

SURVEYS OF THE FISH RESOURCES OF ANGOLA

Cruise Report No 3/2013

Survey of the demersal resources

19 March – 10 April 2013

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

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

Bergen 2013



THE EAF-NANSEN PROJECT

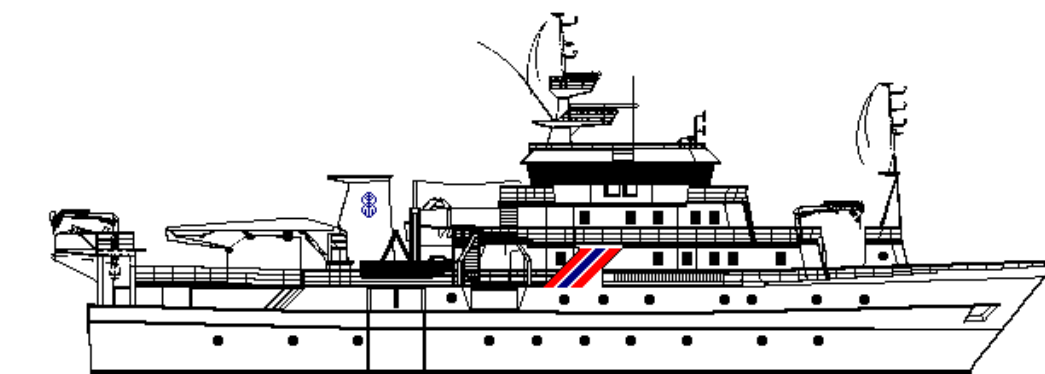
FAO started the implementation of the project "Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries (EAF-Nansen GCP/INT/003/NOR)" in December 2006 with funding from the Norwegian Agency for Development Cooperation (Norad). The EAF-Nansen 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 oeuvre 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 oeuvre et le suivi des progrès de la mise en oeuvre de plans d'aménagement des ressources marines conformes à l'approche écosystémique des pêches.



SURVEY OF THE FISH RESOURCES OF ANGOLA

**Survey of the demersal resources
19.03 – 19.04. 2013**

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 2013	(21surveys)

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by

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Bergen, 2013

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CHAPTER 1 INTRODUCTION

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) 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 senegalensis*, *Umbrina canariensis*, *Merluccius polli*, *M. capensis*, *T. 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*, *Merluccius polli*, *M. capensis*, and *T. trecae*, for subsequent analyses in the INIP Lab.
- To monitor the general hydrographical conditions using CTD-Sonde on each trawl station and map the temperature, salinity and oxygen.

*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:

Silvi Nsiangango (19.03-19.04, Local Cruise Leader), Enoque Canganjo (19.03-19.04), Margarida Napoleão (19.03-19.04), David Kissungo (19.03-19.04), Erickson Saquenha (19.03-19.04), Euzébio dos Santos (19.03-19.04), Noemia Nganga (19.03-19.04), Francisco Amaro (19.03-19.04), Cesaltina Dias (19.03-19.04), & Domingos Pedro (19.03-19.04)

From IMR, Norway:

Jens-Otto Krakstad, Cruise Leader (26.03-19.04), Diana Zaera (19.03-19.04), Jan Frode Wilhelmsen (19.03-19.04), Jarle Kristiansen (19.03-26.03) & Ole Sverre Fosshem (26.03-19.04).

From UMANG Software, India

Presley Dias (26.03-19.04).

Narrative

R/V “Dr Fridtjof Nansen” departed Luanda at 15:30 UTC the 19th March 2013 starting the sampling program the same day with trawl and hydrographic stations. The work continued towards the north to The Congo River. A standard geographical allocation of the trawl stations to be taken during the Angolan demersal trawl surveys was implemented in 2003, and the station positions in the southern region have been similar in the 2000 and 2003-2010 surveys.

The slope off Baía dos Tigres has not been adequately surveyed as the bottom is very steep and rough between 200 and 600 m. The 24th March in the evening, the survey had to be interrupted to sail to Pointe Noire to change the crew. On the 25th March in evening, R/V “Dr Fridtjof Nansen” departed from Pointe Noire to Congo River Mouth to restart the sampling. From Congo River (6°10′) to Luanda (8°54′), the sampling was completed in 13 days that is it was finished on 30th of March.

On the 31st at 10h00′, the vessel departed to central region where it covered the area in between Pontas das Palmeirinhas (9° 11′S) and Benguela (12° 35′ S). Few bottom trawls were taken and distanced from one another in the area between the south of Benguela and Tombwa due to shelf configuration which is very steep with rocky shore. Even though this area was not suitable the bottom trawling, 18 bottom trawls were made to get the general view of biodiversity. Then the bottom trawling finished up to Cunene River mouth on 7th of April.

None of monitoring line was covered because all monitoring lines were carried out during the pelagic survey in accordance with the new standards for monitoring lines run by INIP as both of these surveys are covered at the same season (summer or rainy season) of the year.

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 86 square nautical miles (NM²). Figures 2.1, 2.2 and 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's design and effort for the 2013 demersal survey. Size of the survey area by depth stratum, allocation of trawl stations, proportion of stations relative to stratum size, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed, divided in to: southern region (Cunene to Tombwa), central region (Benguela to Luanda) and northern region (Luanda to Congo River).

Region	Depth strata (m)									Valid	Failures	CTD	Distance
	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800				
Luanda-Congo River													
Area (NM ²)	1379	1969	1940	601	550	437	409	408	702	8395			
# hauls (BT)	18	20	21	5	8	6	5	5	7	95	2	113	1440.6
% area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4	50.76			
% hauls	18.9	21.1	22.1	5.3	8.4	6.3	5.3	5.3	7.4				
Benguela-Luanda													
Area (NM ²)	1068	1586	1439	407	372	343	346	268	357	6186			
# hauls (BT)	16	19	15	5	8	6	8	4	3	84	1	100	869.8
% area	17.3	25.6	23.3	6.6	6	5.5	5.6	4.3	5.8	37.41			
% hauls	19.0	22.6	17.9	6.0	9.5	7.1	9.5	4.8	3.6				
Cunene-Tombwa													
Area (NM ²)	507	591	594	100	77	48	39			1956			
# hauls (BT)	10	11	10		2		2	1		36		63	899.7
% area	25.9	30.2	30.4	5.1	3.9	2.5	2	0	0	11.83			
% hauls	27.8	30.6	27.8	0.0	5.6	0.0	5.6	2.8	0.0				
Grand total													
Area (NM ²)	2954	4146	3973	1108	999	828	794	676	1059	16537			
# hauls (BT)	44	50	46	10	18	12	15	10	10	215		276	3210.1
% area	17.9	25.1	24	6.7	6	5	4.8	4.1	6.4				
% hauls	20.5	23.3	21.4	4.7	8.4	5.6	7.0	4.7	4.7	Total hauls: 218			

A stratified semi-random survey design was used with depth and area as stratifying variables. Trawling was carried out along transects perpendicular to the coast, which were approximately 15 NM apart (Figures 2.1-2.3), and the allocation of trawl stations was proportional to stratum size. Trawling shallower than 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 in southern region or due to 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 reasonably 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 2003-2013 surveys in the southern region and during the 2002-2013 surveys in the central and northern regions (see Annex VIII).

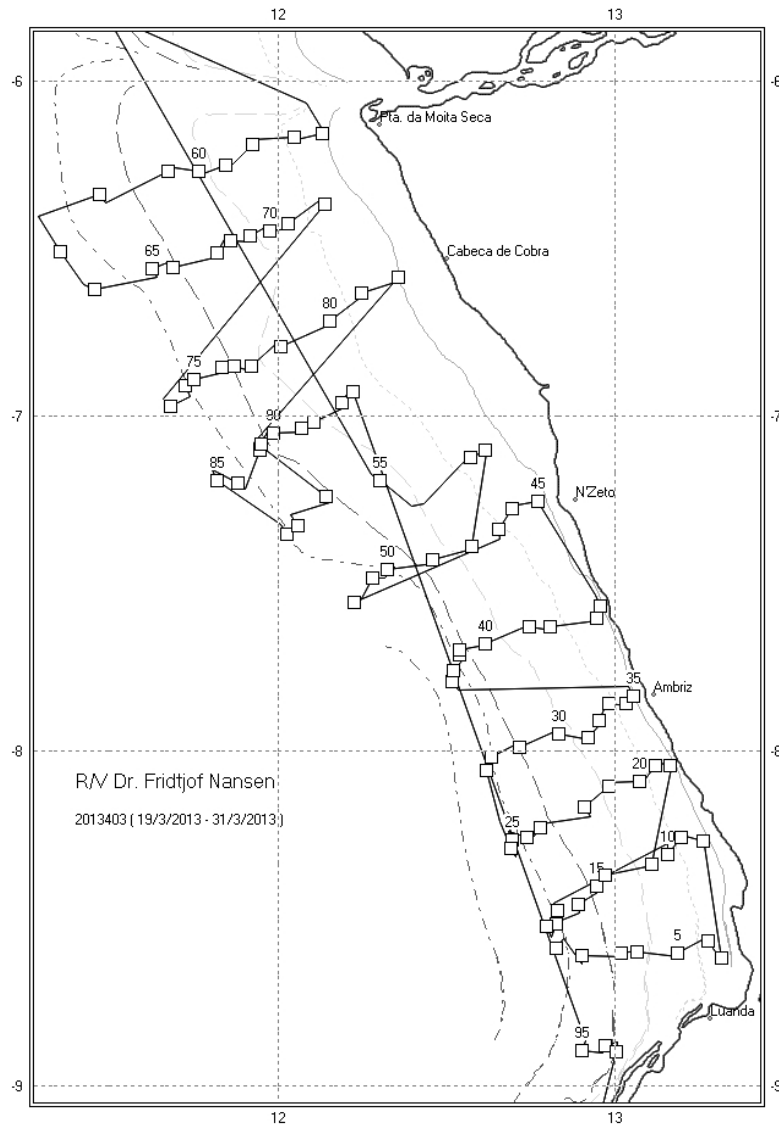


Figure 2.1 Angola north: Luanda - Congo River - Luanda. Course track with trawl stations. Depth contours at 20, 50, 100, 200 and 500 m.

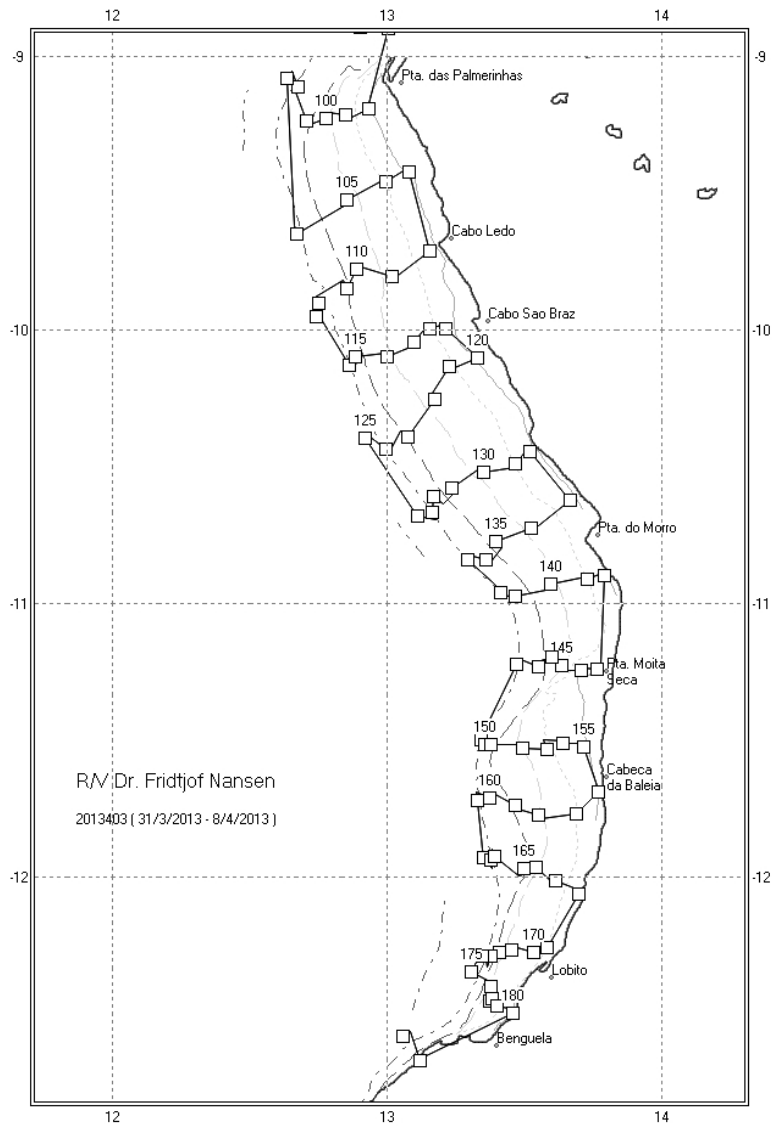


Figure 2.2 Angola central: Ponta das Palmerinhas - Benguela. Course track with trawl stations. Depth contours at 20, 50, 100, 200 and 500 m.

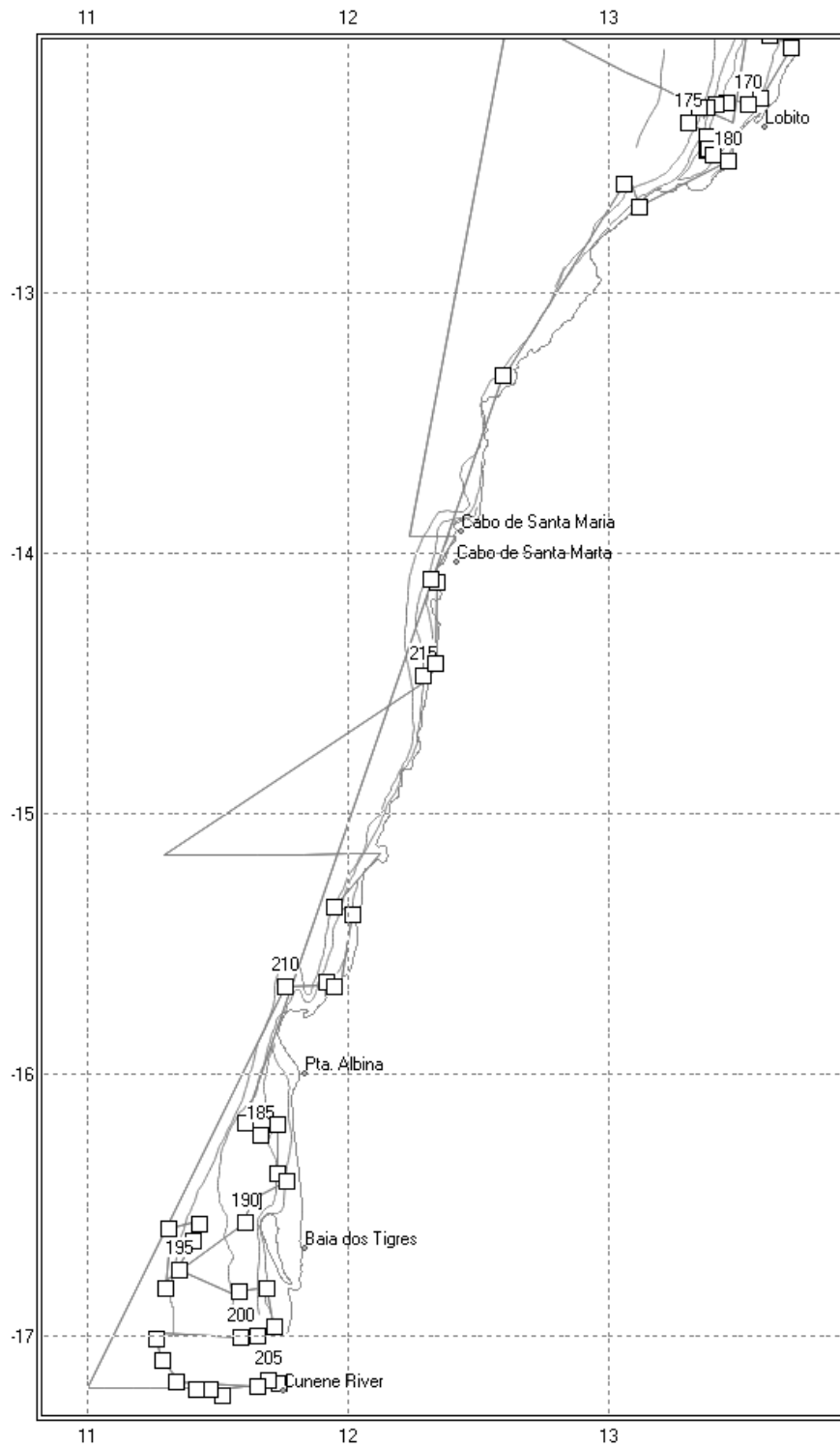


Figure 2.3 Angola south: Tombua-Cunene. Course track with trawl stations. Depth contours at 20, 50, 100, 200 and 500 m.

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 or to 1 000 m depth at the Angola monitoring lines and at all trawl stations.

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

The vessel-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments was out of order during the survey.

Biological sampling

Sampling gear

A Gisund Super bottom trawl with a headline height of about 4.5 m was used during the survey, and the doors are of the Thyborøn' combi type. The distance between the front parts of the wings was about 21 m during deployment at a speed of 3 NM h⁻¹. These settings have been the standard on all swept area surveys with R/V "Dr. Fridtjof Nansen". As in previous surveys, except during the 2002 survey, a 44 m long tickler chain was attached to the footrope on depths of more than 300 m in order to catch more of the bottom dwelling deep-water shrimps. During all tows deeper than 80 m, a 9 m long constraining rope was attached between the wires 120 m in front of the trawl doors. This kept a constant distance between the doors of about 50 m during the trawling. In shallow stations with depths of less than 80 m, the door-to-door distance varied more, depending on bottom type and currents.

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

The records of fishing stations are presented in Annex I. For commercially important species, pooled length frequency distributions, in which individual samples are raised to total catch, are shown by area in Annex II.

Acoustic sampling

Acoustic recordings were carried out at four frequencies: 18, 38 and 120 kHz using a SIMRAD ER60 echo sounder. The 200 kHz transducer was out of order and not in operation during the survey. 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 and depth strata

Table 2.1 shows the areas in NM² for the southern region (Cunene - Tombwa: S17°15'-S16°00'), the central region (Benguela - Ponta das Palmerinhas: S12°40'-S09°00') and the northern region (Ponta das Palmeirinhas - Congo River: S09°00'-S06°00') by depth strata. These strata are used to calculate the swept-area biomass estimates. All valid stations are treated as representative for the relevant depth intervals where the species or group of species were caught.

Calculations

All equations for the calculations are given in Annex IV. The effective fishing width of trawl gear used by R/V "Dr Fridtjof Nansen" is considered to be 18.5 m. The effective fishing area is the product of the fishing width multiplied by the towing distance measured by the GPS. It is assumed that all fish within the trawling path are caught, which gives a catchability coefficient (q), *i.e.* the fraction of the fish encountered by the trawl that was actually caught, equal to 1.

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

The survey design and effort were previously inconsistent, and made any comparison between surveys difficult. Therefore, it was discussed and agreed upon by the responsible of the Demersal Programme of the Instituto Nacional de Investigação 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 2.2.1[⊗] was used to calculate stratified density estimates sorted by survey and stratified by depth and latitude. Biomass estimates by species or species groups were obtained from a stratified mean density estimator using the equations in Annex IV.

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

CHAPTER 3 OCEANOGRAPHIC CONDITIONS

Surface distribution

The most typical feature of the hydrographic conditions in Angolan waters between December and March is the drop in the salinity at the surface, associated with the seasonal rise in the precipitation over the continent and the consequent increase in the discharge of freshwater carried to the ocean by the Congo River and other rivers along the Angolan coast. The regular demersal surveys carried out by R/V "Dr. Fridtjof Nansen" in March-April are coincident with the late phase of the wet season and, typically, it is observed low salinity in the surface waters in the shelf off the northern and central Angola regions.

HORIZONTAL DISTRIBUTIONS

The wind, sea surface temperature (SST), sea surface salinity (SSS), sea surface oxygen (SSO) and sea surface fluorescence (SSF) were continuously recorded during the cruise (Figures 5-6)

Northern Region

In general, the wind were variables in direction and speed (Fig.5a). The winds recorded in the northern region were N -NE, strong offshore (15-20 knots) and very weak (5 - 7nós) in the coastal zone , with the exception of Barra do Dande area where the average speed was around 15 knots.

Surface waters of the North (5 m depth , Figs 6a) seemed to be characterized by the intrusion of Congo River waters with low salinity (28-32) and high temperature (29-30°C), particularly in the offshore area. Most of the lowest temperatures (22-25°C) and high salinity content were recorded in the coastal zone probably indicating the occurrence of upwelling.

The offshore of Congo river mouth and the coastal Nzeto zones were characterized by high sea surface dissolved oxygen values with around 4.5 - 5ml/l and the maximum fluorescence recorded at surface was 0.5µg/l nearly the Congo River mouth and close to Luanda coastal area. Most of oceanic and coastal band between Nzeto and Palmeirinhas was dominated by low fluorescence content values (0.1µg/l).

Central Region

The winds in the central region were moderate mostly of them N -NE direction with an average speed of around 10 knots offshore and weaker in the coastal zone with 4 to 5 knots (Fig.5b).

In this region temperatures decreased from north to south (29 °C in Ponta das Palmeirinhas and 28 °C in Lobito) (Figure 6b). The upwelling system characterized by isotherms parallel to the coast was present along the entire coastal area, being interrupted in the southern area of Ponta do Morro. The coastal zone recorded the lowest temperatures of 23-24 °C at the Ponta das Palmeirinhas and between Sumbe and Benguela areas. High temperature values occurred offshore with isotherm of 28 °C the most representative of the central region.

In this region, the lowest salinity ($S \geq 35$) was recorded in all centres of some gyres observed along the continental shelf, particularly at the Ponta das Palmeirinhas and Sumbe and Lobito zones. In this region was also observed a gradual increase in salinity in the whole extension of the continental shelf southwards with the highest value ($S \geq 36$) recorded in Lobito offshore profile.

The entire central region was rich in dissolved oxygen with around 4.5 ml/l. and higher concentrations of fluorescence with 0.4- 0.9 μ g/l were recorded along the coast and Lobito offshore. However the lowest values ($\leq 0.1\mu$ g/l) was observed across continental shelf.

Southern Region

As observed in the three last years strong winds occurred in the southern coastal region (Fig.5c) with maximum around 30-35 knots, especially in the area between northern Baía dos Tigres and south of Namibe town. The wind direction was largely parallel to the coast, and may predict the occurrence of an intense upwelling.

In the southern region (Fig.6c) 67 CTD stations were effectuated. In between 13° -15° 30'S sea surface temperature (5m depth) ranged from 21 to 24°C and low temperature (17-21°C) occurred close to Cunene River area (15° 30'S). This behaviour can be seen as indices of an intensive upwelling occurrence in this region.

The most isohaline of 36 was representative along the continental shelf and the lowest salinity of about 35 was found in the coastal area between the Tiger's Bay and the Cunene River mouth. Higher surface concentrations of oxygen ranged from 4.5 to 5ml/l in the band of Ponta Albina and Cunene River.

The lowest dissolved oxygen concentrations (2 - 3 ml/l) were recorded in the coastal zone of Cunene River mouth. The fluorescence showed high concentrations of about 2 μ g/l close to Tômbwa area. Lowest concentrations of fluorescence (0 - 0.1 μ g/l) were recorded in the area where the lowest values of oxygen occurred and Tômbwa offshore. The thermal Angola and Benguela Front was well defined and located in the area between the Namibe town and Tômbwa.

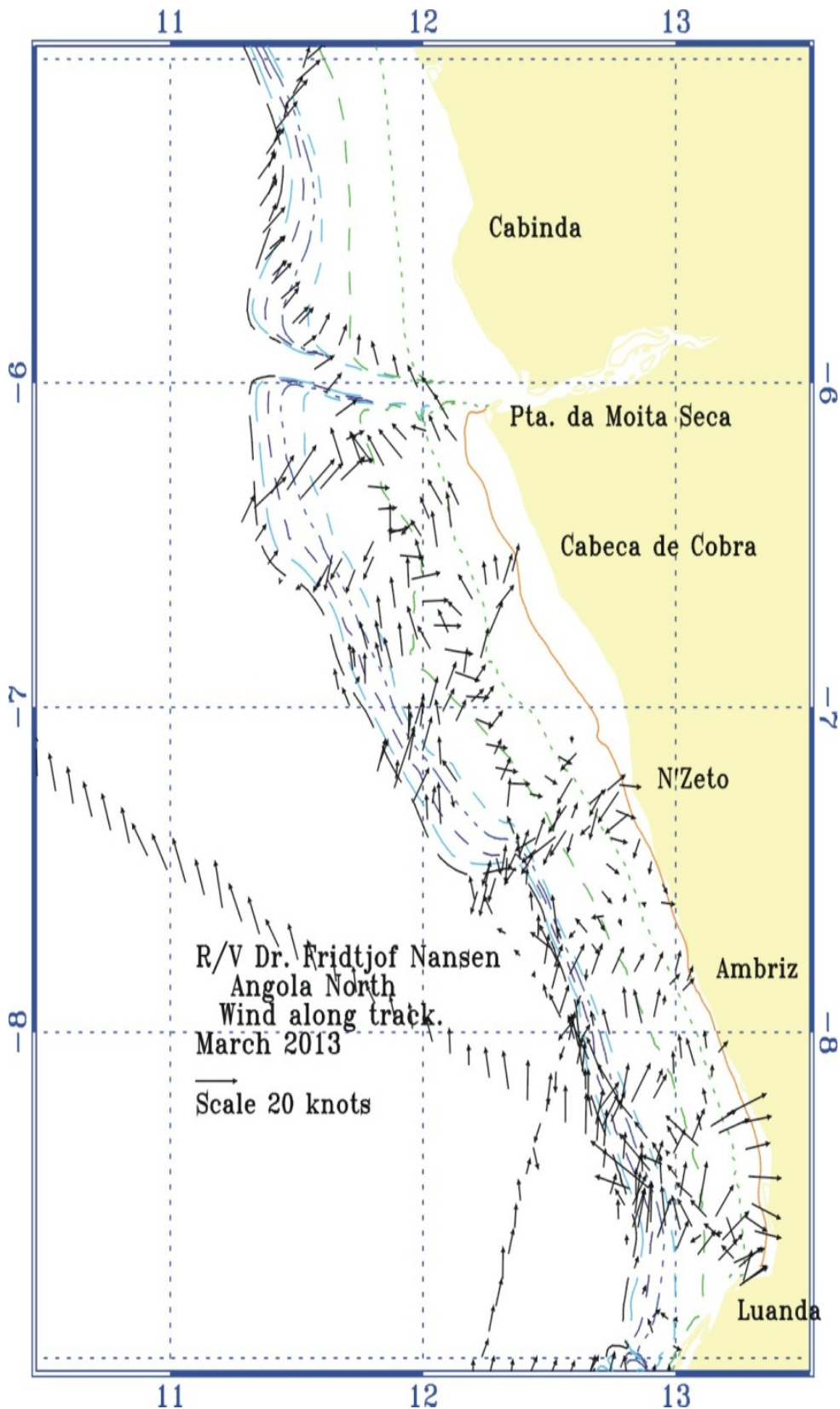


Figure 3a. Distribution of speed and wind along northern region. Depth contour of 10, 20, 50,100, 200 and 500 m.

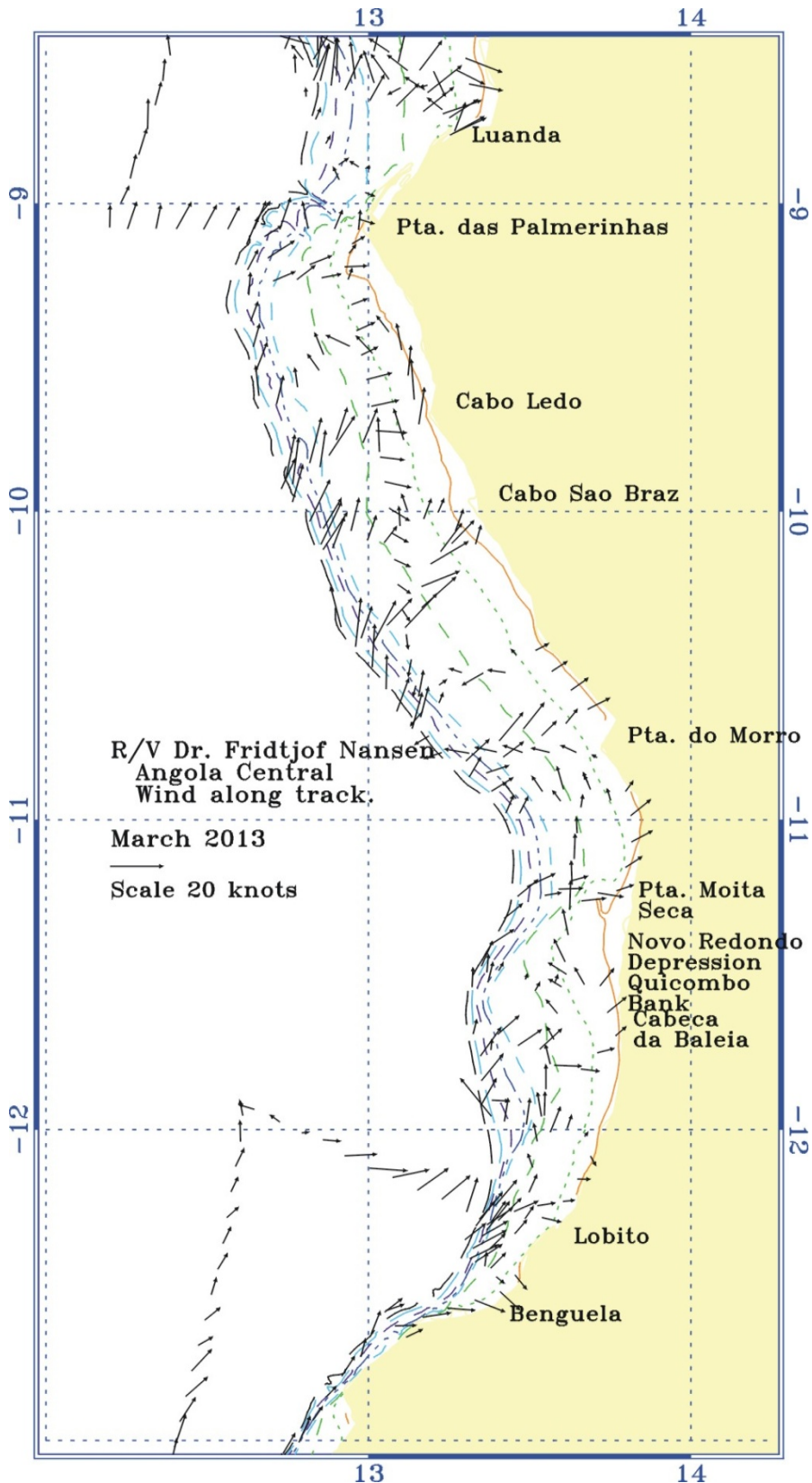


Figure 3b. Distribution of speed and wind along central region. Depth contour of 10, 20, 50, 100, 200 and 500 m.

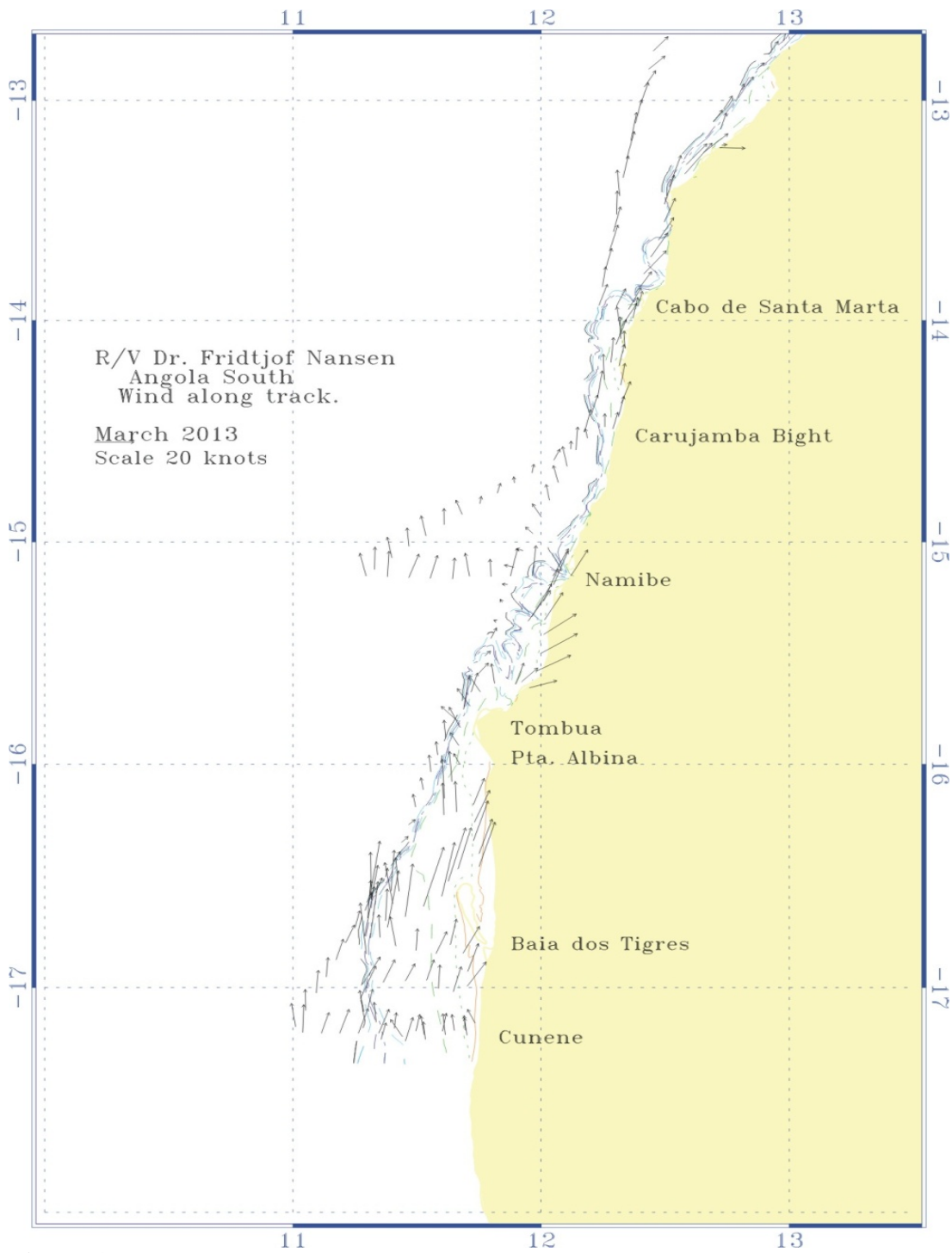


Figure 3c. Distribution of speed and wind along southern region. Depth contour of 10, 20, 50,100, 200 and 500 m.

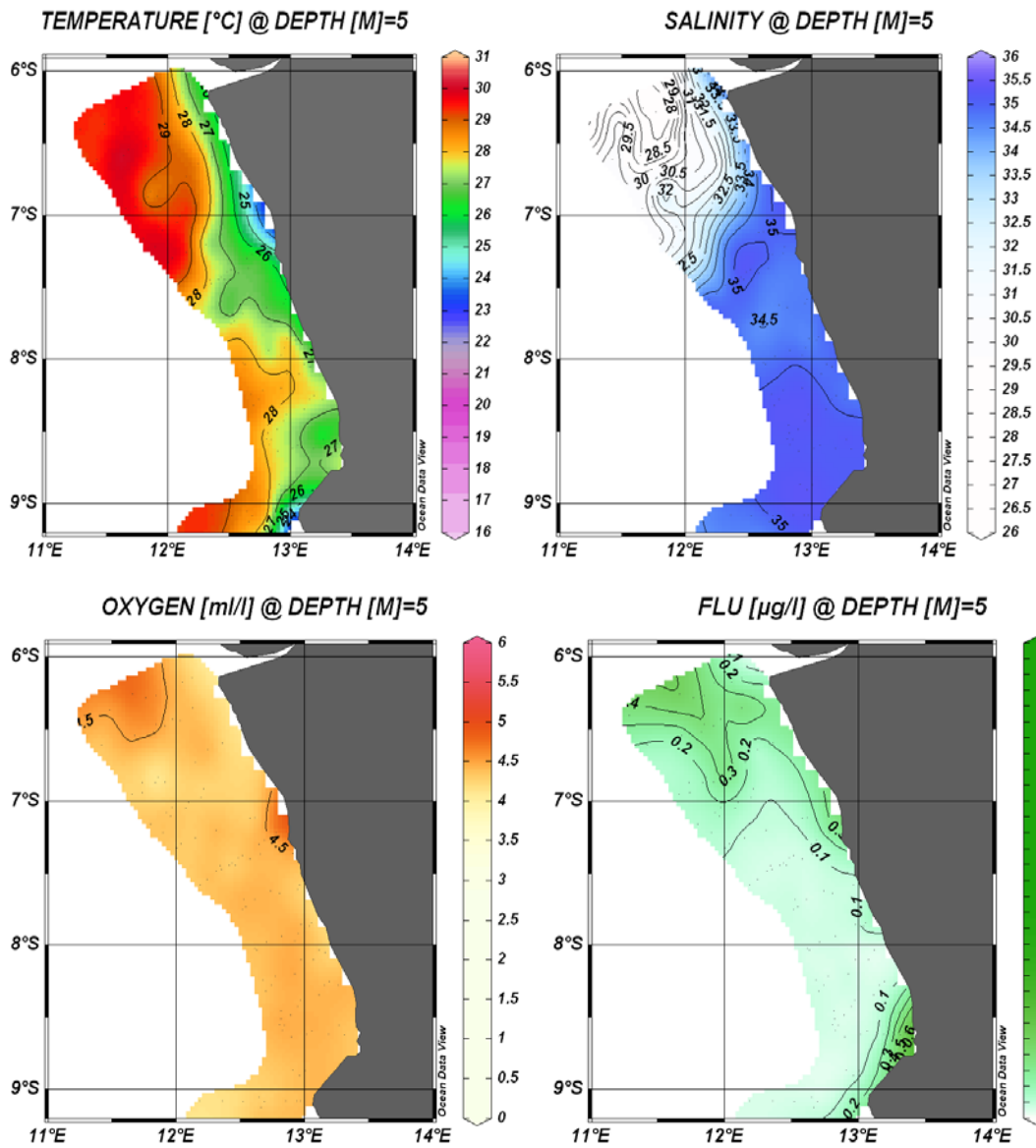
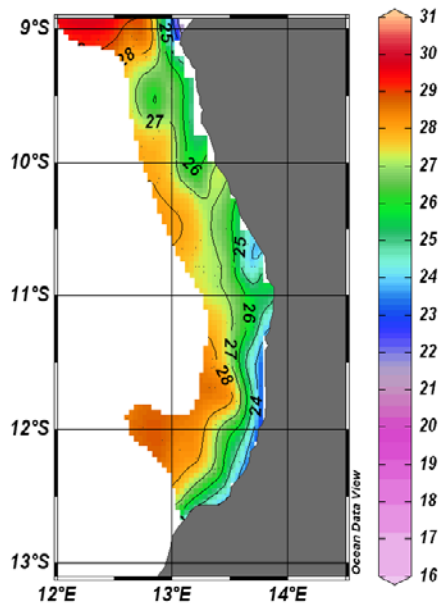
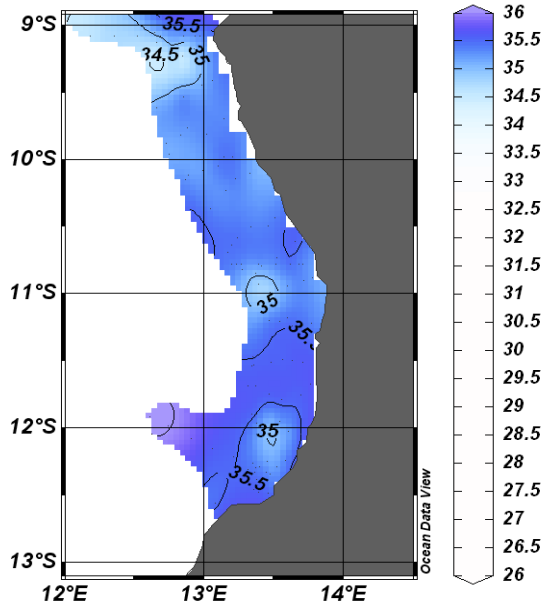


Figure 4a. Distribution of water temperatures and salinity at 5m depth in the Northern region.

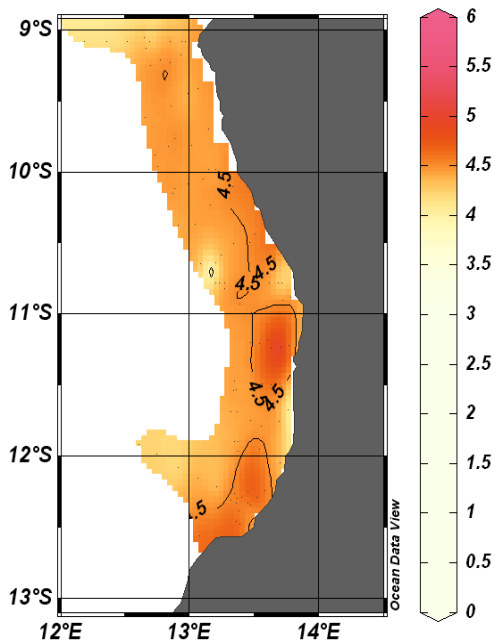
TEMPERATURE [°C] @ DEPTH [M]=5



SALINITY @ DEPTH [M]=5



OXYGEN [ml/l] @ DEPTH [M]=5



FLU [µg/l] @ DEPTH [M]=5

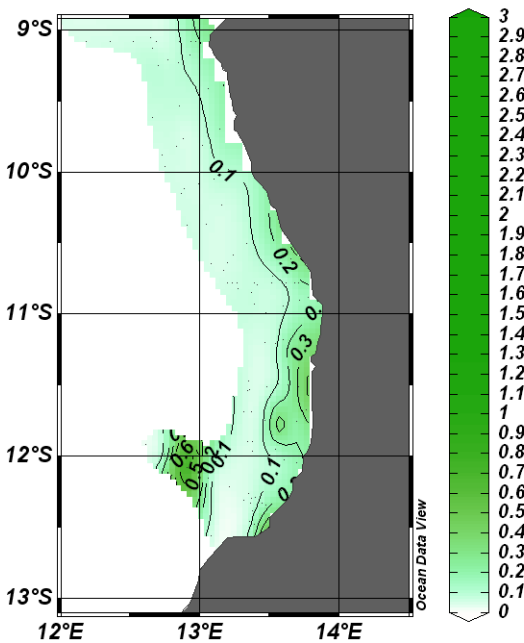
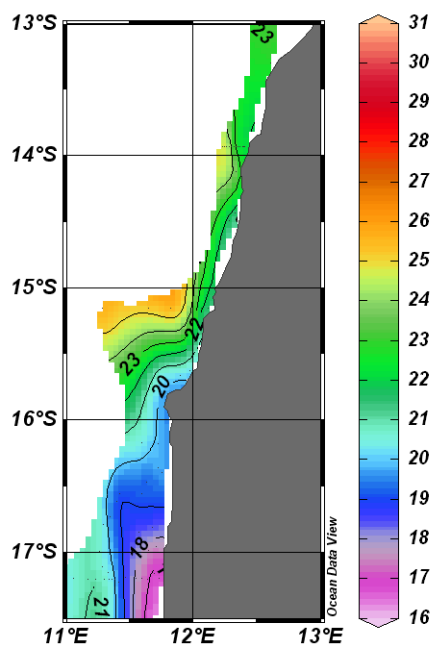
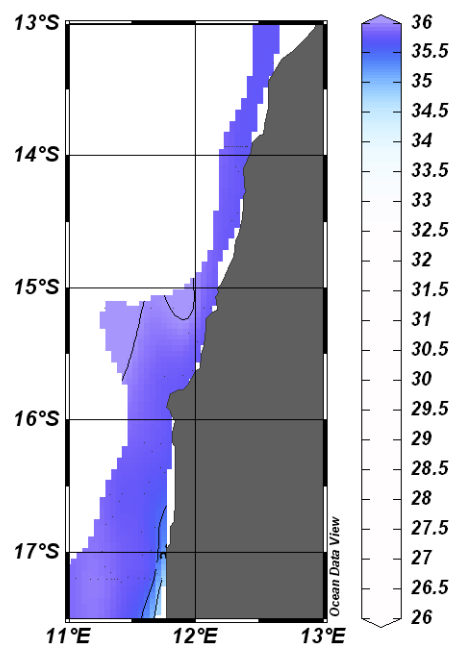


Figure 4b. Distribution of water temperatures and salinity at 5m depth in the central region

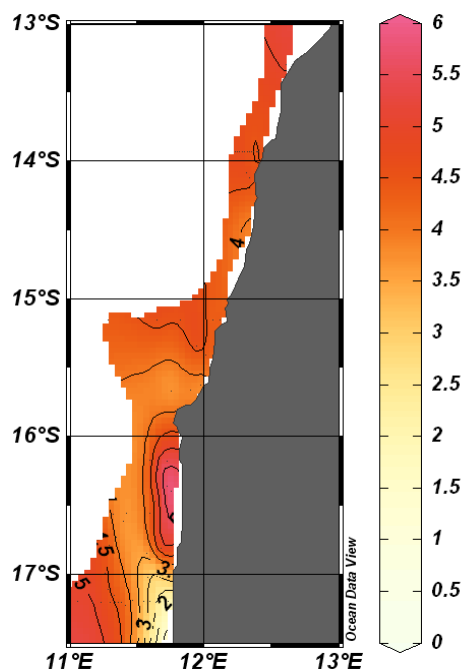
TEMPERATURE [°C] @ DEPTH [M]=5



SALINITY @ DEPTH [M]=5



OXYGEN [ml/l] @ DEPTH [M]=5



FLU [µg/l] @ DEPTH [M]=5

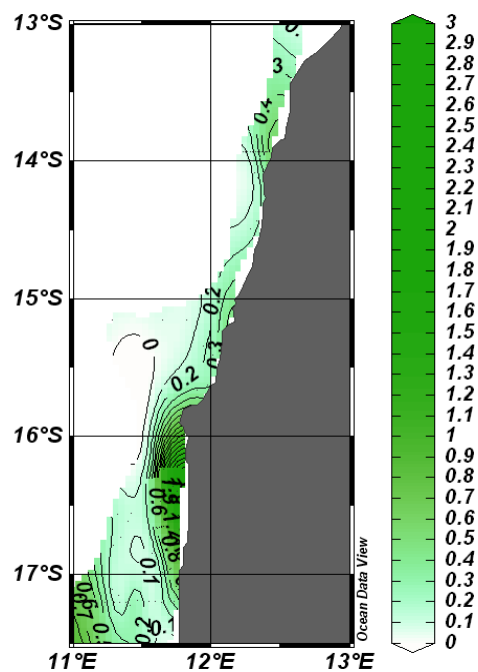


Figure 4c. Distribution of water temperatures and salinity at 5m depth in the Southern region

VERTICAL DISTRIBUTION

Northern Region

At Congo River line monitoring (Fig.7), the values of temperature and salinity were consistent with those observed in the horizontal distribution (Fig. 6a). In the most of the northern of continental shelf high values of temperature (29-30 °C) and low salinity (27-30) were observed. The highest temperature was recorded in these areas coinciding with less saline water (27.5). The coastal zone showed relatively saline waters (30). The layer at above 100m was very rich in dissolved oxygen with values more than 4.5ml/l. The concentrations of fluorescence were low with values around 0.3 μ g/l.

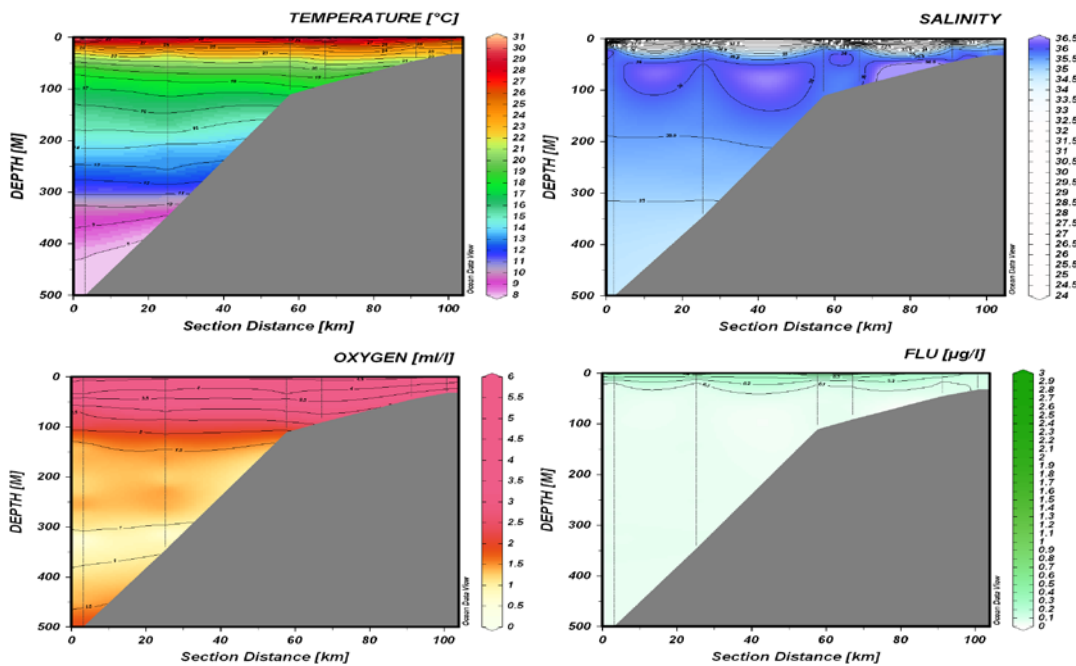


Figure 5a. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Congo River section

High values of dissolved oxygen were found in the coastal zone (3.5-4.5 ml/l) and the minimum value of ≤ 1 ml/l occurred between 200m and 470m depth. The configuration of isolines of temperature, salinity and oxygen in the water column revealed the occurrence of internal waves whose effects had an impact on stations across offshore and continental shelf. Some tongues of water with moderate fluorescence values were present along the continental shelf and the maximum concentration was recorded in the coastal stations.

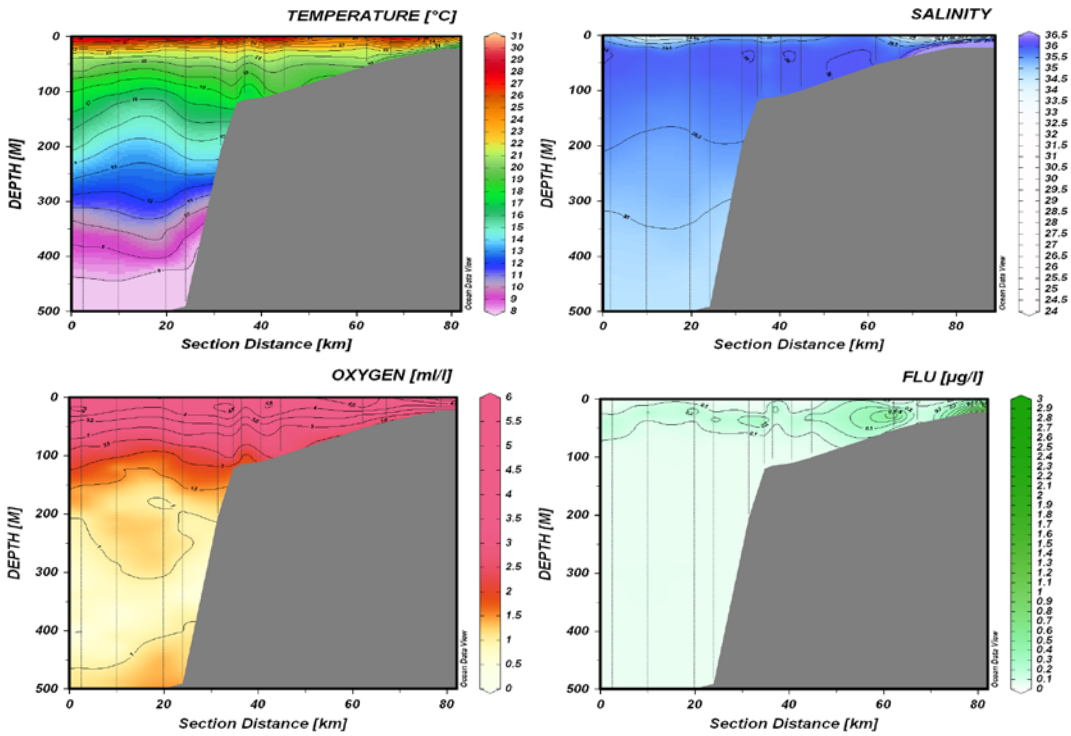


Figure 5b. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Nzeto section.

In Ambriz section (fig. 9), temperature ranged from 25° to 29°C, showing a sinking behaviour in the first 50m depth and decreasing in the water column until 8°C at the bottom. The salinity ranged between 35.8 and 34.5 from surface to the bottom, with the highest salinity recorded in the subsurface layer. The dissolved oxygen concentration was high at surface with value around 4.5ml/l reaching a minimum value of 1 ml/l at depths between 200 and 450m.

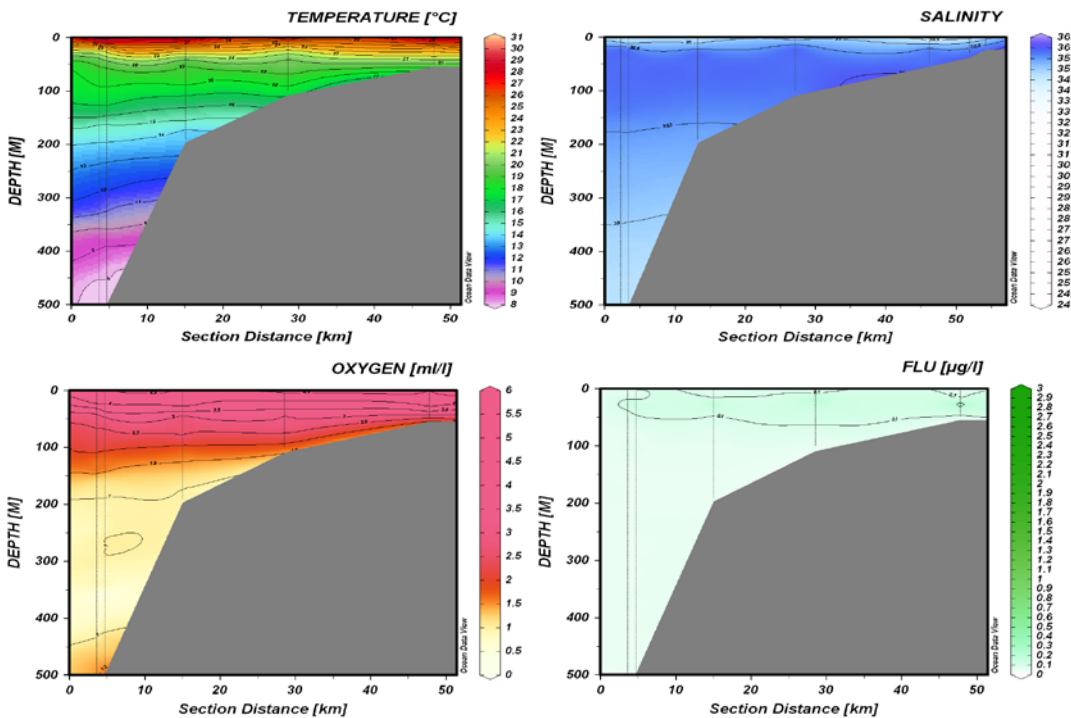


Figure 5c. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Ambriz section.

Central Region

On line monitoring of Ponta das Palmeirinhas (fig. 10) the surface temperature was around 29° C and at the bottom of $\leq 8^{\circ}\text{C}$. The influence of Congo River waters still more pronounced in offshore oceanographic stations showing moderate levels of salinity (35) with the highest (35.7) recorded in the subsurface layer. The surface layer up to a depth of 30m presented well mixed, with dissolved oxygen content in order of 4.5 ml/l and the lowest value (≤ 0.5 ml/l) was observed between 250 and 450m deep. A tongue of water rich in fluorescence with relatively high values ($0.3\mu\text{g/l}$) was recorded in the subsurface layers. The effect of internal waves (see temperature and salinity) was found on the slope before the continental shelf with possible impacts on distribution of demersal resources.

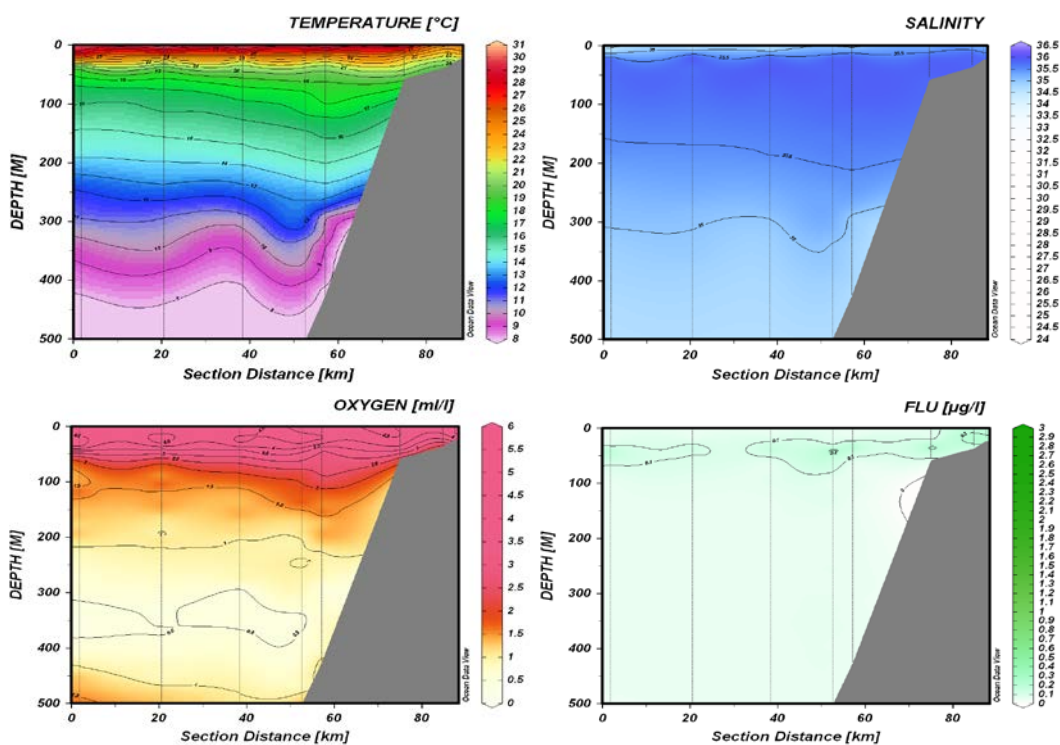


Figure 6a. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Ponta das Palmeirinhas section.

The water column of Ponta do Morro (Figs.11) was homogeneous and well stratified. The temperature ranged from the surface to the bottom between 27 and 11°C, while the salinity varied between 35.5 and 35. Layer above 40m depth is the most abundant in dissolved oxygen with values in the order of 4 - 4.5 ml/l. The highest concentrations of fluorescence ($0.2\mu\text{g/l}$) were recorded along the coast.

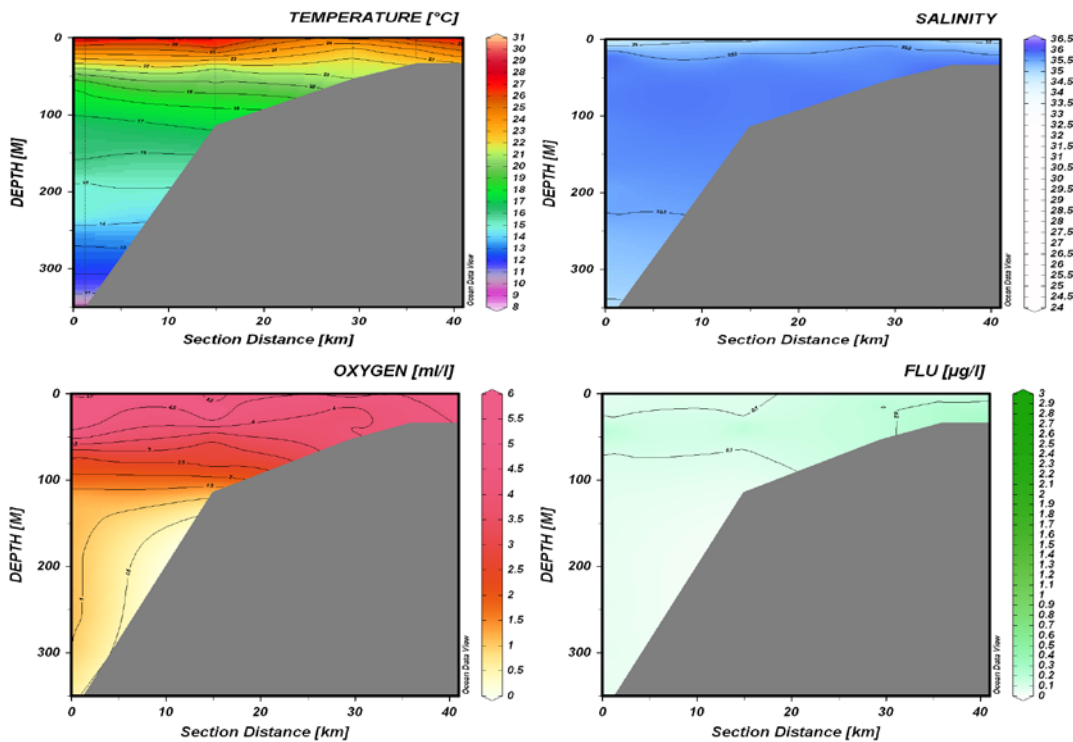


Figure 6b. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Ponta do Morro section.

In Lobito section (Fig.12) the sea surface temperature varied between 25 - 29°C and gradually decreased up to 8°C in the water column. The low salinity value with about 35 have been identified in more coastal oceanographic stations probably due to the local plume river impact (River Catumbela) and the highest value of 36 was observed in two stations offshore. Surface waters above 50m were rich in dissolved oxygen contents with a value around 4.5ml/l and the minimum occurred between 250 and 500m depth. In whole extension of continental shelf a tongue of water was observed with moderate fluorescence values (0.3µg/l) in the subsurface layer.

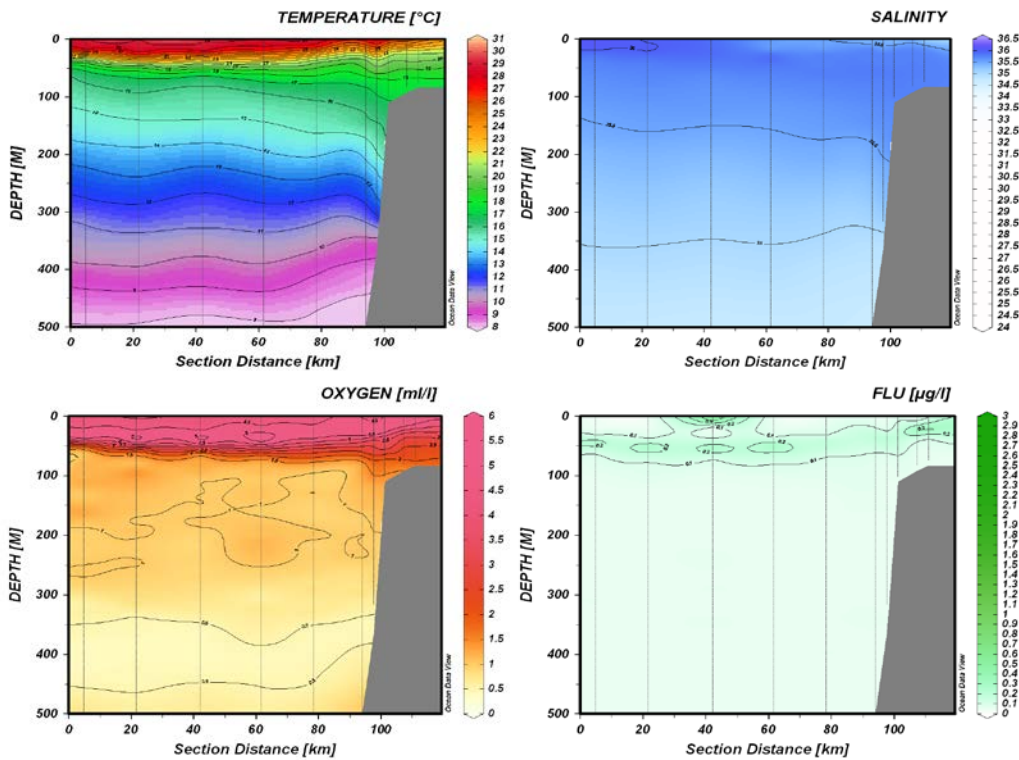


Figure 6c. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Lobito section.

Southern Region

Santa Marta Section

The profile of Santa Marta (fig. 13) showed signs of occurrence of a weak upwelling of tropical type, and this fact mirrored by the isolines of temperature and dissolved oxygen. The sea surface temperature ranged from 25°C offshore to 22°C inshore. Upper to 200m depth salinity was homogeneous with value more than 35.5. The isoline of oxygen more representative was characterized by 4.5ml/l throughout continental shelf and minimum value was recorded between 350 and 400m. The coastal area showed high fluorescence values in the order of 0.7µg/l.

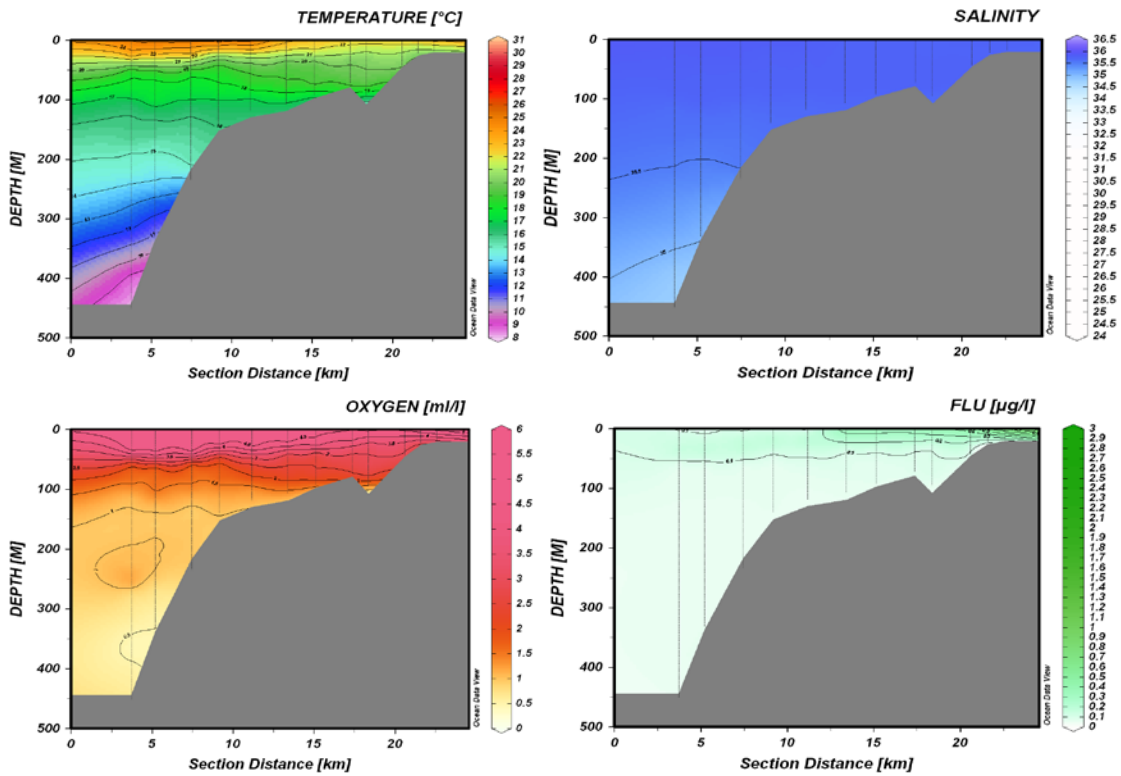


Figure 7a. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Santa Marta section.

Namibe Section

The sea surface temperature ranged between 22 and 27°C and dropped within the column water to 5 °C at 500m depth. The uplift of isolines of all parameters revealed the occurrence of an intense upwelling. The sea surface salinity and the sea surface oxygen content were high with 36 and 4.5ml/l respectively and dominated the whole extension of the continental shelf to the slope. The low dissolved oxygen content (0.5ml/l) was found between 300 and 450m depth.

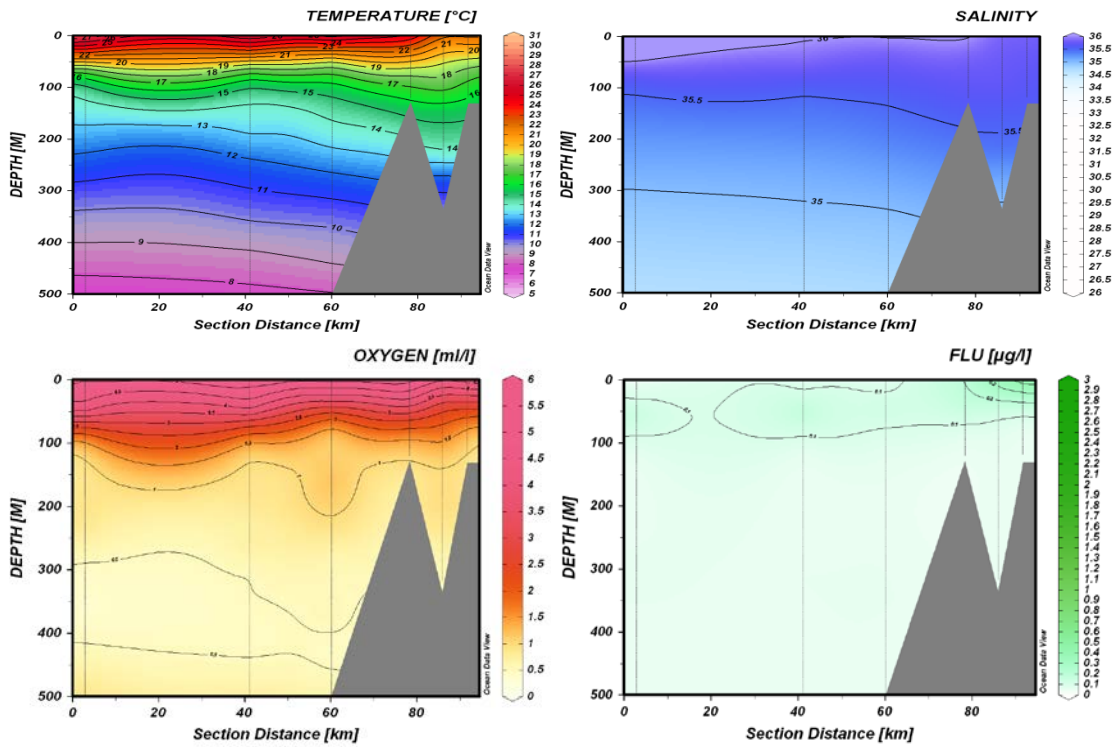


Figure 7b. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Namibe section.

Cunene Section

Signs of intense upwelling were visible in all parameters analysed in this section (Fig.15). Low values of surface temperature (21°C offshore and 17°C inshore) were recorded. The maximum salinity observed on the surface of the entire continental shelf was 35.8, except in two coastal stations where less saline waters with value of 34 occurred probably caused by Cunene River plume. High concentrations of dissolved with around 5ml/l were recorded offshore and coastal zone was poor in oxygen content with about 1-1.5ml/l. Similar pattern was observed in fluorescence being the highest concentrations recorded offshore and the lowest close the coast.

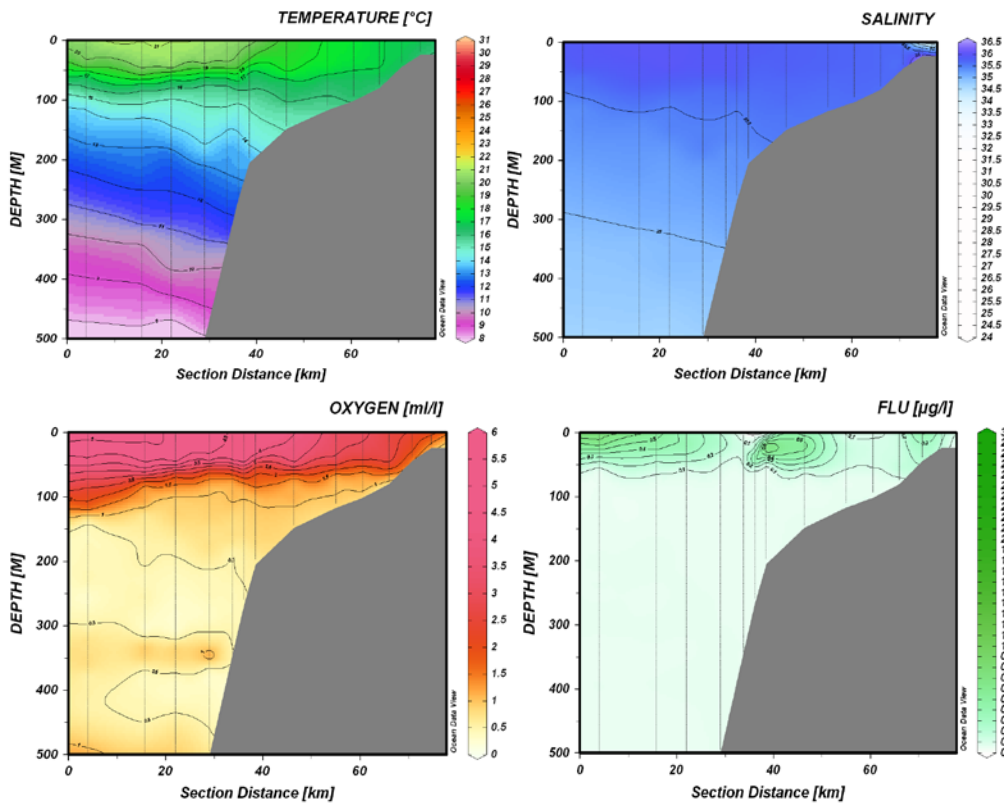


Figure 7c. Vertical distribution of temperature, Salinity, Oxygen and fluorescence at Cunene section.

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

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

The trawl positions are mapped in Figures 2.1-2.3, and the station information and catch by species are presented in Annex I. Pooled length distributions, weighted by the catch of the main species by region, are shown in Annex II. Further, the mean densities (tonnes·NM⁻²) and the frequency of occurrence of the most important species are shown in Annex III. Annex V shows the various 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 shelf - Ponta das Palmerinhas

The survey covered the northern region of Angolan waters from Luanda to the mouth of Congo River. The northern area of Congo River is inaccessible to fisheries research surveys due to restricted oil exploitation areas. 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 59 successful swept-area trawl stations were accomplished on the shelf area in 2013 (Table 2.1).

The total average catch per hour on the inner shelf was 815 kg/h and 423 kg/h in the outer shelf. The demersal group had an average catch rate of 426 kg/h contributing with 52% to the total average catch, cephalopods contributed with 0.2% while shrimps and sharks contributed with less than 1% to the total on the inner shelf. The 'pelagic' group contributed with 273 kg/h representing 33.5 % of the total catch, mainly due to two hauls with large catches of carangids.

On the outer shelf, the 'demersal' group contributed with 64.5% (273 kg/h) to the mean catch rate, which some trawls dominated by big eye grunt (*Brachydeuterus auritus*), while the 'pelagic' group contributed only with 10% to the total catch (43 kg/h). Shrimps, sharks and cephalopods contributed with less than 2% altogether.

Within the main demersal groups on the inner shelf, seabreams (except *B. boops*) had a mean catch rate of 33.4 kg/h (representing 4% of the total catch of the main demersal groups). The big eye grunt was caught in almost all the stations dominating the inner shelf with an average catch rate of 360 kg/h contributing with more than 40% to the demersal group. Croakers and grunts showed a low average catch rate, 12 kg/h (1.5%) and 8.4 kg/h (1%) respectively. Groupers were only caught in three stations with very low mean catch rates (1.7 kg/h representing less than 1%) while snappers were not caught.

On the outer shelf, seabreams were frequently caught with an average catch rate of 71 kg/h (17%); within this group *Dentex angolensis* was the most abundant. Croakers were caught with a mean catch

rate of 112 kg/h (27%) with *canary drum* (*Umbrina canariensis*) the dominating species. Groupers and grunts were caught in few stations with very low average catch rates. Snappers were not caught.

The most common pelagic groups caught on the inner shelf were carangids with 197 kg/h, contributing with 24% of the total average catch rate. Barracudas were frequently caught but with a low average catch rate (44 kg/h representing 5.4%). Clupeoids were caught in few stations with an average catch rate of 24 kg/h (3%). Hairtails, horse mackerel and sardinella also had very low average catch rates 3.5 kg/h, 2.9 kg/h and 1 kg/h respectively, whereas scombrids were found only on one station (0.1 kg/h).

On the outer shelf, hairtail and horse mackerel were the most important pelagic species though with low mean catch rates, 17 kg/h (4%) and 16 kg/h (4%) respectively. Carangids had a lower mean catch rate (7.5 kg/h) compared to the one found on the inner shelf. Barracudas and sardinella were caught in small quantities while clupeids and scombrids were not caught.

Biomass estimates

Table 4.1 shows the swept - area biomass estimates from 1985 to 2013, 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 valid trawl station that have been carried out by strata and survey. 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 high coefficient of variations (CV) indicating that the trends in the time series should be interpreted with care.

The biomass estimate of *Trachurus trecae* was 2 050 tonnes (T), which is a drastic decrease compared to the 2012 biomass estimate (7 164 T) and is one of the lowest estimates since 2 000. The highest estimate (37 000 T) was registered in 1997 and since the estimates have been below 9 000 T.

Merluccius polli was mostly found in juvenile stage on the shelf, and the biomass estimate for 2013 was 55 T which is the highest of the last ten years.

The biomass estimate for seabreams was 11 663 T, similar to the 2012 estimate (11 479 T) and it has been around the same level for the last 10 years. As in previous years, *Dentex angolensis* was the dominant seabream species in the northern shelf.

The estimated biomass for croakers in 2013 was 12 598 T which represents a drastic increase of more than 80% compared to the last year estimate (4 703 T) and similar to the 1997 estimate (12 451 T). *U. canariensis* was the most common croaker found and contributed with more 90% of the total estimate of this group. Other croakers are coastal species.

The biomass estimate of grunts (*Pomadasyus incisus*, *P. Jubelini*, *P. rogeri* and *P. peroteti*) was 934 T showing a decreased from 2012 estimate (5022 T) and is the lowest since 2003 but otherwise higher than the estimates of 2000 (388 T) and 2002 (247 T).

As in previous years, *Epinephelus aeneus* is the common groupers species found on the inner shelf, the 2013 biomass estimate for the group was 134 T. This estimate is the lowest in the time series.

Groupers are coastal dwellers and prefer rocky bottoms where the trawl has no access; therefore the biomass estimates of this species group may not adequately reflect the state of the stock.

Snappers are rarely caught as they are rocky dwellers and are often found on unavailable areas to the trawl; hence the biomass estimates of snappers may not adequately reflect the state of the stock. The estimate for this year was 0.

The biomass estimate of *Parapenaeus longirostris* in 2013 was 36 T that is lower than last year's estimate (42 Tonnes) and much lower than in 2010 (596 Tonnes).

The 2013 biomass estimate for Sepiidae was 130 T, which is the second lowest value since 2000.

The biomass estimate for Ommastrephidae was 150 T which is lower than the 2012 estimate (212 T). 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 the sharks in 2013 was of 345 Tonnes which is much higher than the 2012 estimate value (97 Tonnes) but lower than in 2011 (510 T).

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	Hake		T.treace		Horsemackerel		Shrimps		Cephalopod		Sharks		Clupeids	
	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv
1985401	9	(2)	4496	(1.1)	4496	(1.1)	302	(0.8)	10463	(1.3)	498	(0.9)	364	(1.2)
1985403	0	NA	3324	(1.2)	3324	(1.2)	139	(1.9)	694	(0.6)	451	(0.6)	3907	(1.9)
1985405	3459	(2)	16486	(1.2)	16486	(1.2)	1448	(1.4)	2046	(0.7)	870	(1.2)	205	(1.9)
1985407	7415	(2)	36044	(1.1)	36044	(1.1)	107	(1.4)	436	(0.7)	78	(1.6)	483	(1.1)
1986401	56	(2)	13438	(0.8)	13438	(0.8)	1445	(0.9)	2853	(0.9)	496	(0.8)	2053	(0.7)
1986402	290	(1)	8053	(0.4)	8053	(0.4)	486	(0.7)	1179	(0.4)	825	(0.6)	1365	(0.7)
1989402	62	(1)	12681	(0.9)	12681	(0.9)	92	(1.1)	931	(0.5)	497	(1.0)	1578	(1.9)
1989403	250	(2)	11535	(0.7)	11535	(0.7)	509	(0.6)	549	(0.4)	729	(0.8)	1924	(0.5)
1989407	1029	(2)	39959	(0.6)	39959	(0.6)	256	(1.0)	1715	(0.9)	15984	(1.1)	5043	(0.7)
1991403	0	NA	21484	(0.6)	23038	(0.6)	381	(1.7)	935	(0.4)	705	(0.7)	1841	(1.0)
1991404	384	(1)	14727	(0.7)	14727	(0.7)	2554	(1.8)	4225	(0.6)	107	(0.8)	55	(0.8)
1992408	1304	(1)	15520	(0.6)	16973	(0.6)	79	(1.2)	3114	(0.4)	298	(1.1)	8	(2.0)
1994405	56	(1)	14309	(0.8)	14324	(0.8)	478	(1.4)	3643	(0.5)	52	(1.1)	184	(2.0)
1995402	127	(1)	305	(0.8)	305	(0.8)	951	(1.0)	451	(0.4)	679	(0.6)	1369	(0.8)
1996407	0	NA	32155	(0.5)	32155	(0.5)	347	(0.6)	2203	(0.3)	256	(0.7)	782	(1.6)
1997405	25	(1)	37094	(0.5)	37094	(0.5)	474	(0.9)	6218	(0.5)	758	(0.7)	6391	(1.1)
1999403	6	(1)	4106	(0.5)	4106	(0.5)	326	(1.0)	1202	(0.3)	1297	(0.5)	6392	(0.6)
2000403	12	(2)	6583	(0.6)	6583	(0.6)	150	(0.9)	609	(0.6)	3302	(1.7)	619	(1.5)
2001402	72	(2)	5502	(0.9)	5502	(0.9)	212	(0.8)	866	(0.9)	391	(0.7)	517	(0.7)
2002403	0	NA	9765	(0.5)	9765	(0.5)	52	(0.5)	956	(0.5)	178	(0.6)	1442	(0.6)
2003404	0	NA	9766	(0.5)	9766	(0.5)	497	(0.8)	481	(0.6)	243	(0.5)	2816	(0.6)
2004404	0	(2)	9146	(0.5)	9146	(0.5)	196	(1.1)	1059	(0.3)	492	(0.4)	1567	(0.7)
2005404	0	NA	3792	(0.5)	3792	(0.5)	146	(0.7)	1674	(0.3)	734	(0.3)	599	(0.8)
2006403	0	NA	5078	(0.4)	5078	(0.4)	320	(1.0)	1024	(0.3)	556	(0.8)	2388	(0.9)
2007403	37	(2)	2983	(0.4)	2983	(0.4)	243	(0.7)	703	(0.3)	432	(0.5)	1797	(0.6)
2008402	0	NA	1938	(0.5)	1938	(0.5)	331	(1.3)	1204	(0.4)	464	(0.5)	1754	(0.9)
2009403	0	NA	4412	(0.4)	4412	(0.4)	108	(0.9)	1010	(0.3)	381	(0.8)	2961	(1.3)
2010402	26	(2)	2073	(0.6)	2073	(0.6)	638	(1.2)	906	(0.4)	316	(0.4)	1818	(1.7)
2011403	0	NA	4108	(0.9)	4108	(0.9)	106	(0.7)	970	(0.3)	510	(0.6)	3639	(0.8)
2012403	0	NA	7164	(0.5)	7164	(0.5)	71	(1.1)	2484	(0.5)	97	(0.6)	39588	(1.6)
2013403	55	(1)	2050	(0.6)	2050	(0.6)	104	(0.7)	465	(0.3)	345	(0.5)	1452	(1.7)

survey	Carangids		Scombrids		Hairtails		Barracudas		Snappers		Groupers		Grunts.com		Croakers	
	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv
1985401	9986	(0.9)	44	(2.0)	15711	(0.9)	254	(0.9)	0	NA	479	(1.1)	248	(1.0)	1519	(1.0)
1985403	3740	(1.0)	30	(1.6)	1200	(1.7)	75	(0.8)	63	(1.3)	1771	(0.8)	381	(1.3)	1302	(1.1)
1985405	17742	(1.1)	146	(1.3)	2709	(0.7)	26	(1.7)	62	(2.0)	1978	(0.8)	3629	(0.9)	8695	(0.9)
1985407	42506	(1.0)	88	(1.3)	3608	(0.7)	780	(1.5)	0	NA	3054	(0.6)	14806	(1.1)	3692	(0.9)
1986401	17950	(0.6)	30	(2.0)	8078	(1.1)	2080	(0.7)	434	(2.0)	676	(0.8)	1231	(1.0)	2307	(1.0)
1986402	10364	(0.3)	210	(1.0)	8640	(0.8)	756	(0.5)	0	NA	1515	(0.5)	1694	(0.6)	5049	(0.4)
1989402	13264	(0.9)	97	(1.2)	2277	(0.7)	345	(0.8)	0	NA	989	(1.2)	135	(1.0)	4469	(0.9)
1989403	13966	(0.6)	220	(1.0)	3712	(0.5)	2973	(0.9)	33	(1.6)	841	(0.7)	1102	(0.7)	3231	(0.3)
1989407	46704	(0.6)	208	(0.6)	21132	(1.1)	364	(1.0)	316	(2.0)	315	(0.7)	1788	(0.9)	4214	(0.7)
1991403	43605	(0.7)	96	(1.4)	11448	(0.9)	2739	(1.4)	0	NA	642	(0.9)	822	(0.8)	3797	(0.8)
1991404	14928	(0.7)	318	(0.7)	4949	(0.6)	79	(1.3)	0	NA	1022	(0.7)	860	(1.2)	6450	(0.9)
1992408	17942	(0.6)	158	(0.9)	4588	(0.5)	14	(1.3)	0	NA	1844	(0.8)	932	(0.9)	2778	(0.6)
1994405	21225	(0.6)	337	(0.9)	4423	(0.4)	325	(1.0)	0	NA	2474	(0.8)	612	(0.8)	4095	(0.8)
1995402	7078	(0.7)	181	(0.8)	7208	(0.6)	2109	(1.1)	481	(1.5)	807	(0.7)	2921	(1.1)	2882	(0.7)
1996407	33700	(0.5)	137	(1.1)	3939	(0.4)	89	(1.4)	0	NA	2002	(1.0)	5161	(0.9)	9292	(0.5)
1997405	130055	(0.9)	288	(1.2)	6323	(0.4)	57	(1.7)	73	(2.0)	549	(0.8)	4836	(1.0)	12451	(0.5)
1999403	16570	(0.5)	36	(1.7)	14001	(0.4)	2712	(0.7)	5	(1.6)	1011	(0.6)	5600	(0.8)	8528	(0.9)
2000403	22483	(0.9)	69	(1.2)	4216	(0.8)	1231	(1.4)	196	(1.6)	620	(0.5)	388	(1.0)	2450	(0.7)
2001402	9560	(0.7)	37	(0.9)	17036	(0.9)	856	(0.9)	723	(1.9)	793	(1.0)	2271	(1.0)	1458	(0.8)
2002403	13125	(0.4)	75	(0.6)	19374	(0.6)	1651	(0.8)	63	(2.0)	509	(0.9)	241	(0.5)	2835	(0.5)
2003404	28286	(0.9)	81	(1.6)	6716	(0.6)	2344	(1.3)	142	(2.0)	334	(0.7)	1375	(0.6)	8078	(0.6)
2004404	12764	(0.4)	22	(1.0)	4668	(0.5)	1455	(1.1)	37	(1.9)	502	(0.6)	3316	(0.9)	5545	(0.7)
2005404	10292	(0.6)	116	(1.1)	5632	(0.5)	705	(1.3)	278	(1.3)	568	(0.4)	5754	(1.0)	7949	(0.6)
2006403	11445	(0.4)	50	(0.9)	11299	(0.4)	1570	(0.6)	16	(1.8)	372	(0.7)	2839	(0.8)	4087	(0.6)
2007403	9442	(0.5)	195	(0.9)	9102	(0.6)	1587	(1.2)	83	(1.3)	460	(0.5)	7966	(1.4)	3901	(0.6)
2008402	17154	(0.7)	151	(0.8)	10986	(0.5)	428	(0.5)	79	(2.0)	614	(0.5)	1485	(0.7)	8771	(0.7)
2009403	9792	(0.7)	100	(0.9)	7272	(0.6)	1591	(0.9)	168	(1.3)	586	(0.5)	3209	(0.9)	3936	(0.6)
2010402	5966	(0.4)	85	(1.1)	2984	(0.5)	852	(0.9)	0	NA	358	(0.7)	3197	(0.8)	5518	(0.6)
2011403	10792	(0.7)	76	(0.9)	4827	(0.5)	2919	(0.8)	78	(2.0)	261	(0.8)	6039	(0.5)	7243	(0.7)
2012403	13824	(0.4)	52	(1.2)	1805	(0.7)	954	(1.1)	8	(2.0)	258	(0.6)	5022	(0.9)	4703	(0.6)
2013403	14075	(0.8)	6	(2.0)	2087	(0.4)	2647	(1.1)	0	NA	134	(1.0)	934	(0.6)	12598	(1.2)

survey	Seabreams		P.longirostris		Ommastrephidae		Sepiidae		D.macro		D.angolensis		U.canariensis		B.auritus	
	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv	biomass	cv
1985401	14690	(0.6)	117	(1.4)	10273	(1.3)	13	(1.6)	200	(1.7)	2196	(0.6)	1132	(1.2)	40729	(1.1)
1985403	12881	(0.3)	0	NA	0	NA	0	NA	0	NA	2495	(0.6)	521	(1.5)	6842	(1.4)
1985405	20897	(0.7)	0	NA	0	NA	154	(1.0)	0	NA	2949	(0.7)	602	(1.1)	9182	(1.2)
1985407	31078	(0.5)	10	(1.7)	84	(1.3)	215	(1.3)	125	(1.6)	6371	(1.0)	2650	(1.0)	64007	(1.1)
1986401	17193	(0.4)	521	(1.1)	1847	(1.3)	808	(0.7)	2058	(0.6)	3814	(0.5)	279	(0.7)	95679	(0.3)
1986402	25098	(0.3)	0	NA	0	NA	734	(0.6)	1483	(0.5)	11220	(0.4)	1350	(0.5)	15408	(0.4)
1989402	12958	(0.4)	60	(1.3)	506	(0.9)	288	(0.9)	0	NA	1612	(0.3)	542	(0.8)	5450	(1.0)
1989403	7283	(0.3)	22	(0.9)	161	(0.5)	272	(0.7)	222	(0.9)	2299	(0.6)	172	(0.5)	14252	(0.5)
1989407	15344	(0.6)	31	(1.5)	1661	(0.9)	45	(1.1)	100	(1.0)	2614	(0.5)	1194	(1.4)	51225	(0.7)
1991403	4769	(0.2)	0	NA	368	(0.5)	282	(0.8)	158	(1.1)	1317	(0.4)	496	(0.7)	28701	(0.7)
1991404	15741	(0.4)	129	(0.9)	2718	(0.9)	229	(0.7)	690	(1.0)	3198	(0.4)	4375	(1.3)	1661	(1.8)
1992408	14551	(0.2)	49	(1.7)	1071	(0.4)	901	(0.6)	1532	(1.1)	5112	(0.3)	680	(0.7)	7599	(1.4)
1994405	19599	(0.5)	478	(1.4)	441	(0.3)	1910	(0.4)	1740	(0.8)	3451	(0.4)	2740	(1.1)	7572	(1.1)
1995402	8341	(0.3)	477	(1.1)	72	(0.6)	268	(0.5)	197	(1.1)	2143	(0.4)	342	(1.2)	12801	(0.7)
1996407	19985	(0.7)	10	(1.6)	589	(0.3)	929	(0.6)	2169	(0.8)	4303	(0.4)	2073	(1.1)	26804	(1.2)
1997405	9009	(0.3)	124	(1.4)	1017	(0.7)	5148	(0.6)	324	(0.8)	2837	(0.4)	1161	(0.8)	39107	(0.5)
1999403	13304	(0.3)	113	(0.8)	391	(0.5)	411	(0.4)	146	(0.8)	2881	(0.2)	3582	(1.4)	37727	(0.4)
2000403	13424	(0.3)	18	(0.9)	214	(0.8)	344	(1.0)	65	(0.9)	4053	(0.8)	1271	(1.1)	23205	(0.7)
2001402	8927	(0.4)	101	(0.9)	176	(0.5)	679	(1.1)	417	(0.9)	1228	(0.4)	188	(1.4)	13842	(0.6)
2002403	9187	(0.4)	21	(1.0)	660	(0.7)	97	(0.5)	102	(1.2)	2089	(0.5)	835	(0.8)	15791	(0.7)
2003404	11346	(0.3)	62	(1.4)	115	(0.8)	255	(1.1)	16	(0.8)	3491	(0.3)	3239	(1.3)	66410	(0.9)
2004404	11924	(0.3)	6	(1.3)	344	(0.4)	494	(0.4)	79	(1.1)	5214	(0.4)	1236	(0.5)	24512	(1.0)
2005404	18282	(0.3)	5	(0.9)	146	(0.3)	1307	(0.4)	136	(0.8)	6727	(0.2)	3640	(0.8)	52045	(1.0)
2006403	10872	(0.3)	176	(1.4)	183	(0.7)	418	(0.4)	7	(1.3)	4630	(0.2)	2151	(0.9)	61138	(0.7)
2007403	12758	(0.2)	135	(1.2)	42	(0.6)	429	(0.3)	11	(1.4)	5980	(0.2)	622	(0.7)	12523	(0.6)
2008402	12833	(0.3)	40	(0.9)	226	(0.5)	610	(0.6)	0	NA	4809	(0.3)	3171	(0.6)	52481	(0.9)
2009403	9974	(0.4)	84	(1.1)	163	(0.4)	435	(0.4)	8	(1.3)	4418	(0.3)	985	(0.6)	23822	(1.2)
2010402	13161	(0.2)	596	(1.3)	137	(0.4)	538	(0.6)	20	(1.1)	7293	(0.2)	3389	(0.9)	16682	(0.7)
2011403	9832	(0.2)	11	(0.9)	44	(0.3)	746	(0.3)	1	(1.7)	5888	(0.2)	1975	(0.9)	25797	(0.9)
2012403	11479	(0.3)	42	(1.6)	212	(0.7)	2000	(0.6)	46	(1.7)	5571	(0.3)	1474	(0.9)	32819	(0.8)
2013403	11663	(0.3)	36	(1.2)	149	(0.3)	129	(0.6)	5	(1.0)	7008	(0.4)	11640	(1.3)	27898	(0.8)

Distribution

Seabreams were distributed on the whole northern shelf (Figure 8.1). The densities were <10 tonnes/NM² along the area of distribution.

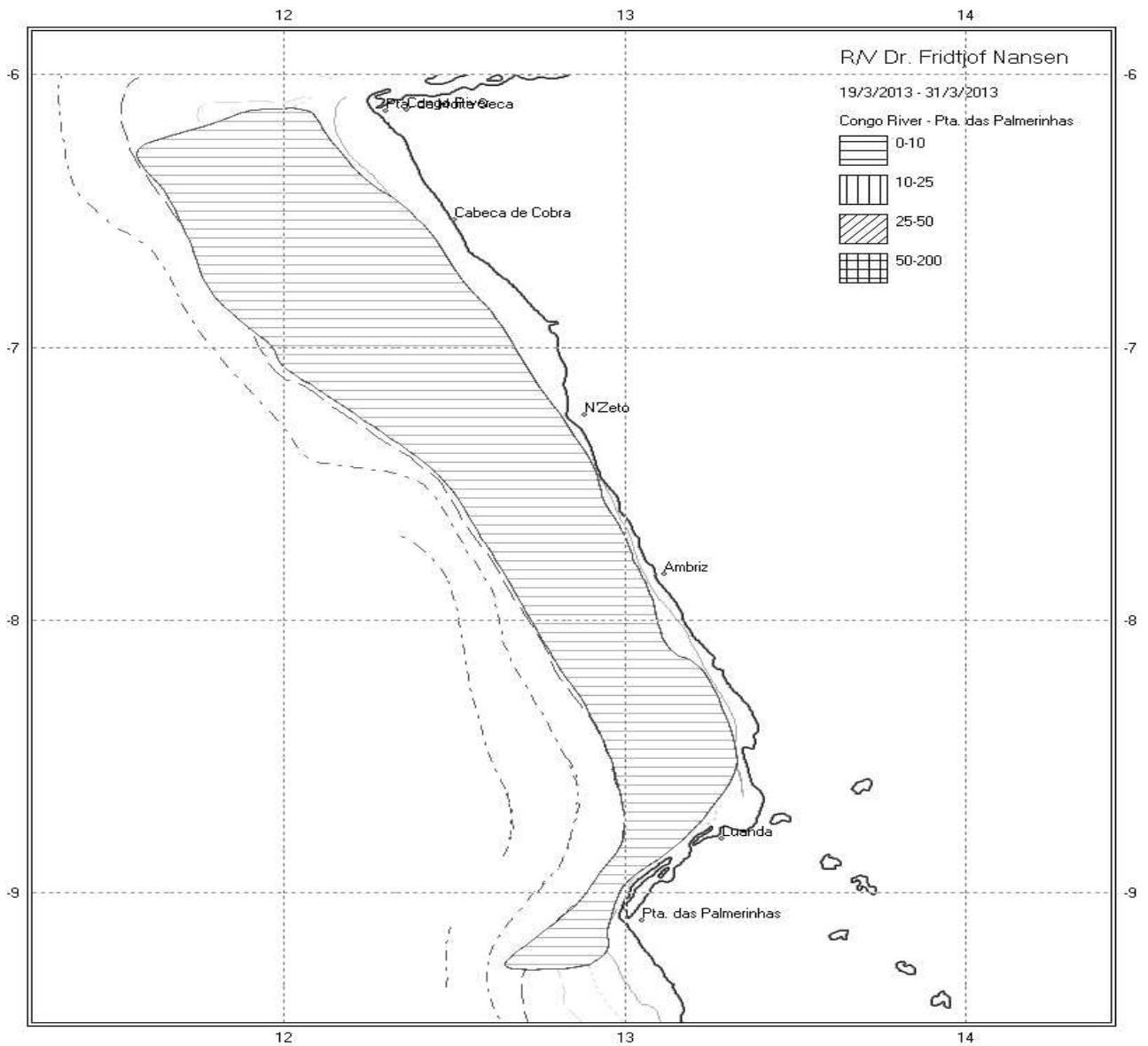


Figure 8.1 Distribution of seabreams (Sparidae) in the northern region, Ponta das Palmerinhas -Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

Ponta das Palmerinhas-Benguela shelf

The central region of Angolan waters covers from Ponta das Palmerinhas to Benguela. A total of 50 successful swept-area trawl stations were accomplished in the region (Table 2.1).

The average catch rates in the central region were 738 kg/h on the inner shelf and 513 kg/h on the outer shelf, both lower rates compared to last year (Annex III). On the inner shelf, the 'demersal' group contributed with 58% to the mean total catch rate, whereas cephalopods contributed with 1 %, shrimps with less than 1%, while sharks were not caught. The pelagic group contributed with 22% to the overall catch. These contributions always differ from year to year and in 2013, the 'demersal' group contributed with 58% while the 'pelagic' with 22% to the total catch.

Demersal fishes were more abundant than pelagic fishes on inner shelf due to the big eye grunt (*Brachydeuterus auritus*) which represented more than 36% of the average total catch rate and contributed with more than 50% to the total catch of demersal commercial fishes. Seabreams (except *Boops boops*) were caught in almost all stations on the inner shelf with a low average catch rate (27 kg/h) and contributed with 3.7% to the mean catch rate. The most common seabreams on the inner shelf were *Pagellus bellottii*, *Dentex barnardi* and *Lighthognathus mormyrus*.

Croakers were caught with average catch rates of 43 kg/h on the inner shelf and most of catches consisted of canary drum (*Umbrina canariensis*). The grunts (*Pomadasyss* spp.) were caught with an average catch rate of 89 kg/h due to a big catch of *P. jubelini*. Groupers were caught with an average catch rate of 1.1 kg/h. Snappers were not caught.

For the pelagic fish in the inner shelf, carangids contributed with 76.7 kg/h to the average catch rate, followed by the hairtails with 21 kg/h. Barracudas and horse mackerel had about the same average catch rate (20 kg/h) contributing with 2.7% to the total average catch. Clupeoids contributed with 17 kg/h, from which *Sardinella aurita* contributed with 6 kg/h. Scombrids contributed with 2 kg/h (0.2 %).

On the outer shelf, the demersal group dominated the total mean catch rate with 196 kg/h which represents 38% of the total catch, followed by the pelagic group with 105 kg/h (21 %). Cephalopods had a mean catch rate of 12 kg/h (2.3%), which is higher than the catch rate found on inner shelf (7 kg/h). Shrimps were caught with a similar average catch rate (less than 1 %) than in the inner shelf.

Seabreams were caught in all stations and dominated the demersal fish group on the outer shelf, with an average catch rate of 89 kg/h contributing with 17% to the total average catch rate. *Dentex angolensis* dominated and contributions from other seabreams were negligible. Big eye grunt was caught with a low average catch rate (50 kg/h or 10 %) compared with what was found on the inner shelf. Grunts were also caught in very low catch rates (average of 21 kg/h), as well as croakers and groupers with mean catch rates of 8 kg/h and 4 kg/h respectively. Snappers were not caught on the outer shelf.

The most common pelagic groups on the outer shelf were carangids with an average catch rate of 52 kg/h though only caught in six stations. Hairtails and horse mackerel were caught with average catch rates 32 kg/h and 19 kg/h respectively. *Sardinella* and scombrids contributed with less than 1% to the total catch. Barracudas and clupeoids were not found on the outer shelf.

Biomass estimates

Table 4.2 shows the time series (1985 to 2013) 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 valid 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.

Trachurus trecae was the only horse mackerel species caught in the central region in 2013. The biomass estimate for this year was 2 550 Tonnes, much lower than 2012 estimate (17 295 T) and 2011 (10 895 T) but similar to 2010 estimate (2 354 T). The biomass on the central shelf has been below 30 000 T since 2003, preceded by a very high estimate of 78 646 T in 2002.

Meluccius polli was the only hake species caught on the central shelf with a biomass estimate of 1 T, one of the lowest values in the time series. These estimates have been generally low, less than 200 T since 2004. The average length of *M. polli* was 29.03 cm TL, inferior to that of 2012 (30.4 cm TL).

Seabreams are the most important commercial demersal fish group in Angola. The biomass estimate for the central shelf this year was 8 400 T which is a slightly increase compared to last year (7 297 T) and similar to 2010 (8 732 T) and 2007 (8 013 T). The biomass estimates have been fairly stable, during the last 7 years with low coefficients of variation (CVs) supporting the reliability of the data. This biomass estimate was dominated by *D. macrophthalmus* (2 918 T), followed by *D. angolensis* (1 990 T). The average total length of seabreams ranged between 17.79 and 21.24 cm, and was similar to 2012 (17.60 and 21.20 cm TL).

The biomass estimate of croakers in 2013 (3 012 T) was similar to the one found in 2012 (3 315 T). *Umbrina canariensis* was the most abundant croaker and contributed to about 40% to the total croakers' biomass. The average length of this species was 24.19 cm TL, similar to 2012 (24.20 cm TL).

The 2013 biomass estimate of grunts (*Pomadasys incisus*, *P. jubelini*, *P. rogeri* and *P. peroteti*) was 6 360 T, about 60% lower than the 2012's estimate. Last year's estimate (15 500 T) is the highest ever recorded for this fish group. The biomass estimate of big eye grunt (*Brachydeuterus auritus*) was 17 730 T giving a combined estimate for all grunts of 24 090 T. The big eye grunt estimates have been fluctuating during the last decade, but showing a decline trend which could be a sign of fishing pressure. The average length of this species was 16.07 cm TL.

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. No snappers were caught this year in the region.

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 2013 survey gave an estimated biomass of 373 T, which is a decrease from the two previous years (444 for 2011 and 992 for 2012). Last year's estimate was the highest value since 1998. 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 2013 biomass estimate for *Parapenaeus longirostris* (deep rose shrimp) was of 103 T which is lower than the 2012 estimate (386 T) and the second lowest of the last five years. *Parapenaeus longirostris* is mainly distributed on the upper slope. There is no clear trend in the time series for this species.

The biomass estimate of Sepiidae in 2013 was of 655 T, lower than the estimate of 2012 (1 700 T) which is the highest estimate value in the time series. 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.

Ommastrephidae, mainly dominated by *Illex coindetti* on the outer shelf, showed a biomass estimate of 130 T. This estimate is lower than last year's (477 T). There is no clear trend for this group. 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 2013 was estimated in 104 T, higher than last year's ((21 T). The annual variability and high CV values may indicate that the estimates do not accurately reflect the state of the stock.

Table 4. 1. Biomass estimates (tonnes) of important species on the shelf (20-200 m) in the Central Region. CV values are indicated in brackets.

	T.treace		Carangids		M.polli		D.macrophthal.		D.angolensis		Seabreams		U.canariensis	
1985407	74892	(0.98)	75408	(0.98)	124	(0.93)	6123	(1.31)	2697	(0.31)	18407	(0.72)	6271	(1.83)
1986401	17875	(0.62)	20440	(0.54)	276	(1.02)	220	(1.25)	1314	(1.16)	9161	(0.46)	2327	(0.86)
1986402	22596	(0.79)	24625	(0.72)	207	(0.97)	1268	(1.46)	4010	(0.39)	13819	(0.46)	2018	(1.15)
1989402	6999	(0.41)	12736	(0.49)	121	(1.62)	6498	(0.66)	956	(0.48)	11443	(0.48)	885	(0.88)
1989403	21473	(0.51)	26453	(0.47)	1013	(0.80)	1115	(0.93)	3628	(0.48)	12167	(0.36)	1130	(0.82)
1989407	9579	(0.94)	12816	(0.90)	480	(1.10)	1530	(1.50)	1667	(0.52)	4531	(0.56)	0	-
1991403	86136	(0.77)	87396	(0.76)	0	(1.69)	2210	(0.88)	1212	(0.40)	9068	(0.31)	1160	(1.44)
1991404	47927	(0.85)	48814	(0.83)	618	(1.20)	17098	(0.54)	956	(0.39)	25675	(0.36)	18422	(1.45)
1992408	32878	(0.46)	35314	(0.46)	1641	(0.62)	18182	(0.58)	1514	(0.32)	25033	(0.44)	1023	(0.98)
1994405	61886	(0.53)	63569	(0.51)	2393	(1.35)	20365	(0.52)	2383	(0.45)	29548	(0.37)	3280	(1.27)
1995402	4875	(0.99)	12635	(0.51)	167	(0.77)	7719	(0.81)	1877	(0.79)	14161	(0.47)	11538	(1.16)
1996407	51220	(0.77)	55750	(0.71)	713	(1.09)	11195	(0.43)	1546	(0.43)	18323	(0.27)	1077	(0.96)
1997405	27729	(0.74)	38605	(0.59)	4557	(1.20)	12220	(1.03)	1497	(0.37)	21952	(0.58)	4599	(0.60)
1997407	68984	-	70873	-	7635	-	24404	-	1260	-	31763	-	4995	-
1998405	4630	(0.89)	7606	(0.64)	375	(1.45)	50924	(1.50)	1990	(0.38)	63225	(1.22)	2239	(0.77)
1999403	12977	(0.53)	20379	(0.43)	15	(1.69)	5178	(0.79)	1163	(0.40)	17435	(0.39)	7999	(1.08)
2000403	19114	(0.49)	25052	(0.41)	240	(1.53)	6060	(0.76)	1639	(0.59)	19310	(0.31)	2499	(0.51)
2001402	16510	(0.48)	20942	(0.42)	123	(1.15)	5680	(0.72)	1670	(0.44)	12617	(0.53)	1076	(1.04)
2002403	78646	(0.41)	85797	(0.38)	1189	(0.83)	11512	(1.16)	923	(0.47)	22198	(0.61)	3492	(0.54)
2003404	25494	(0.54)	29369	(0.47)	1774	(0.85)	557	(0.66)	1046	(0.50)	5595	(0.33)	1001	(0.51)
2004404	12263	(0.58)	15324	(0.47)	174	(1.53)	3525	(1.27)	1015	(0.41)	9583	(0.55)	5700	(1.21)
2005404	7137	(0.52)	9357	(0.44)	44	(1.42)	879	(0.59)	991	(0.39)	7752	(0.31)	2279	(0.64)
2006403	9622	(0.37)	13434	(0.35)	44	(1.07)	2802	(0.42)	1982	(0.39)	11187	(0.31)	4329	(0.65)
2007403	7649	(0.49)	13485	(0.59)	55	(0.84)	1532	(0.86)	1312	(0.64)	8013	(0.36)	5224	(1.39)
2008402	3703	(0.51)	5636	(0.38)	22	(1.17)	1496	(0.87)	1135	(0.34)	5763	(0.32)	1801	(0.97)
2009403	10073	(0.50)	14765	(0.44)	4	(1.51)	699	(0.62)	1756	(0.56)	7443	(0.31)	1419	(0.53)
2010402	2354	(0.57)	13526	(1.34)	22	(1.69)	572	(0.80)	2250	(0.40)	8732	(0.27)	1097	(0.80)
2011403	10895	(1.23)	13231	(1.01)	0	-	497	(1.19)	2805	(0.51)	9550	(0.37)	4003	(1.19)
2012403	17295	(0.51)	21586	(0.46)	13	(0.96)	887	(1.22)	1725	(0.41)	7297	(0.25)	2652	(0.60)
2013403	2550	(0.81)	10759	(0.59)	1	(1.37)	2918	(1.20)	1990	(0.39)	8380	(0.45)	1031	(0.61)

	Croakers		B.auritus		Grunts.com		Snappers		Groupers		P.longirostris		Shrimps		Ommastrephidae	
1985407	10235	(1.45)	5065	(1.03)	5706	(1.37)	0	-	1253	(0.95)	58	(1.61)	58	(1.61)	0	-
1986401	4649	(0.50)	38045	(0.49)	2237	(0.73)	36	(1.96)	411	(0.81)	1483	(1.01)	1632	(0.92)	601	(1.68)
1986402	4510	(0.77)	21342	(0.56)	5301	(0.66)	0	-	518	(1.15)	0	-	371	(1.12)	0	-
1989402	1395	(0.72)	15038	(0.75)	3681	(1.02)	0	-	580	(0.78)	235	(1.05)	237	(1.05)	1236	(0.86)
1989403	2972	(0.72)	50016	(0.80)	1126	(0.92)	20	(1.96)	3093	(1.55)	667	(0.76)	677	(0.75)	750	(0.51)
1989407	595	(1.38)	37091	(0.51)	82	(1.18)	0	-	660	(1.62)	445	(1.43)	453	(1.41)	1476	(0.98)
1991403	2048	(0.85)	19833	(0.57)	425	(0.51)	106	(1.96)	176	(1.12)	10	(1.19)	39	(1.11)	344	(0.63)
1991404	20081	(1.33)	1862	(0.86)	1882	(0.87)	0	-	1021	(0.93)	117	(1.11)	125	(1.04)	693	(0.71)
1992408	1546	(0.70)	27200	(1.32)	765	(1.13)	0	-	1140	(0.88)	106	(1.13)	106	(1.13)	2163	(0.35)
1994405	10292	(0.99)	2633	(1.10)	68	(0.81)	262	(1.96)	417	(0.62)	168	(0.70)	292	(0.92)	1041	(0.57)
1995402	15510	(1.05)	27645	(0.57)	3105	(1.12)	113	(1.96)	376	(0.77)	258	(0.95)	323	(0.80)	2	(1.69)
1996407	5866	(0.51)	18842	(0.70)	3095	(0.65)	109	(1.96)	690	(0.81)	25	(1.34)	116	(0.98)	210	(0.52)
1997405	9033	(0.60)	6964	(0.85)	1592	(1.54)	0	-	233	(1.10)	1087	(0.94)	1088	(0.94)	1324	(0.47)
1997407	7099	-	1953	-	293	-	0	-	1023	-	1265	-	1391	-	418	-
1998405	8609	(0.86)	22014	(0.95)	9117	(0.82)	0	-	198	(1.24)	186	(0.84)	365	(0.82)	377	(0.65)
1999403	9891	(0.90)	93522	(0.61)	3289	(0.87)	526	(1.86)	631	(0.77)	9	(0.93)	15	(0.74)	201	(1.28)
2000403	5391	(0.44)	56245	(0.84)	6824	(0.51)	98	(1.50)	882	(0.87)	290	(0.98)	314	(0.91)	586	(0.61)
2001402	1744	(0.70)	41122	(0.69)	1329	(0.60)	3	(1.96)	64	(1.08)	198	(1.36)	212	(1.28)	186	(0.96)
2002403	6334	(0.42)	66053	(0.75)	2982	(0.57)	0	(1.96)	233	(1.01)	402	(0.88)	531	(0.74)	2363	(0.70)
2003404	5369	(0.41)	38312	(0.49)	8649	(1.12)	44	(1.96)	702	(0.73)	449	(0.80)	515	(0.70)	489	(0.99)
2004404	6602	(1.08)	26743	(0.42)	3494	(0.95)	42	(1.96)	175	(0.99)	969	(1.11)	974	(1.11)	310	(0.89)
2005404	5530	(0.55)	36621	(0.77)	5980	(0.77)	6	(1.96)	608	(0.84)	50	(0.87)	84	(0.71)	233	(0.61)
2006403	4850	(0.58)	33546	(0.86)	4082	(0.85)	35	(1.96)	446	(0.81)	178	(1.07)	188	(1.01)	136	(0.52)
2007403	8081	(1.07)	40402	(0.53)	9275	(0.86)	31	(1.73)	491	(0.99)	36	(0.79)	54	(0.59)	43	(0.53)
2008402	3668	(0.72)	17736	(0.40)	5926	(0.93)	11	(1.96)	151	(0.78)	233	(0.98)	257	(0.90)	327	(0.46)
2009403	2104	(0.56)	22188	(0.83)	4983	(0.59)	124	(1.96)	192	(0.58)	195	(1.15)	195	(1.14)	110	(0.82)
2010402	2661	(0.56)	8156	(0.66)	7676	(0.65)	69	(0.70)	284	(0.82)	183	(0.93)	204	(0.84)	179	(0.63)
2011403	6496	(0.88)	10841	(0.88)	8638	(1.06)	190	(1.96)	444	(0.55)	24	(0.77)	42	(0.83)	28	(1.20)
2012403	3315	(0.51)	18724	(0.56)	15517	(1.12)	0	-	992	(1.33)	386	(1.21)	434	(1.09)	477	(0.87)
2013403	3012	(0.57)	17728	(0.64)	6362	(0.47)	0	-	373	(1.07)	103	(1.14)	185	(0.83)	130	(0.50)

	Sepiidae		Cephalopod		Clupeids		Scombrids		Hairtails		Barracudas		Sharks	
1985407	0	-	5372	(0.77)	423	(1.33)	0	-	2568	(1.16)	253	(1.26)	0	-
1986401	525	(0.64)	1439	(0.47)	717	(0.69)	34	(1.29)	15125	(0.67)	1019	(0.62)	228	(1.47)
1986402	1252	(0.89)	1423	(0.78)	328	(0.89)	16	(1.61)	1089	(0.70)	1117	(0.77)	0	-
1989402	65	(0.93)	1864	(0.59)	560	(1.54)	155	(0.67)	9992	(0.60)	1936	(1.34)	148	(0.94)
1989403	1242	(0.38)	2206	(0.33)	359	(0.94)	95	(0.50)	2128	(0.80)	701	(0.60)	105	(1.06)
1989407	124	(1.12)	2015	(0.79)	1707	(0.81)	310	(1.21)	8488	(1.45)	704	(0.74)	285	(1.29)
1991403	237	(0.45)	850	(0.31)	508	(0.94)	277	(0.81)	7664	(0.72)	583	(0.72)	746	(1.00)
1991404	561	(1.00)	2021	(0.50)	36	(1.61)	126	(1.30)	3174	(0.45)	82	(0.85)	115	(1.69)
1992408	159	(1.16)	2597	(0.30)	70	(1.16)	64	(0.89)	11105	(0.58)	89	(1.29)	483	(1.11)
1994405	1192	(0.70)	2696	(0.41)	22	(0.96)	580	(0.80)	24185	(1.44)	4	(1.96)	269	(0.83)
1995402	590	(0.46)	807	(0.42)	245	(0.59)	213	(1.06)	3885	(0.43)	2113	(0.65)	121	(0.88)
1996407	1392	(0.38)	2402	(0.41)	589	(0.89)	53	(1.77)	3443	(0.44)	946	(0.87)	496	(1.08)
1997405	1411	(0.86)	3268	(0.44)	3442	(1.89)	46	(1.61)	21454	(0.60)	496	(1.80)	208	(0.99)
1997407	1251	-	2531	-	125	-	279	-	13839	-	0	-	149	-
1998405	1315	(0.57)	2587	(0.34)	2860	(1.57)	52	(1.35)	29020	(1.52)	454	(0.82)	310	(0.96)
1999403	307	(0.48)	890	(0.38)	1961	(0.92)	34	(1.28)	8210	(0.66)	1605	(0.53)	107	(1.15)
2000403	575	(0.55)	1744	(0.30)	1594	(0.90)	275	(1.20)	11002	(0.41)	3321	(0.58)	560	(0.82)
2001402	220	(0.72)	1374	(1.06)	80	(1.01)	97	(0.77)	5595	(0.54)	957	(0.41)	343	(0.78)
2002403	275	(0.61)	2930	(0.57)	1625	(0.64)	745	(1.51)	8190	(0.45)	667	(0.63)	120	(0.81)
2003404	370	(0.59)	1327	(0.44)	1439	(0.64)	55	(0.85)	12067	(0.52)	480	(0.61)	266	(0.78)
2004404	261	(0.56)	1026	(0.34)	2193	(0.79)	41	(1.03)	12405	(1.01)	401	(0.85)	586	(0.85)
2005404	768	(0.20)	1427	(0.16)	1535	(0.84)	216	(1.30)	31672	(0.84)	258	(0.75)	201	(0.66)
2006403	905	(0.51)	1674	(0.27)	2275	(0.84)	134	(0.69)	6453	(0.49)	991	(0.93)	475	(0.72)
2007403	1195	(0.40)	1822	(0.30)	2078	(0.67)	18	(1.15)	22472	(0.91)	749	(0.46)	802	(1.19)
2008402	285	(0.44)	1295	(0.22)	945	(1.10)	17	(1.18)	5098	(0.63)	1224	(1.26)	132	(0.68)
2009403	1018	(0.55)	1678	(0.37)	8854	(1.26)	21	(1.57)	20812	(0.85)	152	(0.93)	94	(0.90)
2010402	776	(0.34)	1628	(0.27)	1420	(1.46)	79	(0.84)	7315	(0.40)	350	(0.83)	157	(0.67)
2011403	1280	(0.40)	1956	(0.35)	268	(0.97)	48	(1.28)	4875	(1.24)	313	(0.79)	74	(1.96)
2012403	1713	(0.33)	2983	(0.22)	35480	(0.71)	3086	(1.52)	8349	(0.87)	132	(1.06)	21	(1.17)
2013403	655	(0.36)	1235	(0.20)	1265	(0.60)	161	(0.87)	3707	(0.53)	1144	(1.15)	104	(1.20)

Distribution

Figure 8.2 shows the distribution of seabreams in the central region between Benguela and Luanda. The distribution was spread out over the whole central shelf.

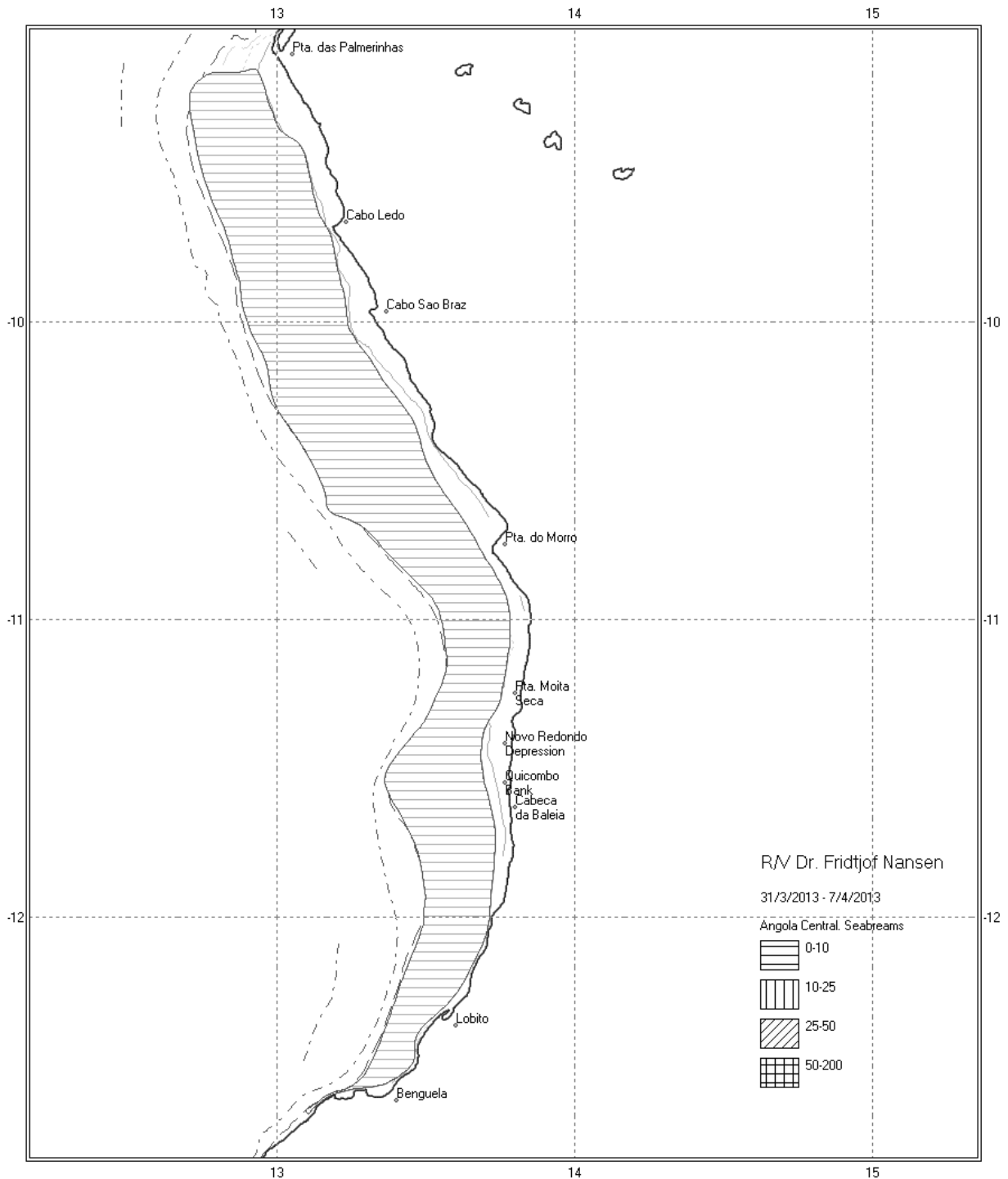


Figure 8.2 Distribution of seabreams (Sparidae) in the central region, Benguela – Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

Tombwa - Cunene shelf

A total of 36 trawl stations were sampled on the southern shelf and all were valid. The southern region has not been regularly sampled throughout the years, except for the 2000 and 2003-2010 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 average total catches per hour on the inner shelf were 2 973 kg/h and 1 779 kg/h on the outer shelf (Annex III). The 'pelagic' group dominated with 64 % of the mean catch rate on the inner shelf and 45 % on the outer shelf. The mean catch rates of the 'demersal' group were respectively 415 kg/h on the inner shelf and 593 kg/h on outer shelf. Shrimps were only caught in very low numbers at only one station on the inner shelf and no caught at the outer shelf. The mean catch rates on the inner shelf were 42 kg/h for cephalopods and 72 kg/h for sharks, while on the outer shelf they were 61 kg/h for cephalopods and 12 kg/hour for sharks. The average catch rate of "other" species group was 546 kg/h and contributed with 18 % to the on the inner shelf while 17 % on the outer shelf with 310 kg/h of the total average catch rate.

The 'pelagic' group was the most predominant on the inner shelf. *Trachurus trecae* dominated with the mean catch rates of 1 734 kg/h (58 %) of the total mean catch on the inner shelf and 772 kg/h (43 %) on outer shelf. *Sardinella aurita* had very low mean catch rates compared to last year (945 kg/h due to one big catch) and were caught at one station on inner shelf as on the outer shelf. Clupeids contributed with 4 % and 1.3 % of total mean catch rate on 127 kg/h on the inner shelf and 23 kg/h on the outer shelf. Carangids were caught with mean catch rates of 127 kg/h on the inner shelf and 2.3kg/h on the outer shelf and contributed lesser than 1 % as well as the Scombrids. Barracuda were caught neither on inner shelf nor on the outer shelf.

Among the demersal species found on both inner and outer shelves, Seabreams were the most abundant and were dominated by *Dentex macrophthalmus*, and *Pagellus bellottii*. This group had average catch rates of 260 kg/h on the inner shelf and 430 kg/h on the outer shelf. Cape hake (*Merluccius capensis*) was caught with an average catch rate of 33.50 kg/h. The average catch rate of croakers (mainly *Argyrosomus hololopidotus* and *Atractoscion aequidens*) was 61 kg/h on inner shelf and on outer shelf was 114 kg/h. Grunts were found at four stations on inner shelf in very low mean catch rate of 46 kg/h and no grunts were caught on the outer shelf. Neither Snappers nor groupers were caught on the shelf.

Biomass estimates

Table 4.3 shows the time series from 1986 to 2013 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 Table 4.3. 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 2013 estimate of 74 090 Tonnes of horse mackerel for the southern region was second lower since 2000. *Trachurus trecae* contributed with 64 780 Tonnes, with the remainder belonging to *Trachurus capensis* (9 310 Tonnes). However, the swept-area estimates of fish species are unreliable as the bottom trawl predominantly catches fish close to the seabed. The contribution of *Trachurus trecae* was high 87% in 2013 and in 2012 (96 %) considerably higher than the contribution of 27% in 2010. Small fish or juveniles (<15 cm) dominated the catches of only *Trachurus trecae*.

The biomass of Seabreams was estimated at 8 360 Tonnes. *Dentex macrophthalmus* contributed to 82%, *P. bellotti* 12 %, *Dentex angolensis* contributed lesser than 1% and 5 % of other Seabreams such as *Dentex barnadi*, *Dentex gibossus*, *Spondylisoma cantharus*, *boops boops* and *Lithognatus mormyrus*. The 2013 estimate of Seabreams was lower than the 2012 estimates, which both were the lowest of the time series. The Seabreams biomass estimates have been fairly stable for the last five years. The mean length of *Dentex macrophthalmus* was 21 cm and that of *Pagellus bellotti* 20 cm (Annex II), both superior to 2012 average lengths. However, a smaller length class (8.4 cm of *Dentex macrophthalmus* was caught in 2013, seemingly absent in 20112, and possibly indicating recruitment to the stock in the southern area.

Estimates of croakers have varied considerably between previous surveys, and the 2013 estimate of 3 090 Tonnes which is slightly stable and lower than the 2012 estimate (3 700 T) as evident of this species' biomass fluctuations. It seems most of big croakers become coastal and their distribution is not totally covered during the survey which makes it difficult to establish a clear trend in the biomass. Whereas the 2010 estimate of 321 T was the lowest in the time series, preceded by two lower estimates in 2009 (695 T) and 2008 (404 T). *Atractoscion aequidens* and *Argyrossomus hololepidotus* were the most abundant croakers species, and occurred predominantly in the 20 to 50 m depth range. Whereas canary drum (*Umbrina canariensis*) contributed to 3 % of total biomass of croakers.

The biomass estimate of hake *Merluccius capensis* was of 2 300 Tonnes, lower than the last year estimate (3 550 Ton). Neither *Merluccius paradoxus* nor *Merluccius polli* (Benguela hake) were caught in this region. With the exception of the unusually high estimate of 31 000 Ton in 2009 and 11 860 Ton in 2004 and this estimate have fairly been similar to previous estimates. Mean length of *Merluccius capensis* in 2013 was (27.77 cm) than that of 2012 (31 cm) (Annex II).

The biomass estimate of cephalopods in 2013 was 3 410 Tonnes, more than half of the 2012 estimate (1 532 Ton), highest of time series since 1990 and fairly similar to (3 235 Ton).

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 2013 biomass estimates of clupeids was of 5 350 Tonnes, and is the sixth highest in the time series, but fluctuations are large, illustrated by the very low biomass estimates (all <3 000 T) between 2007 and 2009. 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 (290 Ton) over time are unlikely to represent a reliable reflection of changes in the stock.

The biomass estimate of Hairtails (*Trichiurus lepturus*) was 245 Tonnes, lower than the 2012 estimate (660 T). 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 about 1 930 Tonnes, lower than the 2012 estimate (2 600 Ton) and similar to 2007 estimate (2 016 Ton) and 2000 estimate (2 051 Ton). These estimates are fairly stable from 2005 to 2007 and 2012 to 2013 indicating a kind of

confidence in biomass estimates after a series of low estimates. Nonetheless this figure should be carefully interpreted, as they do neither reflect the real species composition nor their biomass due to inadequate sampling gear.

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

	T.treace		Horsemackereel		Carangids		D.macrophthalmus		D.angolensis		Seabreams		Croakers		Hake	
1986401	14235	(0.59)	23059	(0.46)	23059	(0.46)	8304	(0.34)	81	(1.15)	9736	(0.33)	1560	(0.94)	1099	(0.55)
1986402	69542	(0.49)	78132	(0.53)	78165	(0.53)	17054	(0.54)	5	(1.69)	19201	(0.49)	3960	(0.96)	3709	(0.81)
1989402	2883	(1.09)	15681	(0.90)	15681	(0.90)	17020	(0.47)	139	(1.59)	17853	(0.47)	1492	(0.63)	349	(0.88)
1989403	979	(0.94)	13706	(0.75)	13706	(0.75)	31615	(0.44)	16	(1.69)	32669	(0.43)	3601	(0.93)	1121	(1.30)
1989407	11636	-	39225	-	39225	-	15509	-	27	-	15594	-	1443	-	6739	-
1991403	21429	(0.59)	50458	(0.51)	50459	(0.51)	20180	(0.37)	6	(1.69)	22333	(0.33)	1341	(0.54)	2920	(1.28)
1991404	25595	(0.60)	62961	(0.58)	62961	(0.58)	21994	(0.44)	7	(1.69)	22536	(0.43)	567	(0.51)	4385	(0.68)
1992408	8106	(0.91)	95433	(0.41)	95436	(0.41)	31822	(0.55)	118	(1.69)	32666	(0.54)	576	(0.91)	6756	(0.46)
1993403	52839	(0.91)	64235	(0.75)	64235	(0.75)	57722	(0.51)	238	(1.58)	58399	(0.52)	2744	(0.60)	4023	(0.40)
2000403	185345	(1.05)	218410	(0.86)	218473	(0.86)	58636	(1.01)	63	(1.29)	61693	(0.95)	3623	(0.61)	3559	(0.80)
2002403	116985	(1.30)	237050	(0.63)	237058	(0.63)	23819	(0.98)	0	-	24802	(1.00)	1046	(1.18)	3779	(0.81)
2003404	76533	(0.80)	113879	(0.74)	114293	(0.75)	13313	(0.38)	0	-	15856	(0.39)	1115	(0.39)	7014	(0.64)
2004404	72982	(0.56)	237659	(0.80)	237659	(0.80)	24702	(0.74)	1	(1.69)	26946	(0.69)	518	(1.18)	11860	(0.64)
2005404	114	(1.83)	129070	(0.52)	129088	(0.52)	12121	(0.50)	221	(1.69)	12654	(0.50)	6164	(0.71)	5067	(0.65)
2006403	126892	(0.47)	184129	(0.48)	184129	(0.48)	11058	(0.32)	0	-	11470	(0.31)	923	(0.55)	3713	(0.39)
2007403	100468	(0.54)	107896	(0.51)	107918	(0.51)	14579	(0.37)	70	(1.69)	15520	(0.36)	4168	(1.21)	3006	(0.52)
2008402	169349	(0.57)	215813	(0.48)	215813	(0.48)	7276	(0.45)	113	(1.69)	9147	(0.38)	404	(0.94)	1722	(1.04)
2009403	322270	(0.82)	322460	(0.82)	322460	(0.82)	9618	(0.53)	1	(1.69)	9804	(0.52)	695	(0.68)	31018	(0.32)
2010402	76870	(0.69)	286228	(0.49)	286240	(0.49)	8118	(0.39)	0	-	9218	(0.38)	321	(0.93)	2495	(0.83)
2012403	29627	(0.72)	30978	(0.69)	35345	(0.81)	5151	(0.71)	0	-	8704	(0.59)	3713	(1.71)	3551	(0.88)
2013403	64782	(0.63)	74092	(0.59)	74092	(0.59)	6859	(0.56)	22	(1.69)	8363	(0.48)	3087	(0.69)	2297	(0.97)

	Ommastrephidae		Sepiidae		Cephalopod		Scombrids		Clupeids		Hairtails		Shrimps		U.canariensis		
1986401	31	(0.64)	138	(0.88)	1188	(1.00)	43	(1.00)	51	(1.83)	334	(0.85)	0	-	135	(1.26)	618
1986402	0	-	886	(0.58)	1555	(0.47)	173	(0.89)	0	-	1694	(1.30)	5	(1.83)	86	(1.48)	2593
1989402	61	(0.54)	159	(1.08)	776	(0.61)	60	(0.79)	0	-	965	(1.36)	5	(1.32)	361	(1.04)	188
1989403	7	(1.69)	3946	(0.95)	6114	(0.83)	35	(1.11)	0	-	510	(0.99)	0	-	442	(0.75)	12200
1989407	192	-	17	-	2087	-	155	-	0	-	1746	-	36	-	86	-	551
1991403	25	(1.09)	59	(0.68)	732	(0.42)	106	(1.46)	6	(1.69)	1335	(0.71)	0	(1.83)	118	(0.93)	4005
1991404	25	(0.91)	31	(0.98)	2192	(1.71)	0	-	444	(1.61)	255	(0.61)	0	-	102	(1.10)	957
1992408	428	(1.16)	150	(0.71)	744	(0.63)	0	-	70	(1.54)	13	(1.42)	0	-	30	(0.99)	2220
1993403	145	(0.40)	182	(1.20)	2501	(0.81)	347	(1.03)	8	(1.55)	361	(1.38)	0	-	496	(0.87)	2278
2000403	9	(1.69)	514	(0.35)	1934	(0.29)	28	(0.87)	43	(1.76)	1008	(1.45)	0	-	305	(0.72)	2051
2002403	21	(1.69)	1378	(1.20)	1937	(0.96)	711	(1.76)	1217	(1.69)	0	-	0	-	12	(1.69)	69
2003404	397	(0.69)	1166	(1.17)	1630	(0.86)	546	(1.83)	3601	(1.55)	48	(1.16)	0	-	172	(0.84)	1163
2004404	549	(0.86)	937	(1.51)	2547	(0.71)	5	(1.83)	12998	(1.82)	1	(1.69)	0	-	8	(1.83)	348
2005404	1655	(0.86)	327	(0.64)	2309	(0.61)	1	(1.83)	2410	(0.74)	274	(1.53)	5	(1.69)	330	(1.20)	1067
2006403	98	(0.91)	1182	(0.87)	1545	(0.68)	2221	(1.66)	308909	(1.03)	26	(1.74)	0	-	229	(1.07)	3630
2007403	555	(1.04)	722	(0.50)	1459	(0.48)	95	(1.35)	1747	(0.78)	93	(1.25)	1	(1.69)	563	(0.96)	2016
2008402	6	(1.69)	1561	(0.73)	3235	(0.57)	1124	(0.85)	43	(1.26)	85	(0.74)	0	(1.69)	44	(0.94)	278
2009403	371	(0.87)	315	(0.71)	1017	(0.50)	50	(1.69)	2148	(1.82)	27	(0.72)	4	(1.69)	118	(1.23)	271
2010402	46	(1.09)	659	(0.66)	1732	(0.73)	605	(1.10)	100656	(1.25)	148	(1.37)	0	(1.69)	99	(1.52)	190
2012403	136	(1.13)	996	(0.43)	1532	(0.54)	52	(1.39)	27011	(1.66)	659	(0.52)	30	(1.36)	13	(1.02)	2616
2013403	1619	(0.66)	358	(0.98)	3410	(0.65)	290	(1.58)	5351	(0.89)	246	(1.11)	2	(1.83)	82	(0.79)	1931

Distribution

Figure 8.3 shows the distribution of seabreams in the southern survey area. A low concentration covered most of survey area shallower than 300 m, with denser concentrations in the central and southern part of this between Cunene River and Baía dos Tigres. The distribution was very similar to the one observed in 2009.

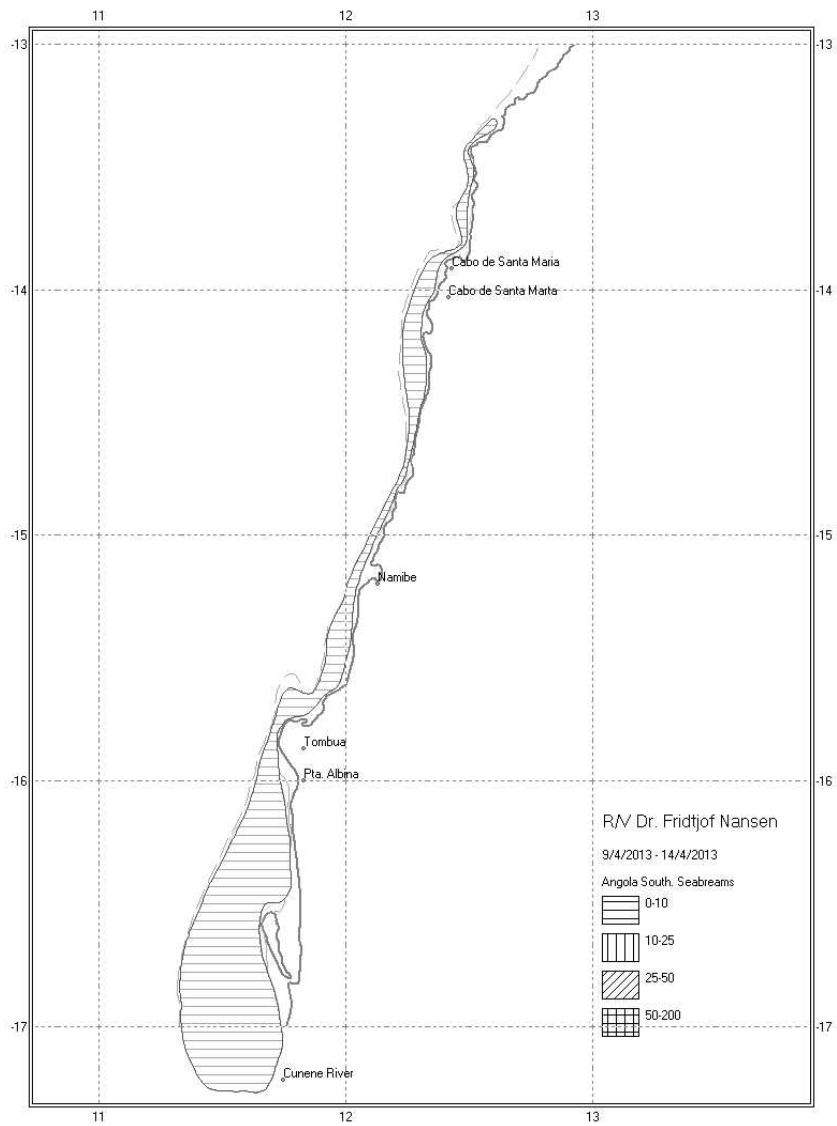


Figure 8.3 Distribution of seabreams (family Sparidae) in the southern region, Cunene-Tombua. Depth contours at 20, 50, 100 and 200 m.

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

The slope is defined in the report, to be between 201 and 800 m bottom depth. The trawl positions are mapped in Figures 9.1 - 9.3, station information and catch by species are presented in Annex I.

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

Luanda – Congo River slope

The survey covered the northern region of Angolan waters from Luanda to mouth Congo River, with a total of 36 successful swept-area trawl stations accomplished on the northern 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 400 kg/hour (Annex VI). The contribution to the total mean catch rate by groups was: 16.5% for the ‘demersal’ group, 24% for the shrimps, 2.7% for the ‘pelagic’ group, 1.7% for cephalopods, and 2% for sharks. The “other” species group dominated the catches and contributed with 53% to the total mean catch rate. *M. polli* was frequently caught on the upper and lower slope with an average catch rate of 41 kg/hour. Seabreams were caught only in five stations (only *Dentex angolensis*) with and the average catch rate of 7 kg/hour.

The average catch rates of the three shrimp species *Parapenaeus longirostris*, *Aristeus varidens* and *Nematocarcinus africana* were 4, 5 and 87 kg/hour, respectively. *Aristeus varidens* was frequently caught with the low 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 5.3 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 982 T, much higher to the 2012 estimate (205 T) and lower than the 2011 (1 215 T) and 2010 (1 404 T) estimates. *Dentex angolensis* was the only seabream caught on the upper slope.

The biomass estimate for *Merluccius polli* was 3 554 T which showed a drastic decrease in relation to the 2012 biomass and higher than the 2011 estimate. In 2008 the biomass was 5 900 T after a

continuous decrease from 2004 (15 300 T) to 2007 (4 117 T). Though the mean length (26.1 cm) of hake caught this year was notably bigger than the 2012 (20.9 cm) which indicated that the absence of recruitment in biomass.

This years' estimate of *Parapenaeus longirostris* (364 T) is the lowest recorded since 1994. Between 2005 and 2011 the biomass appeared to be stable at approximately 1 000 t, with the exception of 2010 (390 T).

The 2012 biomass estimate of *Aristeus varidens* was about 770 T, almost 30% increase compared to 2012, but fairly similar to the estimates from previous years, which ranged between 400 and 700 T, with the exception of 2009, when the biomass was estimated at 915 T. This biomass estimate presented a high coefficient of variation (CV) (0.9) which indicates that this should be interpreted with care

Nematocarcinus. africana is not a commercially important species. The 2013 biomass estimate was 8 728 T, lower than the 2012 estimate (10 197 Tonnes) and similar to the 2011 (8 793 Tonnes). From 2004, there is a noticeable indication of stability in abundance.

The biomass estimate of OMMASTREPHIDAE in 2013 was 90 T which is the lowest in recent years and similar to the estimate from 2010 (96 Tonnes).

The biomass estimate of sharks in 2012 was 72 258 tonnes and the highest in the time series. The biomass estimate drastically increased comparing to the previous 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	Seabreams
1985401	202 (0.0)	21 (0.0)	976 (0.0)	344 (0.0)	0 NA	0 NA	0 NA
1985405	3065 (0.9)	767 (1.3)	251 (0.7)	209 (1.4)	511 (2.4)	285 (0.9)	1541 (0.0)
1985407	28753 (0.9)	11989 (0.5)	260 (1.2)	0 NA	1342 (0.7)	8 (2.4)	0 NA
1986401	11409 (0.4)	14960 (0.2)	1630 (0.8)	3724 (1.4)	3383 (0.6)	0 NA	108 (2.0)
1986402	27562 (0.7)	7854 (0.6)	277 (0.8)	4431 (0.8)	3228 (0.6)	19 (2.3)	288 (2.3)
1989402	13518 (0.8)	7772 (1.3)	1631 (1.2)	2376 (1.4)	795 (0.8)	0 NA	66 (2.3)
1989403	8168 (0.4)	4370 (0.7)	166 (1.1)	375 (1.4)	352 (1.5)	1624 (1.2)	4061 (2.2)
1989407	11265 (0.9)	5137 (0.4)	657 (1.1)	2372 (0.6)	1579 (2.0)	3 (2.3)	497 (1.8)
1991403	19597 (0.6)	8671 (0.7)	135 (1.5)	1376 (1.3)	65 (1.0)	3 (2.3)	49 (1.7)
1991404	19498 (0.7)	2732 (0.3)	991 (1.0)	2381 (0.8)	699 (0.6)	64 (1.8)	527 (0.7)
1992408	13290 (0.4)	8992 (0.7)	209 (0.7)	1462 (1.0)	1148 (0.5)	244 (1.4)	510 (0.9)
1994405	4096 (0.5)	7529 (0.6)	328 (0.5)	841 (0.7)	1753 (0.4)	134 (1.4)	1045 (0.9)
1995402	5892 (1.0)	9641 (0.6)	316 (1.6)	1367 (0.5)	2284 (0.7)	0 NA	506 (1.0)
1996407	5065 (0.3)	4435 (0.4)	566 (1.0)	307 (0.7)	1627 (0.7)	34 (1.4)	597 (1.4)
1997405	6954 (0.3)	14107 (0.4)	659 (0.4)	824 (1.1)	3399 (1.3)	0 NA	871 (1.1)
1997407	8101 (0.4)	5676 (1.7)	330 (1.8)	10 (2.3)	1972 (1.4)	35 (2.3)	878 (2.3)
1999403	3624 (0.5)	11539 (0.5)	1142 (1.5)	1060 (0.4)	3088 (0.8)	113 (1.1)	389 (0.6)
2000403	4385 (0.5)	4683 (0.5)	709 (0.5)	597 (0.9)	1978 (1.0)	0 NA	1650 (2.1)
2001402	4840 (0.7)	8283 (0.7)	1477 (1.5)	1966 (1.2)	1531 (0.7)	0 NA	494 (2.3)
2002403	3479 (0.6)	6415 (0.7)	625 (0.9)	118 (0.7)	3022 (1.0)	27 (1.7)	213 (1.4)
2003404	5310 (0.8)	7986 (0.4)	421 (0.6)	1305 (1.3)	1237 (1.2)	27 (1.7)	141 (1.1)
2004404	15327 (1.3)	12343 (0.3)	871 (0.7)	1571 (0.8)	1695 (0.6)	49 (1.9)	299 (0.7)
2005404	10994 (0.6)	10285 (0.3)	382 (0.5)	1180 (1.0)	1468 (0.4)	19 (1.0)	562 (0.8)
2006403	7553 (0.5)	12526 (0.4)	407 (0.6)	931 (1.6)	2143 (0.7)	18 (1.8)	343 (0.9)
2007403	4117 (0.6)	14856 (0.5)	316 (0.7)	501 (1.0)	749 (0.5)	9 (2.3)	612 (0.7)
2008402	5925 (0.4)	16979 (0.4)	716 (0.8)	846 (0.7)	1365 (0.8)	246 (1.3)	629 (0.7)
2009403	2814 (0.8)	15238 (0.4)	984 (0.6)	1152 (0.7)	1077 (0.5)	24 (1.5)	523 (0.9)
2010402	3166 (0.7)	10135 (0.4)	502 (0.5)	382 (0.8)	2202 (0.8)	7 (2.3)	1404 (1.0)
2011403	2433 (0.8)	11151 (0.5)	609 (0.9)	669 (0.9)	1062 (0.8)	146 (1.4)	1215 (0.9)
2012403	9696 (0.7)	12707 (0.5)	534 (0.6)	313 (0.8)	1088 (1.1)	55 (1.8)	205 (1.7)
2013403	3554 (0.7)	10035 (0.4)	1136 (1.2)	72258 (2.7)	1315 (1.2)	158 (1.1)	982 (0.4)

Survey	P.longirostris		A.varidens		N.africanus		Ommastrephidae		D.macro		D.angolensis	
1985401	21	(0.0)	0	NA	0	NA	975.53	(0.0)	0	NA	0	NA
1985405	0	NA	0	NA	0	NA	0	NA	0	NA	1541	(0.0)
1985407	2108	(0.9)	6691	(0.7)	2864	(0.9)	142	(1.8)	0	NA	0	NA
1986401	1166	(1.3)	538	(2.1)	12631	(0.2)	1618	(0.8)	10	(2.3)	98	(2.3)
1986402	0	NA	1008	(0.5)	4643	(0.9)	0	NA	19	(2.3)	269	(2.3)
1989402	419	(1.2)	204	(0.5)	6953	(1.5)	1429	(1.4)	0	NA	0	NA
1989403	366	(1.0)	164	(1.1)	3682	(0.8)	135	(1.4)	23	(2.3)	4038	(2.3)
1989407	243	(0.7)	91	(0.4)	4699	(0.4)	645	(1.1)	2	(2.3)	496	(1.8)
1991403	88	(1.0)	70	(1.4)	8315	(0.7)	129	(1.5)	0	NA	49	(1.7)
1991404	205	(1.0)	15	(2.7)	2445	(0.4)	631	(1.1)	16	(1.5)	510	(0.7)
1992408	170	(1.0)	272	(0.8)	8439	(0.8)	143	(0.7)	45	(2.3)	465	(0.9)
1994405	532	(0.6)	370	(0.7)	6602	(0.7)	304	(0.5)	0	NA	1045	(0.9)
1995402	860	(0.9)	326	(0.7)	7269	(0.7)	61	(1.2)	57	(1.3)	449	(1.1)
1996407	162	(0.6)	267	(0.5)	3859	(0.5)	228	(0.7)	252	(1.4)	345	(1.5)
1997405	605	(1.1)	333	(0.4)	13096	(0.4)	622	(0.4)	45	(1.3)	826	(1.1)
1997407	1317	(1.4)	0	NA	4088	(1.9)	317	(1.8)	3	(2.3)	876	(2.3)
1999403	542	(0.4)	237	(0.4)	10540	(0.6)	1121	(1.5)	51	(1.5)	339	(0.7)
2000403	497	(0.4)	222	(0.5)	3777	(0.6)	509	(0.6)	7	(2.3)	1588	(2.1)
2001402	535	(0.5)	243	(0.5)	6746	(0.9)	1001	(2.2)	12	(2.3)	481	(2.3)
2002403	800	(1.0)	127	(0.6)	5337	(0.9)	364	(1.3)	13	(2.3)	200	(1.5)
2003404	629	(1.0)	383	(0.8)	6873	(0.4)	220	(0.8)	5	(2.3)	135	(1.1)
2004404	749	(1.0)	359	(0.4)	10930	(0.4)	316	(0.6)	16	(1.5)	284	(0.7)
2005404	984	(0.6)	639	(0.5)	8535	(0.4)	330	(0.5)	16	(2.1)	547	(0.9)
2006403	923	(0.7)	391	(0.4)	11073	(0.4)	184	(0.5)	2	(2.3)	340	(1.0)
2007403	981	(0.8)	373	(0.3)	13285	(0.5)	125	(0.9)	2	(2.3)	595	(0.8)
2008402	933	(0.7)	615	(0.3)	15267	(0.4)	207	(0.8)	0	NA	593	(0.6)
2009403	971	(0.7)	914	(0.3)	13121	(0.4)	131	(0.9)	0	NA	523	(0.9)
2010402	389	(0.6)	388	(0.4)	9207	(0.5)	96	(0.7)	0	NA	1404	(1.0)
2011403	1138	(1.1)	653	(0.3)	8793	(0.6)	122	(0.9)	4	(2.3)	1211	(0.9)
2012403	1980	(1.0)	448	(0.5)	10197	(0.6)	303	(0.8)	0	NA	205	(1.7)
2013403	364	(0.6)	770	(0.9)	8728	(0.4)	90	(0.8)	9	(1.9)	973	(0.4)

Distribution

Figure 9.1 shows the estimated distribution of hake (*M. polli*) in the northern region. The stock distribution covers the slope from Luanda to Congo River, with densities $<10 \text{ NM}^2$ in all the northern extension of its distribution.

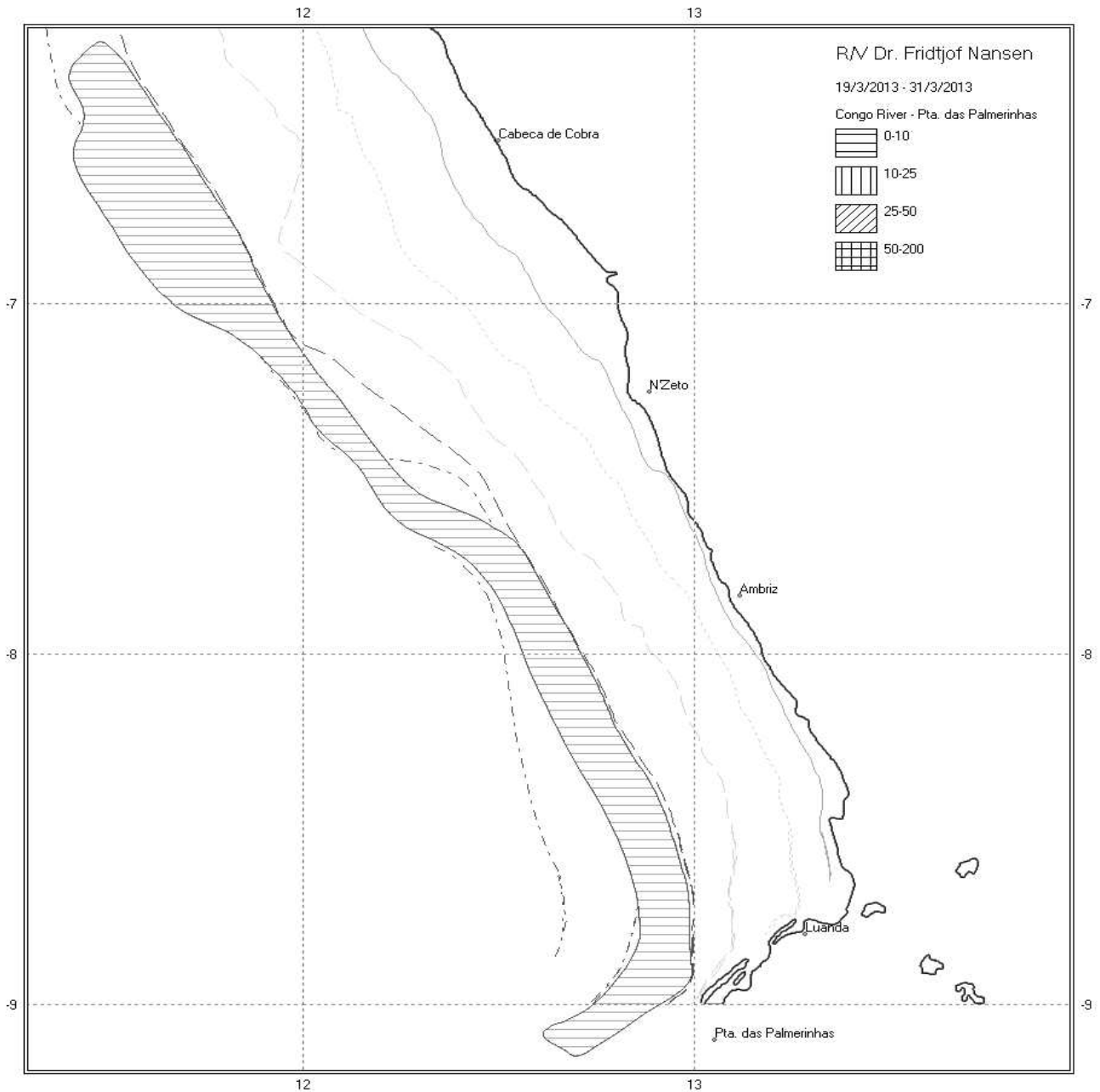


Figure 9.1 Distribution of hake (*Merluccius polli*) in the northern region, Ponta das Palmerinhas – Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

Ponta das Palmeirinhas slope - Benguela

The central region of Angolan waters covered from Ponta das Palmerinhas to Benguela, a total of 37 successful swept-area trawl stations were accomplished on the central slope (Table 2.1).

The average catch rate on the slope was 625 kg/hour, lower than 2012 (767 kg/h) and higher than 2011(425 kg/h) (Annex VI). The ‘demersal’ group contributed with 103 kg/hour, representing 16.5% of the total mean catch rate, while the ‘pelagic’ group had an average catch rate of 4.5 kg/hour and contributed to less 1%. The Shrimps contributed with 140.4 kg/hour (22.5%), Sharks had a mean catch of 15.4 kg/h (2.5%) and cephalopods 4.6 kg/h (0.7%). The “other” group, represented by non-commercial species, dominated the catches and contributed with 357 kg/h (57%) to the total mean catch rate.

Merluccius polli was the only hake species caught with an average catch rate of 43.6 kg/h. Seabreams (*Dentex macrophthalmus*) were only caught in five stations with a catch rate of 10.7 kg/hour. The average catch rates of *Parapenaeus longirostris* (deep-water rose shrimp) and *Aristeus varidens* (red striped shrimp), which are the most commercially important deep-water shrimp species, were 16.6 kg/h and 23.6 kg/h, respectively. *Nematocarcinus Africana*, the non-commercially shrimp was caught in some stations with higher catch rates and shows an average catch rate of 99 kg/hour.

Biomass estimates

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

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

The 2013 biomass estimate for hake (*Merluccius polli*) was 2 836 Tonnes which is the lowest estimate since 2000. In 2004, the biomass estimate of *Merluccius polli* showed a peak of 16 100 Tonnes then from 2005 started declining till the recent estimate. This could be the fishing pressure caused by shrimpers, of course this constant decline is of concern.

In contrast, the biomass estimate of seabreams in 2013 was 997 Tonnes, lower than in 2012 (2 738 tonnes) and at about the same level as in 2007 (808 tonnes). The biomass estimates of seabreams on the central slope have considerably fluctuated from 2001 and the CV of the estimates are relatively high. This estimates consisted of 52% of *Dentex angolensis* and 48% of *Dentex macrophthalmus* caught in five stations on the slope.

Parapenaeus longirostris was not found along all the depth range as different from last year. Its biomass estimates continued increasing from 1 563 Tonnes (2012) to 1 647 Tonnes (2013). Since then the biomass estimates have decreased though with fluctuations. This year the biomass estimate

was of 1 647 Tonnes, a slight higher value than the one in 2012, probably because it was found in a wider depth range thus showing a sign of recovery and many juveniles were caught in the shallower stations. However, analyzing the CV values we can conclude that the time series should be interpreted with care.

The biomass estimate of *Aristeus varidens* in 2013 was 1 418 Tonnes which is the highest of times series but comparable with the 2012 and 2009 s estimates (1 077 T and 1 300 T respectively). This estimate also showed the sign of stock recovery.

In contrast with the non-commercially shrimp species *Nemacarcinus Africana*, the biomass estimate slightly decreased, the 2012 estimate was of 6 086 tonnes which is an increase compared with 2011 estimate (3 400 Tonnes) but at the same level as in 2009 (6 009 Tonnes). The species' biomass has shown a continuous decline since 2007.

The biomass of OMMASTREPHIDAE on the central slope was estimated at 101 Tonnes in 2013 and is much lower compared to last year estimate (675 Tonnes) which is the highest value in time series. There has been a continuous and considerable decline in the biomass estimates during the period 2005-2010, and there is no clear trend.

Trichiurus lepturus was caught on the upper slope, while *Benthodesmus tenuis* in deeper waters, both species belonging to the hairtails. There had been a decrease in the biomass estimate of the group from 2011 (626 Tonnes). Last year the estimate showed a slight increase (600 tonnes) then went down again this year (350 Tonnes).

The biomass estimate of Sharks was of 890 Tonnes in 2013, which is higher than the last year estimate (230 Tonnes) and at the same level as 2007 (1 054 Tonnes). The biomass estimates for shark 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.

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.

	M.polli		D.macro		D.angolensis		Seabreams		Ommastrephidae		Cephalopod	
1985407	18790	(1.03)	39	(2.37)	215	(1.41)	253	(1.25)	0	-	301	(1.10)
1986401	17757	(0.74)	499	(2.10)	474	(2.18)	972	(2.14)	971	(0.90)	1003	(0.85)
1986402	24611	(0.00)	6446	(0.00)	0	-	6446	(0.00)	0	-	57	(0.00)
1989402	2803	(1.26)	804	(2.17)	0	-	804	(2.17)	39	(0.76)	39	(0.76)
1989403	4940	(0.81)	26	(2.37)	33	(2.27)	58	(1.64)	240	(1.66)	277	(1.34)
1989407	12633	(1.00)	324	(1.14)	110	(2.13)	435	(0.98)	409	(0.77)	410	(0.76)
1991403	11939	(0.33)	706	(2.09)	74	(1.79)	780	(2.05)	195	(0.75)	315	(0.45)
1991404	10540	(0.52)	249	(1.79)	239	(1.88)	488	(1.12)	114	(0.82)	114	(0.82)
1992408	6999	(0.28)	358	(1.42)	138	(1.87)	496	(1.03)	141	(0.61)	189	(0.51)
1994405	3803	(0.71)	1113	(1.55)	40	(2.27)	1188	(1.50)	168	(0.59)	219	(0.60)
1995402	4391	(0.41)	6037	(1.30)	226	(0.98)	6264	(1.24)	30	(1.34)	214	(0.79)
1995405	4781	(0.38)	1196	(0.73)	95	(1.42)	1291	(0.66)	85	(0.64)	153	(0.46)
1996407	6440	(0.74)	974	(0.48)	42	(2.27)	1016	(0.47)	41	(0.67)	97	(0.90)
1997405	10375	(0.59)	1700	(1.29)	158	(1.61)	1858	(1.14)	476	(0.65)	538	(0.64)
1997407	8363	(0.34)	4864	(1.25)	180	(1.10)	5045	(1.25)	134	(0.24)	166	(0.28)
1998405	9991	(0.50)	1549	(1.15)	94	(2.23)	1643	(1.06)	389	(0.84)	428	(0.76)
1999403	2995	(0.74)	2806	(0.87)	94	(1.60)	2900	(0.82)	315	(0.61)	344	(0.63)
2000403	5482	(0.60)	1954	(1.01)	105	(1.44)	2059	(1.01)	426	(0.57)	717	(0.50)
2001402	4763	(0.81)	663	(1.70)	102	(2.27)	767	(1.43)	339	(1.08)	623	(0.66)
2002403	3012	(0.65)	2307	(2.19)	111	(2.27)	2418	(1.98)	261	(0.73)	469	(0.64)
2003404	7155	(0.90)	514	(1.97)	92	(2.27)	606	(1.55)	409	(0.65)	420	(0.64)
2004404	16127	(0.77)	10265	(2.24)	572	(2.27)	10840	(2.00)	350	(1.04)	444	(0.85)
2005404	10074	(0.58)	6260	(2.19)	208	(1.43)	6468	(2.11)	536	(1.06)	578	(1.03)
2006403	6967	(0.71)	2138	(2.23)	284	(2.27)	2422	(1.85)	457	(1.08)	623	(1.02)
2007403	6947	(0.97)	612	(1.09)	196	(2.27)	808	(0.42)	138	(1.51)	446	(1.20)
2008402	6032	(0.66)	1681	(2.09)	322	(2.27)	2003	(1.39)	138	(0.76)	363	(0.97)
2009403	5302	(0.48)	168	(0.00)	0	-	168	(0.00)	37	(1.16)	644	(1.22)
2010402	3837	(0.56)	1803	(2.23)	613	(2.27)	2416	(1.09)	40	(1.34)	179	(0.43)
2011403	4318	(1.45)	274	(0.00)	0	-	274	(0.00)	44	(0.33)	223	(0.95)
2012403	4230	(0.92)	2738	(2.27)	0	-	2738	(2.27)	675	(1.24)	741	(1.14)
2013403	2836	(0.43)	481	(1.61)	516	(1.62)	997	(1.06)	101	(0.62)	416	(0.81)

	P.longirostris		A.varidens		N.africanus		Shrimps		Hairtails		Sharks	
1985407	886	(1.47)	942	(2.08)	714	(1.21)	2915	(1.20)	420	(1.56)	17	(2.47)
1986401	653	(0.89)	492	(0.90)	3173	(1.25)	6306	(0.70)	16	(2.27)	557	(0.88)
1986402	0	-	0	-	0	-	13247	(0.00)	498917	(0.00)	0	-
1989402	181	(1.22)	194	(1.13)	592	(1.86)	1008	(0.95)	60	(2.06)	65	(0.69)
1989403	505	(0.84)	228	(0.74)	1020	(1.45)	1963	(0.84)	142	(0.59)	263	(1.17)
1989407	375	(0.32)	194	(0.68)	958	(1.01)	1546	(0.57)	35703	(0.01)	3247	(0.34)
1991403	204	(0.75)	653	(0.21)	3879	(0.45)	4950	(0.35)	2606	(2.13)	732	(0.54)
1991404	190	(0.57)	105	(1.53)	2659	(0.63)	3016	(0.55)	395	(1.25)	1487	(0.88)
1992408	610	(0.95)	366	(0.63)	3224	(0.79)	4436	(0.60)	410	(1.28)	2920	(0.88)
1994405	579	(0.85)	647	(0.67)	2199	(1.07)	3457	(0.69)	1213	(0.82)	707	(0.60)
1995402	425	(0.95)	753	(0.45)	2460	(1.32)	4480	(0.69)	1145	(0.53)	1216	(0.91)
1995405	479	(0.45)	698	(0.23)	2763	(0.37)	4295	(0.25)	2234	(1.21)	1064	(0.44)
1996407	114	(0.53)	671	(0.37)	4971	(0.71)	6457	(0.59)	244	(0.62)	1581	(0.89)
1997405	685	(0.50)	305	(0.54)	4093	(0.68)	6969	(0.37)	902	(1.01)	1214	(0.87)
1997407	2679	(0.54)	0	-	11	(2.27)	2690	(0.53)	1013	(0.21)	42	(1.23)
1998405	556	(0.63)	1192	(1.10)	7000	(0.52)	9048	(0.39)	1840	(1.46)	812	(0.63)
1999403	214	(0.87)	337	(1.06)	1206	(0.75)	1806	(0.49)	728	(0.61)	728	(0.91)
2000403	455	(1.05)	379	(0.35)	1043	(1.02)	2445	(0.45)	871	(0.91)	639	(0.74)
2001402	186	(0.44)	456	(0.63)	517	(2.35)	2575	(0.72)	297	(1.05)	818	(1.77)
2002403	341	(1.23)	243	(0.52)	3039	(0.75)	3749	(0.60)	269	(0.57)	212	(0.92)
2003404	223	(0.44)	498	(1.07)	3284	(1.02)	4087	(0.83)	178	(1.33)	104	(1.02)
2004404	419	(1.08)	576	(0.44)	6204	(0.47)	7350	(0.42)	1581	(1.06)	476	(1.51)
2005404	574	(0.71)	792	(0.41)	5640	(0.46)	7135	(0.37)	2655	(1.55)	307	(0.46)
2006403	1330	(1.36)	359	(0.35)	5351	(0.38)	7180	(0.38)	954	(0.86)	366	(0.85)
2007403	191	(1.32)	653	(0.17)	7913	(0.39)	8939	(0.35)	185	(0.96)	1054	(0.94)
2008402	415	(1.35)	880	(0.27)	5085	(0.44)	6490	(0.33)	762	(0.51)	389	(1.34)
2009403	182	(1.03)	1290	(0.38)	6009	(0.51)	8079	(0.35)	1947	(0.83)	1382	(1.24)
2010402	479	(1.03)	746	(0.55)	6806	(0.60)	8072	(0.54)	2387	(1.90)	350	(1.28)
2011403	319	(0.21)	619	(0.20)	3413	(0.95)	4416	(0.75)	626	(1.97)	229	(0.35)
2012403	1563	(0.57)	1077	(0.59)	6086	(0.45)	9063	(0.33)	883	(1.74)	228	(1.08)
2013403	1647	(1.50)	1418	(0.55)	5877	(0.37)	9056	(0.39)	350	(0.89)	889	(1.04)

Distribution

Figure 9.2 shows the distribution of hake (*M. polli*) in the central region. The distribution covered the whole central slope and was similar to the observations made in previous surveys. A few higher concentrations were found along the whole region at depths between 300 and 400 m.

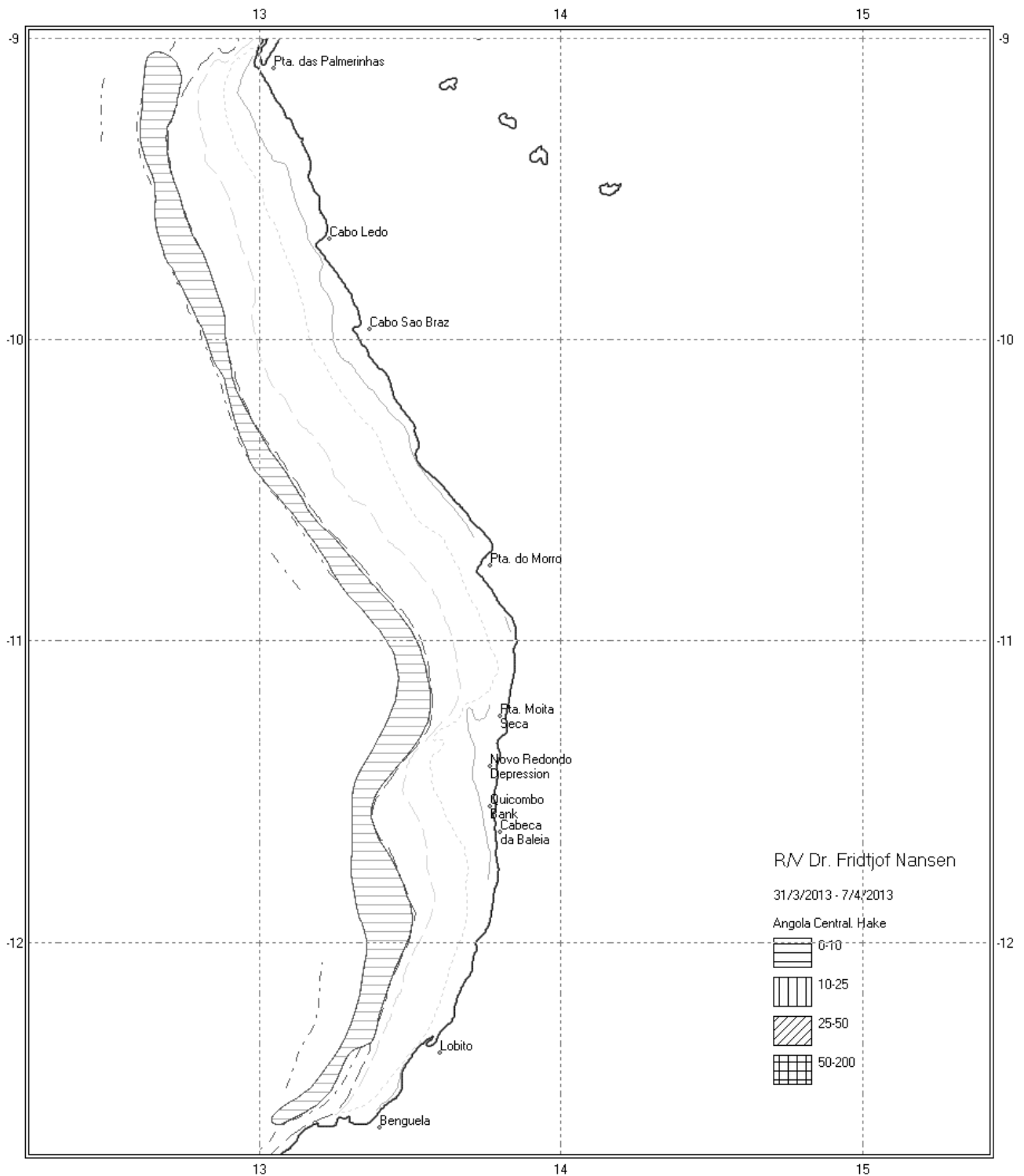


Figure 9.2. Distribution of Benguela hake (*Merluccius polli*) in the central region, Benguela- Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

Tombwa slope - Cunene

The slope is very steep, uneven and rocky in the south, making it difficult to have long 30 minutes trawls. Five trawl stations were carried out on the southern slope in depths between 200 and 800 meters (Annex VI). The total average catch rate in 2013 was 1 220 kg/h, which is about half of last

year's (702 Ton) for this region. The 'demersal' group contributed 17 % and the "other" group (non-commercial species) dominated the catches and contributed with 77% to the total mean catch rate. Shrimps and cephalopods contributed with 3.3 % and 2.5 % respectively. The pelagic group and sharks contributed less 1% each.

Seabreams were not caught in the slope area. Cape hake (*Merluccius capensis*) was caught at all five stations with an average catch rate of 33.5 kg/h. Striped red shrimp (*Aristeus varidens*) was found in four stations with a mean catch of 32 kg/h, which is considerably higher than last year catch rate 3.9 kg/h and 18 kg/h in 2010 while lower than 79 kg/h in 2009.

Biomass estimates

Table 5.3 shows the time series from 1986 to 2013 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 was very low due to the difficult trawling conditions caused by untrawlable sea bed. Therefore catch data were stratified according to depth ranges (201-300 m; 300-400 m; 400-500 m; 500-600 m; 600-700 m and 700-800 m). Further, only five stations in the depth range 201-800 m were included in the biomass estimates in 2013 as in previous years, just two stations were carried out between 200 and 600 meters. The biomass estimates are therefore not reliable.

The biomass estimates of hake have fluctuated over the whole time series (Table 5.3). The 2013 estimate was of 229 Tonnes, the lowest of since 2002 and the second lowest of time series. 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. And it is reasonable to believe that, in previous surveys, a misidentification of the hakes could have happened. Thus the more recent surveys, more precautions have been taken. During the survey only *Merluccius capensis* were caught between 200 and 600 m.

The biomass of horse mackerel (*Trachurus trecae*) greatly fluctuated in this region mainly due to the low number of stations as well as the variability in the distribution pattern of this species and its 2013 estimate was of 12 Tons while it was not caught in 2012. The carangids 2013 estimate was 12 Tons and these species were not caught last year. Hairtails estimate was 13 Tons in 2013 and these species were not caught from 2010 to 2012.

Seabreams mainly *Dentex macrophthalmus* were not caught from 2010 to 2013. There is no clear trend due to the low sampling in this depth range.

Parapenaeus longirostris estimate biomass in 2013 was 21 Tons and this species was not caught from 2010 to 2012 on the southern slope. The biomass for *Aristeus varidens* was estimated at 362 Tons in 2013, which is much higher than in 2012 (25 Tons) and in 2011 (196 Tons). Cephalopods had a biomass of 10 Tons which is three time higher to the 2012 estimates and similar to the one in 2008 (9 Tons).

Sharks (mainly *Galeus polli*) biomass was estimated to 29 Tonnes, lower than last year estimate (47 Tonnes) and higher than the 2011 estimate (4). The highest biomass was estimated in 2008 at 4 323 Tonnes) and no clear trend was noticeable. As earlier mentioned, these estimates are highly unreliable since only five 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.

	Hake	Horse mackerel	Shrimps	Cephalopod	Sharks	Seabreams	P.longirostris	A.varidens
1986401	2754 (0.84)	26 (1.00)	182 (0.16)	15 (1.00)	66 (0.40)	1261 (0.95)	0 -	106 (1.00)
1991403	3285 (0.52)	62 (0.02)	47 (0.43)	43 (0.14)	463 (0.33)	325 (0.83)	21 (0.77)	0 -
1991404	19798 (0.62)	549 (0.48)	0 -	0 -	506 (0.68)	2669 (0.08)	0 -	0 -
1992408	10793 (0.82)	58 (1.00)	235 (0.88)	0 -	49 (0.19)	2035 (1.00)	15 (1.00)	161 (1.00)
1997407	3411 -	13 -	13 -	0 -	917 -	413 -	13 -	0 -
2000403	3358 (0.86)	0 -	44 (0.84)	0 -	73 (0.47)	0 -	44 (0.84)	0 -
2002403	1245 -	0 -	20 -	14 -	104 -	0 -	0 -	0 -
2003404	454 (1.00)	0 -	156 (0.91)	0 -	226 (0.34)	0 -	79 (1.00)	0 -
2004404	5749 (0.53)	50 (0.62)	97 (0.40)	34 (0.93)	40 (0.97)	579 (0.57)	57 (0.75)	30 (1.00)
2005404	882 (0.48)	24 (0.84)	134 (0.71)	15 (1.00)	56 (0.62)	0 -	3 (0.55)	57 (0.87)
2006403	4507 (0.96)	169 (0.66)	72 (1.00)	0 -	5 (1.00)	0 -	0 -	0 -
2007403	1528 -	0 -	27 -	0 -	4323 -	0 -	0 -	0 -
2008402	964 (0.38)	563 (1.00)	280 (0.61)	9 (1.00)	188 (0.42)	232 (1.00)	45 (1.00)	225 (1.00)
2009403	2751 (0.69)	0 -	705 (0.03)	51 (0.38)	192 (0.93)	0 -	0 -	607 (0.13)
2010402	2336 (0.36)	921 (1.00)	729 (1.00)	36 (0.55)	4 (1.00)	0 -	0 -	196 (1.00)
2012403	1959 (0.80)	0 -	33 (1.00)	30 (1.00)	47 (1.00)	0 -	0 -	25 (1.00)
2013403	229 (0.47)	12 (1.00)	411 (0.44)	10 (1.00)	43 (0.40)	0 -	21 (0.86)	362 (0.55)

Distribution

Figure 9.3 shows the distribution of hake (*Merluccius spp.*) 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-low concentration area off Cunene River. The distribution area was similar to the ones found in previous years.

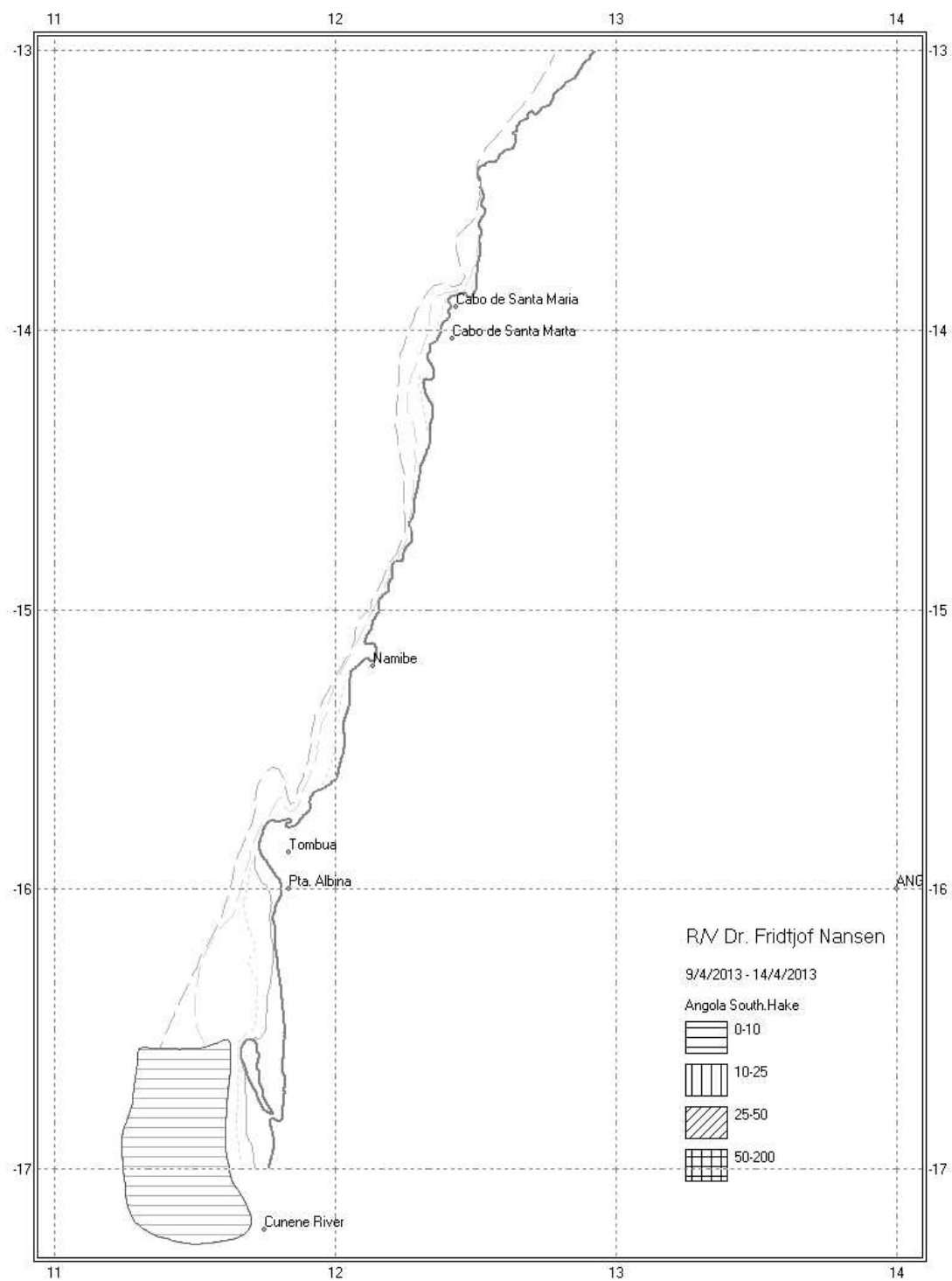


Figure 9.3 Distribution of Cape hake (*Merluccius capensis*) in the southern region, Benguela- Cunene River. Depth contours at 20, 50, 100, 200 and 500 m.

CHAPTER 6 SUMMARY

From 19 March to 18 April the 2012 demersal resource survey off Angola was successfully carried out using R/V “Dr. Fridtjof Nansen”. During this present survey, few bottom trawls were carried out on the shelf and upper slope between Benguela and Tombwa due to unsuitable and poor bottom conditions for trawling, the shelf and upper slope (20-800m) from Cunene River to Congo River was covered.

In total, 218 trawl stations were carried out, of which 215 were valid and used in the biomass estimation of the demersal stocks. To map the oceanographic conditions 276 CTD stations were taken.

Hydrographical conditions

The demersal surveys in March are coincident with the late phase of the wet season, which causes low salinity in the surface waters on the shelf off northern and central Angola due to the freshwater coming for the coastal rivers.

Both temperature and salinity parameters in the southern region were dominated by the zonal transport of surface waters from offshore to the coast. This phenomenon was more pronounced in the Namibe zone. The main feature of this zonal transport was the presence of tropical waters characterized by high temperature (24.5 °C) and high salinity content ($S > 36$),

Zonal transport of surface water was also characteristic for the entire central region except in the northern area of this region (from Cabo Ledo to Ponta das Palmeirinhas). The temperature ranged from 24°C to 28°C rising from coast to offshore and salinity is decreasing northwards. The lowest values of both temperature and salinity were found near the coast probably due to the freshwater intrusion from coastal rivers (Catumbela, Longa, Keve and Kwanza) The seasonal saline front area which is the characteristic pattern of this region during summer period can be observed. Another important feature is the presence of gyres near the coastal rivers possibly due to increased river flows from heavy inland rains.

The northern region was characterized by transport of surface water flowing towards the coast. However this zonal transport met a counter-current carrying inshore coastal waters offshore, most evident in the N'zeto area where the shape of isohalines and the isotherms indicated the strength of this counter-current. The northern part of this region was dominated by the presence of surface water with lower salinity ($S < 30$) indicating water from the Congo River. Gyres obtained in the south off the Congo River mouth were characterized by highest temperature (30 °C) and lowest salinity ($S \leq 28.5$) content in the centre than in the surrounding areas. It was observed that as the temperature increased from coast to open sea, the salinity decreased offshore. The results showed that the year 2010 was warmer (30°C) compared with 29°C last year.

Biomass estimates

Table 6.1 presents the time series from 1985 to 2013 of the biomass estimates for the most important species on the shelf and slope in the northern and central regions off Angola and few stations were taken in addition between Benguela and Tombwa during this present survey. However, the effort, *i.e.* the number of stations by stratum on the southern shelf, is relatively similar from 2000 to 2010 (Annex VIII) and the estimates in this period are comparable. The estimates on the southern slope are very unreliable as the number of tows is very low due to difficult trawling conditions. Tables 4.3 and 5.3 show the biomass estimates of the important species on the southern shelf and slope, respectively.

General trend

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 CV's 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.

The pelagic species; *Trachurus trecae*, *Trachurus capensis*, *Sardinella aurita*, *S. maderensis*, *Sardina pilchardus* and *Engraulis capensis* has been excluded from the analyses as these species are schooling pelagic species and may be caught in great abundance were they are caught obscure the overall tendency for the demersal species.

Overall the average catch rate of the demersal fishes on the shelf was 2 332 kg/h this year. In 2013, the overall average catch rate (excluding the pelagic species) was 6 181 kg/h on the shelf and slope. The situation on the shelf should be closely monitored and it is reason for concern regarding the declining catches.

In the offshore area from 200 m depth, catch rates has been more stable and last year and this present year estimates indicate no clear trend in declining biomass due to the low sampling in this depth range specifically in southern region and more precautions should be taken to interpret these estimations.

Seabreams

Seabreams are the most important commercial demersal fish group in Angola. Biomass estimate for the northern and central regions in 2013 was 20 063 Tonnes which decreased compared to 2012 (25 200 Tonnes) and was an increase from the 2009 estimate of 18 000 Tonnes As usual in previous years, *Dentex angolensis* was the dominant Seabreams species in the northern shelf whereas in central and southern regions dominated by *Dentex macrophthalmus*. The Seabreams biomass estimates have been fairly stable for the last five years.

Hakes

Merluccius polli was mostly found in juvenile stage on the shelf of northern and central regions and the biomass estimate of 2013 was 55 T which is an increase compared to last ten years. The biomass estimate for *Merluccius polli* was 6 390 Tonnes of northern and central regions which showed a decrease in relation to the 2012 biomass (7000 Tonnes). There has been a continuous declining abundance of hake in these two regions since the 2004 estimate and this could be the fishing pressure caused by shrimpers. This constant decline is of concern. In southern region, the biomass estimate of hake *Merluccius capensis* was of 2 300 Tonnes, lower than the last year estimate (3 550 Tonnes). Neither *Merluccius paradoxus* nor *Merluccius polli* (Benguela hake) were caught in this region. With the exception of the unusually high estimate of 31 000 Ton in 2009 and 11 860 Tonnes in 2004 and this estimate have fairly been similar to previous estimates.

Shrimps

The both commercially important shrimp species *Parapenaeus longirostris* and *Aristeus varidens* were caught in higher densities in northern and central regions compared to southern region. *Parapenaeus longirostris* is mainly distributed on the upper slope while *Aristeus varidens* on the lower slope. The 2013 biomass estimate for *Parapenaeus longirostris* (deep water rose shrimp) was 1 750 Tonnes on slope northern and central regions and 21 Tonnes on southern slope. This year the biomass estimate of *Parapenaeus longirostris* was of 1 647 Tonnes on central upper slope, a slightly higher value than the one estimated in 2012, and it was found in a wider depth range thus showing a sign of recovery and many juveniles were caught in the shallower stations.

The 2013 biomass of *Aristeus varidens* was estimated at 2 188 Tonnes increase on the slope of northern and central regions compared to 2012 and fairly similar to the estimates from previous years. This estimate also showed the sign of stock recovery. The biomass for *Aristeus varidens* was estimated at 362 Tons in 2013, which is much higher than in 2012 (25 Tons) and in 2011 (196 Tons) on southern slope. This biomass estimate presented a high coefficient of variation (CV) (0.9) which indicates that this should be interpreted with care.

Grunts

The biomass estimate of grunts (*Pomadourus incisus*, *P. Jubelini*, *P. rogeri* and *P. peroteti*) in the central and northern regions was 7 294 Tonnes which showed decrease from 2012 (247 Tonnes). The last year estimate of 20 539 Tonnes is nearly thrice as high as the 2011 estimate, and is the highest ever recorded for this fish group

The 2013 biomass estimate of big eye grunt (*Brachydeuterus auritus*) in the central and northern regions was 456 620 Tonnes, lower than the 2012 estimate (51543 Tonnes). The big eye grunt estimates have fluctuated for last decade with a decline trend which could be a sign of fishing pressure.

Croakers

However, the estimated biomass of croakers in 2013 was 16 442 Tonnes in the central and northern regions which drastically increased more twice compared to the last year (8 073 Tonnes) and lower than 1996 estimate (15 215 Tonnes). *Umbrina canariensis* was the most common croaker found in the central and northern regions and contributed more than 80 % of the total estimate of this group. The 2013 estimate of *Umbrina canariensis* was 13 137, much higher in relation to the last year

estimate (4 125 Tonnes). South of Tombwa, the biomasses of the croakers have varied considerably between surveys.

Groupers and snappers

Groupers, mainly *Epinephelus aeneus* and *Epinephelus guaza* were found on the shelf in the northern and central regions and they are coastal rocky and muddy shore dwellers. The 2013 survey gave an estimated biomass of 507 Tonnes, which is a decrease from two previous years (2012 and 2011) 1 250 Tonnes and 705 Tonnes respectively. 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 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 rocky dwellers and often unavailable areas, hence the biomass estimates of snappers may not adequately reflect the state of the stock, although no snappers were caught in the region.

Pelagic species

In the northern and central regions, the biomass estimate of *Trachurus trecae* was 16 625 Tonnes, which drastically decreased compared to the 2012 biomass estimate (24 459 Tonnes). The estimates greatly fluctuated in this region mainly due to the low number of stations as well as the variability in the distribution pattern of this species. The carangids 2013 estimate was 24 834 Tonnes lower than the 2012 estimate (35 410). Hairtails estimate was 5 794 Tonnes in 2013. The biomass of horse mackerel (*Trachurus trecae*) greatly fluctuated in this region mainly due to the low number of stations as well as the variability in the distribution pattern of this species in southern region. Its 2013 estimate was of 12 Tons while it was not caught in 2012. The carangids 2013 estimate was 12 Tons and these species were not caught last year. Hairtails estimate was 13 Tons in 2013 and these species were not caught from 2010 to 2012. More adequate results are achieved from the acoustic surveys conducted later in the year.

Table 6.1. Biomass estimates (tonnes) of important species in the Central and Northern Regions. CVs are in brackets.

	Seabreams		D.macro		D.angolensis		M.polli		Shrimps		A.varidens		N.africanus		P.longirostris	
1985401	14690	(0.94)	200	(2.74)	2196	(0.92)	211	(0.12)	323	(1.22)	0	-	0	-	138	(1.93)
1985403	12881	(0.57)	0	-	2495	(0.94)	0	-	139	(3.12)	0	-	0	-	0	-
1985405	22438	(1.03)	0	-	4490	(0.75)	6524	(1.70)	2215	(1.77)	0	-	0	-	0	-
1985407	49738	(0.69)	6286	(2.41)	9283	(1.12)	55083	(1.46)	15069	(1.04)	7633	(1.47)	3578	(1.69)	3062	(1.72)
1986401	27435	(0.54)	2787	(1.22)	5700	(0.92)	29498	(1.21)	24342	(0.60)	1030	(2.63)	15804	(0.77)	3823	(1.22)
1986402	45651	(0.36)	9215	(0.40)	15499	(0.47)	52670	(0.76)	21957	(0.43)	1485	(0.90)	4643	(1.90)	0	-
1989402	25271	(0.55)	7302	(1.28)	2568	(0.49)	16503	(1.50)	9110	(2.48)	397	(1.56)	7545	(2.98)	895	(1.44)
1989403	23569	(0.92)	1386	(1.44)	9997	(2.01)	14371	(0.90)	7519	(1.03)	400	(1.50)	4702	(1.61)	1559	(1.07)
1989407	20807	(0.76)	1956	(2.27)	4888	(0.68)	25407	(1.58)	7393	(0.65)	285	(1.25)	5657	(0.81)	1094	(1.18)
1991403	14666	(0.48)	3075	(1.74)	2651	(0.49)	31536	(0.93)	14041	(0.97)	723	(0.58)	12194	(1.13)	302	(1.48)
1991404	42431	(0.47)	18054	(0.97)	4903	(0.54)	30968	(1.03)	8426	(1.07)	119	(3.61)	5104	(0.95)	640	(0.95)
1992408	40589	(0.52)	20117	(0.99)	7229	(0.37)	23233	(0.60)	13613	(1.17)	638	(1.21)	11662	(1.38)	935	(1.71)
1994405	51379	(0.51)	23219	(0.88)	6918	(0.52)	10343	(1.00)	11756	(1.00)	1017	(1.28)	8801	(1.33)	1757	(1.05)
1995402	29271	(0.83)	14010	(1.70)	4695	(0.71)	10577	(1.30)	15395	(0.93)	1078	(0.95)	9729	(1.47)	2020	(1.09)
1995405	11363	(0.86)	10083	(0.99)	1280	(0.74)	6880	(0.81)	4499	(0.65)	698	(0.62)	2763	(0.97)	680	(1.02)
1996407	39921	(0.62)	14591	(0.66)	6236	(0.54)	12219	(1.08)	11356	(0.96)	938	(0.76)	8830	(1.16)	310	(0.89)
1997405	33690	(0.75)	14289	(1.72)	5318	(0.57)	21911	(0.90)	22638	(0.60)	639	(0.79)	17189	(0.79)	2501	(1.05)
1997407	49236	(0.63)	31595	(0.96)	5712	(0.90)	25581	(0.71)	9977	(2.10)	0	-	4098	(4.15)	5481	(1.07)
1998405	64867	(2.24)	52473	(2.75)	2084	(0.74)	10366	(1.27)	9412	(0.98)	1192	(2.89)	7000	(1.37)	742	(1.32)
1999403	34029	(0.45)	8181	(1.23)	4476	(0.32)	6640	(1.08)	13687	(0.97)	574	(1.68)	11746	(1.14)	878	(0.82)
2000403	36443	(0.45)	8086	(1.25)	7385	(1.25)	10118	(1.00)	7592	(0.76)	601	(0.71)	4820	(1.21)	1259	(1.15)
2001402	22805	(0.64)	6772	(1.22)	3482	(0.84)	9732	(1.30)	11282	(1.23)	699	(1.14)	7263	(1.87)	1020	(0.83)
2002403	34016	(0.85)	13935	(2.04)	3323	(0.66)	7680	(0.93)	10747	(1.11)	371	(0.99)	8375	(1.42)	1565	(1.41)
2003404	17687	(0.42)	1092	(2.52)	4765	(0.42)	14240	(1.35)	13086	(0.85)	881	(1.78)	10157	(1.06)	1363	(1.15)
2004404	32647	(1.79)	13884	(4.41)	7084	(0.69)	31628	(1.73)	20863	(0.59)	935	(0.78)	17133	(0.68)	2143	(1.33)
2005404	33064	(1.12)	7290	(4.97)	8473	(0.29)	21112	(0.99)	17650	(0.59)	1431	(0.77)	14188	(0.73)	1613	(1.07)
2006403	24824	(0.57)	4950	(2.58)	7236	(0.39)	14563	(1.06)	20214	(0.61)	750	(0.63)	16424	(0.71)	2607	(1.92)
2007403	22191	(0.35)	2157	(1.41)	8083	(0.41)	11157	(1.66)	24092	(0.71)	1026	(0.38)	21198	(0.81)	1342	(1.35)
2008402	21227	(0.48)	3176	(3.01)	6860	(0.46)	11979	(0.96)	24057	(0.65)	1508	(0.49)	20352	(0.78)	1622	(1.30)
2009403	18108	(0.41)	876	(0.93)	6697	(0.44)	8120	(1.00)	23619	(0.63)	2204	(0.66)	19130	(0.79)	1432	(1.10)
2010402	25714	(0.39)	2395	(4.44)	11561	(0.50)	7051	(1.08)	19050	(0.79)	1134	(1.01)	16013	(0.90)	1648	(1.18)
2011403	20872	(0.37)	777	(1.44)	9905	(0.42)	6751	(2.52)	15715	(0.96)	1272	(0.40)	12206	(1.22)	1492	(1.76)
2012403	21719	(0.81)	3671	(4.50)	7501	(0.44)	13939	(1.31)	22275	(0.72)	1525	(1.15)	16284	(0.94)	3971	(1.28)
2013403	22022	(0.42)	3413	(2.03)	10486	(0.48)	6471	(0.94)	19405	(0.62)	1944	(1.07)	14952	(0.64)	2149	(3.05)

	Grunts.com		B.auritus		Croakers		U.canariensis		Snappers		Groupers		Carangids		T.trace	
1985401	248	(1.69)	40729	(1.90)	1519	(1.67)	1132	(2.01)	0	-	479	(1.81)	9986	(1.52)	4496	(1.85)
1985403	381	(2.18)	6842	(2.33)	1302	(1.82)	521	(2.43)	63	(2.09)	1771	(1.30)	3740	(1.73)	3324	(1.94)
1985405	3629	(1.56)	9182	(1.99)	8979	(1.52)	602	(1.89)	62	(3.25)	1978	(1.39)	17742	(1.81)	16486	(1.99)
1985407	20511	(1.54)	69072	(1.67)	13935	(2.05)	8921	(2.47)	0	-	4307	(0.91)	117929	(1.33)	110950	(1.39)
1986401	3468	(1.06)	133723	(0.46)	6956	(0.82)	2606	(1.45)	470	(3.02)	1087	(1.01)	38390	(0.72)	31313	(0.88)
1986402	6995	(0.98)	36750	(0.69)	9578	(0.76)	3387	(1.33)	0	-	2033	(0.84)	34989	(0.97)	30649	(1.11)
1989402	3816	(1.85)	20488	(1.13)	5864	(1.15)	1427	(1.14)	0	-	1569	(1.34)	26000	(0.85)	19681	(1.00)
1989403	2228	(1.06)	64268	(1.18)	7826	(0.78)	1302	(1.34)	53	(2.19)	3937	(2.31)	40419	(0.66)	33008	(0.74)
1989407	1870	(1.37)	88316	(0.76)	4812	(1.06)	1194	(2.28)	316	(3.25)	1107	(1.95)	59519	(0.85)	49538	(0.85)
1991403	1247	(0.99)	48534	(0.82)	5848	(1.05)	1657	(1.94)	106	(3.69)	817	(1.28)	131007	(1.03)	107626	(1.18)
1991404	2742	(1.29)	3524	(1.62)	26595	(1.93)	22849	(2.25)	0	-	2043	(1.05)	63901	(1.23)	62772	(1.25)
1992408	1698	(1.27)	34799	(2.01)	4772	(0.76)	1719	(1.18)	0	-	3359	(1.08)	53311	(0.67)	48453	(0.69)
1994405	680	(1.25)	10205	(1.51)	18320	(1.46)	6075	(1.55)	262	(3.69)	2908	(1.07)	86549	(0.75)	77944	(0.83)
1995402	6027	(1.40)	40468	(0.83)	18472	(1.67)	11929	(2.11)	594	(2.14)	1397	(1.05)	19756	(0.74)	5224	(1.74)
1995405	0	-	0	-	245	(1.89)	209	(2.22)	45	(3.18)	348	(3.18)	11370	(1.15)	11258	(1.17)
1996407	8256	(1.04)	45646	(1.30)	15215	(0.62)	3150	(1.40)	109	(3.69)	2692	(1.26)	89864	(0.89)	83774	(0.95)
1997405	6427	(1.49)	46071	(0.75)	21483	(0.69)	5760	(0.94)	73	(3.25)	781	(1.08)	168669	(1.14)	64832	(0.77)
1997407	500	(0.84)	1966	(0.64)	36999	(1.82)	33214	(2.03)	0	-	2840	(1.33)	99747	(0.56)	97858	(0.58)
1998405	9117	(1.56)	22014	(1.79)	8609	(1.62)	2239	(1.46)	0	-	198	(2.33)	7606	(1.20)	4630	(1.67)
1999403	8888	(1.03)	131249	(0.85)	18534	(1.14)	11581	(1.59)	531	(3.49)	1642	(0.83)	36949	(0.60)	17083	(0.78)
2000403	7213	(0.91)	79452	(1.18)	7842	(0.67)	3771	(0.88)	294	(2.04)	1647	(1.01)	47540	(0.80)	25701	(0.72)
2001402	3600	(1.17)	54964	(1.01)	3203	(0.94)	1264	(1.70)	726	(3.16)	859	(1.50)	30501	(0.66)	22012	(0.77)
2002403	3223	(0.99)	81844	(1.16)	9196	(0.61)	4326	(0.86)	251	(4.74)	742	(1.17)	98922	(0.63)	88411	(0.70)
2003404	10025	(1.83)	104721	(0.99)	13474	(0.69)	4260	(1.62)	186	(2.63)	1037	(1.00)	57659	(0.89)	35260	(0.78)
2004404	6810	(1.15)	51255	(0.90)	12196	(1.24)	6977	(1.87)	79	(2.44)	681	(0.91)	28088	(0.58)	21409	(0.71)
2005404	11735	(1.08)	88667	(1.17)	13501	(0.72)	5933	(0.91)	284	(2.07)	1176	(0.88)	20025	(0.67)	10931	(0.70)
2006403	6921	(1.09)	94684	(0.91)	8956	(0.73)	6483	(0.96)	51	(2.69)	819	(0.99)	25200	(0.45)	14925	(0.52)
2007403	17242	(1.38)	52925	(0.80)	11991	(1.40)	5846	(2.35)	113	(1.86)	950	(1.04)	22928	(0.73)	10633	(0.69)
2008402	7411	(1.43)	70217	(1.19)	12684	(0.87)	5058	(0.93)	90	(2.88)	1187	(1.53)	22856	(0.91)	5640	(0.69)
2009403	8192	(0.90)	46010	(1.28)	6064	(0.74)	2409	(0.71)	292	(2.03)	779	(0.73)	24557	(0.69)	14485	(0.68)
2010402	10873	(0.95)	24838	(0.91)	8256	(0.77)	4493	(1.14)	69	(1.32)	643	(0.92)	19492	(1.77)	4427	(0.73)
2011403	14677	(1.23)	36639	(1.11)	13884	(0.99)	6038	(1.57)	267	(2.79)	705	(0.83)	24065	(1.16)	15045	(1.73)
2012403	20538	(1.64)	51544	(0.90)	8073	(0.73)	4125	(0.89)	8	(3.25)	1249	(2.00)	35799	(0.59)	24458	(0.73)
2013403	7297	(0.78)	45625	(0.92)	16442	(1.55)	13137	(1.92)	0	-	760	(1.56)	25219	(0.89)	4985	(0.97)

	Clupeids		Scombrids		Sharks		Cephalopod		Ommastr.		Sepiidae		Hairtails		Barracudas	
1985401	364	(1.93)	44	(3.25)	841	(0.92)	11438	(1.90)	11249	(1.93)	13	(2.72)	15711	(1.45)	254	(1.50)
1985403	3907	(3.17)	30	(2.72)	451	(1.06)	694	(0.95)	0	-	0	-	1200	(2.75)	75	(1.35)
1985405	205	(3.23)	146	(2.16)	1079	(1.74)	2297	(1.00)	0	-	154	(1.61)	3219	(1.31)	26	(2.74)
1985407	906	(1.55)	88	(2.09)	96	(2.42)	6369	(1.24)	225	(2.56)	215	(2.12)	7937	(0.94)	1033	(1.93)
1986401	2770	(0.96)	64	(2.00)	5004	(2.30)	6925	(0.81)	5037	(1.12)	1334	(0.86)	26602	(0.92)	3099	(0.84)
1986402	1693	(0.95)	226	(1.51)	5256	(1.38)	2935	(0.78)	0	-	2040	(1.09)	511874	(0.02)	1874	(0.93)
1989402	2137	(2.42)	252	(1.08)	3086	(2.42)	4465	(1.10)	3209	(1.51)	356	(1.29)	13125	(0.89)	2281	(2.15)
1989403	2282	(0.79)	333	(1.16)	1472	(1.18)	3198	(0.56)	1286	(1.04)	1529	(0.62)	6333	(0.70)	3674	(1.21)
1989407	6749	(0.99)	518	(1.43)	21887	(1.35)	4797	(0.90)	4191	(0.98)	170	(1.62)	66901	(0.69)	1068	(1.09)
1991403	2349	(1.31)	373	(1.28)	3559	(1.18)	2235	(0.43)	1036	(0.74)	528	(0.78)	21783	(1.13)	3322	(1.93)
1991404	91	(1.43)	444	(1.13)	4090	(1.31)	7351	(0.70)	4156	(1.05)	797	(1.37)	9218	(0.61)	161	(1.32)
1992408	82	(1.92)	223	(1.14)	5163	(1.47)	6109	(0.41)	3519	(0.46)	1074	(0.95)	17251	(0.74)	103	(2.12)
1994405	206	(2.91)	926	(1.08)	1869	(0.91)	6886	(0.52)	1954	(0.62)	3167	(0.67)	31574	(2.09)	329	(1.69)
1995402	1679	(1.09)	393	(1.24)	3382	(1.00)	1789	(0.76)	164	(1.21)	881	(0.63)	14521	(0.59)	4222	(1.10)
1995405	0	-	201	(1.88)	1289	(1.01)	979	(1.08)	730	(0.84)	222	(2.43)	5112	(1.63)	0	-
1996407	1371	(1.69)	190	(1.65)	2641	(1.47)	5268	(0.49)	1069	(0.45)	2342	(0.56)	9254	(0.51)	1035	(1.51)
1997405	9833	(1.75)	335	(1.74)	3004	(1.18)	10684	(0.56)	3439	(0.56)	6612	(0.84)	32077	(0.82)	554	(3.05)
1997407	132	(2.45)	289	(2.20)	500	(1.73)	6260	(0.42)	2491	(0.88)	1885	(0.33)	23555	(0.55)	0	-
1998405	2860	(2.97)	52	(2.54)	1122	(1.30)	3016	(0.62)	766	(1.28)	1335	(1.06)	30861	(2.71)	454	(1.54)
1999403	8353	(0.87)	69	(1.84)	3192	(0.73)	3577	(1.08)	2028	(1.86)	760	(0.53)	26027	(0.57)	4317	(0.82)
2000403	2215	(1.41)	349	(1.83)	5098	(1.86)	3778	(0.44)	1735	(0.69)	960	(0.87)	18068	(0.62)	4556	(1.00)
2001402	598	(1.06)	139	(1.11)	3519	(1.85)	4340	(1.36)	1702	(2.83)	944	(1.38)	24459	(1.12)	1818	(0.79)
2002403	3067	(0.78)	820	(2.58)	629	(0.97)	4980	(0.71)	3648	(0.93)	372	(0.88)	30855	(0.70)	2318	(0.99)
2003404	4255	(0.78)	137	(1.75)	1917	(1.93)	2649	(0.57)	1233	(0.99)	625	(0.97)	20199	(0.68)	2824	(1.86)
2004404	3760	(1.00)	63	(1.39)	3125	(1.09)	3400	(0.54)	1319	(0.89)	762	(0.58)	20349	(1.20)	1856	(1.54)
2005404	2134	(1.19)	332	(1.72)	2421	(1.08)	4061	(0.47)	1246	(1.27)	2075	(0.41)	41427	(1.25)	963	(1.68)
2006403	4663	(1.09)	183	(1.03)	2328	(1.48)	3728	(0.54)	961	(1.40)	1324	(0.69)	20849	(0.49)	2561	(0.92)
2007403	3875	(0.84)	214	(1.42)	2789	(1.21)	3287	(0.56)	347	(1.74)	1624	(0.58)	32508	(1.22)	2336	(1.34)
2008402	2700	(1.20)	168	(1.22)	1831	(1.03)	3577	(0.49)	898	(0.62)	895	(0.70)	18211	(0.64)	1652	(1.78)
2009403	11816	(1.85)	121	(1.31)	3009	(1.61)	4317	(0.64)	441	(0.79)	1452	(0.76)	31108	(1.11)	1743	(1.33)
2010402	3238	(1.99)	164	(1.20)	1205	(1.14)	3215	(0.36)	452	(0.69)	1316	(0.54)	14888	(0.94)	1202	(1.21)
2011403	3907	(1.22)	124	(1.32)	1482	(0.97)	3757	(0.51)	238	(1.02)	2026	(0.52)	11390	(1.11)	3232	(1.22)
2012403	75068	(1.57)	3138	(2.82)	659	(1.30)	6742	(0.48)	1667	(1.45)	3713	(0.58)	12125	(1.21)	1086	(1.61)
2013403	2718	(1.56)	166	(1.59)	2122	(1.45)	2917	(0.81)	472	(0.57)	784	(0.59)	6906	(0.61)	3791	(1.38)

ANNEX I Records of fishing stations

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 1
 DATE :19/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°35.34
 start stop duration Lon E 12°49.58
 TIME :11:37:23 12:06:54 30.0 (min) Purpose : 3
 LOG : 1219.71 1221.17 1.5 Region : 4054
 FDEPTH: 719 708 Gear cond.: 0
 BDEPTH: 719 708 Validity : 0
 Towing dir: 0° Wire out : 1300 m Speed : 3.0 kn
 Sorted : 26 Total catch: 288.30 Catch/hour: 576.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	303.60	64790	52.65	
Lamprogrammus exutus	77.00	396	13.35	
Hoplostethus cadenati	43.78	1276	7.59	
Yarella blackfordi	33.44	990	5.80	
Stereomastis sp.	33.00	1562	5.72	
Polymetme corythaeola	31.68	572	5.49	
Talismania longifilis	13.64	88	2.37	
Centrolophus niger	8.36	22	1.45	
Aristeus varidens	5.94	242	1.03	
Coelorinchus sp.	4.40	110	0.76	
Halosaurus ovenii	4.40	44	0.76	
Ebinania costaecanarie	3.30	22	0.57	
Dibranchius atlanticus	2.42	110	0.42	
BathYROconger vicinus	2.20	66	0.38	
Chauliodus sloani	2.20	286	0.38	
Merluccius polli	2.04	2	0.35	
Astronesthes sp.	1.76	22	0.31	
Chlorophthalmus atlanticus	1.10	22	0.19	
Bathypterois phenax	0.66	88	0.11	
Parapagurus cf pilosimanus	0.66	22	0.11	
Chaceon maritae, male	0.60	2	0.10	
AcanthePHYra sp.	0.44	22	0.08	
Total	576.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 3
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°36.27
 start stop duration Lon E 13°1.05
 TIME :05:27:20 05:57:25 30.0 (min) Purpose : 3
 LOG : 1244.09 1245.66 1.6 Region : 4054
 FDEPTH: 150 146 Gear cond.: 0
 BDEPTH: 150 146 Validity : 0
 Towing dir: 0° Wire out : 370 m Speed : 3.1 kn
 Sorted : 134 Total catch: 133.68 Catch/hour: 267.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	156.20	1598	58.42	
Dentex angolensis	48.12	212	18.00	3
Pterothrissus belloci	12.76	96	4.77	
Umbriina canariensis	11.56	40	4.32	2
Brotula barbata	7.68	10	2.87	
Illex coindetii	5.58	100	2.09	
Zeus faber	5.56	32	2.08	
Atractoscion aequidens	4.12	2	1.54	
Trigla lyra	3.56	24	1.33	
Uranoscopus cadenati	2.26	12	0.85	
Branchiostegus semifasciatus *	1.82	2	0.68	
Anthias anthias	1.36	16	0.51	
MiracoRVina angolensis	1.26	4	0.47	
Torpedo torpedo	1.12	2	0.42	
Grammolites gruvelli	0.96	14	0.36	
Citharus linguatula	0.78	22	0.29	
Parapenaeus longirostris,femal	0.54	96	0.20	
Pontinus accraensis	0.54	4	0.20	
Spicara alta	0.54	4	0.20	
Octopus vulgaris	0.52	2	0.19	
Monoleme microstoma	0.38	12	0.14	
Peristedion cataphractum	0.14	2	0.05	
Total	267.36		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 2
 DATE :20/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°36.59
 start stop duration Lon E 12°54.06
 TIME :03:03:18 03:35:39 32.0 (min) Purpose : 3
 LOG : 1232.41 1233.94 1.5 Region : 4054
 FDEPTH: 414 412 Gear cond.: 0
 BDEPTH: 414 412 Validity : 0
 Towing dir: 0° Wire out : 950 m Speed : 2.8 kn
 Sorted : 32 Total catch: 263.84 Catch/hour: 494.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	213.47	64041	43.15	
Centrophorus granulosus	48.53	15	9.81	
Hymenocephalus italicus	44.16	10997	8.93	
Merluccius polli	43.80	201	8.85	1
Etmopterus polli	35.72	943	7.22	
Chaunax pictus	32.21	1843	6.51	
Gadella imberbis	18.71	578	3.78	
Nezumia aequalis	10.13	465	2.05	
Halosaurus ovenii	10.13	718	2.05	
Yarella blackfordi	6.34	253	1.28	
Lamprogrammus exutus	5.63	606	1.14	
Aristeus varidens, female	5.21	634	1.05	
Trichiurus lepturus	4.78	183	0.97	
Malacocephalus laevis	4.50	84	0.91	
Aristeus varidens, male	3.66	478	0.74	
Mystriophis rostellatus	2.96	15	0.60	
Chlorophthalmus atlanticus	1.69	43	0.34	
Callinectes amnicola	1.41	71	0.28	
Ebinania costaecanarie	0.84	15	0.17	
Parapagurus pilosimanus	0.84	15	0.17	
Total	494.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 4
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°36.07
 start stop duration Lon E 13°3.90
 TIME :06:55:37 07:25:17 30.0 (min) Purpose : 3
 LOG : 1250.16 1251.71 1.6 Region : 4054
 FDEPTH: 112 112 Gear cond.: 0
 BDEPTH: 112 112 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.1 kn
 Sorted : 41 Total catch: 41.09 Catch/hour: 82.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	43.06	276	52.40	4
Boops boops	8.44	238	10.27	
Spicara alta	5.40	68	6.57	
Atractoscion aequidens	5.36	2	6.52	
Illex coindetii	4.18	204	5.09	
Zeus faber	3.74	12	4.55	
Trichiurus lepturus	3.30	26	4.02	
Dentex congoensis	2.34	76	2.85	
Dentex barnardi	1.80	6	2.19	
Pterothrissus belloci	1.34	8	1.63	
Chrysaora hyosocella	1.12	2	1.36	
Selene dorsalis	1.04	2	1.27	
Pagellus bellottii	0.56	4	0.68	
B I V A L V E S	0.38	12	0.46	
Monoleme microstoma	0.08	4	0.10	
Citharus linguatula	0.04	2	0.05	
Total	82.18		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 5
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°36.22
 start stop duration Lon E 13°10.96
 TIME :08:42:28 09:12:08 30.0 (min) Purpose : 3
 LOG : 1260.21 1261.79 1.6 Region : 4054
 FDEPTH: 76 79 Gear cond.: 0
 BDEPTH: 76 79 Validity : 0
 Towing dir: 0° Wire out : 190 m Speed : 3.2 kn
 Sorted : 133 Total catch: 695.31 Catch/hour: 1390.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	917.80	10900	66.00	7
Trachurus trecae	186.16	1592	13.39	
Dentex angolensis	112.10	656	8.06	5
Pomadourys incisus	62.92	468	4.52	
Zeus faber	33.68	31	2.42	
Selene dorsalis	18.60	260	1.34	
Alectis alexandrina	16.02	21	1.15	
Stromateus fiatola	14.35	21	1.03	
Sardinella aurita	7.28	52	0.52	
Fistularia petimba	5.68	14	0.41	
Alloteuthis africana	5.30	1154	0.38	
Pagellus bellottii	4.38	42	0.31	6
Dentex barnardi	2.50	10	0.18	
Sepia orbignyana	1.36	2	0.10	
Citharus linguatula	1.04	21	0.07	
Spicara alta	0.94	10	0.07	
Illex coindetii	0.52	10	0.04	
Total	1390.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 6
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°33.98
 start stop duration Lon E 13°16.44
 TIME :10:17:18 10:46:17 29.0 (min) Purpose : 3
 LOG : 1269.07 1270.57 1.5 Region : 4054
 FDEPTH: 44 40 Gear cond.: 0
 BDEPTH: 44 40 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn
 Sorted : 204 Total catch: 720.15 Catch/hour: 1489.97

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	1307.50	21863	87.75	
Pagellus bellottii	64.88	536	4.35	28
Brachydeuterus auritus	28.82	1380	1.93	8
Rhizoprionodon acutus	13.86	4	0.93	
Selene dorsalis	11.15	246	0.75	
Sepia orbignyana	11.15	14	0.75	
Balistes capriscus	7.82	14	0.52	
Lagocephalus laevigatus	7.16	29	0.48	
Pseudupeneus prayensis	6.95	58	0.47	
Raja miraletus	6.23	8	0.42	
Torpedo nobiliana	6.08	8	0.41	
Galeoides decadactylus	5.07	14	0.34	
Zeus faber	3.68	8	0.25	
Pseudolithus senegalensis	2.81	8	0.19	
Sphyræna guachancho	2.46	58	0.17	
Sardinella maderensis	1.30	8	0.09	
Trachurus trecae	0.93	8	0.06	
Fistularia tabacaria	0.79	8	0.05	
Eucinostomus melanopterus	0.58	8	0.04	
Penaeus notialis	0.43	8	0.03	
Grammolites gruveli	0.29	8	0.02	
Total	1489.97		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 7
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°36.99
 start stop duration Lon E 13°18.81
 TIME :11:25:36 11:55:48 30.0 (min) Purpose : 3
 LOG : 1273.70 1275.32 1.6 Region : 4054
 FDEPTH: 34 32 Gear cond.: 0
 BDEPTH: 34 32 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.2 kn
 Sorted : 132 Total catch: 3383.06 Catch/hour: 6766.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	4251.86	46562	62.84	9
Chloroscombrus chrysurus	2068.56	35292	30.57	
Galeoides decadactylus	255.50	918	3.78	
Sphyræna sphyraena	62.72	306	0.93	
Alectis alexandrina	59.66	52	0.88	
Arius parkii	22.44	52	0.33	
Rhizoprionodon acutus	13.80	4	0.20	
Trachurus trecae	11.22	102	0.17	
Penaeus notialis	7.64	154	0.11	
Sardinella maderensis	4.58	52	0.07	
Selene dorsalis	4.58	152	0.07	
Ilisha africana	3.56	52	0.05	
Total	6766.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 8
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°16.17
 start stop duration Lon E 13°15.75
 TIME :02:07:42 02:28:41 21.0 (min) Purpose : 3
 LOG : 1294.70 1295.80 1.1 Region : 4054
 FDEPTH: 30 29 Gear cond.: 0
 BDEPTH: 30 29 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.1 kn
 Sorted : 122 Total catch: 857.15 Catch/hour: 2449.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1639.60	54860	66.95	10
Galeoides decadactylus	290.00	1580	11.84	
Sphyræna sphyraena	228.40	1080	9.33	
Selene dorsalis	101.20	1220	4.13	
Chloroscombrus chrysurus	57.60	520	2.35	
Pagellus bellottii	42.20	220	1.72	11
Pomadasy incisus	29.00	260	1.18	25
Drepane africana	23.20	60	0.95	
Pseudolithus senegalensis	11.00	40	0.45	
Ilisha africana	8.40	160	0.34	
Alectis alexandrina	7.40	20	0.30	
Sardinella maderensis	3.60	60	0.15	
Eucinostomus melanopterus	2.20	20	0.09	
Citharus linguatula	2.20	40	0.09	
Penaeus notialis	2.00	80	0.08	
Trichiurus lepturus	1.00	20	0.04	
Total	2449.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 9
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°15.60
 start stop duration Lon E 13°11.83
 TIME :03:14:03 03:45:32 31.0 (min) Purpose : 3
 LOG : 1300.08 1301.68 1.6 Region : 4054
 FDEPTH: 47 48 Gear cond.: 0
 BDEPTH: 47 48 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn
 Sorted : 61 Total catch: 182.25 Catch/hour: 352.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	193.35	2282	54.81	12
Galeoides decadactylus	58.94	168	16.71	
Dentex barnardi	16.61	99	4.71	
Sphyræna guachancho	16.55	46	4.69	
Pagellus bellottii	16.08	151	4.56	13
Dentex gibbosus	9.00	35	2.55	
Pseudupeneus prayensis	8.71	87	2.47	
Chloroscombrus chrysurus	8.59	64	2.44	
Pseudolithus senegalensis	8.01	12	2.27	
Selene dorsalis	6.68	70	1.89	
Pomadasy jubelini	3.54	17	1.00	
Lagocephalus laevigatus	2.67	6	0.76	
Stromateus fiatola	1.63	6	0.46	
Sardinella maderensis	0.93	6	0.26	
Eucinostomus melanopterus	0.70	6	0.20	
Decapterus rhonchus	0.46	6	0.13	
Alloteuthis africana	0.29	81	0.08	
Total	352.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 10
 DATE :20/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°18.46
 start stop duration Lon E 13°9.35
 TIME :04:20:47 04:50:57 30.0 (min) Purpose : 3
 LOG : 1305.70 1307.34 1.6 Region : 4054
 FDEPTH: 65 63 Gear cond.: 0
 BDEPTH: 65 63 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.3 kn
 Sorted : 123 Total catch: 222.71 Catch/hour: 445.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	288.30	10888	64.73	27
Trachurus trecae	46.98	756	10.55	
Pomadasy jubelini	32.70	92	7.34	
Galeoides decadactylus	14.18	36	3.18	
Dentex angolensis	13.88	96	3.12	14
Pomadasy incisus	13.20	84	2.96	
Raja miraletus	9.14	14	2.05	
Pseudolithus senegalensis	7.92	18	1.78	
Pagellus bellottii	5.68	78	1.28	29
Selene dorsalis	2.60	24	0.58	
Lagocephalus laevigatus	2.48	10	0.56	
Argyrosomus hololepidotus	1.64	4	0.37	
Fistularia petimba	1.22	8	0.27	
Zeus faber	1.06	4	0.24	
Chaetodon hoefleri	1.02	8	0.23	
Sphyræna guachancho	0.84	18	0.19	
Pseudupeneus prayensis	0.78	22	0.18	
Alloteuthis africana	0.74	192	0.17	
Trichiurus lepturus	0.50	10	0.11	
Sardinella aurita	0.42	4	0.09	
Citharus linguatula	0.14	4	0.03	
Lagocephalus laevigatus	0.00	0	0.00	
Total	445.42		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 11
 DATE :20/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°28.55
 start stop duration Lon E 12°49.62
 TIME :08:18:54 08:48:47 30.0 (min) Purpose : 3
 LOG : 1332.11 1333.57 1.5 Region : 4054
 FDEPTH: 459 460 Gear cond.: 0
 BDEPTH: 459 460 Validity : 0
 Towing dir: 0° Wire out : 970 m Speed : 2.9 kn
 Sorted : 39 Total catch: 292.26 Catch/hour: 584.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	362.04	85386	61.94	
Chaunax pictus	45.92	294	7.86	
Merluccius polli	35.40	0	6.06	17
Gadella imberbis	31.78	476	5.44	
Dibranchius atlanticus	22.26	1246	3.81	
Benthodesmus tenuis	17.50	560	2.99	
Aristeus varidens, female	16.66	1246	2.85	
Yarella blackfordi	8.12	224	1.39	
Centrophorus granulosus	7.88	2	1.35	
Stomias boa boa	6.02	126	1.03	
Chaceon maritae, male	5.46	14	0.93	
Aristeus varidens, male	3.92	518	0.67	
Plesionika martia	3.22	98	0.55	
Lamprogrammus exutus	2.80	14	0.48	
Halosaurus ovenii	2.80	154	0.48	
L O B S T E R S	2.80	238	0.48	
Hoplostethus cadenati	2.80	98	0.48	
Nezumia aequalis	2.24	42	0.38	
Bathyrcoconger vicinus	1.26	14	0.22	
Hymenocephalus italicus	1.12	154	0.19	
Plesionika martia	0.84	98	0.14	
Ectreposebastes imus	0.84	14	0.14	
Talismania longifilis	0.56	42	0.10	
Callinectes amnicola	0.28	14	0.05	
Total	584.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 12
 DATE :20/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°30.91
 start stop duration Lon E 12°49.50
 TIME :10:19:57 10:50:03 30.0 (min) Purpose : 3
 LOG : 1338.19 1339.68 1.5 Region : 4054
 FDEPTH: 525 529 Gear cond.: 0
 BDEPTH: 525 529 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 3.0 km
 Sorted : 26 Total catch: 157.98 Catch/hour: 315.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	188.88	44	59.78	
Merluccius polli	34.80	60	11.01	26
MELANOSTOMIATIDAE	22.68	516	7.18	
Lamprogrammus exutus	12.72	264	4.03	
Aristeus varidens, female	9.36	492	2.96	
Dibranchius atlanticus	6.00	384	1.90	
Aristeus varidens, male	4.80	636	1.52	
L O B S T E R S	4.56	612	1.44	
Chaceon maritae	4.56	24	1.44	
Triplophos hemingi	3.72	564	1.18	
Chauliodus sloani	3.24	108	1.03	
Lophiodes kempfi	3.00	12	0.95	
Yarrella blackfordi	2.64	72	0.84	
Trichiurus lepturus	2.52	108	0.80	
Halosauridae sp.	2.52	84	0.80	
Chaunax pictus	1.92	12	0.61	
Hoplostethus cadenati	1.80	60	0.57	
CRANCHIIDAE	1.32	24	0.42	
Bathynectes sp.	1.08	108	0.34	
Talismania sp.	1.08	84	0.34	
Synaphobranchus affinis	0.96	60	0.30	
Hymenocephalus italicus	0.72	12	0.23	
Setarches guentheri	0.60	12	0.19	
Glyphus marsupialis	0.24	60	0.08	
Ebinania costaeacmariae	0.24	24	0.08	
Total	315.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 13
 DATE :21/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°31.43
 start stop duration Lon E 12°47.67
 TIME :12:31:28 01:03:58 32.0 (min) Purpose : 3
 LOG : 1344.46 1345.94 1.5 Region : 4054
 FDEPTH: 726 732 Gear cond.: 0
 BDEPTH: 726 732 Validity : 0
 Towing dir: 0° Wire out : 1370 m Speed : 2.7 km
 Sorted : 26 Total catch: 157.62 Catch/hour: 295.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	105.53	26550	35.71	
Chaceon maritae, male	34.43	68	11.65	
Lamprogrammus exutus	28.80	146	9.74	
Stereomastis sp.	26.33	1778	8.91	
Yarrella blackfordi	23.06	652	7.80	
Xenodermichthys copei	16.99	101	5.75	
Hoplostethus cadenati	13.05	405	4.42	
Gonostoma elongatum	10.91	225	3.69	
Malacocephalus laevis	9.90	248	3.35	
Aristeus varidens	6.98	259	2.36	
Lithodes ferox	4.39	11	1.48	
Bathygadus macrops	3.60	169	1.22	
Dibranchius atlanticus	2.70	158	0.91	
Conger conger	1.91	45	0.65	
Munidopsis sp.	1.80	1204	0.61	
Halosaurus rostratus	1.69	22	0.57	
Bathypterois phenax	1.58	169	0.53	
Lophiodes kempfi	0.79	11	0.27	
Setarches guentheri	0.79	11	0.27	
Bathynectes piperitus	0.34	34	0.11	
Total	295.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 14
 DATE :21/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°27.57
 start stop duration Lon E 12°53.31
 TIME :02:59:25 03:29:54 30.0 (min) Purpose : 3
 LOG : 1355.26 1356.84 1.6 Region : 4054
 FDEPTH: 311 304 Gear cond.: 0
 BDEPTH: 311 304 Validity : 0
 Towing dir: 0° Wire out : 750 m Speed : 3.1 km
 Sorted : 46 Total catch: 162.12 Catch/hour: 324.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	124.74	160	38.47	
Chlorophthalmus atlanticus	110.18	2624	33.98	
Zenopsis conchifer	23.52	154	7.25	
Merluccius polli	16.86	90	5.20	18
Pontinus accraensis	14.34	154	4.42	
Parapenaeus longirostris, femal	10.70	1106	3.30	
Gadella maraldi	9.02	104	2.78	
Bembrops heterurus	6.72	146	2.07	
Synagrops microlepis	4.54	146	1.40	
Malacocephalus occidentalis	1.40	14	0.43	
Ornithoteuthis antillarum	0.98	6	0.30	
Calappa sp.	0.70	14	0.22	
Bathynectes piperitus	0.48	14	0.15	
Dibranchius atlanticus	0.06	6	0.02	
Total	324.24		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 15
 DATE :21/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°24.22
 start stop duration Lon E 12°56.62
 TIME :05:34:41 05:54:41 20.0 (min) Purpose : 3
 LOG : 1364.12 1365.17 1.1 Region : 4054
 FDEPTH: 167 160 Gear cond.: 0
 BDEPTH: 167 160 Validity : 0
 Towing dir: 0° Wire out : 370 m Speed : 3.1 km
 Sorted : 69 Total catch: 552.04 Catch/hour: 1656.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1365.75	97785	82.47	
Miracorvina angolensis	46.35	114	2.80	
Umbrina canariensis	38.70	114	2.34	
Trigla lyra	38.25	270	2.31	
Dentex angolensis	29.82	105	1.80	19
Brotula barbata	28.14	18	1.70	
Raja miraletus	23.85	45	1.44	
Zenopsis conchifer	21.42	42	1.29	
Pontinus accraensis	14.40	90	0.87	
Pterothrissus belloci	13.05	90	0.79	
Trichiurus lepturus	12.42	21	0.75	
Illex coindetii	6.99	135	0.42	
Bembrops heterurus	6.75	45	0.41	
Uranoscopus polli	4.50	15	0.27	
Parapenaeus longirostris	2.49	450	0.15	
Zeus faber	1.68	9	0.10	
Dentex macrophthalmus	0.87	12	0.05	
Monoleme microstoma	0.45	24	0.03	
Scyllarides herklotsii	0.24	24	0.01	
Total	1656.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 16
 DATE :21/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°22.31
 start stop duration Lon E 12°58.15
 TIME :06:53:31 07:23:02 30.0 (min) Purpose : 3
 LOG : 1369.21 1370.70 1.5 Region : 4054
 FDEPTH: 123 124 Gear cond.: 0
 BDEPTH: 123 124 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.0 km
 Sorted : 41 Total catch: 41.23 Catch/hour: 82.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	63.00	360	76.40	21
Lagocephalus laevigatus	6.38	4	7.74	
Umbrina canariensis	3.98	12	4.83	
Zeus faber	3.78	12	4.58	
Illex coindetii	1.92	52	2.33	
Pterothrissus belloci	1.44	8	1.75	
Spicara alta	0.48	8	0.58	
Dentex congoensis	0.36	4	0.44	
Trigla lyra	0.34	4	0.41	
Trichiurus lepturus	0.30	2	0.36	
Pagellus bellottii	0.26	2	0.32	
Boops boops	0.16	2	0.19	
Monoleme microstoma	0.06	2	0.07	
Saurida brasiliensis	0.00	2	0.00	
Total	82.46		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 17
 DATE :21/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°20.27
 start stop duration Lon E 13°6.57
 TIME :08:51:41 09:11:47 20.0 (min) Purpose : 3
 LOG : 1381.29 1382.27 1.0 Region : 4054
 FDEPTH: 84 87 Gear cond.: 0
 BDEPTH: 84 87 Validity : 0
 Towing dir: 0° Wire out : 210 m Speed : 2.9 km
 Sorted : 188 Total catch: 356.83 Catch/hour: 1070.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	861.54	18594	80.48	22
Trachurus trecae	95.19	1422	8.89	24
Selene dorsalis	43.53	405	4.07	
Trichiurus lepturus	13.56	213	1.27	
Galeoides decadactylus	12.21	36	1.14	
Stromateus fiatola	6.48	18	0.61	
Pagellus bellottii	6.03	63	0.56	23
Pomadasy incisus	5.16	21	0.48	
Raja miraletus	4.47	6	0.42	
Dentex angolensis	3.36	24	0.31	
Sphyraena guachancho	3.09	12	0.29	
Sepia officinalis	2.46	6	0.23	
Sardinella aurita	2.28	21	0.21	
Pterothrissus belloci	2.13	33	0.20	
Uranoscopus cadenati	2.01	12	0.19	
Citharus linguatula	1.41	27	0.13	
Pomadasy jubelini	1.38	3	0.13	
Lagocephalus laevigatus	1.02	6	0.10	
Illex coindetii	0.75	15	0.07	
Umbrina canariensis	0.69	6	0.06	
Sphyraena sphyraena	0.51	3	0.05	
Chrysaora hysoscella	0.48	6	0.04	
Alloteuthis africana	0.48	138	0.04	
Saurida brasiliensis	0.27	48	0.03	
Total	1070.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 18
 DATE :21/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°2.63
 start stop duration Lon E 13°9.73
 TIME :11:12:36 11:14:44 2.0 (min) Purpose : 3
 LOG : 1400.31 1400.40 0.1 Region : 4054
 FDEPTH: 28 28 Gear cond.: 0
 BDEPTH: 28 28 Validity : 5
 Towing dir: 0° Wire out : 90 m Speed : 2.5 km
 Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
N O C A T C H	0.00	0	0.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 19
 DATE :21/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°2.54
 start stop duration Lon E 13°7.18
 TIME :11:56:58 12:27:36 31.0 (min) Purpose : 3
 LOG : 1403.65 1405.22 1.6 Region : 4054
 FDEPTH: 42 43 Gear cond.: 0
 BDEPTH: 42 43 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.1 km
 Sorted : 29 Total catch: 28.58 Catch/hour: 55.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	28.37	8336	51.29	30
Galeoides decadactylus	9.27	29	16.76	
Alectis alexandrina	7.66	14	13.86	
Chrysaora hyosocella	3.25	2	5.88	
Trachinotus gorensis	2.59	8	4.69	
Caranx crysos	1.59	2	2.87	
Pomadasy jubelini	1.22	2	2.20	
Raja miraletus	0.68	2	1.22	
Alloteuthis africana	0.48	143	0.87	
Torpedo torpedo	0.12	2	0.21	
Sardinella maderensis	0.04	4	0.07	
Trachurus trecae	0.04	2	0.07	
Total	55.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 20
 DATE :21/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°5.56
 start stop duration Lon E 13°4.34
 TIME :01:12:14 01:42:32 30.0 (min) Purpose : 3
 LOG : 1409.73 1411.31 1.6 Region : 4054
 FDEPTH: 66 66 Gear cond.: 0
 BDEPTH: 66 66 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.1 km
 Sorted : 58 Total catch: 57.87 Catch/hour: 115.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	37.96	402	32.80	31
Galeoides decadactylus	31.08	94	26.85	
Dentex angolensis	14.40	110	12.44	32
Dentex barnardi	7.54	44	6.51	
Sphyræna sphyræna	3.54	14	3.06	
Sphyræna guachancho	3.06	8	2.64	
Selene dorsalis	2.72	22	2.35	
Pagellus bellottii	2.72	32	2.35	33
Raja miraletus	2.08	4	1.80	
Trachurus trecae	1.80	16	1.56	
Dasyatis marmorata	1.68	2	1.45	
Pomadasy incisus	1.60	10	1.38	
Stromateus fiatola	1.54	2	1.33	
Alloteuthis africana	1.08	314	0.93	
Zeus faber	0.66	2	0.57	
Decapterus rhonchus	0.64	2	0.55	
Chloroscombrus chrysurus	0.64	4	0.55	
Pseudupeneus prayensis	0.60	6	0.52	
Seriola carpenteri	0.38	2	0.33	
Citharus linguatula	0.02	2	0.02	
Total	115.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 21
 DATE :21/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°6.41
 start stop duration Lon E 12°58.91
 TIME :02:40:59 03:11:35 31.0 (min) Purpose : 3
 LOG : 1417.73 1419.32 1.6 Region : 4054
 FDEPTH: 96 95 Gear cond.: 0
 BDEPTH: 96 95 Validity : 0
 Towing dir: 0° Wire out : 235 m Speed : 3.1 km
 Sorted : 114 Total catch: 301.25 Catch/hour: 583.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	447.99	5081	76.83	34
Pomadasy jubelini	47.30	64	8.11	
Stromateus fiatola	44.01	58	7.55	
Trachurus trecae	11.79	141	2.02	36
Dentex angolensis	7.99	68	1.37	35
Alloteuthis africana	6.43	1916	1.10	
Trichiurus lepturus	4.39	8	0.75	
Pagellus bellottii	2.88	25	0.49	
Selene dorsalis	2.67	25	0.46	
Dentex barnardi	2.21	8	0.38	
Uranoscopus albesca	1.92	4	0.33	
Sardinella maderensis	1.74	8	0.30	
Trigla lyra	1.06	4	0.18	
Chelidonichthys capensis	0.68	4	0.12	
Total	583.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 22
 DATE :21/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 8°10.13
 start stop duration Lon E 12°54.56
 TIME :04:13:11 04:43:44 31.0 (min) Purpose : 3
 LOG : 1426.27 1427.92 1.7 Region : 4054
 FDEPTH: 117 118 Gear cond.: 0
 BDEPTH: 117 118 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.2 km
 Sorted : 0 Total catch: 46.91 Catch/hour: 90.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	33.33	203	36.71	38
Dentex angolensis	18.62	132	20.51	37
Boops boops	14.75	712	16.24	
Trichiurus lepturus	6.60	12	7.27	
Brotula barbata	3.37	2	3.71	
Trachurus trecae	2.88	45	3.18	39
Illex coindetii	2.81	194	3.09	
Pomadasy jubelini	1.68	2	1.85	
Zeus faber	1.43	8	1.58	
Umrina canariensis	1.16	2	1.28	
Scorpaena stephanica	0.72	2	0.79	
Ariomma bondi	0.64	10	0.70	
Dentex congoensis	0.56	15	0.62	
Spicara alba	0.50	10	0.55	
Pagellus bellottii	0.43	6	0.47	
Pterothrissus belloci	0.35	2	0.38	
Chrysaora hyosocella	0.33	6	0.36	
Trigla lyra	0.31	2	0.34	
Citharus linguatula	0.19	4	0.21	
B I V A L V E S	0.08	4	0.09	
Nematopalaemon hastatus	0.04	10	0.04	
Saurida brasiliensis	0.02	6	0.02	
Total	90.79		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 23
 DATE :21/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°13.82
 start stop duration Lon E 12°46.74
 TIME :06:33:50 07:03:39 30.0 (min) Purpose : 3
 LOG : 1438.74 1440.24 1.5 Region : 4054
 FDEPTH: 314 317 Gear cond.: 0
 BDEPTH: 314 317 Validity : 0
 Towing dir: 0° Wire out : 740 m Speed : 3.0 km
 Sorted : 93 Total catch: 421.25 Catch/hour: 842.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	376.68	0	44.71	
Merluccius polli	146.02	740	17.33	40
Gadella imberbis	51.76	550	6.14	
Parapanaeus longirostris,femal	46.26	1702	5.49	
Hymenocephalus italicus	38.60	7586	4.58	
Pontinus accraensis	32.58	438	3.87	
Hoplostethus cadenati	26.16	30	3.11	
Bembrops greyi	21.84	456	2.59	
Neoharriotta pinnata	16.56	2	1.97	
Laemonema laureysi	15.38	594	1.83	
Raja clavata	15.04	8	1.79	
Synagrops microlepis	14.70	508	1.74	
Malacocephalus occidentalis	14.10	190	1.67	
Zenopsis conchifer	5.58	8	0.66	
Chrysaora hyosocella	5.58	146	0.66	
Benthodesmus tenuis	5.50	258	0.65	
Nematocarcinus africanus	3.52	1092	0.42	
Peristedion cataphractum	2.14	180	0.25	
Todaropsis eblanae	1.62	26	0.19	
Epigonus telescopus	1.36	52	0.16	
Lophiodes kempii	1.10	18	0.13	
Callinectes amnicola	0.42	8	0.05	
Total	842.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 24
 DATE :21/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°15.44
 start stop duration Lon E 12°44.19
 TIME :08:25:14 08:56:11 31.0 (min) Purpose : 3
 LOG : 1445.58 1447.17 1.6 Region : 4054
 FDEPTH: 426 428 Gear cond.: 0
 BDEPTH: 426 428 Validity : 0
 Towing dir: 0° Wire out : 960 m Speed : 3.1 km
 Sorted : 27 Total catch: 211.52 Catch/hour: 409.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	271.66	1068	66.36	41
Nematocarcinus africanus	79.32	1982	19.37	
Chaunax pictus	15.35	292	3.75	
Hymenocephalus italicus	12.14	941	2.96	
Yarella blackfordi	6.35	195	1.55	
Gadella imberbis	4.53	31	1.11	
Dibranchius atlanticus	4.18	302	1.02	
Benthodesmus tenuis	3.62	141	0.88	
Xenodermichthys copei	3.52	132	0.86	
Raja clavata	2.61	2	0.64	
Plesionea edwardsianus	1.76	50	0.43	
Hoplostethus cadenati	0.70	19	0.17	
Aristeus varidens	0.66	60	0.16	
Conger conger	0.66	15	0.16	
Coelorinchus coelorhynchus	0.56	10	0.14	
Squilla mantis	0.56	56	0.14	
Lophiodes kempii	0.41	6	0.10	
Stomias boa boa	0.31	6	0.08	
Physiculus huloti	0.25	19	0.06	
Peristedion cataphractum	0.19	19	0.05	
Galeus polli	0.06	6	0.01	
Total	409.39		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 25
 DATE :21/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°16.02
 start stop duration Lon E 12°41.66
 TIME :10:30:08 11:01:28 31.0 (min) Purpose : 3
 LOG : 1452.37 1453.97 1.6 Region : 4054
 FDEPTH: 618 597 Gear cond.: 0
 BDEPTH: 618 597 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 3.1 kn
 Sorted : 26 Total catch: 154.44 Catch/hour: 298.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	196.95	44315	65.89	
Melanostomias sp.	23.69	476	7.93	
Chaceon maritae, male	18.35	46	6.14	
Lamprogrammus exutus	11.38	128	3.81	
Merluccius polli	8.94	12	2.99	
Yarrella blackfordi	8.36	255	2.80	
Aristeus varidens, female	5.34	314	1.79	
Hoplostethus cadenati	5.23	186	1.75	
Talismania sp.	4.41	372	1.48	
Dibranchius atlanticus	4.41	348	1.48	
Stereomastis sp.	3.60	395	1.20	
Aristeus varidens, male	3.25	430	1.09	
Triplophos hemingi	1.74	232	0.58	
Gadella maraldi	0.93	25	0.31	
S H A R K S	0.81	12	0.27	
Lepidopus caudatus	0.58	23	0.19	
Hymenoccephalus italicus	0.46	58	0.16	
Plesiopenaeus edwardsianus	0.23	105	0.08	
Pennaopsis serrata	0.12	35	0.04	
MYCTOPHIDAE	0.12	46	0.04	
Total	298.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 26
 DATE :22/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°17.36
 start stop duration Lon E 12°41.31
 TIME :12:50:00 01:21:47 32.0 (min) Purpose : 3
 LOG : 1458.49 1459.95 1.5 Region : 4054
 FDEPTH: 707 704 Gear cond.: 0
 BDEPTH: 707 704 Validity : 0
 Towing dir: 0° Wire out : 1430 m Speed : 2.8 kn
 Sorted : 29 Total catch: 316.80 Catch/hour: 594.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	160.05	36898	26.94	
Yarrella blackfordi	159.23	4208	26.81	
Hoplostethus cadenati	86.42	2496	14.55	
Chaceon maritae, male	44.34	0	7.47	
Stereomastis sp.	37.54	2228	6.32	
Melanostomias sp.	36.92	681	6.22	
Lamprogrammus exutus	27.22	103	4.58	
Nezumia aequalis	13.41	330	2.26	
Bathyrcongiger vicinus	7.84	165	1.32	
Talismania longifilis	4.95	144	0.83	
Dibranchius atlanticus	3.92	206	0.66	
ANTHOZOA (Sea anemones)	3.71	21	0.63	
Triplophos hemingi	3.51	371	0.59	
Halosaurus rostratus	2.89	41	0.49	
Gadella maraldi	1.03	41	0.17	
Xenodermichthys copei	1.03	62	0.17	
Total	594.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 27
 DATE :22/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°33.55
 start stop duration Lon E 12°37.01
 TIME :03:24:10 03:58:09 34.0 (min) Purpose : 3
 LOG : 1473.02 1474.52 1.5 Region : 4054
 FDEPTH: 620 614 Gear cond.: 0
 BDEPTH: 620 614 Validity : 0
 Towing dir: 0° Wire out : 1280 m Speed : 2.6 kn
 Sorted : 30 Total catch: 242.08 Catch/hour: 427.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	170.82	31934	39.99	
Chaceon maritae, male	71.15	198	16.66	
Yarrella blackfordi	62.54	1894	14.64	
Triplophos hemingi	22.31	2781	5.22	
Stomias boa boa	14.12	282	3.30	
Stereomastis sp.	13.69	1242	3.21	
Lamprogrammus exutus	12.42	113	2.91	
Xenodermichthys copei	11.86	1087	2.78	
Merluccius polli	10.87	14	2.54	
Aristeus varidens, female	7.20	226	1.69	
Nezumia aequalis	6.78	169	1.59	
Hoplostethus cadenati	6.21	212	1.45	
Chaceon maritae, female	2.12	14	0.50	
Talismania longifilis	1.84	71	0.43	
Conger conger	1.69	71	0.40	
Lophiodes kempii	1.55	14	0.36	
Halosaurus ovenii	1.55	42	0.36	
Bathymectes piperitus	1.27	184	0.30	
Aristeus varidens, male	1.27	155	0.30	
Gadella imberbis	0.99	14	0.23	
Dibranchius atlanticus	0.99	71	0.23	
Chauliodus sloani	0.85	28	0.20	
Octopoteuthis sicula	0.71	14	0.17	
MELANOSTOMIATIDAE	0.56	14	0.13	
Chlorophthalmus atlanticus	0.56	14	0.13	
Dicrolene intronigrer	0.42	99	0.10	
Todaropsis eblanae	0.28	14	0.07	
Raja confundens	0.28	14	0.07	
Plesiopenaeus edwardsianus	0.28	28	0.07	
Total	427.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 28
 DATE :22/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°1.14
 start stop duration Lon E 12°37.85
 TIME :05:57:26 06:27:36 30.0 (min) Purpose : 3
 LOG : 1478.81 1480.34 1.5 Region : 4054
 FDEPTH: 525 530 Gear cond.: 0
 BDEPTH: 525 530 Validity : 0
 Towing dir: 0° Wire out : 1170 m Speed : 3.0 kn
 Sorted : 63 Total catch: 162.72 Catch/hour: 325.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	213.72	37558	65.67	
Ariomma bondi	19.80	526	6.08	
Idiacanthus fasciola	16.48	614	5.06	
Yarrella blackfordi	15.38	442	4.73	
Lamprogrammus exutus	13.04	72	4.01	
Aristeus varidens, female	6.38	312	1.96	
Stereomastis sp.	4.26	484	1.31	
Aristeus varidens, male	3.68	442	1.13	
Dicrolene intronigrer	3.16	468	0.97	
Merluccius polli	3.12	6	0.96	
Hoplostethus cadenati	3.00	104	0.92	
Bathyrcongiger vicinus	2.86	110	0.88	
Chaceon maritae	2.28	6	0.70	
Stomias boa boa	2.12	52	0.65	
Gadella imberbis	1.86	16	0.57	
Lophiodes kempii	1.66	10	0.51	
Plesiopenaeus edwardsianus	1.60	254	0.49	
Illex coindetii	1.56	16	0.48	
Chaunax pictus	1.44	36	0.44	
Chlorophthalmus atlanticus	1.34	32	0.41	
Benthodesmus tenuis	1.24	202	0.38	
Setarches guentheri	1.04	36	0.32	
Bathymectes piperitus	0.72	46	0.22	
Centroscymnus crepidater	0.62	6	0.19	
Malacocephalus occidentalis	0.56	6	0.17	
Octopoteuthis sicula	0.36	6	0.11	
Xenodermichthys copei	0.36	20	0.11	
MYCTOPHIDAE	0.30	36	0.09	
Synagrops microlepis	0.26	6	0.08	
Nemichthys scolopaceus	0.26	42	0.08	
Dibranchius atlanticus	0.26	16	0.08	
Ebinania costaeacanarie	0.26	6	0.08	
Raja confundens	0.26	10	0.08	
Trichiurus lepturus	0.20	6	0.06	
Total	325.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 29
 DATE :22/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°59.45
 start stop duration Lon E 12°42.94
 TIME :07:55:10 08:15:22 20.0 (min) Purpose : 3
 LOG : 1487.03 1488.09 1.1 Region : 4054
 FDEPTH: 194 195 Gear cond.: 0
 BDEPTH: 194 195 Validity : 0
 Towing dir: 0° Wire out : 450 m Speed : 3.2 kn
 Sorted : 32 Total catch: 220.78 Catch/hour: 662.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zeus faber	341.55	834	51.57	
Synagrops microlepis	231.03	12513	34.88	
Brotula barbata	24.81	21	3.75	
Dentex angolensis	23.70	66	3.58	42
Trichiurus lepturus	13.83	30	2.09	
Merluccius polli	10.92	63	1.65	43
Miracorvina angolensis	7.83	24	1.18	
Chlorophthalmus atlanticus	6.87	615	1.04	
Pontinus accraensis	1.20	9	0.18	
Dentex macrophthalmus	0.36	3	0.05	
Parapenaeus longirostris,femal	0.24	39	0.04	
Total	662.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 30
 DATE :22/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°56.89
 start stop duration Lon E 12°49.93
 TIME :09:34:46 10:04:58 30.0 (min) Purpose : 3
 LOG : 1496.46 1497.98 1.5 Region : 4054
 FDEPTH: 109 108 Gear cond.: 0
 BDEPTH: 109 108 Validity : 0
 Towing dir: 0° Wire out : 245 m Speed : 3.0 kn
 Sorted : 61 Total catch: 61.07 Catch/hour: 122.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	36.52	294	29.90	44
Trichiurus lepturus	24.52	40	20.08	
Umbrina canariensis	20.56	90	16.83	58
Boops boops	7.26	334	5.94	
Parapandalus narval	7.00	3276	5.73	
Chrysaora hysoscella	4.82	110	3.95	
Selene dorsalis	3.16	14	2.59	
Dentex barnardi	2.58	12	2.11	
Trigla lyra	2.50	20	2.05	
Sepia orbignyana	2.38	2	1.95	
Dentex congoensis	2.04	68	1.67	
Brachydeuterus auritus	1.58	12	1.29	
Zeus faber	1.44	4	1.18	
Trachurus trecae	1.20	36	0.98	45
Pontinus accraensis	1.10	6	0.90	
Illex coindetii	1.08	136	0.88	
Uranoscopus cadenati	0.64	2	0.52	
Pagellus bellottii	0.60	4	0.49	
Citharus linguatula	0.46	10	0.38	
Chelidichthys gabonensis	0.40	2	0.33	
Anthias anthias	0.30	2	0.25	
Total	122.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 31
 DATE :22/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°57.64
 start stop duration Lon E 12°55.13
 TIME :11:03:14 11:33:20 30.0 (min) Purpose : 3
 LOG : 1503.44 1505.01 1.6 Region : 4054
 FDEPTH: 87 87 Gear cond.: 0
 BDEPTH: 87 87 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.1 kn
 Sorted : 31 Total catch: 31.45 Catch/hour: 62.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	9.84	14	15.64	
Chrysaora hysoscella	8.08	80	12.85	
Trachurus trecae	7.00	196	11.13	59
Alloteuthis africana	6.06	2568	9.63	
Dentex congoensis	5.22	68	8.30	
Dentex angolensis	4.96	82	7.89	46
Selene dorsalis	3.56	16	5.66	
Dentex barnardi	3.28	18	5.21	
Zenopsis conchifer	2.50	2	3.97	
Brachydeuterus auritus	2.34	24	3.72	
Raja miraletus	1.88	2	2.99	
Pseudupeneus prayensis	1.64	14	2.61	
Fistularia petimba	1.28	4	2.03	
Pagellus bellottii	1.10	8	1.75	
Pomadasy peroteti	1.08	4	1.72	
Umbrina canariensis	1.02	4	1.62	
Chelidonichthys gabonensis	0.68	8	1.08	0
Chelidonichthys gabonensis	0.56	2	0.89	
Illex coindetii	0.32	4	0.51	
Chaetodon hoefleri	0.26	2	0.41	
Boops boops	0.18	6	0.29	
Citharus linguatula	0.04	2	0.06	
Saurida brasiliensis	0.02	4	0.03	
Plastic waste	0.00	2	0.00	
Total		62.90	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 32
 DATE :22/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°54.49
 start stop duration Lon E 12°57.05
 TIME :12:21:02 12:51:29 30.0 (min) Purpose : 3
 LOG : 1509.49 1511.08 1.6 Region : 4054
 FDEPTH: 72 71 Gear cond.: 0
 BDEPTH: 72 71 Validity : 0
 Towing dir: 0° Wire out : 175 m Speed : 3.1 kn
 Sorted : 8 Total catch: 7.75 Catch/hour: 15.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	2.80	4	18.06	
Pagellus bellottii	2.12	24	13.68	
Alloteuthis africana	2.12	566	13.68	
Fistularia petimba	1.70	4	10.97	
Chrysaora hysoscella	1.18	36	7.61	
Pagrus africanus	0.90	2	5.81	
Dentex barnardi	0.86	8	5.55	
Galeoides decadactylus	0.82	2	5.29	
Pseudupeneus prayensis	0.74	8	4.77	
Trichiurus lepturus	0.70	2	4.52	
Pomadasy jubelini	0.68	8	4.39	
Pontinus accraensis	0.52	2	3.35	
Dentex congoensis	0.36	6	2.32	
Total		15.50	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 33
 DATE :22/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°51.55
 start stop duration Lon E 12°58.76
 TIME :01:33:19 02:03:25 30.0 (min) Purpose : 3
 LOG : 1514.77 1516.36 1.6 Region : 4054
 FDEPTH: 56 58 Gear cond.: 0
 BDEPTH: 56 58 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.2 kn
 Sorted : 144 Total catch: 143.55 Catch/hour: 287.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	81.16	598	28.27	
Decapterus rhonchus	51.60	184	17.97	
Selene dorsalis	43.28	452	15.07	
Pomadasy jubelini	40.56	122	14.13	
Pagellus bellottii	18.30	120	6.37	47
Galeoides decadactylus	11.46	34	3.99	
Pomadasy incisus	10.64	56	3.71	
Dentex barnardi	4.74	20	1.65	
Raja miraletus	4.30	8	1.50	
Rhinobatos albomaculatus	3.78	2	1.32	
Sphyrna sphyraena	3.06	12	1.07	
Fistularia petimba	3.00	0	1.04	
Pagrus africanus	2.26	6	0.79	
Sardinella maderensis	2.12	14	0.74	
Seriola carpenteri	1.86	2	0.65	
Pseudupeneus prayensis	1.48	8	0.52	
Trichiurus lepturus	1.28	2	0.45	
Trachurus trecae	1.16	8	0.40	
Chaetodon hoefleri	0.38	2	0.13	
Zeus faber	0.28	2	0.10	
Brachydeuterus auritus	0.24	2	0.08	
Illex coindetii	0.16	2	0.06	
Total		287.10	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 34
 DATE :22/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°51.52
 start stop duration Lon E 13°1.98
 TIME :02:46:55 03:17:23 30.0 (min) Purpose : 3
 LOG : 1520.46 1522.00 1.5 Region : 4054
 FDEPTH: 39 41 Gear cond.: 0
 BDEPTH: 39 41 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.0 kn
 Sorted : 112 Total catch: 312.40 Catch/hour: 624.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	273.98	3332	43.85	48
Galeoides decadactylus	59.40	330	9.51	
Sphyrna guachancho	39.62	152	6.34	
Selene dorsalis	36.50	384	5.84	
Chloroscombrus chrysurus	34.76	334	5.56	
Pomadasy incisus	31.64	178	5.06	
Alectis alexandrina	31.20	70	4.99	
Pagellus bellottii	25.54	178	4.09	49
Ephippion guttifer	21.22	6	3.40	
Pseudotolithus senegalensis	19.76	22	3.16	
Stromateus fiatola	16.30	26	2.61	
Dasyatis marmorata	11.54	10	1.85	
Raja miraletus	8.10	10	1.30	
Trachurus trecae	5.34	38	0.85	
Lagocephalus laevigatus	4.52	16	0.72	
Pomadasy jubelini	3.88	10	0.62	
Trichiurus lepturus	1.50	6	0.24	
Total	624.80		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 35
 DATE :22/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°50.24
 start stop duration Lon E 13°3.16
 TIME :03:53:45 04:23:37 30.0 (min) Purpose : 3
 LOG : 1525.06 1526.57 1.5 Region : 4054
 FDEPTH: 24 25 Gear cond.: 0
 BDEPTH: 24 25 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.0 kn
 Sorted : 35 Total catch: 34.56 Catch/hour: 69.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	14.36	106	20.78	50
Alectis alexandrina	13.40	24	19.39	
Selene dorsalis	11.40	230	16.49	
Lagocephalus laevigatus	10.32	46	14.93	
Sphyrna sphyraena	4.24	38	6.13	
Pseudupeneus prayensis	3.08	38	4.46	
Eucinostomus melanopterus	2.88	54	4.17	
Pagrus africanus	2.64	12	3.82	
Rhinobatos albomaculatus	2.40	2	3.47	
Chloroscombrus chrysurus	1.88	22	2.72	
Trichiurus lepturus	0.94	2	1.36	
Brachydeuterus auritus	0.60	152	0.87	
Galeoides decadactylus	0.46	4	0.67	
Sardinella aurita	0.38	2	0.55	
Pennaeus notialis	0.12	2	0.17	
Sardinella maderensis	0.02	2	0.03	
Total	69.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 36
 DATE :22/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°47.61
 start stop duration Lon E 12°31.01
 TIME :08:32:46 09:03:53 31.0 (min) Purpose : 3
 LOG : 1559.46 1561.02 1.6 Region : 4054
 FDEPTH: 743 734 Gear cond.: 0
 BDEPTH: 743 734 Validity : 0
 Towing dir: 0° Wire out : 1550 m Speed : 3.0 kn
 Sorted : 31 Total catch: 238.20 Catch/hour: 461.03

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Holothuria spp.	129.14	236	28.01	
Alloteuthis africana	112.95	24610	24.50	
Yarella blackfordi	33.39	883	7.24	
OPISTHOTEUTHIDAE	31.92	29	6.92	
Hoplostethus cadenati	30.89	825	6.70	
Steromastix sp.	25.74	1676	5.58	
Nezumia aequalis	18.81	457	4.08	
Bathyrcongus sp.	18.23	397	3.95	
Lamprogrammus exutus	17.94	118	3.89	
Chaceon maritae	7.82	15	1.70	
Triplophos hemingi	7.05	972	1.53	
Dicrolene intronigrer	5.57	352	1.21	
Dibranchius atlanticus	4.41	192	0.96	
Raja confundens	4.26	45	0.92	
Photonectes braueri	2.63	74	0.57	
Aristeus varidens, female	2.50	103	0.54	
Talismania longifilis	2.05	58	0.45	
Merluccius polli	1.51	2	0.33	
Xenodermichthys copei	1.47	91	0.32	
Chauliodus sloani	0.74	29	0.16	
PANDALIDAE	0.74	29	0.16	
Bathypterois guentheri	0.29	29	0.06	
Nephropsis atlantica	0.29	29	0.06	
Starfish	0.29	29	0.06	
Cynoglossus senegalensis	0.14	15	0.03	
L O B S T E R S	0.14	91	0.03	
Plesionika martia	0.14	15	0.03	
Total	461.03		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 37
 DATE :22/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°45.63
 start stop duration Lon E 12°31.12
 TIME :11:05:21 11:35:46 30.0 (min) Purpose : 3
 LOG : 1566.37 1567.83 1.5 Region : 4054
 FDEPTH: 621 619 Gear cond.: 0
 BDEPTH: 621 619 Validity : 0
 Towing dir: 0° Wire out : 1300 m Speed : 2.9 kn
 Sorted : 28 Total catch: 223.56 Catch/hour: 447.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	225.60	43920	50.46	
Yarellia blackfordi	43.36	1216	9.70	
Chaceon maritae	42.56	80	9.52	
Lamprogrammus exutus	35.20	208	7.87	
Merluccius polli	28.96	32	6.48	
Nezumia aequalis	15.84	512	3.54	
Aristeus varidens, female	11.84	464	2.65	
CRANCHIIDAE	8.80	48	1.97	
Gadella maraldi	6.72	784	1.50	
Bathuroconger vicinus	6.72	240	1.50	
Triplophos hemingi	4.00	656	0.89	
Melanostomias sp.	3.84	80	0.86	
Halosaurus ovenii	3.68	80	0.82	
Aristeus varidens, male	3.04	272	0.68	
Dibranchius atlanticus	1.76	96	0.39	
Dicrolene intransgrer	1.12	160	0.25	
Stereomastis sp.	1.04	1104	0.23	
Lophiodes kemp	0.80	16	0.18	
Glyphus marsupialis	0.80	96	0.18	
Bathynectes piperitus	0.48	64	0.11	
Xenodermichthys copei	0.32	32	0.07	
Munidopsis sp.	0.32	192	0.07	
Etmopterus pusillus	0.16	2	0.04	
Illex coindetii	0.16	16	0.04	
Total	447.12		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 38
 DATE :23/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°42.72
 start stop duration Lon E 12°32.15
 TIME :01:08:53 01:42:35 34.0 (min) Purpose : 3
 LOG : 1573.91 1575.63 1.7 Region : 4054
 FDEPTH: 358 363 Gear cond.: 0
 BDEPTH: 358 363 Validity : 0
 Towing dir: 0° Wire out : 850 m Speed : 3.1 kn
 Sorted : 27 Total catch: 295.79 Catch/hour: 521.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	173.54	1048	33.25	51
Nematocarcinus africanus	142.87	41561	27.37	
Physiculus huloti	44.65	1106	8.55	
Synagrops microlepis	29.89	1029	5.73	
Chaunax pictus	23.10	2679	4.43	
Munidopsis sp.	19.22	58	3.68	
Benthodesmus tenuis	15.34	718	2.94	
Trichiurus lepturus	14.56	19	2.79	
Helicolenus dactylopterus	11.84	19	2.27	
Bathuroconger vicinus	9.71	233	1.86	
Nettastoma parviceps	8.35	155	1.60	
Nezumia aequalis	7.57	155	1.45	
Lophiodes kemp	5.24	78	1.00	
Malacocephalus occidentalis	4.27	39	0.82	
Bathynectes piperitus	3.69	97	0.71	
Dibranchius atlanticus	2.91	349	0.56	
Parapenaeus longirostris, femal	2.72	316	0.52	
Gadella imberbis	1.94	78	0.37	
Stereomastis sp.	0.58	58	0.11	
Total	521.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 39
 DATE :23/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°41.86
 start stop duration Lon E 12°32.31
 TIME :02:51:40 03:22:05 30.0 (min) Purpose : 3
 LOG : 1578.46 1580.03 1.6 Region : 4054
 FDEPTH: 303 305 Gear cond.: 0
 BDEPTH: 303 305 Validity : 0
 Towing dir: 0° Wire out : 700 m Speed : 3.1 kn
 Sorted : 50 Total catch: 297.66 Catch/hour: 595.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	299.40	7800	50.29	
Synagrops microlepis	93.60	972	15.72	
Merluccius polli	78.72	2304	13.22	52
Zenopsis conchifer	54.12	84	9.09	
Physiculus huloti	28.68	360	4.82	
Helicolenus dactylopterus	8.64	108	1.45	
Trichiurus lepturus	6.48	12	1.09	
Nettastoma parviceps	5.28	72	0.89	
Parapenaeus longirostris	5.28	744	0.89	
Chascanopsetta lugubris	3.72	24	0.62	
Todaropsis eblanuae	3.12	36	0.52	
Pterothrissus belloci	2.88	12	0.48	
Gadella imberbis	2.16	84	0.36	
Parasudis fraser-bruenneri	1.20	24	0.20	
Lophiodes kemp	0.84	12	0.14	
Dibranchius atlanticus	0.60	60	0.10	
Nezumia aequalis	0.60	24	0.10	
Total	595.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 40
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°40.86
 start stop duration Lon E 12°36.84
 TIME :05:35:30 06:05:17 30.0 (min) Purpose : 3
 LOG : 1586.33 1587.87 1.5 Region : 4054
 FDEPTH: 117 118 Gear cond.: 0
 BDEPTH: 117 118 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.1 kn
 Sorted : 41 Total catch: 43.08 Catch/hour: 82.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	16.36	22	19.91	
Dentex congoensis	15.44	562	18.79	
Dentex angolensis	13.08	178	15.92	53
Brachydeuterus auritus	10.86	58	13.22	55
Trigla lyra	5.40	46	6.57	
Lagocephalus laevigatus	3.14	8	3.82	
Pagellus bellottii	3.04	46	3.70	56
Trachurus trerca	1.82	34	2.22	54
Fistularia petimba	1.66	2	2.02	
Uranoscopus polli	1.66	8	2.02	
Brotula barbata	1.58	2	1.92	
Erythrocles monodi	1.58	2	1.92	
Raja miraletus	1.30	2	1.58	
Illex coindetii	1.28	142	1.56	
Scorpaena normani	1.08	2	1.31	
Umbrina canariensis	0.78	2	0.95	
Zeus faber	0.78	2	0.95	
Aricomma bondi	0.52	16	0.63	
Boops boops	0.42	16	0.51	
Citharus linguatula	0.22	6	0.27	
Saurida brasiliensis	0.16	56	0.19	
Total	82.16		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 41
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°37.88
 start stop duration Lon E 12°44.73
 TIME :07:23:38 07:56:10 33.0 (min) Purpose : 3
 LOG : 1596.63 1598.32 1.7 Region : 4054
 FDEPTH: 89 88 Gear cond.: 0
 BDEPTH: 89 88 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.1 kn
 Sorted : 30 Total catch: 30.16 Catch/hour: 54.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	10.84	115	19.76	
Trachurus trerca	7.85	215	14.32	57
Trichiurus lepturus	6.35	9	11.57	
Squatina oculata	6.00	2	10.94	
Alloteuthis africana	4.15	2087	7.56	
Fistularia petimba	3.85	11	7.03	
Sepia orbignyana	2.15	2	3.91	
Pagellus bellottii	1.95	16	3.55	
Stromateus fiatola	1.95	2	3.55	
Brachydeuterus auritus	1.89	11	3.45	
Lagocephalus laevigatus	1.80	2	3.28	
Dentex barnardi	1.24	7	2.25	
Trigla lyra	1.22	9	2.22	
Dentex angolensis	0.85	9	1.56	
Chaetodon hoefleri	0.80	5	1.46	
Pagrus caeruleostictus	0.67	2	1.23	
Zeus faber	0.58	2	1.06	
Chrysaora hyosocella	0.38	4	0.70	
Citharus linguatula	0.22	4	0.40	
Illex coindetii	0.09	11	0.17	
Saurida brasiliensis	0.02	5	0.03	
Total	54.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 42
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°37.81
 start stop duration Lon E 12°48.31
 TIME :08:43:28 09:14:29 31.0 (min) Purpose : 3
 LOG : 1601.92 1603.60 1.7 Region : 4054
 FDEPTH: 73 73 Gear cond.: 0
 BDEPTH: 73 73 Validity : 0
 Towing dir: 0° Wire out : 195 m Speed : 3.3 kn
 Sorted : 68 Total catch: 67.71 Catch/hour: 131.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sphyraena guachancho	42.54	199	32.46	
Lagocephalus laevigatus	28.45	31	21.71	
Pagellus bellottii	17.85	176	13.62	60
Fistularia petimba	8.05	21	6.14	
Sepia orbignyana	6.79	12	5.18	
Alloteuthis africana	6.37	232	4.86	
Caranx crysos	6.19	6	4.73	
Trichiurus lepturus	4.45	10	3.40	
Raja miraletus	3.93	4	3.00	
Pagrus caeruleostictus	2.01	6	1.54	
Seriola carpenteri	1.86	2	1.42	
Pseudupeneus prayensis	0.64	4	0.49	
Chaetodon hoefleri	0.64	4	0.49	
Trigla lyra	0.64	6	0.49	
Dentex barnardi	0.37	2	0.28	
Brachydeuterus auritus	0.27	2	0.21	
Total	131.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 43
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°36.33
 start stop duration Lon E 12°56.73
 TIME :10:36:45 10:57:04 20.0 (min) Purpose : 3
 LOG : 1613.73 1614.78 1.1 Region : 4054
 FDEPTH: 33 33 Gear cond.: 0
 BDEPTH: 33 33 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.1 kn
 Sorted : 49 Total catch: 48.89 Catch/hour: 146.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	68.94	549	47.00	61
Chloroscombrus chrysurus	25.56	159	17.43	
Sphyræna guachancho	16.17	66	11.02	
Selene dorsalis	10.71	96	7.30	
Brachydeuterus auritus	8.67	1656	5.91	
Pseudupeneus prayensis	5.70	60	3.89	
Trichiurus lepturus	2.76	6	1.88	
Alloteuthis africana	2.55	654	1.74	
Sardinella maderensis	1.56	12	1.06	
Fistularia petimba	1.08	3	0.74	
Pagrus africanus	0.93	3	0.63	
Raja miraletus	0.90	3	0.61	
Chilomycterus spinosus mauret.	0.69	3	0.47	
Eucinostomus melanopterus	0.45	6	0.31	
Total	146.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 44
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°34.06
 start stop duration Lon E 12°57.43
 TIME :11:31:47 11:52:03 20.0 (min) Purpose : 3
 LOG : 1617.71 1618.75 1.0 Region : 4054
 FDEPTH: 24 24 Gear cond.: 0
 BDEPTH: 24 24 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.1 kn
 Sorted : 128 Total catch: 1089.51 Catch/hour: 3268.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Galeoides decadactylus	1272.18	6528	38.92	
Brachydeuterus auritus	660.45	9867	20.21	62
Sphyræna guachancho	554.37	3696	16.96	
Ilisha africana	496.23	50133	15.18	
Pseudotolithus senegalensis	104.28	279	3.19	
Selene dorsalis	100.20	1479	3.07	
Alectis alexandrina	23.97	24	0.73	
Ephippion guttifer	23.97	24	0.73	
Chloroscombrus chrysurus	23.70	204	0.73	
Sardinella maderensis	6.12	840	0.19	
Trichiurus lepturus	2.04	24	0.06	
Eucinostomus melanopterus	1.02	24	0.03	
Total	3268.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 45
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°15.29
 start stop duration Lon E 12°46.13
 TIME :02:07:13 02:36:46 30.0 (min) Purpose : 3
 LOG : 1639.53 1641.03 1.5 Region : 4054
 FDEPTH: 28 29 Gear cond.: 0
 BDEPTH: 28 29 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.0 kn
 Sorted : 126 Total catch: 125.87 Catch/hour: 251.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus africanus	110.60	268	43.93	
Sphyræna afra	41.44	2	16.46	
Dentex barnardi	39.36	108	15.64	
Epinephelus goreensis	13.96	2	5.55	
Balistes punctatus	13.32	16	5.29	
Pagellus bellottii	12.24	60	4.86	63
Alectis alexandrina	10.96	4	4.35	
Aluterus monoceros	3.88	4	1.54	
Lycodontis afer	3.00	2	1.19	
Dasyatis marmorata	1.70	2	0.68	
Chaetodon hoefleri	0.98	18	0.39	
Fistularia tabacaria	0.18	2	0.07	
Fistularia petimba	0.12	2	0.05	
Total	251.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 46
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°16.74
 start stop duration Lon E 12°41.57
 TIME :03:25:19 03:55:34 30.0 (min) Purpose : 3
 LOG : 1646.25 1647.87 1.6 Region : 4054
 FDEPTH: 43 42 Gear cond.: 0
 BDEPTH: 43 42 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 3.2 kn
 Sorted : 29 Total catch: 28.70 Catch/hour: 57.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	23.12	136	40.28	64
Pagrus africanus	16.12	50	28.08	
Dentex barnardi	11.56	30	20.14	
Rhinobatos albomaculatus	2.80	2	4.88	
Aluterus heudelotii	1.32	4	2.30	
Sphyræna sphyraena	0.72	2	1.25	
Alloteuthis africana	0.48	122	0.84	
Fistularia petimba	0.38	4	0.66	
Trachinus armatus	0.36	2	0.63	
Xyrichtys novacula	0.28	2	0.49	
Branchiostegus semifasciatus *	0.26	2	0.45	
Total	57.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 47
 DATE :23/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°20.32
 start stop duration Lon E 12°39.17
 TIME :04:34:04 05:07:17 33.0 (min) Purpose : 3
 LOG : 1652.38 1654.07 1.7 Region : 4054
 FDEPTH: 60 63 Gear cond.: 0
 BDEPTH: 60 63 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.1 kn
 Sorted : 160 Total catch: 160.10 Catch/hour: 291.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	186.62	1682	64.11	65
Pagrus caeruleostictus	22.69	60	7.80	
Epinephelus aeneus	19.75	4	6.78	
Lagocephalus laevigatus	13.82	11	4.75	
Sphyræna guachancho	11.82	33	4.06	
Dentex barnardi	11.67	64	4.01	
Raja miraletus	8.05	15	2.77	
Alloteuthis africana	7.20	4089	2.47	
Balistes capricus	2.40	4	0.82	
Seriola carpenteri	2.00	2	0.69	
Dactylopterus volitans	1.27	2	0.44	
Dentex canariensis	1.02	2	0.35	
Sepia orbignyana	0.87	5	0.30	
Fistularia petimba	0.80	4	0.27	
Chaetodon hoefleri	0.78	5	0.27	
Chelidichthys gabonensis	0.25	2	0.09	
Chromis cadenati	0.05	2	0.02	
Total	291.07		99.99	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 48
 DATE :23/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°33.32
 start stop duration Lon E 12°13.58
 TIME :08:57:38 09:27:26 30.0 (min) Purpose : 3
 LOG : 1686.49 1687.91 1.4 Region : 4054
 FDEPTH: 723 718 Gear cond.: 0
 BDEPTH: 723 718 Validity : 0
 Towing dir: 0° Wire out : 1450 m Speed : 2.9 kn
 Sorted : 30 Total catch: 107.48 Catch/hour: 219.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarellia blackfordi	55.58	820	25.86	
Nezumia aequalis	33.76	828	15.71	
Stereomastix sp.	22.24	2030	10.35	
OPISTHOTEUTHIDAE	18.64	6	8.67	
Nematocarcinus africanus	11.66	2498	5.42	
Hoplostethus cadenati	8.42	164	3.92	
Aristeus varidens, female	7.92	316	3.68	
Chaceon maritae	6.08	8	2.83	
Octopoteuthis sicula	4.82	20	2.24	
Merluccius polli	4.62	6	2.15	
Lophius vaillanti	3.96	14	1.84	
Talismania longifilis	3.80	36	1.77	
ANTHOZOA (Sea anemones)	3.66	6	1.70	
MELANOSTOMIATIDAE	3.52	72	1.64	
Monomitopus metriostoma	3.16	36	1.47	
Anemones, white	3.08	6	1.43	
Paramola cuvieri	2.66	6	1.24	
Dicrolene intransgrer	2.58	222	1.20	
Triplophos hemingi	2.36	150	1.10	
Gonostoma denudata	2.30	6	1.07	
Dibranchius atlanticus	2.08	94	0.97	
Raja confundens	2.00	36	0.93	
Plesiopeneaeus edwardsianus	1.64	58	0.76	
Deania calcea	1.22	6	0.57	
Halosaurus ovenii	0.72	6	0.33	
Bathyrroconger vicinus	0.72	6	0.33	
Photonectes braueri	0.50	58	0.20	
Xenodermichthys copei	0.42	14	0.20	
Synaphobranchus kaupii	0.36	6	0.17	
Munidopsis sp.	0.28	136	0.13	
Aristeus varidens, male	0.20	20	0.09	
Metal waste	0.00	4	0.00	
WASTE00	0.00	2	0.00	
Plastic waste	0.00	4	0.00	
Total	214.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 49
 DATE :23/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°29.16
 start stop duration Lon E 12°16.85
 TIME :11:31:08 12:01:08 30.0 (min) Purpose : 3
 LOG : 1695.20 1696.30 1.1 Region : 4054
 FDEPTH: 524 533 Gear cond.: 0
 BDEPTH: 524 533 Validity : 0
 Towing dir: 0° Wire out : 1150 m Speed : 2.2 kn
 Sorted : 28 Total catch: 112.64 Catch/hour: 225.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	100.32	30288	44.53	
Nezumia aequalis	19.60	664	8.70	
Triplophos hemingi	19.20	2624	8.52	
Photomectes braueri	17.04	352	7.56	
Stereomastis sp.	10.56	1192	4.69	
Chaceon maritae	7.44	16	3.30	
Aristeus varidens, female	6.64	200	2.95	
Gonostoma elongatum	6.32	232	2.81	
Ebinania costaeacanarie	3.44	40	1.53	
Malacocephalus occidentalis	3.12	48	1.38	
Benthodesmus tenuis	2.96	104	1.31	
Lamprogrammus exutus	2.88	48	1.28	
Starfish	2.80	72	1.24	
Chlorophthalmus atlanticus	2.40	56	1.07	
Bathymectes piperitus	2.24	96	0.99	
Dicrolene intronigrer	2.00	472	0.89	
Hoplostethus cadenati	1.92	64	0.85	
Aristeus varidens, male	1.84	176	0.82	
Physiculus huloti	1.84	18	0.82	
Halosaurus ovenii	1.76	80	0.78	
Plesiopenaeus edwardsianus	1.76	40	0.78	
Yarrella blackfordi	1.52	48	0.67	
Dibranchius atlanticus	1.04	72	0.46	
CRANCHIIDAE	1.04	24	0.46	
Gadella imberbis	0.64	24	0.28	
Lophius vaillanti	0.64	8	0.28	
Raja confundens	0.48	24	0.21	
Munidopsis sp.	0.48	288	0.21	
Palinurus gilchristi	0.40	136	0.18	
Bathyroconger vicinus	0.40	32	0.18	
Xenodermichthys copei	0.32	24	0.14	
Dicologlossa cuneata	0.24	8	0.11	
Total	225.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 50
 DATE :24/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°27.45
 start stop duration Lon E 12°19.34
 TIME :01:56:59 02:27:48 31.0 (min) Purpose : 3
 LOG : 1702.12 1703.68 1.6 Region : 4054
 FDEPTH: 428 427 Gear cond.: 0
 BDEPTH: 428 427 Validity : 0
 Towing dir: 0° Wire out : 1000 m Speed : 3.0 kn
 Sorted : 16 Total catch: 161.30 Catch/hour: 312.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hymenocephalus italicus	154.06	17419	49.35	
Nematocarcinus africanus	60.58	18310	19.40	
Physiculus huloti	17.23	174	5.52	
Dibranchius atlanticus	16.65	1277	5.33	
Palinurus gilchristi	7.94	1916	2.54	
Stereomastis sp.	7.55	852	2.42	
Gadella imberbis	6.39	271	2.05	
Bathyroconger vicinus	6.19	58	1.98	
Chaunax pictus	4.65	813	1.49	
Aristeus varidens, female	3.68	4	1.18	
Chlorophthalmus atlanticus	3.48	77	1.12	
Etmopterus polli	3.29	368	1.05	
Nezumia aequalis	3.29	155	1.05	
Bathymectes piperitus	2.71	58	0.87	
Lophius vaillanti	2.32	58	0.74	
Malacocephalus occidentalis	2.13	39	0.68	
Dicrolene intronigrer	2.13	232	0.68	
Aristeus varidens, male	2.13	252	0.68	
ANTHOZOA (Sea anemones)	2.13	19	0.68	
Benthodesmus tenuis	1.94	77	0.62	
Halosaurus ovenii	0.58	39	0.19	
Triplophos hemingi	0.58	58	0.19	
Gonostoma elongatum	0.39	19	0.12	
Xenodermichthys copei	0.19	19	0.06	
Total	312.19		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 51
 DATE :24/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°25.72
 start stop duration Lon E 12°27.56
 TIME :05:39:27 06:09:14 30.0 (min) Purpose : 3
 LOG : 1717.21 1718.80 1.6 Region : 4054
 FDEPTH: 117 118 Gear cond.: 0
 BDEPTH: 117 118 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.2 kn
 Sorted : 97 Total catch: 96.81 Catch/hour: 193.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	104.20	518	53.82	66
Dentex congoensis	38.08	512	19.67	
Lagocephalus laevigatus	23.52	28	12.15	
Zeus faber	7.68	18	3.97	
Trigla lyra	4.86	34	2.51	
Trachurus trecae	4.10	62	2.12	67
Umbrina canariensis	2.92	12	1.51	
Dentex barnardi	2.50	10	1.29	
Raja miraletus	2.26	6	1.17	
Pagellus bellottii	1.22	8	0.63	
Scorpaena stephanica	0.82	2	0.42	
Fistularia petimba	0.60	2	0.31	
Spicara alta	0.38	4	0.20	
Ariomma bondi	0.36	8	0.19	
Citharus linguatula	0.06	2	0.03	
Boops boops	0.04	2	0.02	
Illex coindetii	0.02	2	0.01	
Total	193.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 52
 DATE :24/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°23.46
 start stop duration Lon E 12°34.43
 TIME :07:40:39 08:10:25 30.0 (min) Purpose : 3
 LOG : 1728.29 1729.82 1.5 Region : 4054
 FDEPTH: 87 88 Gear cond.: 0
 BDEPTH: 87 88 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.1 kn
 Sorted : 46 Total catch: 46.47 Catch/hour: 92.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	21.28	492	22.90	
Fistularia petimba	20.76	62	22.34	
Sepia orbignyana	9.84	12	10.59	
Alloteuthis africana	7.28	3492	7.83	
Pagellus bellottii	6.46	52	6.95	68
Lagocephalus laevigatus	6.22	6	6.69	
Rhinobatos albomaculatus	3.88	2	4.17	
Trichiurus lepturus	3.64	6	3.92	
Dentex angolensis	3.40	54	3.66	69
Trigla lyra	2.26	16	2.43	
Zeus faber	2.26	6	2.43	
Seriola carpenteri	2.18	2	2.35	
Raja miraletus	1.82	4	1.96	
Umbrina canariensis	0.76	2	0.82	
Dentex barnardi	0.48	2	0.52	
Trachurus trecae	0.30	6	0.32	
Illex coindetii	0.06	2	0.06	
Boops boops	0.06	4	0.06	
Total	92.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 53
 DATE :24/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°6.22
 start stop duration Lon E 12°36.77
 TIME :10:16:04 10:46:01 30.0 (min) Purpose : 3
 LOG : 1746.61 1748.17 1.6 Region : 4054
 FDEPTH: 38 38 Gear cond.: 0
 BDEPTH: 38 38 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 35 Total catch: 35.44 Catch/hour: 70.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	35.04	174	49.44	70
Lagocephalus laevigatus	12.04	36	16.99	
Pagrus caeruleostictus	9.14	26	12.90	
Balistes capricus	6.20	12	8.75	
Fistularia petimba	2.14	8	3.02	
Raja miraletus	1.30	2	1.83	
Dactylopterus volitans	0.76	2	1.07	
Dactylopterus rhonchus	0.76	8	1.07	
Pseudupeneus prayensis	0.72	2	1.02	
Sepia orbignyana	0.66	2	0.93	
Xyrichtys novacula	0.64	4	0.90	
Syacium micrurum	0.44	2	0.62	
Sphyraena sphyraena	0.38	2	0.54	
Alloteuthis africana	0.28	136	0.40	
Chilomycterus spinosus mauret.	0.28	2	0.40	
Fistularia tabacaria	0.10	2	0.14	
Total	70.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 54
 DATE :24/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°57.50
 Lon E 12°34.27
 start stop duration Purpose : 3
 TIME :11:25:19 11:55:14 30.0 (min) Region : 4054
 LOG : 1751.73 1753.25 1.5 Gear cond.: 0
 FDEPTH: 45 47 Validity : 0
 BDEPTH: 45 47 Speed : 3.1 kn
 Towing dir: 0° Wire out : 102 m Catch/hour: 7.34
 Sorted : 4 Total catch: 3.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasys rogeri	4.84	4	65.94	
Trigla lyra	0.96	4	13.08	
Pagellus bellottii	0.92	4	12.53	
Citharichthys stampflii	0.38	2	5.18	
Decapterus rhonchus	0.24	2	3.27	
Total	7.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 55
 DATE :24/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 7°11.72
 Lon E 12°18.17
 start stop duration Purpose : 3
 TIME :02:13:06 02:43:30 30.0 (min) Region : 4054
 LOG : 1773.04 1774.56 1.5 Gear cond.: 0
 FDEPTH: 121 122 Validity : 0
 BDEPTH: 121 122 Speed : 3.0 kn
 Towing dir: 0° Wire out : 300 m Catch/hour: 391.62
 Sorted : 196 Total catch: 195.81

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	240.14	1438	61.32	71
Umbriina canariensis	42.44	62	10.84	72
Selene dorsalis	33.06	54	8.44	
Brachydeuterus auritus	31.88	194	8.14	73
Trichiurus lepturus	13.60	16	3.47	
Atractoscion aequidens	9.08	4	2.32	
Trachurus trecae	6.12	142	1.56	74
Pagellus bellottii	2.22	12	0.57	
Lagocephalus guntheri	2.12	2	0.54	
Dentex congoensis	1.80	48	0.46	
Zeus faber	1.76	6	0.45	
Illex coindetii	1.18	80	0.30	
Trigla lyra	1.10	4	0.28	
Raja miraletus	1.06	2	0.27	
Fistularia petimba	1.00	2	0.26	
Balistes capricus	0.96	2	0.25	
Pterothrissus belloci	0.66	4	0.17	
Sphyrna sphyraena	0.44	2	0.11	
Citharus linguatula	0.42	10	0.11	
Citharichthys stampflii	0.40	2	0.10	
Spicara alta	0.18	4	0.05	
Total	391.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 56
 DATE :27/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°9.52
 Lon E 12°7.84
 start stop duration Purpose : 3
 TIME :05:51:57 06:22:16 30.0 (min) Region : 4054
 LOG : 2077.90 2079.55 1.7 Gear cond.: 0
 FDEPTH: 33 34 Validity : 0
 BDEPTH: 33 34 Speed : 3.3 kn
 Towing dir: 0° Wire out : 110 m Catch/hour: 195.50
 Sorted : 98 Total catch: 97.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	46.12	240	23.59	
Brachydeuterus auritus	44.52	780	22.77	75
Ilisha africana	42.44	1022	21.71	
Pseudotolithus senegalensis	22.72	56	11.62	76
Pteroscion peli	14.20	608	7.26	
Selene dorsalis	6.46	64	3.30	
Arius parkii	2.84	4	1.45	
Galeoides decadactylus	2.68	28	1.37	
Panulirus regius	2.20	2	1.13	
penaeus notialis,male	1.96	100	1.00	
Uranoscopus polli	1.80	18	0.92	
Pisodonophis semicinctus	1.30	4	0.66	
Ephippion guttifer	1.26	2	0.64	
penaeus notialis,female	0.98	30	0.50	
Sepia orbignyana	0.84	58	0.43	
Sphyrna guachancho	0.82	2	0.42	
Dasyatis margarita	0.50	2	0.26	
Syacium micrurum	0.44	4	0.23	
Squilla mantis	0.26	6	0.13	
Bembrops greyi	0.20	2	0.10	
Torpedo nobiliana	0.20	2	0.10	
Trachinus armatus	0.18	4	0.09	
Dicologlossa cuneata	0.16	4	0.08	
Trachinocephalus myops	0.16	2	0.08	
Scorpaena stephanica	0.10	2	0.05	
Epinephelus aeneus	0.06	2	0.03	
Callinectes pallidus	0.04	12	0.02	
penaeus kerathurus	0.02	2	0.01	
Scyllarides herklotsii	0.02	2	0.01	
Alloteuthis africana	0.02	8	0.01	
Total	195.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 57
 DATE :27/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°10.02
 Lon E 12°2.85
 start stop duration Purpose : 3
 TIME :07:21:05 07:51:32 30.0 (min) Region : 4054
 LOG : 2085.71 2087.19 1.5 Gear cond.: 0
 FDEPTH: 45 43 Validity : 0
 BDEPTH: 45 43 Speed : 2.9 kn
 Towing dir: 0° Wire out : 140 m Catch/hour: 166.26
 Sorted : 83 Total catch: 83.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	41.40	276	24.90	
Pagrus pagrus	27.32	98	16.43	
Brachydeuterus auritus	20.24	398	12.17	77
Rhinobatos albomaculatus	11.68	0	7.03	
Dentex canariensis	10.82	20	6.51	
Pomadasys incisus	7.42	34	4.46	
Panulirus regius	6.88	12	4.14	
Galeoides decadactylus	6.66	24	4.01	
Pseudotolithus senegalensis	6.34	10	3.81	
Alectis alexandrina	6.28	6	3.78	
Trichiurus lepturus	5.92	18	3.56	
Lycodontis afer	4.64	2	2.79	
Ilisha africana	1.48	34	0.89	
Trachinus armatus	1.42	32	0.85	
Plectorhynchus mediterraneus	1.24	2	0.75	
Epinephelus aeneus	1.00	2	0.60	
Pagellus bellottii	0.94	6	0.57	
Pseudopenaeus prayvensis	0.84	6	0.51	
Chelidichthys gabonensis	0.78	2	0.47	
Sphyrna sphyraena	0.72	4	0.43	
Scorpaena stephanica	0.50	4	0.30	
Dentex barnardi	0.40	2	0.24	
Dicologlossa hexophthalma	0.36	4	0.22	
Syacium micrurum	0.22	4	0.13	
Alloteuthis africana	0.18	148	0.11	
Trachinocephalus myops	0.18	4	0.11	
Chaetodon hoefleri	0.12	2	0.07	
Saurida brasiliensis	0.12	22	0.07	
Uranoscopus polli	0.10	2	0.06	
Callinectes pallidus	0.02	2	0.01	
Echeneis naucrates	0.02	2	0.01	
Sepia orbignyana	0.02	4	0.01	
Total	166.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 58
 DATE :27/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°11.35
 Lon E 11°55.34
 start stop duration Purpose : 3
 TIME :09:00:07 09:31:14 31.0 (min) Region : 4054
 LOG : 2095.58 2097.18 1.6 Gear cond.: 0
 FDEPTH: 74 73 Validity : 0
 BDEPTH: 74 73 Speed : 3.1 kn
 Towing dir: 0° Wire out : 210 m Catch/hour: 106.72
 Sorted : 55 Total catch: 55.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbriina canariensis	35.30	54	33.08	79
Dentex angolensis	14.21	81	13.31	78
Trichiurus lepturus	10.24	17	9.59	
Dentex barnardi	9.58	37	8.98	
Lagocephalus laevis	7.65	6	7.16	
Branchiostegus semifasciatus *	7.10	12	6.66	
Mustelus mustelus	4.16	2	3.90	
Selene dorsalis	3.37	12	3.16	
Brotula barbata	3.00	4	2.81	
Dentex congoensis	2.75	43	2.58	
Miracorvina angolensis	2.34	2	2.19	
Pagrus caeruleostictus	1.97	4	1.85	
Alloteuthis africana	1.06	254	1.00	
Fistularia petimba	0.97	4	0.91	
Raja miraletus	0.83	2	0.78	
Pagellus bellottii	0.54	6	0.51	
Pomadasys incisus	0.50	2	0.47	
Chaetodon hoefleri	0.41	2	0.38	
Pseudopenaeus prayvensis	0.41	2	0.38	
Illex coindetii	0.27	19	0.25	
Trachurus trecae	0.06	2	0.05	
Total	106.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 59
 DATE :27/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°15.14
 start stop duration Lon E 11°50.61
 TIME :10:34:42 11:05:15 31.0 (min) Purpose : 3
 LOG : 2104.29 2105.88 1.6 Region : 4054
 FDEPTH: 93 93 Gear cond.: 0
 BDEPTH: 93 93 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.1 kn
 Sorted : 116 Total catch: 116.04 Catch/hour: 224.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	74.03	159	32.96	81
Dentex angolensis	59.77	286	26.61	80
Dentex barnardi	23.88	105	10.63	
Trichiurus lepturus	21.41	39	9.53	
Dentex congoensis	9.37	126	4.17	
Pagrus auriga	7.41	2	3.30	
Lagocephalus laevigatus	6.27	6	2.79	
Pagrus pagrus	4.55	4	2.03	
Brotula barbata	4.28	4	1.90	
Epinephelus aeneus	3.75	2	1.67	
Raja miraletus	3.08	4	1.37	
Trigla lyra	1.63	10	0.72	
Zeus faber	1.39	4	0.62	
Panulirus regius	1.39	2	0.62	
Illex coindetii	0.87	70	0.39	
Pagellus bellottii	0.68	2	0.30	
Chelidonichthys gabonensis	0.43	2	0.19	
Trachurus trecae	0.27	4	0.12	
Saurida brasiliensis	0.14	17	0.06	
Total	224.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 60
 DATE :27/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°16.14
 start stop duration Lon E 11°45.75
 TIME :12:19:00 12:48:30 30.0 (min) Purpose : 3
 LOG : 2112.95 2114.55 1.6 Region : 4054
 FDEPTH: 111 110 Gear cond.: 0
 BDEPTH: 111 110 Validity : 0
 Towing dir: 0° Wire out : 305 m Speed : 3.2 kn
 Sorted : 45 Total catch: 45.40 Catch/hour: 90.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	35.36	50	38.94	
Dentex angolensis	23.16	152	25.51	82
Ariomma bondi	13.08	266	14.41	
Dentex congoensis	7.00	86	7.71	
Squatina oculata	2.24	2	2.47	
Branchiostegus semifasciatus *	1.70	2	1.87	
Illex coindetii	1.62	78	1.78	
Raja miraletus	1.56	2	1.72	
Pagrus africanus	1.50	2	1.65	
Brotula barbata	1.24	2	1.37	
Umbrina canariensis	0.94	2	1.04	
Trachurus trecae	0.50	10	0.55	
Trigla lyra	0.40	2	0.44	
Pterothrissus bellocci	0.34	2	0.37	
Citharus linguatula	0.16	2	0.18	
Total	90.80		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 61
 DATE :27/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°16.20
 start stop duration Lon E 11°40.44
 TIME :01:54:12 02:24:51 31.0 (min) Purpose : 3
 LOG : 2121.16 2122.68 1.5 Region : 4054
 FDEPTH: 120 120 Gear cond.: 0
 BDEPTH: 120 120 Validity : 0
 Towing dir: 0° Wire out : 320 m Speed : 3.0 kn
 Sorted : 92 Total catch: 313.56 Catch/hour: 606.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	374.83	4310	61.76	
Spicara alta	58.34	662	9.61	
Dentex angolensis	53.73	319	8.85	83
Boops boops	28.18	1146	4.64	
Ariomma bondi	20.81	203	3.43	
Trichiurus lepturus	19.39	29	3.20	
Trachurus trecae	11.57	192	1.91	84
Brotula barbata	8.88	8	1.46	
Zeus faber	7.12	12	1.17	
Arius heudelotii	6.00	6	0.99	
Mustelus mustelus	4.90	2	0.81	
Branchiostegus semifasciatus *	4.08	6	0.67	
Trigla lyra	2.65	43	0.44	
Pagellus bellottii	1.66	12	0.27	
Saurida brasiliensis	1.61	476	0.26	
Pterothrissus bellocci	0.93	6	0.15	
Raja miraletus	0.74	6	0.12	
Citharus linguatula	0.62	25	0.10	
Syacium micrurum	0.48	25	0.08	
Illex coindetii	0.37	12	0.06	
Total	606.89		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 62
 DATE :27/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°20.35
 start stop duration Lon E 11°28.06
 TIME :04:45:18 05:15:23 30.0 (min) Purpose : 3
 LOG : 2138.39 2139.84 1.5 Region : 4054
 FDEPTH: 352 354 Gear cond.: 0
 BDEPTH: 352 354 Validity : 0
 Towing dir: 0° Wire out : 800 m Speed : 2.9 kn
 Sorted : 66 Total catch: 223.85 Catch/hour: 447.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Laemonema laureysi	75.48	1530	16.86	
Merluccius polli	72.24	768	16.14	85
Chlorophthalmus atlanticus	71.54	1774	15.98	
Setarches guentheri	41.08	2216	9.18	
Benthodesmus tenuis	38.24	1360	8.54	
Epigonus telescopus	19.86	326	4.44	
Parapenaeus longirostris,femal	19.32	708	4.32	
Malacocephalus laevis	17.40	130	3.89	
Synagrops bellus	16.60	326	3.71	
Hymenocephalus italicus	14.28	1660	3.19	
Todaropsis eblanae	10.74	34	2.40	
Trichiurus lepturus	8.84	54	1.97	
Chascanopsetta lugubris	7.54	136	1.68	
Cyttopsis rosea	6.32	102	1.41	
Chamaea pictus	4.48	142	1.00	
Synagrops microlepis	3.94	136	0.88	
Coelorinchus coelorhincus	2.66	102	0.59	
Munidopsis sp.	2.18	346	0.49	
Zenopsis conchifer	2.10	6	0.47	
Bembrops heterurus	2.04	28	0.46	
Mystriopsis rostellatus	1.70	6	0.38	
Shrimps, small, non comm.	1.42	258	0.32	
Dibranchus atlanticus	1.30	164	0.29	
NETTASTOMATIDAE	1.22	14	0.27	
BathYROconger vicinus	1.16	20	0.26	
Etmopterus pusillus	1.16	6	0.26	
Bathynectes piperitus	0.82	14	0.18	
Halosaurus ovenii	0.54	28	0.12	
Parapenaeus longirostris, male	0.48	28	0.11	
Gadella imberbis	0.34	14	0.08	
Kenolepidichthys dagleishi	0.20	14	0.04	
Physiculus huloti	0.20	6	0.04	
Solenocera africana	0.14	14	0.03	
Peristedion cataphractum	0.14	34	0.03	
Total	447.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 63
 DATE :27/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°30.59
 start stop duration Lon E 11°21.27
 TIME :09:10:31 09:10:36 0.0 (min) Purpose : 3
 LOG : 2160.78 2160.80 0.0 Region : 4054
 FDEPTH: 629 628 Gear cond.: 0
 BDEPTH: 629 628 Validity : 5
 Towing dir: 0° Wire out : 1000 m Speed : 9.9 kn
 Sorted : 68 Total catch: 222.24 Catch/hour: 0.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Deania calcea	0.00	0	94.49	
Holothuria sp.	0.00	0	62.01	
Nezumia aequalis	0.00	0	9.48	
Yarrella blackfordi	0.00	0	8.73	
Coral - Alcyonaria?	0.00	0	7.90	
BathYROconger vicinus	0.00	0	2.43	
Stereomastix sp.	0.00	0	2.02	
Hoplostethus cadenati	0.00	0	0.89	
Benthodesmus tenuis	0.00	0	0.73	
Chaeon maritae, male	0.00	0	0.58	
Phononectes braueri	0.00	0	0.57	
Coelorinchus sp.	0.00	0	0.57	
Lophiodes kempii	0.00	0	0.56	
Halosaurus ovenii	0.00	0	0.51	
ENOPLUTEUTHIDAE	0.00	0	0.45	
Aristeus varidens, female	0.00	0	0.35	
Lamprogrammus exutus	0.00	0	0.22	
Ehinania costaeacanarie	0.00	0	0.21	
Dibranchus atlanticus	0.00	0	0.21	
Stomias boa boa	0.00	0	0.15	
Dicrroleme intronigrer	0.00	0	0.12	
Xenodermichthys copei	0.00	0	0.12	
Plesiocpenaeus edwardsianus	0.00	0	0.10	
Synaphobranchus kaupii	0.00	0	0.10	
Talismania longifilis	0.00	0	0.07	
WASTE00	0.00	0	0.00	
Plastic waste	0.00	0	0.00	
Total	0.00		193.57	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 64
 DATE :27/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°37.38
 start stop duration Lon E 11°27.23
 TIME :10:50:51 11:20:54 30.0 (min) Purpose : 3
 LOG : 2170.41 2171.77 1.4 Region : 4054
 FDEPTH: 658 652 Gear cond.: 0
 BDEPTH: 658 652 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 3.2 kn
 Sorted : 21 Total catch: 87.82 Catch/hour: 175.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	40.88	736	23.27	
Nematocarcinus africanus	37.44	7968	21.32	
Nezumia aequalis	20.48	496	11.66	
Hoplostethus cadenati	14.40	560	8.20	
Stereomastis sp.	13.76	944	7.83	
Aristeus varidens, female	7.12	328	4.05	
Gadella maraldi	4.88	292	2.78	
BathYROconger vicinus	4.64	40	2.64	
Hydrolagus sp.	4.56	8	2.60	
Merluccius polli	4.32	6	2.46	
BathYGADUS macrops	2.40	8	1.37	
Chaceon maritae	2.36	6	1.34	
Halosaurus rostratus	2.24	24	1.28	
HISTIOTETHIDAE	1.92	8	1.09	
Xenodermichthys copei	1.60	40	0.91	
Benthodesmus tenuis	1.60	8	0.91	
Munidopsis sp.	1.44	976	0.82	
VITRELEDONELLIDAE	1.36	16	0.77	
Photomectes braueri	1.36	24	0.77	
Triplophos hemingi	1.12	160	0.64	
Laemonema laureysi	0.88	8	0.50	
Setarches guentheri	0.80	8	0.46	
Starfish	0.72	16	0.41	
Dibranchius atlanticus	0.56	40	0.32	
Gonostoma elongatum	0.56	16	0.32	
Aristeus varidens, male	0.56	64	0.32	
Etmopterus pusillus	0.48	8	0.27	
Raja confundens	0.40	8	0.23	
Synaphobranchus kaupii	0.40	8	0.23	
Glyphis marsupialis	0.40	8	0.23	
Total	175.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 65
 DATE :28/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°33.78
 start stop duration Lon E 11°37.54
 TIME :01:35:33 02:05:35 30.0 (min) Purpose : 3
 LOG : 2184.02 2185.63 1.6 Region : 4054
 FDEPTH: 319 322 Gear cond.: 0
 BDEPTH: 319 322 Validity : 0
 Towing dir: 0° Wire out : 930 m Speed : 3.2 kn
 Sorted : 25 Total catch: 121.50 Catch/hour: 243.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	95.60	2080	39.34	
Malacocephalus laevis	32.70	290	13.46	
Grammolites gruvelli	24.80	410	10.21	
Laemonema laureysi	14.50	240	5.97	
Benthodesmus tenuis	13.40	520	5.51	
Chaceon maritae, male	12.50	40	5.14	
BathYNECTES piperitus	11.60	140	4.77	
BathYROconger vicinus	7.50	70	3.09	
ParapENAEUS longirostris	7.00	930	2.88	
CoelORINCHUS sp.	6.10	250	2.51	
Pontinus accraensis	3.30	40	1.36	
Merluccius polli	3.20	10	1.32	
Hymenocephalus italicus	1.60	240	0.66	
Stereomastis sp.	1.50	100	0.62	
Gadella imberbis	1.20	50	0.49	
Todaropsis eblanae	0.90	10	0.37	
Epigonus telescopus	0.90	60	0.37	
Synagrops microlepis	0.80	30	0.33	
Chascanopsetta lugubris	0.80	20	0.33	
Dicrolene intronigrer	0.70	90	0.29	
Raja confundens	0.60	10	0.25	
HISTIOTETHIDAE	0.60	10	0.25	
Nemichthys scolopaceus	0.60	10	0.25	
Peristedion cataphractum	0.40	40	0.16	
Dibranchius atlanticus	0.20	10	0.08	
Total	243.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 66
 DATE :28/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°33.39
 start stop duration Lon E 11°41.30
 TIME :05:40:05 06:10:38 31.0 (min) Purpose : 3
 LOG : 2195.48 2197.14 1.7 Region : 4054
 FDEPTH: 228 233 Gear cond.: 0
 BDEPTH: 228 233 Validity : 0
 Towing dir: 0° Wire out : 575 m Speed : 3.3 kn
 Sorted : 176 Total catch: 176.04 Catch/hour: 340.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	113.03	5421	33.17	
Carcharhinus falciformis	65.32	2	19.17	
Trichiurus lepturus	36.77	110	10.79	
Dentex angolensis	26.52	97	7.78	86
Brotula barbata	25.51	23	7.49	
Pterothrissus belloci	20.36	190	5.98	
Chlorophthalmus atlanticus	8.86	370	2.60	
Zenopsis conchifer	8.55	52	2.51	
ParapENAEUS longirostris, femal	7.32	1074	2.15	
Bembrops heterurus	5.25	101	1.54	
ParapENAEUS longirostris, male	5.07	985	1.49	
Parasudis fraser-bruenneri	4.80	292	1.41	
Miracorvina angolensis	3.45	4	1.01	
Pteroscion pelli	1.97	17	0.58	
Illex coindetii	1.82	105	0.53	
Uranoscopus cadenati	1.20	8	0.35	
Merluccius polli	1.12	12	0.33	
Conger conger	1.05	64	0.31	
Torpedo torpedo	0.79	2	0.23	
Epigonus telescopus	0.39	12	0.11	
Synagrops bellus	0.31	43	0.09	
Syacium micrurum	0.27	21	0.08	
MYCTOPHIDAE	0.23	143	0.07	
B I V A L V E S	0.21	4	0.06	
Callinectes amnicola	0.19	4	0.06	
Peristedion cataphractum	0.15	6	0.05	
Dentex congoensis	0.12	2	0.03	
Solenocera africana	0.08	14	0.02	
Total	340.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 67
 DATE :28/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°30.90
 start stop duration Lon E 11°49.05
 TIME :07:37:15 08:08:00 31.0 (min) Purpose : 3
 LOG : 2206.58 2208.07 1.5 Region : 4054
 FDEPTH: 122 123 Gear cond.: 0
 BDEPTH: 122 123 Validity : 0
 Towing dir: 0° Wire out : 320 m Speed : 2.9 kn
 Sorted : 57 Total catch: 56.53 Catch/hour: 109.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	32.01	54	29.26	
Dentex congoensis	27.45	383	25.08	
Dentex angolensis	12.97	81	11.85	88
Boops boops	6.81	296	6.23	
Trachurus trecae	6.23	130	5.70	87
Ariomma bondi	4.61	87	4.21	
Pterothrissus belloci	3.70	31	3.38	
Plicarax alta	3.46	60	3.17	
Zeus faber	2.69	10	2.46	
Raja miraletus	2.19	6	2.00	
Saurida brasiliensis	1.78	559	1.63	
Syacium micrurum	1.43	64	1.31	
Illex coindetii	1.37	43	1.26	
Torpedo torpedo	0.89	2	0.81	
Trigla lyra	0.85	23	0.78	
Priacanthus arenatus	0.58	2	0.53	
Pagellus bellottii	0.14	2	0.12	
Peristedion cataphractum	0.12	2	0.11	
B I V A L V E S	0.08	8	0.07	
Dicologlossa hexophthalma	0.06	2	0.05	
Total	109.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 68
 DATE :28/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°28.62
 start stop duration Lon E 11°51.47
 TIME :09:03:43 09:34:17 31.0 (min) Purpose : 3
 LOG : 2213.05 2214.59 1.5 Region : 4054
 FDEPTH: 115 115 Gear cond.: 0
 BDEPTH: 115 115 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.0 kn
 Sorted : 60 Total catch: 59.57 Catch/hour: 115.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Boops boops	17.81	960	15.44	
Trichiurus lepturus	14.83	29	12.86	
Dentex angolensis	13.55	85	11.75	90
Saurida brasiliensis	12.31	3470	10.68	
Trigla lyra	10.43	81	9.05	
Umbrina canariensis	8.03	23	6.97	91
Dentex congoensis	7.24	101	6.28	
Brotula barbata	4.84	4	4.20	
Trachurus trecae	3.62	112	3.14	89
Epinephelus aeneus	3.52	2	3.06	
Dentex barnardi	3.48	14	3.02	
Illex coindetii	2.85	116	2.47	
Ariomma bondi	2.75	62	2.38	
Citharus linguatula	2.54	103	2.20	
Priacanthus arenatus	1.66	6	1.44	
Pterothrissus bellocci	1.49	8	1.29	
Fistularia petimba	1.20	2	1.04	
Spicara alta	1.16	37	1.01	
Raja miraletus	0.72	2	0.62	
Uranoscopus cadenati	0.58	2	0.50	
Pagellus bellottii	0.41	4	0.35	
B I V A L V E S	0.12	19	0.10	
Dicologlossa hexophthalma	0.10	2	0.08	
Arnoglossus imperialis	0.08	12	0.07	
Total	115.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 69
 DATE :28/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°27.86
 start stop duration Lon E 11°54.94
 TIME :10:19:46 10:53:28 34.0 (min) Purpose : 3
 LOG : 2218.57 2220.24 1.7 Region : 4054
 FDEPTH: 109 108 Gear cond.: 0
 BDEPTH: 109 108 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.0 kn
 Sorted : 77 Total catch: 77.30 Catch/hour: 136.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	27.56	154	20.21	92
Umbrina canariensis	21.46	58	15.73	94
Pterothrissus bellocci	18.88	699	13.84	
Trichiurus lepturus	13.48	25	9.88	
Trachurus trecae	11.63	356	8.53	93
Saurida brasiliensis	7.24	1537	5.30	
Citharus linguatula	6.53	185	4.79	
Cynoponticus ferox	4.20	2	3.08	
Illex coindetii	4.08	180	2.99	
Raja miraletus	3.49	5	2.56	
Loligo vulgaris	3.18	4	2.33	
Squatina oculata	2.89	2	2.12	
Brotula barbata	2.61	5	1.91	
Priacanthus arenatus	2.29	7	1.68	
Ariomma bondi	2.14	28	1.57	
Zeus faber	1.94	11	1.42	
Uranoscopus cadenati	0.92	11	0.67	
Dentex congoensis	0.88	9	0.65	
Boops boops	0.88	34	0.65	
Parapenaeus longirostris	0.12	37	0.09	
Total	136.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 70
 DATE :28/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°26.86
 start stop duration Lon E 11°58.49
 TIME :11:56:46 12:27:00 30.0 (min) Purpose : 3
 LOG : 2226.26 2227.75 1.5 Region : 4054
 FDEPTH: 96 98 Gear cond.: 0
 BDEPTH: 96 98 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.0 kn
 Sorted : 136 Total catch: 135.85 Catch/hour: 271.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	110.78	228	40.77	95
Trichiurus lepturus	48.20	88	17.74	
Dentex angolensis	20.32	84	7.48	96
Squatina oculata	12.76	2	4.70	
Brachydeuterus auritus	9.28	74	3.42	97
Trachurus trecae	8.40	244	3.09	98
Raja miraletus	6.92	10	2.55	
Saurida brasiliensis	6.56	224	2.41	
Brotula barbata	5.84	4	2.15	
Raja alba	4.78	2	1.76	
Rhinobatos albomaculatus	4.72	2	1.74	
Pterothrissus bellocci	4.56	28	1.68	
Fistularia petimba	3.72	10	1.37	
Priacanthus arenatus	3.56	8	1.31	
Dentex congoensis	3.24	30	1.19	
Branchiostegus semifasciatus *	3.10	2	1.14	
Mustelus mustelus	3.08	2	1.13	
Selene dorsalis	3.00	4	1.10	
Zeus faber	2.90	14	1.07	
Illex coindetii	2.38	82	0.88	
Citharus linguatula	0.96	22	0.35	
Boops boops	0.90	36	0.33	
Ariomma bondi	0.74	12	0.27	
Scorpaena normani	0.60	2	0.22	
Chaetodon hoefleri	0.26	2	0.10	
Pagellus bellottii	0.14	2	0.05	
Total	271.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 71
 DATE :28/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°25.71
 start stop duration Lon E 12°1.71
 TIME :01:29:05 01:59:19 30.0 (min) Purpose : 3
 LOG : 2233.34 2234.85 1.5 Region : 4054
 FDEPTH: 83 82 Gear cond.: 0
 BDEPTH: 83 82 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.0 kn
 Sorted : 137 Total catch: 136.94 Catch/hour: 273.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	73.46	166	26.82	
Umbrina canariensis	60.60	176	22.13	99
Brachydeuterus auritus	37.72	392	13.77	100
Lagocephalus laevigatus	17.40	20	6.35	
Stromateus fiatola	16.82	16	6.14	
Selene dorsalis	12.92	24	4.72	
Dentex angolensis	11.04	58	4.03	101
Mustelus mustelus	9.36	4	3.42	
Dentex barnardi	8.08	22	2.95	
Sphyraena quachancho	7.22	6	2.64	
Trachurus trecae	5.36	122	1.96	102
Raja miraletus	3.76	6	1.37	
Rhinobatos albomaculatus	2.54	2	0.93	
Ariomma bondi	1.68	26	0.61	
Decapterus rhonchus	1.64	4	0.60	
Dentex congoensis	1.46	22	0.53	
Fistularia petimba	0.78	2	0.28	
Pagellus bellottii	0.50	8	0.18	
Alloteuthis africana	0.50	94	0.18	
Uranoscopus cadenati	0.38	2	0.14	
Pterothrissus bellocci	0.34	2	0.12	
Boops boops	0.32	6	0.12	
Total	273.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 72
 DATE :28/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°22.05
 Lon E 12°8.20
 start stop duration Purpose : 3
 TIME :03:10:41 03:41:03 30.0 (min) Region : 4054
 LOG : 2243.55 2245.30 1.8 Gear cond.: 0
 FDEPTH: 43 42 Validity : 0
 BDEPTH: 43 42 Speed : 3.5 kn
 Towing dir: 0° Wire out : 150 m Catch/hour: 167.02
 Sorted : 94 Total catch: 93.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	108.72	1152	58.13	103
Galeoides decadactylus	15.68	68	8.38	
Pagrus africanus	9.84	22	5.26	
Trichiurus lepturus	7.80	20	4.17	
Pseudotolithus senegalensis	6.02	10	3.22	
Pomadasy incisus	5.98	16	3.20	
Sphyræna sphyraena	4.64	24	2.48	
Epinephelus aeneus	4.30	2	2.30	
Ilisha africana	4.20	86	2.25	
Selene dorsalis	3.72	36	1.99	
Trachinus araneus	3.00	8	1.60	
Stromateus fiatola	2.54	4	1.36	
Pagellus bellottii	2.16	10	1.15	
Ballistes capriscus	1.66	4	0.89	
Uranoscopus polli	1.48	4	0.79	
Alectis alexandrina	1.42	2	0.76	
Sardinella maderensis	1.12	6	0.60	
Trachinocephalus myops	1.08	16	0.58	
Eucinostomus melanopterus	0.44	4	0.24	
Trachinus armatus	0.34	10	0.18	
Pseudupeneus prayensis	0.28	2	0.15	
Ariomma bondi	0.20	2	0.11	
Trachurus trecae	0.20	4	0.11	
Alloteuthis africana	0.12	34	0.06	
Dasyatis marmorata	0.08	2	0.04	
Total	187.02		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 73
 DATE :28/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°58.38
 Lon E 11°40.87
 start stop duration Purpose : 3
 TIME :09:15:44 09:45:49 30.0 (min) Region : 4054
 LOG : 2291.94 2293.20 1.3 Gear cond.: 0
 FDEPTH: 716 716 Validity : 0
 BDEPTH: 716 716 Speed : 2.5 kn
 Towing dir: 0° Wire out : 1200 m Catch/hour: 247.90
 Sorted : 20 Total catch: 123.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Holothuria sp.	43.12	302	17.39	
Yarrella blackfordi	38.72	1000	15.62	
Nezumia aequalis	29.88	676	12.05	
Merluccius polli	19.00	26	7.66	104
Lamprogrammus exutus	16.92	36	6.83	
Stereomastis sp.	16.70	1534	6.74	
Hoplostethus cadenati	9.86	302	3.98	
Ijimaia loppei	8.68	4	3.50	
OPISTHOPTERYGIDAE	7.62	6	3.07	
Triplophos hemingi	7.12	712	2.87	
OCTOPODIDAE	6.98	6	2.82	
Bathyrcongus vicinus	6.04	58	2.44	
Chaceon maritae, male	5.16	12	2.08	
Hydrolagus sp.	4.52	6	1.82	
Shrimps, small, non comm.	4.38	798	1.77	
Aristeus varidens, female	3.16	136	1.27	
Photomectes braueri	2.72	50	1.10	
Etmopterus pusillus	2.20	10	0.89	
Xenodermichthys copei	1.72	58	0.69	
Lophius vaillanti	1.72	6	0.69	
Octopoteuthis sicula	1.58	6	0.64	
Dibranchus atlanticus	1.58	78	0.64	
Gadella imberbis	1.58	122	0.64	
Halosaurus ovenii	1.58	20	0.64	
Deania calcea	1.50	6	0.61	
Bathygadus macrops	1.22	14	0.49	
Synaphobranchus kaupii	0.78	14	0.31	
Etmopterus polli	0.62	8	0.25	
Ectreposebastes imus	0.50	6	0.20	
Dicrolene intronigrer	0.42	6	0.17	
Gonostoma elongatum	0.20	6	0.08	
Munidopsis sp.	0.06	128	0.02	
Raja confundens	0.06	6	0.02	
Total	247.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 74
 DATE :28/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°54.64
 Lon E 11°43.51
 start stop duration Purpose : 3
 TIME :11:31:02 12:02:03 31.0 (min) Region : 4054
 LOG : 2300.14 2301.58 1.4 Gear cond.: 0
 FDEPTH: 509 513 Validity : 0
 BDEPTH: 509 513 Speed : 2.8 kn
 Towing dir: 0° Wire out : 1200 m Catch/hour: 376.78
 Sorted : 28 Total catch: 194.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	146.32	35497	38.83	
Lophius vaillanti	69.37	27	18.41	
Merluccius polli	21.95	41	5.83	
Yarrella blackfordi	21.41	569	5.68	
Benthodesmus tenuis	17.48	501	4.64	
Aristeus varidens, female	17.07	1084	4.53	
Chaceon maritae, male	13.41	27	3.56	
Lamprogrammus exutus	12.60	14	3.34	
Stereomastis sp.	12.46	854	3.31	
Chaunax pictus	9.21	95	2.45	
Triplophos hemingi	7.45	1084	1.98	
Hoplostethus cadenati	7.18	257	1.91	
MELANONIDAE	7.05	135	1.87	
Galeus polli	3.52	41	0.93	
Aristeus varidens, male	2.17	271	0.58	
Aristaeomorpha sp.	2.03	27	0.54	
Gonostoma elongatum	0.95	54	0.25	
Gadella imberbis	0.95	27	0.25	
Dicrolene intronigrer	0.95	81	0.25	
Bathyrcongus vicinus	0.81	14	0.22	
Halosaurus ovenii	0.81	27	0.22	
Xenodermichthys copei	0.68	68	0.18	
Munidopsis sp.	0.41	515	0.11	
Bathyrcongus vicinus	0.27	14	0.07	
Nezumia aequalis	0.27	14	0.07	
Total	376.78		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 75
 DATE :29/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°53.63
 Lon E 11°44.95
 start stop duration Purpose : 3
 TIME :01:30:00 02:00:10 30.0 (min) Region : 4054
 LOG : 2306.75 2308.15 1.4 Gear cond.: 0
 FDEPTH: 444 441 Validity : 0
 BDEPTH: 444 441 Speed : 2.8 kn
 Towing dir: 0° Wire out : 1050 m Catch/hour: 186.16
 Sorted : 22 Total catch: 93.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	43.52	12576	23.38	
Lophius vaillanti	19.44	48	10.44	
Benthodesmus tenuis	16.08	176	8.64	
Merluccius polli	13.04	42	7.00	105
Hymenocephalus italicus	11.20	1408	6.02	
Chaunax pictus	10.96	480	5.89	
Stereomastis sp.	9.92	752	5.33	
Laemonema laureysi	8.88	88	4.77	
Aristeus varidens, female	8.56	768	4.60	
Lamprogrammus exutus	7.76	16	4.17	
Gadella imberbis	4.08	144	2.19	
Soft corals	3.68	64	1.98	
Dicrolene intronigrer	3.52	240	1.89	
Dibranchus atlanticus	3.04	312	1.63	
Aristeus varidens, male	2.64	312	1.42	
Etmopterus polli	2.40	48	1.29	
Malacocephalus laevis	2.24	16	1.20	
Chlorophthalmus atlanticus	2.24	48	1.20	
Plesiopenaeus edwardsianus	2.16	40	1.16	
Halosaurus ovenii	2.00	24	1.07	
Yarrella blackfordi	1.84	40	0.99	
Chaceon maritae	1.28	8	0.69	
Gadella imberbis	1.28	88	0.69	
Bathyrcongus vicinus	1.20	32	0.64	
Bathyrcongus vicinus	1.04	16	0.56	
Nezumia aequalis	0.96	48	0.52	
Coelorinchus sp.	0.80	8	0.43	
ARISTEIDAE	0.24	8	0.13	
Nettastoma parviceps	0.16	8	0.09	
Total	186.16		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 76
 DATE :29/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°51.36
 start stop duration Lon E 11°49.96
 TIME :03:26:56 03:57:23 30.0 (min) Purpose : 3
 LOG : 2315.71 2317.19 1.5 Region : 4054
 FDEPTH: 270 275 Gear cond.: 0
 BDEPTH: 270 275 Validity : 0
 Towing dir: 0° Wire out : 700 m Speed : 2.9 kn
 Sorted : 74 Total catch: 150.61 Catch/hour: 301.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus atlanticus	153.54	234	50.97	
Brotula barbata	30.48	30	10.12	
Dentex angolensis	29.40	96	9.76	106
Miracorvina angolensis	21.52	14	7.14	
Chlorophthalmus atlanticus	13.06	290	4.34	
Raja confundens	11.60	32	3.85	
Pontinus accraensis	8.74	120	2.90	
Synagrops microlepis	8.18	358	2.72	
Bembrops greyi	5.06	64	1.68	
Scorpaena stephanica	3.46	18	1.15	
Benthodesmus tenuis	2.20	106	0.73	
Parapenaeus longirostris, femal	1.84	234	0.61	
Nezumia aequalis	1.84	92	0.61	
Sea urchin, weak spines	1.66	10	0.55	
Malacocephalus laevis	1.66	36	0.55	
Parapenaeus longirostris, male	1.52	234	0.50	
C R A B S	1.16	42	0.39	
Pterothrissus bellocci	0.88	10	0.29	
Bathyrhynchus vicinus	0.70	18	0.23	
Peristedion cataphractum	0.64	106	0.21	
Zenopsis conchifer	0.64	4	0.21	
Dibranchius atlanticus	0.36	36	0.12	
Dentex macrophthalmus	0.32	4	0.11	
Merluccius polli	0.22	4	0.07	
Laemonema laureysi	0.14	4	0.05	
Gadella imberbis	0.14	10	0.05	
Stereomastis sculpata	0.10	10	0.03	
MYCTOPHIDAE	0.10	102	0.03	
Todaropsis eblanae	0.06	4	0.02	
Total	301.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 77
 DATE :29/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°51.21
 start stop duration Lon E 11°52.12
 TIME :05:34:09 06:04:29 30.0 (min) Purpose : 3
 LOG : 2322.53 2324.16 1.6 Region : 4054
 FDEPTH: 185 184 Gear cond.: 0
 BDEPTH: 185 184 Validity : 0
 Towing dir: 0° Wire out : 460 m Speed : 3.2 kn
 Sorted : 55 Total catch: 235.20 Catch/hour: 470.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	305.72	15596	64.99	
Dentex angolensis	30.68	138	6.52	107
Brotula barbata	25.56	28	5.43	
Pentheroscion mbizi	19.88	158	4.23	
Pterothrissus bellocci	18.80	136	4.00	
Trichiurus lepturus	11.56	26	2.46	
Bembrops heterurus	8.92	100	1.90	
Parapenaeus longirostris, femal	8.70	1108	1.85	
Parasudis fraser-brueneri	6.62	784	1.41	
Torpedo torpedo	6.34	8	1.35	
Zeus faber	4.76	22	1.01	
Pontinus accraensis	4.10	36	0.87	
Miracorvina angolensis	3.72	8	0.79	
Chlorophthalmus atlanticus	2.66	338	0.57	
MYCTOPHIDAE	2.30	1700	0.49	
Spicara alta	2.30	14	0.49	
PARALEPIDIDAE	2.02	180	0.43	
Illex coindetii	1.44	288	0.31	
Zenopsis conchifer	1.22	8	0.26	
Dentex macrophthalmus	0.64	8	0.14	
Parapenaeus longirostris, male	0.64	172	0.14	
Citharus linguatula	0.58	58	0.12	
Peristedion cataphractum	0.44	14	0.09	
Merluccius polli	0.36	14	0.08	
Conger conger	0.22	14	0.05	
Synagrops microlepis	0.22	14	0.05	
Total	470.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 78
 DATE :29/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°51.17
 start stop duration Lon E 11°55.09
 TIME :07:09:37 07:39:39 30.0 (min) Purpose : 3
 LOG : 2328.37 2329.76 1.4 Region : 4054
 FDEPTH: 117 116 Gear cond.: 0
 BDEPTH: 117 116 Validity : 0
 Towing dir: 10° Wire out : 280 m Speed : 2.8 kn
 Sorted : 220 Total catch: 219.62 Catch/hour: 439.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	145.26	640	33.07	108
Umbriina canariensis	109.42	304	24.91	110
Dentex congoensis	70.70	648	16.10	
Arionma bondi	28.56	568	6.50	
Trachurus trecae	26.40	410	6.01	109
Spicara alta	24.50	616	5.58	
Trichiurus lepturus	6.06	6	1.38	
Lagocephalus laevis	5.46	8	1.24	
Boops boops	4.84	206	1.10	
Torpedo torpedo	3.86	10	0.88	
Zeus faber	3.08	10	0.70	
Dentex barnardi	2.52	8	0.57	
Fistularia petimba	1.96	4	0.45	
Illex coindetii	1.62	46	0.37	
Chaetodon hoefleri	0.98	4	0.22	
Anthias anthias	0.84	8	0.19	
Pagellus bellottii	0.84	8	0.19	
Chelidonichthys gabonensis	0.78	4	0.18	
Trigla lyra	0.60	4	0.14	
Citharus linguatula	0.46	14	0.10	
Bembrops heterurus	0.22	8	0.05	
Conger conger	0.14	10	0.03	
Saurida brasiliensis	0.10	28	0.02	
Peristedion cataphractum	0.04	4	0.01	
Total	439.24		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 79
 DATE :29/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°47.55
 start stop duration Lon E 12°0.34
 TIME :08:42:42 09:13:03 30.0 (min) Purpose : 3
 LOG : 2336.65 2338.30 1.7 Region : 4054
 FDEPTH: 89 90 Gear cond.: 0
 BDEPTH: 89 90 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.3 kn
 Sorted : 64 Total catch: 64.20 Catch/hour: 128.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	70.90	128	55.22	
Trichiurus lepturus	12.48	20	9.72	
Pagellus bellottii	10.16	60	7.91	111
Lagocephalus laevis	6.56	6	5.11	
Trachurus trecae	5.56	82	4.33	112
Fistularia petimba	3.72	12	2.90	
Dentex angolensis	2.62	10	2.04	
Dentex barnardi	2.42	16	1.88	
Chelidonichthys gabonensis	2.26	12	1.76	
Chaetodon hoefleri	2.18	14	1.70	
Illex coindetii	1.76	74	1.37	
Trigla lyra	1.70	14	1.32	
Priacanthus arenatus	1.48	2	1.15	
Sepia orbignyana	1.22	2	0.95	
Pagrus caeruleostictus	1.14	2	0.89	
Arionma bondi	1.12	20	0.87	
Dentex gibbosus	0.50	4	0.39	
Dentex congoensis	0.20	6	0.16	
Brachydeuterus auritus	0.20	2	0.16	
Citharus linguatula	0.16	2	0.12	
Boops boops	0.06	2	0.05	
Total	128.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 80
 DATE :29/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°43.02
 start stop duration Lon E 12°9.15
 TIME :10:38:12 11:08:28 30.0 (min) Purpose : 3
 LOG : 2349.11 2350.60 1.5 Region : 4054
 FDEPTH: 69 68 Gear cond.: 0
 BDEPTH: 69 68 Validity : 0
 Towing dir: 0° Wire out : 210 m Speed : 3.0 kn
 Sorted : 69 Total catch: 69.32 Catch/hour: 138.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevis	50.80	62	36.64	
Pagellus bellottii	36.50	308	26.33	113
Selene dorsalis	19.90	30	14.35	
Squatina oculata	11.76	2	8.48	
Seriola carpenteri	6.96	4	5.02	
Fistularia petimba	2.86	8	2.06	
Pagrus africanus	2.62	6	1.89	
Alloteuthis africana	2.12	822	1.53	
Trigla lyra	1.88	12	1.36	
Balistes capricus	1.50	2	1.08	
Sepia orbignyana	0.90	2	0.65	
Illex coindetii	0.54	22	0.39	
Syacium micrurum	0.30	2	0.22	
Total	138.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 81
 DATE :29/03/13 GEAR TYPE: BT NO: 26 POSITION:Lat S 6°37.99
 start stop duration Lon E 12°14.91
 TIME :12:15:36 12:44:27 29.0 (min) Purpose : 3
 LOG : 2358.34 2359.69 1.4 Region : 4054
 FDEPTH: 46 45 Gear cond.: 0
 BDEPTH: 46 45 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 2.8 km
 Sorted : 92 Total catch: 578.82 Catch/hour: 1197.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	696.29	7390	58.14	114
Selene dorsalis	242.96	1486	20.29	
Pseudotolithus senegalensis	44.57	64	3.72	
Dasyatis marmorata	40.66	52	3.39	
Galeoides decadactylus	31.66	91	2.64	
Pagrus pagrus	21.89	52	1.83	
Umbrina canariensis	20.19	27	1.69	
Pagellus bellottii	19.80	52	1.65	
Elops lacerta	15.37	27	1.28	
Dentex barnardi	13.94	39	1.16	
Trichiurus lepturus	10.43	52	0.87	
Strombus latus	10.16	12	0.85	
Raja miraletus	9.77	12	0.82	
Sphyræna sphyraena	7.55	39	0.63	
Balistes capricus	5.59	12	0.47	
Chaetodon hoefleri	5.34	27	0.45	
Citharus linguatula	0.77	12	0.06	
Decapterus rhonchus	0.64	12	0.05	
Total	1197.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 82
 DATE :29/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°35.12
 start stop duration Lon E 12°21.39
 TIME :02:24:00 02:49:16 25.0 (min) Purpose : 3
 LOG : 2368.73 2370.09 1.4 Region : 4054
 FDEPTH: 24 26 Gear cond.: 0
 BDEPTH: 24 26 Validity : 0
 Towing dir: 0° Wire out : 125 m Speed : 3.2 km
 Sorted : 45 Total catch: 45.38 Catch/hour: 108.91

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrina	39.26	17	36.05	
Selene dorsalis	9.17	106	8.42	
Galeoides decadactylus	8.71	115	8.00	
Pomadasy rogeri	6.46	5	5.93	
Rhinobatos albomaculatus	6.36	5	5.84	
Arius heudelotii	5.93	10	5.44	
Pseudotolithus senegalensis	5.66	5	5.20	
Albula vulpes	4.39	14	4.03	
Pagellus bellottii	4.37	26	4.01	
Pagrus africanus	2.64	10	2.42	
Brachydeuterus auritus	2.42	43	2.23	
Scomberomorus tritor	2.42	5	2.23	
Lagocephalus laevigatus	2.23	10	2.05	
Sepia orbignyana	1.99	2	1.83	
Chloroscombrus chrysurus	1.22	7	1.12	
Pseudupeneus prayensis	1.18	7	1.08	
Balistes capricus	1.08	2	0.99	
Chaetodipterus gorensis	1.01	2	0.93	
Cynoglossus canariensis	0.72	2	0.66	
Hemicaranx bicolor	0.55	5	0.51	
Citharoides macrolepis	0.41	2	0.37	
Ilisha africana	0.29	5	0.26	
Calappa rubroguttata	0.22	2	0.20	
Eucinostomus melanopterus	0.22	2	0.20	
Total	108.91		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 83
 DATE :29/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°6.14
 start stop duration Lon E 11°56.63
 TIME :07:47:03 08:16:38 30.0 (min) Purpose : 3
 LOG : 2414.28 2415.91 1.6 Region : 4054
 FDEPTH: 313 299 Gear cond.: 0
 BDEPTH: 313 299 Validity : 0
 Towing dir: 0° Wire out : 700 m Speed : 3.3 km
 Sorted : 64 Total catch: 293.47 Catch/hour: 586.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	228.60	9208	38.95	
Chlorophthalmus atlanticus	201.42	4626	34.32	
Merluccius polli	48.52	900	8.27	115
Pontinus accraensis	25.38	396	4.32	
Parasudis fraser-bruenneri	14.32	388	2.44	
Parapenaeus longirostris, femal	9.36	1162	1.59	
Laemonema laureysi	9.00	162	1.53	
Miracorvina angolensis	7.84	4	1.34	
Benthodesmus tenuis	6.76	352	1.15	
Raja miraletus	6.30	10	1.07	
Munidopsis sp.	4.14	334	0.71	
Hoplostethus mediterraneus	3.72	2	0.63	
MYCTOPHIDAE	3.52	2502	0.60	
Gadella imberbis	3.42	118	0.58	
Lophiodes kemp	2.70	28	0.46	
Epigonus telescopus	2.26	190	0.39	
Illex coindetii	2.08	28	0.35	
Malacocephalus laevis	2.08	10	0.35	
Bembrops heterurus	1.62	54	0.28	
Peristedion cataphractum	1.44	46	0.25	
Parapenaeus longirostris, male	0.64	100	0.11	
Chascanopsetta lugubris	0.54	10	0.09	
NETTASTOMATIDAE	0.54	10	0.09	
Solenocera africana	0.28	36	0.05	
Hymenocephalus italicus	0.28	36	0.05	
Nezumia sp.	0.18	18	0.03	
Total	586.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 84
 DATE :29/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°12.02
 start stop duration Lon E 11°52.89
 TIME :10:08:00 10:38:03 30.0 (min) Purpose : 3
 LOG : 2425.44 2426.76 1.3 Region : 4054
 FDEPTH: 617 617 Gear cond.: 0
 BDEPTH: 617 617 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 2.6 km
 Sorted : 30 Total catch: 180.36 Catch/hour: 360.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	93.60	17460	25.95	
Lamprogrammus exutus	74.88	396	20.76	
Hoplostethus cadenati	50.88	1752	14.11	
Yarrella blackfordi	41.88	1032	11.61	
MELANONIDAE	22.44	408	6.22	
Chaceon maritae	12.96	24	3.59	
Stereomastis sp.	11.04	1020	3.06	
Chaceon maritae, male	10.68	36	2.96	
Triplophos hemingi	6.96	900	1.93	
Nezumia aequalis	6.24	144	1.73	
Aristeus varidens, female	3.36	132	0.93	
Bathyroconger vicinus	3.12	120	0.86	
OCTOPOTEUTHIDAE	2.76	12	0.77	
Memodermichthys copei	2.76	180	0.77	
Benthodesmus tenuis	2.16	60	0.60	
LOLIGINIDAE	1.92	12	0.53	
Chlorophthalmus atlanticus	1.80	36	0.50	
Sudis hyalina	1.68	36	0.47	
Peristedion cataphractum	1.44	24	0.40	
Ectreposebastes imus	1.20	12	0.33	
Aristeus varidens, male	1.08	96	0.30	
Glyphus marsupialis	0.96	24	0.27	
Etmopterus polli	0.84	12	0.23	
Gadella imberbis	0.84	24	0.23	
Synaphobranchus kaupii	0.84	12	0.23	
Photonectes braueri	0.72	12	0.20	
Plesiopeneus edwardsianus	0.60	12	0.17	
Lophius vaillanti	0.48	12	0.13	
Gadella imberbis	0.48	36	0.13	
Dirollene sp.	0.12	24	0.03	
Total	360.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 85
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°11.62
 start stop duration Lon E 11°49.07
 TIME :12:34:04 01:04:07 30.0 (min) Purpose : 3
 LOG : 2433.81 2435.03 1.2 Region : 4054
 FDEPTH: 769 760 Gear cond.: 0
 BDEPTH: 769 760 Validity : 0
 Towing dir: 0° Wire out : 1350 m Speed : 2.4 km
 Sorted : 21 Total catch: 83.21 Catch/hour: 166.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarrella blackfordi	46.56	800	27.98	
Nezumia aequalis	37.36	872	22.45	
White sea cucumber	22.08	48	13.27	
Lophius vaillanti	7.76	8	4.66	
Triplophos hemingi	7.12	824	4.28	
MELANONIDAE	6.16	104	3.70	
Centroscymnus crepidater	6.16	2	3.70	
ANTHOZOA (Sea anemones)	5.04	8	3.03	
Stereomastis sp.	3.92	1592	2.36	
Chaceon maritae	3.54	6	2.13	
Talismania longifilis	3.36	56	2.02	
Hoplostethus cadenati	3.20	64	1.92	
Halosaurus ovenii	2.32	48	1.39	
Bathyroconger vicinus	1.92	16	1.15	
OCTOPOTEUTHIDAE	1.92	8	1.15	
Glyphus marsupialis	1.60	48	0.96	
Aristeus varidens, female	1.20	32	0.72	
Ectreposebastes imus	1.12	16	0.67	
Chaceon maritae, male	1.04	4	0.62	
Raja confundens	0.88	16	0.53	
Benthodesmus tenuis	0.88	8	0.53	
SEPIOLIDAE	0.56	8	0.34	
Synaphobranchus kaupii	0.56	8	0.34	
Cynoglossus sp.	0.16	8	0.10	
Total	166.42		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 86
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°21.31
 start stop duration Lon E 12°1.42
 TIME :03:18:39 03:48:19 30.0 (min) Purpose : 3
 LOG : 2449.79 2451.07 1.3 Region : 4054
 FDEPTH: 530 526 Gear cond.: 0
 BDEPTH: 530 526 Validity : 0
 Towing dir: 0° Wire out : 1300 m Speed : 2.6 kn
 Sorted : 24 Total catch: 170.17 Catch/hour: 340.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	227.92	42070	66.97	
Stereomastis sp.	20.86	1442	6.13	
Lamprogrammus exutus	17.08	854	5.02	
Hoplostethus cadenati	15.68	546	4.61	
Yarella blackfordi	13.72	350	4.03	
Triplophos hemingi	8.12	1050	2.39	
Chaunax pictus	6.72	14	1.97	
MELANONIDAE	3.50	56	1.03	
Aristeus varidens, female	3.36	196	0.99	
Malacocephalus laevis	3.36	28	0.99	
Chaceon maritae, male	3.36	14	0.99	
Gadella imberbis	2.94	182	0.86	
Plesiopeanaeus edwardsianus	2.80	42	0.82	
Ectreposebastes imus	2.66	42	0.78	
Mundicopsis sp.	2.24	1428	0.66	
Xenodermichthys copei	2.10	126	0.62	
Chlorophthalmus atlanticus	0.98	28	0.29	
Dicrolene intransigens	0.56	140	0.16	
Nemichthys scolopaceus	0.56	14	0.16	
Chaceon maritae	0.56	14	0.16	
Aristeus varidens, male	0.42	42	0.12	
Photichthys argenteus	0.28	14	0.08	
Bathyrcongus vicinus	0.28	14	0.08	
Stomias boa boa	0.28	14	0.08	
Total	340.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 87
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°19.68
 start stop duration Lon E 12°3.52
 TIME :04:51:17 05:21:26 30.0 (min) Purpose : 3
 LOG : 2456.69 2458.32 1.6 Region : 4054
 FDEPTH: 423 429 Gear cond.: 0
 BDEPTH: 423 429 Validity : 0
 Towing dir: 0° Wire out : 1000 m Speed : 3.3 kn
 Sorted : 33 Total catch: 90.82 Catch/hour: 181.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	41.04	13266	22.59	
Hymenocephalus italicus	40.86	4500	22.50	
Lophiodes kempi	18.64	18	10.26	
Stereomastis sp.	17.28	1692	9.51	
Chaunax pictus	13.36	380	7.36	
Merluccius polli	12.60	8	6.94	116
Laemonema laureysi	6.30	140	3.47	
Aristeus varidens, male	4.28	424	2.36	
Pontinus accraensis	3.64	4	2.00	
Yarella blackfordi	3.56	108	1.96	
Chaceon maritae	3.34	14	1.84	
Dibranchius atlanticus	2.66	280	1.46	
Anemones, white	2.52	14	1.39	
B I V A L V E S	2.12	10	1.17	
Aristeus varidens, female	1.84	154	1.01	
Etmopterus polli	1.36	4	0.75	
Triplophos hemingi	1.12	184	0.62	
Gadella imberbis	1.04	36	0.57	
Photonectes braueri	0.94	22	0.52	
Benthodesmus tenuis	0.94	28	0.52	
Todaropsis eblanae	0.72	4	0.40	
Nezumia aequalis	0.68	50	0.37	
Halosaurus ovenii	0.36	28	0.20	
Coloconger cadenati	0.22	4	0.12	
NETTASTOMATIDAE	0.18	10	0.10	
Nemichthys scolopaceus	0.04	14	0.02	
WASTE00	0.00	2	0.00	
Plastic waste	0.00	4	0.00	
Total	181.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 88
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°14.42
 start stop duration Lon E 12°8.47
 TIME :07:19:18 07:49:35 30.0 (min) Purpose : 3
 LOG : 2468.24 2469.76 1.5 Region : 4054
 FDEPTH: 227 218 Gear cond.: 0
 BDEPTH: 227 218 Validity : 0
 Towing dir: 0° Wire out : 570 m Speed : 3.0 kn
 Sorted : 30 Total catch: 151.17 Catch/hour: 302.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	108.84	63	36.00	
Brotula barbata	72.90	62	24.11	
Dentex angolensis	64.40	180	21.30	117
Chlorophthalmus atlanticus	13.08	1324	4.33	
Pterothrissus belloci	7.28	58	2.41	
Bembrops greyi	7.02	74	2.32	
Parapanaeus longirostris, femal	4.94	788	1.63	
Zenopsis conchifer	2.92	21	0.97	
Parapanaeus longirostris, male	2.88	722	0.95	
Pteroscion peli	2.34	16	0.77	
Torpedo torpedo	2.12	6	0.70	
Octopus vulgaris	2.08	6	0.69	
Erythrocles monodi	1.84	2	0.61	
Illex coindetii	1.70	16	0.56	
Squatina oculata	1.66	6	0.55	
Uranoscopus cadenati	1.44	6	0.48	
Monolene microstoma	1.44	128	0.48	
Umbrina canariensis	1.28	2	0.42	
Maurolicus muelleri	0.48	90	0.16	
Calappa sp.	0.42	10	0.14	
Peristedion cataphractum	0.32	6	0.11	
Parasudis fraser-brueneri	0.32	42	0.11	
Spicara alta	0.32	2	0.11	
Physiculus huloti	0.16	6	0.05	
B I V A L V E S	0.16	6	0.05	
Fishing gears	0.00	2	0.00	
Total	302.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 89
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°5.09
 start stop duration Lon E 11°57.00
 TIME :09:47:43 10:18:30 31.0 (min) Purpose : 3
 LOG : 2483.34 2484.89 1.6 Region : 4054
 FDEPTH: 260 252 Gear cond.: 0
 BDEPTH: 260 252 Validity : 0
 Towing dir: 0° Wire out : 600 m Speed : 3.0 kn
 Sorted : 56 Total catch: 336.64 Catch/hour: 651.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	411.02	2054	63.08	
Dentex angolensis	63.91	134	9.81	119
Chlorophthalmus atlanticus	25.95	834	3.98	
Merluccius polli	25.95	331	3.98	118
Brotula barbata	23.61	21	3.62	
Raja confundens	19.12	39	2.93	
Parasudis fraser-brueneri	16.10	271	2.47	
Zenopsis conchifer	12.46	240	1.91	
Torpedo torpedo	10.06	10	1.54	
Pontinus accraensis	8.25	50	1.27	
MYCTOPHIDAE	6.04	2466	0.93	
Nezumia aequalis	5.54	130	0.85	
Illex coindetii	5.13	58	0.79	
Hoplostethus atlanticus	3.21	29	0.49	
Sea urchin	3.02	10	0.46	
Pterothrissus belloci	2.90	19	0.45	
Dentex macrophthalmus	1.80	29	0.28	
Argyrosomus hololepidotus	1.80	10	0.28	
Parapanaeus longirostris, femal	1.61	201	0.25	
Peristedion cataphractum	1.30	29	0.20	
Squatina oculata	0.81	2	0.12	
Parapanaeus longirostris, male	0.79	302	0.12	
Monolene microstoma	0.39	19	0.06	
Todaropsis eblanae	0.39	10	0.06	
Malacocephalus laevis	0.39	10	0.06	
WASTE00	0.00	2	0.00	
Plastic waste	0.00	2	0.00	
Total	651.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 90
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°3.17 Lon E 11°59.12
 start stop duration Purpose : 3
 LOG : 2488.63 2490.07 1.4 Region : 4054
 FDEPTH: 145 149 Gear cond.: 0
 BDEPTH: 145 149 Validity : 0
 Towing dir: 0° Wire out : 350 m Speed : 2.9 kn
 Sorted : 137 Total catch: 137.00 Catch/hour: 274.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	180.78	814	65.98	120
Spicara alta	23.48	300	8.57	
Zenopsis conchifer	14.92	24	5.45	
Brotula barbata	12.16	12	4.44	
Dentex congoensis	8.44	80	3.08	
Lagocephalus lagocephalus	7.92	12	2.89	
Trigla lyra	6.30	62	2.30	
Raja alba	4.74	2	1.73	
Trichiurus lepturus	4.66	6	1.70	
Citharus linguatula	3.12	62	1.14	
Trachurus trecae	2.96	50	1.08	121
Zeus faber	1.36	4	0.50	
Pterothrissus belloci	1.08	6	0.39	
Illex coindetii	0.72	12	0.26	
Uranoscopus cadenati	0.50	2	0.18	
Ariomma bondi	0.42	8	0.15	
Peristedion cataphractum	0.30	6	0.11	
Saurida brasiliensis	0.14	8	0.05	
Total	274.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 91
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°2.29 Lon E 12°4.21
 start stop duration Purpose : 3
 LOG : 2495.91 2497.20 1.3 Region : 4054
 FDEPTH: 119 118 Gear cond.: 0
 BDEPTH: 119 118 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 2.8 kn
 Sorted : 124 Total catch: 124.20 Catch/hour: 266.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	116.40	585	43.74	123
Dentex congoensis	37.63	769	14.14	
Trigla lyra	33.81	276	12.71	
Trachurus trecae	17.06	454	6.41	122
Raja alba	11.31	6	4.25	
Brotula barbata	8.72	9	3.28	
Boops boops	7.41	326	2.79	
Squatina oculata	6.36	4	2.39	
Umbrina canariensis	5.74	19	2.16	
Raja miraletus	4.37	9	1.64	
Branchiostegus semifasciatus *	3.88	4	1.46	
Fistularia petimba	2.10	4	0.79	
Citharus linguatula	1.91	47	0.72	
Trichiurus lepturus	1.76	4	0.66	
Zenopsis conchifer	1.74	4	0.65	
Zeus faber	1.69	6	0.64	
Illex coindetii	1.11	54	0.42	
Priacanthus arenatus	1.07	2	0.40	
Spicara alta	0.79	30	0.30	
Uranoscopus cadenati	0.45	2	0.17	
Dentex barnardi	0.30	2	0.11	
Pagellus bellottii	0.24	2	0.09	
Peristedion cataphractum	0.17	4	0.06	
Dicologlossa hexophthalma	0.11	2	0.04	
Total	266.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 92
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°1.13 Lon E 12°6.35
 start stop duration Purpose : 3
 LOG : 2501.97 2503.57 1.6 Region : 4054
 FDEPTH: 112 114 Gear cond.: 0
 BDEPTH: 112 114 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.2 kn
 Sorted : 163 Total catch: 1738.78 Catch/hour: 3477.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	3165.52	4316	91.03	124
Dentex angolensis	181.76	1704	5.23	125
Selene dorsalis	46.74	82	1.34	
Trachurus trecae	30.24	906	0.87	126
Trigla lyra	28.86	192	0.83	
Dentex congoensis	17.04	384	0.49	
Citharus linguatula	4.94	110	0.14	
Pagellus bellottii	2.46	26	0.07	
Total	3477.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 93
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°57.61 Lon E 12°11.33
 start stop duration Purpose : 3
 LOG : 2510.67 2512.26 1.6 Region : 4054
 FDEPTH: 88 87 Gear cond.: 0
 BDEPTH: 88 87 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.2 kn
 Sorted : 161 Total catch: 161.16 Catch/hour: 322.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex barnardi	72.20	156	22.40	
Dentex congoensis	62.10	1104	19.27	
Lagocephalus laevigatus	44.92	54	13.94	
Pagellus bellottii	40.68	180	12.62	128
Dentex angolensis	34.52	232	10.71	127
Trigla lyra	10.76	92	3.34	
Squatina oculata	10.60	2	2.54	
Pagrus caeruleostictus	8.98	14	2.79	
Chelidonichthys gabonensis	8.20	42	2.54	
Raja alba	7.00	4	2.17	
Trichiurus lepturus	4.42	8	1.37	
Rhinobatos albomaculatus	4.20	2	1.30	
Pseudupeneus prayensis	3.04	16	0.94	
Fistularia petimba	2.60	8	0.81	
Umbrina canariensis	1.70	2	0.53	
Chaetodon hoefleri	1.42	8	0.44	
Scorpaena normani	1.06	2	0.33	
Citharus linguatula	1.00	28	0.31	
Cynoglossus canariensis	0.66	2	0.20	
Sepia orbignyana	0.64	2	0.20	
Uranoscopus cadenati	0.52	2	0.16	
B I V A L V E S	0.28	82	0.09	
Monolele microstoma	0.24	30	0.07	
Saurida brasiliensis	0.20	62	0.06	
Illex coindetii	0.18	4	0.06	
Chaetodon marcellae	0.10	2	0.03	
Arnoglossus imperialis	0.10	14	0.03	
Total	322.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 94
 DATE :30/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°55.62 Lon E 12°13.31
 start stop duration Purpose : 3
 LOG : 2515.59 2517.25 1.7 Region : 4054
 FDEPTH: 81 83 Gear cond.: 0
 BDEPTH: 81 83 Validity : 0
 Towing dir: 0° Wire out : 210 m Speed : 3.3 kn
 Sorted : 97 Total catch: 200.82 Catch/hour: 401.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	223.12	592	55.55	129
Dentex angolensis	86.00	376	21.41	131
Pagellus bellottii	22.12	192	5.51	130
Raja miraletus	10.48	16	2.61	
Squatina oculata	9.08	2	2.26	
Dentex barnardi	6.00	32	1.49	
Pomadourys incisus	5.72	24	1.42	
Trichiurus lepturus	5.28	12	1.31	
Brotula barbata	4.12	4	1.03	
Mustelus mustelus	3.80	2	0.95	
Cynoglossus canariensis	3.20	12	0.80	
Dentex gibbosus	2.96	4	0.74	
Balistes capricus	2.88	4	0.72	
Chaetodon hoefleri	2.60	12	0.65	
Priacanthus arenatus	2.44	4	0.61	
Pagrus caeruleostictus	2.24	4	0.56	
Dentex congoensis	2.04	20	0.51	
Fistularia petimba	1.76	8	0.44	
Zeus faber	1.40	4	0.35	
Alloteuthis africana	1.12	416	0.28	
Sepia orbignyana	0.92	4	0.23	
Sphyraena guanchancho	0.84	4	0.21	
Trigla lyra	0.68	4	0.17	
Illex coindetii	0.56	16	0.14	
Citharus linguatula	0.28	8	0.07	
Total	401.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 95
 DATE :31/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°53.56 Lon E 12°54.09
 start stop duration Purpose : 3
 LOG : 2640.36 2641.95 1.6 Region : 4054
 FDEPTH: 321 314 Gear cond.: 0
 BDEPTH: 321 314 Validity : 0
 Towing dir: 0° Wire out : 720 m Speed : 3.1 kn
 Sorted : 20 Total catch: 339.25 Catch/hour: 678.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	357.10	1394	52.63	132
Synagrops microlepis	66.78	3542	9.84	
Centroporus granulatus	64.88	10	9.56	
Laemonema laureysi	58.66	980	8.65	
Trichiurus lepturus	57.96	140	8.54	
Sea urchin, weak spines	16.66	980	2.46	
Chlorophthalmus atlanticus	13.16	280	1.94	
Bembrops greyi	8.40	182	1.24	
Bathyroconger vicinus	7.84	70	1.16	
Parapenaeus longirostris, femal	6.72	840	0.99	
Pontinus accraensis	6.72	98	0.99	
Malacocephalus laevis	6.44	84	0.95	
Nezumia aequalis	4.48	112	0.66	
Gadella maraldi	0.84	42	0.12	
Bathymectes sp.	0.70	14	0.10	
Conger conger	0.60	14	0.09	
Parapenaeus longirostris, male	0.42	70	0.06	
Solenocera africana	0.14	14	0.02	
Total	678.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 96
 DATE :31/03/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°52.80 Lon E 12°58.16
 start stop duration Purpose : 3
 LOG : 2649.07 2650.71 1.6 Region : 4054
 FDEPTH: 219 216 Gear cond.: 0
 BDEPTH: 219 216 Validity : 0
 Towing dir: 0° Wire out : 530 m Speed : 3.2 kn
 Sorted : 78 Total catch: 272.63 Catch/hour: 527.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus belloci	129.85	734	24.61	
Trachurus trecae	101.50	122	19.23	134
Synagrops microlepis	100.32	6416	19.01	
Dentex angolensis	63.97	207	12.12	133
Merluccius polli	39.46	153	7.48	135
Brotula barbata	38.75	29	7.34	
Zenopsis conchifer	16.06	37	3.04	
Bembrops heterurus	10.57	87	2.00	
Trichiurus lepturus	9.95	149	1.89	
Parapenaeus longirostris, femal	3.97	679	0.75	
Umbrina canariensis	3.31	8	0.63	
Pontinus accraensis	3.06	12	0.58	
Nezumia aequalis	2.40	50	0.45	
Illex coindetii	1.37	17	0.26	
Dicologlossa cuneata	1.16	12	0.22	
Bathyroconger vicinus	0.70	8	0.13	
Monolene microstoma	0.62	21	0.12	
Parapenaeus longirostris, male	0.58	153	0.11	
B I V A L V E S	0.08	25	0.01	
Total	527.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 97
 DATE :31/03/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 8°53.77 Lon E 13°0.17
 start stop duration Purpose : 3
 LOG : 2654.97 2656.07 1.1 Region : 4054
 FDEPTH: 191 196 Gear cond.: 0
 BDEPTH: 191 196 Validity : 0
 Towing dir: 0° Wire out : 450 m Speed : 3.3 kn
 Sorted : 28 Total catch: 154.89 Catch/hour: 464.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	147.30	204	31.70	136
Dentex angolensis	101.85	315	21.92	137
Brotula barbata	88.92	66	19.14	
Synagrops microlepis	36.96	2718	7.95	
Pterothrissus belloci	16.17	138	3.48	
Trichiurus lepturus	10.11	159	2.18	
Bembrops greyi	9.51	81	2.05	
Atractoscion aequidens	9.18	3	1.98	
Merluccius polli	7.98	30	1.72	
Hoplostethus mediterraneus	7.47	180	1.61	
Zenopsis conchifer	7.26	3	1.56	
Trigla lyra	7.08	33	1.52	
S H R I M P S	5.16	1647	1.11	
Pontinus accraensis	4.32	27	0.93	
Zeus faber	2.25	3	0.48	
Nezumia aequalis	1.26	24	0.27	
Umbrina canariensis	1.08	3	0.23	
Illex coindetii	0.33	6	0.07	
GOBIIDAE	0.33	51	0.07	
B I V A L V E S	0.12	51	0.03	
Bathyroconger vicinus	0.03	3	0.01	
Total	464.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 98
 DATE :31/03/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°11.46 Lon E 12°55.85
 start stop duration Purpose : 3
 LOG : 2673.14 2674.38 1.2 Region : 4040
 FDEPTH: 21 22 Gear cond.: 0
 BDEPTH: 21 22 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.6 kn
 Sorted : 51 Total catch: 50.96 Catch/hour: 145.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Balistes capricus	28.57	46	19.62	
Caranx hippos	27.37	49	18.80	
Alectis alexandrina	23.77	37	16.33	
Pagellus bellottii	21.60	131	14.84	138
Sepia orbignyana	17.17	20	11.79	
Lagocephalus laevigatus	13.31	60	9.14	
Selene dorsalis	4.34	83	2.98	
Trichiurus lepturus	1.80	3	1.24	
Eucinostomus melanopterus	1.63	14	1.12	
Sphyraena sphyraena	1.34	3	0.92	
Trachinotus goreensis	1.29	3	0.88	
Arius heudelotii	1.03	3	0.71	
Zenopsis conchifer	0.86	3	0.59	
Pseudupeneus prayensis	0.66	6	0.45	
Decapterus rhonchus	0.57	9	0.39	
Echeneis sp.	0.29	3	0.20	
Total	145.60		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 99
 DATE :31/03/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°12.91 Lon E 12°50.85
 start stop duration Purpose : 3
 LOG : 2680.81 2682.21 1.4 Region : 4040
 FDEPTH: 79 84 Gear cond.: 0
 BDEPTH: 79 84 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 2.8 kn
 Sorted : 132 Total catch: 927.92 Catch/hour: 1855.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	1216.88	8344	65.57	
Brachydeuterus auritus	360.92	3948	19.45	140
Dentex angolensis	100.52	406	5.42	141
Brotula barbata	35.98	42	1.94	
Trachurus trecae	30.66	574	1.65	139
Stromateus fiatola	26.32	28	1.42	
Alloteuthis africana	23.94	5972	1.29	
Lagocephalus laevigatus	19.18	14	1.03	
Epinephelus aeneus	12.32	2	0.66	
Fistularia petimba	9.10	14	0.49	
Balistes capricus	6.44	14	0.35	
Boops boops	5.74	112	0.31	
Pagellus bellottii	3.08	14	0.17	
Saurida brasiliensis	2.38	504	0.13	
Citharus linguatula	1.54	28	0.08	
S H R I M P S	0.84	84	0.05	
Total	1855.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 100
 DATE :31/03/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°13.56 Lon E 12°46.65
 start stop duration Purpose : 3
 LOG : 2687.80 2689.39 1.6 Region : 4040
 FDEPTH: 117 119 Gear cond.: 0
 BDEPTH: 117 119 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.2 kn
 Sorted : 33 Total catch: 33.13 Catch/hour: 66.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	17.92	118	27.04	142
Trigla lyra	15.20	114	22.94	
Lagocephalus lagocephalus	7.20	2	10.87	
Illex coindetii	6.14	386	9.27	
Zeus faber	4.82	8	7.27	
Alloteuthis africana	2.74	774	4.14	
Raja miraletus	1.80	2	2.72	
Selene dorsalis	1.72	6	2.60	
Dentex canariensis	1.40	6	2.11	
Octopus vulgaris	1.36	2	2.05	
Saurida brasiliensis	1.34	280	2.02	
Uranoscopus cadenati	1.14	4	1.72	
Citharus linguatula	0.78	24	1.18	
Dentex congoensis	0.66	8	1.00	
S H R I M P S	0.56	74	0.85	
Bembrops platyrhynchus	0.48	4	0.72	
Sepia orbignyana	0.38	2	0.57	
Scorpaena normani	0.34	2	0.51	
GADIDAE	0.16	76	0.24	
Boops boops	0.12	2	0.18	
Total	66.26		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 101
 DATE :31/03/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°14.19
 start stop duration Lon E 12°42.25
 TIME :04:23:28 04:51:12 28.0 (min) Purpose : 3
 LOG : 2695.41 2696.73 1.3 Region : 4040
 FDEPTH: 231 247 Gear cond.: 0
 BDEPTH: 231 247 Validity : 0
 Towing dir: 0° Wire out : 560 m Speed : 2.9 kn
 Sorted : 103 Total catch: 237.83 Catch/hour: 509.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	111.60	270	21.90	143
Gephyroberyx darwini	74.76	191	14.67	
Zenopsis conchifer	49.05	120	9.62	
Brotula barbata	40.76	32	8.00	
Merluccius polli	35.72	141	7.01	144
Epinephelus gorensis	30.13	2	5.91	
MYCTOPHIDAE	28.71	23884	5.63	
Synagrops microlepis	21.30	1474	4.18	
Pterothrissus bellocci	16.93	131	3.32	
Coelorinchus sp.	16.52	369	3.24	
Raja alba	15.15	13	2.97	
Malacocephalus laevis	11.44	81	2.25	
Epigonus telescopus	9.79	148	1.92	
Erythrocles monodi	7.91	9	1.55	
Chlorophthalmus atlanticus	5.66	1359	1.11	
Miracorvina angolensis	4.97	6	0.98	
Umbrina canariensis	4.86	11	0.95	
Uranoscopus cadenati	4.71	19	0.93	
Illex coindetii	4.41	75	0.87	
Cynoponticus ferox	3.96	4	0.78	
Trichiurus lepturus	3.00	13	0.59	
Pontinus accraensis	2.51	15	0.49	
Lophiodes kemp	1.50	4	0.29	
Bembrops greyi	1.18	34	0.23	
Parapenaeus longirostris, femal	0.77	150	0.15	
Peristedion weberi	0.66	4	0.13	
Monolene microstoma	0.60	28	0.12	
Parapenaeus longirostris, male	0.56	150	0.11	
Sea urchin	0.49	4	0.10	
Total		509.64	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 102
 DATE :31/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°6.64
 start stop duration Lon E 12°40.56
 TIME :06:25:38 06:56:10 31.0 (min) Purpose : 3
 LOG : 2703.77 2705.22 1.5 Region : 4040
 FDEPTH: 428 423 Gear cond.: 0
 BDEPTH: 428 423 Validity : 0
 Towing dir: 0° Wire out : 900 m Speed : 2.8 kn
 Sorted : 30 Total catch: 215.51 Catch/hour: 417.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	114.72	35394	27.50	145
Merluccius polli	97.66	170	23.41	
Chaunax pictus	39.72	1444	9.52	
Dibranchius atlanticus	27.95	1825	6.70	
Etmopterus polli	23.01	557	5.52	
Aristeus varidens, female	22.39	1072	5.37	
Hymenocephalus italicus	21.77	2115	5.22	
Laemonema laureysi	21.15	21	5.07	
Pontinus accraensis	7.74	10	1.86	
Malacocephalus laevis	6.08	31	1.46	
Anemones, white	4.65	31	1.11	
Todaropsis eblanae	4.03	10	0.97	
Lophiodes kemp	3.89	2	0.93	
Aristeus varidens, male	3.62	465	0.87	
Halosaurus ovenii	3.41	124	0.82	
Benthodesmus tenuis	3.19	93	0.77	
Galeus polli	2.69	31	0.64	
Plesiopenaeus edwardsianus	2.69	93	0.64	
Coelorinchus simorhynchus	2.07	52	0.50	
Chaceon maritae	1.59	6	0.38	
Bathymectes piperitus	1.45	41	0.35	
Bassanago albescens	1.34	41	0.32	
Yarella blackfordi	0.31	21	0.07	
WASTE00	0.00	2	0.00	
Plastic waste	0.00	2	0.00	
Total		417.12	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 103
 DATE :31/03/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°4.83
 start stop duration Lon E 12°38.12
 TIME :08:31:35 09:02:16 31.0 (min) Purpose : 3
 LOG : 2710.91 2712.22 1.3 Region : 4040
 FDEPTH: 655 662 Gear cond.: 0
 BDEPTH: 655 662 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 2.6 kn
 Sorted : 31 Total catch: 158.63 Catch/hour: 307.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	108.77	28239	35.43	
Lamprogrammus exutus	36.29	116	11.82	
OPISTHOTEUTHIDAE	33.00	10	10.75	
Nezumia aequalis	29.03	687	9.46	
Dibranchius atlanticus	16.94	1210	5.52	
Ebinania costaecanarie	16.55	10	5.39	
Aristeus varidens, female	9.29	513	3.03	
Aristeus varidens, male	6.68	852	2.17	
Yarella blackfordi	6.58	194	2.14	
Bathyroconger vicinus	6.29	135	2.05	
Talismania longifilis	4.65	203	1.51	
Stomias boa boa	4.16	77	1.36	
Merluccius polli	4.12	4	1.34	
Triplophos hemingi	3.39	494	1.10	
Stereomastis sp.	2.90	416	0.95	
Plesiopenaeus edwardsianus	2.71	223	0.88	
Lophiodes kemp	2.32	19	0.76	
Chaceon maritae	2.11	10	0.69	
Todaropsis eblanae	2.03	10	0.66	
Benthodesmus tenuis	1.65	58	0.54	
Halosaurus ovenii	1.26	29	0.41	
Synphobranchius kaupii	1.16	19	0.38	
Scymnodon squamulosus	0.81	4	0.26	
Chlorophthalmus atlanticus	0.68	19	0.22	
Photonectes braueri	0.68	77	0.22	
Hoplostethus cadenati	0.48	10	0.16	
Etmopterus polli	0.46	6	0.15	
Maulisia microlepis	0.39	58	0.13	
MYCTOPHIDAE	0.39	397	0.13	
Gadella imberbis	0.39	68	0.13	
PARALEPIDIDAE	0.29	10	0.09	
Dicrolene intronigrer	0.19	39	0.06	
Phrynychthys wedli	0.10	10	0.03	
Symphodus sp.	0.10	29	0.03	
Bathymectes piperitus	0.10	10	0.03	
Xenodermichthys copei	0.10	10	0.03	
WASTE00	0.00	2	0.00	
Total		307.02	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 104
 DATE :01/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°38.85
 start stop duration Lon E 12°40.18
 TIME :01:23:42 01:45:40 22.0 (min) Purpose : 3
 LOG : 2745.68 2746.60 0.9 Region : 4040
 FDEPTH: 522 507 Gear cond.: 0
 BDEPTH: 522 507 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 2.5 kn
 Sorted : 28 Total catch: 110.08 Catch/hour: 300.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	80.73	22767	26.89	
Lamprogrammus exutus	45.60	687	15.19	
Laemonema laureysi	36.33	284	12.10	
Chaceon maritae, male	18.44	76	6.14	
Aristeus varidens, female	16.58	829	5.52	
Dibranchius atlanticus	13.42	796	4.47	
Merluccius polli	12.44	11	4.14	
MELANONIDAE	11.35	240	3.78	
Chaceon maritae	9.93	33	3.31	
Yarella blackfordi	7.85	229	2.62	
Stereomastis sp.	6.76	731	2.25	
Chlorophthalmus atlanticus	6.76	164	2.25	
Chaunax pictus	6.55	185	2.18	
Hoplostethus cadenati	6.00	185	2.00	
Anemones, white	4.47	22	1.49	
Aristeus varidens, male	2.07	240	0.69	
HISTIOTEUTHIDAE	1.75	11	0.58	
Dicrolene intronigrer	1.53	240	0.51	
Nezumia aequalis	1.53	98	0.51	
Coelorinchus sp.	1.20	11	0.40	
Benthodesmus tenuis	1.20	33	0.40	
Gadella imberbis	1.09	185	0.36	
Xenodermichthys copei	0.87	44	0.29	
Halosaurus rostratus	0.87	33	0.29	
ONYCHOTEUTHIDAE	0.87	11	0.29	
Austroglossus microlepis	0.65	22	0.22	
Bathyroconger vicinus	0.55	11	0.18	
Caristius maderensis	0.55	11	0.18	
Gadella imberbis	0.55	22	0.18	
Triplophos hemingi	0.44	76	0.15	
Bathymectes piperitus	0.44	44	0.15	
Munidopsis sp.	0.33	65	0.11	
PARALEPIDIDAE	0.22	11	0.07	
Synphobranchius kaupii	0.22	11	0.07	
Nemichthys scolopaceus	0.11	11	0.04	
Total		300.22	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 105
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°31.56
 start stop duration Lon E 12°51.09
 TIME :05:24:03 05:54:24 30.0 (min) Purpose : 3
 LOG : 2761.05 2762.61 1.6 Region : 4040
 FDEPTH: 114 111 Gear cond.: 0
 BDEPTH: 114 111 Validity : 0
 Towing dir: 0° Wire out : 285 m Speed : 3.1 kn
 Sorted : 90 Total catch: 89.54 Catch/hour: 179.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	32.36	52	18.07	
Saurida brasiliensis	29.44	6608	16.44	
Pterothrissus belloci	23.24	114	12.98	
Dentex angolensis	23.12	118	12.91	146
Selene dorsalis	20.32	64	11.35	
Illex coindetii	13.48	642	7.53	
Zeus faber	13.44	38	7.51	
Lagocephalus laevigatus	7.68	10	4.29	
Trigla lyra	4.36	30	2.43	
Cynoponticus ferox	4.22	2	2.36	
Pontinus accraensis	1.88	8	1.05	
Brotula barbata	1.88	2	1.05	
Citharus linguatula	1.40	22	0.78	
Sepia orbignyana	0.56	2	0.31	
Pagellus bellottii	0.42	2	0.23	
Alloteuthis africana	0.38	88	0.21	
Parapenaeus longirostris, femal	0.32	52	0.18	
Bembrops greyi	0.22	2	0.12	
Dentex congoensis	0.14	2	0.08	
Zenopsis conchifer	0.10	2	0.06	
Parapenaeus longirostris, male	0.06	14	0.03	
B I V A L V E S	0.06	4	0.03	
Total	179.08		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 108
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°42.60
 start stop duration Lon E 13°9.23
 TIME :11:17:43 11:47:30 30.0 (min) Purpose : 3
 LOG : 2799.57 2801.11 1.5 Region : 4040
 FDEPTH: 32 32 Gear cond.: 0
 BDEPTH: 32 32 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 122 Total catch: 2107.19 Catch/hour: 4214.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	2221.10	28772	52.70	148
Galeoides decadactylus	748.64	6452	17.76	
Sphyraena sphyraena	293.94	1104	6.97	
Chloroscombrus chrysurus	293.94	4382	6.97	
Pseudupeneus prayensis	105.90	896	2.51	
Pteroscion peli	84.86	1274	2.01	
Pomadasys incisus	80.38	862	1.91	
Selene dorsalis	79.68	1622	1.89	
Pagellus bellottii	76.58	518	1.82	
Umbriina canariensis	47.60	34	1.13	
Ilisha africana	45.88	586	1.09	
Pomadasys jubelini	45.88	104	1.09	
Ephippion guttifer	37.94	34	0.90	
Trachurus trecae	10.68	68	0.25	
Lagocephalus laevigatus	8.52	34	0.20	
Arius heudelotii	8.62	34	0.20	
Sardinella aurita	7.24	34	0.17	
Eucinostomus melanopterus	5.52	104	0.13	
Trachinocephalus myops	5.52	34	0.13	
Sardinella maderensis	4.14	34	0.10	
Bembrops heterurus	1.72	34	0.04	
Total	4214.38		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 106
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°27.53
 start stop duration Lon E 12°59.70
 TIME :07:22:31 07:52:37 30.0 (min) Purpose : 3
 LOG : 2772.92 2774.57 1.7 Region : 4040
 FDEPTH: 51 51 Gear cond.: 0
 BDEPTH: 51 51 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.3 kn
 Sorted : 59 Total catch: 59.40 Catch/hour: 118.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrina	71.88	100	60.51	
Lagocephalus laevigatus	9.12	10	7.68	
Sphyraena sphyraena	7.64	24	6.43	
Pomadasys peroteti	5.80	8	4.88	
Chloroscombrus chrysurus	4.68	26	3.94	
Pomadasys rogeri	4.48	4	3.77	
Pagellus bellottii	2.70	16	2.27	
Cynoponticus ferox	2.24	2	1.89	
Sphyraena guachancho	2.00	2	1.68	
Caranx crysos	1.96	2	1.65	
Galeoides decadactylus	1.54	2	1.30	
Illex coindetii	1.52	58	1.28	
Aluterus heudelotii	1.50	2	1.26	
Fistularia petimba	0.82	2	0.69	
Decapterus punctatus	0.42	8	0.35	
Chelidonichthys gabonensis	0.34	2	0.29	
Citharus linguatula	0.16	2	0.13	
Total	118.80		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 109
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°48.17
 start stop duration Lon E 13°0.97
 TIME :01:23:10 01:54:20 31.0 (min) Purpose : 3
 LOG : 2812.13 2813.66 1.5 Region : 4040
 FDEPTH: 94 95 Gear cond.: 0
 BDEPTH: 94 95 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 2.9 kn
 Sorted : 95 Total catch: 94.58 Catch/hour: 183.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	89.50	921	48.89	149
Alloteuthis africana	21.79	8535	11.91	
Raja miraletus	19.39	31	10.59	
Dentex barnardi	11.44	56	6.25	
Trigla lyra	8.38	64	4.58	
Rhinobatos albomaculatus	8.21	2	4.48	
Pagellus bellottii	4.51	45	2.46	150
Squatina oculata	2.98	4	1.63	
Citharus linguatula	2.86	77	1.56	
Zeus faber	2.79	8	1.52	
Octopus vulgaris	1.74	2	0.95	
Umbriina canariensis	1.72	4	0.94	
Lagocephalus laevigatus	1.34	2	0.73	
Spicara alta	1.06	155	0.58	
Brotula barbata	1.01	2	0.55	
Lepidotrigla carolae	0.83	8	0.45	
Dentex congoensis	0.83	12	0.45	
Chaetodon hoefleri	0.81	4	0.44	
Uranoscopus cadenati	0.52	2	0.29	
Branchiostegus semifasciatus *	0.52	2	0.29	
Trachurus trecae	0.35	2	0.19	
Pomadasys jubelini	0.21	2	0.12	
Dicolloglossa hexophthalma	0.12	2	0.06	
Saurida brasiliensis	0.12	33	0.06	
Arnoglossus imperialis	0.02	4	0.01	
Total	183.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 107
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°25.30
 start stop duration Lon E 13°4.57
 TIME :08:51:01 09:22:35 32.0 (min) Purpose : 3
 LOG : 2781.53 2783.48 2.0 Region : 4040
 FDEPTH: 23 22 Gear cond.: 0
 BDEPTH: 23 22 Validity : 0
 Towing dir: 0° Wire out : 125 m Speed : 3.7 kn
 Sorted : 94 Total catch: 93.50 Catch/hour: 175.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Balistes capriscus	37.65	81	21.48	
Alectis alexandrina	32.78	118	18.70	
Chloroscombrus chrysurus	21.86	99	12.47	
Lagocephalus laevigatus	16.31	52	9.30	
Pagellus bellottii	11.21	43	6.40	147
Arius parkii	10.37	43	5.91	
Ephippion guttifer	8.51	4	4.86	
Scomberomorus tritor	6.24	9	3.56	
Pomadasys rogeri	5.32	8	3.04	
Galeoides decadactylus	3.69	15	2.11	
Pagrus caeruleostictus	3.21	8	1.83	
Caranx crysos	2.85	6	1.63	
Caranx senegallus	2.48	15	1.41	
Sphyraena sphyraena	2.36	6	1.35	
Sepia orbignyana	2.04	2	1.17	
Sardinella maderensis	1.82	8	1.04	
Raja miraletus	1.74	2	0.99	
Brachydeuterus auritus	1.63	17	0.93	
Octopus vulgaris	1.44	2	0.82	
Aluterus monoceros	0.66	4	0.37	
Chilomycterus spinosus mauret.	0.41	2	0.24	
Pseudupeneus prayensis	0.36	2	0.20	
Fistularia petimba	0.21	4	0.12	
Rypticus saponaceus	0.08	2	0.04	
Ilisha africana	0.08	2	0.04	
Total	175.31		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 110
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°46.75
 start stop duration Lon E 12°53.31
 TIME :03:10:29 03:40:33 30.0 (min) Purpose : 3
 LOG : 2821.93 2823.50 1.6 Region : 4040
 FDEPTH: 125 125 Gear cond.: 0
 BDEPTH: 125 125 Validity : 0
 Towing dir: 0° Wire out : 310 m Speed : 3.1 kn
 Sorted : 48 Total catch: 47.51 Catch/hour: 95.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	35.12	152	36.96	151
Lagocephalus guntheri	26.72	40	28.12	
Raja miraletus	9.36	18	9.85	
Trigla lyra	5.64	36	5.94	
Illex coindetii	3.54	80	3.73	
Umbriina canariensis	3.34	8	3.52	
Dentex barnardi	2.44	10	2.57	
Lophiodes kempi	2.44	2	2.57	
Boops boops	1.58	46	1.66	
Dentex congoensis	0.96	10	1.01	
Zenopsis conchifer	0.86	2	0.91	
Dentex macrophthalmus	0.84	4	0.88	
Citharus linguatula	0.64	18	0.67	
Sepia orbignyana	0.46	2	0.48	
Saurida brasiliensis	0.38	150	0.40	
Ariomma bondi	0.34	4	0.36	
Spicara alta	0.24	4	0.25	
Arnoglossus imperialis	0.12	4	0.13	
Total	95.02		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 111
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°50.88
 start stop duration Lon E 12°50.97
 TIME :04:39:25 05:10:11 30.8 (min) Purpose : 3
 LOG : 2830.66 2832.13 1.5 Region : 4040
 FDEPTH: 214 213 Gear cond.: 0
 BDEPTH: 214 213 Validity : 0
 Towing dir: 0° Wire out : 550 m Speed : 2.9 kn
 Sorted : 140 Total catch: 139.96 Catch/hour: 273.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	78.76	295	28.85	152
Brotula barbata	48.80	53	17.88	
Synagrops microlepis	38.23	3224	14.00	
Pterothrissus belloci	16.93	105	6.20	
Bembrops greyi	16.38	142	6.00	
Trichiurus lepturus	14.24	35	5.22	
Dentex angolensis	10.49	35	3.84	153
Parapenaeus longirostris, femal	9.99	1851	3.66	
Parapenaeus longirostris, male	7.30	2064	2.67	
Illex coindetii	7.26	142	2.66	
Coelorrinchus simorhynchus	3.69	72	1.35	
Uranoscopus cadenati	2.89	14	1.06	
Hoplostethus mediterraneus	2.77	57	1.01	
Chlorophthalmus atlanticus	2.71	634	0.99	
Torpedo torpedo	2.30	4	0.84	
Miracorvina angolensis	1.66	4	0.61	
Raja miraletus	1.37	2	0.50	
Mystriophis rostellatus	1.29	23	0.47	
BATHYLAGIDAE	1.25	511	0.46	
Malacocephalus laevis	1.03	8	0.38	
Pontinus accraensis	1.01	8	0.37	
Monolene microstoma	0.92	23	0.34	
Zenopsis conchifer	0.84	16	0.31	
Bathyroconger vicinus	0.35	6	0.13	
Solenocera africana	0.23	80	0.09	
Physiculus huloti	0.10	6	0.04	
Boops boops	0.10	4	0.04	
GOBIIDAE	0.08	47	0.03	
B I V A L V E S	0.02	2	0.01	
Epigonus telescopus	0.02	2	0.01	
Total	273.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 112
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°54.15
 start stop duration Lon E 12°44.96
 TIME :07:40:12 08:10:30 30.3 (min) Purpose : 3
 LOG : 2845.80 2847.12 1.3 Region : 4040
 FDEPTH: 579 574 Gear cond.: 0
 BDEPTH: 579 574 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 2.6 kn
 Sorted : 28 Total catch: 145.39 Catch/hour: 288.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	113.74	29212	39.49	
Lamprogrammus exutus	33.62	642	11.67	
Chaceon maritae, female	30.82	127	10.70	
Chlorophthalmus atlanticus	25.67	670	8.91	
Yarrella blackfordi	12.48	384	4.33	
Parapenaeus longirostris, femal	9.98	606	3.47	
Stomias boa boa	8.91	196	3.10	
Parapenaeus longirostris, male	7.41	883	2.57	
Stromateus fiatola	6.52	794	2.26	
Chaceon maritae, male	5.19	14	1.80	
Hoplostethus cadenati	4.99	153	1.73	
Gadella imberbis	4.64	196	1.61	
Benthodesmus tenuis	4.56	160	1.58	
Centrophorus granulosus	4.36	2	1.51	
OCTOPOTEUTHIDAE	4.20	36	1.46	
Nezumia aequalis	2.24	196	0.78	
J E L Y F I S H	1.60	36	0.56	
Etmopterus polli	1.43	28	0.50	
Bathyroconger vicinus	0.81	28	0.28	
Laemonema laureysi	0.79	10	0.28	
Dicologlossa cuneata	0.63	28	0.22	
Xenodermichthys copei	0.53	28	0.19	
Halosaurus owenii	0.53	10	0.19	
Triplophos hemingi	0.53	71	0.19	
Chaunax pictus	0.53	10	0.19	
Plesiopenaeus edwardsianus	0.46	46	0.16	
Synaphobranchus kaupii	0.36	18	0.12	
Ebinania costaeacanarie	0.36	10	0.12	
Coloconger sp.	0.10	10	0.03	
Total	288.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 113
 DATE :01/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°56.97
 start stop duration Lon E 12°44.48
 TIME :09:24:45 09:50:54 26.2 (min) Purpose : 3
 LOG : 2851.76 2852.82 1.1 Region : 4040
 FDEPTH: 730 728 Gear cond.: 0
 BDEPTH: 730 728 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 2.4 kn
 Sorted : 19 Total catch: 122.87 Catch/hour: 281.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia aequalis	68.97	1170	24.46	
Anemones, white	64.70	151	22.95	
Yarrella blackfordi	26.85	620	9.52	
Lophiodes kempi	16.24	41	5.76	
Chaceon maritae, male	12.41	23	4.40	
Triplophos hemingi	12.11	2230	4.30	
Stereomastis sp.	10.19	385	3.61	
Opisthoteuthis sp.	8.54	2	3.03	
Stomias boa boa	7.16	151	2.54	
OCTOPOTEUTHIDAE	6.47	55	2.30	
Talismania longifilis	6.06	41	2.15	
Bathyroconger vicinus	5.92	96	2.10	
Etmopterus polli	4.96	41	1.76	
Hoplostethus cadenati	4.68	165	1.66	
Chaceon maritae, female	3.95	18	1.40	
Dibranchius atlanticus	3.85	151	1.37	
Raja confundens	3.72	41	1.32	
Synaphobranchus kaupii	3.03	83	1.07	
Aristeus varidens, female	2.75	977	0.98	
Sea cucumbers	2.20	14	0.78	
Paramola cuvieri	1.93	14	0.68	
Dicrolene inronigrer	1.65	151	0.59	
Photonectes braueri	0.96	14	0.34	
Plesiopenaeus edwardsianus	0.69	41	0.24	
Munidopsis sp.	0.69	399	0.24	
Glyphus marsupialis	0.55	28	0.20	
Cynoglossus canariensis	0.41	28	0.15	
Aristeus varidens, male	0.14	28	0.05	
Cubiceps pauciradiatus	0.14	14	0.05	
Total	281.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 114
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°7.61
 start stop duration Lon E 12°51.70
 TIME :12:55:45 01:25:06 29.4 (min) Purpose : 3
 LOG : 2869.86 2871.16 1.3 Region : 4040
 FDEPTH: 455 482 Gear cond.: 0
 BDEPTH: 455 482 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 2.6 kn
 Sorted : 28 Total catch: 309.95 Catch/hour: 633.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	259.05	67462	40.88	
Lophius vaillanti	57.57	67	9.09	
Lamprogrammus exutus	53.74	1844	8.48	
Laemonema laureysi	42.73	1439	6.74	
Chaunax pictus	41.38	1079	6.53	
Yarrella blackfordi	30.58	922	4.83	
MELANONIDAE	20.69	450	3.27	
Dibranchius atlanticus	18.66	1124	2.95	
Aristeus varidens, female	17.54	944	2.77	
Pontinus accraensis	15.74	22	2.48	
Gadella imberbis	15.29	607	2.41	
Hoplostethus cadenati	10.79	360	1.70	
Chlorophthalmus atlanticus	9.67	270	1.53	
Benthodesmus tenuis	7.42	225	1.17	
Chaceon maritae, female	6.60	31	1.04	
Aristeus varidens, male	6.30	832	0.99	
Etmopterus spinax	4.05	135	0.64	
Raja confundens	3.60	90	0.57	
Xenodermichthys copei	2.47	202	0.39	
Chaceon maritae, male	1.88	8	0.30	
Nezumia aequalis	1.80	22	0.28	
Plesiopenaeus edwardsianus	1.12	45	0.18	
Starfish	1.12	45	0.18	
Bathyroconger vicinus	0.90	90	0.14	
Chauliodus sloani	0.67	45	0.11	
Munidopsis sp.	0.45	337	0.07	
Triplophos hemingi	0.45	45	0.07	
Nemichthys scolopaceus	0.45	45	0.07	
Caristius maderensis	0.45	45	0.07	
Stereomastis sp.	0.22	67	0.04	
Crujeiraja sp.	0.22	22	0.04	
Total	633.63		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 115
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°5.74
 start stop duration Lon E 12°52.89
 TIME :02:43:54 03:14:29 30.6 (min) Purpose : 3
 LOG : 2877.00 2878.50 1.5 Region : 4040
 FDEPTH: 316 321 Gear cond.: 0
 BDEPTH: 316 321 Validity : 0
 Towing dir: 0° Wire out : 800 m Speed : 3.0 kn
 Sorted : 31 Total catch: 735.87 Catch/hour: 1443.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	971.61	3154	67.32	
Merluccius polli	126.63	377	8.77	
Laemonema laureysi	108.27	1271	7.50	
Pontinus accraensis	57.90	518	4.01	
Hoplostethus atlanticus	33.48	47	2.32	
Parapenaeus longirostris	25.42	3483	1.76	
Malacocephalus laevis	22.12	188	1.53	
Nezumia aequalis	18.83	565	1.30	
Trichiurus lepturus	17.89	47	1.24	
Aristeus varidens, female	10.83	659	0.75	
Aristeus varidens, male	9.41	1271	0.65	
Pterothrissus bellocci	9.41	47	0.65	
Bathymectes piperitus	8.94	235	0.62	
Dibranchius atlanticus	5.65	377	0.39	
Gadella imberbis	5.18	188	0.36	
Synagrops microlepis	5.18	188	0.36	
Bembrops heterurus	3.30	94	0.23	
Hymenocephalus italicus	2.35	377	0.16	
Chaunax pictus	0.94	47	0.07	
Total	1443.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 116
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°5.82
 start stop duration Lon E 12°59.94
 TIME :05:25:38 05:55:57 30.3 (min) Purpose : 3
 LOG : 2890.37 2892.00 1.6 Region : 4040
 FDEPTH: 106 106 Gear cond.: 0
 BDEPTH: 106 106 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.2 kn
 Sorted : 81 Total catch: 276.94 Catch/hour: 548.03

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	414.46	3451	75.63	154
Lagocephalus laevigatus	28.12	67	5.13	
Trigla lyra	16.96	141	3.09	
Sarda sarda	15.95	6	2.91	
Selene dorsalis	15.95	47	2.91	
Dentex angolensis	11.10	168	2.03	156
Trachurus trecae	10.37	182	1.89	155
Dentex congoensis	6.73	121	1.23	
Sepia orbignyana	6.53	34	1.19	
Illex coindetii	4.10	162	0.75	
Ariomma bondi	3.90	47	0.71	
Pagellus bellottii	3.50	34	0.64	
Sardinella aurita	2.83	14	0.52	
Alloteuthis africana	2.63	835	0.48	
Zeus faber	1.62	6	0.30	
Sardinella maderensis	1.62	6	0.30	
Citharus linguatula	0.93	53	0.17	
Scorpaena normani	0.67	6	0.12	
Saurida brasiliensis	0.06	28	0.01	
Total	548.03		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 117
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°2.71
 start stop duration Lon E 13°5.79
 TIME :07:15:16 07:45:21 30.1 (min) Purpose : 3
 LOG : 2900.27 2901.89 1.6 Region : 4040
 FDEPTH: 86 87 Gear cond.: 0
 BDEPTH: 86 87 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.2 kn
 Sorted : 63 Total catch: 63.17 Catch/hour: 126.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	40.94	387	32.48	
Lagocephalus laevigatus	33.52	42	26.59	
Alloteuthis africana	14.69	4242	11.65	
Dentex angolensis	8.10	118	6.43	157
Pseudupeneus prayensis	6.19	54	4.91	
Fistularia petimba	4.39	10	3.48	
Trichiurus lepturus	3.89	4	3.09	
Pagellus bellottii	3.21	52	2.55	159
Zeus faber	2.85	8	2.26	
Trachurus trecae	1.66	82	1.31	158
Euthymnus alletteratus	1.50	2	1.19	
Illex coindetii	1.22	30	0.97	
Dentex congoensis	1.02	20	0.81	
Torpedo torpedo	0.86	2	0.68	
Citharus linguatula	0.58	18	0.46	
Chelidoniichthys gabonensis	0.54	4	0.43	
Dentex barnardi	0.36	2	0.28	
Bembrops greyi	0.14	2	0.11	
Boops boops	0.12	16	0.09	
Blennius normani	0.10	4	0.08	
Saurida brasiliensis	0.08	6	0.06	
Sepia orbignyana	0.06	2	0.05	
Ariomma bondi	0.04	14	0.03	
Total	126.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 118
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°59.65
 start stop duration Lon E 13°9.34
 TIME :08:45:34 09:15:47 30.2 (min) Purpose : 3
 LOG : 2907.98 2909.73 1.8 Region : 4040
 FDEPTH: 62 61 Gear cond.: 0
 BDEPTH: 62 61 Validity : 0
 Towing dir: 0° Wire out : 170 m Speed : 3.5 kn
 Sorted : 104 Total catch: 386.16 Catch/hour: 766.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	363.22	3166	47.39	
Lagocephalus laevigatus	143.50	212	18.72	
Pagellus bellottii	125.58	1373	16.38	160
Trachurus trecae	60.14	389	7.85	161
Pomadasys incisus	20.05	87	2.62	
Raja miraletus	17.98	22	2.35	
Pseudupeneus prayensis	10.78	81	1.41	
Sphyrna sphyraena	10.34	44	1.35	
Alloteuthis africana	5.93	1352	0.77	
Zeus faber	5.87	14	0.77	
Sardinella maderensis	1.91	8	0.25	
Decapterus punctatus	0.65	30	0.09	
Citharus linguatula	0.22	8	0.03	
Boops boops	0.15	14	0.02	
Saurida brasiliensis	0.15	30	0.02	
Total	766.46		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 119
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 9°59.62
 start stop duration Lon E 13°12.79
 TIME :10:04:06 10:34:48 30.7 (min) Purpose : 3
 LOG : 2914.53 2916.33 1.8 Region : 4040
 FDEPTH: 36 36 Gear cond.: 0
 BDEPTH: 36 36 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.5 kn
 Sorted : 159 Total catch: 542.03 Catch/hour: 1059.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	507.26	6025	47.88	162
Galeoides decadactylus	120.61	518	11.38	
Lagocephalus laevigatus	113.88	410	10.75	
Sphyrna sphyraena	66.51	365	6.28	
Selene dorsalis	49.84	1063	4.70	
Pomadasys jubelini	49.84	119	4.70	
Pseudotolithus senegalensis	37.74	45	3.56	
Chloroscombrus chrysurus	25.58	291	2.41	
Ephippion guttifer	16.34	14	1.54	
Gymnura altavela	11.22	6	1.06	
Rhinobatos albomaculatus	10.55	6	1.00	
Trichiurus lepturus	10.30	20	0.97	
Pagellus bellottii	8.31	39	0.78	
Sardinella aurita	6.10	39	0.58	
Syacium micrurus	5.77	39	0.54	
Trachurus trecae	4.98	33	0.47	
Sardinella maderensis	3.44	39	0.32	
Trachinotus ovatus	2.44	14	0.23	
Ilisha africana	2.33	25	0.22	
Pomadasys incisus	2.05	12	0.19	
Scomberomorus tritor	2.01	2	0.19	
Pseudupeneus prayensis	1.19	6	0.11	
Dentex barnardi	0.66	6	0.06	
Dicologlossa cuneata	0.39	6	0.04	
Total	1059.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 120
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°6.14
 start stop duration Lon E 13°19.73
 TIME :11:49:27 12:17:27 28.0 (min) Purpose : 3
 LOG : 2925.44 2926.85 1.4 Region : 4040
 FDEPTH: 22 23 Gear cond.: 0
 BDEPTH: 22 23 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.0 kn
 Sorted : 121 Total catch: 391.62 Catch/hour: 839.49

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	479.59	8785	57.13	163
Pseudotolithus senegalensis	94.04	493	11.20	
Gymnura altavela	73.57	6	8.76	
Ilisha africana	53.57	892	6.38	
Galeoides decadactylus	33.57	174	4.00	
Sphyrna sphyraena	29.26	334	3.49	
Pteroscion peli	26.47	939	3.15	
Pomadasys incisus	13.16	118	1.57	
Pomadasys jubelini	10.03	34	1.20	
Raja miraletus	4.93	6	0.59	
Stromateus fiatola	4.31	6	0.51	
Cynoglossus browni	3.82	6	0.45	
Chaetodipterus goreensis	2.70	21	0.32	
Selene dorsalis	2.70	307	0.32	
Chloroscombrus chrysurus	2.64	28	0.31	
Trichiurus lepturus	2.42	21	0.29	
Rhinobatos albomaculatus	2.02	6	0.24	
Dicologlossa cuneata	0.41	6	0.05	
Sardinella maderensis	0.28	21	0.03	
Total	839.49		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 121
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°8.08
 start stop duration Lon E 13°13.54
 TIME :01:24:43 01:54:05 29.4 (min) Purpose : 3
 LOG : 2934.81 2936.14 1.3 Region : 4040
 FDEPTH: 63 61 Gear cond.: 0
 BDEPTH: 63 61 Validity : 0
 Towing dir: 0° Wire out : 170 m Speed : 2.7 kn
 Sorted : 116 Total catch: 116.28 Catch/hour: 237.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudupeneus prayensis	78.57	729	33.08	
Pomadasys incisus	54.79	308	23.07	
Pagellus bellottii	19.04	272	8.02	164
Brachydeuterus auritus	16.14	172	6.79	165
Selene dorsalis	13.69	131	5.76	
Raja miraletus	13.12	18	5.52	
Dentex barnardi	8.78	98	3.70	
Lagocephalus laevigatus	4.86	6	2.05	
Sphyræna sphyraena	4.33	6	1.82	
Boops boops	3.60	523	1.51	
Alloteuthis africana	3.33	848	1.40	
Dasyatis margarita	2.06	2	0.87	
Fistularia tabacaria	1.98	2	0.83	
Fistularia petimba	1.92	2	0.81	
Umbrina canariensis	1.74	12	0.73	
Scorpaena stephanica	1.63	27	0.69	
Trichiurus lepturus	1.59	8	0.67	
Zeus faber	1.57	2	0.66	
Decapterus rhonchus	1.41	61	0.59	
Chaetodon hoefleri	0.63	4	0.27	
Serranus accraensis	0.61	6	0.26	
Dentex angolensis	0.55	4	0.23	
Chelidichthys capensis	0.45	2	0.19	
Saurida brasiliensis	0.35	86	0.15	
Trachurus trecae	0.29	4	0.12	
Ilisha africana	0.25	4	0.10	
Grammolites gruvelli	0.22	4	0.09	
Citharus linguatula	0.04	4	0.02	
Total	237.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 122
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°15.15
 start stop duration Lon E 13°10.16
 TIME :03:05:40 03:36:16 30.6 (min) Purpose : 3
 LOG : 2945.76 2947.39 1.6 Region : 4040
 FDEPTH: 98 97 Gear cond.: 0
 BDEPTH: 98 97 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.2 kn
 Sorted : 76 Total catch: 75.77 Catch/hour: 148.57

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	53.33	392	35.90	
Dentex angolensis	31.73	349	21.35	167
Raja miraletus	14.22	24	9.57	
Pagellus bellottii	10.47	137	7.05	166
Squatina oculata	9.88	4	6.65	
Zeus faber	7.43	16	5.00	
Alloteuthis africana	5.78	3625	3.89	
Sepia sp	5.06	10	3.41	
Lagocephalus laevigatus	2.10	16	1.41	
Rhinobatos albomaculatus	2.08	2	1.40	
Torpedo nobiliana	2.02	2	1.36	
Scorpaena normani	1.35	20	0.91	
Pomadasys incisus	0.84	6	0.57	
Citharus linguatula	0.76	24	0.51	
Dentex barnardi	0.69	4	0.46	
Trachurus trecae	0.67	35	0.45	168
Dicologlossa hexophthalma	0.16	2	0.11	
Total	148.57		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 123
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°23.54
 start stop duration Lon E 13°4.47
 TIME :04:59:04 05:31:35 32.5 (min) Purpose : 3
 LOG : 2958.36 2960.04 1.7 Region : 4040
 FDEPTH: 187 183 Gear cond.: 0
 BDEPTH: 187 183 Validity : 0
 Towing dir: 0° Wire out : 460 m Speed : 3.1 kn
 Sorted : 28 Total catch: 317.45 Catch/hour: 585.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	418.89	57497	71.50	
Protula barbata	34.11	37	5.82	
Lagocephalus laevigatus	21.89	54	3.74	
Dentex angolensis	18.53	57	3.16	169
Raja alba	17.37	18	2.96	
Uranoscopus cadenati	13.57	54	2.32	
Raja miraletus	12.29	18	2.10	
Pterothrissus belloci	7.77	37	1.33	
Trichiurus lepturus	7.60	13	1.30	
Bembrops heterurus	5.80	54	0.99	
Erythrocles monodi	5.61	7	0.96	
Zenopsis conchifer	4.06	2	0.69	
Dentex macrophthalmus	3.43	37	0.59	
Bathyrcongus vicinus	3.25	18	0.55	
Malacocephalus laevis	1.99	18	0.34	
Illex coindetii	1.99	37	0.34	
Conger conger	1.62	72	0.28	
Mystriophis rostellatus	1.55	7	0.26	
Miracorvina angolensis	1.29	2	0.22	
S H R I M P S	1.09	469	0.19	
Citharus linguatula	1.09	18	0.19	
Parasudis fraser-bruenneri	0.72	343	0.12	
Solenocera africana	0.37	162	0.06	
Total	585.88		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 124
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°26.20
 start stop duration Lon E 12°59.56
 TIME :07:24:58 07:55:04 30.1 (min) Purpose : 3
 LOG : 2968.19 2969.64 1.5 Region : 4040
 FDEPTH: 459 464 Gear cond.: 0
 BDEPTH: 459 464 Validity : 0
 Towing dir: 0° Wire out : 900 m Speed : 2.9 kn
 Sorted : 31 Total catch: 186.10 Catch/hour: 370.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	145.44	29089	39.20	
Laemonema laureysi	38.39	323	10.35	
Chaunax pictus	25.89	393	6.98	
Dibranchius atlanticus	24.98	1652	6.73	
Lophiodes kempii	16.88	12	4.55	
Hoplostethus cadenati	16.29	578	4.39	
Chaceon maritae, female	13.81	58	3.72	
Merluccius polli	12.72	12	3.43	
Aristeus varidens, female	12.72	706	3.43	
Lamprogrammus exutus	11.44	82	3.08	
Narrella blackfordi	8.21	255	2.21	
Stomias boa boa	7.97	185	2.15	
B I V A L V E S	6.94	24	1.87	
Gadella imberbis	5.78	243	1.56	
Benthodesmus tenuis	4.96	173	1.34	
Aristeus varidens, male	4.84	636	1.31	
Chaceon maritae, male	3.55	8	0.96	
Malacocephalus laevis	2.07	12	0.56	
Chlorophthalmus atlanticus	1.85	46	0.50	
Bassanago albescens	1.40	24	0.38	
Scyliorhinus cervigoni	1.02	4	0.27	
Coelorinchus braueri	0.92	24	0.25	
Bathynectes piperitus	0.70	12	0.19	
Xenodermichthys copei	0.58	88	0.16	
Etmopterus polli	0.58	12	0.16	
Stereomastis sp.	0.46	70	0.12	
Triplophos hemingi	0.34	34	0.09	
Hymenocephalus italicus	0.24	12	0.06	
Total	370.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 125
 DATE :02/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°23.76
 start stop duration Lon E 12°55.17
 TIME :09:32:40 10:03:02 30.4 (min) Purpose : 3
 LOG : 2976.61 2978.07 1.5 Region : 4040
 FDEPTH: 575 572 Gear cond.: 0
 BDEPTH: 575 572 Validity : 0
 Towing dir: 0° Wire out : 0 m Speed : 2.9 kn
 Sorted : 33 Total catch: 166.71 Catch/hour: 329.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	139.28	29891	42.29	
Chaceon maritae, female	76.46	336	23.21	
Lamprogrammus exutus	36.15	454	10.98	
Hoplostethus cadenati	13.73	533	4.17	
MELANONIDAE	13.04	296	3.96	
Dibranchius atlanticus	11.06	840	3.36	
Stereomastis sp.	5.93	721	1.80	
Aristeus varidens, female	5.43	306	1.65	
Gadella imberbis	4.35	79	1.32	
Yarrella blackfordi	3.65	109	1.11	
Benthodesmus tenuis	3.06	109	0.93	
Bathyroconger vicinus	2.77	109	0.84	
Nezumia aequalis	2.37	99	0.72	
Chaceon maritae, male	2.07	10	0.63	
Aristeus varidens, male	1.98	257	0.60	
Laemonema laureysi	1.68	20	0.51	
BYTHIIDEAE	1.58	10	0.48	
Etmopterus polli	1.01	20	0.31	
Chaunax pictus	0.89	20	0.27	
Triplophos hemingi	0.59	69	0.18	
Halosaurus rostratus	0.59	20	0.18	
Chlorophthalmus atlanticus	0.59	10	0.18	
Gadella sp.	0.30	59	0.09	
Nemichthys scolopaceus	0.30	10	0.09	
Xenodermichthys copei	0.20	10	0.06	
Phrynichthys wedli	0.20	59	0.06	
Raja confundens	0.10	20	0.03	
Total	329.36		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 126
 DATE :03/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°40.71
 start stop duration Lon E 13°6.47
 TIME :01:04:54 01:34:32 29.6 (min) Purpose : 3
 LOG : 2997.76 2999.26 1.5 Region : 4040
 FDEPTH: 714 700 Gear cond.: 0
 BDEPTH: 714 700 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 3.0 kn
 Sorted : 10 Total catch: 10.44 Catch/hour: 21.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MELANONIDAE	10.43	196	49.33	
Dibranchius atlanticus	2.73	184	12.93	
Aequorea forskalea	1.82	16	8.62	
Triplophos hemingi	1.46	166	6.90	
Raja confundens	1.21	2	5.75	
Yarrella blackfordi	1.11	65	5.27	
Stereomastis sp.	0.67	77	3.16	
Photonectes braueri	0.32	32	1.53	
Benthodesmus tenuis	0.32	14	1.53	
Lamprogrammus exutus	0.30	6	1.44	
Nemichthys scolopaceus	0.12	8	0.57	
Synagrops bellus	0.10	12	0.48	
Talismania longifilis	0.10	4	0.48	
Macroparalepis affinis	0.08	2	0.38	
Photichthys argenteus	0.06	2	0.29	
Xenodermichthys copei	0.06	6	0.29	
Phrynichthys wedli	0.06	2	0.29	
Gadella imberbis	0.04	2	0.19	
PARALEPIDIDAE	0.04	2	0.19	
Aristeus varidens	0.04	20	0.19	
Cubiceps sp.	0.02	2	0.10	
Caristius maderensis	0.02	2	0.10	
Total	21.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 127
 DATE :03/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°40.10
 start stop duration Lon E 13°9.80
 TIME :03:07:40 03:39:05 31.4 (min) Purpose : 3
 LOG : 3004.96 3006.45 1.5 Region : 4040
 FDEPTH: 492 491 Gear cond.: 0
 BDEPTH: 492 491 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 2.8 kn
 Sorted : 29 Total catch: 251.14 Catch/hour: 479.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lamprogrammus exutus	176.33	8679	36.77	
Nematocarcinus africanus	154.87	48380	32.29	
Chaceon maritae, female	56.37	223	11.75	
Hoplostethus cadenati	22.34	655	4.66	
Aristeus varidens, female	15.47	791	3.23	
Gadella imberbis	11.00	481	2.29	
Laemonema laureysi	9.11	447	1.90	
MELANOSTOMIATIDAE	9.11	206	1.90	
Yarrella blackfordi	7.56	223	1.58	
Aristeus varidens, male	3.95	602	0.82	
Bathyroconger vicinus	2.58	223	0.54	
Benthodesmus tenuis	1.60	103	0.33	
Chaunax pictus	1.37	52	0.29	
Stereomastis sp.	1.37	241	0.29	
Dibranchius atlanticus	1.20	120	0.25	
Ariomma bondi	1.03	17	0.22	
Xenodermichthys copei	1.03	241	0.22	
Aristaeomorpha foliacea	1.03	120	0.22	
Lophius vailanti	0.86	17	0.18	
Halosaurus ovenii	0.52	17	0.11	
Photonectes braueri	0.34	17	0.07	
Phrynichthys wedli	0.17	17	0.04	
Buglossidium sp.	0.17	17	0.04	
Hymenocephalus italicus	0.17	52	0.04	
Total	479.58		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 128
 DATE :03/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°36.63
 start stop duration Lon E 13°10.04
 TIME :04:42:11 05:12:50 30.7 (min) Purpose : 3
 LOG : 3011.12 3012.87 1.8 Region : 4040
 FDEPTH: 333 323 Gear cond.: 0
 BDEPTH: 333 323 Validity : 0
 Towing dir: 0° Wire out : 820 m Speed : 3.4 kn
 Sorted : 31 Total catch: 241.39 Catch/hour: 472.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	233.60	4414	49.43	
Merluccius polli	151.15	1243	31.99	170
Synagrops microlepis	20.46	5755	4.33	
Laemonema laureysi	20.26	258	4.29	
Parapanaeus longirostris, femal	13.33	724	2.82	
Pontinus accraensis	12.69	145	2.68	
Munidopsis sp.	5.07	889	1.07	
Heptranchias perlo	4.46	2	0.94	
Parapanaeus longirostris, male	4.13	2326	0.87	
Gadella imberbis	3.93	166	0.83	
Chaceon maritae	1.51	6	0.32	
MYCTOPHIDAE	1.04	744	0.22	
Coelorinchus sp.	0.31	10	0.07	
Bembrops heterurus	0.22	10	0.05	
Setarches guentheri	0.10	10	0.02	
Bathynectes piperitus	0.10	10	0.02	
Hymenocephalus italicus	0.10	22	0.02	
Solenocera africana	0.10	10	0.02	
Total	472.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 129
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°34.61
 start stop duration Lon E 13°14.10
 TIME :06:36:40 07:02:03 25.4 (min) Purpose : 3
 LOG : 3018.77 3020.11 1.3 Region : 4040
 FDEPTH: 132 131 Gear cond.: 0
 BDEPTH: 132 131 Validity : 0
 Towing dir: 0° Wire out : 330 m Speed : 3.2 kn
 Sorted : 57 Total catch: 57.00 Catch/hour: 134.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	110.22	454	81.82	171
Lagocephalus laevigatus	5.72	9	4.25	
Zeus faber	3.07	7	2.28	
Pterothrissus belloci	2.24	12	1.67	
Torpedo torpedo	1.99	2	1.47	
Sepia orbignyana	1.99	17	1.47	
Trigla lyra	1.77	19	1.32	
Octopus vulgaris	1.51	2	1.12	
Illex coindetii	1.47	45	1.09	
Dentex barnardi	1.18	5	0.88	
Monoleme microstoma	0.95	28	0.70	
Citharus linguatula	0.50	12	0.37	
Peristedion cataphractum	0.50	9	0.37	
Boops boops	0.45	14	0.33	
Dentex macrophthalmus	0.43	5	0.32	
Dentex congensis	0.40	2	0.30	
Pagellus bellottii	0.33	2	0.25	
Total	134.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 130
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°31.07
 start stop duration Lon E 13°20.99
 TIME :08:19:41 08:51:55 32.2 (min) Purpose : 3
 LOG : 3029.53 3031.20 1.7 Region : 4040
 FDEPTH: 95 96 Gear cond.: 0
 BDEPTH: 95 96 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.1 kn
 Sorted : 37 Total catch: 36.96 Catch/hour: 68.81

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	17.87	145	25.97	
Raja miraletus	9.36	15	13.61	
Alloteuthis africana	7.61	2833	11.07	
Lagocephalus laevigatus	6.93	6	10.06	
Zeus faber	6.59	26	9.58	
Dentex angolensis	5.34	67	7.77	172
Torpedo torpedo	4.43	7	6.44	
Sepia orbignyana	2.55	6	3.71	
Pagellus bellottii	2.31	4	3.35	
Fistularia petimba	1.34	4	1.95	
Trichiurus lepturus	1.04	2	1.52	
Euthymnus alletteratus	0.89	2	1.30	
Octopus vulgaris	0.74	2	1.08	
Citharus linguatula	0.54	34	0.78	
Scorpaena normani	0.39	4	0.57	
Dentex barnardi	0.35	2	0.51	
Saurida brasiliensis	0.30	0	0.43	
Illex coindetii	0.09	2	0.14	
Blemnius normani	0.09	2	0.14	
Ariomma bondi	0.02	4	0.03	
Total	68.81		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 131
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°29.34
 start stop duration Lon E 13°27.78
 TIME :09:54:31 10:24:26 29.9 (min) Purpose : 3
 LOG : 3038.67 3040.07 1.4 Region : 4040
 FDEPTH: 54 51 Gear cond.: 0
 BDEPTH: 54 51 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 2.8 kn
 Sorted : 189 Total catch: 189.49 Catch/hour: 379.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasys jubelini	255.50	395	67.24	
Raja miraletus	46.93	70	12.35	
Lagocephalus laevigatus	17.25	20	4.54	
Caranx crysos	14.52	4	3.82	
Pagellus bellottii	12.73	86	3.35	173
Alloteuthis africana	10.43	25	2.74	
Dentex barnardi	9.49	50	2.50	
Sphyraena guachancho	5.59	10	1.47	
Alectis alexandrina	2.01	2	0.53	
Brachydeuterus auritus	1.80	766	0.47	
Epinephelus costae	1.30	2	0.34	
Pseudupeneus prayensis	0.94	14	0.25	
Chilomycterus spinosus mauret.	0.74	4	0.20	
Chaetodon hoefleri	0.34	2	0.09	
Fistularia petimba	0.22	2	0.06	
Syacium micrurum	0.18	2	0.05	
Cephalopholis nigri	0.02	2	0.01	
Total	379.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 132
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°26.65
 start stop duration Lon E 13°30.96
 TIME :11:08:21 11:39:27 31.0 (min) Purpose : 3
 LOG : 3044.62 3046.15 1.5 Region : 4040
 FDEPTH: 30 31 Gear cond.: 0
 BDEPTH: 30 31 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 2.9 kn
 Sorted : 109 Total catch: 108.82 Catch/hour: 210.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrina	110.75	190	52.58	
Drepane africana	25.32	52	12.02	
Rhinobatos albomaculatus	24.00	17	11.39	
Caranx crysos	12.89	27	6.12	
Raja miraletus	12.02	17	5.71	
Sphyraena guachancho	8.94	27	4.25	
Arius heudelotii	5.57	14	2.65	
Stromateus fiatola	4.08	8	1.94	
Dasyatis margarita	2.96	2	1.41	
Trachinotus goreensis	1.63	4	0.77	
Epinephelus aeneus	0.64	2	0.30	
Dasyatis marmorata	0.54	2	0.26	
Syacium micrurum	0.46	4	0.22	
Sardinella aurita	0.41	2	0.19	
Lagocephalus laevigatus	0.41	2	0.19	
Total	210.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 133
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°37.31
 start stop duration Lon E 13°39.93
 TIME :01:05:35 01:30:11 24.6 (min) Purpose : 3
 LOG : 3058.55 3059.87 1.3 Region : 4040
 FDEPTH: 31 30 Gear cond.: 0
 BDEPTH: 31 30 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn
 Sorted : 70 Total catch: 199.68 Catch/hour: 487.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	135.25	966	27.76	
Alectis alexandrina	110.56	112	22.69	
Stromateus fiatola	67.71	205	13.90	
Chloroscombrus chrysurus	39.16	276	8.04	
Sphyraena guachancho	26.74	83	5.49	
Lagocephalus laevigatus	19.52	44	4.01	
Ephippion guttifer	12.83	12	2.63	
Sepia orbignyana	12.49	17	2.56	
Galeoides decadactylus	12.40	151	2.54	
Arius heudelotii	10.81	29	2.22	
Dasyatis margarita	10.20	5	2.09	
Selene dorsalis	7.86	156	1.61	
Caranx crysos	6.66	17	1.37	
Sardinella maderensis	6.39	298	1.31	
Raja miraletus	5.49	12	1.13	
Dasyatis marmorata	1.68	5	0.35	
Trichiurus lepturus	1.12	12	0.23	
Dicologlossa cuneata	0.34	5	0.07	
Total	487.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 134
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°43.45
 start stop duration Lon E 13°31.24
 TIME :02:56:05 03:26:51 30.8 (min) Purpose : 3
 LOG : 3071.72 3073.26 1.5 Region : 4040
 FDEPTH: 92 91 Gear cond.: 0
 BDEPTH: 92 91 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
 Sorted : 66 Total catch: 65.95 Catch/hour: 128.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	32.84	250	25.53	175
Trachurus trecae	13.69	287	10.64	174
Zeus faber	12.56	33	9.76	
Scorpaena normani	10.26	101	7.98	
Citharus linguatula	9.91	156	7.70	
Dentex barnardi	7.74	39	6.02	
Octopus vulgaris	4.99	6	3.88	
Trigla lyra	4.27	25	3.32	
Brotula barbata	4.17	4	3.24	
Raja miraletus	4.17	6	3.24	
Alloteuthis africana	3.72	1823	2.90	
Lagocephalus laevigatus	3.22	10	2.50	
Umbra canariensis	3.14	6	2.44	
Sepia orbignyana	2.91	4	2.26	
Uranoscopus albesca	2.26	6	1.76	
Chloroscombrus chrysurus	2.11	16	1.64	
Torpedo torpedo	1.74	4	1.35	
Pekistiedion cataphractum	1.31	4	1.02	
Saurida brasiliensis	0.92	174	0.71	
Arius heudelotii	0.84	2	0.65	
Branchiostegus semifasciatus *	0.84	8	0.65	
Brachydeuterus auritus	0.41	4	0.32	
Illex coindetii	0.10	4	0.08	
Trichiurus lepturus	0.08	2	0.06	
Total	128.60		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 135
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°46.36
 start stop duration Lon E 13°23.70
 TIME :04:42:12 05:12:17 30.1 (min) Purpose : 3
 LOG : 3082.90 3084.35 1.5 Region : 4040
 FDEPTH: 146 153 Gear cond.: 0
 BDEPTH: 146 153 Validity : 0
 Towing dir: 0° Wire out : 400 m Speed : 2.9 kn
 Sorted : 55 Total catch: 166.70 Catch/hour: 332.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	150.63	20209	45.31	
Trichiurus lepturus	86.98	1019	26.17	
MYCTOPHIDAE	21.28	10056	6.40	
Dentex angolensis	19.30	76	5.81	176
Brotula barbata	18.07	26	5.43	
Pterothrissus belloci	10.67	70	3.21	
Bembrops heterurus	5.36	74	1.61	
Illex coindetii	3.45	64	1.04	
Citharus linguatula	2.97	74	0.89	
Sepia orbignyana	1.91	16	0.58	
Zeus faber	1.85	6	0.56	
Miracorvina angolensis	1.44	6	0.43	
Monoleme microstoma	1.28	54	0.38	
Chlorophthalmus atlanticus	1.22	610	0.37	
Dentex macrophthalmus	1.22	10	0.37	
Trigla lyra	1.18	10	0.35	
Pontinus accraensis	1.06	6	0.32	
Mystriophis rostellatus	0.80	2	0.24	
Umbra canariensis	0.58	2	0.17	
Physiculus capensis	0.42	10	0.13	
Zenopsis conchifer	0.42	6	0.13	
Parapanaeus longirostris	0.22	160	0.07	
Saurida brasiliensis	0.06	6	0.02	
GOBIIDAE	0.06	54	0.02	
Total	332.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 136
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°50.40
 start stop duration Lon E 13°21.49
 TIME :06:38:13 07:08:14 30.0 (min) Purpose : 3
 LOG : 3090.69 3092.17 1.5 Region : 4040
 FDEPTH: 343 342 Gear cond.: 0
 BDEPTH: 343 342 Validity : 0
 Towing dir: 0° Wire out : 750 m Speed : 3.0 kn
 Sorted : 61 Total catch: 188.60 Catch/hour: 376.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	182.52	1127	48.42	177
Laemonema laureysi	84.66	1451	22.46	
Nematocarcinus africanus	35.50	12202	9.42	
Parapenaeus longirostris, femal	14.51	2069	3.85	
Chlorophthalmus atlanticus	11.21	288	2.97	
Chaceon maritae, female	8.47	34	2.25	
Bassanago albescens	6.90	90	1.83	
Synagrops microlepis	6.24	216	1.65	
Trachipterus sp.	4.22	2	1.12	
Malacocephalus occidentalis	3.84	72	1.02	
Hoplostethus cadenati	3.84	108	1.02	
Hymenocephalus italicus	3.36	959	0.89	
Nezumia aequalis	3.00	78	0.80	
Epigonus telescopus	1.56	54	0.41	
Gadella imberbis	1.26	24	0.33	
Parapenaeus longirostris, male	1.08	192	0.29	
Mystriophis rostellatus	0.90	6	0.24	
Bathynectes piperitus	0.84	60	0.22	
Illex coindetii	0.72	6	0.19	
Aristeus varidens, male	0.60	78	0.16	
Benthodesmus tenuis	0.36	18	0.10	
Munidopsis sp.	0.36	102	0.10	
Scorpaena stephanica	0.30	6	0.08	
MYCTOPHIDAE	0.24	162	0.06	
Lophiodes kempii	0.18	6	0.05	
Chaunax pictus	0.12	18	0.03	
Aristeus varidens, female	0.12	6	0.03	
Solenocera africana	0.06	24	0.02	
Metal waste	0.00	2	0.00	
Total	376.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 137
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°50.49
 start stop duration Lon E 13°17.60
 TIME :08:39:37 09:10:41 31.1 (min) Purpose : 3
 LOG : 3098.38 3099.92 1.6 Region : 4040
 FDEPTH: 497 492 Gear cond.: 0
 BDEPTH: 497 492 Validity : 0
 Towing dir: 0° Wire out : 1000 m Speed : 3.0 kn
 Sorted : 27 Total catch: 102.67 Catch/hour: 198.27

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	134.02	35838	67.60	
Aristeus varidens, female	14.87	736	7.50	
Aristeus varidens, male	8.05	1091	4.06	
Chaceon maritae, female	7.57	25	3.82	
Lamprogrammus exultans	5.75	131	2.90	
Laemonema laureysi	5.41	541	2.73	
Stomias boa boa	4.87	139	2.45	
Hoplostethus cadenati	3.71	131	1.87	
Merluccius polli	3.24	4	1.64	
Chlorophthalmus atlanticus	2.84	75	1.43	
Yarrella blackfordi	1.31	42	0.66	
Malacocephalus laevis	1.18	14	0.59	
Todaropsis eblanae	0.75	6	0.38	
Gadella imberbis	0.75	19	0.38	
Halosaurus ovenii	0.75	27	0.38	
Triplophos hemingi	0.70	104	0.35	
Coelorinchus coelorhincus	0.70	6	0.35	
Plesiopenaeus edwardsianus	0.35	126	0.18	
Benthodesmus tenuis	0.35	19	0.18	
Photomectes braueri	0.27	14	0.14	
Xenodermichthys copei	0.19	27	0.10	
Stereomastis sp.	0.19	19	0.10	
MYCTOPHIDAE	0.14	75	0.07	
Lophiodes kempii	0.14	6	0.07	
Solenocera africana	0.06	14	0.03	
Dibranchius atlanticus	0.06	6	0.03	
BathYROconger vicinus	0.06	6	0.03	
WASTE00	0.00	2	0.00	
Total	198.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 138
 DATE :03/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°57.62
 start stop duration Lon E 13°24.72
 TIME :11:13:57 11:44:01 30.1 (min) Purpose : 3
 LOG : 3108.77 3110.29 1.5 Region : 4040
 FDEPTH: 530 512 Gear cond.: 0
 BDEPTH: 530 512 Validity : 0
 Towing dir: 0° Wire out : 1250 m Speed : 3.0 kn
 Sorted : 21 Total catch: 92.52 Catch/hour: 184.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	114.39	23172	61.97	
Chaceon maritae, female	22.51	82	12.19	
Merluccius polli	13.29	16	7.20	
Chlorophthalmus atlanticus	5.31	140	2.88	
Laemonema laureysi	5.31	210	2.88	
Aristeus varidens	4.19	439	2.27	
Etmopterus pusillus	2.86	14	1.55	
Neoharriotta pinnata	2.53	2	1.37	
Hoplostethus cadenati	2.51	168	1.36	
MELANONIDAE	2.37	62	1.29	
Chaceon maritae, male	2.02	6	1.09	
Yarrella blackfordi	1.96	76	1.06	
Triplophos hemingi	1.40	229	0.76	
Lophius vaillanti	1.18	6	0.64	
Malacocephalus laevis	0.62	6	0.34	
Chauliodon sloani	0.56	28	0.30	
Gadella imberbis	0.56	20	0.30	
Coelorinchus coelorhincus	0.42	6	0.23	
Stereomastis sp.	0.42	84	0.23	
BathYROconger vicinus	0.20	14	0.11	
Total	184.60		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 139
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°58.35
 start stop duration Lon E 13°27.92
 TIME :01:07:33 01:37:44 30.2 (min) Purpose : 3
 LOG : 3115.51 3117.01 1.5 Region : 4040
 FDEPTH: 369 377 Gear cond.: 0
 BDEPTH: 369 377 Validity : 0
 Towing dir: 0° Wire out : 940 m Speed : 3.0 kn
 Sorted : 28 Total catch: 253.71 Catch/hour: 504.23

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	169.21	49224	33.56	
Merluccius polli	133.79	197	26.53	
Laemonema laureysi	57.95	1395	11.49	
Hymenocephalus italicus	51.51	5652	10.22	
Chaunax pictus	33.98	2558	6.74	
BathYROconger vicinus	11.09	179	2.20	
Aristeus varidens, female	7.69	537	1.53	
Malacocephalus laevis	6.44	72	1.28	
Yarrella blackfordi	6.08	197	1.21	
Parapenaeus longirostris	4.83	805	0.96	
Chlorophthalmus atlanticus	4.65	107	0.92	
Hoplostethus cadenati	4.29	179	0.85	
Aristeus varidens, male	3.94	554	0.78	
Coelorinchus sp.	3.22	107	0.64	
Gadella imberbis	1.61	54	0.32	
Bathynectes piperitus	0.89	72	0.18	
Benthodesmus tenuis	0.72	54	0.14	
Triplophos hemingi	0.72	179	0.14	
Halosaurus rostratus	0.54	54	0.11	
Synagrops microlepis	0.36	18	0.07	
Etmopterus polli	0.18	72	0.04	
Nemichthys scolopaceus	0.18	72	0.04	
MELANONIDAE	0.18	18	0.04	
Lophius vaillanti	0.18	18	0.04	
Total	504.23		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 140
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°55.78
 start stop duration Lon E 13°35.52
 TIME :05:12:44 05:43:03 30.3 (min) Purpose : 3
 LOG : 3131.95 3133.52 1.6 Region : 4040
 FDEPTH: 116 115 Gear cond.: 0
 BDEPTH: 116 115 Validity : 0
 Towing dir: 0° Wire out : 285 m Speed : 3.1 kn
 Sorted : 66 Total catch: 236.34 Catch/hour: 467.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	151.27	528	32.34	
Brachydeuterus auritus	59.13	309	12.64	180
Pterothrissus bellocci	50.46	315	10.79	
Scorpaena normani	29.21	344	6.25	
Cynoponticus ferox	28.97	2	6.19	
Uranoscopus cadenati	26.48	166	5.66	
Dentex angolensis	26.16	150	5.59	178
Bembrops heterurus	17.16	196	3.67	
Citharus linguatula	13.30	303	2.84	
Pontinus accraensis	11.58	65	2.48	
Brotula barbata	10.29	10	2.20	
J E L L Y F I S H	8.25	202	1.76	
Sepia orbignyana	7.20	10	1.54	
Dentex macrophthalmus	4.75	47	1.02	179
Raja miraletus	4.27	6	0.91	
Trigla lyra	4.04	24	0.86	
Lagocephalus laevigatus	3.03	6	0.65	
Pagellus bellottii	2.32	24	0.50	
Trachurus trecae	2.08	42	0.44	
Synagrops microlepis	1.84	261	0.39	
Umbrina canariensis	1.78	6	0.38	
Alloteuthis africana	1.31	611	0.28	
Branchiostegus semifasciatus *	1.19	6	0.25	
Illex coindetii	0.83	12	0.18	
Parapenaeus longirostris	0.30	83	0.06	
GOBIIDAE	0.24	148	0.05	
Merluccius polli	0.18	6	0.04	
Dentex congoensis	0.10	2	0.02	
Total	467.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 141
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°54.68
 start stop duration Lon E 13°43.70
 TIME :07:04:18 07:34:33 30.3 (min) Purpose : 3
 LOG : 3142.92 3144.56 1.6 Region : 4040
 FDEPTH: 52 51 Gear cond.: 0
 BDEPTH: 52 51 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.2 kn
 Sorted : 115 Total catch: 314.96 Catch/hour: 624.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	213.38	13805	34.16	182
Trichiurus lepturus	178.91	920	28.64	
Trachurus trecae	54.64	486	8.75	181
Galeoides decadactylus	38.12	141	6.10	
Pagellus bellottii	37.53	256	6.01	184
Pomadasys incisus	17.93	115	2.87	
Umbrina canariensis	15.05	125	2.41	183
Raja miraletus	14.44	22	2.31	
Torpedo torpedo	9.54	10	1.53	
Alectis alexandrina	6.98	10	1.12	
Scomberomorus tritor	5.99	4	0.96	
Chloroscombrus chrysurus	5.61	38	0.90	
Selene dorsalis	5.24	71	0.84	
Lagocephalus laevigatus	4.96	4	0.79	
Sphyræna sphyraena	3.81	16	0.61	
Caranx crysos	3.59	4	0.57	
Dentex barnardi	2.72	16	0.43	
Citharus linguatula	2.50	71	0.40	
Sepia orbignyana	0.97	10	0.16	
Sardinella maderensis	0.81	4	0.13	
Trigla sp.	0.65	4	0.10	
Bembrops greyi	0.44	4	0.07	
Dicologlossa cuneata	0.38	4	0.06	
Pseudupeneus prayensis	0.26	4	0.04	
GOBIIDAE	0.16	28	0.03	
Antennarius occidentalis	0.10	4	0.02	
Total	624.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 142
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 10°53.79
 start stop duration Lon E 13°47.36
 TIME :08:23:53 08:54:40 30.8 (min) Purpose : 3
 LOG : 3149.30 3151.08 1.8 Region : 4040
 FDEPTH: 32 30 Gear cond.: 0
 BDEPTH: 32 30 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.5 kn
 Sorted : 204 Total catch: 1352.52 Catch/hour: 2635.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1506.61	23328	57.16	186
Trachurus trecae	301.31	904	11.43	185
Pteroscion peli	199.08	3184	7.55	
Galeoides decadactylus	123.66	1072	4.69	
Dicologlossa cuneata	92.50	1826	3.51	
Pseudotolithus senegalensis	87.48	300	3.32	
Ilisha africana	59.98	988	2.28	
Trichiurus lepturus	57.64	286	2.19	
Torpedo marmorata	46.57	51	1.77	
Pomadasys jubelini	46.24	49	1.75	
Stromateus fiatola	33.17	134	1.26	
Scomberomorus tritor	27.15	33	1.03	
Raja miraletus	13.41	33	0.51	
Selene dorsalis	12.06	653	0.46	
Sphyræna guachancho	7.87	16	0.30	
Sepia orbignyana	6.86	234	0.26	
Panaeus notialis	4.19	51	0.16	
Lagocephalus laevigatus	3.51	117	0.13	
Pomadasys incisus	3.35	33	0.13	
Chloroscombrus chrysurus	1.50	16	0.06	
Bembrops greyi	0.84	16	0.03	
Antennarius sp.	0.66	16	0.03	
Total	2635.63		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 143
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°14.46
 start stop duration Lon E 13°45.73
 TIME :11:16:19 11:36:49 20.5 (min) Purpose : 3
 LOG : 3171.00 3172.23 1.2 Region : 4040
 FDEPTH: 26 25 Gear cond.: 0
 BDEPTH: 26 25 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.6 kn
 Sorted : 46 Total catch: 45.51 Catch/hour: 133.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrina	48.59	53	36.48	
Sardinella maderensis	22.13	1510	16.61	
Trachurus trecae	8.90	59	6.68	187
Trachinotus goreensis	8.87	20	6.66	
Lithognathus mormyrus	8.81	15	6.61	
Pagellus bellottii	8.31	35	6.24	
Ephippion guttifer	6.85	6	5.14	
Chloroscombrus chrysurus	3.80	18	2.86	
Rhinobatos albomaculatus	3.37	3	2.53	
Balistes capricus	3.13	6	2.35	
Sphyræna guachancho	2.58	38	1.93	
Sepia orbignyana	1.73	3	1.30	
Chilomycterus spinosus mauret.	1.38	3	1.03	
Dicologlossa cuneata	1.23	23	0.92	
Eucinostomus melanopterus	0.79	6	0.59	
Galeoides decadactylus	0.76	6	0.57	
Lagocephalus laevigatus	0.73	3	0.55	
Aluterus heudelotii	0.64	3	0.48	
Raja miraletus	0.38	3	0.29	
Pseudupeneus prayensis	0.23	3	0.18	
Total	133.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 144
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°14.69
 start stop duration Lon E 13°42.39
 TIME :12:17:09 12:47:40 30.5 (min) Purpose : 3
 LOG : 3175.99 3177.69 1.7 Region : 4040
 FDEPTH: 22 23 Gear cond.: 0
 BDEPTH: 22 23 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.3 kn
 Sorted : 30 Total catch: 30.46 Catch/hour: 59.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Balistes capricus	46.27	85	77.22	
Sepia orbignyana	6.33	12	10.57	
Dasyatis margarita	1.73	2	2.89	
Raja miraletus	1.44	2	2.40	
Xyrichtys novacula	1.04	8	1.74	
Chilomycterus spinosus mauret.	0.98	4	1.64	
Trachinocephalus myops	0.59	2	0.98	
Vanstraelenia chirophthalmus	0.49	2	0.82	
Pagellus bellottii	0.28	2	0.46	
Scorpaena stephanica	0.24	2	0.39	
Fistularia petimba	0.24	2	0.39	
Rypticus saponaceus	0.16	2	0.26	
Bothus pedas	0.14	2	0.23	
Total	59.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 145
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°13.61
 start stop duration Lon E 13°37.93
 TIME :01:45:13 02:15:43 30.5 (min) Purpose : 3
 LOG : 3183.26 3184.76 1.5 Region : 4040
 FDEPTH: 116 117 Gear cond.: 0
 BDEPTH: 116 117 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.0 kn
 Sorted : 97 Total catch: 929.55 Catch/hour: 1828.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1343.31	264016	73.46	
Brotula barbata	176.01	112	9.63	
Trichiurus lepturus	124.26	775	6.80	
Chlorophthalmus atlanticus	69.88	2339	3.82	
Scorpaena normani	31.73	226	1.74	
Trachurus trecae	27.01	75	1.48	
Umbrina canariensis	14.54	75	0.80	
Dentex angolensis	12.46	75	0.68	
Uranoscopus cadenati	6.80	18	0.37	
Parapenaeus longirostris	5.67	624	0.31	
Argyrosomus hololepidotus	4.31	2	0.24	
Citharus linguatula	3.78	112	0.21	
Pagellus bellottii	3.02	18	0.17	
Syacium micrurum	2.08	57	0.11	
Zenopsis conchifer	1.51	18	0.08	
Pontinus accraensis	1.32	18	0.07	
GOBIIDAE	0.94	395	0.05	
Total	1828.62		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 146
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°11.65
 start stop duration Lon E 13°35.89
 TIME :03:09:03 03:40:08 31.1 (min) Purpose : 3
 LOG : 3188.15 3189.69 1.5 Region : 4040
 FDEPTH: 154 157 Gear cond.: 0
 BDEPTH: 154 157 Validity : 0
 Towing dir: 0° Wire out : 400 m Speed : 3.0 kn
 Sorted : 67 Total catch: 284.93 Catch/hour: 550.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	286.06	264	52.01	
Brotula barbata	126.62	162	23.02	
Trichiurus lepturus	44.19	431	8.03	
Pterothrissus bellocci	22.63	154	4.11	
Parapenaeus longirostris	22.14	8392	4.03	
Dentex angolensis	19.46	73	3.54	
Bembrops heterurus	10.79	129	1.96	
Dentex macrophthalmus	7.95	41	1.45	
Pontinus accraensis	4.13	73	0.75	
Illex coindetii	1.62	33	0.29	
Trigla lyra	1.37	8	0.25	
Scorpaena normani	1.14	8	0.21	
Chlorophthalmus atlanticus	0.66	106	0.12	
Physiculus huloti	0.56	15	0.10	
Syacium micrurum	0.33	8	0.06	
GOBIIDAE	0.33	137	0.06	
Citharus linguatula	0.08	8	0.01	
Total	550.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 147
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°13.76
 start stop duration Lon E 13°32.86
 TIME :04:37:46 05:05:54 28.1 (min) Purpose : 3
 LOG : 3194.13 3195.63 1.5 Region : 4040
 FDEPTH: 250 255 Gear cond.: 0
 BDEPTH: 250 255 Validity : 0
 Towing dir: 0° Wire out : 700 m Speed : 3.2 kn
 Sorted : 124 Total catch: 1519.52 Catch/hour: 3241.07

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus mediterraneus	1185.50	2069	36.58	
Bembrops heterurus	464.66	4579	14.34	
Brotula barbata	407.69	284	12.58	
Parapenaeus longirostris, femal	213.44	40413	6.59	
Parapenaeus longirostris, male	145.15	33116	4.48	
Pterothrissus bellocci	137.90	725	4.25	
Umbrina canariensis	135.06	232	4.17	
Pontinus accraensis	82.27	646	2.54	
Dentex macrophthalmus	80.73	284	2.49	188
Synagrops microlepis	73.22	4347	2.26	
Miracorvina angolensis	63.65	26	1.96	
Epigonus telescopus	52.26	439	1.61	
Epinephelus guaza ?	45.39	2	1.40	
MYCTOPHIDAE	28.45	11100	0.88	
Dentex angolensis	24.06	77	0.74	
B I V A L V E S	19.92	879	0.61	
Physiculus huloti	14.48	105	0.45	
Merluccius polli	12.93	181	0.40	
Trichiurus lepturus	12.67	13	0.39	
Monolea microstoma	11.90	493	0.37	
Coelorinchus coelorhincus	10.34	105	0.32	
Laemonema laureysi	7.25	77	0.22	
PARALEPIDIDAE	5.69	258	0.18	
Bathyrroconger vicinus	2.32	26	0.07	
Calappa sp.	1.81	51	0.06	
Illex coindetii	1.02	51	0.03	
Dicologlossa cuneata	0.77	26	0.02	
Microchirus boscanion	0.51	51	0.02	
Total	3241.07		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 148
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°13.30
 start stop duration Lon E 13°28.07
 TIME :06:52:42 07:23:08 30.4 (min) Purpose : 3
 LOG : 3203.55 3204.96 1.4 Region : 4040
 FDEPTH: 503 510 Gear cond.: 0
 BDEPTH: 503 510 Validity : 0
 Towing dir: 0° Wire out : 1000 m Speed : 2.8 kn
 Sorted : 31 Total catch: 284.47 Catch/hour: 560.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	257.45	50380	45.90	
Lamprogrammus exutus	79.82	2547	14.23	
Aristeus varidens, female	38.29	2478	6.83	
Stomias boa boa	33.50	787	5.97	
Hoplostethus cadenati	31.09	1128	5.54	
Yarella blackfordi	27.86	923	4.97	
Chlorophthalmus atlanticus	22.89	599	4.08	
Merluccius polli	16.56	22	2.95	189
Aristeus varidens, male	14.00	1830	2.50	
Chaceon maritae, male	12.07	47	2.15	
Etmopterus polli	8.72	69	1.55	
Malacocephalus laevis	7.33	51	1.31	
Gadella imberbis	3.23	120	0.58	
Benthoedemus tenuis	1.36	51	0.24	
Plesiopeanaeus edwardianus	1.03	172	0.18	
Xenodermichthys copei	1.03	103	0.18	
Bathyrroconger vicinus	1.03	69	0.18	
Triplophos hemingi	0.85	154	0.15	
CRANCHIIDAE	0.67	18	0.12	
Nezumia aequalis	0.67	103	0.12	
Photonectes braueri	0.51	85	0.09	
Stereomastis sp.	0.34	69	0.06	
Chaceon maritae, female	0.30	6	0.05	
Diceratias pileatus	0.16	51	0.03	
Nemichthys scolopaceus	0.16	18	0.03	
Total	560.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 149
 DATE :04/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°29.89
 start stop duration Lon E 13°20.41
 TIME :10:22:20 10:52:24 30.1 (min) Purpose : 3
 LOG : 3221.93 3223.34 1.4 Region : 4040
 FDEPTH: 508 519 Gear cond.: 0
 BDEPTH: 508 519 Validity : 0
 Towing dir: 0° Wire out : 1000 m Speed : 2.8 kn
 Sorted : 25 Total catch: 246.77 Catch/hour: 492.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	170.06	34583	34.54	
Chaceon maritae, female	105.59	415	21.44	
Trachipterus sp.	39.15	18	7.95	
Merluccius polli	29.66	38	6.02	
Lamprogrammus exutus	29.21	473	5.93	
Aristeus varidens, female	22.34	1205	4.54	
Hoplostethus cadenati	18.73	670	3.80	
Aristeus varidens, male	17.20	2333	3.49	
MELANONIDAE	12.80	335	2.60	
Yarella blackfordi	12.65	395	2.57	
Scale worms	6.92	453	1.41	
Laemonema laureysi	4.94	138	1.00	
Coelorinchus sp.	3.78	38	0.77	
Chaceon maritae, male	3.56	18	0.72	
Epigonus telescopus	2.57	18	0.52	
Bathyrroconger vicinus	2.57	158	0.52	
Chlorophthalmus atlanticus	2.37	60	0.48	
Xenodermichthys copei	2.17	217	0.44	
Malacocephalus laevis	1.78	18	0.36	
MYCTOPHIDAE	1.38	1068	0.28	
Triplophos hemingi	1.38	118	0.28	
Benthoedemus tenuis	1.38	60	0.28	
Ebinania costaecanarie	0.20	38	0.04	
Total	492.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 150
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°30.92
 start stop duration Lon E 13°21.29
 TIME :12:22:09 12:52:36 30.4 (min) Purpose : 3
 LOG : 3228.47 3229.96 1.5 Region : 4040
 FDEPTH: 376 377 Gear cond.: 0
 BDEPTH: 376 377 Validity : 0
 Towing dir: 0° Wire out : 750 m Speed : 2.9 kn
 Sorted : 25 Total catch: 419.83 Catch/hour: 827.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	318.45	8641	38.48	
Hymenocephalus italicus	112.33	11428	13.57	
Laemonema laureysi	82.71	1106	9.99	
Aristeus varidens, female	60.89	390	7.36	
Chaunax pictus	54.05	3386	6.53	
Merluccius polli	52.10	97	6.30	
Aristeus varidens, male	21.48	3093	2.60	
Hoplostethus cadenati	20.50	814	2.48	
Scale worms	17.90	2245	2.16	
Etmopterus polli	17.90	455	2.16	
Gadella imberbis	17.25	846	2.08	
Halosauropsis rostratus	15.61	32	1.89	
Yarrella blackfordi	10.41	357	1.26	
Malacocephalus laevis	7.47	97	0.90	
Chlorophthalmus atlanticus	5.85	195	0.71	
Lophius vaillanti	4.22	32	0.51	
Benthodesmus tenuis	1.95	65	0.24	
Nezumia aequalis	1.62	65	0.20	
MYCTOPHIDAE	1.30	2180	0.16	
MELANONIDAE	1.30	32	0.16	
Synagrops microlepis	0.97	32	0.12	
Heterocarpus grimaldi	0.65	390	0.08	
Nemichthys scolopaceus	0.32	32	0.04	
BathYROconger vicinus	0.32	32	0.04	
Total	827.52		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 151
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°30.98
 start stop duration Lon E 13°22.53
 TIME :02:19:01 02:49:18 30.3 (min) Purpose : 3
 LOG : 3237.42 3238.76 1.3 Region : 4040
 FDEPTH: 304 302 Gear cond.: 0
 BDEPTH: 304 302 Validity : 0
 Towing dir: 0° Wire out : 750 m Speed : 2.7 kn
 Sorted : 63 Total catch: 829.29 Catch/hour: 1643.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	668.94	15606	40.71	
Hoplostethus atlanticus	204.93	367	12.47	
Epigonus telescopus	143.72	1445	8.75	
Dentex macrophthalmus	124.54	210	7.58	
Brotula barbata	116.91	105	7.11	
Pontinus accraensis	105.10	420	6.40	
Hoplostethus cadenati	81.97	2100	4.99	
Pterothrissus bellocci	32.58	236	1.98	
Synagrops microlepis	32.04	1601	1.95	
Merluccius polli	29.94	131	1.82	
Laemonema laureysi	26.79	315	1.63	
Malacocephalus laevis	15.75	210	0.96	
Scale worms	14.70	1944	0.89	
Nezumia aequalis	7.87	420	0.48	
Lophius vaillanti	7.09	157	0.43	
Benthodesmus tenuis	6.82	577	0.41	
Gadella imberbis	5.77	157	0.35	
Parapanaeus longirostris	5.51	919	0.34	
Bathynectes piperitus	5.51	182	0.34	
Mystriophis rostellatus	2.62	26	0.16	
BathYROconger vicinus	2.62	157	0.16	
Aristeus varidens	0.77	77	0.05	
PARALEPIDIDAE	0.52	26	0.03	
Etmopterus polli	0.26	26	0.02	
Total	1643.24		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 152
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°31.63
 start stop duration Lon E 13°29.61
 TIME :05:20:19 05:50:32 30.2 (min) Purpose : 3
 LOG : 3247.97 3249.50 1.5 Region : 4040
 FDEPTH: 105 103 Gear cond.: 0
 BDEPTH: 105 103 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.0 kn
 Sorted : 113 Total catch: 112.90 Catch/hour: 224.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	47.13	103	21.03	
Trigla lyra	46.50	375	20.74	
Dentex angolensis	26.33	230	11.74	191
Lagocephalus laevigatus	17.95	28	8.01	
Cynoponticus ferox	17.51	2	7.81	
Dentex macrophthalmus	14.41	175	6.43	190
Pterothrissus bellocci	13.90	121	6.20	
Zeus faber	9.17	14	4.09	
Citharus linguatula	7.49	171	3.34	
Brotula barbata	5.90	6	2.63	
Umrina canariensis	4.65	16	2.07	
Alloteuthis africana	3.69	1588	1.65	
Illex coindetii	1.91	50	0.85	
Pagellus bellottii	1.83	10	0.81	
Raja miraletus	1.59	2	0.71	
Sepia orbignyana	1.49	2	0.66	
Pontinus accraensis	0.83	6	0.37	
Bembrops heterurus	0.54	6	0.24	
Dentex barnardi	0.50	2	0.22	
Saurida brasiliensis	0.46	73	0.20	
Peristedion cataphractum	0.22	4	0.10	
Dentex congoensis	0.18	4	0.08	
Total	224.16		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 153
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°31.85
 start stop duration Lon E 13°34.76
 TIME :06:41:42 07:12:27 30.8 (min) Purpose : 3
 LOG : 3254.81 3256.58 1.8 Region : 4040
 FDEPTH: 63 64 Gear cond.: 0
 BDEPTH: 63 64 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.5 kn
 Sorted : 86 Total catch: 85.62 Catch/hour: 167.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudupeneus prayensis	73.37	558	43.91	
Dentex barnardi	40.00	181	23.94	
Pagellus bellottii	14.17	113	8.48	192
Lagocephalus laevigatus	7.94	8	4.75	
Raja miraletus	6.61	10	3.96	
Sepia orbignyana	5.89	4	3.53	
Seriola carpenteri	4.78	4	2.86	
Dentex congoensis	4.20	98	2.51	
Dentex angolensis	3.36	64	2.01	193
Lithognathus mormyrus	2.56	4	1.53	
Alloteuthis africana	2.50	999	1.49	
Torpedo torpedo	0.98	2	0.53	
Dentex canariensis	0.64	2	0.39	
Serranus cabrilla	0.10	2	0.06	
Citharus linguatula	0.08	4	0.05	
Total	167.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 154
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°30.71
 start stop duration Lon E 13°38.27
 TIME :08:13:27 08:43:41 30.2 (min) Purpose : 3
 LOG : 3261.91 3263.69 1.8 Region : 4040
 FDEPTH: 43 42 Gear cond.: 0
 BDEPTH: 43 42 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.5 kn
 Sorted : 197 Total catch: 362.79 Catch/hour: 720.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadysys jubelini	393.34	1145	54.63	
Selene dorsalis	77.53	302	10.77	
Pomadysys peroteti	75.74	246	10.52	
Alectis alexandrina	38.56	40	5.36	
Pseudupeneus prayensis	32.53	310	4.52	
Raja miraletus	19.59	32	2.72	
Lithognathus mormyrus	19.25	36	2.67	
Trachinotus ovatus	14.59	30	2.03	
Caranx crysos	9.39	8	1.30	
Octopus vulgaris	8.99	6	1.25	
Chloroscombrus chrysurus	5.56	22	0.77	
Rhinobatos albomaculatus	3.95	2	0.55	
Plectorhynchus mediterraneus	3.10	18	0.43	
Lagocephalus laevigatus	2.64	6	0.37	
Chaetodon hoefleri	2.52	14	0.35	0
Epinephelus aeneus	2.50	2	0.35	
Sphyraena sphyraena	2.22	6	0.31	
Boops boops	2.04	48	0.28	
Torpedo torpedo	1.71	2	0.24	
Pomadysys incisus	1.45	6	0.20	
Chaetodon hoefleri	0.99	2	0.14	
Trachurus trecae	0.81	2	0.11	
Citharus linguatula	0.44	10	0.06	
Citharus linguatula	0.40	2	0.06	
Fistularia tabacaria	0.22	2	0.03	
Total	720.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 155
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°31.44
 start stop duration Lon E 13°42.93
 TIME :09:39:15 10:00:38 21.4 (min) Purpose : 3
 LOG : 3269.27 3270.45 1.2 Region : 4040
 FDEPTH: 29 30 Gear cond.: 0
 BDEPTH: 29 30 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.3 kn
 Sorted : 73 Total catch: 292.67 Catch/hour: 821.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	530.32	8579	64.57	194
Pomadasys inciscus	67.32	1131	8.20	
Chloroscombrus chrysurus	64.21	603	7.82	
Ilisha africana	53.77	710	6.55	
Trichiurus lepturus	27.45	140	3.34	
Galeoides decadactylus	15.55	140	1.89	
Selene dorsalis	13.55	205	1.65	
Sepia orbignyana	8.08	20	0.98	
Rhinobatos albomaculatus	4.94	6	0.60	
Umbrina canariensis	4.77	53	0.58	
Pseudupeneus prayensis	4.66	95	0.57	
Pseudotolithus senegalensis	3.42	8	0.42	
Sardinella maderensis	3.42	84	0.42	
Pteroscion pelli	3.31	95	0.40	
Sphyræna sphyraena	3.20	8	0.39	
Citharus linguatula	2.44	20	0.30	
Torpedo torpedo	2.22	8	0.27	
Epinephelus aeneus	2.22	8	0.27	
Nezumia aequalis	2.22	65	0.27	
Eucinostomus melanopterus	1.77	8	0.22	
Penaeus notialis	1.52	17	0.18	
Dicologlossa cuneata	0.98	1	0.12	
Total	821.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 156
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°41.32
 start stop duration Lon E 13°45.95
 TIME :11:12:23 11:39:14 26.9 (min) Purpose : 3
 LOG : 3279.56 3281.04 1.5 Region : 4040
 FDEPTH: 27 26 Gear cond.: 0
 BDEPTH: 27 26 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.3 kn
 Sorted : 91 Total catch: 199.20 Catch/hour: 445.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	174.48	3251	39.20	195
Ilisha africana	87.73	1450	19.71	
Galeoides decadactylus	24.29	257	5.46	
Trichiurus lepturus	23.96	212	5.38	
Pomadasys jubelini	21.56	302	4.84	
Pteroscion pelli	18.99	769	4.27	
Ephippion guttifer	15.87	9	3.56	
Pseudotolithus elongatus	12.31	87	2.77	
Chloroscombrus chrysurus	11.98	121	2.69	
Sphyræna sphyraena	10.46	76	2.35	
Gymnura micrura	8.96	4	2.01	
Dicologlossa cuneata	8.72	170	1.96	
Drepane africana	5.45	4	1.22	
Penaeus notialis	4.56	96	1.02	
Stromateus fiatola	4.13	18	0.93	
Raja miraletus	3.20	4	0.72	
Sepia orbignyana	2.91	18	0.65	
Pseudotolithus senegalensis	2.28	13	0.51	
Sardinella aurita	1.12	4	0.25	
Selene dorsalis	1.05	42	0.24	
Torpedo marmorata	0.72	4	0.16	
Trachinotus ovatus	0.38	4	0.09	
Squilla mantis	0.04	4	0.01	
Total	445.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 157
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°46.20
 start stop duration Lon E 13°41.27
 TIME :12:44:14 01:14:59 30.8 (min) Purpose : 3
 LOG : 3287.17 3288.86 1.7 Region : 4040
 FDEPTH: 62 67 Gear cond.: 0
 BDEPTH: 62 67 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.3 kn
 Sorted : 96 Total catch: 589.86 Catch/hour: 1150.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasys jubelini	230.01	839	19.98	
Brachydeuterus auritus	183.77	2347	15.97	196
Pseudotolithus senegalensis	147.82	168	12.84	
Trichiurus lepturus	143.04	347	12.43	
Umbrina canariensis	99.67	599	8.66	198
Pagellus bellottii	93.68	671	8.14	197
Pomadasys inciscus	68.04	515	5.91	
Raja miraletus	29.81	47	2.59	
Torpedo torpedo	28.14	47	2.44	
Lithognathus mormyrus	22.28	23	1.94	
Selene dorsalis	21.19	142	1.84	
Lagocephalus laevigatus	17.00	35	1.48	
Sepia orbignyana	13.89	23	1.21	
Trachurus trecae	11.61	84	1.01	
Citharus linguatula	10.42	310	0.91	
Pseudupeneus prayensis	9.93	72	0.86	
Dentex barnardi	4.18	23	0.36	
Aulopus cadenati	4.18	84	0.36	
Galeoides decadactylus	3.22	12	0.28	
Bembrops heterurus	2.87	84	0.25	
Octopus vulgaris	2.75	12	0.24	
Brotula barbata	1.91	12	0.17	
Trigla lyra	1.54	12	0.13	
Total	1150.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 158
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°46.41
 start stop duration Lon E 13°33.05
 TIME :02:29:57 03:00:21 30.4 (min) Purpose : 3
 LOG : 3297.40 3298.99 1.6 Region : 4040
 FDEPTH: 109 112 Gear cond.: 0
 BDEPTH: 109 112 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.1 kn
 Sorted : 104 Total catch: 103.82 Catch/hour: 204.91

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	69.47	172	33.90	
Dentex angolensis	24.99	182	12.19	
Raja miraletus	23.01	22	11.23	
Trigla lyra	22.93	245	11.19	
Sepia orbignyana	16.84	18	8.22	
Brotula barbata	12.36	10	6.03	
Dentex barnardi	6.97	30	3.40	
Trichiurus lepturus	5.37	10	2.62	
Scorpaena stephanica	5.09	2	2.49	
Boops boops	4.36	36	2.13	
Pagellus bellottii	4.22	39	2.06	
Trachurus trecae	3.53	10	1.72	
Citharus linguatula	1.95	67	0.95	
Octopus vulgaris	1.42	4	0.69	
Alloteuthis africana	1.24	373	0.61	
Dentex macrophthalmus	0.41	4	0.20	
Parulibrachius rossignoli	0.30	2	0.14	
Anthias anthias	0.26	2	0.13	
Pomadasys inciscus	0.14	2	0.07	
Arnoglossus imperialis	0.04	2	0.02	
Total	204.91		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 159
 DATE :05/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°44.10
 start stop duration Lon E 13°27.98
 TIME :04:04:56 04:34:59 30.1 (min) Purpose : 3
 LOG : 3304.61 3306.18 1.6 Region : 4040
 FDEPTH: 169 166 Gear cond.: 0
 BDEPTH: 169 166 Validity : 0
 Towing dir: 0° Wire out : 420 m Speed : 3.1 kn
 Sorted : 134 Total catch: 309.29 Catch/hour: 617.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	483.21	67547	78.25	
Brotula barbata	57.74	84	9.35	
SALPS	22.58	2330	3.66	
Chlorophthalmus atlanticus	9.40	3123	1.52	
Pterothrissus belloci	8.99	70	1.45	
Lagocephalus laevigatus	5.81	10	0.94	
Dentex angolensis	4.37	14	0.71	
Raja alba	4.05	4	0.66	
Dentex macrophthalmus	3.67	24	0.59	
Trigla lyra	3.67	28	0.59	
Umbrina canariensis	2.30	4	0.37	
Illex coindetii	2.16	42	0.35	
Sepia orbignyana	2.02	32	0.33	
Bembrops heterurus	1.56	14	0.25	
Trachurus trecae	1.52	4	0.25	
Monolene microstoma	1.10	42	0.18	
Trichiurus lepturus	0.86	4	0.14	
GOBIIDAE	0.72	286	0.12	
Boops boops	0.60	4	0.10	
Zenopsis conchifer	0.60	10	0.10	
S H R I M P S	0.54	240	0.09	
B I V A L V E S	0.08	14	0.01	
Total	617.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 160
 DATE :05/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°42.65
 start stop duration Lon E 13°22.40
 TIME :05:58:06 06:28:40 30.6 (min) Purpose : 3
 LOG : 3313.13 3314.59 1.5 Region : 4040
 FDEPTH: 359 354 Gear cond.: 0
 BDEPTH: 359 354 Validity : 0
 Towing dir: 0° Wire out : 750 m Speed : 2.9 kn
 Sorted : 36 Total catch: 505.88 Catch/hour: 992.57

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hymenocephalus italicus	276.28	32645	27.83	
Laemonema laureysi	235.17	3098	23.69	
Etmopterus polli	176.78	5017	17.81	
Nematocarcinus africanus	148.55	69045	14.97	
Chaunax pictus	25.21	2714	2.54	
Hoplostethus cadenati	22.47	602	2.26	
Malacocephalus laevis	19.17	247	1.93	
Chlorophthalmus atlanticus	15.07	412	1.52	
Aristeus varidens, male	12.32	1754	1.24	
Aristeus varidens, female	10.67	712	1.08	
Merluccius polli	8.44	29	0.85	200
Lophiodon kempi	7.67	82	0.77	
Coslorinchus coelorhincus	6.30	192	0.63	
Bathynectes piperitus	4.65	110	0.47	
Munidopsis sp.	4.10	1370	0.41	
Chaceon maritae, female	3.71	16	0.37	
Synagrops microlepis	3.55	163	0.36	
SALPS	3.55	412	0.36	
Parapeneus longirostris,femal	2.73	385	0.27	
Myctophid sp. B	1.90	1479	0.19	
Bassanago albescens	1.35	55	0.14	
Trichiurus lepturus	1.35	82	0.14	
Gadella imberbis	0.80	27	0.08	
Halosaurus ovenii	0.26	27	0.03	
NETTASTOMATIDAE	0.26	27	0.03	
Scorpaena stephanica	0.26	27	0.03	
Total	992.57		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 161
 DATE :05/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°43.18
 start stop duration Lon E 13°19.59
 TIME :08:14:53 08:46:08 31.3 (min) Purpose : 3
 LOG : 3322.28 3323.65 1.4 Region : 4040
 FDEPTH: 528 526 Gear cond.: 0
 BDEPTH: 528 526 Validity : 0
 Towing dir: 0° Wire out : 1050 m Speed : 2.6 kn
 Sorted : 33 Total catch: 378.89 Catch/hour: 727.47

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	210.74	46355	28.97	
Hoplostethus cadenati	179.81	6557	24.72	
Lamprogrammus exutus	120.00	1793	16.50	
Chaceon maritae, female	44.04	186	6.05	
Yarella blackfordi	34.43	1052	4.73	
Stomias boa boa	24.54	639	3.37	
Aristeus varidens, female	16.07	104	2.21	
Laemonema laureysi	14.84	701	2.04	
Aristeus varidens, male	9.48	113	1.30	
Bassanago albescens	9.06	515	1.25	
Illex coindetii	8.85	40	1.22	
Merluccius polli	8.20	12	1.13	
Nezumia aequalis	7.83	248	1.08	
Lophiodes kempi	7.01	40	0.96	
Benthodesmus tenuis	5.97	248	0.82	
Etmopterus polli	4.74	165	0.65	
Hymenocephalus italicus	4.32	495	0.59	
Chaceon maritae, male	4.05	10	0.56	
HISTIOTUTHIDAE	3.92	21	0.54	
Chaunax pictus	2.05	61	0.28	
Halosaurus ovenii	1.44	61	0.20	
Gadella imberbis	1.44	61	0.20	
SALPS	1.23	123	0.17	
Xenodermichthys copei	1.02	123	0.14	
Stereomastis sp.	0.81	61	0.11	
Phrynichthys wedli	0.40	40	0.06	
Chlorophthalmus atlanticus	0.40	21	0.06	
Epigonus telescopus	0.19	21	0.03	
Myctophid sp. B	0.19	21	0.03	
Symphurus sp.	0.19	21	0.03	
Dibranchus atlanticus	0.19	21	0.03	
Total	727.47		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 162
 DATE :05/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°55.56
 start stop duration Lon E 13°21.03
 TIME :10:59:54 11:29:58 30.1 (min) Purpose : 3
 LOG : 3335.38 3336.80 1.4 Region : 4040
 FDEPTH: 600 605 Gear cond.: 0
 BDEPTH: 600 605 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 2.8 kn
 Sorted : 29 Total catch: 109.53 Catch/hour: 218.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	49.74	1383	22.76	
Nematocarcinus africanus	42.18	9642	19.30	
Chaceon maritae, female	24.56	98	11.24	
MELANONIDAE	22.37	491	10.23	
Hoplostethus cadenati	13.67	589	6.25	
Aristeus varidens, female	9.82	475	4.49	
Chaceon maritae, male	9.60	22	4.39	
Merluccius polli	7.62	6	3.49	
Talismania longifilis	5.75	415	2.63	
Lamprogrammus exutus	4.45	44	2.04	
Etmopterus polli	3.69	68	1.69	
Triplophos hemingi	2.87	415	1.31	
Nezumia aequalis	2.79	217	1.28	
OMMASTREPHIDAE	2.17	6	1.00	
Chlorophthalmus atlanticus	1.96	52	0.89	
Monomitopus metriostoma	1.88	44	0.86	
Bathyroconger vicinus	1.88	68	0.86	
Aristeus varidens, male	1.58	196	0.72	
Octopoteuthis sicula	1.58	6	0.72	
Stereomastis sp.	1.28	188	0.58	
Todaropsis eblanae	1.20	6	0.55	
Halosaurus ovenii	0.98	38	0.45	
Laemonema laureysi	0.90	14	0.41	
Benthodesmus tenuis	0.74	38	0.34	
Setarches guentheri	0.60	6	0.27	
Xenodermichthys copei	0.60	44	0.27	
LYCOTEUTHIDAE	0.52	6	0.24	
Dibranchus atlanticus	0.52	38	0.24	
Gonostoma elongatum	0.36	6	0.16	
Ebinania sp	0.36	14	0.16	
Dicrolene intronigrer	0.30	60	0.14	
Phrynichthys wedli	0.06	14	0.03	
Total	218.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 163
 DATE :06/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°56.30
 start stop duration Lon E 13°22.60
 TIME :12:56:57 01:28:23 31.4 (min) Purpose : 3
 LOG : 3341.18 3342.73 1.6 Region : 4040
 FDEPTH: 511 506 Gear cond.: 0
 BDEPTH: 511 506 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 2.9 kn
 Sorted : 25 Total catch: 179.82 Catch/hour: 343.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	130.65	25710	38.07	
Merluccius polli	45.46	42	13.25	
Chaceon maritae, female	45.31	195	13.20	
MELANONIDAE	28.11	586	8.19	
Yarella blackfordi	20.97	628	6.11	
Aristeus varidens, female	20.13	1090	5.87	
Laemonema laureysi	12.16	573	3.54	
Aristeus varidens, male	9.92	1258	2.89	
Chlorophthalmus atlanticus	5.17	126	1.51	
Illex coindetii	3.63	13	1.06	
Halosaurus ovenii	3.21	126	0.93	
Etmopterus polli	3.07	42	0.90	
Todaropsis eblanae	2.37	13	0.69	
Hoplostethus cadenati	2.08	84	0.61	
Nezumia aequalis	2.08	111	0.61	
Epigonus telescopus	1.66	13	0.48	
Malacocephalus laevis	1.53	13	0.44	
Lamprogrammus exutus	1.53	42	0.44	
Benthodesmus tenuis	1.39	42	0.41	
Triplophos hemingi	1.11	153	0.32	
Bathyroconger vicinus	0.69	13	0.20	
Nettastoma parviceps	0.55	13	0.16	
Xenodermichthys copei	0.40	27	0.12	
Total	343.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 164
 DATE :06/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°55.50
 start stop duration Lon E 13°23.31
 TIME :02:56:16 03:26:23 30.1 (min) Purpose : 3
 LOG : 3346.28 3347.70 1.4 Region : 4040
 FDEPTH: 461 463 Gear cond.: 0
 BDEPTH: 461 463 Validity : 0
 Towing dir: 0° Wire out : 1020 m Speed : 2.8 kn
 Sorted : 24 Total catch: 429.79 Catch/hour: 856.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	426.22	81880	49.78	
Hoplostethus cadenati	109.58	4070	12.80	
Yarella blackfordi	71.04	2070	8.30	
Aristeus varidens, female	60.68	1928	7.09	
MELANONIDAE	30.34	785	3.54	
Etmopterus polli	29.98	536	3.50	
Merluccius polli	24.98	36	2.92	
Halosaurus ovenii	19.30	1000	2.25	
Laemonema laureysi	19.26	1072	2.25	
Lamprogrammus exutus	12.85	464	1.50	
Aristeus varidens, male	11.77	1570	1.38	
Chaunax pictus	9.26	536	1.08	
Benthodesmus tenuis	8.92	536	1.04	
Dibranchus atlanticus	7.49	500	0.87	
Gadella imberbis	4.62	249	0.54	
Chlorophthalmus atlanticus	3.92	143	0.46	
Chaceon maritae, female	2.85	36	0.33	
Nezumia aequalis	1.41	215	0.17	
Nemichthys scolopaceus	0.70	72	0.08	
Ebinania costaecanarie	0.34	72	0.04	
Triplophos hemingi	0.34	143	0.04	
Bathyroconger vicinus	0.34	72	0.04	
Total	856.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 165
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°58.20
 start stop duration Lon E 13°29.77
 TIME :05:40:01 06:00:31 20.5 (min) Purpose : 3
 LOG : 3355.85 3356.93 1.1 Region : 4040
 FDEPTH: 265 252 Gear cond.: 0
 BDEPTH: 265 252 Validity : 0
 Towing dir: 0° Wire out : 660 m Speed : 3.1 kn
 Sorted : 34 Total catch: 189.23 Catch/hour: 553.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	173.27	11163	31.28	
Merluccius polli	146.40	515	26.43	201
Raja alba	31.49	32	5.69	
Lagocephalus laevigatus	28.74	102	5.19	
Parapenaeus longirostris, male	27.40	5069	4.95	
Laemonema laureysi	23.62	342	4.26	
Zenopsis conchifer	22.07	258	3.98	
Pterotrissus bellocci	19.84	152	3.58	
Chlorophthalmus atlanticus	18.18	79241	3.28	
Parapenaeus longirostris, femal	17.80	3082	3.21	
Pontinus accraensis	15.22	120	2.75	
Mybrops heterurus	7.87	205	1.42	
MYCTOPHIDAE	7.52	7586	1.36	
Illex coindetii	3.92	1027	0.71	
J E L Y F I S H	2.72	53	0.49	
SALPS	2.05	258	0.37	
Dentex macrophthalmus	1.84	9	0.33	
Trichiurus lepturus	1.70	53	0.31	
Coelorhynchus coelorhynchus	1.35	53	0.24	
Monoleme microstoma	0.85	53	0.15	
Total	553.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 166
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 11°57.75
 start stop duration Lon E 13°32.37
 TIME :07:08:41 07:39:46 31.1 (min) Purpose : 3
 LOG : 3360.82 3362.38 1.6 Region : 4040
 FDEPTH: 101 103 Gear cond.: 0
 BDEPTH: 101 103 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
 Sorted : 157 Total catch: 156.65 Catch/hour: 302.41

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Dentex barnardi	62.84 18319	20.78	
Dentex macrophthalmus	54.63 417	18.07	202
Boops boops	45.87 363	15.17	
Dentex angolensis	29.73 149	9.83	203
Isurus oxyrinchus	23.20 2	7.67	
Pagellus bellottii	17.76 110	5.87	204
Sphoeroides pachgaster	15.56 25	5.15	
Epinephelus aeneus	12.28 2	4.06	
Zeus faber	7.24 15	2.39	
Atractoscion aequidens	5.89 4	1.95	
Anthias anthias	5.08 110	1.68	
Sepia orbignyana	4.88 6	1.62	
Raja alba	4.56 4	1.51	
Erythrocles monodi	3.55 31	1.17	
Torpedo marmorata	2.99 2	0.99	
SALPS	1.76 108	0.58	
Illex coindetii	1.43 266	0.47	
Chaetodon hoefleri	0.98 6	0.33	
Dentex canariensis	0.77 2	0.26	
Trigla lyra	0.62 6	0.20	
B I V A L V E S	0.37 52	0.12	
Sardinella aurita	0.21 2	0.07	
Alloteuthis africana	0.10 27	0.03	
Arnoglossus imperialis	0.06 4	0.02	
Citharus linguatula	0.06 2	0.02	
Total	302.41	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 167
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°0.76
 start stop duration Lon E 13°36.72
 TIME :08:42:44 09:12:59 30.3 (min) Purpose : 3
 LOG : 3369.05 3370.87 1.8 Region : 4040
 FDEPTH: 73 71 Gear cond.: 0
 BDEPTH: 73 71 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.6 kn
 Sorted : 116 Total catch: 491.37 Catch/hour: 974.62

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagellus bellottii	279.55 2692	28.68	205
Pomadasy incisus	273.92 1894	28.11	
Rhinobatos albomaculatus	89.93 32	9.23	
Lagocephalus laevigatus	78.74 125	8.08	
Pseudupeneus prayensis	63.75 686	6.54	
Trachurus trecae	45.46 528	4.66	206
Sepia orbignyana	38.42 42	3.94	
Raja miraletus	27.17 32	2.79	
Sardinella aurita	26.92 252	2.76	
Zeus faber	8.71 42	0.89	
Trigla lyra	7.46 83	0.77	
Fistularia petimba	6.70 16	0.69	
Alloteuthis africana	5.36 1442	0.55	
Sepia orbignyana	4.26 8	0.44	
Trichiurus lepturus	3.85 8	0.39	
Octopus vulgaris	3.05 2	0.31	
Citharus linguatula	2.68 42	0.27	
Boops boops	2.26 16	0.23	
Dentex angolensis	2.16 42	0.22	
Chaetodon hoefleri	1.84 8	0.19	
Dentex barnardi	0.91 16	0.09	
Erythrocles monodi	0.50 8	0.05	
Arnoglossus imperialis	0.42 32	0.04	
Bembrops greyi	0.42 8	0.04	
Saurida brasiliensis	0.24 32	0.02	
Total	974.68	100.01	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 168
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°3.57
 start stop duration Lon E 13°41.82
 TIME :10:13:50 10:44:36 30.8 (min) Purpose : 3
 LOG : 3378.39 3380.33 1.9 Region : 4040
 FDEPTH: 27 28 Gear cond.: 0
 BDEPTH: 27 28 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.8 kn
 Sorted : 97 Total catch: 519.19 Catch/hour: 1013.05

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pomadasy jubelini	152.66 291	15.07	
Pomadasy incisus	144.76 1778	14.29	
Ilisha africana	122.50 2671	12.09	
Brachydeuterus auritus	79.65 2620	7.86	
Pseudotolithus senegalensis	77.99 260	7.70	
Pteroscion peli	70.09 2474	6.92	
Sardinella aurita	65.93 529	6.51	
Galeoides decadactylus	59.47 591	5.87	
Dasyatis margarita	48.25 41	4.76	
Trichiurus lepturus	29.42 341	2.90	
Dicologlossa cuneata	28.70 51	2.83	
Pemaeus notialis	27.14 581	2.68	
Arius heudelotii	25.78 88	2.54	
Sepia orbignyana	19.34 187	1.91	
Gymnura altavela	13.31 10	1.31	
Selene dorsalis	12.37 62	1.22	
Lithognathus mormyrus	12.06 20	1.19	
Torpedo marmorata	9.78 31	0.96	
Raja miraletus	7.79 20	0.77	
Pagellus bellottii	2.48 10	0.24	
Engraulis encrasicolus	1.23 300	0.12	
Eucinostomus melanopterus	1.23 20	0.12	
Bembrops heterurus	1.13 31	0.11	
Total	1013.05	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 169
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°15.29
 start stop duration Lon E 13°34.71
 TIME :12:14:44 12:44:54 30.2 (min) Purpose : 3
 LOG : 3392.16 3393.61 1.5 Region : 4040
 FDEPTH: 55 61 Gear cond.: 0
 BDEPTH: 55 61 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 2.9 kn
 Sorted : 97 Total catch: 418.74 Catch/hour: 832.76

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pomadasy incisus	275.30 2556	33.06	
Brachydeuterus auritus	150.92 2007	18.12	208
Pagellus bellottii	95.36 949	11.45	209
Chloroscombrus chrysurus	54.55 352	6.55	
Trachurus trecae	45.22 575	5.43	207
Umbria canariensis	27.27 105	3.27	
Aulopus filamentosus	23.75 56	2.85	
Citharus linguatula	22.93 1014	2.75	
Sepia orbignyana	17.86 32	2.14	
Pomadasy jubelini	17.78 56	2.13	
Epinephelus aeneus	16.51 2	1.98	
Selene dorsalis	14.74 56	1.77	
Rhinobatos albomaculatus	13.50 8	1.62	
Raja miraletus	10.48 16	1.26	
Galeoides decadactylus	9.33 24	1.12	
Trichiurus lepturus	6.88 113	0.83	
Pseudupeneus prayensis	6.78 139	0.81	
Pseudotolithus senegalensis	6.54 32	0.79	
Bembrops heterurus	5.15 89	0.62	
Chaetodon hoefleri	4.91 8	0.59	
Sphyraena guachancho	2.53 16	0.30	
Trachinotus ovatus	1.39 8	0.17	
Sardinella aurita	1.13 16	0.14	
Trigla lyra	0.97 8	0.12	
Scorpaena stephanica	0.89 8	0.11	
Dentex barnardi	0.08 16	0.01	
Total	832.76	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 170
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°16.41
 start stop duration Lon E 13°31.79
 TIME :01:29:25 02:00:09 30.7 (min) Purpose : 3
 LOG : 3396.97 3398.53 1.6 Region : 4040
 FDEPTH: 77 76 Gear cond.: 0
 BDEPTH: 77 76 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.0 kn
 Sorted : 88 Total catch: 728.07 Catch/hour: 1421.55

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trachurus trecae	384.17 2206	27.02	212
Trichiurus lepturus	342.78 1980	24.11	
Brachydeuterus auritus	162.68 1626	11.44	211
Pomadasy incisus	147.22 1207	10.36	
Citharus linguatula	81.65 4750	5.74	
Pagellus bellottii	81.18 789	5.71	210
Lagocephalus laevigatus	57.66 80	4.06	
Umbria canariensis	46.70 96	3.29	
Pseudupeneus prayensis	42.99 402	3.02	
Raja miraletus	25.28 31	1.78	
Zeus faber	18.04 47	1.27	
Scomber japonicus	8.04 31	0.57	
Dentex barnardi	7.89 47	0.55	
Alloteuthis africana	7.24 1384	0.51	
Trigla lyra	4.02 16	0.28	
Dentex macrophthalmus	2.40 31	0.17	
Dentex angolensis	1.11 16	0.08	
Chaetodon hoefleri	0.31 16	0.02	
Arnoglossus imperialis	0.16 16	0.01	
Total	1421.55	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 171
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°16.05
 start stop duration Lon E 13°27.11
 TIME :03:04:21 03:34:57 30.6 (min) Purpose : 3
 LOG : 3405.25 3406.91 1.7 Region : 4040
 FDEPTH: 99 99 Gear cond.: 0
 BDEPTH: 99 99 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.3 kn
 Sorted : 184 Total catch: 184.00 Catch/hour: 360.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	120.75	1176	33.47	213
Boops boops	61.57	478	17.07	
Dentex barnardi	41.37	167	11.47	
Pagellus bellottii	27.25	143	7.55	215
Trigla lyra	24.55	282	6.80	
Dentex angolensis	23.02	163	6.38	214
Branchiostegus semifasciatus *	9.92	8	2.75	
Lagocephalus laevigatus	8.33	20	2.31	
Chaetodon hoefleri	7.75	41	2.15	
Umbrina canariensis	7.27	18	2.02	
Zeus faber	7.04	12	1.95	
Sepia orbignyana	6.78	6	1.88	
Raja miraletus	3.61	6	1.00	
Octopus vulgaris	3.18	4	0.88	
Brotula barbata	3.14	8	0.87	
Perulibatrachus rossignoli	2.02	10	0.56	
Citharus linguatula	1.65	47	0.46	
Trichiurus lepturus	0.78	2	0.22	
Alloteuthis africana	0.41	88	0.11	
Pontinus accraensis	0.35	2	0.10	
Illex coindetii	0.04	4	0.01	
Total	360.78		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 172
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°16.52
 start stop duration Lon E 13°24.53
 TIME :04:26:01 04:56:22 30.4 (min) Purpose : 3
 LOG : 3411.07 3412.58 1.5 Region : 4040
 FDEPTH: 109 109 Gear cond.: 0
 BDEPTH: 109 109 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.0 kn
 Sorted : 267 Total catch: 267.13 Catch/hour: 527.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus atlanticus	98.89	148	18.73	
Anthias anthias	83.95	314	15.90	
Dentex macrophthalmus	78.77	468	14.92	217
Umbrina canariensis	76.13	298	14.42	216
Epinephelus guaza ?	75.69	2	14.34	
Dentex barnardi	22.45	89	4.25	
Trigla lyra	17.17	168	3.25	
Dentex angolensis	15.40	81	2.92	218
Sphoeroides pachgaster	13.22	18	2.50	
Pagellus bellottii	12.45	85	2.36	219
Sepia orbignyana	6.70	26	1.27	
Scorpaena normani	3.72	10	0.70	
Raja miraletus	3.56	6	0.67	
Zeus faber	3.48	8	0.66	
Dentex canariensis	3.48	2	0.66	
Erythrocles monodi	2.31	6	0.44	
Chaetodon hoefleri	1.92	12	0.36	
Branchiostegus semifasciatus *	1.84	2	0.35	
Boops boops	1.70	12	0.32	
Plectorhinchus mediterraneus	1.32	2	0.25	
Octopus vulgaris	1.32	2	0.25	
B I V A L V E S	0.71	123	0.13	
Fistularia petimba	0.63	2	0.12	
Citharus linguatula	0.63	22	0.12	
Brotula barbata	0.42	2	0.08	
Arnoglossus imperialis	0.06	6	0.01	
Total	527.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 173
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°17.35
 start stop duration Lon E 13°22.59
 TIME :06:00:24 06:30:58 30.6 (min) Purpose : 3
 LOG : 3417.93 3419.42 1.5 Region : 4040
 FDEPTH: 334 340 Gear cond.: 0
 BDEPTH: 334 340 Validity : 0
 Towing dir: 0° Wire out : 700 m Speed : 2.9 kn
 Sorted : 63 Total catch: 394.57 Catch/hour: 774.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	182.41	569	23.55	220
Galeus polli	182.41	4500	23.55	
Aristeus varidens, male	136.21	20098	17.59	
Lophiodes kempfi	83.57	12	10.79	
Aristeus varidens, female	42.69	2983	5.51	
Pterothrissus belloci	29.34	218	3.79	
Chaceon maritae, female	19.16	73	2.47	
Laemonema laureysi	16.72	375	2.16	
Zenopsis conchifer	14.92	12	1.93	
Hoplostethus atlanticus	12.72	12	1.64	
MYCTOPHIDAE	7.99	1564	1.03	
Munida sp.	6.79	2183	0.88	
Hepttranchias perlo	6.08	4	0.79	
Erotula barbata	5.46	12	0.70	
OMMASTREPHIDAE	4.32	6	0.56	
Lagocephalus laevigatus	3.87	73	0.50	
Epigonus telescopus	2.79	133	0.36	
Yarella blackfordi	2.65	96	0.34	
Halosaurus ovenii	2.53	230	0.33	
Gadella imberbis	2.30	96	0.30	
Hoplostethus cadenati	2.18	73	0.28	
Coelorinchus coelorhincus	1.92	59	0.25	
Hymenocephalus italicus	1.81	1127	0.23	
Illex coindetii	0.96	12	0.12	
Etmopterus polli	0.96	24	0.12	
Bathynectes piperitus	0.84	12	0.11	
Thyrstes atun	0.47	12	0.06	
Bathyrcoonger vicinus	0.35	24	0.05	
Total	774.43		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 174
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°17.37
 start stop duration Lon E 13°20.61
 TIME :08:54:33 09:24:20 29.8 (min) Purpose : 3
 LOG : 3428.72 3429.98 1.3 Region : 4040
 FDEPTH: 600 613 Gear cond.: 0
 BDEPTH: 600 613 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 2.5 kn
 Sorted : 63 Total catch: 639.07 Catch/hour: 1287.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chaceon maritae, female	511.85	2359	39.75	
Yarella blackfordi	320.25	8772	24.87	
Chaceon maritae, male	74.61	282	5.79	
Laemonema laureysi	72.19	484	5.61	
MELANONIDAE	43.16	786	3.35	
Benthesmus tenuis	39.11	1148	3.04	
Hoplostethus cadenati	36.29	1189	2.82	
Aristeus varidens, female	27.02	1209	2.10	
OMMASTREPHIDAE	26.62	20	2.07	
Lamprogrammus exutus	20.97	302	1.63	
Aristeus varidens, male	16.92	2218	1.31	
Talismania longifilis	13.70	383	1.06	
Xenodermichthys copei	10.88	927	0.84	
Lophiodes kempfi	8.50	2	0.66	
Halosaurus ovenii	7.45	141	0.58	
Nezumia aequalis	7.25	181	0.56	
OCTOPOTEUTHIDAE	7.05	40	0.55	
Merluccius polli	5.92	6	0.46	
ANTHOZOA (Sea anemones)	5.84	40	0.45	
Stereomastis sp.	5.04	242	0.39	
Etmopterus polli	4.43	101	0.34	
Merluccius capensis	4.19	4	0.33	
Bathyrcoonger vicinus	3.63	121	0.28	
VITRELEDONELLIDAE	3.43	20	0.27	
Heterocarpus grimaldi	3.43	242	0.27	
Galeus polli	2.42	101	0.19	
Dicologlossa cuneata	2.22	81	0.17	
Chlorophthalmus atlanticus	1.61	60	0.13	
Raja confundens	1.01	40	0.08	
Triplophos hemingi	0.60	81	0.05	
Metal waste	0.00	2	0.00	
Total	1287.58		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 175
 DATE :06/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°20.73
 start stop duration Lon E 13°18.24
 TIME :11:09:39 11:43:40 34.0 (min) Purpose : 3
 LOG : 3434.44 3436.00 1.6 Region : 4040
 FDEPTH: 690 689 Gear cond.: 0
 BDEPTH: 690 689 Validity : 0
 Towing dir: 0° Wire out : 1350 m Speed : 2.8 kn
 Sorted : 25 Total catch: 209.78 Catch/hour: 369.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chaceon maritae, female	83.05	339	22.45	
Yarrella blackfordi	61.02	1344	16.49	
Talismania longifilis	60.58	857	16.37	
Nezumia aequalis	26.90	734	7.27	
Chaceon maritae, male	23.05	58	6.23	
Aristeus varidens, female	17.87	1048	4.83	
Lamprogrammus exutus	15.96	72	4.31	
Raja confundens	13.74	146	3.71	
MELANONIDAE	13.30	280	3.59	
Aristeus varidens, male	8.85	1256	2.39	
Bathyroconger vicinus	6.93	44	1.87	
Luciobrotula molfi	6.35	44	1.72	
Hoplostethus cadenati	6.19	132	1.67	
Galeus polli	6.05	58	1.64	
Halosaurus ovenii	5.17	88	1.40	
Glyphus marsupialis	3.54	146	0.96	
Stereomastis sp.	2.36	190	0.64	
Brama brama	1.46	14	0.40	
Lamprogrammus niger	1.46	14	0.40	
Parapagurus sp.	1.46	14	0.40	
Bassanago albescens	1.02	14	0.28	
CARIDEA	1.02	102	0.28	
Gadella imberbis	1.02	132	0.28	
Triplophos hemingi	0.88	102	0.24	
Lampadena sp.	0.58	14	0.16	
PANDALIDAE	0.14	14	0.04	
Total		369.98	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 176
 DATE :07/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°23.91
 start stop duration Lon E 13°22.59
 TIME :05:18:41 05:49:00 30.3 (min) Purpose : 3
 LOG : 3467.45 3469.03 1.6 Region : 4040
 FDEPTH: 106 108 Gear cond.: 0
 BDEPTH: 106 108 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.1 kn
 Sorted : 191 Total catch: 479.14 Catch/hour: 948.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	719.35	8642	75.87	221
Trigla lyra	70.67	663	7.45	
Pagellus bellottii	34.85	327	3.68	222
Sepia orbignyana	19.22	47	2.03	
Zeus faber	18.68	20	1.97	
Boops boops	17.81	210	1.88	
Helicolenus dactylopterus	15.81	184	1.67	
Sphoeroides pachygaster	13.81	40	1.46	
Umbrina canariensis	10.51	24	1.11	
Raja miraletus	7.74	10	0.82	
Citharus linguatula	5.20	283	0.55	
SEA URCHINS	4.57	360	0.48	
Brotula barbata	4.27	14	0.45	
Erythrocles monodi	2.97	4	0.31	
Pterothrissus bellucci	2.28	24	0.24	
Microchirus frechkopi	0.44	10	0.05	
Total		948.17	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 177
 DATE :07/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°27.21
 start stop duration Lon E 13°22.32
 TIME :06:31:08 06:42:54 11.8 (min) Purpose : 3
 LOG : 3472.20 3472.82 0.6 Region : 4040
 FDEPTH: 98 96 Gear cond.: 0
 BDEPTH: 98 96 Validity : 5
 Towing dir: 0° Wire out : 240 m Speed : 3.2 kn
 Sorted : 43 Total catch: 42.76 Catch/hour: 217.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pentheroscion mbizi	59.54	204	27.32	
Umbrina canariensis	37.11	76	17.03	225
Trigla lyra	32.12	229	14.73	
Sepia orbignyana	20.54	36	9.42	
Citharus linguatula	19.22	668	8.82	
Pterothrissus bellucci	8.21	102	3.77	
Pagellus bellottii	7.44	46	3.41	224
Dentex macrophthalmus	6.58	71	3.02	223
Scorpaena normani	4.44	56	2.03	
Fistularia petimba	4.23	10	1.94	
Dentex angolensis	3.31	41	1.52	
Torpedo torpedo	3.06	5	1.40	
Batrachoides liberiensis	2.65	10	1.22	
Trichiurus lepturus	2.19	5	1.01	
Alloteuthis africana	1.94	367	0.89	
Lagocephalus laevigatus	1.78	5	0.82	
Pontinus accraensis	1.68	10	0.77	
Zeus faber	1.12	5	0.51	
Boops boops	0.82	5	0.37	
Total		217.98	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 178
 DATE :07/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°26.65
 start stop duration Lon E 13°22.90
 TIME :07:13:12 07:43:17 30.1 (min) Purpose : 3
 LOG : 3474.92 3476.61 1.7 Region : 4040
 FDEPTH: 97 101 Gear cond.: 0
 BDEPTH: 97 101 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.4 kn
 Sorted : 47 Total catch: 46.92 Catch/hour: 93.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sepia orbignyana	15.83	18	16.92	
Trigla lyra	15.00	132	16.03	
Pentheroscion mbizi	13.16	36	14.07	
Raja miraletus	8.89	10	9.51	
Dentex macrophthalmus	7.26	60	7.76	
Raja alba	5.70	2	6.10	
Citharus linguatula	4.41	154	4.71	
Pterothrissus bellucci	4.27	50	4.56	
Zeus faber	4.15	8	4.43	
Umbrina canariensis	4.15	8	4.43	
Torpedo torpedo	1.66	6	1.77	
Sphoeroides pachygaster	1.58	4	1.68	
Dentex angolensis	1.54	16	1.64	
Pagellus bellottii	1.42	10	1.51	
Batrachoides liberiensis	1.28	6	1.36	
Trichiurus lepturus	1.06	2	1.13	
Scorpaena normani	0.92	14	0.98	
Alloteuthis africana	0.66	235	0.70	
Brotula barbata	0.58	2	0.62	
Microchirus frechkopi	0.08	2	0.09	
Total		93.56	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 179
 DATE :07/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°28.16
 start stop duration Lon E 13°23.99
 TIME :08:24:24 08:54:27 30.0 (min) Purpose : 3
 LOG : 3480.41 3482.20 1.8 Region : 4040
 FDEPTH: 68 72 Gear cond.: 0
 BDEPTH: 68 72 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.6 kn
 Sorted : 112 Total catch: 433.88 Catch/hour: 866.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	356.07	2974	41.09	226
Pomadasys jubelini	159.79	270	18.44	
Chloroscombrus chrysurus	72.94	350	8.42	
Selene dorsalis	62.72	160	7.24	
Citharus linguatula	33.62	1075	3.88	
Rhinobatos albomaculatus	24.45	10	2.82	
Stromateus fiatola	23.17	36	2.67	
Torpedo torpedo	19.51	66	2.25	
Dasyatis marmorata	17.70	2	2.04	
Trichiurus lepturus	14.24	753	1.64	
Zeus faber	13.22	14	1.53	
Dentex barnardi	12.86	58	1.48	
Umbrina canariensis	10.09	28	1.16	
Torpedo marmorata	8.99	6	1.04	
Pomatomus saltatrix	7.59	8	0.88	
Parapenaeus longirostris	6.79	2185	0.78	
Lagocephalus laevigatus	5.47	6	0.63	
Sepia orbignyana	3.93	2	0.45	
Alloteuthis africana	3.50	1366	0.40	
Pomadasys incisus	2.40	6	0.28	
Chaetodon hoefleri	1.68	6	0.19	
Brotula barbata	1.38	6	0.16	
Bembrops greyi	1.38	20	0.16	
Trigla lyra	0.86	6	0.10	
Pseudupeneus prayensis	0.86	6	0.10	
Scorpaena normani	0.58	6	0.07	
Serranus cabrilla	0.42	6	0.05	
B I V A L V E S	0.36	86	0.04	
Merluccius polli	0.06	6	0.01	
Total		866.60	100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 180
 DATE :07/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°29.74
 start stop duration Lon E 13°27.33
 TIME :09:44:18 10:14:27 30.2 (min) Purpose : 3
 LOG : 3486.90 3488.88 2.0 Region : 4040
 FDEPTH: 25 30 Gear cond.: 0
 BDEPTH: 25 30 Validity : 0
 Towing dir: 0° Wire out : 125 m Speed : 3.9 km
 Sorted : 139 Total catch: 148.85 Catch/hour: 296.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	83.28	569	28.12	227
Gymnura altavela	30.09	2	10.16	
Trichiurus lepturus	25.67	6310	8.67	
Dasysatis marmorata	25.55	8	8.63	
Sardinella maderensis	20.60	115	6.95	
Chloroscombrus chrysurus	11.94	66	4.03	
Alectis alexandrina	11.66	10	3.94	
Sphyræna sphyraena	11.28	36	3.81	
Caranx hippos	9.53	12	3.22	
Albula vulpes	9.45	22	3.19	
Rhinobatos albomaculatus	7.66	4	2.59	
Torpedo torpedo	6.81	48	2.30	
Sepia orbignyana	5.87	10	1.98	
Stromateus fiatola	4.58	10	1.55	
Raja miraletus	4.46	4	1.50	
Lithognathus mormyrus	4.34	6	1.46	
Pomadasy jubelini	4.16	14	1.40	
Pomatomus saltatrix	4.10	4	1.38	
Trigla lyra	3.70	20	1.25	
Uranoscopus polli	2.61	10	0.88	
Epinephelus aeneus	2.47	8	0.83	
Citharus linguatula	1.83	44	0.62	
Pagellus bellottii	1.61	10	0.54	
Scorpaena stephanica	1.00	6	0.34	
Dentex barnardi	0.62	6	0.21	
Euclinostomus melanopterus	0.46	4	0.15	
Pomadasy incisus	0.36	2	0.12	
Illex coindetii	0.28	2	0.09	
Bembrops heterurus	0.20	2	0.07	
Dicologlossa cuneata	0.06	4	0.02	
Total	296.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 181
 DATE :07/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 12°40.15
 start stop duration Lon E 13°6.98
 TIME :12:48:08 01:13:37 25.5 (min) Purpose : 3
 LOG : 3510.14 3511.39 1.3 Region : 4040
 FDEPTH: 31 34 Gear cond.: 0
 BDEPTH: 31 34 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 2.9 km
 Sorted : 21 Total catch: 20.85 Catch/hour: 49.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudupeneus prayensis	30.14	650	61.39	
Dasysatis marmorata	8.22	7	16.74	
Sardinella maderensis	2.92	16	5.95	
Fistularia tabacaria	1.81	42	3.69	
Bothus podas	1.58	35	3.21	
Aulopus filamentosus	0.87	5	1.77	
Syacium micrum	0.75	5	1.53	
Chelidonichthys gabonensis	0.68	5	1.39	
Sphoeroides marmoratus	0.64	16	1.29	
Chilomycterus spinosus mauret.	0.57	2	1.15	
Pagellus bellottii	0.49	5	1.01	
Scorpaena stephanica	0.42	2	0.86	
Total	49.10		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 182
 DATE :07/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 12°34.93
 start stop duration Lon E 13°3.46
 TIME :03:58:36 04:28:51 30.3 (min) Purpose : 3
 LOG : 3524.50 3525.90 1.4 Region : 4040
 FDEPTH: 710 716 Gear cond.: 0
 BDEPTH: 710 716 Validity : 0
 Towing dir: 0° Wire out : 1300 m Speed : 2.8 km
 Sorted : 32 Total catch: 176.49 Catch/hour: 350.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Talismania longifilis	79.80	690	22.79	
Chaceon maritae, female	30.07	137	8.59	
Parapenaeus longirostris, male	29.53	1847	8.44	
Bathyluroconger vicinus	28.15	159	8.04	
Hoplostethus cadenati	27.49	186	7.85	
Raja confundens	22.55	48	6.44	
Nezumia aequalis	22.18	690	6.33	
Yarrella blackfordi	17.14	298	4.90	
Plesiopenaeus edwardsianus	15.09	635	4.31	
Merluccius polli	13.29	14	3.80	
Stomias boa boa	10.43	232	2.98	
Dibranchius atlanticus	9.50	345	2.71	
Parapenaeus longirostris, femal	6.23	801	1.78	
Deania calcea	5.51	10	1.58	
Halosaurus ovenii	5.49	83	1.57	
Stereomastis sp.	5.30	298	1.51	
Opisthoteuthis sp.	4.56	28	1.30	
Chaceon maritae, male	4.48	18	1.28	
Synaphobranchus sp.	4.46	75	1.27	
Coelorinchus sp.	2.80	18	0.80	
Dicrolene intronigrer	2.22	159	0.63	
Triplophos hemingi	1.86	242	0.53	
Malacocephalus laevis	1.49	18	0.42	
PARALEPIDIDAE	0.18	10	0.05	
Gadella imberbis	0.18	10	0.05	
Etmopterus polli	0.08	10	0.02	
Total	350.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 183
 DATE :09/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 13°19.10
 start stop duration Lon E 12°35.59
 TIME :11:41:47 12:09:15 27.5 (min) Purpose : 3
 LOG : 3593.75 3595.13 1.4 Region : 4050
 FDEPTH: 116 114 Gear cond.: 0
 BDEPTH: 116 114 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.0 km
 Sorted : 96 Total catch: 397.46 Catch/hour: 868.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	408.23	3626	47.02	229
Umbriina canariensis	208.22	485	23.98	230
Trigla lyra	108.45	1033	12.49	
Dentex barnardi	29.97	70	3.45	
Trachurus trecae	22.10	520	2.55	228
Dentex angolensis	19.26	79	2.22	
Squatina oculata	17.65	4	2.03	
Boops boops	16.53	264	1.90	
Brotula barbata	12.56	17	1.45	
Pagellus bellottii	10.07	44	1.16	
Citharus linguatula	7.25	140	0.84	
Pontinus accraensis	3.89	17	0.45	
Peristedion cataphractum	1.94	9	0.22	
Perulibatrachus elminensis	1.40	9	0.16	
Sphoeroides pachgaster	0.61	9	0.07	
Total	868.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 184
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°11.10
 start stop duration Lon E 11°36.12
 TIME :07:25:37 07:56:36 31.0 (min) Purpose : 3
 LOG : 3777.11 3778.77 1.7 Region : 4050
 FDEPTH: 73 74 Gear cond.: 0
 BDEPTH: 73 74 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.2 km
 Sorted : 98 Total catch: 636.29 Catch/hour: 1231.53

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	936.77	18294	76.07	231
Dentex macrophthalmus	126.81	5915	10.30	232
Illex coindetii	92.57	2301	7.52	
Scomberomorus tritor	12.31	12	1.00	
Lophius sp.	11.69	25	0.95	
Squalus megalops	10.65	10	0.86	
Raja miraletus	8.94	12	0.73	
Fistularia petimba	8.32	12	0.68	
Chelidonichthys capensis	6.83	12	0.55	
Zeus faber	5.46	25	0.44	
Dentex barnardi	4.59	25	0.37	
Pagellus bellottii	3.35	25	0.27	
Trigla lyra	2.36	37	0.19	
SALPS	0.87	112	0.07	
Total	1231.53		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 185
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°13.89
 start stop duration Lon E 11°39.73
 TIME :08:59:41 09:21:34 21.9 (min) Purpose : 3
 LOG : 3783.98 3785.12 1.1 Region : 4050
 FDEPTH: 62 62 Gear cond.: 0
 BDEPTH: 62 62 Validity : 0
 Towing dir: 0° Wire out : 180 m Speed : 3.1 km
 Sorted : 38 Total catch: 531.48 Catch/hour: 1457.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	924.13	68054	63.41	233
Pagellus bellottii	134.48	1667	9.23	234
J E L Y F I S H	132.67	217	9.10	
Pomatomus saltatrix	80.46	145	5.52	
Mustelus mustelus	50.13	33	3.44	
Illex coindetii	36.97	869	2.54	
Chelidonichthys capensis	31.54	217	2.16	
Atractoscion aequidens	30.11	55	2.07	
Dentex macrophthalmus	26.08	1412	1.79	
Dasysatis marmorata	8.03	3	0.55	
Dentex barnardi	1.43	36	0.10	
Boops boops	1.43	36	0.10	
Total	1457.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 186
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°11.37
 start stop duration Lon E 11°43.68
 TIME :10:13:41 10:42:48 29.1 (min) Purpose : 3
 LOG : 3790.57 3792.32 1.7 Region : 4050
 FDEPTH: 48 47 Gear cond.: 0
 BDEPTH: 48 47 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 3.6 km
 Sorted : 109 Total catch: 2199.48 Catch/hour: 4531.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	3471.39	103620	76.60	235
Boops boops	348.71	4430	7.69	
Illex coindetii	219.50	5672	4.84	
Atractoscion aequidens	103.95	206	2.29	
Pomatomus saltatrix	91.94	206	2.03	
Pagellus bellottii	85.71	1158	1.89	
Lithognathus mormyrus	67.09	206	1.48	
J E L Y F I S H	43.06	288	0.95	
Chelidonichthys capensis	42.24	165	0.93	
Mustelus mustelus	17.39	41	0.38	
Starfish	16.57	4844	0.37	
Umrina canariensis	9.11	82	0.20	
Dentex barnardi	3.71	124	0.08	
Dentex macrophthalmus	3.30	371	0.07	
Dicologlossa cuneata	3.30	82	0.07	
Spondylosoma cantharus	2.88	41	0.06	
Trachinus armatus	2.06	41	0.05	
Total	4531.90		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 187
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°22.72
 start stop duration Lon E 11°43.53
 TIME :12:10:36 12:40:24 29.8 (min) Purpose : 3
 LOG : 3802.15 3803.59 1.5 Region : 4050
 FDEPTH: 50 50 Gear cond.: 0
 BDEPTH: 50 50 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 2.9 km
 Sorted : 110 Total catch: 449.48 Catch/hour: 904.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	231.64	37303	25.60	
Pagellus bellottii	210.12	2497	23.22	236
Chelidonichthys capensis	196.49	656	21.71	
Mustelus mustelus	85.27	32	9.42	
Dentex macrophthalmus	49.93	1750	5.52	
Illex coindetii	44.92	1937	4.96	
Chrysaora hysoscella	41.56	238	4.59	
Atractoscion aequidens	11.58	64	1.28	
Myliobatis aquila	10.67	8	1.18	
Starfish	6.97	1822	0.77	
Stromateus fiatola	5.50	8	0.61	
Pomatomus saltatrix	3.93	8	0.43	
Dicologlossa cuneata	2.05	32	0.23	
Dentex barnardi	1.39	56	0.15	
Spondylosoma cantharus	0.97	8	0.11	
Umrina canariensis	0.64	8	0.07	
GOBIIDAE	0.56	550	0.06	
Trichiurus lepturus	0.32	8	0.04	
Sepia orbignyana	0.24	8	0.03	
Cepola pauciradiatus	0.24	8	0.03	
Total	904.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 188
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°24.47
 start stop duration Lon E 11°45.69
 TIME :01:20:06 01:50:28 30.4 (min) Purpose : 3
 LOG : 3806.57 3808.21 1.6 Region : 4050
 FDEPTH: 23 21 Gear cond.: 0
 BDEPTH: 23 21 Validity : 0
 Towing dir: 0° Wire out : 80 m Speed : 3.2 km
 Sorted : 83 Total catch: 209.20 Catch/hour: 413.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chrysaora hysoscella	184.43	794	44.62	
Trachurus trecae	142.94	6682	34.58	
Dasysatis marmorata	61.36	10	14.85	
Illex coindetii	8.40	148	2.03	
Dentex barnardi	4.94	170	1.20	
Sarda sarda	3.69	4	0.89	
Pomatomus saltatrix	2.29	4	0.55	
Pagellus bellottii	2.19	124	0.53	
Chelidonichthys capensis	2.03	4	0.49	
Starfish	0.49	124	0.12	
Scomber japonicus	0.30	4	0.07	
Spondylosoma cantharus	0.24	4	0.06	
Total	413.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 189
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°29.17
 start stop duration Lon E 11°38.20
 TIME :03:13:21 03:43:15 29.9 (min) Purpose : 3
 LOG : 3817.69 3819.17 1.5 Region : 4050
 FDEPTH: 82 83 Gear cond.: 0
 BDEPTH: 82 83 Validity : 0
 Towing dir: 0° Wire out : 220 m Speed : 3.0 km
 Sorted : 98 Total catch: 2299.64 Catch/hour: 4614.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2946.84	60771	63.86	238
Dentex macrophthalmus	890.87	24791	19.31	237
Atractoscion aequidens	457.18	0	9.91	
Illex coindetii	134.99	0	2.93	
Pagellus bellottii	50.79	0	1.10	
Chelidonichthys capensis	42.80	0	0.93	
GOBIIDAE	23.52	0	0.51	
Dentex barnardi	21.15	0	0.46	
Umrina canariensis	11.76	0	0.25	
Dentex angolenis	9.87	0	0.21	
Chrysaora hysoscella	7.99	0	0.17	
Sepia orbignyana	5.64	0	0.12	
Spondylosoma cantharus	4.21	0	0.09	
Citharus linguatula	3.75	0	0.08	
Trichiurus lepturus	3.29	0	0.07	
Total	4614.66		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 190
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°33.88
 start stop duration Lon E 11°36.09
 TIME :04:39:32 05:04:20 24.8 (min) Purpose : 3
 LOG : 3823.25 3824.53 1.3 Region : 4050
 FDEPTH: 91 91 Gear cond.: 0
 BDEPTH: 91 91 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 3.1 km
 Sorted : 73 Total catch: 1247.80 Catch/hour: 3018.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1221.53	25340	40.46	239
Synagrops microlepis	1211.25	118205	40.12	
Dentex macrophthalmus	234.02	7198	7.75	240
Atractoscion aequidens	117.63	370	3.90	
Illex coindetii	96.65	1851	3.20	
Pagellus bellottii	42.77	288	1.42	
Merluccius capensis	21.39	82	0.71	
Sepia orbignyana	14.81	41	0.49	
Trichiurus lepturus	11.93	165	0.40	
Umrina canariensis	10.28	123	0.34	
Zeus faber	9.05	41	0.30	
Dentex gibbosus	7.81	41	0.26	
Chelidonichthys capensis	6.58	41	0.22	
Pterothrissus belloci	5.35	41	0.18	
Trigla lyra	4.94	82	0.16	
GOBIIDAE	1.65	247	0.05	
Citharus linguatula	1.23	82	0.04	
Total	3018.87		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 191
 DATE :10/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°49.06
 start stop duration Lon E 11°17.91
 TIME :09:05:37 09:30:36 25.0 (min) Purpose : 3
 LOG : 3848.00 3849.19 1.2 Region : 4050
 FDEPTH: 354 349 Gear cond.: 0
 BDEPTH: 354 349 Validity : 0
 Towing dir: 0° Wire out : 700 m Speed : 2.8 km
 Sorted : 83 Total catch: 420.96 Catch/hour: 1011.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dicrolene intronigrer	817.35	4189	80.84	
Chlorophthalmus atlanticus	130.28	3812	12.88	
Aristeus varidens, female	21.06	2388	2.08	
Shrimps, small, non comm.	8.89	2508	0.88	
Merluccius polli	6.44	48	0.64	
Callinectes amnicola	6.32	231	0.62	
Laemonema laureysi	5.84	317	0.58	
Galeus polli	3.70	26	0.37	
Mystriophis rostellatus	3.03	12	0.30	
Lophiodes kempii	2.91	36	0.29	
MYCTOPHIDAE	2.07	742	0.20	
Coelorinchus coelorhincus	1.44	36	0.14	
Parapenaeus longirostris	0.96	135	0.10	
Munidopsis sp.	0.72	135	0.07	
Squilla mantis	0.12	12	0.01	
Total	1011.11		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 192
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°35.49
 start stop duration Lon E 11°18.48
 TIME :01:24:48 01:54:54 30.1 (min) Purpose : 3
 LOG : 3870.39 3871.63 1.2 Region : 4050
 FDEPTH: 575 612 Gear cond.: 0
 BDEPTH: 575 612 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 2.5 kn
 Sorted : 43 Total catch: 438.92 Catch/hour: 874.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Coelorrinchus coelorrinchus	507.95	2934	58.06	
Chaceon maritae, male	119.90	144	13.70	
Nezumia aequalis	60.36	1559	6.90	
Merluccius capensis	36.74	40	4.20	
Aristeus varidens, female	30.38	2380	3.47	
Pontinus accraensis	23.40	307	2.67	
Yarella blackfordi	21.35	759	2.44	
Lamprogrammus exutus	19.08	163	2.18	
Hoplostethus cadenati	15.81	594	1.81	
Triplophos sp.	11.90	1868	1.36	
Laemonema laureysi	6.36	60	0.73	
Talismaania longifilis	5.12	100	0.59	
Benthodesmus tenuis	4.70	60	0.54	
Trachurus trecae	4.50	20	0.51	
Epigonus telescopus	4.11	163	0.47	
MELANONIDAE	1.44	40	0.16	
Bathyracoconger vicinus	1.02	20	0.12	
Chlorophthalmus atlanticus	0.82	20	0.09	
Total	874.92		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 193
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°34.43
 start stop duration Lon E 11°25.74
 TIME :05:34:54 06:05:14 30.3 (min) Purpose : 3
 LOG : 3885.35 3886.95 1.6 Region : 4050
 FDEPTH: 118 119 Gear cond.: 0
 BDEPTH: 118 119 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.2 kn
 Sorted : 60 Total catch: 60.12 Catch/hour: 118.93

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	60.04	932	50.48	241
Dentex macrophthalmus	20.77	315	17.47	242
Chelidonichthys capensis	18.87	182	15.87	
Etrumeus whiteheadi	4.91	59	4.13	
Illex coindetii	3.72	38	3.13	
Trigla lyra	1.78	24	1.50	
Sphoeroides pachgaster	1.66	4	1.40	
Anthias anthias	1.62	26	1.36	
Squalus megalops	1.46	4	1.23	
Sepia orbignyana	1.46	18	1.23	
Pagellus bellottii	0.79	4	0.67	
BATRACHOIDIDAE	0.71	2	0.60	
Dentex canariensis	0.69	2	0.58	
B I V A L V E S	0.30	44	0.25	
Syacium micrurum	0.12	6	0.10	
Dicologlossa cuneata	0.02	8	0.02	
Total	118.93		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 194
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°38.23
 start stop duration Lon E 11°24.10
 TIME :07:08:40 07:33:56 25.3 (min) Purpose : 3
 LOG : 3890.78 3892.09 1.3 Region : 4050
 FDEPTH: 125 123 Gear cond.: 0
 BDEPTH: 125 123 Validity : 0
 Towing dir: 0° Wire out : 310 m Speed : 3.1 kn
 Sorted : 47 Total catch: 46.96 Catch/hour: 111.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	37.61	679	33.73	244
Dentex macrophthalmus	26.93	615	24.15	243
Chelidonichthys capensis	21.65	38	19.42	
Trigla lyra	10.21	102	9.16	
Raja miraletus	4.06	5	3.64	
Synagrops microlepis	3.70	342	3.32	
Scorpaena normani	3.32	38	2.98	
Syacium micrurum	0.88	31	0.79	
SALPS	0.71	81	0.64	
Sphoeroides pachgaster	0.55	2	0.49	
Scorpaena stephanica	0.52	2	0.47	
B I V A L V E S	0.47	62	0.43	
Illex coindetii	0.47	2	0.43	
Sepia orbignyana	0.28	2	0.26	
Citharus linguatula	0.12	2	0.11	
Total	111.50		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 195
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°45.01
 start stop duration Lon E 11°21.04
 TIME :08:42:38 09:12:55 30.3 (min) Purpose : 3
 LOG : 3898.51 3900.23 1.7 Region : 4050
 FDEPTH: 133 134 Gear cond.: 0
 BDEPTH: 133 134 Validity : 0
 Towing dir: 0° Wire out : 330 m Speed : 3.4 kn
 Sorted : 124 Total catch: 123.89 Catch/hour: 245.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	91.85	870	37.43	246
Dentex macrophthalmus	73.51	1084	29.95	247
Trachurus capensis	31.85	111	12.98	245
Trigla lyra	19.73	236	8.04	
Chelidonichthys capensis	6.83	14	2.78	
Pontinus accraensis	4.56	61	1.86	
Syacium micrurum	4.42	135	1.80	
Zeus faber	4.22	8	1.72	
Raja miraletus	3.86	6	1.57	
Sphoeroides pachgaster	2.65	6	1.08	
B I V A L V E S	1.07	133	0.44	
Sepia orbignyana	0.50	2	0.20	
Loligo vulgaris	0.36	4	0.15	
Total	245.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 196
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°50.02
 start stop duration Lon E 11°34.79
 TIME :11:16:35 11:39:00 22.4 (min) Purpose : 3
 LOG : 3915.90 3917.06 1.2 Region : 4050
 FDEPTH: 95 95 Gear cond.: 0
 BDEPTH: 95 95 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.1 kn
 Sorted : 103 Total catch: 2149.45 Catch/hour: 5752.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	4351.45	51385	75.65	249
Loligo vulgaris	559.83	7453	9.73	
Dentex macrophthalmus	455.03	8496	7.91	248
Trigla lyra	71.72	337	1.25	
Merluccius capensis	64.44	447	1.12	
Squalus megalops	63.88	56	1.11	
Zeus faber	61.63	281	1.07	
Atractoscion aequidens	57.14	112	0.99	
Sepia orbignyana	54.35	169	0.94	
Dicologlossa cuneata	9.50	337	0.17	
Citharus linguatula	3.35	225	0.06	
Total	5752.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 197
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°49.37
 start stop duration Lon E 11°41.02
 TIME :12:38:16 12:59:20 21.1 (min) Purpose : 3
 LOG : 3923.62 3924.74 1.1 Region : 4050
 FDEPTH: 27 26 Gear cond.: 0
 BDEPTH: 27 26 Validity : 0
 Towing dir: 0° Wire out : 110 m Speed : 3.2 kn
 Sorted : 63 Total catch: 2499.33 Catch/hour: 7117.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chrysaora hysoscella	3326.00	16035	46.73	
Trachurus trecae	2843.75	370804	39.96	250
Engraulis encrasicolus	770.23	109660	10.82	
Sarda sarda	94.86	111	1.33	
Pomatomus saltatrix	35.00	111	0.49	
Atractoscion aequidens	19.19	225	0.27	
Etrumeus whiteheadi	12.42	903	0.17	
Spondyliosoma cantharus	7.89	111	0.11	
Pseudupeneus prayensis	5.64	111	0.08	
Trichiurus lepturus	2.25	111	0.03	
Total	7117.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 198
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 16°58.03
 start stop duration Lon E 11°42.88
 TIME :02:07:22 02:28:47 21.4 (min) Purpose : 3
 LOG : 3932.56 3933.84 1.3 Region : 4050
 FDEPTH: 24 24 Gear cond.: 0
 BDEPTH: 24 24 Validity : 0
 Towing dir: 0° Wire out : 125 m Speed : 3.6 kn
 Sorted : 69 Total catch: 368.87 Catch/hour: 1033.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chrysaora hysoscella	669.64	4569	64.81	
Trachurus trecae	134.37	4838	13.00	252
Etrumeus whiteheadi	78.91	4793	7.64	
Engraulis encrasicolus	47.51	5375	4.60	
Mustelus mustelus	28.57	8	2.77	
Argyrosomus hololepidotus	25.66	6	2.48	
Trachurus capensis	16.97	1160	1.64	251
Loligo vulgaris	12.86	98	1.24	
Arius heudelotii	8.91	28	0.86	
Pomatomus saltatrix	6.22	14	0.60	
Pagellus bellottii	0.84	56	0.08	
Spondyliosoma cantharus	0.84	70	0.08	
Schedophilus pamarco	0.84	14	0.08	
Vanstraelenia chirophthalmus	0.70	14	0.07	
Dentex barnardi	0.42	14	0.04	
Total	1033.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 199
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°0.00
 start stop duration Lon E 11°39.07
 TIME :03:16:18 03:26:47 10.5 (min) Purpose : 3
 LOG : 3938.94 3939.52 0.6 Region : 4050
 FDEPTH: 63 63 Gear cond.: 0
 BDEPTH: 63 63 Validity : 0
 Towing dir: 0° Wire out : 180 m Speed : 3.3 kn
 Sorted : 62 Total catch: 2199.81 Catch/hour: 12594.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	11550.34	365336	91.71	
254				
Mustelus mustelus	529.18	200	4.20	
Trigla lyra	260.50	1013	2.07	
Dentex macrophthalmus	140.38	11193	1.11	253
Atractoscion aequidens	101.74	406	0.81	
Engraulis encrasicolus	8.13	1013	0.06	
Etrumeus whiteheadi	4.06	200	0.03	
Total	12594.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 200
 DATE :11/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°0.53
 start stop duration Lon E 11°35.16
 TIME :04:20:06 04:50:40 30.6 (min) Purpose : 3
 LOG : 3944.75 3946.32 1.6 Region : 4050
 FDEPTH: 93 90 Gear cond.: 0
 BDEPTH: 93 90 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.1 kn
 Sorted : 101 Total catch: 100.78 Catch/hour: 197.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	57.19	1688	28.91	274
Illex coindetii	38.47	781	19.45	
Dentex macrophthalmus	24.97	681	12.62	255
Mustelus mustelus	24.14	6	12.20	
Merluccius capensis	20.29	92	10.26	256
Chelidonichthys capensis	15.07	98	7.62	
Synagrops microlepis	10.87	1030	5.50	
Atractoscion aequidens	2.08	4	1.05	
Umbra canariensis	1.57	20	0.79	257
GOBIIDAE	0.82	230	0.42	
B I V A L V E S	0.43	206	0.22	
J E L L Y F I S H	0.39	31	0.20	
Dicologlossa cuneata	0.39	16	0.20	
Sepia orbignyana	0.33	6	0.17	
Pterothrissus belloci	0.27	8	0.14	
Trichirus lepturus	0.24	4	0.12	
Zeus faber	0.22	8	0.11	
Citharus linguatula	0.04	2	0.02	
Total	197.80		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 201
 DATE :11/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 17°0.87
 start stop duration Lon E 11°15.86
 TIME :07:48:05 08:09:10 21.1 (min) Purpose : 3
 LOG : 3967.83 3968.75 0.9 Region : 4050
 FDEPTH: 657 679 Gear cond.: 0
 BDEPTH: 657 679 Validity : 0
 Towing dir: 0° Wire out : 1200 m Speed : 2.6 kn
 Sorted : 31 Total catch: 643.05 Catch/hour: 1831.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachyrincus scabrus	700.55	3770	38.26	
Nezumia aequalis	361.74	11146	19.75	
Todarodes angolensis	145.89	382	7.97	
Talismania longifilis	129.51	2731	7.07	
Chaceon maritae, male	109.01	154	5.95	
Merluccius capensis	77.46	100	4.23	258
Trachipterus sp.	75.41	54	4.12	
Chaceon maritae, female	60.20	288	3.29	
Holothuria sp.	24.58	54	1.34	
S H R I M P S	19.11	5299	1.04	
Yarrella blackfordi	16.37	655	0.89	
Lamprogrammus exutus	15.29	219	0.84	
Bathyrcongus vicinus	14.75	108	0.81	
Aristeus varidens, female	12.07	9562	0.66	
Centroscymnus crepidater	11.82	46	0.65	
Dicrolene intronigrer	10.37	219	0.57	
Pontinus accraensis	7.63	108	0.42	
Triplophos sp.	7.63	874	0.42	
Raja confundens	6.55	108	0.36	
Tetragonus cuvieri	4.90	54	0.27	
Aristeus varidens, male	4.36	547	0.24	
Hoplostethus cadenati	4.36	493	0.24	
Benthodesmus tenuis	3.82	54	0.21	
Triplophos sp.	3.27	436	0.18	
Stomias boa boa	2.16	162	0.12	
Apristurus saldanha	1.85	3	0.10	
Halosaurus ovenii	0.54	54	0.03	
Total	1831.18		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 202
 DATE :11/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 17°5.82
 start stop duration Lon E 11°17.11
 TIME :09:56:10 10:25:02 28.9 (min) Purpose : 3
 LOG : 3975.72 3976.98 1.3 Region : 4050
 FDEPTH: 591 588 Gear cond.: 0
 BDEPTH: 591 588 Validity : 0
 Towing dir: 0° Wire out : 1100 m Speed : 2.6 kn
 Sorted : 23 Total catch: 775.37 Catch/hour: 1612.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachyrincus scabrus	967.23	5904	60.00	
Pontinus accraensis	170.94	1430	10.60	
Aristeus varidens, female	92.00	7148	5.71	
Nezumia aequalis	84.53	2486	5.24	
Chaceon maritae, male	84.37	137	5.23	
Raja confundens	43.51	559	2.70	
Merluccius capensis	42.95	69	2.66	259
Talismania longifilis	32.31	622	2.00	
Chaceon maritae, female	25.49	121	1.58	
ANTHOZOA (Sea anemones)	20.50	62	1.27	
Hoplostethus cadenati	9.94	372	0.62	
Yarrella blackfordi	8.69	312	0.54	
Lamprogrammus exutus	8.07	125	0.50	
Centroscymnus crepidater	5.59	62	0.35	
Epigonus denticulatus	4.97	312	0.31	
MELANONIDAE	4.35	125	0.27	
Paramola cuvieri	4.10	2	0.25	
Gadella imberbis	2.47	62	0.15	
Total	1612.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 203
 DATE :12/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 17°10.72
 start stop duration Lon E 11°20.35
 TIME :12:17:05 12:48:29 31.4 (min) Purpose : 3
 LOG : 3986.54 3988.22 1.7 Region : 4050
 FDEPTH: 400 354 Gear cond.: 0
 BDEPTH: 400 354 Validity : 0
 Towing dir: 0° Wire out : 1060 m Speed : 3.2 kn
 Sorted : 27 Total catch: 404.52 Catch/hour: 772.97

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pontinus accraensis	240.50	4276	31.11	
Chlorophthalmus atlanticus	148.38	4103	19.20	
Laemonema laureysi	145.80	1951	18.86	
Bathynectes piperitus	133.74	4706	17.30	
Coelorrinchus braueri	17.79	946	2.30	
Nezumia aequalis	16.07	1808	2.08	
Malacocephalus laevis	14.04	631	1.82	
Galeus polli	9.75	86	1.26	
Parapanaeus longirostris	8.89	1349	1.15	
MYCTOPHIDAE	8.03	3013	1.04	
Pterothrissus belloci	7.17	29	0.93	
Illex coindetii	4.87	29	0.63	
Chaceon maritae, male	3.90	8	0.50	
Raja confundens	3.73	57	0.48	
Merluccius capensis	3.69	10	0.48	
Shrimps, small, non comm.	3.44	1089	0.44	
Synagrops microlepis	2.01	143	0.26	
Chaceon maritae, female	1.20	6	0.16	
Total	772.97		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 204
 DATE :12/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°10.99
 start stop duration Lon E 11°44.07
 TIME :05:20:00 05:50:18 30.3 (min) Purpose : 3
 LOG : 4013.53 4015.39 1.9 Region : 4050
 FDEPTH: 24 24 Gear cond.: 0
 BDEPTH: 24 24 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.7 kn
 Sorted : 74 Total catch: 590.15 Catch/hour: 1168.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Etrumeus whiteheadi	459.49	27937	39.32	
Engraulis encrasicolus	254.63	29297	21.79	
Trachurus trecae	100.08	2723	8.56	260
Trichirus lepturus	63.94	2180	5.47	
Argyrosomus hololepidotus	58.93	8	5.04	
Arius heudelotii	54.44	204	4.66	
Chelidonichthys gabonensis	37.90	44	3.24	
Stromateus fiatola	36.71	73	3.14	
Callorhynchus capensis	28.53	14	2.44	
Loligo sp.	25.31	133	2.17	
Raja alba	14.85	2	1.27	
Gymnura altavela	14.73	2	1.26	
Mustelus mustelus	7.25	14	0.62	
Raja miraletus	5.27	14	0.45	
Dicologlossa cuneata	2.63	59	0.23	
Atractoscion aequidens	2.34	30	0.20	
Panaeus notialis	0.87	630	0.07	
J E L L Y F I S H	0.71	14	0.06	
Total	1168.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 205
 DATE :12/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°10.25
 start stop duration Lon E 11°41.66
 TIME :06:31:58 07:02:56 31.0 (min) Purpose : 3
 LOG : 4018.91 4020.72 1.8 Region : 4050
 FDEPTH: 46 47 Gear cond.: 0
 BDEPTH: 46 47 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.5 kn
 Sorted : 48 Total catch: 712.34 Catch/hour: 1380.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	330.03	10054	23.90	261
Argyrosomus hololepidotus	304.28	145	22.03	
J E L Y F I S H	284.24	3040	20.58	
Chelidonichthys gabonensis	122.93	215	8.90	
Sepia orbignyana	67.21	174	4.87	
Loligo reynaudi	59.61	779	4.32	
Dasyatis margarita	58.64	8	4.25	
Atractoscion aequidens	28.63	174	2.07	
Pomatomus saltatrix	21.52	14	1.56	
Myliobatis aquila	21.09	2	1.53	
Raja miraletus	19.68	19	1.42	
Rhinobatos albomaculatus	16.17	8	1.17	
Mustelus mustelus	13.96	8	1.01	
Raja alba	9.54	2	0.69	
Dentex macrophthalmus	7.99	915	0.58	262
Callorhynchus capensis	5.51	2	0.40	
Dicologlossa cuneata	5.25	78	0.38	
Merluccius capensis	4.67	19	0.34	
Total	1380.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 208
 DATE :12/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°12.54
 start stop duration Lon E 11°28.17
 TIME :11:14:28 11:44:49 30.4 (min) Purpose : 3
 LOG : 4042.90 4044.50 1.6 Region : 4050
 FDEPTH: 153 165 Gear cond.: 0
 BDEPTH: 153 165 Validity : 0
 Towing dir: 0° Wire out : 400 m Speed : 3.2 kn
 Sorted : 101 Total catch: 879.26 Catch/hour: 1738.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1203.24	138364	69.22	
Dentex macrophthalmus	226.08	2989	13.01	269
Trachurus capensis	99.97	909	5.75	271
Merluccius capensis	94.81	556	5.45	270
Pterothrissus belloci	40.19	411	2.31	
Zeus faber	27.99	85	1.61	
Chelidonichthys capensis	16.65	34	0.96	
Peristedion weberi	5.14	34	0.30	
Zenopsis conchifer	4.80	67	0.28	
Trichiurus lepturus	4.80	136	0.28	
Loligo sp.	4.45	16	0.26	
Pontinus accraensis	3.26	85	0.19	
Brotula barbata	3.08	16	0.18	
Dicologlossa cuneata	1.03	51	0.06	
Illex coindetii	1.03	16	0.06	
GOBIIDAE	0.67	51	0.04	
Callinectes amnicola	0.51	34	0.03	
Squilla cadenati	0.51	16	0.03	
Total	1738.24		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 206
 DATE :12/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°11.83
 start stop duration Lon E 11°38.98
 TIME :07:49:40 08:19:44 30.1 (min) Purpose : 3
 LOG : 4024.67 4026.25 1.6 Region : 4050
 FDEPTH: 79 76 Gear cond.: 0
 BDEPTH: 79 76 Validity : 0
 Towing dir: 0° Wire out : 210 m Speed : 3.2 kn
 Sorted : 70 Total catch: 417.58 Catch/hour: 833.77

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	401.11	10431	48.11	263
Synagrops microlepis	140.39	1232	16.84	
Illex coindetii	51.81	1639	6.21	
Chelidonichthys capensis	48.08	307	5.77	
Merluccius capensis	46.76	276	5.61	264
Squatina oculata	43.53	2	5.22	
Dentex macrophthalmus	23.32	847	2.80	265
Sepia orbignyana	11.88	56	1.42	
Argyrosomus hololepidotus	11.06	12	1.33	
Trichiurus lepturus	11.00	351	1.32	
J E L Y F I S H	9.12	319	1.09	
Raja miraletus	8.59	12	1.03	
Dasyatis centroura	7.51	2	0.90	
Arius heudelotii	5.27	22	0.63	
Umrina canariensis	3.73	44	0.45	
Mustelus mustelus	2.90	4	0.35	
Atractoscion aequidens	2.20	6	0.26	
Pterothrissus belloci	1.76	34	0.21	
Dicologlossa cuneata	1.54	22	0.18	
B I V A L V E S	1.44	681	0.17	
GOBIIDAE	0.78	254	0.09	
Total	833.77		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 209
 DATE :12/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°12.63
 start stop duration Lon E 11°25.12
 TIME :12:36:59 01:07:01 30.0 (min) Purpose : 3
 LOG : 4048.30 4049.73 1.4 Region : 4050
 FDEPTH: 185 176 Gear cond.: 0
 BDEPTH: 185 176 Validity : 0
 Towing dir: 0° Wire out : 500 m Speed : 2.9 kn
 Sorted : 94 Total catch: 2299.62 Catch/hour: 4594.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	2555.42	18819	55.62	273
Synagrops microlepis	1063.54	83465	23.15	
Chlorophthalmus atlanticus	430.31	44599	9.37	
Merluccius capensis	398.94	2815	8.68	272
Dentex macrophthalmus	47.03	440	1.02	
Pontinus accraensis	38.22	1910	0.83	
Trachurus trecae	14.21	98	0.31	
Callinectes amnicola	9.79	635	0.21	
Dicologlossa cuneata	9.79	196	0.21	
Munidopsis sp.	8.81	1323	0.19	
Bembrops heterurus	7.83	98	0.17	
Squilla cadenati	3.42	98	0.07	
Pegusa lascaris	2.94	244	0.06	
Zenopsis conchifer	2.44	48	0.05	
Trichiurus lepturus	1.96	48	0.04	
Total	4594.65		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 207
 DATE :12/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 17°13.84
 start stop duration Lon E 11°30.94
 TIME :09:54:50 10:24:43 29.9 (min) Purpose : 3
 LOG : 4037.26 4038.83 1.6 Region : 4050
 FDEPTH: 136 132 Gear cond.: 0
 BDEPTH: 136 132 Validity : 0
 Towing dir: 0° Wire out : 320 m Speed : 3.2 kn
 Sorted : 126 Total catch: 526.06 Catch/hour: 1056.35

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	430.74	6273	40.78	266
Etrumeus whiteheadi	412.83	6508	39.08	
Merluccius capensis	90.00	408	8.52	267
Trachurus trecae	53.33	490	5.05	268
Pterothrissus belloci	29.74	450	2.82	
Zeus faber	15.90	108	1.51	
Squalus megalops	9.86	30	0.93	
Trichiurus lepturus	4.74	157	0.45	
Brotula barbata	2.99	16	0.28	
Squalus megalops	2.65	16	0.25	
Sepia orbignyana	1.41	8	0.13	
Scomber japonicus	0.74	8	0.07	
Dicologlossa cuneata	0.74	16	0.07	
Sardinops ocellatus	0.66	8	0.06	
Total	1056.35		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 210
 DATE :13/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 15°39.63
 start stop duration Lon E 11°45.60
 TIME :07:06:23 07:36:26 30.1 (min) Purpose : 3
 LOG : 4181.00 4182.62 1.6 Region : 4050
 FDEPTH: 116 117 Gear cond.: 0
 BDEPTH: 116 117 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 3.2 kn
 Sorted : 251 Total catch: 1503.37 Catch/hour: 2999.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	1615.75	14247	53.86	275
Umrina canariensis	799.00	2039	26.64	287
Spicara alba	132.85	1427	4.43	
Pagrus africanus	79.41	12	2.65	
Trachurus trecae	70.10	391	2.34	276
Dentex gibbosus	59.62	92	1.99	
Zeus faber	44.08	70	1.47	
Scomber japonicus	36.04	138	1.20	
Anthias anthias	31.19	323	1.04	
Dentex barnardi	27.40	104	0.91	
Spondylisoma cantharus	18.30	46	0.61	
Raja miraletus	16.80	24	0.56	
Squalus megalops	16.36	22	0.55	
Dentex angolensis	14.27	58	0.48	
SALPS	8.98	2418	0.30	
Rhinoptera marginata	8.48	2	0.28	
Atractoscion aequidens	6.48	2	0.22	
Lagocephalus laevigatus	4.01	24	0.13	
BATRACHOIDIDAE	2.87	12	0.10	
Scorpaena stephanica	2.51	12	0.08	
Trigla lyra	1.84	12	0.06	
Pagellus bellottii	1.60	12	0.05	
B I V A L V E S	1.14	208	0.04	
Illex coindetii	0.68	12	0.02	
Total	2999.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 211
 DATE :13/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 15°38.67
 start stop duration Lon E 11°54.92
 TIME :09:21:35 09:47:45 26.2 (min) Purpose : 3
 LOG : 4194.22 4195.77 1.6 Region : 4050
 FDEPTH: 88 93 Gear cond.: 0
 BDEPTH: 88 93 Validity : 2
 Towing dir: 0° Wire out : 250 m Speed : 3.5 kn
 Sorted : 98 Total catch: 437.71 Catch/hour: 1003.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	307.47	6507	30.64	277
Pagellus bellottii	212.65	1577	21.19	279
Dentex macrophthalmus	161.20	1231	16.06	278
Dentex barnardi	135.36	757	13.49	
Trichiurus lepturus	53.76	160	5.36	
Trigla lyra	31.66	332	3.16	
Dentex gibbosus	23.50	69	2.34	
Squatina oculata	18.71	11	1.86	
Illex coindetii	13.30	1039	1.33	
Myliobatis aquila	11.69	9	1.17	
Raja miraletus	11.49	18	1.14	
Atractoscion aequidens	7.96	9	0.79	
Chelidonichthys capensis	5.64	30	0.56	
Citharus linguatula	4.93	291	0.49	
Sepia orbignyana	2.71	18	0.27	
Dentex angolensis	1.01	9	0.10	
B I V A L V E S	0.50	291	0.05	
Total	1003.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 212
 DATE :13/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 15°39.56
 start stop duration Lon E 11°56.86
 TIME :10:25:03 10:55:07 30.1 (min) Purpose : 3
 LOG : 4199.80 4201.73 1.9 Region : 4050
 FDEPTH: 41 33 Gear cond.: 0
 BDEPTH: 41 33 Validity : 2
 Towing dir: 0° Wire out : 140 m Speed : 3.9 kn
 Sorted : 120 Total catch: 2149.46 Catch/hour: 4288.91

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2572.32	17904	59.98	281
Pagellus bellottii	507.46	5611	11.83	280
Lithognathus mormyrus	336.63	1251	7.85	
Dentex barnardi	290.88	2145	6.78	
Decapterus rhonchus	138.66	499	3.23	
Atractoscion aequidens	75.40	108	1.76	
Pseudupeneus prayensis	75.04	1215	1.75	
Pomadasy jubelini	72.89	214	1.70	
Squatina oculata	45.01	36	1.05	
Lagocephalus laevigatus	23.92	72	0.56	
Plectorhinchus mediterraneus	23.23	36	0.54	
Pomatomus saltatrix	22.15	36	0.52	
Etrumeus whiteheadi	18.58	892	0.43	
Raja miraletus	18.22	36	0.42	
Boops boops	15.72	108	0.37	
Diplodus puntazzo	14.65	108	0.34	
Epinephelus aeneus	12.49	36	0.29	
Illex coindetii	11.07	108	0.26	
Pomadasy incisus	4.63	36	0.11	
Syacium micrum	4.63	36	0.11	
Sardinella aurita	4.63	36	0.11	
Citharus linguatula	0.70	36	0.02	
Total	4288.91		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 213
 DATE :13/04/13 GEAR TYPE: BT NO: 25 POSITION:Lat S 15°23.09
 start stop duration Lon E 12°00.93
 TIME :12:58:21 01:23:04 24.7 (min) Purpose : 3
 LOG : 4217.15 4218.47 1.3 Region : 4050
 FDEPTH: 36 50 Gear cond.: 0
 BDEPTH: 36 50 Validity : 2
 Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
 Sorted : 94 Total catch: 593.39 Catch/hour: 1440.27

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	528.37	6485	36.69	282
Lithognathus mormyrus	251.58	1141	17.47	
Dasyatis centroura	133.59	2	9.28	
Pomadasy incisus	102.94	1352	7.15	
Squatina oculata	83.76	12	5.82	
Dentex barnardi	78.79	367	5.47	
Loligo vulgaris	51.33	197	3.56	
Lichia amia	33.59	2	2.33	
Spondyliosa emarginatum	28.74	143	2.00	
Dasyatis marmorata	26.92	24	1.87	
Mustelus mustelus	22.48	17	1.56	
Lagocephalus laevigatus	21.26	24	1.48	
Myliobatis aquila	20.87	12	1.45	
Sphyrna zygaena	13.59	7	0.94	
Ubrina canariensis	10.10	66	0.70	
Scorpaena stephanica	9.83	12	0.68	
Raja miraletus	8.79	12	0.61	
Trachurus trecae	6.82	51	0.47	
Pagrus auriga	2.89	12	0.20	
Diplodus puntazzo	1.55	12	0.11	
Trigla lyra	1.43	12	0.10	
Bothus podas	1.04	12	0.07	
Total	1440.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 214
 DATE :13/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 15°21.35
 start stop duration Lon E 11°56.87
 TIME :02:42:07 03:12:15 30.1 (min) Purpose : 3
 LOG : 4225.00 4226.60 1.6 Region : 4050
 FDEPTH: 119 111 Gear cond.: 0
 BDEPTH: 119 111 Validity : 2
 Towing dir: 0° Wire out : 300 m Speed : 3.2 kn
 Sorted : 86 Total catch: 1295.58 Catch/hour: 2579.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	1673.09	15232	64.85	286
Dentex angolensis	220.38	474	8.54	285
Atractoscion aequidens	191.93	125	7.44	
Trachurus trecae	182.45	1394	7.07	284
Ubrina canariensis	135.57	641	5.25	283
Zeus faber	59.70	84	2.31	
SALPS	47.41	12052	1.84	
Dentex barnardi	39.33	84	1.52	
Trigla lyra	19.52	195	0.76	
Spondyliosa emarginatum	8.08	28	0.31	
Anthias anthias	1.67	28	0.06	
Pagellus bellottii	0.84	28	0.03	
Total	2579.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 215
 DATE :14/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 14°28.18
 start stop duration Lon E 12°17.27
 TIME :10:15:34 10:40:08 24.6 (min) Purpose : 3
 LOG : 4372.65 4374.05 1.4 Region : 4050
 FDEPTH: 107 102 Gear cond.: 0
 BDEPTH: 107 102 Validity : 2
 Towing dir: 0° Wire out : 280 m Speed : 3.4 kn
 Sorted : 89 Total catch: 391.28 Catch/hour: 955.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	461.25	2860	48.27	288
Dentex barnardi	162.27	757	16.98	
Trigla lyra	94.46	1040	9.89	
Dentex angolensis	69.57	374	7.28	290
Pomatomus saltatrix	27.89	15	2.92	
Pagellus bellottii	27.45	195	2.87	289
SALPS	24.22	3431	2.54	
Spondyliosa cantharus	21.51	51	2.25	
Atractoscion aequidens	18.10	10	1.89	
Branchiostegus semifasciatus *	13.82	10	1.45	
Dentex gibbosus	11.75	29	1.23	
Zeus faber	6.86	10	0.72	
Pontinus accraensis	6.23	20	0.65	
Perulibatrachus elminensis	4.76	20	0.50	
Citharus linguatula	3.22	71	0.34	
Fistularia petimba	1.44	10	0.15	
Alloteuthis africana	0.42	93	0.04	
Sardinella aurita	0.29	10	0.03	
Total	955.51		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 216
 DATE :14/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 14°25.45
 start stop duration Lon E 12°20.02
 TIME :11:31:00 12:01:10 30.2 (min) Purpose : 3
 LOG : 4378.09 4379.67 1.6 Region : 4050
 FDEPTH: 65 67 Gear cond.: 0
 BDEPTH: 65 67 Validity : 2
 Towing dir: 0° Wire out : 180 m Speed : 3.1 kn
 Sorted : 83 Total catch: 765.62 Catch/hour: 1522.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomatomus saltatrix	482.07	354	31.66	
Pomadasy jubelini	322.87	384	21.21	
Trachurus trecae	216.67	1277	14.23	292
Lithognathus mormyrus	124.38	382	8.17	
Pagellus bellottii	122.96	998	8.08	291
Dentex barnardi	72.41	412	4.76	
Raja miraletus	37.63	56	2.47	
Trigla lyra	28.54	298	1.87	
SALPS	17.02	2299	1.12	
Atractoscion aequidens	16.11	16	1.06	
Pomadasy incisus	15.33	141	1.01	
Dentex gibbosus	15.17	28	1.00	
Selene dorsalis	12.91	56	0.85	
Sphyrna zygaena	11.22	6	0.74	
Decapterus rhonchus	8.79	28	0.58	
Trichiurus lepturus	8.51	28	0.56	
Pseudupeneus prayensis	4.40	28	0.29	
Alloteuthis africana	2.68	696	0.18	
Dentex macrophthalmus	1.97	14	0.13	
Fistularia tabacaria	0.97	14	0.06	
Total	1522.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 217
 DATE :14/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 14°6.66
 start stop duration Lon E 12°20.46
 TIME :02:17:08 02:47:10 30.0 (min) Purpose : 3
 LOG : 4397.09 4399.06 2.0 Region : 4050
 FDEPTH: 32 33 Gear cond.: 0
 BDEPTH: 32 33 Validity : 2
 Towing dir: 0° Wire out : 130 m Speed : 3.9 kn
 Sorted : 94 Total catch: 399.34 Catch/hour: 798.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	321.57	2892	40.29	293
Decapterus rhonchus	115.54	384	14.48	
Balistes capriscus	97.28	162	12.19	
Lithognathus mormyrus	80.05	178	10.03	
Dasyatis marmorata	73.21	68	9.17	
Pomadasys jubelini	57.00	76	7.14	
Dentex barnardi	16.37	50	2.05	
Raja miraletus	12.19	26	1.53	
Aluterus heudelotii	11.85	8	1.48	
Rhinobatos albomaculatus	7.00	8	0.88	
Syacium micrurum	2.80	16	0.35	
SALPS	2.04	256	0.26	
Dicologlossa hexophthalma	0.68	8	0.09	
Fistularia tabacaria	0.58	8	0.07	
Total	798.15		100.00	

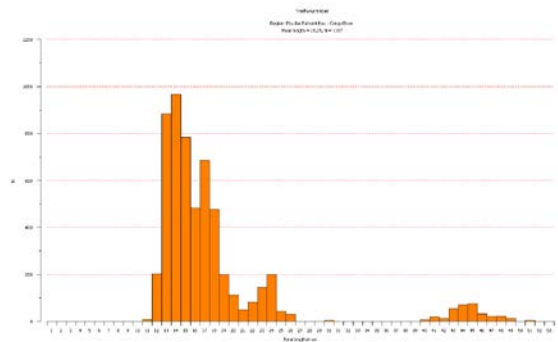
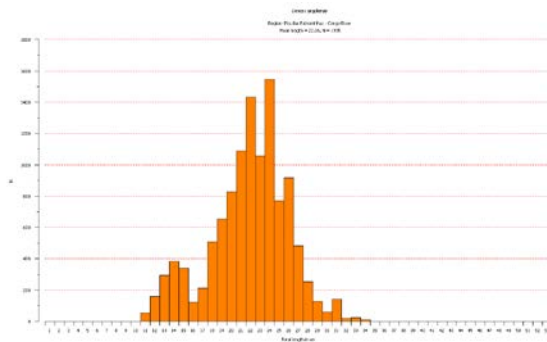
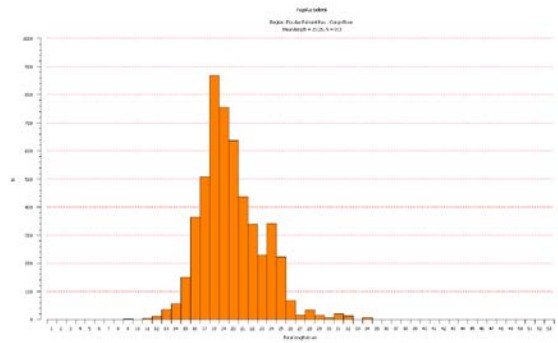
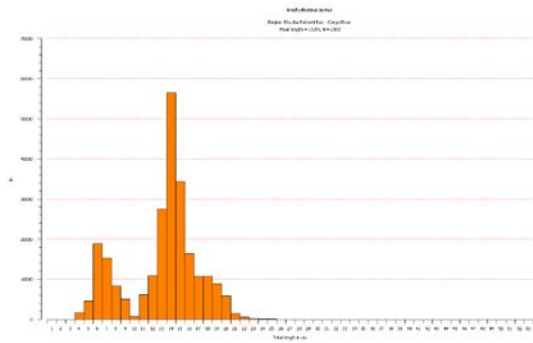
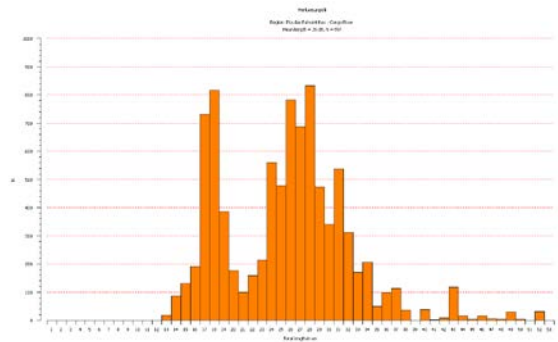
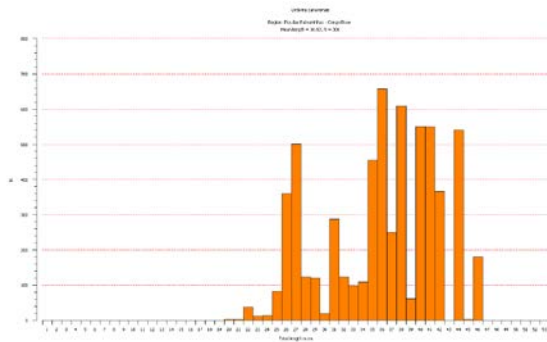
R/V Dr. Fridtjof Nansen SURVEY:2013403 STATION: 218
 DATE :14/04/13 GEAR TYPE: BT NO: 21 POSITION:Lat S 14°5.96
 start stop duration Lon E 12°18.87
 TIME :03:27:09 03:40:42 13.6 (min) Purpose : 3
 LOG : 4402.29 4402.77 0.5 Region : 4050
 FDEPTH: 90 90 Gear cond.: 0
 BDEPTH: 90 90 Validity : 2
 Towing dir: 0° Wire out : 280 m Speed : 2.1 kn
 Sorted : 23 Total catch: 23.12 Catch/hour: 102.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex barnardi	39.37	120	38.45	
Atractoscion aequidens	16.07	13	15.70	
Trigla lyra	10.36	111	10.12	
Squalus megalops	7.13	4	6.96	
Pagellus bellottii	7.04	66	6.88	
Dentex angolensis	4.92	35	4.80	
Spondyliosoma emarginatum	4.03	13	3.94	
Raja miraletus	3.19	4	3.11	
Dentex gibbosus	2.79	13	2.72	
Zeus faber	2.66	4	2.60	
Decapterus rhonchus	2.57	9	2.51	
SALPS	1.20	115	1.17	
Syacium micrurum	0.75	4	0.74	
Alloteuthis africana	0.31	58	0.30	
Total	102.38		100.00	

ANNEX II. Length distribution of main species.

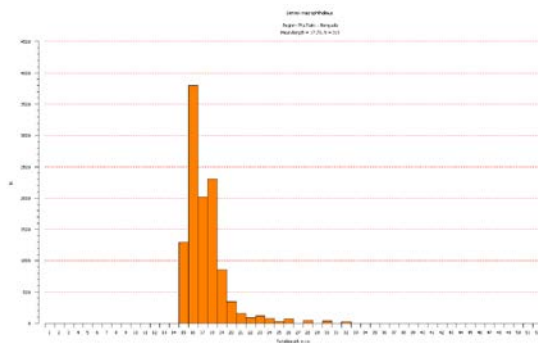
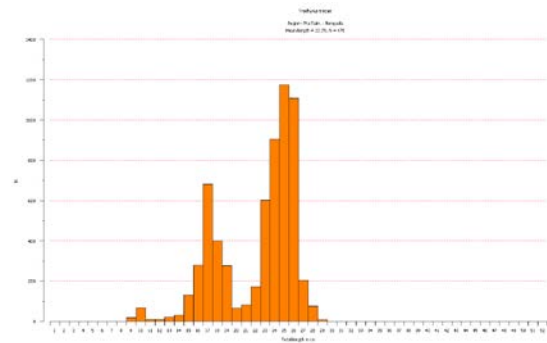
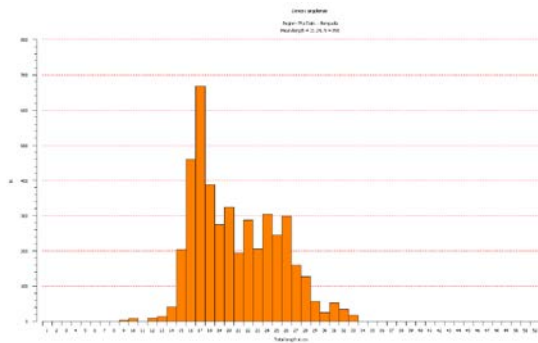
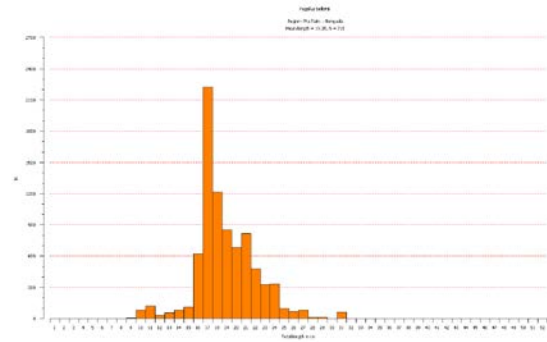
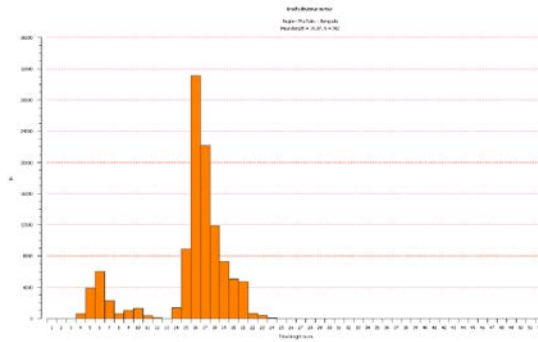
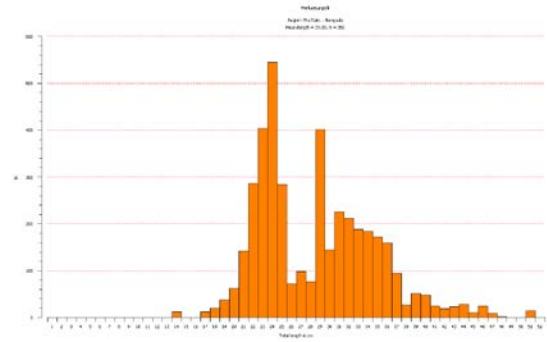
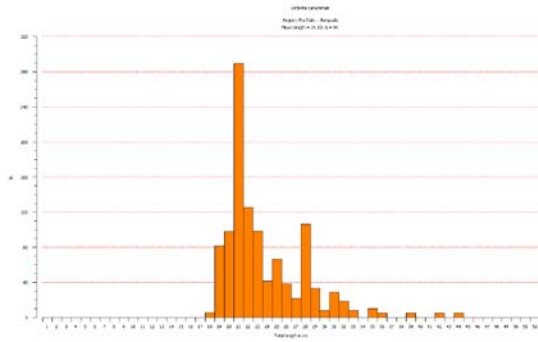
Northern Angola

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



ANNEX III. Swept area estimates

Congo River - Palmerinhas shelf (20-200 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								20-50m	50-100m	100-200m
	>0	10	30	100	300	1000					
Brachydeuterus auritus	14	5	4	5	1	1	50.85	5.748	14	4.231	0.119
Umbrina canariensis	16	5	3		1		42.37	2.117	0.04	0.806	5.147
Chloroscombrus chrysurus	6	3			2		18.64	1.923	6.16	0.129	
Dentex angolensis	20	8	8	1			62.71	1.271		0.615	2.984
Galeoides decadactylus	12	3	2		1		30.51	1.128	3.575	0.111	
Synagrops microlepis	1	1	2		1		8.47	1.036			2.911
Selene dorsalis	19	7	3				49.15	0.503	1.096	0.362	0.128
Pagellus bellottii	40	6	1				79.66	0.389	0.592	0.59	0.022
Trichiurus lepturus	38	5	1				74.58	0.382	0.137	0.36	0.612
Sphyræna guachancho	10	2		1			22.03	0.38	1.123	0.109	
Trachurus trecae	30	1	3				57.63	0.364	0.031	0.608	0.416
Ilisha africana	5	1		1			11.86	0.301	0.986		
Zeus faber	26	1		1			47.46	0.237	0.007	0.07	0.594
Dentex congoensis	22	4					44.07	0.202		0.19	0.386
Sphyræna sphyraena	10	1	1				20.34	0.17	0.545	0.011	0.001
Lagocephalus laevigatus	20	2					37.29	0.145	0.07	0.302	0.06
Dentex barnardi	25	2					45.76	0.138	0.151	0.25	0.021
Pseudotolithus senegalensis	9	1	1				18.64	0.132	0.418	0.012	
Brotula barbata	16	1					28.81	0.126		0.028	0.328
Alectis alexandrina	8	3					18.64	0.117	0.354	0.025	
Trigla lyra	25	2					45.76	0.095	0.002	0.035	0.231
Pomadasyς incisus	9	2					18.64	0.093	0.132	0.157	
Pagrus africanus	9		1				16.95	0.083	0.259	0.009	0.002
Raja miraletus	30						50.85	0.073	0.05	0.101	0.065
Pomadasyς jubelini	7	2					15.25	0.071	0.016	0.194	0.003
Spicara alta	13	1					23.73	0.071		0.001	0.199
Stromateus fiatola	8	1					15.25	0.058	0.036	0.139	
Pterothrissus bellocci	17						28.81	0.053		0.012	0.139
Ariomma bondi	13	1					23.73	0.045		0.006	0.121
Fistularia petimba	26						44.07	0.041	0.007	0.1	0.014
Squatina oculata	8						13.56	0.034		0.081	0.019
Miracorvina angolensis	4	1					8.47	0.033		0.004	0.089
Dasyatis marmorata	4	1					8.47	0.033	0.105	0.003	
Pagrus pagrus	3						5.08	0.031	0.095	0.007	
Alloteuthis africana	23						38.98	0.031	0.008	0.083	
Decapterus rhonchus	6	1					11.86	0.03	0.004	0.085	
Illex coindetii	32						54.24	0.027		0.014	0.063
Zenopsis conchifer	6						10.17	0.027		0.004	0.072
Pagrus caeruleostictus	8						13.56	0.026	0.016	0.064	
Ephippion guttifer	3						5.08	0.025	0.083		
Sphyræna afra		1					1.69	0.023	0.077		
Rhinobatos albomaculatus	9						15.25	0.023	0.042	0.031	
Sepia orbignyana	15						25.42	0.023	0.026	0.039	0.004
Pseudupeneus prayensis	16						27.12	0.02	0.049	0.015	
Epinephelus aeneus	6						10.17	0.018	0.009	0.038	0.006
Citharus linguatula	28						47.46	0.018	0.005	0.009	0.037
Saurida brasiliensis	16						27.12	0.018		0.012	0.038
Balistes capricus	9						15.25	0.017	0.041	0.011	0.002
Raja alba	4						6.78	0.016		0.019	0.027
Atractoscion aequidens	4						6.78	0.015			0.042
Rhizoprionodon acutus	2						3.39	0.015	0.048		
Mustelus mustelus	5						8.47	0.014		0.033	0.008
Pontinus accraensis	7						11.86	0.014		0.001	0.038
Arius parkii	2						3.39	0.013	0.043		
Drepane africana	1						1.69	0.013	0.041		
Branchiostegus semifasciatus *	7						11.86	0.012		0.017	0.019
Sardinella maderensis	11						18.64	0.012	0.034	0.006	
Chrysaora hysoscella	8						13.56	0.011	0.006	0.016	0.01
Pentheroscion mbizi	1						1.69	0.01			0.029
Chaetodon hoefleri	15						25.42	0.01	0.013	0.017	0.002
Merluccius polli	3						5.08	0.01			0.028
Penaeus notialis	4						6.78	0.005	0.018		
Parapenaeus longirostris, female	3						5.08	0.005			0.014
Parapandalus narval	1						1.69	0.004			0.011
S H R I M P S	1						1.69	0.003			0.007
Parapenaeus longirostris	2						3.39	0.001			0.004
penaeus notialis, male	1						1.69	0.001	0.003		
penaeus notialis, female	1						1.69	0.001	0.002		
Parapenaeus longirostris, male	1						1.69				0.001
Nematopalaemon hastatus	1						1.69				
Penaeus kerathurus	1						1.69				
Other fish								0.211	0.32	0.133	0.192
Sum all species								18.344	30.874	10.305	15.26
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES								0.026	0.035	0.038	0.006
Sum GRUNTS, SWEETLIPS								5.92	14.17	4.584	0.121
Sum CROAKERS, DRUMS, WEAKF., KOBES								2.316	0.482	0.825	5.307
Sum PANDORAS, PORGIES, SEABREAMS								2.159	1.15	1.744	3.418
Sum SHARKS, CHIMAERAS								0.063	0.048	0.114	0.027
Sum BATOID FISHES, RAYS								0.156	0.21	0.154	0.111
Sum CEPHALOPODS								0.084	0.034	0.141	0.073
Numbers of stations included in analysis, total and by depth strata								59	18	20	21

Congo River - Palmerinhas slope (200-500 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	Lower limits, Kg/nm								200-300m	300-400m	400-500m	
	>0	10	30	100	300	1000						
Merluccius polli	7	6	3	1			89.47	2.29	0.43	3.617	2.07	
Chlorophthalmus atlanticus	8	2	3	1			73.68	2.099	0.403	4.701	0.042	
Synagrops microlepis	6	2	4	1			68.42	2.006	4.847	1.734		
Nematocarcinus africanus	1	4	2	1			42.11	1.687		0.603	4.539	
Hymenocephalus italicus	6	3	1				52.63	0.556		0.23	1.455	
Dentex angolensis	2	3					26.32	0.425	1.617			
Brotula barbata	2	3					26.32	0.328	1.246			
Laemonema laureysi	6	2					42.11	0.326	0.001	0.711	0.085	
Hoplostethus atlanticus	1		1				10.53	0.279	1.059			
Pterothrissus bellocci	5		1				31.58	0.273	1.018	0.011		
Chaunax pictus	6	2					42.11	0.267		0.114	0.692	
Hoplostethus cadenati	3		1				21.05	0.26		0.602	0.02	
Trichiurus lepturus	5	2					36.84	0.234	0.292	0.352	0.028	
Gadella imberbis	11	2					68.42	0.228	0.001	0.251	0.387	
Benthodesmus tenuis	10	1					57.89	0.215	0.015	0.329	0.231	
Zenopsis conchifer	8	1					47.37	0.212	0.261	0.341		
Centrophorus granulosus	1	2					15.79	0.211		0.255	0.327	
Parapenaeus longirostris,female	10	1					57.89	0.198	0.126	0.392		
Pontinus accraensis	8	1					47.37	0.179	0.133	0.329	0.019	
Trachurus trecae			1				5.26	0.168	0.64			
Physiculus huloti	5	1					31.58	0.157	0.001	0.299	0.096	
Malacocephalus laevis	7	1					42.11	0.115	0.014	0.235	0.039	
Carcharhinus falciformis		1					5.26	0.107	0.407			
Dibranchus atlanticus	11						57.89	0.096	0.002	0.021	0.273	
Etmopterus polli	3	1					21.05	0.078			0.247	
Setarches guentheri		1					5.26	0.075		0.177		
Bembrops greyi	4						21.05	0.073	0.08	0.124		
Nezumia aequalis	11						57.89	0.07	0.064	0.051	0.099	
Aristeus varidens, female	5						26.32	0.065			0.206	
Stereomastix sp.	5						26.32	0.063		0.008	0.189	
Parasudis fraser-bruenneri	5						26.32	0.062	0.139	0.06		
Bathyroconger vicinus	9						47.37	0.062	0.009	0.105	0.048	
Miracorvina angolensis	3						15.79	0.057	0.167	0.03		
Raja confundens	3						15.79	0.055	0.206	0.002		
Lophiodes kempii	6						31.58	0.048		0.04	0.097	
Yarella blackfordi	5						26.32	0.046			0.147	
Epigonus telescopus	5						26.32	0.044	0.002	0.103		
Munidopsis sp.	3						15.79	0.044		0.104		
Bembrops heterurus	5						26.32	0.044	0.099	0.042		
Lophius vaillanti	2						10.53	0.041			0.129	
Grammoplites grueli	1						5.26	0.041		0.096		
Malacocephalus occidentalis	4						21.05	0.038		0.082	0.012	
Helicolenus dactylopterus	2						10.53	0.035		0.083		
Bathynectes piperitus	6						31.58	0.035		0.066	0.022	
Todaropsis eblanae	7						36.84	0.031	0.003	0.069	0.004	
Raja clavata	2						10.53	0.031		0.063	0.014	
Synagrops bellus	2						10.53	0.031	0.002	0.072		
Sea urchin, weak spines	2						10.53	0.031	0.011	0.065		
Chaceon maritae, male	2						10.53	0.03		0.049	0.031	
Halosaurus ovenii	6						31.58	0.03		0.002	0.092	
Lamprogrammus exutus	3						15.79	0.03			0.095	
Aristeus varidens, male	5						26.32	0.029			0.093	
Neoharriotta pinnata	1						5.26	0.029		0.069		
Nettastoma parviceps	3						15.79	0.024		0.055	0.001	
Torpedo torpedo	3						15.79	0.023	0.086			
Chascanopsetta lugubris	4						21.05	0.022		0.052		
Parapenaeus longirostris, male	8						42.11	0.021	0.07	0.006		
Illex coindetii	5						26.32	0.021	0.065	0.008		
Parapenaeus longirostris	2						10.53	0.02		0.048		
MYCTOPHIDAE	4						21.05	0.017	0.042	0.013		
Gadella maraldi	2						10.53	0.016		0.039		
Palinurus gilchristi	1						5.26	0.014			0.044	
Plesiopenaeus edwardsianus	3						15.79	0.013			0.041	
Peristedion cataphractum	9						47.37	0.012	0.016	0.017	0.001	
Coelorrhinus sp.	2						10.53	0.011		0.024	0.005	
Dicrolene intronigrer	3						15.79	0.011		0.003	0.033	
Cyttopsis rosea	1						5.26	0.011		0.027		
Stomias boa boa	2						10.53	0.011			0.036	
Raja miraletus	1						5.26	0.01		0.024		
Shrimps, small, non comm.	1						5.26	0.003		0.006		
Plesionika martia	1						5.26	0.002			0.005	
Aristeus varidens	1						5.26	0.001			0.004	
Solenocera africana	4						21.05	0.001		0.002		
ARISTEIDAE	1						5.26				0.001	
Other fish								0.16	0.239	0.088	0.191	
Sum all species								14.685	13.814	17.103	12.188	
Sum SNAPPERS, JOBFINCHES												
Sum GROUPERS, SEABASSES												
Sum GRUNTS, SWEETLIPS												
Sum CROAKERS, DRUMS, WEAFF., KOBES								0.075	0.236	0.03		
Sum PANDORAS, PORGIES, SEABREAMS								0.429	1.631			
Sum SHARKS, CHIMAERAS								0.431	0.423	0.329	0.574	
Sum BATOID FISHES, RAYS								0.119	0.292	0.089	0.014	
Sum CEPHALOPODS								0.058	0.082	0.083	0.004	
Numbers of stations included in analysis, total and by depth strata								19	5	8	6	

Congo River - Palmerinhas slope (500-800 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								500-600m	600-700m	700-800m
	>0	10	30	100	300	1000					
Deania calcea	2					1	16.67	58.34		175	0.015
Holothuria sp.		1				1	11.11	38.37		114.833	0.244
Yarrella blackfordi	7	9	1		1		100	6.693	0.393	17.368	2.043
Nezumia aequalis	8	3				1	66.67	6.278	0.18	17.848	0.717
Coral - Alcyonaria?					1		5.56	4.875		14.625	
Nematocarcinus africanus	1	1	11	1			77.78	4.331	6.407	4.244	2.922
Stereomastis sp.	14	2		1			94.44	1.769	0.376	4.007	0.844
Bathyroconger vicinus	12			1			72.22	1.575	0.026	4.586	0.101
Hoplostethus cadenati	12	3	2				94.44	1.158	0.223	2.127	0.995
Lamprogrammus exutus	10	5					83.33	0.854	0.421	1.221	0.848
Chaceon maritae, male	7	3	1				61.11	0.774	0.123	1.698	0.447
Benthodesmus tenuis	6		1				38.89	0.507	0.16	1.382	0.005
Photonectes braueri	6		1				38.89	0.412	0.155	1.071	0.03
Aristeus varidens, female	14		1				83.33	0.402	0.314	0.857	0.077
Coelorinchus sp.	1		1				11.11	0.361		1.058	0.022
Lophiodes kempfi	5		1				33.33	0.359	0.031	1.048	0.004
Halosaurus ovenii	8		1				50	0.352	0.022	0.981	0.048
ENOPLUTEUTHIDAE			1				5.56	0.281		0.842	
Merluccius polli	10	1					61.11	0.275	0.411	0.308	0.148
Holothuria spp.			1				5.56	0.238			0.611
Triplophos hemingi	14						77.78	0.219	0.316	0.223	0.146
Alloteuthis africana			1				5.56	0.208			0.534
Dibranchius atlanticus	13	1					77.78	0.19	0.051	0.427	0.086
Chaceon maritae	9	1					55.56	0.18	0.118	0.339	0.088
Lophius vaillanti	5	1					33.33	0.17	0.504	0.003	0.075
Xenodermichthys copei	13	1					77.78	0.158	0.027	0.32	0.112
Ebinania costaecanarie	4	1					27.78	0.144	0.035	0.383	0.016
Stomias boa boa	3	1					22.22	0.126	0.016	0.364	
Melanostomias sp.	2	1					16.67	0.125		0.149	0.193
OPISTHOTEUTHIDAE	2	1					16.67	0.112			0.288
Dicrolene intronigrer	9	1					55.56	0.105	0.05	0.226	0.042
Talismania longifilis	7						38.89	0.103		0.145	0.141
MELANONIDAE	4						22.22	0.083	0.078	0.142	0.036
Plesiopenaeus edwardsianus	7	1					44.44	0.083	0.048	0.198	0.008
Synaphobranchus kaupii	5	1					33.33	0.07		0.199	0.01
Polymetme corythaeola		1					5.56	0.06			0.155
MELANOSTOMIATIDAE	3						16.67	0.05	0.152	0.004	0.018
White sea cucumber	1						5.56	0.05			0.129
Aristeus varidens, male	11						61.11	0.044	0.092	0.053	0.001
Gonostoma elongatum	5						27.78	0.041	0.064	0.003	0.057
Chaunax pictus	4						22.22	0.039	0.141		
Ariomma bondi	1						5.56	0.036	0.129		
Bathyrocongrus sp.	1						5.56	0.034			0.086
Idiacanthus fasciola	1						5.56	0.03	0.108		
Malacocephalus laevis	2						11.11	0.027	0.026		0.051
Gadella maraldi	4						22.22	0.027		0.073	0.005
ANTHOZOA (Sea anemones)	3						16.67	0.026			0.067
Aristeus varidens	2						11.11	0.025			0.065
CRANCHIIDAE	3						16.67	0.022	0.018	0.05	
Gadella imberbis	7						38.89	0.022	0.048	0.015	0.009
Hydrolagus sp.	2						11.11	0.019		0.028	0.026
Ijimaia loppei	1						5.56	0.019			0.049
Chlorophthalmus atlanticus	6						33.33	0.018	0.038	0.015	0.005
Raja confundens	8						44.44	0.017	0.006	0.004	0.036
Centrolophus niger	1						5.56	0.016			0.041
OCTOPODIDAE	1						5.56	0.015			0.04
Centroscyminus crepidater	2						11.11	0.015	0.004		0.036
Octopoteuthis sicula	4						22.22	0.015	0.002	0.004	0.033
Bathygadus macrops	3						16.67	0.015		0.015	0.025
Munidopsis sp.	8						44.44	0.015	0.025	0.011	0.011
Halosaurus rostratus	3						16.67	0.014		0.014	0.024
Chauliodus sloani	4						22.22	0.013	0.022	0.005	0.014
Bathynectes piperitus	6						33.33	0.013	0.031	0.011	0.002
Ectreposebastes imus	4						22.22	0.012	0.021	0.008	0.009
OCTOPOTEUTHIDAE	2						11.11	0.01		0.017	0.011
Shrimps, small, non comm.	1						5.56	0.01			0.025
Glyphus marsupialis	5						27.78	0.008	0.002	0.013	0.009
Aristaeomorpha sp.	1						5.56	0.004	0.015		
PANDALIDAE	1						5.56	0.001			0.003
Acanthephyra sp.	1						5.56	0.001			0.002
Plesionika martia	1						5.56				0.001
Penaeopsis serrata	1						5.56			0.001	
Other fish								0.165	0.23	0.138	0.142
Sum all species								131.2	11.658	368.704	13.085
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES											
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAKF., KOBES											
Sum PANDORAS, PORGIES, SEABREAMS											
Sum SHARKS, CHIMAERAS								58.39	0.029	175.041	0.092
Sum BATOID FISHES, RAYS								0.017	0.006	0.004	0.036
Sum CEPHALOPODS								0.679	0.031	0.949	0.91
Numbers of stations included in analysis, total and by depth strata								18	5	6	7

Palmerinhas - Benguela. Shelf (20-200 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								20- 50m	50- 100m	100- 200m
	>0	10	30	100	300	1000					
Brachydeuterus auritus	4	3	7	5	2		41.18	4.64	10.99	2.44	0.92
Synagrops microlepis	1		2	2	1		11.76	1.75			5.57
Selene dorsalis	14	4		1	1		39.22	1.30	0.49	3.02	0.08
Trichiurus lepturus	20	4	5	1			58.82	0.86	0.32	1.17	1.04
Pomadasys jubelini	5	3	4	1			25.49	0.82	1.28	1.12	
Galeoides decadactylus	8	3	2	1			27.45	0.73	2.23	0.09	
Pomadasys incisus	10	4	4				35.29	0.71	0.57	1.43	
Dentex macrophthalmus	11	2	1	1			29.41	0.64		0.21	1.79
Trachurus trecae	15	5	1	1			43.14	0.62	0.59	1.10	0.09
Pagellus bellottii	29	5	3				72.55	0.61	0.25	1.30	0.16
Lagocephalus laevigatus	28	4	2				66.67	0.45	0.32	0.67	0.32
Dentex angolensis	22	2	3				52.94	0.45		0.53	0.80
Chloroscombrus chrysurus	11	4	1				31.37	0.38	0.94	0.23	
Brotula barbata	13	3	2				35.29	0.32		0.09	0.93
Pseudupeneus prayensis	13	5	1				37.25	0.29	0.35	0.49	
Sphyaena sphyaena	11	1	1				25.49	0.28	0.83	0.04	
Alectis alexandrina	5	3	2				19.61	0.27	0.72	0.13	
Pseudolithus senegalensis	3	3	2				15.69	0.27	0.56	0.25	
Ilisha africana	3	5	1				17.65	0.25	0.79		
Trigla lyra	23	4					52.94	0.25	0.01	0.29	0.43
Raja miraletus	33	1					66.67	0.24	0.14	0.43	0.13
Umbrina canariensis	16	3	1				39.22	0.24	0.11	0.36	0.24
Pteroscion peli	3	2	1				11.76	0.23	0.75		
Sepia orbignyana	34	1					68.63	0.16	0.15	0.18	0.14
Dentex barnardi	20	3					45.1	0.15	0.00	0.24	0.20
Citharus linguatula	35	1					70.59	0.14	0.01	0.30	0.08
Rhinobatos albomaculatus	11	1					23.53	0.11	0.11	0.21	
Stromateus fiatola	7	1					15.69	0.10	0.22	0.08	
Zeus faber	21						41.18	0.10		0.15	0.13
Pterothrissus belloci	9	1					19.61	0.09		0.01	0.29
Alloteuthis africana	22						43.14	0.08		0.20	0.02
Gymnura altavela	3	1					7.84	0.08	0.24		
Dicologlossa cuneata	9	1					19.61	0.08	0.24	0.00	
Balistes capriscus	3	2					9.8	0.07	0.21	0.01	
Hoplostethus atlanticus			1				1.96	0.07			0.21
Sardinella aurita	8	1					17.65	0.06	0.14	0.04	0.01
Ephippion guttifer	5	1					11.76	0.06	0.19		
Anthias anthias	2	1					5.88	0.06			0.19
Chlorophthalmus atlanticus	3	1					7.84	0.05			0.17
Scorpaena normani	10	1					21.57	0.05		0.02	0.14
Epinephelus guaza ?		1					1.96	0.05			0.16
Torpedo torpedo	12						23.53	0.05	0.02	0.11	0.00
Pomadasys peroteti	1	1					3.92	0.05	0.13	0.01	
Torpedo marmorata	4	1					9.8	0.04	0.10	0.01	0.01
Lithognathus mormyrus	6						11.76	0.04	0.08	0.04	

Sardinella maderensis	12		23.53	0.04	0.12	0.00	0.00
Dasyatis margarita	4	1	9.8	0.04	0.11	0.00	
Sphyræna guachancho	7		13.73	0.04	0.09	0.02	
Cynoponticus ferox	4		7.84	0.03		0.00	0.10
Bembrops heterurus	11		21.57	0.03	0.01	0.01	0.09
Caranx crysos	7		13.73	0.03	0.06	0.04	
Epinephelus aeneus	7		13.73	0.03	0.01	0.05	0.03
Uranoscopus cadenati	5		9.8	0.03		0.00	0.10
Arius heudelotii	6		11.76	0.03	0.10	0.00	
Dasyatis marmorata	5		9.8	0.03	0.06	0.03	
Illex coindetii	18		35.29	0.03		0.01	0.09
Sphoeroides pachgaster	4		7.84	0.03		0.00	0.09
Scomberomorus tritor	4		7.84	0.02	0.06	0.01	
Saurida brasiliensis	14		27.45	0.02		0.01	0.06
Parapenaeus longirostris	5		9.8	0.02		0.01	0.06
Penaeus notialis	4		7.84	0.02	0.06		
Drepane africana	2		3.92	0.02	0.06		
Caranx hippos	2		3.92	0.02	0.06		
Raja alba	4		7.84	0.02		0.01	0.05
Octopus vulgaris	12		23.53	0.02	0.02	0.03	0.01
Aulopus filamentosus	2		3.92	0.02	0.00	0.04	
Lagocephalus guntheri	1		1.96	0.02			0.05
Fistularia petimba	10		19.61	0.02	0.00	0.04	0.00
SALPS	2		3.92	0.02			0.05
Chaetodon hoefleri	11		21.57	0.02	0.01	0.03	0.01
Isurus oxyrinchus	1		1.96	0.02			0.05
MYCTOPHIDAE	1		1.96	0.01			0.05
Pontinus accraensis	7		13.73	0.01		0.00	0.04
Trachinotus ovatus	4		7.84	0.01	0.03	0.00	
S H R I M P S	4		7.84	0.00		0.00	0.00
Solenocera africana	1		1.96				0.00
Parapenaeus longirostris, female	1		1.96				0.00
Parapenaeus longirostris, male	1		1.96				
Other fish				0.23	0.23	0.18	0.28
Sum all species				19.26	25.15	17.52	15.43
Sum SNAPPERS, JOBFISHES							
Sum GROUPERS, SEABASSES				0.08	0.01	0.06	0.18
Sum GRUNTS, SWEETLIPS				6.23	12.99	5.00	0.93
Sum CROAKERS, DRUMS, WEAKF., KOB				0.77	1.43	0.63	0.26
Sum PANDORAS, PORGIES, SEABREAMS				1.91	0.33	2.33	2.98
Sum SHARKS, CHIMAERAS				0.02		0.02	0.05
Sum BATOID FISHES, RAYS				0.61	0.80	0.80	0.19
Sum CEPHALOPODS				0.29	0.17	0.42	0.26
Numbers of stations included in analysis, total and by depth strata				51	16	19	16

Palmerinhas - Benguela. Shelf (200-500 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								200- 300m	300- 400m	400- 500m
	>0	10	30	100	300	1000					
<i>Chlorophthalmus atlanticus</i>	11		1	1	1		77.78	3.76	0.22	8.26	0.11
<i>Nematocarcinus africanus</i>		1	7	2			55.56	3.72		2.87	7.34
<i>Merluccius polli</i>	5	4	7				88.89	2.38	2.26	3.60	0.82
<i>Hoplostethus mediterraneus</i>	1				1		11.11	2.06	9.29		
<i>Laemonema laureysi</i>	8	6	2				88.89	1.53	0.24	2.72	0.82
<i>Brotula barbata</i>	1	2	1	1			27.78	1.14	3.97	0.57	
<i>Hymenocephalus italicus</i>	7	1	2				55.56	0.91		1.94	0.13
<i>Bembrops heterurus</i>	3			1			22.22	0.83	3.69	0.02	
<i>Synagrops microlepis</i>	7	3	1				61.11	0.68	2.46	0.30	
<i>Hoplostethus cadenati</i>	9		2				61.11	0.60		0.62	0.96
<i>Pontinus accraensis</i>	6	2	1				50	0.57	0.79	0.79	0.15
<i>Aristeus varidens, female</i>	9	3					66.67	0.54		0.57	0.85
<i>Hoplostethus atlanticus</i>	1	1	1				16.67	0.52		1.16	
<i>Lamprogrammus exutus</i>	3	1	1				27.78	0.52			1.55
<i>Etmopterus polli</i>	6	1	1				44.44	0.49		0.86	0.32
<i>Pterothrissus bellocci</i>	4	2	1				38.89	0.48	1.53	0.32	
<i>Parapenaeus longirostris, female</i>	6		1				38.89	0.48	1.90	0.12	
<i>Chaunax pictus</i>	6	4					55.56	0.45		0.49	0.71
<i>Aristeus varidens, male</i>	11		1				66.67	0.43		0.79	0.23
<i>Epigonus telescopus</i>	4	1	1				33.33	0.42	0.50	0.70	
<i>Dentex macrophthalmus</i>	1	1	1				16.67	0.40	0.65	0.59	
<i>Galeus polli</i>	1		1				11.11	0.35		0.78	0.02
<i>Parapenaeus longirostris, male</i>	5		1				33.33	0.32	1.42	0.02	
<i>Dentex angolensis</i>	2		1				16.67	0.28	1.27		
<i>Yarrella blackfordi</i>	7	2					50	0.28		0.08	0.72
<i>Umbrina canariensis</i>	1		1				11.11	0.24	1.10		
<i>Chaceon maritae, female</i>	7	1					44.44	0.23		0.13	0.51
<i>Lophiodes kempfi</i>	6	1					38.89	0.22	0.01	0.39	0.12
<i>Malacocephalus laevis</i>	10						55.56	0.18	0.11	0.31	0.06
<i>Dibranchus atlanticus</i>	7						38.89	0.17		0.02	0.48
<i>Zenopsis conchifer</i>	3	1					22.22	0.17	0.62	0.06	
<i>Gadella imberbis</i>	13						72.22	0.15		0.16	0.23
<i>Gephyroberyx darwini</i>		1					5.56	0.15	0.66		
<i>Lophius vaillanti</i>	4	1					27.78	0.15		0.05	0.37
MYCTOPHIDAE	7	1					44.44	0.14	0.54	0.04	0.00
<i>Miracorvina angolensis</i>	2	1					16.67	0.12	0.56		
MELANONIDAE	3	1					22.22	0.11		0.01	0.31
<i>Trichiurus lepturus</i>	6						33.33	0.10	0.26	0.08	
<i>Raja alba</i>	2						11.11	0.09	0.38		
<i>Epinephelus guaza ?</i>		1					5.56	0.08	0.36		
<i>Benthodesmus tenuis</i>	10						55.56	0.07		0.05	0.16
<i>Parapenaeus longirostris</i>	3						16.67	0.07		0.15	
<i>Nezumia aequalis</i>	6						33.33	0.07		0.14	0.02
Scale worms	2						11.11	0.07		0.15	
<i>Epinephelus goreensis</i>		1					5.56	0.06	0.27		

Lagocephalus laevigatus	2	11.11	0.06	0.23	0.02	
Halosaurus ovenii	6	33.33	0.05		0.01	0.14
B I V A L V E S	3	16.67	0.05	0.16		0.04
Bathynectes piperitus	9	50	0.05		0.10	0.01
Bathyroconger vicinus	10	55.56	0.04	0.02	0.06	0.02
Coelorinchus coelorhincus	5	27.78	0.04	0.09	0.04	0.00
Illex coindetii	6	33.33	0.04	0.14	0.01	
Bembrops greyi	2	11.11	0.03	0.15		
Coelorinchus sp.	2	11.11	0.03	0.15	0.00	
Halosauropsis rostratus	2	11.11	0.03		0.07	
Physiculus huloti	2	11.11	0.03	0.11		
Monolene microstoma	4	22.22	0.03	0.11		
Stomias boa boa	2	11.11	0.02			0.07
Bassanago albescens	4	22.22	0.02		0.04	0.02
Heptranchias perlo	2	11.11	0.02		0.04	
Munidopsis sp.	4	22.22	0.02		0.04	0.00
MELANOSTOMIATIDAE	1	5.56	0.02			0.05
Erythrocles monodi	1	5.56	0.02	0.07		
Uranoscopus cadenati	2	11.11	0.02	0.07		
Munida sp.	1	5.56	0.01		0.03	
Coelorinchus simorhynchus	2	11.11	0.01	0.03		0.01
PARALEPIDIDAE	2	11.11	0.01	0.05	0.00	
Chaceon maritae, male	2	11.11	0.01			0.03
SALPS	2	11.11	0.01	0.02	0.02	
Plesiopenaeus edwardsianus	3	16.67	0.01			0.03
Aristaeomorpha foliacea	1	5.56	0.00			0.01
Aristeus varidens	1	5.56	0.00		0.00	
Heterocarpus grimaldi	1	5.56	0.00		0.00	
Solenocera africana	4	22.22	0.00	0.00	0.00	
Other fish			0.15	0.15	0.11	0.21
Sum all species			27.54	36.59	30.45	17.61
Sum SNAPPERS, JOBFISHES						
Sum GROUPERS, SEABASSES			0.14	0.62		
Sum GRUNTS, SWEETLIPS						
Sum CROAKERS, DRUMS, WEAKF., KOBS			0.37	1.65		
Sum PANDORAS, PORGIES, SEABREAMS			0.69	1.91	0.59	
Sum SHARKS, CHIMAERAS			0.87		1.68	0.37
Sum BATOID FISHES, RAYS			0.10	0.42		0.02
Sum CEPHALOPODS			0.05	0.14	0.03	0.03
Numbers of stations included in analysis, total and by depth strata			18	4	8	6

Palmerinhas - Benguela. Shelf (500-800 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci-	Mean dens.	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								500-600m	600-700m	700-800m
	>0	10	30	100	300	1000	t/nm ²				
Nematoctopus africanus		1	9				66.67	3.31	5.49	1.44	
Chaceon maritae, female	4	5	2	1			80	2.46	1.45	6.01	0.42
Yarella blackfordi	9	5		1			100	1.54	0.56	4.21	0.59
Lamprogrammus exutus	5	6	1				80	1.06	1.61	0.75	0.00
Hoplostethus cadenati	11	2	1				93.33	0.87	1.21	0.54	0.40
Aristeus varidens, female	9	2					73.33	0.46	0.54	0.61	0.04
Nezumia aequalis	10	2					80	0.45	0.08	0.63	1.21
Chaceon maritae, male	11	1					80	0.44	0.22	1.03	0.22
Talismania longifilis	5	2					46.67	0.42		0.78	1.05
Laemonema laureysi	7	2					60	0.38	0.36	0.72	
MELANONIDAE	8	1					60	0.38	0.30	0.74	0.11
Merluccius polli	8	2					66.67	0.37	0.55	0.17	0.16
Stomias boa boa	5	1					40	0.22	0.31	0.04	0.22
Aristeus varidens, male	11						73.33	0.22	0.25	0.33	0.00
Anemones, white	1	1					13.33	0.19	0.02		0.89
Chlorophthalmus atlanticus	11						73.33	0.18	0.32	0.04	
Benthodesmus tenuis	10	1					73.33	0.16	0.09	0.41	0.00
Bathyroconger vicinus	12	1					86.67	0.15	0.04	0.18	0.42
Dibranchius atlanticus	8						53.33	0.15	0.12	0.17	0.20
Stereomastis sp.	12						80	0.11	0.07	0.11	0.21
Raja confundens	6						40	0.10		0.14	0.34
Trachipterus sp.		1					6.67	0.09	0.17		
Lophiodes kempfi	4						26.67	0.09	0.03	0.11	0.22
Parapenaeus longirostris, male	1	1					13.33	0.09	0.04		0.36
OPISTHOTEUTHIDAE		1					6.67	0.09		0.33	
Etmopterus polli	10						66.67	0.08	0.09	0.08	0.07
Triplophos hemingi	14						93.33	0.08	0.03	0.07	0.21
OMMASTREPHIDAE	1	1					13.33	0.08		0.28	
Halosaurus ovenii	8						53.33	0.06	0.02	0.14	0.07
Plesiopenaeus edwardsianus	5						33.33	0.05	0.01	0.03	0.19
OCTOPOTEUTHIDAE	3						20	0.05	0.02	0.07	0.09
Xenodermichthys copei	11						73.33	0.05	0.03	0.11	0.00
Ebinania costaecanarie	3						20	0.05	0.00	0.16	
Gadella imberbis	10						66.67	0.04	0.07	0.01	0.00
Parapenaeus longirostris, female	2						13.33	0.04	0.05		0.08
Opisthoteuthis sp.	2						13.33	0.03			0.17
Chaceon maritae	2						13.33	0.03	0.05	0.02	
Illex coindetii	2						13.33	0.03	0.06		
Malacocephalus laevis	5						33.33	0.03	0.05		0.02
Chaunax pictus	4						26.67	0.03	0.05		
Bassanago albescens	2						13.33	0.03	0.04	0.01	
Galeus polli	2						13.33	0.02		0.08	
Stromateus fiatola	1						6.67	0.02	0.03		
Scale worms	1						6.67	0.02	0.03		
Luciobrotula nolfi	1						6.67	0.02		0.06	
ANTHOZOA (Sea anemones)	1						6.67	0.02		0.06	
Dicrolene intronigrer	5						33.33	0.02	0.01	0.01	0.05
HISTIOTEUTHIDAE	2						13.33	0.02	0.03		
Todaropsis eblanae	3						20	0.01	0.01	0.03	
Deania calcea	1						6.67	0.01			0.07
Synphobranchius kaupii	4						26.67	0.01	0.00	0.01	0.04
Coelorrinchus sp.	2						13.33	0.01	0.02		
Centrophorus granulosus	1						6.67	0.01	0.02		
Merluccius capensis	1						6.67	0.01		0.04	
Hymenocephalus italicus	1						6.67	0.01	0.02		
Synphobranchius sp.	1						6.67	0.01			0.05
Epigonus telescopus	3						20	0.01	0.02		
Glyphus marsupialis	2						13.33	0.01		0.03	0.01
Aristeus varidens	2						13.33	0.01	0.02		
Heterocarpus grimaldi	1						6.67	0.01		0.03	

CARIDEA	1	6.67	0.00	0.01	
PANDALIDAE	1	6.67		0.00	
Other fish			0.13	0.10	0.18
Sum all species		15.10	14.69	20.98	8.33
Sum SNAPPERS, JOBFISHES					
Sum GROUPERS, SEABASSES					
Sum GRUNTS, SWEETLIPS					
Sum CROAKERS, DRUMS, WEAKEF., KOBES					
Sum PANDORAS, PORGIES, SEABREAMS					
Sum SHARKS, CHIMAERAS		0.14	0.13	0.17	0.14
Sum BATOID FISHES, RAYS		0.10		0.14	0.34
Sum CEPHALOPODS		0.32	0.12	0.76	0.26
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						% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								20-50m	50-100m	100-200m
	>0	10	30	100	300	1000					
<i>Trachurus trecae</i>	1	6	4	3	4	2	95.24	43.92	34.37	78.67	1.33
<i>Chrysaora hysoscella</i>	1	1	1	1		1	23.81	6.20	21.42	0.19	
<i>Synagrops microlepis</i>	2		1		3		28.57	5.68		4.88	12.56
<i>Trachurus capensis</i>	2		1		1		19.05	4.48	0.08		15.59
<i>Dentex macrophthalmus</i>	7	3	4	3			80.95	4.33	0.05	7.17	4.36
<i>Engraulis encrasicolus</i>	1	1	1	1			19.05	1.55	5.40	0.03	
<i>Atractoscion aequidens</i>	7	2	2	1			57.14	1.43	0.73	2.84	
<i>Etrumeus whiteheadi</i>	3	1		2			28.57	1.35	2.51	0.01	2.21
<i>Merluccius capensis</i>	3	4		1			38.1	1.18	0.02	0.54	3.30
<i>Mustelus mustelus</i>	6	2		1			42.86	1.11	0.31	2.37	
<i>Illex coindetii</i>	4	5	3				57.14	1.08	1.06	1.80	0.03
<i>Loligo vulgaris</i>	2			1			14.29	0.88	0.06	2.00	0.00
<i>Pagellus bellottii</i>	4	3	2				42.86	0.82	0.41	1.63	0.00
<i>Chlorophthalmus atlanticus</i>				1			4.76	0.72			2.51
<i>Chelidonichthys capensis</i>	8	4	1				61.9	0.71	0.21	1.29	0.34
J E L L Y F I S H	3	1	2				28.57	0.66	1.55	0.51	
<i>Trigla lyra</i>	5	1	1				33.33	0.54		1.15	0.16
<i>Argyrosomus hololepidotus</i>	2	1	1				19.05	0.54	1.83	0.04	
<i>Pomatomus saltatrix</i>	4	3					33.33	0.34	0.75	0.30	
<i>Sepia orbignyana</i>	9	2					52.38	0.23	0.32	0.31	0.02
<i>Chelidonichthys gabonensis</i>		1	1				9.52	0.22	0.76		
<i>Zeus faber</i>	6	1					33.33	0.19		0.27	0.25
<i>Sarda sarda</i>	1	1					9.52	0.15	0.52		
<i>Trichiurus lepturus</i>	9	1					47.62	0.15	0.30	0.10	0.06
<i>Squalus megalops</i>	3	1					19.05	0.14		0.27	0.07
<i>Pterothrissus belloci</i>	4	1					23.81	0.12		0.03	0.37
<i>Dasyatis marmorata</i>	1	1					9.52	0.10	0.32	0.03	
<i>Arius heudelotii</i>	2	1					14.29	0.09	0.29	0.02	
<i>Lithognathus mormyrus</i>		1					4.76	0.09	0.31		
<i>Loligo reynaudi</i>		1					4.76	0.08	0.28		
<i>Dasyatis margarita</i>		1					4.76	0.08	0.28		
<i>Pontinus accraensis</i>	2	1					14.29	0.08			0.26
<i>Raja miraletus</i>	6						28.57	0.07	0.12	0.06	0.04
<i>Squatina oculata</i>		1					4.76	0.07		0.15	
<i>Dentex barnardi</i>	7						33.33	0.06	0.05	0.11	
<i>Stromateus fiatola</i>	2						9.52	0.06	0.17	0.02	
<i>Umbrina canariensis</i>	6						28.57	0.06	0.04	0.10	
<i>Dicologlossa cuneata</i>	11						52.38	0.06	0.05	0.05	0.07
<i>Myliobatis aquila</i>	2						9.52	0.05	0.10	0.04	
GOBIIDAE	6						28.57	0.05		0.10	0.00
<i>Callorhynchus capensis</i>	2						9.52	0.04	0.16		
<i>Loligo sp.</i>	2						9.52	0.04	0.12		0.02
Starfish	3						14.29	0.03	0.08	0.03	
<i>Raja alba</i>	2						9.52	0.03	0.11		
<i>Spondyliosoma cantharus</i>	6						28.57	0.03	0.06	0.02	
<i>Rhinobatos albomaculatus</i>	1						4.76	0.02	0.08		

Gymnura altavela	1	4.76	0.02	0.07		
Scomberomorus tritor	1	4.76	0.02		0.04	
Lophius sp.	1	4.76	0.02		0.04	
Callinectes amnicola	2	9.52	0.02			0.06
Dentex angolensis	1	4.76	0.02		0.04	
Munidopsis sp.	1	4.76	0.02			0.05
Citharus linguatula	5	23.81	0.01		0.03	0.00
Bembrops heterurus	1	4.76	0.01			0.05
Fistularia petimba	1	4.76	0.01		0.03	
Dentex gibbosus	1	4.76	0.01		0.03	
Zenopsis conchifer	2	9.52	0.01			0.04
Dasyatis centroura	1	4.76	0.01		0.03	
Penaeus notialis	1	4.76	0.00	0.00		
Other fish			0.08	0.05	0.01	0.21
Sum all species			80.11	75.38	107.36	43.98
Sum SNAPPERS, JOBFISHES						
Sum GROUPERS, SEABASSES						
Sum GRUNTS, SWEETLIPS						
Sum CROAKERS, DRUMS, WEAKEF., KOBES			2.02	2.60	2.98	
Sum PANDORAS, PORGIES, SEABREAMS			5.35	0.88	8.99	4.37
Sum SHARKS, CHIMAERAS			1.35	0.47	2.79	0.07
Sum BATOID FISHES, RAYS			0.38	1.07	0.16	0.04
Sum CEPHALOPODS			2.31	1.84	4.11	0.07
Numbers of stations included in analysis, total and by depth strata			21	6	9	6

Tombua - Cunene. Slope (200-500 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								200- 303m	303- 400m	400- 500m
	>0	10	30	100	300	1000					
Dicrolene intronigrer				1			50	14.42		14.42	
Chlorophthalmus atlanticus			2				100	4.61		4.61	
Pontinus accraensis			1				50	3.75		3.75	
Laemonema laureysi	1		1				100	2.37		2.37	
Bathynectes piperitus			1				50	2.08		2.08	
Aristeus varidens, female	1						50	0.37		0.37	
Coelorinchus braueri	1						50	0.28		0.28	
Nezumia aequalis	1						50	0.25		0.25	
Malacocephalus laevis	1						50	0.22		0.22	
Galeus polli	2						100	0.22		0.22	
Shrimps, small, non comm.	2						100	0.21		0.21	
Merluccius capensis	2						100	0.17		0.17	
MYCTOPHIDAE	2						100	0.16		0.16	
Parapenaeus longirostris	2						100	0.16		0.16	
Pterothrissus bellocci	1						50	0.11		0.11	
Callinectes amnicola	1						50	0.11		0.11	
Illex coindetii	1						50	0.08		0.08	
Chaceon maritae, male	1						50	0.06		0.06	
Raja confundens	1						50	0.06		0.06	
Mystriophis rostellatus	1						50	0.05		0.05	
Lophiodes kempii	1						50	0.05		0.05	
Synagrops microlepis	1						50	0.03		0.03	
Coelorinchus coelorhincus	1						50	0.03		0.03	
Chaceon maritae, female	1						50	0.02		0.02	
Munidopsis sp.	1						50	0.01		0.01	
Other fish								0.00		0.00	
Sum all species								29.88		29.88	
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES											
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAKF., KOBIS											
Sum PANDORAS, PORGIES, SEABREAMS											
Sum SHARKS, CHIMAERAS								0.22		0.22	
Sum BATOID FISHES, RAYS								0.06		0.06	
Sum CEPHALOPODS								0.08		0.08	
Numbers of stations included in analysis, total and by depth strata								2		2	

Tombua - Cunene. Slope (500-800 m)

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm								500- 600m	600- 700m	700- 800m
	>0	10	30	100	300	1000					
Trachyrincus scabrus				1	1		66.67	21.13	18.46	26.45	
Coelorrinchus coelorrhynchus				1			33.33	6.85	10.28		
Nezumia aequalis		1	1	1			100	6.44	2.83	13.66	
Chaceon maritae, male			3				100	4.06	4.04	4.12	
Pontinus accraensis	2		1				100	2.59	3.74	0.29	
Talismania longifilis	1	1	1				100	2.11	0.72	4.89	
Merluccius capensis		3					100	2.02	1.56	2.93	
Todarodes angolensis			1				33.33	1.84		5.51	
Aristeus varidens, female	1	1	1				100	1.73	2.37	0.46	
Chaceon maritae, female	1	1					66.67	1.08	0.49	2.27	
Trachipterus sp.		1					33.33	0.95		2.85	
Raja confundens	1	1					66.67	0.64	0.83	0.25	
Yarrella blackfordi	3						100	0.61	0.60	0.62	
Lamprogrammus exutus	3						100	0.55	0.54	0.58	
Hoplostethus cadenati	3						100	0.39	0.51	0.17	
Holothuria sp.	1						33.33	0.31		0.93	
Triplophos sp.	2						66.67	0.30	0.24	0.41	
ANTHOZOA (Sea anemones)	1						33.33	0.26	0.39		
S H R I M P S	1						33.33	0.24		0.72	
Centroscymnus crepidater	2						66.67	0.22	0.11	0.45	
Bathyroconger vicinus	2						66.67	0.20	0.02	0.56	
Dicrolene intronigrer	1						33.33	0.13		0.39	
Benthodesmus tenuis	2						66.67	0.11	0.10	0.14	
Laemonema laureysi	1						33.33	0.09	0.13		
MELANONIDAE	2						66.67	0.08	0.11		
Epigonus denticulatus	1						33.33	0.06	0.10		
Tetragonurus cuvieri	1						33.33	0.06		0.19	
Trachurus trecae	1						33.33	0.06	0.09		
Epigonus telescopus	1						33.33	0.06	0.08		
Aristeus varidens, male	1						33.33	0.06		0.17	
Paramola cuvieri	1						33.33	0.05	0.08		
Gadella imberbis	1						33.33	0.03	0.05		
Stomias boa boa	1						33.33	0.03		0.08	
Apristurus saldanha	1						33.33	0.02		0.07	
Chlorophthalmus atlanticus	1						33.33	0.01	0.02		
Other fish								0.01	0.00	0.02	
Sum all species								55.36	48.47	69.15	
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES											
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAKF., KOBES											
Sum PANDORAS, PORGIES, SEABREAMS											
Sum SHARKS, CHIMAERAS								0.24	0.11	0.52	
Sum BATOID FISHES, RAYS								0.64	0.83	0.25	
Sum CEPHALOPODS								1.84		5.51	
Numbers of stations included in analysis, total and by depth strata								3	2	1	

ANNEX IV Equations

1. Biomass estimates

The stratified estimator of mean density in the entire area is calculated as (Cochran, 1977)

$$\bar{y}_{st} = \sum_{i=1}^L W_i \bar{y}_i, \quad (1)$$

where

L is the number of strata,

$W_i = \frac{area_i}{total\ area}$ is the proportion of the i^{th} stratum of the total survey area,

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

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

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

The total biomass in the area is calculated by

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

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

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

where

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

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

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

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

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

If the sample size is “large” enough, then the Central Limit Theorem states that each time a survey is conducted there is a 95% chance that the true mean is in the interval (see Cochran², 1977)

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

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

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

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

ANNEX V Nansis Species codes

NAN-SIS species codes used in defining the 'grouped species' tables

MAIN GROUP	Demersal	Pelagic	Shrimp	Cephalopod	Sharks
	SPA0000	ENG0000	SHR0000	SQU0000	SHA0000
	POD0000	CLU0000			
	SCI0000	CAR0000			
	ARD0000	SCM0000			
	SER0000	SPH0000			
	LUT0000	TRI0000			
	OPDAA00	STRAA00			
	MERME00				
PELAGIC	Clupeids	Carangids	Scombrids	Hairtails	Barracudas
	ENG0000	CAR0000	SCM0000	TRI0000	SPH0000
	CLU0000				
DEMERSAL	Seabream	Snappers	Groupers	Grunts	Croakers
	SPADE00	LUT0000	SER0000	PODPO00	SCI0000
	SPADI00				
	SPALI00				
	SPAPA00				
	SPAPR00				
	SPASP00				
DEEP-WATER	Seabream	Hake	<i>P.longirostris</i>	<i>A.varidens</i>	<i>N.africanus</i>
	SPADE00	MERME03	SHRPE31	SHRAR22	SHRNE21
	SPADI00	MERME04	SHRPEP1	SHRARA1	
	SPALI00	MERME12	SHRPEP2	SHRARA2	
	SPAPA00	MERME13			
	SPAPR00	MERME92			
	SPASA00				
	SPASP00				

ANNEX VI. Catch rates by species group

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.

1. 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).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
6	42	11.2	96.5	1323.4	13.9	0.4	44.6	1490
7	33		4274.3	2214.9	13.8	7.6	255.5	6766.1
8	29.5		1721.8	407.6		2	317.6	2449
9	47.5	0.3	246.6	33.2			72.6	352.7
10	64	0.7	363.3	51.3			30	445.4
19	42.5	0.5	29.6	11.9			13.3	55.3
20	66	1.1	64.2	12.8			37.7	115.7
33	57	0.2	76.7	185.5			24.7	287.1
34	40		354.8	148.9			121.1	624.8
35	24.5		17.6	32.3		0.1	19.1	69.1
43	33	2.5	78.5	56.8			8.8	146.7
44	24		764.7	1206.6			1297.2	3268.5
45	28.5		176.2	52.4			23.2	251.7
46	42.5	0.5	50.8	0.7			5.4	57.4
47	61.5	8.1	241.7	13.8			27.4	291.1
53	38	0.9	44.2	1.1			24.6	70.9
54	46		5.8	0.2			1.3	7.3
56	33.5	0.9	84.3	95.8			11.5	195.5
57	44	0.2	75.7	55.8			34.5	166.3
72	42.5	0.1	137	23.1			26.8	187
80	68.5	3.6	39.1	26.9	11.8		57.3	138.6
81	45.5		816.7	261.6			119.3	1197.6
82	25	2	27.5	52.9			26.5	108.9
Mean	42.5	1.4	425.6	272.6	1.7	0.6	113.1	814.9
Std dev	13.4	2.8	924.3	552.8	4.5	1.7	269.9	1536.9
% Catch		0.2	52.2	33.5	0.2	0.1	13.9	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
3	148	6.1	72.7	156.2		0.5	31.8	267.4
4	112	4.2	61.6	4.3			12.1	82.2
5	77.5	7.2	1099.7	228.1			55.7	1390.6
15	163.5	7	143.9	12.4		2.5	1490.3	1656.1
16	123.5	1.9	67.8	0.3			12.5	82.5
17	85.5	3.7	878.2	158.2			30.5	1070.5
21	95.5	6.4	508.4	20.6			47.7	583.1
22	117.5	2.8	73.9	9.5			4.6	90.8
29	194.5		67.6	13.8		0.2	580.6	662.3
30	108.5	3.5	71.1	28.9		7	11.7	122.1
31	87	6.4	19.2	20.4			16.9	62.9
32	71.5	2.1	4.9	0.7			7.8	15.5
40	117.5	1.3	45.2	18.2			17.5	82.2
41	88.5	6.4	17.4	14.2			10.8	54.8
42	73	13.2	20.5	55			42.3	131.1
51	117.5		149	4.1			40.5	193.6
52	87.5	17.2	32.4	6.1			37.2	92.9
55	121.5	1.2	327.6	53.2			9.7	391.6
58	73.5	1.3	70.2	13.7	4.2		17.4	106.7
59	93	0.9	187.7	21.7			14.3	224.6
60	110.5	1.6	33.8	35.9	2.2		17.2	90.8
61	120	0.4	473.3	31	4.9		97.4	606.9
67	122.5	1.4	47.4	38.2			22.4	109.4
68	115	2.8	58.9	18.4			35.1	115.3
69	108.5	7.3	53.4	25.1	2.9	0.1	47.6	136.4
70	97	2.4	150.5	59.6	15.8		43.4	271.7
71	82.5	0.5	119.7	100.6	9.4		43.7	273.9
77	184.5	1.4	80.8	11.6		9.3	367.2	470.4
78	116.5	1.6	333.6	32.5			71.6	439.2
79	89.5	3	17.3	88.9			19.2	128.4
90	147	0.7	201.4	7.6			64.3	274
91	118.5	1.1	176.4	18.8	6.4		63.4	266.1
92	113		3366.8	77			33.8	3477.6
93	87.5	0.8	220.2	4.4	10.6		86.3	322.3
94	82	2.6	354.3	6.1	12.9		25.7	401.6
97	193.5	0.3	209	157.4		5.2	92.8	464.7
Mean	112.3	3.4	272.7	43.1	2.1	0.7	100.6	422.6
Std dev	32.3	3.7	580.6	54.1	4.1	2.1	261.4	639.1
% Catch		0.8	64.5	10.2	0.5	0.2	23.8	100.0

C. Slope (201-800 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
1	713.5		79			310	187.6	576.6
2	413		49.4	4.8	84.2	222.3	133.9	494.7
11	459.5		38.2	17.5	7.9	386.7	134.3	584.5
12	527	1.3	47.5	2.5		203.3	61.3	316
13	729		28.8			112.5	154.2	295.5
14	307.5	1	16.9			10.7	295.7	324.2
23	315.5	1.6	146	5.5	16.6	49.8	623	842.5
24	427		271.7	3.6	0.1	81.7	52.3	409.4
25	607.5		20.3	0.6	0.8	205.9	71.3	298.9
26	705.5		27.2			160	406.7	594
27	617	1	23.7			179.6	222.9	427.2
28	527.5	1.9	19.3	1.4	0.6	225.4	76.8	325.4
36	738.5	144.9	25			3.4	287.8	461
37	620	9	65.3		0.2	241.3	131.4	447.1
38	360.5		173.5	29.9		145.6	173	522
39	304	3.1	78.7	6.5		5.3	501.7	595.3
48	720.5	23.5	10.4		1.2	21.4	158.5	215
49	528.5	1	4.9	3		110.6	105.8	225.3
50	427.5		2.1	1.9	3.3	66.4	238.5	312.2
62	353	10.7	72.2	47.1	1.2	21.4	295.1	447.7
64	655	3.3	4.3	1.6	5	45.5	115.9	175.6
65	320.5	1.5	3.9	13.4		7	217.2	243
66	230.5	1.8	58.7	36.8	65.3	12.5	165.7	340.7
73	716	16.2	36.3		8.8	7.5	179	247.9
74	511		35.5	17.5	3.5	167.6	152.7	376.8
75	442.5		24.3	16.1	2.4	57.1	86.2	186.2
76	272.5	0.1	81.9	2.2		3.4	213.7	301.2
83	306	2.1	56.4	6.8		10.3	511.5	586.9
84	617	4.7	75	2.2	0.8	99.6	178.4	360.7
85	764.5	2.5		0.9	6.2	2.8	154.1	166.4
86	528		17.6			234.5	88.2	340.3
87	426	0.7	12.6	0.9	1.4	47.2	118.9	181.6
88	222.5	3.8	140.9		1.7	7.8	148.2	302.3
89	256	5.5	117.1		0.8	2.4	525.8	651.6
95	317.5		357.1	58	64.9	7.3	191.3	678.5
96	217.5	1.4	145.5	111.4		4.5	264.8	527.7
Mean	477.9	6.7	65.8	10.9	7.7	96.7	211.8	399.5
Std dev	173.1	24.2	76.8	22.2	20	103	140.6	164.6
% Catch		1.7	16.5	2.7	1.9	24.2	53.0	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).

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
6	42	2.8			64.9		1422.3	1490
7	33						6766.1	6766.1
8	29.5	11		29	42.2		2366.8	2449
9	47.5	8		3.5	41.7		299.5	352.7
10	64	9.6		45.9	19.6		370.4	445.4
19	42.5			1.2			54.1	55.3
20	66			1.6	24.7		89.5	115.7
33	57			51.2	23		212.9	287.1
34	40	19.8		35.5	25.5		544	624.8
35	24.5				14.4		54.8	69.1
43	33				68.9		77.7	146.7
44	24	104.3					3164.2	3268.5
45	28.5		14		51.6		186.2	251.7
46	42.5				34.7		22.7	57.4
47	61.5		19.7		222		49.3	291.1
53	38				44.2		26.7	70.9
54	46			4.8	0.9		1.6	7.3
56	33.5	36.9	0.1				158.5	195.5
57	44	6.3	1	8.7	12.2		138.1	166.3
72	42.5	6	4.3	6	2.2		168.6	187
80	68.5				36.5		102.1	138.6
81	45.5	64.8			33.7		1099.1	1197.6
82	25	5.7		6.5	4.4		92.4	108.9
Mean	42.5	12	1.7	8.4	33.4		759.5	814.9
Std dev	13.4	25.2	4.9	15.7	46.2		1538.6	1536.9
% Catch		1.5	0.2	1.0	4.1		93.2	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
3	148	16.9			48.1		202.3	267.4
4	112	5.4			45.4		31.4	82.2
5	77.5			62.9	119		1208.7	1390.6
15	163.5	85.1			30.7		1540.4	1656.1
16	123.5	4			63.3		15.2	82.5
17	85.5	0.7		6.5	9.4		1053.9	1070.5
21	95.5			47.3	13.1		522.7	583.1
22	117.5	1.2		1.7	19		68.9	90.8
29	194.5	7.8			24.1		630.4	662.3
30	108.5	20.6			39.7		61.9	122.1
31	87	1		1.1	9.3		51.5	62.9
32	71.5			0.7	3		11.8	15.5
40	117.5	0.8			16.1		65.3	82.2
41	88.5				4.7		50.1	54.8
42	73				20.2		110.8	131.1
51	117.5	2.9			107.9		82.8	193.6
52	87.5	0.8			10.3		81.8	92.9
55	121.5	51.5			242.4		97.7	391.6
58	73.5	37.6		0.5	26.3		42.3	106.7
59	93	74	3.8		91.7		55.1	224.6
60	110.5	0.9			23.2		66.7	90.8
61	120				430.2		176.7	606.9
67	122.5				13.1		96.3	109.4
68	115	8	3.5		17.4		86.3	115.3
69	108.5	21.5			27.6		87.4	136.4
70	97	110.8			20.5		140.5	271.7
71	82.5	60.6			19.6		193.7	273.9
77	184.5	23.6			31.3		415.5	470.4
78	116.5	109.4			148.6		181.2	439.2
79	89.5				16.8		111.6	128.4
90	147				180.8		93.2	274
91	118.5	5.7			116.9		143.5	266.1
92	113	3165.5			184.2		127.8	3477.6
93	87.5	1.7			156.4		164.2	322.3
94	82	223.1		5.7	119.3		53.5	401.6
97	193.5	10.3			101.8		352.6	464.7
Mean	112.3	112.5	0.2	3.5	70.9		235.4	422.6
Std dev	32.3	525.4	0.8	12.9	87.2		348.7	639.1
% Catch		26.6	0.0	0.8	16.8		55.7	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).

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Horse mackerel	Sardinella	Scombrids	Other	Total
6	42	2.5	1318.7			0.9	1.3	0	166.6	1490
7	33	62.7	2132.8	3.6		11.2	4.6	0	4551.2	6766.1
8	29.5	228.4	166.2	8.4	1		3.6	0	2041.4	2449
9	47.5	16.5	15.7				0.9	0	319.5	352.7
10	64	0.8	2.6		0.5	47	0.4	0	394.1	445.4
19	42.5		9.3					0	46	55.3
20	66	6.6	4.4			1.8		0	103	115.7
33	57	3.1	177.9		1.3	1.2	2.1	0	101.6	287.1
34	40	39.6	102.5		1.5	5.3		0	475.9	624.8
35	24.5	4.2	26.7		0.9		0.4	0	36.9	69.1
43	33	16.2	36.3		2.8		1.6	0	89.9	146.7
44	24	554.4	147.9	496.2	2		6.1	0	2061.9	3268.5
45	28.5	41.4	11					0	199.3	251.7
46	42.5	0.7						0	56.7	57.4
47	61.5	11.8	2					0	277.3	291.1
53	38	0.4	0.8					0	69.7	70.9
54	46		0.2					0	7.1	7.3
56	33.5	0.8	6.5	42.4	46.1			0	99.7	195.5
57	44	0.7	47.7	1.5	5.9			0	110.5	166.3
72	42.5	4.6	5.1	4.2	7.8	0.2	1.1	0	163.9	187
80	68.5		26.9		0			0	111.8	138.6
81	45.5	7.6	243.6		10.4			0	936	1197.6
82	25		49.7	0.3				2.4	56.5	108.9
Mean	42.5	43.6	197.1	24.2	3.5	2.9	1	0.1	542.5	814.9
Std dev	13.4	121.3	502.4	103.3	9.7	9.9	1.7	0.5	1043.9	1536.9
% Catch		5.4	24.2	3.0	0.4	0.4	0.1	0.0	66.6	100.0

B: Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeiods	Hairtails	Horse mackerel	Sardinella	Scombrids	Other	Total
3	148				156.2				111.2	267.4
4	112		1		3.3				77.8	82.2
5	77.5		34.6			186.2	7.3		1162.6	1390.6
15	163.5				12.4				1643.7	1656.1
16	123.5				0.3				82.2	82.5
17	85.5	3.6	43.5		13.6	95.2	2.3		912.3	1070.5
21	95.5		2.7		4.4	11.8	1.7		562.5	583.1
22	117.5				6.6	2.9			81.3	90.8
29	194.5				13.8				648.5	662.3
30	108.5		3.2		24.5	1.2			93.3	122.1
31	87		3.6		9.8	7			42.5	62.9
32	71.5				0.7				14.8	15.5
40	117.5				16.4	1.8			64	82.2
41	88.5				6.3	7.9			40.6	54.8
42	73	42.5	8.1		4.5				76	131.1
51	117.5					4.1			189.5	193.6
52	87.5		2.2		3.6	0.3			86.8	92.9
55	121.5	0.4	33.1		13.6	6.1			338.4	391.6
58	73.5		3.4		10.2	0.1			93.1	106.7
59	93				21.4	0.3			202.9	224.6
60	110.5				35.4	0.5			54.9	90.8
61	120				19.4	11.6			575.9	606.9
67	122.5				32	6.2			71.2	109.4
68	115				14.8	3.6			96.9	115.3
69	108.5				13.5	11.6			111.3	136.4
70	97		3		48.2	8.4			212.1	271.7
71	82.5	7.2	14.6		73.5	5.4			173.3	273.9
77	184.5				11.6				458.8	470.4
78	116.5				6.1	26.4			406.8	439.2
79	89.5		70.9		12.5	5.6			39.5	128.4
90	147				4.7	3			266.4	274
91	118.5				1.8	17.1			247.3	266.1
92	113		46.7			30.2			3400.6	3477.6
93	87.5				4.4				317.9	322.3
94	82	0.8			5.3				395.5	401.6
97	193.5				10.1	147.3			307.3	464.7
Mean	112.3	1.5	7.5		17.1	16.7	0.3		379.4	422.6
Std dev	32.3	7.2	16.6		28.1	40.7	1.3		622.5	639.1
% Catch		0.4	1.8		4.0	4.0	0.1		89.8	100.0

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

Slope (201-800 m).

Station	Gear depth	<i>A.varidens</i>	<i>N.africana</i>	<i>P.longirostris</i>	Seabream	Hake	Other	Total
1	713.5	5.9	303.6			2	265	576.6
2	413	8.9	213.5			43.8	228.6	494.7
11	459.5	20.6	362			35.4	166.5	584.5
12	527	14.2	188.9			34.8	78.1	316
13	729	7	105.5				183	295.5
14	307.5			10.7		16.9	296.7	324.2
23	315.5		3.5	46.3		146	646.7	842.5
24	427	0.7	79.3			271.7	57.8	409.4
25	607.5	8.6	197			8.9	84.4	298.9
26	705.5		160				434	594
27	617	8.5	170.8			10.9	237	427.2
28	527.5	10.1	213.7			3.1	98.5	325.4
36	738.5	2.5				1.5	457	461
37	620	14.9	225.6			29	177.7	447.1
38	360.5		142.9	2.7		173.5	202.9	522
39	304			5.3		78.7	511.3	595.3
48	720.5	8.1	11.7			4.6	190.6	215
49	528.5	8.5	100.3				116.5	225.3
50	427.5	5.8	60.6				245.8	312.2
62	353			19.8		72.2	355.7	447.7
64	655	7.7	37.4			4.3	126.2	175.6
65	320.5			7		3.2	232.8	243
66	230.5			12.4	26.5	1.1	300.7	340.7
73	716	3.2				19	225.7	247.9
74	511	19.2	146.3			21.9	189.3	376.8
75	442.5	11.2	43.5			13	118.4	186.2
76	272.5			3.4	29.7	0.2	267.9	301.2
83	306			10		48.5	528.4	586.9
84	617	4.4	93.6				262.7	360.7
85	764.5	1.2					165.2	166.4
86	528	3.8	227.9				108.6	340.3
87	426	6.1	41			12.6	121.9	181.6
88	222.5			7.8	64.4		230.1	302.3
89	256			2.4	65.7	26	557.5	651.6
95	317.5			7.1		357.1	314.3	678.5
96	217.5			4.5	64	39.5	419.7	527.7
Mean	477.9	5	86.9	3.9	7	41.1	255.6	399.5
Std dev	173.1	5.8	101.6	8.6	18.8	78.4	147.5	164.6
% Catch		1.3	21.8	1.0	1.8	10.3	64.0	100.0

2. C: Slope (201-800 m)

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
101	239	4.4	228	3		1.3	272.9	509.6
102	425.5	4	97.7	3.2	25.7	143.4	143.1	417.1
103	658.5	35	40.6	1.6	1.3	127.5	101	307
104	514.5	2.6	59.6	1.2		99.4	137.5	300.2
111	213.5	7.3	139.8	14.2		17.5	94.2	273
112	576.5	4.2	33.6	4.6	5.8	131.6	108.3	288
113	729	15	1.7		5	4.1	256.2	281.9
114	468.5		53.7	7.4	4	284	284.4	633.6
115	318.5		126.6	17.9		45.7	1253.2	1443.4
124	461.5		24.2	5	1.6	163	177.2	371
125	573.5		36.2	3.1	1	146.7	142.4	329.4
126	707		0.3	0.3			20.5	21.1
127	491.5		176.3	1.6		175.3	126.3	479.6
128	328		151.1		4.5	17.6	299.4	472.5
136	342.5	0.7	182.5	0.4		51.9	141.5	376.9
137	494.5	0.8	9	0.3		157.3	30.8	198.3
138	521		13.3		5.4	118.6	47.3	184.6
139	373		133.8	0.7	0.2	185.7	183.9	504.2
147	252.5	1	769.5	12.7		358.6	2099.3	3241.1
148	506.5	0.7	96.4	1.4	8.7	310.8	143	560.9
149	513.5		58.9	1.4		209.6	222.5	492.4
150	376.5		52.1	2	17.9	401.5	354.1	827.5
151	303		271.4	6.8	0.3	6.3	1358.5	1643.2
160	356.5		8.4	1.4	176.8	174.3	631.7	992.6
161	527	12.8	128.2	6	4.7	236.3	339.5	727.5
162	602.5	5.5	14.2	0.7	3.7	53.6	140.8	218.6
163	508.5	6	47	1.4	3.1	160.7	125	343.2
164	462		37.8	8.9	30	498.7	280.8	856.2
165	258.5	3.9	148.2	1.7		45.2	354.8	553.8
173	337	5.3	187.9		189.5	178.9	212.9	774.4
174	606.5	37.1	31.1	39.1	6.9	47.4	1126.1	1287.6
175	689.5		23.8		6	31.4	308.7	370
182	713	4.6	15.5		5.6	50.9	273.5	350.1
Mean	468.2	4.6	103	4.5	15.4	140.4	357.3	625.2
Std dev	146.5	8.9	139.7	7.6	43.9	123.1	452.4	594.1
% Catch		0.7	16.5	0.7	2.5	22.5	57.1	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)

Station	Gear depth	<i>B.auritus</i>	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
98	21.5					21.6		124	145.6
106	51				10.3	2.7		105.8	118.8
107	22.5	1.6			5.3	14.4		153.9	175.3
108	32	2221.1	132.5		126.3	76.6		1658	4214.4
118	61.5				20	125.6		620.8	766.5
119	36	507.3	37.7		51.9	9		453.5	1059.3
120	22.5	479.6	120.5		23.2			216.2	839.5
121	62	16.1	1.7	0.6	54.8	28.4		135.9	237.5
131	52.5	1.8		1.3	255.5	22.2		99.1	380
132	30.5			0.6				210	210.6
133	30.5	135.3						352	487.2
141	51.5	213.4	15.1		17.9	40.2		338.1	624.7
142	31	1506.6	286.6		49.6			792.9	2635.6
143	25.5					17.1		116.1	133.2
144	22.5					0.3		59.6	59.9
153	63.5			0.1		60.7		106.2	167.1
154	42.5			2.5	473.6	19.3		224.7	720.1
155	29.5	530.3	11.5	2.2	67.3			210	821.3
156	26.5	174.5	33.6		21.6			215.5	445.1
157	64.5	183.8	247.5		298	120.1		301.5	1150.9
168	27.5	79.6	148.1		297.4	14.5		473.4	1013.1
169	58	150.9	33.8	16.5	293.1	95.4		243	832.8
179	70	356.1	10.1	0.4	162.2	12.9		325	866.6
180	27.5	83.3		2.5	4.5	6.6		199.4	296.2
181	32.5					0.5		48.6	49.1
Mean	39.8	265.7	43.1	1.1	89.3	27.5		311.3	738
Std dev	16.1	520.4	80.4	3.3	130.7	38		331.9	907.6
% Catch		36.0	5.8	0.1	12.1	3.7		42.2	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	B.auritus	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
99	81.5	360.9		12.3		103.6		1379	1855.8
100	118					19.3		46.9	66.3
105	112.5					23.5		155.5	179.1
109	94.5		1.7		0.2	105.4		75.7	183.1
110	125		3.3			38.4		53.3	95
116	106	414.5				14.6		119	548
117	86.5					11.7		114.4	126
122	97.5				0.8	42.9		104.8	148.6
123	185		1.3			22		562.6	585.9
129	131.5					112.2		22.5	134.7
130	95.5					8		60.8	68.8
134	91.5	0.4	3.1			41.4		83.6	128.6
135	149.5		2			20.5		309.9	332.4
140	115.5	59.1	1.8			33.2		373.6	467.7
145	116.5		18.8			15.5		1794.3	1828.6
146	155.5					27.4		522.6	550.1
152	104		4.6			43.1		176.4	224.2
158	110.5				0.1	36.6		168.2	204.9
159	167.5		2.3			8		607.2	617.6
166	102		5.9	12.3		165.7		118.5	302.4
167	72				273.9	282.6		418.1	974.7
170	76.5	162.7	46.7		147.2	92.6		972.4	1421.5
171	99		7.3			212.4		141.1	360.8
172	109		76.1	75.7	1.3	132.5		242.2	527.9
176	107		10.5			754.2		183.5	948.2
178	99		17.3			10.2		66	93.6
179	70	356.1	10.1	0.4	162.2	12.9		325	866.6
Mean	110.3	50.1	7.9	3.7	21.7	88.5		340.6	512.6
Std dev	27.9	122.6	16.8	14.7	65.1	149.8		424.4	508.7
% Catch		9.8	1.5	0.7	4.2	17.3		66.4	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).

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Horse mackerel	Sardinella	Scombrids	Other	Total
98	21.5	1.3	56.1		1.8				86.4	145.6
106	51	9.6	78.9						30.2	118.8
107	22.5	2.4	60	0.1			1.8	6.2	104.8	175.3
108	32	293.9	373.6	45.9		10.7	11.4		3478.9	4214.4
118	61.5	10.3	363.9			60.1	1.9		330.2	766.5
119	36	66.5	75.4	2.3	10.3	5	9.5		888.3	1059.3
120	22.5	29.3	5.3	53.6	2.4		0.3		748.6	839.5
121	62	4.3	15.1	0.2	1.6	0.3			216	237.5
131	52.5	5.6	16.5						357.9	380
132	30.5	8.9	123.6				0.4		77.6	210.6
133	30.5	26.7	164.2		1.1		6.4		288.7	487.2
141	51.5	3.8	21.4		178.9	54.6	0.8	6	359.1	624.7
142	31	7.9	13.6	60	57.6	301.3		27.1	2168.1	2635.6
143	25.5	2.6	52.4			8.9	22.1		47.2	133.2
144	22.5								59.9	59.9
153	63.5		4.8						162.3	167.1
154	42.5	2.2	131			0.8			586	720.1
155	29.5	3.2	77.8	53.8	27.4		3.4		655.7	821.3
156	26.5	10.5	13	87.7	24		1.1		308.8	445.1
157	64.5		21.2		143	11.6			975.1	1150.9
168	27.5		12.4	123.7	29.4		65.9		781.6	1013.1
169	58	2.5	69.3		6.9	45.2	1.1		707.7	832.8
179	70		135.7		14.2				716.7	866.6
180	27.5	11.3	33.1		25.7		20.6		205.5	296.2
181	32.5						2.9		46.2	49.1
Mean	39.8	20.1	76.7	17.1	21	19.9	6	1.7	575.5	738
Std dev	16.1	58.8	99.6	33.6	44.7	61.2	13.9	5.6	761.5	907.6
% Catch		2.7	10.4	2.3	2.8	2.7	0.8	0.2	78.0	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeiods	Hairtails	Horse mackerel	Sardinella	Scombrids	Other	Total
99	81.5		1216.9			30.7			608.3	1855.8
100	118		1.7						64.5	66.3
105	112.5		20.3		32.4				126.4	179.1
109	94.5					0.3			182.7	183.1
110	125								95	95
116	106		15.9			10.4	4.5	15.9	501.3	548
117	86.5				3.9	1.7		1.5	119	126
122	97.5					0.7			147.9	148.6
123	185				7.6				578.3	585.9
129	131.5								134.7	134.7
130	95.5				1			0.9	66.9	68.8
134	91.5		2.1		0.1	13.7			112.7	128.6
135	149.5				87				245.4	332.4
140	115.5				151.3	2.1			314.3	467.7
145	116.5				124.3	27			1677.4	1828.6
146	155.5				44.2				505.9	550.1
152	104				47.1				177	224.2
158	110.5				5.4	3.5			196	204.9
159	167.5				0.9	1.5			615.2	617.6
166	102						0.2		302.2	302.4
167	72				3.8	45.5	26.9		898.5	974.7
170	76.5				342.8	384.2		8	686.6	1421.5
171	99				0.8				360	360.8
172	109								527.9	527.9
176	107								948.2	948.2
178	99				1.1				92.5	93.6
179	70		135.7		14.2				716.7	866.6
Mean	110.3		51.6		32.1	19.3	1.2	1	407.5	512.6
Std dev	27.9		234.4		73.7	73.8	5.2	3.4	366	508.7
% Catch			10.1		6.3	3.8	0.2	0.2	79.5	100.0

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

Slope (201-800 m).

Station	Gear depth	<i>A.varidens</i>	<i>N.africana</i>	<i>P.longirostris</i>	Seabream	Hake	Other	Total
101	239			1.3	111.6	35.7	361	509.6
102	425.5	26	114.7			97.7	178.7	417.1
103	658.5	16	108.8			4.1	178.2	307
104	514.5	18.7	80.7			12.4	188.4	300.2
111	213.5			17.3	10.5	78.8	166.5	273
112	576.5		113.7	17.4			156.9	288
113	729	2.9					279	281.9
114	468.5	23.8	259.1				350.7	633.6
115	318.5	20.2		25.4		126.6	1271.1	1443.4
124	461.5	17.6	145.4			12.7	195.2	371
125	573.5	7.4	139.3				182.7	329.4
126	707						21.1	21.1
127	491.5	19.4	154.9				305.3	479.6
128	328			17.5		151.1	303.9	472.5
136	342.5	0.7	35.5	15.6		182.5	142.6	376.9
137	494.5	22.9	134			3.2	38.1	198.3
138	521	4.2	114.4			13.3	52.7	184.6
139	373	11.6	169.2	4.8		133.8	184.8	504.2
147	252.5			358.6	104.8	12.9	2764.8	3241.1
148	506.5	52.3	257.4			16.6	234.6	560.9
149	513.5	39.5	170.1			29.7	253.1	492.4
150	376.5	82.4	318.4			52.1	374.6	827.5
151	303	0.8		5.5	124.5	29.9	1482.5	1643.2
160	356.5	23	148.5	2.7		8.4	809.9	992.6
161	527	25.6	210.7			8.2	483	727.5
162	602.5	11.4	42.2			7.6	157.4	218.6
163	508.5	30.1	130.6			45.5	137	343.2
164	462	72.5	426.2			25	332.5	856.2
165	258.5			45.2	1.8	146.4	360.4	553.8
173	337	178.9				182.4	413.1	774.4
174	606.5	43.9				10.1	1233.5	1287.6
175	689.5	26.7					343.3	370
182	713			35.8		13.3	301	350.1
Mean	468.2	23.6	99.2	16.6	10.7	43.6	431.4	625.2
Std dev	146.5	34.7	108.4	62.4	33.2	58	543.3	594.1
% Catch		3.8	15.9	2.7	1.7	7.0	69.0	100.0

3. 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).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
185	62	37	193.5	924.1	50.1		252.7	1457.4
186	47.5	219.5	624.5	3471.4	17.4		199.2	4531.9
187	50	45.2	274.6	232	85.3		268	905
188	22	8.4	7.4	146.9			250.6	413.3
197	26.5		27.1	3723.5			3366.6	7117.2
198	24	12.9	36.7	277.8	28.6		677.4	1033.2
199	63		242.1	11562.5	529.2		260.5	12594.3
204	24	25.3	115.7	878.1	35.8	0.9	112.8	1168.6
205	46.5	126.8	345.6	330	19.5		559.1	1380.9
212	37	11.1	1354	2734.2	45		144.7	4288.9
213	43	51.3	1005	40.4	119.8		223.7	1440.3
216	66	2.7	691.2	246.9	11.2		570.6	1522.6
217	32.5		475	115.5			207.6	798.1
Mean	41.8	41.5	414.8	1898.7	72.4	0.1	545.7	2973.2
Std dev	15.6	63.8	408.9	3190.9	141.7	0.2	865.7	3485.3
% Catch		1.4	14.0	63.9	2.4	0.0	18.4	100.0

B. Outer shelf (71-200 m)

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
183	115		704.8	22.1	17.6		123.5	868.1
184	73.5	92.6	134.7	949.1	10.6		44.5	1231.5
189	82.5	140.6	1445.8	2950.1			78.1	4614.7
190	91	111.5	433.9	1233.5			1240	3018.9
193	118.5	5.2	22.3	64.9	1.5		25.1	118.9
194	124	0.8	26.9	37.6			46.2	111.5
195	133.5	0.9	73.5	123.7			47.3	245.4
196	95	614.2	576.6	4351.4	63.9		146.2	5752.3
200	91.5	38.8	48.9	57.4	24.1		28.5	197.8
206	77.5	63.7	92.3	412.1	46.4		219.2	833.8
207	134	1.4	523.7	472.3	12.5		46.4	1056.3
208	159	5.5	324	104.8			1304	1738.2
209	180.5		446	2571.6			1577.1	4594.6
210	116.5	0.7	2621.8	106.1	16.4		254.7	2999.7
211	90.5	16	541.7	361.2	18.7		65.9	1003.5
214	115		2269.2	182.4			128.3	2580
215	104.5	0.4	310.6	461.5			182.9	955.5
218	90	0.3	74.2	2.6	7.1		18.2	102.4
Mean	110.7	60.7	592.8	803.6	12.2		309.8	1779.1
Std dev	28.4	145	759.8	1233.5	17.8		498.1	1756.5
% Catch		3.4	33.3	45.2	0.7		17.4	100.0

C. Slope (201-800 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
191	351.5		823.8		3.7	30.9	152.7	1011.1
192	593.5		55.8	9.2		30.4	779.5	874.9
201	668	145.9	103.1	3.8	13.7	35.5	1529.2	1831.2
202	589.5		51		5.6	92	1463.4	1612
203	377	4.9	3.7		9.7	12.3	742.3	773
Mean	515.9	30.2	207.5	2.6	6.5	40.2	933.4	1220.4
Std dev	142.2	64.7	346.3	4	5.3	30.3	571.3	471.6
% Catch		2.5	17.0	0.2	0.5	3.3	76.5	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).

Station	Gear depth	<i>B.auritus</i>	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
185	62		30.1			162		1265.3	1457.4
186	47.5		113.1			162.7		4256.1	4531.9
187	50		12.2			262.4		630.4	905
188	22					7.4		405.9	413.3
197	26.5		19.2			7.9		7090.1	7117.2
198	24		25.7			2.1		1005.5	1033.2
199	63		101.7			140.4		12352.2	12594.3
204	24		61.3			0		1107.3	1168.6
205	46.5		332.9			8		1040	1380.9
212	37		75.4	12.5	100.7	1135		2965.3	4288.9
213	43		10.1		102.9	861.6		465.6	1440.3
216	66		16.1		338.2	336.9		831.4	1522.6
217	32.5				57	418		323.2	798.1
Mean	41.8		61.4	1	46.1	269.6		2595.3	2973.2
Std dev	15.6		89.9	3.5	96.1	355.4		3520.1	3485.3
% Catch			2.1	0.0	1.6	9.1		87.3	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	<i>B.auritus</i>	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
183	115		208.2			467.5		192.4	868.1
184	73.5					134.7		1096.8	1231.5
189	82.5		468.9			976.9		3168.8	4614.7
190	91		127.9			284.6		2606.3	3018.9
193	118.5					22.3		96.7	118.9
194	124					26.9		84.6	111.5
195	133.5					73.5		171.9	245.4
196	95		57.1			455		5240.2	5752.3
200	91.5		3.7			25		169.2	197.8
206	77.5		17			23.3		793.5	833.8
207	134					430.7		625.6	1056.3
208	159					226.1		1512.2	1738.2
209	180.5					47		4547.6	4594.6
210	116.5		805.5			1736.9		457.3	2999.7
211	90.5		8			533.7		461.9	1003.5
214	115		327.5			1933.6		318.8	2580
215	104.5		18.1			292.6		644.9	955.5
218	90		16.1			54.1		32.2	102.4
Mean	110.7		114.3			430.3		1234.5	1779.1
Std dev	28.4		217.6			570		1592.4	1756.5
% Catch			6.4			24.2		69.4	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).

Station	Gear depth	Barracuda	Carangids	Clupeiods	Hairtails	Horse mackerel	Sardinella	Scombrids	Other	Total
185	62					924.1			533.3	1457.4
186	47.5					3471.4			1060.5	4531.9
187	50				0.3	231.6			673	905
188	22					142.9		4	266.4	413.3
197	26.5			782.6	2.2	2843.7		94.9	3393.7	7117.2
198	24			126.4		151.3			755.5	1033.2
199	63			12.2		11550.3			1031.8	12594.3
204	24			714.1	63.9	100.1			290.5	1168.6
205	46.5					330			1050.9	1380.9
212	37		138.7	18.6		2572.3	4.6		1554.7	4288.9
213	43					6.8			1433.4	1440.3
216	66		21.7		8.5	216.7			1275.7	1522.6
217	32.5		115.5						682.6	798.1
Mean	41.8		21.2	127.2	5.8	1734	0.4	7.6	1077.1	2973.2
Std dev	15.6		47.6	278.2	17.6	3191.1	1.3	26.2	804.1	3485.3
% Catch			0.7	4.3	0.2	58.3	0.0	0.3	36.2	100.0

B. Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeiods	Hairtails	Horse mackerel	Sardinella	Scombrids	Other	Total
183	115					22.1			846	868.1
184	73.5					936.8		12.3	282.4	1231.5
189	82.5				3.3	2946.8			1664.5	4614.7
190	91				11.9	1221.5			1785.4	3018.9
193	118.5			4.9		60			54	118.9
194	124					37.6			73.9	111.5
195	133.5					123.7			121.7	245.4
196	95					4351.4			1400.9	5752.3
200	91.5				0.2	57.2			140.4	197.8
206	77.5				11	401.1			421.7	833.8
207	134			413.5	4.7	53.3		0.7	584	1056.3
208	159				4.8	100			1633.5	1738.2
209	180.5				2	2569.6			2023.1	4594.6
210	116.5					70.1		36	2893.6	2999.7
211	90.5				53.8	307.5			642.3	1003.5
214	115					182.4			2397.5	2580
215	104.5					461.2	0.3		494	955.5
218	90		2.6						99.8	102.4
Mean	110.7		0.1	23.2	5.1	772.4	0	2.7	975.5	1779.1
Std dev	28.4		0.6	97.4	12.7	1246.1	0.1	8.8	897.7	1756.5
% Catch			0.0	1.3	0.3	43.4	0.0	0.2	54.8	100.0

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

Slope (201-800 m)

Station	Gear depth	<i>A.varidens</i>	<i>N.africana</i>	<i>P.longirostris</i>	Seabream	Hake	Other	Total
191	351.5	21.1		1		6.4	982.7	1011.1
192	593.5	30.4				36.7	807.8	874.9
201	668	16.4				77.5	1737.3	1831.2
202	589.5	92				43	1477	1612
203	377	0		8.9		3.7	760.4	773
Mean	515.9	32		2		33.5	1153	1220.4
Std dev	142.2	35.3		3.9		30.2	432.6	471.6
% Catch		2.6		0.2		2.7	94.5	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, except the 200 kHz (which was out of order), 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 24.02.2013 in Baia dos Elefantes using Cu-64, Cu-60 and WC-38.1 spheres for 18, 38 and 120 kHz, respectively. The details of the settings of the 38 kHz echo sounder were 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	25.13 dB
SA correction	-0,55 dB
Angle sensitivity	21.9
3 dB beamwidth	7,01° along ship 6,98° athwardship
Alongship offset	-0.12°
Athwardship offset	0.02°

Bottom detection menu Minimum level -40 dB

Fishing gear

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

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm mesh size in the codend with an inner net of 10 mm mesh size. The trawl height was about 4.5 m and distance between wings during towing about 21 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. Since 19.02.08 new and heavier "Thyborøn" combi trawl doors (7.41 m², 1720 kg) have been in used. During the present survey the door distance was kept nearly constant at about 50 m at all depths by the use of a 9 m strap between the wires at 120 m distance from the doors (normally applied at depths greater than 80 m). At depths greater than 300 m the trawl was equipped with a tickler chain, which improves the catchability of bottom living and borrowing species, particularly shrimps.

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

ANNEX VIII Station allocation by survey and depth strata

Numbers of valid bottom trawl stations by depth strata. Angolan demersal surveys 1985-2013.

	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	
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	
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	
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	
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	
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
300-400south	0	0	0	0	1	0	0	0	0	2	0	1	0	0	0	0	0	0	1	0	0	1	0	1	2	2	1	1	1	2	2	2	0	1	2	
400-500south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
500-600south	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	2
600-700south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	2	3	1	2	2	1	1	1	1	0	2	1
700-800south	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	2	2	2	0	1	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	
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	
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	
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	
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	3	6	8	
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	
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	5	8	
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	
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	3	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	

ANNEX IX Angolan Monitoring Lines

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

ANNEX X. Shark sampling

Shark sampling

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

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

It is important to note that sharks haven't been a target group during the surveys and that bottom trawl is not the ideal gear for catching the more pelagic species. Therefore the results truly reflect neither the species composition nor their abundance in Angolan waters.

Methodology

For biological sampling, sharks were first identified then measured, weighed, sexed, and the stage of maturation noted. Stomachs were cut open, its content sorted and preys were identified to the lowest possible taxon. The liver weight was recorded in order to calculate the hepatosomatic index *HSI* (liver mass/body mass x 100).

The presence of open umbilical scars is assumed to indicate that juveniles have been born recently.

Physical properties of seawater clearly influence biological events at all scales, therefore data on depth, salinity, oxygen content and specific temperature of the water in which sharks occur, were collected from CTD stations.

Identification. The sharks caught were identified using the different keys available on board.

Morphometric measurements. All specimens caught were measured, weighed (g) and sexed. Total length (TL, nearest lower cm) was measured in a straight line from the tip of snout to the upper tip of the upper caudal fin lobe in its natural position. All fish length data are given as total lengths, since this is the measurement most often used as an independent variable and it is a standard measurement in the shark literature.

Reproductive information. Maturity was assessed using both, external and internal characteristics. Maturity stages followed the scale shown below, being adapted to the different groups, when necessary.

Males	
Stage 1: Immature	Claspers underdeveloped, gonads thread-like, sperm ducts straight
Stage 2: Maturing	Claspers soft and developing gonads enlarged, sperm ducts meandering
Stage 3: Mature	Claspers stiff, gonads rounded, sperm ducts tightly coiled
Stage 4: Active	Claspers stiff and swollen, gonads rounded, sperm flowing under pressure
Female	
Stage 1: immature	Ovaries small, oocytes not differentiated, oviduct thread-like
Stage 2: Maturing	Ovaries enlarged, oocytes of various sizes, oviduct similar to stage 1
Stage 3: Mature	Ovaries large, oocytes larger and of similar size, can be counted easily
Stage 4 Developing, early pregnancy	Uteri filled with non-segmented yolky matter
Stage 5: Differentiating, mid-term gravid	Uteri with small non pigmented embryos, with yolk sacs attached
Stage 6: Expecting, late pregnancy	Embryos fully formed, yolk sac reduced or absent
Stage 7: Post-natal, resting	Ovaries similar to stage 1, uteri dilated

Feeding habits. The determination of stomach content was made macroscopically on board the vessel. The prey was identified to the lowest taxa possible. Stomach fullness was recorded using a four-point scale:

Empty (except for some water)

Some content (content appears clearly)

Full (filled, but not expanded)

Expanded (stomach very expanded and tight)

Results

We have included some preliminary results.

A total of 673 individuals, belonging to 11 families, were caught: Hexanchidae (cow sharks), Squalidae (dogfish sharks), Centrophoridae (gulper shark), Etmopteridae

(lanternshark), Somniosidae (sleeper sharks), Squatinidae (angelsharks), Scyliorhinidae (catsharks), Triakidae (houndsharks), Carcharhinidae (requiem sharks), Lamnidae (mackerel sharks) and Sphyrnidae (hammerhead sharks).

The depth interval where they were found ranged from 24 to 764 m.

About their distribution

Northern region (Ponta das Palmerinhas – Congo River): sharks were found in 26 (26.8%) out of the 97 trawl stations worked out in this region. *Etmopterus polli* was the most abundant species.

Central region (Benguela – Ponta das Palmerinhas): sharks were found in 24 (28.2%) out of the 85 trawl stations worked out in this region. Here, as in the northern region, *Etmopterus polli* as the most abundant species.

Southern region (Cunene River - Tombua): sharks were found in 23 out of the 36 (63.8%) trawl stations worked out in this region. *Squalus megalops* was the most abundant species.