

## SURVEY OF THE FISH RESOURCES OF ANGOLA

**Cruise Report No 2/2014**

**Survey of the demersal resources**

7 March – 6 April 2014

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

**Instituto Nacional de Investigação Pesqueira  
INIP, Luanda  
Angola**

Bergen 2014



## **THE EAF-NANSEN PROJECT**

FAO started the implementation of the project “Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries (EAF-Nansen GCP/INT/003/NOR)” in December 2006 with funding from the Norwegian Agency for Development Cooperation (Norad). The EAF-Nansen project is a follow-up to earlier projects/programmes in a partnership involving FAO, Norad and the Institute of Marine Research (IMR), Bergen, Norway on assessment and management of marine fishery resources in developing countries. The project works in partnership with governments and also GEF-supported Large Marine Ecosystem (LME) projects and other projects that have the potential to contribute to some components of the EAF-Nansen project.

The EAF-Nansen project offers an opportunity to coastal countries in sub-Saharan Africa, working in partnership with the project, to receive technical support from FAO for the development of national and regional frameworks for the implementation of Ecosystem Approach to Fisheries management and to acquire additional knowledge on their marine ecosystems for their use in planning and monitoring. The project contributes to building the capacity of national fisheries management administrations in ecological risk assessment methods to identify critical management issues and in the preparation, operationalization and tracking the progress of implementation of fisheries management plans consistent with the ecosystem approach to fisheries.

## **LE PROJET EAF-NANSEN**

La FAO a initié la mise en oeuvre du projet "Renforcement de la base des connaissances pour mettre en œuvre une approche écosystémique des pêcheries marines dans les pays en développement (EAF-Nansen GCP/INT/003/NOR)" en décembre 2006. Le projet est financé par de l'Agence norvégienne de coopération pour le développement (Norad). Le projet EAF-Nansen fait suite aux précédents projets/ programmes dans le cadre du partenariat entre la FAO, Norad et l'Institut de recherche marine (IMR) de Bergen en Norvège, sur l'évaluation et l'aménagement des ressources halieutiques dans les pays en développement. Le projet est mis en oeuvre en partenariat avec les gouvernements et en collaboration avec les projets grands écosystèmes marins (GEM) soutenus par le Fonds pour l'Environnement Mondial (FEM) et d'autres projets régionaux qui ont le potentiel de contribuer à certains éléments du projet EAF-Nansen.

Le projet EAF-Nansen offre l'opportunité aux pays côtiers de l'Afrique subsaharienne partenaires de recevoir un appui technique de la FAO pour le développement de cadres nationaux et régionaux visant une approche écosystémique de l'aménagement des pêches et la possibilité d'acquérir des connaissances complémentaires sur leurs écosystèmes marins. Ces éléments seront utilisés pour la planification et le suivi des pêcheries et de leurs écosystèmes. Le projet contribue à renforcer les capacités des administrations nationales responsables de l'aménagement des pêches en introduisant des méthodes d'évaluation des risques écologiques pour identifier les questions d'aménagement d'importance majeure ainsi que la préparation, la mise en œuvre et le suivi des progrès de la mise en œuvre de plans d'aménagement des ressources marines conformes à l'approche écosystémique des pêches.

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/730/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 2014	(22 surveys)

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by

**Sigbjørn Mehl and Oddgeir Alvheim**  
Institute of Marine Research  
P.O. Box 1870 Nordnes  
N-5817 Bergen, NORWAY

**Virgílio Estevão and Marisa Macuéria**  
Instituto Nacional de Investigação Pesqueira  
Luanda, ANGOLA

**Bergen, 2014**

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## Executive summary

Since the late 1990 a demersal survey has been performed annually in February – April to map and describe the distribution, composition and abundance of the main demersal species. Special emphasis has been put on seabreams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), snappers (Lutjanidae), hakes (Merlucciidae), cephalopods and shrimps, including collection of biological data such as length, weight, sex, maturity stage and stomach content. In addition the general hydrographical conditions have been monitored by mapping temperature, salinity and oxygen. Water samples have been collected for analyzes of nutritions and phytoplankton, and zooplankton has been sampled along the hydrographic transects.

The coastal ocean of Angola is characterized by a semi-annual seasonal cycle, with two stratified periods, during February-March and in October-November. The principal upwelling season occurs in June-August while it is weak and less regular counterpart in December-January. 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 for the rivers.

The Angola coast has a great diversity of fish and invertebrate marine species which individually has relatively low biomass but together form an important fishery. Abundance trends within stocks of low biomass may show great variation from year to year due to low frequency of occurrence and large variability in catch rates that consequently can be observed as a high coefficient of variability (CV) connected to the biomass estimate. These low biomass estimates with individually large CVs may sometimes obscure the greater picture, and make it difficult to use them for management purposes.

The 2014 biomass estimates for the combined northern and central regions, i.e. Congo River – Benguela, are generally higher than last year. The combined estimate of important demersal species is about 15 % higher in 2014 than in 2013. This may be a year effect, which is known to occur in both acoustic and bottom trawl surveys in many areas. The increase in biomass estimates may also be signs of improved recruitment, for several species, i.e. some seabreams and hake, the mean length was lower in 2014 than in 2013. Compared to previous years, the 2014 combined demersal species biomass estimate was at about the average value for the ten last years.

In previous survey reports a concern about declining trends in the biomass of bycatch species in the shrimp fishery have been expressed. This trend is less pronounced in this year's survey result, and in some regions the commercially important shrimp species show weak signs of increased abundance and perhaps recovery.

The main pelagic species caught in the bottom trawl, horse mackerel and sardinellas, are schooling species and may be caught in great abundance, and may therefore obscure the overall tendency for the demersal species. In the northern and central regions, the biomass estimate of Cunene horse mackerel (*Trachurus trecae*) was 32 000 Tonnes, which is the highest estimate since 2003. The estimates have fluctuated due to the relatively low number of stations as well as the variability in the distribution pattern of this species.

## CHAPTER 1 INTRODUCTION

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### 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 Pesqueira (INIP) of Angola, and the responsible from the Institute of Marine Research (IMR), Norway, for the Angolan Demersal Programme, and were the following:

- To survey, map and describe the distribution, composition and abundance of the main demersal species, with special emphasis on seabreams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), hakes (Merlucciidae), cephalopods 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 such as length, weight, sex and maturity stage of *Dentex macrophthalmus*, *D. angolensis*, *Pagellus bellottii*, *Pseudolithus* spp., *Umbrina canariensis*, *Merluccius polli*, *M. capensis*, *Trachurus trecae*, *Brachydeuterus auritus*, *Penaeus notialis*, *P. keraturus*, *A. varidens*, *P. longirostris*, and *Chaceon maritae*.
- To collect the stomach contents and otoliths for some species such as *D. angolensis*, *D. macrophthalmus*, *P. bellottii*, *P. senegalensis*, *P. typus*, *U. canariensis*, *B. auritus*, *M. polli*, *M. capensis*, and *T. trecae*, for subsequent analyses in the INIP Lab.
- To monitor the general hydrographical conditions using thermosalinograph and CTD-sonde on trawl station and map the temperature, salinity and oxygen.

\*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.

## Participation

The scientific staff consisted of:

From INIP, Angola:

07.03-17.03: Virgílio Estevão (local cruise leader), Noemia Nganga, Teresa Hungulo, Euzébio dos Santos, Alberto Rodrigues, Florencio André, Fátima Delicado, Adélia Rodrigues & Margarida Napoleão.

17.03-06.04: Virgílio Estevão (local cruise leader), Adélia Rodrigues, Margarida Napoleão, Euzébio dos Santos, Francisco Almeida, Pedro Panzo, David Kissungo, Cesaltina Dias (to 25.03), Catarina Ruby & Marisa Macuéria.

From IMR, Norway: Sigbjørn Mehl, cruise leader (11.03-06.04), Magne Olsen (07.03-11.03), Oddgeir Alvheim (07.03-06.04), Tore Mørk (07.03-11.03), Jan Arne Vågenes (07.03-11.03), Jan Frode Wilhelmsen (11.03-06.04) & Håkon Matre Langøen (11.03-06.04)

## Narrative

R/V “Dr. Fridtjof Nansen” departed Luanda at 15:00 UTC the 7<sup>th</sup> March 2014, starting the sampling program the same evening with trawl and CTD stations. The 10<sup>th</sup> March at 06:00, the survey was interrupted to sail to Pointe Noire for change of crew. In the evening the 11<sup>th</sup> March, the vessel departed Pointe Noire and steamed southwards to restart the sampling south of the Congo River Mouth at 07:30 the next morning. The work continued towards south until the 16<sup>th</sup> March at 18:00, when the survey had to be interrupted again to sail to Luanda for change of personnel. Off Cabeça da Cobra at about 1000 m depth, one water sampling station was performed for salinity analyses, and on the way to Luanda a CTD transect was taken off Ambriz. The vessel departed Luanda in the afternoon the 18<sup>th</sup> March and finalised the sampling in the northern region at 21:00 the 20<sup>th</sup> March.

The survey of the central region started at midnight the 20<sup>th</sup> March. Two CTD transects were taken in the region, south of Cabo São Braz and off Lobito, with water sampling on the deepest station of the latter for salinity analyses. At 17:30 the 24<sup>th</sup> March the survey once more was interrupted to bring an ill person to Luanda. The coverage of the central region continued at 19:30 the next day, and was completed at 22:30 the 29<sup>th</sup> March. The survey of the southern region started in the morning 30<sup>th</sup> March and was completed at noon the 3<sup>rd</sup> April. Between Benguela and Tombua three additional trawl hauls were done. Due to rough weather in addition to the bad bottom conditions, only three hauls were done deeper than 200 m in the southern region. Two CTD transects were taken in the region, off Ponta Albina and Cunene, with water sampling on the deepest station of the former. The vessel arrived in Walvis Bay in the morning 4<sup>th</sup> April.

Five transects were carried out during the present survey with CTD and water sampling for salinity analyses. All five monitoring lines and nine out of eleven standard transects were done during the pelagic survey about one to six weeks earlier, with CTD, water and plankton sampling.



## CHAPTER 2 METHODS

### 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 80 square nautical miles (NM<sup>2</sup>). Figures 2.1-2.3 show the cruise tracks in the northern, central and southern regions, respectively, and the locations of bottom trawl and hydrographical stations.

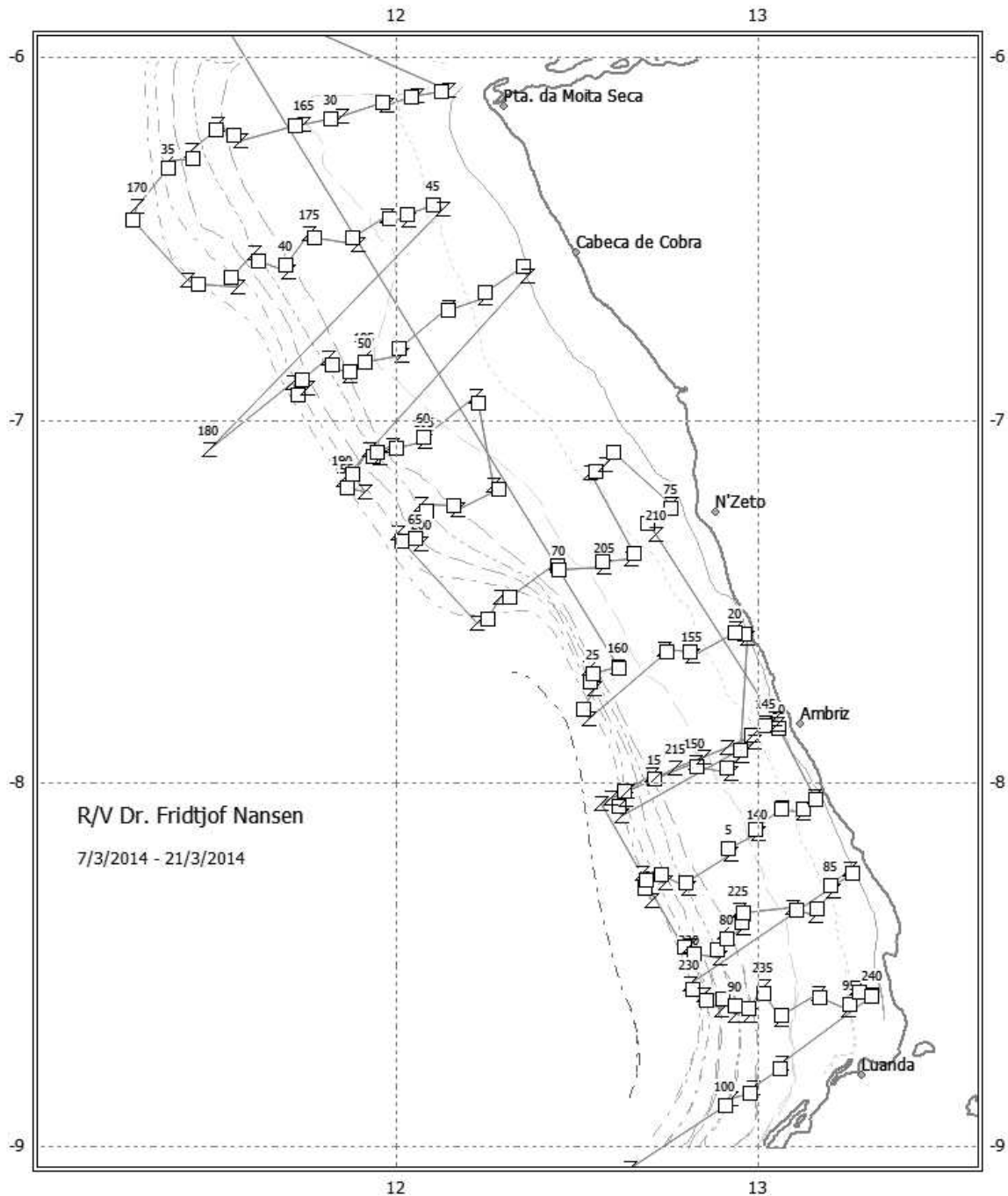
**Table 2.1** Survey design and effort for the 2014 demersal survey. Size of the survey area by depth stratum, allocation of trawl stations, proportion of stations relative to stratum size, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed, divided in to: northern region (Ponta das Palmerinhas to Congo River), central region (Benguela to Luanda) and southern region (Cunene to Tombua).

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				
<b>Ponta das Palmerinhas - Congo River</b>													
Area (NM <sup>2</sup> )	1379	1969	1940	601	550	437	409	408	702	<b>8395</b>			
# hauls (BT)	19	20	19	9	9	7	6	5	4	<b>98</b>	2	109	1555
% area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4	51			
% hauls	19.4	20.4	19.4	9.2	9.2	7.1	6.1	5.1	4.1				
<b>Benguela - Luanda</b>													
Area (NM <sup>2</sup> )	1068	1586	1439	407	372	343	346	268	357	<b>6186</b>			
# hauls (BT)	14	18	14	8	7	6	7	3	4	<b>81</b>	1	94	1241
% area	17.3	25.6	23.3	6.6	6.0	5.5	5.6	4.3	5.8	37			
% hauls	17.3	22.2	17.3	9.9	8.6	7.4	8.6	3.7	4.9				
<b>Cunene - Tombua</b>													
Area (NM <sup>2</sup> )	507	591	594	100	77	48	39			<b>1956</b>		41	480
# hauls (BT)	8	8	5	1	1	1				<b>24</b>			
% area	25.9	30.2	30.4	5.1	3.9	2.5	2.0	0.0	0.0	12			
% hauls	33.3	33.3	20.8	4.2	4.2	4.2	0.0	0.0	0.0				
<b>Grand total</b>													
Area (NM <sup>2</sup> )	2954	4146	3973	1108	999	828	794	676	1059	<b>16537</b>			
# hauls (BT)	41	46	38	18	17	14	13	8	8	<b>203</b>	3	244	3276
% area	17.9	25.1	24.0	6.7	6.0	5.0	4.8	4.1	6.4				
% hauls	20.2	22.7	18.7	8.9	8.4	6.9	6.4	3.9	3.9	<b>Total hauls: 206</b>			

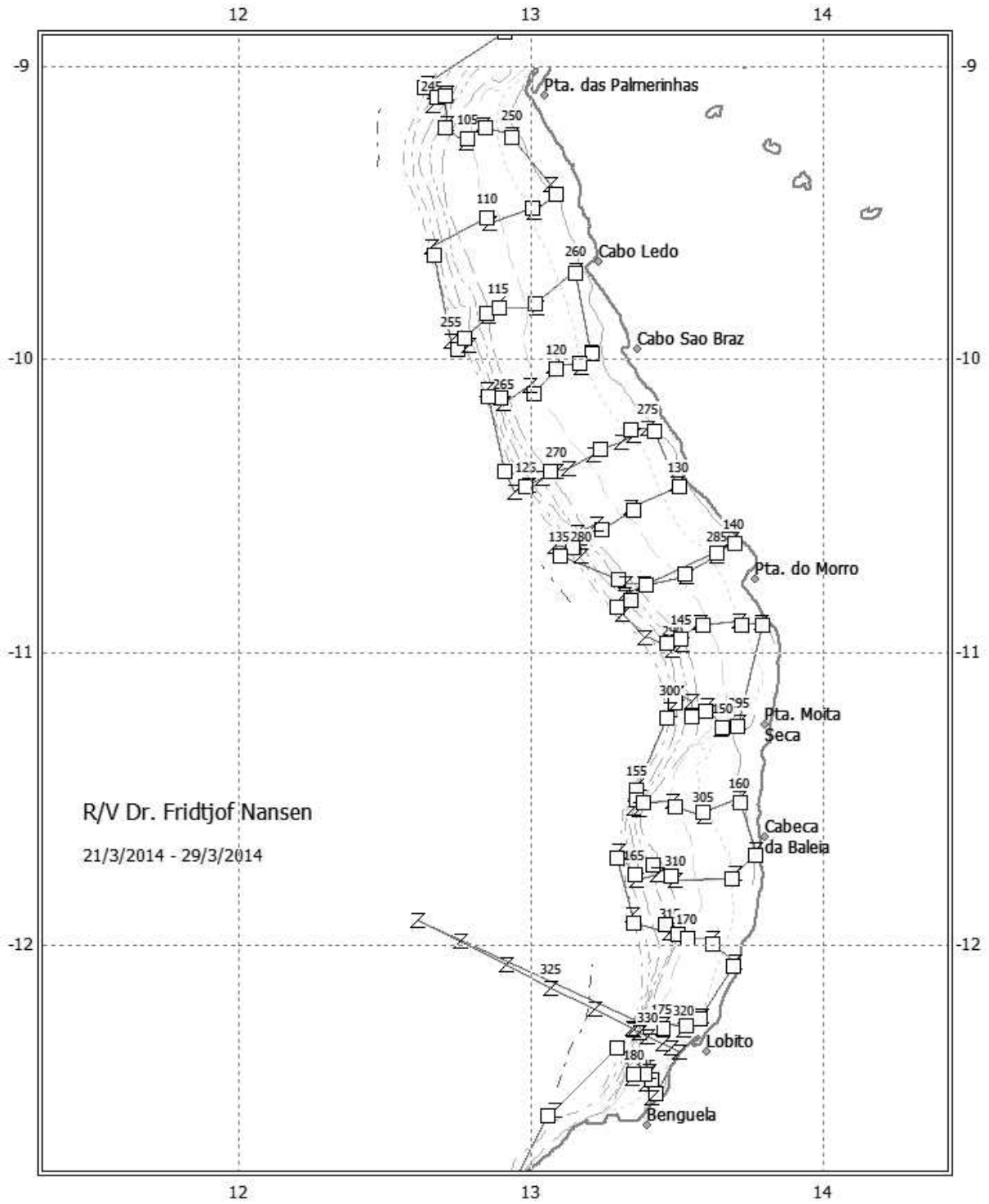
A stratified semi-random survey design was used with depth and area as stratifying variables. Trawling was carried out along transects perpendicular to the coast (Figures 2.1-2.3), and the allocation of trawl stations was proportional to stratum size. Trawling shallower than 300 m was mainly done during daytime and deeper than 300 m during dark hours. Sometimes, the planned design is slightly modified due to unsuitable bottom conditions or for non-accessible areas with oil exploitation in the northern region.

Based on a decision made in 2003 the trawl positions of the 2000 demersal survey should be the standard for future surveys in the southern region as the survey had a reasonable good

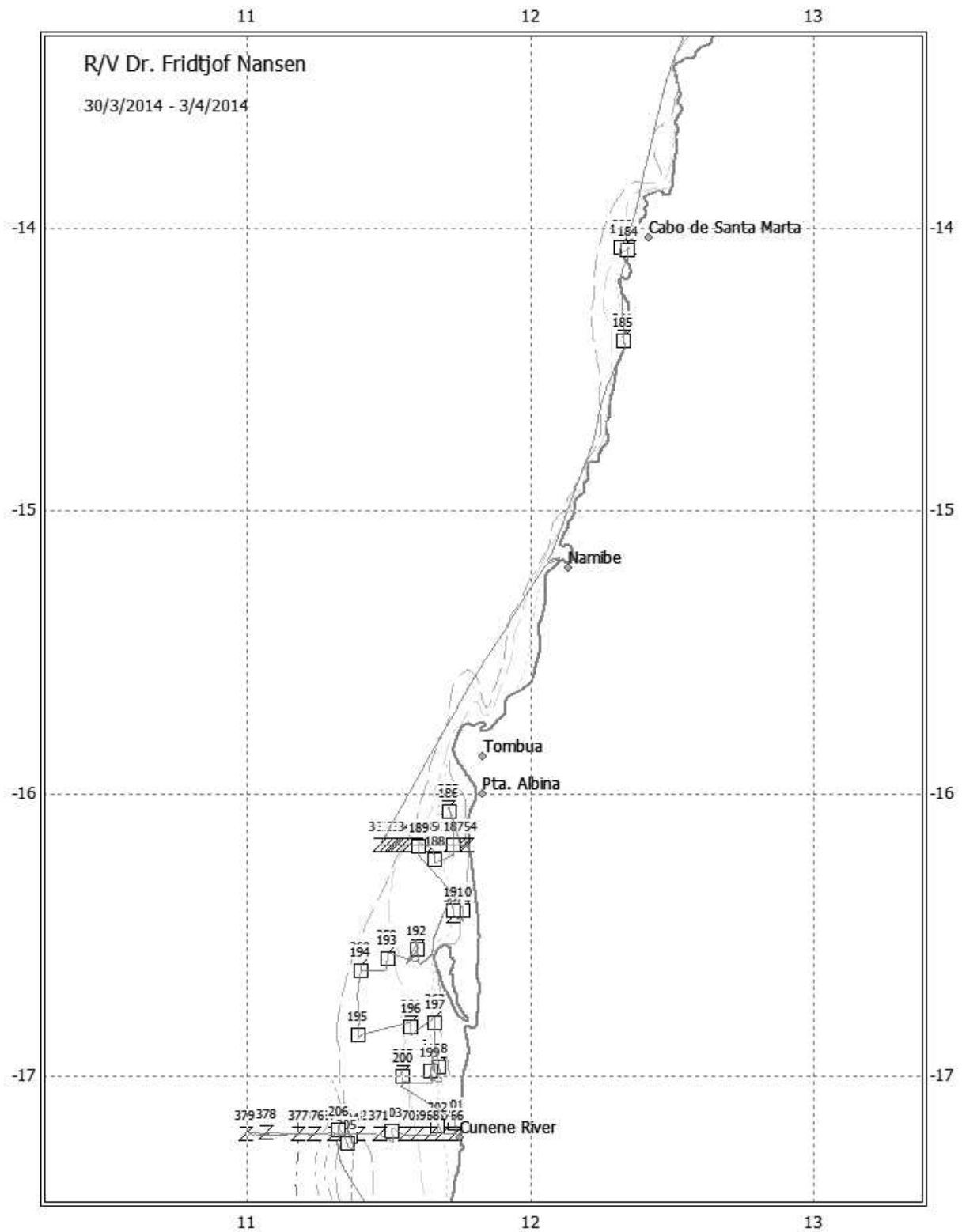
coverage. Furthermore, it was decided that the trawl positions of the 2002 demersal survey should be used as the standard for future surveys in the central and northern regions, as the survey had a good coverage of these regions. Therefore, the station positions and effort have been similar during the 2000 and 2003-2014 surveys in the southern region and during the 2002-2014 surveys in the central and northern regions (see Annex VIII). As done in 2013, a few additional trawl stations were performed in the area between Benguela and Tombua to obtain a time series of catch rates of demersal important species for future analyses. These stations are not included in the current biomass estimates.



**Figure 2.1** Angola north: Congo River - Ponta das Palmerinhas. Course track with trawl and hydrographical stations. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.



**Figure 2.2** Angola central: Ponta das Palmerinhas - Benguela. Course track with trawl and hydrographical stations. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.



**Figure 2.3** Angola south: Tombua - Cunene. Course track with trawl and hydrographical stations. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.

## **Meteorological and hydrographical sampling**

A Seabird 911+ CTD probe was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done with the customised Seabird Sea save software installed on a PC. Profile data were logged down to a few meters above the bottom. Attached to the CTD was also a Chelsea fluorometer of the type Mk III Aquatracka. It measures chlorophyll A in microgram per litre with an uncertainty of 3 %. Factory slope and offset was 0.00921 and -0.02.

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

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

The vessel-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments was used during the whole survey. In addition an ADCP mounted on the CTD-rig was used beyond about 150 m depth.

### **Fish 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 were of the “Thyborøn” combi type. The distance between the front parts of the wings was about 21 m during deployment at a speed of 3 NM h<sup>-1</sup>. 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 about 80 m, a 9 m long constraining rope was attached between the wires about 120 m in front of the trawl doors. This kept a constant distance between the doors of about 55 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.

Trawl duration was standardized to 30 minutes. The trawling start time is controlled by using a “SCANMAR” sensor 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 Nansis 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. The records of fishing stations are presented in Annex I. For some commercially important species, pooled length frequency distributions, in which individual samples are raised to total catch, are shown by area in Annex II. All biological data records were entered in the Nansis database and were quality controlled during the survey.

### *Acoustic sampling*

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

## Areas, depth strata and calculations

Table 2.1 shows the areas, in  $\text{NM}^2$ , for the southern region (Cunene - Tombua:  $\text{S}17^{\circ}15' - \text{S}16^{\circ}00'$ ), the central region (Benguela - Ponta das Palmerinhas:  $\text{S}12^{\circ}40' - \text{S}09^{\circ}00'$ ) and the northern region (Ponta das Palmerinhas - 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 stations are treated as representative for the relevant depth intervals where the species or group of species were caught.

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 difficult any comparison between surveys. Therefore, it was discussed and agreed upon by the responsible of the Demersal Programme of the Instituto Nacional de Investigação Pesqueira 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 3.0.2<sup>⊗</sup> 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.

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<sup>⊗</sup> 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>.

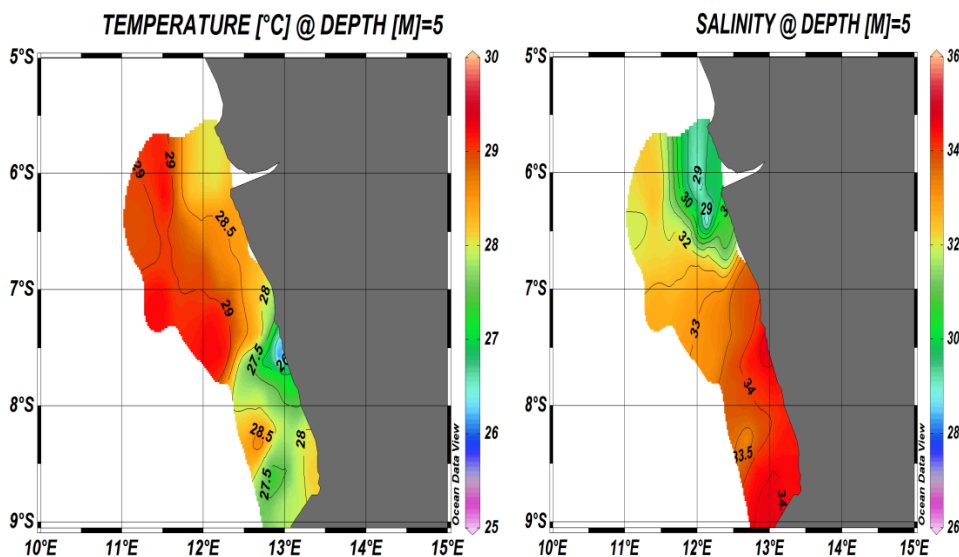
## CHAPTER 3 OCEANOGRAPHIC CONDITIONS

### Surface Distribution

Sea surface temperature (SST, 5m) and surface sea salinity (SSS, 5m) were continuously recorded during the cruise.

### Northern Region

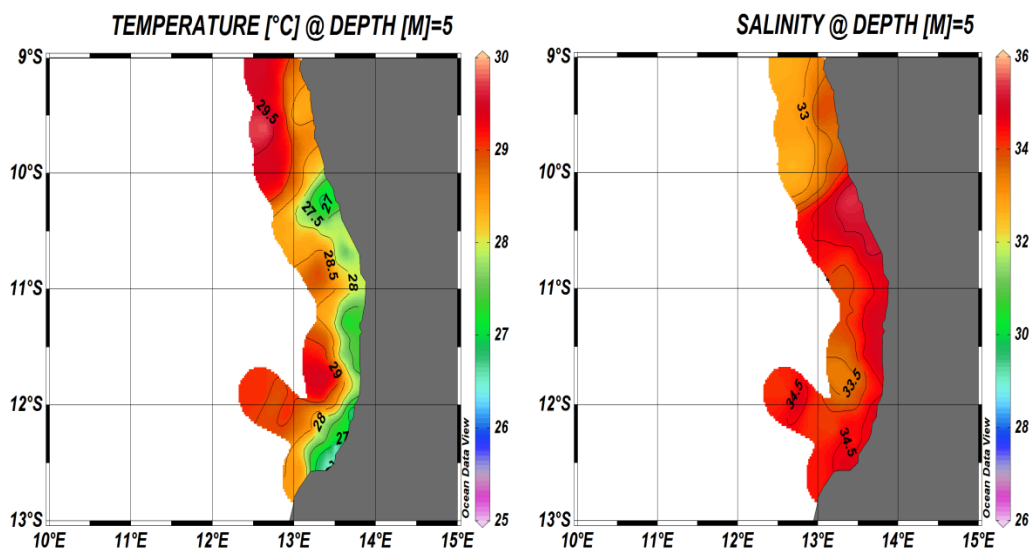
The temperature at surface varied between 26 °C and 29 °C and the salinity between 29 to 34.5 (Fig. 3.1). Compared with the pelagic survey conducted a month before, in this survey the salinity level around Congo River mouth was almost 1.5 times higher, ranging from 18 to 28. The salinity increased gradually southwards, reaching around 34.5 in the coastal zone. Cold and saline water were observed near the coast of Ambriz, seeming as an indication of the upwelling process.



**Figure 3.1** Distribution of water temperatures and salinity at 5m depth in the northern region.

### Central Region

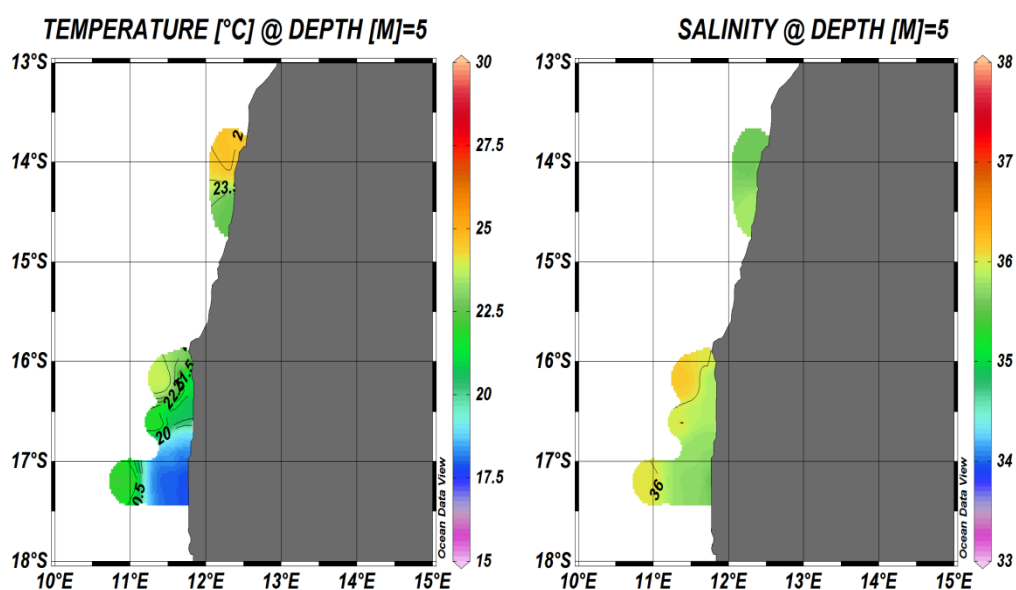
In this region (Fig. 3.2), the surface water temperature ranged from 27 °C inshore to 29.5 °C. The isotherms of 28 and 28.5 °C were the most representative recorded along the area between Cabo São Braz and Lobito. In the northern area of this region as well as between Quicombo and Lobito there were not observed a large variation in the salinity levels (33 and 33.4). The higher levels of salinity (34.5 35) were recorded near the coastal areas and moderately low values (33) between Palmeirinhas and Cabo São Braz, particularly offshore.



**Figure 3.2** Distribution of water temperatures and salinity at 5m depth in the Central region.

### Southern Region

The description of oceanographic conditions is constrained due to scarcity of CTD stations in this region that made it not possible to identify the geographical position of Angola - Benguela Front. In the southern region, the sea surface temperature ranged from 17 °C to 25 °C and the minimum (17 °C) was observed around Cunene River mouth (Fig.3.3), probably due to the occurrence of the phenomenon of intensive upwelling characterized by cold waters and high salinity contents (36), usually characteristic pattern of spatial distribution of these parameters in the upwelling systems. Another factor associated to the upwelling process is a gradual increase in temperature offshorewards. The highest value of salinity (36) was observed offshore between Ponta Albina and Cunene river mouth.

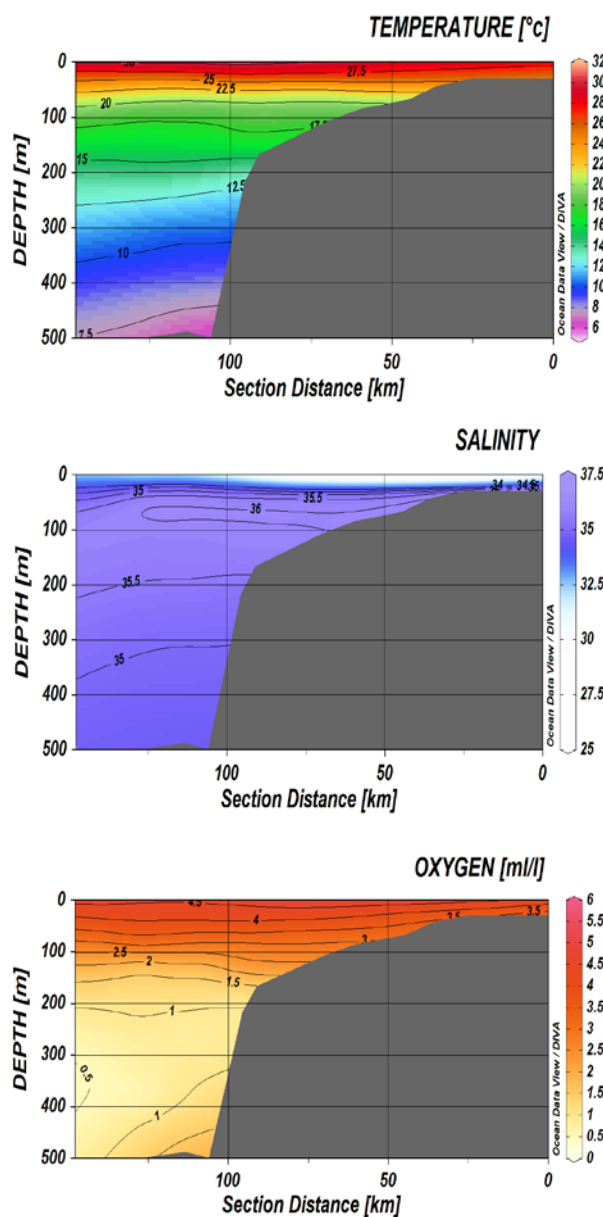


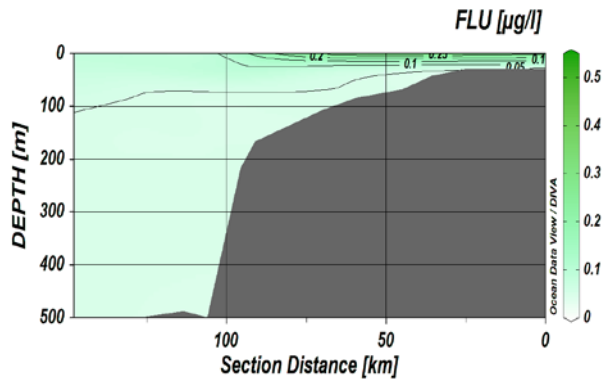
**Figure 3.3** Distribution of water temperatures and salinity at 5m depth in the southern region.



## Standards Sections

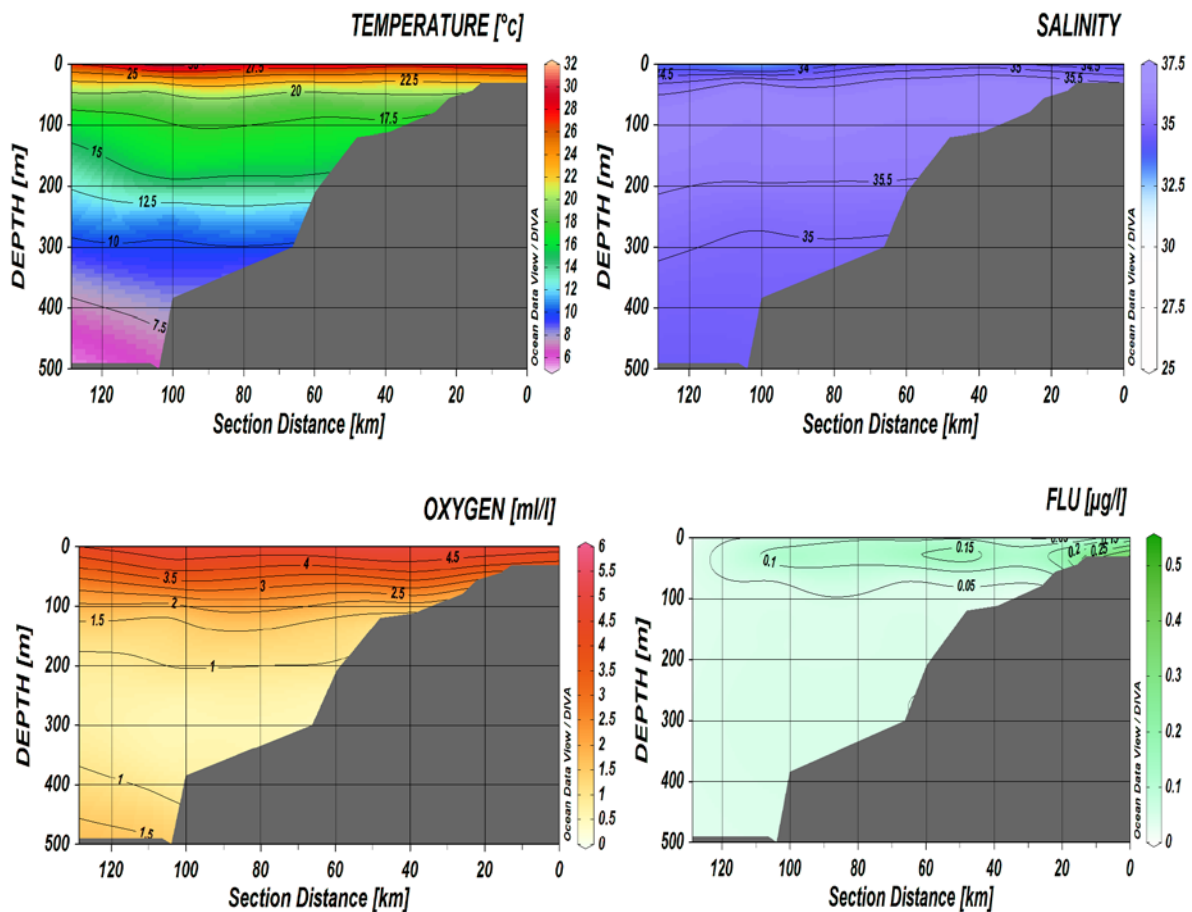
In the Congo River section (Fig. 3.4) the temperature remained at 25 °C up 30 m depth, which is characterized by a homogeneous layer probably due to the discharge of Congo River and stream drift. Below this layer up 250 m the temperature gradually varied from 22.5 to 12.5 °C and reached 10 °C deeper than 300 m. The salinity pattern was similar to the surface temperature, with presence of a homogeneous layer between 0 and 25 m and below this depth range seemed to occur a strong mixing process. This process is characterized by laminar bodies water mass which increases significantly even in the thermocline zone. Below this layer a gradual decrease in salinity occurred with depth. The oxygen content was stable (4 ml/l) throughout the surface layer and the minimum value of oxygen was observed below 130 m. The fluorescence showed that the major biological activity occurred along the coast with values around 0.1 - 0.25 µg/l.





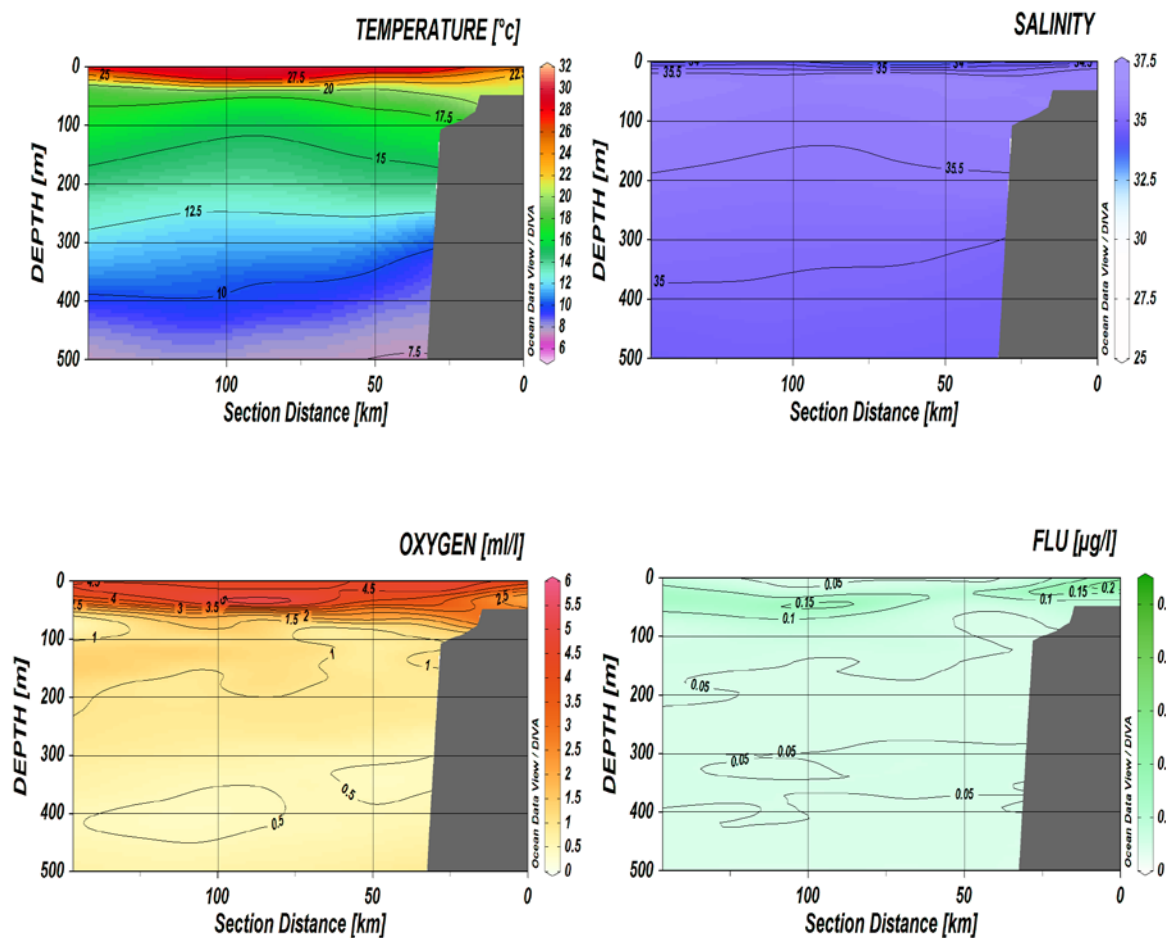
**Figure 3.4** Vertical sections of temperature, salinity, oxygen and fluorescence off Congo River.

In the Ponta das Palmerinhas section a homogeneous layer was observed. The thickness of this layer decrease from 0-50 to 0-25m. The surface temperature ranged from 18 to 25 °C reaching 10 °C close to 300 m. The salinity varied widely from 34 to 35.5 at the fullest extent of the continental shelf. However, offshore was observed a presence of less saline waters ( $\leq 34$ ) possibly originated by the Congo River outflow. The high oxygen contents (4 - 5ml/l) were observed in the surface layer (0-30 m) in the coastal zone, and gradually decreased towards offshore. The minimum oxygen zone was recorded between 350 and 400m and the highest fluorescence values (0.1 - 0.2 mg / l) occurred mainly in the subsurface layer inshore.



**Figure 3.5** Vertical sections of temperature, salinity, oxygen and fluorescence off Ponta das Palmerinhas.

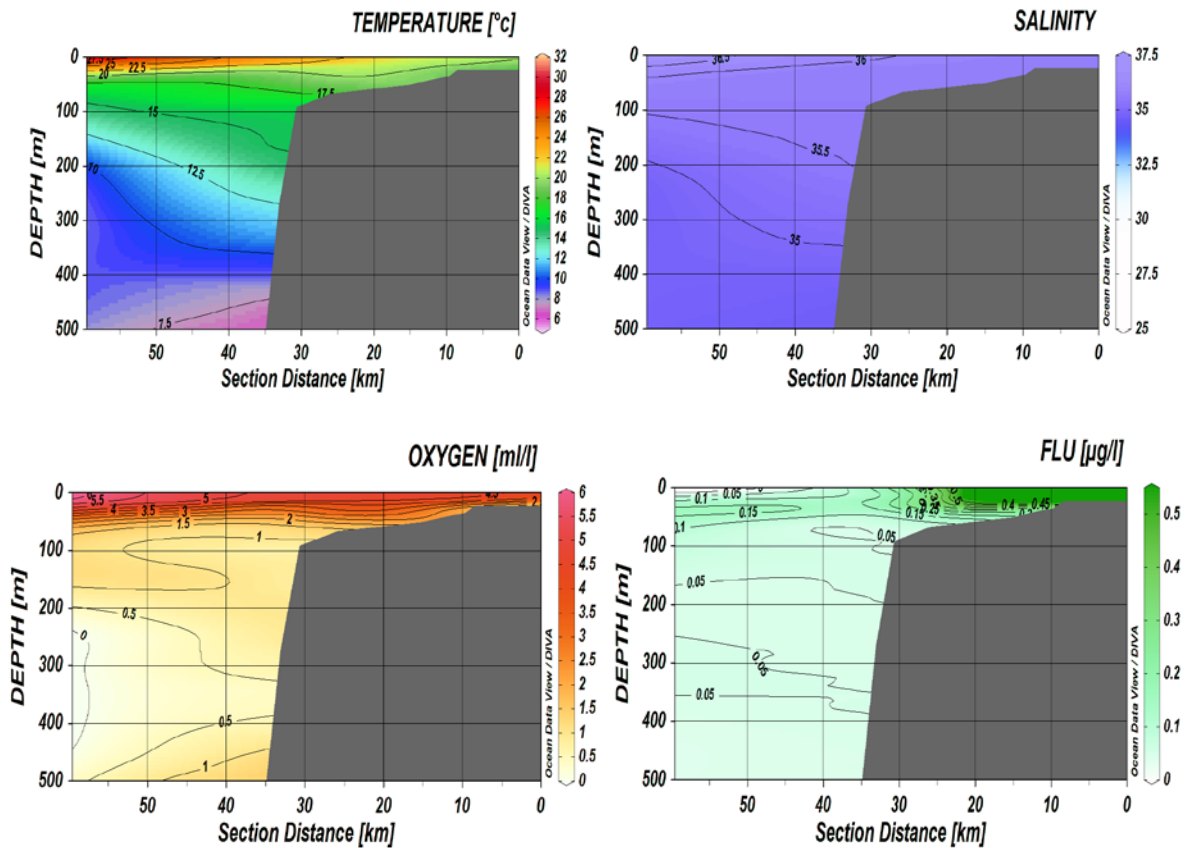
In the Lobito section (Fig. 3.6) the distribution pattern of the homogeneous layer presented a different scenario compared with the previous section. The thickness mean was much deeper along the coastal zone compare to the offshore. The sea surface temperature ranged from 19 to 25 °C in 0-50 m depths layer. Beneath this layer temperature decreased with values between 10 to 17.5 °C. Salinity showed similar pattern observed in the previous section with the lowest value ( $\leq 34$ ) identified offshore. The oxygen content varied between 3.5 and 5 ml/l in surface waters and the lowest value ( $<1$  ml/l) occurred in the layer between 200-400m. The biological activity characterized by the fluorescence with value around 0.3  $\mu\text{g/l}$  occurred in the surface layer inshore and the subsurface layer (20 - 60 m) was characterized by values around 0.1 - 0.05  $\mu\text{g/l}$ .



**Figure 3.6** Vertical sections of temperature, salinity, oxygen and fluorescence off Lobito.

In the Ponta Albina section (Fig.3.7), the variation of oceanographic parameters showed a pattern of uniform distribution in the surface layer and in particular offshore. The whole continental shelf was dominated by high values of temperature, salinity, oxygen and fluorescence. The sea surface temperature varied between 20 and 27.5 °C and decreased with depth up to 7.5 °C. The highest salinity (36.5) occurred offshore and very stratified in the water column. The oxygen content at surface ranged from 4 to 5 ml/l and the minimum value occurred in the same layer as the previous section (200 m). Noteworthy, an anoxic layer (0 ml/l) was identified offshore between 250m and 430 m. The peaks of fluorescence (1 - 0.75

$\mu\text{g/l}$ ) occurred in the surface layer along the entire continental shelf. In summary, the results showed a trend of occurrence of intense upwelling in this region.



**Figure 3.7** Vertical sections of temperature, salinity, oxygen and fluorescence off Ponta Albina.

In general, as observed in the previous section, the vertical distribution of temperature, salinity, oxygen and fluorescence in the Cunene River section (Fig. 3.8) showed high values at surface layer. However, in this section the variations in salinity and fluorescence were relatively higher compare with the previous section, while the temperature and oxygen were lower. It is also noted the sinking of warm water mass and well oxygenated with saline water and major biological activity. Below 200 m depth predominated low temperatures with value around  $12.5\text{ }^{\circ}\text{C}$ . Sea surface Salinity ranged from 35.75 to 36 being the highest salinity recorded offshore. High oxygen contents (4 - 5 ml / l) occurred offshore and inshore have been reported low values (3 - 1ml/l), probably due to occurrence of upwelling process. The fluorescence showed that the main biological activity was recorded in the surface layer (up to 20 m depth) offshore with values about 0.5 - 0.25  $\mu\text{g/l}$ .

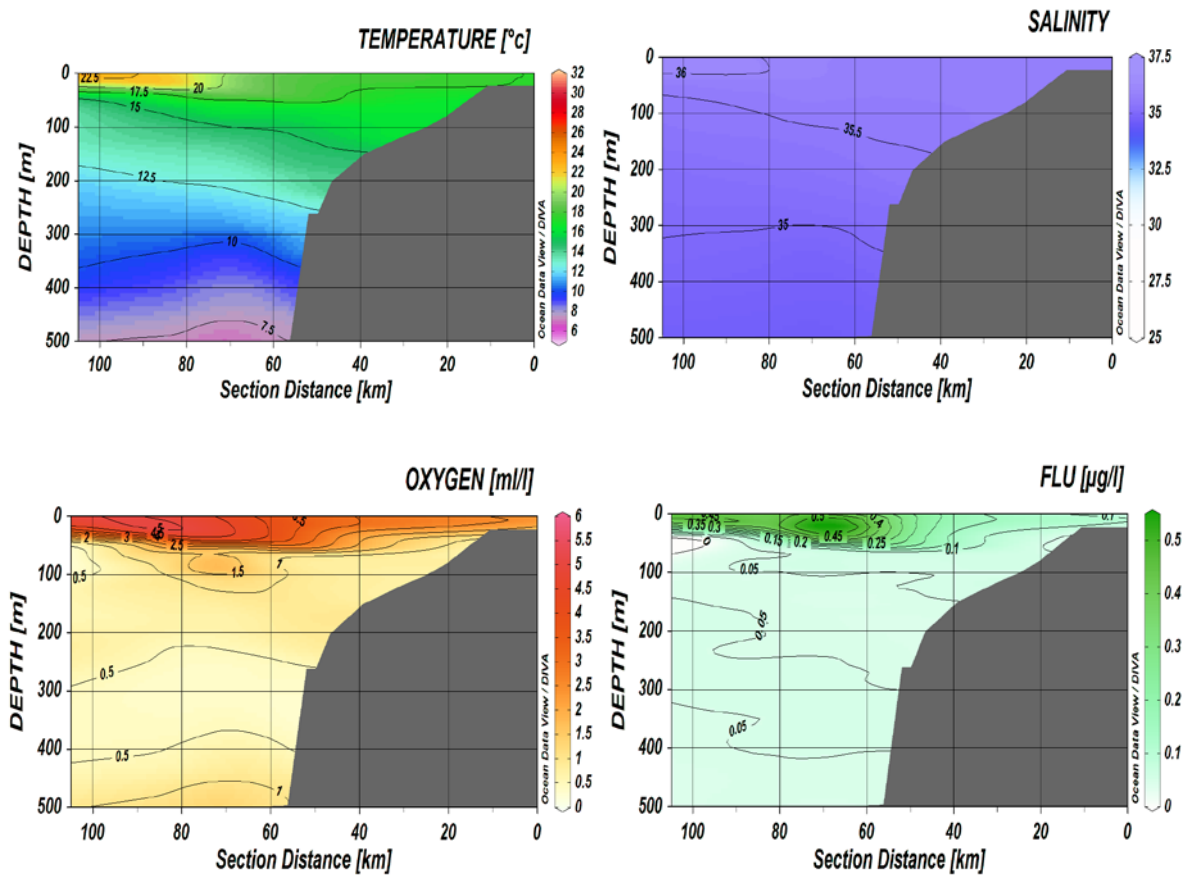


Figure 3.8 Vertical sections of temperature, salinity, oxygen and fluorescence off Cunene River.

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

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

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

### Congo River - Ponta das Palmerinhas shelf

The survey covered the northern region of Angolan waters from Ponta das Palmerinhas to Mouth of Congo River. The area north of Congo River is inaccessible to fisheries research surveys due to the restricted oil exploitation area. During some of the previous surveys, this area (Cabinda) has been covered, but to make plausible comparisons the biomass estimates in Table 4.1 only include trawl stations south of Congo River. A total of 58 successful swept-area trawl stations were accomplished on the shelf area in 2014 (Table 2.1).

The total average catch per hour on the inner shelf was 967 kg/h and 842 kg/h in the outer shelf (Annex VI). The demersal group had an average catch rate of 567 kg/h contributing 58% to the total average catch, while cephalopods, shrimps and sharks contributed less than 1% on the inner shelf. The pelagic group had an average catch rate of 250 kg/h (25 %), dominated by a few hauls with large catches of carangids (*Trachurus trecae*).

On the outer shelf, the demersal group contributed 42 % to the mean catch rate, while the pelagic group contributed 30 %. Shrimps, sharks and cephalopods contributed less than 2 % altogether.

Seabreams were caught in most stations on the inner and had a mean catch rate of 83 kg/h (9 % of the total) on the inner shelf. Grunts (except *Brachydeuterus auritus*, big eye grunt) were also caught in most stations on the inner shelf with an average catch rate of 26 kg/h, contributing 3 % to the total. Bigeye grunt was the dominating species on the inner shelf with an average catch rate of about 440 kg/h. Croakers were caught in a low average of 10 kg/h or 1.0 % of the total on the inner shelf, groupers had an even lower mean catch rate of 5 kg/h (less than 1%), while snappers were only caught on one station.

Seabreams were frequently caught in all stations on the outer shelf with an average catch rate of 137 kg/h (16 %). *Dentex angolensis* was the most abundant seabream. Croakers were more abundant on the outer shelf than on the inner shelf with a mean catch rate of 22 kg/h (2.6 %) and canary drum (*Umbrina canariensis*) was the dominating species of this group. Grunts

(except big eye grunt) were caught less frequently than on the inner shelf with the average catch rate of 1 kg/h. Bigeye grunt had an average catch rate of about 170 kg/h (20 %) on the outer shelf. Groupers were caught in few stations with low average catch rate (2 kg/h) while snappers were not found on the outer shelf.

The most common pelagic groups caught on the inner shelf were carangids with 159 kg/h, contributing 16 % to the total average catch rate. *Chloroscombrus chrysurus* was the main species, followed by *Trachurus trecae*. Barracudas were frequently caught with an average catch rate of 11 kg/h (1.2 %), while clupeoids were encountered less frequently with a mean catch rate of 57 kg/h (6 %). Hairtails and scombrids had very low average catch rates of 3.2 and 1.2 kg/h, respectively.

Also on the outer shelf carangids was the most important pelagic group with a mean catch rate of 217 kg/h (26 %), and *T. trecae* was the dominating species. Hairtails had a mean catch rate of 30 kg/h, while barracudas, clupeoids and scombrids were much less abundant, contributing less than 1 %.

### **Biomass estimates**

Table 4.1 shows swept -area biomass estimates from 1985 to 2014 for the commercial species and fish groups found on the shelf off northern Angola. The biomass estimates were calculated by stratifying by depth (20-49 m, 50-99 m and 100-199 m). 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 4.1 have a high coefficient of variations (CV) indicating that the trends in the time series should be interpreted with care.

The biomass estimate of *T. trecae* was 24 600 Tonnes, which is the highest estimate since 1997, when 37 000 Tonnes was estimated. From 1999 to 2013 the estimates were below 10 000 Tonnes.

The biomass estimate of *Merluccius polli* was 400 T, which is the highest estimate since 1992.

The biomass estimate of seabreams in 2014 was 19 300 Tonnes, more than 60 % higher than the 2012 and 2013 estimates and one of the highest in the time series. As usual in previous years, *D. angolensis* was the dominant seabream species on the northern shelf, with 41 % of the combined seabream biomass.

The estimated biomass of croakers in 2014 was only 2 600 Tonnes, a large reduction compared to the record high estimate of 12 600 Tonnes in 2013. *U. canariensis* was the most common croaker found and contributed more than 50 % to the total estimate of this group.

The biomass estimate of grunts (*Pomadasys incisus*, *P. jubelini*, *P. rogeri* and *P. peroteti*) was 1 800 Tonnes, about the double of the 2013 estimate but one of the lowest in the ten last years.

As in previous years, *Epinephelus aeneus* was the most common grouper found on the inner shelf, and the grouper biomass estimate for 2014 was about 400 Tonnes. This estimate is at

about the average of the time series since 2000, but lower than earlier estimates. Groupers are coastal dwellers and prefer rocky shore and their distribution is not well covered. Therefore the biomass estimates of this species group may not adequately reflect the state of the stock.

Snappers are rarely caught as they are also rocky dwellers and often unavailable, hence the biomass estimates of snappers may not adequately reflect the state of the stock. The estimate for this year was about 200 Tonnes, the highest since 2005.

The biomass estimate of *Parapenaeus longirostris* in 2014 was 200 Tonnes, higher than the three previous estimates, but only one third of the 2010 estimate.

The 2014 biomass estimate of Sepiidae was 700 Tonnes, much higher than the 2013 estimate and at about the average of the last fifteen years.

The Ommastrephidae biomass estimate was about 500 Tonnes, more than three times higher than in 2013 and the highest since 2002. The annual biomass estimates vary and no clear trends in the abundance of the group can be seen in the time series.

The biomass estimate of sharks in 2014 was about 100 Tonnes, similar to the 2012 estimate but one of the lowest in the time series.

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

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	9 (1.65)	4,496 (1.11)	302 (0.79)	10,463 (1.25)	498 (0.93)	364 (1.16)	9,986 (0.92)	44 (1.96)
1985.2	0	3,324 (1.17)	139 (1.88)	694 (0.57)	451 (0.64)	3,907 (1.91)	3,740 (1.04)	30 (1.64)
1985.3	3,459 (1.65)	16,486 (1.20)	1,448 (1.38)	2,046 (0.67)	870 (1.23)	205 (1.94)	17,742 (1.09)	146 (1.30)
1985.4	7,415 (1.65)	36,044 (1.14)	107 (1.37)	436 (0.72)	78 (1.55)	483 (1.15)	42,506 (1.02)	88 (1.26)
1986.1	56 (1.64)	13,438 (0.81)	1,445 (0.90)	2,853 (0.87)	496 (0.76)	2,053 (0.73)	17,950 (0.62)	30 (1.96)
1986.2	290 (1.21)	8,053 (0.37)	486 (0.72)	1,179 (0.38)	825 (0.56)	1,365 (0.67)	10,364 (0.32)	210 (0.97)
1989.1	62 (1.46)	12,681 (0.90)	92 (1.08)	931 (0.53)	497 (0.97)	1,578 (1.87)	13,264 (0.86)	97 (1.18)
1989.2	250 (1.65)	11,535 (0.66)	509 (0.61)	549 (0.38)	729 (0.85)	1,924 (0.53)	13,966 (0.57)	220 (0.98)
1989.3	1,029 (1.62)	39,959 (0.58)	256 (1.04)	1,715 (0.90)	15,984 (1.10)	5,043 (0.73)	46,704 (0.59)	208 (0.59)
1991.1	0	21,484 (0.57)	381 (1.69)	935 (0.37)	705 (0.67)	1,841 (0.96)	43,605 (0.68)	96 (1.36)
1991.2	312 (1.14)	14,727 (0.71)	2,554 (1.79)	4,225 (0.60)	107 (0.82)	55 (0.78)	14,928 (0.70)	318 (0.74)
1992	1,304 (1.04)	15,520 (0.65)	79 (1.19)	3,114 (0.38)	298 (1.10)	8 (1.96)	17,942 (0.59)	158 (0.87)
1994	51 (1.21)	14,309 (0.81)	478 (1.40)	3,643 (0.48)	52 (1.09)	184 (1.96)	21,225 (0.62)	337 (0.87)
1995.1	127 (1.17)	305 (0.80)	951 (0.98)	451 (0.40)	679 (0.64)	1,369 (0.79)	7,078 (0.69)	181 (0.81)
1996	0	32,155 (0.54)	347 (0.64)	2,203 (0.33)	256 (0.67)	782 (1.62)	33,700 (0.51)	137 (1.14)
1997.1	25 (1.50)	37,094 (0.51)	474 (0.89)	6,218 (0.50)	758 (0.67)	6,391 (1.14)	130,055 (0.87)	288 (1.18)
1999	6 (1.17)	4,106 (0.47)	326 (0.96)	1,202 (0.35)	1,297 (0.54)	6,392 (0.60)	16,570 (0.54)	36 (1.65)
2000	12 (1.65)	6,583 (0.56)	150 (0.92)	609 (0.65)	3,302 (1.70)	619 (1.54)	22,483 (0.88)	69 (1.20)
2001	6 (1.65)	5,502 (0.87)	212 (0.80)	866 (0.88)	391 (0.74)	517 (0.71)	9,560 (0.71)	37 (0.93)
2002	0	9,765 (0.52)	52 (0.52)	956 (0.51)	178 (0.64)	1,442 (0.57)	13,125 (0.41)	75 (0.61)
2003	0	9,766 (0.53)	497 (0.81)	481 (0.57)	243 (0.51)	2,816 (0.60)	28,286 (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)
2009	0 NA	4,412 (0.36)	108 (0.86)	1,010 (0.27)	381 (0.80)	2,961 (1.27)	9,792 (0.73)	100 (0.88)
2010	26 (1.65)	2,073 (0.59)	638 (1.24)	906 (0.35)	316 (0.43)	1,818 (1.69)	5,966 (0.40)	85 (1.08)
2011	0 NA	4,108 (0.91)	106 (0.69)	970 (0.26)	510 (0.55)	3,639 (0.78)	10,792 (0.66)	76 (0.92)
2012	0 NA	7,164 (0.51)	71 (1.09)	2,484 (0.45)	97 (0.58)	39,588 (1.65)	13,824 (0.42)	52 (1.17)
2013	55 (1.13)	2,050 (0.61)	104 (0.67)	465 (0.27)	345 (0.47)	1,452 (1.66)	14,075 (0.81)	6 (1.96)
2014	402 (1.62)	24,612 (0.50)	332 (0.72)	1,542 (0.29)	87 (0.92)	3,867 (0.79)	31,239 (0.43)	302 (0.55)



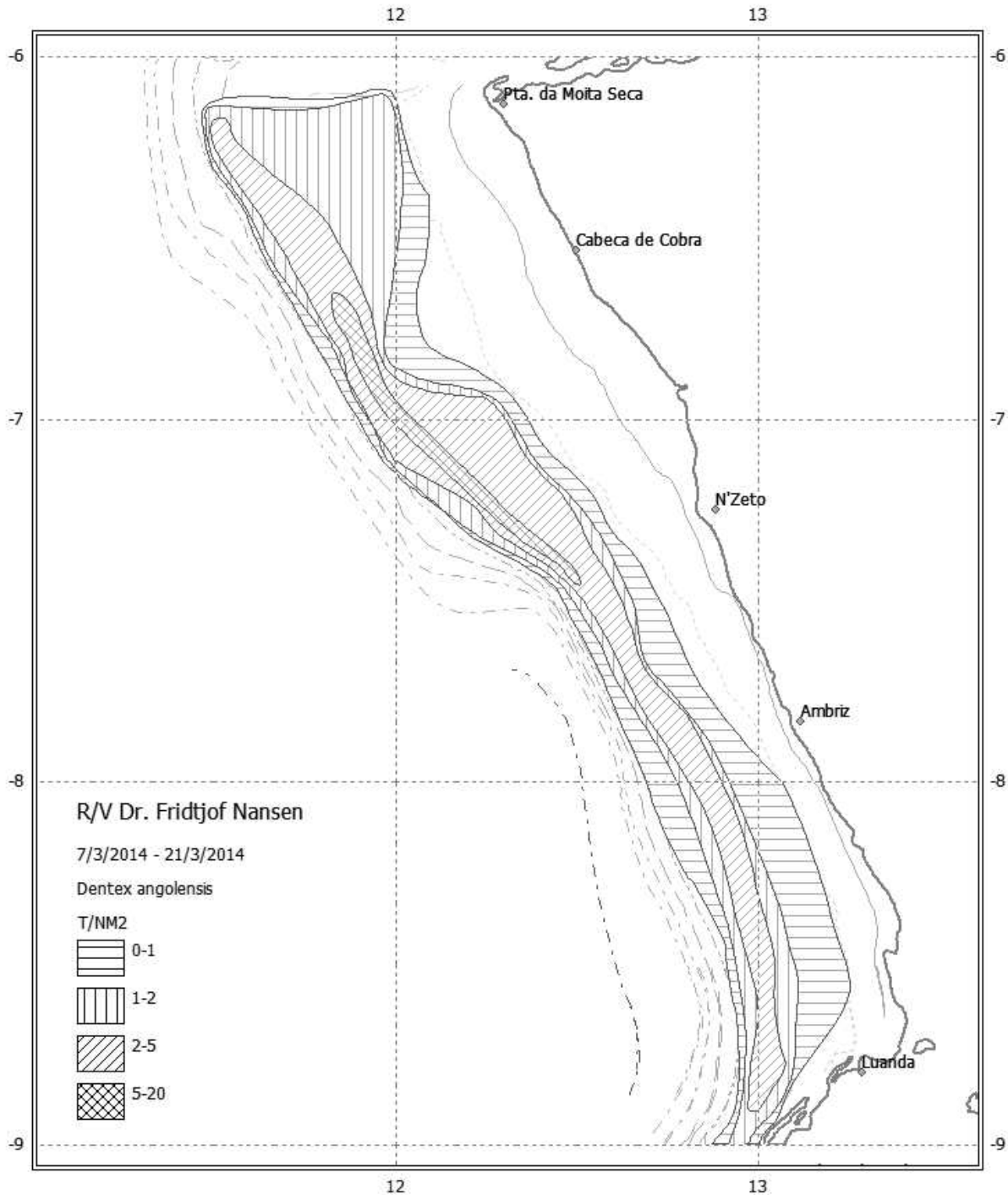
**Table 4.1** Continue

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)	15,714 (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	6,716 (0.56)	2,344 (1.34)	142 (1.96)	334 (0.68)	1,375 (0.60)	8,078 (0.62)	11,346 (0.33)	62 (1.42)
2004	4,668 (0.47)	1,455 (1.15)	37 (1.87)	502 (0.63)	3,316 (0.86)	5,545 (0.74)	11,924 (0.28)	6 (1.28)
2005	5,632 (0.54)	705 (1.35)	278 (1.27)	568 (0.40)	5,754 (0.96)	7,949 (0.59)	18,282 (0.25)	5 (0.87)
2006	11,299 (0.39)	1,570 (0.61)	16 (1.82)	372 (0.71)	2,839 (0.77)	4,087 (0.57)	10,872 (0.25)	176 (1.42)
2007	9,102 (0.58)	1,587 (1.16)	83 (1.35)	460 (0.47)	7,966 (1.40)	3,901 (0.58)	12,758 (0.25)	135 (1.21)
2008	10,986 (0.53)	428 (0.51)	79 (1.96)	614 (0.54)	1,485 (0.69)	8,771 (0.67)	12,833 (0.28)	40 (0.89)
2009	7,272 (0.64)	1,591 (0.87)	168 (1.34)	586 (0.55)	3,209 (0.92)	3,936 (0.59)	9,974 (0.36)	84 (1.07)
2010	2,984 (0.46)	852 (0.95)	0 NA	358 (0.66)	3,197 (0.83)	5,518 (0.62)	13,161 (0.23)	596 (1.31)
2011	4,827 (0.47)	2,919 (0.81)	78 (1.96)	261 (0.84)	6,039 (0.54)	7,243 (0.71)	9,832 (0.20)	11 (0.94)
2012	1,805 (0.71)	954 (1.09)	8 (1.96)	258 (0.61)	5,022 (0.90)	4,703 (0.63)	11,479 (0.27)	42 (1.56)
2013	2,087 (0.42)	2,647 (1.05)	0 NA	134 (0.95)	934 (0.56)	12,598 (1.20)	11,663 (0.26)	36 (1.22)
2014	3,179 (1.03)	743 (0.71)	222 (1.96)	437 (0.72)	1,804 (0.61)	2,635 (0.60)	19,302 (0.27)	196 (1.10)

Survey	Ommastrephidae	Sepiidae	D.macrophthalmus	D.angolensis	U.canariensis	B.auritus
1985.1	10,273 (1.27)	13	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	1,847 (1.26)	808 (0.72)	2,058 (0.56)	3,814 (0.54)	279 (0.74)	95,679 (0.32)
1986.2	0	734 (0.56)	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)	229 (0.73)	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)	268 (0.46)	197 (1.11)	2,143 (0.38)	342 (1.15)	12,801 (0.74)
1996	589 (0.27)	929 (0.56)	2,169 (0.80)	4,303 (0.40)	2,073 (1.15)	26,804 (1.21)
1997.1	1,017 (0.71)	5,148 (0.59)	324 (0.78)	2,837 (0.41)	1,161 (0.79)	39,107 (0.51)
1999	391 (0.45)	411 (0.41)	146 (0.76)	2,881 (0.19)	3,582 (1.45)	37,727 (0.43)
2000	214 (0.83)	344 (1.01)	65 (0.86)	4,053 (0.77)	1,271 (1.08)	23,205 (0.70)
2001	176 (0.51)	679 (1.13)	417 (0.85)	1,228 (0.39)	188 (1.36)	13,842 (0.59)
2002	660 (0.72)	97 (0.47)	102 (1.18)	2,089 (0.52)	835 (0.83)	15,791 (0.65)
2003	115 (0.80)	255 (1.05)	16 (0.80)	3,491 (0.28)	3,239 (1.27)	66,410 (0.88)
2004	344 (0.42)	494 (0.42)	79 (1.12)	5,214 (0.39)	1,236 (0.53)	24,512 (1.00)
2005	146 (0.33)	1,307 (0.37)	136 (0.84)	6,727 (0.17)	3,640 (0.76)	52,045 (1.02)
2006	183 (0.74)	418 (0.41)	7 (1.34)	4,630 (0.20)	2,151 (0.93)	61,138 (0.66)
2007	42 (0.57)	429 (0.33)	11 (1.38)	5,980 (0.24)	622 (0.73)	12,523 (0.61)
2008	226 (0.50)	610 (0.57)	0 NA	4,809 (0.28)	3,171 (0.64)	52,481 (0.95)
2009	163 (0.41)	435 (0.37)	8 (1.31)	4,418 (0.28)	985 (0.57)	23,822 (1.20)
2010	137 (0.40)	538 (0.57)	20 (1.11)	7,293 (0.24)	3,389 (0.86)	16,682 (0.73)
2011	44 (0.30)	746 (0.31)	1 (1.65)	5,888 (0.22)	1,975 (0.89)	25,797 (0.85)
2012	212 (0.69)	2,000 (0.56)	46 (1.65)	5,571 (0.32)	1,474 (0.88)	32,819 (0.77)
2013	149 (0.30)	129 (0.63)	5 (0.96)	7,008 (0.36)	11,640 (1.30)	27,898 (0.77)
2014	489 (0.52)	737 (0.40)	0 NA	8,045 (0.31)	1,400 (0.69)	44,915 (0.51)

## Distribution

*D. angolensis* was distributed along the whole northern shelf (Figure 4.1). The densities were  $<5$  tonnes/NM<sup>2</sup> in most of the area of distribution, with a narrow belt with densities from 5 to 20 tonnes/NM<sup>2</sup> on the outer shelf from Cabeça de Cobra to N'Zeto.



**Figure 4.1** Distribution of *Dentex angolensis* in the northern region, Ponta das Palmerinhas - Congo River. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.

## **Ponta das Palmerinhas - Benguela shelf**

The central region of Angolan waters covers from Ponta das Palmerinhas to Benguela. A total of 46 successful swept-area trawl stations were accomplished in the region (Table 2.1).

The average catch rates in the central region were 640 kg/h on the inner shelf and 2036 kg/h on the outer shelf (Annex VI), the latter quite high compared to last year. On the inner shelf, the demersal group contributed with 45% to the mean total catch rate, cephalopods with 1 %, while shrimps and sharks contributed with less than 1%. The pelagic group contributed with 29 % to the overall catch.

Demersal fishes were more abundant than pelagic fishes on inner shelf due to the big eye grunt (*Brachydeuterus auritus*) which represented about 18 % of the average total catch rate and contributed more than 50 % to the total catch of commercially important demersal fishes. Seabreams were caught in most stations on the inner shelf with and contributed 7 % (44 kg /h) to the mean catch rate. The most common Seabreams on the inner shelf were *Pagellus bellottii*, *Dentex barnardi* and *D. angolensis*.

Croakers were caught with an average catch rate of 40 kg/h on the inner shelf and most of the catches consisted of canary drum (*Umbrina canariensis*). The grunts (*Pomadasyss* spp.) were caught with a relatively high average catch rate of 77 kg/h due to a big catch of *P. jubelini*. Groupers had an average catch rate of 4 kg/h. Snappers were not found on the inner shelf.

In the pelagic fish group on the inner shelf, clupeoids (*Sardinella aurita*) had a mean catch rate of 78 kg/h followed by carangids with 66 kg/h, *Trachurus trecae* being the most important species. Hairtails and Barracuda had average catch rates of 37 kg/h and 3 kg/h, respectively, while Scombrids were very scarce.

On the outer shelf, the demersal group had a mean catch rates of 347 kg/h or 17 % of the total catch, followed by the pelagic group with 235 kg/h (11 %). Cephalopods increased its mean catch rate (29 kg/h) compared to the inner shelf. Like on the inner shelf, shrimps and sharks had low catch rates and contributed with less than 1%.

Seabreams were caught in all stations and dominated among commercially important demersal fishes on the outer shelf with an average catch rate of 221 kg/h contributing 11 % of the total catch. *D. macrophthalmus* was the most abundant Seabream, mainly due to one large catch, followed by *D. angolensis*. Except for one large catch, big eye grunt was caught in low catch rates and contributed less than 3 % of the total catch on the outer shelf. Other grunts were only caught in station. Croakers and groupers had mean catch rates of 29 kg/h and 5 kg/h, respectively. Snappers were not caught on the outer shelf either.

The most common pelagic groups on the outer shelf were carangids with average catch rate of 91 kg/h, and *T. trecae* was the dominating species. Clupeoids had a mean catch rate of 69 kg/h, followed by scombrids (58 kg/h). *Sardinella aurita* and *Scomber japonicus* were both caught in large numbers on one station. Hairtails had a mean catch rate of 15 kg/h, while Barracuda was only found in low numbers on one station.

## **Biomass estimates**

Table 4.2 shows the time series (1985 to 2014) of swept-area biomass estimates for commercial species and groups of species on the central shelf off Angola. The biomass

estimates were calculated by allocating catch data to depth ranges (20-50, 51-100 and 101-200 m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the number 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 rather reflect their availability to the trawl than their abundance. Some of the biomass estimates in Table 4.2 have a high coefficient of variation (CV), implying that the trends in the time series should be interpreted with care.

*T. trecae* was the only horse mackerel species caught in the central region in 2014. The biomass estimate for 2014 was 7 400 Tonnes, about three times higher than the 2013 estimate but less than half of the 2012 estimate. The biomass on the central shelf has been below 30 000 tonnes since 2003, preceded by a very high estimate of 78 000 tonnes in 2002.

*Merluccius polli* was the only hake species caught on the central shelf with a biomass estimate of 100 Tonnes, the highest since 2004. The average length of *M. Polli* was 23 cm, lower than the 29 cm measured in 2013, and could be due to recruitment.

Seabreams are the most important commercial demersal fish group in Angola. Biomass estimate for the central shelf in 2014 was 16 500 Tonnes, about twice the 2013 estimate and the highest since 2002. *D. macrophthalmus* dominated and contributed about 50 % (8 100 Tonnes) of total biomass of the seabreams followed by *D. angolensis* (3 700 Tonnes). The average length of *D. macrophthalmus* was 19 cm, *D. angolensis* 21 cm and *Pagellus bellottii* 20 cm, quite similar to last year.

The biomass estimate of croakers increased from 3 000 Tonnes in 2013 to 4 300 Tonnes in 2014. *U. canariensis* was the most abundant croaker, and contributed about 50 % of the total croakers biomass. The average length of this species was 24 cm, similar to 2013 and 2012.

The 2014 biomass estimate of grunts (*Pomadasys incisus*, *P. jubelini*, *P. rogeri* and *P. peroteti*) was 5 400 tonnes, somewhat lower than in 2013, much lower than the record high 2012 estimate and slightly lower than the average since 2000. The biomass estimate of big eye grunt (*Brachydeuterus auritus*) was 10 300 Tonnes. The big eye grunt estimates have fluctuated over the last decade showing a declining trend. The average length of this species was 17 cm, similar to that of last year (16 cm).

Catches of snappers are infrequent and low 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, and no snappers were caught in the region in the last three surveys.

Groupers, mainly *Epinephelus aeneus* and *E. guaza* were found on the inner and outer shelves and they are coastal rocky and muddy shore dwellers. The 2014 survey gave an estimated biomass of 650 Tonnes, which is above the average value for the last ten years. The high CV values indicate that 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 2014 biomass estimate for *Parapenaeus longirostris* (deep rose shrimp) was 75 Tonnes, which is lower than the 2013 estimate (100 Tonnes) and among the lowest in the time series. *P. longirostris* is mainly distributed on the upper slope, and there is no clear trend in the time series for the shelf.

The biomass estimate of Sepiidae in 2013 was almost 1 200 Tonnes, about the double of the 2013 estimate. However, the annually variability and the inadequate sampling gear used (bottom trawl) may indicate that the estimates do not accurately reflect the state of the stock.

For Ommastrephidae, mainly *Allotethus africanus* on the inner shelf and *Illex coindetti* on the outer shelf, the biomass estimate of was about 400 Tonnes in 2014, much higher than in 2013 and similar to 2012. There is no clear trend compared to the previous years, and the annual variability and high CV values may indicate that the estimates do not accurately reflect the state of the stock.

The biomass estimate of Sharks in 2014 decreased slightly compare to 2013 to about 90 Tonnes. The annual variability and high CV values may indicate that the estimates do not accurately reflect the state of the stock.

**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	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	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	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	1,707 (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	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	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	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	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	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	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	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	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	1,961 (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	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	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	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	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	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	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	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	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	945 (1.10)	5,636 (0.38)	17 (1.18)
2009	4 (1.51)	10,073 (0.50)	195 (1.14)	1,678 (0.37)	94	8,854 (1.26)	14,765 (0.44)	21 (1.57)
2010	22 (1.69)	2,354 (0.57)	204 (0.84)	1,628 (0.27)	157	1,420 (1.46)	13,526 (1.34)	79 (0.84)
2011	0 -	10,895 (1.23)	42 (0.83)	1,956 (0.35)	74	268 (0.97)	13,231 (1.01)	48 (1.28)
2012	13 (0.96)	17,295 (0.51)	434 (1.09)	2,983 (0.22)	21	35,480 (0.71)	21,586 (0.46)	3,086 (1.52)
2013	1 (1.37)	2,550 (0.81)	185 (0.83)	1,235 (0.20)	104	1,265 (0.60)	10,759 (0.59)	161 (0.87)
2014	113 (0.91)	7,446 (0.58)	113 (1.05)	2,677 (0.34)	86	9,366 (1.13)	9,896 (0.46)	4,732 (1.13)

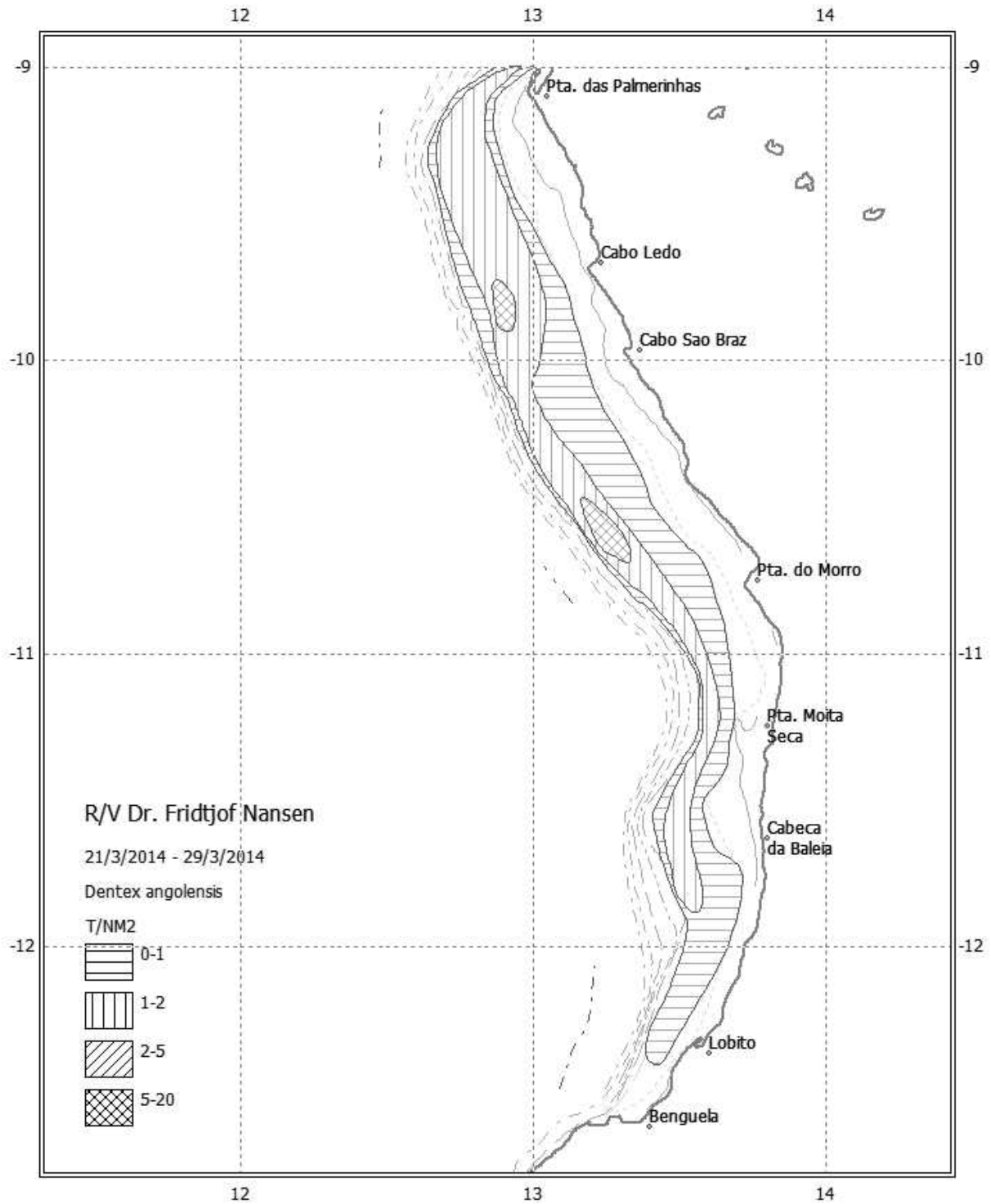
**Table 4.1** Continue

Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.4	2,568 (1.16)	253 (1.26)	0 -	1,253 (0.95)	5,706 (1.37)	10,235 (1.45)	18,407 (0.72)	58 (1.61)
1986.1	15,125 (0.67)	1,019 (0.62)	36 (1.96)	411 (0.81)	2,237 (0.73)	4,649 (0.50)	9,161 (0.46)	1,483 (1.01)
1986.2	1,089 (0.70)	1,117 (0.77)	0 -	518 (1.15)	5,301 (0.66)	4,510 (0.77)	13,819 (0.46)	0 -
1989.1	9,992 (0.60)	1,936 (1.34)	0 -	580 (0.78)	3,681 (1.02)	1,395 (0.72)	11,443 (0.48)	235 (1.05)
1989.2	2,128 (0.80)	701 (0.60)	20 (1.96)	3,093 (1.55)	1,126 (0.92)	2,972 (0.72)	12,167 (0.36)	667 (0.76)
1989.3	8,488 (1.45)	704 (0.74)	0 -	660 (1.62)	82 (1.18)	595 (1.38)	4,531 (0.56)	445 (1.43)
1991.1	7,664 (0.72)	583 (0.72)	106 (1.96)	176 (1.12)	425 (0.51)	2,048 (0.85)	9,068 (0.31)	10 (1.19)
1991.2	3,174 (0.45)	82 (0.85)	0 -	1,021 (0.93)	1,882 (0.87)	20,081 (1.33)	25,675 (0.36)	117 (1.11)
1992	11,105 (0.58)	89 (1.29)	0 -	1,140 (0.88)	765 (1.13)	1,546 (0.70)	25,033 (0.44)	106 (1.13)
1994	24,185 (1.44)	4 (1.96)	262 (1.96)	417 (0.62)	68 (0.81)	10,292 (0.99)	29,548 (0.37)	168 (0.70)
1995.1	3,885 (0.43)	2,113 (0.65)	113 (1.96)	376 (0.77)	3,105 (1.12)	15,510 (1.05)	14,161 (0.47)	258 (0.95)
1996	3,443 (0.44)	946 (0.87)	109 (1.96)	690 (0.81)	3,095 (0.65)	5,866 (0.51)	18,323 (0.27)	25 (1.34)
1997.1	21,454 (0.60)	496 (1.80)	0 -	233 (1.10)	1,592 (1.54)	9,033 (0.60)	21,952 (0.58)	1,087 (0.94)
1997.2	13,839 -	0 -	0 -	1,023 -	293 -	7,099 -	31,763 -	1,265 -
1998	29,020 (1.52)	454 (0.82)	0 -	198 (1.24)	9,117 (0.82)	8,609 (0.86)	63,225 (1.22)	186 (0.84)
1999	8,210 (0.66)	1,605 (0.53)	526 (1.86)	631 (0.77)	3,289 (0.87)	9,891 (0.90)	17,435 (0.39)	9 (0.93)
2000	11,002 (0.41)	3,321 (0.58)	98 (1.50)	882 (0.87)	6,824 (0.51)	5,391 (0.44)	19,310 (0.31)	290 (0.98)
2001	5,595 (0.54)	957 (0.41)	3 (1.96)	64 (1.08)	1,329 (0.60)	1,744 (0.70)	12,617 (0.53)	198 (1.36)
2002	8,190 (0.45)	667 (0.63)	0 (1.96)	233 (1.01)	2,982 (0.57)	6,334 (0.42)	22,198 (0.61)	402 (0.88)
2003	12,067 (0.52)	480 (0.61)	44 (1.96)	702 (0.73)	8,649 (1.12)	5,369 (0.41)	5,595 (0.33)	449 (0.80)
2004	12,405 (1.01)	401 (0.85)	42 (1.96)	175 (0.99)	3,494 (0.95)	6,602 (1.08)	9,583 (0.55)	969 (1.11)
2005	31,672 (0.84)	258 (0.75)	6 (1.96)	608 (0.84)	5,980 (0.77)	5,530 (0.55)	7,752 (0.31)	50 (0.87)
2006	6,453 (0.49)	991 (0.93)	35 (1.96)	446 (0.81)	4,082 (0.85)	4,850 (0.58)	11,187 (0.31)	178 (1.07)
2007	22,472 (0.91)	749 (0.46)	31 (1.73)	491 (0.99)	9,275 (0.86)	8,081 (1.07)	8,013 (0.36)	36 (0.79)
2008	5,098 (0.63)	1,224 (1.26)	11 (1.96)	151 (0.78)	5,926 (0.93)	3,668 (0.72)	5,763 (0.32)	233 (0.98)
2009	20,812 (0.85)	152 (0.93)	124 (1.96)	192 (0.58)	4,983 (0.59)	2,104 (0.56)	7,443 (0.31)	195 (1.15)
2010	7,315 (0.40)	350 (0.83)	69 (0.70)	284 (0.82)	7,676 (0.65)	2,661 (0.56)	8,732 (0.27)	183 (0.93)
2011	4,875 (1.24)	313 (0.79)	190 (1.96)	444 (0.55)	8,638 (1.06)	6,496 (0.88)	9,550 (0.37)	24 (0.77)
2012	8,349 (0.87)	132 (1.06)	0 -	992 (1.33)	15,517 (1.12)	3,315 (0.51)	7,297 (0.25)	386 (1.21)
2013	3,707 (0.53)	1,144 (1.15)	0 -	373 (1.07)	6,362 (0.47)	3,012 (0.57)	8,380 (0.45)	103 (1.14)
2014	3,079 (0.53)	167 (0.74)	0 -	655 (0.69)	5,426 (0.57)	4,327 (0.47)	16,519 (0.53)	75 (1.47)

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	601 (1.68)	525 (0.64)	220 (1.25)	1,314 (1.16)	2,327 (0.86)	38,045 (0.49)
1986.2	0 -	1,252 (0.89)	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)	1,242 (0.38)	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)	237 (0.45)	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)	590 (0.46)	7,719 (0.81)	1,877 (0.79)	11,538 (1.16)	27,645 (0.57)
1996	210 (0.52)	1,392 (0.38)	11,195 (0.43)	1,546 (0.43)	1,077 (0.96)	18,842 (0.70)
1997.1	1,324 (0.47)	1,411 (0.86)	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	377 (0.65)	1,315 (0.57)	50,924 (1.50)	1,990 (0.38)	2,239 (0.77)	22,014 (0.95)
1999	201 (1.28)	307 (0.48)	5,178 (0.79)	1,163 (0.40)	7,999 (1.08)	93,522 (0.61)
2000	586 (0.61)	575 (0.55)	6,060 (0.76)	1,639 (0.59)	2,499 (0.51)	56,245 (0.84)
2001	186 (0.96)	220 (0.72)	5,680 (0.72)	1,670 (0.44)	1,076 (1.04)	41,122 (0.69)
2002	2,363 (0.70)	275 (0.61)	11,512 (1.16)	923 (0.47)	3,492 (0.54)	66,053 (0.75)
2003	489 (0.99)	370 (0.59)	557 (0.66)	1,046 (0.50)	1,001 (0.51)	38,312 (0.49)
2004	310 (0.89)	261 (0.56)	3,525 (1.27)	1,015 (0.41)	5,700 (1.21)	26,743 (0.42)
2005	233 (0.61)	768 (0.20)	879 (0.59)	991 (0.39)	2,279 (0.64)	36,621 (0.77)
2006	136 (0.52)	905 (0.51)	2,802 (0.42)	1,982 (0.39)	4,329 (0.65)	33,546 (0.86)
2007	43 (0.53)	1,195 (0.40)	1,532 (0.86)	1,312 (0.64)	5,224 (1.39)	40,402 (0.53)
2008	327 (0.46)	285 (0.44)	1,496 (0.87)	1,135 (0.34)	1,801 (0.97)	17,736 (0.40)
2009	110 (0.82)	1,018 (0.55)	699 (0.62)	1,756 (0.56)	1,419 (0.53)	22,188 (0.83)
2010	179 (0.63)	776 (0.34)	572 (0.80)	2,250 (0.40)	1,097 (0.80)	8,156 (0.66)
2011	28 (1.20)	1,280 (0.40)	497 (1.19)	2,805 (0.51)	4,003 (1.19)	10,841 (0.88)
2012	477 (0.87)	1,713 (0.33)	887 (1.22)	1,725 (0.41)	2,652 (0.60)	18,724 (0.56)
2013	130 (0.50)	655 (0.36)	2,918 (1.20)	1,990 (0.39)	1,031 (0.61)	17,728 (0.64)
2014	414 (0.86)	1,181 (0.40)	8,145 (1.05)	3,744 (0.62)	2,295 (0.63)	10,332 (0.64)

## Distribution

Figure 4.2 shows the distribution of *Dentex angolensis* in the central region between Ponta das Palmerinhas and Benguela. The species was found along the whole central shelf, with the highest densities on the outer shelf.



**Figure 4.2** Distribution of *Dentex angolensis* in the central region, Ponta das Palmerinhas - Benguela. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.

## **Tombua - Cunene shelf**

A total of 21 trawl stations were sampled on the southern shelf. The southern region has not been regularly sampled throughout the years, except for the 2000 and 2003-2014 surveys. Other survey results from the time series should therefore be interpreted with caution, as the strategy and design of these surveys were not standardized.

The total average catch rate on the inner shelf was 3 100 kg/h and on the outer shelf 2 000 kg/h (Annex VI). The pelagic group dominated with 53 % of the mean catch rate on the inner shelf (1 705 kg/h) and 42 % on the outer shelf (851 kg/h). The mean catch rates of the demersal group were 917 kg/h (29 %) on the inner shelf and 919 kg/h (45 %) on outer shelf. Shrimps were not caught on the inner shelf or on the outer shelf. The mean catch rates of cephalopods on the inner shelf were 120 kg/h and of sharks 80 kg/h, and on the outer shelf 52 kg/h for cephalopods and 30 kg/hour for sharks. The average catch rate of the “other” species group was 350 kg/h on the inner shelf, contributing 11 % to the total catch, and 177 kg/h (8 %) on the outer shelf.

Among the demersal species found on both the inner and outer shelves, Seabreams were the most abundant and were dominated by *Dentex macrophthalmus*, and *Pagellus bellottii*. This group had an average catch rate of 430 kg/h (13 %) on the inner shelf and 593 kg/h (29 %) on the outer shelf. Cape hake (*Merluccius capensis*) was caught with an average catch rate of 271 kg/h (8 %) on the inner shelf and 279 kg/h (13 %) on the outer shelf, while *M. polli* was not found on the shelf. The average catch rate of croakers (mainly *Argyrosomus hololepidotus* and *Atractoscion aequidens*) was 127 kg/h (4 %) on inner shelf and on outer shelf was 45 kg/h (2 %). Grunts were found on three stations on inner shelf with a mean catch rate of 72 kg/h (2 %), while no grunts were caught on the outer shelf. Snappers and Groupers were not caught on the shelf.

The pelagic group was the most predominant group on the inner shelf. Carangids, mainly *Trachurus trecae*, dominated with a mean catch rate of 1 629 kg/h and 51 % of the total on the inner shelf and 848 kg/h (41 %) on outer shelf. Clupeoids (*Sardinella aurita*) had a mean catch rate of 63 kg/h (2 %) on inner shelf, while it only was caught in low numbers on one station on the outer shelf. Scombrids were caught with a mean catch rate of 11 kg/h on the inner shelf and 3 kg/h on the outer shelf and contributed less than 1 % to the total. Barracuda were caught neither on the inner shelf nor on the outer shelf, while Hairtails were caught in low numbers on one station on the inner shelf.

## **Biomass estimates**

Table 4.3 shows the time series from 1986 to 2014 of swept-area biomass estimates for commercial species in the southern shelf region. The biomass estimates were calculated by stratifying depth (20-50, 51-100 and 101-200 m). The sampling intensity in the southern region has been variable throughout the years and only strata with at least two stations are included in the estimates. The high coefficients of variation (CV) shown in Table 4.3 indicate that the biomass estimates and its time series trends should be interpreted with care.



The 2014 horse mackerel estimate of 73 000 Tonnes was similar to the 2013 estimate but the second lowest since 2000. *T. trecae* contributed with 72 500 Tonnes, the remainder belonging to *T. capensis*. However, the swept-area estimates of pelagic fish species are unreliable as the bottom trawl predominantly catches fish close to the seabed. The contribution of *T. trecae* was high in the three last years (99 % in 2014, 87% in 2013 and 96 % in 2012), while it only contributed 27 % in 2010. Small fish or juveniles (<15 cm) dominated the catches of only *T. trecae*.

The biomass of Seabreams was estimated at 25 100 Tonnes and *D. macrophthalmus* contributed 70 %. The 2014 estimate of Seabreams was the highest since 2004, about three times higher than the 2013 estimate. The mean length of *D. macrophthalmus* was 14 cm (Annex II), much less than in 2013 (21 cm), indicating recruitment to the stock in the southern area.

Biomass estimates of croakers have varied considerably between previous surveys, and the 2014 estimate of 4 050 Tonnes is higher than the 2013 estimate (3 080 T). *Atractoscion aequidens* and *Argyrossomus hololepidotus* were the most abundant croakers species, and occurred predominantly in the 20 to 50 m depth range.

The biomass estimate of cape hake, *M. capensis*, was 18 400 Tonnes, the highest since 2009 and much higher than the 2013 estimate (2 300 Tonnes). *M. polli* (Benguela hake) was not caught on the shelf in this region. With a few exceptions the biomass estimates have been fairly low in the whole time series. Mean length of *M. capensis* in 2014 was 26 cm, similar to 2013 (25 cm) (Annex II).

The biomass estimate of cephalopods in 2014 was 4 700 Tonnes, higher than previous years and one of the highest in the time series.

The biomass estimates of the pelagic species group are unreliable, as the bottom trawl is not a very suitable sample tool for these groups. The 2014 biomass estimates of clupeoids was 2 100 Tonnes. The large fluctuations in the time series do not reflect the true change of abundance of these species. Similarly, the fluctuations in the Scombrids biomass estimates (360 Tonnes in 2014) over time are unlikely to represent a reliable reflection of changes in the stock.

The biomass estimate of Hairtails (*Trichiurus lepturus*) was only 14 Tonnes, much lower than the 2013 estimate (250 Tonnes) and one of the lowest in the time series. However, as a benthopelagic species, its biomass estimates over time are unlikely to represent a reliable reflection of changes in the stock.

The biomass estimate of Sharks (which includes Chimaeriformes) was 3 200 Tonnes, the highest since 2006. The figure should be carefully interpreted, as they do neither reflect the real species composition nor their biomass due to inadequate sampling gear.

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

Survey	Hake	T.treace	Horsemackereel	Cephalopod	Sharks	Clupeoids	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 NA	78165 (0.53)	173 (0.89)
1989.1	349 (0.88)	2883 (1.09)	15681 (0.90)	776 (0.61)	188 (0.88)	0 NA	15681 (0.90)	60 (0.79)
1989.2	1121 (1.30)	979 (0.94)	13706 (0.75)	6114 (0.83)	12200 (1.37)	0 NA	13706 (0.75)	35 (1.11)
1989.3	6739 NA	11636 NA	39225 NA	2087 NA	551 NA	0 NA	39225 NA	155 NA
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 NA
1992	6756 (0.46)	8106 (0.91)	95433 (0.41)	744 (0.63)	2220 (0.65)	70 (1.54)	95436 (0.41)	0 NA
1993	4023 (0.40)	52839 (0.91)	64235 (0.75)	2501 (0.81)	2278 (0.71)	8 (1.55)	64235 (0.75)	347 (1.03)
2000	3559 (0.80)	185345 (1.05)	218410 (0.86)	1934 (0.29)	2051 (0.48)	43 (1.76)	218473 (0.86)	28 (0.87)
2002	3779 (0.81)	116985 (1.30)	237050 (0.63)	1937 (0.96)	69 (0.94)	1217 (1.69)	237058 (0.63)	711 (1.76)
2003	7014 (0.64)	76533 (0.80)	113879 (0.74)	1630 (0.86)	1163 (1.16)	3601 (1.55)	114293 (0.75)	546 (1.83)
2004	11860 (0.64)	72982 (0.56)	237659 (0.80)	2547 (0.71)	348 (0.72)	12998 (1.82)	237659 (0.80)	5 (1.83)
2005	5067 (0.65)	114 (1.83)	129070 (0.52)	2309 (0.61)	1067 (0.38)	2410 (0.74)	129088 (0.52)	1 (1.83)
2006	3713 (0.39)	126892 (0.47)	184129 (0.48)	1545 (0.68)	3630 (1.40)	308909 (1.03)	184129 (0.48)	2221 (1.66)
2007	3006 (0.52)	100468 (0.54)	107896 (0.51)	1459 (0.48)	2016 (0.49)	1747 (0.78)	107918 (0.51)	95 (1.35)
2008	1722 (1.04)	169349 (0.57)	215813 (0.48)	3235 (0.57)	278 (1.12)	43 (1.26)	215813 (0.48)	1124 (0.85)
2009	31018 (0.32)	322270 (0.82)	322460 (0.82)	1017 (0.50)	271 (0.61)	2148 (1.82)	322460 (0.82)	50 (1.69)
2010	2495 (0.83)	76870 (0.69)	286228 (0.49)	1732 (0.73)	190 (1.01)	100656 (1.25)	286240 (0.49)	605 (1.10)
2011	4827 (0.53)	32076 (0.53)	104890 (0.66)	1683 (0.50)	2054 (0.60)	65380 (0.97)	104890 (0.66)	485 (0.71)
2012	3551 (0.88)	29627 (0.72)	30978 (0.69)	1532 (0.54)	2616 (0.73)	27011 (1.66)	35345 (0.81)	52 (1.39)
2013	2297 (0.97)	64782 (0.63)	74092 (0.59)	3410 (0.65)	1931 (0.87)	5351 (0.89)	74092 (0.59)	290 (1.58)
2014	18432 (0.50)	72569 (0.36)	73178 (0.36)	4741 (0.44)	3233 (0.49)	2168 (1.61)	73178 (0.36)	365 (1.41)

	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 NA	886 (0.58)	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)	3946 (0.95)	31615 (0.44)	16 (1.69)	442 (0.75)
1989.3	1746 NA	1443 NA	15594 NA	192 NA	17 NA	15509 NA	27 NA	86 NA
1991.1	1335 (0.71)	1341 (0.54)	22333 (0.33)	25 (1.09)	59 (0.68)	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)	150 (0.71)	31822 (0.55)	118 (1.69)	30 (0.99)
1993	361 (1.38)	2744 (0.60)	58399 (0.52)	145 (0.40)	182 (1.20)	57722 (0.51)	238 (1.58)	496 (0.87)
2000	1008 (1.45)	3623 (0.61)	61693 (0.95)	9 (1.69)	514 (0.35)	58636 (1.01)	63 (1.29)	305 (0.72)
2002	0 NA	1046 (1.18)	24802 (1.00)	21 (1.69)	1378 (1.20)	23819 (0.98)	0 NA	12 (1.69)
2003	48 (1.16)	1115 (0.39)	15856 (0.39)	397 (0.69)	1166 (1.17)	13313 (0.38)	0 NA	172 (0.84)
2004	1 (1.69)	518 (1.18)	26946 (0.69)	549 (0.86)	937 (1.51)	24702 (0.74)	1 (1.69)	8 (1.83)
2005	274 (1.53)	6164 (0.71)	12654 (0.50)	1655 (0.86)	327 (0.64)	12121 (0.50)	221 (1.69)	330 (1.20)
2006	26 (1.74)	923 (0.55)	11470 (0.31)	98 (0.91)	1182 (0.87)	11058 (0.32)	0 NA	229 (1.07)
2007	93 (1.25)	4168 (1.21)	15520 (0.36)	555 (1.04)	722 (0.50)	14579 (0.37)	70 (1.69)	563 (0.96)
2008	85 (0.74)	404 (0.94)	9147 (0.38)	6 (1.69)	1561 (0.73)	7276 (0.45)	113 (1.69)	44 (0.94)
2009	27 (0.72)	695 (0.68)	9804 (0.52)	371 (0.87)	315 (0.71)	9618 (0.53)	1 (1.69)	118 (1.23)
2010	148 (1.37)	321 (0.93)	9218 (0.38)	46 (1.09)	659 (0.66)	8118 (0.39)	0 NA	99 (1.52)
2011	649 (0.66)	768 (1.05)	15964 (0.38)	57 (1.39)	305 (0.80)	15671 (0.39)	3 (1.69)	179 (0.95)
2012	659 (0.52)	3713 (1.71)	8704 (0.59)	136 (1.13)	996 (0.43)	5151 (0.71)	0 NA	13 (1.02)
2013	246 (1.11)	3087 (0.69)	8363 (0.48)	1619 (0.66)	358 (0.98)	6859 (0.56)	22 (1.69)	82 (0.79)
2014	14 (1.83)	4050 (0.51)	25168 (0.34)	53 (1.69)	2103 (0.74)	17747 (0.37)	0 NA	72 (0.92)

## Distribution

Figure 4.2 shows the distribution of *Dentex macrophthalmus* in the southern survey area. Most of the survey area shallower than 300 m was covered by low density registrations, with denser concentrations in the central part of the shelf between Pta. Albina and Cunene.

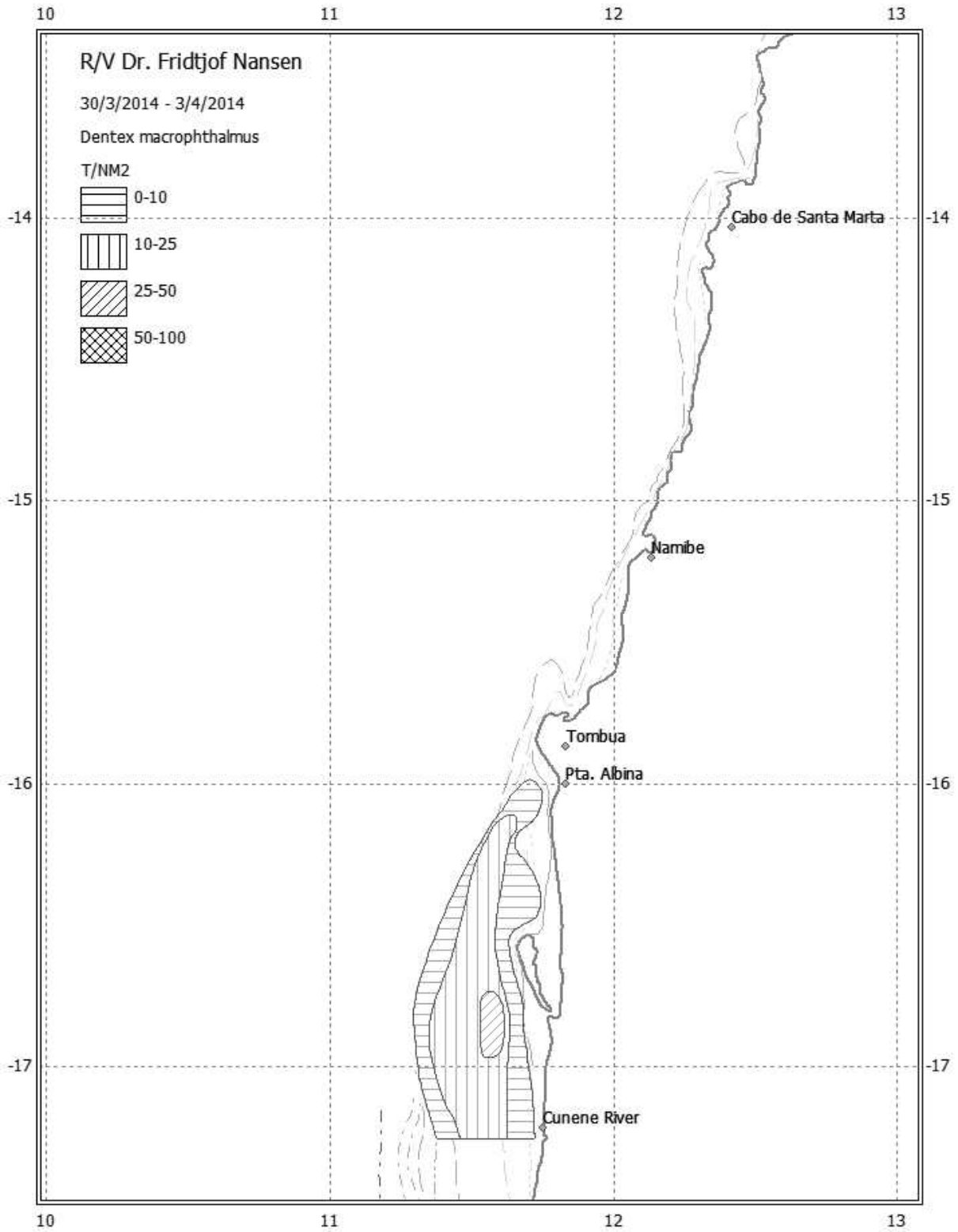


Figure 4.2 Distribution of *Dentex macrophthalmus* in the southern region, Cunene-Tombua. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.

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

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

Pooled length distributions weighted by the catch of the main species by region are shown in Annex II. Further, the mean densities (tonnes $\text{NM}^{-2}$ ) and the frequency of occurrence of the most important species are shown in Annex III. Annex V shows the various Nansis species codes used for species and groups of species, and Annex VI presents the catch rates of these species and species groups.

### Congo River - Ponta das Palmerinhas slope

The survey covered the northern region of Angolan waters from Luanda to mouth Congo River, with a total of 40 successful swept-area trawl stations on the slope (Table 2.1). The northern area of Congo River is recently inaccessible to fishery surveys due to restricted oil exploitation areas. The various strata have been sampled with variable intensity throughout the time series, and Annex VIII shows the numbers of trawls by strata and by survey.

The average catch rate for all species was 716 kg/hour (Annex VI). The contributions to the total mean catch rate by groups were: 13 % for the demersal group, 13 % for the shrimps, 1.3 % for the pelagic group, 1.5 % for cephalopods and 0.6 % for sharks. The “other” species group dominated the catches and contributed with 70 % to the total mean catch rate. *Merluccius polli* was frequently caught on the upper and lower slope with an average catch rate of 56 kg/hour. Seabreams were caught in eighth stations (only *Dentex angolensis*) with an average catch rate of 11 kg/hour.

The average catch rates of the three shrimp species *Parapenaeus longirostris*, *Aristeus varidens* and *Nematocarcinus africana* were 13, 7 and 67 kg/hour, respectively. *A. varidens* was caught most frequently, but with the lowest catch rates.

### Biomass estimates

Biomass estimates in tonnes of the most important species groups are presented in Table 5.1. Estimates were calculated by stratifying trawl catches by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799 m). Some of the biomass estimates in Table 5.1 have a high coefficient of variation (CV), indicating that the trends in the time series should be interpreted with care.

The biomass estimate of Seabreams was about 1000 Tonnes, almost the same as the 2013 estimate and much higher than the 2012 estimate (200 Tonnes). *D. angolensis* was the dominating seabream caught on the upper slope.

The biomass estimate for *Merluccius polli* was 4 800 Tonnes, somewhat higher than the 2013 estimate but only half of the 2012 estimate.

This years' estimate of *Parapenaeus longirostris* (1 100 Tonnes) is about three times higher than the 2013 estimate, lower than the 2012 estimate of 2 000 Tonnes and similar to the 2011 estimate. Between 2005 and 2014 the biomass have been stable at approximately 1 000 Tonnes, with the exception of 2010, 2012 and 2013.

The 2014 biomass estimate of *Aristeus varidens* was about 770 Tonnes, higher than most recent years, with the exception of 2009, when the biomass was estimated at 915 Tonnes.

*Nematocarcinus africana* is not a commercially important species. The 2014 biomass estimate was 5 900 Tonnes, only about the half of most estimates since 2004.

The biomass estimate of Ommastrephidae in 2014 was 770 Tonnes which is the highest since 2001.

The biomass estimate of sharks was 500 Tonnes in 2014 and below the average of the ten last years.

**Table 5.1** Biomass estimates (tonnes) of important species on the slope (200-800 m) in the northern region.cv values are indicated in brackets.

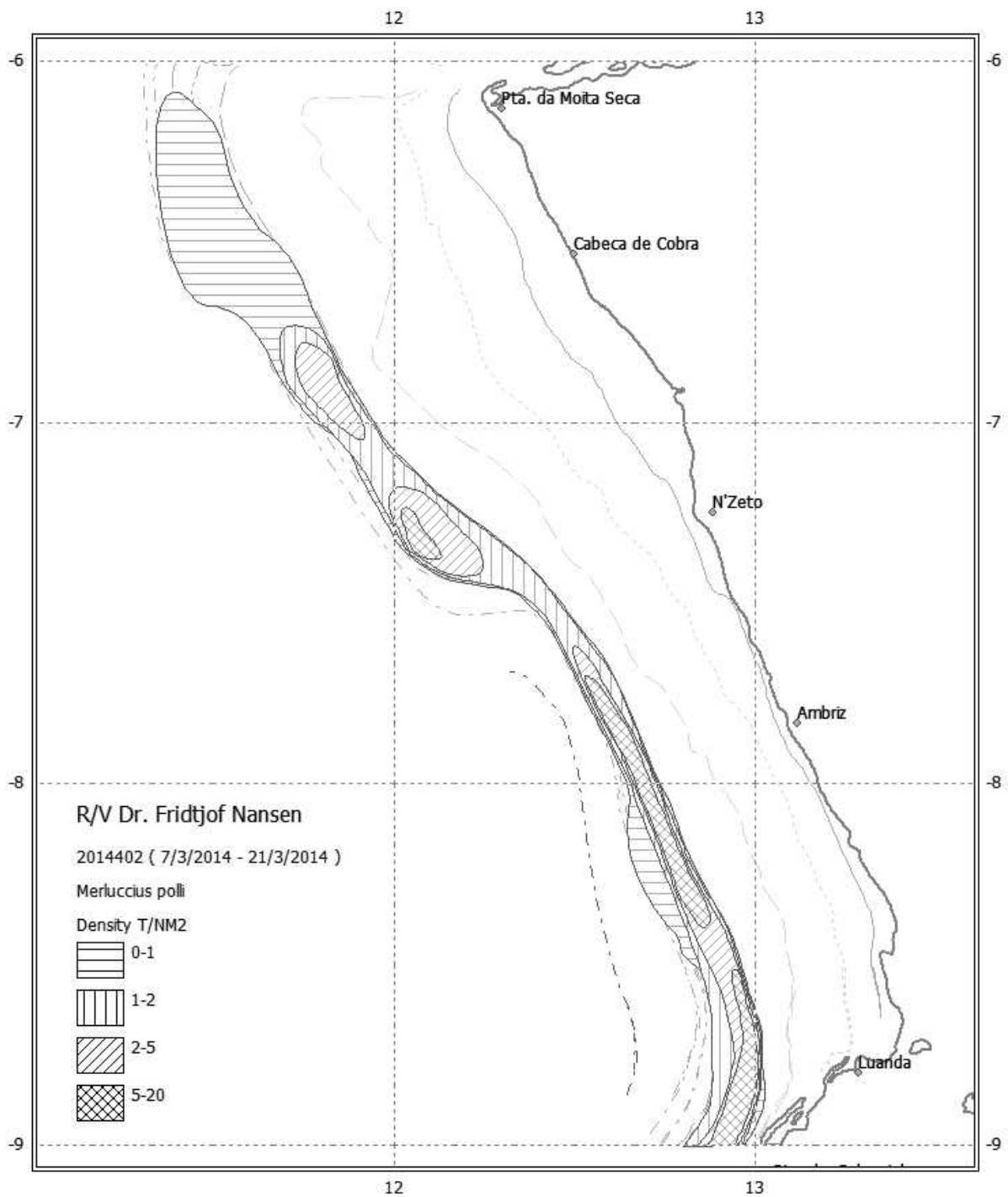
Survey	M.polli	Shrimps	Cephalopod	Sharks	Hairtails	Croakers
1985.1	202 (0.00)	21 (0.00)	976 (0.00)	344 (0.00)	0	0
1985.3	3,065 (0.86)	767 (1.27)	251 (0.68)	209 (1.36)	511 (2.38)	285 (0.87)
1985.4	28,753 (0.95)	11,989 (0.48)	260 (1.25)	0	1,342 (0.67)	8 (2.38)
1986.1	11,409 (0.39)	14,960 (0.25)	1,630 (0.81)	3,724 (1.41)	3,383 (0.64)	0
1986.2	27,562 (0.67)	7,854 (0.56)	277 (0.85)	4,431 (0.75)	3,228 (0.61)	19 (2.27)
1989.1	13,518 (0.78)	7,772 (1.34)	1,631 (1.23)	2,376 (1.44)	795 (0.81)	0
1989.2	8,168 (0.42)	4,370 (0.67)	166 (1.11)	375 (1.39)	352 (1.45)	1,624 (1.21)
1989.3	11,265 (0.91)	5,137 (0.36)	657 (1.05)	2,372 (0.57)	1,579 (1.97)	3 (2.27)
1991.1	19,597 (0.65)	8,671 (0.68)	135 (1.45)	1,376 (1.25)	65 (1.03)	3 (2.27)
1991.2	19,498 (0.67)	2,732 (0.34)	991 (1.05)	2,381 (0.80)	699 (0.61)	64 (1.82)
1992	13,290 (0.44)	8,992 (0.74)	209 (0.69)	1,462 (1.01)	1,148 (0.55)	244 (1.41)
1994	4,096 (0.48)	7,529 (0.61)	328 (0.48)	841 (0.66)	1,753 (0.37)	134 (1.36)
1995.1	5,892 (1.01)	9,641 (0.56)	316 (1.55)	1,367 (0.52)	2,284 (0.72)	0
1996	5,065 (0.31)	4,435 (0.43)	566 (1.03)	307 (0.71)	1,627 (0.69)	34 (1.36)
1997.1	6,954 (0.28)	14,107 (0.38)	659 (0.35)	824 (1.12)	3,399 (1.26)	0
1997.2	8,101 (0.39)	5,676 (1.67)	330 (1.80)	10 (2.27)	1,972 (1.37)	35 (2.27)
1999	3,624 (0.52)	11,539 (0.52)	1,142 (1.49)	1,060 (0.43)	3,088 (0.83)	113 (1.07)
2000	4,385 (0.54)	4,683 (0.49)	709 (0.47)	597 (0.89)	1,978 (1.04)	0
2001	4,840 (0.71)	8,283 (0.73)	1,477 (1.55)	1,966 (1.23)	1,531 (0.74)	0
2002	3,479 (0.60)	6,415 (0.74)	625 (0.87)	118 (0.74)	3,022 (1.01)	27 (1.73)
2003	5,310 (0.76)	7,986 (0.38)	421 (0.61)	1,305 (1.29)	1,237 (1.15)	27 (1.70)
2004	15,327 (1.33)	12,343 (0.33)	871 (0.70)	1,571 (0.78)	1,695 (0.57)	49 (1.91)
2005	10,994 (0.60)	10,285 (0.35)	382 (0.53)	1,180 (1.00)	1,468 (0.44)	19 (1.05)
2006	7,553 (0.51)	12,526 (0.37)	407 (0.55)	931 (1.59)	2,143 (0.74)	18 (1.79)
2007	4,117 (0.55)	14,856 (0.47)	316 (0.66)	501 (1.01)	749 (0.49)	9 (2.27)
2008	5,925 (0.37)	16,979 (0.40)	716 (0.76)	846 (0.67)	1,365 (0.79)	246 (1.28)
2009	2,814 (0.76)	15,238 (0.39)	984 (0.63)	1,152 (0.69)	1,077 (0.50)	24 (1.49)
2010	3,166 (0.73)	10,135 (0.43)	502 (0.51)	382 (0.78)	2,202 (0.84)	7 (2.27)
2011	2,433 (0.78)	11,151 (0.51)	609 (0.94)	669 (0.91)	1,062 (0.76)	146 (1.43)
2012	9,696 (0.72)	12,707 (0.50)	534 (0.63)	313 (0.81)	1,088 (1.06)	55 (1.85)
2013	3,579 (0.66)	10,060 (0.36)	801 (1.23)	784 (1.09)	762 (0.63)	158 (1.10)
2014	4,794 (0.61)	8,223 (0.40)	902 (0.35)	528 (0.86)	799 (0.71)	2 (2.27)

**Table 5.1** Continue

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)	1,618 (0.81)	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)	631 (1.10)	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)	304 (0.52)	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)	220 (0.81)	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)	207 (0.78)	593 (0.64)
2009	523 (0.87)	971 (0.68)	914 (0.32)	13,121 (0.45)	131 (0.92)	523 (0.87)
2010	1,404 (0.96)	389 (0.63)	388 (0.42)	9,207 (0.48)	96 (0.75)	1,404 (0.96)
2011	1,215 (0.88)	1,138 (1.07)	653 (0.28)	8,793 (0.64)	122 (0.86)	1,211 (0.88)
2012	205 (1.67)	1,980 (1.03)	448 (0.47)	10,197 (0.61)	303 (0.78)	205 (1.67)
2013	982 (0.41)	364 (0.64)	526 (0.33)	9,075 (0.39)	91 (0.80)	973 (0.41)
2014	978 (0.67)	1,097 (0.74)	771 (0.52)	5,949 (0.54)	770 (0.37)	910 (0.71)

## Distribution

Figure 5.21 shows the estimated distribution of hake (*Merluccius polli*) in the northern region. The distribution covers the slope the whole way from the Congo River to Ponta das Palmerinhas, mainly with densities <5 NM<sup>2</sup>, but with a narrow belt with densities from 5-20 NM<sup>2</sup> on the upper slope from north of Ambriz to Ponta das Palmerinhas.



**Figure 5.1** Distribution of hake (*Merluccius polli*) in the northern region, Ponta das Palmerinhas – Congo River. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.

## **Ponta das Palmerinhas – Benguela slope**

In the central region of Angolan waters from Ponta das Palmerinhas to Benguela, a total of 35 successful swept-area trawl stations were accomplished on the slope (Table 2.1).

The average catch rate on the slope was 1076 kg/hour (Annex VI), higher than in 2013 (625 kg/h) and 2012 (767 kg/h). The demersal group contributed with 213 kg/hour or 20 % of the total mean catch rate, while the pelagic group had an average catch rate of 2 kg/hour and contributed less 1 %. The shrimps contributed with 151 kg/hour (14 %), sharks had a mean catch of 6 kg/h (0.6 %) and cephalopods 8 kg/h (0.8 %). The “other” group, represented by non-commercial species, dominated the catches and contributed with 696 kg/h (65 %) to the total mean catch rate.

*Merluccius polli* was the only hake species caught with an average catch rate of 149 kg/h. Seabreams (*Dentex macrophthalmus* and *D. angolensis*) were only caught in six stations with a mean catch rate of 7 kg/hour. The average catch rates of *Parapenaeus longirostris* and *Aristeus varidens*, which are the two most commercially important deep-water shrimp species, were 14 kg/h and 23 kg/h, respectively. *Nematocarcinus africana*, a non-commercially shrimp, was caught in more than half of the stations with higher catch rates, 107 kg/hour on average.

### **Biomass estimates**

Biomass estimates in Tonnes of the most important groups are presented in Table 5.2. The biomasses were calculated by stratifying trawl catches by depth (200-300, 301-400, 401-500, 501-600, 601-700 and 701-800m).

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

The 2014 biomass estimate for hake (*M. polli*) was 8 700 Tonnes which is the highest estimate since 2005. In 2004, the biomass estimate of *M. polli* showed a peak of 16 100 Tonnes, and from 2005 started a declining trend until 2013, that could be related to the fishing pressure.

The biomass estimate of Seabreams in 2014 was 400 Tonnes, lower than in 2013 (1 000 tonnes) and one of the lowest estimates in the time series. The biomass estimates of Seabreams on the central slope have fluctuated considerably from 2001 and the CV of the estimates are relatively high. This estimates consisted of 46 % *D. angolensis* and 53 % *D. macrophthalmus* caught in six stations on the slope.

The *P. longirostris* biomass estimates of 800 Tonnes was only about the half of the 2012 and 2013 estimates, but higher than in the period of 2007-2011. The high CVs indicate that the time series should be interpreted with care.



The biomass estimate of *A. varidens* in 2014 was 1 600 Tonnes, a small increase compared to last year and the highest in the times series. The last estimates indicate signs of stock recovery, and the CVs are lower than for *P. longirostris*.

The biomass estimate of the non-commercially shrimp species *N. africana* also increased compared to 2013 to 6 800 tonnes, which is the highest estimate since 2007.

The biomass of Ommastrephidae on the central slope was estimated at 360 Tonnes in 2014, three times higher than last year but only about half of the 2012 estimate, which was the second highest in time series. There was a decrease in biomass in the period 2007-2011, but there is no clear trend, and the CVs are high.

Of the hairtails, *Trichiurus lepturus* was caught on the upper slope, and *Benthodesmus tenuis* in deeper waters. There has been a decrease in the biomass estimate of the group since 2010 (2 300 Tonnes), and the 2014 estimate of about 100 Tonnes is only about one third of the 2013 estimate.

The biomass estimate of sharks was 400 Tonnes in 2014, which is less than the half of last year's estimate. The biomass estimates for sharks show considerable fluctuations in the time series, which is also reflected in the high CVs values giving no clear trend of shark abundance. It is important to note that the sampling gear used during these surveys is not adequate for this group, and the estimates presented here may reflect neither the species composition nor the true biomass.

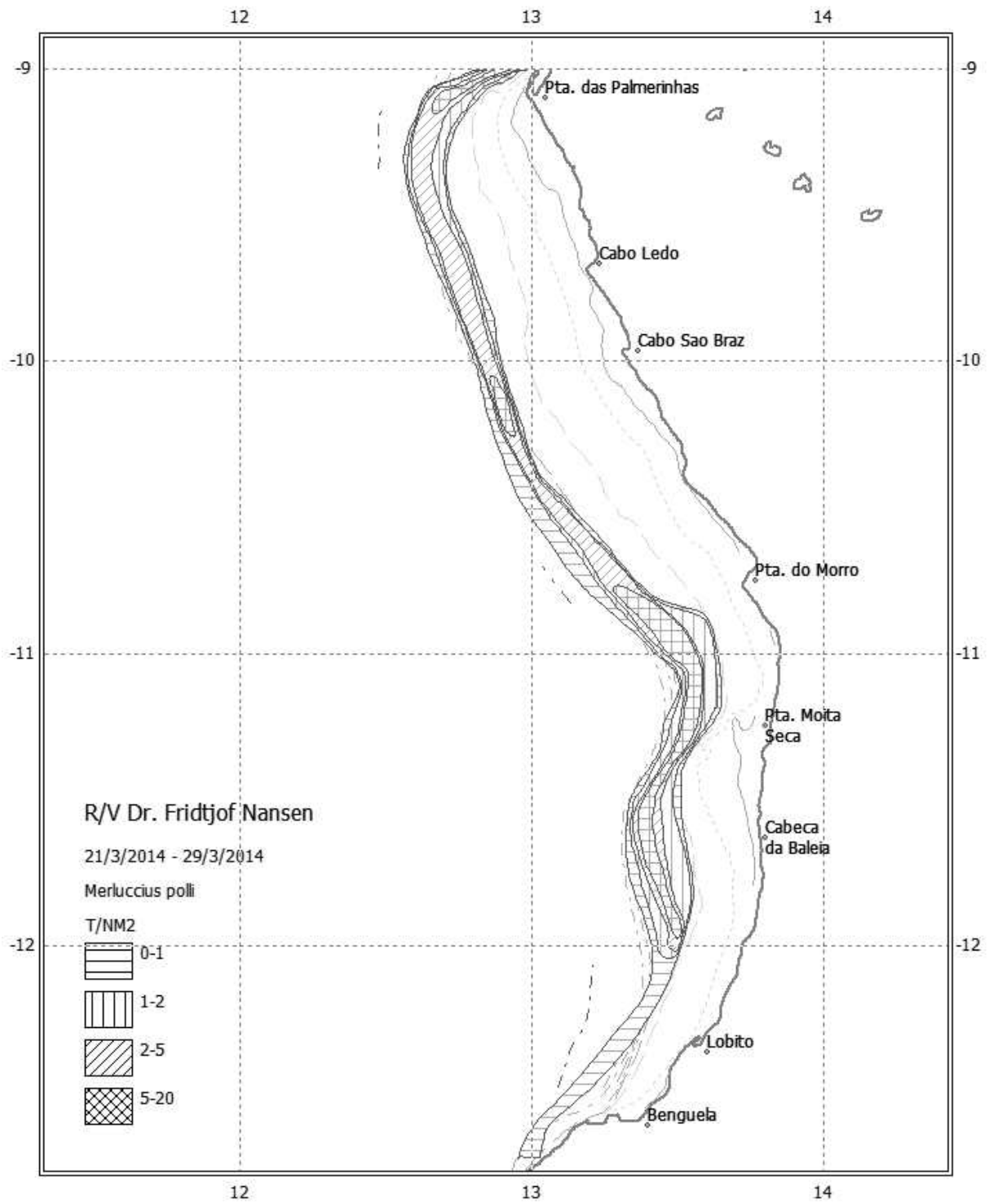
## **Distribution**

Figure 5.2 shows the distribution of hake (*Merluccius polli*) in the central region. The distribution covered the whole central slope with the highest densities from Pta. do Morro to north of Lobito.

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

Survey	M.polli	Shrimps	Cephalopod	Sharks	Hairtails	Seabreams
1985.4	18,790 (1.03)	2,915 (1.20)	301 (1.10)	17 (2.47)	420 (1.56)	253 (1.25)
1986.1	17,757 (0.74)	6,306 (0.70)	1,003 (0.85)	557 (0.88)	16 (2.27)	972 (2.14)
1986.2	24,611 (0.00)	13,247 (0.00)	57 (0.00)	-	498,917 (0.00)	6,446 (0.00)
1989.1	2,803 (1.26)	1,008 (0.95)	39 (0.76)	65 (0.69)	60 (2.06)	804 (2.17)
1989.2	4,940 (0.81)	1,963 (0.84)	277 (1.34)	263 (1.17)	142 (0.59)	58 (1.64)
1989.3	12,633 (1.00)	1,546 (0.57)	410 (0.76)	3,247 (0.34)	35,703 (0.01)	435 (0.98)
1991.1	11,939 (0.33)	4,950 (0.35)	315 (0.45)	732 (0.54)	2,606 (2.13)	780 (2.05)
1991.2	10,540 (0.52)	3,016 (0.55)	114 (0.82)	1,487 (0.88)	395 (1.25)	488 (1.12)
1992	6,999 (0.28)	4,436 (0.60)	189 (0.51)	2,920 (0.88)	410 (1.28)	496 (1.03)
1994	3,803 (0.71)	3,457 (0.69)	219 (0.60)	707 (0.60)	1,213 (0.82)	1,188 (1.50)
1995.1	4,391 (0.41)	4,480 (0.69)	214 (0.79)	1,216 (0.91)	1,145 (0.53)	6,264 (1.24)
1995.2	4,781 (0.38)	4,295 (0.25)	153 (0.46)	1,064 (0.44)	2,234 (1.21)	1,291 (0.66)
1996	6,440 (0.74)	6,457 (0.59)	97 (0.90)	1,581 (0.89)	244 (0.62)	1,016 (0.47)
1997.1	10,375 (0.59)	6,969 (0.37)	538 (0.64)	1,214 (0.87)	902 (1.01)	1,858 (1.14)
1997.2	8,363 (0.34)	2,690 (0.53)	166 (0.28)	42 (1.23)	1,013 (0.21)	5,045 (1.25)
1998	9,991 (0.50)	9,048 (0.39)	428 (0.76)	812 (0.63)	1,840 (1.46)	1,643 (1.06)
1999	2,995 (0.74)	1,806 (0.49)	344 (0.63)	728 (0.91)	728 (0.61)	2,900 (0.82)
2000	5,482 (0.60)	2,445 (0.45)	717 (0.50)	639 (0.74)	871 (0.91)	2,059 (1.01)
2001	4,763 (0.81)	2,575 (0.72)	623 (0.66)	818 (1.77)	297 (1.05)	767 (1.43)
2002	3,012 (0.65)	3,749 (0.60)	469 (0.64)	212 (0.92)	269 (0.57)	2,418 (1.98)
2003	7,155 (0.90)	4,087 (0.83)	420 (0.64)	104 (1.02)	178 (1.33)	606 (1.55)
2004	16,127 (0.77)	7,350 (0.42)	444 (0.85)	476 (1.51)	1,581 (1.06)	10,840 (2.00)
2005	10,074 (0.58)	7,135 (0.37)	578 (1.03)	307 (0.46)	2,655 (1.55)	6,468 (2.11)
2006	6,967 (0.71)	7,180 (0.38)	623 (1.02)	366 (0.85)	954 (0.86)	2,422 (1.85)
2007	6,947 (0.97)	8,939 (0.35)	446 (1.20)	1,054 (0.94)	185 (0.96)	808 (0.42)
2008	6,032 (0.66)	6,490 (0.33)	363 (0.97)	389 (1.34)	762 (0.51)	2,003 (1.39)
2009	5,302 (0.48)	8,079 (0.35)	644 (1.22)	1,382 (1.24)	1,947 (0.83)	168 (0.00)
2010	3,837 (0.56)	8,072 (0.54)	179 (0.43)	350 (1.28)	2,387 (1.90)	2,416 (1.09)
2011	4,318 (1.45)	4,416 (0.75)	223 (0.95)	229 (0.35)	626 (1.97)	274 (0.00)
2012	4,230 (0.92)	9,063 (0.33)	741 (1.14)	228 (1.08)	883 (1.74)	2,738 (2.27)
2013	2,836 (0.43)	9,056 (0.39)	416 (0.81)	889 (1.04)	350 (0.89)	997 (1.06)
2014	8,775 (0.60)	9,627 (0.28)	461 (0.63)	407 (0.68)	125 (0.66)	426 (0.82)

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)	971 (0.90)	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)	476 (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)	261 (0.73)	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)	536 (1.06)	6,260 (2.19)	208 (1.43)
2006	1,330 (1.36)	359 (0.35)	5,351 (0.38)	457 (1.08)	2,138 (2.23)	284 (2.27)
2007	191 (1.32)	653 (0.17)	7,913 (0.39)	138 (1.51)	612 (1.09)	196 (2.27)
2008	415 (1.35)	880 (0.27)	5,085 (0.44)	138 (0.76)	1,681 (2.09)	322 (2.27)
2009	182 (1.03)	1,290 (0.38)	6,009 (0.51)	37 (1.16)	168 (0.00)	0 -
2010	479 (1.03)	746 (0.55)	6,806 (0.60)	40 (1.34)	1,803 (2.23)	613 (2.27)
2011	319 (0.21)	619 (0.20)	3,413 (0.95)	44 (0.33)	274 (0.00)	0 -
2012	1,563 (0.57)	1,077 (0.59)	6,086 (0.45)	675 (1.24)	2,738 (2.27)	0 -
2013	1,647 (1.50)	1,418 (0.55)	5,877 (0.37)	101 (0.62)	481 (1.61)	516 (1.62)
2014	816 (0.77)	1,615 (0.42)	6,810 (0.40)	364 (0.78)	229 (1.30)	197 (1.13)



**Figure 5.2** Distribution of Benguela hake (*Merluccius polli*) in the central region, Benguela-Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.

## **Tombua – Cunene slope**

The slope is very steep, uneven and rocky in the south, making it difficult to have 30 minutes long trawl hauls. Due to rough weather, only three trawl stations were carried out on the southern slope in depths between 200 and 500 meters (Annex VI). The total average catch rate in 2014 was 789 kg/h. The demersal group contributed 23 % and the “other” group (non-commercial species) dominated the catches and contributed with 72% to the total mean catch rate. Shrimps and sharks contributed with 1.2 % and 1.7 %, respectively. The pelagic group and Cephalopods contributed less than 1 % each.

Seabreams were caught on the shallowest slope station in low numbers. *Merluccius polli* was also caught in low numbers on the shallowest slope station. *M. capensis* (Cape hake) was caught at the two shallowest stations with an average catch rate of 169 kg/h, while *M. paradoxus* (Deepwater Cape hake) was caught on the deepest station (205 kg/h). Striped red shrimp (*Aristeus varidens*) was found on the deepest station with a catch of 22 kg/h.

### ***Biomass estimates***

Table 5.3 shows the time series from 1986 to 2014 of the swept-area biomass estimates for different species and species groups on the southern slope. The number of trawl stations on the southern slope is very low due to the difficult trawling conditions caused by untrawlable sea bed. Catch data are stratified according to depth ranges (201-300 m; 300-400 m; 400-500 m and 500-600 m). The weather conditions were rough in 2014. Only three stations in the depth range 201-500 m were included in the biomass estimates in 2014 as in previous years. The biomass estimates are therefore not reliable.

The biomass estimates of hake have fluctuated over the whole time series (Table 5.3). The 2014 estimate was of 1 600 Tonnes, much higher than the 2013 estimate but below the average value for the ten last years (2 100 Tonnes). 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. During the survey *M. capensis* dominated the catches between 200 and 500 m (61 %), while *M. Polli* was caught in low numbers on the shallowest station on the slope and *M. Paradoxus* in somewhat higher abundance on the deepest.

The biomass of horse mackerel (*Trachurus trecae*) have also fluctuated in this region due to the low number of stations as well as the variability in the distribution pattern of this species. The 2014 estimate was 22 Tonnes.

Seabreams were not caught from 2010 to 2014. There is no clear trend due to the low sampling effort in this depth range.

*Parapenaeus longirostris* was not caught on the slope in 2014, like in many previous years. The biomass of *A. varidens* was estimated at 66 Tonnes in 2014, which is much lower than in 2013 (360 Tonnes) and in 2010 (200 Tonnes), but higher than in 2012 (25 Tonnes). Cephalopods had a biomass of 60 Tonnes which is six time higher than the 2013 estimate.

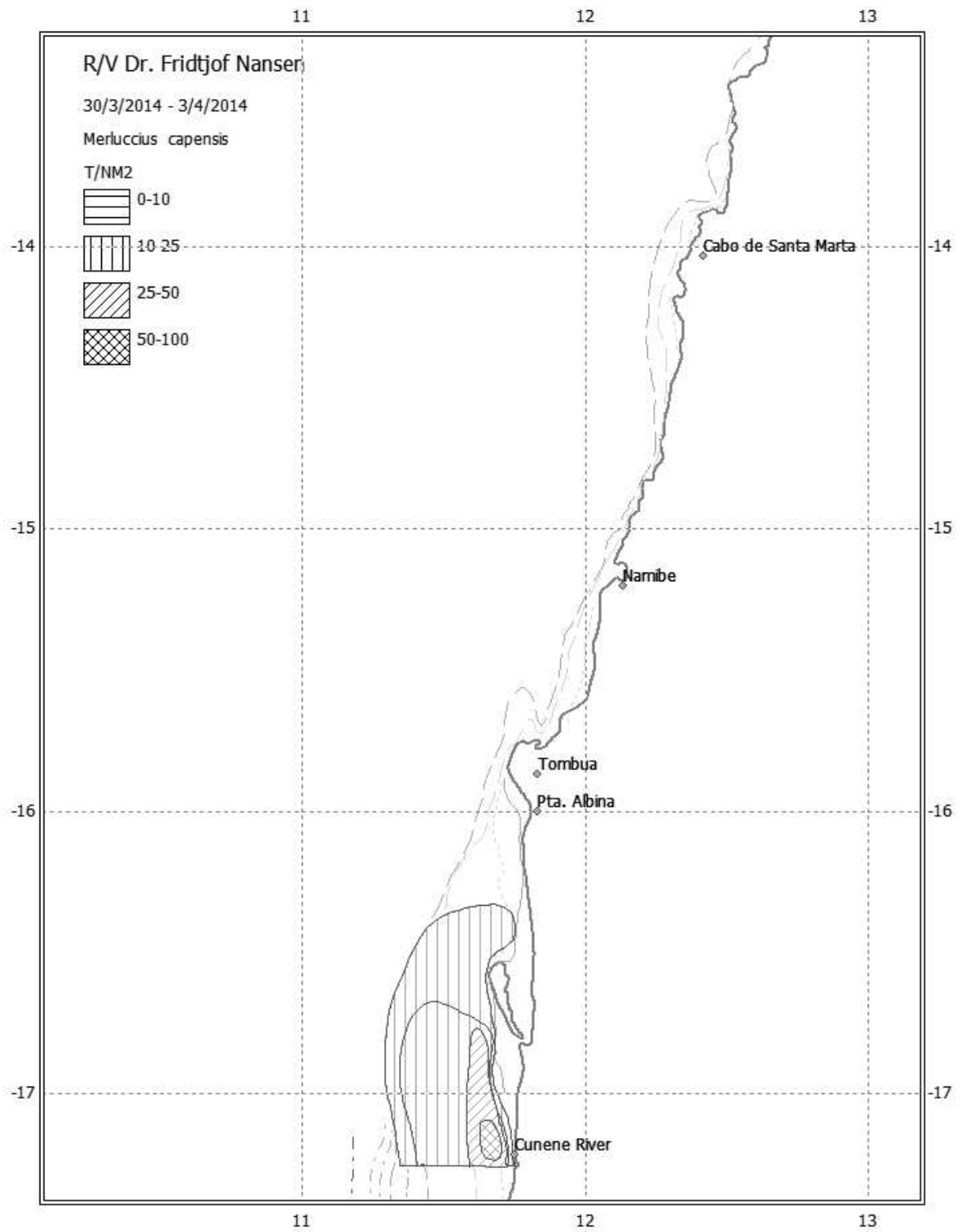
Sharks (mainly *Galeus polli*) biomass was estimated to 110 Tonnes, higher than last year’s estimate (40 Tonnes). The highest biomass was estimated in 2008 at 4 300 Tonnes and no clear trend is noticeable. As earlier mentioned, these estimates are highly unreliable since only three hauls makes the basis for the estimates.

**Table 5.3** 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 NA
1991.2	19798 (0.62)	549 (0.48)	0 NA	0 NA	506 (0.68)	2669 (0.08)	0	0 NA
1992	10793 (0.82)	58 (1.00)	235 (0.88)	0 NA	49 (0.19)	2035 (1.00)	15	161 (1.00)
1997.2	3411 NA	13 NA	13 NA	0 NA	917 NA	413 NA	13	0 NA
2000	3358 (0.86)	0 NA	44 (0.84)	0 NA	73 (0.47)	0 NA	44	0 NA
2002	1245 NA	0 NA	20 NA	14 NA	104 NA	0 NA	0	0 NA
2003	454 (1.00)	0 NA	156 (0.91)	0 NA	226 (0.34)	0 NA	79	0 NA
2004	5749 (0.53)	50 (0.62)	97 (0.40)	34 (0.93)	40 (0.97)	579 (0.57)	57	30 (1.00)
2005	882 (0.48)	24 (0.84)	134 (0.71)	15 (1.00)	56 (0.62)	0 NA	3	57 (0.87)
2006	4507 (0.96)	169 (0.66)	72 (1.00)	0 NA	5 (1.00)	0 NA	0	0 NA
2007	1528 NA	0 NA	27 NA	0 NA	4323 NA	0 NA	0	0 NA
2008	964 (0.38)	563 (1.00)	280 (0.61)	9 (1.00)	188 (0.42)	232 (1.00)	45	225 (1.00)
2009	2751 (0.69)	0 NA	705 (0.03)	51 (0.38)	192 (0.93)	0 NA	0	607 (0.13)
2010	2336 (0.36)	921 (1.00)	729 (1.00)	36 (0.55)	4 (1.00)	0 NA	0	196 (1.00)
2011	3902 (0.09)	48 (0.06)	198 (0.41)	5 (1.00)	104 (0.79)	45 (0.47)	12	0 NA
2012	1959 (0.80)	0 NA	33 (1.00)	30 (1.00)	47 (1.00)	0 NA	0	25 (1.00)
2013	229 (0.47)	12 (1.00)	411 (0.44)	10 (1.00)	43 (0.40)	0 NA	21	362 (0.55)
2014	1666 (0.22)	22 (1.00)	80 (0.77)	62 (0.54)	116 (0.74)	6 (1.00)	0	66 (1.00)

## Distribution

Figure 5.3 shows the distribution of Cape hake (*Merluccius capensis*) in the southern region. Hake was found in a continuous low concentration area covering large parts of the outer shelf and slope, from Cunene to Baía dos Tigres, with a smaller medium concentration area off Cunene River.



**Figure 5.3** Distribution of Cape hake (*Merluccius capensis*) in the southern region, Benguela- Cunene River. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m.

## CHAPTER 6 SUMMARY

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From 07 March to 06 April the 2014 demersal resource survey off Angola was successfully carried out using R/V “Dr. Fridtjof Nansen”. During this present survey, the shelf and upper slope (20-800 m) from Congo River to Cunene River was covered. Only a few bottom trawls were carried out on the shelf between Benguela and Tombua due to unsuitable and poor bottom conditions for trawling. In total, 206 trawl stations were carried out, of which 203 were valid and used in the biomass estimations. To map the oceanographic conditions 244 CTD stations were taken.

### **Biomass estimates**

Table 6.1 presents the time series from 1985 to 2014 of the biomass estimates for the most important species on the shelf and slope in the northern and central regions off Angola. The estimates on the southern slope are very unreliable as the number of tows is very low due to difficult trawling conditions. Tables 4.3 and 5.3 show the biomass estimates of the important species on the southern shelf and slope, respectively.

#### *General trend*

The coast of Angola has a great diversity of fish and invertebrate marine species which individually has relatively low biomass but together form an important fishery. Abundance trends within stocks of low biomass may show great variation from year to year due to low frequency of occurrence and large variability in catch rates that consequently can be observed as a high coefficient of variability (CV) connected to the biomass estimate. These low biomass estimates with individually large CVs may sometimes obscure the greater picture. We have therefore chosen to look at the overall trend in catch rates this year and compare these with the catch trends of the last ten years when the survey methodology has been kept reasonably constant.

### **Seabreams**

Seabreams are the one most important commercial demersal fish group in Angola. Biomass estimate for the northern and central regions in 2014 was 37 000 Tonnes, the highest since 1999 and above the average of the whole time series. As in previous years, *Dentex angolensis* was the dominant Seabreams species on the shelf in the northern region, whereas in the central and southern regions *D. macrophthalmus* dominated.

### **Hakes**

*Merluccius polli* was mostly found in juvenile stage on the shelf of the northern and central regions and the biomass estimate in 2014 was 500 Tonnes which is an increase compared to the 50 Tonnes estimated previous year. The total biomass estimate for *M. polli* on the shelf and slope of northern and central regions was 14 000 Tonnes, which is more than the double of the 2013 biomass estimate and equal to the 2012 estimate. There has been a declining abundance of hake in these two regions since 2004 and this could be related to the fishing pressure. In the southern region, the biomass estimate of hake (61 % *M. capensis*) on the shelf and slope was 20 000 Tonnes, which is the highest since 2009 and about the double of the average estimate since 1991.

## **Shrimps**

The two commercially important shrimp species *Parapenaeus longirostris* and *Aristeus varidens* were caught in higher densities in the northern and central regions compared to the southern region. *P. longirostris* is mainly distributed on the upper slope and *A. varidens* on the lower slope. The 2014 biomass estimate of *P. longirostris* was about 2 200 Tonnes in the northern and central regions, equal to last year's estimate and just above the average value for the last ten years (2000 Tonnes).

In 2014 the biomass of *A. varidens* was estimated to about 2 400 Tonnes, a small increase compared to the 2013 estimate and well above the average of the ten last years (1 400 Tonnes). The biomass estimate of both shrimp species have a relatively high coefficient of variation (CV), which indicates that they should be interpreted with care.

## **Grunts**

The biomass estimate of grunts (*Pomadasys incisus*, *P. Jubelini*, *P. rogeri* and *P. peroteti*) in the central and northern regions was 7 200 Tonnes which is almost the same as found in 2013. The 2012 estimate of 20 500 Tonnes is the highest ever recorded for this fish group.

The 2014 biomass estimate of big eye grunt (*Brachydeuterus auritus*) in the central and northern regions was 55 000 Tonnes, higher than the 2013 estimate (45 000 Tonnes) and at about the average level over the last ten years. The big eye grunt estimates have fluctuated in the last decade but with signs of a declining trend which could be a sign of increased fishing pressure, or related to other factors such as environmental conditions and recruitment.

## **Croakers**

The estimated biomass of croakers in 2014 was about 7 000 Tonnes in the central and northern regions, which is less than half of last year's estimate (16 400 Tonnes) and lower than the average over the ten last years. *Umbrina canariensis* was the most common croaker found in the central and northern regions and contributed more than 50 % of the total estimate of this group. The 2014 estimate of *U. canariensis* was 3 700, much lower than last year's estimate (13 100 Tonnes).



### ***Groupers and snappers***

The 2014 survey gave an estimated biomass of 1 100 Tonnes Groupers, mainly *Epinephelus aeneus* and *E. guaza*. This is an increase compared to 2013 and slightly lower than the 2012 estimate. The high CV values indicate that 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. Groupers are coastal dwellers and prefer rocky shore and their distribution is not well covered therefore the biomass estimates of this species group may not adequately reflect the state of the stock.

Snappers are rarely caught as they also are rocky dwellers and therefore often unavailable for trawl surveys, hence the biomass estimates of snappers may not adequately reflect the state of the stock. The biomass estimate for 2014 was about 200 Tonnes, while in 2013 no snappers were caught in the northern and central regions.

### **Pelagic species**

The pelagic species; *Trachurus trecae*, *T. capensis*, *Sardinella aurita*, *S. maderensis*, *Sardina pilchardus* and *Engraulis capensis* are schooling pelagic species and can be caught in great abundance, and may therefore obscure the overall tendency for the demersal species.

In the northern and central regions, the biomass estimate of *T. trecae* was 32 000 Tonnes, which is the highest estimate since 2003. The estimates have fluctuated due to the relatively low number of stations as well as the variability in the distribution pattern of this species. The carangids biomass estimate was 41 000 in 2014, also the highest since 2003. The Hairtails estimate was 5 200 Tonnes in 2014, similar to the 2013 estimate and one of the lowest in the time series. There has been a decreasing trend in the Hairtails estimates since 2005.

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

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	211 (0.12)	4,496 (1.85)	323 (1.22)	11,438 (1.90)	841 (0.92)	364 (1.93)	9,986 (1.52)	44 (3.25)
1985.2	0	3,324 (1.94)	139 (3.12)	694 (0.95)	451 (1.06)	3,907 (3.17)	3,740 (1.73)	30 (2.72)
1985.3	6,524 (1.70)	16,486 (1.99)	2,215 (1.77)	2,297 (1.00)	1,079 (1.74)	205 (3.23)	17,742 (1.81)	146 (2.16)
1985.4	55,083 (1.46)	110,950 (1.39)	15,069 (1.04)	6,369 (1.24)	96 (2.42)	906 (1.55)	117,929 (1.33)	88 (2.09)
1986.1	29,498 (1.21)	31,313 (0.88)	24,342 (0.60)	6,925 (0.81)	5,004 (2.30)	2,770 (0.96)	38,390 (0.72)	64 (2.00)
1986.2	52,670 (0.76)	30,649 (1.11)	21,957 (0.43)	2,935 (0.78)	5,256 (1.38)	1,693 (0.95)	34,989 (0.97)	226 (1.51)
1989.1	16,503 (1.50)	19,681 (1.00)	9,110 (2.48)	4,465 (1.10)	3,086 (2.42)	2,137 (2.42)	26,000 (0.85)	252 (1.08)
1989.2	14,371 (0.90)	33,008 (0.74)	7,519 (1.03)	3,198 (0.56)	1,472 (1.18)	2,282 (0.79)	40,419 (0.66)	333 (1.16)
1989.3	25,407 (1.58)	49,538 (0.85)	7,393 (0.65)	4,797 (0.90)	21,887 (1.35)	6,749 (0.99)	59,519 (0.85)	518 (1.43)
1991.1	31,536 (0.93)	107,626 (1.18)	14,041 (0.97)	2,235 (0.43)	3,559 (1.18)	2,349 (1.31)	131,007 (1.03)	373 (1.28)
1991.2	30,968 (1.03)	62,772 (1.25)	8,426 (1.07)	7,351 (0.70)	4,090 (1.31)	91 (1.43)	63,901 (1.23)	444 (1.13)
1992	23,233 (0.60)	48,453 (0.69)	13,613 (1.17)	6,109 (0.41)	5,163 (1.47)	82 (1.92)	53,311 (0.67)	223 (1.14)
1994	10,343 (1.00)	77,944 (0.83)	11,756 (1.00)	6,886 (0.52)	1,869 (0.91)	206 (2.91)	86,549 (0.75)	926 (1.08)
1995.1	10,577 (1.30)	5,224 (1.74)	15,395 (0.93)	1,789 (0.76)	3,382 (1.00)	1,679 (1.09)	19,756 (0.74)	393 (1.24)
1995.2	6,880 (0.81)	11,258 (1.17)	4,499 (0.65)	979 (1.08)	1,289 (1.01)	0	11,370 (1.15)	201 (1.88)
1996	12,219 (1.08)	83,774 (0.95)	11,356 (0.96)	5,268 (0.49)	2,641 (1.47)	1,371 (1.69)	89,864 (0.89)	190 (1.65)
1997.1	21,911 (0.90)	64,832 (0.77)	22,638 (0.60)	10,684 (0.56)	3,004 (1.18)	9,833 (1.75)	168,669 (1.14)	335 (1.74)
1997.2	25,581 (0.71)	97,858 (0.58)	9,977 (2.10)	6,260 (0.42)	500 (1.73)	132 (2.45)	99,747 (0.56)	289 (2.20)
1998	10,366 (1.27)	4,630 (1.67)	9,412 (0.98)	3,016 (0.62)	1,122 (1.30)	2,860 (2.97)	7,606 (1.20)	52 (2.54)
1999	6,640 (1.08)	17,083 (0.78)	13,687 (0.97)	3,577 (1.08)	3,192 (0.73)	8,353 (0.87)	36,949 (0.60)	69 (1.84)
2000	10,118 (1.00)	25,701 (0.72)	7,592 (0.76)	3,778 (0.44)	5,098 (1.86)	2,215 (1.41)	47,540 (0.80)	349 (1.83)
2001	9,732 (1.30)	22,012 (0.77)	11,282 (1.23)	4,340 (1.36)	3,519 (1.85)	598 (1.06)	30,501 (0.66)	139 (1.11)
2002	7,680 (0.93)	88,411 (0.70)	10,747 (1.11)	4,980 (0.71)	629 (0.97)	3,067 (0.78)	98,922 (0.63)	820 (2.58)
2003	14,240 (1.35)	35,260 (0.78)	13,086 (0.85)	2,649 (0.57)	1,917 (1.93)	4,255 (0.78)	57,659 (0.89)	137 (1.75)
2004	31,628 (1.73)	21,409 (0.71)	20,863 (0.59)	3,400 (0.54)	3,125 (1.09)	3,760 (1.00)	28,088 (0.58)	63 (1.39)
2005	21,112 (0.99)	10,931 (0.70)	17,650 (0.59)	4,061 (0.47)	2,421 (1.08)	2,134 (1.19)	20,025 (0.67)	332 (1.72)
2006	14,563 (1.06)	14,925 (0.52)	20,214 (0.61)	3,728 (0.54)	2,328 (1.48)	4,663 (1.09)	25,200 (0.45)	183 (1.03)
2007	11,157 (1.66)	10,633 (0.69)	24,092 (0.71)	3,287 (0.56)	2,789 (1.21)	3,875 (0.84)	22,928 (0.73)	214 (1.42)
2008	11,979 (0.96)	5,640 (0.69)	24,057 (0.65)	3,577 (0.49)	1,831 (1.03)	2,700 (1.20)	22,856 (0.91)	168 (1.22)
2009	8,120 (1.00)	14,485 (0.68)	23,619 (0.63)	4,317 (0.64)	3,009 (1.61)	11,816 (1.85)	24,557 (0.69)	121 (1.31)
2010	7,051 (1.08)	4,427 (0.73)	19,050 (0.79)	3,215 (0.36)	1,205 (1.14)	3,238 (1.99)	19,492 (1.77)	164 (1.20)
2011	6,751 (2.52)	15,045 (1.73)	15,715 (0.96)	3,757 (0.51)	1,482 (0.97)	3,907 (1.22)	24,065 (1.16)	124 (1.32)
2012	13,939 (1.31)	24,458 (0.73)	22,275 (0.72)	6,742 (0.48)	659 (1.30)	75,068 (1.57)	35,799 (0.59)	3,138 (2.82)
2013	6,471 (0.94)	4,985 (0.97)	19,405 (0.62)	2,917 (0.81)	2,122 (1.45)	2,718 (1.56)	25,219 (0.89)	166 (1.59)
2014	14,084 (1.09)	32,060 (0.69)	18,296 (0.55)	5,583 (0.38)	1,107 (1.13)	11,325 (1.77)	41,137 (0.58)	5,036 (2.00)

Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.1	15,711 (1.45)	254 (1.50)	0	479 (1.81)	248 (1.69)	1,519 (1.67)	14,690 (0.94)	138 (1.93)
1985.2	1,200 (2.75)	75 (1.35)	63 (2.09)	1,771 (1.30)	381 (2.18)	1,302 (1.82)	12,881 (0.57)	0
1985.3	3,219 (1.31)	26 (2.74)	62 (3.25)	1,978 (1.39)	3,629 (1.56)	8,979 (1.52)	22,438 (1.03)	0
1985.4	7,937 (0.94)	1,033 (1.93)	0 NA	4,307 (0.91)	20,511 (1.54)	13,935 (2.05)	49,738 (0.69)	3,062 (1.72)
1986.1	26,602 (0.92)	3,099 (0.84)	470 (3.02)	1,087 (1.01)	3,468 (1.06)	6,956 (0.82)	27,435 (0.54)	3,823 (1.22)
1986.2	511,874 (0.02)	1,874 (0.93)	0	2,033 (0.84)	6,995 (0.98)	9,578 (0.76)	45,651 (0.36)	0
1989.1	13,125 (0.89)	2,281 (2.15)	0	1,569 (1.34)	3,816 (1.85)	5,864 (1.15)	25,271 (0.55)	895 (1.44)
1989.2	6,333 (0.70)	3,674 (1.21)	53 (2.19)	3,937 (2.31)	2,228 (1.06)	7,826 (0.78)	23,569 (0.92)	1,559 (1.07)
1989.3	66,901 (0.69)	1,068 (1.09)	316 (3.25)	1,107 (1.95)	1,870 (1.37)	4,812 (1.06)	20,807 (0.76)	1,094 (1.18)
1991.1	21,783 (1.13)	3,322 (1.93)	106 (3.69)	817 (1.28)	1,247 (0.99)	5,848 (1.05)	14,666 (0.48)	302 (1.48)
1991.2	9,218 (0.61)	161 (1.32)	0	2,043 (1.05)	2,742 (1.29)	26,595 (1.93)	42,431 (0.47)	640 (0.95)
1992	17,251 (0.74)	103 (2.12)	0	3,359 (1.08)	1,698 (1.27)	4,772 (0.76)	40,589 (0.52)	935 (1.71)
1994	31,574 (2.09)	329 (1.69)	262 (3.69)	2,908 (1.07)	680 (1.25)	18,320 (1.46)	51,379 (0.51)	1,757 (1.05)
1995.1	14,521 (0.59)	4,222 (1.10)	594 (2.14)	1,397 (1.05)	6,027 (1.40)	18,472 (1.67)	29,271 (0.83)	2,020 (1.09)
1995.2	5,112 (1.63)	0	45 (3.18)	348 (3.18)	0	245 (1.89)	11,363 (0.86)	680 (1.02)
1996	9,254 (0.51)	1,035 (1.51)	109 (3.69)	2,692 (1.26)	8,256 (1.04)	15,215 (0.62)	39,921 (0.62)	310 (0.89)
1997.1	32,077 (0.82)	554 (3.05)	73 (3.25)	781 (1.08)	6,427 (1.49)	21,483 (0.69)	33,690 (0.75)	2,501 (1.05)
1997.2	23,555 (0.55)	0	0	2,840 (1.33)	500 (0.84)	36,999 (1.82)	49,236 (0.63)	5,481 (1.07)
1998	30,861 (2.71)	454 (1.54)	0	198 (2.33)	9,117 (1.56)	8,609 (1.62)	64,867 (2.24)	742 (1.32)
1999	26,027 (0.57)	4,317 (0.82)	531 (3.49)	1,642 (0.83)	8,888 (1.03)	18,534 (1.14)	34,029 (0.45)	878 (0.82)
2000	18,068 (0.62)	4,556 (1.00)	294 (2.04)	1,647 (1.01)	7,213 (0.91)	7,842 (0.67)	36,443 (0.45)	1,259 (1.15)
2001	24,459 (1.12)	1,818 (0.79)	726 (3.16)	859 (1.50)	3,600 (1.17)	3,203 (0.94)	22,805 (0.64)	1,020 (0.83)
2002	30,855 (0.70)	2,318 (0.99)	251 (4.74)	742 (1.17)	3,223 (0.99)	9,196 (0.61)	34,016 (0.85)	1,565 (1.41)
2003	20,199 (0.68)	2,824 (1.86)	186 (2.63)	1,037 (1.00)	10,025 (1.83)	13,474 (0.69)	17,687 (0.42)	1,363 (1.15)
2004	20,349 (1.20)	1,856 (1.54)	79 (2.44)	681 (0.91)	6,810 (1.15)	12,196 (1.24)	32,647 (1.79)	2,143 (1.33)
2005	41,427 (1.25)	963 (1.68)	284 (2.07)	1,176 (0.88)	11,735 (1.08)	13,501 (0.72)	33,064 (1.12)	1,613 (1.07)
2006	20,849 (0.49)	2,561 (0.92)	51 (2.69)	819 (0.99)	6,921 (1.09)	8,956 (0.73)	24,824 (0.57)	2,607 (1.92)
2007	32,508 (1.22)	2,336 (1.34)	113 (1.86)	950 (1.04)	17,242 (1.38)	11,991 (1.40)	22,191 (0.35)	1,342 (1.35)
2008	18,211 (0.64)	1,652 (1.78)	90 (2.88)	1,187 (1.53)	7,411 (1.43)	12,684 (0.87)	21,227 (0.48)	1,622 (1.30)
2009	31,108 (1.11)	1,743 (1.33)	292 (2.03)	779 (0.73)	8,192 (0.90)	6,064 (0.74)	18,108 (0.41)	1,432 (1.10)
2010	14,888 (0.94)	1,202 (1.21)	69 (1.32)	643 (0.92)	10,873 (0.95)	8,256 (0.77)	25,714 (0.39)	1,648 (1.18)
2011	11,390 (1.11)	3,232 (1.22)	267 (2.79)	705 (0.83)	14,677 (1.23)	13,884 (0.99)	20,872 (0.37)	1,492 (1.76)
2012	12,125 (1.21)	1,086 (1.61)	8 (3.25)	1,249 (2.00)	20,538 (1.64)	8,073 (0.73)	21,719 (0.81)	3,971 (1.28)
2013	6,906 (0.61)	3,791 (1.38)	0 NA	760 (1.56)	7,297 (0.78)	16,442 (1.55)	22,022 (0.42)	2,149 (3.05)
2014	7,182 (0.89)	910 (1.00)	222 (3.25)	1,092 (0.92)	7,230 (0.84)	6,970 (0.66)	37,225 (0.50)	2,183 (1.13)

Table 6.1 cont.

Survey	A.varidens	N.africanus	Ommastrephidae	Sepiidae	B.auritus	D.angolensis	U.canariensis	D.macrophthalmus
1985.1	0	0	11,249 (1.93)	13	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)	5,037 (1.12)	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	2,040 (1.09)	36,750 (0.69)	15,499 (0.47)	3,387 (1.33)	9,215 (0.40)
1989.1	397 (1.56)	7,545 (2.98)	3,209 (1.51)	356 (1.29)	20,488 (1.13)	2,568 (0.49)	1,427 (1.14)	7,302 (1.28)
1989.2	400 (1.50)	4,702 (1.61)	1,286 (1.04)	1,529 (0.62)	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)	170 (1.62)	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)	528 (0.78)	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)	4,156 (1.05)	797 (1.37)	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)	1,954 (0.62)	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)	881 (0.63)	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)	222 (2.43)	0	1,280 (0.74)	209 (2.22)	10,083 (0.99)
1996	938 (0.76)	8,830 (1.16)	1,069 (0.45)	2,342 (0.56)	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)	3,439 (0.56)	6,612 (0.84)	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)	766 (1.28)	1,335 (1.06)	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)	760 (0.53)	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)	960 (0.87)	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)	944 (1.38)	54,964 (1.01)	3,482 (0.84)	1,264 (1.70)	6,772 (1.22)
2002	371 (0.99)	8,375 (1.42)	3,648 (0.93)	372 (0.88)	81,844 (1.16)	3,323 (0.66)	4,326 (0.86)	13,935 (2.04)
2003	881 (1.78)	10,157 (1.06)	1,233 (0.99)	625 (0.97)	104,721 (0.99)	4,765 (0.42)	4,260 (1.62)	1,092 (2.52)
2004	935 (0.78)	17,133 (0.68)	1,319 (0.89)	762 (0.58)	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)	1,246 (1.27)	2,075 (0.41)	88,667 (1.17)	8,473 (0.29)	5,933 (0.91)	7,290 (4.97)
2006	750 (0.63)	16,424 (0.71)	961 (1.40)	1,324 (0.69)	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)	1,624 (0.58)	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)	898 (0.62)	895 (0.70)	70,217 (1.19)	6,860 (0.46)	5,058 (0.93)	3,176 (3.01)
2009	2,204 (0.66)	19,130 (0.79)	441 (0.79)	1,452 (0.76)	46,010 (1.28)	6,697 (0.44)	2,409 (0.71)	876 (0.93)
2010	1,134 (1.01)	16,013 (0.90)	452 (0.69)	1,316 (0.54)	24,838 (0.91)	11,561 (0.50)	4,493 (1.14)	2,395 (4.44)
2011	1,272 (0.40)	12,206 (1.22)	238 (1.02)	2,026 (0.52)	36,639 (1.11)	9,905 (0.42)	6,038 (1.57)	777 (1.44)
2012	1,525 (1.15)	16,284 (0.94)	1,667 (1.45)	3,713 (0.58)	51,544 (0.90)	7,501 (0.44)	4,125 (0.89)	3,671 (4.50)
2013	1,944 (1.07)	14,952 (0.64)	472 (0.57)	784 (0.59)	45,625 (0.92)	10,486 (0.48)	13,137 (1.92)	3,413 (2.03)
2014	2,387 (0.83)	12,759 (0.79)	2,037 (0.62)	1,919 (0.53)	55,248 (0.73)	12,896 (0.48)	3,698 (0.85)	8,443 (1.92)

# ANNEX I Records of fishing stations

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 1  
 DATE :07/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°17.06  
 start stop duration Lon E 12°41.14  
 TIME :19:19:31 19:50:03 30.5 (min) Purpose : 3  
 LOG : 5006.19 5007.83 1.6 Region : 4054  
 FDEPTH: 713 706 Gear cond.: 0  
 BDEPTH: 713 706 Validity : 0  
 Towing dir: 0° Wire out : 1660 m Speed : 3.2 kn  
 Sorted : 45 Total catch: 276.67 Catch/hour: 543.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarrella blackfordi	243.03	6621	44.71	
Nematocarcinus africanus	91.00	19202	16.74	
Stereomastis sp.	48.33	7898	8.89	
Malacocephalus occidentalis	32.77	778	6.03	
Lamprogrammus exutus	30.12	83	5.54	
ANTHOZOA (Sea anemones)	12.14	35	2.23	
Xenodermichthys copei	12.02	24	2.21	
Dicrolene intronigra	11.79	731	2.17	
Bathyrcoconger vicinus	7.90	283	1.45	
Hoplostethus cadenati	7.43	189	1.37	
Chaceon maritae	6.86	18	1.26	100
Merluccius polli	6.52	8	1.20	99
Aristeus varidens	5.89	259	1.08	102
Talismania sp.	4.72	141	0.87	
Dibranchius atlanticus	3.65	189	0.67	
Anemones, white	2.83	12	0.52	
Todaropsis eblanae	2.59	12	0.48	
Talismania longifilis	2.48	47	0.46	
Lamprogrammus niger	2.36	47	0.43	
Triplophos hemingi	2.36	295	0.43	
Lophodes kempi	2.00	12	0.37	
Nettastoma melanurum	0.83	12	0.15	
Myxine sp.	0.71	12	0.13	
Xenodermichthys sp.	0.59	106	0.11	
Stomias boa boa	0.59	118	0.11	
Chaceon maritae	0.53	6	0.10	101
Halosaurus ovenii	0.47	12	0.09	
Plesiopeneus edwardsianus	0.35	24	0.07	
Malacocephalus laevis	0.24	12	0.04	
Diastobranthus capensis	0.24	12	0.04	
Glyphus marsupialis	0.12	12	0.02	
Melanonus zugmayeri	0.12	12	0.02	
Total	543.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 3  
 DATE :08/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°14.88  
 start stop duration Lon E 12°43.96  
 TIME :00:00:53 00:30:58 30.1 (min) Purpose : 3  
 LOG : 5018.02 5019.76 1.7 Region : 4054  
 FDEPTH: 417 419 Gear cond.: 0  
 BDEPTH: 417 419 Validity : 0  
 Towing dir: 0° Wire out : 890 m Speed : 3.5 kn  
 Sorted : 28 Total catch: 306.08 Catch/hour: 610.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	251.89	75566	41.26	
Lamprogrammus exutus	134.94	20932	22.10	
Talismania sp.	38.18	527	6.25	
Hoplostethus cadenati	36.92	1251	6.05	
Gadella maraldi	35.55	395	5.82	
Sigmops bathyphilus	21.06	483	3.45	
Gadella imberbis	17.33	746	2.84	
Dicrolene intronigra	12.95	943	2.12	
Myxine sp.	10.75	88	1.76	
Aristeus varidens	7.90	1031	1.29	111
Aristeus varidens	7.02	483	1.15	110
Merluccius polli	4.91	14	0.80	112
Parapeneus longirostris	3.07	285	0.50	113
Hymenocephalus sp.	2.85	351	0.47	
Malacocephalus occidentalis	2.85	176	0.47	
Lithodes ferox	2.63	22	0.43	
Dibranchius atlanticus	2.63	154	0.43	
Bathyrcoconger vicinus	1.97	66	0.32	
Anemones, white	1.97	22	0.32	
Yarrella blackfordi	1.97	66	0.32	
Rossia enigmatica	1.97	22	0.32	
Halosaurus ovenii	1.76	88	0.29	
Ariomma bondi	1.54	44	0.25	
Malacocephalus laevis	1.10	44	0.18	
Stereomastis sp.	1.10	154	0.18	
Benthodesmus tenuis	1.10	66	0.18	
Stomias boa boa	0.88	22	0.14	
Chaceon maritae, female	0.86	2	0.14	
Todaropsis eblanae	0.66	44	0.11	
Xenodermichthys copei	0.22	22	0.04	
Total	610.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 2  
 DATE :07/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°15.70  
 start stop duration Lon E 12°41.50  
 TIME :21:21:22 21:53:36 32.2 (min) Purpose : 3  
 LOG : 5011.07 5012.59 1.5 Region : 4054  
 FDEPTH: 610 598 Gear cond.: 0  
 BDEPTH: 610 598 Validity : 0  
 Towing dir: 0° Wire out : 1350 m Speed : 2.8 kn  
 Sorted : 20 Total catch: 273.53 Catch/hour: 509.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	188.93	71179	37.11	
Yarrella blackfordi	73.25	1965	14.39	
Aristeus varidens	46.67	893	9.17	104
Gonostoma denudatum	37.07	759	7.28	
Malacocephalus occidentalis	31.49	826	6.19	
Hoplostethus cadenati	29.93	849	5.88	
Stereomastis sp.	23.67	2926	4.65	
Chaceon maritae	23.11	60	4.54	103
Lamprogrammus exutus	20.32	89	3.99	
Bathyrcoconger vicinus	9.60	290	1.89	
Gadella imberbis	4.69	625	0.92	
Lophius vaillanti	3.57	22	0.70	
Xenodermichthys copei	2.90	134	0.57	
Dibranchius atlanticus	2.23	134	0.44	
Lithodes ferox	1.82	2	0.36	
Triplophos hemingi	1.56	268	0.31	
Plesiopeneus edwardsianus	1.34	45	0.26	
Chaceon maritae, male	1.28	6	0.25	
Benthodesmus tenuis	1.12	22	0.22	
Rajella barnardi	1.12	45	0.22	
OPHIDIIDAE	0.89	89	0.18	
Halosaurus ovenii	0.89	22	0.18	
Alepocephalus rostratus	0.89	67	0.18	
Trachinocephalus myops	0.67	67	0.13	
Total	509.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 4  
 DATE :08/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°16.13  
 start stop duration Lon E 12°47.95  
 TIME :02:20:45 02:50:08 29.4 (min) Purpose : 3  
 LOG : 5029.67 5031.25 1.6 Region : 4054  
 FDEPTH: 302 302 Gear cond.: 0  
 BDEPTH: 302 302 Validity : 0  
 Towing dir: 0° Wire out : 670 m Speed : 3.2 kn  
 Sorted : 28 Total catch: 328.54 Catch/hour: 670.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	354.04	6739	52.77	118
Chlorophthalmus atlanticus	119.73	2426	17.85	
RHINOCHIMAERIDAE	36.56	4	5.45	
Gadella maraldi	21.34	247	3.18	
Pontonus accraensis	20.44	202	3.05	
Synagrops microlepis	19.99	1056	2.98	
MYCTOPHIDAE	16.40	472	2.44	
Hymenocephalus italicus	13.25	3235	1.98	
Bembrops heterurus	13.03	247	1.94	
Dibranchius atlanticus	13.03	1101	1.94	
Aequorea forskalea	11.46	472	1.71	
Parapeneus longirostris	11.23	1630	1.67	119
Nematocarcinus africanus	8.76	3370	1.31	
Malacocephalus occidentalis	6.51	45	0.97	
Parapeneus longirostris	2.25	427	0.33	120
Nezumia aequalis	1.57	22	0.23	
Trichirus lepturus	0.67	112	0.10	
Epigonus telescopus	0.45	45	0.07	
Solenocera africana	0.22	90	0.03	
Total	670.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 5  
DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°10.61  
start stop duration Lon E 12°54.90  
TIME :07:15:32 07:48:06 32.6 (min) Purpose : 3  
LOG : 5042.73 5044.57 1.8 Region : 4054  
FDEPTH: 118 118 Gear cond.: 0  
BDEPTH: 118 118 Validity : 0  
Towing dir: 0° Wire out : 300 m Speed : 3.4 kn  
Sorted : 57 Total catch: 432.23 Catch/hour: 796.49

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 8  
DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°4.04  
start stop duration Lon E 13°37.35  
TIME :11:53:00 12:23:48 30.8 (min) Purpose : 3  
LOG : 5066.40 5068.23 1.8 Region : 4054  
FDEPTH: 45 44 Gear cond.: 0  
BDEPTH: 45 44 Validity : 0  
Towing dir: 0° Wire out : 120 m Speed : 3.6 kn  
Sorted : 34 Total catch: 110.09 Catch/hour: 214.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	309.58	2128	38.87	3
Trachurus trecae	291.34	11526	36.58	2
Trichiurus lepturus	52.24	166	6.56	
Dentex angolensis	50.18	332	6.30	1
Chelidonichthys capensis	13.97	111	1.75	
Octopus vulgaris	11.48	28	1.44	
Raja miraletus	10.93	28	1.37	
Zeus faber	10.10	83	1.27	
Spicara alta	9.40	291	1.18	
Illex coindetii	7.06	208	0.89	
B I V A L V E S	5.95	650	0.75	
Brotula barbata	5.92	4	0.74	
Citharus linguatula	4.02	125	0.50	
Sphoeroides pachgaster	2.91	15	0.37	
Chaetodon hoefleri	2.21	15	0.28	
Scomber japonicus	2.21	28	0.28	
Pontinus accraensis	2.03	15	0.25	
Saurida brasiliensis	1.84	485	0.23	
Boops boops	1.53	42	0.19	
Umrina canariensis	1.18	4	0.15	
Arnoglossus imperialis	0.42	28	0.05	
Total	796.49		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	64.58	7087	30.11	15
Trachurus trecae	36.53	2468	17.03	13
Pomadasys incisus	26.18	49	12.21	
Scomberomorus tritor	24.35	12	11.35	
Galeoides decadactylus	15.19	31	7.09	
Alectis alexandrinus	11.65	18	5.43	
Squatina oculata	6.35	6	2.96	
Raja miraletus	5.79	23	2.70	
Citharus linguatula	4.29	162	2.00	
Caranx rhonchus	3.68	86	1.72	
Trichiurus lepturus	2.49	12	1.16	
Pagellus bellottii	2.36	49	1.10	14
Sepia orbignyana	1.62	31	0.75	
Sardinella aurita	1.56	23	0.73	
Sphyraena sphyraena	1.56	80	0.73	
Epinephelus aeneus	1.54	2	0.72	
Bembrops heterurus	1.17	37	0.55	
Eucinostomus melanopterus	1.05	12	0.49	
Torpedo torpedo	0.88	12	0.41	
Alloteuthis africana	0.86	255	0.40	
Penaeus notialis	0.43	12	0.20	
Sardinella maderensis	0.37	6	0.17	
Total	214.46		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 6  
DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°7.38  
start stop duration Lon E 12°59.48  
TIME :09:03:48 09:34:17 30.5 (min) Purpose : 3  
LOG : 5052.41 5054.10 1.7 Region : 4054  
FDEPTH: 95 95 Gear cond.: 0  
BDEPTH: 95 95 Validity : 0  
Towing dir: 0° Wire out : 270 m Speed : 3.3 kn  
Sorted : 95 Total catch: 601.12 Catch/hour: 1183.31

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 9  
DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°2.48  
start stop duration Lon E 13°9.49  
TIME :13:10:35 13:40:27 29.9 (min) Purpose : 3  
LOG : 5072.14 5073.66 1.5 Region : 4054  
FDEPTH: 28 28 Gear cond.: 0  
BDEPTH: 28 28 Validity : 0  
Towing dir: 0° Wire out : 100 m Speed : 3.1 kn  
Sorted : 164 Total catch: 163.67 Catch/hour: 328.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	700.69	3484	59.21	4
Brachydeuterus auritus	245.55	2518	20.75	5
Zeus faber	42.17	49	3.56	
Brotula barbata	40.18	26	3.40	
Sepia orbignyana	27.91	26	2.36	
Dentex angolensis	20.10	222	1.70	6
Octopus vulgaris	19.96	37	1.69	
Lagocephalus laevis	18.48	26	1.56	
Chelidonichthys capensis	14.51	98	1.23	
Fistularia petimba	10.43	26	0.88	
Branchiostegus semifasciatus	8.68	12	0.73	
Citharus linguatula	8.07	150	0.68	
Scomber japonicus	7.81	87	0.66	
Dentex barnardi	5.22	26	0.44	
Uranoscopus cadenati	4.35	12	0.37	
Selene dorsalis	4.09	49	0.35	
Dicologlossa cuneata	2.97	12	0.25	
Pagellus bellottii	1.38	12	0.12	
Illex coindetii	0.75	12	0.06	
Total	1183.31		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	149.41	137	45.45	
Pomadasys incisus	79.16	106	24.08	
Drepene africana	46.44	66	14.13	
Brachydeuterus auritus	7.01	313	2.13	19
Raja miraletus	5.95	14	1.81	
Eucinostomus melanopterus	5.83	92	1.77	
Pseudotolithus senegalensis	5.00	6	1.52	17
Caranx rhonchus	4.38	96	1.33	
Pagellus bellottii	3.86	62	1.17	18
Pomadasys jubelini	3.01	8	0.92	
Sphyraena sphyraena	3.01	110	0.92	
Dentex barnardi	2.45	8	0.75	
Panulirus regius	2.37	12	0.72	
Bembrops heterurus	2.07	34	0.63	
Sphyraena guanchancho	1.67	10	0.51	
Sardinella aurita	1.27	24	0.38	
Trachurus trecae	1.12	58	0.34	16
Cynoglossus senegalensis	1.10	8	0.34	
Caranx crysos	0.94	2	0.29	
Torpedo marmorata	0.44	8	0.13	
Trichiurus lepturus	0.40	4	0.12	
Pseudupeneus prayensis	0.38	2	0.12	
Sepia orbignyana	0.38	4	0.12	
Fistularia petimba	0.36	2	0.11	
Dicologlossa cuneata	0.30	6	0.09	
Ilisha africana	0.20	6	0.06	
Penaeus notialis	0.20	8	0.06	
Scorpaena normani	0.04	2	0.01	
Total	328.76		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 7  
DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°3.98  
start stop duration Lon E 13°3.83  
TIME :10:40:21 11:00:13 19.9 (min) Purpose : 3  
LOG : 5060.60 5061.65 1.1 Region : 4054  
FDEPTH: 66 66 Gear cond.: 0  
BDEPTH: 66 66 Validity : 0  
Towing dir: 0° Wire out : 170 m Speed : 3.2 kn  
Sorted : 135 Total catch: 485.50 Catch/hour: 1466.03

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 10  
DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°50.70  
start stop duration Lon E 13°3.41  
TIME :15:21:27 15:41:17 19.8 (min) Purpose : 3  
LOG : 5088.90 5090.18 1.3 Region : 4054  
FDEPTH: 24 24 Gear cond.: 0  
BDEPTH: 24 24 Validity : 0  
Towing dir: 0° Wire out : 100 m Speed : 3.9 kn  
Sorted : 113 Total catch: 824.66 Catch/hour: 2495.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	678.54	33406	46.28	7
Brachydeuterus auritus	500.26	10469	34.12	8
Sardinella aurita	132.41	2479	9.03	
Raja miraletus	24.58	54	1.68	
Dentex angolensis	21.95	284	1.50	12
Caranx rhonchus	12.50	57	0.85	
Torpedo torpedo	9.45	42	0.64	
Fistularia petimba	9.24	12	0.63	
Sepia orbignyana	8.58	21	0.58	
Pagellus bellottii	8.49	196	0.58	10
Pseudupeneus prayensis	8.27	121	0.56	
Alectis alexandrinus	6.40	12	0.44	
Sphyraena sphyraena	6.40	21	0.44	
Stromateus fiatola	6.19	12	0.42	
Chloroscombrus chrysurus	6.19	42	0.42	
Dentex barnardi	5.77	22	0.39	9
Citharus linguatula	4.47	229	0.30	
Galeoides decadactylus	3.80	21	0.26	
Pseudotolithus typus	2.93	33	0.20	11
Bembrops heterurus	1.96	42	0.13	
Epinephelus aeneus	1.57	3	0.11	
Dicologlossa cuneata	1.42	12	0.10	
Selene dorsalis	1.09	21	0.07	
Pomadasys incisus	0.97	12	0.07	
Sphyraena guanchancho	0.97	21	0.07	
Serranus accraensis	0.54	12	0.04	
Saurida brasiliensis	0.42	42	0.03	
Engraulis encrasicolus	0.33	12	0.02	
Scorpaena stephanica	0.33	12	0.02	
Total	1466.03		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1867.87	70811	74.86	20
Galeoides decadactylus	199.18	1952	7.98	
Chloroscombrus chrysurus	158.40	9301	6.35	
Caranx rhonchus	48.71	1537	1.95	
Pseudupeneus prayensis	26.99	263	1.08	
Pomadasys perotai	25.45	21	1.02	
Raja miraletus	24.15	45	0.97	
Stromateus fiatola	18.00	197	0.72	
Selene dorsalis	15.79	505	0.63	
Trachinotus teraia	14.89	9	0.60	
Penaeus notialis	14.25	197	0.57	
Alectis alexandrinus	13.16	133	0.53	
Pomadasys incisus	11.86	88	0.48	
Eucinostomus melanopterus	10.32	197	0.41	
Sphyraena guanchancho	9.86	45	0.40	
Pomadasys jubelini	8.56	21	0.34	
Trichiurus lepturus	6.60	67	0.26	
Pagellus bellottii	5.72	67	0.23	
Drepene africana	4.39	3	0.18	
Pseudotolithus senegalensis	3.63	3	0.15	
Sardinella maderensis	2.42	21	0.10	
Ilisha africana	1.97	45	0.08	
Sphyraena sphyraena	1.75	67	0.07	
Arius parkii	1.27	3	0.05	
Total	2495.19		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 11  
 DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°50.14  
 start stop duration Lon E 13°11.13  
 TIME :16:24:55 16:44:29 19.6 (min) Purpose : 3  
 LOG : 5093.05 5094.02 1.0 Region : 4054  
 FDEPTH: 41 40 Gear cond.: 0  
 BDEPTH: 41 40 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.0 kn  
 Sorted : 109 Total catch: 818.02 Catch/hour: 2507.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1830.14	53991	72.97	21
Galeoides decadactylus	169.24	852	6.75	
Ilisha africana	111.75	1174	4.46	
Selene dorsalis	86.70	1150	3.46	
Pomadasy perotaei	60.25	162	2.40	25
Raja miraletus	45.53	117	1.82	
Pagellus bellottii	33.36	392	1.33	22
Pseudotolithus senegalensis	32.90	117	1.31	
Sphyræna guachancho	22.53	71	0.90	
Pomadasy incisus	18.86	300	0.75	23
Chloroscombrus chrysurus	17.26	276	0.69	
Dicologlossa cuneata	13.80	25	0.55	
Perna notialis	12.88	254	0.51	
Trachurus trecae	11.50	438	0.46	24
Pseudupeneus prayensis	8.52	117	0.34	
Sepia orbignyana	7.60	25	0.30	
Trichiurus lepturus	5.30	25	0.21	
Pteroscion pelli	5.30	71	0.21	
Eucinostomus melanopterus	3.46	46	0.14	
Cynoglossus canariensis	3.46	25	0.14	
Atractoscion aequidens	3.00	25	0.12	
Citharus linguatula	3.00	71	0.12	
Grammolites gruvelli	1.62	46	0.06	
Total	2507.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 14  
 DATE :08/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°0.96  
 start stop duration Lon E 12°37.79  
 TIME :23:59:42 00:29:49 30.1 (min) Purpose : 3  
 LOG : 5133.66 5135.29 1.6 Region : 4054  
 FDEPTH: 532 531 Gear cond.: 0  
 BDEPTH: 532 531 Validity : 0  
 Towing dir: 0° Wire out : 1110 m Speed : 3.2 kn  
 Sorted : 25 Total catch: 322.14 Catch/hour: 641.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	393.11	79424	61.26	
Stomias boa boa	89.34	2072	13.92	
Lamprogrammus exutus	83.65	2020	13.03	
Dicrolene intronigra	12.95	596	2.02	
Hoplostethus cadenati	12.17	699	1.90	
Yarella blackfordi	11.91	414	1.86	
Aristeus varidens, female	8.29	440	1.29	
Stereomastis sp.	8.03	1450	1.25	
Chaceon maritæ, male	8.03	26	1.25	
Chaceon maritæ, female	3.37	26	0.52	
Illex coindetii	3.37	26	0.52	
Triplophos hemingi	2.33	363	0.36	
Aristeus varidens, male	2.07	311	0.32	
Xenodermichthys copei	1.29	104	0.20	
Malacocephalus laevis	1.04	26	0.16	
OPHIDIIDAE	0.52	104	0.08	
Alepocephalus sp.	0.26	26	0.04	
Total	641.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 12  
 DATE :08/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°51.79  
 start stop duration Lon E 12°58.80  
 TIME :17:20:45 17:40:02 19.3 (min) Purpose : 3  
 LOG : 5097.88 5098.91 1.0 Region : 4054  
 FDEPTH: 57 58 Gear cond.: 0  
 BDEPTH: 57 58 Validity : 0  
 Towing dir: 0° Wire out : 160 m Speed : 3.2 kn  
 Sorted : 90 Total catch: 833.41 Catch/hour: 2593.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1458.08	21128	56.22	29
Galeoides decadactylus	487.38	4456	18.79	
Pagellus bellottii	402.88	3096	15.53	28
Pomadasy incisus	56.45	405	2.18	27
Caranx rhonchus	45.75	1506	1.76	
Pseudupeneus prayensis	29.22	261	1.13	
Trachurus trecae	27.79	1186	1.07	26
Raja miraletus	18.83	87	0.73	
Sphyræna guachancho	13.04	28	0.50	
Ubrina canariensis	12.76	28	0.49	
Selene dorsalis	12.76	174	0.49	
Torpedo torpedo	6.94	28	0.27	
Sardinella aurita	6.94	174	0.27	
Trichiurus lepturus	6.38	28	0.25	
Citharus linguatula	5.79	261	0.22	
Grammolites gruvelli	2.61	59	0.10	
Total	2593.60		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 15  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°59.00  
 start stop duration Lon E 12°42.71  
 TIME :05:28:24 05:49:11 20.8 (min) Purpose : 3  
 LOG : 5144.11 5145.18 1.1 Region : 4054  
 FDEPTH: 195 194 Gear cond.: 0  
 BDEPTH: 195 194 Validity : 0  
 Towing dir: 0° Wire out : 500 m Speed : 3.1 kn  
 Sorted : 130 Total catch: 593.17 Catch/hour: 1712.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	639.10	1504	37.31	
Synagrops microlepis	596.54	40346	34.83	
Brotula barbata	144.08	107	8.41	
Merluccius polli	125.72	1634	7.34	31
Chlorophthalmus atlanticus	42.04	1940	2.45	
Zenopsis conchifer	33.15	603	1.94	
Bembrops heterurus	31.50	332	1.84	
Parapenaeus longirostris	21.77	2463	1.27	
Dentex angolensis	16.05	46	0.94	30
Illex coindetii	15.62	202	0.91	
Uranoscopus polli	9.59	35	0.56	
Cynoponticus ferox	9.24	3	0.54	
Ubrina canariensis	7.71	12	0.45	
Pontinus accraensis	5.57	46	0.33	
Pterothrissus bellocci	3.21	35	0.19	
Lophiodes kempi	2.97	12	0.17	
Citharus linguatula	2.71	202	0.16	
Sea cucumber (bread like)	2.25	12	0.13	
Coelorinchus caelorhincus	1.41	35	0.08	
Chelidonichthys capensis	1.30	12	0.08	
MYCTOPHIDAE	0.95	627	0.06	
Synchiropus phaeton	0.23	12	0.01	
Total	1712.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 13  
 DATE :08/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°3.48  
 start stop duration Lon E 12°36.97  
 TIME :21:17:22 21:47:15 29.9 (min) Purpose : 3  
 LOG : 5126.57 5128.15 1.6 Region : 4054  
 FDEPTH: 625 622 Gear cond.: 0  
 BDEPTH: 625 622 Validity : 0  
 Towing dir: 0° Wire out : 1550 m Speed : 3.2 kn  
 Sorted : 51 Total catch: 431.76 Catch/hour: 866.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	279.24	8653	32.21	
Nematocarcinus africanus	172.73	40367	19.92	
Chaceon maritæ, male	85.18	273	9.82	
Hoplostethus cadenati	81.24	1554	9.37	
Nezumia aequalis	63.84	1741	7.36	
Lamprogrammus exutus	42.85	155	4.94	
Stereomastis sp.	29.36	2731	3.39	
Stomias boa boa	27.31	512	3.15	
Chaceon maritæ, female	11.27	52	1.30	
Onmastrephes barttrami	11.08	34	1.28	
Triplophos hemingi	10.42	1161	1.20	
Aristeus varidens, female	9.90	410	1.14	
Lophiodes kempi	8.55	34	0.99	
Opisthotectis agassizi	6.14	34	0.71	
Bathyrhynchus vicinus	5.80	171	0.67	
Talismania sp.	3.25	155	0.38	
Dicrolene intronigra	2.73	325	0.31	
Ectreposebastes imus	2.73	34	0.31	
Malacocephalus laevis	1.89	34	0.22	
Bassanago albescens	1.20	18	0.14	
Dibranchius atlanticus	1.20	102	0.14	
Xenodermichthys copei	1.20	86	0.14	
Selachophidium guentheri	1.18	205	0.14	
Chlorophthalmus atlanticus	1.02	16	0.12	
Bathynectes piperitus	1.02	86	0.12	
Glyphus marsupialis	1.02	34	0.12	
Rajella barnardi	0.68	34	0.08	
Benthodesmus tenuis	0.68	18	0.08	
Aristeus varidens	0.52	68	0.06	
Peristedion cataphractum	0.18	18	0.02	
Plesiopenaeus edwardsianus	0.18	18	0.02	
Chaunax pictus	0.18	18	0.02	
Cynoglossus browni	0.16	16	0.02	
Total	865.98		99.88	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 16  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°56.94  
 start stop duration Lon E 12°49.87  
 TIME :07:15:24 07:39:58 24.6 (min) Purpose : 3  
 LOG : 5153.38 5154.64 1.3 Region : 4054  
 FDEPTH: 111 110 Gear cond.: 0  
 BDEPTH: 111 110 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.1 kn  
 Sorted : 117 Total catch: 1415.36 Catch/hour: 3456.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2040.15	94840	59.03	32
Brachydeuterus auritus	893.19	2315	25.84	33
Pagellus bellottii	127.47	1319	3.69	35
Selene dorsalis	62.12	352	1.80	
Ubrina canariensis	59.78	147	1.73	
Dentex angolensis	53.33	440	1.54	
Sphaeroides pachygaster	31.94	59	0.92	
Dentex barnardi	27.55	88	0.80	
Pontinus accraensis	26.67	176	0.77	
Dentex congoensis	25.49	703	0.74	
Saurida brasiliensis	16.41	1495	0.47	
Citharus linguatula	13.77	205	0.40	
Brotula barbata	13.63	10	0.39	
Chelidonichthys gabonensis	13.19	29	0.38	
Boops boops	12.31	176	0.36	
Chelidonichthys capensis	12.01	59	0.35	0
Sepia orbignyana	9.16	5	0.26	
Trichiurus lepturus	9.06	10	0.26	
Scorpaena normani	2.64	29	0.08	
Synchiropus phaeton	2.34	88	0.07	
Serranus accraensis	2.05	29	0.06	
Illex coindetii	1.76	29	0.05	
Blennius normani	0.29	29	0.01	
Total	3456.31		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 17  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°57.22  
 start stop duration Lon E 12°54.83  
 TIME :08:46:35 09:05:10 18.6 (min) Purpose : 3  
 LOG : 5160.60 5161.69 1.1 Region : 4054  
 FDEPTH: 88 88 Gear cond.: 0  
 BDEPTH: 88 88 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.5 kn  
 Sorted : 103 Total catch: 102.51 Catch/hour: 330.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	94.89	4057	28.68	38
Pagellus bellottii	55.71	365	16.84	37
Umbrina canariensis	51.58	352	15.59	39
Brachydeuterus auritus	22.40	213	6.77	36
Pomadasy inciscus	15.04	71	4.55	41
Fistularia petimba	11.62	19	3.51	
Pseudupeneus prayensis	8.88	119	2.68	
Brotula barbata	8.88	6	2.68	
Chelidichthys gabonensis	8.78	90	2.65	
Dentex barnardi	8.04	29	2.43	
Lagocephalus laevigatus	7.75	10	2.34	
Boops boops	7.46	313	2.25	
Sphyaena sphyaena	6.62	23	2.00	
Chelidichthys capensis	3.71	23	1.12	
Argyrosomus hololepidotus	3.13	6	0.95	
Citharus linguatula	3.07	129	0.93	
Pagrus caeruleostictus	2.74	3	0.83	
Octopus vulgaris	2.58	3	0.78	
Selene dorsalis	2.26	39	0.68	
Dentex angolensis	1.78	42	0.54	40
Dentex congoensis	1.48	52	0.45	
Scomber japonicus	0.61	6	0.19	
Saurida brasiliensis	0.52	116	0.16	
Todaropsis eblanae	0.42	6	0.13	
Sepia orbignyana	0.39	16	0.12	
Alloteuthis africana	0.16	55	0.05	
Synchiropus phaeton	0.16	10	0.05	
Starfish	0.06	3	0.02	
Chlorophthalmus atlanticus	0.06	3	0.02	
Bathynectes sp.	0.03	3	0.01	
Parapandalus narval	0.03	16	0.01	
Blennius normani	0.03	3	0.01	
Total	330.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 18  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°54.25  
 start stop duration Lon E 12°56.92  
 TIME :10:02:00 10:32:05 30.1 (min) Purpose : 3  
 LOG : 5166.45 5168.25 1.8 Region : 4054  
 FDEPTH: 73 71 Gear cond.: 0  
 BDEPTH: 73 71 Validity : 0  
 Towing dir: 0° Wire out : 190 m Speed : 3.6 kn  
 Sorted : 79 Total catch: 79.43 Catch/hour: 158.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	48.77	495	30.78	43
Trachurus trecae	31.84	1731	20.09	42
Raja miraletus	13.24	14	8.36	
Pseudupeneus prayensis	11.53	122	7.28	
Sea urchin, weak spines	7.16	2539	4.52	
Pseudotolithus typus	6.86	8	4.33	
Selene dorsalis	6.00	88	3.79	
Rhinobatos albomaculatus	5.82	4	3.68	
Galeoides decadactylus	5.33	18	3.36	
Lagocephalus laevigatus	4.29	8	2.71	
Pomadasy inciscus	3.31	16	2.09	
Fistularia petimba	2.27	6	1.44	
Pagrus caeruleostictus	1.32	6	0.83	
Dentex congoensis	1.22	22	0.77	
Sepia orbignyana	1.22	8	0.77	
Brachydeuterus auritus	1.22	10	0.77	
Pomadasy jubelini	1.16	4	0.73	
Dentex barnardi	1.14	6	0.72	
Sphyaena guachancho	1.00	6	0.63	
Zeus faber	0.98	6	0.62	
Chaetodon hoefleri	0.60	4	0.38	
Citharus linguatula	0.56	38	0.35	
Dentex angolensis	0.42	14	0.26	
Sardinella aurita	0.30	6	0.19	
Caranx rhonchus	0.22	8	0.14	
Alloteuthis africana	0.20	56	0.13	
Scomber japonicus	0.16	2	0.10	
Chelidichthys capensis	0.16	4	0.10	
Saurida brasiliensis	0.08	16	0.05	
Synchiropus phaeton	0.04	2	0.03	
Monoleme microstoma	0.04	4	0.03	
Total	158.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 19  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°35.13  
 start stop duration Lon E 12°57.75  
 TIME :12:23:21 12:44:14 20.9 (min) Purpose : 3  
 LOG : 5185.93 5187.19 1.3 Region : 4054  
 FDEPTH: 23 23 Gear cond.: 0  
 BDEPTH: 23 23 Validity : 0  
 Towing dir: 0° Wire out : 90 m Speed : 3.6 kn  
 Sorted : 260 Total catch: 1896.77 Catch/hour: 5450.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	2908.88	99158	53.37	44
Chloroscombrus chrysurus	881.47	36270	16.17	
Ilisha africana	732.10	22046	13.43	
Galeoides decadactylus	479.11	2727	8.79	
Sphyaena guachancho	132.16	483	2.42	
Pseudotolithus typus	63.56	190	1.17	45
Selene dorsalis	48.68	420	0.89	
Alectis alexandrinus	34.20	63	0.63	
Drepane africana	32.30	20	0.59	
Ephippion guttifer	30.83	20	0.57	
Pomadasy perotaei	26.84	83	0.49	
Trichiurus lepturus	22.87	190	0.42	
Raja miraletus	14.68	43	0.27	
Lagocephalus laevigatus	14.68	63	0.27	
Pomadasy inciscus	11.75	147	0.22	
Sepia orbignyana	8.82	20	0.16	
Penaeus notialis	4.40	63	0.08	
Pteroscion peli	2.10	63	0.04	
Epinephelus aeneus	1.06	3	0.02	
Total	5450.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 20  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°34.94  
 start stop duration Lon E 12°56.13  
 TIME :13:28:11 13:48:41 20.5 (min) Purpose : 3  
 LOG : 5189.71 5190.73 1.0 Region : 4054  
 FDEPTH: 32 32 Gear cond.: 0  
 BDEPTH: 32 32 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.0 kn  
 Sorted : 259 Total catch: 259.41 Catch/hour: 759.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	339.37	9123	44.70	46
Pagellus bellottii	139.84	1054	18.42	47
Chloroscombrus chrysurus	129.75	1095	17.09	
Pseudupeneus prayensis	41.33	436	5.44	
Sphyaena guachancho	27.22	73	3.59	
Selene dorsalis	15.01	164	1.98	
Galeoides decadactylus	10.86	97	1.43	
Pagrus caeruleostictus	9.69	59	1.28	
Sardinella maderensis	8.52	73	1.12	
Rhinobatos albomaculatus	6.06	6	0.80	
Caranx rhonchus	5.65	129	0.74	
Scomberomorus tritor	5.06	6	0.67	
Pomadasy inciscus	3.95	29	0.52	
Raja miraletus	3.28	18	0.43	
Torpedo torpedo	2.78	3	0.37	
Balistus capricus	2.63	3	0.35	
Drepane africana	1.76	3	0.23	
Albula vulpes	1.58	3	0.21	
Pseudotolithus senegalensis	1.52	3	0.20	
Dentex barnardi	1.32	6	0.17	
Chilomycterus spinosus mauretanicus	0.88	3	0.12	
Eucinostomus melanopterus	0.70	9	0.09	
Trichiurus lepturus	0.26	3	0.03	
Chaetodon hoefleri	0.23	3	0.03	
Total	759.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 21  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°37.97  
 start stop duration Lon E 12°48.55  
 TIME :15:03:23 15:33:08 29.8 (min) Purpose : 3  
 LOG : 5199.95 5201.68 1.7 Region : 4054  
 FDEPTH: 72 72 Gear cond.: 0  
 BDEPTH: 72 72 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.5 kn  
 Sorted : 0 Total catch: 131.36 Catch/hour: 264.93

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	101.24	1067	38.22	48
Galeoides decadactylus	57.38	196	21.66	
Caranx rhonchus	44.01	1031	16.61	
Sphyaena guachancho	20.97	85	7.92	
Lagocephalus laevigatus	8.25	14	3.11	
Selene dorsalis	7.93	85	2.99	
Raja miraletus	7.16	16	2.70	
Rhinobatos albomaculatus	5.93	4	2.24	
Chloroscombrus chrysurus	4.34	30	1.64	
Pomadasy jubelini	2.72	10	1.03	
Trachurus trecae	1.37	87	0.52	49
Trichiurus lepturus	1.25	2	0.47	
Pomadasy inciscus	0.75	4	0.28	
Sepia orbignyana	0.48	2	0.18	
Sardinella aurita	0.28	4	0.11	
Bembrops heterurus	0.28	10	0.11	
Alloteuthis africana	0.22	20	0.08	
Citharus linguatula	0.20	20	0.08	
Scomber japonicus	0.10	2	0.04	
Chelidichthys gabonensis	0.04	2	0.02	
Saurida brasiliensis	0.02	4	0.01	
Total	264.93		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 22  
 DATE :09/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°37.92  
 start stop duration Lon E 12°44.73  
 TIME :16:19:04 16:50:35 31.5 (min) Purpose : 3  
 LOG : 5205.94 5207.63 1.7 Region : 4054  
 FDEPTH: 89 88 Gear cond.: 0  
 BDEPTH: 89 88 Validity : 0  
 Towing dir: 0° Wire out : 230 m Speed : 3.2 kn  
 Sorted : 0 Total catch: 64.13 Catch/hour: 122.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	38.53	2244	31.56	50
Chelidichthys capensis	32.66	247	26.76	
Dentex congoensis	10.11	246	8.28	
Pagellus bellottii	10.07	139	8.25	51
Lagocephalus laevigatus	9.75	13	7.98	
Pomadasy jubelini	3.52	4	2.88	
Raja miraletus	3.10	6	2.54	
Sphyaena sphyaena	2.30	8	1.89	
Galeoides decadactylus	1.77	6	1.45	
Caranx rhonchus	1.68	44	1.37	
Torpedo spotted	1.45	2	1.19	
Sepia orbignyana	0.95	13	0.78	
Citharus linguatula	0.91	30	0.75	
Ilex coindetii	0.74	11	0.61	
Sardinella aurita	0.69	11	0.56	
Uranoscopus polli	0.55	2	0.45	
Scomber japonicus	0.49	10	0.41	
Saurida brasiliensis	0.48	88	0.39	
Fistularia petimba	0.46	4	0.37	
Zeus faber	0.36	2	0.30	
Chloroscombrus chrysurus	0.36	2	0.30	
Alloteuthis africana	0.29	105	0.23	
Dentex angolensis	0.29	10	0.23	
Brachydeuterus auritus	0.27	2	0.22	
Grammolites gruvelli	0.19	2	0.16	
Pseudupeneus prayensis	0.10	2	0.08	
Ilisha africana	0.02	2	0.02	
Total	122.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 23  
 DATE :09/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 7°47.54  
 start stop duration Lon E 12°30.94  
 TIME :19:43:44 20:14:24 30.7 (min) Purpose : 3  
 LOG : 5228.31 5229.87 1.6 Region : 4054  
 FDEPTH: 750 743 Gear cond.: 0  
 BDEPTH: 750 743 Validity : 0  
 Towing dir: 0° Wire out : 1700 m Speed : 3.0 kn  
 Sorted : 0 Total catch: 407.98 Catch/hour: 797.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chaceon maritae	232.72	575	29.17	
Anermits, mixed	225.61	3614	28.28	
Anemones, white	113.08	219	14.17	
Stereomastis sp.	35.32	1533	4.43	
Nezumia aequalis	33.40	849	4.19	
ANTHOZOA (Sea anemones)	27.38	137	3.43	
Centrophorus squamosus	21.47	2	2.69	
Yarrella blackfordi	20.26	438	2.54	
Hoplostethus cadenati	19.71	465	2.47	
Aristeus varidens	19.44	1232	2.44	
Torpedo nobiliana	10.33	2	1.29	
Melanonius zugmayeri	5.75	27	0.72	
Stomias boa boa	5.48	137	0.69	
Bathyrcongiger vicinus	4.65	55	0.58	
Zameus (Scymnodon) squamulosus	4.11	27	0.51	
Dibranchius atlanticus	3.83	137	0.48	
J E L Y F I S H	3.83	27	0.48	
Halosaurus ovenii	3.56	55	0.45	
Talismania sp.	1.37	27	0.17	
Glyphus marsupialis	1.37	82	0.17	
Starfish	1.37	55	0.17	
Parapagurus pilosimanus	1.10	55	0.14	
Rossia enigmatica	1.10	27	0.14	
Xenodermichthys copei	0.82	27	0.10	
Bathypterois phenax *	0.82	55	0.10	
Total	797.87		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 24  
 DATE :09/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 7°42.94  
 start stop duration Lon E 12°32.26  
 TIME :21:50:47 22:18:13 27.4 (min) Purpose : 3  
 LOG : 5235.82 5237.27 1.4 Region : 4054  
 FDEPTH: 364 360 Gear cond.: 0  
 BDEPTH: 364 360 Validity : 0  
 Towing dir: 0° Wire out : 850 m Speed : 3.2 kn  
 Sorted : 63 Total catch: 296.33 Catch/hour: 647.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	174.97	31762	27.00	
Merluccius polli	166.49	335	25.69	52
Laemonema sp.	65.34	914	10.08	
Torpedo nobiliana	53.72	9	8.29	
Chaunax 'pink'	44.67	5047	6.89	
Parapenaeus longirostris	27.84	3394	4.30	
Mystriophis rostellatus	21.06	256	3.25	
Hymenocephalus italicus	14.45	2410	2.23	
Hermits, mixed	12.88	315	1.99	
Munidopsis sp.	10.04	59	1.55	
Illex coindetii	9.84	98	1.52	
Bathynectes piperitus	6.98	127	1.08	
Aristeus varidens, male	5.53	737	0.85	
Lophiodes kempi	4.92	28	0.76	
Dicrolene intronigra	4.92	177	0.76	
Malacocephalus laevis	4.33	28	0.67	
Hoplostethus cadenati	2.56	107	0.39	0
Chaceon maritae	2.32	9	0.36	
CANCRIDA	1.97	20	0.30	
VITRELEDONELLIDAE	1.86	9	0.29	
Coelorinchus caelorhincus	1.66	63	0.26	
Stereomastis sp.	1.57	127	0.24	
Hoplostethus cadenati	1.38	48	0.21	
NETTASTOMATIDAE	1.18	9	0.18	
Aristeus varidens, female	1.18	87	0.18	
Stomias boa boa	0.98	48	0.15	
Chlorophthalmus atlanticus	0.87	28	0.13	
Yarrella blackfordi	0.68	20	0.10	
Halosaurus ovenii	0.59	48	0.09	
Triplophos hemingi	0.48	39	0.07	
GALATHEIDAE	0.39	304	0.06	
Starfish	0.20	28	0.03	
Raja sp.	0.13	28	0.02	
Total	647.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 25  
 DATE :09/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 7°41.63  
 start stop duration Lon E 12°32.65  
 TIME :23:32:16 00:02:26 30.2 (min) Purpose : 3  
 LOG : 5240.32 5241.87 1.6 Region : 4054  
 FDEPTH: 257 257 Gear cond.: 0  
 BDEPTH: 257 257 Validity : 0  
 Towing dir: 0° Wire out : 600 m Speed : 3.1 kn  
 Sorted : 34 Total catch: 373.45 Catch/hour: 742.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	228.82	6191	30.81	
Parapenaeus longirostris	102.38	17107	13.78	
Munidopsis sp.	83.57	45524	11.25	
Merluccius polli	75.47	1663	10.16	53
Zenopsis conchifer	67.82	131	9.13	
Synagrops microlepis	67.82	3960	9.13	
Illex coindetii	47.03	613	6.33	
Parasudis fraserbrunneri	19.03	919	2.56	
Chascanopsetta lugubris	14.00	263	1.89	
Lophiodes kempi	8.97	284	1.21	
Bembrops heterurus	6.13	284	0.82	
Vitreledonella richardi	5.69	22	0.77	
Dibranchius atlanticus	4.81	656	0.65	
Calappa pelli	4.81	459	0.65	
Pontinus accraensis	2.84	131	0.38	
Conger sp.	1.53	88	0.21	
Epigonus telescopus	0.66	22	0.09	
Solenocera africana	0.44	66	0.06	
Peristedion cataphractum	0.44	88	0.06	
Raja sp.	0.22	22	0.03	
Hymenocephalus italicus	0.22	88	0.03	
Total	742.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 26  
 DATE :10/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°40.80  
 start stop duration Lon E 12°36.80  
 TIME :05:17:36 05:37:06 19.5 (min) Purpose : 3  
 LOG : 5252.79 5253.90 1.1 Region : 4054  
 FDEPTH: 117 118 Gear cond.: 0  
 BDEPTH: 117 118 Validity : 0  
 Towing dir: 0° Wire out : 290 m Speed : 3.4 kn  
 Sorted : 164 Total catch: 821.94 Catch/hour: 2529.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1173.42	10000	46.40	55
Trachurus trecae	978.46	43305	38.69	54
Trichiurus lepturus	85.72	120	3.39	
Dentex congolensis	73.69	1772	2.91	
Sardinella aurita	48.74	622	1.93	
Dentex angolensis	45.05	326	1.78	56
Chelidonichthys capensis	38.55	502	1.52	
Raja miraletus	22.46	31	0.89	
Zeus faber	16.68	74	0.66	
Scomber japonicus	13.29	15	0.53	
Illex coindetii	9.02	132	0.36	
Spicara alta	7.82	265	0.31	
Sepia orbignyana	5.48	58	0.22	
Saurida brasiliensis	3.38	1003	0.13	
Cynoponticus ferox	3.02	3	0.12	
Citharus linguatula	2.80	163	0.11	
Scomber japonicus	1.48	15	0.06	0
Total	2529.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 27  
 DATE :12/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°5.42  
 start stop duration Lon E 12°7.57  
 TIME :07:28:20 07:59:21 31.0 (min) Purpose : 3  
 LOG : 5601.88 5603.66 1.8 Region : 4054  
 FDEPTH: 31 39 Gear cond.: 0  
 BDEPTH: 31 39 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.4 kn  
 Sorted : 0 Total catch: 167.27 Catch/hour: 323.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ilisha africana	79.57	1631	24.59	
Brachydeuterus auritus	63.75	797	19.70	57
Pseudotolithus senegalensis	29.21	27	9.03	58
Pseudotolithus typus	23.95	50	7.40	60
Galeoides decadactylus	21.47	106	6.64	
Sphyraena guachancho	17.83	25	5.51	
Selene dorsalis	14.16	168	4.38	
Caranx crysos	13.81	2	4.27	
Trichiurus lepturus	10.54	68	3.26	
Pteroscion pelli	9.09	149	2.81	
Pagrus caeruleostictus	7.43	25	2.30	
Albula vulpes	6.58	15	2.03	
Pomadourus incisus	4.35	21	1.35	59
Panulirus regius	4.35	12	1.35	
Uranoscopus polli	2.59	19	0.80	
Pseudupeneus prayensis	2.44	15	0.75	
Ubrina canariensis	2.11	33	0.65	61
Citharus linguatula	1.43	14	0.44	
Trachinocephalus myops	1.30	27	0.40	
Calappa rubroguttata	1.20	10	0.37	
Arius parkii	1.16	2	0.36	
Trachinus armatus	1.10	31	0.34	
Conger wilsoni	0.77	2	0.24	
Pisodonophis semicinctus	0.75	2	0.23	
Cynoglossus senegalensis	0.66	2	0.20	
Atractoscion aequidens	0.46	4	0.14	
Grammolites gruvelli	0.43	14	0.13	
Bothus podas	0.31	10	0.10	
Chloroscombrus chrysurus	0.29	10	0.09	
Dicologlossa cuneata	0.27	4	0.08	
Portunus sanguinolentus	0.06	8	0.02	
Trachinus lineolatus	0.06	4	0.02	
Penaeus notialis	0.06	8	0.02	
Total	323.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 28  
 DATE :12/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°6.42  
 start stop duration Lon E 12°2.51  
 TIME :08:41:37 09:07:21 25.7 (min) Purpose : 3  
 LOG : 5607.05 5608.43 1.4 Region : 4054  
 FDEPTH: 43 45 Gear cond.: 0  
 BDEPTH: 43 45 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn  
 Sorted : 36 Total catch: 36.22 Catch/hour: 84.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	27.75	138	32.85	
Pagrus caeruleostictus	15.55	37	18.42	
Sphyraena guachancho	5.55	7	6.57	
Epinephelus aeneus	5.27	2	6.24	
Trichiurus lepturus	4.92	14	5.83	
Lagocephalus laevigatus	3.26	7	3.87	
Caranx crysos	2.80	2	3.31	
Alectis alexandrinus	2.73	2	3.23	
Trachinus radiatus	2.57	5	3.04	
Sepia orbignyana	2.29	2	2.71	
Raja miraletus	2.24	5	2.65	
Uranoscopus polli	1.89	2	2.24	
Pagellus bellottii	1.80	9	2.13	
Pomadourus incisus	1.45	5	1.71	
Chelidonichthys gabonensis	1.19	2	1.41	
Citharus linguatula	0.98	2	1.16	
Alloteuthis africana	0.79	40	0.94	
Trachinocephalus myops	0.77	2	0.91	
Grammolites gruvelli	0.68	2	0.80	
Total	84.46		100.00	



R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 29  
 DATE :12/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°7.24  
 start stop duration Lon E 11°57.79  
 TIME :09:53:04 10:23:39 30.6 (min) Purpose : 3  
 LOG : 5612.31 5614.01 1.7 Region : 4054  
 FDEPTH: 68 70 Gear cond.: 0  
 BDEPTH: 68 70 Validity : 0  
 Towing dir: 0° Wire out : 200 m Speed : 3.3 kn  
 Sorted : 124 Total catch: 124.33 Catch/hour: 243.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	56.59	304	23.20	65
Trachurus trecae	49.72	2497	20.39	66
Lagocephalus laevigatus	47.07	43	19.30	
Brachydeuterus auritus	36.91	473	15.14	67
Umbrina canariensis	22.07	86	9.05	62
Dentex congoensis	7.10	108	2.91	64
Trichiurus lepturus	6.10	12	2.50	
Raja miraletus	5.65	8	2.32	
Pagellus bellottii	4.63	65	1.90	63
Brotula barbata	3.04	8	1.25	
Selene dorsalis	1.88	6	0.77	
Argyrosomus hololepidotus	0.71	6	0.29	
Citharus linguatula	0.67	25	0.27	
Arius parkii	0.41	2	0.17	
Parapenaeus longirostris	0.35	51	0.14	121
Chaetodon hoefleri	0.18	2	0.07	
Zeus faber	0.16	4	0.06	
Sepia orbignyana	0.14	2	0.06	
Parapenaeus longirostris	0.12	18	0.05	122
Saurida brasiliensis	0.10	43	0.04	
Bothus podas	0.10	2	0.04	
Alloteuthis africana	0.08	6	0.03	
Arnoglossus imperialis	0.04	6	0.02	
Parapandalus narval	0.02	6	0.01	
Grammolites gruveli	0.02	2	0.01	
Illex coindetii	0.02	2	0.01	
Total	243.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 32  
 DATE :12/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°12.57  
 start stop duration Lon E 11°33.18  
 TIME :15:02:54 15:37:46 34.9 (min) Purpose : 3  
 LOG : 5639.75 5641.53 1.8 Region : 4054  
 FDEPTH: 184 185 Gear cond.: 0  
 BDEPTH: 184 185 Validity : 0  
 Towing dir: 0° Wire out : 500 m Speed : 3.1 kn  
 Sorted : 97 Total catch: 278.87 Catch/hour: 479.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	180.96	21550	37.71	
Pterothrissus belloci	68.05	545	14.18	
Dentex angolensis	51.10	236	10.65	75
Parapenaeus longirostris	36.24	176	7.55	
Illex coindetii	31.99	453	6.67	
Brotula barbata	31.76	46	6.62	
Trichiurus lepturus	22.89	43	4.77	
Chelidonichthys gabonensis	20.53	170	4.28	
Bembrops heterurus	13.56	344	2.83	
Zeus faber	5.66	9	1.18	
Uranoscopus polli	4.89	59	1.02	
Pentheroscion mbizi	4.37	40	0.91	
Monoleme microstoma	2.91	217	0.61	
Zenopsis conchifer	1.20	3	0.25	
Peristedion cataphractum	1.02	24	0.21	
Chlorophthalmus atlanticus	0.96	136	0.20	
Bassanago albescens	0.62	12	0.13	
Pontinus accraensis	0.55	12	0.11	
Gadella maraldi	0.46	15	0.10	
Calappa pelii	0.12	3	0.03	
Total	479.85		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 30  
 DATE :12/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°10.01  
 start stop duration Lon E 11°49.32  
 TIME :11:43:33 12:15:27 31.9 (min) Purpose : 3  
 LOG : 5622.61 5624.31 1.7 Region : 4054  
 FDEPTH: 91 97 Gear cond.: 0  
 BDEPTH: 91 97 Validity : 0  
 Towing dir: 0° Wire out : 220 m Speed : 3.2 kn  
 Sorted : 111 Total catch: 111.05 Catch/hour: 208.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	131.62	5680	63.02	71
Dentex angolensis	39.76	203	19.04	68
Trichiurus lepturus	8.88	9	4.25	
Raja miraletus	6.45	9	3.09	
Brotula barbata	6.39	8	3.06	
Lagocephalus laevigatus	4.31	4	2.06	
Dentex congoensis	3.35	47	1.60	69
Branchiostegus semifasciatus	2.92	4	1.40	
Umbrina canariensis	1.45	4	0.69	
Selar crumenophthalmus	0.77	2	0.37	
Pagellus bellottii	0.77	17	0.37	70
Zeus faber	0.77	2	0.37	
Scorpaena angolensis	0.34	2	0.16	
Ariomma bondi	0.30	8	0.14	
Chelidonichthys capensis	0.30	4	0.14	
Spicara alta	0.21	2	0.10	
Citharus linguatula	0.11	4	0.05	
Saurida brasiliensis	0.08	60	0.04	
Illex coindetii	0.04	4	0.02	
Arnoglossus imperialis	0.02	2	0.01	
Starfish	0.02	2	0.01	
Parapenaeus longirostris	0.02	15	0.01	
Total	208.87		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 33  
 DATE :12/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°11.73  
 start stop duration Lon E 11°30.30  
 TIME :16:40:51 17:10:25 29.6 (min) Purpose : 3  
 LOG : 5645.45 5647.02 1.6 Region : 4054  
 FDEPTH: 219 230 Gear cond.: 0  
 BDEPTH: 219 230 Validity : 0  
 Towing dir: 0° Wire out : 600 m Speed : 3.2 kn  
 Sorted : 27 Total catch: 155.11 Catch/hour: 314.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	154.38	449	49.04	76
Brotula barbata	47.74	69	15.16	
Synagrops microlepis	43.82	2771	13.92	
Trichiurus lepturus	36.94	95	11.73	
Pterothrissus belloci	11.65	83	3.70	
Illex coindetii	4.26	69	1.35	
Parapenaeus longirostris	3.13	378	0.99	
Spicara alta	2.96	16	0.94	
Zeus faber	2.70	2	0.86	
Uranoscopus polli	2.35	12	0.75	
Bembrops heterurus	1.91	30	0.61	
Pentheroscion mbizi	1.04	4	0.33	
Peristedion cataphractum	0.65	14	0.21	
Citharus linguatula	0.57	45	0.18	
Dicologlossa cuneata	0.22	6	0.07	
Zenopsis conchifer	0.16	6	0.05	
Merluccius polli	0.14	6	0.05	
Pontinus accraensis	0.12	2	0.04	
Chlorophthalmus atlanticus	0.08	6	0.03	
Total	314.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 31  
 DATE :12/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°11.16  
 start stop duration Lon E 11°43.35  
 TIME :13:11:24 13:42:05 30.7 (min) Purpose : 3  
 LOG : 5628.80 5630.70 1.9 Region : 4054  
 FDEPTH: 110 113 Gear cond.: 0  
 BDEPTH: 110 113 Validity : 0  
 Towing dir: 0° Wire out : 310 m Speed : 3.7 kn  
 Sorted : 0 Total catch: 96.31 Catch/hour: 188.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	51.90	295	27.56	93
Dentex congoensis	43.53	3254	23.11	
Umbrina canariensis	17.33	43	9.20	95
Trachurus trecae	14.98	571	7.95	94
Chelidonichthys gabonensis	10.62	82	5.64	
Lagocephalus laevigatus	9.35	8	4.96	
Brotula barbata	8.37	12	4.44	
Trichiurus lepturus	7.74	10	4.11	
Dentex barnardi	4.52	14	2.40	
Selar crumenophthalmus	4.32	10	2.29	
Spicara alta	3.36	0	1.79	
Ariomma bondi	2.78	68	1.47	
Raja miraletus	2.74	4	1.45	
Pagellus bellottii	1.49	8	0.79	74
Sphoeroides pachgaster	1.17	2	0.62	
Zeus faber	0.82	2	0.44	
Illex coindetii	0.80	16	0.43	
Citharus linguatula	0.70	35	0.37	
Branchiostegus semifasciatus	0.47	2	0.25	
Saurida brasiliensis	0.43	137	0.23	
Chelidonichthys capensis	0.43	2	0.23	
Boops boops	0.37	10	0.20	
Arnoglossus imperialis	0.06	16	0.03	
Sepia orbignyana	0.04	2	0.02	
Parapenaeus longirostris	0.02	12	0.01	
Total	188.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 34  
 DATE :12/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°16.49  
 start stop duration Lon E 11°26.43  
 TIME :18:37:38 19:07:59 30.4 (min) Purpose : 3  
 LOG : 5653.38 5654.93 1.6 Region : 4054  
 FDEPTH: 358 362 Gear cond.: 0  
 BDEPTH: 358 362 Validity : 0  
 Towing dir: 0° Wire out : 800 m Speed : 3.1 kn  
 Sorted : 32 Total catch: 318.01 Catch/hour: 628.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	215.33	4488	34.25	
Chaunax pictus	160.49	362	25.53	
Benthodesmus tenuis	110.99	4084	17.65	
Merluccius polli	26.57	132	4.23	77
Epigonus telescopus	22.08	302	3.51	
Munidopsis sp.	16.74	2540	2.66	
Lophiodes kempi	15.44	144	2.46	
Illex coindetii	14.43	101	2.30	
Parapenaeus longirostris	10.83	923	1.72	
Bathyrcongiger vicinus	6.64	57	1.06	
Chascanopsetta lugubris	6.21	87	0.99	
Bathynectes piperitus	4.03	57	0.64	
Hymenoccephalus italicus	3.32	403	0.53	
Coelorinchus caelorhincus	3.02	73	0.48	
Histioteuthis sp.	2.59	14	0.41	
Bembrops greyi	2.17	57	0.35	
Hoplostethus cadenati	1.30	14	0.21	
Dibranchius atlanticus	1.30	158	0.21	
Synagrops microlepis	1.30	30	0.21	
Calappa pelii	1.15	14	0.18	
Halosaurus ovenii	1.15	73	0.18	
Laemonema laureysi	1.01	30	0.16	
Nezumia aequalis	0.57	30	0.09	
Total	628.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 35  
DATE :12/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°18.05  
start stop duration Lon E 11°22.44  
TIME :20:40:50 21:09:54 29.1 (min) Purpose : 3  
LOG : 5662.10 5663.50 1.4 Region : 4054  
FDEPTH: 487 488 Gear cond.: 0  
BDEPTH: 487 488 Validity : 0  
Towing dir: 0° Wire out : 1050 m Speed : 2.9 kn  
Sorted : 38 Total catch: 119.24 Catch/hour: 246.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lamprogrammus niger	53.04	145	21.54	
Chaceon maritae	39.02	130	15.85	
Aristeus varidens	29.19	2327	11.86	
Yarrella blackfordi	18.50	621	7.51	
Laemonema laureysi	16.33	289	6.63	
Stereomastis sculpta	14.74	29	5.99	
Merluccius polli	8.88	14	3.61	
Nezumia aequalis	7.66	188	3.11	
Priacanthus arenatus	6.94	14	2.82	
Benthodesmus tenuis	6.07	202	2.47	
Diastobranchnus capensis	5.64	29	2.29	
Etmopterus lucifer**	5.49	116	2.23	
Chaunax pictus	5.35	29	2.17	
Gadella imberbis	5.20	231	2.11	
Halosaurus ovenii	4.77	116	1.94	
Dicrolene intronigra	3.47	231	1.41	
Lophiodes kempi	3.18	14	1.29	
Malacocephalus occidentalis	2.46	29	1.00	
Myxistrophis rostellatus	2.46	101	1.00	
Chlorophthalmus atlanticus	2.17	43	0.88	
Bathyroconger vicinus	2.02	159	0.82	
Stomias boa boa	1.73	29	0.70	
Coelorhynchus caelorhincus	1.59	14	0.65	
Dibranchius atlanticus	0.29	14	0.12	
Total	246.19		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 36  
DATE :12/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°26.73  
start stop duration Lon E 11°16.55  
TIME :23:21:24 23:49:20 27.9 (min) Purpose : 3  
LOG : 5674.05 5675.53 1.5 Region : 4054  
FDEPTH: 761 787 Gear cond.: 0  
BDEPTH: 761 787 Validity : 0  
Towing dir: 0° Wire out : 1550 m Speed : 3.2 kn  
Sorted : 34 Total catch: 136.09 Catch/hour: 292.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
HOLUTHUROIDEA	173.40	215	59.31	
ANTHOZOA (Sea anemones)	19.68	60	6.73	
Talismania bifurcata	17.36	60	5.94	
Yarrella blackfordi	15.30	249	5.23	
Malacocephalus occidentalis	12.89	266	4.41	
Stereomastis sp.	12.37	602	4.23	
Hoplostethus atlanticus	7.56	52	2.59	
Triplophos sp.	4.90	498	1.68	
Bathyroconger vicinus	4.38	26	1.50	
S H R I M P S	3.95	687	1.35	
Halosaurus ovenii	2.84	60	0.97	
Aristeus varidens	2.75	112	0.94	152
Plesiopeanaeus edwardsianus	2.49	172	0.85	
Benthodesmus tenuis	1.98	86	0.68	
Deania profundorum	1.95	2	0.67	
Bathygadus melanobranchus	1.72	52	0.59	
Etmopterus polli	1.59	4	0.54	
Diastobranchnus capensis	1.29	9	0.44	
Stemonidium sp.	1.29	9	0.44	
Borostomias antarcticus	0.77	17	0.26	
Starfish small	0.43	9	0.15	
Bathypterois phenax	0.34	43	0.12	
Dibranchius atlanticus	0.26	17	0.09	
Aristeus varidens	0.26	26	0.09	153
GONOSTOMATIDAE	0.26	9	0.09	
Photonetes braueri**	0.17	17	0.06	
Nephropsis atlantica	0.17	9	0.06	
Total	292.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 37  
DATE :13/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°37.38  
start stop duration Lon E 11°27.26  
TIME :02:43:51 03:15:19 31.5 (min) Purpose : 3  
LOG : 5692.35 5693.85 1.5 Region : 4054  
FDEPTH: 657 654 Gear cond.: 0  
BDEPTH: 657 654 Validity : 0  
Towing dir: 0° Wire out : 1400 m Speed : 2.9 kn  
Sorted : 21 Total catch: 153.44 Catch/hour: 292.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
HOLUTHUROIDEA	56.20	53	19.21	
Yarrella blackfordi	36.98	601	12.64	
Malacocephalus occidentalis	36.18	868	12.36	
Bristle worms (straws)	32.57	2950	11.13	
Chaceon maritae	18.71	1682	6.39	
Bathyroconger vicinus	17.89	160	6.11	
Small shrimps	15.62	2977	5.34	
Deania profundorum	12.42	67	4.24	
Gadella imberbis	12.15	748	4.15	
Hoplostethus cadenati	7.61	67	2.60	
Aristeus varidens	5.21	240	1.78	148
Merluccius polli	4.96	6	1.69	
Unidentified demersal fish	4.94	13	1.69	
Nezumia africana	4.14	13	1.41	
Coral - Alcyonaria?	3.74	13	1.28	
Stomias boa boa	3.34	67	1.14	
THYSANOTEUTHIDAE	3.20	13	1.09	
Halosaurus ovenii	2.67	27	0.91	
Triplophos sp.	2.40	307	0.92	
Plesiopeanaeus edwardsianus	1.87	67	0.64	
Lophiodes kempi	1.74	13	0.59	
Triplophos hemingi	1.74	187	0.59	
Chaceon maritae	1.74	6	0.59	154
Dibranchius atlanticus	1.34	40	0.46	
Talismania sp.	1.20	27	0.41	
MYCTOPHIDAE	0.67	481	0.23	
Chaceon maritae	0.63	4	0.22	155
Total	291.84		99.73	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 38  
DATE :13/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°36.09  
start stop duration Lon E 11°32.84  
TIME :05:03:32 05:32:29 28.9 (min) Purpose : 3  
LOG : 5701.48 5702.97 1.5 Region : 4054  
FDEPTH: 509 510 Gear cond.: 0  
BDEPTH: 509 510 Validity : 0  
Towing dir: 0° Wire out : 1150 m Speed : 3.1 kn  
Sorted : 81 Total catch: 203.49 Catch/hour: 421.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	124.85	17832	29.60	
Yarrella blackfordi	64.79	1492	15.36	
Lophiodes kempi	37.43	12	8.88	151
Aristeus varidens	18.03	721	4.28	
Centrophorus granulosus	17.53	87	4.16	
Chaceon maritae	17.41	25	4.13	149
Triplophos hemingi	17.16	2164	4.07	
Lamprogrammus exutus	15.54	50	3.69	
Chaceon maritae	10.07	37	2.39	150
Stomias boa boa	9.82	137	2.33	
Xenodermichthys copei	9.82	597	2.33	
Todaropsis eblanae	8.08	25	1.92	
Gadella imberbis	7.46	286	1.77	
Stereomastis sculpta	7.21	448	1.71	
Merluccius polli	6.94	12	1.65	
Illex coindetii	6.47	37	1.53	
Himantolophus groenlandicus	5.89	2	1.40	
Malacocephalus laevis	5.22	75	1.24	
Squalus uyato	5.14	2	1.22	
Hoplostethus atlanticus	4.73	149	1.12	
Plesiopeanaeus edwardsianus	3.98	124	0.94	
Benthodesmus tenuis	3.73	75	0.88	
Laemonema laureysi	3.36	298	0.80	
Bathynectes piperitus	3.36	37	0.80	
Chaunax pictus	2.61	25	0.62	
Bathyroconger vicinus	1.37	50	0.32	
Halosaurus ovenii	1.24	25	0.29	
Gonostoma elongatum	0.87	37	0.21	
Diastobranchnus capensis	0.50	37	0.12	
Ectreposebastes imus	0.50	25	0.12	
Dibranchius atlanticus	0.37	25	0.09	
Avocettina acuticeps	0.12	12	0.03	
Symphurus sp.	0.12	12	0.03	
Fishing gears	0.00	0	0.00	
Total	421.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 39  
DATE :13/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°33.45  
start stop duration Lon E 11°37.20  
TIME :07:25:14 07:56:03 30.8 (min) Purpose : 3  
LOG : 5712.20 5713.86 1.6 Region : 4054  
FDEPTH: 319 335 Gear cond.: 0  
BDEPTH: 319 335 Validity : 0  
Towing dir: 0° Wire out : 750 m Speed : 3.2 kn  
Sorted : 20 Total catch: 301.97 Catch/hour: 587.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	185.72	3387	31.59	
Synagrops microlepis	126.74	3387	21.56	
Laemonema laureysi	57.24	905	9.74	
Synagrops bellus	23.62	321	4.87	
Pterothrissus belloci	25.70	146	4.37	
Coelorhynchus caelorhincus	21.90	350	3.73	
Illex coindetii	20.73	234	3.53	
Lithodes ferox	20.44	29	3.48	
Parapeneus longirostris	18.11	1168	3.08	156
Malacocephalus occidentalis	16.94	146	2.88	
Munidopsis sp.	14.60	2657	2.48	
Benthodesmus tenuis	12.26	526	2.09	
Parapeneus longirostris	6.13	1051	1.04	157
Merluccius polli	5.30	70	0.90	78
Pontinus accraensis	5.26	117	0.89	
Bathynectes sp.	4.67	58	0.79	
Hymenocephalus italicus	3.21	438	0.55	
Hoplostethus atlanticus	2.92	29	0.50	
Dibranchius atlanticus	2.63	292	0.45	
Gadella imberbis	2.34	88	0.40	
Lophiodes kempi	1.46	29	0.25	
Antigonia sp.	1.46	58	0.25	
Lepidotrigla carolae	1.17	88	0.20	
Zenopsis conchifer	0.58	29	0.10	
PARALEPIDIDAE	0.58	58	0.10	
RAJIDAE	0.58	29	0.10	
Persistedion cataphractum	0.29	58	0.05	
Symphurus sp.	0.29	29	0.05	
Total	587.87		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 40  
DATE :13/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°34.22  
start stop duration Lon E 11°41.81  
TIME :09:18:08 09:49:23 31.3 (min) Purpose : 3  
LOG : 5720.19 5721.91 1.7 Region : 4054  
FDEPTH: 232 225 Gear cond.: 0  
BDEPTH: 232 225 Validity : 0  
Towing dir: 0° Wire out : 550 m Speed : 3.3 kn  
Sorted : 32 Total catch: 236.55 Catch/hour: 454.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	254.02	13375	55.93	
Dentex angolensis	58.66	157	12.91	79
Illex coindetii	38.48	461	8.47	
Pterothrissus belloci	25.57	173	5.63	
Brotula barbata	18.59	15	4.09	
Zenopsis conchifer	14.28	46	3.15	
Bembrops heterurus	9.45	92	2.08	
Parapeneus longirostris	7.14	599	1.57	
Chlorophthalmus atlanticus	6.45	426	1.42	
Uranoscopus polli	5.99	12	1.32	
Synagrops bellus	4.15	35	0.91	
Trichurus lepturus	3.92	8	0.86	
Citharus linguatula	3.92	58	0.86	
Merluccius polli	3.57	23	0.79	
Total	454.18		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 41  
 DATE :13/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°29.59  
 start stop duration Lon E 11°46.45  
 TIME :11:08:43 11:39:32 30.8 (min) Purpose : 3  
 LOG : 5729.73 5731.28 1.6 Region : 4054  
 FDEPTH: 129 129 Gear cond.: 0  
 BDEPTH: 129 129 Validity : 0  
 Towing dir: 0° Wire out : 360 m Speed : 3.0 kn  
 Sorted : 61 Total catch: 242.08 Catch/hour: 471.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	139.08	2219	29.51	
Trachurus trecae	92.04	5295	19.53	81
Dentex angolensis	90.95	491	19.30	80
Boops boops	51.55	1316	10.94	
Spicara alta	32.01	459	6.79	
Arionna bondi	11.21	226	2.38	
Selene dorsalis	10.75	31	2.28	
Illex coindetii	9.81	140	2.08	
Trigla lyra	9.11	218	1.93	
Brotula barbata	5.84	8	1.24	
Lagocephalus laevigatus	4.83	8	1.02	
Trichiurus lepturus	4.05	8	0.86	
Pterothrissus belloci	2.65	16	0.56	
Citharus linguatula	2.18	78	0.46	
Synagrops microlepis	1.56	101	0.33	
Peristedion cf weberi	1.09	16	0.23	
Sepia orbignyana	1.01	8	0.21	
Uranoscopus polli	0.93	8	0.20	
Arnoglossus imperialis	0.47	23	0.10	
Aesopia cornuta	0.16	8	0.03	
Total	471.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 42  
 DATE :13/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°29.57  
 start stop duration Lon E 11°52.95  
 TIME :13:03:24 13:33:43 30.3 (min) Purpose : 3  
 LOG : 5739.97 5741.74 1.8 Region : 4054  
 FDEPTH: 116 115 Gear cond.: 0  
 BDEPTH: 116 115 Validity : 0  
 Towing dir: 0° Wire out : 310 m Speed : 3.5 kn  
 Sorted : 116 Total catch: 116.08 Catch/hour: 229.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	116.18	8485	50.58	83
Dentex angolensis	25.61	125	11.15	82
Trichiurus lepturus	19.23	22	8.37	
Arionna bondi	15.79	485	6.87	
Epinephelus aeneus	10.27	2	4.47	
Saurida brasiliensis	7.44	2201	3.24	
Brotula barbata	6.13	6	2.67	
Illex coindetii	4.83	172	2.10	
Rostroraja alba	3.84	2	1.67	
Pistularia petimba	3.09	8	1.34	
Citharus linguatula	3.09	75	1.34	
Selene dorsalis	2.91	4	1.27	
Priacanthus arenatus	2.47	6	1.08	
Raja miraletus	1.64	4	0.72	
Dentex congoensis	1.58	18	0.69	
Zeus faber	1.46	4	0.64	
Chelidonichthys gabonensis	1.35	14	0.59	
Pterothrissus belloci	1.17	6	0.51	
Uranoscopus polli	0.95	4	0.41	
Boops boops	0.20	8	0.09	
Pagellus bellottii	0.20	4	0.09	
Parapenaeus longirostris	0.16	51	0.07	
Scomber japonicus	0.12	2	0.05	
Total	229.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 43  
 DATE :13/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°26.40  
 start stop duration Lon E 11°59.06  
 TIME :15:09:09 15:39:30 30.4 (min) Purpose : 3  
 LOG : 5750.52 5752.16 1.6 Region : 4054  
 FDEPTH: 94 94 Gear cond.: 0  
 BDEPTH: 94 94 Validity : 0  
 Towing dir: 0° Wire out : 250 m Speed : 3.2 kn  
 Sorted : 59 Total catch: 290.86 Catch/hour: 575.01

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	414.33	2995	72.06	87
Dentex angolensis	33.96	162	5.91	86
Brotula barbata	13.29	16	2.31	
Trachurus trecae	13.09	846	2.28	84
Octopus vulgaris	13.09	8	2.28	
Saurida brasiliensis	11.98	2610	2.08	
Umbria canariensis	11.39	77	1.98	85
Cynoponticus ferox	10.68	2	1.86	
Citharus linguatula	9.27	162	1.61	
Zeus faber	8.56	8	1.49	
Trichiurus lepturus	6.37	10	1.11	
Sepia orbignyana	4.92	6	0.86	
Uranoscopus polli	4.84	51	0.84	
Rostroraja alba	3.91	2	0.68	
Pagellus bellottii	2.37	51	0.41	
Pistularia petimba	2.31	6	0.40	
Scorpaena stephanica	2.04	8	0.35	
Gobiidae	1.88	152	0.33	
Lagocephalus laevigatus	1.70	2	0.30	
Pterothrissus belloci	1.44	8	0.25	
Boops boops	1.36	18	0.24	
Illex coindetii	1.19	8	0.21	
Priacanthus arenatus	0.79	4	0.14	
Parapenaeus longirostris	0.26	103	0.04	
Total	575.01		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 44  
 DATE :13/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°25.85  
 start stop duration Lon E 12°1.89  
 TIME :16:23:18 16:53:03 29.8 (min) Purpose : 3  
 LOG : 5755.79 5757.38 1.6 Region : 4054  
 FDEPTH: 82 81 Gear cond.: 0  
 BDEPTH: 82 81 Validity : 0  
 Towing dir: 0° Wire out : 230 m Speed : 3.2 kn  
 Sorted : 118 Total catch: 1426.32 Catch/hour: 2876.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	2235.37	27939	77.71	88
Trachurus trecae	474.53	33531	16.50	89
Saurida brasiliensis	32.37	6355	1.13	
Pagellus bellottii	24.75	214	0.86	92
Umbria canariensis	23.15	40	0.80	90
Dentex congoensis	17.61	476	0.61	
Dentex angolensis	15.57	71	0.54	91
Fistularia petimba	14.52	24	0.50	
Chaetodon hoefleri	9.04	24	0.31	
Trichiurus lepturus	8.73	12	0.30	
Citharus linguatula	5.47	119	0.19	
Brotula barbata	4.66	14	0.16	
Rhinobatos albomaculatus	4.58	4	0.16	
Cynoponticus ferox	3.61	2	0.13	
Pagrus caeruleostictus	1.94	2	0.07	
Parapenaeus longirostris	0.48	95	0.02	
Arnoglossus imperialis	0.24	24	0.01	
Total	2876.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 45  
 DATE :13/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°24.22  
 start stop duration Lon E 12°6.21  
 TIME :17:41:53 18:12:12 30.3 (min) Purpose : 3  
 LOG : 5763.38 5764.99 1.6 Region : 4054  
 FDEPTH: 50 46 Gear cond.: 0  
 BDEPTH: 50 46 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn  
 Sorted : 0 Total catch: 136.16 Catch/hour: 269.45

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chelidonichthys gabonensis	116.24	323	43.14	
Lagocephalus laevigatus	43.42	51	16.11	
Pagrus caeruleostictus	18.80	55	6.98	
Pagellus bellottii	16.74	156	6.21	96
Rhinobatos albomaculatus	13.38	10	4.96	
Citharus linguatula	11.58	109	4.30	
Pomadourus incisus	9.89	46	3.67	97
Cynoponticus ferox	7.80	14	2.89	
Uranoscopus polli	5.03	34	1.87	
Dactylopterus volitans	3.74	8	1.39	
Balistes caprisus	3.72	8	1.38	
Trachinus armatus	3.62	61	1.34	
Bothus podas	3.32	81	1.23	
Trachinus radiatus	3.21	10	1.19	
Sepia orbignyana	3.15	34	1.17	
Trachinocephalus myops	2.14	20	0.79	
Pegusa lascaris	2.12	12	0.79	
Dicologlossa hexophthalma	0.67	8	0.25	
Brachydeuterus auritus	0.57	4	0.21	
Torpedo torpedo	0.20	2	0.07	
Grammolites gruweli	0.10	4	0.04	
Arnoglossus imperialis	0.02	4	0.01	
Total	269.45		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 46  
 DATE :14/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°55.52  
 start stop duration Lon E 11°43.91  
 TIME :03:13:30 03:44:17 30.8 (min) Purpose : 3  
 LOG : 5841.80 5843.34 1.6 Region : 4054  
 FDEPTH: 515 521 Gear cond.: 0  
 BDEPTH: 515 521 Validity : 0  
 Towing dir: 0° Wire out : 1200 m Speed : 3.0 kn  
 Sorted : 22 Total catch: 113.46 Catch/hour: 221.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	78.95	16949	35.70	
Stomias boa boa	31.29	585	14.15	
Benthodesmus tenuis	15.40	478	6.96	
Lamprogrammus exultus	12.57	234	5.68	
Yarellia blackfordi	10.53	273	4.76	
Triplophos hemingi	9.65	682	4.36	
Stereomastix sp.	7.31	556	3.31	
Halosaurus ovenii	5.85	10	2.64	
Hoplostethus cadenati	5.75	205	2.60	
Aristeus variidens, female	5.65	263	2.56	
Haliphion atlanticus	4.97	10	2.25	
SQUALIDAE	3.31	29	1.50	
Merluccius polli	3.26	6	1.47	
Illex coindetii	3.22	19	1.45	
Chaunax pictus	3.12	19	1.41	
Chaceon maritae	3.00	12	1.36	
Gadella sp.	2.83	283	1.28	
Plesiopenaeus edwardsianus	2.63	29	1.19	
Aristeus variidens, male	2.63	380	1.19	
Xenodermichthys copei	2.34	166	1.06	
Malacocephalus laevis	1.85	10	0.84	
Bathycoromus vicinus	1.66	107	0.75	
Gadella imberbis	1.36	49	0.62	
Chrysaora hysoscella	0.88	10	0.40	
Dibranchius atlanticus	0.68	117	0.31	
Bythynectes sp.	0.29	10	0.13	
MATCHOPHIDAE	0.19	78	0.09	
Total	221.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 47  
 DATE :14/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 6°53.07  
 start stop duration Lon E 11°44.54  
 TIME :05:11:14 05:41:12 30.0 (min) Purpose : 3  
 LOG : 5848.89 5850.50 1.6 Region : 4054  
 FDEPTH: 443 449 Gear cond.: 0  
 BDEPTH: 443 449 Validity : 0  
 Towing dir: 0° Wire out : 930 m Speed : 3.2 kn  
 Sorted : 21 Total catch: 176.34 Catch/hour: 353.03

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	107.63	17856	30.49	
Merluccius polli	49.57	120	14.04	98
Yarrrella blackfordi	22.28	645	6.31	
Laemonema laureysii	19.48	448	5.52	
Chaunax pictus	14.29	378	4.05	
Chaceon maritae	14.29	56	4.05	
Stomias boa boa	13.31	350	3.77	
Stereomastis sp.	12.05	1051	3.41	
Aristeus varidens	9.67	757	2.74	
Illex coindetii	9.53	70	2.70	
Lamprogrammus exutus	8.83	14	2.50	
Gadella imberbis	8.55	266	2.42	
Benthodesmus tenuis	7.43	182	2.10	
Triplophos hemingi	6.03	673	1.71	
Dibranchius atlanticus	4.62	280	1.31	
Centrophorus squamosus**	4.34	42	1.23	
Plesiopenaeus edwardsianus	3.50	112	0.99	
Stomias sp.	3.36	70	0.95	
Coelorinchus caelorhincus	3.36	42	0.95	
Hymenocephalus italicus	3.22	280	0.91	
Dicrolene intronigra	2.94	210	0.83	
Malacocephalus occidentalis	2.94	14	0.83	
Lophius vaillanti	2.40	4	0.68	
Halosaurus ovenii	2.24	28	0.64	
Galeus polli	2.24	14	0.64	
Bristle worms (straws)	1.96	126	0.56	
Chlorophthalmus atlanticus	1.96	28	0.56	
Synagrops microlepis	1.82	28	0.52	
Nezumia aequalis	1.82	70	0.52	
Trichiurus lepturus	1.72	2	0.49	
NETTASTOMATIDAE	1.54	28	0.44	
B I V A L V E S	1.54	28	0.44	
Uroconger sp.	1.40	14	0.40	
Bathyrconger vicinus	1.12	14	0.32	
Total	353.03		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 48  
 DATE :14/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°50.69  
 start stop duration Lon E 11°49.56  
 TIME :07:23:57 07:54:19 30.4 (min) Purpose : 3  
 LOG : 5858.67 5860.31 1.6 Region : 4054  
 FDEPTH: 269 264 Gear cond.: 0  
 BDEPTH: 269 264 Validity : 0  
 Towing dir: 0° Wire out : 680 m Speed : 3.2 kn  
 Sorted : 117 Total catch: 522.93 Catch/hour: 1032.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	482.80	37019	46.75	
Chlorophthalmus atlanticus	226.81	4797	21.96	
Merluccius polli	79.77	1833	7.72	105
Parapenaeus longirostris	55.26	7465	5.35	
Pterothrissus bellocii	39.46	322	3.82	
Munidopsis sp.	28.76	3164	2.78	
Parasudis fraserbrunneri	22.51	470	2.18	
Illex coindetii	22.42	652	2.17	
Brotula barbata	15.80	10	1.53	
Zenopsis conchifer	10.68	43	1.03	
Pontinus accraensis	10.17	87	0.98	
Malacocephalus occidentalis	9.38	113	0.91	
Bembrops heterurus	5.57	105	0.54	
Dentex angolensis	5.49	14	0.53	106
Coelorinchus caelorhincus	3.65	61	0.35	
Trigla lyra	2.09	26	0.20	
Rajella dissimilis	2.09	51	0.20	
Chascanopsetta lugubris	1.92	26	0.19	
Synaphobranchus kauplii	1.38	8	0.13	
Peristedion cataphractum	1.22	36	0.12	
Acanthocarus brevipinnis	1.13	18	0.11	
Citharus linguatula	1.13	138	0.11	
Trichiurus lepturus	1.13	2	0.11	
Ariomma bondi	0.61	8	0.06	
GOBIIDAE	0.51	36	0.05	
MYCTOPHIDAE	0.51	0	0.05	
Lophius vaillanti	0.51	18	0.05	
Total	1032.78		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 49  
 DATE :14/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°51.62  
 start stop duration Lon E 11°52.37  
 TIME :08:57:11 09:27:25 30.2 (min) Purpose : 3  
 LOG : 5863.85 5865.44 1.6 Region : 4054  
 FDEPTH: 179 193 Gear cond.: 0  
 BDEPTH: 179 193 Validity : 0  
 Towing dir: 0° Wire out : 440 m Speed : 3.2 kn  
 Sorted : 86 Total catch: 1909.11 Catch/hour: 3789.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	3225.27	590128	85.12	
Dentex angolensis	178.37	796	4.71	107
Brotula barbata	85.86	89	2.27	
Trichiurus lepturus	72.15	89	1.90	
Spicara alta	70.38	399	1.86	
Illex coindetii	42.06	665	1.11	
Umbrina canariensis	38.07	89	1.00	
Zeus faber	35.85	177	0.95	
Sphoeroides pachgaster	21.69	44	0.57	
Ariomma bondi	8.42	133	0.22	
Bembrops heterurus	7.96	44	0.21	
Citharus linguatula	1.77	139	0.05	
Saurida brasiliensis	1.33	353	0.04	
Total	3789.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 50  
 DATE :14/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°50.10  
 start stop duration Lon E 11°54.99  
 TIME :10:24:33 10:52:42 28.1 (min) Purpose : 3  
 LOG : 5870.49 5871.99 1.5 Region : 4054  
 FDEPTH: 117 118 Gear cond.: 0  
 BDEPTH: 117 118 Validity : 0  
 Towing dir: 0° Wire out : 320 m Speed : 3.2 kn  
 Sorted : 168 Total catch: 394.60 Catch/hour: 841.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	282.61	13079	33.60	109
Dentex angolensis	266.39	1008	31.67	108
Dentex congoensis	212.95	2185	25.31	
Spicara alta	18.14	205	2.16	
Epinephelus aeneus	15.94	4	1.90	
Ariomma bondi	15.43	352	1.83	
Trigla lyra	6.61	49	0.79	
Zeus faber	5.52	23	0.66	
Lagocephalus laevigatus	4.75	4	0.57	
Raja miraletus	2.73	4	0.32	
Pagellus bellottii	2.20	9	0.26	
Chaetodon hoefleri	2.20	4	0.26	
Dentex barnardi	1.75	4	0.21	
Zenopsis conchifer	1.71	4	0.20	
Illex coindetii	1.41	34	0.17	
Citharus linguatula	0.62	19	0.07	
Boops boops	0.23	9	0.03	
Total	841.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 51  
 DATE :14/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°47.97  
 start stop duration Lon E 12°0.47  
 TIME :12:09:55 12:36:30 26.6 (min) Purpose : 3  
 LOG : 5880.49 5882.09 1.6 Region : 4054  
 FDEPTH: 91 89 Gear cond.: 0  
 BDEPTH: 91 89 Validity : 0  
 Towing dir: 0° Wire out : 250 m Speed : 3.6 kn  
 Sorted : 0 Total catch: 74.11 Catch/hour: 167.29

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex barnardi	117.61	334	70.30	114
Pagellus bellottii	15.40	77	9.20	115
Lagocephalus laevigatus	12.17	14	7.27	
Trigla lyra	9.64	52	5.76	
Raja miraletus	6.68	9	3.99	
Decapterus rhonchus**	2.75	2	1.65	
Dentex congoensis	1.17	18	0.70	116
Pagrus caeruleostictus	1.04	2	0.62	
Chaetodon hoefleri	0.34	2	0.20	
Dentex angolensis	0.29	2	0.18	
Illex coindetii	0.20	2	0.12	
Total	167.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 52  
 DATE :14/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°41.59  
 start stop duration Lon E 12°8.70  
 TIME :14:12:28 14:43:10 30.7 (min) Purpose : 3  
 LOG : 5893.81 5895.54 1.7 Region : 4054  
 FDEPTH: 70 70 Gear cond.: 0  
 BDEPTH: 70 70 Validity : 0  
 Towing dir: 0° Wire out : 190 m Speed : 3.4 kn  
 Sorted : 120 Total catch: 119.62 Catch/hour: 233.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	154.30	717	66.00	
Pagellus bellottii	26.70	156	11.42	117
Squatina aculeata	14.27	2	6.10	
Trichiurus lepturus	11.63	21	4.97	
Raja miraletus	10.01	16	4.28	
Alectis alexandrinus	5.86	6	2.51	
Seriola carpenteri	3.58	2	1.53	
Balistes capricus	3.19	2	1.36	
Chaetodon hoefleri	0.94	4	0.40	
Decapterus rhonchus**	0.72	18	0.31	
Syaculum micrurus	0.72	4	0.31	
Fistularia tabacaria	0.61	2	0.26	
Alloteuthis africana	0.55	135	0.23	
Sepia orbignyana	0.27	4	0.12	
Chelidichthys gabonensis	0.25	2	0.11	
Saurida brasiliensis	0.12	16	0.05	
Bembrops heterurus	0.04	4	0.02	
Arnoglossus imperialis	0.04	4	0.02	
Total	233.79		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 53  
 DATE :14/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°38.62  
 start stop duration Lon E 12°14.79  
 TIME :15:50:47 16:10:15 19.5 (min) Purpose : 3  
 LOG : 5903.82 5904.98 1.1 Region : 4054  
 FDEPTH: 47 46 Gear cond.: 0  
 BDEPTH: 47 46 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.6 kn  
 Sorted : 0 Total catch: 84.88 Catch/hour: 261.57

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	88.44	225	33.81	
Pagellus bellottii	48.32	284	18.47	
Lagocephalus laevigatus	37.41	43	14.30	
Pagrus caeruleostictus	20.65	55	7.89	
Balistes capricus	20.52	34	7.85	
Raja miraletus	19.45	37	7.43	
Alectis alexandrinus	5.08	6	1.94	
Sphyraena guachancho	4.31	22	1.65	
Chelidichthys gabonensis	4.07	18	1.56	
Pomadasys rogeri	3.45	3	1.32	
Syaculum micrurus	2.84	25	1.08	
Decapterus rhonchus**	1.79	12	0.68	
Cynoglossus canariensis	1.42	6	0.54	
Fistularia tabacaria	1.14	3	0.44	
Trachinus radiatus	1.11	3	0.42	
Alloteuthis africana	0.52	154	0.20	
Trachinus armatus	0.52	3	0.20	
Citharus linguatula	0.40	3	0.15	
Starfish	0.06	3	0.02	
Bembrops heterurus	0.06	3	0.02	
Total	261.57		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 54  
 DATE :14/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°34.41  
 start stop duration Lon E 12°21.07  
 TIME :17:11:27 17:36:59 25.5 (min) Purpose : 3  
 LOG : 5913.10 5914.61 1.5 Region : 4054  
 FDEPTH: 24 23 Gear cond.: 0  
 BDEPTH: 24 23 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.6 kn  
 Sorted : 0 Total catch: 47.19 Catch/hour: 110.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy jubelini	22.33	26	20.13	126
Pagellus bellottii	18.57	101	16.74	127
Lagocephalus laevigatus	15.14	47	13.65	
Raja miraletus	8.25	12	7.44	
Decapterus rhonchus**	8.01	233	7.23	
Alectis alexandrinus	7.71	2	6.95	
Albula vulpes	5.08	21	4.58	
Pagrus caeruleostictus	4.49	16	4.05	
Sardinella maderensis	4.02	31	3.62	
Selene dorsalis	3.60	21	3.24	
Sphyræna guachancho	3.06	5	2.75	
Euthynnus alletteratus	2.91	2	2.63	
Balistes capricus	2.68	5	2.42	
Brachydeuterus auritus	2.54	24	2.29	128
Zanobatus shoemleini	1.39	2	1.25	
Pistularia petimba	1.13	2	1.02	
Sardinella aurita	0.02	2	0.02	
Total	110.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 55  
 DATE :14/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 7°10.82  
 start stop duration Lon E 11°52.06  
 TIME :23:29:20 00:01:09 31.8 (min) Purpose : 3  
 LOG : 5962.37 5963.85 1.5 Region : 4054  
 FDEPTH: 615 623 Gear cond.: 0  
 BDEPTH: 615 623 Validity : 0  
 Towing dir: 0° Wire out : 1350 m Speed : 2.8 kn  
 Sorted : 27 Total catch: 168.08 Catch/hour: 316.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	75.55	1606	23.85	
Lamprogrammus exutus	64.58	294	20.38	
Hoplostethus cadenati	38.57	826	12.17	
Stereomastis sp.	26.47	2115	8.35	
Lophiodes kempii	22.73	34	7.18	
Nematocarcinus africanus	15.83	2432	5.00	
Chaceon maritae	15.27	41	4.82	129
Nezumia aequalis	14.93	362	4.71	
Etmopterus lucifer	8.60	45	2.71	
Stomias boa boa	8.03	147	2.53	
Bathyroconger vicinus	7.24	158	2.28	
Myctophid sp. A	3.85	23	1.21	
Aristeus varidens	3.62	136	1.14	158
Gadella imberbis	2.26	136	0.71	
Synaphobranchus kaupii	1.70	57	0.54	
Halosaurus ovenii	1.47	23	0.46	
Xenodermichthys copei	1.36	79	0.43	
Plesiopemaneus edwardsianus	1.36	45	0.43	
Coral - Alcyonaria?	0.83	45	0.26	
Chaunax 'Pink'	0.79	45	0.25	
Opisthotethis agassizi	0.68	23	0.21	
Benthodesmus tenuis	0.68	11	0.21	
Aristeus varidens	0.34	45	0.11	159
Starfish	0.11	11	0.04	
Total	316.83		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 56  
 DATE :15/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 7°8.64  
 start stop duration Lon E 11°52.90  
 TIME :02:01:19 02:31:19 30.0 (min) Purpose : 3  
 LOG : 5970.06 5971.56 1.5 Region : 4054  
 FDEPTH: 496 514 Gear cond.: 0  
 BDEPTH: 496 514 Validity : 0  
 Towing dir: 0° Wire out : 1450 m Speed : 3.0 kn  
 Sorted : 30 Total catch: 92.94 Catch/hour: 185.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	31.26	810	16.82	
Stomias boa boa	25.56	378	13.75	
Benthodesmus tenuis	16.98	420	9.13	
Stereomastis sp.	16.56	1038	8.91	
Centrophorus granulosus	12.84	6	6.91	
Opisthotethis agassizi	9.60	6	5.16	
Gadella maraldi	9.60	126	5.16	
Nematocarcinus africanus	8.04	1608	4.33	
Triplophos hemingi	7.38	1062	3.97	
Aristeus varidens	5.76	276	3.10	131
Lamprogrammus exutus	5.58	24	3.00	
Gadella imberbis	5.28	282	2.84	
Chaceon maritae	5.16	14	2.78	130
Chaunax 'pink'	5.04	12	2.71	
Malaccocephalus laevis	4.62	96	2.49	
Hoplostethus cadenati	2.46	60	1.32	
Lophiodes kempii	2.40	6	1.29	
MYCTOPHIDAE	2.34	42	1.26	
Vitreledonella richardi	2.34	6	1.26	
Illex coindetii	1.74	12	0.94	
Aristeus varidens	1.20	162	0.65	125
Nezumia aequalis	1.02	36	0.55	
Dibranchius atlanticus	0.84	48	0.45	
Bathyroconger vicinus	0.84	72	0.45	
Xenodermichthys copei	0.54	6	0.29	
Galeus polli	0.36	6	0.19	
Halosaurus ovenii	0.30	6	0.16	
Bathynectes piperitus	0.24	18	0.13	
Total	185.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 57  
 DATE :15/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 7°5.80  
 start stop duration Lon E 11°56.27  
 TIME :04:07:15 04:29:26 22.2 (min) Purpose : 3  
 LOG : 5978.67 5979.78 1.1 Region : 4054  
 FDEPTH: 314 307 Gear cond.: 0  
 BDEPTH: 314 307 Validity : 1  
 Towing dir: 0° Wire out : 800 m Speed : 3.0 kn  
 Sorted : 56 Total catch: 168.27 Catch/hour: 455.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	176.92	3092	38.87	
Synagrops microlepis	85.54	2962	18.79	
Merluccius polli	58.76	930	12.91	167
Pontinus accraensis	26.29	292	5.78	
Illex coindetii	20.29	187	4.46	
Benthodesmus tenuis	12.98	649	2.85	
Laemonema laureysi	11.20	146	2.46	
Malaccocephalus occidentalis	8.28	73	1.82	
Zenopsis conchifer	7.87	16	1.73	
Nematocarcinus africanus	6.41	2191	1.41	
Munidopsis sp.	6.41	698	1.41	
Coelorinchus caelorhincus	4.87	73	1.07	
Parapenaeus longirostris	4.22	438	0.93	
URCHINS	4.14	8	0.91	
Bathyroconger vicinus	3.73	49	0.82	
Lophiodes kempii	3.17	65	0.70	
Gadella imberbis	2.68	41	0.59	
Acanthocarpus brevipinnis	2.35	41	0.52	
Hymenocephalus italicus	1.87	219	0.41	
C R A B S	1.70	32	0.37	
Trigla lyra	1.14	8	0.25	
MYCTOPHIDAE	1.14	625	0.25	
Bassanago albens	0.97	8	0.21	
Peristedion cataphractum	0.65	49	0.14	
B I V A L V E S	0.57	73	0.12	
Chascanopsetta lugubris	0.57	8	0.12	
GOBIDAE	0.32	32	0.07	
Bathynectes piperitus	0.16	8	0.04	
Total	455.19		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 58  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°5.02  
 start stop duration Lon E 11°56.91  
 TIME :05:34:34 06:04:40 30.1 (min) Purpose : 3  
 LOG : 5982.97 5984.52 1.6 Region : 4054  
 FDEPTH: 263 253 Gear cond.: 0  
 BDEPTH: 263 253 Validity : 0  
 Towing dir: 0° Wire out : 650 m Speed : 3.1 kn  
 Sorted : 73 Total catch: 490.62 Catch/hour: 977.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	623.06	30773	63.71	
Merluccius polli	58.90	712	6.02	166
Chlorophthalmus atlanticus	42.66	1124	4.36	
Dentex angolensis	39.59	82	4.05	165
Illex coindetii	31.77	347	3.25	
Parapenaeus longirostris	30.28	1192	3.10	
Trichiurus lepturus	29.66	38	3.03	
Pterothrissus belloci	21.01	34	2.15	
Benthodesmus tenuis	16.88	215	1.73	
Erotula barbata	15.07	12	1.54	
Pontinus accraensis	13.08	100	1.34	
Malaccocephalus occidentalis	9.93	100	1.02	
Coelorinchus caelorhincus	6.12	84	0.63	
Zenopsis conchifer	5.96	50	0.61	
Gephyroberyx darwini	4.31	34	0.44	
URCHINS	3.81	16	0.39	
Squatina oculata	3.51	2	0.36	
Bathynectes piperitus	3.15	16	0.32	
Synagrops bellus	2.99	32	0.31	
Peristedion cataphractum	2.65	16	0.27	
PARALEPIDIDAE	2.49	50	0.25	
Chascanopsetta lugubris	2.49	16	0.25	
Trigla lyra	2.31	16	0.24	
Citharus linguatula	2.15	66	0.22	
Cyttus traversi	2.15	32	0.22	
MYCTOPHIDAE	1.99	50	0.20	
Total	977.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 59  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°4.33  
 start stop duration Lon E 12°0.04  
 TIME :07:18:50 07:49:04 30.2 (min) Purpose : 3  
 LOG : 5989.65 5991.33 1.7 Region : 4054  
 FDEPTH: 150 150 Gear cond.: 0  
 BDEPTH: 150 150 Validity : 0  
 Towing dir: 0° Wire out : 430 m Speed : 3.3 kn  
 Sorted : 72 Total catch: 194.23 Catch/hour: 385.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	106.34	399	27.59	133
Sphoeroides pachgaster	85.50	81	22.18	
Trachurus trecae	76.24	4142	19.78	134
Zenopsis conchifer	31.26	65	8.11	
Brotula barbata	17.27	16	4.48	
Scomber japonicus	15.76	200	4.09	
Chelidonichthys capensis	9.69	71	2.51	
Ariomma bondi	9.69	2304	2.51	
Pterothrissus belloci	4.19	32	1.09	
Rostroraja alba	4.13	4	1.07	
Ubrina canariensis	3.73	6	0.97	
Illex coindetii	3.55	79	0.92	
Trichiurus lepturus	3.53	6	0.92	
Zeus faber	3.10	10	0.80	
Priacanthus arenatus	2.64	4	0.68	
Citharus linguatula	2.16	48	0.56	
Squatina oculata	2.16	2	0.56	
Saurida brasiliensis	2.06	474	0.54	
Spicara alta	1.59	12	0.41	
Peristedion cataphractum	0.79	14	0.21	
Erythrocles schlegelii	0.12	2	0.03	
Total	385.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 60  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°22.47  
 start stop duration Lon E 12°44.50  
 TIME :08:50:29 09:21:22 30.9 (min) Purpose : 3  
 LOG : 5997.27 5998.95 1.7 Region : 4054  
 FDEPTH: 119 116 Gear cond.: 0  
 BDEPTH: 119 116 Validity : 0  
 Towing dir: 0° Wire out : 350 m Speed : 3.3 kn  
 Sorted : 397 Total catch: 992.77 Catch/hour: 1928.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	563.09	40541	29.20	136
Dentex angolensis	443.25	3442	22.99	135
Dentex congoensis	387.70	6458	20.11	
Trigla lyra	198.51	1466	10.29	
Umbriina canariensis	183.07	227	9.49	137
Priacanthus arenatus	35.25	62	1.83	
Zenopsis conchifer	18.84	19	0.98	
Rhinobatos albomaculatus	15.64	4	0.81	
Brotula barbata	15.34	19	0.80	
Scomber japonicus	12.18	146	0.63	
Zeus faber	12.04	58	0.62	
Spicara alta	11.56	645	0.60	
Squatina oculata	6.16	10	0.32	
Pistularia petimba	4.37	10	0.23	
Trichiurus lepturus	4.08	4	0.21	
Citharus linguatula	3.50	91	0.18	
Lagocephalus laevigatus	3.05	4	0.16	
Illex coindetii	2.47	39	0.13	
Dentex barnardi	1.88	4	0.10	
Boops boops	1.75	43	0.09	
Pterothrissus belloci	1.69	10	0.09	
Ariomma bondi	1.26	19	0.07	
Pagellus bellottii	1.17	4	0.06	
Sepia orbignyana	0.49	4	0.03	
Total	1928.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 61  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°56.94  
 start stop duration Lon E 12°13.71  
 TIME :11:07:45 11:32:26 24.7 (min) Purpose : 3  
 LOG : 6012.11 6013.31 1.2 Region : 4054  
 FDEPTH: 83 83 Gear cond.: 0  
 BDEPTH: 83 83 Validity : 0  
 Towing dir: 0° Wire out : 240 m Speed : 2.9 kn  
 Sorted : 0 Total catch: 49.11 Catch/hour: 119.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	59.81	141	50.09	139
Pagellus bellottii	13.66	129	11.44	
Epinephelus aeneus	9.19	5	7.70	
Dentex congoensis	4.86	73	4.07	
Pistularia petimba	4.35	15	3.64	
Lagocephalus laevigatus	3.40	5	2.85	
Trichiurus lepturus	3.09	2	2.59	
Octopus vulgaris	2.89	5	2.42	
Chelidonichthys capensis	2.80	12	2.34	
Raja miraletus	2.72	5	2.28	
Umbriina canariensis	2.46	2	2.06	
Brotula barbata	2.46	2	2.06	
Trigla lyra	2.36	17	1.98	
Scorpaena stephanica	1.75	2	1.47	
Chaetodon hoeffleri	1.53	12	1.28	
Pagrus caeruleostictus	1.34	5	1.12	
Citharus linguatula	0.58	15	0.49	
Illex coindetii	0.15	2	0.12	
Total	119.39		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 62  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°11.05  
 start stop duration Lon E 12°17.13  
 TIME :13:29:33 14:00:06 30.6 (min) Purpose : 3  
 LOG : 6027.24 6028.83 1.6 Region : 4054  
 FDEPTH: 121 120 Gear cond.: 0  
 BDEPTH: 121 120 Validity : 0  
 Towing dir: 0° Wire out : 350 m Speed : 3.1 kn  
 Sorted : 0 Total catch: 389.29 Catch/hour: 764.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	626.08	43290	81.89	141
Dentex angolensis	66.19	230	8.66	142
Lagocephalus laevigatus	24.04	18	3.14	
Dentex congoensis	12.02	318	1.57	
Zeus faber	11.49	18	1.50	
Pagellus bellottii	6.01	53	0.79	
Pterothrissus belloci	4.24	18	0.55	
Sepia orbignyana	4.07	18	0.53	
Trigla lyra	4.07	35	0.53	
Citharus linguatula	3.71	35	0.49	
Illex coindetii	2.47	18	0.32	
Boops boops	0.18	18	0.02	
Total	764.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 63  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°13.95  
 start stop duration Lon E 12°29.57  
 TIME :15:36:15 16:07:55 31.7 (min) Purpose : 3  
 LOG : 6039.79 6041.50 1.7 Region : 4054  
 FDEPTH: 203 201 Gear cond.: 0  
 BDEPTH: 203 201 Validity : 0  
 Towing dir: 0° Wire out : 510 m Speed : 3.2 kn  
 Sorted : 66 Total catch: 308.52 Catch/hour: 584.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	405.94	29860	69.43	
Dentex angolensis	47.11	135	8.06	143
Brotula barbata	36.61	34	6.26	
Illex coindetii	32.22	364	5.51	
Pterothrissus belloci	20.39	174	3.49	
Zenopsis conchifer	19.03	83	3.25	
Saurida brasiliensis	7.05	447	1.21	
Grammoplites gruvelli	5.46	68	0.93	
Trichiurus lepturus	4.81	8	0.82	
Syacium micrurum	2.20	152	0.38	
Trigla lyra	1.90	15	0.32	
Scomber japonicus	0.76	8	0.13	
Pontinus accraensis	0.61	8	0.10	
Bathyroconger vicinus	0.38	8	0.06	
Citharus linguatula	0.23	8	0.04	
Total	584.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 64  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°14.69  
 start stop duration Lon E 12°44.95  
 TIME :17:25:30 17:55:56 30.4 (min) Purpose : 3  
 LOG : 6047.87 6049.54 1.7 Region : 4054  
 FDEPTH: 310 312 Gear cond.: 0  
 BDEPTH: 310 312 Validity : 0  
 Towing dir: 0° Wire out : 700 m Speed : 3.3 kn  
 Sorted : 74 Total catch: 543.74 Catch/hour: 1072.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	626.42	13372	58.43	
Synagrops microlepis	220.22	13041	20.54	
Merluccius polli	102.49	1928	9.56	144
Trichiurus lepturus	33.68	43	3.14	
Zenopsis conchifer	20.45	30	1.91	
Illex coindetii	18.42	217	1.72	
Parasudis fraserbrunneri	6.90	158	0.64	
Pontinus accraensis	5.92	87	0.55	
Gadella imberbis	5.76	217	0.54	
Pterothrissus belloci	5.62	30	0.52	
Benthodesmus tenuis	5.62	317	0.52	
Coelorinchus caelorhincus	3.45	73	0.32	
Bembrops heterurus	3.45	87	0.32	
Malacocephalus occidentalis	2.31	14	0.22	
Parapenaeus longirostris	1.74	174	0.16	
Synagrops bellus	1.44	30	0.13	
Bathyroconger vicinus	1.44	14	0.13	
Hymenocephalus italicus	1.30	158	0.12	
Lophius vaillanti	1.30	30	0.12	
APOGONIDAE	1.30	87	0.12	
PARALEPIDIDAE	1.16	59	0.11	
Bathynectes piperitus	0.87	14	0.08	
Acanthocarpus brevipinnis	0.43	14	0.04	
B I V A L V E S	0.30	30	0.03	
Peristedion cataphractum	0.14	14	0.01	
Total	1072.11		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 65  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°19.21  
 start stop duration Lon E 12°3.18  
 TIME :19:25:19 19:55:53 30.6 (min) Purpose : 3  
 LOG : 6056.23 6057.73 1.5 Region : 4054  
 FDEPTH: 425 432 Gear cond.: 0  
 BDEPTH: 425 432 Validity : 0  
 Towing dir: 0° Wire out : 900 m Speed : 2.9 kn  
 Sorted : 46 Total catch: 288.72 Catch/hour: 566.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	225.97	895	39.88	145
Hymenocephalus italicus	107.22	11311	18.92	
Nematocarcinus africanus	45.50	11802	8.03	
Chaunax pictus	39.74	883	7.01	
Laemonema laureysi	36.19	860	6.39	
Stereomastis sp.	28.22	2563	4.98	
Benthodesmus tenuis	12.64	418	2.23	
Malacocephalus laevis	11.05	159	1.95	
Dibranchius atlanticus	9.70	871	1.71	
Gadella imberbis	8.60	306	1.52	
Bristle worms (straws)	7.48	601	1.32	
Aristeus varidens	6.99	748	1.23	
Todaropsis eblanae	5.40	26	0.95	
Illex coindetii	4.04	37	0.71	
Coloconger sp.	3.06	37	0.54	
Plesionenaeus edwardsianus	2.83	75	0.50	
Chaceon maritae	2.71	26	0.48	
Coelorinchus caelorhincus	2.08	49	0.37	
Nezumia aequalis	1.73	98	0.30	
Halargyreus oventi	1.73	98	0.30	
NETTASTOMATIDAE	1.59	49	0.28	
Etmopterus spinax	1.24	26	0.22	
Bathynectes piperitus	0.61	26	0.11	
Tripliphos hemingi	0.26	26	0.05	
Peristedion cataphractum	0.12	26	0.02	
Total	566.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 66  
 DATE :15/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°19.80  
 start stop duration Lon E 12°1.01  
 TIME :21:16:40 21:46:37 29.9 (min) Purpose : 3  
 LOG : 6061.85 6063.22 1.4 Region : 4054  
 FDEPTH: 512 502 Gear cond.: 0  
 BDEPTH: 512 502 Validity : 0  
 Towing dir: 0° Wire out : 1100 m Speed : 2.8 kn  
 Sorted : 29 Total catch: 220.20 Catch/hour: 441.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Plesionenaeus edwardsianus	125.75	26003	28.51	
Yarella blackfordi	91.03	2588	20.64	
Lamprogrammus exitus	49.16	166	11.14	
Chaunax pictus	29.53	152	6.69	
Stomias boa boa	20.09	457	4.55	
Hoplostethus cadenati	16.75	288	3.80	
Benthodesmus sp.	15.67	288	3.55	
Laemonema laureysi	14.00	745	3.17	
Stereomastis sp.	12.02	821	2.72	
Plesionika edwardsii	10.04	182	2.28	
Aristeus varidens	8.81	471	2.00	
Dicrolene intronigra	8.67	745	1.97	
Illex coindetii	8.05	90	1.83	
Tripliphos hemingi	7.45	958	1.69	
Bristle worms (straws)	4.87	639	1.10	
Chaceon maritae	4.55	12	1.03	
Centropristis squamosus	3.81	14	0.86	
Nezumia aequalis	3.65	60	0.83	
Dibranchius atlanticus	2.88	288	0.65	
Merluccius polli	2.82	4	0.64	
Etmopterus spinax	0.76	14	0.17	
Bathyroconger vicinus	0.76	90	0.17	
Total	441.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 67  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°32.51  
 start stop duration Lon E 12°15.15  
 TIME :00:57:16 01:17:05 19.8 (min) Purpose : 3  
 LOG : 6083.97 6084.73 0.8 Region : 4054  
 FDEPTH: 700 687 Gear cond.: 0  
 BDEPTH: 700 687 Validity : 0  
 Towing dir: 0° Wire out : 1450 m Speed : 2.3 kn  
 Sorted : 0 Total catch: 54.58 Catch/hour: 165.23

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 70  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°24.43  
 start stop duration Lon E 12°26.94  
 TIME :07:16:52 07:37:45 20.9 (min) Purpose : 3  
 LOG : 6105.42 6106.31 0.9 Region : 4054  
 FDEPTH: 118 117 Gear cond.: 0  
 BDEPTH: 118 117 Validity : 0  
 Towing dir: 0° Wire out : 290 m Speed : 2.6 kn  
 Sorted : 0 Total catch: 145.05 Catch/hour: 416.81

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
JELLYFISH	50.43	133	30.52	
Yarrella blackfordi	37.60	860	22.76	
Nezumia aequalis	22.10	58	13.37	
Stereomastis sp.	11.96	100	7.24	
Stomias boa boa	11.65	245	7.05	
Lamprogrammus exutus	7.63	30	4.62	
Aristeus varidens	3.81	160	2.31	
Luciobrotula nolfi	2.45	112	1.48	
Dicrolene intronigra	1.94	18	1.17	
Bathuroconger vicinus	1.88	21	1.14	
Benthodesmus sp.	1.85	54	1.12	
Illex coindetii	1.70	12	1.03	
Nematocarcinus africanus	1.66	218	1.01	
Todaropsis eblanae	1.51	3	0.92	
Opisthotectis agassizii	1.36	3	0.82	
Laemonema laureysi	1.33	61	0.81	
Triplophos hemingi	1.24	157	0.75	
Hoplostethus cadenati	1.18	27	0.71	
Dibranchius atlanticus	1.00	82	0.60	
Lophiodes kempi	0.76	3	0.46	
Starfish	0.09	3	0.05	
Plesionika edwardsii	0.09	12	0.05	
Total	165.23		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	233.88	1333	56.11	160
Dentex congoensis	95.37	1448	22.88	
Chelidonicichthys capensis	40.90	379	9.79	
Zeus faber	15.34	86	3.68	
Raja miraletus	13.45	26	3.23	
Sepia orbignyana	6.21	78	1.49	
Brotula barbata	3.97	6	0.95	
Citharus linguatula	1.44	55	0.34	
Scorpaena normani	1.38	3	0.33	
Uranoscopus cadenati	1.21	6	0.29	
Fistularia petimba	1.15	3	0.28	
Pagellus bellottii	1.09	6	0.26	
Illex coindetii	0.78	9	0.19	
Lophiodes kempi	0.66	6	0.16	
Boops boops	0.09	3	0.02	
Total	416.81		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 68  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°28.99  
 start stop duration Lon E 12°18.75  
 TIME :02:43:55 02:48:25 4.5 (min) Purpose : 3  
 LOG : 6090.10 6090.30 0.2 Region : 4054  
 FDEPTH: 516 516 Gear cond.: 0  
 BDEPTH: 516 516 Validity : 0  
 Towing dir: 0° Wire out : 1150 m Speed : 2.6 kn  
 Sorted : 0 Total catch: 18.57 Catch/hour: 247.60

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 71  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°23.12  
 start stop duration Lon E 12°34.27  
 TIME :08:50:16 09:22:18 32.0 (min) Purpose : 3  
 LOG : 6114.67 6116.48 1.8 Region : 4054  
 FDEPTH: 87 87 Gear cond.: 0  
 BDEPTH: 87 87 Validity : 0  
 Towing dir: 0° Wire out : 220 m Speed : 3.4 kn  
 Sorted : 0 Total catch: 158.55 Catch/hour: 296.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	56.13	1680	22.67	
Caelorinchus braueri	36.27	13	14.65	
Stomias boa boa	26.67	1200	10.77	
Nematocarcinus africanus	16.13	973	6.52	
Yarrella blackfordi	15.87	267	6.41	
Lamprogrammus exutus	15.73	40	6.35	
Aristeus varidens	13.20	867	5.33	
Nezumia aequalis	10.53	267	4.25	
Triplophos hemingi	9.87	1147	3.98	
Chaceon maritae	7.33	13	2.96	
Gadella maraldi	5.47	227	2.21	
Stereomastis sp.	5.07	547	2.05	
Benthodesmus sp.	4.53	133	1.83	
Todaropsis eblanae	3.60	27	1.45	
Malacocephalus laevis	3.60	53	1.45	
Illex coindetii	3.33	27	1.35	
Gadella imberbis	3.20	40	1.29	
Dicrolene intronigra	2.13	13	0.86	
Xenodermichthys copei	1.87	107	0.75	
Laemonema laureysi	1.87	13	0.75	
Starfish	1.20	40	0.48	
Luciobrotula nolfi	1.20	13	0.48	
Hermits, mixed	1.20	27	0.48	
JELLYFISH	0.80	40	0.32	
Halosaurus ovenii	0.40	13	0.16	
Dibranchius atlanticus	0.27	53	0.11	
Myctophid sp. A	0.13	13	0.05	
Total	247.60		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	80.84	629	27.23	162
Dentex angolensis	38.90	198	13.11	161
Dentex congoensis	29.13	565	9.81	
Seriola carpenteri	29.05	28	9.79	
Epinephelus aeneus	20.37	2	6.86	
Chelidonicichthys capensis	12.66	97	4.26	
Trachurus trecae	10.46	412	3.53	163
Brotula barbata	10.11	7	3.41	
Sepia orbignyana	9.34	9	3.15	
Lagocephalus laevis	9.04	13	3.05	
Fistularia petimba	9.02	26	3.04	
Dentex barnardi	8.24	22	2.78	
Umrina canariensis	5.35	7	1.80	164
Octopus vulgaris	3.69	2	1.24	
Rhinobatos albomaculatus	3.63	2	1.22	
Pagrus caeruleostictus	3.54	7	1.19	
Squatina oculata	2.62	2	0.88	
Citharus linguatula	1.61	36	0.54	
Pseudupeneus prayvensis	1.57	11	0.53	
Scorpaena normani	1.33	2	0.45	
Sardinella aurita	1.29	9	0.44	
Chaetodon hoefleri	1.25	7	0.42	
Scomber japonicus	1.16	13	0.39	
Zeus faber	0.77	2	0.26	
Chelidonicichthys gabonensis	0.73	4	0.25	
Sphyraena sphyraena	0.58	2	0.20	
Rypticus saponaceus	0.52	2	0.18	
Total	296.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 69  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°23.88  
 start stop duration Lon E 12°26.77  
 TIME :05:15:05 05:21:29 6.4 (min) Purpose : 3  
 LOG : 6101.70 6102.02 0.3 Region : 4054  
 FDEPTH: 117 118 Gear cond.: 0  
 BDEPTH: 117 118 Validity : 0  
 Towing dir: 0° Wire out : 290 m Speed : 3.0 kn  
 Sorted : 0 Total catch: 40.95 Catch/hour: 383.91

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 72  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°21.82  
 start stop duration Lon E 12°39.27  
 TIME :10:30:08 10:57:19 27.2 (min) Purpose : 3  
 LOG : 6124.30 6125.89 1.6 Region : 4054  
 FDEPTH: 65 61 Gear cond.: 0  
 BDEPTH: 65 61 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.5 kn  
 Sorted : 85 Total catch: 85.29 Catch/hour: 188.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spicara alta	155.63	5775	40.54	
Dentex congoensis	147.19	1425	38.34	
Trachurus trecae	35.53	1566	9.26	169
Dentex angolensis	20.91	94	5.45	168
Chelidonicichthys capensis	14.06	122	3.66	
Zeus faber	3.75	19	0.98	
Brotula barbata	3.66	9	0.95	
Illex coindetii	1.97	28	0.51	
Chaetodon hoefleri	1.22	9	0.32	
Total	383.91		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	147.68	3744	78.44	170
Lagocephalus laevis	25.78	29	13.69	
Seriola carpenteri	3.53	4	1.88	
Raja miraletus	1.68	2	0.89	
Dactylopterus volitans	1.46	2	0.77	
Balistes capricus	1.15	2	0.61	
Fistularia petimba	1.08	2	0.57	
Alloteuthis africana	1.02	353	0.54	
Sepia orbignyana	0.97	4	0.52	
Chelidonicichthys gabonensis	0.77	11	0.41	
Sphyraena sphyraena	0.75	2	0.40	
Sardinella aurita	0.53	2	0.28	
Cynoglossus canariensis	0.42	2	0.22	
Dentex congoensis	0.35	2	0.19	
Trachurus trecae	0.35	13	0.19	
Illex coindetii	0.26	2	0.14	
Bembrops heterurus	0.18	7	0.09	
Syacium micrurus	0.09	4	0.05	
Caranx rhonchus	0.09	2	0.05	
Argocheilichthys imperialis	0.07	11	0.04	
Dibranchius atlanticus	0.07	4	0.04	
Total	188.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 73  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION: Lat S 7°8.11 Lon E 12°33.16  
 start stop duration  
 TIME :12:42:38 13:09:00 26.4 (min) Purpose : 3  
 LOG : 6141.21 6142.61 1.4 Region : 4054  
 FDEPTH: 46 45 Gear cond.: 0  
 BDEPTH: 46 45 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn  
 Sorted : 0 Total catch: 23.23 Catch/hour: 52.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	20.11	16	38.05	
Pagrus caeruleostictus	12.47	36	23.59	
Dentex barnardi	8.08	20	15.28	
Raja miraletus	4.07	7	7.71	
Pagellus bellottii	2.89	20	5.47	
Syacium micrurum	1.75	11	3.31	
Xyrichtys novacula	1.02	7	1.94	
Sepia orbignyana	0.77	5	1.46	
Sphyraena guachancho	0.66	2	1.25	
Trachinus radiatus	0.46	2	0.86	
Trachinus arenatus	0.32	2	0.60	
Trachinus lineolatus	0.16	2	0.30	
Alloteuthis africana	0.09	68	0.17	
Total	52.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 76  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION: Lat S 7°16.80 Lon E 12°41.62  
 start stop duration  
 TIME :17:03:47 17:32:36 28.8 (min) Purpose : 3  
 LOG : 6167.64 6169.35 1.7 Region : 4054  
 FDEPTH: 43 43 Gear cond.: 0  
 BDEPTH: 43 43 Validity : 0  
 Towing dir: 0° Wire out : 130 m Speed : 3.6 kn  
 Sorted : 0 Total catch: 74.01 Catch/hour: 154.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	82.51	271	53.53	
Pagellus bellottii	20.95	106	13.59	174
Chilomycterus reticulatus	13.29	2	8.62	
Pomadoury jubelini	9.16	10	5.95	
Raja miraletus	7.60	15	4.93	
Dactylopterus volitans	3.44	6	2.23	
Citharus linguatula	3.12	23	2.03	
Balistes capricus	2.96	2	1.92	
Chilomycterus spinosus mauretanicus	2.02	6	1.31	
Chelidonichthys gabonensis	1.54	8	1.00	
Sphyraena sphyraena	1.54	4	1.00	
Seriola carpenteri	1.46	2	0.95	
Sepia orbignyana	1.37	6	0.89	
Epinephelus aeneus	1.25	2	0.81	
Dasyatis marmorata	0.58	2	0.38	
Sardinella maderensis	0.44	2	0.28	
Chloroscombrus chrysurus	0.42	2	0.27	
Fistularia petimba	0.29	2	0.19	
Gorgorians (coral) red/pink	0.19	6	0.12	
Total	154.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 74  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION: Lat S 7°5.01 Lon E 12°36.06  
 start stop duration  
 TIME :13:54:18 14:23:49 29.5 (min) Purpose : 3  
 LOG : 6146.80 6148.30 1.5 Region : 4054  
 FDEPTH: 38 38 Gear cond.: 0  
 BDEPTH: 38 38 Validity : 0  
 Towing dir: 0° Wire out : 140 m Speed : 3.0 kn  
 Sorted : 0 Total catch: 42.24 Catch/hour: 85.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	47.24	132	55.04	
Pagellus bellottii	8.43	55	9.82	171
Pagrus caeruleostictus	7.07	22	8.24	
Rhinobatos albomaculatus	4.23	4	4.92	
Aluterus heudelotii	3.47	4	4.05	
Balistes capricus	3.23	4	3.76	
Trachinus radiatus	2.26	10	2.63	
Pseudupeneus prayensis	2.09	10	2.44	
Sepia orbignyana	1.67	2	1.94	
Syacium micrurum	1.48	6	1.73	
Octopus vulgaris	1.06	2	1.23	
Xyrichtys novacula	0.83	8	0.97	
Dentex barnardi	0.77	2	0.90	
Sphyraena guachancho	0.59	2	0.69	
Bothus podas	0.47	6	0.54	
Pegusa triophthalma	0.39	2	0.45	
Rypticus saponaceus	0.20	2	0.24	
Trachinus lineolatus	0.18	2	0.21	
Chelidonichthys gabonensis	0.16	2	0.19	
Total	85.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 77  
 DATE :19/03/14 GEAR TYPE: BT NO: 25 POSITION: Lat S 8°26.78 Lon E 12°47.78  
 start stop duration  
 TIME :00:45:59 01:14:03 28.1 (min) Purpose : 3  
 LOG : 6352.58 6354.22 1.6 Region : 4054  
 FDEPTH: 507 527 Gear cond.: 0  
 BDEPTH: 507 527 Validity : 0  
 Towing dir: 0° Wire out : 1230 m Speed : 3.5 kn  
 Sorted : 29 Total catch: 202.83 Catch/hour: 433.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	225.04	43631	51.91	
Lamprogrammus niger	101.30	5147	23.36	
Triplophos hemingi	35.01	3621	8.08	
Stomias boa boa	26.33	718	6.07	
Hoplostethus cadenati	7.03	284	1.62	
Stereomastis sp.	6.43	658	1.48	
Xenodermichthys copei	5.69	344	1.31	
Aristeus varidens	4.64	314	1.07	180
Ariomma bondi	3.74	90	0.86	
Yarella blackfordi	3.44	105	0.79	
Aristeus varidens	3.14	374	0.72	177
Zameus (Scymnodon) squamulosus	2.39	15	0.55	
Plesiopeneus edwardsianus	2.09	195	0.48	
Ancistrocheirus lesueuri	1.30	4	0.30	
Merluccius polli	1.22	2	0.28	176
Myctophid sp. A	0.75	344	0.17	
Bathynectes sp.	0.75	45	0.17	
Halosaurus ovenii	0.60	15	0.14	
Nezumia aequalis	0.45	45	0.10	
Ectreposebastes imus**	0.45	15	0.10	
Chaceon maritae	0.38	4	0.09	179
Selachophidium guentheri	0.30	60	0.07	
Gadella maraldi	0.30	30	0.07	
Chaceon maritae	0.17	2	0.04	178
NEMICHTHYIDAE	0.15	15	0.03	
Hymenocephalus italicus	0.15	15	0.03	
Bathyroconger vicinus	0.15	15	0.03	
Himantolophus groenlandicus	0.15	30	0.03	
Total	433.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 75  
 DATE :16/03/14 GEAR TYPE: BT NO: 26 POSITION: Lat S 7°14.33 Lon E 12°45.42  
 start stop duration  
 TIME :15:53:12 16:17:31 24.3 (min) Purpose : 3  
 LOG : 6160.30 6161.67 1.4 Region : 4054  
 FDEPTH: 29 28 Gear cond.: 0  
 BDEPTH: 29 28 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.4 kn  
 Sorted : 0 Total catch: 328.71 Catch/hour: 810.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	204.83	1245	25.27	172
Pagrus caeruleostictus	101.85	229	12.56	
Lutjanus gorensis	90.92	20	11.22	
Pseudupeneus prayensis	73.98	686	9.13	
Balistes punctatus	42.52	42	5.24	
Caranx rhonchus	42.12	792	5.20	
Dentex barnardi	34.92	143	4.31	
Rhinobatos albomaculatus	34.18	15	4.22	
Chloroscombrus chrysurus	31.42	205	3.88	
Pagrus africanus	21.45	22	2.65	
Epinephelus aeneus	15.59	5	1.92	
Zanobatus shoeneleini	14.45	27	1.78	
Fistularia tabacaria	14.01	5	1.73	
Aluterus heudelotii	13.24	17	1.63	
Lutjanus fulgens	11.39	2	1.41	
Epiphysion guttifer	10.55	5	1.30	
Pomadoury jubelini	9.54	7	1.18	173
Acanthurus monroviae	7.32	7	0.90	
Dasyatis marmorata	5.92	12	0.73	
Chaetodon robustus	4.27	72	0.53	
Balistes capricus	3.92	5	0.48	
Boops boops	3.67	760	0.45	
Alectis alexandrinus	3.65	5	0.45	
Chilomycterus spinosus mauretanicus	2.47	7	0.30	
Seriola carpenteri	2.34	2	0.29	
Sphyraena guachancho	2.24	2	0.28	
Fistularia petimba	2.15	22	0.26	
Scyllarides herklotsii	2.10	2	0.26	
Sardinella maderensis	1.31	10	0.16	
B I V A L V E S	0.99	493	0.12	
Chromis chromis**	0.79	57	0.10	
Rypticus saponaceus	0.20	2	0.02	
Coris julis	0.12	2	0.02	
Holacanthus africanus	0.10	2	0.01	
Bodianus speciosus	0.10	2	0.01	
Total	810.63		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 78  
 DATE :19/03/14 GEAR TYPE: BT NO: 25 POSITION: Lat S 8°27.94 Lon E 12°49.37  
 start stop duration  
 TIME :02:39:07 03:07:49 28.7 (min) Purpose : 3  
 LOG : 6359.90 6361.35 1.4 Region : 4054  
 FDEPTH: 448 449 Gear cond.: 0  
 BDEPTH: 448 449 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.0 kn  
 Sorted : 24 Total catch: 346.51 Catch/hour: 724.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	250.83	64098	34.63	
Hoplostethus cadenati	151.32	1317	20.89	
Chaunax 'pink'	107.41	732	14.83	
Gadella maraldi	40.39	966	5.58	
Merluccius polli	27.22	46	3.76	181
Yarella blackfordi	25.46	732	3.52	
Stomias boa boa	25.17	673	3.47	
Dibranchius atlanticus	20.49	585	2.83	
Xenodermichthys copei	12.29	1434	1.70	
Halosaurus ovenii	11.71	1112	1.62	
Aristeus varidens	9.37	1376	1.29	182
Bathyroconger vicinus	8.20	1259	1.13	
Illex coindetii	6.44	29	0.89	
Aristeus varidens	5.85	907	0.81	183
Lophiodes kemp	5.58	4	0.77	
Stereomastis sp.	5.56	468	0.77	
Chaceon maritae	4.68	29	0.65	
Zameus (Scymnodon) squamulosus	3.22	29	0.44	
Plesiopeneus edwardsianus	2.63	59	0.36	
Symphurus sp.	0.29	29	0.04	
Bathynectes piperitus	0.29	146	0.04	
Total	724.41		100.00	



R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 79  
 DATE :19/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°27.25  
 start stop duration Lon E 12°53.23  
 TIME :04:24:46 04:55:55 31.1 (min) Purpose : 3  
 LOG : 6366.98 6368.68 1.7 Region : 4054  
 FDEPTH: 307 302 Gear cond.: 0  
 BDEPTH: 307 302 Validity : 0  
 Towing dir: 0° Wire out : 800 m Speed : 3.3 kn  
 Sorted : 69 Total catch: 428.30 Catch/hour: 824.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	500.42	10147	60.66	
Gadella maraldi	71.65	763	8.69	
Pontinus accraensis	44.38	670	5.38	
Synagrops microlepis	44.15	1364	5.35	185
Lophiodes kempfi	29.12	35	3.53	
Bembrops greyi	25.77	520	3.12	
Merluccius polli	24.89	437	3.02	184
Scyliorhinus cervigoni	21.73	12	2.63	
Parapenaeus longirostris	18.61	2843	2.26	186
Dibranchius atlanticus	10.52	578	1.27	
Conger conger	8.90	23	1.08	
Gadella imberbis	7.05	289	0.85	
Nezumia aequalis	5.09	139	0.62	
Pterothrissus belloci	2.66	12	0.32	
Hymenococephalus italicus	2.54	35	0.31	
Ommastrephes bartrami	2.08	23	0.25	
Callinectes amnicola	1.62	35	0.20	
Illex coindetii	1.39	23	0.17	
Peristedion cataphractum	1.16	58	0.14	
Parapenaeus longirostris	0.58	127	0.07	187
Solenocera africana	0.23	23	0.03	
Halosaurus ovenii	0.23	12	0.03	
Calappa sp.	0.23	12	0.03	
Total	824.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 82  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°21.18  
 start stop duration Lon E 12°57.37  
 TIME :08:24:15 08:54:21 30.1 (min) Purpose : 3  
 LOG : 6382.30 6383.84 1.6 Region : 4054  
 FDEPTH: 122 121 Gear cond.: 0  
 BDEPTH: 122 121 Validity : 0  
 Towing dir: 0° Wire out : 320 m Speed : 3.1 kn  
 Sorted : 99 Total catch: 98.80 Catch/hour: 196.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	60.84	283	30.89	200
Boops boops	32.85	680	16.68	202
Spicara alta	24.56	512	12.47	203
Dentex congensis	20.01	409	10.16	201
Lagocephalus laevigatus	13.02	18	6.61	
Ruthymnus alletteratus	11.72	14	5.95	206
Patellidae indetCvI	6.60	1206	3.35	
Octopus vulgaris	4.94	10	2.51	
Sepia orbignyana	4.47	22	2.27	
Trachurus trecae	4.33	70	2.20	205
Citharus linguatula	2.47	104	1.26	
Zeus faber	1.99	10	1.01	
Ariomma bondi	1.89	28	0.96	
Scomber japonicus	1.51	12	0.77	204
Trigla lyra	1.12	14	0.57	
Uranoscopus cadenati	1.00	6	0.51	
Pterothrissus belloci	0.84	4	0.43	
Torpedo torpedo	0.66	2	0.33	
Dentex barnardi	0.64	2	0.32	
Lophius vaillanti	0.62	2	0.31	
Chaetodon hoefleri	0.38	2	0.19	
Lophiodes kempfi	0.22	2	0.11	
Raja miraletus	0.14	2	0.07	
Dicologlossa sp.	0.08	2	0.04	
Illex coindetii	0.06	8	0.03	
Total	196.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 80  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°25.45  
 start stop duration Lon E 12°54.78  
 TIME :05:51:14 06:11:49 20.6 (min) Purpose : 3  
 LOG : 6372.12 6373.16 1.0 Region : 4054  
 FDEPTH: 223 225 Gear cond.: 0  
 BDEPTH: 223 225 Validity : 0  
 Towing dir: 0° Wire out : 560 m Speed : 3.0 kn  
 Sorted : 15 Total catch: 188.04 Catch/hour: 547.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	181.63	15415	33.15	
Zenopsis conchifer	105.37	192	19.23	
Bembrops greyi	57.96	1600	10.58	
Pterothrissus belloci	43.27	315	7.90	
Brotula barbata	25.82	38	4.71	192
Dentex angolensis	21.68	82	3.96	189
Illex coindetii	20.86	315	3.81	
Merluccius polli	20.34	210	3.71	190
Trichiurus lepturus	16.61	55	3.03	191
Chlorophthalmus atlanticus	14.69	251	2.68	
Coelioxichus caelioxichus	12.59	184	2.30	
Parapenaeus longirostris	10.11	2165	1.85	193
Parapenaeus longirostris	4.98	1521	0.91	194
Uranoscopus polli	3.93	15	0.72	
Dentex macrophthalmus	2.83	12	0.52	188
Conger conger	2.10	26	0.38	
Syaciium micrurum**	1.46	1064	0.27	
Scorpaena normani	0.93	26	0.17	
Gephyroberyx darwini	0.79	15	0.14	
Total	547.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 83  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°20.77  
 start stop duration Lon E 13°6.15  
 TIME :10:05:25 10:28:28 23.1 (min) Purpose : 3  
 LOG : 6392.37 6393.53 1.2 Region : 4054  
 FDEPTH: 85 85 Gear cond.: 0  
 BDEPTH: 85 85 Validity : 0  
 Towing dir: 0° Wire out : 260 m Speed : 3.0 kn  
 Sorted : 35 Total catch: 107.81 Catch/hour: 280.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zeus faber	33.25	109	11.85	
Pterothrissus belloci	28.02	578	9.99	
Sepia orbignyana	24.59	320	8.77	
Trachurus trecae	21.23	929	7.57	207
Dentex angolensis	19.98	234	7.12	209
Citharus linguatula	19.44	414	6.93	
Brachydeuterus auritus	15.22	172	5.43	208
Raja clavata	11.71	8	4.17	
Raja miraletus	9.91	16	3.53	
Gobiidae sp. 'bars'	9.52	1171	3.39	
Chelidonichthys gabonensis	9.05	47	3.23	
Bembrops heterurus	7.03	39	2.50	
Stromateus fiatola	5.85	8	2.09	
Chilomycterus spinosus mauretanicus	5.54	16	1.98	
Saurida brasiliensis	5.54	258	1.98	
Galeoides decadactylus	4.81	16	1.72	
Selene dorsalis	4.53	55	1.61	
Trichiurus lepturus	4.53	16	1.61	
Dicologlossa cuneata	4.37	23	1.56	
Scorpaena normani	4.14	148	1.47	
Pentheroscion mbizi	2.50	16	0.89	
Fistularia petimba	2.19	16	0.78	
Torpedo torpedo	2.19	8	0.78	
Merluccius polli	1.95	62	0.70	210
Brotula barbata	1.72	16	0.61	
Uranoscopus polli	0.94	23	0.23	
Monoleme microstoma	0.62	31	0.22	
Total	260.37		92.82	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 81  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°22.69  
 start stop duration Lon E 12°57.24  
 TIME :07:18:24 07:48:41 30.3 (min) Purpose : 3  
 LOG : 6378.95 6380.52 1.6 Region : 4054  
 FDEPTH: 135 134 Gear cond.: 0  
 BDEPTH: 135 134 Validity : 0  
 Towing dir: 0° Wire out : 350 m Speed : 3.1 kn  
 Sorted : 101 Total catch: 207.28 Catch/hour: 410.73

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	226.45	1129	55.13	195
Spicara alta	81.16	596	19.76	196
Boops boops	16.37	178	3.98	198
Zenopsis conchifer	12.48	20	3.04	
Sepia orbignyana	12.05	93	2.93	
Brotula barbata	9.87	4	2.40	
B I V A L V E S	9.51	1225	2.32	
Erythrocles monodi	9.39	55	2.29	199
Zeus faber	8.01	52	1.95	
Octopus vulgaris	5.43	12	1.32	
Lagocephalus laevigatus	4.60	8	1.12	
Bembrops heterurus	3.41	44	0.83	
Citharus linguatula	2.42	87	0.59	
Illex coindetii	1.90	24	0.46	
Peristedion cataphractum	1.55	40	0.38	
Pterothrissus belloci	1.39	8	0.34	
Dentex congensis	1.35	28	0.33	197
Uranoscopus cadenati	1.07	16	0.26	
Scorpaena normani	0.87	4	0.21	
Pagellus bellottii	0.71	4	0.17	
Chelidonichthys gabonensis	0.67	20	0.16	
Syaciium micrurum**	0.08	12	0.02	
Total	410.73		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 84  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°20.37  
 start stop duration Lon E 13°9.56  
 TIME :11:27:57 12:00:16 32.3 (min) Purpose : 3  
 LOG : 6397.90 6399.56 1.7 Region : 4054  
 FDEPTH: 66 64 Gear cond.: 0  
 BDEPTH: 66 64 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.1 kn  
 Sorted : 64 Total catch: 1561.22 Catch/hour: 2898.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	2067.51	43253	71.34	211
Stromateus fiatola	279.21	546	9.63	212
Trachurus trecae	228.71	10778	7.89	215
Lagocephalus laevigatus	107.34	91	3.70	
Sardinella aurita	73.22	954	2.53	213
Pagellus bellottii	35.48	364	1.22	217
Selene dorsalis	31.84	455	1.10	216
Dentex angolensis	30.02	408	1.04	214
Sepia orbignyana	13.18	136	0.45	
Sphyraena sphyraena	8.63	45	0.30	
Pomadasys incisus	7.72	45	0.27	
Bembrops heterurus	5.46	136	0.19	
Citharus linguatula	3.64	182	0.13	
Sphyraena guachancho	2.73	45	0.09	
Trichiurus lepturus	1.82	45	0.06	
Pseudupeneus prayensis	1.36	45	0.05	
Saurida brasiliensis	0.45	45	0.02	
Total	2898.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 85  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°16.63  
 start stop duration Lon E 13°11.99  
 TIME :12:48:17 13:13:38 25.4 (min) Purpose : 3  
 LOG : 6403.89 6405.27 1.4 Region : 4054  
 FDEPTH: 47 46 Gear cond.: 0  
 BDEPTH: 47 46 Validity : 0  
 Towing dir: 0° Wire out : 120 m Speed : 3.3 kn  
 Sorted : 80 Total catch: 161.64 Catch/hour: 382.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Stromateus fiatola	151.48	251	39.59	218
Galeoides decadactylus	33.33	133	8.71	220
Pomadasy s jubelini	25.85	90	6.76	225
Pomadasy incisus	23.86	137	6.24	228
Chloroscombrus chrysurus	23.67	199	6.19	221
Pseudupeneus prayensis	23.20	260	6.06	219
Pagellus bellottii	19.93	256	5.21	223
Trachurus trecae	13.59	682	3.55	224
Selene dorsalis	13.49	260	3.53	222
Dentex barnardi	10.75	47	2.81	227
Raja miraletus	9.70	43	2.54	
Citharus linguatula	7.15	246	1.87	
Brachydeuterus auritus	3.93	52	1.03	232
Pagrus caeruleostictus	3.27	9	0.85	226
Bembrops heterurus	2.60	62	0.68	
Trichiurus lepturus	2.32	24	0.61	
Sepia orbignyana	1.80	19	0.47	
Torpedo torpedo	1.80	24	0.47	
Lagocephalus laevis	1.80	5	0.47	
Pseudotolithus senegalensis	1.70	5	0.45	229
Sardinella maderensis	1.70	5	0.45	230
Sardinella aurita	1.61	28	0.42	231
Caranx rhonchus	0.99	14	0.26	
Syacium micrurus	0.95	5	0.25	
Sphyraena sphyraena	0.85	9	0.22	
Eucinostomus melanopterus	0.52	5	0.14	
Penaeus notialis	0.38	5	0.10	
Serranus sp.	0.33	5	0.09	
Gobidae sp. 'bars'	0.05	52	0.01	
Total	382.58		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 86  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°14.68  
 start stop duration Lon E 13°15.40  
 TIME :14:05:03 14:35:23 30.3 (min) Purpose : 3  
 LOG : 6410.06 6411.99 1.9 Region : 4054  
 FDEPTH: 28 29 Gear cond.: 0  
 BDEPTH: 28 29 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.8 kn  
 Sorted : 120 Total catch: 120.24 Catch/hour: 237.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	146.34	1984	61.54	236
Alectis alexandrinus	14.16	20	5.95	
Pagellus bellottii	13.33	162	5.61	233
Penaeus notialis	11.55	273	4.86	
Brachydeuterus auritus	10.64	208	4.47	234
Sardinella maderensis	7.51	190	3.16	237
Sepia orbignyana	7.06	20	2.97	
Lagocephalus laevis	4.29	16	1.80	
Eucinostomus melanopterus	3.48	49	1.46	
Raja miraletus	2.95	8	1.24	
Pseudupeneus prayensis	2.75	30	1.16	
Pomadasy jubelini	2.51	2	1.06	
Selene dorsalis	1.23	40	0.52	
Galeoides decadactylus	1.19	6	0.50	
Balistes capricus	1.09	2	0.46	
Dicologlossa cuneata	0.91	18	0.38	
Caranx rhonchus	0.89	18	0.37	239
Citharus linguatula	0.85	34	0.36	
Torpedo marmorata	0.85	2	0.36	
Drepane africana	0.81	2	0.34	
Bembrops heterurus	0.73	16	0.31	
Pagrus caeruleostictus	0.65	2	0.27	238
Trachurus trecae	0.61	38	0.26	235
Cynoglossus canariensis	0.45	6	0.19	
Stromateus fiatola	0.30	4	0.12	
Chilomycterus spinosus mauretanicus	0.28	2	0.12	
Fistularia petimba	0.20	2	0.08	
Sphyraena sphyraena	0.14	4	0.06	
Sardinella aurita	0.04	2	0.02	
Total	237.79		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 87  
 DATE :19/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°33.79  
 start stop duration Lon E 12°49.04  
 TIME :18:55:40 19:26:03 30.4 (min) Purpose : 3  
 LOG : 6446.74 6448.10 1.4 Region : 4054  
 FDEPTH: 679 681 Gear cond.: 0  
 BDEPTH: 679 681 Validity : 0  
 Towing dir: 0° Wire out : 1400 m Speed : 2.7 kn  
 Sorted : 54 Total catch: 648.86 Catch/hour: 1281.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarrrella blackfordi	545.10	16590	42.54	
Hoplostethus cadenati	270.65	7829	21.12	240
Nematocarcinus africanus	214.72	46381	16.76	
Lamprogrammus exutus	51.67	213	4.03	
Stereomastis sp.	41.95	2607	3.27	
Nezumia duodecim	37.45	948	2.92	
Stomias boa boa	31.28	592	2.44	
Xenodermichthys copei	16.59	948	1.29	
Triplophos hemingi	13.27	1588	1.04	
Bathyrcoconger vicinus	9.95	261	0.78	
Dibranchius atlanticus	7.11	972	0.55	
Benthodesmus tenuis	5.92	213	0.46	
Arionma bondi	5.69	95	0.44	
Aristeus varidens	5.21	213	0.41	245
Gadella imberbis	4.98	166	0.39	
Talismania longifilis	4.50	166	0.35	
Chaceon maritae	4.07	6	0.32	243
Melanonus zugmayeri	2.84	213	0.22	
Ectreposebastes imus**	2.13	24	0.17	
Zameus (Scymnodon) squamulosus	2.13	24	0.17	242
Merluccius polli	1.82	2	0.14	241
Halosaurus ovenii	0.95	24	0.07	
Caristius groenlandicus	0.71	47	0.06	
Nemichthys scolopaceus	0.47	24	0.04	
Chaceon maritae	0.32	2	0.02	244
Total	1281.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 88  
 DATE :19/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°35.55  
 start stop duration Lon E 12°51.35  
 TIME :20:51:39 21:21:55 30.3 (min) Purpose : 3  
 LOG : 6451.36 6452.78 1.4 Region : 4054  
 FDEPTH: 522 523 Gear cond.: 0  
 BDEPTH: 522 523 Validity : 0  
 Towing dir: 0° Wire out : 1100 m Speed : 2.8 kn  
 Sorted : 26 Total catch: 259.72 Catch/hour: 514.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lophiodes kempfi	163.78	14	31.80	
Nematocarcinus africanus	163.78	46156	31.80	
Lamprogrammus exutus	63.01	2720	12.24	
Hymenocephalus italicus	20.40	2165	3.96	
Gadella imberbis	17.63	541	3.42	
Stomias boa boa	11.66	236	2.26	
Yarrrella blackfordi	11.38	375	2.21	
Hoplostethus cadenati	10.69	389	2.08	246
Aristeus varidens, female	10.41	500	2.02	247
Ommastrephes bartramii	7.36	56	1.43	
Aristeus varidens, male	6.80	916	1.32	248
Stereomastis sp.	6.38	750	1.24	
Illex coindetii	6.29	40	1.22	
Chaceon maritae, male	5.97	28	1.16	
Chaceon maritae, female	3.89	14	0.75	
Benthodesmus tenuis	3.75	125	0.73	
Conger conger	0.97	56	0.19	
Halosaurus ovenii	0.42	14	0.08	
Callinectes ammicola	0.42	28	0.08	
Total	514.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 89  
 DATE :19/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°35.42  
 start stop duration Lon E 12°53.97  
 TIME :22:37:44 23:07:19 29.6 (min) Purpose : 3  
 LOG : 6456.99 6458.48 1.5 Region : 4054  
 FDEPTH: 416 411 Gear cond.: 0  
 BDEPTH: 416 411 Validity : 0  
 Towing dir: 0° Wire out : 900 m Speed : 3.0 kn  
 Sorted : 28 Total catch: 174.98 Catch/hour: 354.93

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	122.05	44233	34.39	
Chaunax 'pink'	55.88	3302	15.74	
Merluccius polli	45.56	81	12.84	249
Gadella maraldi	33.91	424	9.56	
Dibranchius atlanticus	18.97	1584	5.34	
Yarrrella blackfordi	11.38	402	3.21	
Hymenocephalus italicus	9.15	1349	2.58	
Malacocephalus laevis	7.14	89	2.01	
Aristeus varidens, female	6.69	546	1.89	250
Nezumia aequalis	6.35	201	1.79	
Benthodesmus tenuis	5.80	233	1.63	
Halosaurus ovenii	5.46	568	1.54	
Chaceon maritae, male	4.69	12	1.32	
Zameus (Scymnodon) squamulosus	4.56	112	1.29	
Aristeus varidens, male	2.78	357	0.78	251
Nithinectes piperitus	2.68	89	0.75	
Lophius vaillanti	2.45	45	0.69	
Chlorophthalmus atlanticus	2.33	55	0.66	
Plesionaeus edwardsianus	1.66	32	0.47	
Triplophos hemingi	1.44	178	0.41	
Illex coindetii	1.12	12	0.31	
Xenodermichthys copei	0.77	233	0.22	
Hoplostethus cadenati	0.67	22	0.19	
Symphurus sp.	0.67	45	0.19	
Stereomastis sp.	0.45	55	0.13	
Lamprogrammus exutus	0.22	45	0.06	
Myctophid sp. A	0.10	45	0.03	
Total	354.93		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 90  
 DATE :20/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°36.40  
 start stop duration Lon E 12°55.98  
 TIME :01:32:13 02:10:48 38.6 (min) Purpose : 3  
 LOG : 6472.23 6473.93 1.7 Region : 4054  
 FDEPTH: 345 331 Gear cond.: 0  
 BDEPTH: 345 331 Validity : 0  
 Towing dir: 0° Wire out : 800 m Speed : 2.6 kn  
 Sorted : 12 Total catch: 115.32 Catch/hour: 179.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	37.23	19470	20.76	
Merluccius polli	23.51	1106	13.11	252
Laemonema laureysi	21.84	224	12.17	
Lophius vaillanti	13.86	42	7.73	
Dibranchius atlanticus	11.06	1218	6.17	
Gephyroberyx darwini	10.54	9	5.88	
Malacocephalus laevis	8.96	70	4.99	
Hymenocephalus italicus	8.54	3205	4.76	
Pontinus accraensis	8.12	112	4.53	
Parapanaeus longirostris,femal	7.84	1106	4.37	253
Bathyrcoconger vicinus	6.72	112	3.75	
Conger conger	4.06	14	2.26	
Myctophid sp. A	3.78	1092	2.11	
Chaunax 'pink'	2.94	196	1.64	
Pterothrissus belloci	2.66	14	1.48	
Benthodesmus tenuis	2.10	126	1.17	
Bathynectes piperitus	1.68	28	0.94	
Nezumia aequalis	1.12	42	0.62	
Zameus (Scymnodon) squamulosus	0.98	210	0.55	
Solenocera africana	0.42	70	0.23	
Triplophos hemingi	0.42	56	0.23	
Chlorophthalmus atlanticus	0.42	0	0.23	
Aristeus varidens	0.28	28	0.16	
Parapanaeus longirostris, male	0.14	14	0.08	254
Scyliorhinus cervigoni	0.14	14	0.08	
**	0.00	5	0.00	
Plastic bags	0.00	0	0.00	
Total	179.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 91  
DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°37.04  
start stop duration Lon E 12°58.38  
TIME :05:21:24 05:41:36 20.2 (min) Purpose : 3  
LOG : 6483.23 6484.24 1.0 Region : 4054  
FDEPTH: 229 226 Gear cond.: 0  
BDEPTH: 229 226 Validity : 0  
Towing dir: 0° Wire out : 560 m Speed : 3.0 kn  
Sorted : 90 Total catch: 2099.25 Catch/hour: 6235.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	4093.54	368433	65.65	258
Chlorophthalmus atlanticus	871.72	17899	13.98	
Bembrops heterurus	321.09	4031	5.15	
Merluccius polli	306.74	3279	4.92	259
Zenopsis conchifer	126.39	205	2.03	
Parapenaeus longirostris	88.13	19334	1.41	
Pterothrissus bellocci	84.03	615	1.35	
Pontinus kuhlii	66.27	410	1.06	
Parapenaeus longirostris	64.22	17831	1.03	0
Raja miraletus	49.19	68	0.79	
Dentex angolensis	40.07	143	0.64	257
Coelorinchus polli	37.57	751	0.60	
Dentex macropthalmus	28.01	205	0.45	260
Brotula barbata	27.68	21	0.44	256
Monolele microstoma	9.56	820	0.15	
Gephyroberyx darwini	9.56	68	0.15	
Illex coindetii	8.20	68	0.13	
Calappa pelii	2.05	68	0.03	
Dicologlossa cuneata	0.68	68	0.01	
Peristedion weberi	0.68	68	0.01	
Total	6235.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 92  
DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°34.55  
start stop duration Lon E 13°0.89  
TIME :07:10:36 07:41:03 30.4 (min) Purpose : 3  
LOG : 6489.80 6491.45 1.6 Region : 4054  
FDEPTH: 147 152 Gear cond.: 0  
BDEPTH: 147 152 Validity : 0  
Towing dir: 0° Wire out : 375 m Speed : 3.3 kn  
Sorted : 0 Total catch: 138.66 Catch/hour: 273.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus bellocci	82.23	534	30.10	
Dentex angolensis	80.28	422	29.38	261
Illex coindetii	14.27	282	5.22	
Trachurus trecae	11.94	14	4.37	263
Trichiurus lepturus	11.80	215	4.32	265
Brotula barbata	8.63	14	3.16	264
B I V A L V E S	7.19	741	2.63	
Zenopsis conchifer	6.74	18	2.47	
Octopus vulgaris	6.23	10	2.28	
Bembrops heterurus	4.97	108	1.82	
Ubrina canariensis	3.96	14	1.45	262
Citharus linguatula	3.86	120	1.41	
Zeus faber	3.78	16	1.38	
Pontinus kuhlii	3.65	57	1.33	
Uranoscopus cadenati	3.09	22	1.13	
Lophiodes kempfi	2.56	6	0.94	
Miracorvina angolensis	2.42	6	0.89	
Chelidonichthys gabonensis	2.36	18	0.87	
Parapenaeus longirostris	2.15	1226	0.79	
G A S T R O P O D S	1.93	130	0.71	
Spherooides pachgaster	1.89	4	0.69	
Sepia orbignyana	1.69	12	0.62	
Monolele microstoma	1.54	102	0.56	
Torpedo torpedo few spots	0.99	2	0.36	
Parapenaeus longirostris	0.69	398	0.25	0
Calappidae indetCV4	0.65	24	0.24	
Bathyroconger vicinus	0.57	4	0.21	
Saurida brasiliensis	0.51	67	0.19	
Gobiidae sp. 'yellowfin'	0.32	83	0.12	
ACANTHURIDAE	0.30	79	0.11	
Squilla mantis	0.04	2	0.01	
Total	273.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 93  
DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°38.05  
start stop duration Lon E 13°3.84  
TIME :08:35:44 09:06:13 30.5 (min) Purpose : 3  
LOG : 6496.49 6497.95 1.5 Region : 4054  
FDEPTH: 115 112 Gear cond.: 0  
BDEPTH: 115 112 Validity : 0  
Towing dir: 0° Wire out : 290 m Speed : 2.9 kn  
Sorted : 55 Total catch: 110.98 Catch/hour: 218.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	64.96	543	29.74	271
Brachydeuterus auritus	51.81	311	23.72	267
Sardinella aurita	22.36	181	10.24	266
Zeus faber	18.98	59	8.69	
Spherooides pachgaster	9.96	12	4.56	
Trachurus trecae	9.76	102	4.47	268
Scomber japonicus	9.06	102	4.14	269
Octopus vulgaris	7.48	8	3.42	
Chelidonichthys gabonensis	6.46	55	2.96	
Sepia orbignyana	3.70	35	1.69	
Dentex congoensis	2.60	55	1.19	270
Trichiurus lepturus	2.36	4	1.08	
B I V A L V E S	2.24	567	1.03	
Citharus linguatula	2.13	83	0.97	
G A S T R O P O D S	1.81	193	0.83	
Illex coindetii	1.34	43	0.61	
Dicologlossa cuneata	0.55	8	0.25	
Pontinus accraensis	0.43	4	0.20	
Spicara alta	0.43	12	0.20	
Arnoglossus imperialis	0.04	4	0.02	
Total	218.46		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 94  
DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°35.18  
start stop duration Lon E 13°10.18  
TIME :10:11:33 10:42:22 30.8 (min) Purpose : 3  
LOG : 6505.52 6507.31 1.8 Region : 4054  
FDEPTH: 78 77 Gear cond.: 0  
BDEPTH: 78 77 Validity : 0  
Towing dir: 0° Wire out : 200 m Speed : 3.5 kn  
Sorted : 82 Total catch: 270.35 Catch/hour: 526.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	186.04	2004	35.34	272
Sardinella aurita	57.31	7326	10.89	277
Torpedo torpedo	44.21	84	8.40	
Sepia orbignyana	44.15	31	8.39	
Selene dorsalis	30.91	354	5.87	275
Lagocephalus laevigatus	21.97	31	4.17	
Fistularia petimba	20.56	31	3.91	
Octopus vulgaris	17.72	6	3.37	
Raja miraletus	17.22	31	3.27	
Dasyatis marmorata	14.26	6	2.71	
Trachurus trecae	14.14	462	2.69	273
Dentex angolensis	12.91	109	2.45	274
Zeus faber	11.94	18	2.27	
Galeoides decadactylus	11.37	45	2.16	
Pomadasy incisus	7.13	37	1.35	276
Pagellus bellottii	6.54	64	1.24	
Sardinella maderensis	1.46	6	0.28	
Citharus linguatula	1.40	31	0.27	
Chloroscombrus chrysurus	1.09	6	0.21	
Dicologlossa cuneata	0.95	6	0.18	
Bembrops heterurus	0.95	12	0.18	
Chaetodon hoefleri	0.90	6	0.17	
Illex coindetii	0.51	6	0.10	
Scomber japonicus	0.43	12	0.08	
Pterothrissus bellocci	0.25	6	0.05	
Monolele microstoma	0.12	12	0.02	
Saurida brasiliensis	0.06	6	0.01	
Total	526.48		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 95  
DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°36.31  
start stop duration Lon E 13°14.99  
TIME :11:42:41 12:14:03 31.4 (min) Purpose : 3  
LOG : 6512.85 6514.52 1.7 Region : 4054  
FDEPTH: 54 52 Gear cond.: 0  
BDEPTH: 54 52 Validity : 0  
Towing dir: 0° Wire out : 150 m Speed : 3.2 kn  
Sorted : 61 Total catch: 605.70 Catch/hour: 1158.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	338.92	6981	29.26	278
Trachurus trecae	188.59	8741	16.28	280
Pomadasy incisus	186.68	3175	16.11	281
Sardinella aurita	148.80	3137	12.84	279
Chloroscombrus chrysurus	95.82	1186	8.27	284
Torpedo torpedo few spots	50.49	96	4.36	
Selene dorsalis	44.37	1377	3.83	282
Brachydeuterus auritus	22.57	2142	1.95	283
Pseudupeneus prayensis	15.11	19	1.30	
Galeoides decadactylus	13.96	57	1.21	
Bembrops heterurus	9.37	268	0.81	
Citharus linguatula	8.61	459	0.74	
Raja miraletus	7.84	19	0.68	
Lagocephalus laevigatus	6.69	19	0.58	
Sepia orbignyana	5.16	57	0.45	
Sphyræna sphyræna	3.25	38	0.28	
Chaetodon hoefleri	3.06	19	0.26	
Sardinella maderensis	2.10	19	0.18	
Serranus accraensis	2.10	57	0.18	
Rypticus saponaceus	1.72	19	0.15	
Fistularia petimba	1.15	19	0.10	
Trigla lyra	0.77	19	0.07	
Gobiidae sp. 'bars'	0.57	77	0.05	
Scorpaena normani	0.57	19	0.05	
Illex coindetii	0.19	38	0.02	
Plastic bags	0.00	4	0.00	
Total	1158.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 96  
DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°34.32  
start stop duration Lon E 13°16.63  
TIME :12:52:30 13:17:38 25.1 (min) Purpose : 3  
LOG : 6517.33 6518.70 1.4 Region : 4054  
FDEPTH: 42 39 Gear cond.: 0  
BDEPTH: 42 39 Validity : 0  
Towing dir: 0° Wire out : 130 m Speed : 3.3 kn  
Sorted : 30 Total catch: 422.24 Catch/hour: 1008.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	369.69	17114	36.67	290
Pagellus bellottii	145.74	1872	14.46	285
Sardinella aurita	70.53	1538	7.00	286
Rhinobatos albomaculatus	59.16	33	5.87	
Pseudupeneus prayensis	57.16	936	5.67	
Dasyatis margarita	44.46	33	4.41	
Pseudotolithus typus	32.42	100	3.22	
Raja miraletus	27.08	67	2.69	
Sepia orbignyana	26.74	167	2.65	
Selene dorsalis	26.41	936	2.62	289
Epinephelus aeneus	22.40	33	2.22	
Pomadasy incisus	18.72	134	1.86	
Brachydeuterus auritus	15.38	2206	1.53	288
Sphyræna sphyræna	14.37	100	1.43	
Pomadasy jubelini	14.04	33	1.39	
Trachurus trecae	12.70	602	1.26	287
Caranx rhonchus	11.36	267	1.13	
Bembrops heterurus	10.70	334	1.06	
Fistularia petimba	9.36	67	0.93	
Bucinosomus melanopterus	9.03	134	0.90	
Citharus linguatula	4.35	234	0.43	
Penaeus notialis	3.34	33	0.33	
Dicologlossa cuneata	2.01	33	0.20	
Serranus cabrilla	1.00	33	0.10	
Total	1008.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 97  
 DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°34.93  
 start stop duration Lon E 13°18.64  
 TIME :14:03:54 14:34:31 30.6 (min) Purpose : 3  
 LOG : 6522.24 6524.12 1.9 Region : 4054  
 FDEPTH: 31 33 Gear cond.: 0  
 BDEPTH: 31 33 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.7 kn  
 Sorted : 62 Total catch: 423.00 Catch/hour: 829.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	215.22	109023	25.96	291
Trachurus trecae	139.72	12843	16.85	296
Chloroscombrus chrysurus	130.55	69154	15.74	292
Sardinella aurita	105.14	3034	12.68	293
Eginephelus aeneus	69.15	71	8.34	
Pagellus bellottii	35.28	282	4.26	297
Selene dorsalis	31.75	1058	3.83	298
Caranx rhonchus	26.81	706	3.23	294
Penaeus notialis	19.05	847	2.30	295
Pseudupeneus prayensis	15.52	141	1.87	
Trachinotus ovatus	14.82	353	1.79	
Gobiidae sp. 'bars'	7.76	141	0.94	
Stromateus fiatola	5.65	71	0.68	
Citharus linguatula	4.94	141	0.60	
Sphyaena guanchancho	4.94	141	0.60	
Trichiurus lepturus	2.82	141	0.34	
Total	829.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 100  
 DATE :20/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°52.91  
 start stop duration Lon E 12°54.53  
 TIME :20:19:52 20:51:39 31.8 (min) Purpose : 3  
 LOG : 6557.80 6559.35 1.6 Region : 4054  
 FDEPTH: 311 314 Gear cond.: 0  
 BDEPTH: 311 314 Validity : 0  
 Towing dir: 0° Wire out : 650 m Speed : 2.9 kn  
 Sorted : 47 Total catch: 475.86 Catch/hour: 898.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	374.58	1378	41.69	
Heart urchin	109.31	736	12.17	
Chlorophthalmus atlanticus	84.02	181	9.35	
Gephyroberyx darwini	69.48	57	7.73	
Pontinus kuhlii	64.19	76	7.14	
Laemonema globiceps	60.04	642	6.68	
Bembrops heterurus	50.41	1265	5.61	
Parapenaeus longirostris	35.31	4852	3.93	
Coelrorhinchus caelrorhinchus	14.16	359	1.58	
Bathuroconger vicinus	13.97	170	1.56	
Lophius vailanti	10.69	4	1.19	
Malacocephalus occidentalis	3.21	19	0.36	
Bathynectes piperitus	2.45	38	0.27	
Gadella imberbis	1.70	57	0.19	
Parapenaeus longirostris	1.51	227	0.17	0
NEPHROPIDAE	1.32	19	0.15	
Acanthocarpus brevipinnis	1.13	19	0.13	
Chaunax pictus	0.94	19	0.11	
Total	898.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 98  
 DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°46.96  
 start stop duration Lon E 13°3.62  
 TIME :16:57:44 17:27:55 30.2 (min) Purpose : 3  
 LOG : 6543.15 6544.89 1.7 Region : 4054  
 FDEPTH: 121 119 Gear cond.: 0  
 BDEPTH: 121 119 Validity : 0  
 Towing dir: 0° Wire out : 350 m Speed : 3.4 kn  
 Sorted : 101 Total catch: 393.29 Catch/hour: 781.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Miracorvina angolensis	251.13	1031	32.13	304
Trachurus trecae	108.35	4170	13.86	300
Dentex angolensis	106.96	551	13.68	299
Pterothrissus bellocci	77.05	588	9.86	
Pontinus kuhlii	52.39	364	6.70	
Chelidichthys gabonensis	51.61	334	6.60	
Umbrina canariensis	23.09	101	2.95	301
Pagellus bellottii	22.93	123	2.93	302
Brotula barbata	22.10	78	2.83	305
Zenopsis conchifer	20.15	32	2.58	
Spicara alta	9.84	155	1.26	303
Citharus linguatula	7.21	225	0.92	
Sepia orbignyana	6.16	46	0.79	
Octopus vulgaris	5.66	8	0.72	
Bembrops heterurus	4.57	62	0.58	
Zeus faber	4.03	12	0.52	
Spherooides sp.	3.26	8	0.42	
Illex coindetii	1.79	16	0.23	
Saurida brasiliensis	1.47	248	0.19	
Chaetodon hoefleri	1.23	8	0.16	
B I V A L V E S	0.62	171	0.08	
Total	781.63		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 101  
 DATE :20/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°4.22  
 start stop duration Lon E 12°38.25  
 TIME :23:57:03 00:29:09 32.1 (min) Purpose : 3  
 LOG : 6581.30 6583.02 1.7 Region : 4040  
 FDEPTH: 660 665 Gear cond.: 0  
 BDEPTH: 660 665 Validity : 0  
 Towing dir: 0° Wire out : 1550 m Speed : 3.2 kn  
 Sorted : 28 Total catch: 177.67 Catch/hour: 332.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	135.52	7539	40.79	
Nematocarcinus africanus	54.75	5733	16.48	
Nezumia aequalis	31.19	808	9.39	
Lamprogrammus exutus	20.87	123	6.28	
Talismania sp.	17.28	179	5.20	
Stercomastis sp.	11.44	1245	3.44	
Aristeus varidens, female	10.99	538	3.31	317
J E L Y F I S H	10.55	34	3.17	
Chaceon maritae	9.57	34	2.88	320
Stomias boa boa	6.17	146	1.86	
Hoplostethus cadenati	3.93	90	1.18	
Bathuroconger vicinus	2.69	67	0.81	
Chaceon maritae	2.54	7	0.77	319
Xenodermichthys copei	2.24	146	0.68	
Dibranchius atlanticus	1.68	79	0.51	
Merluccius polli	1.48	2	0.44	
Aristeus varidens, male	1.46	168	0.44	318
Rajella barnardi	1.46	11	0.44	
Synaphobranchus affinis	1.12	45	0.34	
Plesionopaeus edwardsianus	1.12	79	0.34	
Triplophos heningi	1.01	123	0.30	
Benthodesmus tenuis	0.79	22	0.24	
Zameus (Scymnodon) squamulosus	0.56	79	0.17	
Bathynectes piperitus	0.56	11	0.17	
Dicrolene intronigra	0.45	11	0.14	
Halosaurus ovenii	0.45	11	0.14	
Starfish	0.22	11	0.07	
Myctophidae sp. silver	0.11	101	0.03	
Total	332.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 99  
 DATE :20/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°51.06  
 start stop duration Lon E 12°58.54  
 TIME :18:34:45 19:05:11 30.4 (min) Purpose : 3  
 LOG : 6550.96 6552.66 1.7 Region : 4054  
 FDEPTH: 216 223 Gear cond.: 0  
 BDEPTH: 216 223 Validity : 0  
 Towing dir: 0° Wire out : 550 m Speed : 3.4 kn  
 Sorted : 58 Total catch: 513.47 Catch/hour: 1012.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus bellocci	415.64	2587	41.05	
Merluccius polli	196.54	726	19.41	307
Bembrops heterurus	128.72	1246	12.71	
Dentex angolensis	68.77	284	6.79	306
Brotula barbata	66.15	53	6.53	310
Gephyroberyx darwini	36.63	39	3.62	309
Dicologlossa cuneata	19.09	268	1.89	
Synagrops microlepis	13.09	838	1.29	311
Coelrorhinchus caelrorhinchus	12.30	205	1.22	
Trichiurus lepturus	10.10	32	1.00	308
Bassanago albescens	8.36	110	0.83	
Calappa rubroguttata	8.20	126	0.81	
Syacium micrurum	7.10	237	0.70	
Zenopsis conchifer	5.21	16	0.51	
Peristedion cataphractum	5.21	95	0.51	
G A S T R O P O D S	5.17	1656	0.51	
Parapenaeus longirostris, female	3.94	678	0.39	313
Pontinus kuhlii	1.58	16	0.16	
Gadella maraldi	0.47	16	0.05	
Parapenaeus longirostris, male	0.16	47	0.02	312
Total	1012.43		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 102  
 DATE :21/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°6.16  
 start stop duration Lon E 12°40.61  
 TIME :02:13:57 02:46:48 32.8 (min) Purpose : 3  
 LOG : 6590.43 6592.10 1.7 Region : 4040  
 FDEPTH: 434 461 Gear cond.: 0  
 BDEPTH: 434 461 Validity : 0  
 Towing dir: 0° Wire out : 1000 m Speed : 3.1 kn  
 Sorted : 27 Total catch: 596.86 Catch/hour: 1090.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chaunax 'pink'	223.48	3376	20.49	
Merluccius polli	195.35	764	17.91	321
Nematocarcinus africanus	186.50	26127	17.11	
Dibranchius atlanticus	117.37	5788	10.76	
Holothuria sp.	70.74	362	6.49	
Aristeus varidens, female	47.43	2331	4.35	322
Laemonema laureysi	39.39	1286	3.61	
Scorpaena normani	35.37	40	3.24	
B I V A L V E S	28.14	80	2.58	
Lamprogrammus exutus	25.72	924	2.36	
Yarella blackfordi	17.69	724	1.62	
Nezumia aequalis	17.28	482	1.58	
Laemonema sp.	16.88	161	1.55	
Malacocephalus laevis	15.27	121	1.40	
Zameus (Scymnodon) squamulosus	11.25	281	1.03	
Bathuroconger vicinus	10.85	161	1.00	
Aristeus varidens, male	7.24	924	0.66	323
Benthodesmus tenuis	5.23	201	0.48	
Hymenocephalus italicus	4.42	563	0.41	
Hoplostethus cadenati	4.02	121	0.37	
Plesionopaeus edwardsianus	2.81	80	0.26	
Chelidichthys capensis	2.81	281	0.26	
Chlorophthalmus atlanticus	2.41	40	0.22	
Stercomastis sp.	2.01	241	0.18	
Halosaurus ovenii	0.40	40	0.04	
Calappa pelii	0.40	40	0.04	
**	0.00	4	0.00	
Total	1090.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 103  
 DATE :21/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°5.98  
 start stop duration Lon E 12°42.51  
 TIME :04:09:32 04:40:22 30.8 (min) Purpose : 3  
 LOG : 6596.90 6598.48 1.6 Region : 4040  
 FDEPTH: 362 358 Gear cond.: 0  
 BDEPTH: 362 358 Validity : 0  
 Towing dir: 0° Wire out : 850 m Speed : 3.1 kn  
 Sorted : 45 Total catch: 490.71 Catch/hour: 955.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lophiodes kempii	232.06	214	24.30	
Merluccius pollii	219.22	514	22.95	324
Raja clavata	120.31	171	12.60	
Nematocarcinus africanus	75.36	30142	7.89	
Chaunax pictus	74.50	7921	7.80	
Chaceon maritae, female	43.46	128	4.55	
Gadella maraldi	41.32	428	4.33	
Dibranchius atlanticus	37.25	2655	3.90	
Hymenocephalus italicus	29.54	4239	3.09	
Gadella imberbis	20.55	728	2.15	
Pontinus accraensis	18.20	64	1.91	
Illex coindetii	6.85	43	0.72	
Lagocephalus laevigatus	6.64	64	0.69	
Nezumia aequalis	6.42	107	0.67	
Pterothrissus belloci	4.92	21	0.52	
Aristeus varidens, female	4.92	321	0.52	335
Callinectes ammicola	3.85	43	0.40	
Ommastrephes bartrami	2.14	21	0.22	
Aristeus varidens, male	1.93	257	0.20	336
Etmopterus pollii	1.93	43	0.20	
Chloropthalmus atlanticus	1.71	43	0.18	
Halosaurus ovenii	1.07	43	0.11	
MYCTOPHIDAE	0.64	621	0.07	
Solenocera africana	0.21	21	0.02	
Total	955.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 106  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°12.33  
 start stop duration Lon E 12°50.53  
 TIME :09:13:09 09:43:28 30.3 (min) Purpose : 3  
 LOG : 6620.15 6621.77 1.6 Region : 4040  
 FDEPTH: 82 75 Gear cond.: 0  
 BDEPTH: 82 75 Validity : 0  
 Towing dir: 0° Wire out : 210 m Speed : 3.2 kn  
 Sorted : 0 Total catch: 70.31 Catch/hour: 139.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	31.42	218	22.59	341
Trachurus trecae	24.14	940	17.35	343
Raja miraletus	19.43	34	13.97	
Sepia orbignyana	15.34	18	11.02	
Brachydeuterus auritus	13.14	97	9.44	342
Selene dorsalis	6.02	46	4.32	346
Boops boops	4.49	8	3.23	347
Citharus linguatula	4.29	75	3.09	
Sphyraena sphyraena	3.76	16	2.70	345
Alloteuthis africana	3.44	956	2.47	
Lagocephalus laevigatus	3.30	4	2.38	
Sardinella maderensis	2.49	2	1.79	
PATELLIDAE	1.64	152	1.18	
Umbrina canariensis	1.60	14	1.15	348
Chelidichthys gabonensis	1.33	12	0.95	
Trichiurus lepturus	0.95	12	0.68	344
C R A B S	0.36	121	0.26	
Parapanaeus longirostris	0.34	137	0.24	
GOBIDAE	0.32	273	0.23	
Parapandalus narval	0.30	117	0.21	
Trigla lyra	0.24	2	0.17	
Grammolites gruvelli	0.22	2	0.16	
Saurida brasiliensis	0.16	30	0.11	
Dicologlossa cuneata	0.16	2	0.11	
Scomber japonicus	0.14	2	0.10	
Sphoeroides marmoratus	0.06	4	0.04	
Octopus vulgaris	0.06	2	0.04	
Total	139.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 104  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°12.55  
 start stop duration Lon E 12°42.37  
 TIME :06:07:40 06:37:41 30.0 (min) Purpose : 3  
 LOG : 6605.60 6607.13 1.5 Region : 4040  
 FDEPTH: 245 241 Gear cond.: 0  
 BDEPTH: 245 241 Validity : 0  
 Towing dir: 0° Wire out : 600 m Speed : 3.1 kn  
 Sorted : 48 Total catch: 440.97 Catch/hour: 881.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	379.71	40483	43.07	328
Zenopsis conchifer	101.09	336	11.47	
Lagocephalus laevigatus	84.13	464	9.54	
Bembrops heterurus	75.65	592	8.58	
Brotula barbata	53.46	46	6.06	327
Dentex angolensis	45.14	98	5.12	325
Merluccius pollii	42.07	336	4.77	330
Pterothrissus belloci	30.71	240	3.48	
Nezumia aequalis	16.47	272	1.87	
Parapanaeus longirostris, female	13.12	2607	1.45	341
Parapanaeus longirostris	12.00	2719	1.35	342
Trichiurus lepturus	9.80	22	1.11	326
Chloropthalmus atlanticus	5.28	336	0.60	
Uranoscopus pollii	3.84	16	0.44	
Miracorvina angolensis	1.96	2	0.22	
Umbrina canariensis	1.94	2	0.22	329
Syacium micrurum	1.92	96	0.22	
Epigonus telescopus	1.76	32	0.20	
Illex coindetii	1.44	48	0.16	
Squilla mantis	0.16	32	0.02	
Total	881.65		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 107  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°14.40  
 start stop duration Lon E 12°56.11  
 TIME :10:34:10 11:05:10 31.0 (min) Purpose : 3  
 LOG : 6627.52 6629.34 1.8 Region : 4040  
 FDEPTH: 22 31 Gear cond.: 0  
 BDEPTH: 22 31 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.5 kn  
 Sorted : 0 Total catch: 59.45 Catch/hour: 115.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	66.23	105	57.56	
Caranx rhonchus	15.99	21	13.89	350
Alectis alexandrinus	10.28	19	8.93	349
Trachinotus ovatus	6.37	14	5.53	351
Balistes caprisicus	5.28	10	4.59	
Raja miraletus	3.93	8	3.41	
Citharus linguatula	3.23	23	2.81	
Pagellus bellottii	0.99	6	0.86	352
Chloromyxerus spinosus mauretanicus	0.87	2	0.76	
Chloroscombrus chrysurus	0.77	4	0.67	
Trigla lyra	0.43	4	0.37	
Cynoglossus browni	0.43	2	0.37	
Fistularia petimba	0.27	2	0.24	
Total	115.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 105  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°14.74  
 start stop duration Lon E 12°47.00  
 TIME :07:47:37 08:18:10 30.6 (min) Purpose : 3  
 LOG : 6613.69 6615.34 1.6 Region : 4040  
 FDEPTH: 115 114 Gear cond.: 0  
 BDEPTH: 115 114 Validity : 0  
 Towing dir: 0° Wire out : 290 m Speed : 3.2 kn  
 Sorted : 61 Total catch: 270.41 Catch/hour: 531.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	164.74	6037	31.02	335
Scomber japonicus	114.89	1265	21.63	339
Trigla lyra	73.53	611	13.85	
Sphoeroides pachgaster	46.13	81	8.69	
Dentex angolensis	30.32	240	5.71	340
Zeus faber	24.67	35	4.64	
Brotula barbata	18.74	18	3.53	338
Octopus vulgaris	13.96	18	2.63	
B I V A L V E S	10.17	752	1.92	
Citharus linguatula	7.25	222	1.36	
Selene dorsalis	7.25	35	1.36	337
Raja miraletus	4.87	10	0.92	
Pterothrissus belloci	3.36	18	0.63	
Umbrina canariensis	2.30	10	0.43	336
Scorpaena normani	2.04	27	0.38	
Illex coindetii	1.87	45	0.35	
Zenopsis conchifer	1.59	18	0.30	
Ariomma bondi	1.51	27	0.28	
Sepia orbignyana	1.24	10	0.23	
Spicara alta	0.27	10	0.05	
Bembrops heterurus	0.27	10	0.05	
Arnoglossus imperialis	0.10	10	0.02	
Total	531.08		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 108  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°26.10  
 start stop duration Lon E 13°5.14  
 TIME :13:09:37 13:35:51 26.2 (min) Purpose : 3  
 LOG : 6642.84 6644.31 1.5 Region : 4040  
 FDEPTH: 21 21 Gear cond.: 0  
 BDEPTH: 21 21 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.4 kn  
 Sorted : 209 Total catch: 208.68 Catch/hour: 477.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrinus	126.59	323	26.51	356
Chloroscombrus chrysurus	100.41	561	21.03	358
Balistes caprisicus	96.36	190	20.18	359
Caranx senegalensis	90.39	213	18.93	357
Lagocephalus laevigatus	13.73	53	2.88	
Chrysaora hysoscella	10.07	2	2.11	
Aluterus heudelotii	6.16	37	1.29	
Pomadasys perotaei	5.65	5	1.18	
Pagellus bellottii	4.67	16	0.98	353
Sardinella maderensis	4.35	18	0.91	
Raja miraletus	4.03	7	0.84	
Epinephelus aeneus	2.97	9	0.62	354
Sepia orbignyana	1.97	5	0.41	
Rypticus saponaceus	1.92	34	0.40	355
B I V A L V E S	1.81	142	0.38	
Pseudupeneus prayensis	1.51	9	0.32	
Scorpaena stephanica	1.10	14	0.23	
Pagrus caeruleostictus	1.01	5	0.21	
Fistularia petimba	0.62	7	0.13	
Sardinella aurita	0.57	2	0.12	
Syacium micrurum	0.46	5	0.10	
Trachinus lineolatus	0.37	5	0.08	
Pegusa lascaris	0.27	2	0.06	
Bothus podas	0.27	5	0.06	
Chloromyxerus spinosus mauretanicus	0.27	2	0.06	
Total	477.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 109  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°28.93  
 start stop duration Lon E 13°0.40  
 TIME :14:38:55 15:09:44 30.8 (min) Purpose : 3  
 LOG : 6651.48 6653.02 1.6 Region : 4040  
 FDEPTH: 50 48 Gear cond.: 0  
 BDEPTH: 50 48 Validity : 0  
 Towing dir: 0° Wire out : 140 m Speed : 3.0 kn  
 Sorted : 112 Total catch: 112.22 Catch/hour: 218.47

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy perotaei	64.93	66	29.72	360
Pagellus bellottii	32.90	224	15.06	364
Alectis alexandrinus	17.83	21	8.16	363
Chloroscombus chrysurus	16.43	68	7.52	367
Pomadasy jubelini	15.07	14	6.90	361
Sphyrana guachancho	14.52	72	6.65	365
Octopus vulgaris	10.57	6	4.84	
Pomadasy incisus	9.91	39	4.54	362
Galeoides decadactylus	9.54	19	4.37	368
Lagocephalus laevigatus	4.85	8	2.22	
Balistes capricus	4.40	10	2.01	
Raja miraletus	4.28	6	1.96	
Carcharhinus leucas	3.64	2	1.67	
Brachydeuterus auritus	2.65	16	1.21	366
Chelidonichthys gabonensis	1.50	8	0.69	
Pseudupeneus prayensis	1.07	6	0.49	
Alloteuthis africana	1.07	290	0.49	
Citharus linguatula	0.88	6	0.40	
Trachinotus ovatus	0.86	2	0.39	
Cynoglossus senegalensis	0.74	2	0.34	
Sepia orbignyana	0.45	2	0.20	
Bembrops heterurus	0.25	6	0.12	
Monolene microstoma	0.14	4	0.06	
Total	218.47		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 110  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°30.85  
 start stop duration Lon E 12°50.88  
 TIME :16:43:02 17:09:20 26.3 (min) Purpose : 3  
 LOG : 6665.35 6666.69 1.3 Region : 4040  
 FDEPTH: 114 111 Gear cond.: 0  
 BDEPTH: 114 111 Validity : 0  
 Towing dir: 0° Wire out : 320 m Speed : 3.1 kn  
 Sorted : 43 Total catch: 86.14 Catch/hour: 196.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	52.75	265	26.84	369
Chelidonichthys gabonensis	27.10	201	13.79	
Sphoeroides pachgaster	16.70	23	8.50	
Pterothrissus belloci	15.79	100	8.03	
Brotula barbata	15.19	18	7.73	371
Zeus faber	13.41	78	6.83	
Selene dorsalis	13.10	41	6.66	370
Citharus linguatula	9.40	201	4.78	
B I V A L V E S	6.98	557	3.55	
Saurida brasiliensis	6.52	1031	3.32	
Illex coindetii	5.79	201	2.95	
Octopus vulgaris	3.51	5	1.79	
Raja miraletus	3.24	5	1.65	
Torpedo torpedo	2.46	5	1.25	
Uranoscopus cadenati	1.87	5	0.95	
Chloroscombus chrysurus	1.10	5	0.56	
Bembrops greyi	1.10	14	0.56	
Scorpaena stephanica	0.27	5	0.14	
Arionomma bondi	0.14	5	0.07	
GADIDAE	0.05	18	0.02	
Calappa sp.	0.05	5	0.02	
Total	196.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 111  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°38.70  
 start stop duration Lon E 12°40.00  
 TIME :19:32:03 20:02:04 30.0 (min) Purpose : 3  
 LOG : 6682.76 6684.21 1.4 Region : 4040  
 FDEPTH: 537 547 Gear cond.: 0  
 BDEPTH: 537 547 Validity : 0  
 Towing dir: 0° Wire out : 1150 m Speed : 2.9 kn  
 Sorted : 23 Total catch: 236.57 Catch/hour: 472.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Laemonema laureysi	169.49	979	35.85	
Nematopalaemon tenuipes	83.14	36875	17.58	
Hoplostethus cadenati	48.57	1399	10.27	
Lamprogrammus exutus	26.78	160	5.66	
Stereomastis sp.	20.79	2478	4.40	
Dibranchius atlanticus	20.19	939	4.27	
Yarella blackfordi	13.99	440	2.96	
Chaunax pictus	12.79	220	2.71	
Merluccius polli	11.71	12	2.48	371
Aristeus varidens, female	10.99	640	2.32	372
Conger conger	9.39	380	1.99	
Gadella imberbis	8.39	420	1.78	
Aristeus varidens, male	6.40	560	1.35	373
Coelorrhinus caelorrhinus	6.00	380	1.27	
Hymenocephalus italicus	5.40	640	1.14	
Stomias boa boa	4.00	80	0.85	
Halosaurus ovenii	3.00	100	0.63	
Chaceon maritae, female	2.80	14	0.59	508
Benthodesmus tenuis	2.20	60	0.46	
Callinectes amnicola	1.80	80	0.38	
Chaceon maritae, male	1.62	4	0.34	509
Malacocephalus laevis	1.60	40	0.34	
Chlorophthalmus atlanticus	1.00	20	0.21	
Plesiopeanaeus edwardsianus	0.80	20	0.17	
Total	472.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 112  
 DATE :21/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°57.77  
 start stop duration Lon E 12°45.03  
 TIME :22:57:55 23:28:12 30.3 (min) Purpose : 3  
 LOG : 6703.02 6704.55 1.5 Region : 4040  
 FDEPTH: 737 729 Gear cond.: 0  
 BDEPTH: 737 729 Validity : 0  
 Towing dir: 0° Wire out : 1500 m Speed : 3.0 kn  
 Sorted : 28 Total catch: 569.60 Catch/hour: 1128.29

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	312.97	9865	27.74	
Yarella blackfordi	268.21	7686	23.77	
Lamprogrammus niger	87.95	555	7.79	
Holothuria sp.	83.20	238	7.37	
Nezumia aequalis	57.84	1426	5.13	
Chaceon maritae, female	51.50	198	4.56	376
Nematocarcinus africanus	45.96	14381	4.07	
Triplophos hemingi	36.05	3922	3.20	
Stereomastis sp.	31.69	1426	2.81	
Chaceon maritae, male	26.54	40	2.35	377
Stomias boa boa	25.35	515	2.25	
Dibranchius atlanticus	25.35	1268	2.25	
Coloconger sp.	18.22	79	1.62	
BRACHIOEUTHIDAE	10.70	40	0.95	
Talismania sp.	7.92	317	0.70	
Rajella barnardi	7.53	158	0.67	
Xenodermichthys copei	7.53	673	0.67	
Bathyrhocogaster vicinus	5.55	158	0.49	
Aristeus varidens, female	4.75	277	0.42	374
Zameus (Scymmodon) squamulosus	3.57	79	0.32	
Plesiopeanaeus edwardsianus	2.38	198	0.21	
Dicrolene intronigra	1.98	119	0.18	
Starfish	1.98	158	0.18	
SEPIOLIDAE	1.19	119	0.11	
Aristeus varidens, male	1.19	198	0.11	375
CHIROSTYLIDAE	0.79	436	0.07	
NETTASTOMATIDAE	0.40	40	0.04	
Total	1128.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 113  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°55.70  
 start stop duration Lon E 12°46.27  
 TIME :01:01:41 01:38:03 36.4 (min) Purpose : 3  
 LOG : 6709.76 6712.60 2.8 Region : 4040  
 FDEPTH: 504 504 Gear cond.: 0  
 BDEPTH: 506 504 Validity : 0  
 Towing dir: 0° Wire out : 1150 m Speed : 3.0 kn  
 Sorted : 28 Total catch: 284.00 Catch/hour: 468.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	111.52	38042	23.80	
Illex coindetii	93.21	379	19.89	
Chaceon maritae	86.28	330	18.42	380
Lamprogrammus exutus	77.87	1138	16.62	
Hoplostethus cadenati	29.53	940	6.30	
Aristeus varidens	12.04	627	2.57	378
Yarella blackfordi	11.38	379	2.43	
Stereomastis sp.	7.42	792	1.58	
Stomias boa boa	6.76	132	1.44	
Triplophos hemingi	6.27	693	1.34	
Aristeus varidens	4.45	660	0.95	379
Dibranchius atlanticus	3.30	99	0.70	
Chlorophthalmus atlanticus	2.47	66	0.53	
Chaceon maritae	2.14	16	0.46	381
Chaunax pictus	1.98	49	0.42	
Nezumia aequalis	1.98	132	0.42	
Dicrolene intronigra	1.65	66	0.35	
Plesiopeanaeus edwardsianus	1.65	594	0.35	
Bathyrhocogaster vicinus	1.15	33	0.25	
Benthodesmus tenuis	0.99	49	0.21	
Mycotophidae sp. silver	0.99	1551	0.21	
Todaropsis eblanae	0.82	16	0.18	
Zameus (Scymmodon) squamulosus	0.66	16	0.14	
Bathynectes piperitus	0.66	16	0.14	
CHIROSTYLIDAE	0.49	742	0.11	
Xenodermichthys copei	0.49	66	0.11	
NETTASTOMATIDAE	0.16	16	0.04	
Hymenocephalus italicus	0.16	16	0.04	
Total	468.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 114  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°50.50  
 start stop duration Lon E 12°51.00  
 TIME :05:16:41 05:36:50 20.1 (min) Purpose : 3  
 LOG : 6721.56 6722.63 1.1 Region : 4040  
 FDEPTH: 210 208 Gear cond.: 0  
 BDEPTH: 210 208 Validity : 0  
 Towing dir: 0° Wire out : 530 m Speed : 3.2 kn  
 Sorted : 59 Total catch: 852.57 Catch/hour: 2538.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1739.61	11672	68.52	385
Zenopsis conchifer	229.70	1042	9.05	
Bembrops heterurus	152.58	1292	6.01	
Pterothrissus belloci	133.40	1084	5.25	
Merluccius polli	114.64	1209	4.52	383
Brotula barbata	51.28	57	2.02	384
Raja clavata	43.77	42	1.72	
Dentex angolensis	30.79	917	1.21	382
Illex coindetii	10.84	250	0.43	
B I V A L V E S	5.84	500	0.23	
Parapenaeus longirostris	5.42	727	0.21	386
Malacocephalus laevis	4.59	83	0.18	
Parapenaeus longirostris	4.17	1167	0.16	387
Chlorophthalmus atlanticus	4.17	792	0.16	
Syacium micrurum	3.75	208	0.15	
Citharus linguatula	2.50	83	0.10	
Octopus vulgaris	1.64	3	0.06	
Total	2538.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 115  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°49.27  
 start stop duration Lon E 12°53.62  
 TIME :06:25:31 06:55:53 30.4 (min) Purpose : 3  
 LOG : 6726.47 6728.06 1.6 Region : 4040  
 FDEPTH: 123 121 Gear cond.: 0  
 BDEPTH: 123 121 Validity : 0  
 Towing dir: 0° Wire out : 300 m Speed : 3.2 kn  
 Sorted : 78 Total catch: 257.22 Catch/hour: 508.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	272.12	1363	53.55	388
Dentex congoensis	59.59	535	11.73	394
Spicara alta	30.58	202	6.02	
Trigla lyra	24.18	156	4.76	
Umbriina canariensis	22.76	79	4.48	389
Raja clavata	14.60	6	2.87	
Dentex barnardi	13.24	45	2.60	390
Spherooides pachgaster	12.72	26	2.50	
Dentex macrophthalmus	9.92	45	1.95	391
Scomber japonicus	8.53	85	1.68	393
Zeus faber	7.82	14	1.54	
B I V A L V E S	5.93	666	1.17	
Ariomma bondi	5.81	91	1.14	
Sepia orbignyana	5.16	45	1.01	
Pagellus bellottii	4.96	20	0.98	395
Citharus linguatula	3.46	99	0.68	
Trachurus trecae	3.40	6	0.67	392
Uranoscopus polli	1.96	14	0.38	
Syacium micrurum	0.85	40	0.17	
Chelidonichthys gabonensis	0.59	6	0.12	
Total	508.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 116  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°48.50  
 start stop duration Lon E 13°0.89  
 TIME :08:08:12 08:17:31 9.3 (min) Purpose : 3  
 LOG : 6736.52 6736.98 0.5 Region : 4040  
 FDEPTH: 95 96 Gear cond.: 0  
 BDEPTH: 95 96 Validity : 0  
 Towing dir: 0° Wire out : 250 m Speed : 3.0 kn  
 Sorted : 5 Total catch: 43.22 Catch/hour: 278.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Atractoscion aequidens	103.26	26	37.11	399
Trigla lyra	54.72	393	19.67	
Dentex angolensis	33.35	367	11.99	396
Octopus vulgaris	27.55	19	9.90	
Raja miraletus	14.42	19	5.18	
Citharus linguatula	9.21	200	3.31	
Dentex barnardi	7.92	19	2.85	397
B I V A L V E S	5.79	605	2.08	
Saurida brasiliensis	4.31	863	1.55	
Uranoscopus polli	3.15	13	1.13	
Zeus faber	3.03	6	1.09	
Pagellus bellottii	2.96	26	1.06	398
Chaetodon hoeferi	2.06	13	0.74	
Illex coindetii	1.74	26	0.62	
Brotula barbata	1.61	6	0.58	400
Selene dorsalis	0.90	6	0.32	
Chelidonichthys gabonensis	0.84	6	0.30	
Boops boops	0.71	13	0.25	
Scorpaena normani	0.39	6	0.14	
Fistularia petimba	0.32	6	0.12	
Total	278.24		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 117  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°42.17  
 start stop duration Lon E 13°9.04  
 TIME :10:05:17 10:36:47 31.5 (min) Purpose : 3  
 LOG : 6748.73 6750.65 1.9 Region : 4040  
 FDEPTH: 32 31 Gear cond.: 0  
 BDEPTH: 32 31 Validity : 0  
 Towing dir: 0° Wire out : 115 m Speed : 3.7 kn  
 Sorted : 0 Total catch: 99.03 Catch/hour: 188.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrinus	24.65	34	13.07	409
Rhinobatos albomaculatus	22.90	11	12.14	
Galeoides decadactylus	21.64	84	11.47	408
Chloroscombrus chrysurus	14.40	95	7.63	410
Caranx crysos	12.19	145	6.46	406
Eucinostomus melanopterus	11.31	122	6.00	
Sphyraena guachancho	10.19	17	5.40	407
Stromateus fiatola	7.62	10	4.04	412
Dasyatis margarita	5.75	4	3.05	
Pomadasyes perotaei	5.75	13	3.05	411
Brachydeuterus auritus	4.84	130	2.56	402
Pagellus bellottii	4.84	11	2.56	401
Sardinella maderensis	4.67	25	2.47	404
Balistes capricus	3.98	8	2.11	
Raja miraletus	3.90	11	2.07	
Pseudotolithus senegalensis	3.35	6	1.78	403
Pomadasyes jubelini	3.07	2	1.63	
Ephippion guttifer	3.07	2	1.63	
Lagocephalus laevigatus	2.86	11	1.51	
Selene dorsalis	2.70	44	1.43	405
Scomberomorus tritor	2.53	2	1.34	
Trichiurus lepturus	2.48	19	1.31	
Chilomycterus spinosus mauretanicus	2.00	10	1.06	
Pseudupeneus prayensis	1.50	10	0.80	
Syacium micrurum**	1.09	13	0.58	
Dasyatis marmorata	0.95	2	0.50	
Sepia orbignyana	0.84	2	0.44	
Trigla lyra	0.78	6	0.41	
Caranx senegalensis	0.48	10	0.25	
Rypticus saponaceus	0.48	10	0.25	
Trachinocephalus myops	0.44	6	0.23	
Bothus podas	0.27	4	0.14	
Bembrops greyi	0.21	6	0.11	
Alloteuthis sp.	0.21	6	0.11	
Aluterus heudelotii	0.19	2	0.10	
Dicologlossa cuneata	0.13	2	0.07	
Pistularia petimba	0.13	4	0.07	
Sardinella aurita	0.08	2	0.04	
Citharus linguatula	0.08	2	0.04	
Saurida brasiliensis	0.04	8	0.02	
Pteroscion peli	0.02	2	0.01	
Starfish	0.02	2	0.01	
Trachurus trecae	0.02	2	0.01	
Total	188.63		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 118  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 9°58.89  
 start stop duration Lon E 13°12.54  
 TIME :12:29:19 13:01:05 31.8 (min) Purpose : 3  
 LOG : 6766.06 6767.76 1.7 Region : 4040  
 FDEPTH: 36 35 Gear cond.: 0  
 BDEPTH: 36 35 Validity : 0  
 Towing dir: 0° Wire out : 115 m Speed : 3.2 kn  
 Sorted : 0 Total catch: 147.60 Catch/hour: 278.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	78.45	1039	28.14	419
Brachydeuterus auritus	53.96	1071	19.36	420
Rhinobatos albomaculatus	25.80	13	9.25	
Gymnura micrura	18.21	2	6.53	
Galeoides decadactylus	17.41	79	6.25	421
Raja miraletus	16.69	36	5.99	
Pseudotolithus senegalensis	16.28	32	5.84	413
Syacium micrurum**	6.21	64	2.23	
Eucinostomus melanopterus	6.19	66	2.22	
Trachurus trecae	4.91	81	1.76	414
Sphyraena guachancho	4.76	68	1.71	422
Pomadasyes perotaei	4.19	9	1.50	423
Sardinella maderensis	4.06	36	1.46	417
Arius parkii	2.98	4	1.07	
Pagellus bellottii	2.95	11	1.06	415
Trichiurus lepturus	2.93	34	1.05	
Ilsha africana	2.72	38	0.98	
Sardinella aurita	2.12	13	0.76	418
Selar crumenophthalmus	1.64	2	0.59	
Epinephelus aeneus	1.59	2	0.57	
Alectis alexandrinus	1.21	2	0.43	
Bembrops heterurus	0.85	19	0.30	
Dicologlossa cuneata	0.66	13	0.24	
Chloroscombrus chrysurus	0.59	4	0.21	
Sepia orbignyana	0.40	2	0.14	
Torpedo torpedo	0.38	8	0.14	
Illex coindetii	0.25	45	0.09	
Dentex barnardi	0.19	2	0.07	416
Gobioides sp.	0.09	23	0.03	
Pseudupeneus prayensis	0.09	2	0.03	
Total	278.75		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 119  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°0.85  
 start stop duration Lon E 13°10.02  
 TIME :11:52:32 14:22:25 29.9 (min) Purpose : 3  
 LOG : 6772.34 6773.92 1.6 Region : 4040  
 FDEPTH: 60 63 Gear cond.: 0  
 BDEPTH: 60 63 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.2 kn  
 Sorted : 0 Total catch: 44.99 Catch/hour: 90.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	26.22	42	29.03	
Lagocephalus laevigatus	15.82	18	17.52	
Pseudupeneus prayensis	8.67	82	9.60	
Octopus vulgaris	7.79	2	8.62	
Dentex angolensis	5.94	110	6.58	427
Arius parkii	5.08	6	5.62	
Trichiurus lepturus	4.40	8	4.87	
Pagellus bellottii	3.13	44	3.47	424
Bembrops heterurus	2.85	78	3.16	
Selene dorsalis	1.65	10	1.82	428
Scorpaena stephanica	1.00	8	1.11	
Sphyraena guachancho	1.00	2	1.11	
Trigla lyra	0.98	8	1.09	
Alloteuthis africana	0.72	201	0.80	
Sphyraena sphyraena	0.70	2	0.78	
Citharus linguatula	0.66	32	0.73	
Dentex barnardi	0.62	10	0.69	426
Saurida brasiliensis	0.60	106	0.67	
Brachydeuterus auritus	0.60	6	0.67	425
Serranus cabrilla	0.58	10	0.64	
Brotula barbata	0.48	2	0.53	
Sardinella aurita	0.36	2	0.40	
Fistularia petimba	0.14	4	0.16	
Monolene sp.	0.10	10	0.11	
Sepia orbignyana	0.08	30	0.09	
Dicologlossa cuneata	0.06	2	0.07	
Trachurus trecae	0.02	2	0.02	
C R A B S	0.02	10	0.02	
Lophiodes kempii	0.02	2	0.02	
Total	90.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 120  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°1.75  
 start stop duration Lon E 13°5.03  
 TIME :15:19:18 15:49:34 30.3 (min) Purpose : 3  
 LOG : 6780.06 6781.74 1.7 Region : 4040  
 FDEPTH: 86 86 Gear cond.: 0  
 BDEPTH: 86 86 Validity : 0  
 Towing dir: 0° Wire out : 230 m Speed : 3.3 kn  
 Sorted : 64 Total catch: 580.45 Catch/hour: 1150.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	791.89	20230	68.83	429
Lagocephalus laevigatus	93.48	125	8.12	
Sardinella aurita	74.57	963	6.48	430
Trigla lyra	51.44	714	4.47	
Octopus vulgaris	48.17	36	4.19	
Raja miraletus	27.47	36	2.39	
Selene dorsalis	15.52	71	1.35	432
Pseudupeneus prayensis	14.45	161	1.26	
Sepia orbignyana	9.10	71	0.79	
Scomber japonicus	7.33	71	0.64	431
Citharus linguatula	3.75	107	0.33	
Boops boops	3.03	36	0.26	
Saurida brasiliensis	2.68	464	0.23	
Bembrops heterurus	1.07	18	0.09	
Bembrops heterurus	1.07	18	0.09	0
Dentex barnardi	1.07	18	0.09	
Alloteuthis africana	1.07	71	0.09	
Illex coindetii	0.89	18	0.08	
Gobioides sp.	0.89	18	0.08	
Dentex congoensis	0.89	36	0.08	
Pagellus bellottii	0.36	18	0.03	
PATELLIDAE	0.36	36	0.03	
Total	1150.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 121  
 DATE :22/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°7.02  
 start stop duration Lon E 13°0.61  
 TIME :16:51:57 17:21:50 29.9 (min) Purpose : 3  
 LOG : 6790.34 6791.93 1.6 Region : 4040  
 FDEPTH: 106 107 Gear cond.: 0  
 BDEPTH: 106 107 Validity : 0  
 Towing dir: 0° Wire out : 300 m Speed : 3.2 kn  
 Sorted : 77 Total catch: 206.01 Catch/hour: 413.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	83.33	783	20.14	
Pagellus bellottii	50.02	580	12.09	433
Trachurus trecae	49.92	1299	12.07	434
Boops boops	45.22	1795	10.93	439
Saurida brasiliensis	45.00	7299	10.88	
Sphoeroides pachgaster	34.36	84	8.31	
Raja miraletus	17.81	26	4.31	
Citharus linguatula	12.73	725	3.08	
Dentex congolensis	10.24	815	2.48	436
Illex coindetii	9.86	319	2.38	
Pistularia petimba	8.15	16	1.97	
Uranoscopus polli	7.73	26	1.87	
Zeus faber	7.25	20	1.75	1
Sepia officinalis	6.06	2	1.47	
Selene dorsalis	5.54	10	1.34	435
HOLUTHUROIDEA	3.29	293	0.80	
Sepia orbignyana	2.35	20	0.57	
Octopus vulgaris	2.23	2	0.54	
Todaropsis eblanae	1.73	6	0.42	
PATELLIDAE	1.67	141	0.40	
Scorpaena normani	1.67	16	0.40	
Dentex angolensis	1.57	32	0.38	438
Trichiurus lepturus	1.22	2	0.30	
Chelidonichthys gabonensis	0.78	10	0.19	
Dicologlossa cuneata	0.68	46	0.17	
Sardinella aurita	0.68	16	0.17	437
Ubrina canariensis	0.62	6	0.15	
Brachydeuterus auritus	0.58	6	0.14	
Arnoglossus imperialis	0.52	32	0.13	
Cepola macrophthalma	0.42	10	0.10	
Dicologlossa hexophthalma	0.42	6	0.10	
Total	413.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 122  
 DATE :22/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°9.96  
 start stop duration Lon E 12°53.77  
 TIME :19:12:51 19:44:27 31.6 (min) Purpose : 3  
 LOG : 6800.40 6801.96 1.6 Region : 4040  
 FDEPTH: 317 314 Gear cond.: 0  
 BDEPTH: 317 314 Validity : 0  
 Towing dir: 0° Wire out : 650 m Speed : 3.0 kn  
 Sorted : 57 Total catch: 926.51 Catch/hour: 1758.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	1065.04	501	60.56	
Merluccius polli	348.35	2118	19.81	440
Aristeus varidens, male	79.44	1148	4.52	444
Laemonema laureysi	50.91	501	2.89	
Gephyroberyx darwini	34.72	59	1.97	441
Synagrops microlepis	28.00	1678	1.59	442
Zenopsis conchifer	25.30	59	1.44	
Pontinus kuhlii	24.43	294	1.39	
Gadella imberbis	21.77	647	1.24	
Aristeus varidens, female	21.18	1266	1.20	443
Hymenocephalus italicus	12.36	2824	0.70	
Malacocephalus occidentalis	10.59	59	0.60	
Parapanaeus longirostris, female	6.19	854	0.35	445
Pterothrissus belloci	5.88	30	0.33	
Parapandalus narval	5.01	1824	0.28	
MYCTOPHIDAE	3.83	1000	0.22	
Munidopsis sp.	3.53	501	0.20	
Coelorinchus caelorhincus	2.66	89	0.15	
Lophiodes kempi	2.66	89	0.15	
Trichiurus auriga	2.07	59	0.12	
Bathynectes piperitus	2.07	59	0.12	
Acanthocarpus brevipinnis	1.18	30	0.07	
Parapanaeus longirostris, male	1.18	148	0.07	446
Raja sp.	0.30	30	0.02	
Total	1758.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 123  
 DATE :22/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°7.62  
 start stop duration Lon E 12°51.32  
 TIME :21:02:59 21:27:47 24.8 (min) Purpose : 3  
 LOG : 6806.78 6807.99 1.2 Region : 4040  
 FDEPTH: 496 521 Gear cond.: 0  
 BDEPTH: 496 521 Validity : 0  
 Towing dir: 0° Wire out : 1050 m Speed : 2.9 kn  
 Sorted : 33 Total catch: 433.03 Catch/hour: 1047.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	331.50	7403	31.64	
Hoplostethus atlanticus	212.61	7140	20.29	
Chaceon maritae	163.55	566	15.61	449
Lamprogrammus exutus	66.68	723	6.36	
Aristeus varidens, female	61.96	3397	5.91	447
Chaunax pictus	49.69	1006	4.74	
Yarella blackfordi	35.23	1195	3.36	
Neoharriotta pinnata	32.08	31	3.06	
Merluccius polli	24.22	63	2.31	
Chlorophthalmus atlanticus	14.47	346	1.38	
Todarodes angolensis	12.58	63	1.20	
Laemonema laureysi	6.92	786	0.66	
Chaceon maritae	6.60	31	0.63	500
Hymenocephalus italicus	6.29	786	0.60	
Aristeus varidens, male	5.35	629	0.51	448
Lophiodes kempi	3.46	63	0.33	
Stomias boa boa	3.46	94	0.33	
Halosaurus ovenii	2.83	126	0.27	
Coelorinchus caelorhincus	2.83	94	0.27	
Conger conger	1.57	126	0.15	
Malacocephalus laevis	1.57	31	0.15	
MYCTOPHIDAE	1.26	1164	0.12	
Stereomastis sp.	0.94	94	0.09	
Total	1047.65		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 124  
 DATE :22/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°23.05  
 start stop duration Lon E 12°54.67  
 TIME :23:29:32 00:00:24 30.9 (min) Purpose : 3  
 LOG : 6823.24 6824.93 1.7 Region : 4040  
 FDEPTH: 585 585 Gear cond.: 0  
 BDEPTH: 585 585 Validity : 0  
 Towing dir: 0° Wire out : 1350 m Speed : 3.3 kn  
 Sorted : 26 Total catch: 343.56 Catch/hour: 667.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	320.39	49650	47.98	
Lamprogrammus exutus	77.07	1238	11.54	
Hoplostethus atlanticus	77.07	2527	11.54	
Triplophos hemingi	27.79	3158	4.16	
Gadella maraldi	22.99	834	3.44	
Yarella blackfordi	17.18	480	2.57	
Aristeus varidens, female ***	15.67	758	2.35	502
Chaceon maritae, female ***	14.66	76	2.19	
Neoharriotta pinnata	12.32	2	1.85	
Stereomastis sp.	12.13	657	1.82	
Bathyroconger vicinus	10.61	404	1.59	
Lophiodes kempi	9.35	25	1.40	
Stomias boa boa	8.34	177	1.25	
Chlorophthalmus atlanticus	7.33	177	1.10	
Illex coindetii	5.81	25	0.87	
Aristeus varidens, male ***	4.55	480	0.68	501
Zameus (Scymnodon) squamulosus	4.04	76	0.61	
Rajella barnardi	3.54	25	0.53	
Benthodesmus tenuis	3.03	101	0.45	
Dicrolene intronigra	2.53	354	0.38	
Myctophidae sp. silver	2.27	2198	0.34	
Nezumia aequalis	2.27	51	0.34	
HIMANTOLOPHIDAE	2.02	25	0.30	
Plesiopanaeus edwardsianus	1.26	202	0.19	
Nemichthys scolopaceus	1.26	25	0.19	
Bathynectes piperitus	1.01	25	0.15	
Solea sp.	0.76	25	0.11	
Xenodermichthys copei	0.51	25	0.08	
Total	667.76		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 125  
 DATE :23/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°26.12  
 start stop duration Lon E 12°59.00  
 TIME :02:39:24 03:10:51 31.4 (min) Purpose : 3  
 LOG : 6837.13 6838.73 1.6 Region : 4040  
 FDEPTH: 481 475 Gear cond.: 0  
 BDEPTH: 481 475 Validity : 0  
 Towing dir: 0° Wire out : 1100 m Speed : 3.1 kn  
 Sorted : 29 Total catch: 368.30 Catch/hour: 702.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	214.02	53197	30.46	
Hoplostethus atlanticus	93.86	2957	13.36	
Lamprogrammus exutus	91.52	1431	13.02	
Chaunax pictus	55.84	775	7.95	
Dibranchius atlanticus	47.87	1244	6.81	
Aristeus varidens, female	34.97	1900	4.98	506
B I V A L V E S	28.64	71	4.08	
Gadella maraldi	26.75	258	3.81	
Lophiodes kempi	19.96	48	2.84	
Stomias boa boa	9.62	258	1.37	
Yarella blackfordi	9.39	305	1.34	
Dicrolene intronigra	8.68	422	1.24	
Chaceon maritae, female	8.59	53	1.22	504
Merluccius polli	8.24	10	1.17	503
Aristeus varidens, male	7.04	1057	1.00	507
Centrophorus granulosus	6.83	2	0.97	
Triplophos hemingi	4.22	517	0.60	
Malacocephalus laevis	3.76	422	0.53	
Xenodermichthys copei	3.05	258	0.43	
Stereomastis sp.	2.82	399	0.40	
Synagrops microlepis	2.58	164	0.37	
Benthodesmus tenuis	2.12	71	0.30	
Halosaurus ovenii	1.87	71	0.27	
Nezumia aequalis	1.64	48	0.23	
Ariomma bonndi	1.64	76	0.23	
Chaceon maritae, male	1.30	4	0.18	
Nemichthys scolopaceus	0.93	71	0.13	505
Myctophidae sp. silver	0.93	563	0.13	
Zameus (Scymnodon) squamulosus	0.93	23	0.13	
Chlorophthalmus atlanticus	0.93	23	0.13	
DICERATIIDAE	0.71	23	0.10	
Plesiopanaeus edwardsianus	0.71	23	0.10	
Bathyroconger vicinus	0.48	48	0.07	
Bathynectes piperitus	0.23	23	0.03	
Total	702.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 126  
 DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°22.90  
 start stop duration Lon E 13°3.87  
 TIME :05:18:41 05:38:51 20.2 (min) Purpose : 3  
 LOG : 6850.59 6851.68 1.1 Region : 4040  
 FDEPTH: 188 184 Gear cond.: 0  
 BDEPTH: 188 184 Validity : 0  
 Towing dir: 0° Wire out : 465 m Speed : 3.2 kn  
 Sorted : 107 Total catch: 4382.08 Catch/hour: 13041.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	12248.75	1612301	93.92	
Uranoscopus polli	345.33	1098	2.65	
Raja miraletus	152.53	244	1.17	
Pontinus accraensis	91.52	122	0.70	
Sphoeroides pachgaster	65.89	122	0.51	
Dentex angolensis	48.81	122	0.37	
Gephyroberyx darwini	34.17	122	0.26	511
Loligo vulgaris	31.73	122	0.24	512
Bembrops greyi	8.54	122	0.07	
Zenopsis conchifer	8.54	122	0.07	
Syacium micrum	4.88	122	0.04	
Chlorophthalmus atlanticus	1.22	122	0.01	
Total	13041.90		100.00	



R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 127  
 DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°18.30  
 start stop duration Lon E 13°14.13  
 TIME :08:30:02 09:00:18 30.3 (min) Purpose : 3  
 LOG : 6867.67 6869.42 1.8 Region : 4040  
 FDEPTH: 91 91 Gear cond.: 0  
 BDEPTH: 91 91 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.5 kn  
 Sorted : 64 Total catch: 128.41 Catch/hour: 254.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	71.99	603	28.28	
Trachurus trecae	59.31	1391	23.30	435
Raja miraletus	28.78	52	11.31	
Squatina aculeata	26.96	8	10.59	
Zeus faber	11.06	32	4.35	
Pagellus bellottii	10.90	107	4.28	513
Sepia officinalis	8.72	4	3.43	
Alloteuthis africana	7.65	2137	3.01	
Citharus linguatula	6.22	222	2.45	
Lagocephalus laevigatus	5.11	20	2.01	
Dentex angolensis	4.20	75	1.65	511
Dentex barnardi	4.08	40	1.60	512
Pseudupeneus prayensis	3.85	71	1.51	
Saurida brasiliensis	1.55	396	0.61	
Trichiurus lepturus	0.97	4	0.38	515
Dicologlossa cuneata	0.87	20	0.34	
Selene dorsalis	0.63	4	0.25	514
Scomber japonicus	0.59	8	0.23	516
B I V A L V E S	0.44	28	0.17	
Grammolites gruvelli	0.36	8	0.14	
Boops boops	0.16	12	0.06	
GADIDAE	0.12	4	0.05	
Total	254.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 128  
 DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°14.38  
 start stop duration Lon E 13°20.41  
 TIME :10:27:15 10:57:28 30.2 (min) Purpose : 3  
 LOG : 6879.54 6881.28 1.7 Region : 4040  
 FDEPTH: 51 50 Gear cond.: 0  
 BDEPTH: 51 50 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.5 kn  
 Sorted : 0 Total catch: 148.65 Catch/hour: 295.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	117.68	143	39.87	
Trachurus trecae	77.07	1402	26.12	518
Brachydeuterus auritus	39.33	399	13.33	517
Raja miraletus	13.58	32	4.60	
Pomadasy jubelini	9.73	10	3.30	523
Galeoides decadactylus	8.18	28	2.77	522
Pagellus bellottii	6.37	77	2.16	526
Dentex barnardi	3.83	60	1.30	521
Selene dorsalis	2.86	34	0.97	524
Cynoglossus senegalensis	2.12	10	0.72	
Bembrops heterurus	2.06	46	0.70	
Octopus vulgaris	2.03	4	0.69	
Pseudotolithus senegalensis	1.73	2	0.59	527
Chloroscombrus chrysurus	1.65	10	0.56	525
Dicologlossa cuneata	1.43	26	0.48	
Citharus linguatula	1.25	34	0.42	
Trigla lyra	0.71	6	0.24	
Sardinella aurita	0.66	8	0.22	520
Sardinella maderensis	0.66	6	0.22	519
Trachinotus ovatus	0.42	2	0.14	
Torpedo torpedo	0.38	2	0.13	
Illex coindetii	0.34	2	0.11	
Serranus cabrilla	0.34	8	0.11	
Pseudupeneus prayensis	0.32	8	0.11	
Syacium micrurum	0.30	2	0.10	
Gobidae sp. 'bars'	0.08	24	0.03	
Monolele microstoma	0.04	2	0.01	
Total	295.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 129  
 DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°14.69  
 start stop duration Lon E 13°25.36  
 TIME :11:48:09 12:16:49 28.7 (min) Purpose : 3  
 LOG : 6886.80 6888.61 1.8 Region : 4040  
 FDEPTH: 28 27 Gear cond.: 0  
 BDEPTH: 28 27 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.8 kn  
 Sorted : 0 Total catch: 66.74 Catch/hour: 139.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	25.57	741	18.31	528
Drepane africana	21.93	29	15.70	536
Rhinobatos albomaculatus	20.47	23	14.65	
Raja miraletus	13.35	42	9.56	
Alectis alexandrinus	12.98	13	9.29	535
Arius parkii	8.10	17	5.80	
Chloroscombrus chrysurus	6.72	69	4.81	534
Trachurus trecae	5.44	126	3.90	532
Rhizoprionodon acutus	3.87	2	2.77	
Sardinella maderensis	3.14	17	2.25	529
Sardinella aurita	2.80	52	2.01	530
Selene dorsalis	2.36	98	1.69	531
Eucinostomus melanopterus	1.84	21	1.32	
Lagocephalus laevigatus	1.67	2	1.20	
Caranx crysos	1.67	2	1.20	
Sphyraena guachancho	1.51	38	1.08	533
Pomadasy jubelini	1.28	2	0.91	
Torpedo marmorata	1.13	4	0.81	
Galeoides decadactylus	1.11	17	0.79	537
Bembrops heterurus	0.65	13	0.46	
Syacium micrurum	0.46	4	0.33	
Sepia orbignyana	0.42	2	0.30	
Pseudupeneus prayensis	0.29	8	0.21	
Ephippion guttifer	0.29	2	0.21	
Dicologlossa cuneata	0.27	4	0.19	
Penaeus notialis	0.13	2	0.09	
Ilisha africana	0.08	2	0.06	
Trichiurus lepturus	0.06	2	0.04	
Torpedo torpedo	0.06	2	0.04	
Total	139.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 130  
 DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°26.17  
 start stop duration Lon E 13°30.53  
 TIME :13:39:31 14:09:55 30.4 (min) Purpose : 3  
 LOG : 6899.47 6901.32 1.9 Region : 4040  
 FDEPTH: 30 29 Gear cond.: 0  
 BDEPTH: 30 29 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.7 kn  
 Sorted : 0 Total catch: 84.94 Catch/hour: 167.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	33.38	776	19.91	531
Alectis alexandrinus	32.05	39	19.12	530
Lagocephalus laevigatus	28.26	65	16.86	
Rhinobatos albomaculatus	14.61	12	8.71	
Raja miraletus	13.82	30	8.24	
Stromateus fiatola	7.58	14	4.52	529
Gymnura micrura	6.95	2	4.14	
Chloroscombrus chrysurus	6.12	39	3.65	532
Arius parkii	4.05	10	2.41	
Ephippion guttifer	3.77	2	2.25	
Drepane africana	3.59	6	2.14	
Epinephelus aeneus	2.49	4	1.48	
Trachinotus ovatus	2.07	4	1.24	
Sardinella aurita	1.70	26	1.01	534
Syacium micrurum	1.66	16	0.99	
Caranx crysos	1.22	2	0.73	
Galeoides decadactylus	1.13	2	0.67	
Dasyatis marmorata	0.79	4	0.47	
Selene dorsalis	0.61	16	0.36	533
Pseudupeneus prayensis	0.51	8	0.31	
Sardinella maderensis	0.36	2	0.21	
Bembrops heterurus	0.30	6	0.18	
Trichiurus lepturus	0.30	4	0.18	
Trachurus trecae	0.18	8	0.11	
Eucinostomus melanopterus	0.12	2	0.07	
Caranx rhonchus	0.04	2	0.02	
Gobidae sp. 'bars'	0.02	2	0.01	
Total	167.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 131  
 DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°30.85  
 start stop duration Lon E 13°21.00  
 TIME :15:34:45 16:05:09 30.4 (min) Purpose : 3  
 LOG : 6914.29 6915.94 1.6 Region : 4040  
 FDEPTH: 94 95 Gear cond.: 0  
 BDEPTH: 94 95 Validity : 0  
 Towing dir: 0° Wire out : 260 m Speed : 3.2 kn  
 Sorted : 62 Total catch: 244.55 Catch/hour: 482.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	210.38	2228	43.59	
Trachurus trecae	66.75	1934	13.83	535
Trigla lyra	48.91	367	10.13	
Raja miraletus	37.26	53	7.72	
Zenopsis conchifer	37.05	166	7.68	
Lagocephalus laevigatus	16.72	91	3.46	
Pagellus bellottii	10.80	83	2.24	536
Brachydeuterus auritus**	10.72	97	2.22	538
Ubrina canariensis	10.62	32	2.20	539
Uranoscopus cadenati	8.92	30	1.85	
Citharus linguatula	8.09	284	1.68	
Sepia orbignyana	5.70	8	1.18	
Dentex angolensis	3.53	59	0.73	537
Dicologlossa cuneata	3.45	16	0.72	
Saurida brasiliensis	2.33	353	0.48	
Pterothrissus belloci	0.75	16	0.16	
Trichiurus lepturus	0.38	8	0.08	
Illex coindetii	0.08	22	0.02	
Alloteuthis africana	0.08	30	0.02	
Boops boops	0.08	8	0.02	
Scorpaena normani	0.08	8	0.02	
Total	482.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 132  
 DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°34.95  
 start stop duration Lon E 13°14.46  
 TIME :17:07:45 17:37:45 30.0 (min) Purpose : 3  
 LOG : 6924.60 6926.10 1.5 Region : 4040  
 FDEPTH: 131 130 Gear cond.: 0  
 BDEPTH: 131 130 Validity : 0  
 Towing dir: 0° Wire out : 325 m Speed : 3.0 kn  
 Sorted : 65 Total catch: 4350.87 Catch/hour: 8701.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	7160.96	1020410	82.29	541
Dentex angolensis	368.50	1474	4.23	542
Scomber japonicus	254.60	1060	2.93	544
Torpedo torpedo	156.78	268	1.80	
Trigla lyra	111.22	1474	1.28	
Sphoeroides pachgaster	99.16	402	1.14	
Pterothrissus belloci	80.40	536	0.92	
Scorpaena stephanica	67.00	134	0.77	
Illex coindetii	62.98	670	0.72	
Ubrina canariensis	57.62	134	0.66	
Uranoscopus cadenati	46.90	134	0.54	
Octopus vulgaris	44.22	134	0.51	
Zenopsis conchifer	26.80	134	0.31	
Sepia orbignyana	26.80	402	0.31	
Brotula barbata	22.56	28	0.26	540
Syacium micrurum**	20.10	670	0.23	
Citharus linguatula	20.10	536	0.23	
Bembrops heterurus	18.76	268	0.22	
Pagellus bellottii	18.76	134	0.22	
Peristedion cataphractum	14.74	268	0.17	
Spicara alta	13.40	268	0.15	543
Ariomma bondi	6.70	268	0.08	
Arnoglossus imperialis	2.68	268	0.03	
Total	8701.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 133  
DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°36.54  
 start stop duration Lon E 13°9.89  
TIME :19:00:19 19:30:22 30.1 (min) Purpose : 3  
LOG : 6932.65 6934.10 1.4 Region : 4040  
FDEPTH: 341 345 Gear cond.: 0  
BDEPTH: 341 345 Validity : 0  
Towing dir: 0° Wire out : 720 m Speed : 2.9 kn  
Sorted : 46 Total catch: 388.90 Catch/hour: 776.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Laemonema laureysi	246.09	2851	31.69	
Hymenocephalus italicus	103.53	5279	13.33	
Merluccius polli	86.18	459	11.10	545
Nematocarcinus africanus	72.98	31771	9.40	
Chaunax pictus	53.81	4532	6.93	
Chaceon maritae	47.18	226	6.08	
Yarella blackfordi	42.43	1410	5.46	
CHIROSTYLIDAE	27.33	1613	3.52	
Dibranchus atlanticus	23.26	1749	3.00	
Chlorophthalmus atlanticus	22.74	629	2.93	
Synagrops microlepis	7.65	373	0.98	
Nezumia aequalis	6.45	102	0.83	
Loligo vulgaris	4.75	34	0.61	
Lophiodes kempi	4.75	120	0.61	
Etmopterus molleri**	4.25	238	0.55	
Aristeus varidens	4.07	238	0.52	547
Malacocephalus laevis	3.73	52	0.48	
Pontinus accraensis	3.57	34	0.46	
Gadella imberbis	3.05	136	0.39	
Hoplostethus atlanticus	2.38	86	0.31	
Aristeus varidens	2.22	339	0.29	546
Conger conger	1.88	68	0.24	
Plesiopenaeus edwardsianus	1.02	238	0.13	
MYCTOPHIDAE	1.02	373	0.13	
Solenocera africana	0.18	34	0.02	
Total	776.51		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 134  
DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°38.61  
 start stop duration Lon E 13°8.51  
TIME :21:10:30 21:39:21 28.8 (min) Purpose : 3  
LOG : 6939.56 6941.02 1.5 Region : 4040  
FDEPTH: 511 505 Gear cond.: 0  
BDEPTH: 511 505 Validity : 0  
Towing dir: 0° Wire out : 1050 m Speed : 3.0 kn  
Sorted : 26 Total catch: 294.56 Catch/hour: 612.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	363.87	91585	59.38	
Aristeus varidens	60.87	3273	9.93	548
Lamprogrammus exutus	60.42	1442	9.86	
Aristeus varidens	23.80	3341	3.88	549
Chaceon maritae	19.68	44	3.21	0
Lophiodes kempi	18.54	23	3.02	
Hoplostethus atlanticus	15.10	503	2.46	
Illex coindetii	12.59	92	2.05	
Gadella maraldi	8.93	389	1.46	
Yarella blackfordi	6.64	206	1.08	
Stomias boa boa	5.26	137	0.86	
Stereomastis sp.	2.29	275	0.37	
Halosaurus ovenii	2.06	92	0.34	
Chaceon maritae	2.04	4	0.33	
Plesiopenaeus edwardsianus	1.83	229	0.30	
Myctophidae sp. silver	1.37	549	0.22	
Triplophos hemingi	1.37	160	0.22	
Benthoedemus tenuis	1.37	46	0.22	
Merluccius polli	1.35	2	0.22	
Gadella imberbis	1.14	69	0.19	
Xenodermichthys copei	0.92	114	0.15	
Bathyroconger vicinus	0.92	69	0.15	
DICERATIIDAE	0.46	23	0.07	
Total	612.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 135  
DATE :23/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°40.33  
 start stop duration Lon E 13°5.88  
TIME :23:24:23 23:57:05 32.7 (min) Purpose : 3  
LOG : 6947.19 6948.77 1.6 Region : 4040  
FDEPTH: 737 736 Gear cond.: 0  
BDEPTH: 737 736 Validity : 0  
Towing dir: 0° Wire out : 1550 m Speed : 2.9 kn  
Sorted : 31 Total catch: 94.38 Catch/hour: 173.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Holothuria sp.	54.28	121	31.34	
Yarella blackfordi	35.56	842	20.53	
Nezumia aequalis	14.15	314	8.17	
Stereomastis sp.	9.74	683	5.63	
Stomias boa boa	7.71	204	4.45	
Rajella barnardi	5.94	6	3.43	
Chaceon maritae, male ***	5.78	11	3.34	
Chaceon maritae, female ***	5.17	17	2.99	
Lophiodes kempi	5.06	11	2.92	
Todarodes angolensis	3.58	17	2.07	
Triplophos hemingi	3.30	352	1.91	
Talismania sp.	3.25	66	1.88	
Lamprogrammus exutus	3.08	17	1.78	
Nematocarcinus africanus	2.97	661	1.72	
Dibranchus atlanticus	2.53	110	1.46	
Hoplostethus atlanticus	2.04	50	1.18	
Merluccius polli	1.93	2	1.11	
Aristeus varidens, female ***	1.65	72	0.95	
Plesiopenaeus edwardsianus	1.54	187	0.89	
JELLYFISH	1.38	39	0.79	
Bathyroconger vicinus	0.44	6	0.25	
Zameus (Scymnodon) squamulosus	0.33	6	0.19	
Benthoedemus tenuis	0.28	6	0.16	
Xenodermichthys copei	0.28	17	0.16	
Aristeus varidens, male ***	0.28	33	0.16	
STERNOPTYCHIDAE	0.22	6	0.13	
CHIROSTYLIDAE	0.22	77	0.13	
Myctophidae sp. silver	0.17	17	0.10	
Nephropsis atlantica	0.17	17	0.10	
NEMICHTHYIDAE	0.11	11	0.06	
Halosaurus ovenii	0.06	6	0.03	
Total	173.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 136  
DATE :24/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°44.93  
 start stop duration Lon E 13°17.94  
TIME :09:23:17 09:53:23 30.1 (min) Purpose : 3  
LOG : 6983.17 6984.67 1.5 Region : 4040  
FDEPTH: 270 265 Gear cond.: 0  
BDEPTH: 270 265 Validity : 0  
Towing dir: 0° Wire out : 660 m Speed : 3.0 kn  
Sorted : 111 Total catch: 1989.88 Catch/hour: 3966.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	2208.80	49300	55.69	
Merluccius polli	968.77	10190	24.42	552
Synagrops microlepis	351.63	19375	8.86	553
Erotula barbata	86.43	144	2.18	550
Bembrops greyi	62.07	682	1.56	
Laemonema laureysi	60.64	466	1.53	
Nezumia aequalis	26.19	574	0.66	
Myctophidae sp. silver	25.48	6997	0.64	
Pterothrissus belloci	24.76	179	0.62	
Dentex macrophthalmus	22.96	72	0.58	551
Zenopsis conchifer	20.09	215	0.51	
Parapenaeus longirostris, female	19.38	1292	0.49	554
Parapenaeus longirostris, male	19.02	1041	0.48	555
Scorpaena normani	15.43	323	0.39	
Chaceon maritae	13.63	36	0.34	
Malacocephalus laevis	11.84	108	0.30	
Loligo vulgaris	6.46	36	0.16	
Gadella imberbis	6.10	215	0.15	
Epigonus telescopus	6.10	359	0.15	
Dibranchus atlanticus	4.31	144	0.11	
Trichiurus lepturus	2.87	108	0.07	
Calappa sp.	1.79	36	0.05	
Stereomastis sp.	1.79	36	0.05	
Total	3966.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 137  
DATE :24/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°46.28  
 start stop duration Lon E 13°23.66  
TIME :11:09:54 11:29:21 19.4 (min) Purpose : 3  
LOG : 6990.03 6991.15 1.1 Region : 4040  
FDEPTH: 145 149 Gear cond.: 0  
BDEPTH: 145 149 Validity : 0  
Towing dir: 0° Wire out : 450 m Speed : 3.5 kn  
Sorted : 58 Total catch: 1574.91 Catch/hour: 4858.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	4356.09	666990	89.66	556
Sphoeroides lobatus	178.24	416	3.67	
Sepia orbignyana	74.96	416	1.54	
Dentex angolensis	59.97	333	1.23	558
Trachurus trecae	44.14	83	0.91	
Trichiurus lepturus	39.15	416	0.81	
Zeus faber	30.82	167	0.63	
Zenopsis conchifer	23.32	500	0.48	
Dentex macrophthalmus	21.66	167	0.45	557
Illex coindetii	11.66	33	0.34	
Chlorophthalmus atlanticus	8.33	999	0.17	
Bembrops greyi	5.00	83	0.10	
Total	4858.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 138  
DATE :24/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°43.92  
 start stop duration Lon E 13°31.44  
TIME :12:47:51 13:13:13 25.4 (min) Purpose : 3  
LOG : 7000.40 7001.72 1.3 Region : 4040  
FDEPTH: 92 91 Gear cond.: 0  
BDEPTH: 92 91 Validity : 0  
Towing dir: 0° Wire out : 270 m Speed : 3.1 kn  
Sorted : 99 Total catch: 518.20 Catch/hour: 1225.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	718.20	148768	58.60	559
Trachurus trecae	217.18	4870	17.72	560
Selene dorsalis	33.94	125	2.77	562
Uranoscopus cadenati	31.71	85	2.59	
Brotula barbata	30.74	35	2.51	
Scorpaena normani	29.37	281	2.40	
Zeus faber	25.45	38	2.08	
Dentex barnardi	22.14	123	1.81	564
Brachydeuterus auritus	21.52	232	1.76	565
Citharus linguatula	20.03	369	1.63	
Trigla lyra	19.80	161	1.62	
Dentex angolensis	13.67	88	1.12	561
Pagellus bellottii	8.73	123	0.71	563
Fistularia petimba	7.73	12	0.63	
Torpedo torpedo	5.16	12	0.42	
Argyrosomus hololepidotus	3.69	12	0.30	
Mystriophis rostellatus	3.19	24	0.26	
Zenopsis conchifer	2.46	24	0.20	
Trichiurus lepturus	2.32	12	0.19	
Umbrina canariensis	1.84	12	0.15	
Lagocephalus laevigatus	1.70	12	0.14	
Pontinus accraensis	1.58	24	0.13	
Saurida brasiliensis	0.97	123	0.08	
Pterothrissus belloci	0.73	12	0.06	
Sepia orbignyana	0.61	24	0.05	
Dicologosolossa hexophthalma	0.35	12	0.03	
Sea urchin	0.24	12	0.02	
Paramola cuvieri	0.24	85	0.02	
ANTENNARIIDAE	0.24	12	0.02	
Total	1225.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 139  
 DATE :24/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°39.70  
 start stop duration Lon E 13°37.98  
 TIME :14:26:25 14:56:57 30.5 (min) Purpose : 3  
 LOG : 7010.89 7012.60 1.7 Region : 4040  
 FDEPTH: 47 45 Gear cond.: 0  
 BDEPTH: 47 45 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.4 kn  
 Sorted : 209 Total catch: 209.05 Catch/hour: 410.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy inciscus	106.87	393	26.01	567
Pomadasy jubelini	74.86	69	18.22	566
Lagocephalus laevigatus	65.05	120	15.83	
Raja miraletus	48.94	100	11.91	
Alectis alexandrinus	37.89	53	9.22	569
Galeoides decadactylus	32.82	55	7.99	568
Stromateus fiatola	10.24	24	2.49	570
Rhinobatos albomaculatus	5.54	4	1.35	
Brachydeuterus auritus	5.03	104	1.22	571
Gymnura micrura	4.17	2	1.01	
Caranx crysos	3.42	4	0.83	572
Octopus vulgaris	2.95	2	0.72	
Dicologlossa cuneata	2.59	53	0.63	
Bembrops heterurus	2.48	57	0.60	
Chloroscombrus chrysurus	2.46	14	0.60	573
Pomadasy rogeri	1.20	2	0.29	
Citharus linguatula	0.86	24	0.21	
Trichiurus lepturus	0.63	4	0.15	
Alloteuthis africana	0.49	134	0.12	
Serranus cabrilla	0.47	10	0.11	
Scorpaena normani	0.39	4	0.10	
Calappa rubroguttata	0.39	8	0.10	
Torpedo torpedo	0.37	8	0.09	
Mystriophis rostellatus	0.33	2	0.08	
Pseudupeneus prayensis	0.14	2	0.03	
Sphyraena sphyraena	0.10	2	0.02	
Penaeus notialis	0.10	4	0.02	
Gobioides sp.	0.06	24	0.01	
Total	410.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 140  
 DATE :24/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°37.68  
 start stop duration Lon E 13°41.73  
 TIME :15:43:54 16:14:34 30.7 (min) Purpose : 3  
 LOG : 7018.06 7019.94 1.9 Region : 4040  
 FDEPTH: 22 22 Gear cond.: 0  
 BDEPTH: 22 22 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.7 kn  
 Sorted : 92 Total catch: 559.82 Catch/hour: 1095.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	451.68	7663	41.23	574
Trichiurus lepturus	151.23	2115	13.80	580
Sardinella aurita	137.96	3793	12.59	579
Ephippion guttifer	94.64	90	8.64	
Sardinella maderensis	64.15	2419	5.86	578
Alectis alexandrinus	44.54	18	4.07	
Galeoides decadactylus	28.47	192	2.60	
Chloroscombrus chrysurus	27.79	372	2.54	
Trachurus trecae	15.75	309	1.44	576
Selene dorsalis	15.42	339	1.43	577
Sphyraena qubnancho	12.72	225	1.15	
Ilisha africana	8.22	90	0.75	
Pomadasy inciscus	7.65	45	0.70	575
Drepane africana	7.08	12	0.65	
Arius parkii	6.61	2	0.60	
Rhinobatos albomaculatus	5.81	6	0.53	
Pomadasy rogeri	3.39	12	0.31	
Sepia orbignyana	3.27	12	0.30	
Sepia officinalis	3.15	12	0.29	
Trachinotus ovatus	2.25	33	0.21	
Lagocephalus laevigatus	1.47	23	0.13	
Eucinostomus melanopterus	1.02	12	0.09	
Pseudupeneus prayensis	1.02	23	0.09	
Penaeus notialis	0.23	12	0.02	
Total	1095.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 141  
 DATE :25/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°49.26  
 start stop duration Lon E 13°20.48  
 TIME :20:45:23 21:17:39 32.3 (min) Purpose : 3  
 LOG : 7306.15 7307.81 1.7 Region : 4040  
 FDEPTH: 339 341 Gear cond.: 0  
 BDEPTH: 339 341 Validity : 0  
 Towing dir: 0° Wire out : 860 m Speed : 3.1 kn  
 Sorted : 55 Total catch: 384.19 Catch/hour: 714.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	229.33	1900	32.10	587
Laemonema laureysi	187.42	5610	26.24	
Nematocarcinus africanus	78.61	33722	11.00	
Hymenocephalus italicus	67.81	13393	9.49	
Chlorophthalmus atlanticus	57.66	1445	8.07	
Chaunax pictus	35.53	2928	4.97	
Hoplostethus atlanticus	7.55	247	1.06	
Bathynectes piperitus	6.25	143	0.87	
Munidopsis sp.	5.73	1601	0.80	
Lophiodes kempi	5.47	143	0.77	
Etmopterus polli	5.34	833	0.75	
Aristeus varidens, male	4.03	573	0.56	590
Myctophidae sp. silver	4.03	2850	0.56	
Malacocephalus occidentalis	3.51	52	0.49	
Bathyrcongiger vicinus	2.34	91	0.33	
Parapenaeus longirostris, female	2.21	586	0.31	588
Chaceon maritae	2.01	7	0.28	591
Mystriophis rostellatus	1.82	13	0.26	
Coelorinchus caelorrhincus	1.69	39	0.24	
Gadella imberbis	1.43	39	0.20	
Aristeus varidens, female	1.43	104	0.20	589
Agrostichthys parkeri	1.30	13	0.18	
Solenocera africana	0.65	156	0.09	
Acanthephyra sp.	0.52	247	0.07	
Peristedion cataphractum	0.39	78	0.05	
NETTASTOMATIDAE	0.26	13	0.04	
Total	714.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 142  
 DATE :25/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°50.68  
 start stop duration Lon E 13°17.51  
 TIME :22:45:57 23:15:47 29.8 (min) Purpose : 3  
 LOG : 7314.55 7315.94 1.4 Region : 4040  
 FDEPTH: 509 507 Gear cond.: 0  
 BDEPTH: 509 507 Validity : 0  
 Towing dir: 0° Wire out : 1100 m Speed : 2.8 kn  
 Sorted : 22 Total catch: 80.80 Catch/hour: 162.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	71.93	33761	44.26	
Chaceon maritae, female	27.31	139	16.81	592
Aristeus varidens, female	14.18	784	8.73	594
Aristeus varidens, male	8.99	1195	5.53	595
Gadella imberbis	6.28	259	3.86	
Plesiopeneus edwardsianus	5.85	1623	3.60	
Stomias boa boa	5.37	139	3.30	
Lophiodes kempi	3.26	12	2.00	
Triplophos hemingi	3.20	416	1.97	
Illex coindetii	2.29	12	1.41	
Lamprogrammus exutus	1.81	60	1.11	
Hoplostethus atlanticus	1.75	91	1.08	
Merluccius polli	1.53	2	0.94	
Chaceon maritae, male	0.99	2	0.61	593
Etmopterus polli	0.84	84	0.52	
Bathyrcongiger vicinus	0.84	36	0.52	
Selachophidium sp.	0.84	151	0.52	
Bathynectes piperitus	0.60	12	0.37	
MYCTOPHIDAE	0.54	247	0.33	
Nezumia aequalis	0.54	91	0.33	
Peristedion cataphractum	0.48	66	0.30	
Hymenocephalus italicus	0.48	36	0.30	
Melanocetus johnsoni	0.42	6	0.26	
Ariomma bondi	0.36	6	0.22	
Yarrella blackfordi	0.36	12	0.22	
Benthodesmus tenuis	0.30	6	0.19	
Munidopsis sp.	0.30	36	0.19	
Stereomastis sp.	0.30	36	0.19	
Xenodermichthys copei	0.30	18	0.19	
Chaunax pictus	0.24	12	0.15	
Total	162.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 143  
 DATE :26/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat N 10°57.11  
 start stop duration Lon E 13°24.35  
 TIME :01:26:57 02:04:57 28.0 (min) Purpose : 3  
 LOG : 7328.25 7330.29 1.6 Region : 4040  
 FDEPTH: 527 518 Gear cond.: 0  
 BDEPTH: 527 518 Validity : 0  
 Towing dir: 0° Wire out : 1200 m Speed : 2.7 kn  
 Sorted : 23 Total catch: 115.85 Catch/hour: 248.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	89.36	60814	35.99	
Chaceon maritae	53.14	225	21.41	
Aristeus varidens	31.50	1896	12.69	597
Aristeus varidens	18.64	2604	7.51	596
Stomias boa boa	15.11	439	6.09	
Plesiopeneus edwardsianus	12.00	3354	4.83	
Triplophos hemingi	6.21	504	2.50	
Hoplostethus atlanticus	3.86	43	1.55	
Gadella imberbis	3.54	204	1.42	
Stereomastis sp.	2.79	225	1.12	
Yarrella blackfordi	2.36	75	0.95	
Illex coindetii	2.04	11	0.82	
Gadella maraldi	1.93	214	0.78	
Bathyrcongiger vicinus	1.82	75	0.73	
Lamprogrammus exutus	1.29	32	0.52	
Ariomma bondi	0.96	32	0.39	
Trachipterus sp.	0.43	11	0.17	
Nezumia aequalis	0.21	11	0.09	
Diceratias pileatus	0.21	21	0.09	
Etmopterus polli	0.21	21	0.09	
MELANOCETIDAE	0.21	43	0.09	
Xenodermichthys copei	0.11	11	0.04	
Chaunax pictus	0.11	11	0.04	
Bathynectes piperitus	0.11	21	0.04	
Myctophidae sp. silver	0.11	64	0.04	
Plastic bags	0.00	4	0.00	
Total	248.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 144  
 DATE :26/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°58.09  
 start stop duration Lon E 13°27.76  
 TIME :03:27:42 03:53:44 26.1 (min) Purpose : 3  
 LOG : 7336.32 7337.72 1.4 Region : 4040  
 FDEPTH: 369 375 Gear cond.: 0  
 BDEPTH: 369 375 Validity : 0  
 Towing dir: 0° Wire out : 925 m Speed : 3.2 kn  
 Sorted : 60 Total catch: 362.71 Catch/hour: 835.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	470.56	871	56.33	598
Nematocarcinus africanus	136.26	41473	16.31	
Hymenocephalus italicus	85.68	17869	10.26	
Etmopterus polli	31.51	2336	3.77	
Chaunax pictus	28.33	2681	3.39	
Laemonema laureysi	20.87	415	2.50	
Hoplostethus cadenati	14.93	428	1.79	
Synagrops microlepis	10.36	539	1.24	
Bassanago albescens	6.50	180	0.78	
Aristeus varidens	4.84	732	0.58	600
Aristeus varidens	4.28	387	0.51	599
S H A R K S	3.06	2	0.37	
Malacocephalus occidentalis	3.04	41	0.36	
Chaceon maritae	2.63	14	0.31	
Callinectes amnicola	2.07	55	0.25	
Chlorophthalmus atlanticus	1.80	55	0.22	
Stomias boa boa	1.66	41	0.20	
Plesiopeneus edwardsianus	1.11	470	0.13	
Parapenaeus longipes	1.11	180	0.13	
MYCTOPHIDAE	0.83	1050	0.10	
Lophiodes kempi	0.69	14	0.08	
Triplophos hemingi	0.69	55	0.08	
Scyliorhinus cervigoni	0.69	14	0.08	
Gadella imberbis	0.69	41	0.08	
Ariomma bondi	0.55	28	0.07	
Halosaurus ovenii	0.41	41	0.05	
Solenocera africana	0.28	28	0.03	
Total	835.42		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 145  
DATE :26/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°57.20  
start stop duration Lon E 13°30.58  
TIME :05:34:26 06:04:38 30.2 (min) Purpose : 3  
LOG : 7346.56 7348.12 1.6 Region : 4040  
FDEPTH: 212 201 Gear cond.: 0  
BDEPTH: 212 201 Validity : 0  
Towing dir: 0° Wire out : 525 m Speed : 3.1 kn  
Sorted : 100 Total catch: 704.40 Catch/hour: 1399.47

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 148  
DATE :26/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°54.45  
start stop duration Lon E 13°47.57  
TIME :10:13:17 10:39:20 26.0 (min) Purpose : 3  
LOG : 7371.79 7373.35 1.6 Region : 4040  
FDEPTH: 33 33 Gear cond.: 0  
BDEPTH: 33 33 Validity : 0  
Towing dir: 0° Wire out : 110 m Speed : 3.6 kn  
Sorted : 73 Total catch: 309.50 Catch/hour: 713.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	362.13	10053	25.88	
Zenopsis conchifer	174.58	1218	12.47	
Pterothrissus bellocci	149.94	1033	10.71	
Bembrops heterurus	144.38	1444	10.32	
Synagrops microlepis	116.03	7484	8.29	
Merluccius polli	95.36	1192	6.81	604
Brotula barbata	75.30	87	5.38	601
Coelorinchus caelorrhincus	47.94	874	3.43	
Dentex angolensis	43.93	133	3.14	602
Dentex macrophthalmus	35.01	383	2.50	603
Illex coindetii	30.20	344	2.16	
Parapenaeus longirostris, female	29.26	4554	2.09	605
Monoleme microstoma	22.65	848	1.62	
Lophiodes kempfi	21.72	40	1.55	
Parapenaeus longirostris, male	16.69	3636	1.19	606
Pontinus kuhlii	13.65	93	0.98	
Chaceon maritae, female	6.75	26	0.48	
Calappa sp.	3.44	54	0.25	
Cynoponticus ferox	1.97	2	0.14	
Chelidonichthys gabonensis	1.85	14	0.13	
Mystriophis rostellatus	1.73	14	0.12	
Ariomma bondii	1.45	40	0.10	
Trichiurus lepturus	1.45	26	0.10	
Gephyroberyx darwini	1.29	2	0.09	
Bathyroconger vicinus	0.66	14	0.05	
Squilla mantis	0.14	14	0.01	
Total	1399.47		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pteroscion peli	177.30	3018	24.86	629
Dicologlossa cuneata	131.89	3214	18.49	
Brachydeuterus auritus	93.20	1691	13.07	626
Pseudotolithus senegalensis	51.22	270	7.18	625
Trichiurus lepturus	45.62	498	6.40	628
Ephippion guttifer	26.43	12	3.71	
Torpedo marmorata	22.81	53	3.20	
Raja miraletus	15.55	21	2.18	
Galeoides decadactylus	15.14	260	2.12	623
Sardinella aurita	13.57	62	1.90	627
Epinephelus aeneus	12.44	12	1.74	
Gymnura micrura	11.91	12	1.67	
Sardinella maderensis	11.41	104	1.60	630
Brotula barbata	9.33	157	1.31	624
Pagellus bellottii	8.39	12	1.18	
Bembrops heterurus	7.47	145	1.05	
Argyrosomus hololepidotus	7.35	21	1.03	
Rhinobatos albomaculatus	5.81	12	0.81	
Ilisha africana ***	5.69	83	0.80	
Selene dorsalis	5.60	124	0.79	631
Penaeus notialis	5.39	115	0.76	
Pomadasyus incisus	4.77	53	0.67	
Bucinosomus melanopterus	4.15	32	0.58	
Penaeus notialis	4.03	21	0.57	632
Citharus linguatula	3.20	104	0.45	
Chloroscombrus chrysurus	2.79	32	0.39	
Sepia orbignyana	2.42	12	0.34	
Pomadasyus perotaei	1.96	12	0.27	
Penaeus notialis	1.75	53	0.25	633
Scorpaena normani	1.54	83	0.22	
Stromateus fiatola	1.54	12	0.22	
Trachurus trecae	0.62	12	0.09	
Octopus vulgaris	0.62	12	0.09	
Scorpaena stephanica	0.21	12	0.03	
Total	713.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 146  
DATE :26/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 10°54.45  
start stop duration Lon E 13°35.23  
TIME :07:14:46 07:44:54 30.1 (min) Purpose : 3  
LOG : 7354.71 7356.27 1.6 Region : 4040  
FDEPTH: 113 113 Gear cond.: 0  
BDEPTH: 113 113 Validity : 0  
Towing dir: 0° Wire out : 280 m Speed : 3.1 kn  
Sorted : 62 Total catch: 1062.18 Catch/hour: 2115.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	439.58	56015	20.78	
Bembrops heterurus	437.50	751	20.68	
Trachurus trecae	429.74	0	20.32	607
Trichiurus lepturus	181.73	6239	8.59	608
Sphoeroides spengleri	126.85	52	6.00	
Pontinus kuhlii	89.83	984	4.25	
Pterothrissus bellocci	88.54	1450	4.19	
Uranoscopus albesca	87.76	595	4.15	
Brachydeuterus auritus	54.88	285	2.59	609
Citharus linguatula	35.73	777	1.69	
Dentex angolensis	26.66	155	1.26	612
Raja miraletus	26.41	26	1.25	
Stromateus fiatola	21.75	26	1.03	
Merluccius polli	13.98	362	0.66	610
Illex coindetii	11.13	259	0.53	
Zeus faber	9.84	52	0.47	
Miracorvina angolensis	8.54	26	0.40	
Scomber japonicus	5.44	52	0.26	
Sepia officinalis	4.92	26	0.23	
Sarda sarda	3.54	2	0.17	
Dentex macrophthalmus	2.33	26	0.11	
Gadella maraldi	2.07	78	0.10	
Brotula barbata	2.07	26	0.10	
Saurida brasiliensis	1.55	233	0.07	
Ubrina canariensis	0.86	4	0.04	611
Atractoscion aeguidens	0.68	4	0.03	
Parapenaeus longirostris	0.52	104	0.02	
Calappa sp.	0.52	26	0.02	
Trigla lyra	0.26	26	0.01	
Total	2115.19		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 149  
DATE :26/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°15.23  
start stop duration Lon E 13°42.29  
TIME :12:45:14 13:09:03 23.8 (min) Purpose : 3  
LOG : 7393.77 7395.27 1.5 Region : 4040  
FDEPTH: 22 23 Gear cond.: 0  
BDEPTH: 22 23 Validity : 0  
Towing dir: 0° Wire out : 110 m Speed : 3.8 kn  
Sorted : 78 Total catch: 77.98 Catch/hour: 196.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	703.19	9072	41.96	616
Pagellus bellottii	244.88	1516	14.61	615
Trichiurus lepturus	117.95	1150	7.04	
Citharus linguatula	70.50	12440	4.21	
Galeoides decadactylus	64.32	393	3.84	620
Pteroscion peli	62.91	674	3.75	618
Scorpaena normani	54.21	2442	3.23	
Dentex barnardi	52.52	842	3.13	617
Pseudotolithus senegalensis	47.06	45	2.81	613
Grammolites gruvelli	42.12	813	2.51	
Ubrina canariensis	35.38	422	2.11	614
Lagocephalus laevigatus	26.13	56	1.56	
Pseudupeneus prayensis	23.03	449	1.37	
Sardinella aurita	16.85	112	1.01	
Pomadasyus incisus	15.46	139	0.92	619
Serranus accraensis	15.16	310	0.90	
Dicologlossa cuneata	13.48	83	0.80	
Brotula barbata	13.21	139	0.79	621
Trachurus trecae	12.65	139	0.75	622
Torpedo torpedo	11.79	27	0.70	
Chelidonichthys gabonensis	10.96	139	0.65	
Selene dorsalis	6.47	83	0.39	
Gobiidae	5.91	589	0.35	
Chloroscombrus chrysurus	3.93	27	0.23	
Atractoscion aeguidens	3.37	27	0.20	
Sepia orbignyana	0.56	27	0.03	
Ephippion guttifer	0.56	56	0.03	
Penaeus notialis	0.56	27	0.03	
B I V A L V E S	0.56	27	0.03	
Squilla mantis	0.29	27	0.02	
Total	1675.97		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Balistes capricus	93.12	164	47.41	
Lagocephalus laevigatus	44.33	103	22.57	
Alectis alexandrinus	18.21	23	9.27	634
Ephippion guttifer	16.73	8	8.52	
Sepia orbignyana	8.51	5	4.33	
Octopus vulgaris	4.23	3	2.15	
Trachurus lineolatus	2.47	10	1.26	
Symphurus sp.	1.39	38	0.71	
Aluterus heudelotii	1.28	5	0.65	
Chilomycterus spinosus mauretanicus	0.91	3	0.46	
Fistularia petimba	0.86	8	0.44	
Syacium micrurum	0.78	3	0.40	
Pagellus bellottii	0.73	8	0.37	
Rypticus saponaceus	0.65	8	0.33	
Balistes punctatus	0.63	3	0.32	
Trachinocephalus myops	0.50	5	0.26	
Sardinella aurita	0.35	3	0.18	
Decapterus punctatus	0.25	3	0.13	
Selene dorsalis	0.20	3	0.10	
Bothus podas	0.20	3	0.10	
Citharus linguatula	0.08	3	0.04	
Fishing gears	0.00	3	0.00	
Total	196.42		100.00	

R/V Dr. Fridtjof Nansen				SURVEY:2014402				STATION: 150			
DATE	start	stop	duration	GEAR TYPE: BT NO: 26	POSITION: Lat	Lon	S	11°15.32	E	13°39.33	
TIME : 13:54:00	14:24:34	30.6	(min)	Purpose :	3						
LOG : 7399.44	7401.01	1.6		Region :	4040						
FDEPTH: 59	72			Gear cond.:	0						
BDEPTH: 59	72			Validity :	0						
Towing dir: 0°	Wire out : 180 m			Speed :	3.1 kn						
Sorted : 94	Total catch: 375.76			Catch/hour:	737.51						
SPECIES		CATCH/HOUR		% OF TOT. C		SAMP					
Trachurus trecae	320.16	6610	43.41	635							
Pagellus bellottii	64.22	487	8.71	642							
Umrbrina canariensis	58.88	416	7.98	641							
Brachydeuterus auritus	37.84	345	5.13	640							
Raja miraletus	32.19	71	4.36								
Lagocephalus laevisgatus	27.32	55	3.70								
Torpedo torpedo	26.46	47	3.59								
Citharus linguatula	19.55	1028	2.65								
Pomatomus saltatrix	19.16	16	2.60								
Dentex angolensis	14.21	228	1.93	638							
Sepia orbignyana	10.83	55	1.47								
Argyrosomus hololepidotus	9.74	16	1.32								
Balistes caprisicus	9.66	16	1.31								
Torpedo marmorata	8.64	8	1.17								
Pistularia petimba	8.64	24	1.17								
Alloteuthis africana	7.54	2049	1.02								
Pseudotolithus senegalensis	6.75	8	0.92								
Zeus faber	6.44	8	0.87								
Chelidonichthys capensis	6.20	47	0.84								
Dentex congoensis	5.81	94	0.79	639							
Trichiurus lepturus	5.26	16	0.71								
Dentex bairdii	4.87	19	0.66	637							
Pseudupeneus prayensis	4.40	39	0.60								
Pterothrissus belloci	4.00	94	0.54								
Dicologlossa hexophthalma	3.85	24	0.52								
Selene dorsalis	3.22	47	0.44	636							
Bembrops heterurus	3.06	55	0.42								
Serranus accraensis	1.57	31	0.21								
Epinephelus gorensis	1.33	8	0.18								
Chaetodon hoefleri	1.02	8	0.14								
Sardinella aurita	0.86	8	0.12								
Trigla lyra	0.86	47	0.12								
Scorpaena stephanica	0.63	39	0.09								
Saurida brasiliensis	0.55	196	0.07								
Boops boops	0.55	8	0.07								
Brotula barbata	0.47	8	0.06								
ANTENNARIIDAE	0.39	8	0.05								
Dicologlossa cuneata	0.39	8	0.05								
Fishing gears	0.00	4	0.00								
Total	737.51		100.00								

R/V Dr. Fridtjof Nansen				SURVEY:2014402				STATION: 151			
DATE	start	stop	duration	GEAR TYPE: BT NO: 26	POSITION: Lat	Lon	S	11°12.05	E	13°35.80	
TIME : 15:48:06	16:18:45	30.6	(min)	Purpose :	3						
LOG : 7409.02	7410.72	1.7		Region :	4040						
FDEPTH: 154	155			Gear cond.:	0						
BDEPTH: 154	155			Validity :	0						
Towing dir: 0°	Wire out : 420 m			Speed :	3.3 kn						
Sorted : 58	Total catch: 162.59			Catch/hour:	318.28						
SPECIES		CATCH/HOUR		% OF TOT. C		SAMP					
Brotula barbata	91.75	115	28.83	643							
Pterothrissus belloci	69.73	438	21.91								
Bembrops heterurus	35.63	454	11.19								
Dentex angolensis	35.30	143	11.09	645							
Pontinus accraensis	13.82	159	4.34								
Synagrops microlepis	13.37	828	4.20	646							
Merluccius polli	11.78	307	3.70	644							
Raja miraletus	11.67	22	3.67								
Scomber japonicus	10.41	104	3.27	647							
Cynoponticus ferox	7.67	6	2.41								
Gadella maraldi	3.29	70	1.03								
Citharus linguatula	2.62	43	0.82								
Sepia orbignyana	2.35	22	0.74								
GOBIIDAE	2.04	258	0.64								
Trichiurus lepturus	1.70	39	0.54								
Syacium micrurum	1.21	82	0.38								
Squilla mantis	0.70	22	0.22								
Illex coindetii	0.67	14	0.21								
Dentex macropthalmus	0.49	6	0.15	648							
MYCTOPHIDAE	0.43	76	0.14								
Parapeneus longirostris	0.39	76	0.12	649							
Conger conger	0.39	6	0.12								
Zenopsis conchifer	0.31	39	0.10								
B I V A L V E S	0.27	131	0.09								
Parapeneus longirostris	0.22	98	0.07	650							
Chlorophthalmus atlanticus	0.06	14	0.02								
Metal waste	0.00	2	0.00								
Total	318.28		100.00								

R/V Dr. Fridtjof Nansen				SURVEY:2014402				STATION: 152			
DATE	start	stop	duration	GEAR TYPE: BT NO: 26	POSITION: Lat	Lon	S	11°13.19	E	13°32.87	
TIME : 17:04:37	17:34:20	29.7	(min)	Purpose :	3						
LOG : 7415.18	7416.74	1.6		Region :	4040						
FDEPTH: 250	247			Gear cond.:	0						
BDEPTH: 250	247			Validity :	0						
Towing dir: 0°	Wire out : 600 m			Speed :	3.2 kn						
Sorted : 60	Total catch: 1694.12			Catch/hour:	3420.16						
SPECIES		CATCH/HOUR		% OF TOT. C		SAMP					
Merluccius polli	1288.83	12493	37.68	651							
Chlorophthalmus atlanticus	879.57	14810	25.72								
Bembrops heterurus	358.38	3525	10.48								
Pterothrissus belloci	211.41	1300	6.18								
Brotula barbata	189.93	113	5.55	652							
Pontinus accraensis	121.53	1300	3.55								
Parapeneus longirostris	62.18	11419	1.82	653							
Coelorinchus caelorhincus	58.79	1074	1.72								
Synagrops microlepis	57.66	3448	1.69								
Parapeneus longirostris	48.61	13454	1.42	654							
Zenopsis conchifer	33.35	57	0.98								
Illex coindetii	26.57	283	0.78								
Laemonema laureysi	22.05	226	0.64								
Syacium micrurum	19.22	1017	0.56								
Malacocephalus occidentalis	11.87	113	0.35								
Cynoponticus ferox	10.42	4	0.30								
Bathyracoconger vicinus	6.22	57	0.18								
OPHIDIIDAE	5.09	226	0.15								
Epigonus telescopus	4.52	57	0.13								
G A S T R O P O D S	3.96	622	0.12								
Total	3420.16		100.00								

R/V Dr. Fridtjof Nansen				SURVEY:2014402				STATION: 153			
DATE	start	stop	duration	GEAR TYPE: BT NO: 26	POSITION: Lat	Lon	S	11°10.23	E	13°29.54	
TIME : 19:28:40	19:58:47	30.1	(min)	Purpose :	3						
LOG : 7424.13	7425.55	1.4		Region :	4040						
FDEPTH: 419	418			Gear cond.:	0						
BDEPTH: 419	418			Validity :	0						
Towing dir: 0°	Wire out : 850 m			Speed :	2.8 kn						
Sorted : 33	Total catch: 494.20			Catch/hour:	984.14						
SPECIES		CATCH/HOUR		% OF TOT. C		SAMP					
Nematocarcinus africanus	365.02	109505	37.09								
Lamprogrammus exutus	272.82	8423	27.72								
Chaceon maritae	159.31	568	16.19	655							
Laemonema laureysi	37.94	657	3.85								
Chaceon maritae	35.55	90	3.61	656							
Chaunax pictus	28.38	986	2.88								
Hoplostethus cadenati	26.88	627	2.73								
Halosaurus ovenii	18.82	1762	1.91								
Aristeus varidens	13.44	807	1.37	657							
Stomias boa boa	5.38	90	0.55								
Gadella imberbis	5.38	299	0.55								
Hymenocephalus italicus	3.88	358	0.39								
Yarella blackfordi	3.29	119	0.33								
Aristeus varidens	2.99	478	0.30	658							
Dibranchius atlanticus	2.09	986	0.21								
Conger conger	1.79	30	0.18								
Plesiopeaneus edwardsianus	0.60	657	0.06								
Etmopterus polli	0.60	30	0.06								
Total	984.14		100.00								

R/V Dr. Fridtjof Nansen				SURVEY:2014402				STATION: 154			
DATE	start	stop	duration	GEAR TYPE: BT NO: 26	POSITION: Lat	Lon	S	11°13.55	E	13°27.81	
TIME : 21:16:45	21:46:47	30.0	(min)	Purpose :	3						
LOG : 7429.52	7430.93	1.4		Region :	4040						
FDEPTH: 527	533			Gear cond.:	0						
BDEPTH: 527	533			Validity :	0						
Towing dir: 0°	Wire out : 1050 m			Speed :	2.8 kn						
Sorted : 23	Total catch: 140.72			Catch/hour:	281.07						
SPECIES		CATCH/HOUR		% OF TOT. C		SAMP					
Nematocarcinus africanus	173.57	55376	61.75								
Chaceon maritae	25.01	98	8.90	660							
Lamprogrammus exutus	12.30	439	4.38								
Aristeus varidens, female	10.55	647	3.75								
Gadella imberbis	9.55	362	3.40								
Stomias boa boa	8.57	274	3.05								
Trichiurus hemingi	7.79	911	2.77								
Aristeus varidens, male	6.47	759	2.30								
Hoplostethus cadenati	5.71	198	2.03								
Etmopterus polli	4.17	76	1.49								
Yarella blackfordi	4.17	164	1.49								
Glyphus marsupialis	2.96	1109	1.05								
Merluccius polli	2.26										

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 156  
DATE :27/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°30.25  
start stop duration Lon E 13°21.67  
TIME :02:01:31 02:29:32 28.0 (min) Purpose : 3  
LOG : 7452.26 7453.77 1.5 Region : 4040  
FDEPTH: 377 387 Gear cond.: 0  
BDEPTH: 377 387 Validity : 0  
Towing dir: 0° Wire out : 900 m Speed : 3.2 kn  
Sorted : 29 Total catch: 400.06 Catch/hour: 856.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	453.88	12891	52.98	
Hoplostethus cadenati	80.04	2638	9.34	
Lamprogrammus exultans	59.06	908	6.89	
Gadella maraldi	47.37	660	5.53	
Stomias boa boa	47.37	1139	5.53	
Plesiopeneus edwardsianus	42.74	19884	4.99	
Chaunax pictus	26.98	1469	3.15	
Hymenocephalus italicus	17.09	1679	1.99	
Malacocephalus laevis	14.99	30	1.75	
Yarrella blackfordi	11.39	240	1.33	
Triplophos hemingi	8.09	2938	0.94	
Aristeus varidens	7.49	749	0.87	665
Gadella imberbis	7.19	270	0.84	
Chaceon maritae	6.00	51	0.70	
Etmopterus polli, male	5.40	270	0.63	
Synagrops microlepis	5.10	570	0.59	
Merluccius polli	4.20	30	0.49	
Aristeus varidens	3.30	450	0.38	666
Myctophidae sp. silver	2.40	1310	0.28	
Halosaurus ovenii	2.40	120	0.28	
Chlorophthalmus atlanticus	2.10	60	0.24	
NEMICHTHYIDAE	1.20	270	0.14	
Peristedion cataphractum	0.30	90	0.03	
Xenodermichthys copei	0.30	90	0.03	
Trichiurus lepturus	0.30	30	0.03	
Total	856.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 159  
DATE :27/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°32.87  
start stop duration Lon E 13°35.22  
TIME :08:39:58 09:09:30 29.5 (min) Purpose : 3  
LOG : 7478.81 7480.43 1.6 Region : 4040  
FDEPTH: 63 62 Gear cond.: 0  
BDEPTH: 63 62 Validity : 0  
Towing dir: 0° Wire out : 180 m Speed : 3.3 kn  
Sorted : 116 Total catch: 352.64 Catch/hour: 716.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy incisus	492.71	3528	68.79	678
Lagocephalus laevigatus	49.84	61	6.96	
Boops boops	34.00	658	4.75	
Pseudopeneus prayensis	26.38	292	3.68	
Dentex barnardi	22.55	238	3.15	679
Raja miraletus	15.36	24	2.14	
Trachurus trecae	12.49	195	1.74	680
Umrina canariensis	8.17	24	1.14	681
Pagellus bellottii	7.68	97	1.07	683
Grammolites gruvelli	7.31	116	1.02	
Selene dorsalis	5.91	24	0.83	682
Citharus linguatula	5.42	195	0.76	
Sepia orbignyana	4.98	4	0.69	
Octopus vulgaris	4.81	6	0.67	
Alloteuthis africana	4.02	1072	0.56	
Epinephelus aeneus	3.17	2	0.44	
Chelidonichthys gabonensis	1.83	24	0.26	
Illex coindetii	1.83	37	0.26	
Chilomycterus spinosus mauretanicus	1.34	6	0.19	
Fistularia petimba	1.28	6	0.18	
Chaetodon hoefleri	1.22	6	0.17	
Serranus accraensis	1.16	24	0.16	
Scomber japonicus	0.97	6	0.14	
G A S T R O P O D S	0.55	67	0.08	
Pontinus accraensis	0.43	6	0.06	
B I V A L V E S	0.30	30	0.04	
Calappa rubroguttata	0.24	18	0.03	
Starfish	0.18	12	0.03	
Saurida brasiliensis	0.12	30	0.02	
Total	716.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 157  
DATE :27/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°30.83  
start stop duration Lon E 13°23.13  
TIME :05:30:38 05:46:20 15.7 (min) Purpose : 3  
LOG : 7462.86 7463.69 0.8 Region : 4040  
FDEPTH: 269 268 Gear cond.: 0  
BDEPTH: 269 268 Validity : 0  
Towing dir: 0° Wire out : 700 m Speed : 3.2 kn  
Sorted : 81 Total catch: 460.10 Catch/hour: 1758.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1011.86	64525	57.55	
Brotula barbata	184.89	107	10.52	668
Merluccius polli	166.09	1754	9.45	669
Parapeneus longirostris	117.06	30604	6.66	671
Parapeneus longirostris	76.39	11259	4.34	670
Pterothrissus belloci	30.19	149	1.72	
Laemonema laureysi	23.96	214	1.36	
Bembrops caudimacula	15.40	149	0.88	
Acanthocarpus brevipinnis	14.56	214	0.83	
Zeus faber	8.56	65	0.49	
Chlorophthalmus atlanticus	5.77	237	0.33	
Chaceon maritae	5.58	27	0.32	
Coelorinchus caelorhincus	5.35	42	0.30	
Epigonus telescopus	4.05	42	0.23	
Malacocephalus occidentalis	2.98	65	0.17	
PARALEPIDIDAE	2.56	130	0.15	
Syacium micrurum	1.30	42	0.07	
Illex coindetii	0.42	27	0.02	
G A S T R O P O D S	0.23	84	0.01	0
Hoplostethus cadenati	0.23	27	0.01	
MYCTOPHIDAE	0.23	42	0.01	
Total	1677.67		95.41	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 160  
DATE :27/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°30.94  
start stop duration Lon E 13°42.91  
TIME :10:20:03 10:49:23 29.4 (min) Purpose : 3  
LOG : 7489.76 7491.60 1.8 Region : 4040  
FDEPTH: 28 30 Gear cond.: 0  
BDEPTH: 28 30 Validity : 0  
Towing dir: 0° Wire out : 110 m Speed : 3.8 kn  
Sorted : 64 Total catch: 217.45 Catch/hour: 444.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pteroscion peli	109.66	5550	24.67	684
Brachydeuterus auritus	55.07	1282	12.39	685
Ilisha africana	50.90	650	11.45	688
Trichiurus lepturus	44.28	251	9.96	686
Pomadasy incisus	34.16	331	7.68	689
Gymnura micrura	32.63	4	7.34	
Pseudotolithus senegalensis	30.05	221	6.76	687
Raja miraletus	16.87	25	3.79	
Sepia officinalis	9.81	31	2.21	
Dicologlossa cuneata	8.65	251	1.95	
Ephippion guttifer	8.59	6	1.93	
Cynoglossus senegalensis	6.38	6	1.43	
Rhinobatos albomaculatus	6.17	6	1.39	
Umrina canariensis	5.89	117	1.32	690
Cymbium marmoratum	3.19	31	0.72	
Bembrops heterurus	2.94	86	0.66	
Penaeus notialis	2.51	331	0.57	
Torpedo marmorata	2.27	12	0.51	
Galeoides decadactylus	2.09	25	0.47	
Argyrosomus hololepidotus	2.09	43	0.47	692
Stromateus fiatola	1.33	2	0.30	
Sardinella maderensis	1.29	6	0.29	
Trachurus trecae	1.17	25	0.26	
Squilla mantis	1.17	37	0.26	
Chloroscombrus chrysurus	1.17	12	0.26	
Selene dorsalis	0.86	92	0.19	691
Trigla lyra	0.74	6	0.17	
Boops boops	0.55	6	0.12	
Alloteuthis africana	0.49	282	0.11	
Dentex barnardi	0.43	6	0.10	
CYPRAEIDAE (Bulia)	0.31	6	0.07	
Citharus linguatula	0.31	6	0.07	
Starfish	0.25	6	0.06	
Penaeus kerathurus	0.18	6	0.04	
Scorpaena stephanica	0.12	6	0.03	
Total	444.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 158  
DATE :27/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°31.54  
start stop duration Lon E 13°29.49  
TIME :07:10:32 07:40:46 30.2 (min) Purpose : 3  
LOG : 7470.59 7472.23 1.6 Region : 4040  
FDEPTH: 105 106 Gear cond.: 0  
BDEPTH: 105 106 Validity : 0  
Towing dir: 0° Wire out : 270 m Speed : 3.3 kn  
Sorted : 58 Total catch: 157.92 Catch/hour: 313.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	84.85	675	27.07	
Trichiurus lepturus	53.09	119	16.94	677
Sphoeroides pachgaster	42.43	99	13.54	
Dentex angolensis	37.51	258	11.97	672
Citharus linguatula	23.38	443	7.46	
Brotula barbata	17.62	16	5.62	675
Pterothrissus belloci	14.09	119	4.50	
Sepia officinalis	12.50	14	3.99	
Octopus vulgaris	6.47	6	2.06	
Illex coindetii	4.92	145	1.57	
Scomber japonicus	2.74	26	0.87	676
Branchiostegus semifasciatus	2.30	2	0.73	
Lagocephalus laevigatus	2.04	2	0.65	
Saurida brasiliensis	1.98	347	0.63	
Pontinus accraensis	1.79	16	0.57	
Chelidonichthys gabonensis	1.39	10	0.44	
Prilaeanthus arenatus	1.13	2	0.36	
Dentex barnardi	1.09	6	0.35	673
Alloteuthis africana	0.89	264	0.28	
Dentex macrophthalmus	0.60	6	0.19	674
Zeus faber	0.60	6	0.19	
Total	313.44		100.00	

R/V Dr. Fridtjof Nansen		SURVEY:2014402		STATION: 161	
DATE	:27/03/14	GEAR TYPE: BT NO:	26	POSITION:Lat	S 11°41.56
	start	stop	duration	Lon	E 13°46.13
TIME	:12:03:22	12:26:11	22.8 (min)	Purpose	: 3
LOG	: 7500.94	7502.38	1.4	Region	: 4040
FDEPTH:	25	23		Gear cond.:	0
BDEPTH:	25	23		Validity	: 0
Towing dir:	0°	Wire out	: 110 m	Speed	: 3.8 kn
Sorted	: 83	Total catch:	358.19	Catch/hour:	941.78
SPECIES		CATCH/HOUR		% OF TOT. C	SAMP
		weight	numbers		
Trichiurus lepturus		213.68	1007	22.69	
Pomadasy jubelini		97.23	103	10.32	694
Ilisha africana ***		79.80	1312	8.47	
Lagocephalus laevigatus		71.78	250	7.62	
Gymnura micrura		50.88	24	5.40	
Brachydeuterus auritus		45.88	1131	4.87	
Rhinobatos albomaculatus		43.17	24	4.58	
Torpedo marmorata		40.46	58	4.30	
Galeoides decadactylus		36.18	363	3.84	696
Dasyatis margarita		36.05	34	3.83	
Pomadasy incisus		28.37	260	3.01	
Sphyræna guachancho		25.53	124	2.71	697
Ephippion guttifer		20.67	11	2.19	
Drepane africana		20.35	24	2.16	
Chloroscombrus chrysurus		17.17	168	1.82	693
Pseudotolithus senegalensis		16.72	147	1.78	
Pentanemus quinquarius		10.28	11	1.09	
Dicologlossa cuneata		9.26	181	0.98	
Argyrosomus hololepidotus		9.26	103	0.98	
Epinephelus aeneus		8.91	11	0.95	
Panulirus regius		7.57	24	0.80	
Selene dorsalis		6.99	103	0.74	
Trachurus trecae		6.31	124	0.67	695
Arius parkii		6.10	11	0.65	
Pteroscion peli		5.31	260	0.56	
Eucinostomus melanopterus		5.31	45	0.56	
Raja miraletus		4.18	11	0.44	
Caranx rhonchus		3.94	32	0.42	
Penaeus notialis		3.16	45	0.34	
Pomadasy perotaei		2.92	34	0.31	
Centrarchops chapini		2.37	11	0.25	
Sardinella maderensis		1.45	58	0.15	698
Rypticus saponaceus		1.34	11	0.14	
Cynoglossus senegalensis		1.00	11	0.11	
Bembrops heterurus		0.89	24	0.09	
Pseudupeneus prayensis		0.66	11	0.07	
Alloteuthis africana		0.45	329	0.05	
Scorpaena stephanica		0.21	11	0.02	
Total		941.78		100.00	

R/V Dr. Fridtjof Nansen		SURVEY:2014402		STATION: 162	
DATE	:27/03/14	GEAR TYPE: BT NO:	26	POSITION:Lat	S 11°46.35
	start	stop	duration	Lon	E 13°41.20
TIME	:13:28:00	13:57:38	29.6 (min)	Purpose	: 3
LOG	: 7509.11	7510.69	1.6	Region	: 4040
FDEPTH:	62	67		Gear cond.:	0
BDEPTH:	62	67		Validity	: 0
Towing dir:	0°	Wire out	: 180 m	Speed	: 3.2 kn
Sorted	: 102	Total catch:	572.63	Catch/hour:	1159.95
SPECIES		CATCH/HOUR		% OF TOT. C	SAMP
		weight	numbers		
Pomadasy incisus		208.72	1781	17.99	709
Trichiurus lepturus		152.69	1566	13.16	699
Brachydeuterus auritus		128.18	533	11.05	700
Pseudupeneus prayensis		120.69	1679	10.40	701
Lagocephalus laevigatus		99.38	182	8.57	
Raja miraletus		75.88	91	6.54	
Atractoscion aequidens		63.97	45	5.51	706
Lithognathus mormyrus		63.40	113	5.47	703
Dentex barnardi		32.78	555	2.83	704
Pagellus bellottii		32.78	306	2.83	702
Ubrina canariensis		25.18	215	2.17	707
Trachurus trecae		24.61	136	2.12	705
Sepia orbignyana		23.13	12	1.99	
Citharus linguatula		20.54	907	1.77	
Bembrops heterurus		19.73	352	1.70	
Selene dorsalis		13.05	69	1.12	708
Galeoides decadactylus		9.64	34	0.83	
Pseudotolithus senegalensis		8.95	12	0.77	
Chloroscombrus chrysurus		8.39	57	0.72	
Serranus accraensis		8.28	148	0.71	
Alloteuthis africana		6.36	352	0.55	
Pomadasy perotaei		5.67	12	0.49	
Chelidonichthys gabonensis		2.49	12	0.21	
Chilomycterus spinosus mauretanicus		2.27	12	0.20	
Torpedo torpedo		1.26	12	0.11	
Boops boops		0.57	22	0.05	
Saurida brasiliensis		0.45	126	0.04	
Dentex angolensis		0.22	22	0.02	
Cymbium marmoratum		0.22	12	0.02	
Calappa rubroguttata		0.22	12	0.02	
Monolele microstoma		0.12	12	0.01	
Paramola cuvieri		0.12	12	0.01	
Total		1159.95		100.00	

R/V Dr. Fridtjof Nansen		SURVEY:2014402		STATION: 163	
DATE	:27/03/14	GEAR TYPE: BT NO:	26	POSITION:Lat	S 11°45.78
	start	stop	duration	Lon	E 13°28.84
TIME	:15:35:48	16:05:58	30.2 (min)	Purpose	: 3
LOG	: 7523.56	7525.15	1.6	Region	: 4040
FDEPTH:	167	167		Gear cond.:	0
BDEPTH:	167	167		Validity	: 0
Towing dir:	0°	Wire out	: 400 m	Speed	: 3.2 kn
Sorted	: 58	Total catch:	1336.99	Catch/hour:	2658.91
SPECIES		CATCH/HOUR		% OF TOT. C	SAMP
		weight	numbers		
Synagrops microlepis		2125.12	370455	79.92	710
Brotula barbata		174.27	91	6.55	
Trachurus trecae		114.35	137	4.30	
Pterothrissus belloci		64.49	366	2.43	
Dentex angolensis		41.62	91	1.57	712
Bembrops caudimacula		26.07	274	0.98	
Trichiurus lepturus		23.79	91	0.89	
Sphoeroides lobatus		22.87	91	0.86	
Parapenaeus longirostris		20.13	686	0.76	
Dentex macrophthalmus		13.72	91	0.52	711
Merluccius polli		9.15	91	0.34	
Trigla lyra		6.40	46	0.24	
Chlorophthalmus atlanticus		6.40	149	0.24	
Zenopsis conchifer		5.03	137	0.19	
Illex coindetii		4.12	91	0.15	
Syacium micrurum		1.37	91	0.05	
Total		2658.91		100.00	

R/V Dr. Fridtjof Nansen		SURVEY:2014402		STATION: 164	
DATE	:27/03/14	GEAR TYPE: BT NO:	26	POSITION:Lat	S 11°43.53
	start	stop	duration	Lon	E 13°24.99
TIME	:16:53:06	17:23:31	30.4 (min)	Purpose	: 3
LOG	: 7530.13	7531.81	1.7	Region	: 4040
FDEPTH:	257	256		Gear cond.:	0
BDEPTH:	257	256		Validity	: 0
Towing dir:	0°	Wire out	: 650 m	Speed	: 3.3 kn
Sorted	: 60	Total catch:	1703.28	Catch/hour:	3359.53
SPECIES		CATCH/HOUR		% OF TOT. C	SAMP
		weight	numbers		
Chlorophthalmus atlanticus		2302.96	49018	68.55	
Merluccius polli		486.79	5509	14.49	713
Synagrops microlepis		202.96	14673	6.04	714
Zenopsis conchifer		114.40	112	3.41	
Pterothrissus belloci		78.15	450	2.33	
Bembrops heterurus		41.03	450	1.22	
Raja sp.		38.22	57	1.14	
Brotula barbata		35.42	57	1.05	715
Pontinus accraensis		27.55	170	0.82	
Parapenaeus longirostris		12.94	1799	0.39	716
Parapenaeus longirostris		8.44	1237	0.25	717
Laemonema laureysi		7.30	112	0.22	
Calappa sp.		3.37	282	0.10	
Total		3359.53		100.00	

R/V Dr. Fridtjof Nansen		SURVEY:2014402		STATION: 165	
DATE	:27/03/14	GEAR TYPE: BT NO:	25	POSITION:Lat	S 11°45.50
	start	stop	duration	Lon	E 13°21.20
TIME	:19:10:54	19:41:07	30.2 (min)	Purpose	: 3
LOG	: 7539.23	7540.74	1.5	Region	: 4040
FDEPTH:	445	439		Gear cond.:	0
BDEPTH:	445	439		Validity	: 0
Towing dir:	0°	Wire out	: 1000 m	Speed	: 3.0 kn
Sorted	: 29	Total catch:	414.95	Catch/hour:	823.86
SPECIES		CATCH/HOUR		% OF TOT. C	SAMP
		weight	numbers		
Nematocarcinus africanus		331.77	84044	40.27	
Laemonema laureysi		115.55	1995	14.03	
Yarellia blackfordi		112.28	3276	13.63	
Hoplostethus cademati		55.69	1846	6.76	
Dibranchius atlanticus		32.16	2085	3.90	
Todaropsis eblanae		23.53	149	2.86	
Aristeus varidens		21.44	1310	2.60	719
Chaceon maritae		20.55	89	2.49	
Lamprogrammus exutus		15.19	60	1.84	
Hymenoccephalus italicus		12.21	1191	1.48	
Stomias affinis		9.23	149	1.12	
Benthodesmus tenuis		8.93	328	1.08	
Halosaurus ovenii		8.64	536	1.05	
Deania profundorum		8.34	149	1.01	
Lophiodes caularis		7.45	60	0.90	
Etmopterus polli		7.15	119	0.87	
Zameus (Scymnodon) squamulosus		7.15	30	0.87	
Aristeus varidens		6.25	8047	0.76	720
Gadella imberbis		2.98	149	0.36	
Neoharriotta pinnata		2.52	2	0.31	
Chaceon pictus		2.38	89	0.29	
Galeus polli		2.38	30	0.29	
Chlorophthalmus atlanticus		2.08	60	0.25	
Malacocephalus occidentalis		2.08	30	0.25	
Glyphus marsupialis		1.79	715	0.22	
Coelorinchus caelorhincus		1.79	60	0.22	
Merluccius polli		1.75	2	0.21	718
MYCTOPHIDAE		0.60	179	0.07	
Total		823.86		100.00	

R/V Dr. Fridtjof Nansen		SURVEY:2014402		STATION: 166	
DATE	:27/03/14	GEAR TYPE: BT NO:	25	POSITION:Lat	S 11°42.09
	start	stop	duration	Lon	E 13°17.63
TIME	:21:17:39	21:47:46	30.1 (min)	Purpose	: 3
LOG	: 7548.06	7549.52	1.5	Region	: 4040
FDEPTH:	696	694		Gear cond.:	0
BDEPTH:	696	694		Validity	: 0
Towing dir:	0°	Wire out	: 1400 m	Speed	: 2.9 kn
Sorted	: 29	Total catch:	382.46	Catch/hour:	762.13
SPECIES		CATCH/HOUR		% OF TOT. C	SAMP
		weight	numbers		
Lamprogrammus exutus		135.48	1891	17.78	
Yarellia blackfordi		117.61	3160	15.43	
Chaceon maritae		113.98	466	14.96	721
Nematocarcinus africanus		101.29	36889	13.29	
Hoplostethus cademati		45.07	1425	5.91	
Tripliphos hemingi		39.63	9404	5.20	
ALPPOCPHALIDAE		34.19			

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 167  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°55.62  
 start stop duration Lon E 13°21.01  
 TIME :00:13:55 00:44:20 30.4 (min) Purpose : 3  
 LOG : 7562.68 7564.17 1.5 Region : 4040  
 FDEPTH: 602 603 Gear cond.: 0  
 BDEPTH: 602 603 Validity : 0  
 Towing dir: 0° Wire out : 1350 m Speed : 2.9 kn  
 Sorted : 20 Total catch: 161.14 Catch/hour: 317.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chaceon maritae	71.48	284	22.49	
Yarrrella blackfordi	49.07	1546	15.44	
Triplophos hemingi	41.50	4481	13.06	
Nematocarcinus africanus	40.39	13381	12.71	
Aristeus varidens	26.35	1909	8.29	
Hoplostethus cadenati	16.09	237	5.06	
Benthodesmus tenuis	11.05	158	3.48	
Plesiopenaeus edwardsianus	8.52	2430	2.68	
Todaropsis eblanae	8.36	47	2.63	
Stereomastis sp.	6.31	1026	1.99	
Gadella imberbis	6.00	331	1.89	
Bathurocoenger vicinus	5.05	237	1.59	
Talismania sp.	4.42	379	1.39	
Nezumia aequalis	3.79	47	1.19	
Lamprogrammus exutus	3.47	47	1.09	
Halosaurus ovenii	3.16	79	0.99	
Xenodermichthys copei	2.84	221	0.89	
Himantolophus groenlandicus	2.21	79	0.70	
Etmopterus polli	2.05	32	0.65	
NEMICHTHYIDAE	1.58	79	0.50	
Zameus (Szymmodon) squamulosus	1.42	473	0.45	
Bathynectes piperitus	1.10	221	0.35	
Dibranchius atlanticus	0.95	47	0.30	
Gadella maraldi	0.36	47	0.11	
Mycetophidae sp. silver	0.16	32	0.05	
Notacanthus sexspinis	0.16	16	0.05	
Total		317.83	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 168  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°55.93  
 start stop duration Lon E 13°27.43  
 TIME :02:37:48 03:08:24 30.6 (min) Purpose : 3  
 LOG : 7574.77 7576.36 1.6 Region : 4040  
 FDEPTH: 334 332 Gear cond.: 0  
 BDEPTH: 334 332 Validity : 0  
 Towing dir: 0° Wire out : 900 m Speed : 3.1 kn  
 Sorted : 25 Total catch: 253.62 Catch/hour: 497.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	130.55	4116	26.26	
Gadella maraldi	127.02	1470	25.55	
Nematocarcinus africanus	60.76	33754	12.22	
Bathurocoenger vicinus	26.27	568	5.28	
Hymenocephalus italicus	25.29	6135	5.09	
Etmopterus polli	15.09	392	3.04	
Chaceon maritae	14.90	59	3.00	730
Chlorophthalmus atlanticus	14.90	392	3.00	
Aristeus varidens	13.33	980	2.68	732
CHIROSTYLIDAE	11.96	2313	2.41	
Chaunax pictus	6.47	490	1.30	
Stomias boa boa	5.29	157	1.06	
Aristeus varidens	4.90	529	0.99	731
Synagrops microlepis	4.51	314	0.91	
Merluccius polli	4.35	20	0.88	724
Dibranchius atlanticus	3.92	255	0.79	
Zenopsis conchifer	3.72	20	0.75	
Nezumia aequalis	3.33	176	0.67	
Lophius vaillanti	3.33	98	0.67	
Pterothrissus belloci	3.33	20	0.67	
Triplophos hemingi	3.14	235	0.63	
Mycetophidae sp. silver	2.74	2509	0.55	
Parapenaeus longirostris	1.57	157	0.32	733
Halosaurus ovenii	1.37	59	0.28	
Malacocephalus occidentalis	0.98	20	0.20	
Symphurus sp.	0.98	59	0.20	
NETTASTOMATIDAE	0.78	98	0.16	
Cubiceps pauciradiatus	0.78	20	0.16	
Bathynectes piperitus	0.59	59	0.12	
Stereomastis sp.	0.59	59	0.12	
Benthodesmus tenuis	0.39	20	0.08	
Total		497.13	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 169  
 DATE :28/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°57.75  
 start stop duration Lon E 13°30.03  
 TIME :05:14:09 05:39:39 25.5 (min) Purpose : 3  
 LOG : 7584.43 7585.77 1.4 Region : 4040  
 FDEPTH: 255 258 Gear cond.: 0  
 BDEPTH: 255 258 Validity : 0  
 Towing dir: 0° Wire out : 660 m Speed : 3.2 kn  
 Sorted : 56 Total catch: 913.95 Catch/hour: 2150.47

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zenopsis conchifer	519.53	2146	24.16	
Chlorophthalmus atlanticus	508.24	9751	23.63	
Merluccius polli	428.42	3162	19.92	734
Synagrops microlepis	415.62	19991	19.33	738
Brotula barbata	53.65	75	2.49	741
Gephyroberyx darwini	41.13	38	1.91	736
Chaceon maritae	33.51	113	1.56	
Parapenaeus longirostris	29.36	4706	1.37	740
Malacocephalus laevis	24.85	188	1.16	
Pterothrissus belloci	19.58	113	0.91	
Bembrops caudimacula	19.20	452	0.89	
Pontinus accraensis	16.19	188	0.75	
Parapenaeus longirostris	11.29	1769	0.53	739
Coelorrhinus caelorrhinus	10.16	301	0.47	
Raja clavata	5.51	2	0.26	
Laemonema laureysi	4.52	113	0.21	
Todaropsis eblanae	4.14	38	0.19	
Dentex macrophthalmus	1.98	5	0.09	735
Trachurus trecae	1.72	2	0.08	737
Acanthoparus brevipinnis	0.75	38	0.04	
G A S T R O P O D S	0.38	75	0.02	
Syacium micrurum	0.38	38	0.02	
MYCTOPHIDAE	0.38	188	0.02	
Fishing gears	0.00	2	0.00	
Total		2150.47	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 170  
 DATE :28/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 11°58.55  
 start stop duration Lon E 13°32.01  
 TIME :06:33:56 07:05:34 31.6 (min) Purpose : 3  
 LOG : 7590.20 7591.83 1.6 Region : 4040  
 FDEPTH: 103 101 Gear cond.: 0  
 BDEPTH: 103 101 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 3.1 kn  
 Sorted : 0 Total catch: 150.52 Catch/hour: 285.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Anthias anthias	73.05	599	25.59	
Dentex barnardi	39.29	155	13.77	744
Dentex macrophthalmus	38.08	298	13.34	743
Umbriina canariensis	33.91	133	11.88	742
Dentex angolensis	29.54	154	10.35	745
Zeus faber	25.79	44	9.04	
Sphaeroides pachgaster	12.55	27	4.40	
Pagellus bellottii	10.41	57	3.65	746
Raja clavata	5.16	2	1.81	
Octopus vulgaris	2.39	4	0.84	
Boops boops	2.31	23	0.81	
Sepia orbignyana	2.29	11	0.80	
Trigla lyra	1.65	15	0.58	
Chaetodon hoeferli	1.59	9	0.56	
Raja miraletus	1.54	2	0.54	
Dentex gibbosus	1.37	2	0.48	
Chelidonichthys gabonensis	1.02	9	0.36	
Erythrocles monodi	0.91	2	0.32	
Trigloporus lastoviza	0.47	2	0.17	
Sepia officinalis	0.44	2	0.15	
E F V A L V E S	0.40	32	0.14	
Loligo vulgaris	0.34	8	0.12	
Progathodes marcellae	0.28	4	0.10	
Sardinella aurita	0.23	4	0.08	
Scomber japonicus	0.17	2	0.06	
Pontinus accraensis	0.13	4	0.05	
G A S T R O P O D S	0.11	13	0.04	
Total		285.44	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 171  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°59.84  
 start stop duration Lon E 13°37.09  
 TIME :09:26:47 09:47:04 20.3 (min) Purpose : 3  
 LOG : 7601.10 7602.15 1.1 Region : 4040  
 FDEPTH: 72 72 Gear cond.: 0  
 BDEPTH: 72 72 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.1 kn  
 Sorted : 53 Total catch: 116.96 Catch/hour: 346.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	114.56	929	33.11	751
Lagocephalus laevis	76.45	195	22.09	
Pseudupeneus prayensis	59.76	757	17.27	
Trachurus trecae	18.22	219	5.27	750
Rhinobatos albomaculatus	17.28	6	4.99	
Raja miraletus	11.95	30	3.45	
Pagellus bellottii	11.42	302	3.30	749
Octopus vulgaris	7.34	6	2.12	
Zeus faber	6.27	12	1.81	
Chelidonichthys gabonensis	5.38	65	1.56	
Citharus linguatula	4.67	225	1.35	
Dentex barnardi	2.43	24	0.70	747
Chilomycterus spinosus mauretanicus	1.60	6	0.46	
Alloteuthis africana	1.60	627	0.46	
Grammolites gruvelli	1.54	24	0.44	
Saurida brasiliensis	1.30	266	0.38	
Sepia orbignyana	1.18	6	0.34	
Arnoglossus imperialis	1.01	65	0.29	
Chaetodon hoeferli	1.01	6	0.29	
Dentex angolensis	0.59	24	0.17	748
Chelidonichthys lastoviza ***	0.47	6	0.14	
Total		346.04	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 172  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°4.21  
 start stop duration Lon E 13°41.56  
 TIME :10:41:51 10:55:31 13.7 (min) Purpose : 3  
 LOG : 7608.92 7609.75 0.8 Region : 4040  
 FDEPTH: 28 28 Gear cond.: 0  
 BDEPTH: 28 28 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.6 kn  
 Sorted : 0 Total catch: 3097.37 Catch/hour: 13594.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	13589.93	246759	99.96	752
Raja miraletus	3.29	4	0.02	
Pomadasys incisus	0.97	4	0.01	
Scomber japonicus	0.48	4	0.00	
Citharus linguatula	0.13	4	0.00	
Penaeus notialis	0.09	4	0.00	
Total		13594.89	100.00	



R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 173  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°15.24  
 start stop duration Lon E 13°34.72  
 TIME :12:38:39 13:08:30 29.9 (min) Purpose : 3  
 LOG : 7622.06 7623.65 1.6 Region : 4040  
 FDEPTH: 55 61 Gear cond.: 0  
 BDEPTH: 55 61 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn  
 Sorted : 92 Total catch: 646.58 Catch/hour: 1299.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy incisus	296.80	2665	22.84	754
Brachydeuterus auritus	270.95	3029	20.85	755
Pagellus bellottii	199.44	1576	15.15	753
Citharus linguatula	67.06	2894	5.15	
Umbrina canariensis	50.09	255	3.85	760
Sepia orbignyana	44.44	52	3.42	
Trichiurus lepturus	42.41	175	3.26	756
Rhinobatos albomaculatus	42.25	22	3.25	
Pomadasy perotaei	39.18	107	3.01	761
Chloroscombrus chrysurus	34.59	241	2.66	759
Dentex barnardi	28.80	525	2.22	757
Pseudotolithus senegalensis	27.46	54	2.11	758
Trachurus trecae	26.51	416	2.04	762
Raja miraletus	18.85	121	1.45	
Lagocephalus laevigatus	16.68	52	1.28	
Epinephelus aeneus	16.36	2	1.26	
Pseudupeneus prayensis	14.39	201	1.11	
Chaetodon hoefleri	11.30	40	0.87	
Bembrops heterurus	8.48	121	0.65	
Torpedo torpedo	8.20	12	0.63	
Pteroscion peli	6.99	40	0.54	
Selene dorsalis	5.25	26	0.40	
Chilomycterus spinosus mauretanicus	4.92	2	0.38	
Scorpaena stephanica	4.30	26	0.33	
Serranus accraensis	3.62	40	0.28	
Alloteuthis africana	2.15	121	0.17	
Spondyliosisoma cantharus	2.01	12	0.15	
Ephippion guttifer	2.01	26	0.15	
Gobioides sp.	1.87	26	0.14	
Monolene microstoma	1.87	12	0.14	
Engraulis encrasicolus	0.40	26	0.03	
Total	1299.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 174  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°16.58  
 start stop duration Lon E 13°31.70  
 TIME :13:54:40 14:24:49 30.1 (min) Purpose : 3  
 LOG : 7627.41 7629.06 1.6 Region : 4040  
 FDEPTH: 77 75 Gear cond.: 0  
 BDEPTH: 77 75 Validity : 0  
 Towing dir: 0° Wire out : 210 m Speed : 3.3 kn  
 Sorted : 134 Total catch: 1912.43 Catch/hour: 3805.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1258.41	12720	33.07	773
Rhinobatos albomaculatus	821.01	456	21.57	
Pomadasy incisus	228.24	1650	6.00	772
Dasyatis marmorata	192.38	58	5.05	
Pagellus bellottii	182.13	1481	4.79	763
Raja miraletus	152.54	285	4.01	
Umbrina canariensis	141.15	683	3.71	765
Citharus linguatula	118.95	7200	3.13	
Trachurus trecae	82.53	1309	2.17	764
Torpedo torpedo	82.53	113	2.17	
Pomadasy perotaei	81.67	285	2.15	770
Pomadasy jubelini	71.72	143	1.88	771
Trichiurus lepturus	67.72	285	1.78	
Boops boops	48.38	541	1.27	
Sepia orbignyana	43.82	257	1.15	
Trigla lyra	32.74	370	0.86	
Arnoglossus imperialis	31.30	28	0.82	768
Atractoscion aequidens	28.74	58	0.76	769
Pseudupeneus prayensis	24.48	456	0.64	
Octopus vulgaris	22.77	28	0.60	
Torpedo marmorata	16.22	28	0.43	
Serranus accraensis	15.36	285	0.40	
Selene dorsalis	15.36	143	0.40	766
Chloroscombrus chrysurus	14.09	86	0.37	
Dentex barnardi	11.96	171	0.31	767
Pterothrissus belloci	6.55	86	0.17	
Bembrops heterurus	5.97	143	0.16	
Dentex macrophthalms	3.70	28	0.10	
Alloteuthis africana	1.43	428	0.04	
Saurida brasiliensis	1.43	227	0.04	
Sea urchin	0.28	28	0.01	
GOBIIDAE	0.28	113	0.01	
Total	3805.83		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 175  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°17.22  
 start stop duration Lon E 13°26.88  
 TIME :15:24:51 15:55:15 30.4 (min) Purpose : 3  
 LOG : 7636.22 7637.84 1.6 Region : 4040  
 FDEPTH: 98 96 Gear cond.: 0  
 BDEPTH: 98 96 Validity : 0  
 Towing dir: 0° Wire out : 260 m Speed : 3.2 kn  
 Sorted : 93 Total catch: 521.69 Catch/hour: 1029.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalms	360.75	2916	35.05	778
Trigla lyra	95.67	951	9.29	
Dentex barnardi	94.13	365	9.15	779
Sea urchin	73.81	5205	7.17	
Scomber japonicus	65.86	519	6.40	781
Sphoeroides pachygaster	59.55	166	5.79	
Umbrina canariensis	49.05	154	4.77	774
Boops boops	39.89	420	3.88	780
Sepia orbignyana	35.02	122	3.40	
Epinephelus aeneus	34.47	12	3.35	
Pagellus bellottii	32.81	232	3.19	777
Scorpaena normani	16.14	233	1.57	
Citharus linguatula	15.90	375	1.54	
Raja miraletus	14.58	22	1.42	
Chaetodon hoefleri	11.60	67	1.13	
Dentex angolensis	9.17	132	0.89	776
Zeus faber	8.29	12	0.81	
Plectorhynchus mediterraneus	5.98	2	0.58	
Perulibatrachus rossignoli	3.87	22	0.38	
Uranoscopus polli	2.33	12	0.23	
Monolene microstoma	0.43	43	0.04	
Total	1029.31		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 176  
 DATE :28/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°16.92  
 start stop duration Lon E 13°24.45  
 TIME :16:39:26 17:08:42 29.3 (min) Purpose : 3  
 LOG : 7642.23 7643.69 1.5 Region : 4040  
 FDEPTH: 108 109 Gear cond.: 0  
 BDEPTH: 108 109 Validity : 0  
 Towing dir: 0° Wire out : 320 m Speed : 3.0 kn  
 Sorted : 94 Total catch: 1954.29 Catch/hour: 4007.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	1467.91	25640	36.63	784
Scomber japonicus	911.59	8567	22.75	785
Dentex macrophthalms	475.65	3363	11.87	786
Boops boops	461.28	3900	11.51	783
Umbrina canariensis	220.09	845	5.49	782
Zenopsis conchifer	83.21	43	2.08	
Dentex barnardi	66.75	168	1.67	788
Octopus vulgaris	49.01	43	1.22	
Pontinus accraensis	44.35	84	1.11	
Pagellus bellottii	41.40	295	1.03	789
Erythrocles monodi	30.00	43	0.75	
Dentex angolensis	29.14	168	0.73	787
Raja miraletus	25.78	43	0.64	
Gephyroberyx darwini	22.39	43	0.56	
Zeus faber	16.47	43	0.41	
Epinephelus goreensis	14.85	2	0.37	
Atractoscion aequidens	14.64	8	0.37	790
Sepia orbignyana	9.29	43	0.23	
Chaetodon hoefleri	7.18	43	0.18	
Citharus linguatula	7.18	168	0.18	
E I V A L V E S	5.06	506	0.13	
Chelidonichthys gabonensis	4.22	43	0.11	
Total	4007.43		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 177  
 DATE :29/03/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 12°30.48  
 start stop duration Lon E 13°25.62  
 TIME :11:31:15 11:39:49 8.6 (min) Purpose : 3  
 LOG : 7770.05 7770.54 0.5 Region : 4040  
 FDEPTH: 31 32 Gear cond.: 0  
 BDEPTH: 31 32 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.5 kn  
 Sorted : 95 Total catch: 231.15 Catch/hour: 1618.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	1192.37	21130	73.68	791
Sardinella maderensis	134.56	4327	8.31	792
Engraulis encrasicolus	114.61	66084	7.08	
Lithognathus mormyrus	57.41	84	3.55	793
Chloroscombrus chrysurus	54.19	252	3.35	794
Octopus vulgaris	24.36	21	1.51	
Uranoscopus polli	10.78	49	0.67	
Dentex barnardi	10.08	21	0.62	
Pagrus caeruleostictus	6.30	28	0.39	
Sepia orbignyana	3.85	7	0.24	
Pseudupeneus prayensis	3.36	28	0.21	
Lagocephalus laevigatus	2.73	28	0.17	
Rypticus saponaceus	2.16	14	0.10	
Dentex barnardi	1.61	28	0.10	0
Sphyræna sphyræna	0.49	7	0.03	
Total	1618.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 178  
 DATE :29/03/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 12°27.51  
 start stop duration Lon E 13°24.62  
 TIME :12:45:59 13:17:12 31.2 (min) Purpose : 3  
 LOG : 7775.79 7777.49 1.7 Region : 4040  
 FDEPTH: 69 70 Gear cond.: 0  
 BDEPTH: 69 70 Validity : 0  
 Towing dir: 0° Wire out : 200 m Speed : 3.3 kn  
 Sorted : 91 Total catch: 573.76 Catch/hour: 1102.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	704.68	5360	63.91	795
Pomadasy jubelini	112.35	267	10.19	803
Gymnura micrura	71.68	2	6.50	
Pomadasy incisus	46.14	200	4.18	801
Trichiurus lepturus	31.54	1115	2.86	802
Umbrina canariensis	25.18	156	2.28	796
Lagocephalus laevigatus	18.39	12	1.67	
Trachurus trecae	16.16	100	1.47	800
Pterothrissus belloci	15.09	56	1.37	
Pagellus bellottii	11.70	56	1.06	799
Selene dorsalis	8.46	33	0.77	797
Synagrops microlepis	7.34	1997	0.67	
Citharus linguatula	6.34	200	0.58	
Rhinobatos albomaculatus	6.07	2	0.55	
Chloroscombrus chrysurus	5.02	23	0.45	
Umbrina canariensis	4.23	12	0.38	
Dentex macrophthalms	2.67	23	0.24	
Dentex barnardi	2.33	11	0.21	798
Serranus accraensis	2.00	33	0.18	
Epinephelus marginatus	2.00	12	0.18	
Parapanaeus longirostris, female	1.56	334	0.14	817
Pseudupeneus prayensis	0.56	12	0.05	
Alloteuthis africana	0.44	135	0.04	
Parapanaeus longirostris, male	0.33	77	0.03	818
Saurida brasiliensis	0.33	44	0.03	
Gobioides sp.	0.10	12	0.01	
Sphoeroides spengleri	0.00	2	0.00	
Perulibatrachus rossignoli	0.00	2	0.00	
Total	1102.68		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 179  
 DATE :29/03/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 12°26.49  
 start stop duration Lon E 13°23.43  
 TIME :13:57:20 14:26:06 28.8 (min) Purpose : 3  
 LOG : 7780.60 7782.10 1.5 Region : 4040  
 FDEPTH: 94 98 Gear cond.: 0  
 BDEPTH: 94 98 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.1 kn  
 Sorted : 0 Total catch: 128.16 Catch/hour: 267.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	128.55	1297	48.10	804
Trigla lyra	25.28	217	9.46	
Sepia orbignyana	17.31	42	6.48	
Spherooides pachgaster	13.14	79	4.92	
Raja miraletus	12.24	17	4.58	
Citharus linguatula	7.80	129	2.92	
Pterothrissus belloci	7.57	106	2.83	
Octopus vulgaris	7.17	6	2.68	
Pagellus bellottii	5.92	38	2.22	807
Zeus faber	4.92	15	1.84	
Alloteuthis africana	4.57	40	1.71	
Miracorvina angolensis	4.46	13	1.67	810
Trichiurus lepturus	4.23	6	1.58	806
Atractoscion aequidens	4.21	2	1.58	811
Lophius vaillanti	3.38	15	1.26	
Pontinus accraensis	3.36	23	1.26	
Scorpaena normani	2.92	31	1.09	
Ubrina canariensis	2.42	8	0.91	808
Brotula barbata	1.84	6	0.69	
Dentex barnardi	1.33	4	0.50	809
Illex coindetii	1.25	23	0.47	
Torpedo torpedo	1.17	2	0.44	
Chaetodon hoeffleri	0.58	6	0.22	
Trachurus trecae	0.58	6	0.22	
Trachinotus ovatus	0.42	2	0.16	
Boops boops	0.23	6	0.09	
Merluccius polli	0.15	8	0.05	805
Saurida brasiliensis	0.10	19	0.04	
Ephippion guttifer	0.08	6	0.03	
Pistularia petimba	0.08	2	0.03	
Total	267.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 182  
 DATE :29/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 12°35.02  
 start stop duration Lon E 13°35.51  
 TIME :21:51:48 22:21:23 29.6 (min) Purpose : 3  
 LOG : 7816.98 7818.36 1.4 Region : 4040  
 FDEPTH: 701 689 Gear cond.: 0  
 BDEPTH: 701 689 Validity : 0  
 Towing dir: 0° Wire out : 1500 m Speed : 2.8 kn  
 Sorted : 60 Total catch: 367.96 Catch/hour: 745.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarrella blackfordi	228.89	5181	30.69	
Hoplostethus cadenati	104.35	3004	13.99	
Talismania sp.	44.27	1399	5.94	
Aristeus varidens	42.81	3211	5.74	830
Nezumia aequalis	35.03	888	4.70	
Stomias boa boa	29.19	584	3.91	
Lamprogrammus exutus	29.07	195	3.90	
Rajella barnardi	27.97	328	3.75	
Aristeus varidens	24.45	341	3.28	829
Etmopterus polli	22.74	49	3.05	
Chaceon maritae	19.58	61	2.63	827
Chaceon maritae	18.85	73	2.53	828
Triplophos hemingi	17.51	2092	2.35	
Plesioopenaues edwardsianus	14.72	1070	1.97	
Merluccius polli	13.70	14	1.84	826
Dibranchius atlanticus	11.68	377	1.57	
Stereomastis sp.	10.09	462	1.35	
Bathyrcongery vicinus	7.30	49	0.98	
Coelorinchus caelorhincus	6.93	97	0.93	
Halosaurus ovenii	6.69	97	0.90	
Melanomus sp.	6.08	61	0.82	
OMMASTREPHIDAE	5.72	36	0.77	
Benthodesmus tenuis	4.74	122	0.64	
Zameus (Scymnodon) squamulosus	4.62	12	0.62	
Synphobranchius affinis	4.26	61	0.57	
Xenodermichthys copei	2.07	146	0.28	
Dicrolene intronigra	0.85	97	0.11	
Gadella maraldi	0.73	24	0.10	
NETTASTOMATIDAE	0.61	12	0.08	
Myctophidae sp. silver	0.24	195	0.03	
NEMICHTHYIDAE	0.12	12	0.02	
Total	745.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 180  
 DATE :29/03/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 12°26.38  
 start stop duration Lon E 13°21.13  
 TIME :15:04:47 15:34:59 30.2 (min) Purpose : 3  
 LOG : 7784.85 7786.49 1.6 Region : 4040  
 FDEPTH: 107 109 Gear cond.: 0  
 BDEPTH: 107 109 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.3 kn  
 Sorted : 57 Total catch: 975.63 Catch/hour: 1938.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	1537.77	14793	79.33	812
Boops boops	257.36	3040	13.28	813
Spherooides pachgaster	57.75	169	2.98	
Spicara alta	36.48	675	1.88	814
Scomber japonicus	15.87	101	0.82	816
Trigla lyra	14.19	113	0.73	
Sepia orbignyana	11.48	34	0.59	
Pagellus bellottii	5.07	34	0.26	815
Scorpaena normani	2.36	34	0.12	
Total	1938.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 183  
 DATE :30/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 14°3.99  
 start stop duration Lon E 12°19.11  
 TIME :08:51:47 09:21:52 30.1 (min) Purpose : 3  
 LOG : 7918.08 7919.71 1.6 Region : 4050  
 FDEPTH: 95 96 Gear cond.: 0  
 BDEPTH: 95 96 Validity : 0  
 Towing dir: 0° Wire out : 250 m Speed : 3.3 kn  
 Sorted : 89 Total catch: 283.85 Catch/hour: 566.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	380.97	3811	67.26	831
Dentex barnardi	62.25	371	10.99	832
Squatina oculata	33.12	8	5.85	
Atractoscion aequidens	26.86	14	4.74	836
Pomatomus saltatrix	19.39	10	3.42	837
Alloteuthis africana	10.32	5371	1.82	
Squalus megalops	10.18	10	1.80	
Chelidichthys gabonensis	5.53	74	0.98	
Dentex angolensis	4.47	42	0.79	834
Diplodus cervinus cervinus	3.99	6	0.70	835
Sepia orbignyana	3.43	2	0.61	
Raja miraletus	3.41	6	0.60	
Pagellus bellottii	1.60	16	0.28	833
Sardinella aurita	0.86	6	0.15	
Total	566.38		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 181  
 DATE :29/03/14 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°21.00  
 start stop duration Lon E 13°17.74  
 TIME :16:50:28 17:20:40 30.2 (min) Purpose : 3  
 LOG : 7795.04 7796.55 1.5 Region : 4040  
 FDEPTH: 729 735 Gear cond.: 0  
 BDEPTH: 729 735 Validity : 0  
 Towing dir: 0° Wire out : 1550 m Speed : 3.0 kn  
 Sorted : 30 Total catch: 226.91 Catch/hour: 450.81

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	126.95	4456	28.16	
Lamprogrammus exutus	73.01	715	16.20	
Yarrella blackfordi	71.23	1774	15.80	
Nezumia aequalis	47.54	1490	10.55	
Talismania sp.	21.62	493	4.79	
Triplophos hemingi	20.13	2013	4.46	
Aristeus varidens, male	17.88	2549	3.97	822
Aristeus varidens, female	16.09	1119	3.57	821
Stomias boa boa	10.29	238	2.28	
RAJIDAE	9.54	745	2.12	
Chaceon maritae, female	7.61	45	1.69	823
Conger conger	7.01	105	1.56	
Merluccius polli	4.51	4	1.00	820
Halosaurus ovenii	4.33	89	0.96	
Plesioopenaues edwardsianus	3.44	566	0.76	
Onychoteuthis banksi	2.60	2	0.58	
Stereomastis sp.	2.54	284	0.56	
Diabrobranchus capensis	1.79	30	0.40	
OPHIDIIDAE	1.49	179	0.33	
Xenodermichthys copei	1.05	60	0.23	
Dibranchius atlanticus	0.16	16	0.04	
Total	450.81		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 184  
 DATE :30/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 14°4.66  
 start stop duration Lon E 12°20.65  
 TIME :10:01:11 10:31:16 30.1 (min) Purpose : 3  
 LOG : 7923.51 7925.30 1.8 Region : 4050  
 FDEPTH: 30 31 Gear cond.: 0  
 BDEPTH: 30 31 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.6 kn  
 Sorted : 144 Total catch: 1014.35 Catch/hour: 2023.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	1532.97	18570	75.77	838
Dasyatis marmorata	247.98	195	12.26	
Sepia officinalis	85.45	56	4.22	
Lithognathus mormyrus	33.79	98	1.67	840
Aluterus heudelotii	28.62	28	1.41	
Balistes capricus	23.04	42	1.14	
Rhinobatos albomaculatus	16.06	14	0.79	
Pomadourus jubelini	11.73	14	0.58	
Trachurus trecae	10.61	56	0.52	839
Fistularia petimba	9.63	28	0.48	
Sphyrna sphyraena	5.59	28	0.28	
Chilomycterus spinosus mauretanicus	4.89	14	0.24	
Sarda sarda	4.31	2	0.21	841
Sphyrna zygaena	2.45	2	0.12	
Squalus megalops	2.41	2	0.12	
Dicologlossa hexophthalma	1.95	14	0.10	
Alloteuthis africana	1.82	949	0.09	
Total	2023.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 185  
 DATE :31/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 14°24.02  
 start stop duration Lon E 12°19.72  
 TIME :12:44:06 13:05:29 21.4 (min) Purpose : 3  
 LOG : 7943.49 7944.68 1.2 Region : 4050  
 FDEPTH: 69 64 Gear cond.: 0  
 BDEPTH: 69 64 Validity : 0  
 Towing dir: 0° Wire out : 200 m Speed : 3.3 kn  
 Sorted : 149 Total catch: 1199.30 Catch/hour: 3365.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	874.69	6196	25.99	842
Spondyliosoma cantharus	660.06	2021	19.61	847
Pomadasyss jubelini	512.78	786	15.24	850
Atractoscion aequidens	450.36	651	13.38	848
Pomadasyss incisus	400.07	4086	11.89	846
Dentex barnardi	174.22	1302	5.18	849
Sepia orbignyana	77.23	45	2.29	
Selene dorsalis	59.27	247	1.76	844
Pagellus bellottii	48.94	359	1.45	843
Lithognathus mormyrus	28.51	90	0.85	845
Squatina aculeata	21.50	3	0.64	
Pomatomus saltatrix	15.27	22	0.45	
Raja miraletus	14.59	22	0.43	
Trigla lyra	10.78	112	0.32	
Myliobatis aquila	8.64	3	0.26	
Umrina canariensis	4.49	22	0.13	
Boops boops	2.92	22	0.09	
Sardinella aurita	1.35	22	0.04	
Total	3365.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 189  
 DATE :31/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 16°11.20  
 start stop duration Lon E 11°36.27  
 TIME :12:25:23 12:55:07 29.7 (min) Purpose : 3  
 LOG : 8120.60 8122.19 1.6 Region : 4050  
 FDEPTH: 72 73 Gear cond.: 0  
 BDEPTH: 72 73 Validity : 0  
 Towing dir: 0° Wire out : 210 m Speed : 3.2 kn  
 Sorted : 79 Total catch: 612.81 Catch/hour: 1236.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	555.80	7120	44.94	870
Trachurus trecae	390.33	6757	31.56	872
Squalus blainville	68.44	137	5.53	
Pagellus bellottii	65.53	718	5.30	873
Atractoscion aequidens	34.03	214	2.75	871
Sepia orbignyana	31.30	44	2.53	
Loligo vulgaris	26.58	91	2.15	
Chelidichthys capensis	18.79	75	1.52	
Raja miraletus	15.12	30	1.22	
Zeus faber	9.77	30	0.79	
Sphoeroides pachgaster	9.30	14	0.75	
Spondyliosoma cantharus	8.54	30	0.69	874
Scorpaena stephanica	1.53	14	0.12	
Boops boops	1.07	14	0.09	
Sea urchin	0.46	2	0.04	
Citharus linguatula	0.16	14	0.01	
Total	1236.75		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 186  
 DATE :31/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 16°3.66  
 start stop duration Lon E 11°42.93  
 TIME :08:36:00 08:59:03 23.1 (min) Purpose : 3  
 LOG : 8099.96 8101.23 1.3 Region : 4050  
 FDEPTH: 45 45 Gear cond.: 0  
 BDEPTH: 45 45 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.3 kn  
 Sorted : 73 Total catch: 1286.38 Catch/hour: 3347.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1749.84	78911	52.28	852
Pagellus bellottii	695.33	7608	20.77	853
Sepia officinalis	284.41	398	3.89	
Chelidichthys capensis	125.62	310	3.75	
Dentex macrophthalmus	96.87	4821	2.89	854
Loligo vulgaris	86.70	885	2.59	
Dentex barnardi	69.44	708	2.07	855
Raja miraletus	62.81	88	1.88	
Atractoscion aequidens	56.36	83	1.68	851
Mustelus mustelus	51.99	23	1.55	
Lithognathus mormyrus	30.08	88	0.90	857
Dentex gibbosus	28.31	221	0.85	856
Boops boops	5.75	133	0.17	
Spondyliosoma cantharus	3.54	44	0.11	858
Total	3347.04		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 190  
 DATE :31/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 16°24.74  
 start stop duration Lon E 11°45.62  
 TIME :14:47:52 15:17:52 30.0 (min) Purpose : 3  
 LOG : 8137.32 8139.20 1.9 Region : 4050  
 FDEPTH: 22 22 Gear cond.: 0  
 BDEPTH: 22 22 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.8 kn  
 Sorted : 245 Total catch: 3168.56 Catch/hour: 6337.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	5433.48	757152	85.74	875
Mustelus sp.	325.44	36	5.14	
Loligo vulgaris	145.44	864	2.30	
JELLYFISH	143.64	108	2.27	
Sarda sarda	99.72	72	1.57	880
Chelidichthys capensis	75.96	180	1.20	
Scomber japonicus	40.32	1908	0.64	877
Sardinella aurita	37.80	396	0.60	878
Pagellus bellottii	18.00	216	0.28	879
Boops boops	11.16	360	0.18	
Spondyliosoma cantharus	6.16	108	0.10	876
Total	6337.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 187  
 DATE :31/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 16°10.97  
 start stop duration Lon E 11°43.78  
 TIME :09:52:36 10:22:50 30.2 (min) Purpose : 3  
 LOG : 8107.46 8109.27 1.8 Region : 4050  
 FDEPTH: 47 47 Gear cond.: 0  
 BDEPTH: 47 47 Validity : 0  
 Towing dir: 0° Wire out : 150 m Speed : 3.6 kn  
 Sorted : 72 Total catch: 1440.00 Catch/hour: 2858.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1408.40	76533	49.28	859
Atractoscion aequidens	539.07	1111	18.86	860
Loligo vulgaris	294.94	1786	10.32	
Pagellus bellottii	188.55	2660	6.60	861
Chelidichthys capensis	122.26	318	4.28	
Sepia orbignyana	99.64	79	3.49	
Mustelus mustelus	59.15	79	2.07	
Dentex barnardi	47.63	318	1.67	862
Lithognathus mormyrus	30.57	79	1.07	
Boops boops	23.82	516	0.83	
Spondyliosoma cantharus	14.69	119	0.51	864
Dentex canariensis	13.89	119	0.49	863
Sardinella aurita	13.50	119	0.47	
Scomber japonicus	1.98	40	0.07	
Total	2858.09		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 191  
 DATE :31/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 16°24.61  
 start stop duration Lon E 11°43.62  
 TIME :16:02:00 16:32:30 30.5 (min) Purpose : 3  
 LOG : 8142.95 8144.82 1.9 Region : 4050  
 FDEPTH: 51 54 Gear cond.: 0  
 BDEPTH: 51 54 Validity : 0  
 Towing dir: 0° Wire out : 160 m Speed : 3.7 kn  
 Sorted : 131 Total catch: 3483.13 Catch/hour: 6852.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	3266.32	62673	47.67	881
Mustelus mustelus	1173.74	210	17.13	
Sardinella aurita	774.10	8550	11.30	882
Gymnura micrura	636.69	53	9.29	
Merluccius capensis	285.84	1678	4.17	885
Chelidichthys capensis	275.39	419	4.03	
Pagellus bellottii	188.28	1627	2.75	883
Loligo vulgaris	145.28	1782	2.12	
Atractoscion aequidens	83.39	210	1.22	884
Umrina canariensis	13.12	157	0.19	886
Dentex macrophthalmus	8.91	525	0.13	887
Total	6852.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 188  
 DATE :31/03/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 16°13.82  
 start stop duration Lon E 11°39.77  
 TIME :11:10:14 11:37:12 27.0 (min) Purpose : 3  
 LOG : 8114.27 8115.61 1.3 Region : 4050  
 FDEPTH: 61 61 Gear cond.: 0  
 BDEPTH: 61 61 Validity : 0  
 Towing dir: 0° Wire out : 180 m Speed : 3.0 kn  
 Sorted : 99 Total catch: 2101.20 Catch/hour: 4674.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2909.50	53669	62.24	865
Pagellus bellottii	1106.92	158269	23.68	866
Sepia orbignyana	188.59	236	4.03	
Atractoscion aequidens	99.51	189	2.13	867
Chelidichthys capensis	90.03	283	1.93	
Dasyatis marmorata	47.39	47	1.01	
Dentex barnardi	42.16	378	0.90	868
Loligo vulgaris	41.69	189	0.89	
Myliobatis aquila	41.69	47	0.89	
Spondyliosoma cantharus	31.26	283	0.67	869
Squalus blainville	28.90	47	0.62	
Mustelus mustelus	27.01	47	0.58	
Pomadasyss jubelini	19.89	47	0.43	
Total	4674.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 192  
 DATE :01/04/14 GEAR TYPE: BT NO: 26 POSITION:Lat S 16°33.00  
 start stop duration Lon E 11°35.98  
 TIME :05:14:33 05:44:49 30.3 (min) Purpose : 3  
 LOG : 8180.52 8182.03 1.5 Region : 4050  
 FDEPTH: 0 90 Gear cond.: 0  
 BDEPTH: 0 90 Validity : 0  
 Towing dir: 0° Wire out : 225 m Speed : 3.0 kn  
 Sorted : 67 Total catch: 1066.88 Catch/hour: 2114.73

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1545.39	35425	73.08	888
Dentex macrophthalmus	260.54	8757	12.32	889
Merluccius capensis	79.88	553	3.78	890
Mustelus mustelus	57.78	14	2.73	
Atractoscion aequidens	49.47	32	2.34	
Loligo vulgaris	30.43	307	1.44	
Chelidichthys capensis	26.74	93	1.26	
Raja miraletus	19.37	61	0.92	
Pagellus bellottii	15.68	155	0.74	891
Synaxrops microlepis	11.67	922	0.55	892
Dicologlossa cuneata	5.85	123	0.28	
Pterothrissus belloci	4.62	32	0.22	
Citharus linguatula	2.78	123	0.13	
Umrina canariensis	2.78	32	0.13	
GOBIIDAE	1.84	339	0.09	
Total	2114.81		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 193  
 DATE :01/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°34.95  
 start stop duration Lon E 11°29.70  
 TIME :07:36:51 08:07:26 30.6 (min) Purpose : 3  
 LOG : 8190.72 8192.40 1.7 Region : 4050  
 FDEPTH: 110 111 Gear cond.: 0  
 BDEPTH: 110 111 Validity : 0  
 Towing dir: 0° Wire out : 280 m Speed : 3.3 kn  
 Sorted : 65 Total catch: 646.30 Catch/hour: 1267.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	450.20	8020	35.53	893
Trachurus trecae	352.16	5451	27.79	894
Merluccius capensis	163.53	922	12.90	895
Atractoscion aequidens	128.24	157	10.12	896
Sepia orbignyana	55.69	39	4.39	
Zeus faber	25.29	78	2.00	
Chelidonichthys capensis	23.92	98	1.89	
Trigla lyra	18.82	137	1.49	
Squalus megalops	17.84	20	1.41	
Pterothrissus belloci	14.31	118	1.13	
Loligo vulgaris	9.80	78	0.77	
Pagellus bellottii	2.55	20	0.20	
Umbria canariensis	1.96	20	0.15	
Dicolloglossa cuneata	1.37	20	0.11	
Citharus linguatula	0.98	20	0.08	
Arnoglossus imperialis	0.59	20	0.05	
Total	1267.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 194  
 DATE :01/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°37.61  
 start stop duration Lon E 11°24.06  
 TIME :09:34:11 10:04:23 30.2 (min) Purpose : 3  
 LOG : 8200.68 8202.42 1.7 Region : 4050  
 FDEPTH: 124 127 Gear cond.: 0  
 BDEPTH: 124 127 Validity : 0  
 Towing dir: 0° Wire out : 320 m Speed : 3.4 kn  
 Sorted : 66 Total catch: 528.47 Catch/hour: 1049.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus belloci	448.86	3734	42.76	
Dentex macrophthalmus	315.87	4211	30.09	897
Trachurus trecae	134.74	683	12.84	898
Merluccius capensis	85.80	334	8.17	899
Scomber japonicus	16.78	79	1.60	900
Raja miraletus	11.92	16	1.14	
Chelidonichthys capensis	10.65	32	1.01	
Loligo vulgaris	9.06	32	0.86	
Zeus faber	5.56	16	0.53	
Squalus megalops	4.49	4	0.43	
Sepia orbignyana	2.86	16	0.27	
Trigla lyra	2.07	16	0.20	
Syacium micrurum	0.95	32	0.09	
Total	1049.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 195  
 DATE :01/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°51.16  
 start stop duration Lon E 11°23.67  
 TIME :12:30:46 12:45:57 15.2 (min) Purpose : 3  
 LOG : 8214.39 8215.06 0.7 Region : 4050  
 FDEPTH: 128 131 Gear cond.: 0  
 BDEPTH: 128 131 Validity : 0  
 Towing dir: 0° Wire out : 390 m Speed : 2.6 kn  
 Sorted : 64 Total catch: 533.70 Catch/hour: 2109.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	965.57	13439	45.77	902
Trachurus trecae	417.27	5308	19.78	901
Merluccius capensis	372.92	2285	17.68	903
Pterothrissus belloci	168.30	1581	7.98	
Raja miraletus	43.00	67	2.04	
Squalus megalops	39.29	134	1.86	
Loligo vulgaris	34.27	134	1.62	
Trigla lyra	15.45	134	0.73	
Trachurus capensis	13.75	134	0.65	904
Chelidonichthys capensis	13.75	32	0.65	
Illex coindetii	11.74	67	0.56	
Zeus faber	6.76	166	0.32	
Sepia orbignyana	6.05	32	0.29	
PATELLIDAE	1.34	32	0.06	
Total	2109.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 196  
 DATE :01/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°49.43  
 start stop duration Lon E 11°34.73  
 TIME :14:36:13 14:51:48 15.6 (min) Purpose : 3  
 LOG : 8227.43 8228.27 0.8 Region : 4050  
 FDEPTH: 96 96 Gear cond.: 0  
 BDEPTH: 96 96 Validity : 0  
 Towing dir: 0° Wire out : 250 m Speed : 3.2 kn  
 Sorted : 63 Total catch: 882.01 Catch/hour: 3396.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1638.52	14118	48.24	905
Dentex macrophthalmus	830.87	24893	24.46	907
Merluccius capensis	533.38	4090	15.70	906
Trigla lyra	101.09	528	2.98	
Sepia orbignyana	95.31	289	2.81	
Pterothrissus belloci	54.38	816	1.60	
Pagellus bellottii	32.73	239	0.96	908
Synagrops microlepis	25.03	4044	0.74	
Mustelus mustelus	21.10	12	0.62	
GOBIIDAE	16.83	3320	0.50	
Brotula barbata	15.87	193	0.47	
Atractoscion aequidens	15.71	35	0.46	909
Pegusa lascaris	15.40	578	0.45	
Zeus faber	0.46	46	0.01	
Total	3396.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 197  
 DATE :01/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°48.43  
 start stop duration Lon E 11°39.68  
 TIME :16:21:21 16:50:01 28.7 (min) Purpose : 3  
 LOG : 8236.35 8237.89 1.5 Region : 4050  
 FDEPTH: 45 45 Gear cond.: 0  
 BDEPTH: 45 45 Validity : 0  
 Towing dir: 0° Wire out : 170 m Speed : 3.2 kn  
 Sorted : 35 Total catch: 362.70 Catch/hour: 759.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	420.02	3296	55.33	910
Argyrosomus hololepidotus	91.87	27	12.10	913
Dicolloglossa cuneata	59.90	1770	7.89	
Trachurus trecae	49.91	1224	6.58	912
Raja miraletus	48.41	113	6.38	
Chelidonichthys capensis	33.15	75	4.37	
Arius parkii	16.20	38	2.13	
Dentex macrophthalmus	15.82	2995	2.08	911
Mustelus mustelus	12.18	4	1.60	
Starfish	8.77	2166	1.16	
GOBIIDAE	0.94	772	0.12	
Calappa pelii	0.75	19	0.10	
C R A B S	0.75	19	0.10	
Pterothrissus belloci	0.19	19	0.02	
Engraulis encrasicolus	0.19	19	0.02	
Total	759.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 198  
 DATE :02/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°57.95  
 start stop duration Lon E 11°40.59  
 TIME :05:25:19 05:55:24 30.1 (min) Purpose : 3  
 LOG : 8267.00 8268.53 1.5 Region : 4050  
 FDEPTH: 0 37 Gear cond.: 0  
 BDEPTH: 0 37 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn  
 Sorted : 39 Total catch: 502.27 Catch/hour: 1001.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	592.42	3862	59.13	915
Pomatomus saltatrix	145.25	263	14.50	916
Argyrosomus hololepidotus	96.08	32	9.59	914
Loligo vulgaris	38.18	1273	3.81	
Dicolloglossa cuneata	23.48	702	2.34	
Mustelus mustelus	22.06	8	2.20	
Arius parkii	21.28	66	2.12	
Dasyatis marmorata	12.93	2	1.29	
Callorhynchus capensis	12.89	8	1.29	
Chelidonichthys capensis	12.51	22	1.25	
Dentex macrophthalmus	9.87	1580	0.99	918
Spondyliosoma cantharus	6.80	44	0.68	917
Boops boops	2.41	66	0.24	
Merluccius merluccius	1.54	22	0.15	
Engraulis encrasicolus	1.54	241	0.15	
Starfish	1.32	329	0.13	
Scorpaena stephanica	1.10	132	0.11	
Sardinella aurita	0.22	44	0.02	
Total	1001.87		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 199  
 DATE :02/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°58.89  
 start stop duration Lon E 11°38.95  
 TIME :07:18:32 07:48:38 30.1 (min) Purpose : 3  
 LOG : 8273.13 8274.75 1.6 Region : 4050  
 FDEPTH: 61 61 Gear cond.: 0  
 BDEPTH: 61 61 Validity : 0  
 Towing dir: 0° Wire out : 170 m Speed : 3.2 kn  
 Sorted : 72 Total catch: 2318.83 Catch/hour: 4622.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2574.46	59514	55.70	919
Merluccius capensis	1026.98	8037	22.22	920
Mustelus mustelus	275.56	64	5.96	
Myliobatis aquila	162.02	64	3.51	
Chelidonichthys capensis	136.50	574	2.95	
Dentex macrophthalmus	104.61	4465	2.26	922
Pomatomus saltatrix	86.75	64	1.88	924
Arius parkii	79.10	191	1.71	
Raja miraletus	78.46	191	1.70	
Argyrosomus hololepidotus	31.48	22	0.68	921
Atractoscion aequidens	24.24	64	0.52	923
Loligo vulgaris	11.48	191	0.25	
Pterothrissus belloci	7.65	255	0.17	
Umbria canariensis	7.65	64	0.17	
Spondyliosoma cantharus	5.10	64	0.11	
Dicolloglossa cuneata	5.10	128	0.11	
Bathynectes sp.	5.10	191	0.11	
Total	4622.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 200  
 DATE :02/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 16°59.88  
 start stop duration Lon E 11°32.78  
 TIME :09:12:33 09:42:39 30.1 (min) Purpose : 3  
 LOG : 8284.60 8286.24 1.6 Region : 4050  
 FDEPTH: 105 106 Gear cond.: 0  
 BDEPTH: 105 106 Validity : 0  
 Towing dir: 0° Wire out : 270 m Speed : 3.3 kn  
 Sorted : 65 Total catch: 2161.17 Catch/hour: 4306.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2577.75	24992	59.86	926
Dentex macrophthalmus	778.59	10880	18.08	931
Merluccius capensis	489.25	4015	11.36	925
Chelidonichthys capensis	127.57	526	2.96	
Atractoscion aequidens	123.63	263	2.87	927
Loligo vulgaris	84.17	197	1.95	
Synagrops microlepis	48.66	6994	1.13	928
Pterothrissus belloci	25.65	263	0.60	
Spondyliosoma cantharus	17.10	66	0.40	929
Pagellus bellottii	12.49	66	0.29	932
Zeus faber	11.84	66	0.27	
Dentex barnardi	6.58	66	0.15	930
G A S T R O P O D S	2.63	1841	0.06	
B I V A L V E S	0.66	132	0.02	
Total	4306.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 201  
 DATE :02/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 17°9.79  
 start stop duration Lon E 11°44.01  
 TIME :11:45:06 12:15:57 30.9 (min) Purpose : 3  
 LOG : 8300.53 8302.21 1.7 Region : 4050  
 FDEPTH: 24 23 Gear cond.: 0  
 BDEPTH: 24 23 Validity : 0  
 Towing dir: 0° Wire out : 110 m Speed : 3.3 kn  
 Sorted : 79 Total catch: 754.91 Catch/hour: 1468.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L L Y F I S H	1030.79	10421	70.21	
Coelorinchus caelorhincus	74.65	37	5.08	
Arius parkii	69.28	537	4.72	
Mustelus mustelus	67.62	19	4.61	
Chelidonichthys capensis	57.45	56	3.91	
Raja miraletus	42.67	56	2.91	
Trachurus trecae	36.58	480	2.49	933
Narke capensis	19.59	56	1.33	
Sepia orbignyana	12.74	19	0.87	
Argyrosomus hololepidotus	11.63	37	0.79	934
Squalus megalops	11.63	19	0.79	
Merluccius capensis	10.52	56	0.72	
Pterothrissus belloci	7.02	278	0.48	
Pegusa lascaris	6.65	37	0.45	
Trichiurus lepturus	6.46	19	0.44	
Cheilodactylus fasciatus	2.22	19	0.15	
Starfish	0.54	74	0.04	
Cynoglossus canariensis	0.18	19	0.01	
Rhinobatos blochii	0.00	2	0.00	
Total	1468.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 205  
 DATE :03/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 17°14.20  
 start stop duration Lon E 11°21.14  
 TIME :08:57:56 09:28:53 31.0 (min) Purpose : 3  
 LOG : 8397.05 8398.60 1.6 Region : 4050  
 FDEPTH: 351 356 Gear cond.: 0  
 BDEPTH: 351 356 Validity : 0  
 Towing dir: 0° Wire out : 820 m Speed : 3.0 kn  
 Sorted : 55 Total catch: 418.91 Catch/hour: 811.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	234.59	6831	28.90	
Pontinus accraensis	205.23	3488	25.28	
Merluccius capensis	113.08	320	13.93	948
Laemonema laureysi	69.77	1380	8.59	
Coelorinchus caelorhincus	49.55	1657	6.10	
Malacocephalus occidentalis	45.64	930	5.62	
Bathynectes piperitus	30.37	973	3.74	
Galeus polli	24.13	275	2.97	
Lophius vaillanti	9.15	4	1.13	
Neoharriotta pinnata	8.26	2	1.02	
Moroteuthis sp.	7.98	2	0.98	
Pterothrissus belloci	3.20	16	0.39	
PANDALIDAE	3.20	1134	0.39	
Synagrops microlepis	2.62	248	0.32	949
Chaceon maritae	2.03	16	0.25	
CONGRIDAE	1.16	16	0.14	
Acanthephyra sp.	1.01	508	0.12	
MYCTOPHIDAE	0.58	233	0.07	
Squilla mantis	0.29	29	0.04	
Total	811.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 202  
 DATE :02/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 17°10.45  
 start stop duration Lon E 11°40.24  
 TIME :13:44:15 14:14:58 30.7 (min) Purpose : 3  
 LOG : 8309.48 8311.11 1.6 Region : 4050  
 FDEPTH: 66 70 Gear cond.: 0  
 BDEPTH: 66 70 Validity : 0  
 Towing dir: 0° Wire out : 200 m Speed : 3.2 kn  
 Sorted : 101 Total catch: 1522.42 Catch/hour: 2973.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	1699.22	14648	57.15	935
Trachurus trecae	676.76	13066	22.76	936
Chelidonichthys capensis	182.52	938	6.14	
Raja miraletus	94.34	146	3.17	
Atractoscion aeguidens	73.24	205	2.46	938
Pomatoms saltatrix	47.46	29	1.60	
J E L L Y F I S H	39.84	2125	1.34	
Mustelus mustelus	28.42	29	0.96	
Arius heudelotii**	27.83	88	0.94	
Dentex macrophthalms	27.25	1025	0.92	937
Pegusa lascaris	23.44	527	0.79	
Argyrosomus hololepidotus	18.01	10	0.61	939
Loligo vulgaris	13.77	264	0.46	
Pterothrissus belloci	12.60	293	0.42	
Spondyliosoma cantharus	4.98	29	0.17	
Pagellus bellottii	1.17	29	0.04	
G A S T R O P O D S	0.88	498	0.03	
GOBIIDAE	0.88	205	0.03	
Marja squinado	0.59	88	0.02	
HARPISQUILLIDAE	0.29	29	0.01	
Total	2973.48		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 206  
 DATE :03/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 17°11.37  
 start stop duration Lon E 11°19.38  
 TIME :10:26:52 10:57:19 30.4 (min) Purpose : 3  
 LOG : 8402.84 8404.38 1.5 Region : 4050  
 FDEPTH: 440 437 Gear cond.: 0  
 BDEPTH: 440 437 Validity : 0  
 Towing dir: 0° Wire out : 970 m Speed : 3.0 kn  
 Sorted : 91 Total catch: 452.55 Catch/hour: 891.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius paradoxus	205.52	493	23.05	950
Chaceon maritae, male	139.90	217	15.69	951
Pontinus accraensis	127.68	1793	14.32	
Lophius vaillanti	103.45	20	11.60	
Nesumia aequalis	93.20	3340	10.45	
Gadella maraldi	66.40	916	7.45	
Hoplostethus cadenati	28.18	2118	3.16	
Paramola cuvieri	27.98	49	3.14	
Aristeus varidens, female	21.08	2611	2.36	953
Chaceon maritae, female	14.48	69	1.62	952
Moroteuthis sp.	13.10	30	1.47	
Chlorophthalmus atlanticus	13.00	345	1.46	
Epigonus telescopus	10.44	650	1.17	
Ebinania sp	8.18	20	0.92	
Zameus (Scymnodon) squamulosus	3.94	10	0.44	
Malacocephalus laevis	3.55	49	0.40	
Scyliorhinus cervigoni	2.96	20	0.33	
MYCTOPHIDAE	2.27	828	0.25	
Gadella imberbis	1.48	138	0.17	
Aristeus varidens, male	1.38	266	0.15	954
Nematocarcinus africanus	0.59	217	0.07	
Benthodesmus tenuis	0.49	10	0.06	
Bathynectes piperitus	0.49	39	0.06	
Triplophos hemingi	0.49	59	0.06	
Galeus polli	0.49	10	0.06	
Starfish	0.30	10	0.03	
Bathyroconger vicinus	0.30	10	0.03	
Synagrops microlepis	0.30	20	0.03	
NEMICHTHYIDAE	0.10	10	0.01	
Total	891.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 203  
 DATE :02/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 17°11.64  
 start stop duration Lon E 11°30.73  
 TIME :16:13:58 16:44:39 30.7 (min) Purpose : 3  
 LOG : 8322.33 8324.00 1.7 Region : 4050  
 FDEPTH: 132 135 Gear cond.: 0  
 BDEPTH: 132 135 Validity : 0  
 Towing dir: 0° Wire out : 350 m Speed : 3.3 kn  
 Sorted : 51 Total catch: 1182.20 Catch/hour: 2311.24

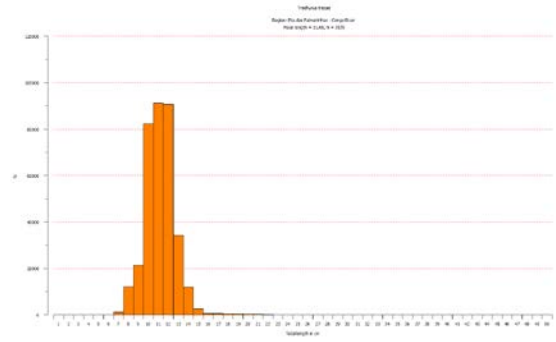
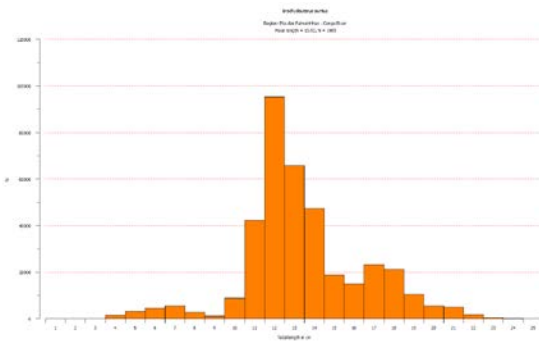
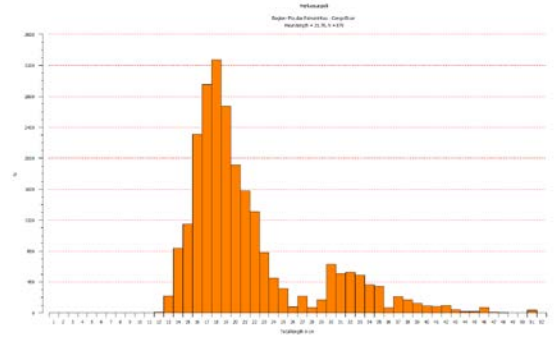
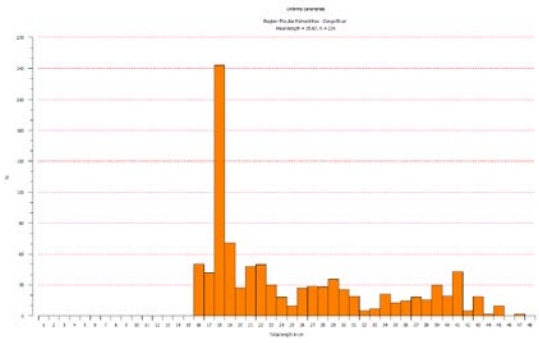
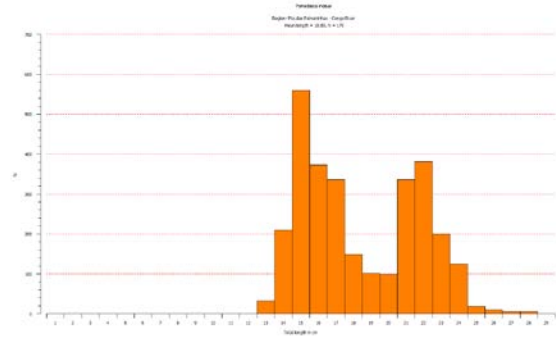
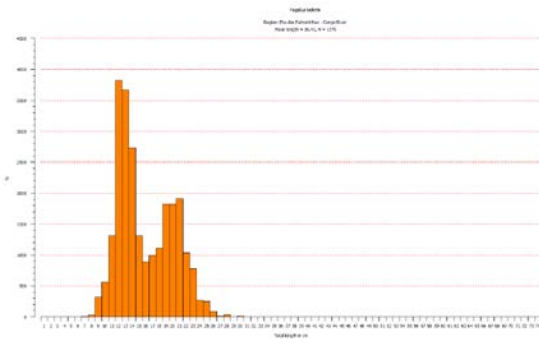
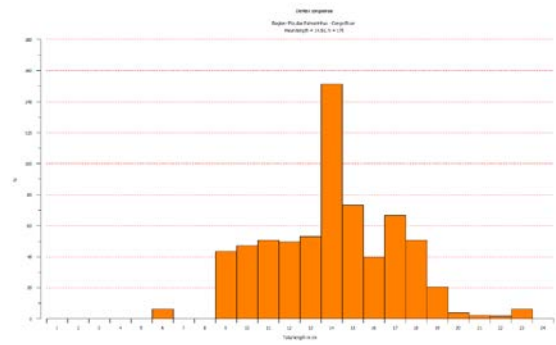
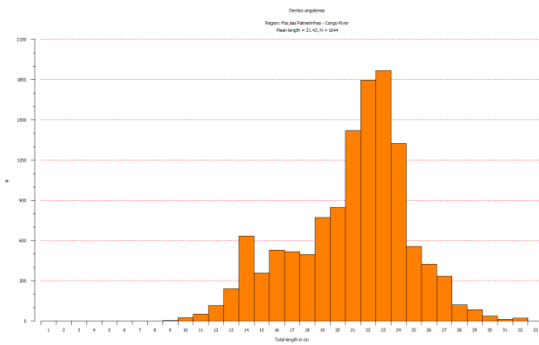
SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	728.45	6880	31.52	941
Dentex macrophthalms	630.42	5306	27.28	939
Merluccius capensis	589.05	3597	25.49	940
Trachurus capensis	151.09	1844	6.54	942
Chelidonichthys capensis	78.24	90	3.39	
Squalus megalops	50.81	180	2.20	
Loligo vulgaris	40.02	180	1.73	
Atractoscion aeguidens	31.48	90	1.36	943
Zeus faber	4.50	45	0.19	
Pterothrissus belloci	3.60	45	0.16	
Squilla mantis	3.15	45	0.14	
GOBIIDAE	0.45	45	0.02	
Total	2311.24		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2014402 STATION: 204  
 DATE :03/04/14 GEAR TYPE: BT NO: 27 POSITION:Lat S 17°12.63  
 start stop duration Lon E 11°21.84  
 TIME :07:22:22 07:52:52 30.5 (min) Purpose : 3  
 LOG : 8392.24 8393.69 1.4 Region : 4050  
 FDEPTH: 285 289 Gear cond.: 0  
 BDEPTH: 285 289 Validity : 0  
 Towing dir: 0° Wire out : 700 m Speed : 2.9 kn  
 Sorted : 57 Total catch: 337.36 Catch/hour: 663.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	377.94	14247	56.95	
Merluccius capensis	225.21	850	33.93	944
Pontinus kuhlii	32.10	755	4.84	
Merluccius polli	12.98	342	1.96	945
Trachurus capensis	7.08	24	1.07	947
Pterothrissus belloci	5.51	94	0.83	
Dentex macrophthalms	2.01	12	0.30	946
Callinectes amnicola	0.59	24	0.09	
PANDALIDAE	0.12	35	0.02	
Parapanaeus longirostris	0.12	24	0.02	
Total	663.66		100.00	

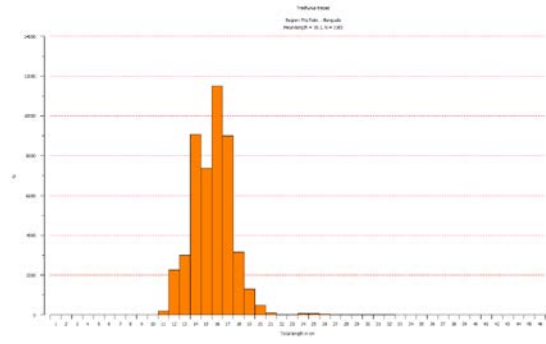
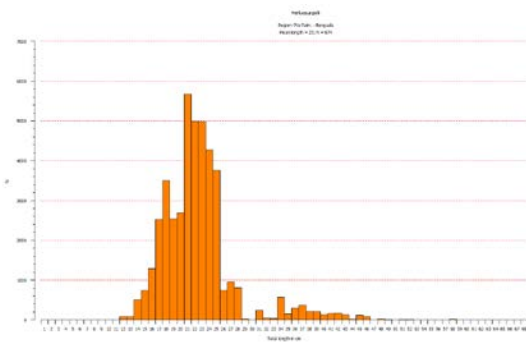
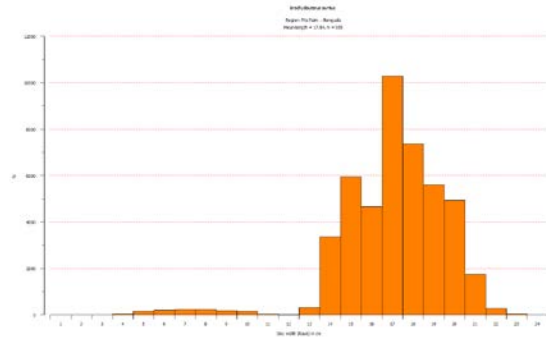
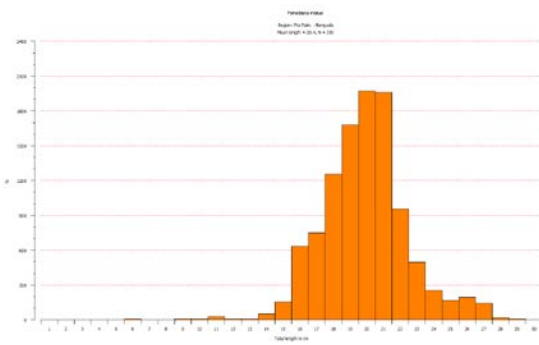
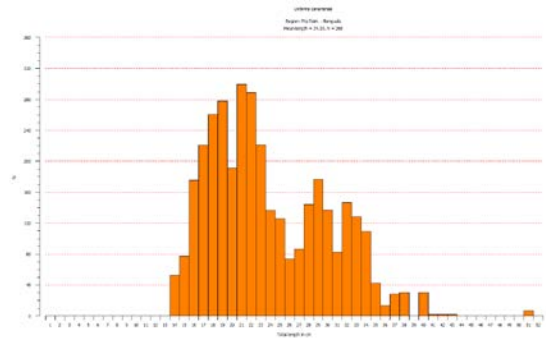
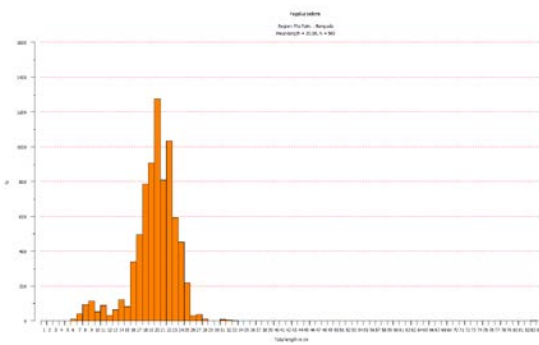
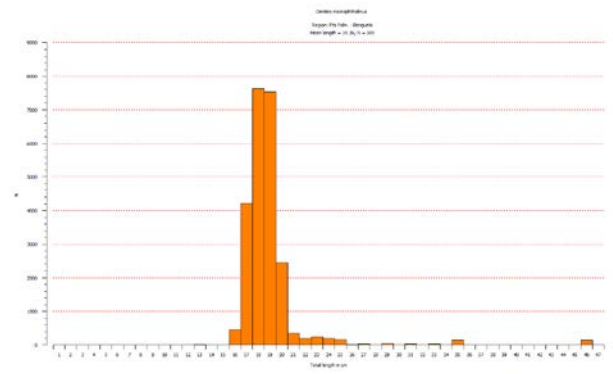
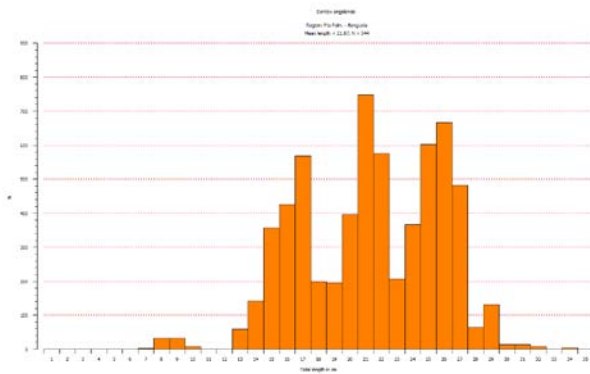
# ANNEX II Length distribution of main species

## Northern Angola Pooled length frequency distribution of the main species weighted by the catch



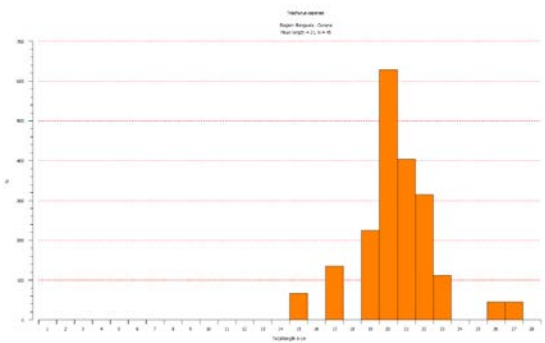
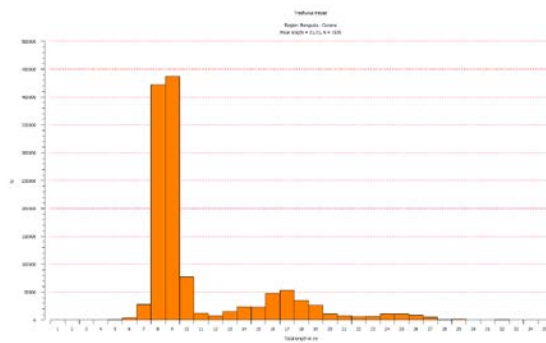
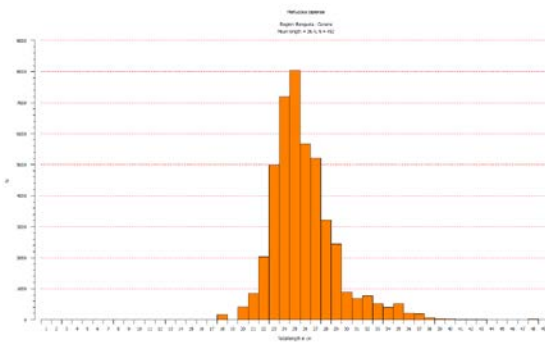
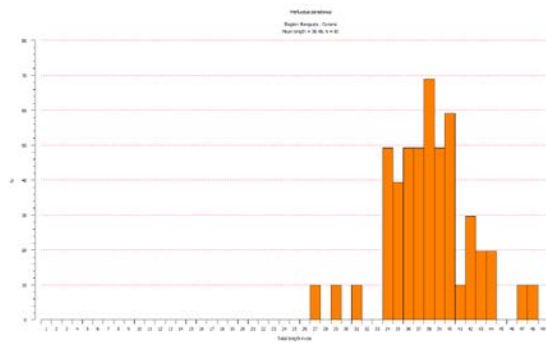
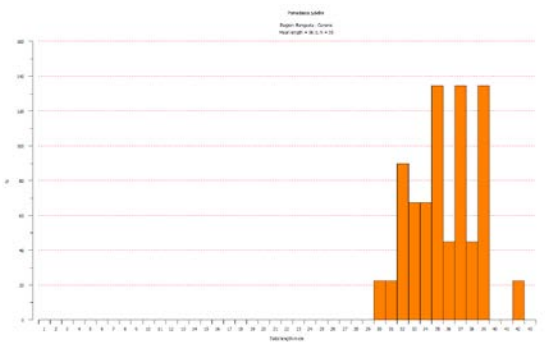
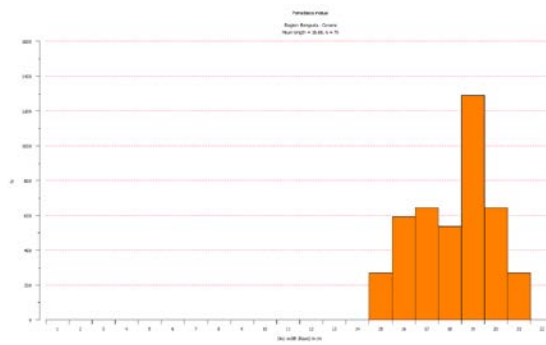
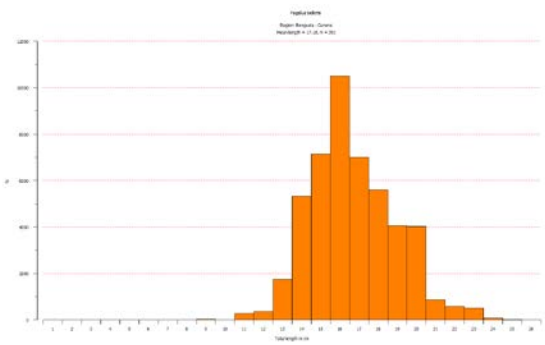
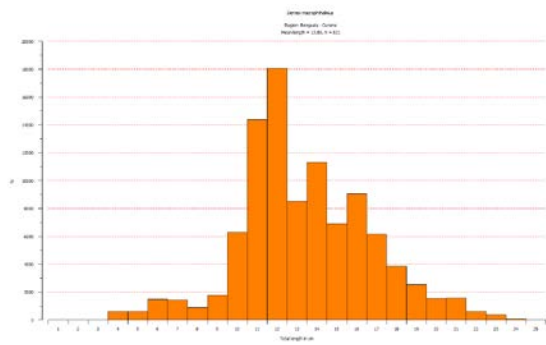
# Central Angola

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



# Southern Angola

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





# ANNEX III Swept area estimates

## Congo River – Ponta das Palmerinhas shelf (20-200 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci-	Mean dence t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	Lower lim	Kg/nm							0-50m	50-100m	100-200m
	>0	10	30	100	300	1000					
Brachydeuterus auritus	11	4	4	4	7		51.72	8.835	11.134	11.328	3.911
Trachurus trecae	17	5	9	6	1		65.52	4.354	0.319	4.188	8.564
Synagrops microlepis	1		1	1		1	6.9	2.198			6.709
Dentex angolensis	12	14	7	1			58.62	1.414		0.553	3.733
Pagellus bellottii	31	7	5	2			77.59	1.165	1.16	2.016	0.274
Chloroscombrus chrysurus	9		5	2			27.59	0.984	2.827	0.169	
Galeoides decadactylus	10	3	3	2			31.03	0.896	1.782	0.905	
Dentex congoensis	16	2	3	1			37.93	0.596		0.116	1.697
Trichiurus lepturus	29	3		1			56.9	0.571	0.088	0.091	1.56
Ilisha africana	3	1	1	1			10.34	0.454	1.385		
Lagocephalus laevigatus	26	4	2				55.17	0.363	0.3	0.669	0.105
Sardinella aurita	12	5	2				32.76	0.354	0.271	0.66	0.116
Selene dorsalis	20	5					43.1	0.269	0.454	0.227	0.129
Pomadasys inciscus	16	2	1				32.76	0.262	0.342	0.434	
Brotula barbata	19	3	1				39.66	0.254		0.137	0.631
Stromateus fiatola	5		2				12.07	0.253	0.275	0.472	
Umbrina canariensis	14	3	1				31.03	0.248	0.003	0.195	0.548
Raja miraletus	34	1					60.34	0.193	0.284	0.205	0.09
Pseudupeneus prayensis	16	3					32.76	0.172	0.404	0.116	
Pagrus caeruleostictus	16	1	1				31.03	0.151	0.444	0.018	
Pterothrissus belloci	11	3					24.14	0.148		0.049	0.399
Spicara alta	10	3					22.41	0.148			0.45
Zeus faber	22	3					43.1	0.139		0.153	0.262
Sepia orbignyana	38	1					67.24	0.138	0.1	0.217	0.093
Sphyræna guachancho	17		1				31.03	0.136	0.356	0.058	
Chelidonicichthys gabonensis	17	1	1				32.76	0.132	0.203	0.03	0.17
Caranx rhonchus	15	4					32.76	0.131	0.229	0.162	
Miracorvina angolensis	1		1				3.45	0.126			0.386
Trigla lyra	7		1				13.79	0.123		0.019	0.356
Dentex barnardi	15	1	1				29.31	0.121	0.093	0.206	0.06
Chelidonicichthys capensis	11	3					24.14	0.102		0.102	0.204
Citharus linguatula	46						79.31	0.094	0.066	0.116	0.1
Epinephelus aeneus	11	1					20.69	0.087	0.174	0.048	0.042
Illex coindetii	27	2					50	0.085		0.006	0.254
Sphoeroides pachgaster	5	2					12.07	0.083			0.253
Rhinobatos albomaculatus	8	2					17.24	0.08	0.189	0.029	0.025
Merluccius polli	1		1				3.45	0.071		0.003	0.214
Zenopsis conchifer	7	1					13.79	0.067			0.204
Pseudolithus typus	4	1					8.62	0.064	0.181	0.014	
Bembrops heterurus	19	1					34.48	0.059	0.028	0.04	0.111
Pomadasys perotaei	2	1					5.17	0.059	0.179		
Fistularia petimba	22						37.93	0.058	0.021	0.134	0.014
Octopus vulgaris	13						22.41	0.054	0.002	0.09	0.068
Pomadasys jubelini	11						18.97	0.052	0.146	0.011	
Alectis alexandrinus	10						17.24	0.05	0.133	0.019	
Lutjanus goreensis		1					1.72	0.047	0.143		
Saurida brasiliensis	21	1					37.93	0.047		0.082	0.056
Drepane africana	4	1					8.62	0.045	0.137		
Pseudolithus senegalensis	5	1					10.34	0.04	0.121		
Torpedo torpedo	8	1					15.52	0.035	0.009	0.093	0.001
Ariomma bondi	9						15.52	0.035			0.107
Scomber japonicus	14						24.14	0.035		0.016	0.09
Parapenaeus longirostris	8	1					15.52	0.035		0.002	0.104
Penaeus notialis	10						17.24	0.032	0.099		
Pontinus kuhlii	1	1					3.45	0.028			0.086
Torpedo torpedo few spots	1	1					3.45	0.028		0.08	0.002
Sphyræna sphyraena	14						24.14	0.027	0.037	0.044	
Chlorophthalmus atlanticus	2	1					5.17	0.024			0.073
Dasyatis margarita		1					1.72	0.023	0.072		
Balistes capricus	10						17.24	0.023	0.063	0.006	
Balistes punctatus		1					1.72	0.022	0.067		
Priacanthus arenatus	3	1					6.9	0.022		0.001	0.065
Seriola carpenteri	5						8.62	0.02	0.006	0.053	
Ephippion guttifer	2						3.45	0.02	0.061		
Pontinus accraensis	5						8.62	0.02			0.06
Cynoponticus ferox	5						8.62	0.019	0.013	0.022	0.02
Uranoscopus polli	10						17.24	0.018	0.015	0.01	0.028
Eucinostomus melanopterus	8						13.79	0.017	0.053		
Dicologlossa cuneata	10						17.24	0.015	0.03	0.015	0.001
Sardinella maderensis	10						17.24	0.015	0.041	0.005	
Scomberomorus tritor	2						3.45	0.015	0.045		
BIVALVES	6						10.34	0.014	0.002		0.042
Chaetodon hoefleri	14						24.14	0.013		0.028	0.01
Pagrus africanus	1						1.72	0.011	0.034		
GOBIIDAE	6						10.34	0.011	0.011	0.02	0.001
Dasyatis marmorata	3						5.17	0.01	0.01	0.02	
Parapandalus narval	2						3.45				
Other fish								0.237	0.398	0.148	0.168
Sum all species								27.397	25.036	24.652	32.648
Sum SNAPPERS									0.053	0.161	
Sum GROUPERS								0.092	0.176	0.056	0.045
Sum GRUNTS								9.208	11.806	11.773	3.911
Sum CROAKERS								0.495	0.338	0.219	0.941
Sum PANDORAS								3.458	1.73	2.909	5.765
Sum SHARKS								0.016	0.009	0.025	0.013
Sum BATOID FISHES								0.393	0.591	0.454	0.131
Sum CEPHALOPODS								0.28	0.105	0.317	0.415
Numbers of stations included in analysis								58	19	20	19

## Congo River - Ponta das Palmerinhas slope (200-500 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci-	Mean dence t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower lii Kg/nm								200-300m	300-400m	400-500m	
	>0	10	30	100	300	1000						
Synagrops microlepis	4	4	4	3		1	66.67	8.996	22.263	1.721	0.009	
Chlorophthalmus atlanticus	8	2	6	3			79.17	4.379	5.029	6.626	0.036	
Merluccius polli	10	6	4	3			95.83	3.018	2.621	4.086	2.011	
Nematocarcinus africanus	2	2	5				37.5	1.328		0.824	4.076	
Pterothrissus bellocci	8	3		1			50	0.893	2.252	0.128		
Bembrops heterurus	7	1	1	1			41.67	0.747	1.745	0.248		
Parapenaeus longirostris	15	3	1				79.17	0.7	1.33	0.527	0.015	
Dentex angolensis	2	5	1				33.33	0.567	1.513			
Zenopsis conchifer	9	1	2				50	0.519	1.283	0.1		
Illex coindetii	15	3					75	0.412	0.722	0.3	0.114	
Brotula barbata	5	3					33.33	0.329	0.878			
Chaunax pictus	3	1	1				20.83	0.302		0.586	0.33	
Chaunax sp.	1	2	1				16.67	0.288		0.169	0.899	
Gadella maraldi	2	4					25	0.264	0.002	0.317	0.58	
Hoplostethus cadenati	3	1	1				20.83	0.26		0.019	1.013	
Benthodesmus tenuis	9	1					41.67	0.241		0.521	0.182	
Hymenocephalus italicus	11		1				50	0.235	0.001	0.175	0.674	
Laemonema laureysi	5	2					29.17	0.226		0.335	0.4	
Munidopsis sp.	5	1					25	0.214	0.4	0.17		
Pontinus kuhlii	1	2					12.5	0.184	0.248	0.244		
Trichiurus lepturus	8	2					41.67	0.182	0.363	0.116	0.009	
Pontinus accraensis	10	1					45.83	0.182	0.095	0.391		
Gephyroberyx darwini	4	2					25	0.181	0.175	0.308		
Lamprogrammus exutus	2		1				12.5	0.174			0.695	
Heart urchin			1				4.17	0.156		0.415		
Dibranchius atlanticus	12						50	0.137	0.017	0.141	0.31	
Aristeus varidens	7	1					33.33	0.126		0.025	0.465	
Coelorinchus caelorhincus	13						54.17	0.121	0.121	0.176	0.038	
Bembrops greyi	2	1					12.5	0.115	0.213	0.095		
Yarella blackfordi	6						25	0.109		0.002	0.434	
Chaceon maritae	6	1					29.17	0.096		0.008	0.37	
Lophiodes kempfi	8						33.33	0.095	0.032	0.189	0.049	
Laemonema sp.			1				4.17	0.086		0.229		
Malacocephalus occidentalis	10						41.67	0.086	0.068	0.132	0.043	
Laemonema globiceps			1				4.17	0.085		0.228		
Gadella imberbis	9						37.5	0.077		0.068	0.206	
Lamprogrammus niger			1				4.17	0.076			0.306	
Torpedo nobiliana			1				4.17	0.071		0.188		
Raja miraletus			1				4.17	0.068	0.18			
Stereomastis sp.	6						25	0.067		0.006	0.26	
Bathyrcongus vicinus	10						41.67	0.065	0.001	0.124	0.072	
Parasudis fraserbrunneri	3						12.5	0.063	0.146	0.023		
Stomias boa boa	5						20.83	0.057		0.003	0.221	
Coelorinchus polli			1				4.17	0.052	0.138			
Synagrops bellus	4						16.67	0.048	0.025	0.104		
RHINOCHIMAERIDAE			1				4.17	0.047		0.126		
Malacocephalus laevis	5						20.83	0.047		0.053	0.107	
Lophius vaillanti	6						25	0.046	0.002	0.103	0.026	
Talismania sp.			1				4.17	0.046			0.183	
Dentex macropthalmus	2						8.33	0.042	0.113			
Halosaurus ovenii	9						37.5	0.041		0.007	0.152	
Nezumia aequalis	8						33.33	0.036		0.029	0.098	
Chascanopsetta lugubris	5						20.83	0.034	0.066	0.025		
MYCTOPHIDAE	6						25	0.032	0.009	0.077	0.001	
Epigonus telescopus	3						12.5	0.031	0.002	0.082		
Bathynectes piperitus	10						41.67	0.031	0.011	0.059	0.02	
Mystriophis rostellatus	2						8.33	0.031		0.074	0.014	
Dicrolene intronigra	4						16.67	0.031		0.017	0.097	
Lithodes ferox	2						8.33	0.03		0.071	0.013	
Scyliorhinus cervigoni	2						8.33	0.028		0.074		
Sigmops bathyphilus	1						4.17	0.025			0.101	
Dicologlossa cuneata	3						12.5	0.025	0.067			
Stereomastis sculpta	1						4.17	0.021			0.085	
Conger conger	3						12.5	0.021	0.008	0.047		
Xenodermichthys copei	3						12.5	0.018			0.073	
Peristedion cataphractum	11						45.83	0.017	0.037	0.008	0.001	
Hermits	1						4.17	0.017		0.045		
Uranoscopus polli	3						12.5	0.016	0.043			
Aequorea forskalea	1						4.17	0.015		0.039		
Plesiopenaeus edwardsianus	4						16.67	0.014			0.058	
Syacium micrurum	3						12.5	0.014	0.036			
Monolene microstoma	1						4.17	0.013	0.035			
Bristle worms (straws)	2						8.33	0.013			0.052	
Myxine sp.	1						4.17	0.013			0.052	
Zameus (Scymnodon) squamulosus	3						12.5	0.012		0.004	0.043	
Bassanago albescens	2						8.33	0.012	0.028	0.004		
Triplophos hemingi	5						20.83	0.011		0.003	0.041	
Calappa pelii	3						12.5	0.011	0.025	0.004		
URCHINS	2						8.33	0.011	0.014	0.015		
Citharus linguatula	5						20.83	0.01	0.028			
Calappa rubroguttata	1						4.17	0.01	0.027			
Priacanthus arenatus	1						4.17	0.01			0.04	
Solenocera africana	4						16.67	0.002	0.002	0.003		
Other fish							0.18	0.187	0.126	0.251		
Sum all species							27.741	42.6	21.161	15.325		
Sum SNAPPERS		JOBFISHES										
Sum GROUPERS		SEABASSES										
Sum GRUNTS		SWEETLIPS										
Sum CROAKERS		DRUMS WEAKF. KOB								0.001	0.004	
Sum PANDORAS		PORGIE SEABREAMS								0.61	1.626	
Sum SHARKS		CHIMAERAS						0.11	0.013	0.204	0.116	
Sum BATOID FISHES		RAYS						0.142	0.188	0.191		
Sum CEPHALOPODS								0.439	0.743	0.323	0.157	
Numbers of stations included in analysis: total and by depth strata								24	9	9	6	

### Congo River - Ponta das Palmerinhas slope (500-800 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci-	Mean dence t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower lii Kg/nm							500-600m	600-700m	700-800m	
	>0	10	30	100	300						1000
Nematocarcinus africanus	3	2	6	1		75	3.435	4.477	3.467	0.941	
Yarrella blackfordi	6	6	3	1		100	3.356	1.095	6.221	2.897	
Hoplostethus cadenati	10	3		1		87.5	1.132	0.262	2.567	0.294	
Chaceon maritae	13	1	1			93.75	0.957	0.293	0.892	2.636	
Lamprogrammus exutus	6	6				75	0.956	1.102	1.107	0.312	
Stomias boa boa	11	3				87.5	0.624	0.979	0.489	0.066	
Stereomastis sp.	11	3				87.5	0.609	0.27	0.8	1.018	
Lophiodes kempfi	6	1	1			50	0.525	1.023	0.196	0.021	
Hermits			1			6.25	0.465			2.481	
HOLUTHUROIDEA		1	1			12.5	0.463		0.325	1.818	
Aristeus varidens	15	1				100	0.385	0.367	0.445	0.306	
Plesiopenaeus edwardsianus	9		1			62.5	0.318	0.689	0.028	0.03	
Nezumia aequalis	5	2				43.75	0.299	0.026	0.585	0.367	
Anemones	1		1			12.5	0.239			1.273	
Malacocephalus occidentalis	1	3				25	0.237		0.396	0.474	
Triplophos hemingi	12					75	0.221	0.352	0.165	0.024	
Lamprogrammus niger	1	1				12.5	0.185	0.413		0.024	
Bathyroconger vicinus	14					87.5	0.16	0.023	0.31	0.179	
JELLYFISH		1				6.25	0.137		0.365		
Gadella imberbis	8					50	0.122	0.156	0.143		
ANTHOZOA (Sea anemones)	3					18.75	0.119			0.633	
Xenodermichthys copei	11					68.75	0.114	0.088	0.135	0.133	
Benthodesmus tenuis	9					56.25	0.106	0.19	0.051	0.021	
Nezumia duodecim			1			6.25	0.087		0.232		
Gonostoma denudatum			1			6.25	0.082		0.22		
Bristle worms (straws)	1	1				12.5	0.082	0.025	0.189		
Chaunax pictus	3	1				25	0.079	0.179	0.001		
Dicrolene intronigra	5					31.25	0.078	0.102	0.028	0.122	
Illex coindetii	7					43.75	0.067	0.142	0.012		
Centroprorus granulosus	2					12.5	0.062	0.143			
Merluccius polli	7					43.75	0.057	0.067	0.04	0.067	
Dibranchius atlanticus	12					75	0.055	0.024	0.079	0.083	
Centroprorus squamosus	2					12.5	0.053	0.02		0.236	
Hymenocephalus italicus	2					12.5	0.046	0.105			
Halosaurus ovenii	12					75	0.044	0.039	0.035	0.074	
Laemonema laureysi	3					18.75	0.042	0.088	0.01		
Benthodesmus sp.	2					12.5	0.04	0.081	0.013		
Ommastrephes bartrami	2					12.5	0.038	0.038	0.058		
Opisthoteuthis agassizi	4					25	0.037	0.046	0.046		
Talismania bifurcata	1					6.25	0.034			0.182	
Small shrimps	1					6.25	0.034		0.09		
Deania profundorum	2					12.5	0.031		0.072	0.02	
Malacocephalus laevis	6					37.5	0.03	0.06	0.01	0.002	
Todaropsis eblanae	3					18.75	0.026	0.038	0.011	0.027	
Hoplostethus atlanticus	2					12.5	0.024	0.022		0.079	
Plesionika edwardsii	2					12.5	0.023	0.052	0.001		
Torpedo nobiliana	1					6.25	0.021			0.114	
Talismania sp.	4					25	0.021		0.024	0.064	
Gadella maraldi	2					12.5	0.021	0.047			
Ariomma bondi	2					12.5	0.02	0.015	0.035		
Etmopterus lucifer	1					6.25	0.019		0.051		
Melanonus zugmayeri	3					18.75	0.019		0.018	0.064	
Zameus (Scymnodon) squamulosus	3					18.75	0.018	0.01	0.013	0.045	
MYCTOPHIDAE	5					31.25	0.017	0.015	0.027		
Talismania longifilis	2					12.5	0.015		0.028	0.026	
Triplophos sp.	2					12.5	0.015		0.014	0.051	
Stereomastis sculpta	1					6.25	0.015	0.034			
Chaunax sp.	2					12.5	0.012	0.024	0.005		
Himantolophus groenlandicus	2					12.5	0.012	0.028			
Ectreposebastes imus	4					25	0.012	0.004	0.028		
Unidentified demersal fish	1					6.25	0.011		0.029		
Squalus uyato	1					6.25	0.01	0.024			
Haliphion atlanticus	1					6.25	0.01	0.024			
SHRIMPS	1					6.25	0.008			0.041	
Glyphus marsupialis	3					18.75	0.005		0.005	0.016	
Other fish							0.15	0.096	0.188	0.199	
Sum all species							16.747	13.396	20.299	17.462	
Sum SNAPPERS											
Sum GROUPERS											
Sum GRUNTS											
Sum CROAKERS											
Sum PANDORAS											
Sum SHARKS							0.206	0.217	0.136	0.318	
Sum BATOID FISHES							0.025		0.01	0.114	
Sum CEPHALOPODS							0.195	0.303	0.146	0.039	
Numbers of stations included in analysis: total and by depth strata							16	7	6	3	

Ponta das Palmerinhas - Benguela. Shelf (20-200 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm <sup>2</sup>	depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm								Mean densities by bottom		
	>0	10	30	100	300	1000			0-50m	50-100m	100-200m
Synagrops microlepis	2		1	2	1	3	19.57	18.552		1.649	58.835
Brachydeuterus auritus	10	7	2	3	1		50	2.602	1.514	5.373	0.127
Sardinella aurita	13	1	2		2		39.13	2.057	2.793	0.358	3.504
Dentex macrophthalmus	8	1	1	2	1		28.26	1.769		0.866	4.7
Trachurus trecae	18	6	3	3			65.22	1.746	0.068	2.994	1.819
Scomber japonicus	10	1	2		1		30.43	1.003		0.13	3.13
Pomadasys incisus	6	1	4	1			26.09	0.981	0.393	2.2	
Dentex angolensis	14	7	1	1			50	0.803		0.206	2.372
Trichiurus lepturus	16	6	5				58.7	0.761	0.885	0.731	0.675
Pagellus bellottii	21	6	3				65.22	0.685	0.124	1.419	0.302
Rhinobatos albomaculatus	10	2		1			28.26	0.679	0.297	1.503	
Raja miraletus	28	4	2				73.91	0.593	0.298	0.859	0.545
Lagocephalus laevigatus	17	7	2				56.52	0.562	0.604	0.963	0.004
Trigla lyra	15	8	1				52.17	0.547	0.004	0.692	0.904
Umbrina canariensis	12	6	2				43.48	0.525	0.011	0.711	0.801
Bembrops heterurus	17	1		1			41.3	0.383	0.032	0.077	1.128
Citharus linguatula	30	3	1				73.91	0.351	0.018	0.666	0.278
Sphoeroides pachgaster	4	6	1				23.91	0.316		0.127	0.876
Dentex barnardi	18	5					50	0.291	0.026	0.503	0.283
Brotula barbata	12	1	1				30.43	0.27	0.019	0.084	0.762
Pterothrissus belloci	9	4					28.26	0.256		0.06	0.765
Uranoscopus polli	5			1			13.04	0.249	0.022	0.01	0.782
Sepia orbignyana	28	4					69.57	0.247	0.044	0.367	0.296
Pomadasys jubelini	4	3	1				17.39	0.246	0.387	0.328	
Pteroscion peli	3	2	1				13.04	0.218	0.571	0.114	
Pseudupeneus prayensis	20	1	1				47.83	0.209	0.021	0.519	
Torpedo torpedo	11	1	1				28.26	0.208	0.002	0.235	0.379
Chloroscombrus chrysurus	17	3					43.48	0.204	0.52	0.116	0.003
Alectis alexandrinus	7	2	1				21.74	0.204	0.67		
Octopus vulgaris	18	3					45.65	0.201	0.091	0.22	0.286
Selene dorsalis	24	2					56.52	0.172	0.243	0.205	0.059
Galeoides decadactylus	12	1					28.26	0.155	0.335	0.134	
Atractoscion aequidens	5	1	1				15.22	0.153		0.362	0.036
Pomadasys perotaei	6	3					19.57	0.144	0.196	0.216	
Sardinella maderensis	10	1	1				26.09	0.144	0.467	0.005	
Zeus faber	16						34.78	0.138		0.114	0.306
Pseudotolithus senegalensis	8	2					21.74	0.132	0.233	0.155	
Zenopsis conchifer	7	2					19.57	0.131		0.068	0.345
Balistes capriscus	4	2					13.04	0.131	0.408	0.018	
Dasyatis marmorata	2		1				6.52	0.128	0.003	0.325	
Sphoeroides lobatus	1		1				4.35	0.128			0.42
Gymnura micrura	5	2					15.22	0.122	0.245	0.122	
Pontinus accraensis	6	2					17.39	0.108		0.01	0.341
Dicologlossa cuneata	14		1				32.61	0.106	0.304	0.033	0.002
Ephippion guttifer	10	1					23.91	0.104	0.337	0.005	
Sphoeroides spengleri			1				2.17	0.089			0.292
Illex coindetii	15	1					34.78	0.087	0.001	0.011	0.271
Ilisha africana	4	2					13.04	0.085	0.281		
Lithognathus mormyrus		2					4.35	0.079	0.12	0.11	
Scorpaena normani	10	1					23.91	0.073	0.004	0.174	0.013
Engraulis encrasicolus	1		1				4.35	0.073	0.239	0.001	
Uranoscopus cadenati	2	2					8.7	0.063		0.072	0.116
Pontinus kuhlii		1					2.17	0.063			0.207
Uranoscopus albesca		1					2.17	0.061			0.202
Caranx senegalus	1	1					4.35	0.059	0.193		
Torpedo marmorata	5	1					13.04	0.056	0.128	0.043	
Spicara alta	3	1					8.7	0.055			0.182
Scorpaena stephanica	8	1					19.57	0.054	0.003	0.01	0.16
Epinephelus aeneus	7	1					17.39	0.054	0.056	0.094	
Dentex congoensis	3	1					8.7	0.053		0.012	0.158
Anthias anthias		1					2.17	0.051			0.169
Sea urchin	2	1					6.52	0.051		0.129	
Saurida brasiliensis	18	1					41.3	0.049		0.029	0.124
Sphyrna guachancho	7						15.22	0.043	0.141	0.002	
Chelidonichthys gabonensis	13						28.26	0.041	0.004	0.039	0.082
Gephyroberyx darwini	1	1					4.35	0.039			0.129
Grammolites gruvelli	4	1					10.87	0.033		0.084	
Stromateus fiatola	6						13.04	0.033	0.057		0.05
Serranus accraensis	7						15.22	0.031		0.079	
Drepane africana	4						8.7	0.031	0.1		
Alloteuthis africana	18						39.13	0.03	0.005	0.071	0.002
Sepia officinalis	7						15.22	0.029	0.025	0.014	0.053
Syacium micrurum	12						26.09	0.027	0.023		0.066

Ponta das Palmerinhas - Benguela. Shelf (20-200 m) cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm <sup>2</sup>	depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm								Mean densities by bottom		
	>0	10	30	100	300	1000			0-50m	50-100m	100-200m
BIVALVES	11						23.91	0.026	0.004	0.013	0.066
Chaetodon hoeferi	9						19.57	0.026		0.05	0.021
Dasyatis margarita	2						4.35	0.024	0.079		
Merluccius polli	4						8.7	0.024			0.078
Arnoglossus imperialis	5						10.87	0.024		0.055	0.008
Erythrocles monodi	1	1					4.35	0.022			0.074
Loligo vulgaris	2						4.35	0.022			0.071
Argyrosomus hololepidotus	5						10.87	0.02	0.036	0.024	
Arius parkii	6						13.04	0.02	0.054	0.009	
Fistularia petimba	11						23.91	0.019	0.004	0.033	0.018
Caranx rhonchus	4						8.7	0.019	0.064		
Eucinostomus melanopterus	7						15.22	0.018	0.06		
Bembrops caudimacula	1						2.17	0.018			0.059
Squatina aculeata	1						2.17	0.017		0.043	
Parapenaeus longirostris	5						10.87	0.016		0.004	0.048
Raja clavata	2						4.35	0.014			0.045
Pomatomus saltatrix	1						2.17	0.014		0.035	
Epinephelus goreensis	2						4.35	0.012		0.002	0.035
Peristedion cataphractum	1						2.17	0.011			0.035
Penaeus notialis	7						15.22	0.011	0.034	0.001	
Chlorophthalmus atlanticus	4						8.7	0.01			0.034
Parapandalus narval	1						2.17			0.001	
Penaeus kerathurus	1						2.17				
Other fish							0.166	0.225		0.124	0.159
Sum all species							41.758	14.12		27.218	88.091
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES							0.154	0.069		0.181	0.204
Sum GRUNTS, SWEETLIPS							3.979	2.498		8.127	0.127
Sum CROAKERS, DRUMS, WEAKE., KOB							1.058	0.851		1.374	0.857
Sum PANDORAS, PORGIES, SEABREAMS,							3.687	0.284		3.12	7.817
Sum SHARKS, CHIMAERAS							0.022	0.016		0.043	
Sum BATOID FISHES, RAYS							1.823	1.053		3.088	0.969
Sum CEPHALOPODS							0.617	0.166		0.683	0.983
Numbers of stations included in analysis, total and by depth strata							46	14		18	14

Ponta das Palmerinhas - Benguela. Slope (200-500 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	depth strata t/nm <sup>2</sup>			
	Lower limits, Kg/nm							Mean densities by bottom			
	>0	10	30	100	300			200-300m	300-400m	400-500m	
Chlorophthalmus atlanticus	12	1		3	3	95	11.939	24.911	5.611	0.043	
Merluccius polli	5	2	6	4	2	95	8.278	14.316	6.324	1.353	
Synagrops microlepis	7	1	2	3	2	75	6.87	16.931	0.262	0.026	
Nematocarcinus africanus		5	3	3		55	3.333		3.953	7.797	
Zenopsis conchifer	3	1	4	1		45	1.933	4.71	0.139		
Laemonema laureysi	5	4	3			60	1.363	0.48	2.42	1.295	
Bembrops heterurus		2	2	1		25	1.223	3.058			
Brotula barbata		6	2			40	1.163	2.907			
Pterothrissus belloci	6	2	3			55	1.096	2.682	0.067		
Lamprogrammus exutus	2	3	1			30	0.897		0.259	3.226	
Parapenaeus longirostris	10	2	1			65	0.8	1.949	0.058		
Chaceon maritae	9	5	1			75	0.743	0.238	0.55	1.819	
Hymenocephalus italicus	8	2	1			55	0.593		1.595	0.138	
Aristeus varidens	12	4				80	0.576		0.745	1.259	
Chaunax pictus	6	4				50	0.516		1.051	0.592	
Hoplostethus cadenati	5	2	1			40	0.514	0.001	1.016	0.634	
Lophiodes kempii	6		1			35	0.468	0.088	1.143	0.131	
Dibranchius atlanticus	5	3	1			45	0.443	0.018	0.306	1.313	
Gadella maraldi	2	2	1			25	0.388		0.982	0.176	
Chaunax sp.			1			5	0.366			1.465	
Yarrella blackfordi	5	1	1			35	0.341		0.259	1.001	
Pontinus accraensis	4		1			25	0.295	0.647	0.102		
Raja clavata	1	1	1			15	0.273	0.193	0.559		
Dentex macrophthalmus	2	2				20	0.225	0.563			
Coelorinchus caelorhincus	5	2				35	0.205	0.486	0.021	0.012	
Dentex angolensis	1	2				15	0.193	0.482			
Hoplostethus atlanticus	2		1			15	0.17		0.047	0.615	
Lagocephalus laevigatus	1	1				10	0.148	0.344	0.031		
Nezumia aequalis	7					35	0.129	0.177	0.077	0.124	
Stomias boa boa	5	1				30	0.128		0.24	0.178	
Malacocephalus laevis	7					35	0.127	0.165	0.084	0.125	
Gadella imberbis	10					50	0.126	0.026	0.257	0.105	
Gephyroberyx darwini	1	2				15	0.125	0.167	0.167		
Illex coindetii	6					30	0.122	0.277	0.032		
Holothuria sp.		1				5	0.116			0.464	
Etmopterus polli	8					40	0.107		0.267	0.055	
Plesiopenaeus edwardsianus	6	1				35	0.106		0.198	0.146	
Bembrops greyi		1				5	0.104	0.26			
BIVALVES	3					15	0.102	0.023		0.372	
Scorpaena normani	1	1				10	0.084	0.065		0.232	
Bathyrcongus vicinus	7					35	0.078	0.027	0.131	0.084	
MYCTOPHIDAE	13					65	0.072	0.109	0.072	0.012	
CHIROSTYLIDAE	2					10	0.066		0.19		
Pontinus kuhlii	2					10	0.063	0.055	0.118		
Halosaurus ovenii	8					40	0.059		0.024	0.205	
Raja sp.	1	1				10	0.058	0.144	0.001		
Malacocephalus occidentalis	8					40	0.057	0.059	0.085	0.015	
Bembrops caudimacula	2					10	0.054	0.136			
Todaropsis eblanae	2					10	0.046	0.016		0.157	
Triplophos hemingi	5					25	0.042		0.053	0.094	
Syacium micrurum	5					25	0.042	0.105			
Monolene microstoma	1					5	0.037	0.091			
Zameus (Scymnodon) squamulosus	4					20	0.035			0.141	
Benthodesmus tenuis	5					25	0.029		0.002	0.115	
Laemonema sp.	1					5	0.028			0.111	
Epigonus telescopus	4					20	0.027	0.066			
Acanthocarpus brevipinnis	3					15	0.026	0.06	0.006		
Trichiurus lepturus	4					20	0.024	0.058	0.001		
Xenodermichthys copei	3					15	0.02		0.001	0.078	
Cynoponticus ferox	2					10	0.02	0.049			
Loligo vulgaris	2					10	0.019	0.027	0.023		
Stomias affinis	1					5	0.015			0.062	
Bathynectes piperitus	4					20	0.015		0.042	0.002	
Dicrolene intronigra	1					5	0.014			0.057	
Deania profundorum	1					5	0.014			0.056	
Calappa sp.	3					15	0.014	0.034			
Zeus faber	1					5	0.013	0.034			
Lophiodes caularis	1					5	0.012			0.05	
Stereomastix sp.	5					25	0.012	0.007	0.003	0.032	
Centrophorus granulosus	1					5	0.011			0.045	
Bassanago albescens	1					5	0.01		0.029		
Parapandalus narval	1					5	0.008	0.024			
Glyphus marsupialis	1					5	0.003			0.012	
Solenocera africana	4					20	0.002		0.006		
Acanthephyra sp.	1					5	0.001		0.002		
Other fish							0.142	0.124	0.191	0.101	
Sum all species							47.915	77.365	29.826	26.12	
Sum SNAPPERS, JOBFINCHES											
Sum GROUPERS, SEABASSES											
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAKEFS., KOBS							0.006	0.016			
Sum PANDORAS, PORGIES, SEABREAMS,							0.418	1.045			
Sum SHARKS, CHIMAERAS							0.189		0.305	0.33	
Sum BATOID FISHES, RAYS							0.331	0.338	0.56		
Sum CEPHALOPODS							0.193	0.326	0.065	0.157	
Numbers of stations included in analysis, total and by depth strata							20	8	7	5	

## Ponta das Palmerinhas - Benguela. Slope (500-800 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>		
	Lower limits, Kg/nm							500-600m	600-700m	700-800m
	>0	10	30	100	300					
Nematocarcinus africanus	1	6	3	2		80	3.668	5.856	1.64	0.54
Yarrella blackfordi	7	4	4			100	2.231	0.364	4.527	4.15
Chaceon maritae	12	4	2			120	1.587	1.563	2.025	1.069
Hoplostethus cadenati	4	2	2	1		60	1.534	0.314	1.487	4.853
Lamprogrammus exutus	7	6	1			93.33	1.252	1.221	1.616	0.847
Aristeus varidens	15	3				120	1.053	1.191	1.218	0.465
Hoplostethus atlanticus	4	1	1			40	0.695	1.294		0.023
Nezumia aequalis	8	3				73.33	0.485	0.017	0.788	1.327
Triplophos hemingi	10	3				86.67	0.467	0.2	0.858	0.658
Laemonema laureysi	3		1			26.67	0.427	0.768	0.065	
Stomias boa boa	13	1				93.33	0.347	0.219	0.502	0.482
Holothuria sp.		2				13.33	0.308			1.539
Stereomastis sp.	14	1				100	0.279	0.186	0.306	0.489
Talismania sp.	6	1				46.67	0.255		0.681	0.365
Lamprogrammus niger		1				6.67	0.193			0.967
Nematopalaemon tenuipes		1				6.67	0.191	0.359		
Illex coindetii	6	1				46.67	0.189	0.341	0.027	
Dibranchius atlanticus	10					66.67	0.164	0.097	0.188	0.31
Chaunax pictus	4	1				33.33	0.147	0.276		
Merluccius polli	9					60	0.145	0.177	0.134	0.072
Bathyroconger vicinus	12					80	0.141	0.06	0.358	0.066
Plesiopenaeus edwardsianus	12					80	0.121	0.089	0.213	0.082
Rajella barnardi	4	1				33.33	0.107	0.014	0.261	0.151
Neoharriotta pinnata	1	1				13.33	0.099	0.185		
Lophiodes kempi	5					33.33	0.087	0.141		0.058
Gadella imberbis	6					40	0.08	0.124	0.051	
ALEPOCEPHALIDAE		1				6.67	0.078		0.294	
Gadella maraldi	5					33.33	0.073	0.132	0.01	
Etmopterus polli	5					33.33	0.071	0.023	0.221	
Benthodesmus tenuis	10					66.67	0.062	0.031	0.169	0.003
Chlorophthalmus atlanticus	5					33.33	0.058	0.109		
Xenodermichthys copei	13					86.67	0.054	0.013	0.102	0.098
Halosaurus ovenii	9					60	0.052	0.035	0.09	0.049
Zameus (Scymnodon) squamulosus	8					53.33	0.044	0.017	0.1	0.043
Conger conger	3					20	0.041	0.047		0.078
Coloconger sp.	1					6.67	0.04			0.2
Todarodes angolensis	2					13.33	0.037	0.054		0.041
Coelorinchus caelorrhincus	3					20	0.037	0.038	0.062	
Lophius vaillanti	1					6.67	0.03		0.114	
Hymenocephalus italicus	4					26.67	0.028	0.053		
BRACHIOTEUTHIDAE	1					6.67	0.024			0.118
J E L L Y F I S H	1					6.67	0.022		0.082	
RAJIDAE	1					6.67	0.021			0.106
Todaropsis eblanae	2					13.33	0.02	0.002	0.071	
Dicrolene intronigra	5					33.33	0.015	0.014	0.011	0.022
Melanonus sp.	1					6.67	0.014		0.054	
MYCTOPHIDAE	9					60	0.014	0.025	0.002	0.002
OMMASTREPHIDAE	1					6.67	0.014		0.051	
Synaphobranchus affinis	2					13.33	0.012		0.047	
Glyphus marsupialis	1					6.67	0.007	0.013		
Other fish							0.084	0.067	0.076	0.137
Sum all species							17.205	15.73	18.501	19.41
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKF., KOBES										
Sum PANDORAS, PORGIES, SEABREAMS,										
Sum SHARKS, CHIMAERAS							0.214	0.226	0.321	0.043
Sum BATOID FISHES, RAYS							0.128	0.014	0.261	0.257
Sum CEPHALOPODS							0.292	0.397	0.149	0.201
Numbers of stations included in analysis, total and by depth strata							15	8	4	3

## Tombua - Cunene. Shelf (20-200 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower limits, Kg/nm								0-50m	50-100m	100-200m	
	>0	10	30	100	300	1000						
Trachurus trecae	1	2	1	8	8	1	100	39.478	38.741	48.462	26.281	
Merluccius capensis	1	2	2	5	2		57.14	8.568	2.014	13.674	10.887	
Dentex macrophthalmus	4	1	3	5	1		66.67	7.723	1.557	5.931	20.457	
Pagellus bellottii	6	3	2	1	2		66.67	5.608	8.808	5.855	0.092	
Atractoscion aequidens	4	5	3	2			66.67	2.453	2.296	3.064	1.727	
Chelidonichthys capensis	6	4	7				80.95	2.01	1.665	2.63	1.568	
JELLYFISH		1			1		9.52	1.571	3.967	0.156		
Loligo vulgaris	5	7	3				71.43	1.407	2.119	0.869	1.13	
Pterothrissus belloci	8	1	1	1			52.38	1.113	0.047	0.289	4.135	
Spondyliosoma cantharus	8	1		1			47.62	1.087	0.113	2.674	0.105	
Sardinella aurita	4	1		1			28.57	1.066	0.173	2.625		
Mustelus mustelus	5	5	1				52.38	0.977	1.042	1.522		
Sepia orbignyana	5	4	1				47.62	0.85	0.396	1.584	0.4	
Gymnura micrura				1			4.76	0.82		2.152		
Pomadasys jubelini	2			1			14.29	0.779	0.041	2.003		
Raja miraletus	5	6					52.38	0.655	0.672	0.801	0.394	
Dentex barnardi	1	4	1				28.57	0.58	0.428	1.068	0.04	
Pomadasys incisus				1			4.76	0.57		1.497		
Sepia officinalis		1	1				9.52	0.524	1.377			
Pomatotus saltatrix	2	2	1				23.81	0.476	0.595	0.654		
Dasyatis marmorata	1	1	1				14.29	0.428	0.926	0.199		
Mustelus sp.			1				4.76	0.41	1.076			
Argyrosomus hololepidotus	3	1	1				23.81	0.377	0.797	0.193		
Myliobatis aquila	1	1	1				14.29	0.318		0.834		
Arius parkii	2	2					19.05	0.276	0.417	0.306		
Trachurus capensis	1		1				9.52	0.244			1.024	
Trigla lyra	4		1				23.81	0.222		0.431	0.243	
Squalus megalops	5	2					33.33	0.211	0.053	0.039	0.74	
JELLYFISH			1				4.76	0.181	0.475			
Lithognathus mormyrus	4						19.05	0.17	0.339	0.107		
Squalus blainville	1	1					9.52	0.148		0.389		
Dicologlossa cuneata	4	1					23.81	0.145	0.354	0.02	0.008	
Sarda sarda	1	1					9.52	0.131	0.345			
Synagrops microlepis	2	1					14.29	0.126	0.049	0.097	0.298	
Coelorinchus caelorhincus		1					4.76	0.109	0.287			
Zeus faber	7						33.33	0.095		0.04	0.337	
Scomber japonicus	2	1					14.29	0.09	0.14		0.155	
Selene dorsalis		1					4.76	0.085		0.222		
Pegusa lascaris	3						14.29	0.067	0.026	0.152		
Squatina oculata		1					4.76	0.048		0.127		
Umbrina canariensis	5						23.81	0.042	0.012	0.091	0.012	
Arius heudelotii**	1						4.76	0.042		0.109		
Dentex gibbosus	1						4.76	0.041	0.107			
Aluterus heudelotii	1						4.76	0.038	0.101			
GOBIIDAE	5						23.81	0.031	0.011	0.068	0.003	
Balistes capricus	1						4.76	0.031	0.081			
Squatina aculeata	1						4.76	0.031		0.08		
Narke capensis	1						4.76	0.029	0.075			
Brotula barbata	1						4.76	0.023		0.061		
Rhinobatos albomaculatus	1						4.76	0.022	0.057			
Illex coindetii	1						4.76	0.021			0.089	
Callorhynchus capensis	1						4.76	0.02	0.053			
Dentex canariensis	1						4.76	0.018	0.048			
Alloteuthis africana	2						9.52	0.018	0.006	0.04		
Starfish	2						9.52	0.015	0.04			
Sphoeroides pachgaster	1						4.76	0.014		0.036		
Fistularia petimba	1						4.76	0.013	0.034			
Other fish								0.096	0.124	0.089	0.064	
Sum all species								82.74	72.083	101.241	70.188	
Sum SNAPPERS, JOBFISHES												
Sum GROUPERS, SEABASSES												
Sum GRUNTS, SWEETLIPS								1.349	0.041	3.5		
Sum CROAKERS, DRUMS, WEAKEF., KOBES								2.871	3.104	3.347	1.739	
Sum PANDORAS, PORGIES, SEABREAMS,								15.239	11.401	15.668	20.694	
Sum SHARKS, CHIMAERAS								1.849	2.233	2.158	0.74	
Sum BATOID FISHES, RAYS								2.271	1.73	3.986	0.394	
Sum CEPHALOPODS								2.82	3.897	2.492	1.619	
Numbers of stations included in analysis, total and by depth strata								21	8	8	5	



## Tombua - Cunene. Slope (200-500 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	Lower limits, Kg/nm								200-300m	300-400m	400-500m	
	>0	10	30	100	300	1000						
<i>Chlorophthalmus atlanticus</i>	1		1	1			100	7.147	13.25	7.76	0.431	
<i>Merluccius capensis</i>			2				66.67	3.879	7.895	3.74		
<i>Pontinus accraensis</i>			2				66.67	3.675		6.788	4.235	
<i>Merluccius paradoxus</i>			1				33.33	2.272			6.817	
<i>Chaceon maritae</i>	2		1				100	1.729		0.067	5.121	
<i>Lophius vaillanti</i>	1		1				66.67	1.245		0.303	3.431	
<i>Nezumia aequalis</i>			1				33.33	1.031			3.092	
<i>Laemonema laureysi</i>		1					33.33	0.769		2.308		
<i>Gadella maraldi</i>		1					33.33	0.734			2.203	
<i>Coelorinchus caelorhincus</i>		1					33.33	0.546		1.639		
<i>Malacocephalus occidentalis</i>		1					33.33	0.503		1.51		
<i>Pontinus kuhlii</i>		1					33.33	0.375	1.126			
<i>Bathynectes piperitus</i>	1	1					66.67	0.34		1.004	0.016	
<i>Hoplostethus cadenati</i>	1						33.33	0.312			0.935	
<i>Paramola cuvieri</i>	1						33.33	0.309			0.928	
<i>Galeus polli</i>	2						66.67	0.271		0.798	0.016	
<i>Aristeus varidens</i>	1						33.33	0.248			0.745	
<i>Moroteuthis sp.</i>	2						66.67	0.233		0.264	0.435	
<i>Merluccius polli</i>	1						33.33	0.152	0.455			
<i>Epigonus telescopus</i>	1						33.33	0.115			0.346	
<i>Pterothrissus bellocci</i>	2						66.67	0.1	0.193	0.106		
<i>Neoharriotta pinnata</i>	1						33.33	0.091		0.273		
<i>Ebinania sp.</i>	1						33.33	0.09			0.271	
<i>Trachurus capensis</i>	1						33.33	0.083	0.248			
<i>Zameus (Scymnodon) squamulosus</i>	1						33.33	0.044			0.131	
<i>Malacocephalus laevis</i>	1						33.33	0.039			0.118	
PANDALIDAE	2						66.67	0.037	0.004	0.106		
<i>Scyliorhinus cervigoni</i>	1						33.33	0.033			0.098	
<i>Synagrops microlepis</i>	2						66.67	0.032		0.087	0.01	
MYCTOPHIDAE	2						66.67	0.031		0.019	0.075	
<i>Dentex macrophthalmus</i>	1						33.33	0.023	0.07			
<i>Gadella imberbis</i>	1						33.33	0.016			0.049	
CONGRIDAE	1						33.33	0.013		0.038		
<i>Acanthephyra sp.</i>	1						33.33	0.011		0.033		
<i>Nematocarcinus africanus</i>	1						33.33	0.007			0.02	
<i>Parapenaeus longirostris</i>	1						33.33	0.001	0.004			
Other fish							0.029	0.021	0.01		0.056	
Sum all species							26.566	23.266	26.853		29.578	
Sum SNAPPERS, JOBFISHES												
Sum GROUPERS, SEABASSES												
Sum GRUNTS, SWEETLIPS												
Sum CROAKERS, DRUMS, WEAKF., KOBES												
Sum PANDORAS, PORGIES, SEABREAMS,							0.023	0.07				
Sum SHARKS, CHIMAERAS							0.439		1.071	0.245		
Sum BATOID FISHES, RAYS												
Sum CEPHALOPODS							0.233		0.264	0.435		
Numbers of stations included in analysis, total and by depth strata							3	1	1	1	1	

## ANNEX IV Equations

### 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/NM<sup>2</sup>] 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:

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

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 1999<sup>1</sup>):

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

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 Cochran<sup>2</sup>, 1977)

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

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

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

<sup>2</sup> Cochran, W.G.1977. Sampling Techniques, 3<sup>rd</sup> 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	STR0000			
	MERME00				
PELAGIC	Clupeoids	Carangids	Scombrids	Hairtails	Barracudas
	ENG0000	CAR0000	SCM0000	TRI0000	SPH0000
	CLU0000				
	DUS0000				
DEMERSAL	Seabream	Snappers	Groupers	Grunts	Croakers
	SPADE00	LUT0000	SER0000	HAE0000	SCI0000
	SPADI00			(all species)	
	SPALI00			HAEP000	
	SPAPA00			(commercial	
	SPAPR00			species)	
	SPASA00				
	SPASP00				
DEEP-WATER	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africanus</i>
	SPADE00	MERME03	SHRPE31	SHRAR22	SHRNE21
	SPADI00	MERME04	(SHRPEP1)	(SHRARA1)	
	SPALI00		(SHRPEP2)	(SHRARA2)	
	SPAPA00				
	SPAPR00				
	SPASA00				
	SPASP00				

## ANNEX VI Catch rates

Families included under each group:

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

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

Cephalopods: squids and octopuses.

### Angola north

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).

Number of stations: 26									
Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total	
7	66	8.6	542.5	851	0	0	0	64	1466
8	45	2.5	94.7	82.2	6.4	0.4	28.4	214.5	
9	28	0.4	100.5	13	0	0.2	214.7	328.8	
10	24	0	1924.4	291.6	0	14.3	265	2495.2	
11	41	7.6	1983.8	255.1	0	12.9	248.6	2508	
12	58	0	1930.2	112.7	0	0	550.8	2593.6	
19	23	8.8	3014.2	1851.5	0	4.4	571.6	5450.5	
20	32	0	495.7	191.5	0	0	72.1	759.2	
27	35	0	141.5	136.2	0	0.1	45.8	323.5	
28	44	3.1	24.1	43.7	0	0	13.6	84.5	
29	69	0.2	131.5	57.7	0	0.5	54	243.9	
45	48	3.1	46	0	0	0	220.3	269.4	
52	70	0.8	26.7	21.8	14.3	0	170.2	233.8	
53	47	0.5	72.4	11.2	0	0	177.4	261.6	
54	24	0	47.9	29.3	0	0	33.7	110.9	
72	63	2.3	148	5.3	0	0	32.7	188.3	
73	46	0.9	23.4	0.7	0.0	0.0	27.9	52.9	
74	38	2.7	16.5	0.6	0.0	0.0	66.0	85.8	
75	29	0.0	494.4	83.1	0.0	0.0	233.2	810.6	
76	43	1.4	113.9	3.9	0.0	0.0	35.0	154.1	
84	65	13.2	2140.7	626.2	0.0	0.0	118.2	2898.3	
85	47	1.8	89.6	209.7	0.0	0.4	81.1	382.6	
86	29	7.1	27.1	171.2	0.0	11.5	20.8	237.8	
95	53	5.4	552.0	482.9	0.0	0.0	118.2	1158.5	
96	41	26.7	249.7	505.1	0.0	3.3	223.3	1008.1	
97	32	0.0	319.7	462.2	0.0	19.1	28.2	829.1	
Mean	44	3.7	567.3	250.0	0.8	2.6	142.9	967.3	
Std dev		5.9	849.2	396.7	3.0	5.4	148.4	1269.0	
% Catch		0.4	58.6	25.8	0.1	0.3	14.8	100.0	

B. Outer shelf (71-200 m).

Number of stations: 32

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
5	118	18.5	368.4	345.8	0	0	63.8	796.5
6	95	48.6	312.4	712.6	0	0	109.7	1183.3
15	195	15.6	293.6	639.1	0	21.8	742.7	1712.7
16	111	10.9	1214.8	2111.3	0	0	119.3	3456.3
17	88	3.6	178.2	104.4	0	0	44.7	330.9
18	72	1.4	65.4	39.5	0	0	52.1	158.4
21	72	0.7	104.7	80.2	0	0	79.3	264.9
22	89	2	24.3	44.1	0	0	51.8	122.1
26	118	14.5	1292.2	1127.7	0	0	94.7	2529
30	94	0	51.7	141.3	0	0	15.8	208.9
31	112	0.8	127.5	27	0	0	32.9	188.4
32	185	32	87.2	22.9	0	36.2	301.5	479.8
41	129	10.8	287.4	106.8	0	0	66.2	471.3
42	116	4.8	44	138.4	0	0.2	42.3	229.7
43	94	19.2	476.7	19.5	0	0.3	59.4	575
44	82	0	2323	483.3	0	0.5	69.8	2876.6
49	186	42.1	302.3	72.1	0	0	3372.7	3789.2
50	118	1.4	499.4	282.6	0	0	57.7	841.1
51	90	0.2	135.5	2.8	0	0	28.8	167.3
59	150	3.6	127.3	95.5	2.2	0	156.9	385.5
60	118	3	1034.2	579.4	6.2	0	305.7	1928.3
61	83	3	93.8	3.1	0	0	19.5	119.4
62	121	6.5	84.4	626.1	0	0	47.5	764.6
70	118	7	334.4	0	0	0	75.4	416.8
71	87	13.0	197.0	42.6	2.6	0.0	41.6	296.8
81	135	19.4	254.7	0.0	0.0	0.0	136.6	410.7
82	122	9.5	114.3	17.6	0.0	0.0	55.6	196.9
83	85	24.6	41.4	36.1	0.0	0.0	158.3	260.4
92	150	22.2	95.3	23.7	0.0	2.8	129.2	273.2
93	114	12.5	119.4	43.5	0.0	0.0	43.0	218.5
94	78	62.4	212.6	105.3	0.0	0.0	146.2	526.5
98	120	13.6	426.2	108.4	0.0	0.0	233.4	781.6
Mean	114	13.4	353.9	255.7	0.3	1.9	217.3	842.5
Std dev		15.0	481.3	433.7	1.2	7.4	591.6	1001.8
% Catch		1.6	42.0	30.4	0.0	0.2	25.8	100.0

C. Slope (201-800 m).

Number of stations: 40

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
1	710	2.6	50.8	0	0	97.4	392.8	543.6
2	604	0	21.2	1.1	0	236.9	249.8	509.1
3	418	2.6	152.8	1.1	0	269.9	184.1	610.5
4	302	0	354	0.7	36.6	22.5	257.2	670.9
13	624	17.2	46.8	0.7	0	184.4	616.9	866
14	532	3.4	97.1	0	0	403.5	137.8	641.7
23	747	1.1	0	0	25.6	20.8	750.4	797.9
24	362	11.7	171.4	0	0	209.5	255.3	648
25	257	52.7	75.5	0	0	102.8	511.7	742.7
33	225	4.3	203.3	36.9	0	3.1	67.2	314.8
34	360	17	26.6	111	0	10.8	463.3	628.7
35	488	0	65.4	6.1	5.5	29.2	140	246.2
36	774	0	0	2	3.5	9.5	277.4	292.4
37	656	3.2	5	0	12.4	22.7	248.6	291.8
38	510	14.5	22.5	3.7	22.7	146.9	211.4	421.7
39	327	20.7	5.3	12.3	0	24.2	525.3	587.9
40	229	38.5	80.8	3.9	0	7.1	323.8	454.2
46	518	8.2	15.8	15.4	3.3	89.9	88.6	221.2
47	446	9.5	61.3	9.1	6.6	120.8	145.6	353
48	267	22.4	101.1	1.1	0	55.3	852.9	1032.8
55	619	0.7	64.6	0.7	8.6	21.1	221.1	316.8
56	505	13.7	5.6	17	13.2	15	121.4	185.9
57	311	20.3	58.8	13	0	10.6	352.5	455.2
58	258	31.8	113.6	29.7	3.5	30.3	769.2	978
63	202	32.2	83.7	5.6	0	0	463.2	584.7
64	311	18.4	102.5	39.3	0	1.7	910.2	1072.1
65	429	9.4	226	12.6	1.2	55.3	262.1	566.7
66	507	8.1	60.7	15.7	4.6	144.6	207.6	441.1
67	694	4.6	12	1.8	0	5.6	141.2	165.2
77	517	1.3	102.8	0.0	2.4	234.9	92.1	433.6
78	449	6.4	27.2	0	3.2	268.7	418.9	724.4
79	305	3.5	24.9	0	21.7	19.4	755.5	825
80	224	20.9	70.7	16.6	0	15.1	424.7	548
87	680	0	53.5	5.9	2.1	219.9	1000	1281.5
88	523	13.6	63	3.7	0	181	253.6	515
89	414	1.1	45.8	5.8	4.6	133.2	164.5	354.9
90	338	0	23.5	2.1	1.1	45.9	106.7	179.3
91	228	8.2	402.5	0	0	152.3	5672.3	6235.4
99	220	0	331.5	10.1	0	4.1	666.8	1012.4
100	313	0	374.6	0	0	36.8	487	898.4
Mean	435	10.6	95.1	9.6	4.6	91.6	504.8	716.2
Std dev		12.1	105.7	19.2	8.4	99.2	874.5	935.5
% Catch		1.5	13.3	1.3	0.6	12.8	70.5	100.0

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).

Number of stations: 26

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
7	66	2.9	2.1	1	36.2	0	1423.8	1466
8	45	0	1.5	26.2	2.4	0	184.4	214.5
9	28	5	0	82.2	6.3	0	235.3	328.8
10	24	3.6	0	45.9	5.7	0	2440	2495.2
11	41	41.2	0	79.1	33.4	0	2354.3	2508
12	58	12.8	0	56.5	402.9	0	2121.5	2593.6
19	23	65.7	1.1	38.6	0	0	5345.2	5450.5
20	32	1.5	0	4	150.8	0	602.9	759.2
27	35	64.8	0	4.4	7.4	0	246.9	323.5
28	44	0	5.3	1.4	17.3	0	60.4	84.5
29	69	22.8	0	0	68.3	0	152.8	243.9
45	48	0	0	9.9	35.5	0	224	269.4
52	70	0	0	0	26.7	0	207.1	233.8
53	47	0	0	3.5	69	0	189.2	261.6
54	24	0	0	22.3	23.1	0	65.5	110.9
72	63	0	0	0	148	0	40.2	188.3
73	46	0.0	0.0	0.0	23.4	0.0	29.4	52.9
74	38	0.0	0.2	0.0	16.3	0.0	69.3	85.8
75	29	0.0	15.8	9.5	366.7	102.3	316.3	810.6
76	43	0.0	1.2	9.2	103.5	0.0	40.3	154.1
84	65	0.0	0.0	7.7	65.5	0.0	2825.1	2898.3
85	47	1.7	0.3	49.7	33.9	0.0	296.9	382.6
86	29	0.0	0.0	2.5	14.0	0.0	221.3	237.8
95	53	0.0	3.8	186.7	338.9	0.0	629.1	1158.5
96	41	32.4	23.4	32.8	145.7	0.0	773.8	1008.1
97	32	0.0	69.2	0.0	35.3	0.0	724.7	829.1
Mean	44	9.8	4.8	25.9	83.7	3.9	839.2	967.3
Std dev		19.5	14.2	41.2	114.6	20.1	1244.3	1269.0
% Catch		1.0	0.5	2.7	8.7	0.4	86.8	100.0



B. Outer shelf (71-200 m).

Number of stations: 32								
Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
5	118	1.2	0	0	51.7	0	743.6	796.5
6	95	0	0	0	26.7	0	1156.6	1183.3
15	195	7.7	0	0	16.1	0	1689	1712.7
16	111	59.8	2.1	0	246.2	0	3148.3	3456.3
17	88	54.7	0	15	77.2	0	183.9	330.9
18	72	6.9	0	4.5	52.9	0	94.2	158.4
21	72	0	0	3.5	101.2	0	160.2	264.9
22	89	0	0	3.5	20.5	0	98.1	122.1
26	118	0	0	0	118.7	0	2410.3	2529
30	94	1.4	0	0	43.9	0	163.5	208.9
31	112	17.3	0	0	101.8	0	69.2	188.4
32	185	4.4	0	0	51.1	0	424.4	479.8
41	129	0	0	0	281.6	0	189.7	471.3
42	116	0	10.3	0	27.6	0	191.9	229.7
43	94	11.4	0	0	37.7	0	525.9	575
44	82	23.2	0	0	59.9	0	2793.6	2876.6
49	186	38.1	0	0	178.4	0	3572.7	3789.2
50	118	0	15.9	0	483.4	0	341.7	841.1
51	90	0	0	0	135.5	0	31.8	167.3
59	150	3.7	0	0	106.3	0	275.4	385.5
60	118	183.1	0	0	835.7	0	909.5	1928.3
61	83	2.5	9.2	0	79.7	0	28.1	119.4
62	121	0	0	0	84.4	0	680.2	764.6
70	118	0	0	0	330.4	0	86.4	416.8
71	87	5.4	20.9	0.0	160.6	0.0	109.9	296.8
81	135	0	0	0	244.9	0	165.9	410.7
82	122	0	0	0	114.3	0	82.6	196.9
83	85	2.5	0	0	20	0	237.9	260.4
92	150	6.4	0	0	80.3	0	186.6	273.2
93	114	0	0	0	67.6	0	150.9	218.5
94	78	0	0	7.1	19.5	0	499.9	526.5
98	120	274.2	0	0	129.9	0	377.5	781.6
Mean	114	22	1.8	1.1	137	0	680.6	842.5
Std dev		57.5	5	3	164.7	0	965.4	1001.8
		2.6	0.2	0.1	16.3	0.0	80.8	100.0

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).

Number of stations: 26								
Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scomberids	Other	Total
7	66	7.4	704.7	132.7	0	0	621.2	1466
8	45	1.6	51.9	1.9	2.5	24.4	132.3	214.5
9	28	4.7	6.4	1.5	0.4	0	315.8	328.8
10	24	11.6	251	4.4	6.6	0	2221.6	2495.2
11	41	22.5	115.5	111.8	5.3	0	2252.9	2508
12	58	13	86.3	6.9	6.4	0	2480.9	2593.6
19	23	132.2	964.3	732.1	22.9	0	3599	5450.5
20	32	27.2	150.4	8.5	0.3	5.1	567.8	759.2
27	35	17.8	28.3	79.6	10.5	0	187.3	323.5
28	44	5.5	33.3	0	4.9	0	40.7	84.5
29	69	0	51.6	0	6.1	0	186.2	243.9
45	48	0	0	0	0	0	269.4	269.4
52	70	0	10.2	0	11.6	0	212	233.8
53	47	4.3	6.9	0	0	0	250.4	261.6
54	24	3.1	19.3	4	0	2.9	81.6	110.9
72	63	0.8	4	0.5	0	0	183	188.3
73	46	0.7	0.0	0.0	0.0	0.0	52.2	52.9
74	38	0.6	0.0	0.0	0.0	0.0	85.2	85.8
75	29	2.2	79.5	1.3	0.0	0.0	727.5	810.6
76	43	1.5	1.9	0.4	0.0	0.0	150.3	154.1
84	65	11.4	260.6	73.2	1.8	0.0	2551.4	2898.3
85	47	0.9	51.7	3.3	2.3	0.0	324.4	382.6
86	29	0.1	163.2	7.6	0.0	0.0	66.9	237.8
95	53	3.3	328.8	150.9	0.0	0.0	675.5	1158.5
96	41	14.4	420.2	70.5	0.0	0.0	503.1	1008.1
97	32	4.9	343.7	105.1	2.8	0.0	372.6	829.1
Mean	44	11.2	159.0	57.6	3.2	1.2	735.0	967.3
Std dev		25.8	235.8	145.7	5.3	4.8	984.2	1269.0
% Catch		1.2	16.4	6.0	0.3	0.1	76.0	100.0

B. Outer shelf (71-200 m).

Number of stations: 32								
Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scomberids	Other	Total
5	118	0	291.3	0	52.2	2.2	450.7	796.5
6	95	0	704.8	0	0	7.8	470.7	1183.3
15	195	0	0	0	639.1	0	1073.6	1712.7
16	111	0	2102.3	0	9.1	0	1345	3456.3
17	88	6.6	97.1	0	0	0.6	226.5	330.9
18	72	1	38.1	0.3	0	0.2	118.9	158.4
21	72	21	57.6	0.3	1.3	0.1	184.7	264.9
22	89	2.3	40.6	0.7	0	0.5	78	122.1
26	118	0	978.5	48.7	85.7	14.8	1401.4	2529
30	94	0	132.4	0	8.9	0	67.6	208.9
31	112	0	19.3	0	7.7	0	161.3	188.4
32	185	0	0	0	22.9	0	457	479.8
41	129	0	102.8	0	4	0	364.4	471.3
42	116	0	119.1	0	19.2	0.1	91.3	229.7
43	94	0	13.1	0	6.4	0	555.6	575
44	82	0	474.5	0	8.7	0	2393.3	2876.6
49	186	0	0	0	72.1	0	3717	3789.2
50	118	0	282.6	0	0	0	558.5	841.1
51	90	0	2.8	0	0	0	164.5	167.3
59	150	0	76.2	0	3.5	15.8	290	385.5
60	118	0	563.1	0	4.1	12.2	1349	1928.3
61	83	0	0	0	3.1	0	116.3	119.4
62	121	0	626.1	0	0	0	138.5	764.6
70	118	0	0	0	0	0	416.8	416.8
71	87	0.6	39.5	1.3	0.0	1.2	254.3	296.8
81	135	0	0	0	0	0	410.7	410.7
82	122	0	4.3	0	0	13.2	179.4	196.9
83	85	0	25.8	0	4.5	0	230.1	260.4
92	150	0	11.9	0	11.8	0	249.5	273.2
93	114	0	9.8	22.4	2.4	9.1	174.9	218.5
94	78	0	46.1	58.8	0	0.4	421.1	526.5
98	120	0	108.4	0	0	0	673.3	781.6
Mean	114	1	217.8	4.1	30.2	2.4	587	842.5
Std dev		3.8	422.6	13.7	113	4.9	765.3	1001.8
% Catch		0.1	25.9	0.5	3.6	0.3	69.7	100.0

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

Number of stations: 40

Station	Gear depth	A.varidens	Hake	N.africana	P.longirostris	Seabream	Other	Total
1	710	5.9	6.5	91	0	0	440.1	543.6
2	604	46.7	0	188.9	0	0	273.4	509.1
3	418	14.9	4.9	251.9	3.1	0	335.7	610.5
4	302	0	354	8.8	13.5	0	294.7	670.9
13	624	10.4	0	172.7	0	0	682.8	866
14	532	10.4	0	393.1	0	0	238.2	641.7
23	747	19.4	0	0	0	0	778.4	797.9
24	362	6.7	166.5	175	27.8	0	272	648
25	257	0	75.5	0	102.4	0	564.8	742.7
33	225	0	0.1	0	3.1	154.4	157.2	314.8
34	360	0	26.6	0	10.8	0	591.3	628.7
35	488	29.2	8.9	0	0	0	208.1	246.2
36	774	3	0	0	0	0	289.3	292.4
37	656	5.2	5	0	0	0	281.7	291.8
38	510	18	6.9	124.8	0	0	271.9	421.7
39	327	0	5.3	0	24.2	0	558.3	587.9
40	229	0	3.6	0	7.1	58.7	384.8	454.2
46	518	8.3	3.3	78.9	0	0	130.7	221.2
47	446	9.7	49.6	107.6	0	0	186.2	353
48	267	0	79.8	0	55.3	5.5	892.3	1032.8
55	619	4	0	15.8	0	0	297	316.8
56	505	7	0	8	0	0	170.9	185.9
57	311	0	58.8	6.4	4.2	0	385.8	455.2
58	258	0	58.9	0	30.3	39.6	849.2	978
63	202	0	0	0	0	47.1	537.6	584.7
64	311	0	102.5	0	1.7	0	967.9	1072.1
65	429	7	226	45.5	0	0	288.2	566.7
66	507	8.8	2.8	0	0	0	429.5	441.1
67	694	3.8	0	1.7	0	0	159.7	165.2
77	517	7.8	1.2	225.0	0.0	0.0	199.5	433.6
78	449	15.2	27.2	250.8	0	0	431.1	724.4
79	305	0	24.9	0	19.2	0	780.9	825
80	224	0	20.3	0	15.1	24.5	488	548
87	680	5.2	1.8	214.7	0	0	1059.7	1281.5
88	523	17.2	0	163.8	0	0	334	515
89	414	9.5	45.6	122	0	0	177.8	354.9
90	338	0.3	23.5	37.2	8	0	110.3	179.3
91	228	0	306.7	0	152.3	68.1	5708.2	6235.4
99	220	0	196.5	0	4.1	68.8	743	1012.4
100	313	0	374.6	0	36.8	0	487	898.4
Mean	435	6.8	56.7	67.1	13	11.7	560.9	716.2
Std dev		9.5	99.5	98.8	29.8	30.2	871.2	935.5
% Catch		0.9	7.9	9.4	1.8	1.6	78.3	100.0

## Angola central

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

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

Number of stations: 22

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
107	27	0	1	33.4	0	0	80.7	115.1
108	21	2	16.2	322.3	0	0	137	477.5
109	49	12.1	125.5	49.6	3.6	0	27.6	218.5
117	32	1	22.3	82	0	0	83.2	188.6
118	36	0.6	82.1	100.7	0	0	95.3	278.8
119	62	8.6	16.4	8.1	0	0	57.2	90.3
128	51	2.4	61.3	83.3	0	0	148.1	295.1
129	28	0.4	34.9	36.7	3.9	0.1	63.6	139.7
130	30	0	39.9	52.2	0	0	75.5	167.6
139	46	3.4	188.4	54.7	0	0.1	164.1	410.8
140	22	6.4	469.3	471.8	0	0.2	147.7	1095.5
147	55	0.6	1193.1	157.8	0	0.6	323.9	1676
148	33	3	366	81.2	0	11.2	251.8	713.1
149	23	12.7	1.4	19	0	0	163.3	196.4
150	66	18.4	206.2	329.5	0	0	183.4	737.5
159	63	15.6	569.4	19.4	0	0	111.8	716.3
160	29	10.3	237.9	50.1	0.0	2.7	143.6	444.5
161	24	0.4	222.0	275.1	0.0	3.2	441.1	941.8
162	65	29.5	578.7	198.7	0.0	0.0	353.0	1160.0
173	58	46.6	941.7	109.2	0.0	0.0	202.2	1299.7
177	32	28.2	77.0	1496.2	0.0	0.0	16.9	1618.3
178	70	0.4	913.3	61.2	0.0	1.9	125.9	1102.7
Mean	42	9.2	289.3	186.0	0.3	0.9	154.4	640.2
Std dev		12.2	347.6	317.2	1.1	2.5	106.7	500.7
% Catch		1.4	45.2	29.1	0.0	0.1	24.1	100.0

**B. Outer shelf (71-200 m).**

Number of stations: 24

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
105	115	17.1	51.4	286.9	0	0	175.8	531.1
106	79	18.8	50.7	37.5	0	0.6	31.5	139.1
110	113	9.3	67.9	14.2	0	0	105.1	196.5
115	122	5.2	382.6	11.9	0	0	108.5	508.2
116	96	29.3	149.8	0.9	0	0	98.2	278.2
120	86	59.2	5.4	889.5	0	0	196.7	1150.7
121	107	22.2	108.3	57.4	0	0	225.8	413.7
126	186	31.7	48.8	0	0	0	12961.4	13041.9
127	91	16.4	19.3	61.5	27	0	130.3	254.5
131	95	5.9	35.7	67.1	0	0	373.9	482.7
132	131	134	467.4	254.6	0	0	7845.7	8701.7
137	147	91.6	81.6	83.3	0	0	4601.8	4858.3
138	92	0.6	102.3	253.4	0	0	869.2	1225.5
146	113	16.1	110	642.2	0	0.5	1346.4	2115.2
151	155	3	139.3	12.1	0	0.6	163.2	318.3
158	106	24.8	56.8	55.8	0	0	176	313.4
163	167	4.1	238.8	138.1	0	20.1	2257.8	2658.9
170	102	5.5	228	0.4	0	0	51.6	285.4
171	72	10.1	14.4	132.8	0	0	188.7	346
174	76	68	2071.5	179.7	0	0	1486.6	3805.8
175	97	35	626.3	65.9	0	0	302.2	1029.3
176	109	58.3	1323.8	2379.5	0	0	245.8	4007.4
179	96	30.3	149.1	5.2	0	0	82.6	267.3
180	108	11.5	1800.2	15.9	0	0	110.8	1938.3
Mean	111	29.5	347.1	235.2	1.1	0.9	1422.3	2036.2
Std dev		32.1	566.5	504.2	5.5	4.1	3040.5	3101.6
% Catch		1.4	17.0	11.6	0.1	0.0	69.9	100.0

C. Slope (201-800 m).

Number of stations: 35								
Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
101	663	0	22.8	0.8	0.6	68.3	239.7	332.2
102	448	0	221.1	5.2	11.3	244	609	1090.5
103	360	9	219.2	0	1.9	82.4	642.4	955
104	243	1.4	144.6	9.8	0	25.1	700.7	881.6
111	542	0	38.5	2.2	0	101.3	330.8	472.8
112	733	11.9	89.9	0	3.6	54.3	968.6	1128.3
113	504	94	79.5	1	0.7	129.7	163.7	468.5
114	209	12.5	196.7	0	0	15.4	2319.9	2544.5
122	316	0	348.3	2.1	0	113	1295.2	1758.6
123	509	12.6	90.9	0	32.1	398.8	513.3	1047.7
124	585	5.8	79.6	3	16.4	341.9	221.1	667.8
125	478	0	108.4	2.1	7.8	256.7	327.6	702.6
133	343	4.8	86.2	0	4.3	80.5	600.9	776.5
134	508	12.6	61.8	1.4	0	450.4	86.7	612.8
135	737	3.6	5	0.3	0.3	6.4	157.5	173.2
136	268	6.5	1078.2	2.9	0	38.4	2840.7	3966.5
141	340	0	229.3	0	5.3	87.5	392.2	714.3
142	508	2.3	4.2	0.3	0.8	101	53.9	162.5
143	523	2	1.3	0	0.2	151.5	93.2	248.2
144	372	0	470.6	0	35.3	147.9	181.7	835.4
145	207	30.2	249.6	1.5	0	46	1072.3	1399.5
152	249	26.6	1483.8	0	0	110.8	1799	3420.2
153	419	0	272.8	0	0.6	382	328.7	984.1
154	530	0.2	14.6	0	4.2	193.5	68.6	281.1
155	490	0	73	1.2	2.9	137	106.2	320.2
156	382	0	63.3	0.3	5.4	507.4	280.3	856.7
157	269	0.4	431.7	0	0	193.5	1132.8	1758.3
164	257	0	522.2	0	0	21.4	2815.9	3359.5
165	442	23.5	16.9	8.9	27.5	361.3	385.7	823.9
166	695	3.1	135.5	3.1	4.9	135.7	479.8	762.1
167	603	8.4	3.5	11	3.5	75.3	216.2	317.8
168	333	0	4.4	0.4	15.1	80.6	396.7	497.1
169	257	4.1	484	1.7	0	40.7	1619.9	2150.5
181	732	2.6	79	0	0	37.4	331.8	450.8
182	695	5.7	43.6	4.7	27.4	82	582.4	745.9
Mean	450	8.1	213	1.8	6.1	151.4	695.9	1076.2
Std dev		16.9	309.1	2.9	9.9	134	748.7	950.5
% Catch		0.8	19.8	0.2	0.6	14.1	64.7	100.0

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).

Number of stations: 22

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
107	27	0	0	0	0	1	0	114.1
108	21	0	4.9	5.7	5.7	0	0	461.3
109	49	0	0	89.9	32.9	0	0	95.7
117	32	3.4	0.5	8.8	4.8	0	0	171.1
118	36	16.3	1.6	4.2	3.1	0	0	253.6
119	62	0	0.6	0	9.7	0	0	80.1
128	51	1.7	0.3	9.7	10.2	0	0	273.1
129	28	0	0	1.3	0	0	0	138.4
130	30	0	2.5	0	0	0	0	165.2
139	46	0	0.5	182.9	0	0	0	227.4
140	22	0	0	11	0	0	0	1084.5
147	55	148.7	15.2	15.5	297.4	0	0	1199.2
148	33	235.9	12.4	6.7	8.4	0	0	449.7
149	23	0	0.7	0	0.7	0	0	195
150	66	75.4	2.9	0	89.7	0	0	569.6
159	63	8.2	4.3	492.7	64.2	0	0	146.8
160	29	147.7	0.0	34.2	1.0	0.0	0.0	261.7
161	24	31.3	10.3	128.5	0.0	0.0	0.0	771.7
162	65	98.1	8.3	214.4	129.7	0.0	0.0	709.4
173	58	84.5	20.0	336.0	230.3	0.0	0.0	628.9
177	32	0.0	1.6	0.0	75.4	0.0	0.0	1541.3
178	70	29.4	4.0	158.5	16.7	0.0	0.0	894.1
Mean	42	40.0	4.1	77.3	44.6	0.0	0.0	474.2
Std dev		65.1	5.6	130.1	79.9	0.0	0.0	408.2
% Catch		6.2	0.6	12.1	7.0	0.0	0.0	74.1



B. Outer shelf (71-200 m).

Number of stations: 24								
Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
105	115	2.3	0	0	30.3	0	498.5	531.1
106	79	1.6	0	0	35.9	0	101.6	139.1
110	113	0	0	0	52.7	0	143.8	196.5
115	122	22.8	0	0	359.8	0	125.6	508.2
116	96	103.3	0	0	44.9	0	130	278.2
120	86	0	0	0	5.4	0	1145.4	1150.7
121	107	0.6	0	0	107	0	306	413.7
126	186	0	0	0	48.8	0	12993.1	13041.9
127	91	0	0	0	19.3	0	235.2	254.5
131	95	10.6	0	0	14.4	0	457.6	482.7
132	131	57.6	0	0	387.3	0	8256.9	8701.7
137	147	0	0	0	81.6	0	4776.7	4858.3
138	92	5.5	0	0	44.5	0	1175.5	1225.5
146	113	10.1	0	0	29	0	2076.1	2115.2
151	155	0	0	0	35.8	0	282.5	318.3
158	106	0	0	0	39.2	0	274.2	313.4
163	167	0	0	0	55.3	0	2603.6	2658.9
170	102	33.9	73	0	121	0	57.5	285.4
171	72	0	0	0	14.4	0	331.6	346
174	76	169.9	15.4	381.6	246.2	0	2992.8	3805.8
175	97	49	34.5	0	536.8	0	409	1029.3
176	109	234.7	14.8	0	1074.2	0	2683.6	4007.4
179	96	11.1	0	0	136	0	120.1	267.3
180	108	0	0	0	1800.2	0	138.1	1938.3
Mean	111	29.7	5.7	15.9	221.7	0.0	1763.1	2036.2
Std dev		59.4	16.4	77.9	412.5	0.0	3066.6	3101.6
% Catch		1.5	0.3	0.8	10.9	0.0	86.6	100.0

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).

Number of stations: 22

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scomberids	Other	Total
107	27	0	33.4	0	0	0	81.7	115.1
108	21	0	317.4	4.9	0	0	155.2	477.5
109	49	14.5	35.1	0	0	0	168.8	218.5
117	32	10.2	54.4	4.7	2.5	2.5	114.2	188.6
118	36	4.8	86.8	6.2	2.9	0	178.1	278.8
119	62	1.7	1.7	0.4	4.4	0	82.2	90.3
128	51	0	82	1.3	0	0	211.8	295.1
129	28	1.5	29.2	5.9	0.1	0	103	139.7
130	30	0	42.3	2.1	0.3	0	123	167.6
139	46	0.1	43.8	0	0.6	0	366.3	410.8
140	22	12.7	105.8	202.1	151.2	0	623.7	1095.5
147	55	0	23	16.8	117.9	0	1518.1	1676
148	33	0	9	25	45.6	0	633.5	713.1
149	23	0	18.7	0.4	0	0	177.4	196.4
150	66	0	323.4	0.9	5.3	0	408	737.5
159	63	0	18.4	0	0	1	696.9	716.3
160	29	0.0	3.2	1.3	44.3	0.0	395.8	444.5
161	24	25.5	34.4	1.4	213.7	0.0	666.7	941.8
162	65	0.0	46.0	0.0	152.7	0.0	961.2	1160.0
173	58	0.0	66.4	0.4	42.4	0.0	1190.5	1299.7
177	32	0.5	54.2	1441.5	0.0	0.0	122.1	1618.3
178	70	0.0	29.6	0.0	31.5	0.0	1041.5	1102.7
Mean	42	3.3	66.3	78.0	37.1	0.2	455.4	640.2
Std dev		6.6	86.4	307.5	62.7	0.6	412.5	500.7
% Catch		0.5	10.4	12.2	5.8	0.0	71.1	100.0

B. Outer shelf (71-200 m).

Number of stations: 24								
Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scomberids	Other	Total
105	115	0	172	0	0	114.9	244.2	531.1
106	79	3.8	30.2	2.5	0.9	0.1	101.6	139.1
110	113	0	14.2	0	0	0	182.3	196.5
115	122	0	3.4	0	0	8.5	496.2	508.2
116	96	0	0.9	0	0	0	277.3	278.2
120	86	0	807.4	74.6	0	7.5	261.2	1150.7
121	107	0	55.5	0.7	1.2	0	356.3	413.7
126	186	0	0	0	0	0	13041.9	13041.9
127	91	0	59.9	0	1	0.6	193	254.5
131	95	0	66.8	0	0.4	0	415.5	482.7
132	131	0	0	0	0	254.6	8447.1	8701.7
137	147	0	44.1	0	39.1	0	4775	4858.3
138	92	0	251.1	0	2.3	0	972.1	1225.5
146	113	0	429.7	0	181.7	9	1494.7	2115.2
151	155	0	0	0	1.7	10.4	306.2	318.3
158	106	0	0	0	53.1	2.7	257.6	313.4
163	167	0	114.4	0	23.8	0	2520.8	2658.9
170	102	0	0	0.2	0	0.2	285	285.4
171	72	0	18.2	114.6	0	0	213.3	346
174	76	0	112	0	67.7	0	3626.1	3805.8
175	97	0	0	0	0	65.9	963.5	1029.3
176	109	0	0	1467.9	0	911.6	1627.9	4007.4
179	96	0	1	0	4.2	0	262	267.3
180	108	0	0	0	0	15.9	1922.5	1938.3
Mean	111	0.2	90.9	69.2	15.7	58.4	1801.8	2036.2
Std dev		0.8	183.1	299.2	39.9	190.2	3075.0	3101.6
% Catch		0.0	4.5	3.4	0.8	2.9	88.5	100.0

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

Number of stations: 35

Station	Gear depth	A.varidens	Hake	N.africana	P.longirostris	Seabream	Other	Total
101	663	12.5	1.5	54.7	0	0	263.5	332.2
102	448	54.7	195.3	186.5	0	0	654	1090.5
103	360	6.9	219.2	75.4	0	0	653.6	955
104	243	0	42.1	0	25.1	45.1	769.3	881.6
111	542	17.4	11.7	0	0	0	443.7	472.8
112	733	5.9	0	46	0	0	1076.4	1128.3
113	504	16.5	0	111.5	0	0	340.5	468.5
114	209	0	114.6	0	15.4	30.8	2383.7	2544.5
122	316	100.6	348.3	0	7.4	0	1302.3	1758.6
123	509	67.3	24.2	331.5	0	0	624.6	1047.7
124	585	20.2	0	320.4	0	0	327.2	667.8
125	478	42	8.2	214	0	0	438.4	702.6
133	343	6.3	86.2	73	0	0	611.1	776.5
134	508	84.7	1.4	363.9	0	0	162.9	612.8
135	737	1.9	1.9	3	0	0	166.3	173.2
136	268	0	968.8	0	38.4	23	2936.4	3966.5
141	340	5.5	229.3	78.6	2.2	0	398.7	714.3
142	508	23.2	1.5	71.9	0	0	65.9	162.5
143	523	50.1	0	89.4	0	0	108.8	248.2
144	372	9.1	470.6	136.3	1.1	0	218.4	835.4
145	207	0	95.4	0	46	78.9	1179.2	1399.5
152	249	0	1288.8	0	110.8	0	2020.5	3420.2
153	419	16.4	0	365	0	0	602.7	984.1
154	530	17	2.3	173.6	0	0	88.2	281.1
155	490	53.1	1.1	64.5	0	0	201.5	320.2
156	382	10.8	4.2	453.9	0	0	387.8	856.7
157	269	0	166.1	0	193.5	80.7	1318.1	1758.3
164	257	0	486.8	0	21.4	0	2851.4	3359.5
165	442	27.7	1.7	331.8	0	0	462.6	823.9
166	695	34.5	0.0	101.3	0.0	0.0	626.4	762.1
167	603	26.4	0	40.4	0	0	251.1	317.8
168	333	18.2	4.4	60.8	1.6	0	412.2	497.1
169	257	0	428.4	0	40.7	2	1679.4	2150.5
181	732	34	4.5	0	0	0	412.3	450.8
182	695	67.3	13.7	0	0	0	664.9	745.9
Mean	450	23.7	149.2	107.1	14.4	7.4	774.4	1076.2
Std dev	163	26.3	286.1	131.7	38	20.5	757.6	950.5
% Catch		2.2	13.9	10.0	1.3	0.7	72.0	100.0

## Angola south

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).

Number of stations: 13

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
184	31	87.3	1578.5	20.5	4.9	0	332.2	2023.3
185	67	77.2	2282.4	935.3	21.5	0	49.3	3365.7
186	45	371.1	985.7	1749.8	52	0	188.4	3347
187	47	394.6	858.2	1423.9	59.1	0	122.3	2858.1
188	61	230.3	1299.7	2909.5	55.9	0	179.1	4674.5
190	22	145.4	35.3	5611.3	325.4	0	219.6	6337.1
191	53	145.3	579.5	4040.4	44	0	913.1	5722.3
192	45	30.4	408.3	1545.4	57.8	0	72.9	2114.8
197	45	0	543.9	50.1	12.2	0	152.9	759.1
198	37	38.2	138	594.2	34.9	0	196.6	1001.9
199	61	11.5	1279.2	2574.5	275.6	0	481.6	4622.3
201	24	12.7	91.4	43	79.3	0	1241.8	1468.2
202	68	13.8	1851.7	676.8	28.4	0	402.8	2973.5
Mean	47	119.8	917.8	1705.7	80.8	0	350.2	3174.4
Std dev		134.9	709.4	1689.4	100.2	0	352	1755
% Catch		3.8	28.9	53.7	2.5	0.0	11.0	100.0

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

Number of stations: 8

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
183	96	13.7	99.2	381.8	43.3	0	28.3	566.4
189	73	57.9	665	390.3	68.4	0	55.1	1236.8
193	111	65.5	746.5	352.2	17.8	0	85.3	1267.3
194	126	11.9	401.7	161.6	4.5	0	480	1059.7
195	130	52.1	1338.5	431	39.3	0	248.6	2109.5
196	96	95.3	1428.6	1638.5	21.1	0	213.2	3396.7
200	106	84.2	1427.6	2577.7	0	0	217	4306.5
203	134	40	1250.9	879.5	50.8	0	89.9	2311.2
Mean	109	52.6	919.7	851.6	30.7	0	177.2	2031.8
Std dev		30.1	512.5	839.7	23.7	0	147.7	1277.9
% Catch		2.6	45.3	41.9	1.5	0.0	8.7	100.0

### C. Slope (201-800 m).

Number of stations: 3

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
204	287	0	240.2	7.1	0	0.2	416.1	663.7
205	354	8	113.1	0	32.4	4.2	654.2	811.8
206	439	13.1	205.5	0.5	7.4	23.1	642.2	891.7
Mean	360	7	186.3	2.5	13.3	9.2	570.8	789.1
Std dev		6.6	65.7	4	17	12.2	134.1	115.7
% Catch		0.9	23.6	0.3	1.7	1.2	72.3	100.0

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

A. Inner shelf (20-70 m).

Number of stations: 13

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
184	31	0	0	11.7	1566.8	0	444.8	2023.3
185	67	454.9	0	912.9	914.6	0	1083.3	3365.7
186	45	56.4	0	0	929.3	0	2361.4	3347
187	47	539.1	0	0	319.2	0	1999.9	2858.1
188	61	99.5	0	19.9	1180.3	0	3374.8	4674.5
190	22	0	0	0	35.3	0	6301.8	6337.1
191	53	96.5	0	0	197.2	0	5428.6	5722.3
192	45	52.2	0	0	276.2	0	1786.3	2114.8
197	45	91.9	0	0	15.8	0	651.4	759.1
198	37	96.1	0	0	19.1	0	886.7	1001.9
199	61	63.4	0	0	109.7	0	4449.2	4622.3
201	24	11.6	0	0	0	0	1456.6	1468.2
202	68	91.2	0	0	33.4	0	2848.8	2973.5
Mean	47	127.1	0	72.7	430.5	0	2544.1	3174.4
Std dev		169	0	252.5	530	0	1866.6	1755
% Catch		4.0	0.0	2.3	13.6	0.0	80.1	100.0

B. Outer shelf (71-200 m).

Number of stations: 8

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
183	96	26.9	0	0	72.3	0	467.2	566.4
189	73	34	0	0	630.9	0	571.8	1236.8
193	111	130.2	0	0	452.7	0	684.3	1267.3
194	126	0	0	0	315.9	0	743.8	1059.7
195	130	0	0	0	965.6	0	1143.9	2109.5
196	96	15.7	0	0	863.6	0	2517.4	3396.7
200	106	123.6	0	0	814.8	0	3368.2	4306.5
203	134	31.5	0	0	630.4	0	1649.3	2311.2
Mean	109	45.2	0	0	593.3	0	1393.2	2031.8
Std dev		52.1	0	0	300.4	0	1052.1	1277.9
% Catch		2.2	0.0	0.0	29.2	0.0	68.6	100.0

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

A. Inner shelf (20-70 m).

Number of stations: 13

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scomberids	Other	Total
184	31	5.6	10.6	0	0	4.3	2002.8	2023.3
185	67	0	934	1.3	0	0	2430.4	3365.7
186	45	0	1749.8	0	0	0	1597.2	3347
187	47	0	1408.4	13.5	0	2	1434.2	2858.1
188	61	0	2909.5	0	0	0	1765	4674.5
190	22	0	5433.5	37.8	0	140	725.8	6337.1
191	53	0	3266.3	774.1	0	0	1681.9	5722.3
192	45	0	1545.4	0	0	0	569.4	2114.8
197	45	0	49.9	0.2	0	0	709	759.1
198	37	0	592.4	1.8	0	0	407.7	1001.9
199	61	0	2574.5	0	0	0	2047.8	4622.3
201	24	0	36.6	0	6.5	0	1425.2	1468.2
202	68	0	676.8	0	0	0	2296.7	2973.5
Mean	47	0.4	1629.8	63.7	0.5	11.3	1468.7	3174.4
Std dev		1.5	1577.8	213.7	1.8	38.7	673.8	1755
% Catch		0.0	51.3	2.0	0.0	0.4	46.3	100.0

B. Outer shelf (71-200 m).

Number of stations: 8

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scomberids	Other	Total
183	96	0	381	0.9	0	0	184.5	566.4
189	73	0	390.3	0	0	0	846.4	1236.8
193	111	0	352.2	0	0	0	915.1	1267.3
194	126	0	134.7	0	0	26.9	898.1	1059.7
195	130	0	431	0	0	0	1678.5	2109.5
196	96	0	1638.5	0	0	0	1758.2	3396.7
200	106	0	2577.7	0	0	0	1728.8	4306.5
203	134	0	879.5	0	0	0	1431.7	2311.2
Mean	109	0	848.1	0.1	0	3.4	1180.2	2031.8
Std dev		0	843	0.3	0	9.5	560.5	1277.9
% Catch		0.0	41.7	0.0	0.0	0.2	58.1	100.0

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

Number of stations: 3

Station	Gear depth	A.varidens	Hake	N.africana	P.longirostris	Seabream	Other	Total
204	287	0	238.2	0	0.1	2	423.3	663.7
205	354	0	113.1	0	0	0	698.8	811.8
206	439	22.5	205.5	0.6	0	0	663.2	891.7
Mean	360	7.5	185.6	0.2	0	0.7	595.1	789.1
Std dev		13	64.9	0.3	0.1	1.2	149.8	115.7
% Catch		1.0	23.5	0.0	0.0	0.1	75.4	100.0

## ANNEX VII Instruments and fishing gear used

The Simrad ER-60 scientific echo sounder is equipped with keel-mounted transducers with nominal operating frequencies of 18, 38, 120 and 200 kHz. All frequencies were run during the survey only for observation of fish and bottom conditions. No scrutinizing of the recordings was done.

Last standard sphere calibrations were carried out 14.12.2013 in Kyunn Phi Lar, MynMar, using Cu-64, Cu-60, WC-38.1 and WC-38.1 spheres for 18, 38,120 and 200 kHz, respectively. The details of the settings of the 38 kHz echo sounder where as follows:

Transceiver-2 menu (38 kHz)	
Transducer depth	5.50 m
Absorbtion coeff.	9,5 dB/km
Pulse duration	medium (1,024ms)
Bandwidth	2,43 kHz
Max power	2000 Watt
2-way beam angle	-20,6dB
gain	26.13 dB
SA correction	-0,71 dB
Angle sensitivity	21.9
3 dB beamwidth	6,75° along ship
6,95° athwardship	
Alongship offset	-0.11°
Athwardship offset	0.05°

Bottom detection menu      Minimum level -40 dB

### Fishing gear

The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super bottom trawl". During the present survey only the bottom trawl was used.

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm mesh size in the codend with an inner net of 10 mm mesh size. The trawl height was about 4.5 m and distance between wings during towing about 21 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. Since 19.02.08 new and heavier "Thyborøn" combi trawl doors (7.41 m<sup>2</sup>, 1720 kg) have been in used. During the present survey the door distance was kept nearly constant at about 50 m at all depths by the use of a 9 m strap between the wires at 120 m distance from the doors (normally applied at depths greater than 80 m). At depths greater than 300 m the trawl was equipped with a tickler chain, which improves the catchability of bottom living and borrowing species, particularly shrimps.

The SCANMAR system was used on all trawl hauls. This equipment consists of sensors, a hydrophone, a receiver, a display unit and a battery charger. Communication between sensors and ship is based on acoustic transmission. The doors are fitted with sensors to provide information on their distance, and the trawl was equipped with a trawl eye that provides information about the trawl opening. A catch sensor on the cod-end indicated the size of the catch.



## ANNEX VIII Station allocation by survey and depth strata

Numbers of valid bottom trawl stations by depth strata. Angolan demersal surveys 1985-2014.

	1985	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	1997.2	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
OUTSIDE	11	13	13	11	28	24	31	23	10	30	56	55	1	17	16	0	5	1	62	0	0	1	0	0	1	0	3	0	1	0	0	0	0	0	0	0	0
20-50south	0	2	0	0	6	3	5	2	3	6	2	4	3	0	0	0	0	0	0	0	0	8	0	2	4	8	7	8	5	6	9	8	0	6	10	8	
50-100south	0	1	0	0	8	6	8	8	1	14	12	20	11	0	0	0	0	0	4	0	0	9	0	5	7	7	5	5	8	8	6	6	0	8	11	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	7	7	0	7	10	5	
200-300south	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	0	1	0	1
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	1	2	2	2	0	1	2	1
400-500south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
500-600south	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	2	0
600-700south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	2	3	1	2	2	1	1	1	0	2	1	0
700-800south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	2	2	2	0	1	0	0	
20-50central	0	0	0	3	8	11	17	24	5	17	13	15	0	9	14	0	10	6	1	9	14	23	12	16	16	17	16	16	15	17	16	16	11	18	16	14	
50-100central	0	0	0	4	15	14	21	29	4	26	13	16	0	12	13	0	12	9	10	17	19	27	18	18	19	18	20	18	20	18	18	18	15	19	19	18	
100-200central	0	0	0	2	2	4	13	11	3	15	10	12	0	14	15	12	12	8	13	12	14	22	16	15	13	14	14	16	15	14	14	13	9	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	1	2	2	2	5	8	
300-400central	0	0	0	2	4	1	0	7	1	7	3	9	0	9	11	15	10	7	1	6	6	10	4	6	4	6	6	6	6	6	6	6	6	3	6	8	7
400-500central	0	0	0	4	5	0	3	4	3	6	3	7	0	8	9	18	9	7	0	4	6	8	6	2	3	3	4	3	2	3	3	3	2	4	6	6	
500-600central	0	0	0	1	2	0	1	2	4	1	0	9	0	5	7	14	8	7	0	7	5	9	3	5	3	3	5	4	5	4	4	4	4	4	5	8	7
600-700central	0	0	0	0	0	0	0	0	0	0	0	6	0	1	3	10	3	0	0	5	1	6	3	4	4	4	6	4	4	3	1	3	0	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	6	4	4	4	4	3	4
20-50north	5	4	7	6	14	13	3	14	3	7	8	12	0	9	9	0	9	8	0	0	14	11	11	16	13	15	14	14	17	17	17	19	13	11	18	19	
50-100north	9	8	7	7	25	28	19	33	14	20	19	17	0	9	12	0	12	10	4	0	24	24	14	23	20	24	20	18	21	19	20	20	18	14	20	20	
100-200north	5	5	3	6	5	20	6	6	4	11	12	10	0	11	11	0	12	11	8	0	29	24	18	23	20	21	21	17	23	23	20	19	17	13	21	19	
200-300north	1	0	1	5	5	6	8	6	4	4	14	9	0	8	7	0	10	9	3	0	12	11	7	7	7	8	7	6	7	7	7	5	7	4	5	9	
300-400north	0	0	5	6	15	4	2	4	4	6	6	5	0	9	8	0	9	8	2	0	12	10	11	6	6	6	6	5	5	4	5	6	4	4	8	9	
400-500north	0	0	1	2	3	6	5	4	4	6	2	6	0	6	4	0	8	7	0	0	7	8	5	6	6	6	6	5	6	6	6	6	6	5	6	7	
500-600north	0	0	3	3	3	3	3	6	0	1	0	5	0	5	5	0	10	8	0	0	6	7	8	6	6	6	7	4	6	6	7	5	6	3	5	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	6	5	4	5	5	5	
700-800north	0	0	0	0	0	0	1	0	0	0	0	4	0	3	2	0	5	5	0	0	0	8	3	9	9	8	9	7	6	7	7	8	6	7	7	4	
TOTAL	31	33	40	66	161	148	159	194	77	200	193	245	24	147	162	91	157	118	126	71	178	264	152	186	185	200	208	179	198	193	191	188	131	171	215	203	