.: 0
 BDEPTH: 30 28 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.3 kn
 Sorted : 36 Total catch: 36.45 Catch/hour: 72.18

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 53
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°32.83
 start stop duration Lon E 13°30.32
 TIME :16:19:08 16:50:18 31.2 (min) Purpose : 3
 LOG : 5373.75 5375.44 1.7 Region : 4040
 FDEPTH: 103 103 Gear cond.: 0
 BDEPTH: 103 103 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.3 kn
 Sorted : 56 Total catch: 388.92 Catch/hour: 748.64

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Alectis alexandrinus	25.25	22	34.98
Rhinobatos albomaculatus	11.39	18	15.78
Sepia orbignyana	7.62	16	10.56
Ephippion guttifer	5.68	4	7.87
Balistes punctatus	4.85	8	6.72
Pagellus bellottii	4.18	34	5.79
Alloteuthis africana	3.45	850	4.77
Sphyrna guachancho	2.65	2	3.68
Lagocephalus laevigatus	2.40	12	3.32
Citharus linguatula	2.06	22	2.85
Cynoglossus canariensis	1.64	12	2.28
Dicologlossa cuneata	0.40	6	0.55
Antennarius sp.	0.26	2	0.36
Selene dorsalis	0.24	2	0.33
Dentex barnardi	0.10	2	0.14
Grammolites gruvelli	0.02	4	0.03
Total	72.18	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
Trichiurus lepturus	302.48	978	40.40
Umbrina canariensis	119.54	244	15.97
Brachydeuterus auritus	77.96	541	10.41
Trigla lyra	51.36	373	6.86
Pomadasy jubelini	31.70	31	4.23
Citharus linguatula	31.18	416	4.17
Dentex macrophthalmus	27.24	125	3.64
Atractoscion aequidens	16.84	6	2.25
Lagocephalus laevigatus	12.78	10	1.71
Brotula barbata	12.70	12	1.70
Raja miraletus	11.43	21	1.53
Pterothrissus belloci	11.22	52	1.50
Rhinobatos albomaculatus	11.07	4	1.48
Scorpaena normani	8.74	42	1.17
Pagellus bellottii	8.22	42	1.10
Alloteuthis africana	5.29	1342	0.71
Argyrosomus hololepidotus	4.81	2	0.64
Dentex barnardi	2.81	10	0.38
Illex coindetii	1.25	31	0.17
Total	748.64	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 54
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°30.58
 start stop duration Lon E 13°21.43
 TIME :18:37:26 19:07:17 29.9 (min) Purpose : 3
 LOG : 5386.60 5387.96 1.4 Region : 4040
 FDEPTH: 377 385 Gear cond.: 0
 BDEPTH: 377 385 Validity : 0
 Towing dir: 0° Wire out : 870 m Speed : 2.7 kn
 Sorted : 38 Total catch: 236.91 Catch/hour: 476.04

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 57
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°12.68
 start stop duration Lon E 13°37.87
 TIME :07:03:00 07:33:04 30.1 (min) Purpose : 3
 LOG : 5451.10 5452.66 1.6 Region : 4040
 FDEPTH: 114 112 Gear cond.: 0
 BDEPTH: 114 112 Validity : 0
 Towing dir: 0° Wire out : 285 m Speed : 3.1 kn
 Sorted : 29 Total catch: 29.27 Catch/hour: 58.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	292.06	117	61.35	
Nematocarcinus africanus	82.22	28921	17.27	
Gadella maraldi	20.64	217	4.33	
Aristeus varidens, female	15.91	896	3.34	110
Chlorophthalmus atlanticus	15.47	366	3.25	
Centrophorus squamosus	10.09	651	2.12	
Hymenocephalus italicus	5.75	699	1.21	
Parapenaeus longirostris, femal, female	5.45	496	1.14	112
Aristeus varidens, male	5.41	655	1.14	111
Halosaurus ovenii	4.44	293	0.93	
Chaunax pictus	3.86	317	0.81	
Malacocephalus occidentalis	3.58	56	0.75	
Zenopsis conchifer	3.01	2	0.63	
Nezumia aequalis	2.07	135	0.43	
Chaceon maritae	1.83	4	0.38	
Pontinus accraensis	1.00	20	0.21	
Calappa sp.	0.86	14	0.18	
Conger conger	0.76	10	0.16	
Solenocera africana	0.62	135	0.13	
Trichiurus lepturus	0.62	20	0.13	
Gadella imberbis	0.24	4	0.05	
MYCTOPHIDAE	0.14	58	0.03	
Total	476.04		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	17.86	74	30.58	116
Brotula barbata	10.28	16	17.59	
Scorpaena normani	6.78	70	11.62	
Trigla lyra	3.59	26	6.15	
Lagocephalus laevigatus	3.35	16	5.74	
Zeus faber	2.95	8	5.06	
Citharus linguatula	2.04	36	3.48	
Raja miraletus	1.98	2	3.38	
Octopus vulgaris	1.96	4	3.35	
Dentex barnardi	1.92	4	3.28	
Illex coindetii	1.62	72	2.77	
Pontinus accraensis	1.00	4	1.71	
Uranoscopus polli	0.82	4	1.40	
Syacium micrurum	0.48	16	0.82	
Dentex macrocephalus	0.44	2	0.75	
Umbrina canariensis	0.40	2	0.68	
Octopus macropus	0.34	2	0.58	
Bembrops greyi	0.18	6	0.31	
Sepia orbignyana	0.18	2	0.31	
Alloteuthis africana	0.14	38	0.24	
Saurida brasiliensis	0.12	12	0.20	
Total	58.40		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 55
 DATE :21/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°13.91
 start stop duration Lon E 13°27.84
 TIME :21:51:34 22:22:26 30.9 (min) Purpose : 3
 LOG : 5404.43 5405.92 1.5 Region : 4040
 FDEPTH: 514 513 Gear cond.: 0
 BDEPTH: 514 513 Validity : 0
 Towing dir: 0° Wire out : 1150 m Speed : 2.9 kn
 Sorted : 30 Total catch: 124.32 Catch/hour: 241.71

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 58
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°16.64
 start stop duration Lon E 13°41.94
 TIME :08:26:48 08:57:28 30.7 (min) Purpose : 3
 LOG : 5458.31 5459.91 1.6 Region : 4040
 FDEPTH: 21 21 Gear cond.: 0
 BDEPTH: 21 21 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 3.1 kn
 Sorted : 73 Total catch: 72.95 Catch/hour: 142.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	74.66	21426	30.89	
Yarellia blackfordi	38.73	1198	16.02	0
Stomias boa boa	30.80	747	12.74	
Hoplostethus cadenati	22.16	1034	9.17	
Lamprogrammus exutus	21.78	855	9.01	
Trichiurus lepturus	21.54	1143	8.91	
Aristeus varidens, female, female	8.32	490	3.44	113
Aristeus varidens, male, male	7.47	988	3.09	114
Laemonema laureysi	5.13	70	2.12	
Merluccius polli	2.06	4	0.85	
Stereomastix sculpta	1.87	187	0.77	
OMMASTREPHIDAE	1.09	8	0.45	
Malacocephalus occidentalis	1.01	8	0.42	
Xenodermichthys copei	0.62	54	0.26	
SQUALIDAE	0.54	62	0.23	
BOTHIDAE	0.54	31	0.23	
Triplophos hemingi	0.54	70	0.23	0
Malacocephalus laevis	0.47	31	0.19	
Halosaurus ovenii	0.39	31	0.16	
Gadella imberbis	0.39	31	0.16	
Caelorinchus sp.	0.39	16	0.16	
Chlorophthalmus atlanticus	0.31	8	0.13	
Hymenocephalus italicus	0.31	39	0.13	
Bathyroconger vicinus	0.23	16	0.10	
Dicrolene intronigra	0.16	31	0.06	
Catastyx laticeps	0.08	8	0.03	
Peristegion cataphractum	0.08	16	0.03	
Solenocera africana	0.04	39	0.02	
Total	241.71		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	76.61	540	53.67	117
Trachinocephalus myops	11.35	25	7.95	
Pseudupeneus prayensis	9.53	47	6.68	
Aluterus scriptus	7.98	20	5.59	
Lagocephalus laevigatus	5.28	20	3.70	
Sepia orbignyana	4.36	6	3.06	
Fistularia tabacaria	4.32	74	3.03	
Raja miraletus	2.99	4	2.10	
Raja leopards	2.92	2	2.04	
Rypticus saponaceus	2.76	47	1.93	
Balistes capricus	2.50	4	1.75	
Ephippion guttifer	2.19	2	1.54	
Scorpaena stephanica	1.64	8	1.15	
Lophiodes kempi	1.39	2	0.97	
Chilomycterus spinosus mauret.	1.17	8	0.82	
Rhinobatos albomaculatus	1.10	2	0.77	
Bothus podas africanus	1.02	12	0.71	
Xyrichtys novacula	0.96	6	0.67	
Lithognathus mormyrus	0.82	2	0.58	
Sphyraena sphyraena	0.63	6	0.44	
Trachinus armatus	0.41	4	0.29	
Dentex angolensis	0.33	2	0.23	
Scorpaena normani	0.25	2	0.18	
Citharus linguatula	0.22	4	0.15	
Total	142.76		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 56
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°13.07
 start stop duration Lon E 13°35.86
 TIME :05:41:36 06:10:57 29.3 (min) Purpose : 3
 LOG : 5446.31 5447.76 1.5 Region : 4040
 FDEPTH: 149 150 Gear cond.: 0
 BDEPTH: 149 150 Validity : 0
 Towing dir: 10° Wire out : 365 m Speed : 3.0 kn
 Sorted : 106 Total catch: 105.70 Catch/hour: 216.16

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 59
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 11°17.45
 start stop duration Lon E 13°44.43
 TIME :09:37:11 10:07:10 30.0 (min) Purpose : 3
 LOG : 5464.18 5465.76 1.6 Region : 4040
 FDEPTH: 21 23 Gear cond.: 0
 BDEPTH: 21 23 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 3.2 kn
 Sorted : 86 Total catch: 455.04 Catch/hour: 910.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	58.38	82	27.01	
Brotula barbata	48.57	84	22.47	
Bembrops greyi	30.78	360	14.24	
Dentex angolensis	25.56	86	11.83	115
Zeus faber	11.41	33	5.28	
Illex coindetii	9.94	425	4.60	
Parapenaeus longirostris	9.80	3918	4.53	
Scorpaena normani	9.24	82	4.28	
Pterothrissus belloci	7.77	102	3.60	
Citharus linguatula	1.45	55	0.67	
Syacium micrurum	1.35	59	0.62	
Miracorvina angolensis	0.51	2	0.24	
Pentheroscion mibzi	0.47	2	0.22	
Uranoscopus polli	0.31	2	0.14	
Calappa sp.	0.27	6	0.12	
Trigla lyra	0.22	2	0.10	
Squilla mantis	0.08	2	0.04	
Saurida brasiliensis	0.04	4	0.02	
Total	216.16		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	316.47	14759	34.76	119
Pteroscion peli	167.74	2443	18.42	
Galeoides decadactylus	87.91	798	9.66	
Ilisha africana	59.50	1987	6.54	
Lithognathus mormyrus	58.22	180	6.40	
Pseudotolithus senegalensis	35.51	114	3.90	118
Selene dorsalis	31.37	1206	3.45	
Pomadasys incisus	30.79	494	3.38	
Trichiurus lepturus	29.27	142	3.22	
Arius parkii	19.11	28	2.10	
Torpedo marmorata	13.58	10	1.49	
Ephippion guttifer	13.58	10	1.49	
Eucinostomus melanopterus	9.40	76	1.03	
Sphyraena sphyraena	8.36	162	0.92	
Pseudupeneus prayensis	5.42	66	0.60	
Epinephelus aeneus	5.42	10	0.60	
Sardinella maderensis	3.70	20	0.41	
Lagocephalus laevigatus	2.94	10	0.32	
Sepia orbignyana	2.86	10	0.31	
Pagellus bellottii	2.28	20	0.25	
Umbrina canariensis	2.10	28	0.23	
Penaeus notialis	1.14	28	0.13	
Dicologlossa cuneata	1.04	20	0.11	
Cynoglossus senegalensis	1.04	20	0.11	
Chloroscombrus chrysurus	0.66	10	0.07	
Dentex barnardi	0.58	10	0.06	
Scorpaena stephanica	0.38	10	0.04	
Total	910.38		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 60
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat N 0°0.00
 start stop duration Lon E 0°0.00
 TIME :12:11:29 12:38:04 27.0 (min) Purpose : 3
 LOG : 5487.26 5488.79 1.5 Region : 4040
 FDEPTH: 34 34 Gear cond.: 0
 BDEPTH: 34 34 Validity : 0
 Towing dir: 0° Wire out : 115 m Speed : 3.4 kn
 Sorted : 177 Total catch: 665.02 Catch/hour: 1477.82

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 63
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°57.94
 start stop duration Lon E 13°27.58
 TIME :17:19:32 17:49:04 29.5 (min) Purpose : 3
 LOG : 5516.37 5517.85 1.5 Region : 4040
 FDEPTH: 371 366 Gear cond.: 0
 BDEPTH: 371 366 Validity : 0
 Towing dir: 0° Wire out : 880 m Speed : 3.0 kn
 Sorted : 59 Total catch: 233.20 Catch/hour: 473.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	516.00	17620	34.92	121
Cynoponticus ferox	298.22	69	20.18	
Pseudotolithus senegalensis	166.00	627	11.23	120
Trichiurus lepturus	140.33	833	9.50	
Galeoides decadactylus	118.67	333	8.03	
Pteroscion peli	91.33	1133	6.18	
Dicologlossa cuneata	33.00	713	2.23	
Dasyatis margarita	32.00	33	2.17	
Saurida brasiliensis	21.27	2900	1.44	
Trachurus trecae	20.13	2187	1.36	122
Gymnura micrura	10.27	7	0.69	
Torpedo nobiliana	7.87	13	0.53	
Grammolites gruvelli	6.60	120	0.45	
Stromateus fistola	5.53	7	0.37	
Torpedo marmorata	3.40	7	0.23	
Pomadasys jubelini	2.80	7	0.19	
Selene dorsalis	1.13	27	0.08	
Chloroscombrus chrysurus	1.07	7	0.07	
Brotula barbata	0.93	13	0.06	
Cynoglossus canariensis	0.93	7	0.06	
Sphyræna sphyraena	0.27	13	0.02	
Penæna notialis	0.07	27	0.00	
Total		1477.82	100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	326.61	2177	68.95	
Nematocarcinus africanus	76.78	24024	16.21	
Gadella maraldi	23.32	382	4.92	
Hymenocephalus italicus	13.49	2665	2.85	
Aristeus varidens, male	6.66	682	1.41	127
Nezumia aequalis	4.71	154	0.99	
MYCTOPHIDAE	3.74	3315	0.79	
Chlorophthalmus atlanticus	3.01	65	0.63	
Centrophorus squamosus	2.60	431	0.55	
Aristeus varidens, female	2.60	171	0.55	128
Munidopsis sp.	2.27	699	0.48	
Malacocephalus occidentalis	1.54	24	0.33	
Todarodes sagittatus	1.46	16	0.31	
Chaunax pictus	1.30	114	0.27	
Callinectes sp.	0.81	41	0.17	
Synagrops microlepis	0.49	49	0.10	
Gadella imberbis	0.41	16	0.09	
Halosaurus ovenii	0.41	32	0.09	
Conger conger	0.41	106	0.09	
Hoplostethus cadenati	0.41	16	0.09	
Trichiurus lepturus	0.41	16	0.09	
Dibranchius atlanticus	0.24	24	0.05	
Total		473.66	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 61
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°54.92
 start stop duration Lon E 13°43.99
 TIME :13:24:53 13:54:55 30.0 (min) Purpose : 3
 LOG : 5493.08 5494.78 1.7 Region : 4040
 FDEPTH: 50 53 Gear cond.: 0
 BDEPTH: 50 53 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.4 kn
 Sorted : 81 Total catch: 81.02 Catch/hour: 161.88

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 64
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°48.41
 start stop duration Lon E 13°20.00
 TIME :20:00:57 20:30:04 29.1 (min) Purpose : 3
 LOG : 5529.49 5530.98 1.5 Region : 4040
 FDEPTH: 320 319 Gear cond.: 0
 BDEPTH: 320 319 Validity : 0
 Towing dir: 0° Wire out : 790 m Speed : 3.1 kn
 Sorted : 89 Total catch: 532.89 Catch/hour: 1097.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	84.32	1656	52.09	124
Raja miraletus	22.28	28	13.76	
Trichiurus lepturus	17.48	454	10.80	
Pseudotolithus senegalensis	9.09	16	5.62	123
Zeus faber	6.95	16	4.30	
Rhinobatos albomaculatus	5.19	4	3.21	
Alloteuthis africana	4.00	945	2.47	
Epinephelus aeneus	2.20	2	1.36	
Torpedo torpedo	1.94	6	1.20	
Dentex canariensis	1.38	4	0.85	
Argyrosomus hololepidotus	1.18	2	0.73	
Trachurus trecae	1.12	172	0.69	125
Sphyræna guachancho	0.88	2	0.54	
Pagellus bellottii	0.74	4	0.46	
Citharus linguatula	0.72	18	0.44	
Chelidonichthys capensis	0.50	2	0.31	
Torpedo nobiliana	0.42	2	0.26	
Grammolites gruvelli	0.42	6	0.26	
J E L L Y F I S H	0.34	18	0.21	
Dentex barnardi	0.32	6	0.20	
Brotula barbata	0.14	2	0.09	
Scorpaena stephanica	0.12	2	0.07	
GOBIIDAE	0.08	30	0.05	
Scorpaena normani	0.04	2	0.02	
Saurida brasiliensis	0.04	22	0.02	
Total		161.88	100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	709.00	15132	64.57	
Merluccius polli	260.23	2027	23.70	
Gadella maraldi	30.91	408	2.81	
Aristeus varidens, male, male	19.90	2683	1.81	130
Hymenocephalus italicus	17.55	3177	1.60	
Scorpaena normani	14.34	161	1.31	
Todarodes sagittatus	12.49	124	1.14	
Epigonus telescopus	7.29	124	0.66	
Aristeus varidens, female, female	7.05	359	0.64	129
Munidopsis sp.	5.44	902	0.50	
Zenopsis conchifer	4.18	4	0.38	
Malacocephalus occidentalis	2.84	49	0.26	
Synagrops microlepis	2.35	111	0.21	
Callinectes sp.	1.32	37	0.12	
Nezumia sp.	0.74	12	0.07	
MYCTOPHIDAE	0.49	359	0.05	
Gadella imberbis	0.49	12	0.05	
Parapanaeus longirostris	0.37	37	0.03	
Lophiodes kempi	0.37	12	0.03	
Centrophorus squamosus	0.37	49	0.03	
Dibranchius atlanticus	0.12	12	0.01	
Solenocera africana	0.12	12	0.01	
Total		1097.99	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 62
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°55.29
 start stop duration Lon E 13°35.27
 TIME :15:16:12 15:47:04 30.9 (min) Purpose : 3
 LOG : 5503.57 5505.33 1.8 Region : 4040
 FDEPTH: 115 114 Gear cond.: 0
 BDEPTH: 115 114 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.4 kn
 Sorted : 34 Total catch: 33.63 Catch/hour: 65.39

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 65
 DATE :22/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°48.44
 start stop duration Lon E 13°16.06
 TIME :22:03:39 22:29:29 25.8 (min) Purpose : 3
 LOG : 5537.64 5538.92 1.3 Region : 4040
 FDEPTH: 476 467 Gear cond.: 0
 BDEPTH: 476 467 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 3.0 kn
 Sorted : 27 Total catch: 205.34 Catch/hour: 476.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	16.04	56	24.53	126
Brotula barbata	14.87	14	22.75	
Pterothrissus belloci	10.32	91	15.79	
Zeus faber	7.58	19	11.60	
Chelidonichthys capensis	3.15	16	4.82	
Citharus linguatula	2.02	27	3.09	
Miracorvina angolensis	1.69	4	2.59	
Raja miraletus	1.46	2	2.23	
Uranoscopus cadenati	1.28	8	1.96	
Illex coindetii	1.07	84	1.64	
Bembrops heterurus	0.99	12	1.52	
Scorpaena normani	0.95	12	1.46	
Dentex canariensis	0.84	2	1.28	
Trichiurus lepturus	0.78	2	1.19	
Brachydeuterus auritus	0.66	6	1.01	
J E L L Y F I S H	0.49	14	0.74	
Sepia obxignana	0.43	4	0.65	
Pontinus accraensis	0.39	8	0.59	
Parapanaeus longirostris	0.14	35	0.21	
Alloteuthis africana	0.12	33	0.18	
GOBIIDAE	0.08	41	0.12	
Merluccius polli	0.04	2	0.06	
Total		65.39	100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	257.84	53693	54.06	
Yarrella blackfordi	58.03	437	12.17	
Trichiurus lepturus	40.42	1412	8.47	
Hoplostethus cadenati	19.00	681	3.98	
Stomias boa boa	17.42	592	3.65	
Laemonema laureysi	16.03	1064	3.36	
Aristeus varidens, female	15.17	836	3.18	132
Aristeus varidens, male	11.34	1568	2.38	131
OMMASTREPHIDAE	6.46	88	1.35	
Lamprogrammus exutus	6.27	139	1.31	0
Merluccius polli	6.27	12	1.31	
Malacocephalus laevis	5.41	105	1.13	
Chaunax pictus	4.02	35	0.84	
Triplophos hemingi	3.14	418	0.66	
Halosaurus ovenii	2.28	139	0.48	
Callinectes sp.	2.28	35	0.48	
Chlorophthalmus atlanticus	1.58	35	0.33	
Halicolenus dactylopterus	1.39	19	0.29	
Bathyrcongler vicinus	0.88	88	0.19	
SQUALIDAE	0.70	19	0.15	
Gadella imberbis	0.53	19	0.11	
Stereomastis sp.	0.35	53	0.07	
Solenocera africana	0.19	105	0.04	
Total		476.98	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 66
DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°46.52
start stop duration Lon E 13°23.54
TIME :06:04:45 06:34:05 29.3 (min) Purpose : 3
LOG : 5596.16 5597.68 1.5 Region : 4040
FDEPTH: 149 146 Gear cond.: 0
BDEPTH: 149 146 Validity : 0
Towing dir: 0° Wire out : 375 m Speed : 3.1 kn
Sorted : 52 Total catch: 52.00 Catch/hour: 106.41

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 70
DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°26.65
start stop duration Lon E 13°31.02
TIME :12:35:54 13:01:33 25.7 (min) Purpose : 3
LOG : 5638.97 5640.38 1.4 Region : 4040
FDEPTH: 28 31 Gear cond.: 0
BDEPTH: 28 31 Validity : 0
Towing dir: 0° Wire out : 110 m Speed : 3.3 kn
Sorted : 77 Total catch: 77.05 Catch/hour: 180.23

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brotula barbata	24.56	37	23.08
Dentex angolensis	21.59	94	20.29
Bembrops greyi	15.35	190	14.42
Trichurus lepturus	10.05	65	9.44
Dentex macropthalmus	6.14	51	5.77
Scylliorhinus stellaris	5.95	12	5.60
Citharus linguatula	3.95	72	3.71
Syacium micrurum	3.32	115	3.12
Zenopsis conchifer	2.86	10	2.69
Pterothrissus bellocci	2.21	14	2.08
Trigla lyra	1.35	10	1.27
Squatina aculeata	1.27	2	1.19
Anthias antonii	1.21	16	1.13
Illex coindetii	1.19	143	1.12
Torpedo torpedo	1.17	2	1.10
Todaropsis eblanae	1.15	27	1.08
Umbrina canariensis	1.06	4	1.00
Uranoscopus polli	0.94	6	0.88
Scorpaena normani	0.90	4	0.85
Peristedion cataphractum	0.08	2	0.08
Calappa sp.	0.08	2	0.08
Ariomma bondi	0.04	2	0.04
Total	106.41		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	48.89	3593	27.13
Pseudolithus senegalensis	25.38	44	14.08
Ephippion guttifer	18.95	7	10.51
Trachurus trecae	14.27	264	7.92
Raja miraletus	12.12	19	6.72
Dasyatis marmorata	11.93	42	6.62
Rhinobatos albomaculatus	10.29	7	5.71
J E L Y F I S H	4.35	14	2.41
Pomadasys jubelini	4.00	9	2.22
Alectis alexandrinus	3.98	2	2.21
Citharus linguatula	3.70	30	2.05
Epinephelus aeneus	3.60	5	2.00
Dasyatis marmorata	3.11	2	1.73
Dasyatis marmorata	2.57	2	1.43
Pomadasys incisus	2.20	40	1.22
Galeoides decadactylus	1.94	5	1.08
Sphyraena sphyraena	1.80	73	1.00
Selene dorsalis	1.45	7	0.80
Sepia orbignyana	0.96	2	0.53
Chloroscombrus chrysurus	0.80	5	0.44
B I V A L V E S	0.70	2	0.39
Sardinella aurita	0.68	2	0.38
Argyrosomus hololepidotus	0.54	2	0.30
Cynoglossus canariensis	0.47	2	0.26
Chelidichthys capensis	0.42	5	0.23
Balistes capricus	0.35	2	0.19
Dicologlossa cuneata	0.35	5	0.19
Alloteuthis africana	0.16	89	0.09
ATEMNIARIIDAE	0.12	2	0.06
Pseudupeneus prayensis	0.09	2	0.05
Laegocephalus laevigatus	0.07	2	0.04
Total	180.23		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 67
DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°43.04
start stop duration Lon E 13°30.95
TIME :08:00:05 08:20:03 20.0 (min) Purpose : 3
LOG : 5607.90 5608.95 1.1 Region : 4040
FDEPTH: 90 88 Gear cond.: 0
BDEPTH: 90 88 Validity : 0
Towing dir: 0° Wire out : 230 m Speed : 3.2 kn
Sorted : 22 Total catch: 22.07 Catch/hour: 66.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Raja miraletus	19.93	27	30.04
Alloteuthis africana	13.68	6412	20.62
Citharus linguatula	7.21	177	10.87
Brotula barbata	6.37	6	9.61
Dentex angolensis	5.77	42	8.70
Zeus faber	4.03	30	6.07
Brachydeuterus auritus	2.62	21	3.94
Scorpaena normani	2.49	27	3.76
Sepia orbignyana	0.75	21	1.13
Todaropsis eblanae	0.75	33	1.13
Uranoscopus polli	0.60	3	0.91
Saurida brasiliensis	0.57	102	0.86
Chaetodon hoefleri	0.54	3	0.82
Torpedo torpedo	0.51	3	0.77
Trachurus trecae	0.21	6	0.32
Syacium micrurum	0.15	6	0.23
Illex coindetii	0.15	3	0.23
Total	66.34		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 71
DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°27.04
start stop duration Lon E 13°27.48
TIME :13:46:23 14:12:48 26.4 (min) Purpose : 3
LOG : 5644.27 5645.54 1.3 Region : 4040
FDEPTH: 48 51 Gear cond.: 0
BDEPTH: 48 51 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 2.9 kn
Sorted : 314 Total catch: 313.72 Catch/hour: 712.46

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pomadasys jubelini	422.52	924	59.30
Pagellus bellottii	56.32	443	7.91
Dentex barnardi	39.86	302	5.59
Raja miraletus	39.06	64	5.48
Pseudupeneus prayensis	26.23	200	3.68
Sphyraena guachancho	24.64	41	3.46
Pomadasys incisus	21.80	109	3.06
Argyrosomus hololepidotus	16.35	16	2.30
Trachurus trecae	16.24	177	2.28
Umbrina canariensis	7.36	23	1.03
Dentex canariensis	7.04	25	0.99
Sepia orbignyana	5.09	5	0.71
Selene dorsalis	3.82	20	0.54
Caranx crysos	3.20	2	0.45
Trichurus lepturus	2.77	5	0.39
Epinephelus aeneus	2.73	5	0.38
Chaetodon hoefleri	2.70	20	0.38
Sparus caeruleostictus *	2.54	7	0.36
Plectorhynchus mediterraneus	2.02	5	0.28
Galeoides decadactylus	1.88	2	0.26
Fistularia petimba	1.57	11	0.22
Chelidichthys capensis	1.54	9	0.22
Balistes capricus	1.09	2	0.15
Decapterus rhonchus	0.77	2	0.11
Citharus linguatula	0.75	14	0.11
Scorpaena stephanica	0.70	11	0.10
Chloroscombrus chrysurus	0.50	2	0.07
Brachydeuterus auritus	0.36	5	0.05
Antennarius sp.	0.25	2	0.04
Alloteuthis africana	0.23	84	0.03
Grammolites gruvelli	0.18	2	0.03
Saurida brasiliensis	0.16	25	0.02
Chilomycterus spinosus mauret.	0.14	2	0.02
Arnoglossus imperialis	0.05	2	0.01
Total	712.46		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 68
DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°38.61
start stop duration Lon E 13°37.29
TIME :09:31:53 09:55:58 24.1 (min) Purpose : 3
LOG : 5617.72 5618.93 1.2 Region : 4040
FDEPTH: 45 45 Gear cond.: 0
BDEPTH: 45 45 Validity : 0
Towing dir: 0° Wire out : 115 m Speed : 3.0 kn
Sorted : 59 Total catch: 145.76 Catch/hour: 363.19

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	178.73	9137	49.21
Trichurus lepturus	64.29	279	17.70
Trachurus trecae	43.06	1306	11.86
Raja miraletus	33.26	272	9.16
Galeoides decadactylus	14.18	27	3.90
Pomadasys incisus	9.42	22	2.59
Chloroscombrus chrysurus	4.04	22	1.11
Sardinella aurita	4.04	10	1.11
Epinephelus aeneus	2.14	2	0.59
Zeus faber	2.07	5	0.57
Selene dorsalis	1.74	12	0.48
Pseudupeneus prayensis	1.40	35	0.38
Sardinella maderensis	1.22	5	0.34
Octopus mungopus	1.02	5	0.28
Citharus linguatula	0.77	17	0.21
Sepia orbignyana	0.62	27	0.17
Pteroscion peli	0.57	5	0.16
Torpedo torpedo	0.45	5	0.12
Sphyraena sphyraena	0.17	5	0.05
Total	363.19		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 72
DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°32.57
start stop duration Lon E 13°21.99
TIME :15:21:16 15:46:14 25.0 (min) Purpose : 3
LOG : 5653.43 5654.81 1.4 Region : 4040
FDEPTH: 95 94 Gear cond.: 0
BDEPTH: 95 94 Validity : 0
Towing dir: 0° Wire out : 240 m Speed : 3.3 kn
Sorted : 60 Total catch: 423.29 Catch/hour: 1017.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	832.60	8107	81.86
Pagellus bellottii	91.67	589	9.01
Dentex angolensis	25.06	303	2.46
Ephippion guttifer	22.88	50	2.25
Alloteuthis africana	17.16	7418	1.69
Zeus faber	13.79	50	1.36
Chelidichthys capensis	5.72	50	0.56
Trachurus trecae	5.38	168	0.53
Citharus linguatula	1.01	67	0.10
Saurida brasiliensis	0.84	135	0.08
Peristedion cataphractum	0.67	17	0.07
Merluccius polli	0.17	17	0.02
Boops boops	0.17	17	0.02
Total	1017.12		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 69
DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°39.34
start stop duration Lon E 13°41.09
TIME :10:37:01 11:02:27 25.4 (min) Purpose : 3
LOG : 5622.77 5624.20 1.4 Region : 4040
FDEPTH: 30 28 Gear cond.: 0
BDEPTH: 30 28 Validity : 0
Towing dir: 0° Wire out : 100 m Speed : 3.4 kn
Sorted : 88 Total catch: 355.78 Catch/hour: 839.43

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	541.13	34889	64.46
Trichurus lepturus	158.67	529	18.90
Rhinobatos albomaculatus	47.66	21	5.68
Pteroscion peli	22.98	731	2.74
Stromateus fiatola	13.64	14	1.62
Raja miraletus	12.29	21	1.46
Torpedo torpedo	10.90	14	1.30
Dasyatis marmorata	8.78	7	1.05
Chloroscombrus chrysurus	5.62	38	0.67
Gymnura micrura	3.59	5	0.43
Etmopterus lucifer	3.14	7	0.37
Selene dorsalis	2.50	78	0.30
Sardinella maderensis	2.41	14	0.29
Citharus linguatula	1.96	14	0.23
Dicologlossa cuneata	1.25	21	0.15
Trachurus trecae	1.18	54	0.14
Conger conger	1.09	7	0.13
Galeoides decadactylus	0.31	132	0.04
Squilla mantis	0.21	7	0.03
Pseudupeneus prayensis	0.14	7	0.02
Total	839.43		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 73
 DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°35.03
 start stop duration Lon E 13°14.51
 TIME :16:57:30 17:27:05 29.6 (min) Purpose : 3
 LOG : 5663.44 5665.04 1.6 Region : 4040
 FDEPTH: 130 130 Gear cond.: 0
 BDEPTH: 130 130 Validity: 0
 Towing dir: 0° Wire out : 320 m Speed : 3.2 kn
 Sorted : 64 Total catch: 64.23 Catch/hour: 130.28

SPECIES	weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	50.67	122	38.89	
Dentex angolensis	21.60	134	16.58	144
Brotula barbata	17.85	18	13.70	
Pterothrissus belloci	14.26	14	10.95	
Raja miraletus	6.80	20	5.22	
Trigla lyra	6.25	93	4.80	
Syacium micrurum	2.82	91	2.16	
Citharus linguatula	2.39	51	1.84	
Lagocephalus laevigatus	1.66	2	1.28	
Uranoscopus polli	1.12	12	0.86	
Zenopsis conchifer	1.01	2	0.78	
Sepia orbignyana	0.75	6	0.58	
Peristedion cataphractum	0.61	12	0.47	
Microchirus frechkopi	0.59	12	0.45	
Illex coindetii	0.47	57	0.36	
Saurida brasiliensis	0.43	79	0.33	
Bembrus greyi	0.37	6	0.28	
Ariomma bondi	0.32	10	0.25	
Brachydeuterus auritus	0.32	2	0.25	
Total	130.28		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 74
 DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°36.59
 start stop duration Lon E 13°9.86
 TIME :19:05:00 19:35:20 30.3 (min) Purpose : 3
 LOG : 5672.63 5674.05 1.4 Region : 4040
 FDEPTH: 341 344 Gear cond.: 0
 BDEPTH: 341 344 Validity: 0
 Towing dir: 0° Wire out : 810 m Speed : 2.8 kn
 Sorted : 57 Total catch: 459.52 Catch/hour: 909.04

SPECIES	weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	530.17	10125	58.32	
Hymenocephalus italicus	134.52	16063	14.80	
Merluccius polli	126.61	823	13.93	
Nematocarcinus africanus	37.03	13420	4.07	
Trichiurus lepturus	12.34	475	1.36	
Gadella maraldi	9.81	127	1.08	
Todaropsis eblanae	9.50	79	1.04	
Aristeus varidens, male	9.34	1266	1.03	145
Aristeus varidens, female, female	8.23	475	0.91	146
MYCTOPHIDAE	7.28	6805	0.80	
Munidopsis sp.	6.65	1424	0.73	
Callinectes amnicola	6.01	95	0.66	
Chuanax pictus	3.80	79	0.42	
Scorpaena normani	3.48	63	0.38	
Lopholodes kempi	1.90	32	0.21	
Epigonus telescopus	0.95	16	0.10	
Malacocephalus occidentalis	0.85	16	0.10	
Synagrops microlepis	0.47	16	0.05	
Total	909.04		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 75
 DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°38.48
 start stop duration Lon E 13°8.22
 TIME :21:11:56 21:41:36 29.7 (min) Purpose : 3
 LOG : 5680.66 5682.16 1.5 Region : 4040
 FDEPTH: 512 515 Gear cond.: 0
 BDEPTH: 512 515 Validity: 0
 Towing dir: 0° Wire out : 1150 m Speed : 3.0 kn
 Sorted : 25 Total catch: 197.56 Catch/hour: 399.51

SPECIES	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	163.03	37341	40.81	
Hoplostethus cadenati	49.14	1729	12.30	
Yarella blackfordi *	41.56	1365	10.46	
Stomias boa boa	41.09	1031	10.29	
Trichiurus lepturus	27.30	5614	6.83	
Aristeus varidens, male	13.65	1638	3.42	148
Aristeus varidens, female, female	13.19	698	3.30	147
Lamprogrammus exutus	12.74	502	3.19	
Triplophos hemingi	7.72	910	1.93	
Centrophorus uyato	6.98	2	1.75	
Lopholodes kempi	6.07	16	1.52	
Stereomastis sp.	5.90	698	1.48	
Gadella maraldi	3.64	364	0.91	
Chaceon maritae, female	2.10	8	0.53	
Lagocephalus laevigatus	1.66	16	0.42	
Merluccius polli	1.40	2	0.35	
Chaceon maritae, male	1.15	2	0.29	
Callinectes sp.	0.75	16	0.19	
Centrophorus squamosus	0.44	16	0.11	0
Total	399.51		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 76
 DATE :23/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°39.88
 start stop duration Lon E 13°5.62
 TIME :23:51:22 00:22:12 30.8 (min) Purpose : 3
 LOG : 5692.44 5693.92 1.5 Region : 4040
 FDEPTH: 738 735 Gear cond.: 0
 BDEPTH: 738 735 Validity: 0
 Towing dir: 0° Wire out : 1470 m Speed : 2.9 kn
 Sorted : 32 Total catch: 127.53 Catch/hour: 248.19

SPECIES	weight	numbers	% OF TOT. C	SAMP
Yarella blackfordi	48.26	1629	19.45	
Hoplostethus cadenati	33.47	1504	13.49	
Lamprogrammus exutus	26.78	86	10.79	
J E L I V F I S H	23.74	47	9.57	
Malacocephalus laevis	19.07	381	7.68	
Stomias boa boa	14.56	374	5.87	
Stereomastis sp.	14.01	965	5.65	
HOLUTHUROIDEA	13.23	8	5.33	
Nematocarcinus africanus	10.12	2016	4.08	
Triplophos hemingi	7.16	849	2.89	
Bajacalifornia magalops	6.77	202	2.73	
Bassanago albescens	6.62	101	2.67	
Dicrolene intronigra	5.53	381	2.23	
Aristeus varidens, female	4.44	210	1.79	
Dibranchius atlanticus	3.11	125	1.25	
OMMASTREPHIDAE	2.65	16	1.07	
Epigonus sp.	2.49	78	1.00	
Glyphus marsupialis	2.26	249	0.91	
Centrophorus squamosus	1.32	23	0.53	
Aristeus varidens, male	0.86	101	0.35	
Trichiurus lepturus	0.62	23	0.25	
Halosaurus orenii	0.39	16	0.16	
Cataetyx laticeps	0.31	47	0.13	
Chaceon maritae	0.25	2	0.10	
GALATHEIDAE *	0.16	163	0.06	
Total	248.19		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 77
 DATE :24/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°25.48
 start stop duration Lon E 12°55.62
 TIME :02:42:25 03:14:14 31.8 (min) Purpose : 3
 LOG : 5709.92 5711.55 1.6 Region : 4040
 FDEPTH: 614 603 Gear cond.: 0
 BDEPTH: 614 603 Validity: 0
 Towing dir: 0° Wire out : 1260 m Speed : 3.1 kn
 Sorted : 25 Total catch: 152.76 Catch/hour: 288.05

SPECIES	weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	181.02	3724	62.84	
Stomias boa boa	35.75	849	12.41	
Yarella blackfordi	20.70	668	7.19	
Lamprogrammus exutus	11.88	215	4.12	
Stereomastis sp.	7.47	1018	2.59	
Hoplostethus cadenati	5.66	260	1.96	
Aristeus varidens, male	5.09	249	1.77	
Triplophos hemingi	4.64	690	1.61	
Merluccius polli	4.53	8	1.57	
Trichiurus lepturus	3.85	113	1.34	
Glyphus marsupialis	1.92	158	0.67	
OMMASTREPHIDAE	1.24	11	0.43	
Chaceon maritae	1.02	4	0.35	
Bajacalifornia magalops	0.68	79	0.24	
Aristeus varidens, female	0.68	181	0.24	
Raja alba	0.34	11	0.12	
Scopelosaurus meadi	0.34	11	0.12	
Epigonus sp.	0.34	45	0.12	
GALATHEIDAE *	0.34	328	0.12	
Bathyrhynchus vicinus	0.23	11	0.08	
Dicrolene intronigra	0.23	23	0.08	
Dibranchius atlanticus	0.11	23	0.04	
Total	288.05		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 78
 DATE :24/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°15.52
 start stop duration Lon E 13°24.70
 TIME :09:11:03 09:41:22 30.3 (min) Purpose : 3
 LOG : 5749.90 5751.48 1.6 Region : 4040
 FDEPTH: 33 31 Gear cond.: 0
 BDEPTH: 33 31 Validity: 0
 Towing dir: 0° Wire out : 115 m Speed : 3.1 kn
 Sorted : 51 Total catch: 50.99 Catch/hour: 100.90

SPECIES	weight	numbers	% OF TOT. C	SAMP
Raja miraletus	38.73	69	38.38	
Trachurus trecae	26.62	1567	26.38	149
Brachydeuterus auritus	7.22	4102	7.16	
Pseudotolithus senegalensis	5.38	8	5.33	
Rhinobatos albomaculatus	4.00	4	3.96	
Cynoglossus canariensis	3.76	14	3.73	
Bothus podas africanus	2.91	22	2.88	
Selene dorsalis	2.20	2	2.18	
Pagellus bellottii	1.86	49	1.84	150
Galeoides decadactylus	1.56	2	1.55	
Sardinella maderensis	1.46	6	1.45	
Dicologlossa cuneata	1.41	20	1.39	
Dentex barnardi	1.33	18	1.31	
Sepia orbignyana	0.67	2	0.67	
Ephippion guttifer	0.55	4	0.55	
Chloroscombrus chrysurus	0.36	2	0.35	
Citharus linguatula	0.32	8	0.31	
Alloteuthis africana	0.22	57	0.22	
Torpedo marmorata	0.20	2	0.20	
Sardinella aurita	0.06	2	0.06	
Penaeus notialis	0.06	2	0.06	
Pseudupeneus prayensis	0.04	4	0.04	
Total	100.90		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 79
 DATE :24/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°13.13
 start stop duration Lon E 13°20.09
 TIME :10:23:27 10:53:37 30.2 (min) Purpose : 3
 LOG : 5755.58 5757.16 1.6 Region : 4040
 FDEPTH: 46 46 Gear cond.: 0
 BDEPTH: 46 46 Validity: 0
 Towing dir: 0° Wire out : 125 m Speed : 3.1 kn
 Sorted : 38 Total catch: 37.84 Catch/hour: 75.25

SPECIES	weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	22.97	410	30.52	151
Chilomycterus spinosus mauret.	15.71	2	20.88	
Raja miraletus	13.32	38	17.71	
Pagellus bellottii	6.01	153	7.98	153
Trachurus trecae	3.62	221	4.81	152
Alloteuthis africana	3.24	788	4.31	
Dentex barnardi	1.99	34	2.64	
Torpedo torpedo	1.29	10	1.72	
Argyrosomus hololepidotus	1.15	2	1.53	
Octopus macropus	0.99	4	1.32	
Pseudotolithus senegalensis	0.91	2	1.22	
Chelidonichthys capensis	0.62	2	0.82	
Sepia orbignyana	0.56	4	0.74	
Trichiurus lepturus	0.46	2	0.61	
Grammolites gruweli	0.40	8	0.53	
Chloroscombrus chrysurus	0.38	2	0.50	
Selene dorsalis	0.36	2	0.48	
Pomadasys incisus	0.36	2	0.48	
Pseudupeneus prayensis	0.28	6	0.37	
Cynoglossus canariensis	0.24	2	0.32	
Citharus linguatula	0.22	8	0.29	
Dicologlossa cuneata	0.14	2	0.18	
Saurida brasiliensis	0.04	14	0.05	
Total	75.25		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 80
DATE :24/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°13.23
 start stop duration Lon E 13°16.45
TIME :11:36:20 12:01:27 25.1 (min) Purpose : 3
LOG : 5761.02 5762.28 1.3 Region : 4040
FDEPTH: 66 68 Gear cond.: 0
BDEPTH: 66 68 Validity : 0
Towing dir: 0° Wire out : 165 m Speed : 3.0 kn
Sorted : 89 Total catch: 768.15 Catch/hour: 1834.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	846.31	12509	46.13	154
Trichurus lepturus	601.86	1130	32.80	
Pomadourus incisus	139.06	800	7.58	
Selene dorsalis	120.38	697	6.56	
Trachurus trecae	35.14	1603	1.91	156
Raja miraletus	25.46	41	1.39	
Alloteuthis africana	23.00	5319	1.25	
Pseudupeneus prayensis	13.14	370	0.72	
Chelidonichthys capensis	11.70	103	0.64	
Pagellus bellottii	8.22	81	0.45	
Dentex angolensis	4.73	411	0.26	155
Dentex barnardi	3.30	81	0.18	
Citharus linguatula	2.05	81	0.11	
Boops boops	0.41	41	0.02	
Total	1834.75		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 81
DATE :24/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°15.69
 start stop duration Lon E 13°10.50
TIME :13:10:00 13:37:26 27.4 (min) Purpose : 3
LOG : 5769.51 5770.83 1.3 Region : 4040
FDEPTH: 96 96 Gear cond.: 0
BDEPTH: 96 96 Validity : 0
Towing dir: 0° Wire out : 245 m Speed : 2.9 kn
Sorted : 61 Total catch: 395.94 Catch/hour: 865.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	623.94	7008	72.07	158
Chelidonichthys capensis	117.97	669	13.63	
Pagellus bellottii	28.71	256	3.32	159
Raja miraletus	22.33	28	2.58	
Zeus faber	15.35	44	1.77	
Lagocephalus laevis	11.65	15	1.35	
Squatina oculata	10.10	15	1.17	
Octopus vulgaris	8.68	15	1.00	
Alloteuthis africana	7.96	2644	0.92	
Trachurus trecae	7.26	227	0.84	157
Citharus linguatula	5.27	129	0.61	
Saurida brasiliensis	2.84	767	0.33	
Sepia orbignyana	2.56	28	0.30	
Dentex angolensis	1.14	15	0.13	
Total	865.76		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 82
DATE :24/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°22.63
 start stop duration Lon E 13°3.98
TIME :15:11:00 15:41:04 30.1 (min) Purpose : 3
LOG : 5781.31 5782.90 1.6 Region : 4040
FDEPTH: 176 174 Gear cond.: 0
BDEPTH: 176 174 Validity : 0
Towing dir: 0° Wire out : 425 m Speed : 3.2 kn
Sorted : 62 Total catch: 393.48 Catch/hour: 785.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	667.44	118476	85.01	
Raja alba	29.93	12	3.81	
Erythrocles monodi	24.90	24	3.17	
Spicara alta	14.87	62	1.89	
Dentex macrophthalmus	13.97	78	1.78	161
Zeus faber	9.22	24	1.17	
Dentex angolensis	9.12	36	1.16	160
Illex coindetii	7.18	239	0.91	
Raja miraletus	6.35	12	0.81	
Uranoscopus polli	1.80	12	0.23	
Total	784.77		99.95	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 83
DATE :27/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°58.59
 start stop duration Lon E 12°45.83
TIME :22:02:11 22:26:27 24.3 (min) Purpose : 3
LOG : 6046.45 6047.62 1.2 Region : 4040
FDEPTH: 755 768 Gear cond.: 0
BDEPTH: 755 768 Validity : 0
Towing dir: 0° Wire out : 1600 m Speed : 2.9 kn
Sorted : 60 Total catch: 205.33 Catch/hour: 507.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	103.24	2378	20.34	
Bajacalifornia magalops	71.10	2146	14.01	
Nezumia micronychodon	61.88	1389	12.19	
Hoplostethus cadonati	48.92	939	9.64	
Nematocarcinus africanus	42.18	10173	8.31	
Stereomastis sp.	22.89	1382	4.51	
Lamprogrammus exutus	18.89	321	3.72	
Stomias boa boa	17.43	467	3.43	
Lophiodes kempii	16.24	17	3.20	
OMMASTREPHIDAE	14.86	64	2.93	
Bassanago albescens	13.42	178	2.64	
Laemonema laureysi	10.43	188	2.06	
Malacocephalus occidentalis	8.28	129	1.63	
Merluccius polli	7.34	10	1.45	
HOLTHUROIDEA	7.14	25	1.41	
Scymnodon obscurus	6.92	25	1.36	
Plesiopeneus edwardsianus	6.82	475	1.34	
Chaceon maritae, female	6.40	25	1.26	
Chaceon maritae, male	4.55	7	0.90	
Triplophos hemingi	3.14	418	0.62	
Aristeus varidens, female	2.42	114	0.48	
Glyphus marsupialis	2.42	40	0.48	
Dibranchius atlanticus	2.10	72	0.41	
Bathypterois phenax	1.85	168	0.37	
Halosaurus ovenii	1.68	17	0.33	
Caelorinchus sp.	1.04	64	0.20	
Epigonus pandionis	0.72	82	0.14	
Etmopterus spinax	0.62	7	0.12	
Raja confundens	0.57	17	0.11	
GALATHEIDAE	0.57	188	0.11	
Etmopterus polli	0.49	7	0.10	
Etmopterus pusillus	0.37	2	0.07	
Nemichthys scolopaceus	0.25	17	0.05	
Benthodesmus tenuis	0.25	7	0.05	
Aristeus varidens, male	0.17	25	0.03	
Total	507.61		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 84
DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°5.32
 start stop duration Lon E 12°52.90
TIME :00:25:40 00:55:55 30.3 (min) Purpose : 3
LOG : 6057.70 6059.16 1.5 Region : 4040
FDEPTH: 304 303 Gear cond.: 0
BDEPTH: 304 303 Validity : 0
Towing dir: 0° Wire out : 700 m Speed : 2.9 kn
Sorted : 85 Total catch: 399.93 Catch/hour: 792.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	444.21	8407	56.02	
Merluccius polli	116.81	1212	14.73	183
Gephyroberyx darwini	58.10	59	7.33	
Pterothrissus belloci	35.73	238	4.51	
Parapeneus longirostris, femal	27.36	3188	3.45	
Gadella imberbis	24.21	393	3.05	
Malacocephalus occidentalis	14.42	163	1.82	
Shrimps, small, non comm.	12.53	1790	1.58	
Helicolenus dactylopterus	11.86	137	1.50	
Lophius vomerinus	9.97	6	1.26	
MYCTOPHIDAE	9.20	8952	1.16	
Synagrops microlepis	6.05	289	0.76	
Aristeus varidens, female	4.01	238	0.51	
Zenopsis conchifer	3.59	8	0.45	
Aristeus varidens, male	3.49	444	0.44	
Epigonus pandionis	3.15	26	0.40	
Hymenocephalus italicus	2.82	85	0.36	
Dicrolene sp.	1.63	59	0.21	
Galeus polli	1.63	8	0.21	
Bembrops heterurus	1.29	26	0.16	
Parapeneus longirostris, male	0.52	103	0.07	
Dibranchius atlanticus	0.44	18	0.06	
Total	792.99		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 85
DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°6.30
 start stop duration Lon E 13°0.15
TIME :04:56:36 05:26:39 30.0 (min) Purpose : 3
LOG : 6078.26 6079.76 1.5 Region : 4040
FDEPTH: 106 107 Gear cond.: 0
BDEPTH: 106 107 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
Sorted : 107 Total catch: 341.78 Catch/hour: 682.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	443.41	3651	64.95	184
Saurida brasiliensis	86.11	15605	12.61	
Trachurus trecae	74.64	2235	10.93	185
Trichiurus lepturus	21.97	38	3.22	
Trigla lyra	9.99	104	1.46	
Zenopsis conchifer	9.09	6	1.33	
Sepia officinalis hierredda	5.99	24	0.88	
Zeus faber	5.77	14	0.85	
Pagellus bellottii	3.87	44	0.57	
Illex coindetii	3.83	38	0.56	
Dentex canariensis	3.83	60	0.56	
Raja miraletus	3.14	4	0.46	
Citharus linguatula	2.44	52	0.36	
Raja alba	2.44	2	0.36	
Scorpaena normani	2.22	22	0.32	
Umbrina canariensis	1.70	4	0.25	
Boops boops	1.48	60	0.22	
Ariomma bondi	0.52	14	0.08	
OPHIDIIDAE	0.14	8	0.02	
Spicara alta	0.08	14	0.01	
Total	682.65		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 86
DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°2.54
 start stop duration Lon E 13°5.62
TIME :06:46:08 07:16:55 30.8 (min) Purpose : 3
LOG : 6088.86 6090.31 1.5 Region : 4040
FDEPTH: 86 86 Gear cond.: 0
BDEPTH: 86 86 Validity : 0
Towing dir: 0° Wire out : 220 m Speed : 2.8 kn
Sorted : 76 Total catch: 200.68 Catch/hour: 391.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	170.96	6581	43.72	186
Dentex congoensis	64.31	92	16.44	
Saurida brasiliensis	23.85	4385	6.10	
Ephippion guttifer	22.88	21	5.85	
Brachydeuterus auritus	16.41	129	4.20	
Zeus faber	12.65	92	3.23	
Pseudupeneus prayensis	11.42	209	2.92	
Raja miraletus	9.65	16	2.47	
Trigla lyra	8.91	113	2.28	
Illex coindetii	8.52	2064	2.18	
Boops boops	8.15	483	2.08	
Trichiurus lepturus	8.09	16	2.07	
Sepia officinalis hierredda	4.23	49	1.08	
Citharus linguatula	4.19	92	1.07	
Pagellus bellottii	3.76	92	0.96	
Torpedo torpedo	3.55	6	0.91	
Dentex barnardi	2.63	33	0.67	
Sarda sarda	2.53	2	0.65	
Fistularia petimba	1.71	6	0.44	
Todaropsis eblanae	1.44	21	0.37	
Dentex angolensis	0.97	27	0.25	
Dicologlossa hexophthalma	0.27	6	0.07	
Total	391.06		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 87
 DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°59.79
 start stop duration Lon E 13°9.37
 TIME :08:15:14 08:45:16 30.0 (min) Purpose : 3
 LOG : 6096.30 6097.82 1.5 Region : 4040
 FDEPTH: 62 60 Gear cond.: 0
 BDEPTH: 62 60 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.0 kn
 Sorted : 75 Total catch: 75.48 Catch/hour: 150.81

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	33.97 352	22.52	188
Trichurus lepturus	24.48 44	16.23	
Pseudupeneus prayensis	16.78 164	11.13	
Trachurus trecae	14.49 486	9.61	189
Alloteuthis africana	13.19 4176	8.74	
Selene dorsalis	12.01 92	7.96	
Squatina oculata	11.09 2	7.35	
Raja miraletus	9.27 14	6.15	
Pagellus bellottii	2.26 24	1.50	
Trigla lyra	2.02 20	1.34	
Zeus faber	1.96 4	1.30	
Dentex angolensis	1.68 142	1.11	
Torpedo torpedo	1.46 2	0.97	
Pomadasys incisus	1.32 6	0.87	
Saurida brasiliensis	1.24 236	0.82	
Grammolites gruvelli	0.82 18	0.54	
Dicologlossa cuneata	0.72 4	0.48	
Brotula barbata	0.62 6	0.41	
Umbrina canariensis	0.50 6	0.33	
Dentex barnardi	0.40 6	0.26	
Miracorvina angolensis	0.30 2	0.20	
Sepia officinalis hierredda	0.16 6	0.11	
Citharus linguatula	0.08 20	0.05	
Fistularia petimba	0.02 2	0.01	
Total	150.81	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 90
 DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°48.06
 start stop duration Lon E 13°0.90
 TIME :13:59:48 14:31:39 31.9 (min) Purpose : 3
 LOG : 6131.40 6133.03 1.6 Region : 4040
 FDEPTH: 94 95 Gear cond.: 0
 BDEPTH: 94 95 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.1 kn
 Sorted : 37 Total catch: 36.56 Catch/hour: 68.87

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Squatina oculata	10.55 12	15.32	
Trichurus lepturus	9.80 13	14.22	
Raja miraletus	7.86 11	11.41	
Dentex barnardi	6.80 17	9.87	
Zeus faber	4.22 17	6.13	
Umbrina canariensis	4.07 8	5.91	
Illex coindetii	3.99 164	5.80	
Alloteuthis africana	3.64 1432	5.28	
Dentex angolensis	3.01 40	4.38	194
Citharus linguatula	2.83 51	4.10	
Pagellus bellottii	2.47 13	3.58	
Branchiostegus semifasciatus *	2.26 4	3.28	
Trachurus trecae	1.71 53	2.49	193
Chloroscombrus chrysurus	1.43 9	2.08	
Dentex macrophthalmus	0.96 2	1.39	
Saurida brasiliensis	0.75 145	1.09	
Chaetodon hoefleri	0.68 4	0.98	
Chelidnichthys gabonensis	0.53 23	0.77	
Uranoscopus polli	0.34 2	0.49	
Boops boops	0.26 4	0.38	
Dentex congoensis	0.23 4	0.33	
Sea urchin, weak spines	0.21 30	0.30	
Dicologlossa cuneata	0.17 2	0.25	
Parapandalus narval	0.11 66	0.16	
Total	68.87	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 88
 DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 10°0.50
 start stop duration Lon E 13°13.39
 TIME :09:38:55 10:09:33 30.6 (min) Purpose : 3
 LOG : 6102.41 6103.83 1.4 Region : 4040
 FDEPTH: 33 35 Gear cond.: 0
 BDEPTH: 33 35 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 2.8 kn
 Sorted : 67 Total catch: 331.30 Catch/hour: 649.18

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pteroscopus peli	244.55 4742	37.67	
Pseudotolithus senegalensis	126.49 551	19.48	187
Ilisha africana	88.57 1387	13.64	
Selene dorsalis	48.75 447	7.51	
Trichurus lepturus	41.15 180	6.34	
Galeoides decadactylus	37.32 118	5.80	
Brachydeuterus auritus	20.54 690	3.16	
Dicologlossa cuneata	13.25 94	2.04	
Penaeus notialis	7.60 63	1.17	
Ephippion guttifer	6.58 8	1.01	
Raja miraletus	5.33 55	0.82	
Cynoglossus canariensis	2.35 8	0.36	
Citharus linguatula	1.88 39	0.29	
Pomadasys incisus	1.49 8	0.23	
Grammolites gruvelli	1.49 31	0.23	
Torpedo torpedo	0.78 8	0.12	
Arius parkii	0.76 2	0.12	
Total	649.18	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 91
 DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°32.45
 start stop duration Lon E 12°51.47
 TIME :16:34:40 17:04:04 29.4 (min) Purpose : 3
 LOG : 6149.46 6151.11 1.6 Region : 4040
 FDEPTH: 115 113 Gear cond.: 0
 BDEPTH: 115 113 Validity : 0
 Towing dir: 0° Wire out : 295 m Speed : 3.4 kn
 Sorted : 93 Total catch: 179.82 Catch/hour: 366.85

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Saurida brasiliensis	84.16 17239	22.94	
Brachydeuterus auritus	57.39 343	15.64	195
Brotula barbata	39.78 39	10.84	
Gobiidae	38.25 28245	10.43	
Selene dorsalis	29.68 57	8.09	
Synagrops microlepis	26.28 4804	7.16	
Trichurus lepturus	24.99 112	6.81	
Citharus linguatula	10.47 122	2.85	
Pterothrissus belloci	9.18 61	2.50	
Parapenaeus longirostris, femal	8.73 853	2.38	198
Parapenaeus longirostris, male	5.06 1010	1.38	197
Zeus faber	4.90 31	1.33	
Illex coindetii	4.69 169	1.28	
Dentex angolensis	4.39 27	1.20	
Umbrina canariensis	3.82 4	1.04	
Torpedo torpedo	3.33 10	0.91	
Uranoscopus polli	3.02 10	0.82	
Miracorvina angolensis	2.96 10	0.81	
Scorpaena normani	2.71 10	0.74	
Merluccius polli	2.51 133	0.68	196
Perulibrachius rossignoli	0.57 6	0.16	
Total	366.85	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 89
 DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°44.56
 start stop duration Lon E 13°10.10
 TIME :11:56:43 12:25:23 28.7 (min) Purpose : 3
 LOG : 6118.83 6120.17 1.3 Region : 4040
 FDEPTH: 31 31 Gear cond.: 0
 BDEPTH: 31 31 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 2.8 kn
 Sorted : 171 Total catch: 169.57 Catch/hour: 355.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Galeoides decadactylus	84.79 450	23.88	
Sphyrna guachancho	56.21 140	15.83	
Chloroscombrus chrysurus	52.97 360	14.92	
Decapterus rhonchus	35.59 685	10.03	
Selene dorsalis	31.09 592	8.76	
Brachydeuterus auritus	28.37 1193	7.99	190
J E L Y F I S H	19.26 2	5.43	
Pseudotolithus typus	14.76 31	4.16	191
Citharus linguatula	4.79 33	1.35	
Sardinella maderensis	3.62 33	1.02	192
Raja miraletus	2.72 8	0.77	
Ephippion guttifer	2.72 2	0.77	
Octopus vulgaris	2.49 2	0.70	
Pomadasys incisus	1.51 6	0.42	
Zeus faber	1.47 2	0.41	
Cynoglossus canariensis	1.44 6	0.41	
Sepia orbignyana	1.42 4	0.40	
Lagocephalus laevigatus	1.15 4	0.32	
Trachinocephalus myops	1.11 6	0.31	
Caranx crysos	1.05 2	0.29	
Pisodonophis semicinctus	0.92 2	0.26	
Pseudupeneus prayensis	0.86 10	0.24	
Trachurus trecae	0.86 13	0.24	
Trichurus lepturus	0.80 2	0.22	
Aluterus scriptus	0.67 4	0.19	
Trachinus radiatus	0.61 2	0.17	
Eucinetomus melanopterus	0.40 2	0.11	
Dicologlossa cuneata	0.31 4	0.09	
Pagellus bellottii	0.25 2	0.07	
Chilomycterus spinosus mauret.	0.23 2	0.06	
Umbrina canariensis	0.19 2	0.05	
Alloteuthis africana	0.19 63	0.05	
Rypticus saponaceus	0.13 2	0.04	
Penaeus kerathurus	0.06 2	0.02	
Total	355.00	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 92
 DATE :28/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°37.78
 start stop duration Lon E 12°39.65
 TIME :20:00:48 20:30:13 29.4 (min) Purpose : 3
 LOG : 6167.62 6169.13 1.5 Region : 4040
 FDEPTH: 534 537 Gear cond.: 0
 BDEPTH: 534 537 Validity : 0
 Towing dir: 0° Wire out : 1210 m Speed : 3.1 kn
 Sorted : 22 Total catch: 101.76 Catch/hour: 207.53

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	58.74 22907	28.30	
Laemonema laureysi	35.32 277	17.02	
Merluccius polli	26.00 41	12.53	199
Aristeus varidens, female	15.50 873	7.47	
Trichurus lepturus	10.69 351	5.15	
Stereomastis sp.	8.40 930	4.05	
Gonostoma denudata	8.40 261	4.05	
Chaunax pictus	7.02 65	3.38	
Aristeus varidens, male	5.96 702	2.87	
Diplophos sp.	4.89 106	2.36	
Dibranchius atlanticus	4.16 147	2.00	
Chaceon maritae	3.61 8	1.74	
Hoplostethus atlanticus	2.53 98	1.22	
Malacocephalus occidentalis	2.45 41	1.18	
Gadella maraldi	2.37 33	1.14	
Scymnodon obscurus	2.04 8	0.98	
Lamprogrammus exutus	1.39 33	0.67	
CONGRIDAE	1.31 41	0.63	
Etmopterus polli	1.22 24	0.59	
Calappa sp.	1.22 41	0.59	
Etmopterus pusillus	1.22 8	0.59	
Chlorophthalmus atlanticus	0.90 16	0.43	
Triplophos hemingi	0.73 82	0.35	
Nezumia aequalis	0.65 82	0.31	
Halosaurus ovenii	0.41 16	0.20	
Coloconger sp.	0.41 8	0.20	
Total	207.53	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 93
DATE :29/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°29.21
start stop duration Lon E 13°0'45
TIME :04:53:13 05:23:18 30.1 (min) Purpose : 3
LOG : 6200.52 6201.97 1.5 Region : 4040
FDEPTH: 50 51 Gear cond.: 0
BDEPTH: 50 51 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 2.9 kn
Sorted : 65 Total catch: 163.50 Catch/hour: 326.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	109.65	1113	33.63	200
Pagellus bellottii	104.39	1472	32.02	201
Trachurus trecae	21.18	1490	6.50	202
Sphyræna guachancho	17.45	26	5.35	
Trigla lyra	16.33	108	5.01	
Alloteuthis africana	9.45	2291	2.90	
Raja miraletus	8.37	12	2.57	
Pseudupeneus prayensis	4.49	18	1.38	
Dentex barnardi	4.43	24	1.36	
Cynoglossus canariensis	3.83	12	1.17	
Argyrosomus hololepidotus	3.65	2	1.12	
Saurida brasiliensis	3.47	855	1.06	
Umbrina canariensis	2.55	4	0.78	
Stromateus fiatola	2.45	2	0.75	
Chelidonichthys capensis	2.39	4	0.73	
Pomadasys rogeri	2.39	2	0.73	
Citharus linguatula	2.03	12	0.62	
Pseudolithus senegalensis	1.83	2	0.56	
Pomadasys inciscus	1.56	6	0.48	
Sepia officinalis hierredda	1.44	12	0.44	
Fistularia petimba	0.96	18	0.29	
Chaetodon humeralis	0.90	6	0.28	
Selene dorsalis	0.72	6	0.22	
Engraulis encrasicolus	0.12	24	0.04	
Total		326.02	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 94
DATE :29/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°27.28
start stop duration Lon E 13°4'56
TIME :06:22:01 06:44:30 22.5 (min) Purpose : 3
LOG : 6208.33 6209.40 1.1 Region : 4040
FDEPTH: 26 25 Gear cond.: 0
BDEPTH: 26 25 Validity : 0
Towing dir: 0° Wire out : 105 m Speed : 2.9 kn
Sorted : 212 Total catch: 211.99 Catch/hour: 565.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sphyræna guachancho	317.29	502	56.10	
Alectis alexandrinus	67.76	128	11.98	
Panulirus regius	50.42	51	8.92	
Pagrus caeruleostictus	32.68	77	5.78	203
Arius parkii	18.94	32	3.35	
Galeoides decadactylus	12.27	19	2.17	
Ephippion guttifer	9.95	3	1.76	
Chloroscombrus chrysurus	9.34	37	1.65	
Fistularia tabacaria	8.94	8	1.58	
Octopus sp.	5.55	3	0.98	
Lutjanus goreensis	4.51	5	0.80	
Bodianus speciosus	4.35	8	0.77	
Chaetodon hoeferi	4.06	29	0.72	
Dasyatis marmorata	2.88	3	0.51	
Dentex barnardi	2.88	8	0.51	
Raja miraletus	2.83	5	0.50	
Serranus cabrilla	2.08	5	0.37	
Sepia orbignyana	2.00	3	0.35	
Dentex gibbosus	1.68	3	0.30	
Rypticus saponaceus	1.55	21	0.27	
Balistes punctatus	1.09	8	0.19	
Pseudupeneus prayensis	1.01	5	0.18	
Pomadasys inciscus	0.67	3	0.12	
Citharus linguatula	0.59	3	0.10	
Ephippion sp.	0.24	5	0.04	
Total		565.56	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 95
DATE :29/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°17.47
start stop duration Lon E 12°58'88
TIME :08:15:46 08:32:24 16.6 (min) Purpose : 3
LOG : 6219.65 6220.52 0.9 Region : 4040
FDEPTH: 26 28 Gear cond.: 0
BDEPTH: 26 28 Validity : 0
Towing dir: 0° Wire out : 105 m Speed : 3.1 kn
Sorted : 53 Total catch: 52.97 Catch/hour: 191.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lepidochelys olivacea	144.32	4	75.51	
Ephippion guttifer	14.65	4	7.66	
Scorpaena stephanica	8.30	32	4.34	
Raja miraletus	7.94	14	4.15	
Pseudupeneus prayensis	5.92	22	3.10	
Pomadasys rogeri	2.74	4	1.43	
Squatina oculata	2.56	4	1.34	
Pagellus bellottii	1.44	4	0.76	
Trichiurus lepturus	1.33	4	0.70	
Citharus linguatula	1.19	7	0.62	
Chilomycterus spinosus mauret.	0.36	4	0.19	
Echeneis naucrates	0.36	4	0.19	
Total		191.11	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 96
DATE :29/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°13.85
start stop duration Lon E 12°51'31
TIME :09:42:17 10:14:36 32.3 (min) Purpose : 3
LOG : 6228.18 6229.69 1.5 Region : 4040
FDEPTH: 74 80 Gear cond.: 0
BDEPTH: 74 80 Validity : 0
Towing dir: 0° Wire out : 205 m Speed : 2.8 kn
Sorted : 34 Total catch: 142.94 Catch/hour: 265.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	113.76	3827	42.89	204
Alloteuthis africana	51.13	13583	19.27	
Selene dorsalis	28.62	122	10.79	
Dentex angolensis	23.74	115	8.95	206
Raja miraletus	13.55	22	5.11	
Zeus faber	11.56	30	4.36	
Trachurus trecae	11.04	464	4.16	205
Sepia orbignyana	4.14	4	1.56	
Saurida brasiliensis	2.06	395	0.78	
Citharus linguatula	1.45	15	0.55	
Dentex barnardi	1.37	7	0.52	
Sardinella aurita	1.37	7	0.52	
Boops boops	1.06	46	0.40	
Lagocephalus laevigatus	0.43	2	0.16	
Total		265.28	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 97
DATE :29/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°15.02
start stop duration Lon E 12°47'10
TIME :11:16:54 11:47:00 30.1 (min) Purpose : 3
LOG : 6235.67 6237.05 1.4 Region : 4040
FDEPTH: 114 114 Gear cond.: 0
BDEPTH: 114 114 Validity : 0
Towing dir: 0° Wire out : 260 m Speed : 2.8 kn
Sorted : 62 Total catch: 62.45 Catch/hour: 124.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chelidonichthys gabonensis	37.57	327	30.18	
Dentex angolensis	20.73	88	16.65	207
Illex coindetii	11.84	327	9.51	
Zeus faber	9.77	26	7.85	
Raja miraletus	9.27	14	7.45	
Brotula barbata	7.18	6	5.76	
Saurida brasiliensis	6.58	1064	5.28	
Pterothrissus belloci	6.12	34	4.92	
Octopus vulgaris	5.88	8	4.72	
Euthynnus alletteratus	2.55	2	2.05	
Citharus linguatula	1.71	34	1.38	
Monolene microstoma	1.34	44	1.07	
Uranoscopus cadenati	0.88	4	0.70	
Bembrops heterurus	0.88	8	0.70	
Umbrina canariensis	0.86	2	0.69	
Ephippion guttifer	0.34	4	0.27	
Selene dorsalis	0.34	2	0.27	
Parapenaeus longirostris, femal	0.28	46	0.22	208
Microchirus frechkopi	0.28	4	0.22	
GOBIIDAE	0.06	40	0.05	
Parapenaeus longirostris, male	0.04	10	0.03	209
Total		124.49	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 98
DATE :29/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 9°12.13
start stop duration Lon E 12°42'10
TIME :12:58:57 13:29:02 30.1 (min) Purpose : 3
LOG : 6243.38 6244.78 1.4 Region : 4040
FDEPTH: 260 260 Gear cond.: 0
BDEPTH: 260 260 Validity : 0
Towing dir: 0° Wire out : 570 m Speed : 2.8 kn
Sorted : 93 Total catch: 229.95 Catch/hour: 458.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	58.64	776	12.79	210
Malacocephalus occidentalis	55.33	485	12.06	
Brotula barbata	48.07	36	10.48	
Dentex angolensis	44.18	106	9.63	211
Malacocephalus laevis	36.82	1574	8.03	
Ephippion guttifer	34.11	2	7.44	
Bembrops heterurus	31.93	293	6.96	
Hoplostethus mediterraneus	31.24	56	6.81	
Parapenaeus longirostris, femal	24.93	2896	5.44	
Synagrops microlepis	22.16	1237	4.83	
Parapenaeus longirostris, male	13.90	2007	3.03	
Trichiurus lepturus	11.69	18	2.55	
Zenopsis conchifer	11.69	36	2.55	
Dentex macrophthalmus	9.22	16	2.01	212
Pterothrissus belloci	4.75	28	1.04	
Epigonus telescopus	4.51	42	0.98	
Helicolenus dactylopterus	4.23	8	0.92	
OPHICHTHIDAE	1.91	4	0.42	
Echinus gilchristi ?	1.86	14	0.40	
Chlorophthalmus atlanticus	1.76	32	0.38	
Raja clavata	1.54	14	0.33	
Monolene microstoma	1.48	46	0.32	
Illex coindetii	1.06	24	0.23	
Saurida brasiliensis	0.98	371	0.21	
Laemonema laureysi	0.28	4	0.06	
MYCTOPHIDAE	0.24	144	0.05	
SOLEIDAE	0.18	4	0.04	
Total		458.68	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 99
DATE :29/03/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 9°6.48
start stop duration Lon E 12°40'50
TIME :15:06:26 15:36:35 30.2 (min) Purpose : 3
LOG : 6251.41 6252.89 1.5 Region : 4040
FDEPTH: 434 431 Gear cond.: 0
BDEPTH: 434 431 Validity : 0
Towing dir: 0° Wire out : 1030 m Speed : 2.9 kn
Sorted : 207 Total catch: 310.05 Catch/hour: 617.01

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	405.97	1180	65.80	213
Nematocarcinus africanus	47.46	3586	7.69	
Aristeus varidens, female	34.07	394	5.52	
Trichiurus auriga	29.41	30	4.77	
Laemonema laureysi	20.60	107	3.34	
Gonostoma denudata	17.01	511	2.76	
Chaunax pictus	13.07	243	2.12	
CHIMAERIDAE	9.07	2	1.47	
Dibranchius atlanticus	7.10	412	1.15	
Gadomus capensis	5.67	177	0.92	
Malacocephalus occidentalis	4.84	42	0.78	
Hoplostethus cadenati	3.86	153	0.63	
Cubiceps sp.	3.68	6	0.60	
Aristeus varidens, male	3.10	1552	0.50	
Etmopterus polli	2.57	70	0.42	
Synagrops microlepis	1.73	100	0.28	
Trichiurus auriga	1.53	60	0.25	0
Yarella blackfordi	1.37	28	0.22	
Xenodermichthys copei	1.13	111	0.18	
Stereomastix sp.	0.94	113	0.15	
Triplophos hemingi	0.94	123	0.15	
Nezumia aequalis	0.88	16	0.14	
Halosaurus ovenii	0.54	34	0.09	
Galeus polli	0.46	6	0.07	
Total		617.01	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 100
 DATE :29/03/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 9°4.35
 start stop duration Lon E 12°37.10
 TIME :17:51:18 18:21:11 29.9 (min) Purpose : 3
 LOG : 6262.93 6264.38 1.5 Region : 4040
 FDEPTH: 735 739 Gear cond.: 0
 BDEPTH: 735 739 Validity : 0
 Towing dir: 0° Wire out : 1570 m Speed : 2.9 kn
 Sorted : 31 Total catch: 76.83 Catch/hour: 154.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	55.24	14730	35.79	
Yarella blackfordi	36.42	930	23.60	
Lamprogrammus exutus	12.21	50	7.91	
Hymenocephalus italicus	8.03	187	5.21	
Merluccius polli	7.79	10	5.05	
Bathypterois sp.	6.59	1191	4.27	
Stereomastis sp.	5.42	191	3.51	
Illex coindetii	4.02	6	2.60	
Xenodermichthys copei	3.37	368	2.19	
Todaropsis eblanae	3.31	10	2.15	
Plesionika martia	2.37	161	1.54	
Gonostoma denudata	1.91	36	1.24	
Lophius vaillanti	1.57	40	1.02	
Triplophos hemingi	1.37	167	0.89	
Talismania longifilis	1.27	20	0.82	
Aristeus varidens, male	0.80	100	0.52	
Aristeus varidens, female	0.60	56	0.39	
Dibranchius atlanticus	0.60	40	0.39	
Hoplostethus cadenati	0.40	20	0.26	
Acanthephyra sp.	0.40	10	0.26	
Triplophos sp.	0.30	16	0.20	
Malacocephalus laevis	0.16	6	0.10	
Nezumia aequalis	0.10	6	0.07	
Plesiopenaeus edwardsianus	0.06	6	0.04	
Total	154.33		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 101
 DATE :29/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°53.73
 start stop duration Lon E 12°54.03
 TIME :23:41:14 00:11:21 30.1 (min) Purpose : 3
 LOG : 6284.05 6285.49 1.4 Region : 4054
 FDEPTH: 319 311 Gear cond.: 0
 BDEPTH: 319 311 Validity : 0
 Towing dir: 0° Wire out : 690 m Speed : 2.9 kn
 Sorted : 22 Total catch: 134.46 Catch/hour: 267.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	142.88	670	53.32	214
Sea urchin, weak spines	30.01	287	11.20	
Laemonema laureysi	18.89	263	7.05	
Gephyroberyx darwini	17.34	12	6.47	
Caelorinchus sp.	9.56	299	3.57	
Parapenaeus longirostris, female	8.25	1124	3.08	
Trichiurus lepturus	6.82	323	2.54	
Malacocephalus laevis	6.58	48	2.45	
Pontinus accraensis	6.22	132	2.32	
Shrimps, small, non comm.	6.10	3659	2.28	
Aristeus varidens, male	3.35	395	1.25	
Bembrops heterurus	2.51	72	0.94	
Conger conger	1.67	12	0.62	
Hymenocephalus italicus	1.43	538	0.54	
Callinectes sp.	1.20	24	0.45	
Chaunax pictus	1.08	24	0.40	
Synagrops microlepis	0.96	36	0.36	
Aristeus varidens, female	0.84	36	0.31	
CONGRIDAE	0.84	36	0.31	
Chloropthalmus atlanticus	0.72	12	0.27	
MYCTOPHIDAE	0.36	347	0.13	
Halosaurus ovenii	0.24	12	0.09	
Parapenaeus longirostris, male	0.12	12	0.04	
Total	267.94		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 102
 DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°52.74
 start stop duration Lon E 12°58.19
 TIME :05:09:40 05:24:27 14.8 (min) Purpose : 3
 LOG : 6296.93 6297.67 0.7 Region : 4054
 FDEPTH: 217 218 Gear cond.: 0
 BDEPTH: 217 218 Validity : 0
 Towing dir: 0° Wire out : 520 m Speed : 3.0 kn
 Sorted : 73 Total catch: 349.24 Catch/hour: 1417.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MYCTOPHIDAE	591.80	169080	41.74	
Synagrops microlepis	128.53	28124	9.07	
Brotula barbata	115.29	45	8.13	
Trichiurus lepturus	92.31	414	6.51	
Merluccius polli	87.12	276	6.14	217
Pterothrissus belloci	83.50	499	5.89	
Bembrops heterurus	75.91	840	5.35	
Parapenaeus longirostris, female	47.29	8074	3.34	
Zeus faber	45.91	85	3.24	
Dentex angolensis	30.65	126	2.16	215
Seriola carpenteri	23.14	16	1.63	
Parapenaeus longirostris, male	15.71	4315	1.11	
Umrina canariensis	15.55	24	1.10	216
Uranoscopus polli	14.17	37	1.00	
Miracorvina angolensis	12.79	16	0.90	
Hoplostethus melanopus	12.10	37	0.85	
Nezumia aequalis	10.51	300	0.74	
Dicologlossa cuneata	5.68	69	0.40	
Scorpaena normani	4.14	53	0.29	
Raja alba	2.07	16	0.15	
Calappa sp.	1.75	16	0.12	
Trachinus armatus	0.69	16	0.05	
COLOCONGRIDAE	0.53	16	0.04	
Peristedion cataphractum	0.37	16	0.03	
Todaropsis eblanae	0.16	37	0.01	
Xenodermichthys copei	0.16	16	0.01	
Total	1417.75		100.01	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 104
 DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°36.30
 start stop duration Lon E 13°18.68
 TIME :09:45:21 10:07:42 22.4 (min) Purpose : 3
 LOG : 6329.46 6330.64 1.2 Region : 4054
 FDEPTH: 33 31 Gear cond.: 0
 BDEPTH: 33 31 Validity : 0
 Towing dir: 0° Wire out : 115 m Speed : 3.2 kn
 Sorted : 112 Total catch: 526.98 Catch/hour: 1414.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	371.14	808	26.23	
Pteroscion pelli	301.88	10032	21.34	
Brachydeuterus auritus	180.08	18008	12.73	219
Ilisha africana	150.31	5796	10.62	
Pseudotolithus typus	126.58	260	8.95	
Trichiurus lepturus	83.11	728	5.87	
Penaeus notialis	52.30	1871	3.70	
Sphyræna guachancho	34.63	70	2.45	
Stromateus fiatola	28.05	46	1.98	
Penaeus notialis	25.50	1409	1.80	0
Drepane africana	16.40	11	1.16	
Arius parkii	12.46	24	0.88	
Selene dorsalis	12.00	601	0.85	
Chloroscombrus chrysurus	6.82	416	0.48	
Rhizoprionodon acutus	5.23	3	0.37	
Dicologlossa cuneata	3.70	70	0.26	
B I V A L V E S	1.61	1074	0.11	
Citharus linguatula	1.05	46	0.07	
Grammolites gruveli	0.70	24	0.05	
GOBIIDAE	0.46	185	0.03	
Sardinella maderensis	0.46	11	0.03	
Sepia orbignyana	0.24	24	0.02	
Total	1414.71		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 105
 DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°33.65
 start stop duration Lon E 13°16.24
 TIME :10:48:57 11:13:03 24.1 (min) Purpose : 3
 LOG : 6334.05 6335.36 1.3 Region : 4054
 FDEPTH: 44 44 Gear cond.: 0
 BDEPTH: 44 44 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.3 kn
 Sorted : 111 Total catch: 707.64 Catch/hour: 1761.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1021.07	139875	57.96	220
Galeoides decadactylus	327.01	784	18.56	
Trichiurus lepturus	140.37	1098	7.97	
Selene dorsalis	61.79	1287	3.51	
Stromateus fiatola	33.56	47	1.90	
Chloroscombrus chrysurus	26.34	612	1.50	
Rhizoprionodon acutus	21.16	2	1.20	
Ephippion guttifer	18.65	15	1.06	
Ilisha africana	14.12	189	0.80	
Torpedo torpedo	13.17	32	0.75	
Alectis alexandrinus	11.60	32	0.66	
Epinephelus aeneus	10.18	15	0.58	
Sphyræna guachancho	9.41	110	0.53	
Arius parkii	7.37	15	0.42	
Pagellus bellottii	7.22	62	0.41	
Lithognathus mormyrus	5.65	15	0.32	
Pomadasys jubelini	5.65	15	0.32	
Sepia orbignyana	5.50	32	0.31	
Citharus linguatula	4.85	142	0.28	
Sardinella aurita	4.71	15	0.27	
Penaeus notialis	2.96	62	0.17	0
Grammolites gruveli	2.66	32	0.15	
Pteroscion pelli	2.04	32	0.12	
Penaeus notialis	1.72	80	0.10	
Dicologlossa cuneata	1.72	32	0.10	
Sardinella maderensis	0.80	47	0.05	
Pseudupeneus prayensis	0.47	15	0.03	
Total	1761.76		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 106
 DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°35.63
 start stop duration Lon E 13°14.98
 TIME :11:55:31 12:21:48 26.3 (min) Purpose : 3
 LOG : 6337.76 6339.12 1.4 Region : 4054
 FDEPTH: 54 52 Gear cond.: 0
 BDEPTH: 54 52 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.1 kn
 Sorted : 381 Total catch: 1523.46 Catch/hour: 3478.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	2595.43	142557	74.62	223
Galeoides decadactylus	163.01	374	4.69	
Trichiurus lepturus	161.64	667	4.65	
Trachurus trecae	152.97	4621	4.40	221
Chloroscombrus chrysurus	59.00	584	1.70	
Pomadasys incisus	58.90	219	1.69	
Pagellus bellottii	28.58	228	0.82	222
Torpedo torpedo	28.49	110	0.82	
Pomadasys jubelini	25.11	64	0.72	
Epinephelus aeneus	22.47	9	0.65	
Raja miraletus	21.64	64	0.62	
Lithognathus mormyrus	18.36	46	0.53	
Pseudotolithus senegalensis	17.44	27	0.50	
Alectis alexandrinus	16.99	27	0.49	
Dasyatis margarita	16.89	2	0.49	
Sepia orbignyana	16.07	18	0.46	
Caranx crysos	11.78	9	0.34	
Selene dorsalis	10.32	174	0.30	
Zeus faber	8.95	18	0.26	
Stromateus fiatola	8.77	18	0.25	
Rhizoprionodon acutus	7.99	2	0.23	
Sphyræna guachancho	7.85	37	0.23	
Atractoscion aequidens	6.76	18	0.19	
Citharus linguatula	4.75	137	0.14	
Chelidonichthys gabonensis	2.19	9	0.06	
Pisodonophis semicinctus	1.92	9	0.06	
Dentex barnardi	1.37	18	0.04	
Sardinella maderensis	0.46	27	0.01	
Penaeus notialis	0.46	18	0.01	0
Brotula barbata	0.37	9	0.01	
Penaeus notialis	0.37	18	0.01	
Alloteuthis africana	0.37	82	0.01	
GOBIIDAE	0.27	37	0.01	
Pseudupeneus prayensis	0.18	9	0.01	
Anthias anthias	0.09	9	0.00	
Total	3478.22		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 107
DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°37.96
start stop duration Lon E 13°4.03
TIME :14:04:21 14:36:39 32.3 (min) Purpose : 3
LOG : 6352.17 6353.74 1.6 Region : 4054
FDEPTH: 113 112 Gear cond.: 0
BDEPTH: 113 112 Validity : 0
Towing dir: 0° Wire out : 260 m Speed : 2.9 kn
Sorted : 123 Total catch: 123.37 Catch/hour: 229.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	70.42	288	30.72	224
Umbrina canariensis	52.77	186	23.02	226
Trichiurus lepturus	31.50	52	13.74	
Dentex congoensis	19.70	151	8.59	
Brotula barbata	16.54	15	7.21	
Zeus faber	8.25	26	3.60	
Raja miraletus	4.61	6	2.01	
Chaetodon hoefleri	4.48	28	1.95	
Branchiostegus semifasciatus *	3.33	4	1.45	
Chelidonicichthys gabonensis	3.01	26	1.31	
Illex coindetii	2.19	87	0.96	
Octopus vulgaris	1.99	4	0.87	
Scorpaena stephanica	1.69	4	0.74	
Trachurus trcaae	1.69	43	0.74	225
Brachydeuterus auritus	1.60	13	0.70	
Pterothrissus belloci	1.28	20	0.56	
Pontinus accraensis	1.00	6	0.44	
Chloroscombrus chrysurus	0.85	7	0.37	
Citharus linguatula	0.71	22	0.31	
Dentex barnardi	0.67	2	0.29	
Perulibatrachus elminensis	0.41	2	0.18	
Saurida brasiliensis	0.35	95	0.15	
Laemonema laureysi	0.19	4	0.08	
Arnoglossus imperialis	0.02	2	0.01	
Total		229.24	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 108
DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°34.72
start stop duration Lon E 13°1.09
TIME :15:36:19 16:02:04 25.8 (min) Purpose : 3
LOG : 6358.51 6359.88 1.4 Region : 4054
FDEPTH: 144 146 Gear cond.: 0
BDEPTH: 144 146 Validity : 0
Towing dir: 0° Wire out : 365 m Speed : 3.2 kn
Sorted : 66 Total catch: 65.52 Catch/hour: 152.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	43.22	89	28.31	
Brotula barbata	25.40	19	16.64	
Dentex angolensis	18.76	72	12.29	228
Pterothrissus belloci	16.29	98	10.67	
Umbrina canariensis	13.75	40	9.00	227
Synagrops microlepis	11.18	1251	7.33	
Atractoscion aequidens	4.59	2	3.01	
Aristeus varidens, female	4.03	1009	2.64	
Spicara alta	2.75	19	1.80	
Pontinus accraensis	2.05	9	1.34	
Illex coindetii	1.89	82	1.24	
Grammolites gruvelli	1.79	19	1.18	
Uranoscopus polli	1.75	9	1.14	
Citharus linguatula	1.61	30	1.05	
Monolene microstoma	1.07	30	0.70	
Chelidonicichthys gabonensis	0.70	2	0.46	
Miracorvina angolensis	0.56	2	0.37	
Anthias anthias	0.44	7	0.29	
Aristeus varidens, female	0.40	149	0.26	
Dentex angolensis	0.23	2	0.15	
Peristedion cataphractum	0.21	2	0.14	
Total		152.67	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 109
DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°36.14
start stop duration Lon E 12°54.10
TIME :17:48:52 18:18:48 29.9 (min) Purpose : 3
LOG : 6369.60 6371.03 1.4 Region : 4054
FDEPTH: 415 407 Gear cond.: 0
BDEPTH: 415 407 Validity : 0
Towing dir: 0° Wire out : 940 m Speed : 2.9 kn
Sorted : 50 Total catch: 351.05 Catch/hour: 703.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	371.87	102579	52.84	
Merluccius polli	132.61	253	18.84	229
Laemonema laureysi	86.30	786	12.26	
Malacocephalus laevis	26.94	126	3.83	
Dibranchius atlanticus	21.47	1726	3.05	
Nezumia aequalis	16.14	561	2.29	
Chaunax pictus	12.49	449	1.77	
Lophius vaillanti	6.03	14	0.86	
Triplophos hemingi	4.63	716	0.66	
Aristeus varidens, female	4.07	309	0.58	
Galeus polli	4.07	225	0.58	
Trichiurus lepturus	4.07	154	0.58	
Etmopterus polli	3.37	140	0.48	
CONGRIDAE	2.81	28	0.40	
Halosaurus ovenii	2.53	239	0.36	
Aristeus varidens, male	2.25	323	0.32	
Calappa sp.	1.68	56	0.24	
Hymenocephalus italicus	0.42	154	0.06	
Total		703.74	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 110
DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°35.44
start stop duration Lon E 12°51.26
TIME :20:07:02 20:37:06 30.1 (min) Purpose : 3
LOG : 6378.36 6379.78 1.4 Region : 4054
FDEPTH: 528 530 Gear cond.: 0
BDEPTH: 528 530 Validity : 0
Towing dir: 0° Wire out : 1160 m Speed : 2.9 kn
Sorted : 52 Total catch: 235.88 Catch/hour: 470.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	251.41	114277	53.42	
Hoplostethus cadenati	59.26	2829	12.59	
Triplophos hemingi	53.44	6465	11.35	
Lamprogrammus exutus	42.02	531	8.93	
Yarrella blackfordi	19.04	639	4.04	
Gonostoma denudata	9.52	198	2.02	
Dibranchius atlanticus	7.72	639	1.64	
Chaunax pictus	6.64	36	1.41	
Aristeus varidens, female	4.23	225	0.90	
Stereomastis sp.	3.41	549	0.72	
Illex coindetii	2.79	18	0.59	
Merluccius polli	2.71	6	0.58	
Todaropsis eblanae	2.69	10	0.57	
Aristeus varidens, male	1.54	198	0.33	
Bembrops heterurus	0.72	18	0.15	
Halosaurus ovenii	0.72	28	0.15	
Gadella imberbis	0.64	64	0.14	
Glyphus marsupialis	0.54	36	0.11	
Malacocephalus laevis	0.54	10	0.11	
Xenodermichthys copei	0.54	54	0.11	
Etmopterus polli	0.54	10	0.11	
Total		470.66	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 111
DATE :30/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°35.10
start stop duration Lon E 12°49.53
TIME :22:31:28 23:01:08 29.7 (min) Purpose : 3
LOG : 6386.35 6387.77 1.4 Region : 4054
FDEPTH: 704 704 Gear cond.: 0
BDEPTH: 704 704 Validity : 0
Towing dir: 0° Wire out : 1500 m Speed : 2.9 kn
Sorted : 34 Total catch: 338.89 Catch/hour: 685.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	212.34	53327	30.98	
Hoplostethus cadenati	118.10	5420	17.23	
Merluccius polli	111.22	182	16.23	230
Lamprogrammus exutus	73.61	263	10.74	
Stereomastis sp.	40.04	2406	5.84	
Opistotheutis rossi	26.90	61	3.92	
Bajaacali-fornia magalops	23.05	485	3.36	
Bathyrhoconger vicinus	16.38	425	2.39	
Nezumia aequalis	14.96	384	2.18	
Triplophos hemingi	12.13	1416	1.77	
Yarrella blackfordi	11.53	303	1.68	
Aristeus varidens, female	8.49	384	1.24	
Dicrolene inronigra	5.66	425	0.83	
OMMASTREPHIDAE	3.64	20	0.53	
Scymnodon obscurus	2.00	4	0.29	
Stomias boa boa	1.42	81	0.21	
Aristeus varidens, male	1.21	162	0.18	
Melanocetus johnsoni	1.21	40	0.18	
Cataetyx laticeps	1.01	121	0.15	
Dibranchius atlanticus	0.40	61	0.06	
Total		685.32	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 112
DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°28.05
start stop duration Lon E 12°53.49
TIME :00:54:34 01:25:33 31.0 (min) Purpose : 3
LOG : 6396.77 6398.31 1.5 Region : 4054
FDEPTH: 310 307 Gear cond.: 0
BDEPTH: 310 307 Validity : 0
Towing dir: 0° Wire out : 690 m Speed : 3.0 kn
Sorted : 62 Total catch: 184.89 Catch/hour: 357.97

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	130.98	796	36.59	231
Chlorophthalmus atlanticus	108.03	2457	30.18	
Nematocarcinus africanus	50.53	41524	14.12	
Pterothrissus belloci	18.41	128	5.14	
Pontinus accraensis	8.31	76	2.32	
Trichiurus lepturus	7.67	325	2.14	
Synagrops microlepis	6.51	238	1.82	
Laemonema laureysi	5.40	64	1.51	
Zenopsis conchifer	4.88	6	1.36	
Malacocephalus laevis	3.72	70	1.04	
MYCTOPHIDAE	3.25	2747	0.91	
Hymenocephalus italicus	2.09	732	0.58	
Trachipterus trachipterus	1.45	6	0.41	
Parapenaeus longirostris	1.05	122	0.29	
Gadella imberbis	0.87	29	0.24	
Raja sp.	0.87	6	0.24	
Caelorinchus sp.	0.76	23	0.21	
Stereomastis sp.	0.70	122	0.19	
Todarodes sp.	0.46	6	0.13	
CONGRIDAE	0.41	12	0.11	
Callinectes sp.	0.35	6	0.10	
Nezumia aequalis	0.29	12	0.08	
Lophiodes sp.	0.29	12	0.08	
Dibranchius atlanticus	0.29	23	0.08	
Galeus polli	0.23	17	0.06	
Bembrops heterurus	0.17	6	0.05	
Total		357.97	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 113
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°15.94
 start stop duration Lon E 13°15.63
 TIME :04:56:23 05:18:33 22.2 (min) Purpose : 3
 LOG : 6424.61 6425.75 1.1 Region : 4054
 FDEPTH: 29 28 Gear cond.: 0
 BDEPTH: 29 28 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn
 Sorted : 131 Total catch: 647.48 Catch/hour: 1752.31

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 116
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°20.18
 start stop duration Lon E 13°6.57
 TIME :08:42:19 09:12:54 30.6 (min) Purpose : 3
 LOG : 6442.70 6444.34 1.6 Region : 4054
 FDEPTH: 83 89 Gear cond.: 0
 BDEPTH: 83 89 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.2 kn
 Sorted : 71 Total catch: 164.50 Catch/hour: 322.76

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pseudotolithus senegalensis	476.29	953	27.18
Pteroscion pelli	466.01	9101	26.59
Ilisha africana	224.98	9808	12.84
Pomadasy jubelini	142.71	696	8.14
Galeoides decadactylus	129.20	476	7.37
Brachydeuterus auritus	73.91	5540	4.22
Conger conger	73.88	22	4.22
Trichiurus lepturus	33.69	130	1.92
Dasyatis margarita	33.56	14	1.92
Dicologlossa cuneata	27.12	501	1.55
Sepia officinalis hierredda	23.27	38	1.33
Chloroscombrus chrysurus	12.61	360	0.72
Penaeus notialis	8.09	309	0.46
Drepane africana	6.55	14	0.37
Scyllarides herklotsii	3.98	14	0.23
Selene dorsalis	3.46	168	0.20
Pomadasy incisus	3.36	14	0.19
Sardinella maderensis	3.09	233	0.18
Cynoglossus senegalensis	2.95	27	0.17
Sardinella aurita	1.54	130	0.09
Lagocephalus laevigatus	1.03	14	0.06
Grammoplites gruvelli	1.03	14	0.06
Total	1752.31		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trichiurus lepturus	208.94	432	64.74
Galeoides decadactylus	31.37	73	9.72
Brachydeuterus auritus	27.76	1111	8.60
Decapterus rhonchus	14.17	14	4.39
Dentex angolensis	8.36	41	2.59
Euthynnus alletteratus	7.63	4	2.36
Alloteuthis africana	7.46	3624	2.31
Zeus faber	3.61	10	1.12
Pseudotolithus senegalensis	3.34	4	1.03
Stromateus fiatola	2.98	4	0.92
Citharus sp.	2.16	35	0.67
Saurida brasiliensis	1.49	294	0.46
Trachurus trecae	1.28	35	0.40
Pterothrissus bellocci	1.00	14	0.31
Miracorvina angolensis	0.90	4	0.28
GOBIIDAE	0.35	104	0.11
Total	322.80		100.01

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 114
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°15.94
 start stop duration Lon E 13°15.63
 TIME :04:56:23 05:18:33 22.2 (min) Purpose : 3
 LOG : 6424.61 6425.75 1.1 Region : 4054
 FDEPTH: 29 28 Gear cond.: 0
 BDEPTH: 29 28 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn
 Sorted : 68 Total catch: 391.08 Catch/hour: 1058.40

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 118
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°23.02
 start stop duration Lon E 12°56.15
 TIME :11:31:12 12:01:29 30.3 (min) Purpose : 3
 LOG : 6458.36 6459.79 1.4 Region : 4054
 FDEPTH: 163 167 Gear cond.: 0
 BDEPTH: 163 167 Validity : 0
 Towing dir: 0° Wire out : 380 m Speed : 2.8 kn
 Sorted : 176 Total catch: 627.15 Catch/hour: 1242.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Stromateus fiatola	391.47	625	36.99
Brachydeuterus auritus	212.86	45488	20.11
Galeoides decadactylus	200.95	463	18.99
Raja miraletus	80.38	195	7.59
Alectis alexandrinus	30.83	30	2.91
Dasyatis centroura	22.60	3	2.14
Sepia officinalis hierredda	21.89	30	2.07
Torpedo marmorata	20.41	16	1.93
Alloteuthis africana	12.50	2858	1.18
Pagellus bellottii	10.88	179	1.03
Torpedo torpedo	10.58	89	1.00
Pseudotolithus senegalensis	7.93	3	0.75
Trichiurus lepturus	7.01	46	0.66
Sphyræna guanchancho	5.36	89	0.51
Trigla lyra	4.76	16	0.45
Pseudupeneus prayensis	3.73	60	0.35
Pomadasy incisus	3.44	16	0.32
Sepia orbignyana	2.08	16	0.20
Citharus linguatula	1.65	30	0.16
Grammoplites gruvelli	1.65	30	0.16
Penaeus notialis	1.65	30	0.16
Epinephelus aeneus	1.54	3	0.15
Selene dorsalis	1.19	16	0.11
Sardinella maderensis	1.06	46	0.10
Total	1058.40		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trichiurus lepturus	1039.95	6388	83.68
Dentex angolensis	86.10	289	6.93
Brotula barbata	40.42	32	3.25
Umbrina canariensis	32.00	59	2.58
Pterothrissus bellocci	8.84	61	0.71
Miracorvina angolensis	7.43	18	0.60
Zenopsis conchifer	5.03	12	0.41
Spicara alta	4.85	22	0.39
Lophiodes kempfi	3.57	6	0.29
Monolele microstoma	3.25	117	0.26
Parapenaeus longirostris, femal	2.52	400	0.20
Zeus faber	2.22	12	0.18
Bembrops heterurus	2.22	18	0.18
Illex coindetii	1.96	67	0.16
Pontinus accraensis	0.99	6	0.08
Uranoscopus polli	0.85	6	0.07
Citharus linguatula	0.44	6	0.04
Parapenaeus longirostris, male	0.06	18	0.00
Total	1242.70		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 115
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°18.52
 start stop duration Lon E 13°9.39
 TIME :07:18:09 07:48:13 30.1 (min) Purpose : 3
 LOG : 6435.50 6437.13 1.6 Region : 4054
 FDEPTH: 65 62 Gear cond.: 0
 BDEPTH: 65 62 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn
 Sorted : 62 Total catch: 265.87 Catch/hour: 530.50

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 119
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°26.15
 start stop duration Lon E 12°54.94
 TIME :13:00:46 13:26:08 25.4 (min) Purpose : 3
 LOG : 6463.51 6464.69 1.2 Region : 4054
 FDEPTH: 229 230 Gear cond.: 0
 BDEPTH: 229 230 Validity : 0
 Towing dir: 0° Wire out : 500 m Speed : 2.8 kn
 Sorted : 89 Total catch: 406.13 Catch/hour: 960.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Brachydeuterus auritus	288.75	7971	54.43
Trichiurus lepturus	112.80	2163	21.26
Pomadasy jubelini	35.02	86	6.60
Galeoides decadactylus	23.25	68	4.38
Dentex angolensis	16.88	102	3.18
Sphyræna guanchancho	13.89	18	2.62
Raja miraletus	13.31	18	2.51
Alloteuthis africana	8.32	2061	1.57
Seriola carpenteri	4.25	4	0.80
Selene dorsalis	3.57	52	0.67
Brotula barbata	2.51	2	0.47
Saurida brasiliensis	1.62	261	0.30
Lagocephalus laevigatus	1.62	8	0.30
Alectis alexandrinus	1.34	2	0.25
Citharus linguatula	0.76	18	0.14
Umbrina canariensis	0.68	8	0.13
Sepia orbignyana	0.60	8	0.11
Pagellus bellottii	0.42	8	0.08
Dentex congoensis	0.34	8	0.06
Engraulis encrasicolus	0.26	86	0.05
Chaetodon hoeferi	0.26	4	0.05
Trachurus trecae	0.08	8	0.02
Total	530.50		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Synagrops microlepis	441.88	34546	46.00
Brotula barbata	149.49	111	15.56
Epinephelus goreensis	56.05	2	5.84
Chlorophthalmus atlanticus	44.25	1313	4.61
Dentex angolensis	41.20	111	4.29
Trichiurus lepturus	36.61	92	3.81
Pterothrissus bellocci	28.85	265	3.00
Merluccius polli	22.89	336	2.38
MYCTOPHIDAE	18.09	14360	1.88
Caelorinchus sp.	16.18	345	1.68
Spicara alta	15.04	52	1.57
Bembrops heterurus	14.24	154	1.48
Umbrina canariensis	13.53	31	1.41
Zenopsis conchifer	13.13	52	1.37
Dentex barnardi	11.71	31	1.22
Parapenaeus longirostris, femal	9.46	1424	0.98
Miracorvina angolensis	7.64	9	0.80
Parapenaeus longirostris, male	4.99	601	0.52
Pontinus accraensis	4.68	40	0.49
Illex coindetii	3.36	52	0.35
Zeus faber	3.05	9	0.32
Monolele microstoma	1.23	61	0.13
Epigonus telescopus	1.02	21	0.11
Gephyroberyx darwini	0.71	9	0.07
Hymenocephalus italicus	0.61	31	0.06
Conger conger	0.52	9	0.05
UNIDENTIFIED FISH	0.09	9	0.01
Total	960.50		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 120
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°28.89
 start stop duration Lon E 12°49.84
 TIME :15:02:50 15:32:55 30.1 (min) Purpose : 3
 LOG : 6472.66 6474.27 1.6 Region : 4054
 FDEPTH: 451 455 Gear cond.: 0
 BDEPTH: 451 455 Validity : 0
 Towing dir: 0° Wire out : 1050 m Speed : 3.2 kn
 Sorted : 78 Total catch: 310.41 Catch/hour: 619.17

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 123
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°26.48
 start stop duration Lon E 12°45.92
 TIME :21:55:48 22:25:06 29.3 (min) Purpose : 3
 LOG : 6493.80 6495.21 1.4 Region : 4054
 FDEPTH: 699 701 Gear cond.: 0
 BDEPTH: 699 701 Validity : 0
 Towing dir: 0° Wire out : 1550 m Speed : 2.9 kn
 Sorted : 55 Total catch: 387.11 Catch/hour: 792.72

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	386.27	99975	62.39
Merluccius polli	131.25	235	21.20
Centrophorus granulosus	16.95	4	2.74
Yarella blackfordi	10.89	347	1.76
Aristeus varidens, male	10.41	698	1.68
Xenodermichthys copei	9.93	953	1.60
CHIMAERIDAE	9.45	12	1.53
Hoplostethus cadenati	7.30	389	1.18
Chaunax pictus	6.16	66	1.00
B I V A L V E S	5.86	30	0.95
Triplophos hemingi	4.07	114	0.66
Aristeus varidens, female	3.89	489	0.63
Laemonema laureysi	2.45	120	0.40
Dibranchius atlanticus	2.09	12	0.34
Stereomastis sp.	1.91	251	0.31
Gadella imberbis	1.56	72	0.25
Acanthephyra sp.	1.44	4159	0.23
Illex coindetii	1.32	32	0.21
Zenopsis conchifer	1.32	6	0.21
Neoharriotta pinnata	1.14	54	0.18
Etmopterus spinax	1.00	4	0.16
Squalus megalops	0.60	2	0.10
Malacocephalus occidentalis	0.54	12	0.09
Etmopterus polli	0.54	14	0.09
Galeus polli	0.40	2	0.06
Etmopterus pusillus	0.30	2	0.05
Hymnocephalus italicus	0.12	72	0.02
Total	619.17	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	295.29	14851	37.25
Nematocarcinus africanus	172.01	43003	21.70
Lamprogrammus exutus	81.71	530	10.31
Yarella blackfordi	72.82	2251	9.19
Stereomastis sp.	54.90	3426	6.93
Triplophos hemingi	29.53	3942	3.73
Nezumia sp.	24.66	545	3.11
Stomias boa boa	16.48	602	2.08
OMMASTREPHIDAE	8.89	29	1.12
Aristeus varidens, female	6.59	215	0.83
Dicrolene sp.	5.45	502	0.69
Bassanago albescens	4.59	100	0.58
Bathyrroconger vicinus	3.44	129	0.43
Talismania longifilis	3.01	100	0.38
Xenodermichthys copei	3.01	186	0.38
Trichiurus lepturus	2.15	258	0.27
Chaceon maritae	2.03	2	0.26
Bajacalifornia magalops	1.43	57	0.18
Merluccius polli	0.72	2	0.09
Mystriophis rostellatus	0.72	14	0.09
Scopelosaurus meadi	0.57	14	0.07
Aristeus varidens, male	0.57	57	0.07
Glyphus marsupialis	0.57	43	0.07
Synaphobranchus kaupii	0.43	14	0.05
Dibranchius atlanticus	0.43	57	0.05
Cataetyx laticeps	0.29	14	0.04
Callinectes sp.	0.14	14	0.02
GALATHEIDAE *	0.14	129	0.02
Acanthephyra sp.	0.14	29	0.02
Total	792.72	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 121
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°28.35
 start stop duration Lon E 12°48.21
 TIME :17:12:37 17:42:20 29.7 (min) Purpose : 3
 LOG : 6480.62 6482.08 1.5 Region : 4054
 FDEPTH: 536 536 Gear cond.: 0
 BDEPTH: 536 536 Validity : 0
 Towing dir: 0° Wire out : 1290 m Speed : 2.9 kn
 Sorted : 62 Total catch: 265.20 Catch/hour: 535.40

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 124
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°16.56
 start stop duration Lon E 12°40.86
 TIME :00:39:02 01:09:40 30.6 (min) Purpose : 3
 LOG : 6505.05 6506.46 1.4 Region : 4054
 FDEPTH: 714 692 Gear cond.: 0
 BDEPTH: 714 692 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 2.8 kn
 Sorted : 88 Total catch: 1978.85 Catch/hour: 3876.30

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	175.03	43758	32.69
Torpedo nobiliana	129.57	8	24.20
Hoplostethus cadenati	80.23	3846	14.98
Lamprogrammus exutus	32.69	472	6.10
Squalus megalops	32.60	8	6.09
Yarella blackfordi	18.80	478	3.51
Aristeus varidens, female	12.27	404	2.29
Triplophos hemingi	9.45	1120	1.76
Stereomastis sp.	9.10	977	1.70
Gonostoma denudata	7.21	170	1.35
Trichiurus lepturus	5.75	178	1.07
Chaceon maritae	5.15	8	0.96
Aristeus varidens, male	4.80	412	0.90
Illex coindetii	2.93	8	0.55
Bathyrroconger vicinus	2.93	129	0.55
Todaropsis eblanae	2.06	8	0.38
Chaunax pictus	1.55	8	0.29
Xenodermichthys copei	0.95	57	0.18
Acanthephyra sp.	0.87	145	0.16
Dibranchius atlanticus	0.69	24	0.13
Gadella imberbis	0.42	8	0.08
Dicologlossa cuneata	0.34	8	0.06
Total	535.40	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	2937.34	19567	75.78
Nematocarcinus africanus	409.50	107975	10.56
Yarella blackfordi	134.57	5622	3.47
Lithodes ferox	102.27	45	2.64
Stereomastis sp.	100.49	8545	2.59
Lamprogrammus exutus	40.72	133	1.05
Triplophos hemingi	34.08	4603	0.88
Stomias boa boa	31.87	840	0.82
Nezumia sp.	19.04	398	0.49
Xenodermichthys copei	17.26	1283	0.45
Aristeus varidens	14.16	576	0.37
Talismania longifilis	7.97	221	0.21
Dicrolene sp.	7.52	576	0.19
Bassanago albescens	4.43	88	0.11
Bathygadus melanobranchus	4.43	45	0.11
Glyphus marsupialis	2.66	266	0.07
Dibranchius atlanticus	2.66	221	0.07
Nessorhamphus ingolfianus	2.21	45	0.06
Ebinania costaecanarie	1.76	45	0.05
Ariomma bondi	1.33	45	0.03
Total	3876.30	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 122
 DATE :31/03/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°27.30
 start stop duration Lon E 12°47.01
 TIME :19:14:02 19:44:50 30.8 (min) Purpose : 3
 LOG : 6486.48 6487.98 1.5 Region : 4054
 FDEPTH: 601 606 Gear cond.: 0
 BDEPTH: 601 606 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 2.9 kn
 Sorted : 50 Total catch: 207.44 Catch/hour: 404.10

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 125
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°3.57
 start stop duration Lon E 13°10.02
 TIME :05:18:44 05:48:11 29.4 (min) Purpose : 3
 LOG : 6540.44 6541.92 1.5 Region : 4054
 FDEPTH: 28 26 Gear cond.: 0
 BDEPTH: 28 26 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.0 kn
 Sorted : 52 Total catch: 326.95 Catch/hour: 666.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	187.01	52855	46.28
Hoplostethus cadenati	54.55	2494	13.50
Yarella blackfordi	36.94	1130	9.14
Gonostoma denudata	17.92	421	4.44
Bathyrroconger vicinus	16.05	16	3.97
Etmopterus pusillus	13.71	55	3.39
Lamprogrammus exutus	13.09	125	3.24
Merluccius polli	11.06	16	2.74
Stereomastis sp.	9.90	1083	2.45
Triplophos hemingi	9.74	592	2.41
Nezumia aequalis	6.47	47	1.60
Aristeus varidens, female	6.08	257	1.50
Chaceon maritae	5.45	8	1.35
Trichiurus lepturus	3.74	117	0.93
Aristeus varidens, male	3.51	421	0.87
Malacocephalus laevis	1.48	62	0.37
Histioteuthis sp.	1.40	8	0.35
Gadella maraldi	1.32	23	0.33
Xenodermichthys copei	0.94	62	0.23
Laemonema laureysi	0.86	8	0.21
Nemichthys curvirostris	0.70	16	0.17
Halosaurus ovenii	0.62	8	0.15
Acanthephyra sp.	0.62	31	0.15
Gadella imberbis	0.47	55	0.12
Diplophos sp.	0.47	31	0.12
Total	404.10	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pseudotolithus typus	233.38	61	35.02
Galeoides decadactylus	79.89	236	11.99
Pteroscion peli	62.36	2274	9.36
Ilisha africana	51.20	1924	7.68
Pomadasys jubelini	44.43	204	6.67
Pseudotolithus senegalensis	30.90	98	4.64
Pentanemus quinquarius	25.52	310	3.83
Drepane africana	22.50	16	3.38
Trichiurus lepturus	22.01	130	3.30
Sphyraena guachancho	10.03	37	1.50
Scomberomus critor	9.62	8	1.44
Cynoglossus senegalensis	9.46	57	1.42
Fanulirus regius	9.37	71	1.41
B I V A L V E S	8.32	8	1.25
Torpedo nobiliana	8.07	8	1.21
Ehippion guttifer	6.20	8	0.93
Chloroscombrus chrysurus	4.81	41	0.72
Raja miraletus	4.81	8	0.72
Dasyatis margarita	4.65	8	0.70
Gymnura altavela	4.57	8	0.69
Dicologlossa cuneata	4.32	73	0.65
Pomadasys incisus	4.16	6	0.62
Brachydeuterus auritus	2.93	1834	0.44
Sardinella maderensis	2.85	245	0.43
Total	666.34	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 126
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°3.15
 start stop duration Lon E 13°7.45
 TIME :06:28:32 06:58:37 30.1 (min) Purpose : 3
 LOG : 6545.22 6546.60 1.4 Region : 4054
 FDEPTH: 41 43 Gear cond.: 0
 BDEPTH: 41 43 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 2.8 kn
 Sorted : 112 Total catch: 335.46 Catch/hour: 669.14

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 129
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°6.78
 start stop duration Lon E 12°58.93
 TIME :10:46:21 11:16:55 30.6 (min) Purpose : 3
 LOG : 6565.32 6566.78 1.5 Region : 4054
 FDEPTH: 96 94 Gear cond.: 0
 BDEPTH: 96 94 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 2.9 kn
 Sorted : 195 Total catch: 194.91 Catch/hour: 382.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	251.93	21513	37.65	247
Galeoides decadactylus	202.62	457	30.28	
Pseudotolithus senegalensis	58.64	120	8.76	246
Stromateus fiatola	58.64	114	8.76	
Dasyatis marmorata	38.48	6	5.75	
Raja miraletus	19.57	42	2.92	
Scomberomorus tritor	11.25	6	1.68	
Panulirus regius	7.78	30	1.16	
Trichiurus lepturus	6.28	96	0.94	
Pomadasy jubelini	5.45	6	0.81	
Alectis alexandrinus	2.57	6	0.38	
Cynoglossus senegalensis	1.44	6	0.21	
Sepia orbignyana	1.38	6	0.21	
Peneus notialis	0.90	24	0.13	
Torpedo torpedo	0.72	54	0.11	
Selene dorsalis	0.72	6	0.11	
Sardinella maderensis	0.48	24	0.07	
Sphyrna guachancho	0.30	24	0.04	
Total	669.14		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	133.22	824	34.84	254
Trichiurus lepturus	89.76	126	23.47	
Dentex angolensis	25.60	155	6.70	256
Selene dorsalis	15.70	94	4.10	
Brotula barbata	14.52	14	3.80	
Saurida brasiliensis	11.67	2562	3.05	
Decapterus rhonchus	11.62	10	3.04	
Trachurus trecae	9.14	235	2.39	257
Umbrina canariensis	9.03	24	2.36	255
Citharus linguatula	7.55	173	1.98	
Alloteuthis africana	7.14	2661	1.87	
Raja miraletus	7.08	12	1.85	
Uranoscopus cadenati	5.16	16	1.35	
COBLIDAE	5.10	4421	1.33	
Dentex barnardi	4.73	18	1.24	
Miracorvina angolensis	3.83	12	1.00	
Stromateus fiatola	3.47	4	0.91	
Torpedo torpedo	2.81	16	0.73	
Pterothrissus belloci	2.53	37	0.66	
Fistularia petimba	2.32	8	0.61	
Argyrosomus hololepidotus	1.94	8	0.51	
Octopus macropus	1.69	6	0.44	
Pseudotolithus senegalensis	1.67	2	0.44	
Scorpaena angolensis	0.82	2	0.22	
Chelidonichthys capensis	0.77	4	0.20	
Chelidonichthys gabonensis	0.61	4	0.16	
Pagellus bellottii	0.61	8	0.16	
Parapanaeus longirostris, femal	0.51	86	0.13	
Scorpaena normani	0.51	6	0.13	
Pontinus accraensis	0.43	2	0.11	
Illex coindetii	0.31	6	0.08	
Zeus faber	0.20	2	0.05	
Sepia orbignyana	0.16	6	0.04	
Antennarius sp.	0.12	2	0.03	
Boops boops	0.08	4	0.02	
Parapanaeus longirostris, male	0.02	6	0.01	
Total	382.43		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 127
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°3.60
 start stop duration Lon E 13°3.85
 TIME :07:59:16 08:30:13 31.0 (min) Purpose : 3
 LOG : 6553.53 6555.07 1.6 Region : 4054
 FDEPTH: 64 66 Gear cond.: 0
 BDEPTH: 64 66 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.0 kn
 Sorted : 91 Total catch: 214.18 Catch/hour: 415.21

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Stromateus fiatola	140.47	279	33.83	
Brachydeuterus auritus	71.59	1739	17.24	248
Trichiurus lepturus	63.24	271	15.23	
Galeoides decadactylus	45.85	159	11.04	
Dentex angolensis	23.40	122	5.64	250
Torpedo torpedo	17.43	95	4.20	
Raja miraletus	13.45	17	3.24	
Pseudotolithus senegalensis	8.32	10	2.00	
Pomadasy incisus	8.18	45	1.97	
Trachurus trecae	5.87	50	1.41	249
Pagellus bellottii	5.54	48	1.34	
Epinephelus aeneus	2.62	4	0.63	
Zeus faber	2.44	10	0.59	
Alloteuthis africana	1.90	353	0.46	
Selene dorsalis	1.71	14	0.41	
Dentex barnardi	1.67	23	0.40	
Engraulis encrasicolus	1.53	271	0.37	
Total	415.21		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 130
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°10.46
 start stop duration Lon E 12°54.58
 TIME :12:31:56 13:02:30 30.6 (min) Purpose : 3
 LOG : 6574.58 6576.21 1.6 Region : 4054
 FDEPTH: 116 116 Gear cond.: 0
 BDEPTH: 116 116 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.2 kn
 Sorted : 0 Total catch: 172.69 Catch/hour: 339.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	157.85	717	46.56	259
Umbrina canariensis	139.69	424	41.20	258
Trichiurus lepturus	9.33	18	2.75	
Chelidonichthys gabonensis	5.50	41	1.62	
Dentex congoensis	4.83	53	1.42	262
Torpedo torpedo	4.20	2	1.24	
Dentex barnardi	3.91	12	1.15	261
Zeus faber	3.34	20	0.98	
Branchiostegus semifasciatus *	2.95	4	0.87	
Pagellus bellottii	2.08	8	0.61	260
Trachurus trecae	2.04	39	0.60	263
Raja miraletus	1.43	2	0.42	
Chaetodon hoefleri	1.22	10	0.36	
Citharus linguatula	0.69	16	0.20	
Total	339.05		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 128
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°5.24
 start stop duration Lon E 13°3.17
 TIME :09:15:12 09:46:25 31.2 (min) Purpose : 3
 LOG : 6557.58 6559.19 1.6 Region : 4054
 FDEPTH: 72 70 Gear cond.: 0
 BDEPTH: 72 70 Validity : 0
 Towing dir: 0° Wire out : 190 m Speed : 3.1 kn
 Sorted : 56 Total catch: 223.92 Catch/hour: 430.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	164.89	2110	38.32	251
Dentex angolensis	64.57	269	15.01	252
Trachurus trecae	32.21	577	7.48	253
Raja miraletus	28.98	46	6.73	
Trichiurus lepturus	28.44	115	6.61	
Pomadasy incisus	19.91	92	4.63	
Zeus faber	18.30	54	4.25	
Galeoides decadactylus	17.30	100	4.02	
Torpedo torpedo	11.30	31	2.63	
Alloteuthis africana	10.45	2091	2.43	
Epinephelus aeneus	7.69	2	1.79	
Pomadasy jubelini	4.69	8	1.09	
Lagocephalus laevigatus	4.07	15	0.95	
Citharus linguatula	3.00	108	0.70	
Selene dorsalis	2.61	15	0.61	
Pagellus bellottii	2.54	61	0.59	
Engraulis encrasicolus	1.92	331	0.45	
Chelidonichthys gabonensis	1.69	8	0.39	
Dentex barnardi	1.69	15	0.39	
Brotula barbata	1.61	2	0.38	
Chaetodon hoefleri	1.23	15	0.29	
Grammolites gruvelli	1.23	15	0.29	
Total	430.34		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 131
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°12.03
 start stop duration Lon E 12°49.89
 TIME :14:11:34 14:43:18 31.7 (min) Purpose : 3
 LOG : 6583.35 6584.80 1.5 Region : 4054
 FDEPTH: 134 142 Gear cond.: 0
 BDEPTH: 134 142 Validity : 0
 Towing dir: 0° Wire out : 340 m Speed : 2.7 kn
 Sorted : 165 Total catch: 165.36 Catch/hour: 312.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spicara alta	115.73	991	37.01	
Dentex angolensis	78.57	367	25.13	265
Dentex congoensis	31.48	344	10.07	264
Zeus faber	19.38	119	6.20	
Mustelus mustelus	14.56	6	4.66	
Zenopsis conchifer	10.02	17	3.21	
Illex coindetii	7.62	236	2.44	
Erythrocles monodi	5.82	30	1.86	
Trachurus trecae	5.24	55	1.68	266
Trichiurus lepturus	4.77	4	1.52	
Boops boops	3.69	34	1.16	
Lepidotrigla carolae	3.54	108	1.13	
Umbrina canariensis	2.67	2	0.85	
Dentex barnardi	2.19	6	0.70	0
Dentex congoensis	2.04	9	0.65	
Pterothrissus belloci	2.04	13	0.65	
Sepia orbignyana	1.04	8	0.33	
Citharus linguatula	0.66	19	0.21	
Chaetodon hoefleri	0.66	4	0.21	
Octopus macropus	0.36	2	0.11	
Uranoscopus polli	0.21	2	0.07	
Monolene microstoma	0.15	8	0.05	
Scorpaena normani	0.13	2	0.04	
SOLEIDAE	0.11	4	0.04	
Total	312.69		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 132
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°14.15
 start stop duration Lon E 12°43.51
 TIME :16:18:40 16:48:59 30.3 (min) Purpose : 3
 LOG : 6594.61 6596.03 1.4 Region : 4054
 FDEPTH: 426 429 Gear cond.: 5
 BDEPTH: 426 429 Validity : 0
 Towing dir: 0° Wire out : 1050 m Speed : 2.8 kn
 Sorted : 28 Total catch: 251.77 Catch/hour: 498.39

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 135
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°2.37
 start stop duration Lon E 12°36.79
 TIME :23:50:23 00:20:50 30.4 (min) Purpose : 3
 LOG : 6623.80 6625.15 1.4 Region : 4054
 FDEPTH: 631 639 Gear cond.: 0
 BDEPTH: 631 639 Validity : 0
 Towing dir: 0° Wire out : 1300 m Speed : 2.7 kn
 Sorted : 28 Total catch: 251.41 Catch/hour: 495.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	244.67	15330	49.09	
Torpedo nobiliana	93.43	16	18.75	
Yarella blackfordi	57.80	6920	11.60	
Merluccius polli	32.37	91	6.49	267
CHIMAERIDAE	20.69	6	4.15	
Laemonema laureysi	14.41	190	2.89	
Hoplostethus cadenati	5.70	222	1.14	
Chaunax pictus	4.91	48	0.99	
Illex coindettii	4.75	79	0.95	
Etmopterus spinax	3.96	79	0.79	
Dibranchus atlanticus	3.96	317	0.79	
Triplophos hemingi	2.38	333	0.48	
B I V A L V E S	2.38	16	0.48	
Trichiurus lepturus	2.24	4	0.45	
Aristeus varidens, female	2.06	190	0.41	
Gadella imberbis	0.95	143	0.19	
Gonostoma elongatum	0.79	16	0.16	
Halosaurus ovenii	0.63	63	0.13	
Aristeus varidens, male	0.32	127	0.06	
Total	498.39		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	300.69	7642	60.68	
Yarella blackfordi	45.06	1171	9.09	
Hoplostethus cadenati	25.72	1224	5.19	
Lamprogrammus exutus	23.06	89	4.65	
Opisthoteuthis agassizi	19.69	35	3.97	
Triplophos hemingi	17.56	2093	3.54	
Stomias boa boa	14.90	585	3.01	
Lophiodes kempfi	13.84	18	2.79	
Stereomastis sp.	11.71	1614	2.36	
Xenodermichthys copei	5.68	426	1.15	
Aristeus varidens, female	4.08	142	0.82	
Bathyrroconger vicinus	2.66	53	0.54	
Nezumia sp.	2.48	53	0.50	
Scymnodon obscurus	2.37	8	0.48	
Dicrolene sp.	2.13	373	0.43	
Aristeus varidens, male	1.06	106	0.21	
Trichiurus lepturus	0.71	35	0.14	
Glyphus marsupialis	0.53	18	0.11	
Chlorophthalmus atlanticus	0.35	18	0.07	
Cataetix laticeps	0.35	53	0.07	
Callinectes sp.	0.35	71	0.07	
Deania calcea	0.20	2	0.04	
Etmopterus polli	0.18	2	0.04	
Dibranchus atlanticus	0.18	18	0.04	
Total	495.55		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 133
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°15.60
 start stop duration Lon E 12°41.35
 TIME :18:45:19 19:15:13 30.0 (min) Purpose : 3
 LOG : 6602.52 6603.90 1.4 Region : 4054
 FDEPTH: 623 615 Gear cond.: 0
 BDEPTH: 623 615 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 2.8 kn
 Sorted : 28 Total catch: 296.01 Catch/hour: 592.22

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 136
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°3.47
 start stop duration Lon E 12°35.59
 TIME :01:44:49 02:15:18 30.5 (min) Purpose : 3
 LOG : 6630.72 6632.15 1.4 Region : 4054
 FDEPTH: 738 736 Gear cond.: 0
 BDEPTH: 738 736 Validity : 0
 Towing dir: 0° Wire out : 1470 m Speed : 2.8 kn
 Sorted : 32 Total catch: 518.79 Catch/hour: 1021.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	316.17	134719	53.39	
Yarella blackfordi	86.97	2647	14.69	
Hoplostethus cadenati	71.84	3361	12.13	
Laemonema laureysi	29.83	358	5.04	
Trichiurus lepturus	17.87	62	3.02	
Stereomastis sp.	15.77	1198	2.66	
Gonostoma elongatum	10.30	252	1.74	
Etmopterus spinax	9.04	42	1.53	
Xenodermichthys copei	8.20	630	1.39	
Merluccius polli	7.70	12	1.30	268
Triplophos hemingi	5.88	860	0.99	
Nezumia aequalis	3.58	358	0.60	
Aristeus varidens, male	3.16	358	0.53	
Aristeus varidens, female	2.52	148	0.43	
Nemichthys curvirostris	1.48	168	0.25	
Gadella imberbis	0.84	20	0.14	
Ariomma bondi	0.64	20	0.11	
Histioteuthis reversa	0.42	0	0.07	
Total	592.22		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Triplophos hemingi	314.96	32819	30.84	
Nematocarcinus africanus	267.72	69921	26.21	
Yarella blackfordi	147.40	3717	14.43	
Stereomastis sp.	50.39	3874	4.93	
Lamprogrammus exutus	46.61	63	4.56	
Bajacalifornia magalops	25.51	220	2.50	
Xenodermichthys copei	24.25	1638	2.37	
Nezumia micronychodon	21.42	504	2.10	
Merluccius polli	21.42	31	2.10	
Bassanago albescens	17.64	189	1.73	
Caelorinchus sp.	15.75	63	1.54	
Stomias boa boa	10.71	504	1.05	
OMMASTREPHIDAE	10.08	31	0.99	
Hoplostethus cadenati	10.08	850	0.99	
Centroprorus granulosus	7.38	2	0.72	
Dibranchus sp.	6.61	220	0.65	
Dicrolene sp.	6.61	409	0.65	
Lophiodes kempfi	5.35	31	0.52	
Aristeus varidens	3.15	157	0.31	
Deania calcea	2.20	2	0.22	
Glyphus marsupialis	1.57	126	0.15	
Callinectes sp.	1.57	189	0.15	
CRURIRAJA parcomaculata	1.26	31	0.12	
NEPHROPODIDAE	0.94	31	0.09	
GALATHEIDAE *	0.63	252	0.06	
Total	1021.24		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 134
 DATE :01/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 8°1.06
 start stop duration Lon E 12°37.72
 TIME :21:42:12 22:12:18 30.1 (min) Purpose : 3
 LOG : 6617.58 6618.98 1.4 Region : 4054
 FDEPTH: 540 541 Gear cond.: 0
 BDEPTH: 540 541 Validity : 0
 Towing dir: 0° Wire out : 1230 m Speed : 2.8 kn
 Sorted : 55 Total catch: 251.36 Catch/hour: 500.88

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 137
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°50.70
 start stop duration Lon E 13°3.41
 TIME :08:43:56 09:14:14 30.3 (min) Purpose : 3
 LOG : 6668.04 6669.68 1.7 Region : 4054
 FDEPTH: 24 25 Gear cond.: 0
 BDEPTH: 24 25 Validity : 0
 Towing dir: 0° Wire out : 95 m Speed : 3.3 kn
 Sorted : 91 Total catch: 517.55 Catch/hour: 1024.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	307.57	74096	61.41	
Stomias boa boa	57.31	1614	11.44	
Yarella blackfordi	46.01	1363	9.19	
Hoplostethus cadenati	26.46	1202	5.28	
Triplophos hemingi	20.80	3892	4.15	
Stereomastis sp.	6.99	646	1.40	
Centroprorus granulosus	6.28	2	1.25	
Merluccius polli	3.77	10	0.75	
OMMASTREPHIDAE	3.05	18	0.61	
Aristeus varidens, female	3.05	126	0.61	
Echiostoma barbartum	2.69	279	0.54	
Xenodermichthys copei	2.07	179	0.41	
Notacanthus sexspinis	1.97	46	0.39	
Lamprogrammus exutus	1.89	233	0.38	
Bathygadus melanobranchus	1.26	36	0.25	
Halosaurus ovenii	1.18	46	0.23	
Laemonema laureysi	1.08	18	0.21	
Setarches guentheri	1.00	10	0.20	
Aristeus varidens, male	0.90	136	0.18	
Dibranchus atlanticus	0.82	6277	0.16	
Chaunax pictus	0.72	10	0.14	
Conger conger	0.72	100	0.14	
Dicrolene sp.	0.64	100	0.13	
Trichiurus lepturus	0.54	28	0.11	
Cataetix laticeps	0.46	100	0.09	
Raja alba	0.46	10	0.09	
Scymnodon obscurus	0.40	2	0.08	
Pseudotolithus senegalensis	0.36	10	0.07	
Glyphus marsupialis	0.36	108	0.07	
Nemichthys scolopaceus	0.10	18	0.02	
Total	500.88		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	396.86	5475	38.74	
Brachydeuterus auritus	267.16	17250	26.08	269
Galeoides decadactylus	101.99	930	9.95	
Ilisha africana	63.07	1685	6.16	
Sardinella aurita	59.52	4401	5.81	270
Trichiurus lepturus	32.15	354	3.14	
Sardinella maderensis	31.93	2661	3.12	271
Sphyraena guachancho	19.40	34	1.89	
Pterosciron pelli	15.18	687	1.48	
Epiplaton guttifer	9.90	2	0.97	
Raja miraletus	9.64	12	0.94	
Alectis alexandrinus	8.51	12	0.83	
Eucinostomus melanopterus	2.77	34	0.27	
Pseudotolithus senegalensis	2.55	12	0.25	
Lagocephalus laevigatus	2.34	12	0.23	
Pomadourus jubelini	0.99	12	0.10	
Selene dorsalis	0.55	22	0.05	
Total	1024.51		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 138
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°49.82
 start stop duration Lon E 13°0.90
 TIME :09:49:37 10:10:44 21.1 (min) Purpose : 3
 LOG : 6672.32 6673.35 1.0 Region : 4054
 FDEPTH: 42 41 Gear cond.: 0
 BDEPTH: 42 41 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 2.9 kn
 Sorted : 89 Total catch: 510.70 Catch/hour: 1450.17

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 142
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°56.17
 start stop duration Lon E 12°50.58
 TIME :14:33:40 14:57:20 23.7 (min) Purpose : 3
 LOG : 6693.58 6694.77 1.2 Region : 4054
 FDEPTH: 106 106 Gear cond.: 0
 BDEPTH: 106 106 Validity : 0
 Towing dir: 0° Wire out : 255 m Speed : 3.0 kn
 Sorted : 69 Total catch: 68.51 Catch/hour: 173.74

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Brachydeuterus auritus	601.87	1528	41.50
Chloroscombrus chrysurus	578.65	5662	39.90
Galeoides decadactylus	157.43	747	10.86
Trichiurus lepturus	23.68	48	1.63
Selene dorsalis	22.89	301	1.58
Alectis alexandrinus	14.40	20	0.99
Scomberomorus tritor	14.34	6	0.99
Pagellus bellottii	9.71	142	0.67
Raja miraletus	9.54	20	0.66
Sepia officinalis hierredda	7.64	20	0.53
Trachurus trecae	4.60	97	0.32
Citharus linguatula	2.39	20	0.16
Sphyræna guachancho	1.76	62	0.12
Torpedo torpedo	0.97	48	0.07
Penaeus notialis	0.31	20	0.02
Total	1450.17		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Umrina canariensis	48.56	94	27.95
Trichiurus lepturus	27.13	30	15.62
Brachydeuterus auritus	19.91	137	11.46
Dentex angolensis	19.27	223	11.09
Dentex congoensis	9.18	251	5.28
Pagellus bellottii	7.99	56	4.60
Parapandalus narval	6.44	3096	3.71
Spicara alta	4.87	492	2.80
Chelidionichthys gabonensis	4.11	33	2.36
Citharus linguatula	3.55	127	2.04
Trachurus trecae	3.12	89	1.80
Illex coindetii	3.04	221	1.75
Chelidionichthys capensis	2.21	10	1.27
Dentex barnardi	2.10	10	1.21
Saurida brasiliensis	1.88	373	1.08
Zeus faber	1.83	5	1.05
Pagrus caeruleostictus	1.47	3	0.85
Brotula barbata	1.22	3	0.70
Uranoscopus polli	1.14	8	0.66
TETRAODONTIDAE	1.12	3	0.64
Pontinus accraensis	0.86	10	0.50
Scorpaena stephanica	0.84	3	0.48
Branchiostegus semifasciatus *	0.76	3	0.44
Fistularia petimba	0.61	3	0.35
Scorpaena normani	0.46	5	0.26
Boops boops	0.05	3	0.03
Parapenaeus longirostris	0.03	5	0.01
Total	173.74		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 139
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°51.51
 start stop duration Lon E 12°58.72
 TIME :10:45:38 11:15:21 29.7 (min) Purpose : 3
 LOG : 6676.91 6678.45 1.5 Region : 4054
 FDEPTH: 56 59 Gear cond.: 0
 BDEPTH: 56 59 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.1 kn
 Sorted : 0 Total catch: 147.96 Catch/hour: 298.61

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 143
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°59.59
 start stop duration Lon E 12°43.67
 TIME :16:15:51 16:46:34 30.7 (min) Purpose : 3
 LOG : 6703.90 6705.38 1.5 Region : 4054
 FDEPTH: 164 167 Gear cond.: 0
 BDEPTH: 164 167 Validity : 0
 Towing dir: 0° Wire out : 400 m Speed : 2.9 kn
 Sorted : 96 Total catch: 548.70 Catch/hour: 1071.68

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Pagellus bellottii	76.79	517	25.72
Epinephelus aeneus	45.91	4	15.38
Umrina canariensis	41.88	101	14.02
Trachurus trecae	35.22	1124	11.79
Raja miraletus	30.47	81	10.21
Dentex barnardi	28.36	258	9.50
Pseudupeneus prayensis	10.07	226	3.37
Alloteuthis africana	6.66	1701	2.23
Trichiurus lepturus	5.45	12	1.82
Pagrus caeruleostictus	4.24	8	1.42
Torpedo torpedo	2.72	30	0.91
Sepia orbignyana	2.04	6	0.68
Sphyræna guachancho	1.68	8	0.56
Citharus linguatula	1.33	36	0.45
Dasyatis marmorata	1.27	2	0.43
Chaetodon hoefleri	1.07	6	0.36
Fistularia petimba	0.93	4	0.31
Cynoglossus canariensis	0.54	4	0.18
Chelidionichthys capensis	0.50	2	0.17
Zeus faber	0.44	2	0.15
Grammolites gruvelli	0.40	6	0.14
Sardinella aurita	0.30	16	0.10
Saurida brasiliensis	0.22	48	0.07
Boops boops	0.10	8	0.03
Total	298.61		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Synagrops microlepis	549.96	53354	51.32
MYCTOPHIDAE	166.99	290309	15.58
Zenopsis conchifer	116.35	211	10.86
Dentex angolensis	49.65	168	4.63
Trichiurus lepturus	48.98	100	4.57
Brotula barbata	26.39	21	2.46
Uranoscopus polli	23.95	168	2.23
Zeus faber	18.38	45	1.71
Citharus linguatula	13.93	1045	1.30
Saurida brasiliensis	13.03	2605	1.22
Pterothrissus belloci	9.02	90	0.84
Parapenaeus longirostris	6.23	1580	0.58
Octopus zonatus	6.23	35	0.58
Heptranchias perlo	5.76	2	0.54
Grammolites gruvelli	5.12	78	0.48
Pteroscion pelli	3.46	21	0.32
Illex sp.	3.34	100	0.31
Trigla lyra	3.13	45	0.29
Squilla mantis	1.23	33	0.11
Dicologlossa cuneata	0.57	12	0.05
Total	1071.68		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 140
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°54.29
 start stop duration Lon E 12°56.99
 TIME :12:00:11 12:30:57 30.8 (min) Purpose : 3
 LOG : 6682.36 6683.98 1.6 Region : 4054
 FDEPTH: 72 72 Gear cond.: 0
 BDEPTH: 72 72 Validity : 0
 Towing dir: 0° Wire out : 170 m Speed : 3.2 kn
 Sorted : 179 Total catch: 178.75 Catch/hour: 348.78

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 144
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°46.58
 start stop duration Lon E 12°30.45
 TIME :19:57:21 20:27:04 29.7 (min) Purpose : 3
 LOG : 6726.76 6728.20 1.4 Region : 4054
 FDEPTH: 745 774 Gear cond.: 0
 BDEPTH: 745 774 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 2.9 kn
 Sorted : 56 Total catch: 622.28 Catch/hour: 1256.29

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Pomadasyd jubelini	91.02	140	26.10
Trachurus trecae	77.27	2421	22.15
Pagellus bellottii	35.80	318	10.27
Raja miraletus	28.68	62	8.22
Umrina canariensis	25.95	43	7.44
Dentex congoensis	22.54	320	6.46
Argyrosomus hololepidotus	14.54	10	4.17
Alloteuthis africana	10.58	2211	3.03
Dentex barnardi	9.76	12	2.80
Trichiurus lepturus	8.88	10	2.55
Zeus faber	4.37	20	1.25
Pagrus caeruleostictus	3.61	8	1.03
Dasyatis marmorata	3.26	2	0.93
Pseudupeneus prayensis	3.20	43	0.92
Brachydeuterus auritus	2.42	21	0.69
Fistularia petimba	1.72	4	0.49
Sepia orbignyana	1.21	2	0.35
Torpedo torpedo	1.07	2	0.31
Chelidionichthys capensis	0.86	6	0.25
Sardinella aurita	0.68	25	0.20
Dentex angolensis	0.49	14	0.14
Chaetodon hoefleri	0.49	4	0.14
Cynoglossus canariensis	0.25	2	0.07
Boops boops	0.08	4	0.02
Saurida brasiliensis	0.06	12	0.02
Total	348.78		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Hoplostethus cadenati	591.82	26249	47.11
Stereomastix sp.	270.48	10437	21.53
Yarella blackfordi	121.25	3487	9.65
Nematocarcinus africanus	101.04	26049	8.04
Triplophos hemingi	47.30	5996	3.77
Talismania longifilis	31.76	67	2.53
Gonostoma denudata	29.76	733	2.37
Malacocephalus laevis	14.88	333	1.18
Aristeus varidens, female	7.77	289	0.62
Etmopterus polli	6.66	66	0.53
Chaceon maritae, male	5.59	10	0.45
Chaceon maritae, female	5.55	22	0.44
Bathyrcongus vicinus	4.66	22	0.37
Xenodermichthys copei	4.66	444	0.37
Gadella maraldi	4.00	289	0.32
Dibranchius atlanticus	3.33	133	0.27
Merluccius polli	2.42	4	0.19
Laemonema sp.	1.55	22	0.12
Plesionika martia	1.33	111	0.11
Squilla sp.	0.44	22	0.04
Total	1256.29		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 145
 DATE :02/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°47.00
 start stop duration Lon E 12°31.82
 TIME :22:27:49 22:58:07 30.3 (min) Purpose : 3
 LOG : 6734.25 6735.72 1.5 Region : 4054
 FDEPTH: 633 648 Gear cond.: 0
 BDEPTH: 633 648 Validity : 0
 Towing dir: 0° Wire out : 1450 m Speed : 2.9 kn
 Sorted : 29 Total catch: 330.31 Catch/hour: 653.86

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 148
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°42.16
 start stop duration Lon E 12°38.13
 TIME :05:17:24 05:44:28 27.1 (min) Purpose : 3
 LOG : 6757.73 6759.09 1.4 Region : 4054
 FDEPTH: 116 114 Gear cond.: 0
 BDEPTH: 116 114 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.0 kn
 Sorted : 103 Total catch: 269.95 Catch/hour: 598.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Nematocarcinus africanus	276.54	67328	42.29
Hoplostethus cadenati	136.09	5814	20.81
Yarella blackfordi	52.48	1263	8.03
Stomias boa boa	43.77	1067	6.69
Triplophos hemingi	43.33	5683	6.63
Lamprogrammus exutus	39.41	152	6.03
Centrophorus granulatus	20.19	8	3.09
Stereomastis sp.	9.36	1154	1.43
Gadella imberbis	5.66	174	0.87
Trichiurus lepturus	3.70	109	0.57
Nezumia sp.	3.48	131	0.53
Bathyrcongus vicinus	1.96	65	0.30
Xenodermichthys copei	1.96	131	0.30
Nemichthys scolopaceus	1.74	44	0.27
Laemonema laureysi	1.74	22	0.27
Malacocephalus laevis	1.74	44	0.27
Deania calcea	1.58	4	0.24
Melanonus sp.	1.31	22	0.20
Dicrolene sp.	1.31	174	0.20
Aristeus varidens	1.31	22	0.20
Setarches guentheri	1.09	22	0.17
Dibranchius atlanticus	1.09	44	0.17
Scopelosaurus meadi	0.87	22	0.13
Glyphus marsupialis	0.44	22	0.07
Gonostoma elongatum	0.44	22	0.07
Synaphobranchus kaupii	0.44	22	0.07
Etmopterus polli	0.40	4	0.06
Cataetys laticeps	0.22	65	0.03
GALATHEIDAE *	0.22	131	0.03
Total	653.86	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Umbrina canariensis	386.33	793	64.57
Dentex angolensis	61.44	317	10.27
Trachurus trecae	48.54	1104	8.11
Trichiurus lepturus	31.41	62	5.25
Spicara alta	19.73	528	3.30
Dentex congoensis	16.14	193	2.70
Trigla lyra	10.31	80	1.72
Pagellus bellottii	7.76	44	1.30
Citharus linguatula	5.10	106	0.85
Scorpaena stephanica	3.97	13	0.66
Zeus faber	2.48	7	0.41
Saurida brasiliensis	2.04	80	0.34
Todaropsis eblanae	1.62	100	0.27
Sepia orbignyana	0.80	7	0.13
Grammolites gruvelli	0.55	131	0.09
Chlorophthalmus atlanticus	0.13	13	0.02
Total	598.34	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 149
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°37.57
 start stop duration Lon E 12°44.49
 TIME :07:03:06 07:33:30 30.4 (min) Purpose : 3
 LOG : 6768.87 6770.47 1.6 Region : 4054
 FDEPTH: 88 87 Gear cond.: 0
 BDEPTH: 88 87 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.2 kn
 Sorted : 75 Total catch: 386.76 Catch/hour: 763.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Dentex congoensis	315.00	2992	41.27
Trichiurus lepturus	173.68	466	22.75
Brachydeuterus auritus	95.53	584	12.51
Sepia officinalis hierredda	31.18	32	4.09
Zeus faber	23.84	95	3.12
Raja miraletus	22.66	32	2.97
Alloteuthis africana	20.76	2479	2.72
Fistularia petimba	19.34	55	2.53
Trigla lyra	17.53	150	2.30
Atractoscion aequidens	15.00	8	1.97
Dentex angolensis	12.24	221	1.60
Saurida brasiliensis	6.00	1397	0.79
Citharus linguatula	4.03	87	0.53
Dentex barnardi	4.03	24	0.53
Dentodon hoefleri	1.03	8	0.13
Illex coindetii	0.87	8	0.11
Spicara alta	0.63	63	0.08
Total	763.34	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 146
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°42.94
 start stop duration Lon E 12°32.17
 TIME :00:44:07 01:14:38 30.5 (min) Purpose : 3
 LOG : 6743.00 6744.43 1.4 Region : 4054
 FDEPTH: 370 369 Gear cond.: 0
 BDEPTH: 370 369 Validity : 0
 Towing dir: 0° Wire out : 800 m Speed : 2.8 kn
 Sorted : 25 Total catch: 433.97 Catch/hour: 853.43

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Nematocarcinus africanus	520.65	119558	61.01
Merluccius polli	104.52	393	12.25
Trichiurus lepturus	43.66	1652	5.12
Laemonema laureysi	35.69	501	4.18
Hymenocephalus italicus	22.12	2330	2.59
Pontinus kuhlii	17.40	29	2.04
Chauanax pictus	16.22	1032	1.90
Malacocephalus laevis	15.04	118	1.76
Lophiodes kempi	14.45	29	1.69
Gadella imberbis	11.21	442	1.31
Dibranchius atlanticus	10.32	1209	1.21
CONGRIDAE	7.08	88	0.83
Centrophorus granulatus	7.08	2	0.83
Yarella blackfordi	4.42	177	0.52
Epigonus telescopus	4.42	59	0.52
Caelorinchus sp.	4.13	88	0.48
Hoplostethus cadenati	3.83	177	0.45
OMIASSTREPHIDAE	2.95	29	0.35
Aristeus varidens	2.36	265	0.28
Synaphobranchus kaupii	1.77	59	0.21
Helicolenus dactylopterus	1.47	29	0.17
Stereomastis sp.	0.88	206	0.10
Parapenaeus longirostris	0.59	59	0.07
Triplophos hemingi	0.59	118	0.07
Hirundichthys affinis	0.45	2	0.05
Total	853.35	99.99	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 150
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°37.57
 start stop duration Lon E 12°48.56
 TIME :08:21:17 08:51:31 30.2 (min) Purpose : 3
 LOG : 6775.14 6776.71 1.6 Region : 4054
 FDEPTH: 70 71 Gear cond.: 0
 BDEPTH: 70 71 Validity : 0
 Towing dir: 0° Wire out : 175 m Speed : 3.1 kn
 Sorted : 0 Total catch: 92.39 Catch/hour: 183.43

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagellus bellottii	142.36	1753	77.61
Raja miraletus	5.10	8	2.78
Rhinobatos albomaculatus	5.10	4	2.78
Brachydeuterus auritus	5.08	34	2.77
Squatina oculata	4.96	2	2.71
Sepia officinalis hierredda	4.61	242	2.51
Fistularia petimba	3.97	10	2.16
Alloteuthis africana	3.30	989	1.80
Seriola carpenteri	1.79	2	0.97
Umbrina canariensis	1.63	10	0.89
Dentex barnardi	1.59	4	0.87
Decapterus rhonchus	1.37	30	0.75
Trigla lyra	0.73	0	0.40
Galeoides decadactylus	0.69	4	0.38
Sphyræna guanchano	0.62	4	0.34
Illocephalus laevigatus	0.36	2	0.19
Illex coindetii	0.18	4	0.10
Total	183.43	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 147
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°42.54
 start stop duration Lon E 12°33.21
 TIME :02:47:07 03:17:46 30.6 (min) Purpose : 3
 LOG : 6749.28 6750.81 1.5 Region : 4054
 FDEPTH: 251 264 Gear cond.: 0
 BDEPTH: 251 264 Validity : 0
 Towing dir: 0° Wire out : 600 m Speed : 3.0 kn
 Sorted : 61 Total catch: 367.77 Catch/hour: 720.18

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Chlorophthalmus atlanticus	209.73	5416	29.12
Synagrops japonicus	193.28	10187	26.84
Merluccius polli	172.72	2820	23.98
Parapenaeus longirostris, femal	50.87	8718	7.06
Parapenaeus longirostris, male	47.11	8883	6.54
MICROPHIDAE	16.10	22688	2.24
Raja leopardus	6.58	12	0.91
Gadella imberbis	6.23	211	0.86
Illex coindetii	4.23	47	0.59
Dibranchius atlanticus	3.52	564	0.49
Pterothrissus belloci	2.94	23	0.41
Trichiurus lepturus	2.47	117	0.34
Monolele microstoma	1.41	35	0.20
Peristedion cataphractum	1.06	235	0.15
Zenopsis conchifer	0.94	12	0.13
Pontinus accraensis	0.47	35	0.07
Lepidotrigla cadmani	0.35	12	0.05
Hemiramphus balao	0.18	2	0.02
Total	720.18	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 152
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°34.45
 start stop duration Lon E 12°56.72
 TIME :10:48:35 11:18:32 29.9 (min) Purpose : 3
 LOG : 6789.77 6791.29 1.5 Region : 4054
 FDEPTH: 28 27 Gear cond.: 0
 BDEPTH: 28 27 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 3.0 kn
 Sorted : 124 Total catch: 5413.73 Catch/hour: 10849.16

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Brachydeuterus auritus	8355.67	64074	77.02
Chloroscombrus chrysurus	1586.57	19441	14.62
Galeoides decadactylus	227.54	2092	2.10
Ephippion guttifer	110.72	88	1.02
Decapterus rhonchus	106.35	2703	0.98
Pagellus bellottii	102.87	611	0.95
Stromateus fiatola	100.26	174	0.92
Pseudotolithus senegalensis	80.20	88	0.74
Raja miraletus	53.19	88	0.49
Selene dorsalis	50.56	872	0.47
Arius parkii	48.82	174	0.45
Pseudupeneus prayensis	12.20	174	0.11
Sphyræna sphyraena	8.72	437	0.08
Rhizoprionodon acutus	4.61	4	0.04
Sardinella maderensis	0.88	174	0.01
Total	10849.16	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 153
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°15.15
 start stop duration Lon E 12°46.51
 TIME :13:38:27 14:09:14 30.8 (min) Purpose : 3
 LOG : 6811.71 6813.20 1.5 Region : 4054
 FDEPTH: 25 28 Gear cond.: 0
 BDEPTH: 25 28 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 2.9 kn
 Sorted : 278 Total catch: 278.03 Catch/hour: 542.14

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 156
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°27.85
 start stop duration Lon E 12°17.11
 TIME :21:04:12 21:34:14 30.0 (min) Purpose : 3
 LOG : 6855.87 6857.37 1.5 Region : 4054
 FDEPTH: 427 438 Gear cond.: 0
 BDEPTH: 427 438 Validity : 0
 Towing dir: 0° Wire out : 1080 m Speed : 3.0 kn
 Sorted : 50 Total catch: 453.24 Catch/hour: 905.27

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pseudupeneus prayensis	138.84	3134	25.61
Pagrus caeruleostictus	100.13	1240	18.47
Balistes punctatus	42.90	51	7.91
Epinephelus aeneus	34.12	8	6.29
Pagellus bellottii	32.95	205	6.08
Pomadasys incisus	29.83	950	5.50
Dentex canariensis	28.37	64	5.23
Lutjanus gorenensis	22.95	4	4.23
Dasyatis margarita	15.99	10	2.95
Aluterus heudelottii	15.83	18	2.92
Dentex barnardi	13.69	341	2.52
Acanthurus monroviae	9.46	12	1.74
Rhinobatos albomaculatus	7.99	4	1.47
Decapterus punctatus	7.10	413	1.31
Ephippion guttifer	6.14	4	1.13
Chaetodon marcellae	5.75	86	1.06
PLATYRHINIDAE	5.67	10	1.05
Torpedo marmorata	4.78	2	0.88
Lutjanus sp.	3.00	90	0.55
Dasyatis margarita	2.98	2	0.55
Fistularia petimba	2.67	14	0.49
Scyllarides herklotsii	2.57	4	0.47
Bodianus speciosus	1.38	2	0.26
Chloroscombrus chrysurus	1.03	12	0.19
Sepia orbignyana	1.01	4	0.19
Sphyræna sphyræna	0.97	2	0.18
Chromis cadenati	0.94	58	0.17
Chilomycterus spinosus mauret.	0.88	2	0.16
Lutjanus fulgens	0.70	86	0.13
Fistularia tabacaria	0.62	4	0.12
Boops boops	0.31	49	0.06
Rypticus saponaceus	0.23	2	0.04
Scorpaena stephanica	0.21	2	0.04
Plectorhinchus mediterraneus	0.10	2	0.02
Total	542.14	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Nematocarcinus africanus	444.01	106957	49.05
Merluccius polli	147.40	557	16.28
Trichiurus lepturus	135.72	10786	14.99
Hymenocephalus italicus	54.65	5249	6.04
Chaunax pictus	28.04	521	3.10
Laemonema laureysi	24.99	449	2.76
Chaceon maritæ, male	20.31	36	2.24
Aristeus varidens, female	11.68	863	1.29
Malacocephalus occidentalis	8.45	54	0.93
Aristeus varidens, male	8.09	665	0.89
Dibranchius atlanticus	6.11	467	0.68
Chaceon maritæ, female	4.49	18	0.50
Plesionika martia	4.13	90	0.46
Galeus polli	3.60	18	0.40
Stereomastis sp.	2.52	306	0.28
Etmopterus polli	0.72	18	0.08
Halosaurus ovenii	0.36	18	0.04
Total	905.27	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 157
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°29.49
 start stop duration Lon E 12°15.44
 TIME :23:15:29 23:46:30 31.0 (min) Purpose : 3
 LOG : 6864.15 6865.61 1.5 Region : 4054
 FDEPTH: 534 533 Gear cond.: 0
 BDEPTH: 534 533 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 2.8 kn
 Sorted : 28 Total catch: 280.88 Catch/hour: 543.29

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Nematocarcinus africanus	266.34	4884	49.02
Yarella blackfordi	59.19	1793	10.89
Triplophos hemingi	52.92	6824	9.74
Merluccius polli	37.23	77	6.85
Lamprogrammus exutus	34.12	139	6.28
Hoplostethus cadenati	28.72	1410	5.29
Stomias boa boa	11.84	313	2.18
Trichiurus lepturus	10.10	331	1.86
Lophius vaillanti	7.85	2	1.45
Stereomastis sp.	6.09	662	1.12
Aristeus varidens, female	4.87	279	0.90
OMASTREPHIDAE	3.31	52	0.61
Laemonema laureysi	3.13	35	0.58
Bathyrcongus vicinus	3.13	348	0.58
Dibranchius atlanticus	2.96	261	0.54
Chaceon maritæ	2.17	6	0.40
Nezumia sp.	1.91	52	0.35
Coloconger sp.	1.57	17	0.29
Aristeus varidens, male	1.39	157	0.26
Scymnodon obscurus	1.16	6	0.21
Xenodermichthys copei	1.04	139	0.19
Gadella imberbis	0.70	17	0.13
Cataetx laticeps	0.70	122	0.13
Malacocephalus occidentalis	0.52	17	0.10
Etmopterus polli	0.31	6	0.06
Total	543.29	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 154
 DATE :03/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°10.03
 start stop duration Lon E 12°24.91
 TIME :15:04:28 15:29:52 25.2 (min) Purpose : 3
 LOG : 6819.06 6820.53 1.5 Region : 4054
 FDEPTH: 43 42 Gear cond.: 0
 BDEPTH: 43 43 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 24 Total catch: 23.70 Catch/hour: 56.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagrus caeruleostictus	22.82	12	40.51
Dentex canariensis	7.73	5	13.71
Sepia orbignyana	7.61	5	13.50
Dactylopterus volitans	3.35	5	5.95
Rhinobatos albomaculatus	3.19	2	5.65
Decapterus rhonchus	2.92	5	5.19
Dentex barnardi	2.47	14	4.39
Balistes punctatus	2.31	2	4.09
Raja miraletus	2.07	2	3.67
Zeus faber	1.00	2	1.77
Fistularia petimba	0.38	5	0.68
Alloteuthis africana	0.26	88	0.46
Trachinotus ovatus	0.24	2	0.42
Total	56.34	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 158
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°33.16
 start stop duration Lon E 12°14.13
 TIME :01:51:10 02:22:59 31.8 (min) Purpose : 3
 LOG : 6873.58 6875.05 1.5 Region : 4054
 FDEPTH: 721 712 Gear cond.: 0
 BDEPTH: 721 712 Validity : 0
 Towing dir: 0° Wire out : 1430 m Speed : 2.8 kn
 Sorted : 33 Total catch: 203.30 Catch/hour: 383.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Yarella blackfordi	81.91	2184	21.37
E C H I N O D E R M A T A	53.51	34	13.96
Nematocarcinus africanus	35.41	7569	9.24
Nezumia aequalis	35.19	826	9.18
Stereomastis sp.	34.96	3179	9.12
Stomias boa boa	32.02	769	8.35
Talismania longifilis	15.39	91	4.01
Triplophos hemingi	14.93	1991	3.90
Dicrolene sp.	11.99	588	3.13
Aristeus varidens, female	11.65	430	3.04
HOLUTHUROIDEA	10.18	23	2.66
Xenodermichthys copei	7.47	339	1.95
OMASTREPHIDAE	6.90	23	1.80
Hoplostethus cadenati	6.45	68	1.68
Trichiurus lepturus	5.54	317	1.45
Chaceon maritæ	3.62	11	0.94
Lamprogrammus exutus	3.39	34	0.89
Dibranchius atlanticus	2.49	136	0.65
Halosaurus ovenii	1.92	34	0.50
Bassanago albescens	1.81	34	0.47
GALATHEIDAE *	1.47	656	0.38
Plesionika martia	1.13	124	0.30
Scymnodon obscurus	0.94	2	0.25
Cataetx laticeps	0.79	57	0.21
RAJIDAE	0.68	11	0.18
Bathypterois phenax	0.45	57	0.12
MYCTOPHIDAE	0.45	23	0.12
Coloconger sp.	0.34	11	0.09
Nemichthys scolopaceus	0.11	11	0.03
Aristeus varidens, male	0.11	11	0.03
Etmopterus pusillus	0.08	2	0.02
Etmopterus polli	0.04	2	0.01
Total	383.34	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 159
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°25.41
 start stop duration Lon E 12°27.44
 TIME :05:18:49 05:48:57 30.1 (min) Purpose : 3
 LOG : 6891.29 6892.74 1.5 Region : 4054
 FDEPTH: 117 116 Gear cond.: 0
 BDEPTH: 117 116 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 2.9 kn
 Sorted : 84 Total catch: 167.64 Catch/hour: 333.83

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 163
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°11.38
 start stop duration Lon E 12°17.98
 TIME :14:00:13 14:30:35 30.4 (min) Purpose : 3
 LOG : 6949.36 6950.85 1.5 Region : 4054
 FDEPTH: 120 120 Gear cond.: 0
 BDEPTH: 120 120 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.0 kn
 Sorted : 46 Total catch: 45.72 Catch/hour: 90.30

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Dentex angolensis	148.95	554	44.62 315
Umbrina canariensis	48.19	159	14.44 314
Trichurus lepturus	44.01	108	13.18
Dentex congoensis	41.82	400	12.53 316
Spicara alta	15.93	474	4.77
Trigla lyra	12.70	108	3.81
Lagocephalus laevigatus	6.09	8	1.83
Trachurus trecae	5.97	147	1.79 317
Raja miraletus	3.35	8	1.00
Pagellus bellottii	1.59	8	0.48
Dentex barnardi	1.27	4	0.38
Zeus faber	1.19	4	0.36
Chaetodon hoefleri	1.04	8	0.31
Citharus linguatula	0.92	20	0.27
Illex coindetii	0.32	16	0.10
Uranoscopus polli	0.28	4	0.08
Monolele microstoma	0.20	12	0.06
Total	333.83		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trichurus lepturus	45.62	229	50.52
Dentex angolensis	12.05	97	13.34 326
Selene dorsalis	7.19	16	7.96
Fistularia petimba	5.92	12	6.56
Chelidonichthys gabonensis	3.30	20	3.65
Illex coindetii	2.65	109	2.93
Brotula barbata	2.57	2	2.84
Saurida brasiliensis	2.33	573	2.58
Zeus faber	1.48	4	1.64
Octopus vulgaris	1.36	2	1.51
Raja miraletus	1.30	2	1.44
Dentex canariensis	0.95	22	1.05 327
Umbrina canariensis	0.91	2	1.01
Pterothrissus belloci	0.79	6	0.87
Citharus linguatula	0.65	16	0.72
Uranoscopus polli	0.49	2	0.55
Spicara alta	0.43	28	0.48
Trachurus trecae	0.16	4	0.17
URCHINS	0.10	8	0.11
Arnoglossus imperialis	0.04	4	0.04
Total	90.30		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 160
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°21.98
 start stop duration Lon E 12°33.14
 TIME :06:59:32 07:29:49 30.3 (min) Purpose : 3
 LOG : 6900.91 6902.51 1.6 Region : 4054
 FDEPTH: 87 87 Gear cond.: 0
 BDEPTH: 87 87 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.2 kn
 Sorted : 101 Total catch: 286.94 Catch/hour: 568.39

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 164
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°15.54
 start stop duration Lon E 12°9.09
 TIME :16:07:16 16:37:27 30.2 (min) Purpose : 3
 LOG : 6961.49 6963.01 1.5 Region : 4054
 FDEPTH: 237 231 Gear cond.: 0
 BDEPTH: 237 231 Validity : 0
 Towing dir: 0° Wire out : 600 m Speed : 3.0 kn
 Sorted : 66 Total catch: 161.19 Catch/hour: 320.35

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Dentex congoensis	269.00	3062	47.33 319
Dentex angolensis	121.19	775	21.32 318
Sepia orbignyana	50.41	83	8.87
Pagellus bellottii	35.77	250	6.29 320
Zeus faber	22.34	71	3.93
Dentex barnardi	16.24	55	2.86 321
Trigla lyra	7.92	67	1.39
Rhinobatos albomaculatus	7.65	6	1.35
Epinephelus aeneus	7.13	2	1.25
Raja miraletus	7.05	12	1.24
Alloteuthis africana	6.16	733	1.08
Chaetodon hoefleri	5.21	34	0.92
Mustelus mustelus	2.99	2	0.53
Pagrus caeruleostictus	2.83	6	0.50
Branchiostegus semifasciatus *	2.65	6	0.47
Chelidonichthys gabonensis	2.34	12	0.41
Trachurus trecae	0.99	12	0.17
Citharus linguatula	0.50	12	0.09
Total	568.39		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Synagrops microlepis	110.22	6908	34.41
Dentex angolensis	59.92	175	18.70 328
Nezumia aequalis	58.81	1799	18.36
Brotula barbata	13.91	14	4.34
Illex coindetii	10.29	147	3.21
Pterothrissus belloci	9.76	85	3.05
Squatina aculeata	9.44	4	2.95
Parapenaeus longirostris	8.45	1570	2.64
MYCTOPHIDAE	7.79	7212	2.43
Bembrrops heterurus	7.02	81	2.19
Saurida brasiliensis	6.36	1298	1.99
Zenopsis conchifer	5.90	40	1.84
Trichurus lepturus	5.41	10	1.69
Torpedo torpedo	3.44	4	1.07
Citharus linguatula	1.17	85	0.37
Pentheroscion mbizi	1.07	4	0.34
Lophius vaillanti	0.72	2	0.22
GOBIIDAE	0.36	18	0.11
Ariomma bondi	0.22	4	0.07
Dicologlossa cuneata	0.10	4	0.03
Total	320.35		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 161
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°5.87
 start stop duration Lon E 12°36.58
 TIME :09:31:00 10:01:11 30.2 (min) Purpose : 3
 LOG : 6920.91 6922.52 1.6 Region : 4054
 FDEPTH: 37 37 Gear cond.: 0
 BDEPTH: 37 37 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn
 Sorted : 86 Total catch: 157.91 Catch/hour: 313.94

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 165
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°20.01
 start stop duration Lon E 12°3.96
 TIME :18:22:58 18:52:58 30.0 (min) Purpose : 3
 LOG : 6972.56 6974.03 1.5 Region : 4054
 FDEPTH: 420 410 Gear cond.: 0
 BDEPTH: 420 410 Validity : 0
 Towing dir: 0° Wire out : 1040 m Speed : 2.9 kn
 Sorted : 49 Total catch: 129.67 Catch/hour: 259.25

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Chloroscombrus chrysurus	240.48	2376	76.60 322
Pagellus bellottii	57.97	439	18.47
Rhinobatos albomaculatus	2.50	2	0.80
Pseudupeneus prayensis	2.05	8	0.65
Sarda sarda	1.89	2	0.60
Balistes capricus	1.89	4	0.60
Xyrichtys novacula	1.61	14	0.51
UNIDENTIFIED FISH	1.61	4	0.51
Pagrus caeruleostictus	1.17	4	0.37
Psettodes belcheri	1.15	4	0.37
Epinephelus aeneus	0.83	2	0.27
Citharichthys stampflii	0.50	4	0.16
Todaropsis eblanae	0.28	4	0.09
Total	313.94		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Merluccius polli	116.96	476	45.11 329
Laemonema laureysi	19.89	506	7.67
Chaunax pictus	14.70	330	5.67
Nematocarcinus africanus	13.56	3273	5.23
Trichurus lepturus	13.00	380	5.01
Stereomastix sp.	11.50	1024	4.43
Aristeus varidensis, female	10.26	2129	3.96
Hymenocephalus italicus	9.40	650	3.62
Squalus megalops	7.40	2	2.85
Malacocephalus occidentalis	6.20	46	2.39
Ommastrephes bartrami	5.70	30	2.20
Dibranchius atlanticus	4.76	566	1.84
Chaceon maritae, male	4.66	10	1.80
Bathophilus longipinnis	3.50	20	1.35
Aristeus varidensis, male	3.26	356	1.26
CONGRIDAE	2.90	66	1.12
Calappa sp.	1.86	36	0.72
Chaceon maritae, female	1.54	8	0.59
E I V A L V E S	1.42	4	0.55
Halosaurus ovenii	1.00	34	0.39
MYCTOPHIDAE	1.00	256	0.39
Lophius vaillanti	0.92	4	0.35
Gadella imberbis	0.86	50	0.33
Yarrella blackfordi	0.86	26	0.33
Gadella maraldi	0.70	36	0.27
Nezumia aequalis	0.56	30	0.22
Illex coindetii	0.56	6	0.22
Etmopterus pusillus	0.36	2	0.14
Total	259.25		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 162
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°6.83
 start stop duration Lon E 12°31.14
 TIME :11:04:19 11:34:51 30.5 (min) Purpose : 3
 LOG : 6928.88 6930.38 1.5 Region : 4054
 FDEPTH: 49 49 Gear cond.: 0
 BDEPTH: 49 49 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 2.9 kn
 Sorted : 107 Total catch: 107.02 Catch/hour: 210.26

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagrus caeruleostictus	82.22	193	39.10 324
Boops boops	33.01	1061	15.70
Dentex canariensis	24.75	49	11.77 325
Decapterus rhonchus	7.80	334	3.71
Rhinobatos albomaculatus	6.29	2	2.99
Fistularia petimba	6.19	37	2.94
Pseudupeneus prayensis	6.13	149	2.92
Raja miraletus	3.34	12	1.59
Lagocephalus laevigatus	2.99	2	1.42
Sepia orbignyana	2.89	6	1.37
Epinephelus aeneus	2.73	14	1.37
Chaetodon hoefleri	2.69	16	1.28
Cephalopholis taeniops	2.48	6	1.18
Zeus faber	2.40	2	1.14
Dentex barnardi	2.28	10	1.08
Mustelus mustelus	2.16	2	1.03
Aluterus heudelotii	2.12	2	1.01
Citharus linguatula	2.00	10	0.95
Octopus vulgaris	1.87	2	0.89
Scorpaena stephanica	1.85	14	0.88
Rypticus saponaceus	1.83	16	0.87
Bodianus speciosus	1.65	2	0.78
Chilomycterus spinosus mauret.	1.55	6	0.74
Chelidonichthys capensis	1.34	6	0.64
SERRANIDAE	1.26	86	0.60
Dactylopterus volitans	1.04	2	0.50
Pagellus bellottii	1.00	6	0.48
Chloroscombrus chrysurus	0.88	8	0.42
Sardinella aurita	0.65	41	0.31 323
Chaetodon marcellae	0.45	6	0.21
Chromis cadaneti	0.26	20	0.12
Bothus podas africanus	0.18	2	0.08
Total	210.26		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 166
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°21.46
 start stop duration Lon E 12°17.76
 TIME :20:32:40 21:02:56 30.3 (min) Purpose : 3
 LOG : 6981.17 6982.67 1.5 Region : 4054
 FDEPTH: 522 533 Gear cond.: 0
 BDEPTH: 522 533 Validity : 0
 Towing dir: 0° Wire out : 1150 m Speed : 3.0 kn
 Sorted : 56 Total catch: 291.55 Catch/hour: 577.90

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 169
 DATE :05/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°1.20
 start stop duration Lon E 12°6.25
 TIME :05:17:30 05:47:06 29.6 (min) Purpose : 3
 LOG : 7023.15 7024.50 1.4 Region : 4054
 FDEPTH: 112 110 Gear cond.: 0
 BDEPTH: 112 110 Validity : 0
 Towing dir: 0° Wire out : 275 m Speed : 2.7 kn
 Sorted : 88 Total catch: 88.40 Catch/hour: 179.19

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Merluccius polli	188.36 355	32.59	330
Nematocarcinus africanus	149.34 32634	25.84	
Yarellia blackfordi	58.37 1782	10.10	
Triplophos hemingi	51.71 7098	8.95	
Gonostoma denudata	47.77 1114	8.27	
Stereomastis sp.	14.05 874	2.43	
Aristeus varidens, female	7.08 1187	1.22	
Laemonema laureysi	6.76 63	1.17	
Gadella imberbis	6.66 323	1.15	
Malacocephalus laevis	6.66 32	1.15	
Aristeus varidens, male	5.41 646	0.94	
Lamprogrammus exutus	5.31 42	0.92	
Etmopterus pusillus	4.48 32	0.78	
Ommastrephes pteropus	4.26 22	0.74	
Hoplostethus cadenati	3.43 147	0.59	
Plesionika martia	2.81 32	0.49	
Halosaurus ovenii	2.72 73	0.47	
Chaceon maritae, female	2.50 10	0.43	
Dibranchius atlanticus	2.40 323	0.42	
Callinectes sp.	2.30 32	0.40	
Chaunax pictus	1.76 22	0.31	
Caelorinchus coelorhincus	1.76 22	0.31	
Xenodermichthys copei	0.93 42	0.16	
Trichiurus lepturus	0.73 22	0.13	
Nezumia aequalis	0.32 22	0.05	
Total	577.90	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	70.36 584	39.26	332
Dentex congoensis	49.66 744	27.71	333
Trigla lyra	42.16 347	23.53	
Trachurus trecae	4.76 152	2.66	334
Citharus linguatula	3.57 47	1.99	
Zeus faber	1.89 6	1.05	
Illex coindetii	1.82 77	1.02	
Cynoponticus ferox	1.20 2	0.67	
Squatina oculata	1.07 2	0.60	
Fistularia petimba	0.85 2	0.48	
Torpedo marmorata	0.57 2	0.32	
Sepia orbignyana	0.47 6	0.26	
Dicologlossa hexophthalma	0.41 4	0.23	
Peristedion cataphractum	0.41 16	0.23	
Total	179.19	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 170
 DATE :05/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°57.33
 start stop duration Lon E 12°11.08
 TIME :06:58:16 07:28:07 29.9 (min) Purpose : 3
 LOG : 7032.51 7034.10 1.6 Region : 4054
 FDEPTH: 87 86 Gear cond.: 0
 BDEPTH: 87 86 Validity : 0
 Towing dir: 0° Wire out : 225 m Speed : 3.2 kn
 Sorted : 83 Total catch: 83.35 Catch/hour: 167.48

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pagellus bellottii	65.00 303	38.81	336
Dentex angolensis	24.41 175	14.58	335
Dentex congoensis	17.78 334	10.62	338
Dentex barnardi	13.46 46	8.04	337
Raja miraletus	9.24 16	5.52	
Pagrus caeruleostictus	7.64 18	4.56	
Squatina oculata	5.45 4	3.25	
Chelidichthys gabonensis	5.18 32	3.10	
Dentex gibbosus	3.92 8	2.34	
Zeus faber	3.48 12	2.08	
Sepia officinalis hierredra	2.71 6	1.62	
Rhinobatos albomaculatus	2.23 2	1.33	
Chaetodon hoefleri	1.81 12	1.08	
Pseudupeneus prayensis	1.61 16	0.96	
Fistularia petimba	1.19 4	0.71	
Mustelus mustelus	1.06 2	0.64	
Citharus linguatula	0.52 6	0.31	
Scorpaena stephanica	0.42 2	0.25	
Illex coindetii	0.36 12	0.22	
Total	167.48	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 167
 DATE :04/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°10.81
 start stop duration Lon E 11°51.99
 TIME :23:33:00 00:03:11 30.2 (min) Purpose : 3
 LOG : 6996.05 6997.43 1.4 Region : 4054
 FDEPTH: 625 632 Gear cond.: 0
 BDEPTH: 625 632 Validity : 0
 Towing dir: 0° Wire out : 1330 m Speed : 2.7 kn
 Sorted : 33 Total catch: 236.88 Catch/hour: 470.62

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	179.40 8330	38.12	
Triplophos hemingi	63.00 8817	13.39	
Nematocarcinus africanus	41.72 13434	8.87	
Lamprogrammus exutus	41.30 83	8.78	
Yarellia blackfordi	32.26 709	6.86	
Stomias boa boa	29.48 723	6.26	
Xenodermichthys copei	21.00 1266	4.46	
Stereomastis sp.	9.87 848	2.10	
Raja confundens	7.37 28	1.57	
Malacocephalus laevis	7.23 28	1.54	
Opisthotheutis rossi	7.09 14	1.51	
Lophius vomerinus	6.02 4	1.28	
Chaceon maritae	4.95 12	1.05	
Etmopterus pusillus	2.98 12	0.63	
Bassanago albescens	2.78 42	0.59	
Trichiurus lepturus	2.50 111	0.53	
Aristeus varidens, female	2.50 97	0.53	
Dicrolene sp.	1.95 153	0.41	
Halosaurus ovenii	1.53 14	0.33	
Callinectes sp.	0.83 14	0.18	
Dibranchius atlanticus	0.83 83	0.18	
Heterocarpus grimaldii	0.70 28	0.15	
Etmopterus polli	0.60 10	0.13	
Coloconger sp.	0.56 14	0.12	
Nezumia sp.	0.56 14	0.12	
MYCTOPHIDAE	0.42 14	0.09	
Parasudis fraser-bruenneri	0.42 14	0.09	
Melanocetus johnsoni	0.42 14	0.09	
Scymnodon obscurus	0.20 2	0.04	
Aristeus varidens, male	0.14 14	0.03	
Total	470.62	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 171
 DATE :05/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°56.64
 start stop duration Lon E 12°13.60
 TIME :08:13:50 08:43:51 30.0 (min) Purpose : 3
 LOG : 7037.47 7038.94 1.5 Region : 4054
 FDEPTH: 81 80 Gear cond.: 0
 BDEPTH: 81 80 Validity : 0
 Towing dir: 0° Wire out : 210 m Speed : 2.9 kn
 Sorted : 60 Total catch: 191.15 Catch/hour: 382.30

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	123.90 574	32.41	
Pagellus bellottii	106.80 630	27.94	
Dentex congoensis	70.50 824	18.44	
Dentex barnardi	20.70 90	5.41	339
Epinephelus aeneus	20.50 8	5.36	
Torpedo torpedo	14.04 24	3.67	
Chaetodon hoefleri	7.86 42	2.06	
Priacanthus arenatus	7.86 8	2.06	
Pagrus caeruleostictus	4.80 8	1.26	
Alloteuthis africana	3.42 1514	0.89	
Zeus faber	1.92 6	0.50	
Total	382.30	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 168
 DATE :05/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°6.21
 start stop duration Lon E 11°56.63
 TIME :01:58:37 02:28:45 30.1 (min) Purpose : 3
 LOG : 7006.89 7008.26 1.4 Region : 4054
 FDEPTH: 315 320 Gear cond.: 0
 BDEPTH: 315 320 Validity : 0
 Towing dir: 0° Wire out : 700 m Speed : 2.7 kn
 Sorted : 62 Total catch: 185.82 Catch/hour: 370.04

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	141.59 3184	38.26	
Merluccius polli	106.94 1107	28.90	331
Hymenocephalus italicus	15.53 2294	4.20	
Pontinus accraensis	14.28 185	3.86	
Malacocephalus occidentalis	14.10 179	3.81	
Parapanaeus longirostris, female	11.89 1523	3.21	
Synagrops microlepis	10.10 472	2.73	
Laemonema laureysi	9.62 251	2.60	
MYCTOPHIDAE	9.38 12695	2.53	
Trichiurus lepturus	7.89 263	2.13	
GALATHEIDAE *	7.53 968	2.03	
Gadella imberbis	5.74 185	1.55	
Caelorinchus coelorhincus	3.11 84	0.84	
Bathyroconger vicinus	2.81 18	0.76	
Parapanaeus longirostris, male	1.91 287	0.52	
Small shrimps	1.43 520	0.39	
Lophius vomerinus	1.37 24	0.37	
Chascanopsetta lugubris	1.25 24	0.34	
Callinectes sp.	1.14 12	0.31	
Pterothrissus belloci	0.78 6	0.21	
Stereomastis sp.	0.42 48	0.11	
Dibranchius atlanticus	0.42 36	0.11	
Peristedion cataphractum	0.36 30	0.10	
Illex coindetii	0.24 6	0.06	
Solenocera africana	0.18 24	0.05	
Parasudis fraser-bruenneri	0.06 12	0.02	
Total	370.04	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 172
 DATE :06/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°1.47
 start stop duration Lon E 12°3.60
 TIME :11:25:20 11:55:56 30.6 (min) Purpose : 3
 LOG : 7074.54 7076.10 1.6 Region : 4054
 FDEPTH: 118 120 Gear cond.: 0
 BDEPTH: 118 120 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.1 kn
 Sorted : 101 Total catch: 207.39 Catch/hour: 406.51

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex congoensis	163.87 2411	40.31	341
Dentex angolensis	100.36 627	24.69	340
Chelidichthys gabonensis	62.72 514	15.43	
Trachurus trecae	54.10 957	13.31	342
Brotula barbata	6.25 6	1.54	
Pterothrissus belloci	5.49 31	1.35	
Raja miraletus	3.90 6	0.96	
Scipara alta	3.37 333	0.83	
Citharus linguatula	1.72 27	0.42	
Uranoscopus polli	1.45 4	0.36	
Pagellus bellottii	1.22 4	0.30	
Trichiurus lepturus	0.88 2	0.22	
Fistularia petimba	0.82 2	0.20	
Illex coindetii	0.20 16	0.05	
Sepia orbignyana	0.12 4	0.03	
Arnoglossus imperialis	0.04 4	0.01	
Total	406.51	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 173
 DATE :06/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°4.97
 start stop duration Lon E 12°0.54
 TIME :13:02:25 13:33:16 30.9 (min) Purpose : 3
 LOG : 7081.97 7083.57 1.6 Region : 4054
 FDEPTH: 153 150 Gear cond.: 0
 BDEPTH: 153 150 Validity : 0
 Towing dir: 0° Wire out : 380 m Speed : 3.1 kn
 Sorted : 57 Total catch: 56.99 Catch/hour: 110.84

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 176
 DATE :06/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°54.88
 start stop duration Lon E 11°43.52
 TIME :20:33:30 20:58:40 24.8 (min) Purpose : 3
 LOG : 7117.24 7118.48 1.2 Region : 4054
 FDEPTH: 519 504 Gear cond.: 0
 BDEPTH: 519 504 Validity : 0
 Towing dir: 0° Wire out : 1220 m Speed : 3.0 kn
 Sorted : 62 Total catch: 62.08 Catch/hour: 150.01

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dentex angolensis	44.25	161	39.92
Trichurus lepturus	17.60	27	15.88
Brotula barbata	16.92	19	15.27
Mustelus mustelus	8.07	2	7.28
Illex coindetii	5.66	268	5.11
Chelidonichthys gabonensis	4.14	43	3.74
Saurida brasiliensis	3.75	819	3.39
Trachurus trecae	2.24	25	2.02
Citharus linguatula	1.89	35	1.70
Sepia orbignyana	1.63	16	1.47
Raja miraletus	1.24	2	1.12
Zenopsis conchifer	1.17	4	1.05
Dentex congoensis	0.64	8	0.58
Peristedion cataphractum	0.41	8	0.37
Spicara alta	0.35	6	0.32
Ariomma bondi	0.31	6	0.28
Bembrops heterurus	0.29	4	0.26
Pterothrissus belloci	0.23	2	0.21
Parapenaeus longirostris	0.04	16	0.04
Total	110.84		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Lamprogrammus exutus	33.71	70	22.47
Merluccius polli	18.73	36	12.48
Halosaurus ovenii	14.28	46	9.52
Aristeus varidens, female	11.48	532	7.65
Stereomastis sp.	11.33	681	7.55
Laemonema laureysi	8.07	459	5.38
Malacocephalus laevis	7.37	31	4.91
Lophius vaillanti	7.32	5	4.88
Yarella blackfordi	5.82	167	3.88
Aristeus varidens, male	4.86	256	3.24
Nematocarcinus africanus	4.62	1269	3.08
Chaceon maritae, male	4.40	12	2.93
Etmopterus pusillus	3.70	29	2.46
Hoplostethus cadenati	3.67	87	2.45
Chaunax pictus	2.42	34	1.61
Nezumia aequalis	1.98	46	1.32
Gonostoma denudata	1.64	34	1.10
Calappa sp.	1.28	27	0.85
Chaceon maritae, female	1.09	5	0.72
Trichurus lepturus	0.63	5	0.42
Todarodes sagittatus	0.60	2	0.40
MYCTOPHIDAE	0.31	319	0.21
Munidopsis sp.	0.29	230	0.19
Xenodermichthys copei	0.22	10	0.14
Gadella maraldi	0.12	5	0.08
Dasyatis sp.	0.05	5	0.03
Dibranchius atlanticus	0.02	2	0.02
Total	150.01		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 174
 DATE :06/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 7°5.22
 start stop duration Lon E 11°57.00
 TIME :14:34:51 15:07:09 32.3 (min) Purpose : 3
 LOG : 7087.90 7089.42 1.5 Region : 4054
 FDEPTH: 268 262 Gear cond.: 0
 BDEPTH: 268 262 Validity : 0
 Towing dir: 0° Wire out : 650 m Speed : 2.8 kn
 Sorted : 156 Total catch: 524.23 Catch/hour: 973.50

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 177
 DATE :06/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°53.97
 start stop duration Lon E 11°45.19
 TIME :22:22:53 22:53:15 30.4 (min) Purpose : 3
 LOG : 7122.74 7124.20 1.5 Region : 4054
 FDEPTH: 441 449 Gear cond.: 0
 BDEPTH: 441 449 Validity : 0
 Towing dir: 0° Wire out : 1050 m Speed : 2.9 kn
 Sorted : 57 Total catch: 216.35 Catch/hour: 427.43

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Synagrops japonicus	552.05	33123	56.71
Merluccius polli	125.39	2082	12.88
Alloteuthis africana	53.48	22368	5.49
Dentex angolensis	36.95	89	3.80
Chlorophthalmus atlanticus	34.76	2217	3.57
Parapenaeus longirostris, male	33.04	3913	3.39
Parapenaeus longirostris, femal	27.82	3736	2.86
Ariomma bondi	26.98	791	2.77
Todaropsis eblanae	19.80	362	2.03
Squatina oculata	10.96	2	1.13
Bembrops heterurus	10.58	583	1.09
Trichurus lepturus	7.24	11	0.74
Brotula barbata	6.48	6	0.67
Pterothrissus belloci	5.76	54	0.59
Scorpaena normani	5.40	65	0.56
Nezumia aequalis	4.94	137	0.51
Torpedo torpedo	4.81	6	0.49
MYCTOPHIDAE	3.92	2550	0.40
Uranoscopus polli	1.37	6	0.14
Peristedion cataphractum	0.65	19	0.07
Zenopsis conchifer	0.65	19	0.07
Bathyrhynchus vicinus	0.30	6	0.03
Dibranchius atlanticus	0.11	19	0.01
Drepane africana	0.06	6	0.01
Total	973.50		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Merluccius polli	137.21	433	32.10
Carcharhinus falciformis	72.11	2	16.87
Laemonema laureysi	26.97	741	6.31
Trichurus lepturus	21.16	575	4.95
Chaunax pictus	18.97	332	4.44
Aristeus varidens, female	18.14	1363	4.24
Hymenocephalus italicus	17.13	1991	4.01
Stereomastis sp.	16.06	1458	3.76
Yarella blackfordi	13.28	403	3.11
Small shrimps	10.96	2128	2.57
OMMASTREPHIDAE	10.61	95	2.48
Dicrolene sp.	10.55	717	2.47
Centrophorus granulosus	8.20	2	1.92
Gadella imberbis	6.93	207	1.62
Lamprogrammus exutus	4.39	18	1.03
Aristeus varidens, male	3.91	456	0.92
Coloconger sp.	3.91	95	0.92
Malacocephalus occidentalis	3.14	24	0.73
Triplophos hemingi	3.02	474	0.71
Dibranchius atlanticus	2.96	255	0.69
Halosaurus ovenii	2.67	142	0.62
Etmopterus polli	2.41	83	0.56
Chaceon maritae	2.17	12	0.51
Coloconger cadenati	1.84	6	0.43
Caelorinchus coelorrhincus	1.72	89	0.40
Galeus polli	1.58	36	0.37
Nezumia aequalis	1.13	53	0.26
Gonostoma denudata	1.01	36	0.24
Etmopterus pusillus	0.69	4	0.16
Callinectes sp.	0.65	12	0.15
Deania profundorum	0.53	6	0.12
Hoplostethus cadenati	0.47	6	0.11
Plesiopenaeus edwardsianus	0.36	6	0.08
Chlorophthalmus atlanticus	0.30	6	0.07
Nessorhynchus ingolfianus	0.30	12	0.07
Total	427.43		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 175
 DATE :06/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°57.95
 start stop duration Lon E 11°40.26
 TIME :18:17:29 18:47:14 29.8 (min) Purpose : 3
 LOG : 7108.51 7109.93 1.4 Region : 4054
 FDEPTH: 727 730 Gear cond.: 0
 BDEPTH: 727 730 Validity : 0
 Towing dir: 0° Wire out : 1530 m Speed : 2.9 kn
 Sorted : 44 Total catch: 202.53 Catch/hour: 408.46

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 178
 DATE :07/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°50.92
 start stop duration Lon E 11°49.68
 TIME :00:23:15 00:55:33 32.3 (min) Purpose : 3
 LOG : 7131.27 7132.82 1.6 Region : 4054
 FDEPTH: 272 270 Gear cond.: 0
 BDEPTH: 272 270 Validity : 0
 Towing dir: 0° Wire out : 620 m Speed : 2.9 kn
 Sorted : 29 Total catch: 89.25 Catch/hour: 165.74

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Hoplostethus atlanticus	245.51	8350	60.10
Nezumia aequalis	53.73	1016	13.15
Stereomastis sp.	21.52	1970	5.27
Yarella blackfordi *	12.52	1089	3.07
Todarodes sagittatus	12.26	73	3.00
Etmopterus polli	8.57	93	2.10
Nematocarcinus africanus	7.72	526	1.89
Lamprogrammus exutus	7.26	18	1.78
Synphobranchius kaupii	7.26	36	1.78
Chaceon maritae, male	6.17	10	1.51
Gonostoma denudata	3.91	83	0.96
Xenodermichthys copei	3.73	91	0.91
Talismania longifilis	3.01	91	0.74
Merluccius polli	2.52	4	0.62
Etmopterus pusillus	2.12	8	0.52
Chaceon maritae, female	2.00	10	0.49
Scorpaena normani	1.55	18	0.38
CONGRIDAE	1.45	36	0.36
Hymenocephalus italicus	1.27	83	0.31
Aristeus varidens	1.09	54	0.27
Dibranchius atlanticus	1.01	28	0.25
Yarella blackfordi *	0.83	119	0.20
Halosaurus ovenii	0.73	10	0.18
Dasyatis sp.	0.73	18	0.18
Total	408.46		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Synagrops microlepis	85.52	3772	51.60
Chlorophthalmus atlanticus	27.02	758	16.30
Parasudis fraser-bruenneri	10.36	240	6.25
Merluccius polli	8.08	156	4.87
Munidopsis sp.	6.30	563	3.80
Pontinus accraensis	5.68	72	3.43
Brotula barbata	5.18	4	3.13
Bembrops heterurus	3.73	84	2.25
Peristedion cataphractum	1.95	212	1.18
Nezumia aequalis	1.89	45	1.14
Parapenaeus longirostris, femal	1.62	206	0.97
Trichurus lepturus	1.28	50	0.77
Dibranchius atlanticus	1.23	128	0.74
Laemonema laureysi	1.23	17	0.74
Chascanopsetta lugubris	1.11	22	0.67
Stereomastis sp.	1.11	95	0.67
Gadella imberbis	0.72	22	0.44
Dentex angolensis	0.72	4	0.44
MYCTOPHIDAE	0.50	334	0.30
Parapenaeus longirostris, male	0.17	28	0.10
Solenocera africana	0.11	22	0.07
BOTHIDAE	0.11	6	0.07
Monolele microstoma	0.11	6	0.07
Total	165.74		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 179
 DATE :07/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°51.89
 start stop duration Lon E 11°52.37
 TIME :05:26:46 05:56:49 30.1 (min) Purpose : 3
 LOG : 7141.60 7142.98 1.4 Region : 4054
 FDEPTH: 182 198 Gear cond.: 0
 BDEPTH: 182 198 Validity : 0
 Towing dir: 0° Wire out : 465 m Speed : 2.8 kn
 Sorted : 61 Total catch: 224.15 Catch/hour: 447.41

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 183
 DATE :07/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°30.06
 start stop duration Lon E 11°52.86
 TIME :12:53:57 13:24:25 30.5 (min) Purpose : 3
 LOG : 7181.23 7182.68 1.5 Region : 4054
 FDEPTH: 115 116 Gear cond.: 0
 BDEPTH: 115 116 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 2.9 kn
 Sorted : 68 Total catch: 68.13 Catch/hour: 134.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	330.90	16984	73.96	
Illex coindetii	19.00	461	4.25	
Trichiurus lepturus	17.37	138	3.88	
Zenopsis conchifer	16.75	26	3.74	
Brotula barbata	16.57	18	3.70	
Dentex angolensis	12.77	60	2.86	350
Bembrops heterurus	5.45	66	1.22	
Zeus faber	5.33	14	1.19	
Squalus megalops	3.69	2	0.83	
Saurida brasiliensis	3.25	922	0.73	
Pentheroscion mbizi	2.99	20	0.67	
Ariomma bondi	2.99	162	0.67	
Spicara alta	2.14	14	0.48	
Squatina oculata	1.76	6	0.39	
Umbrina canariensis	1.76	6	0.39	
Parapenaeus longirostris	1.70	291	0.38	
Pterothrissus belloci	0.98	6	0.22	
Trigla lyra	0.52	6	0.12	
Citharus linguatula	0.40	14	0.09	
MYCTOPHIDAE	0.32	170	0.07	
CONGRIDAE	0.32	20	0.07	
Microchirus boscanion	0.26	6	0.06	
Peristedion cataphractum	0.20	6	0.04	
Total	447.41		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	95.44	197	71.11	
Brachydeuterus auritus	16.55	106	12.33	358
Dentex angolensis	5.02	20	3.74	360
Saurida brasiliensis	4.73	1099	3.52	
Pagellus bellottii	2.95	22	2.20	359
Zeus faber	1.87	6	1.39	
Torpedo torpedo	1.87	2	1.39	
Trachurus trecae	1.48	49	1.10	361
Raja miraletus	0.98	2	0.73	
Illex coindetii	0.79	30	0.59	
Chelidonichthys gabonensis	0.79	6	0.59	
Citharus linguatula	0.69	18	0.51	
Pterothrissus belloci	0.59	4	0.44	
Dentex congoensis	0.30	8	0.22	
Parapenaeus longirostris	0.10	30	0.07	
Boops boops	0.04	2	0.03	
Arnoglossus imperialis	0.02	2	0.01	
Total	134.20		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 180
 DATE :07/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°47.36
 start stop duration Lon E 11°52.68
 TIME :07:01:51 07:33:27 31.6 (min) Purpose : 3
 LOG : 7147.47 7149.01 1.5 Region : 4054
 FDEPTH: 141 154 Gear cond.: 0
 BDEPTH: 141 154 Validity : 0
 Towing dir: 0° Wire out : 370 m Speed : 2.9 kn
 Sorted : 58 Total catch: 127.39 Catch/hour: 241.80

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 184
 DATE :07/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°30.36
 start stop duration Lon E 11°48.64
 TIME :14:25:35 14:55:56 30.4 (min) Purpose : 3
 LOG : 7187.87 7189.30 1.4 Region : 4054
 FDEPTH: 124 125 Gear cond.: 0
 BDEPTH: 124 125 Validity : 0
 Towing dir: 0° Wire out : 315 m Speed : 2.8 kn
 Sorted : 37 Total catch: 37.49 Catch/hour: 74.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	196.65	12349	81.33	
Illex coindetii	11.09	353	4.58	
Dentex angolensis	10.91	47	4.51	351
Pterothrissus belloci	6.49	46	2.68	
Trichiurus lepturus	4.08	21	1.69	
Brotula barbata	3.55	4	1.47	
Trigla lyra	2.81	38	1.16	
Saurida brasiliensis	1.48	273	0.61	
Citharus linguatula	1.37	30	0.57	
Squatina oculata	1.23	4	0.51	
Zenopsis conchifer	1.01	4	0.42	
Parapenaeus longirostris	0.80	72	0.33	
Trachurus trecae	0.27	4	0.11	
Dentex congoensis	0.08	4	0.03	
Total	241.80		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	28.57	87	38.54	
Dentex angolensis	16.90	73	22.81	362
Trachurus trecae	8.60	172	11.60	364
Squatina oculata	5.34	2	7.20	
Dentex congoensis	4.15	53	5.60	363
Saurida brasiliensis	3.26	826	4.40	
Spicara alta	2.08	40	2.80	
Illex coindetii	1.58	77	2.13	
Selene dorsalis	1.58	6	2.13	
Zeus faber	0.79	2	1.07	
Ariomma bondi	0.49	8	0.67	
Chelidonichthys gabonensis	0.49	4	0.67	
Pterothrissus belloci	0.20	2	0.27	
Citharus linguatula	0.06	2	0.08	
Parapenaeus longirostris	0.02	6	0.03	
Total	74.12		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 181
 DATE :07/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°45.91
 start stop duration Lon E 11°54.88
 TIME :08:26:31 08:50:42 24.2 (min) Purpose : 3
 LOG : 7152.90 7154.21 1.3 Region : 4054
 FDEPTH: 115 111 Gear cond.: 0
 BDEPTH: 115 111 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.3 kn
 Sorted : 152 Total catch: 152.26 Catch/hour: 377.66

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 185
 DATE :07/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°35.01
 start stop duration Lon E 11°42.21
 TIME :16:49:55 17:20:05 30.2 (min) Purpose : 3
 LOG : 7200.22 7201.79 1.6 Region : 4054
 FDEPTH: 236 228 Gear cond.: 0
 BDEPTH: 236 228 Validity : 0
 Towing dir: 0° Wire out : 580 m Speed : 3.1 kn
 Sorted : 94 Total catch: 94.00 Catch/hour: 187.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	117.69	243	31.16	352
Brachydeuterus auritus	61.51	352	16.29	353
Selene dorsalis	48.00	117	12.71	
Trichiurus lepturus	42.17	69	11.17	
Trachurus trecae	34.11	747	9.03	354
Dentex congoensis	28.40	203	7.52	355
Dentex angolensis	19.59	55	5.19	356
Zeus faber	5.70	12	1.51	
Mustelus mustelus	5.18	2	1.37	
Ephippion guttifer	4.07	2	1.08	
Saurida brasiliensis	3.10	789	0.82	
Raja miraletus	2.60	5	0.69	
Fistularia petimba	2.08	5	0.55	
Dentex barnardi	1.14	2	0.30	
Illex coindetii	0.89	22	0.24	
Spicara alta	0.64	27	0.17	
Trigla lyra	0.40	2	0.11	
Boops boops	0.37	7	0.10	
Total	377.66		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	87.23	4661	46.65	
Dentex angolensis	33.52	97	17.93	365
Brotula barbata	24.07	24	12.87	
Trichiurus lepturus	18.10	281	9.68	
Parapenaeus longirostris, femal	7.44	2809	3.98	
Parapenaeus longirostris, male	5.59	2087	2.99	
Pterothrissus belloci	3.18	36	1.70	
Todaropsis eblanae	1.49	36	0.80	
Todarodes sagittatus	0.99	4	0.53	
Scorpaena normani	0.99	8	0.53	
Chlorophthalmus atlanticus	0.90	109	0.48	
GOBIIDAE	0.80	109	0.43	
MYCTOPHIDAE	0.70	376	0.37	
Ariomma bondi	0.50	16	0.27	
Peristedion cataphractum	0.50	10	0.27	
Zenopsis conchifer	0.40	6	0.21	
Uranoscopus polli	0.20	2	0.11	
Nezumia aequalis	0.20	6	0.11	
Merluccius polli	0.10	2	0.05	
Gadella maraldi	0.06	2	0.03	
CONGRIDAE	0.04	2	0.02	
Total	187.00		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 182
 DATE :07/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°48.36
 start stop duration Lon E 12°0.60
 TIME :09:53:03 10:23:02 30.0 (min) Purpose : 3
 LOG : 7161.07 7162.42 1.4 Region : 4054
 FDEPTH: 91 89 Gear cond.: 0
 BDEPTH: 91 89 Validity : 0
 Towing dir: 0° Wire out : 225 m Speed : 2.7 kn
 Sorted : 16 Total catch: 16.15 Catch/hour: 32.31

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 186
 DATE :07/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°34.54
 start stop duration Lon E 11°38.01
 TIME :19:07:48 19:37:51 30.1 (min) Purpose : 3
 LOG : 7210.14 7211.57 1.4 Region : 4054
 FDEPTH: 331 351 Gear cond.: 0
 BDEPTH: 331 351 Validity : 0
 Towing dir: 0° Wire out : 865 m Speed : 2.9 kn
 Sorted : 44 Total catch: 107.49 Catch/hour: 214.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chelidonichthys gabonensis	15.31	68	47.37	
Ephippion guttifer	8.80	8	27.24	
Pagellus bellottii	7.30	66	22.60	357
Selene dorsalis	0.70	2	2.17	
Dentex congoensis	0.20	2	0.62	
Total	32.31		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	41.52	2922	19.35	
Miracoarvina angolensis	24.95	10	11.63	
Laemonema laureysi	24.55	683	11.44	
Malacocephalus laevis	23.05	192	10.75	
Parapenaeus longirostris, femal	21.56	2138	10.05	
Hymenocephalus italicus	18.26	377	8.51	
Trichiurus lepturus	16.17	1916	7.54	
Merluccius polli	12.77	50	5.95	366
Munidopsis sp.	11.68	1401	5.44	
Dibranchius atlanticus	3.59	473	1.67	
Hoplostethus mediterraneus	2.30	2	1.07	
MYCTOPHIDAE	1.50	1120	0.70	
Ariomma bondi	1.50	30	0.70	
Bembrops heterurus	1.50	281	0.70	
Chascanopsetta lugubris	1.50	30	0.70	
Gadella maraldi	1.26	48	0.59	
Todarodes sagittatus	1.20	6	0.56	
Lophius vaillanti	0.90	12	0.42	
Nezumia aequalis	0.90	48	0.42	
Bathynectes piperitus	0.90	8	0.42	
Dasyatis sp.	0.90	12	0.42	
Grammoplites gruvelli	0.66	28	0.31	
Peristedion cataphractum	0.60	18	0.28	
Chaceon maritae, female	0.50	2	0.23	
Gadella imberbis	0.24	6	0.11	
Chaunax pictus	0.12	12	0.06	
Total	214.55		100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 187
 DATE :07/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°37.29
 start stop duration Lon E 11°27.42
 TIME :22:04:12 22:33:41 29.5 (min) Purpose : 3
 LOG : 7224.57 7226.01 1.4 Region : 4054
 FDEPTH: 660 657 Gear cond.: 0
 BDEPTH: 660 657 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 2.9 kn
 Sorted : 57 Total catch: 431.46 Catch/hour: 877.84

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 190
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°27.85
 start stop duration Lon E 11°58.54
 TIME :07:02:05 07:32:32 30.4 (min) Purpose : 3
 LOG : 7275.71 7277.26 1.6 Region : 4054
 FDEPTH: 97 95 Gear cond.: 0
 BDEPTH: 97 95 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.1 kn
 Sorted : 95 Total catch: 94.95 Catch/hour: 187.16

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	499.76 11780	56.93	
Nematocarcinus africanus	90.03 28810	10.26	
Lamprogrammus exutus	86.98 244	9.91	
Xenodermichthys copei	68.67 2885	7.82	
Triplophos hemingi	35.10 4395	4.00	
Malacocephalus occidentalis	22.14 488	2.52	
Dicrolene intronigra	19.84 962	2.26	
Stereomastis sp.	15.26 946	1.74	
Yarella blackfordi	10.68 260	1.22	
Bathyrcongus vicinus	6.10 77	0.70	
Merluccius polli	5.80 6	0.66	
Aristeus varidens, female	3.05 108	0.35	
Paramola cuvieri	2.34 2	0.27	
Halosaurus ovenii	2.30 31	0.26	
Plesiopterus edwardsianus	2.30 109	0.26	
Gonostoma denudata	1.53 31	0.17	
Dibranchius atlanticus	1.53 321	0.17	
Deania profundorum	1.22 2	0.14	
Etmopterus pusillus	1.22 4	0.14	
Coloconger sp.	1.08 16	0.12	
Glyphus marsupialis	0.77 47	0.09	
MYCTOPHIDAE	0.16 153	0.02	
Total	877.84	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	66.92 637	35.76	372
Trichiurus lepturus	63.96 258	34.18	
Trachurus trecae	16.26 554	8.69	375
Dentex congoensis	11.53 91	6.16	373
Selene dorsalis	6.50 22	3.48	
Dentex angolensis	5.81 20	3.11	374
Umbrina canariensis	3.94 20	2.11	
Saurida brasiliensis	3.15 775	1.69	
Epinephelus aeneus	2.46 2	1.32	
Stromateus fiatola	2.37 2	1.26	
Raja miraletus	1.58 2	0.84	
Pterothrissus belloci	0.79 4	0.42	
Pagellus bellottii	0.59 4	0.32	
Citharus linguatula	0.59 14	0.32	
Chaetodon hoeffleri	0.30 2	0.16	
Boops boops	0.30 20	0.16	
Todaropsis eblanae	0.10 2	0.05	
Total	187.16	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 188
 DATE :08/04/2008 GEAR TYPE: BT NO: 22 POSITION:Lat S 6°38.31
 start stop duration Lon E 11°24.16
 TIME :00:19:36 00:49:07 29.5 (min) Purpose : 3
 LOG : 7231.82 7233.20 1.4 Region : 4054
 FDEPTH: 720 724 Gear cond.: 0
 BDEPTH: 720 724 Validity : 0
 Towing dir: 0° Wire out : 1460 m Speed : 2.8 kn
 Sorted : 64 Total catch: 332.70 Catch/hour: 676.22

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 191
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°24.79
 start stop duration Lon E 12°1.39
 TIME :08:23:22 08:53:05 29.7 (min) Purpose : 3
 LOG : 7281.58 7283.14 1.6 Region : 4054
 FDEPTH: 80 80 Gear cond.: 0
 BDEPTH: 80 80 Validity : 0
 Towing dir: 0° Wire out : 215 m Speed : 3.1 kn
 Sorted : 80 Total catch: 266.18 Catch/hour: 537.38

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
HOLUTHUROIDEA	343.50 305	50.80	
Nezumia micronychodon	80.28 1778	11.87	
Hoplostethus cadenati	31.50 224	4.66	
Trachyrincus scabrus	28.96 122	4.28	
Yarella blackfordi	26.93 671	3.98	
Stereomastis sp.	21.34 1209	3.16	
Bassanago albescens	17.28 102	2.55	
Halosaurus ovenii	15.24 346	2.25	
Triplophos hemingi	14.23 1443	2.10	
Dicrolene sp.	11.18 722	1.65	
Shrimps, small, non comm.	11.18 2510	1.65	
Lophius vomerinus	9.45 6	1.40	
Anemones, white	8.13 51	1.20	
OMMASTREPHIDAE	7.11 41	1.05	
Xenodermichthys copei	6.10 163	0.90	
Coryphaenoides macrolophus	5.59 10	0.83	
Etmopterus pusillus	4.88 16	0.72	
Aristeus varidens, female	4.07 142	0.60	
GALATHEIDAE *	4.07 1870	0.60	
Coloconger sp.	4.07 30	0.60	
Talismania longifilis	3.56 41	0.53	
Glyphus marsupialis	3.05 102	0.45	
Cruriraja parcomaculata	3.05 51	0.45	
Chaceon maritae	2.74 6	0.41	
Deania profundorum	2.64 4	0.39	
Starfish	2.54 142	0.38	
Lithodes ferox	1.12 2	0.17	
Dibranchius atlanticus	1.02 71	0.15	
Aristeus varidens, male	1.02 61	0.15	
Heterocarpus grimaldii	0.41 10	0.06	
Total	676.22	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	279.51 2566	52.01	376
Trichiurus lepturus	162.07 438	30.16	
Trachurus trecae	58.73 1080	10.93	377
Stromateus fiatola	7.77 14	1.45	
Dentex barnardi	7.23 14	1.34	
Selene dorsalis	5.25 20	0.98	
Raja miraletus	4.60 6	0.86	
Pseudopeneus prayensis	3.29 6	0.61	
Umbrina canariensis	2.95 14	0.55	
Saurida brasiliensis	1.31 204	0.24	
Epinephelus aeneus	1.11 2	0.21	
Dentex angolensis	0.99 6	0.18	
Priacanthus arenatus	0.91 2	0.17	
Dentex congoensis	0.67 6	0.12	
Pagellus bellottii	0.67 6	0.12	
Boops boops	0.32 20	0.06	
Total	537.38	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 189
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°26.66
 start stop duration Lon E 11°54.17
 TIME :05:24:33 05:54:10 29.6 (min) Purpose : 3
 LOG : 7267.80 7269.26 1.5 Region : 4054
 FDEPTH: 109 110 Gear cond.: 0
 BDEPTH: 109 110 Validity : 0
 Towing dir: 0° Wire out : 275 m Speed : 3.0 kn
 Sorted : 132 Total catch: 132.00 Catch/hour: 267.48

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 192
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°25.51
 start stop duration Lon E 12°5.64
 TIME :09:41:44 10:11:34 29.8 (min) Purpose : 3
 LOG : 7288.06 7289.62 1.6 Region : 4054
 FDEPTH: 53 55 Gear cond.: 0
 BDEPTH: 53 55 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.1 kn
 Sorted : 61 Total catch: 60.71 Catch/hour: 122.07

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	71.73 521	26.82	368
Umbrina canariensis	61.60 154	23.03	367
Dentex angolensis	37.89 154	14.17	369
Trichiurus lepturus	34.55 81	12.92	
Leptocharias smithii	12.56 4	4.70	
Selene dorsalis	10.84 47	4.05	
Trachurus trecae	10.44 255	3.90	371
Pterothrissus belloci	9.02 61	3.37	
Citharus linguatula	5.17 103	1.93	
Dentex congoensis	4.76 59	1.78	
Saurida brasiliensis	2.43 462	0.91	370
Uranoscopus polli	1.32 8	0.49	
Raja miraletus	1.32 2	0.49	
Zeus faber	0.71 2	0.27	
Todaropsis eblanae	0.61 10	0.23	
Peristedion cataphractum	0.61 6	0.23	
Sardinella aurita	0.51 2	0.19	
Pentheroscion mbizi	0.51 4	0.19	
Boops boops	0.41 22	0.15	
Parapeneus longirostris	0.30 47	0.11	
Bembrops heterurus	0.20 2	0.08	
Total	267.48	100.00	

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Lagocephalus laevigatus	70.88 70	58.06	
Selene dorsalis	12.97 22	10.62	
Pagellus bellottii	12.47 99	10.21	378
Epinephelus aeneus	9.25 4	7.58	
Trichiurus lepturus	5.73 16	4.69	
Balistes caprisicus	2.51 4	2.06	
Seriola carpenteri	2.31 8	1.89	
Raja miraletus	1.61 2	1.32	
Pagrus caeruleostictus	1.31 4	1.07	
Brachydeuterus auritus	0.70 8	0.58	
Alloteuthis africana	0.70 338	0.58	
Trachurus trecae	0.70 10	0.58	
Chelidonichthys gabonensis	0.50 2	0.41	
Dentex rhonchus	0.40 8	0.33	
Pseudopeneus prayensis	0.02 2	0.02	
Total	122.07	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 193
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°16.03
 start stop duration Lon E 12°7.03
 TIME :11:26:26 11:57:29 31.1 (min) Purpose : 3
 LOG : 7298.50 7300.12 1.6 Region : 4054
 FDEPTH: 40 40 Gear cond.: 0
 BDEPTH: 40 40 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 52 Total catch: 51.56 Catch/hour: 99.63

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Galeoides decadactylus	16.43 62	16.49	
Pseudotolithus senegalensis	15.85 17	15.90	379
Sphyraena guachancho	14.88 35	14.93	
Rhizoprionodon acutus	12.75 4	12.80	
Stromateus fiatola	9.47 8	9.50	
Trichiurus lepturus	9.08 15	9.12	
Selene dorsalis	5.02 14	5.04	
Elops lacerta	2.71 6	2.72	
Arius parkii	2.22 2	2.23	
Alectis alexandrinus	2.03 2	2.04	
Brachydeuterus auritus	1.93 27	1.94	380
Albula vulpes	1.74 4	1.75	
Pomadourus jubelini	1.64 2	1.65	
Pagellus bellottii	1.45 12	1.45	381
Caranx hippos	1.06 2	1.07	
Alloteuthis africana	0.48 259	0.48	
Uranoscopus polli	0.39 2	0.39	
Raja miraletus	0.39 2	0.39	
Trachurus trecae	0.10 2	0.10	
Sardinella aurita	0.02 4	0.02	
Total	99.63	100.00	

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 194
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°5.30
 start stop duration Lon E 12°7.89
 TIME :13:22:41 13:52:55 30.2 (min) Purpose : 3
 LOG : 7309.99 7311.63 1.6 Region : 4054
 FDEPTH: 31 37 Gear cond.: 0
 BDEPTH: 31 37 Validity : 0
 Towing dir: 0° Wire out : 115 m Speed : 3.3 kn
 Sorted : 91 Total catch: 91.30 Catch/hour: 181.15

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 198
 DATE :09/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°9.63
 start stop duration Lon E 11°43.36
 TIME :12:45:18 13:18:40 33.4 (min) Purpose : 3
 LOG : 7469.62 7471.24 1.6 Region : 4054
 FDEPTH: 107 107 Gear cond.: 0
 BDEPTH: 107 107 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 2.9 kn
 Sorted : 116 Total catch: 116.00 Catch/hour: 208.57

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Selene dorsalis	39.58	280	21.85
Brachydeuterus auritus	26.79	1692	14.79
Rhizoprionodon acutus	25.60	2	14.13
Ilisha africana	23.31	502	12.87
Albula vulpes	18.45	40	10.19
Galeoides decadactylus	16.17	73	8.93
Pseudolithus senegalensis	13.69	32	7.56
Sphyræna guachancho	4.96	26	2.74
Pomadasy jubelini	3.57	2	1.97
Pteroscion peli	3.08	42	1.70
Epinephelus aeneus	1.59	2	0.88
Ethmalosa fimbriata	1.09	14	0.60
Stromateus fiatola	0.89	2	0.49
Trichurus lepturus	0.89	10	0.49
Pomadasy incisus	0.69	2	0.38
Alloteuthis africana	0.60	91	0.33
Penæus notialis	0.20	6	0.11
Total	181.15		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichurus lepturus	181.42	236	86.98
Dentex angolensis	9.53	49	4.57
Dentex congolensis	5.57	72	2.67
Epinephelus aeneus	4.05	2	1.94
Umbrina canariensis	2.61	7	1.25
Zeus faber	2.16	4	1.03
Todaropsis eblanae	1.80	88	0.86
Trachurus trecae	0.45	5	0.22
Pterothrissus belloci	0.36	2	0.17
Ariomma bondi	0.27	5	0.13
Chelidichthys gabonensis	0.18	2	0.09
Spicara alta	0.18	2	0.09
Total	208.57		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 195
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°6.48
 start stop duration Lon E 12°2.00
 TIME :14:46:30 15:12:26 25.9 (min) Purpose : 3
 LOG : 7316.38 7317.71 1.3 Region : 4054
 FDEPTH: 44 50 Gear cond.: 0
 BDEPTH: 44 50 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.1 kn
 Sorted : 104 Total catch: 103.90 Catch/hour: 240.42

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 199
 DATE :09/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°8.29
 start stop duration Lon E 11°48.07
 TIME :14:23:00 14:53:05 30.1 (min) Purpose : 3
 LOG : 7477.79 7479.31 1.5 Region : 4054
 FDEPTH: 91 91 Gear cond.: 0
 BDEPTH: 91 91 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
 Sorted : 30 Total catch: 30.48 Catch/hour: 60.80

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Selene dorsalis	178.06	861	74.06
Selar crumenophthalmus	32.63	97	13.57
Sphyræna guachancho	7.29	12	3.03
Albula vulpes	5.21	12	2.17
Epinephelus aeneus	3.93	5	1.64
Alectis alexandrinus	3.36	2	1.40
Pagellus bellottii	2.08	7	0.87
Arius parkii	1.97	2	0.82
Elops lacerta	1.85	2	0.77
Pagrus caeruleostictus	1.27	2	0.53
Dentex barnardi	0.93	2	0.38
Lagocephalus laevigatus	0.69	2	0.29
Chelidichthys capensis	0.69	2	0.29
Fistularia petimba	0.23	2	0.10
Ethmalosa fimbriata	0.23	5	0.10
Total	240.42		100.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	18.75	70	30.84
Trichurus lepturus	14.36	24	23.62
Epinephelus aeneus	11.47	2	18.86
Dentex congolensis	8.38	88	13.78
Umbrina canariensis	2.59	8	4.27
Lagocephalus laevigatus	1.60	2	2.62
Pagrus caeruleostictus	0.90	2	1.48
Todaropsis eblanae	0.80	44	1.31
Raja miraletus	0.80	2	1.31
Chelidichthys capensis	0.60	2	0.98
Trachurus trecae	0.40	6	0.66
Spicara alta	0.10	2	0.16
Saurida brasiliensis	0.04	8	0.07
Parapandalus narval	0.02	8	0.03
Total	60.80		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 196
 DATE :08/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°7.76
 start stop duration Lon E 11°56.67
 TIME :16:01:28 16:31:50 30.4 (min) Purpose : 3
 LOG : 7322.14 7323.65 1.5 Region : 4054
 FDEPTH: 70 73 Gear cond.: 0
 BDEPTH: 70 73 Validity : 0
 Towing dir: 0° Wire out : 180 m Speed : 3.0 kn
 Sorted : 144 Total catch: 144.25 Catch/hour: 285.17

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Selene dorsalis	97.96	569	34.35
Trichurus lepturus	93.41	180	32.76
Lepidochelys olivacea	59.31	2	20.80
Sphyræna guachancho	9.49	10	3.33
Selar crumenophthalmus	9.29	28	3.26
Scomberomorus tritor	5.34	2	1.87
Epinephelus aeneus	3.16	2	1.11
Pomadasy incisus	1.78	6	0.62
Brachydeuterus auritus	1.68	79	0.59
Umbrina canariensis	1.29	4	0.45
Chloroscombrus chrysurus	0.99	6	0.35
Dentex angolensis	0.79	4	0.28
Fistularia petimba	0.59	2	0.21
Pseudupeneus prayensis	0.10	2	0.03
Total	285.17		100.00

R/V "DR. FRIDTJOF NANSEN" SURVEY:2008402 STATION: 197
 DATE :09/04/2008 GEAR TYPE: BT NO: 19 POSITION:Lat S 6°11.59
 start stop duration Lon E 11°38.07
 TIME :11:10:16 11:40:18 30.0 (min) Purpose : 3
 LOG : 7461.79 7463.25 1.5 Region : 4054
 FDEPTH: 121 119 Gear cond.: 0
 BDEPTH: 121 119 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 2.9 kn
 Sorted : 114 Total catch: 113.71 Catch/hour: 227.12

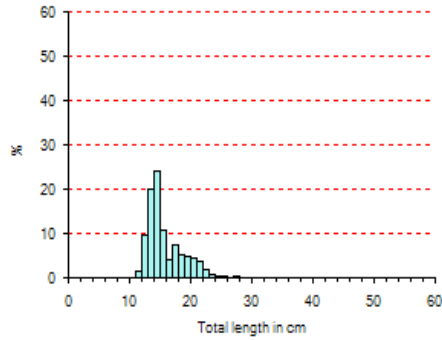
SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex congolensis	90.18	1166	39.71
Dentex angolensis	44.74	256	19.70
Umbrina canariensis	40.05	144	17.63
Spicara alta	13.28	110	5.85
Trachurus trecae	12.68	148	5.58
Trichurus lepturus	9.89	20	4.35
Miracorvina angolensis	5.49	14	2.42
Dentex gibbosus	2.80	4	1.23
Todaropsis eblanae	2.60	108	1.14
Zeus faber	2.50	4	1.10
Ariomma bondi	1.00	24	0.44
Sphoeroides pachgaster	1.00	2	0.44
Chelidichthys gabonensis	0.40	4	0.18
Chaetodon hoeferli	0.30	2	0.13
Boops boops	0.20	4	0.09
Parapandalus narval	0.02	14	0.01
Total	227.12		100.00

ANNEX II. Length distribution of main species.

Southern Angola

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

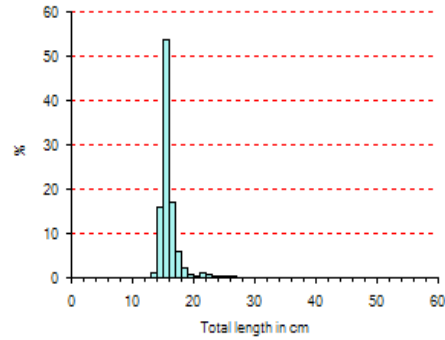
Dentex macrophthalmus



Mean length = 15.84

N = 526

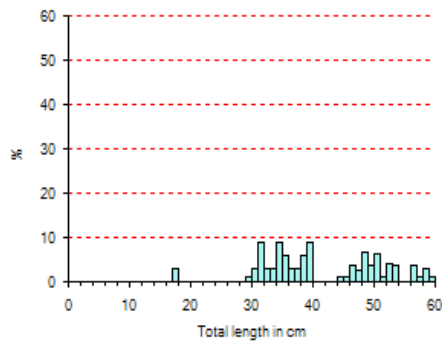
Trachurus capensis



Mean length = 15.97

N = 491

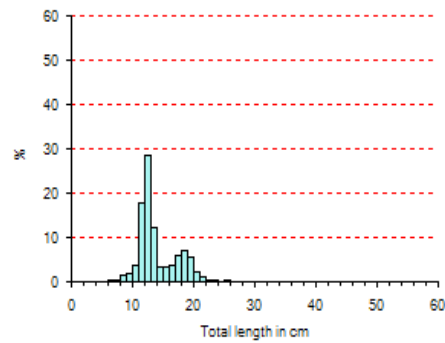
Merluccius capensis



Mean length = 41.49

N = 57

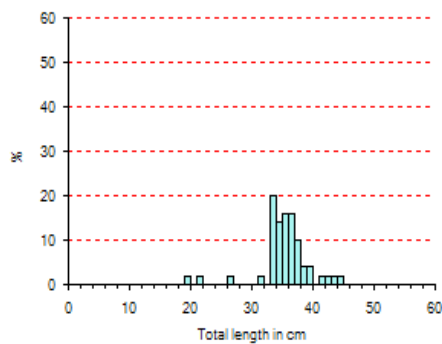
Trachurus trecae



Mean length = 14.08

N = 2690

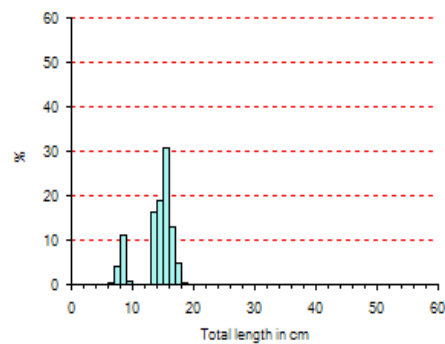
Merluccius polli



Mean length = 35.34

N = 50

Pagellus bellottii

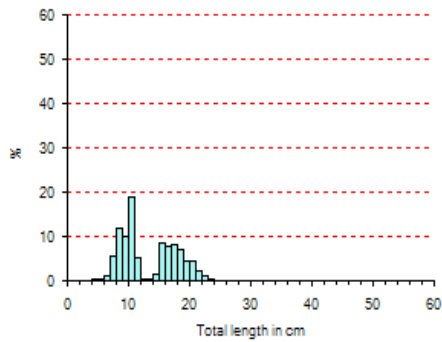


Mean length = 14.03

N = 166

Central Angola

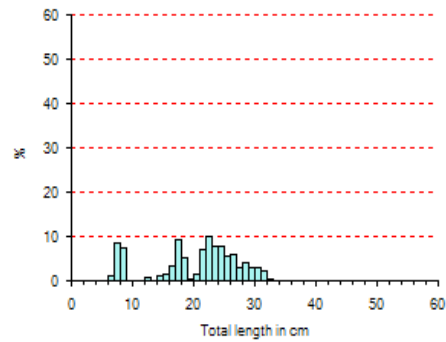
Brachydeuterus auritus



Mean length = 13.39

N = 1444

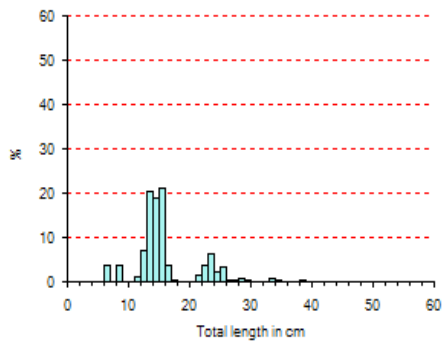
Dentex angolensis



Mean length = 20.65

N = 400

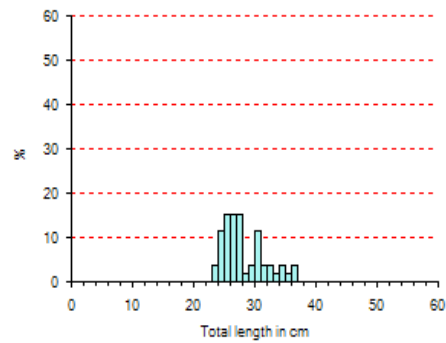
Dentex barnardi



Mean length = 15.99

N = 71

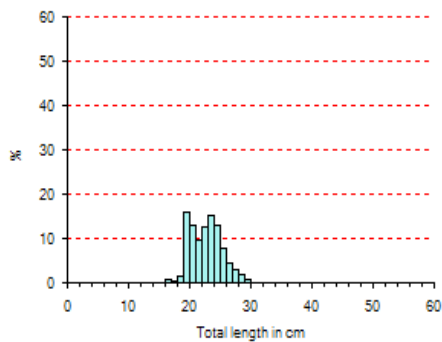
Dentex canariensis



Mean length = 29.97

N = 53

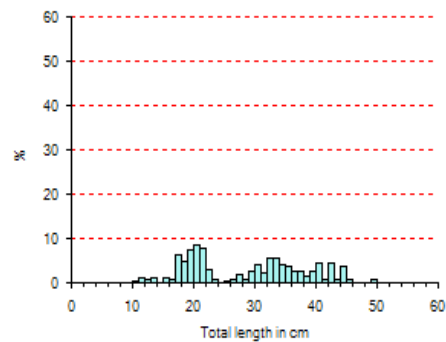
Dentex macrophthalmus



Mean length = 22.71

N = 216

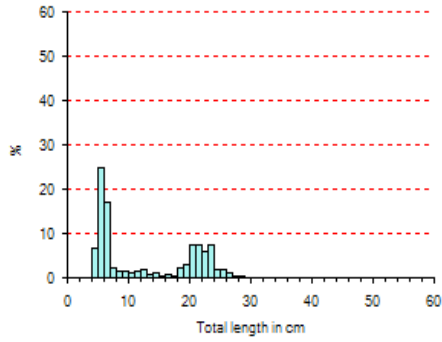
Merluccius polli



Mean length = 28.84

N = 267

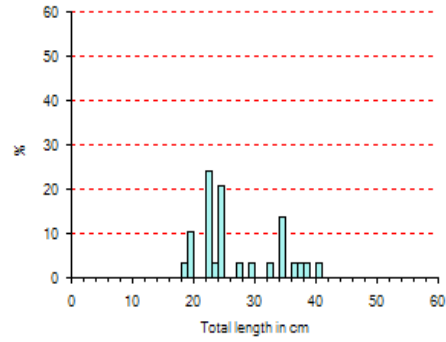
Pagellus bellottii



Mean length = 12.78

N = 864

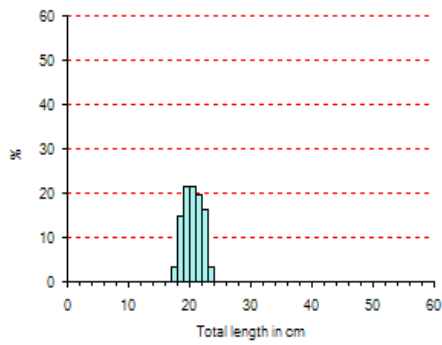
Pagrus caeruleostictus



Mean length = 27.09

N = 29

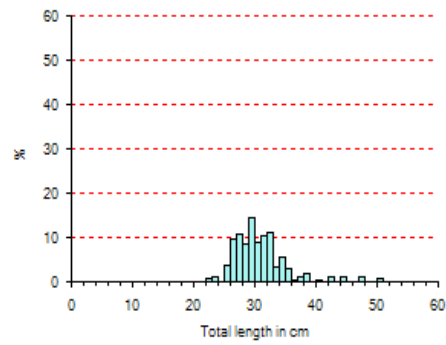
Pomadasys incisus



Mean length = 20.52

N = 61

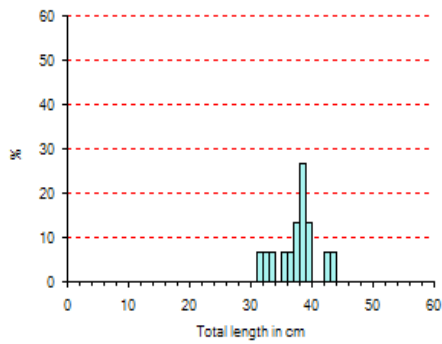
Pseudolithus senegalensis



Mean length = 30.90

N = 117

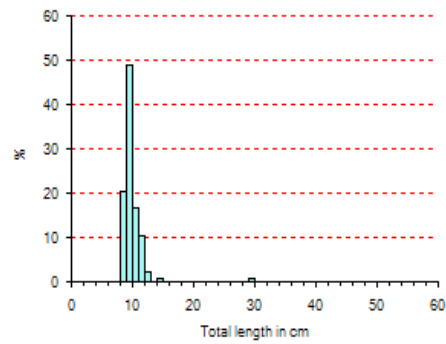
Pseudolithus typus



Mean length = 37.57

N = 15

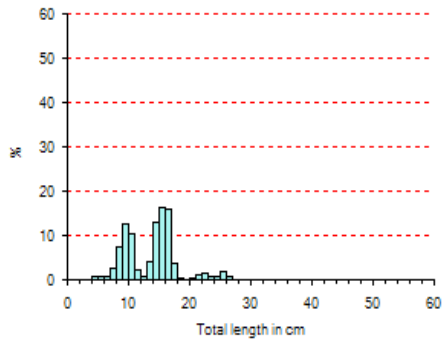
Sardinella maderensis



Mean length = 9.93

N = 153

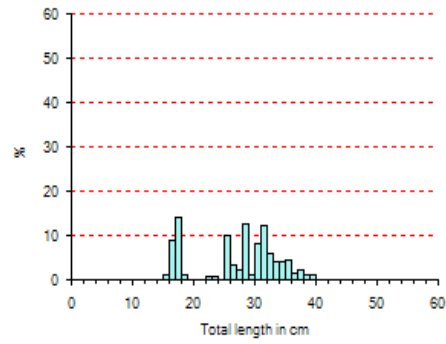
Trachurus trecae



Mean length = 13.92

N = 1853

Umbrina canariensis

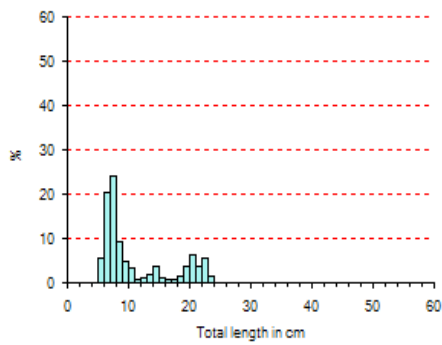


Mean length = 27.31

N = 91

Northern Angola

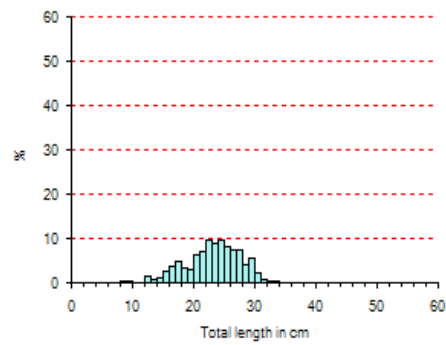
Brachydeuterus auritus



Mean length = 11.22

N = 1611

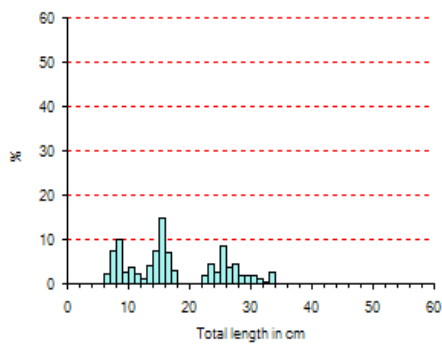
Dentex angolensis



Mean length = 23.15

N = 1437

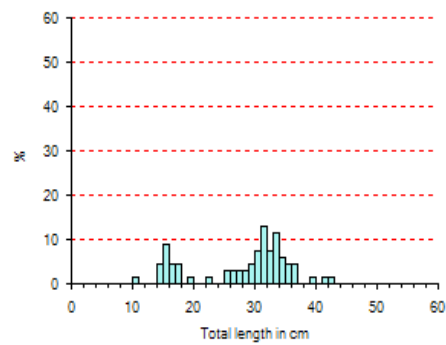
Dentex barnardi



Mean length = 17.41

N = 119

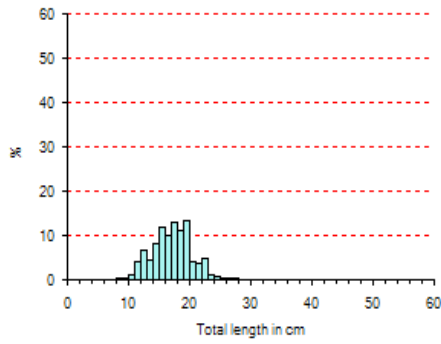
Dentex canariensis



Mean length = 28.09

N = 69

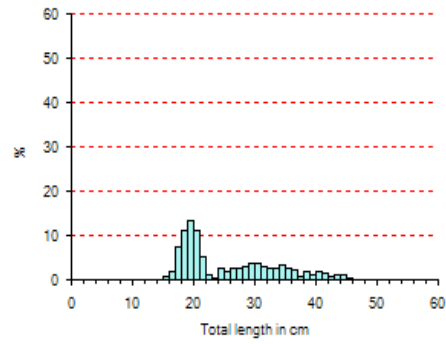
Dentex congensis



Mean length = 17.09

N = 999

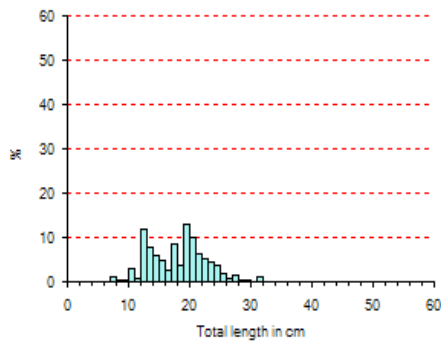
Merluccius polli



Mean length = 25.91

N = 627

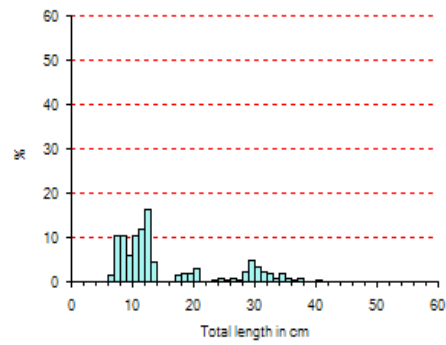
Pagellus bellottii



Mean length = 18.15

N = 643

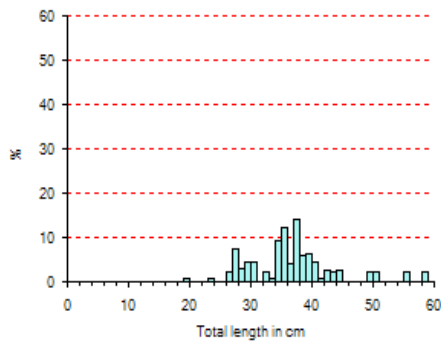
Pagrus caeruleostictus



Mean length = 15.52

N = 107

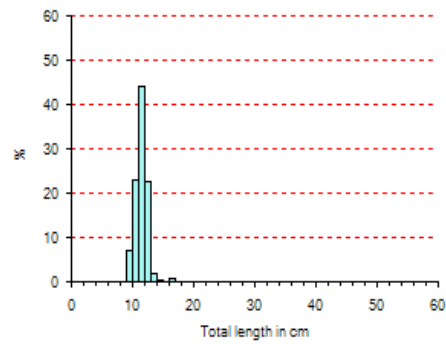
Pseudolithus senegalensis



Mean length = 36.90

N = 92

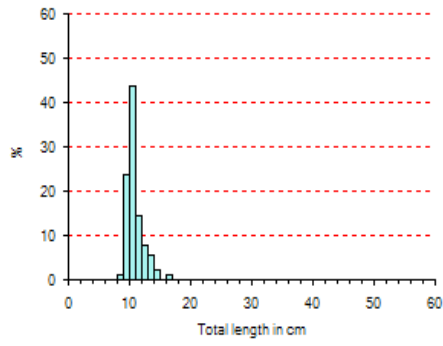
Sardinella aurita



Mean length = 11.46

N = 170

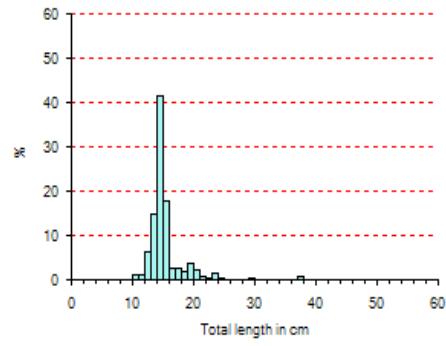
Sardinella maderensis



Mean length = 10.87

N = 89

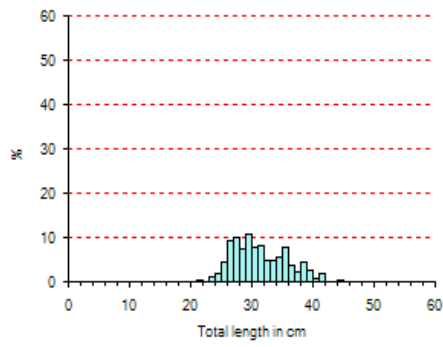
Trachurus trecae



Mean length = 15.36

N = 1565

Umbrina canariensis



Mean length = 31.35

N = 478

ANNEX III. Swept area estimates

SWEPT AREA ANALYSIS
A. Luanda - Congo River. Shelf

SPECIES NAME SAMPLE DISTRIB. BY CATCH CLASSES

SPECIES NAME	Lower limits, Kg/mm					density t/nm ²	% inci- dens. 0-20m	Mean 20-50m	Mean densities by bottom depth strata t/nm ²		
	>0	10	30	100	300				1000	50-100m	100-200m
Brachydeuterus auritus		11	5	9	1	52.63	10.133		22.459	10.632	0.267
Trichiurus lepturus		20	13	11		78.95	2.046		0.707	2.216	2.905
Chloroscombus chrysurus		8	1	1	2	22.81	1.668		5.821	0.097	0.001
Galeoides decadactylus		6	2	7	2	29.82	1.199		3.707	0.452	
Dentex angolensis		20	9	6		61.4	0.895			0.731	1.735
Decapterus rhonchus		6		1		14.04	0.856		0.24	2.246	
Dentex congoensis		18	4	4		45.61	0.68			1.141	0.759
Synagrops microlepis		1		2	2	7.02	0.669				1.817
Umbrina canariensis		13	7	2	1	40.35	0.598			0.145	1.485
Pagellus bellottii	21	6	4			54.39	0.531	0.46	1.106	0.037	
Pteroscion peli	4	1		1		12.28	0.479	1.7		0.006	
Stromateus fiatola		8	2	2		22.81	0.451		1.264	0.275	
Pseudotolithus senegalensis		8	3		1	21.05	0.409		1.396	0.05	
Trachurus trecae	25	7	1			57.89	0.352	0.01	0.672	0.308	
Selene dorsalis	19	4	2			43.86	0.341	0.754	0.262	0.102	
Ilisha africana	2	2	2			10.53	0.294	1.047			
Raja miraletus	31	2				57.89	0.228	0.375	0.315	0.033	
Pseudotolithus typus				2		3.51	0.206		0.733		
Pomadasyx jubelini		7	3	1		19.3	0.202		0.414	0.246	
Pagrus caeruleostictus		11	1	1		22.81	0.138		0.437	0.041	0.002
Spicara alta	15		1			28.07	0.116		0.001	0.315	
Pseudupeneus prayensis		13		1		24.56	0.112		0.349	0.039	
Epinephelus aeneus		18	2			35.09	0.111		0.115	0.219	0.007
Brotula barbata	13	1				24.56	0.104		0.032	0.252	
MYCTOPHIDAE		1		1		3.51	0.102				0.276
Zeus faber	30					52.63	0.101	0.007	0.143	0.131	
Ephippion guttifer		6		1		12.28	0.094		0.308	0.016	0.006
Zenopsis conchifer		5		1		10.53	0.092				0.25
Dentex barnardi	22					38.6	0.082	0.041	0.179	0.021	
Pomadasyx incisus		8	2			17.54	0.079		0.088	0.156	
Sphyræna guachancho		14	1			26.32	0.079		0.214	0.054	
Chelidonichthys gabonensis		18	1			33.33	0.071			0.063	0.133
Sepia orbignyana	18	1				33.33	0.062	0.04	0.139	0.007	
Torpedo torpedo	13					22.81	0.062	0.05	0.128	0.009	
Trigla lyra	10	1				19.3	0.062	0.01	0.041	0.122	
Alloteuthis africana		17				29.82	0.057		0.028	0.14	
Penaeus notialis	8	1				15.79	0.052	0.185	0.001		
Alectis alexandrinus		9				15.79	0.052		0.148	0.029	
Lagocephalus laevigatus		9	1			17.54	0.052		0.014	0.125	0.01
Sepia officinalis hierredda		6				10.53	0.051		0.107	0.061	
Citharus linguatula		32				56.14	0.046		0.024	0.038	0.07
Saurida brasiliensis		22				38.6	0.043		0.118	0.051	0.068
Dasyatis margarita		3	1			7.02	0.043		0.118	0.027	
Rhizoprionodon acutus		6				10.53	0.042		0.135	0.013	
Conger conger		1				1.75	0.042	0.148			
Arius parkii	4	1				8.77	0.041	0.147			
Pterothrissus belloci		17				29.82	0.039			0.007	0.099
Illex coindetii	19					33.33	0.038		0.003	0.101	
Sardinella aurita	7	1				14.04	0.037	0.127	0.002	0.001	
Dentex canariensis		4				7.02	0.036		0.128		0.002
Lepidochelys olivacea			1			1.75	0.035			0.099	
Fistularia petimba		16				28.07	0.029		0.02	0.048	0.016
Balistes punctatus		1	1			3.51	0.027		0.096		
Dasyatis marmorata		2	1			5.26	0.027		0.087	0.007	
Drepane africana	3					0.026		0.092			
Scomberomorus tritor		4				7.02	0.024		0.076	0.009	
Selar crumenophthalmus		1	1			3.51	0.024		0.066	0.016	
Sardinella maderensis		9				15.79	0.023		0.081	0.001	
Mustelus mustelus		7				12.28	0.022		0.005	0.012	0.045
Dicologlossa cuneata		5				8.77	0.021		0.074		0.001
Rhinobatos albomaculatus		7				12.28	0.02		0.041	0.024	
Uranoscopus polli		10				17.54	0.019		0.001		0.051
Chaetodon hoefleri		15				26.32	0.017		0.006	0.031	0.012
Pentanemus quinquarius		1				1.75	0.015		0.053		
Torpedo marmorata		3				5.26	0.015		0.051		0.001
Atractoscion aequidens		3				5.26	0.015			0.035	0.007
Albula vulpes	3					5.26	0.014	0.05			

Lutjanus gorensis	1		1.75	0.014		0.049				
Lithognathus mormyrus	2		3.51	0.013		0.011	0.03			
Dasyatis centroura	1		1.75	0.013		0.045				
Squatina oculata	6	10.53		0.012		0.016	0.016			
Miracorvina angolensis	5		8.77	0.011			0.008	0.022		
Aluterus heudelotii	2		3.51	0.011		0.039				
Panulirus regius	2	3.51		0.01	0.037					
Grammoplites grueveli	10		17.54	0.01		0.012	0.007	0.012		
Parapenaeus longirostris	8		14.04	0.006				0.015		
Parapandalus narval	3		5.26	0.004				0.01		
Aristeus varidens, male	1		1.75	0.002				0.006		
Parapenaeus longirostris, femal	2		3.51	0.002			0.001	0.004		
Aristeus varidens, female	1		1.75					0.001		
Parapenaeus longirostris, male	2		3.51					0.001		
Other fish			0.192	0	0.265	0.146	0.18			
Sum all species			25.052	0	45.311	22.826	11.736			
Sum SNAPPERS, JOBFISHES				0.016		0.057				
Sum GROUPERS, SEABASSES				0.114		0.122	0.219	0.007		
Sum GRUNTS, SWEETLIPS				10.415		22.961	11.034	0.267		
Sum CROAKERS, DRUMS, WEAKF., KOBES					1.73		3.829	0.265	1.526	
Sum PANDORAS, PORGIES, SEABREAMS,					2.38		1.076	3.234	2.561	
Sum SHARKS, CHIMAERAS				0.09		0.14	0.042	0.097		
Sum BATOID FISHES, RAYS				0.418		0.806	0.501	0.043		
Sum CEPHALOPODS				0.224		0.18	0.347	0.14		
Numbers of stations included in analysis, total and by depth strata						57	0	16	20	21

SWEPT AREA ANALYSIS
B. Luanda - Congo River. Slope

SPECIES NAME SAMPLE DISTRIB. BY CATCH CLASSES

SPECIES NAME	Lower limits, Kg/mm					Mean	% inci- dens.	Mean densities by bottom depth strata t/nm ²				
	>0	10	30	100	300			1000	200-300m	300-400m	400-500m	500-600m
Nematocarcinus africanus		2	1	5	5		54.17	4.574		4.042	8.181	
Merluccius polli	7	3	12			91.67	2.656	2.03	3.486	3.926	1.427	
Synagrops microlepis		3	2	2	1		33.33	1.257	4.22	0.124		
Synagrops japonicus		3		1	1		8.33	1.084	3.716			
MYCTOPHIDAE		12			1		54.17	0.912	3.046	0.103	0.006	0.002
Chlorophthalmus atlanticus		5	3	3			45.83	0.878	1.541	2.051	0.002	0.002
Trichiurus lepturus		18	2	2			91.67	0.625	0.79	0.58	0.993	0.103
Brotula barbata	4		2			25	0.452	1.549				
Yarella blackfordi		7	4				45.83	0.428		0.031	0.481	1.206
Laemonema laureysi		14	1	1			66.67	0.419	0.006	0.664	1.008	0.108
Torpedo nobiliana				2			8.33	0.322			0.554	0.733
Hoplostethus cadenati		7	3				41.67	0.316		0.027	0.074	1.168
Triplophos hemingi		7	3				41.67	0.295		0.004	0.08	1.096
Dentex angolensis		1	5				25	0.287	0.985			
Parapenaeus longirostris, femal		7	2				37.5	0.265	0.699	0.295		
Lamprogrammus exutus		3	4				29.17	0.222			0.025	0.862
Pterothrissus belloci		6	2				33.33	0.216	0.649	0.129		
Hymenocephalus italicus		10	1				45.83	0.204	0.003	0.422	0.461	
Chaunax pictus	14					58.33	0.166		0.124	0.484	0.075	
Bembrops heterurus		8	1				37.5	0.164	0.539	0.029		0.004
Parapenaeus longirostris, male		6	2				33.33	0.154	0.519	0.015		
Nezumia aequalis	11					50	0.137	0.363	0.008	0.104	0.013	
Aristeus varidens, female		13					54.17	0.134		0.006	0.284	0.245
Malacocephalus laevis		8					33.33	0.13		0.339	0.157	0.082
Stereomastis sp.	14					58.33	0.123	0.006	0.014	0.182	0.292	
Dibranchius atlanticus		19					79.17	0.109	0.023	0.104	0.238	0.085
Carcharhinus falciformis			1				4.17	0.104			0.417	
Stomias boa boa	1					8.33	0.103				0.413	
Gonostoma demudata		4	1				20.83	0.095			0.006	0.375
Epinephelus goreensis			1				4.17	0.084	0.287			
Alloteuthis africana			1				4.17	0.079	0.271			
Aristeus varidens, male		13					54.17	0.071		0.023	0.155	0.107
Zeus faber	1					8.33	0.068	0.234				
Miracorvina angolensis		3					12.5	0.066	0.1	0.175		
Gadella imberbis	14					58.33	0.063	0.033	0.129	0.059	0.048	
Pontinus accraensis		6					25	0.058	0.054	0.203		
Squalus megalops		2	1				12.5	0.057			0.045	0.184
Centrophorus granulosus		4					16.67	0.054		0.05	0.135	0.038
Malacocephalus occidentalis		6					25	0.048		0.103	0.103	0.003
Caelorinchus sp.	4					16.67	0.045	0.083	0.101			
Sea urchin, weak spines			1				4.17	0.044		0.209		
Illex coindetii	9					37.5	0.043	0.086	0.002	0.038	0.033	
Ariomma bondi	4					16.67	0.043	0.14	0.01			
CHIMAERIDAE	2					8.33	0.043			0.172		
Umbrina canariensis		2					8.33	0.042	0.143			
Chaceon maritae, male		3					12.5	0.041			0.14	0.024
Zenopsis conchifer		7					29.17	0.039	0.105	0.033	0.007	
Todaropsis eblanae		5					20.83	0.038	0.108			0.027
Halosaurus ovenii		10					41.67	0.037		0.002	0.042	0.106
Lophius vaillanti	6					25	0.034	0.003	0.006	0.04	0.087	
Seriola carpenteri	1					4.17	0.032	0.11				
OMMASTREPHIDAE		4					16.67	0.029		0.021	0.061	0.038
Gephyroberyx darwini		2					8.33	0.026	0.004	0.121		
Pontinus kuhlii	1					4.17	0.026		0.124			
Spicara alta	1					4.17	0.022	0.077				
Uranoscopus polli		3					12.5	0.022	0.075			
Xenodermichthys copei		8					33.33	0.022	0.001		0.052	0.034
Lophiodes kempfi	1					4.17	0.021		0.103			
CONGRIDAE	6					25	0.021		0.059	0.033		
Small shrimps	2					8.33	0.018		0.01	0.063		
Dentex barnardi	1					4.17	0.017	0.06				
Mumidopsis sp.	2					8.33	0.017		0.082		0.002	
Hoplostethus melanopus		1					4.17	0.017	0.058			
Dicrolene sp.	2					8.33	0.016			0.061	0.004	
Squatina oculata	1					4.17	0.016	0.055				
Parasudis fraser-bruenneri		2					8.33	0.015	0.051			
Scorpaena normani		3					12.5	0.015	0.052			
Chaceon maritae, female		5					20.83	0.014		0.003	0.034	0.02
Galeus polli	5					20.83	0.014		0.002	0.055		
Parapenaeus longirostris		3					12.5	0.014	0.04	0.011		
Chaceon maritae	3					12.5	0.014			0.013	0.042	

Bathyrcongery vicinus	4			16.67	0.013	0.002	0.02		0.035		
Etmopterus pusillus	5			20.83	0.013			0.008	0.046		
B I V A L V E S	3		12.5	0.013			0.053				
Squatina aculeata	1		4.17	0.013	0.045						
Torpedo torpedo	2		8.33	0.012	0.041						
GALATHEIDAE *		1		4.17	0.011			0.055			
Etmopterus polli	6		25	0.011				0.04	0.005		
Plesionika martia	2		8.33	0.01				0.023	0.016		
Shrimps, small, non comm.		1		4.17	0.009			0.042			
Aristeus varidens	1		4.17	0.003		0.017					
Acanthephyra sp.	2		8.33	0.003			0.007	0.005			
Glyphis marsupialis		2		8.33	0.001				0.005		
Plesionaeus edwardsianus	1		4.17	0.001				0.002			
Solenocera africana	2		8.33			0.001	0.001				
Other fish				0.187	0.218	0.218	0.167	0.146			
Sum all species				18.641	23.218	14.534	19.27	16.093			
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES					0.084	0.287					
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAKF., KOB						0.109	0.248	0.175			
Sum PANDORAS, PORGIES, SEABREAMS,						0.305	1.045				
Sum SHARKS, CHIMAERAS					0.338	0.1	0.052	0.909	0.282		
Sum BATOID FISHES, RAYS					0.349	0.082	0.012	0.554	0.736		
Sum CEPHALOPODS					0.208	0.469	0.034	0.132	0.126		
Numbers of stations included in analysis, total and by depth strata							24	7	5	6	6

SWEPT AREA ANALYSIS
C. Luanda - Congo River. Slope

SPECIES NAME SAMPLE DISTRIB. BY CATCH CLASSES

SPECIES NAME	Lower limits, Kg/mm					den- t/mm ²	% inci- dens. 600-700m	Mean 700-800m	Mean densities by bottom depth strata t/mm ²					
	>0	10	30	100	300				1000	800-m	-m			
Other fish						0	0	0	0	0				
Sum all species						0	0	0	0	0				
Sum SNAPPERS, JOBFISHES														
Sum GROUPERS, SEABASSES														
Sum GRUNTS, SWEETLIPS														
Sum CROAKERS, DRUMS, WEAKF., KOB														
Sum PANDORAS, PORGIES, SEABREAMS,														
Sum SHARKS, CHIMAERAS														
Sum BATOID FISHES, RAYS														
Sum CEPHALOPODS														
Numbers of stations included in analysis, total and by depth strata										14	6	8	0	0

SWEPT AREA ANALYSIS
A. Benguela - Palmerinhas. Shelf

SPECIES NAME SAMPLE DISTRIB. BY CATCH CLASSES

SPECIES NAME	Lower limits, Kg/mm					dence t/mm ²	% inci- dens. 0-20m	Mean 20-50m	Mean densities by bottom depth strata t/mm ²		
	>0	10	30	100	300				1000	50-100m	100-200m
Brachydeuterus auritus		9	6	5	11	63.27	4.724		4.527	7.373	1.353
Trichiurus lepturus		21	5	5	1	65.31	1.282		0.873	1.711	1.166
Trachurus trecae	22	4	3	1		0.909		0.257	1.926	0.273	
Pomadasyus incisus		12	2	2	1	34.69	0.789		0.159	1.901	
Synagrops microlepis		1			2	6.12	0.738				2.584
Pomadasyus jubelinii		6	2		2	20.41	0.702		0.956	0.954	0.07
Pagellus bellottii	26	5	1			0.433		0.363	0.723	0.119	
Umbrina canariensis		15	2	2		38.78	0.376		0.021	0.224	0.987
Pteroscion peli	3	1	2			12.24	0.359		1.089	0.008	
Raja miraletus	34	4				0.351		0.398	0.487	0.111	
Dentex macrophthalmus		9	2	1		24.49	0.311			0.193	0.826
Sphyaena guachancho		7	1		1	18.37	0.307		0.882	0.049	
Galeoides decadactylus		8	3	2		26.53	0.303		0.783	0.122	
Pseudolithus senegalensis		5	1	2		16.33	0.241		0.718	0.017	
Dentex angolensis		21	2			46.94	0.237		0.001	0.164	0.607
Selene dorsalis	18	3	1			0.236		0.284	0.323	0.064	
Brotula barbata	12	2	1			0.218		0.002	0.054	0.689	
Cynoponticus ferox				1		2.04	0.179		0.548		
Pseudupeneus prayensis		23	1			48.98	0.178		0.308	0.2	
Citharus linguatula		43	1			89.8	0.164		0.04	0.275	0.157
Saurida brasiliensis		22	2			48.98	0.163		0.066	0.069	0.403
Chloroscombus chrysurus		12	3			30.61	0.159		0.26	0.19	
Sardinella maderensis		8		1		18.37	0.156		0.455	0.019	
Dentex barnardi	26	1				0.148		0.142	0.172	0.124	
Alloteuthis africana		23	1			48.98	0.134		0.027	0.314	0.013
Trigla lyra	14	2				32.65	0.133		0.201	0.194	
Zeus faber	27					55.1	0.114		0.008	0.179	0.148
Ilisha africana	1	1	1			6.12	0.104		0.318		
Chelidonichthys capensis		10		1		22.45	0.102		0.005	0.252	0.01
Rhinobatos albomaculatus		13	1			28.57	0.102		0.164	0.095	0.04
Scorpaena normani		10	2			24.49	0.095		0.001	0.129	0.156
Lithognathus mormyrus		9	2			22.45	0.094		0.144	0.122	
Lepidochelys olivacea		1		1		2.04	0.094		0.287		
Dasysatis centroura		1		1		4.08	0.083			0.213	
Ephippion guttifer		13				26.53	0.083		0.159	0.078	0.001
Pterothrissus bellouci		9				18.37	0.072			0.041	0.197
Alectis alexandrinus		3	1			8.16	0.068		0.207		
Illex coindetii	18					0.066			0.079	0.123	
Sepia orbignyana	24					0.062		0.053	0.107	0.013	
Chelidonichthys gabonensis		2	2			8.16	0.055			0.07	0.099
Stromateus fiatola		4	1			10.2	0.054		0.035	0.108	
Torpedo torpedo	17					0.051		0.026	0.102	0.01	
Dentex congoensis		1	1			4.08	0.046			0.119	
Anthias anthias	4	1				0.043			0.001	0.149	
Bembrops greyi	4	1				0.042				0.147	
Lagocephalus laevigatus		17				34.69	0.04		0.033	0.037	0.052
Epinephelus aeneus		8				16.33	0.039		0.103	0.015	
Sphyaena sphyaena		9				18.37	0.037		0.059	0.046	
Panulirus regius		1				0.036		0.11			
Dicologlossa cuneata		12				24.49	0.035		0.104	0.002	
Arius parkii	4					0.032		0.097			
Argyrosomus hololepidotus		8				16.33	0.031		0.047	0.033	0.011
Parapenaeus longirostris.femal		2	1			6.12	0.028			0.057	0.019
Dentex canariensis		5				10.2	0.027		0.015	0.002	0.073
Decapterus rhonchus		1	1			4.08	0.026		0.081		
Octopus vulgaris	9					0.026		0.006	0.042	0.027	
Chaetodon hoefleri		12				24.49	0.025		0.026	0.031	0.015
GOBIIDAE	5	1				0.024			0.002	0.082	
Pagrus caeruleostictus			1			2.04	0.023		0.072		
Squatina oculata	4					0.023		0.005	0.056		
Branchiostegus semifasciatus *		5				10.2	0.022			0.039	0.024
Raja alba	2					0.021				0.073	
Erythrocles monodi		2				4.08	0.02				0.071
Atractoscion aequidens		4				8.16	0.019			0.012	0.052
Dasysatis margarita		1				2.04	0.019		0.059		
J.E.L.L.Y.F.I.S.H	4					0.017		0.051	0.001	0.001	
Uranoscopus polli		10				20.41	0.015			0.02	0.026
Syacium micrurum		7				14.29	0.015				0.052
Dasysatis marmorata		5				10.2	0.015		0.038	0.006	
Pseudolithus typus		3				6.12	0.014		0.039	0.005	
Parapenaeus longirostris, male		3				6.12	0.013			0.025	0.011
Parapenaeus longirostris		3				6.12	0.012				0.042

Grammoplites grueveli	12	24.49	0.012		0.017	0.016			
Chilomycterus spinosus mauret.	5	10.2	0.012		0.035				
Epigonus telescopus	5	10.2	0.011			0.014	0.02		
Fistularia petimba	7	14.29	0.011		0.006	0.023	0.001		
Torpedo marmorata	3	6.12	0.011		0.034				
Seriola carpenteri	2	4.08	0.011	0.011	0.019				
Acanthurus monroviae	1	2.04	0.01		0.032				
Cynoglossus canariensis	9	18.37	0.01		0.023	0.007			
Hyperoglyphe moselii	1	2.04	0.01				0.035		
Penaeus notialis	4	8.16	0.006	0.019					
Parapandalus narval	2	4.08							
Penaeus kerathurus	1	2.04							
Other fish		0.208	0	0.33	0.096	0.221			
Sum all species		16.328	0	16.015	19.971	11.743			
Sum SNAPPERS, JOBFISHES			0.003		0.01				
Sum GROUPERS, SEABASSES			0.042		0.108	0.017			
Sum GRUNTS, SWEETLIPS			6.222		5.66	10.232	1.423		
Sum CROAKERS, DRUMS, WEAKF, KOBES				1.049		1.913	0.312	1.062	
Sum PANDORAS, PORGIES, SEABREAMS,				1.327		0.747	1.495	1.762	
Sum SHARKS, CHIMAERAS			0.031		0.011	0.056	0.021		
Sum BATOID FISHES, RAYS			0.673		0.765	0.904	0.254		
Sum CEPHALOPODS			0.308		0.102	0.558	0.203		
Numbers of stations included in analysis, total and by depth strata					49	0	16	19	14

SWEPT AREA ANALYSIS
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SPECIES NAME SAMPLE DISTRIB. BY CATCH CLASSES

SPECIES NAME	Lower limits, Kg/mm					dence t/mm ²	% inci- dens. 200-300m	Mean 300-400m	Mean densities by bottom depth strata t/mm ²		
	>0	10	30	100	300				1000	400-500m	500-600m
Merluccius polli	6	2	3	4		4.712	2.544	8.25	4.884	0.36	
Chlorophthalmus atlanticus		9		1	3	86.67	4.102	1.662	9.677	0.027	0.017
Nematocarcinus africanus			6	5		73.33	2.722		1.658	6.039	3.192
Hymenocephalus italicus		5		2		46.67	0.866		2.162		0.003
Dentex macrophthalmus		1		1		13.33	0.55	4.125			
Yarella blackfordi		3				40	0.37		0.003	0.995	0.638
Aristeus varidens, female		12	1			86.67	0.355		0.27	0.693	0.406
Trichiurus lepturus		11	1			80	0.344	0.558	0.082	0.483	0.524
Stomias boa boa	3	2				0.301			0.397	0.831	
Centrophorus squamosus		6		1		46.67	0.275		0.666	0.027	0.011
Hoplostethus cadenati		6	1			46.67	0.247		0.002	0.272	0.717
Gadella maraldi	9	1				0.242	0.066	0.486	0.123	0.055	
Synagrops microlepis		6	1			46.67	0.238	1.594	0.053	0.02	
Aristeus varidens, male		13				86.67	0.221		0.29	0.197	0.247
Malacocephalus occidentalis		9	1			66.67	0.214	0.991	0.134	0.105	0.029
Gadella imberbis	7	1				0.192	0.075	0.475	0.006	0.004	
Laemonema laureysi		4	1			33.33	0.172	0.005		0.413	0.331
Parapanaeus longirostris, femal		4				26.67	0.144	0.508	0.191		
Gephyroberyx darwini			1			6.67	0.134		0.334		
Pterothrissus belloci		2	1			20	0.123	0.306	0.206		
Brotula barbata		1				0.115	0.861				
Lamprogrammus exutus		6				40	0.113			0.109	0.341
Dentex angolensis			1			6.67	0.105	0.791			
Malacocephalus laevis		3	1			26.67	0.105	0.686		0.061	0.004
Yarella blackfordi *			1			6.67	0.091				0.342
Zenopsis conchifer		5				33.33	0.082	0.429	0.062		
Epinephelus goreensis			1			6.67	0.081	0.611			
Bembrops heterurus		1	1			13.33	0.079	0.572	0.007		
Chaux pictus	7					0.077	0.079	0.058		0.057	
MYCTOPHIDAE		9				60	0.077	0.033	0.18		0.002
Hoplostethus mediterraneus			1			6.67	0.075	0.559			
Trichiurus auriga	1					0.07			0.35		
Lophius sp.		1				6.67	0.07	0.174			
Todarodes sagittatus		4				26.67	0.064	0.081	0.133		
Chaceon maritae, female		2				13.33	0.058				0.216
Gonosoma denudata		2				13.33	0.057			0.193	0.068
Scorpaena normani		3				20	0.054	0.109	0.099		
Stereomastis sp.						0.048	0.054	0.002	0.037	0.149	
Triplophos hemingi	7	7				46.67	0.044			0.084	0.103
Helicolenus dactylopterus		3				20	0.041	0.076	0.068	0.016	
Parapanaeus longirostris, male		3				20	0.04	0.293	0.003		
Munidopsis sp.	3					0.033		0.082			
Dibranchius atlanticus		6				40	0.032		0.017	0.08	0.034
Shrimps, small, non comm.		1				6.67	0.029		0.072		
Epigonus telescopus		3				20	0.029	0.081	0.045		
Halosaurus ovenii		8				53.33	0.024		0.029	0.046	0.01
Lophius vomerinus		1				6.67	0.023		0.057		
Todaropsis eblanae		1				6.67	0.023		0.056		
Nezumia aequalis	6					0.022	0.011	0.039	0.016	0.005	
CHIMAERIDAE	1					6.67	0.021		0.103		
Lophiodes kempii	3					20	0.019		0.013	0.05	
Nezumia sp.	3					20	0.018		0.038	0.012	
Parapanaeus longirostris		2				13.33	0.018		0.045		
OMMASTREPHIDAE		2				13.33	0.017			0.072	0.009
Chaceon maritae	3					0.017		0.011	0.022	0.029	
Centrophorus uyato		1				6.67	0.015				0.058
Callinectes sp.	5					0.015		0.021	0.026	0.006	
Callinectes amnicola		1				6.67	0.014		0.036		
Pontinus accraensis		3				20	0.013	0.048	0.017		
Gadomus capensis		1				6.67	0.013			0.064	
Diplophos sp.	1					0.011				0.04	
Bathyrcongus vicinus		4				26.67	0.01		0.018	0.01	0.004
Chaceon maritae, male		2				13.33	0.01				0.038
Solenocera africana		4				26.67	0.002		0.004	0.002	
Plesiopeneus edwardsianus		1				6.67	0.001				0.005
Other fish						0.123	0.279	0.051	0.119	0.157	
Sum all species						18.62	17.878	26.379	16.282	9.104	
Sum SNAPPERS, JOBFISHES								0.081	0.611		
Sum GROUPERS, SEABASSES											
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAKF., KOBBS											
Sum PANDORAS, PORGIES, SEABREAMS,								0.655	4.916		

Sum SHARKS, CHIMAERAS	0.337		0.675	0.188	0.109		
Sum BATOID FISHES, RAYS	0.004	0.028		0.003			
Sum CEPHALOPODS	0.108	0.11	0.19	0.072	0.009		
Numbers of stations included in analysis, total and by depth strata			15	2	6	3	4

SWEPT AREA ANALYSIS
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SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					den- sity t/nm ²	% inci- dens. 600-700m	Mean 700-800m	Mean densities by bottom depth strata t/nm ²				
	Lower limits, Kg/mm	10	30	100	300				1000	800-m	-m		
Other fish	>0	10	30	100	300	1000	0	0	0	0	0		
Sum all species							0	0	0	0	0		
Sum SNAPPERS, JOBFISHES													
Sum GROUPERS, SEABASSES													
Sum GRUNTS, SWEETLIPS													
Sum CROAKERS, DRUMS, WEAKF., KOB													
Sum PANDORAS, PORGIES, SEABREAMS,													
Sum SHARKS, CHIMAERAS													
Sum BATOID FISHES, RAYS													
Sum CEPHALOPODS													
Numbers of stations included in analysis, total and by depth strata									8	3	5	0	0

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:

$$var(biomass) = \left(\sum_{i=1}^L \frac{W_i^2 s_i^2}{n_i} \right) A^2 \quad (3)$$

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):

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

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)

$$biomass \pm t_{\alpha/2} SE \quad (6)$$

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 1	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				
DEEP 2	Hake	Ommastrephidae	Sepiidae	<i>A.varidens</i>	<i>P.longirostris</i>
	MERME03	SQUOM21	SQUSE10	SHRAR22	SHRPE31
	MERME12	SQUOM31	SQUSE11	SHRARA1	SHRPEP1
	MERME13	SQUOM51	SQUSE12	SHRARA2	SHRPEP2
	MERME92		SQUSE13		
			SQUSE15		

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 demersal 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	27					42.2	1320.8	1363
2	44						589.4	589.4
13	61	0.3					156.8	157.1
14	37						764.7	764.7
15	23						1078	1078
16	24						16699.3	16699.3
24	22	117.1					1732.7	1849.8
25	50	3.1					515.7	518.8
27	51	515.7				1.8	2236.2	2753.8
Mean	38	70.7				4.9	2788.2	2863.8
SD		171.3				14.0	5256.3	5247.7
%Catch		2.5				0.2	97.4	

B. Outer shelf (71-200 m)

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
3	87	167.2					5267.2	5434.3
4	133	41.7					15158.5	15200.2
5	150	202.0					4271.6	4473.6
6	179	53.1					1800.7	1853.9
10	139	284.0					1847.1	2131.1
11	115	498.5					10029.4	10527.9
12	95	18.9					24866.7	24885.6
17	95	493.8				0.3	1022.6	1516.7
20	126	229.0				64.2	9049.6	9342.8
21	118	277.2				10.4	3926.1	4213.7
22	90	623.7				18.6	2815.9	3458.3
26	74	98.1				12.0	4793.0	4903.1
Mean	116	248.9				8.8	7070.7	7328.4
SD		197.9				18.6	6945.8	6859.4
%Catch		3.4				0.1	96.5	

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	27	47.4	241.1		1.1	9.0	1064.4	1363.0
2	44		403.2		142.4		43.8	589.4
13	61	0.3	123.3		30.9		2.6	157.1
14	37		14.3		15.7		734.7	764.7
15	23		401.9		11.7		664.4	1078.0
16	24		3496.8		302.9		12899.6	16699.3
24	22	117.1	1576.2		5.3	1.5	149.7	1849.8
25	50	3.1	322.2		98.9		94.6	518.8
27	51	517.6	2155.2		23.1		57.9	2753.8
Mean	38	76.2	970.5		70.2	1.2	1745.7	2863.8
SD		170.2	1192.8		99.6	3.0	4200.0	5247.7
%Catch		2.7	33.9		2.5	0.0	61.0	

B. Outer shelf (71-200 m).

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Sharks	Other	Total
3	87	168.8	5145.6				120.0	5434.3
4	133	48.1	14990.2				161.9	15200.2
5	150	244.7	3238.5			1.8	988.6	4473.6
6	179	470.9	914.3	0.1		67.7	400.7	1853.9
10	139	338.4	14.4		39.2	6.3	1732.8	2131.1
11	115	498.5	9926.8		71.7		30.9	10527.9
12	95	18.9	24571.5		295.1		0.0	24885.6
17	95	514.7	619.7		206.7		175.6	1516.7
20	126	405.8	8515.3				421.7	9342.8
21	118	287.6	3872.8				53.3	4213.7
22	90	642.3	2669.6		92.4	2.4	51.5	3458.3
26	74	110.1	4718.6		13.2	14.9	46.3	4903.1
Mean	116	312.4	6599.8		59.9	7.8	348.6	7328.4
SD		200.4	7131.3		96.4	19.4	517.0	6859.4
%Catch		4.3	90.1		0.8	0.1	4.8	

C. Slope (201-800 m).

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Sharks	Other	Total
7	322	231.3	154.0	14.1	2.3	34.5	1476.7	1912.9
8	726	7.4		55.5	13.8	22.6	2911.2	3010.5
9	760	26.1	1.1	1.1	32.7	41.3	1786.1	1888.3
18	344	69.4		52.2		12.6	2973.2	3107.4
19	634	98.4	6.8	17.1	14.1	16.9	804.3	957.6
Mean	557	86.5	32.4	28.0	12.6	25.6	1990.3	2175.3
SD		88.5	68.0	24.4	13.0	12.0	938.9	894.5
%Catch		4.0	1.5	1.3	0.6	1.2	91.5	

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	27	5.8	227.5		7.7		1122	1363
2	44		403.2				186.2	589.4
13	61		120.9	2.4			33.8	157.1
14	36.5		14.3				750.4	764.7
15	22.5		388.3	13.1	0.6		676	1078
16	23.5		3443.5	53.4			13202.5	16699.3
24	22		1535.4	40.8			273.6	1849.8
25	50		299.8	22.4			196.6	518.8
27	51		2155.2				598.6	2753.8
Mean	38	0.6	954.2	14.7	0.9		1893.3	2863.8
SD		1.9	1179.8	20.2	2.5		4254.9	5247.7
%Catch			33.3	0.5			66.1	

B. Outer shelf (71-200 m).

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracuda	Other	Total
3	86.5		5145.6				288.8	5434.3
4	132.5		14990.2				210	15200.2
5	149.5		3237		1.5		1235.1	4473.6
6	178.5		907.3	7			939.6	1853.9
10	138.5		13.1		1.3		2116.7	2131.1
11	114.5		9926.8				601.1	10527.9
12	94.5		24571.5				314.1	24885.6
17	95		609.3		10.4		897	1516.7
20	125.5		8508.4		6.8		827.6	9342.8
21	118	10.5	3693.4	163.9	5		340.9	4213.7
22	90		2669.6				788.7	3458.3
26	73.5		4587.3	131.3			184.5	4903.1
Mean	116	0.9	6571.6	25.2	2.1		728.7	7328.4
SD		3.0	7142.2	57.6	3.5		553.2	6859.4
%Catch			89.7	0.3			9.9	

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	322	59.9	171.5	11.6		2.5	1667.5	1912.9
8	726		4.6		8.3		2997.7	3010.5
9	760		26.1		0.4		1861.9	1888.3
18	344		69.4		52.2		2985.8	3107.4
19	634		59.5		9.9		888.1	957.6
Mean	557	12.0	66.2	2.3	14.2	0.5	2080.2	2175.3
SD		26.8	64.3	5.2	21.7	1.1	908.4	894.5
%Catch		0.6	3.0	0.1	0.7		95.6	

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 shells (20-70 m).

Station	Gear depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
31.0	66.5	540.8	247.3		14.1		182.0	984.2
36.0	54.5	1804.9	292.7		0.7		173.2	2271.3
37.0	51.5	640.3	422.5		1.1		104.6	1168.5
48.0	63.5	31.7	39.1		24.8		60.5	156.1
49.0	23.5	716.3	297.6		0.6		61.2	1075.7
50.0	29.0	4.3	28.1		11.1		28.7	72.2
51.0	42.5	95.2	9.3		5.8		171.5	281.8
52.0	62.0	64.8	22.6		10.9		29.1	127.3
58.0	21.0	77.8	0.6		4.4		60.0	142.8
59.0	22.0	638.2	132.9	1.1	2.9		135.3	910.4
60.0	34.0	777.1	168.5	0.1			532.2	1477.8
61.0	51.5	99.4	19.5		4.0		39.0	161.9
68.0	45.0	190.9	118.6		1.6		52.1	363.2
69.0	29.0	564.1	184.0			3.1	88.2	839.4
70.0	29.5	84.6	34.9		1.1		59.6	180.2
71.0	49.5	578.9	51.9		5.3		76.3	712.5
78.0	32.0	15.8	30.7	0.1	0.9		53.5	100.9
79.0	46.0	33.4	4.8		4.8		32.3	75.3
80.0	67.0	1002.0	757.4		23.0		52.4	1834.8
87.0	61.0	41.0	51.0		13.3	11.1	34.4	150.8
88.0	34.0	393.8	178.5	7.6			69.3	649.2
89.0	31.0	45.1	182.2	0.1	4.1		123.6	355.0
93.0	50.5	230.4	41.8		10.9		42.9	326.0
94.0	25.5	63.7	394.4		7.6		99.9	565.6
95.0	27.0	4.2	1.3			2.6	183.0	191.1
Mean	41.9	349.5	148.5	0.4	6.1	0.7	101.8	607.0
Std dev		427.1	178.3	1.5	6.9	2.3	102.7	592.2
%Catch		57.6	24.5	0.1	1.0	0.1	16.8	

B. Outer shelf (71-200 m).

Station	Gear depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
32	91.5	450.0	29.5	48.8	29.9		331.6	889.8
33	106.5	756.0	38.9		2.3		91.7	889.0
34	96.0	90.1	223.1		24.3		33.8	371.2
35	73.0	257.9	161.7		19.6		72.3	511.4
38	71.5	7.3	23.0		13.7		30.7	74.8
39	102.5	103.6		0.2	0.6		27.4	131.9
46	160.0	184.2	51.1	7.6	10.5	1.9	567.3	822.6
47	108.0	263.8	0.4		6.5		35.2	305.8
53	103.0	301.8	302.5		6.5		137.8	748.6
56	149.5	75.1	58.4	9.8	9.9		62.9	216.2
57	113.0	30.9			4.2		23.3	58.4
62	114.5	34.1	0.8	0.1	1.6		28.7	65.4
66	147.5	53.3	10.0		2.3	7.2	33.5	106.4
67	89.0	14.8	0.2		15.3		36.0	66.3
72	94.5	949.7	5.4		17.2		44.9	1017.1
73	130.0	39.8	50.7		1.2		38.6	130.3
81	96.0	653.8	7.3		19.2	10.1	175.4	865.8
82	175.0	23.1			7.2		754.5	784.8
85	106.5	454.4	96.6		9.8		121.8	682.6
86	86.0	96.2	181.6		14.2		99.1	391.1
90	94.5	17.8	12.9	0.1	7.6	10.5	19.8	68.9
91	114.0	110.8	54.7	13.8	4.7		182.9	366.9
96	77.0	139.9	41.0	0.0	55.3		29.0	265.3
97	114.0	28.8	2.9	0.3	17.7		74.8	124.5
Mean	108.9	214.0	56.4	3.4	12.6	1.2	127.2	414.8
Std dev		259.2	80.8	10.3	12.0	3.2	181.3	332.1
%Catch		51.6	13.6	0.8	3.0	0.3	30.7	

C. Slope (201-800 m).

Station	Gear depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
29	747.0	20.6		16.1	1.8	0.2	206.8	245.5
30	745.5	4.7	1.7	19.5	59.5	1.4	417.8	504.6
40	258.5	346.0	22.1	6.7	5.8		232.5	613.1
41	475.5	22.7	2.6	244.7		3.8	73.5	347.4
42	568.5	18.5	3.1	100.4		0.8	117.5	240.3
43	661.5	17.5	2.1	101.1		2.2	115.6	238.6
44	693.5	39.0	3.8	79.1		0.2	125.5	247.6
45	350.5	320.1	0.6	112.3	10.1	103.3	319.8	866.1
54	381.0	292.1	0.6	109.6		10.1	63.7	476.0
55	513.5	24.0	21.5	90.5	1.1	0.5	104.1	241.7
63	368.5	326.6	0.4	86.0	1.5	2.6	56.5	473.7
64	319.5	260.2		27.4	12.5	0.4	797.5	1098.0
65	471.5	12.5	40.4	284.5	6.5	0.7	132.3	477.0
74	342.5	126.6	12.3	54.6	9.5		706.0	909.0
75	513.5	14.1	27.3	189.9		7.4	160.8	399.5
76	736.5	32.3	0.6	17.7	2.6	1.3	193.6	248.2
77	608.5	16.6	3.8	188.7	1.2		77.6	288.0
83	761.5	26.2	0.2	54.0	14.9	8.4	403.9	507.6
84	303.5	118.4		47.9		1.6	625.0	793.0
92	535.5	27.4	10.7	80.2		4.5	84.8	207.5
98	260.0	194.2	11.7	38.8	1.1		212.9	458.7
99	432.5	406.0	30.9	84.6		12.1	83.4	617.0
100	737.0	20.0		59.5	7.3		67.5	154.3
Mean	512.4	116.8	8.6	91.0	5.9	7.0	233.8	463.1
Std dev		136.2	11.8	73.0	12.5	21.3	215.5	254.2
%Catch		25.2	1.9	19.7	1.3	1.5	50.5	

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	Gear depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
31	66.5	19.7			88.4	4.7	871.4	984.2
36	54.5	45.7		6.6	1147.2	66.2	1005.7	2271.3
37	51.5	87.9			141.7	6.8	932.0	1168.5
48	63.5	11.7		0.1			144.3	156.1
49	23.5	8.5		14.6	17.8	3.0	1031.8	1075.7
50	29.0	4.3			0.0		67.9	72.2
51	42.5	56.5		23.8	9.7	4.2	187.6	281.8
52	62.0	63.5		1.2			62.6	127.3
58	21.0	77.8					65.0	142.8
59	22.0	61.1		5.4	30.8	205.3	607.7	910.4
60	34.0				2.8	257.3	1217.7	1477.8
61	51.5	2.4		2.2		10.3	147.0	161.9
68	45.0			2.1	9.4	0.6	351.1	363.2
69	29.0					23.0	816.5	839.4
70	29.5			3.6	6.2	25.9	144.5	180.2
71	49.5	103.2		2.7	446.3	23.7	136.5	712.5
78	32.0	3.2				5.4	92.3	100.9
79	46.0	8.0			0.4	2.1	64.8	75.3
80	67.0	16.2			139.1		1679.5	1834.8
87	61.0	4.3			1.3	0.8	144.4	150.8
88	34.0				1.5	371.0	276.7	649.2
89	31.0	0.3			1.5	14.9	338.3	355.0
93	50.5	108.8			3.9	8.0	205.2	326.0
94	25.5	37.2	4.5	2.3	0.7		520.8	565.6
95	27.0	1.4			2.7		186.9	191.1
Mean	41.9	28.9	0.2	2.6	82.1	41.3	451.9	607.0
SD		35.8	0.9	5.5	241.2	93.5	445.5	592.2
%Catch		4.8		0.4	13.5	6.8	74.4	

B. Outer shelf (71-200 m).

Station	Gear depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
32	91.5	106.4			42.2	52.4	688.9	889.8
33	106.5	114.6				282.1	492.3	889.0
34	96.0	83.3				6.8	281.1	371.2
35	73.0	45.5			91.6	23.3	351.0	511.4
38	71.5	7.3					61.0	68.3
39	102.5	92.7				7.1	32.0	131.9
46	160.0	63.5				10.8	748.3	822.6
47	108.0	263.8				0.0	42.1	305.8
53	103.0	38.3			31.7	141.2	537.5	748.6
56	149.5	25.6				1.0	189.6	216.2
57	113.0	20.2				0.4	37.8	58.4
62	114.5	16.9				1.7	46.8	65.4
66	147.5	27.7				1.1	77.6	106.4
67	89.0	5.8					60.6	66.3
72	94.5	116.7					900.4	1017.1
73	130.0	21.6					108.7	130.3
81	96.0	29.8					835.9	865.8
82	175.0	23.1					761.7	784.8
85	106.5	7.7				1.7	673.2	682.6
86	86.0	71.7					319.4	391.1
90	94.5	13.5				4.1	51.3	68.9
91	114.0	4.4				6.8	355.7	366.9
96	77.0	25.1					240.2	265.3
97	114.0	20.7				0.9	102.9	124.5
Mean	108.9	51.9			6.9	22.6	333.2	414.5
Std dev		57.7			20.9	62.9	295.9	332.4
%Catch		12.5			1.7	5.4	80.4	

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	Gear depth	Carangids	Scombrids	Hairtails	Barracuda	Clupeids	Other	Total
31	66.5	24.8		159.8	3.9		795.7	984.2
36	54.5	260.4		15.7	5.6	11.0	1978.7	2271.3
37	51.5	367.2		28.7	23.3	3.2	746.0	1168.5
48	63.5	33.5		5.6	0.0		117.0	156.1
49	23.5	58.6		2.8	18.6	217.7	778.1	1075.7
50	29.0	25.5			2.7		44.0	72.2
51	42.5	7.3			2.0		272.5	281.8
52	62.0	18.4		1.1	3.0		104.8	127.3
58	21.0				0.6		142.1	142.8
59	22.0	32.0		29.3	8.4	63.2	777.5	910.4
60	34.0	22.3		140.3	0.3		1314.9	1477.8
61	51.5	1.1		17.5	0.9		142.4	161.9
68	45.0	48.8		64.3	0.2	5.3	244.6	363.2
69	29.0	9.3		158.7		2.4	669.1	839.4
70	29.5	20.5		11.9	1.8	0.7	145.3	180.2
71	49.5	24.5		2.8	24.6		660.5	712.5
78	32.0	29.2				1.5	70.2	100.9
79	46.0	4.4		0.5			70.4	75.3
80	67.0	155.5		601.9			1077.4	1834.8
87	61.0	26.5		24.5			99.8	150.8
88	34.0	48.8		41.1		88.6	470.7	649.2
89	31.0	121.5		0.8	56.2	3.6	172.8	355.0
93	50.5	21.9			17.4		286.7	326.0
94	25.5	77.1			317.3		171.2	565.6
95	27.0			1.3			189.8	191.1
Mean	41.9	57.6		52.3	19.5	15.9	461.7	607.0
Std dev		86.7		124.7	63.3	47.0	474.4	592.2
%Catch		9.5		8.6	3.2	2.6	76.1	

B. Outer shelf (71-200 m).

Station	Gear depth	Carangids	Scombrids	Hairtails	Barracuda	Clupeids	Other	Total
32	91.5			28.2		1.3	860.3	889.8
33	106.5	38.9					850.1	889.0
34	96.0	223.1					148.1	371.2
35	73.0	57.2		97.5		2.2	354.6	511.4
38	71.5	20.3		1.1	1.7		51.3	74.3
39	102.5						131.9	131.9
46	160.0			51.1			771.5	822.6
47	108.0	0.4					305.4	305.8
53	103.0			302.5			446.2	748.6
56	149.5			58.4			157.8	216.2
57	113.0						58.4	58.4
62	114.5			0.8			64.6	65.4
66	147.5			10.0			96.4	106.4
67	89.0	0.2					66.1	66.3
72	94.5	5.4					1011.7	1017.1
73	130.0			50.7			79.6	130.3
81	96.0	7.3					858.5	865.8
82	175.0						784.8	784.8
85	106.5	74.6		22.0			586.0	682.6
86	86.0	171.0	2.5	8.1			209.5	391.1
90	94.5	3.1		9.8			55.9	68.9
91	114.0	29.7		25.0			312.2	366.9
96	77.0	39.7				1.4	224.2	265.3
97	114.0	0.3	2.6				121.6	124.5
Mean	108.9	28.0	0.2	27.7	0.1	0.2	358.6	414.8
Std dev		56.6	0.7	63.7	0.3	0.6	323.9	332.1
%Catch		6.7	0.1	6.7			86.5	

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	Gear depth	Seabream	Hake	P.longirostris	A.varidens	N.africana	Other	Total
29	747.0		15.6		12.9		217.0	245.5
30	745.5				12.3		492.3	504.6
40	258.5	251.2	94.8	6.7			260.4	613.1
41	475.5		19.2		15.1	229.6	83.4	347.4
42	568.5		14.1		14.2	85.6	126.4	240.3
43	661.5		2.2		3.3	96.1	137.0	238.6
44	693.5		9.0		9.5	67.7	161.4	247.6
45	350.5		320.1	7.6	14.9	89.8	433.8	866.1
54	381.0		292.1	5.4	21.3	82.2	75.0	476.0
55	513.5		2.1		15.8	74.7	149.2	241.7
63	368.5		326.6		9.3	76.8	61.0	473.7
64	319.5		260.2	0.4	27.0		810.4	1098.0
65	471.5		6.3		26.5	257.8	186.4	477.0
74	342.5		126.6		17.6	37.0	727.8	909.0
75	513.5		1.4		26.8	163.0	208.3	399.5
76	736.5				5.3	10.1	232.8	248.2
77	608.5		4.5		5.8	181.0	96.7	288.0
83	761.5		7.3		2.6	42.2	455.5	507.6
84	303.5		116.8	27.9	7.5		640.8	793.0
92	535.5		26.0		21.5	58.7	101.3	207.5
98	260.0	53.4	58.6	38.8			307.8	458.7
99	432.5		406.0		37.2	47.5	126.4	617.0
100	737.0		7.8		1.4	55.2	89.9	154.3
Mean	512.4	13.2	92.1	3.8	13.4	72.0	268.7	463.1
Std dev		53.0	130.7	9.7	9.9	73.5	219.4	254.2
%Catch		2.9	19.9	0.8	2.9	15.5	58.0	

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	Gear depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
104	32.0	621.0	315.4	77.8	0.2	5.2	395.1	1414.7
105	44.0	1059.2	302.7	4.7	5.5	21.2	368.5	1761.8
106	53.0	2774.8	429.8	0.8	16.4	8.0	248.4	3478.2
113	28.5	1162.3	279.4	8.1	23.3		279.3	1752.3
114	28.5	236.6	436.9	1.7	36.5		346.7	1058.4
115	63.5	344.6	135.9		8.9		41.1	530.5
125	27.0	378.2	100.5				187.7	666.3
126	42.0	316.0	80.2	0.9	1.4		270.6	669.1
127	65.0	121.3	211.3		1.9		80.7	415.2
137	24.5	285.9	612.0				126.6	1024.5
138	41.5	611.6	660.3	0.3	7.6		170.3	1450.2
139	57.5	197.3	42.6		8.7		50.0	298.6
152	27.5	8587.6	1853.3			4.6	403.6	10849.2
153	26.5	266.2	9.1		1.0		265.9	542.1
154	42.5	33.0	3.2		7.9		12.3	56.3
155	62.5	2917.3	1515.3		16.2	3.6	22.0	4474.4
161	37.0	60.0	242.4		0.3		11.3	313.9
162	49.0	149.7	9.3		4.8	2.2	44.3	210.3
192	54.0	23.7	22.1		0.7		75.5	122.1
193	40.0	23.1	41.7		0.5	12.8	21.6	99.6
194	34.0	49.4	70.7	0.2	0.6	25.6	34.6	181.2
195	47.0	10.2	221.6				8.7	240.4
Mean	42.1	919.5	345.3	4.3	6.5	3.8	157.5	1436.8
Std dev		1892.9	476.1	16.5	9.3	7.2	140.4	2378.9
%Catch		64.0	24.0	0.3	0.5	0.3	11.0	

B. Outer shelf (71-200 m).

Station	Gear depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
107	112.5	161.7	34.0		4.2		29.3	229.2
108	145.0	63.3	43.2	4.4	1.9		39.8	152.7
116	86.0	40.4	235.0		7.5		40.0	322.8
118	165.0	166.0	1040.0	2.6	2.0		32.3	1242.7
128	71.0	267.6	63.3		10.5		89.0	430.3
129	95.0	195.2	129.7	0.5	9.3		47.7	382.4
130	116.0	308.4	11.4				19.3	339.1
131	138.0	120.6	10.0		9.0	14.6	158.5	312.7
140	72.0	206.2	86.8		11.8		44.0	348.8
142	106.0	109.8	30.3	6.5	3.0		24.2	173.7
143	165.5	79.5	49.0	6.2	9.6	5.8	921.6	1071.7
148	115.0	471.7	79.9		2.4		44.3	598.3
149	87.5	441.8	173.7		52.8		95.1	763.3
150	70.5	145.6	3.2		8.1	5.0	21.7	183.4
159	116.5	241.8	50.0		0.3		41.7	333.8
160	87.0	452.2	1.0		56.6	3.0	55.7	568.4
163	120.0	16.5	53.0		4.0		16.8	90.3
169	111.0	120.0	4.8		2.3	1.1	51.0	179.2
170	86.5	132.2			3.1	6.5	25.7	167.5
171	80.5	347.2			3.4		31.7	382.3
172	119.0	271.7	55.0		0.3		79.5	406.5
173	151.5	61.8	19.8		7.3	8.1	13.8	110.8
179	190.0	34.1	17.4	1.7	19.0	5.4	369.8	447.4
180	147.5	14.5	4.3	0.8	11.1	1.2	209.8	241.8
181	113.0	228.7	124.3		0.9	5.2	18.6	377.7
182	90.0	7.5	0.7				24.1	32.3
183	115.5	24.9	96.9	0.1	0.8		11.5	134.2
184	124.5	21.1	38.7		1.6	5.3	7.4	74.1
189	109.5	176.9	56.3	0.3	0.6	12.6	20.8	267.5
190	96.0	91.6	89.1		0.1		6.4	187.2
191	80.0	293.4	233.8				10.1	537.4
196	71.5	8.7	216.5				60.0	285.2
197	120.0	183.5	22.6		2.6		18.5	227.1
198	107.0	21.8	181.9		1.8		3.1	208.6
199	91.0	42.1	14.8		0.8		3.1	60.8
Mean	110.6	159.1	93.4	0.7	7.1	2.1	76.7	339.2
Std dev		133.1	178.6	1.7	12.7	3.8	162.7	262.6
%Catch		46.9	27.5	0.2	2.1	0.6	22.6	

C. Slope (201-800 m).

Station	Gear depth	Demersal	Pelagic	Shrimps	Cephalopods	Sharks	Other	Total
101	315.0	142.9	6.8	18.7			99.6	267.9
102	217.5	261.4	115.5	63.0	0.2		977.8	1417.8
109	411.0	132.6	4.1	378.2		7.4	181.4	703.7
110	529.0	44.7		257.7	5.5	0.5	162.2	470.7
111	704.0	190.5		222.0	30.5	2.0	240.2	685.3
112	308.5	131.0	7.7	51.6	0.5	0.2	167.0	358.0
119	229.5	302.5	36.6	14.5	3.4		603.6	960.5
120	453.0	131.2		402.0	1.3	30.4	54.2	619.2
121	536.0	32.7	5.8	193.0	5.0	32.6	266.4	535.4
122	603.5	24.2	3.7	197.2	1.4	13.7	163.9	404.1
123	700.0	87.9	2.2	179.9	8.9		513.9	792.7
124	703.0	48.2		426.3			3401.7	3876.3
132	427.5	32.4	2.2	247.0	4.8	24.6	187.3	498.4
133	619.0	7.7	17.9	321.8	0.4	9.0	235.3	592.2
134	540.5	6.3	0.5	311.9	3.0	6.7	172.4	500.9
135	635.0	25.2	0.7	306.4	19.7	2.7	140.9	495.6
136	737.0	74.6		272.4	10.1	9.6	654.5	1021.2
144	759.5	2.4		110.1		6.7	1137.1	1256.3
145	640.5	40.7	3.7	278.3		22.2	309.0	653.9
146	369.5	104.5	43.7	523.6	2.9	7.1	171.5	853.3
147	257.5	172.7	2.5	98.0	4.2		442.8	720.2
156	432.5	147.4	135.7	467.9		4.3	149.9	905.3
157	533.5	71.4	10.1	272.6	3.3	1.5	184.4	543.3
158	716.5	15.4	5.5	48.3	6.9	1.1	306.1	383.3
164	234.0	74.9	5.4	8.4	10.3	9.4	211.9	320.4
165	415.0	117.0	13.0	27.1	6.3	7.8	88.2	259.3
166	527.5	193.7	0.7	164.6	4.3	4.5	210.1	577.9
167	628.5	43.3	2.5	45.1	7.1	3.8	368.9	470.6
168	317.5	106.9	7.9	15.4	0.2		239.6	370.0
174	265.0	168.8	7.2	60.9	73.3	11.0	652.3	973.5
175	728.5	9.8		8.8	12.3	10.7	366.9	408.5
176	511.5	52.4	0.6	21.0	0.6	3.7	71.7	150.0
177	445.0	152.1	21.2	33.4	10.6	85.5	124.6	427.4
178	271.0	14.0	1.3	1.9			148.6	165.7
185	232.0	57.7	18.1	13.0	2.5		95.7	187.0
186	341.0	37.7	16.2	21.6	1.2		137.9	214.6
187	658.5	112.6		96.2	0.0	2.4	666.6	877.8
188	722.0	11.2		19.7	7.1	7.5	630.7	676.2
Mean	491.5	89.0	13.1	163.1	6.5	8.6	393.1	673.5
Std dev		73.6	28.7	151.7	12.7	15.3	560.8	609.4
%Catch		13.2	1.9	24.2	1.0	1.3	58.4	

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	Gear depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
104	32.0					428.5	986.3	1414.7
105	44.0	12.9		10.2	5.7	2.0	1731.0	1761.8
106	53.0	48.3		22.5	84.0	24.2	3299.2	3478.2
113	28.5				146.1	942.3	664.0	1752.3
114	28.5	10.9		1.5	3.4	7.9	1034.6	1058.4
115	63.5	17.6			35.0	0.7	477.2	530.5
125	27.0				48.6	326.6	291.1	666.3
126	42.0				5.4	58.6	605.0	669.1
127	65.0	30.6		2.6	8.2	8.3	365.5	415.2
137	24.5				1.0	17.7	1005.8	1024.5
138	41.5	9.7					1440.5	1450.2
139	57.5	109.4		45.9		41.9	101.4	298.6
152	27.5	102.9				80.2	10666.1	10849.2
153	26.5	175.1	26.7	34.1	29.9		276.3	542.1
154	42.5	33.0					23.3	56.3
155	62.5	155.7		0.9	7.3		4310.4	4474.4
161	37.0	59.1		0.8			254.0	313.9
162	49.0	110.3		6.5			93.5	210.3
192	54.0	13.8		9.2			99.0	122.1
193	40.0	1.4			1.6	15.8	80.7	99.6
194	34.0			1.6	4.3	16.8	158.5	181.2
195	47.0	4.3		3.9			232.2	240.4
Mean	42.1	40.7	1.2	6.4	17.3	89.6	1281.6	1436.8
SD		54.3	5.7	12.2	35.5	219.8	2357.6	2378.9
%Catch		2.8	0.1	0.4	1.2	6.2	89.2	

B. Outer shelf (71-200 m)

Station	Gear depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
107	112.5	90.8				52.8	85.7	229.2
108	145.0	19.0				18.9	114.8	152.7
116	86.0	8.4				4.2	310.2	322.8
118	165.0	86.1				39.4	1117.2	1242.7
128	71.0	68.8		7.7	24.6		329.3	430.3
129	95.0	30.9				16.5	335.0	382.4
130	116.0	168.7				139.7	30.7	339.1
131	138.0	114.3				2.7	195.7	312.7
140	72.0	72.2			91.0	40.5	145.1	348.8
142	106.0	40.0				48.6	85.2	173.7
143	165.5	49.6				3.5	1018.6	1071.7
148	115.0	85.3				386.3	126.7	598.3
149	87.5	331.3				15.0	417.1	763.3
150	70.5	143.9				1.6	36.5	182.1
159	116.5	193.6				48.2	92.0	333.8
160	87.0	445.0		7.1			116.2	568.4
163	120.0	13.0				0.9	76.4	90.3
169	111.0	120.0					59.2	179.2
170	86.5	132.2					35.3	167.5
171	80.5	326.7		20.5			35.1	382.3
172	119.0	265.4					141.1	406.5
173	151.5	44.9					66.0	110.8
179	190.0	12.8				4.8	429.9	447.4
180	147.5	11.0					230.8	241.8
181	113.0	49.1				117.7	210.8	377.7
182	90.0	7.5					24.8	32.3
183	115.5	8.3					125.9	134.2
184	124.5	21.1					53.1	74.1
189	109.5	42.7				62.1	162.7	267.5
190	96.0	17.9		2.5		3.9	162.8	187.2
191	80.0	9.5		1.1		2.9	523.8	537.4
196	71.5	0.8		3.2	1.8	1.3	278.2	285.2
197	120.0	137.7				45.5	43.9	227.1
198	107.0	15.1		4.0		2.6	186.8	208.6
199	91.0	28.0		11.5		2.6	18.7	60.8
Mean	110.6	91.8		1.6	3.4	30.3	212.0	339.1
Std dev		105.3		4.1	15.6	69.3	245.5	258.8
%Catch		27.1		0.5	1.0	8.9	62.5	

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	Gear depth	Carangids	Scombrids	Hairtails	Barracuda	Clupeids	Other	Total
104	32.0	18.8		83.1	34.6	150.8	1127.4	1414.7
105	44.0	99.7		140.4	9.4	19.6	1492.6	1761.8
106	53.0	251.1		161.6	7.9	0.5	3057.2	3478.2
113	28.5	16.1		33.7		229.6	1472.9	1752.3
114	28.5	32.0		7.0	5.4	1.1	1013.0	1058.4
115	63.5	9.2		112.8	13.9		394.6	530.5
125	27.0	4.8	9.6	22.0	10.0	54.0	565.8	666.3
126	42.0	3.3	11.2	6.3	0.3	0.5	647.5	669.1
127	65.0	7.6		63.2			344.4	415.2
137	24.5	405.9		32.1	19.4	154.5	412.5	1024.5
138	41.5	620.5	14.3	23.7	1.8		789.9	1450.2
139	57.5	35.2		5.4	1.7	0.3	256.0	298.6
152	27.5	1743.5			8.7	0.9	9096.1	10849.2
153	26.5	8.1			1.0		533.0	542.1
154	42.5	3.2					53.2	56.3
155	62.5	1336.1		179.2			2959.1	4474.4
161	37.0	240.5	1.9				71.6	313.9
162	49.0	8.7					200.9	210.3
192	54.0	16.4		5.7			100.0	122.1
193	40.0	8.2		9.1	14.9		67.4	99.6
194	34.0	39.6		0.9	5.0	24.4	111.3	181.2
195	47.0	214.0			7.3	0.2	18.9	240.4
Mean	42.1	232.8	1.7	40.3	6.4	29.0	1126.6	1436.8
Std dev		455.8	4.2	57.5	8.5	63.5	1974.2	2378.9
%Catch		16.2	0.1	2.8	0.4	2.0	78.4	

B: Outer shelf (71-200 m).

Station	Gear depth	Carangids	Scombrids	Hairtails	Barracuda	Clupeids	Other	Total
107	112.5	2.5		31.5			195.2	229.2
108	145.0			43.2			109.4	152.7
116	86.0	15.4	7.6	208.9			90.8	322.8
118	165.0			1040.0			202.7	1242.7
128	71.0	34.8		28.4			367.1	430.3
129	95.0	36.5		89.8			256.2	382.4
130	116.0	2.0		9.3			327.7	339.1
131	138.0	5.2		4.8			302.7	312.7
140	72.0	77.3		8.9		0.7	262.0	348.8
142	106.0	3.1		27.1			143.5	173.7
143	165.5			49.0			1022.7	1071.7
148	115.0	48.5		31.4			518.4	598.3
149	87.5			173.7			589.7	763.3
150	70.5	3.2			0.6		179.7	183.4
159	116.5	6.0		44.0			283.8	333.8
160	87.0	1.0					567.4	568.4
163	120.0	7.3		45.6			37.3	90.3
169	111.0	4.8					174.4	179.2
170	86.5						167.5	167.5
171	80.5						382.3	382.3
172	119.0	54.1		0.9			351.5	406.5
173	151.5	2.2		17.6			91.0	110.8
179	190.0			17.4			430.0	447.4
180	147.5	0.3		4.1			237.5	241.8
181	113.0	82.1		42.2			253.4	377.7
182	90.0	0.7					31.6	32.3
183	115.5	1.5		95.4			37.3	134.2
184	124.5	10.2		28.6			35.4	74.1
189	109.5	21.3		34.5		0.5	211.1	267.5
190	96.0	22.8		64.0			100.4	187.2
191	80.0	64.0		162.1			311.3	537.4
196	71.5	108.2	5.3	93.4	9.5		68.7	285.2
197	120.0	12.7		9.9			204.5	227.1
198	107.0	0.4		181.4			26.7	208.6
199	91.0	0.4		14.4			46.0	60.8
Mean	110.6	18.0	0.4	74.3	0.3		246.2	339.2
Std dev		27.6	1.5	174.7	1.6	0.1	200.8	258.8
%Catch		5.3	0.1	21.9	0.1		72.6	

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	Gear depth	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africana</i>	Other	Total
101	315.0		142.9	8.4	4.2		112.5	267.9
102	217.5	30.6	87.1	63.0			1237.1	1417.8
109	411.0		132.6		6.3	371.9	193.0	703.7
110	529.0		2.7		5.8	251.4	210.8	470.7
111	704.0		111.2		9.7	212.3	352.1	685.3
112	308.5		131.0	1.0		50.5	175.4	358.0
119	229.5	52.9	22.9	14.5			870.2	960.5
120	453.0		131.2		14.3	386.3	87.3	619.2
121	536.0				17.1	175.0	343.3	535.4
122	603.5		11.1		9.6	187.0	196.4	404.1
123	700.0		0.7		7.2	172.0	612.8	792.7
124	703.0				14.2	409.5	3452.6	3876.3
132	427.5		32.4		2.4	244.7	219.0	498.4
133	619.0		7.7		5.7	316.2	262.7	592.2
134	540.5		3.8		3.9	307.6	185.6	500.9
135	635.0				5.1	300.7	189.7	495.6
136	737.0		21.4		3.1	267.7	729.0	1021.2
144	759.5		2.4		7.8	101.0	1145.0	1256.3
145	640.5				1.3	276.5	376.0	653.9
146	369.5		104.5	0.6	2.4	520.6	225.2	853.3
147	257.5		172.7	98.0			449.5	720.2
156	432.5		147.4		19.8	444.0	294.1	905.3
157	533.5		37.2		6.3	266.3	233.4	543.3
158	716.5				11.8	35.4	336.2	383.3
164	234.0	59.9		8.4			252.0	320.4
165	415.0		117.0		13.5	13.6	115.2	259.3
166	527.5		188.4		12.5	149.3	227.7	577.9
167	628.5				2.6	41.7	426.3	470.6
168	317.5		106.9	13.8			249.3	370.0
174	265.0	37.0	125.4	60.9			750.3	973.5
175	728.5		2.5		1.1	7.7	397.1	408.5
176	511.5		18.7		16.3	4.6	110.3	150.0
177	445.0		137.2		22.0		268.2	427.4
178	271.0	0.7	8.1	1.8			155.2	165.7
185	232.0	33.5	0.1	13.0			140.4	187.0
186	341.0		12.8	21.6			180.2	214.6
187	658.5		5.8		3.1	90.0	779.0	877.8
188	722.0				5.1		671.1	676.2
Mean	491.5	5.6	53.3	8.0	6.2	147.5	452.9	673.5
Std dev		15.3	62.9	20.8	6.2	156.9	574.0	609.4
%Catch		0.8	7.9	1.2	0.9	21.9	67.2	

ANNEX VII Instruments and fishing gear used

The Simrad EK-60/18, 38, 120 and 200kHz scientific sounder was run during the survey only for observation of fish and bottom conditions.

Standard sphere calibrations were carried out using 38.1 mm diameter tungsten carbide sphere for 18, 38, 120 and 200 kHz. The calibrations took place 18.03.2008, Baia dos Elefantes. The details of the settings of the 38kHz echo sounder were as follows:

Transceiver-2 menu (38 kHz)

Transducer depth	5.50 m
Absorbtion coeff.	8,7 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 meshsize in the codend with an innernet of 10 mm meshsize. 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. New doors are 'Thyborøn' combi type, 7.41 m², 1720 kg. These have been in used onboard since 19.02.08. During the present survey the door distance was kept nearly constant at about 50 m at all depths by the use of a 9.5 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 1985-2008.

	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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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	6	4	5	5
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
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
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
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
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	5	5	4	
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
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
600-700north	0	0	0	0	0	1	0	0	1	0	0	3	0	2	3	0	0	0	0	0	1	7	5	6	6	7	8	4	8	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
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