

SURVEY OF THE FISH RESOURCES OF ANGOLA

Cruise Report No 2/2011

Survey of the demersal resources

Part I

North and Central regions: Congo River - Benguela

23 March – 8 April 2011

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

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



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 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 2011	(19 surveys)



CRUISE REPORTS "DR. FRIDTJOF NANSEN"

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**Survey of the demersal resources
23 March - 8 April 2010**

by

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CHAPTER 1 INTRODUCTION

1.1 Objectives

The objectives of the cruise had been previously discussed and agreed upon by the responsible of the Demersal Programme of the Instituto Nacional de Investigação 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 map and describe the distribution, composition and abundance of the main demersal species, with emphasis on seabreams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), hakes (Merlucciidae), cephalopods and shrimps (*Parapenaeus longirostris* and *Aristeus varidens*) on the Angolan shelf and slope (down to 800 m), from Benguela (12°35'S) to Congo River (06°00'S) using bottom trawl and the swept-area method. Due to time constraints, it had been agreed to cover the southern region from Tombua (15°40'S) to Cunene River (17°14'S) at the end of the pelagic survey in July-August.
- 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*, *Brachydeuterus auritus*, *A. varidens*, *P. longirostris*, *Chaceon maritae*, *Panulirus regius* and cephalopods.
- To collect stomach contents for *D. angolensis*, *Merluccius polli*, *P. senegalensis*, *U. canariensis* and *B. auritus*, for subsequent analyses in the INIP Lab.
- To monitor the general hydrographical conditions using thermosalinograph and CTD-sonde on trawl station and map the temperature, salinity and oxygen.
- To carry out four monitoring lines (Namibe, Lobito, Palmerinhas and Congo River mouth) using INIP's new standard hydrographical profiles for collection of temperature, salinity and oxygen, water nutrients, phytoplankton and zooplankton.

1.2 Participation

The scientific staff consisted of:

From INIP, Angola (22.03-09.04): Silvi Nsiangango (Local Cruise Leader), Virgílio Estêvão, Fátima Delicado, Mário Fortunato, Pedro Panzo, David Kissungu, Euzébio dos Santos, Bomba Bazika Sangolay and Paulo Coelho.

From IMR, Norway: (20.03-09.04) Sigbjørn Mehl (Cruise Leader), Inês Dias Bernardes,

Jan Frode Wilhelmsen and Terje Svoren.

1.3 Narrative

R/V “Dr Fridtjof Nansen” departed from Pointe Noire, Congo, at 1500 20th March 2011 and made a stop to take onboard fuel before steaming to Luanda for change of personnel. The vessel called port in Luanda at 1030 22nd March and departed shortly before noon 23rd March.

The survey started with trawl and hydrographical stations in the central region at 1300 the same day. A standard geographical allocation of the trawl stations, to be taken during the Angolan demersal trawl surveys, was implemented in 2003. The station positions in the central and northern regions have been similar in the 2002-2010 surveys. Two monitoring lines, one off Pta. das Palmerinhas and another off Lobito were carried out in this region; the first monitoring line had 7 stations while the latter had 8 stations. On each station of the monitoring line, zooplankton was sampled with a multinet and phytoplankton with CTD bottles.

The survey of the central region was completed in the early evening 29th March and the vessel steamed to the northern region, where the survey continued at noon 30th March. In this region one Angolan monitoring line was done at the Congo River (Pta. da Moita Seca). The survey of the northern region was completed shortly after noon 7th April and R/V “Dr. Fridtjof Nansen” called port in Luanda at noon 8th April.

The monitoring lines were carried out in accordance with the new standards for monitoring lines run by INIP, see Annex IX. These transects were selected according to the regional requirements as the Angolan monitoring lines (Namibe, Lobito, Ponta das Palmerinhas and the Congo River). They end further off-shore and the distance between the stations is longer than the former standard “Nansen” transects. The depth intervals for plankton sampling were introduced in 2009 and repeated this year.

Due to time constraints, the southern region was not covered during the 2011 survey. In the central region the number of trawl stations was reduced by approximately 30% and the CTD sonde was not used in all trawl stations. Only at bottom trawl stations in deeper waters, CTD profiles were taken to complement shallower stations taken during the preceding pelagic survey from 9 to 15 March. In addition two “CTD transects” were done at bottom trawl stations off Cabo Sao Braz and Pta. do Morro. In the northern region the number of trawl stations was reduced by approximately 15%. CTD profiles were taken at about every 2nd or 3rd bottom trawl station. In the Northern region, one “CTD transect” was done at bottom trawl stations off Ambriz. Due to problems with the sea water pump, the thermosalinograph was not run in large parts of the northern region.

CHAPTER 2 METHODS

2.1 Survey effort

Table 2.1 presents the surveyed area by depth strata, allocation of trawl stations, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed. The table also shows the allocation of effort relative to the stratum size as percentage hauls versus percentage area, by depth, region and total area. The overall average coverage was 1 valid trawl station per 110 square nautical miles (NM²). Figures 2.1-2.2 show the cruise tracks in the central and northern regions, respectively, and the locations of bottom trawl, plankton and hydrographical stations.

Table 2.1 Survey design and effort for the 2011 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: central region (Benguela to Ponta das Palmerinhas) and northern region (Ponta das Palmerinhas to Congo River).

Region	Depth strata (m)									Valid	Failures	CTD	Distance (NM)
	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800				
Benguela-Ponta das Palmerinhas													
Area (NM ²)	1068	1586	1439	407	372	343	346	268	357	6186	1		
# hauls (BT)	11	15	9	2	3	2	4	0	4	50		31	719
% area	17.3	25.6	23.3	6.6	6	5.5	5.6	4.3	5.8				
% hauls	22.0	30.0	18.0	4.0	6.0	4.0	8.0	0.0	8.0				
Ponta das Palmerinhas-Congo River													
Area (NM ²)	1379	1969	1940	601	550	437	409	408	702	8395			
# hauls (BT)	13	18	17	7	4	6	6	4	6	81	1	79	1222
% area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4				
% hauls	16.0	22.2	21.0	8.6	4.9	7.4	7.4	4.9	7.4				
Grand total													
Area (NM ²)	2447	3555	3379	1008	922	788	755	676	1059	14581			
# hauls (BT)	24	33	26	9	7	8	10	4	10	131	2	110	1941
% area	17.9	25.1	24	6.7	6	5	4.8	4.1	6.4				
% hauls	18.3	25.2	19.8	6.9	5.3	6.1	7.6	3.1	7.6	Total hauls: 133			

A stratified semi-random survey design was used with depth and area as stratifying variables. Trawling was carried out along transects perpendicular to the coast (Figures 2.1-2.2), 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. Adjustments to the planned design occurred when unsuitable bottom conditions were found or in non-accessible areas with oil exploitation, namely in the northern region.

Based on a decision made in 2003 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 2002-2010 surveys in the central and northern regions (see Annex VIII). As mentioned, due to time constraints the southern region was not covered during the 2011 survey. In the regions covered the number of trawl stations was reduced, being the reduction around 29% in the central region and 15% in the northern region.

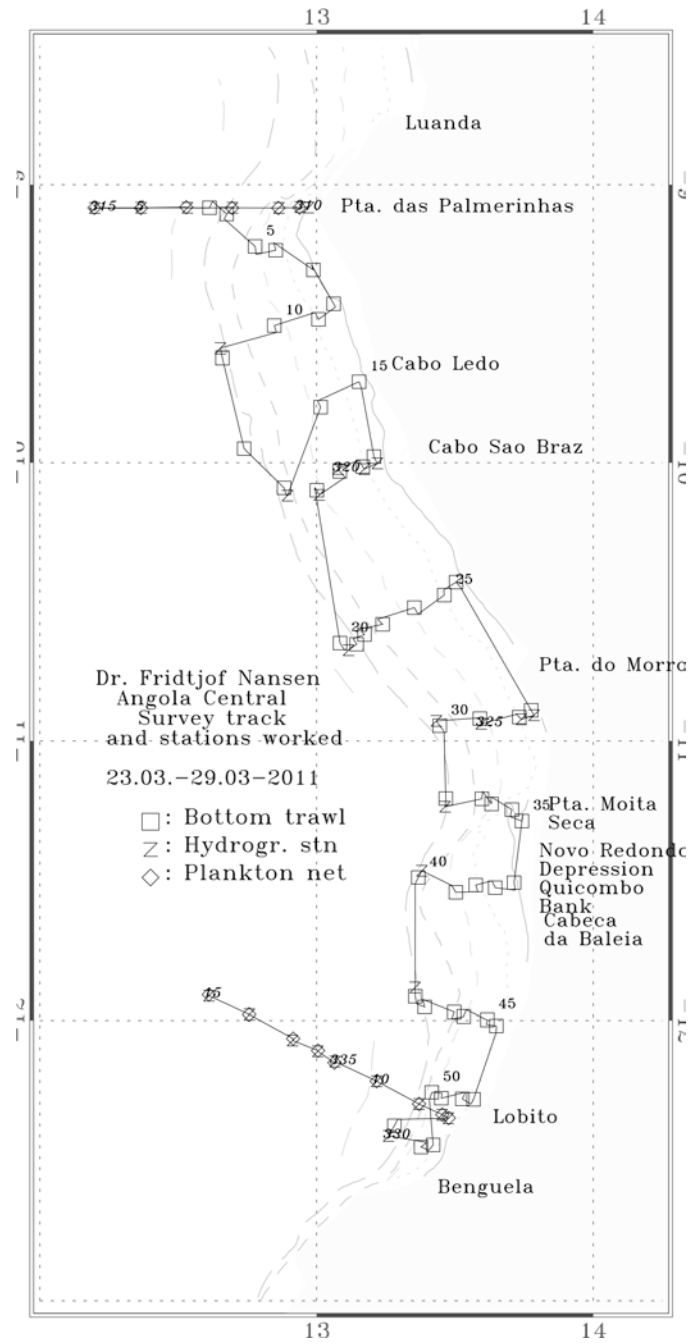


Figure 2.1 Angola central: Benguela - Ponta das Palmerinhas. Course track with trawl, hydrographic, plankton stations and hydrographical transects. Depth contours at 20, 50, 100, 200 and 500 m.

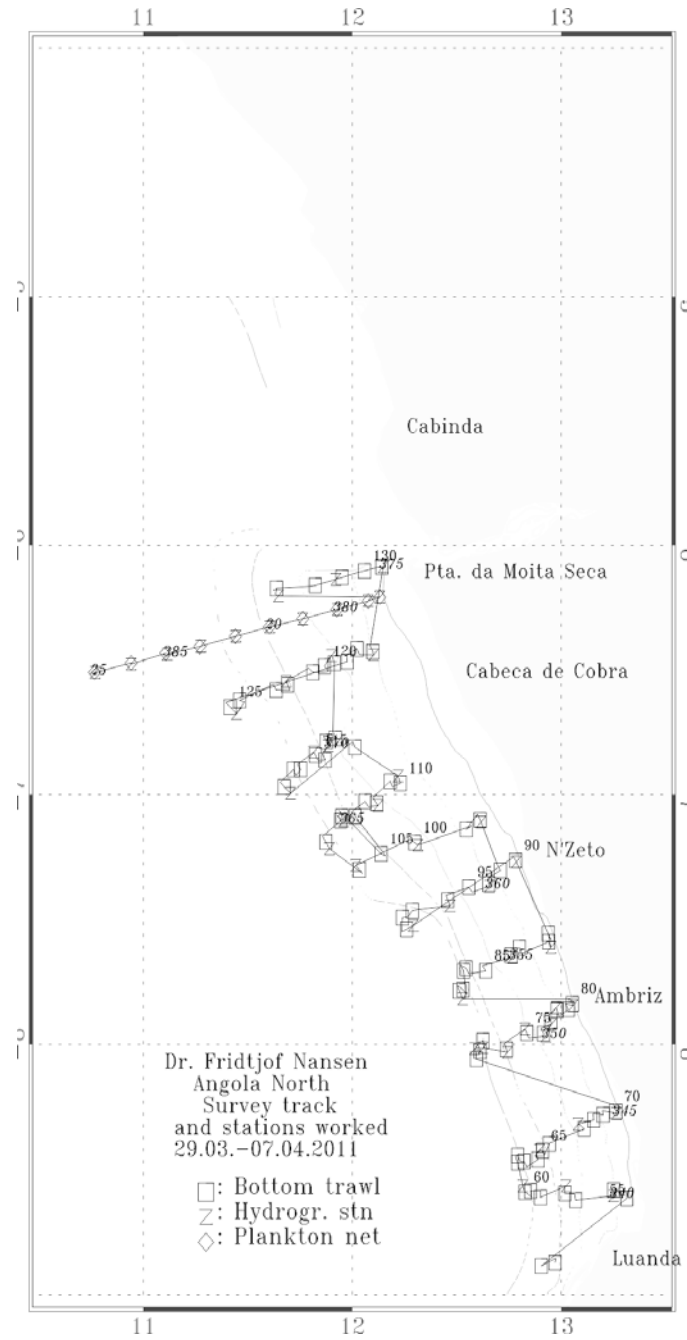


Figure 2.2 Angola north: Ponta das Palmerinhas - Congo River. Course track with trawl, hydrographic, plankton stations and hydrographical transects.. Depth contours at 20, 50, 100, 200 and 500 m.

2.2 Meteorological and hydrographical sampling

A Seabird 911+ CTD probe was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done with the customised Seabird Seasave software installed on a PC. Profile data were logged down to a few meters above the bottom. A Chelsea fluorometer of the type Mk III Aquatrack was also attached to the CTD. It measures chlorophyll *a*, in microgram per litre, with an uncertainty of 3%. Factory slope and offset was 0.921 and -0.02.

Water samples for sensor calibration of oxygen were taken at the surface (4-5 m) and above the bottom on the Lobito and Congo River monitoring lines. However, the results of the analyses were biased and could not be used for correction of oxygen values. The salinity sensor has shown to be stable, and no calibration was conducted during the survey.

A 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 during the entire cruise. Due to problems with the sea water pump the thermosalinograph could not run in most of the northern region.

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

A vessel-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments logged the current profiles continuously, and was set to ping synchronously with the echo sounders. The frequency of the VMADCP is 150 kHz, and data were averaged and stored in 4 m vertical bins in shallow water to approximately 400 m bottom depth and 8 m bins deeper than this.

2.3 Fish sampling

Sampling gear

A “Gisund Super” bottom trawl with a headline height of about 4.5 m was used during the survey, and the doors were of the “Thyborørn” combi type. The distance between the wings was about 21 m during deployment, at a speed of 3 NM h⁻¹. These settings have been standard on all swept area surveys with R/V “Dr. Fridtjof Nansen”. A detailed description of the fishing gear is given in Annex VII.

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 warps 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 could show bigger variations, depending on bottom type and currents.

Trawl duration was standardized to 30 minutes; start time is controlled by using a “SCANMAR” sensor to detect the landing of the trawl on the bottom, and the stop-time is defined as the time when the wires start to haul the net. In some cases the towing was interrupted before 30 minutes either due to poor bottom conditions or too high catches of fish indicated by the installed catch sensors. If the stations were not trusted to reflect the density of fish on the bottom they were recorded as invalid in the Nansis database, and thus not considered for biomass estimates. Table 2.1 shows the numbers of valid and invalid stations.

Sampling the catches

Catches were sampled for species composition by weight and numbers. The total body length of the fish (cm) was measured to the nearest 1 cm below, the carapace length of shrimps and carapace width of crabs to 1 mm below and the mantle length of squids to 1 cm below. The records of fishing stations, in numbers and weight, are presented in Annex I. For some commercially important species, pooled length frequency distributions, in which individual samples are raised to total catch, are shown by area in Annex II. The catch data, from each station, is logged into Nansis software after the sampling is complete. All the data introduced is quality controlled during the survey.

Acoustic sampling

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

2.4 Plankton sampling

Zooplankton

The sampling was conducted by an “HYDROBIOS Multinet” with 5 nets, at the monitoring lines. The nets (180 μ m) were remotely opened from the bridge of the vessel. The depth intervals covered in 2011 were the same as established in 2009: 200-100 m, 100 -75 m, 75-50 m, 50-25 m and from 25 m to the surface. In stations shallower than 25 m, the sample was taken from the bottom and up to the surface. A “SCANMAR” depth sensor gave real-time information of the depth and a flow meter inside the net was used to estimate the sampling volume. The zooplankton samples were preserved in 4% formalin to be taken to the INIP for further analysis.

Phytoplankton

Phytoplankton samples were taken at each CTD station of the monitoring lines at five different standard depths, as defined in 2009: 5 m, 15 m, 25 m, 50 m and 75 m. The samples were preserved in 4% formalin and taken for further analysis at INIP.

2.5 Areas, depth strata and calculations

Table 2.1 shows the areas, in NM^2 , for the central region (Benguela - Ponta das Palmerinhas: $\text{S}12^{\circ}40'$ - $\text{S}09^{\circ}00'$) and the northern region (Ponta das Palmerinhas - Congo River: $\text{S}09^{\circ}00'$ - $\text{S}06^{\circ}00'$) by depth strata. These strata are used to calculate the swept-area biomass estimates. All valid stations are treated as representative for the relevant depth intervals where the species or group of species were caught.

All equations used for the calculations are given in Annex IV. The effective fishing width of the 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, previous to 2002, were inconsistent, and made difficult any comparison between surveys. Therefore, it was discussed and agreed upon by the responsible of the Demersal Programme of the INIP, 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

3.1 Surface distribution

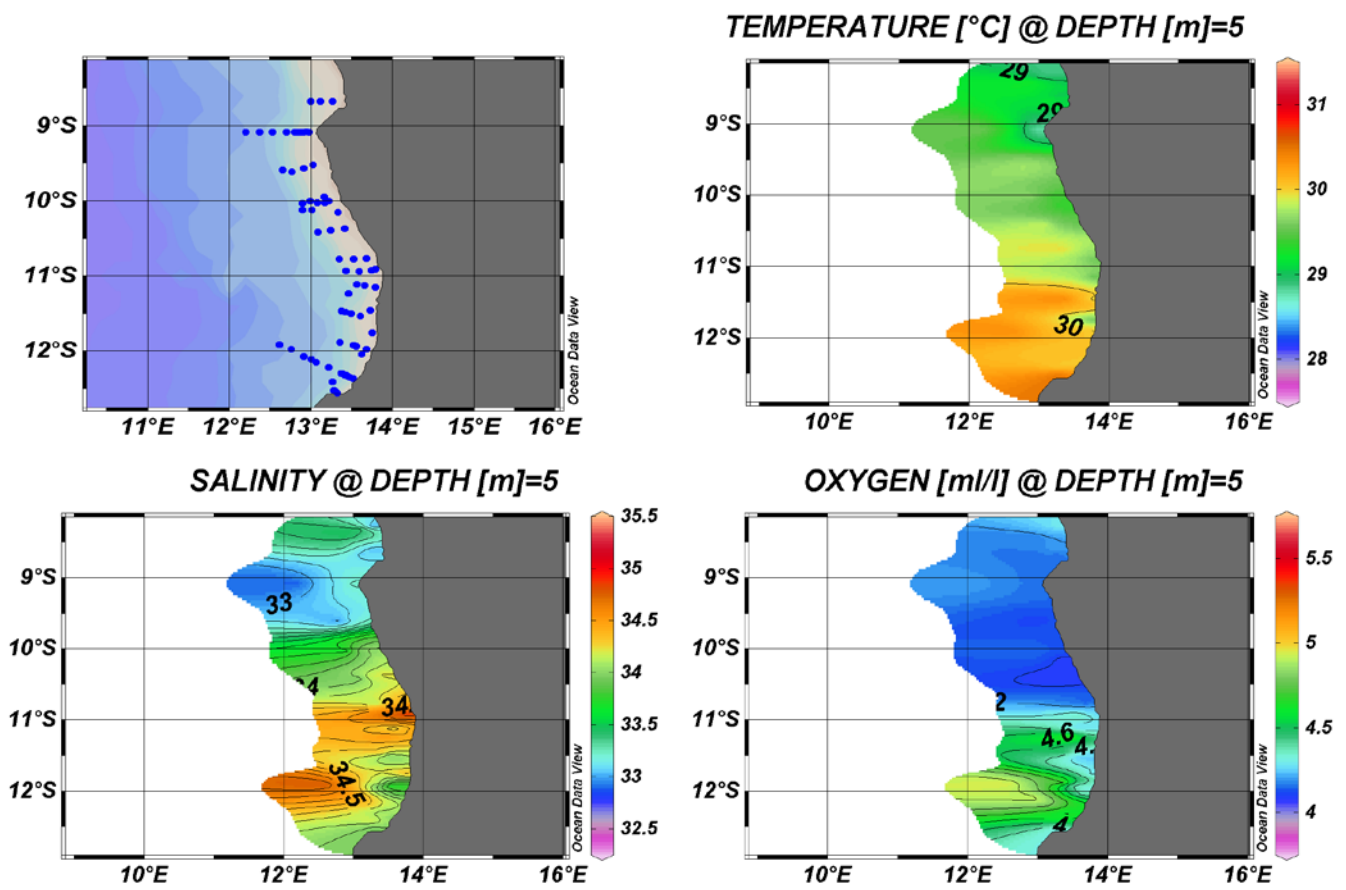
The salient feature of the hydrographical conditions in Angolan waters between December and March is the drop in the salinity at the surface, associated to the seasonal rise in the precipitation over the continent and consequent increase in the discharge of freshwater carried to the ocean by the Congo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

Central Region

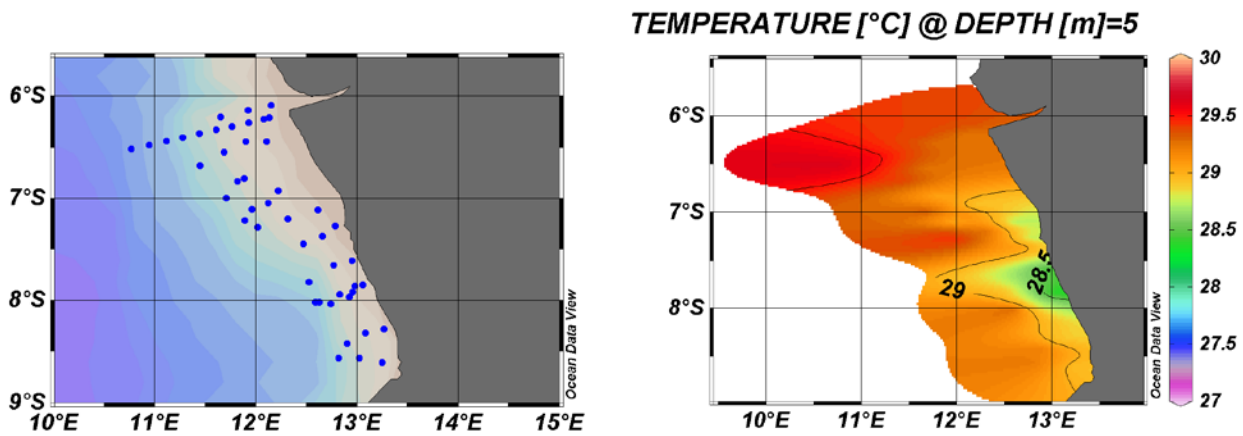
Figure 3.1 shows temperature, salinity and oxygen signature at 5 m depth. CTD data have been pooled from the present survey and the preceding pelagic survey, between 9-15 March. The temperatures ranged from 29°C to 30°C, rising from coast to offshore as from north to south. The temperatures were, in average, 4-5 °C higher than the temperature values usually recorded, such as the ones found in 2010. Salinity ranged from 32.9 to 34.8 and was lower than the values found in the 2010 demersal survey. An increasing salinity gradient was observed from north to south as from the coast to offshore. The lowest sea surface salinity value was found in the northern area of the central region; this might indicate some influence of Congo River plume such far south. Both low temperature and salinity values were found near the coast probably due to the freshwater intrusion from coastal rivers increased by rainfalls of the region. Oxygen ranged from 4.1 mg/l in north to 4.8 mg/l further south.

Northern Region

Over the whole region the temperatures ranged between 29°C and 30°C, which was similar to values observed in the two previous years. Temperature increased from coast to open sea. In the southern part of the region, salinity ranged from 33.0 to 33.5, while in the north it was dominated by the presence of surface water with lower salinity ($S < 30$). Oxygen variation was smaller than in the central region (values ranged from 4.2 to 4.3ml/l), with the lowest values observed in the north.



Figures 3.1 CTD in the Central Region stations (map on the top left) are from the present survey and the preceding pelagic survey 9-15 March. From left to right: Surface distribution (5 m depth) of temperature ($^{\circ}\text{C}$), salinity and oxygen (ml/l).



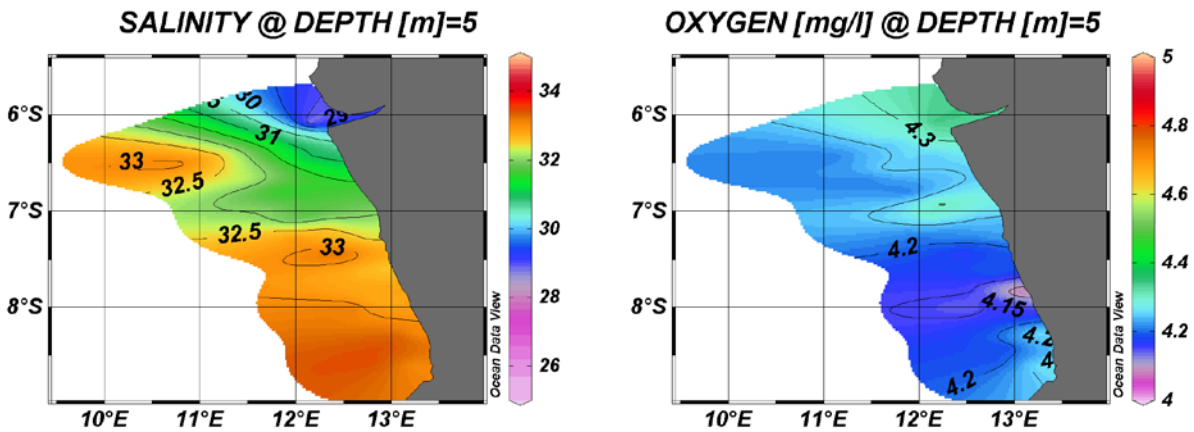
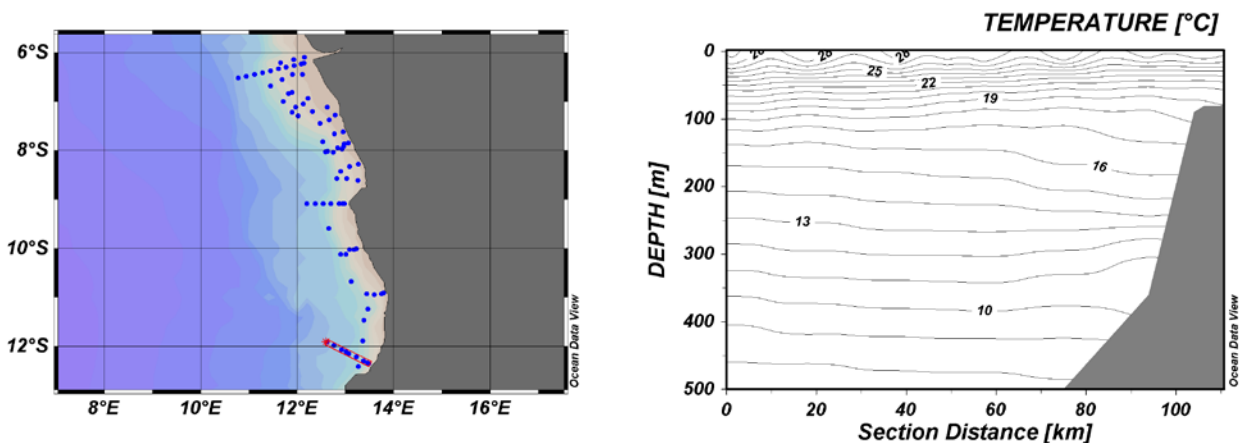


Figure 3.2 CTD stations in the Northern Region (map on the top left). From left to right: Surface distribution, (5 m depth) of temperature ($^{\circ}\text{C}$), salinity and oxygen (ml/l).

3.2 Vertical sections

In the Central region (Figure 3.3 - 3.4), high surface values of temperature (30°C) were observed in the upper layer of the Lobito transect, while salinity ranged from 35.5 to 35.7 in the surface, showing the characteristic pattern of tropical waters during summer. Over the water column, salinity also showed fairly stable conditions reaching 34.8 at 500 m. At 500 m and deeper the temperature was below 8°C . The surface layer in the transect off Ponta das Palmerinhas was characterized by waters of somewhat lower temperature (26°C) and slightly lower salinity than off Lobito, showing the effect of turbulence possibly caused by the intrusion of the rainfalls through the rivers. The oxygen content did not vary much in the two transects in the central region. The surface layer was dominated by waters of 4.5 ml/l O_2 , while the minimum value of oxygen (1.0-1.5 ml/l) was located between 350 and 450 m depth.



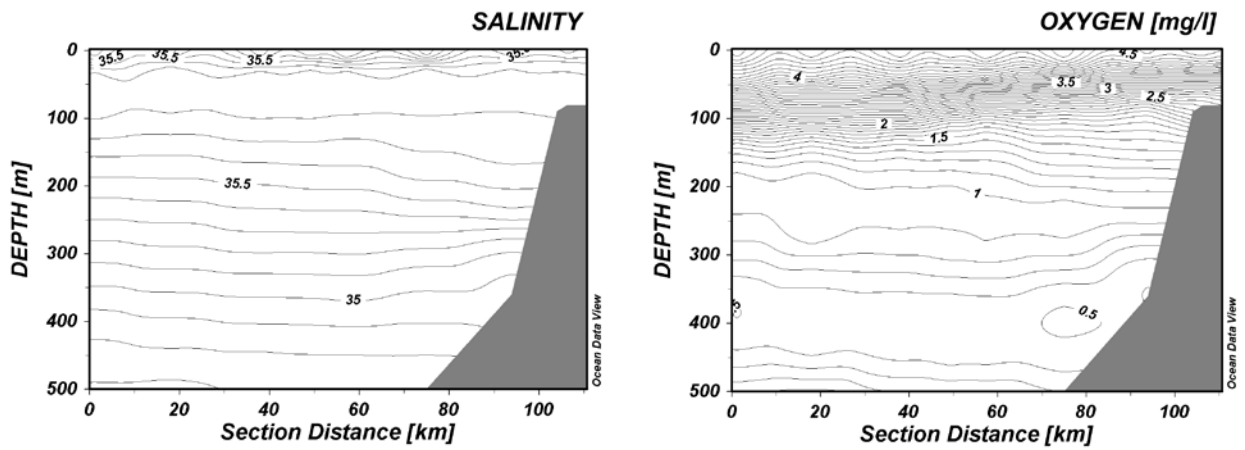


Figure 3.3 CTD stations from Angola Central Lobito monitoring line (highlighted in red on the map on the top left). From left to right: vertical sections of temperature ($^{\circ}\text{C}$), salinity and oxygen (ml/l) off Lobito.

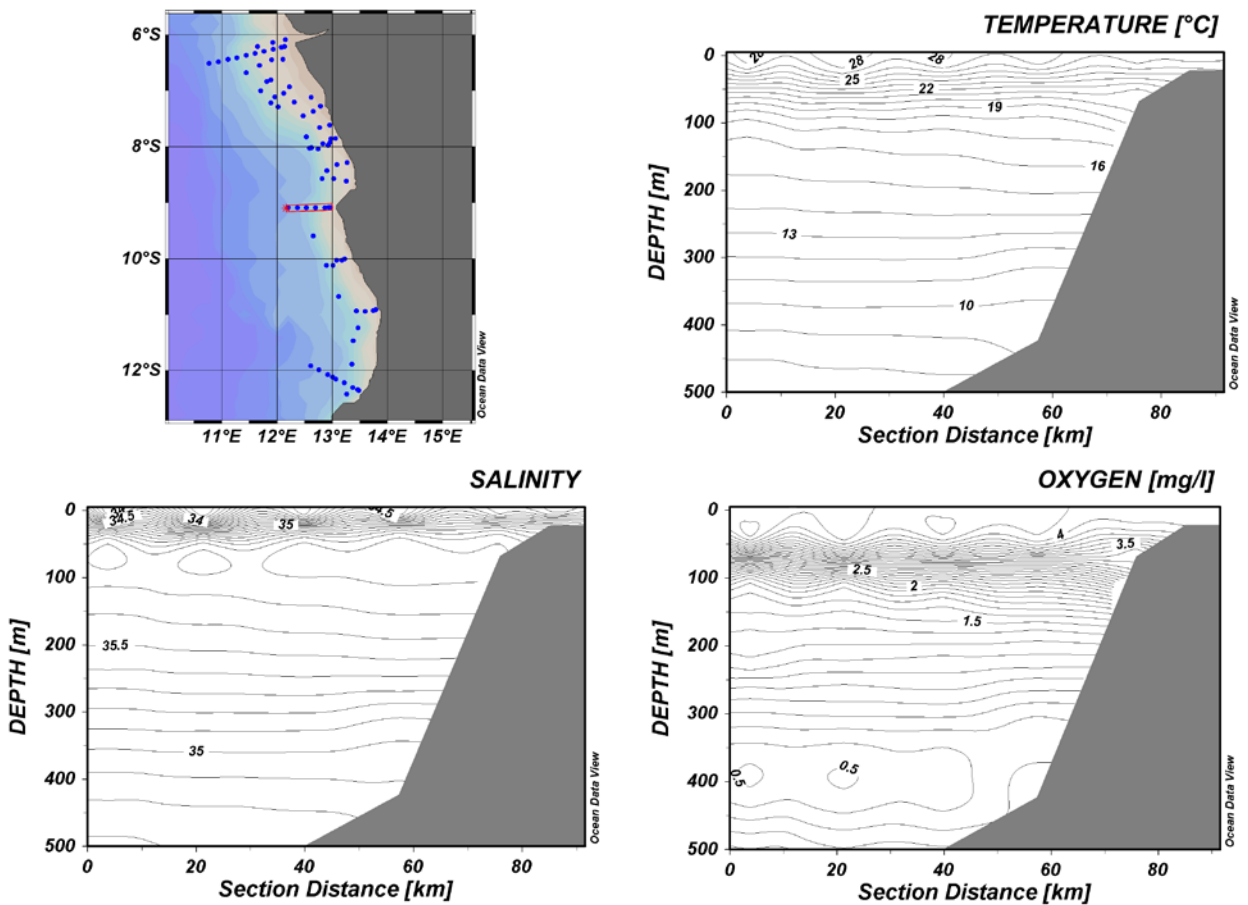


Figure 3.4 CTD stations from Angola Central Pta. das Palmerinhas monitoring line (highlighted in red on the map on the top left). From left to right: vertical sections of temperature ($^{\circ}\text{C}$), salinity and oxygen (ml/l) off Pta. das Palmerinhas.

In the northern region, one monitoring line was done at the Congo River (Pta. da Moita Seca) (Figure 3.5). The surface values of temperature were close to 30°C, salinity was below 34, while oxygen was about 4 mg/l. At 500 m and deeper the temperature was 8°C, the salinity was about 35, while oxygen was about 1 mg/l.

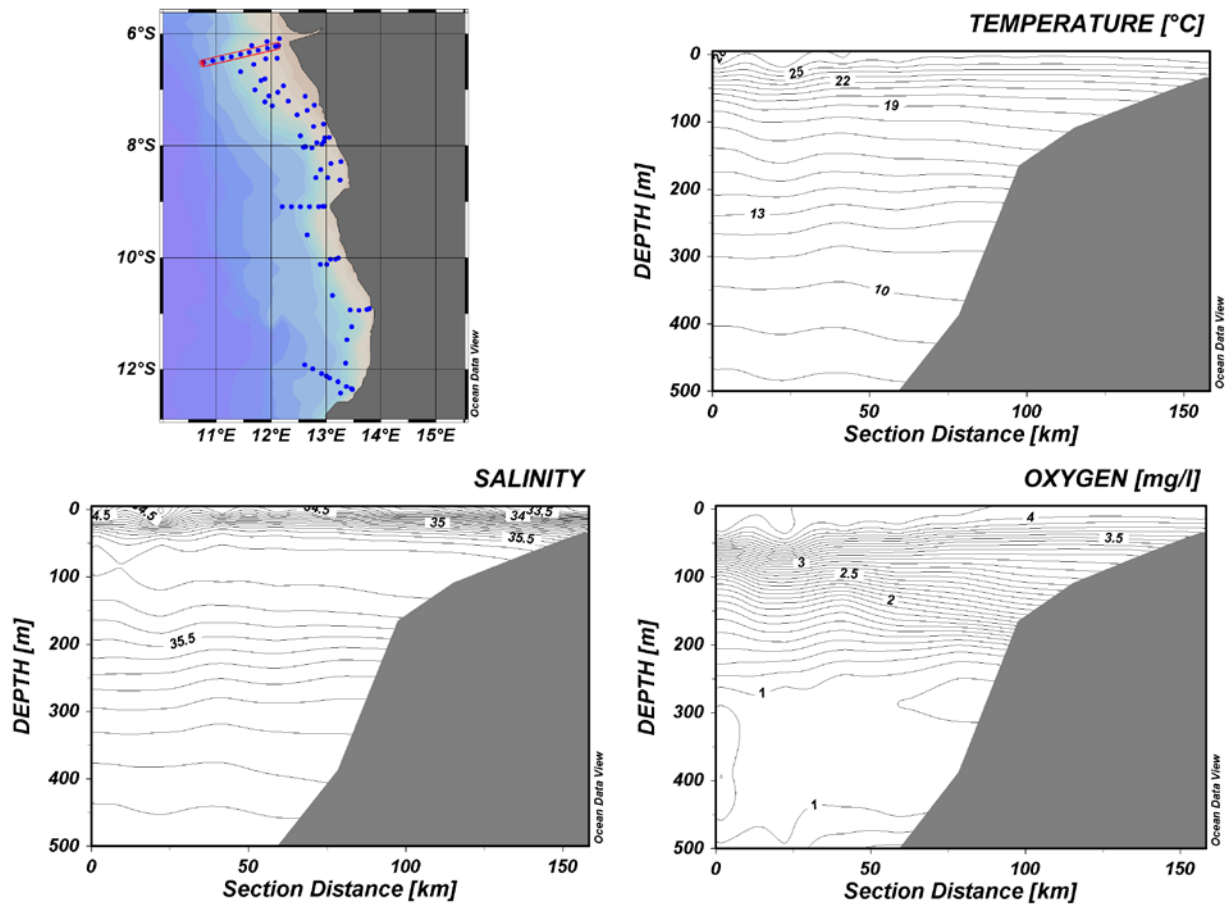


Figure 3.5 CTD stations from Angola North Congo River monitoring line (highlighted in red on the map on the top left). From left to right: vertical sections of temperature ($^{\circ}\text{C}$), salinity and oxygen (mg/l) off Congo River.

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

The inner shelf is defined to be the area between 20 and 70 m bottom depth, and the outer shelf from 71 to 200 m depth. Several of the species which inhabit the shelf, particularly the seabreams (Sparidae) and hakes (Merlucidae), are also found in deeper waters, usually in smaller densities. The results from fish distribution on the slope, below 200m, are presented in Chapter 5.

Maps with trawl station positions can be consulted in Figures 2.1-2.2, 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 Nansis species codes used for species and groups of species, and Annex VI presents the catch rates of the same species and species groups.

4.1 Benguela - Ponta das Palmerinhas shelf

The central region of Angolan waters covers the area from Benguela to Ponta das Palmerinhas. A total of 35 successful swept-area trawl hauls were accomplished on the central shelf area (Table 2.1).

The average catch was 521 kg/hour on the inner shelf and 766 kg/hour on the outer shelf (Annex VI). On the inner shelf, the demersal group was the most abundant and contributed 58% to the overall catch, the pelagic group contributed to 15% of the mean catch rate, cephalopods contributed 1.7 % whereas shrimps and sharks contributed to less than 1% of the total average catch rate. On the outer shelf, demersal fish were also more abundant than pelagic fish contributing to 40% of the average catch rate, whilst the pelagic group contributed to 30%, cephalopods contributed to 2.6 %, shrimps contributed to less than 1% of the total average catch, while no sharks were observed.

As in previous years seabreams (except *Boops boops*) were caught in most of the trawl stations on the inner shelf as well as in all stations on the outer shelf, and the average catch rates were 30 kg/hour on the inner and 98 kg/hour on the outer shelf. The most common seabreams on the inner shelf were *Pagellus bellottii* (84%) and *D. barnardi* (11%) while *D. angolensis* (35%), *P. bellottii* (34%) and *D. barnardi* (23%) were the most common seabreams on the outer shelf. Snappers were only caught on the inner shelf, although with low average catch rates (3.4 kg/h). Groupers were caught on both the inner and outer shelf, with average catch rates of 5.4 and 2.3 kg/hour, respectively. Grunts (*Pomadasyss* spp.) were caught on approximately half of the stations on the inner shelf, with an average catch rate of 34 kg/hour, while on the outer shelf grunts were only caught on three stations. The average catch rate was relatively high with 114 kg/hour. However, one station particularly (#45) contributed to the high average catch rate on the outer shelf. On both inner and outer shelf, *P. peroteti* and *P. incisus* dominated among the grunts. Croakers had average catch rates of 47 kg/h on the inner shelf and 49 kg/h on the outer shelf. Catches mainly consisted of *U. canariensis* (canary drum) and *Pseudotolithus senegalensis*.

The most common pelagic groups on the inner shelf were carangids, clupeids and barracudas (*Sphyraena guachancho* and *S. sphyraena*) with average catch rates of 58, 2.5 and 5.2 kg/hour, respectively. The average catch rates of the same species groups on the outer shelf were 168 kg/hour of carangids, 2.1 kg/hour of clupeids and 0.4 kg/hour of barracudas. The hairtail (*Trichiurus lepturus*) was caught on the inner shelf with an average catch rate of 10 kg/hour, whereas on the outer shelf the average catch rate was 55 kg/hour.

Biomass estimates

Table 4.1 shows the time series from 1985 to 2011 of swept-area biomass estimates for commercial species and groups of species on the shelf off Central Angola. The biomass estimates were calculated by stratifying by depth (20-49, 50-99 and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of conducted trawls by strata and survey. It must be noted that the biomass estimates presented for the pelagic species may not reflect the true biomass trends, as pelagic species are often unavailable for the bottom trawl. Therefore, the biomass estimates of the pelagic species may reflect its availability to the trawl however not their abundance. Some of the biomass estimates in Table 4.1 have a high coefficient of variation (CV), which indicates that the trends in the time series should be interpreted with care.

T. trecae was the only horse mackerel species found in the Central and Northern regions. The biomass on the central shelf has dramatically decreased from 2002. There was a slight indication of improvement in 2009 when the estimate was 10 000 tonnes, while the 2010 estimate of 2000 tonnes is the lowest in the whole time series. The numbers from 2011 survey show that the estimated biomass increased close to 11 000 tonnes.

M. polli was not caught on the shelf in 2011. The 2010 estimate of 22 tonnes was the same as in 2008 while the 2009 estimate of 4 tonnes decreased, about 80%, comparing with 2008. The estimate from 2009 was also the second lowest in the time series.

Seabreams is the most important commercially demersal fish group in Angola. The survey biomass estimates for the Central shelf have greatly fluctuated throughout the years. From 1991 to 2002, the total biomass was between 20 000 and 30 000 tonnes with a peak of 63 200 tonnes in 1998. The seabream biomass has declined since 1998 and was estimated to 5 800 tonnes in 2008, the second lowest in the time series. There was a small increase since 2009 up to the current survey, with the 2011 estimate on 9 500 tonnes. Despite this increase in biomass, the estimate numbers are still among the lowest biomass estimates in the time series.

The biomass estimate of croakers increased from 4 800 tonnes in 2006 to about 8 000 tonnes in 2007 which is the highest estimate since 1999, but decreased to 3 600 tonnes in 2008 and further to 2 100 tonnes in 2009. In 2010 the biomass was estimated to 2 700 tonnes, while the estimated biomass increased to 6 500 tonnes in 2011. *Umbrina canariensis* was the most abundant croaker, and contributed to about 61% of the total croaker biomass.

The 2011 biomass estimate of grunts (*Pomadasys incisus*, *P. jubelini*, *P. rogeri* and *P. peroteti*) was 8 600 tonnes. This was an increase compared to the 2010 and 2009 estimates of 7 600 and 5 000 tonnes, respectively. The biomass estimates have been below 10 000 tonnes during the whole time series and the present estimate is the third highest since 1998.

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.

Groupers, mainly *Epinephelus aeneus*, are found on the inner shelf and are coastal rocky and sandy shore dwellers. The 2011 survey shows an estimated biomass of 440 tonnes. The high CVs indicates that the biomass estimates of *E. aeneus* should be considered with care. There is no clear trend in the time series as the survey estimates vary largely between years.

The biomass estimate of *P. longirostris* (deep water rose shrimp) of about 20 tonnes is the lowest since 1999, much lower than the 180, 200 and 230 tonnes estimated in 2010, 2009 and 2008, respectively. *P. longirostris* is mainly distributed in the deeper parts of the shelf and the slope.

The biomass estimate of Sepiidae was 540 tonnes in 2011, while in 2010 only 2 tonnes were found on the Central shelf. The Sepiidae biomass was estimated to 120 tonnes in 2009, which was a considerable increase from the 2008 estimate of 38 tonnes. However, the annually variability and the high CVs may indicate that the estimates do not accurately reflect the state of the stock.

The biomass estimate of Ommastrephidae was 30 tonnes for this survey, lower than the 180 tonnes estimated in 2010. The annual variability and CVs are also high for this group, since 330 tonnes were estimated for 2008 followed by a decrease in 2009 and a subsequent increase in 2010.

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.

Survey	M.poli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.4	124 (0.93)	74,892 (0.98)	58 (1.61)	5,372 (0.77)	0	423 (1.33)	75,408 (0.98)	0
1986.1	276 (1.02)	17,875 (0.62)	1,632 (0.92)	1,439 (0.47)	228 (1.47)	717 (0.69)	20,440 (0.54)	34 (1.29)
1986.2	207 (0.97)	22,596 (0.79)	371 (1.12)	1,423 (0.78)	0	328 (0.89)	24,625 (0.72)	16 (1.61)
1989.1	121 (1.62)	6,999 (0.41)	237 (1.05)	1,864 (0.59)	148 (0.94)	560 (1.54)	12,736 (0.49)	155 (0.67)
1989.2	1,013 (0.80)	21,473 (0.51)	677 (0.75)	2,206 (0.33)	105 (1.06)	359 (0.94)	26,453 (0.47)	95 (0.50)
1989.3	480 (1.10)	9,579 (0.94)	453 (1.41)	2,015 (0.79)	285 (1.29)	1,707 (0.81)	12,816 (0.90)	310 (1.21)
1991.1	0 (1.69)	86,136 (0.77)	39 (1.11)	850 (0.31)	746 (1.00)	508 (0.94)	87,396 (0.76)	277 (0.81)
1991.2	618 (1.20)	47,927 (0.85)	125 (1.04)	2,021 (0.50)	115 (1.69)	36 (1.16)	48,814 (0.83)	126 (1.30)
1992	1,641 (0.62)	32,878 (0.46)	106 (1.13)	2,597 (0.30)	483 (1.11)	70 (1.16)	35,314 (0.46)	64 (0.89)
1994	2,393 (1.35)	61,886 (0.53)	292 (0.92)	2,696 (0.41)	269 (0.83)	22 (0.96)	63,569 (0.51)	580 (0.80)
1995.1	167 (0.77)	4,875 (0.99)	323 (0.80)	807 (0.42)	121 (0.88)	245 (0.59)	12,635 (0.51)	213 (1.06)
1996	713 (1.09)	51,220 (0.77)	116 (0.98)	2,402 (1.01)	496 (1.08)	589 (0.89)	55,750 (0.71)	53 (1.77)
1997.1	4,557 (1.20)	27,729 (0.74)	1,088 (0.94)	3,268 (0.44)	208 (0.99)	3,442 (1.89)	38,605 (0.59)	46 (1.61)
1997.2	7,635	68,984	1,391	2,531	149	125	70,873	279
1998	375 (1.45)	4,630 (0.89)	365 (0.82)	2,587 (0.34)	310 (0.96)	2,860 (1.57)	7,606 (0.64)	52 (1.35)
1999	15 (1.69)	12,977 (0.53)	15 (0.74)	890 (0.38)	107 (1.15)	1,961 (0.92)	20,379 (0.43)	34 (1.28)
2000	240 (1.53)	19,114 (0.49)	314 (0.91)	1,744 (0.30)	560 (0.82)	1,594 (0.90)	25,052 (0.41)	275 (1.20)
2001	123 (1.15)	16,510 (0.48)	212 (1.28)	1,374 (1.06)	343 (0.78)	80 (1.01)	20,942 (0.42)	97 (0.77)
2002	1,189 (0.83)	78,646 (0.41)	531 (0.74)	2,930 (0.57)	120 (0.81)	1,625 (0.64)	85,797 (0.38)	745 (1.51)
2003	1,774 (0.85)	25,494 (0.54)	515 (0.70)	1,327 (0.44)	266 (0.78)	1,439 (0.64)	29,369 (0.47)	55 (0.85)
2004	174 (1.53)	12,263 (0.58)	974 (1.11)	1,026 (0.34)	586 (0.85)	2,193 (0.79)	15,324 (0.47)	41 (1.03)
2005	44 (1.42)	7,137 (0.52)	84 (0.71)	1,427 (0.16)	201 (0.66)	1,535 (0.84)	9,357 (0.44)	216 (1.30)
2006	44 (1.07)	9,622 (0.37)	188 (1.01)	1,674 (0.27)	475 (0.72)	2,275 (0.84)	13,434 (0.35)	134 (0.69)
2007	55 (0.84)	7,649 (0.49)	54 (0.59)	1,822 (0.30)	802 (1.19)	2,078 (0.67)	13,485 (0.59)	18 (1.15)
2008	22 (1.17)	3,703 (0.51)	257 (0.90)	1,295 (0.22)	132 (0.68)	945 (1.10)	5,636 (0.38)	17 (1.18)
2009	4 (1.51)	10,073 (0.50)	195 (1.14)	1,678 (0.37)	94 (0.90)	8,854 (1.26)	14,765 (0.44)	21 (1.57)
2010	22 (1.69)	2,354 (0.57)	204 (0.84)	1,628 (0.27)	157 (0.67)	1,420 (1.46)	13,526 (1.34)	79 (0.84)
2011	0 NA	10,895 (1.23)	42 (0.83)	1,956 (0.35)	74 (1.96)	268 (0.97)	13,231 (1.01)	48 (1.28)

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

Table 4.1 continue.

Survey	Ommastrephidae	Sepiidae	D.macrophthalmus	D.angolensis	U.canariensis	B.auritus
1985.4	0	0	6,123 (1.31)	2,697 (0.31)	6,271 (1.83)	5,065 (1.03)
1986.1	273 (1.68)	525 (0.64)	220 (1.25)	1,314 (1.16)	2,327 (0.86)	38,045 (0.49)
1986.2	0	1,132 (1.00)	1,268 (1.46)	4,010 (0.39)	2,018 (1.15)	21,342 (0.56)
1989.1	1,236 (0.86)	65 (0.93)	6,498 (0.66)	956 (0.48)	885 (0.88)	15,038 (0.75)
1989.2	750 (0.51)	1,168 (0.41)	1,115 (0.93)	3,628 (0.48)	1,130 (0.82)	50,016 (0.80)
1989.3	1,476 (0.98)	124 (1.12)	1,530 (1.50)	1,667 (0.52)	0	37,091 (0.51)
1991.1	344 (0.63)	235 (0.46)	2,210 (0.88)	1,212 (0.40)	1,160 (1.44)	19,833 (0.57)
1991.2	693 (0.71)	561 (1.00)	17,098 (0.54)	956 (0.39)	18,422 (1.45)	1,862 (0.86)
1992	2,163 (0.35)	159 (1.16)	18,182 (0.58)	1,514 (0.32)	1,023 (0.98)	27,200 (1.32)
1994	1,041 (0.57)	1,192 (0.70)	20,365 (0.52)	2,383 (0.45)	3,280 (1.27)	2,633 (1.10)
1995.1	2 (1.69)	385 (0.70)	7,719 (0.81)	1,877 (0.79)	11,538 (1.16)	27,645 (0.57)
1996	210 (0.52)	28 (1.32)	11,195 (0.43)	1,546 (0.43)	1,077 (0.96)	18,842 (0.70)
1997.1	1,324 (0.47)	1,323 (0.94)	12,220 (1.03)	1,497 (0.37)	4,599 (0.60)	6,964 (0.85)
1997.2	418	1,251	24,404	1,260	4,995	1,953
1998	376 (0.65)	1,295 (0.58)	50,924 (1.50)	1,990 (0.38)	2,239 (0.77)	22,014 (0.95)
1999	201 (1.28)	113 (0.64)	5,178 (0.79)	1,163 (0.40)	7,999 (1.08)	93,522 (0.61)
2000	586 (0.61)	418 (0.71)	6,060 (0.76)	1,639 (0.59)	2,499 (0.51)	56,245 (0.84)
2001	186 (0.96)	178 (0.83)	5,680 (0.72)	1,670 (0.44)	1,076 (1.04)	41,122 (0.69)
2002	2,363 (0.70)	173 (0.91)	11,512 (1.16)	923 (0.47)	3,492 (0.54)	66,053 (0.75)
2003	230 (0.58)	101 (0.82)	557 (0.66)	1,046 (0.50)	1,001 (0.51)	38,312 (0.49)
2004	310 (0.89)	206 (0.65)	3,525 (1.27)	1,015 (0.41)	5,700 (1.21)	26,743 (0.42)
2005	233 (0.61)	565 (0.27)	879 (0.59)	991 (0.39)	2,279 (0.64)	36,621 (0.77)
2006	128 (0.54)	123 (1.00)	2,802 (0.42)	1,982 (0.39)	4,329 (0.65)	33,546 (0.86)
2007	43 (0.53)	245 (1.53)	1,532 (0.86)	1,312 (0.64)	5,224 (1.39)	40,402 (0.53)
2008	327 (0.46)	38 (1.07)	1,496 (0.87)	1,135 (0.34)	1,801 (0.97)	17,736 (0.40)
2009	110 (0.82)	124 (1.41)	699 (0.62)	1,756 (0.56)	1,419 (0.53)	22,188 (0.83)
2010	179 (0.63)	2 (0.91)	572 (0.80)	2,250 (0.40)	1,097 (0.80)	8,156 (0.66)
2011	28 (1.20)	539 (0.76)	497 (1.19)	2,805 (0.51)	4,003 (1.19)	10,841 (0.88)

Distribution

Figure 4.1 shows the distribution of seabreams in the Central Region between Benguela and Luanda. The distribution covered the whole Central shelf, with higher catch rates (25-50 kg/hour) between 50 and 100m. The highest catch rates were observed in the Lobito – Benguela area.

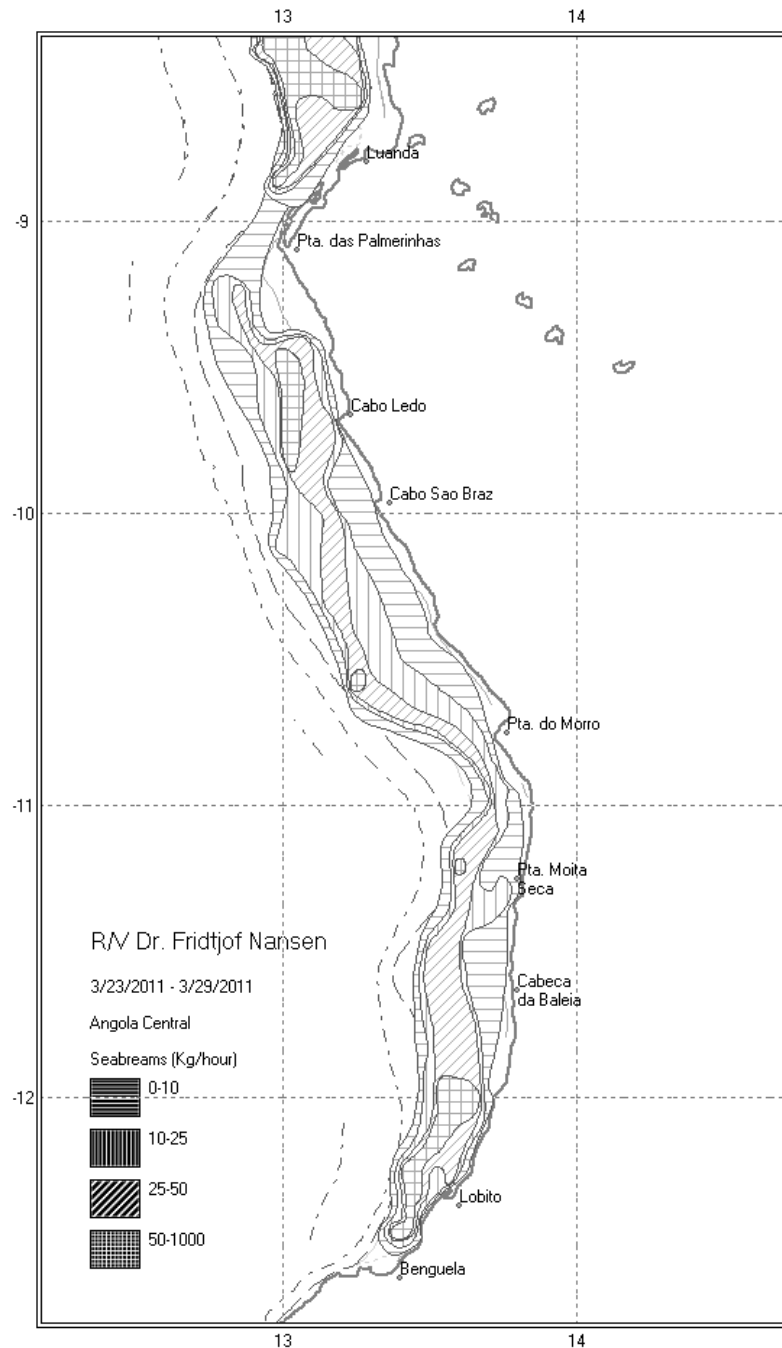


Figure 4.1 Distribution of seabreams (Sparidae) in the Central Region, Benguela – Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

4.2 Ponta das Palmerinhas – Congo River shelf

The survey covered the Northern Region of Angolan waters from Ponta das Palmerinhas to Congo River. The area further north from Congo River is inaccessible to fisheries surveys due to the restricted oil exploitation areas. In some earlier surveys Cabinda was covered, but to make plausible comparisons the biomass estimates in Table 4.2 only include trawl stations south of Congo River. A total of 48 successful swept-area trawl stations were sampled on the shelf area in 2011.

The average catch per hour on the inner shelf was 914 kg/hour. On the outer shelf the catch rates were 362 kg/hour. The demersal group dominated the catches on the inner shelf, with an average catch rate of 472 kg/hour and a relative contribution of 52%. The pelagic group contributed 29%, while shrimps, cephalopods and sharks contributed to less than 1% of the total. On the outer shelf, the demersal fish contributed to 53% of the mean catch rate and the pelagic group to 14%. Shrimps, sharks and cephalopods contributed to less than 3% altogether.

Seabreams (except *B. boops*) had a mean catch rate of 19 kg/h (2% of the total) on the inner shelf. On the outer shelf the average catch rate was 69 kg/h (19% of the total). The most abundant seabream on the inner shelf was *P. bellottii*, while *D. angolensis* dominated on the outer shelf. Snappers were only caught on one station on the inner part of the shelf. The catch rates of groupers were 2.0 kg/hour on the inner and 1.2 kg/hour on outer shelf, respectively. The grunts (*Pomadasys incisus* and *P. rogeri*) were caught more often on the inner shelf than on the outer shelf. The average catch rate of grunts on the inner shelf was 60 kg/hour and 17 kg/hour on the outer shelf. Croakers were relatively frequent on the shelf and the average catch rates were 74 kg/hour on the inner shelf and 22 kg/hour on outer shelf. *Pseudotolithus senegalensis* and *Pteroscion peli* were the most abundant species on the inner shelf, while *U. canariensis* was most abundant on the outer shelf.

The most common pelagic groups caught on the inner shelf were carangids (125 kg/hour), clupeids (53 kg/hour), hairtails (44 kg/h) and barracudas (42) kg/hour. Scombrids were not common in the catches (1 kg/hour). On the outer shelf carangids were still the most important group with 22 kg/hour, hairtails had an average catch rate of 18 kg/hour, while clupeids were only caught in small amounts on two stations and barracudas and scombrids were not found.

Biomass estimates

Table 4.2 show swept-area biomass estimates from 1985 to 2011 for the commercial species and groups of species on the shelf off Northern Angola. The biomass estimates were calculated by stratifying by depth (20-49m, 50-99m and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of trawls that have been carried out by strata and survey. Again, it must be noted that the biomass estimates presented for the pelagic species cannot be trusted as a good reflection of the true biomass as the species are often unavailable to the bottom trawl. Some of the biomass estimates in Table 4.2 have a high coefficient of variations (CV), suggesting that the trends in the time series should be interpreted with care.

The biomass estimate of *T. trecae* was 4 100 tonnes in 2011, while in 2010 and 2009 the estimates were 2000 and 4 400 tonnes, respectively. The highest estimate of 37 000 tonnes was registered in 1997, while the estimates have been below 10 000 tonnes the last 10 years.

Like in 2009 and 2008 *M. polli* was not caught on the Northern shelf, throughout this survey. However, in 2010 and 2007, the biomass of *M. polli* was estimated to 26 and 37 tonnes, respectively.

The biomass estimate of seabreams on the Northern shelf was 9 800 tonnes in 2011. This is a decrease from the 13 100 tonnes estimated in 2010 and similar to the 2009 estimate, but considerably lower compared to the very high 2005 estimate of 18 300 tonnes which was the highest estimate since 1996. As in the previous years, *D. angolensis* was the dominating seabream species in the north.

The biomass estimate of croakers was estimated to 7 200 tonnes in 2011, above the 2010 and 2009 of 5 500 and 3 900 tonnes, respectively. *U. canariensis* contributed to 27% of the total estimate of this group.

The biomass estimate of grunts (*Pomadasys incisus*, *P. jubelini* and *P. peroteti*) was 6 000 tonnes in 2011, almost twice the 2010 and 2009 estimates, although lower than the relatively large estimate of 8000 tonnes in 2007.

The snappers were rare in the catch as they inhabit rocky and often unavailable areas. Hence the biomass estimates of snappers may not adequately reflect the state of the stock, which was about 80 tonnes this year.

As in the previous years, groupers, mainly *Epinephelus aeneus*, were found on the outer shelf in very low abundance. The biomass estimates since 2000 have been fluctuating around 500 tonnes. However, for this year only 260 tonnes was estimated.

The biomass estimate on the Northern shelf of *P. longirostris* in 2010 was the highest in the time series with 540 tonnes. For this survey, a significant lower biomass was estimated, close to 11 tonnes. However, the biomass estimates of this species on the shelf this year must be seen in connection with increased biomass in deeper waters.

The 2011 biomass estimate of Sepiidae was 420 tonnes. The biomass of these species on the Northern shelf is relatively low with large fluctuations from year to year.

The biomass estimate of Ommastrephidae has decreased gradually from 230 tonnes in 2008 to 40 tonnes in 2011, the same as the 2007 estimate. These are the lowest estimates in the time series since 1989. The annual biomass estimates vary and no clear trend in the abundance of Ommastrephidae can be seen from the data in Table 4.2.

The biomass estimate of sharks in 2011 was 500 tonnes. The estimate is higher than the 2010 estimate but considerably lower than the 3 300 tonnes estimated in 2000.

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

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	9 (1.65)	4,496 (1.11)	302 (0.79)	10,463 (1.25)	498 (0.93)	364 (1.16)	9,986 (0.92)	44 (1.96)
1985.2	0	3,324 (1.17)	139 (1.88)	694 (0.57)	451 (0.64)	3,907 (1.91)	3,740 (1.04)	30 (1.64)
1985.3	3,459 (1.65)	16,486 (1.20)	1,448 (1.38)	2,046 (0.67)	870 (1.23)	205 (1.94)	17,742 (1.09)	146 (1.30)
1985.4	7,415 (1.65)	36,044 (1.14)	107 (1.37)	436 (0.72)	78 (1.55)	483 (1.15)	42,506 (1.02)	88 (1.26)
1986.1	56 (1.64)	13,438 (0.81)	1,445 (0.90)	2,853 (0.87)	496 (0.76)	2,053 (0.73)	17,950 (0.62)	30 (1.96)
1986.2	290 (1.21)	8,053 (0.37)	486 (0.72)	1,179 (0.38)	825 (0.56)	1,365 (0.67)	10,364 (0.32)	210 (0.97)
1989.1	62 (1.46)	12,681 (0.90)	92 (1.08)	931 (0.53)	497 (0.97)	1,578 (1.87)	13,264 (0.86)	97 (1.18)
1989.2	250 (1.65)	11,535 (0.66)	509 (0.61)	549 (0.38)	729 (0.85)	1,924 (0.53)	13,966 (0.57)	220 (0.98)
1989.3	1,029 (1.62)	39,959 (0.58)	256 (1.04)	1,715 (0.90)	15,984 (1.10)	5,043 (0.73)	46,704 (0.59)	208 (0.59)
1991.1	0	21,484 (0.57)	381 (1.69)	935 (0.37)	705 (0.67)	1,841 (0.96)	43,605 (0.68)	96 (1.36)
1991.2	312 (1.14)	14,727 (0.71)	2,554 (1.79)	4,225 (0.60)	107 (0.82)	55 (0.78)	14,928 (0.70)	318 (0.74)
1992	1,304 (1.04)	15,520 (0.65)	79 (1.19)	3,114 (0.38)	298 (1.10)	8 (1.96)	17,942 (0.59)	158 (0.87)
1994	51 (1.21)	14,309 (0.81)	478 (1.40)	3,643 (0.48)	52 (1.09)	184 (1.96)	21,225 (0.62)	337 (0.87)
1995.1	127 (1.17)	305 (0.80)	951 (0.98)	451 (0.40)	679 (0.64)	1,369 (0.79)	7,078 (0.69)	181 (0.81)
1996	0	32,155 (0.54)	347 (0.64)	2,203 (0.33)	256 (0.67)	782 (1.62)	33,700 (0.51)	137 (1.14)
1997.1	25 (1.50)	37,094 (0.51)	474 (0.89)	6,218 (0.50)	758 (0.67)	6,391 (1.14)	130,055 (0.87)	288 (1.18)
1999	6 (1.17)	4,106 (0.47)	326 (0.96)	1,202 (0.35)	1,297 (0.54)	6,392 (0.60)	16,570 (0.54)	36 (1.65)
2000	12 (1.65)	6,583 (0.56)	150 (0.92)	609 (0.65)	3,302 (1.70)	619 (1.54)	22,483 (0.88)	69 (1.20)
2001	6 (1.65)	5,502 (0.87)	212 (0.80)	866 (0.88)	391 (0.74)	517 (0.71)	9,566 (0.71)	37 (0.93)
2002	0	9,765 (0.52)	52 (0.52)	956 (0.51)	178 (0.64)	1,442 (0.57)	13,125 (0.41)	75 (0.61)
2003	0	9,995 (0.54)	501 (0.80)	501 (0.57)	250 (0.51)	2,816 (0.60)	28,515 (0.94)	81 (1.64)
2004	0 (1.65)	9,146 (0.49)	196 (1.14)	1,059 (0.26)	492 (0.44)	1,567 (0.70)	12,764 (0.42)	22 (1.00)
2005	0	3,792 (0.52)	146 (0.66)	1,674 (0.31)	734 (0.31)	599 (0.79)	10,292 (0.63)	116 (1.11)
2006	0	5,078 (0.42)	320 (0.99)	1,024 (0.33)	556 (0.84)	2,388 (0.90)	11,445 (0.37)	50 (0.86)
2007	37 (1.63)	2,983 (0.38)	243 (0.71)	703 (0.26)	432 (0.47)	1,797 (0.64)	9,442 (0.47)	195 (0.93)
2008	0 NA	1,938 (0.49)	331 (1.25)	1,204 (0.37)	464 (0.45)	1,754 (0.88)	17,154 (0.71)	151 (0.80)
2009	0 NA	4,412 (0.36)	108 (0.86)	1,010 (0.27)	381 (0.80)	2,961 (1.27)	9,792 (0.73)	100 (0.88)
2010	26 (1.65)	2,073 (0.59)	638 (1.24)	906 (0.35)	316 (0.43)	1,818 (1.69)	5,966 (0.40)	85 (1.08)
2011	0 NA	4,108 (0.91)	106 (0.69)	970 (0.26)	510 (0.55)	3,639 (0.78)	10,792 (0.66)	76 (0.92)
Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.1	15,711 (0.87)	254 (0.90)	0	479 (1.09)	248 (1.02)	1,519 (1.00)	14,690 (0.57)	117 (1.38)
1985.2	1,200 (1.65)	75 (0.81)	63 (1.26)	1,771 (0.78)	381 (1.31)	1,302 (1.10)	12,881 (0.34)	0
1985.3	2,709 (0.73)	26 (1.65)	62 (1.96)	1,978 (0.84)	3,629 (0.94)	8,695 (0.94)	20,897 (0.67)	0
1985.4	3,608 (0.70)	780 (1.46)	0	3,054 (0.63)	14,806 (1.14)	3,692 (0.93)	31,078 (0.45)	10 (1.65)
1986.1	8,078 (1.11)	2,080 (0.67)	434 (1.96)	676 (0.80)	1,231 (0.98)	2,307 (0.97)	17,193 (0.40)	521 (1.09)
1986.2	8,640 (0.82)	756 (0.51)	0	1,515 (0.51)	1,694 (0.59)	5,049 (0.37)	25,098 (0.28)	0
1989.1	2,277 (0.71)	345 (0.80)	0	989 (1.17)	135 (0.96)	4,469 (0.88)	12,958 (0.37)	60 (1.29)
1989.2	3,712 (0.46)	2,973 (0.89)	33 (1.64)	841 (0.68)	1,102 (0.72)	3,231 (0.34)	7,283 (0.34)	22 (0.90)
1989.3	21,132 (1.13)	364 (1.02)	316 (1.96)	315 (0.73)	1,788 (0.86)	4,214 (0.70)	15,344 (0.58)	31 (1.50)
1991.1	11,448 (0.88)	2,739 (1.40)	0	642 (0.92)	822 (0.85)	3,797 (0.83)	4,769 (0.23)	0
1991.2	4,949 (0.57)	79 (1.27)	0	1,022 (0.69)	860 (1.21)	6,450 (0.93)	15,741 (0.39)	129 (0.94)
1992	4,588 (0.47)	14 (1.29)	0	1,844 (0.80)	932 (0.90)	2,778 (0.59)	14,551 (0.22)	49 (1.65)
1994	4,423 (0.45)	325 (1.03)	0	2,474 (0.75)	612 (0.83)	4,095 (0.80)	19,599 (0.47)	478 (1.40)
1995.1	7,208 (0.58)	2,109 (1.10)	481 (1.50)	807 (0.70)	2,921 (1.08)	2,882 (0.73)	8,341 (0.30)	477 (1.13)
1996	3,939 (0.43)	89 (1.35)	0	2,002 (0.97)	5,161 (0.90)	9,292 (0.49)	19,985 (0.68)	10 (1.60)
1997.1	6,323 (0.41)	57 (1.70)	73 (1.96)	549 (0.76)	4,836 (1.05)	12,451 (0.53)	9,009 (0.28)	124 (1.38)
1999	14,001 (0.39)	2,712 (0.70)	5 (1.64)	1,011 (0.60)	5,600 (0.80)	8,528 (0.91)	13,304 (0.25)	113 (0.79)
2000	4,216 (0.75)	1,231 (1.37)	196 (1.64)	620 (0.48)	388 (0.98)	2,450 (0.66)	13,424 (0.35)	18 (0.91)
2001	17,036 (0.94)	856 (0.86)	723 (1.91)	793 (0.97)	2,271 (1.04)	1,458 (0.80)	8,927 (0.40)	101 (0.86)
2002	19,374 (0.60)	1,651 (0.78)	63 (1.96)	509 (0.88)	241 (0.54)	2,835 (0.53)	9,187 (0.35)	21 (1.00)
2003	6,818 (0.56)	2,345 (1.34)	142 (1.96)	340 (0.68)	1,376 (0.60)	5,571 (0.52)	9,889 (0.29)	65 (1.42)
2004	4,668 (0.47)	1,455 (1.15)	37 (1.87)	502 (0.63)	3,316 (0.86)	5,545 (0.74)	11,924 (0.28)	6 (1.28)
2005	5,632 (0.54)	705 (1.35)	278 (1.27)	568 (0.40)	5,754 (0.96)	7,949 (0.59)	18,282 (0.25)	5 (0.87)
2006	11,299 (0.39)	1,570 (0.61)	16 (1.82)	372 (0.71)	2,839 (0.77)	4,087 (0.57)	10,872 (0.25)	176 (1.42)
2007	9,102 (0.58)	1,587 (1.16)	83 (1.35)	460 (0.47)	7,966 (1.40)	3,901 (0.58)	12,758 (0.25)	135 (1.21)
2008	10,986 (0.53)	428 (0.51)	79 (1.96)	614 (0.54)	1,485 (0.69)	8,771 (0.67)	12,833 (0.28)	40 (0.89)
2009	7,272 (0.64)	1,591 (0.87)	168 (1.34)	586 (0.55)	3,209 (0.92)	3,936 (0.59)	9,974 (0.36)	84 (1.07)
2010	2,984 (0.46)	852 (0.95)	0 NA	358 (0.66)	3,197 (0.83)	5,518 (0.62)	13,161 (0.23)	596 (1.31)
2011	4,827 (0.47)	2,919 (0.81)	78 (1.96)	261 (0.84)	6,039 (0.54)	7,243 (0.71)	9,832 (0.20)	11 (0.94)

Table 4.1 continue

Survey	Ommastrephidae	Sepiidae	D.macrophthalmus	D.angolensis	U.canariensis	B.auritus
1985.1	10,273 (1.27)	0	200 (1.65)	2,196 (0.55)	1,132 (1.21)	40,729 (1.15)
1985.2	0	0	0	2,495 (0.57)	521 (1.46)	6,842 (1.40)
1985.3	0	154 (0.97)	0	2,949 (0.69)	602 (1.14)	9,182 (1.20)
1985.4	84 (1.34)	215 (1.28)	125 (1.64)	6,371 (0.97)	2,650 (0.95)	64,007 (1.08)
1986.1	1,531 (1.23)	808 (0.72)	2,058 (0.56)	3,814 (0.54)	279 (0.74)	95,679 (0.32)
1986.2	0	696 (0.60)	1,483 (0.48)	11,220 (0.35)	1,350 (0.48)	15,408 (0.45)
1989.1	506 (0.85)	288 (0.93)	0	1,612 (0.34)	542 (0.80)	5,450 (0.97)
1989.2	161 (0.53)	272 (0.72)	222 (0.87)	2,299 (0.57)	172 (0.54)	14,252 (0.46)
1989.3	1,661 (0.93)	45 (1.08)	100 (0.95)	2,614 (0.46)	1,194 (1.37)	51,225 (0.66)
1991.1	368 (0.53)	282 (0.76)	158 (1.06)	1,317 (0.37)	496 (0.72)	28,701 (0.70)
1991.2	2,718 (0.88)	226 (0.74)	690 (0.95)	3,198 (0.41)	4,375 (1.32)	1,661 (1.75)
1992	1,071 (0.40)	901 (0.64)	1,532 (1.10)	5,112 (0.26)	680 (0.65)	7,599 (1.38)
1994	441 (0.35)	1,910 (0.45)	1,740 (0.78)	3,451 (0.37)	2,740 (1.13)	7,572 (1.14)
1995.1	72 (0.58)	236 (0.48)	197 (1.11)	2,143 (0.38)	342 (1.15)	12,801 (0.74)
1996	589 (0.27)	106 (1.19)	2,169 (0.80)	4,303 (0.40)	2,073 (1.15)	26,804 (1.21)
1997.1	1,017 (0.71)	4,468 (0.68)	324 (0.78)	2,837 (0.41)	1,161 (0.79)	39,107 (0.51)
1999	391 (0.45)	254 (0.55)	146 (0.76)	2,881 (0.19)	3,582 (1.45)	37,727 (0.43)
2000	214 (0.83)	46 (0.66)	65 (0.86)	4,053 (0.77)	1,271 (1.08)	23,205 (0.70)
2001	176 (0.51)	196 (0.63)	417 (0.85)	1,228 (0.39)	188 (1.36)	13,842 (0.59)
2002	660 (0.72)	75 (0.59)	102 (1.18)	2,089 (0.52)	835 (0.83)	15,791 (0.65)
2003	121 (0.80)	206 (1.37)	16 (0.80)	3,201 (0.27)	769 (0.67)	66,412 (0.88)
2004	344 (0.42)	185 (0.83)	79 (1.12)	5,214 (0.39)	1,236 (0.53)	24,512 (1.00)
2005	146 (0.33)	427 (0.51)	136 (0.84)	6,727 (0.17)	3,640 (0.76)	52,045 (1.02)
2006	174 (0.77)	94 (0.61)	7 (1.34)	4,630 (0.20)	2,151 (0.93)	61,138 (0.66)
2007	42 (0.57)	190 (0.70)	11 (1.38)	5,980 (0.24)	622 (0.73)	12,523 (0.61)
2008	226 (0.50)	268 (0.87)	0 NA	4,809 (0.28)	3,171 (0.64)	52,481 (0.95)
2009	163 (0.41)	98 (0.83)	8 (1.31)	4,418 (0.28)	985 (0.57)	23,822 (1.20)
2010	137 (0.40)	206 (1.08)	20 (1.11)	7,293 (0.24)	3,389 (0.86)	16,682 (0.73)
2011	44 (0.30)	420 (0.45)	1 (1.65)	5,888 (0.22)	1,975 (0.89)	25,797 (0.85)

Distribution

Seabreams were distributed on the whole Northern shelf (Figure 4.2). The highest densities (> 50 kg/hour) were found on the central and outer part of the shelf.

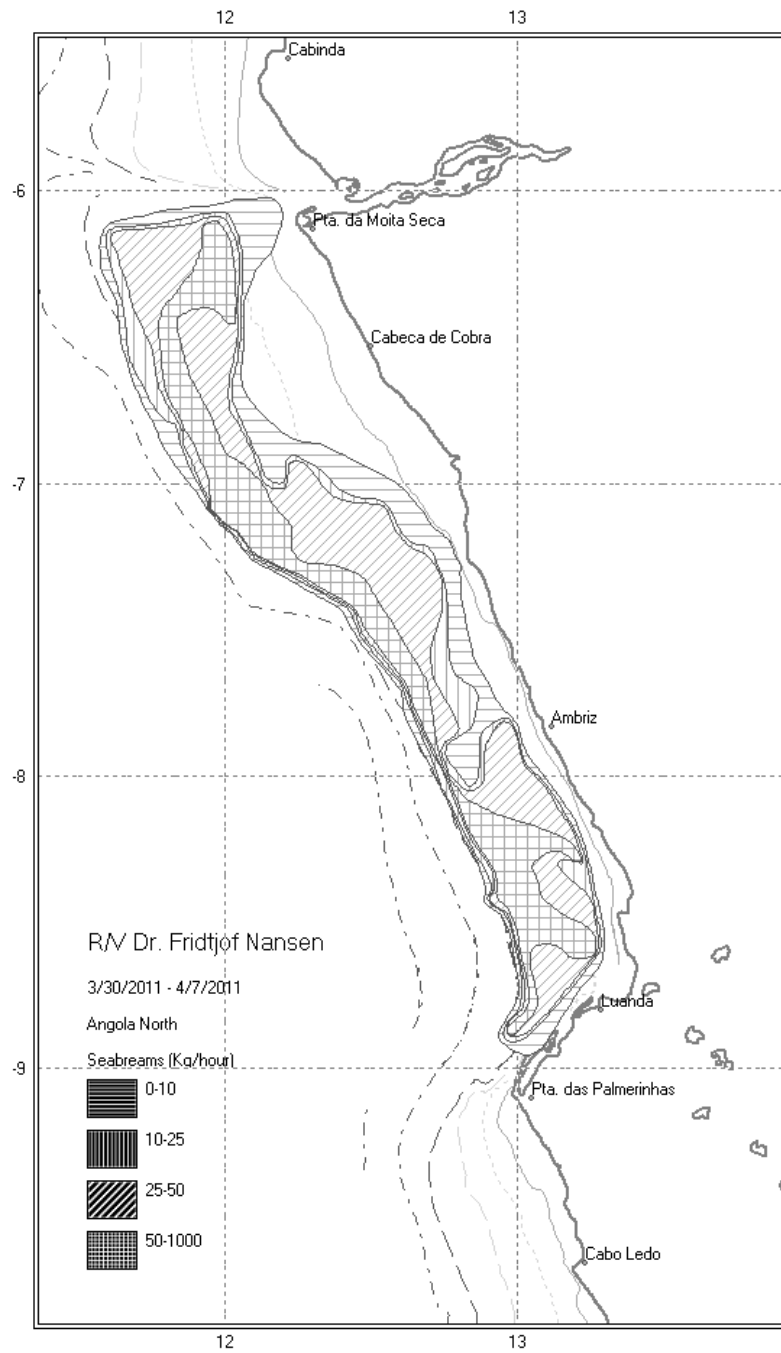


Figure 4.2 Distribution of seabreams (Sparidae) in the Northern Region, Ponta das Palmerinhas - Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

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

The slope is defined in the report to be between 201 and 800 m bottom depth. The trawl positions are mapped in Figures 2.1-2.2, station information and catch by species are presented in Annex I. Pooled length distributions, weighted by 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.

5.1 Benguela – Ponta das Palmerinhas slope

The central region of Angolan waters covered from Benguela to Ponta das Palmerinhas, and a total of 15 successful swept-area trawl stations were accomplished on the central slope.

The average catch rate on the slope was 425 kg/hour. The demersal group contributed to 87 kg/hour (20%) of the mean catch rate, while the pelagic group had an average catch rate of 7 kg/hour (1.7%). Shrimps contributed to 82 kg/hour (19%), while cephalopods and sharks contributed 1% and <1%, respectively. The “other” group of non-commercial species dominated the catches and contributed to 240 kg/hour (56%) of the total mean catch rate. *M. polli* was caught in all stations, while *M. capensis* was not found during the present survey. The average catch rate of *M. polli* was 61 kg/hour, close to the 62 kg/hour from 2010. Seabreams (*D. macrophthalmus*) were only caught at one station, with a catch rate of 20 kg/hour. The average catch rates of *P. longirostris* and *A. varidens* were 2.7 kg/hour and 12.1 kg/hour, respectively. *Nematocarcinus africana* had an average catch rate of 66 kg/hour.

Biomass estimates

Biomass estimates, in tonnes, of the most important groups are presented in Table 5.1. The biomasses were calculated by stratifying by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799m). 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. Once more, it is important to highlight that 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 5.1 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

The 2011 biomass estimate of hake (*M. polli*) was 4 300 tonnes, while 3 800, 5 300 and 6000 tonnes were estimated in 2010, 2009 and 2008, respectively. The biomass again showed a decrease, being about 1 000 tonnes lower than the 2007 and 2006 estimates. In 2004, the biomass estimate of *M. polli* showed a peak of 16 100 tonnes. Since then, the decrease has been 73%. The reasons for this reduction in biomass are not clear, but the constant decline is of concern.

The biomass estimate of seabreams this year was 270 tonnes, considerably lower than the 2 400 tonnes of the 2010 estimate. In 2009 the biomass estimate was even lower with 170 tonnes, among the lowest values in the time series. The biomass estimates of seabreams on the Central slope have fluctuated considerably in recent years and the CV of the estimates are also relatively high. *D. macrophthalmus* was the only seabream found on only one station on the slope this year.

P. longirostris is distributed in depths between 200 and 400 m, and the biomass estimate increased from 220 tonnes to about 1 300 tonnes from 2003 to 2006. In 2007 the biomass estimate decreased to 190 tonnes, increased to above 400 tonnes in 2008 and decreased again to 180 tonnes in 2009. In 2010 the biomass has increased to 480 tonnes, while in 2011 the estimate was about 320 tonnes. However, the high CV in many years shows that these estimates were imprecise.

The biomass estimate of *A. varidens* was 620 tonnes in 2011, slightly lower than the 750 tonnes estimated in 2010. In 2009, a peak in the estimates (1300 tonnes) was reported.

In contrast to the two previous shrimp species, *N. africana* is not commercially important. The 2011 estimate of *N. africana* was 3 400 tonnes, a 50% reduction compared to the 2010 estimate (6 800 tonnes). The species' biomass increased from 2008, following a drop from the 2007 estimate (7 900 tonnes), the highest biomass estimate recorded.

The biomass estimate of Ommastrephidae on the Central slope was estimated to 44 tonnes, twice as much compared to 2010, the lowest value in the time series. There has been a continuous and considerable decline during the period 2005-2010. This decline followed the highest biomass estimate (510 tonnes) recorded in the time series.

Hairtails were mainly caught in the shallower areas of the slope. There was a continuous increase in the biomass from 2007 (200 tonnes) until 2010 (2 400 tonnes). However, the 2011 estimate of about 600 tonnes is only 25% of the 2010 estimate.

The biomass estimate of sharks was 230 tonnes in 2011. Last year, a biomass of 350 tonnes was observed, being in 2009 near 1 400 tonnes. The biomass estimates of sharks have varied considerably in recent years. Hence, the high CV and large variability in biomass between surveys show that there is no clear trend in the abundance of sharks. It is noteworthy that the sampling gear used in DFN is not adequate for this group, therefore the trawl data may reflect neither the species composition nor the true biomass trend.

Table 5.1 Biomass estimates (tonnes) of important species on the slope (200-800 m) in the Central Region. CV values are indicated in brackets.

Survey	M.polli	Shrimps	Cephalopod	Sharks	Hairtails	Seabreams
1985.4	18,790 (1.03)	2,915 (1.20)	301 (1.10)	17 (2.47)	420 (1.56)	253 (1.25)
1986.1	17,757 (0.74)	6,306 (0.70)	1,003 (0.85)	557 (0.88)	16 (2.27)	972 (2.14)
1986.2	24,611 (0.00)	13,247 (0.00)	57 (0.00)	0	498,917 (0.00)	6,446 (0.00)
1989.1	2,803 (1.26)	1,008 (0.95)	39 (0.76)	65 (0.69)	60 (2.06)	804 (2.17)
1989.2	4,940 (0.81)	1,963 (0.84)	277 (1.34)	263 (1.17)	142 (0.59)	58 (1.64)
1989.3	12,633 (1.00)	1,546 (0.57)	410 (0.76)	3,247 (0.34)	35,703 (0.01)	435 (0.98)
1991.1	11,939 (0.33)	4,950 (0.35)	315 (0.45)	732 (0.54)	2,606 (2.13)	780 (2.05)
1991.2	10,540 (0.52)	3,016 (0.55)	114 (0.82)	1,487 (0.88)	395 (1.25)	488 (1.12)
1992	6,999 (0.28)	4,436 (0.60)	189 (0.51)	2,920 (0.88)	410 (1.28)	496 (1.03)
1994	3,803 (0.71)	3,457 (0.69)	219 (0.60)	707 (0.60)	1,213 (0.82)	1,188 (1.50)
1995.1	4,391 (0.41)	4,480 (0.69)	214 (0.79)	1,216 (0.91)	1,145 (0.53)	6,264 (1.24)
1995.2	4,781 (0.38)	4,295 (0.25)	153 (0.46)	1,064 (0.44)	2,234 (1.21)	1,291 (0.66)
1996	6,440 (0.74)	6,457 (0.59)	97 (0.90)	1,581 (0.89)	244 (0.62)	1,016 (0.47)
1997.1	10,375 (0.59)	6,969 (0.37)	538 (0.64)	1,214 (0.87)	902 (1.01)	1,858 (1.14)
1997.2	8,363 (0.34)	2,690 (0.53)	166 (0.28)	42 (1.23)	1,013 (0.21)	5,045 (1.25)
1998	9,991 (0.50)	9,048 (0.39)	428 (0.76)	812 (0.63)	1,840 (1.46)	1,643 (1.06)
1999	2,995 (0.74)	1,806 (0.49)	344 (0.63)	728 (0.91)	728 (0.61)	2,900 (0.82)
2000	5,482 (0.60)	2,445 (0.45)	717 (0.50)	639 (0.74)	871 (0.91)	2,059 (1.01)
2001	4,763 (0.81)	2,575 (0.72)	623 (0.66)	818 (1.77)	297 (1.05)	767 (1.43)
2002	3,012 (0.65)	3,749 (0.60)	469 (0.64)	212 (0.92)	269 (0.57)	2,418 (1.98)
2003	7,155 (0.90)	4,087 (0.83)	420 (0.64)	104 (1.02)	178 (1.33)	606 (1.55)
2004	16,127 (0.77)	7,350 (0.42)	444 (0.85)	476 (1.51)	1,581 (1.06)	10,840 (2.00)
2005	10,074 (0.58)	7,135 (0.37)	578 (1.03)	307 (0.46)	2,655 (1.55)	6,468 (2.11)
2006	6,967 (0.71)	7,180 (0.38)	623 (1.02)	366 (0.85)	954 (0.86)	2,422 (1.85)
2007	6,947 (0.97)	8,939 (0.35)	446 (1.20)	1,054 (0.94)	185 (0.96)	808 (0.42)
2008	6,032 (0.66)	6,490 (0.33)	363 (0.97)	389 (1.34)	762 (0.51)	2,003 (1.39)
2009	5,302 (0.48)	8,079 (0.35)	644 (1.22)	1,382 (1.24)	1,947 (0.83)	168 (0.00)
2010	3,837 (0.56)	8,072 (0.54)	179 (0.43)	350 (1.28)	2,387 (1.90)	2,416 (1.09)
2011	4,318 (1.45)	4,416 (0.75)	223 (0.95)	229 (0.35)	626 (1.97)	274 (0.00)

Survey	P.longirostris	A.varidens	N.africanus	Ommastrephidae	D.macrophthalmus	D.angolensis
1985.4	886 (1.47)	942 (2.08)	714 (1.21)	0	39 (2.37)	215 (1.41)
1986.1	653 (0.89)	492 (0.90)	3,173 (1.25)	74 (1.13)	499 (2.10)	474 (2.18)
1986.2	0	0	0	0	6,446 (0.00)	0
1989.1	181 (1.22)	194 (1.13)	592 (1.86)	39 (0.76)	804 (2.17)	0
1989.2	505 (0.84)	228 (0.74)	1,020 (1.45)	240 (1.66)	26 (2.37)	33 (2.27)
1989.3	375 (0.32)	194 (0.68)	958 (1.01)	409 (0.77)	324 (1.14)	110 (2.13)
1991.1	204 (0.75)	653 (0.21)	3,879 (0.45)	195 (0.75)	706 (2.09)	74 (1.79)
1991.2	190 (0.57)	105 (1.53)	2,659 (0.63)	114 (0.82)	249 (1.79)	239 (1.88)
1992	610 (0.95)	366 (0.63)	3,224 (0.79)	141 (0.61)	358 (1.42)	138 (1.87)
1994	579 (0.85)	647 (0.67)	2,199 (1.07)	168 (0.59)	1,113 (1.55)	40 (2.27)
1995.1	425 (0.95)	753 (0.45)	2,460 (1.32)	30 (1.34)	6,037 (1.30)	226 (0.98)
1995.2	479 (0.45)	698 (0.23)	2,763 (0.37)	85 (0.64)	1,196 (0.73)	95 (1.42)
1996	114 (0.53)	671 (0.37)	4,971 (0.71)	41 (0.67)	974 (0.48)	42 (2.27)
1997.1	685 (0.50)	305 (0.54)	4,093 (0.68)	474 (0.65)	1,700 (1.29)	158 (1.61)
1997.2	2,679 (0.54)	0	11 (2.27)	134 (0.24)	4,864 (1.25)	180 (1.10)
1998	556 (0.63)	1,192 (1.10)	7,000 (0.52)	389 (0.84)	1,549 (1.15)	94 (2.23)
1999	214 (0.87)	337 (1.06)	1,206 (0.75)	315 (0.61)	2,806 (0.87)	94 (1.60)
2000	455 (1.05)	379 (0.35)	1,043 (1.02)	426 (0.57)	1,954 (1.01)	105 (1.44)
2001	186 (0.44)	456 (0.63)	517 (2.35)	339 (1.08)	663 (1.70)	102 (2.27)
2002	341 (1.23)	243 (0.52)	3,039 (0.75)	242 (0.77)	2,307 (2.19)	111 (2.27)
2003	223 (0.44)	498 (1.07)	3,284 (1.02)	409 (0.65)	514 (1.97)	92 (2.27)
2004	419 (1.08)	576 (0.44)	6,204 (0.47)	350 (1.04)	10,265 (2.24)	572 (2.27)
2005	574 (0.71)	792 (0.41)	5,640 (0.46)	510 (1.15)	6,260 (2.19)	208 (1.43)
2006	1,330 (1.36)	359 (0.35)	5,351 (0.38)	457 (1.08)	2,138 (2.23)	284 (2.27)
2007	191 (1.32)	653 (0.17)	7,913 (0.39)	138 (1.51)	612 (1.09)	196 (2.27)
2008	415 (1.35)	880 (0.27)	5,085 (0.44)	138 (0.76)	1,681 (2.09)	322 (2.27)
2009	182 (1.03)	1,290 (0.38)	6,009 (0.51)	37 (1.16)	168 (0.00)	0 NA
2010	479 (1.03)	746 (0.55)	6,806 (0.60)	21 (1.29)	1,803 (2.23)	613 (2.27)
2011	319 (0.21)	619 (0.20)	3,413 (0.95)	44 (0.33)	274 (0.00)	0 NA

Distribution

Figure 5.1 shows the distribution of hake (*M. polli*) in the Central Region. The distribution covered the whole Central slope. Some medium density concentrations (10 – 25 Kg hour⁻¹) were found along the whole region, being the highest concentrations (> 50 Kg hour⁻¹) found from Cabo Ledo until the north of Ponta das Palmerinhas, at depths between 300 and 400 m.

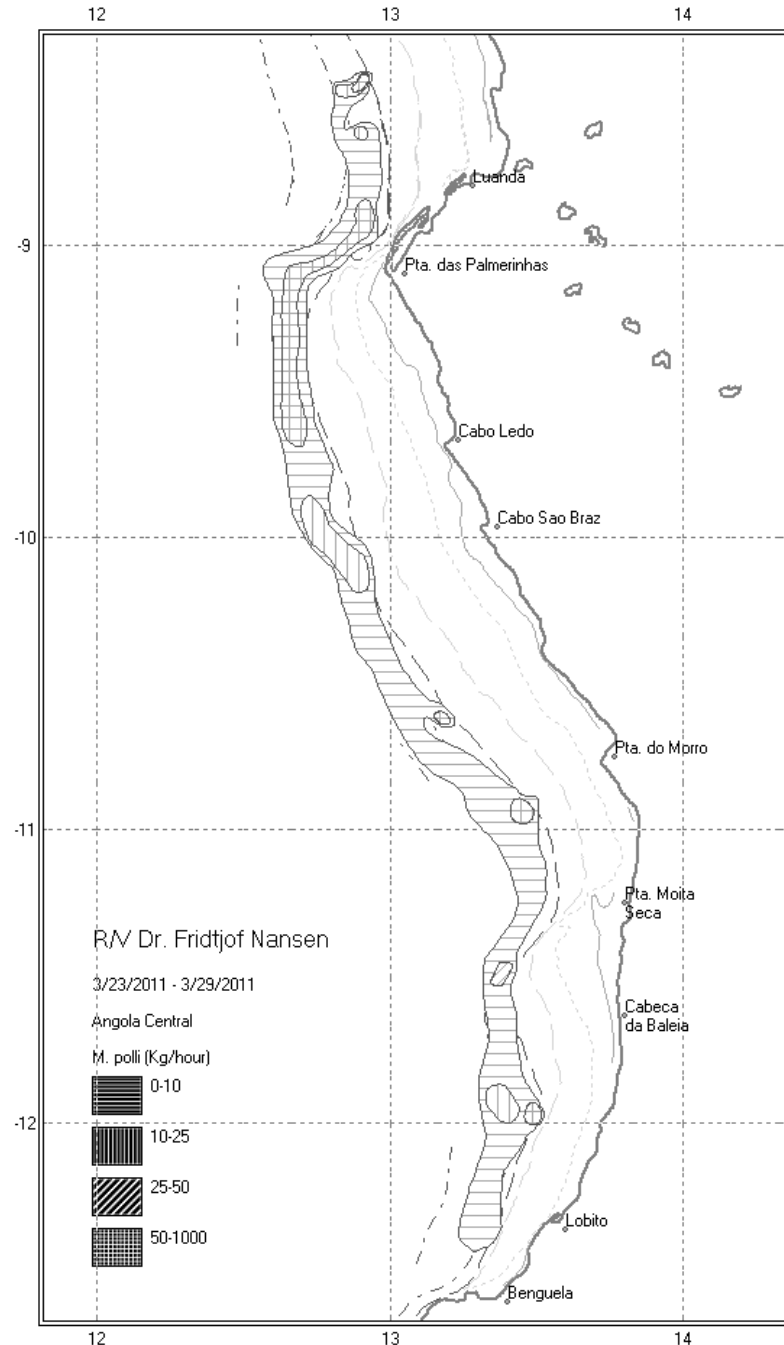


Figure 5.1 Distribution of Benguela hake (*Merluccius polli*) in the Central Region, Benguela - Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

5.2 Ponta das Palmerinhas – Congo River slope

The survey covered the Northern Region of Angolan waters from Ponta das Palmerinhas to Congo River, and a total of 33 successful swept-area trawl stations were accomplished on the Northern slope. The area north of Congo River is currently inaccessible to fisheries surveys due to the restricted oil exploitation areas. Only stations south of the Congo River were included in the time series of biomass estimates presented in Table 5.2. The various strata have been sampled with variable intensity throughout the time series, and in Annex VIII the numbers of trawls by strata by survey can be consulted.

The average catch per hour of all species was 458 kg/hour (Annex VI); the demersal group contributed 13% to the mean catch rate, the pelagic group 2.4%, and shrimps, cephalopods and sharks each contributed 26, 1.4 and 1.5%, respectively. The “other” group dominated the catches, contributing to 56% to the total mean catch rate. *M. polli* was frequently caught on the outer shelf and the average catch rate was 23 kg/hour. Seabreams (mainly *D. angolensis*) were only caught in six stations on the Northern slope and the average catch rate was 13 kg/hour. The averages catch rates of the three shrimp species *P. longirostris*, *A. varidens* and *N. africana* were 11.7, 6.8 and 95 kg/hour, respectively. The average catch rate of *P. longirostris* should be looked with care since one station (#122) contributed to raise considerably the average catch rate of *P. longirostris*.

Biomass estimates

Biomass estimates of the most important species groups are presented in Table 5.2. The biomasses were calculated by stratifying by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799 m). Some of the biomass estimates in Table 5.2 have a high coefficient of variation (CV), which indicates that the trends in the time series should be interpreted with care.

The biomass estimate of seabreams in 2011 was about 1 200 tonnes, slightly lower than the 2010 estimate of 1 400 tonnes. The 2010 estimate was though the highest estimate since 2000. As in previous surveys, *D. angolensis* was the most abundant seabream on the Northern slope.

The biomass estimates of *M. polli* was 2 400 tonnes in 2011, while 3 200 and 2 800 tonnes was estimated in 2010 and 2009, respectively. The estimate from this survey, is the second lowest estimate in the time series. In 2008 the biomass increased to 5 900 tonnes, after a continuous decrease from 2004 to 2007, from 15 300 tonnes 4 100 tonnes.

P. longirostris biomass on the slope was estimated to 1 100 tonnes in 2011. This is considerably higher than the 400 tonnes estimated in 2010 when a record high proportion (600 tonnes) was found on the shelf. The overall biomass estimates for the Northern region has ranged between 900 and 1 100 tonnes from 2005 to 2009.

The 2011 biomass estimate of *A. varidens* was about 650 tonnes, considerably higher than in 2010. A peak in the biomass was reported in 2009 with a biomass estimate of 900 tonnes, the highest since 1986.

N. africana biomass estimate in the present survey was around 9 000 tonnes, the lowest since 2005. Recent surveys indicated a high and relatively stable abundance of *N. Africana*.

The biomass estimate of Ommastrephidae in 2010 was 70 tonnes which is the lowest since the survey in 1995 and among the second lowest from the time series.

The 2011 biomass estimate of hairtails was about 1 100 tonnes, only half of the 2010 estimate but similar to the biomass estimates in 2009 and 2008.

The biomass estimate of sharks in 2011 was 670 tonnes, an increase in relation to the 2010 estimate of 380 tonnes.

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

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

Table 5.2 continue

Survey	Seabreams	P.longirostris	A.varidens	N.africanus	Ommastrephidae	D.angolensis
1985.1	0	21 (0.00)	0	0	976 (0.00)	0
1985.3	1,541 (0.00)	0	0	0	0	1,541 (0.00)
1985.4	0	2,108 (0.88)	6,691 (0.69)	2,864 (0.90)	142 (1.78)	0
1986.1	108 (2.02)	1,166 (1.29)	538 (2.09)	12,631 (0.23)	261 (0.33)	98 (2.27)
1986.2	288 (2.27)	0	1,008 (0.48)	4,643 (0.88)	0	269 (2.27)
1989.1	66 (2.27)	419 (1.15)	204 (0.50)	6,953 (1.48)	1,429 (1.40)	0
1989.2	4,061 (2.24)	366 (1.01)	164 (1.14)	3,682 (0.81)	135 (1.37)	4,038 (2.26)
1989.3	497 (1.79)	243 (0.67)	91 (0.40)	4,699 (0.38)	645 (1.07)	496 (1.80)
1991.1	49 (1.66)	88 (1.00)	70 (1.37)	8,315 (0.72)	129 (1.47)	49 (1.66)
1991.2	527 (0.66)	205 (0.98)	15 (2.67)	2,445 (0.37)	619 (1.11)	510 (0.66)
1992	510 (0.90)	170 (1.05)	272 (0.80)	8,439 (0.80)	143 (0.73)	465 (0.85)
1994	1,045 (0.91)	532 (0.58)	370 (0.75)	6,602 (0.69)	281 (0.55)	1,045 (0.91)
1995.1	506 (0.98)	860 (0.88)	326 (0.67)	7,269 (0.73)	61 (1.16)	449 (1.08)
1996	597 (1.43)	162 (0.62)	267 (0.45)	3,859 (0.50)	228 (0.66)	345 (1.50)
1997.1	871 (1.08)	605 (1.14)	333 (0.35)	13,096 (0.40)	622 (0.37)	826 (1.13)
1997.2	878 (2.27)	1,317 (1.41)	0	4,088 (1.92)	317 (1.85)	876 (2.27)
1999	389 (0.58)	542 (0.43)	237 (0.42)	10,540 (0.58)	1,121 (1.52)	339 (0.69)
2000	1,650 (2.05)	497 (0.44)	222 (0.50)	3,777 (0.63)	509 (0.64)	1,588 (2.14)
2001	494 (2.27)	535 (0.53)	243 (0.47)	6,746 (0.90)	1,001 (2.17)	481 (2.27)
2002	213 (1.45)	800 (1.04)	127 (0.57)	5,337 (0.89)	364 (1.27)	200 (1.54)
2003	141 (1.10)	629 (1.01)	383 (0.83)	6,873 (0.42)	216 (0.83)	135 (1.08)
2004	299 (0.69)	749 (0.98)	359 (0.39)	10,930 (0.37)	316 (0.56)	284 (0.71)
2005	562 (0.81)	984 (0.63)	639 (0.51)	8,535 (0.42)	330 (0.53)	547 (0.85)
2006	343 (0.95)	923 (0.67)	391 (0.39)	11,073 (0.43)	184 (0.49)	340 (0.95)
2007	612 (0.73)	981 (0.78)	373 (0.31)	13,285 (0.52)	125 (0.89)	595 (0.77)
2008	629 (0.66)	933 (0.71)	615 (0.30)	15,267 (0.45)	205 (0.78)	593 (0.64)
2009	523 (0.87)	971 (0.68)	914 (0.32)	13,121 (0.45)	131 (0.92)	523 (0.87)
2010	1,404 (0.96)	389 (0.63)	388 (0.42)	9,207 (0.48)	92 (0.78)	1,404 (0.96)
2011	1,215 (0.88)	1,138 (1.07)	653 (0.28)	8,793 (0.64)	74 (1.09)	1,211 (0.88)

Distribution

Figure 5.2 shows the estimated distribution of hake (*M. polli*) in the Northern Region. The stock distribution covers the slope from Ponta das Palmerinhas to Cabeça de Cobra, with highest densities (25-50 kg/hour) on the upper part of the slope from Ambriz and N'Zeto.

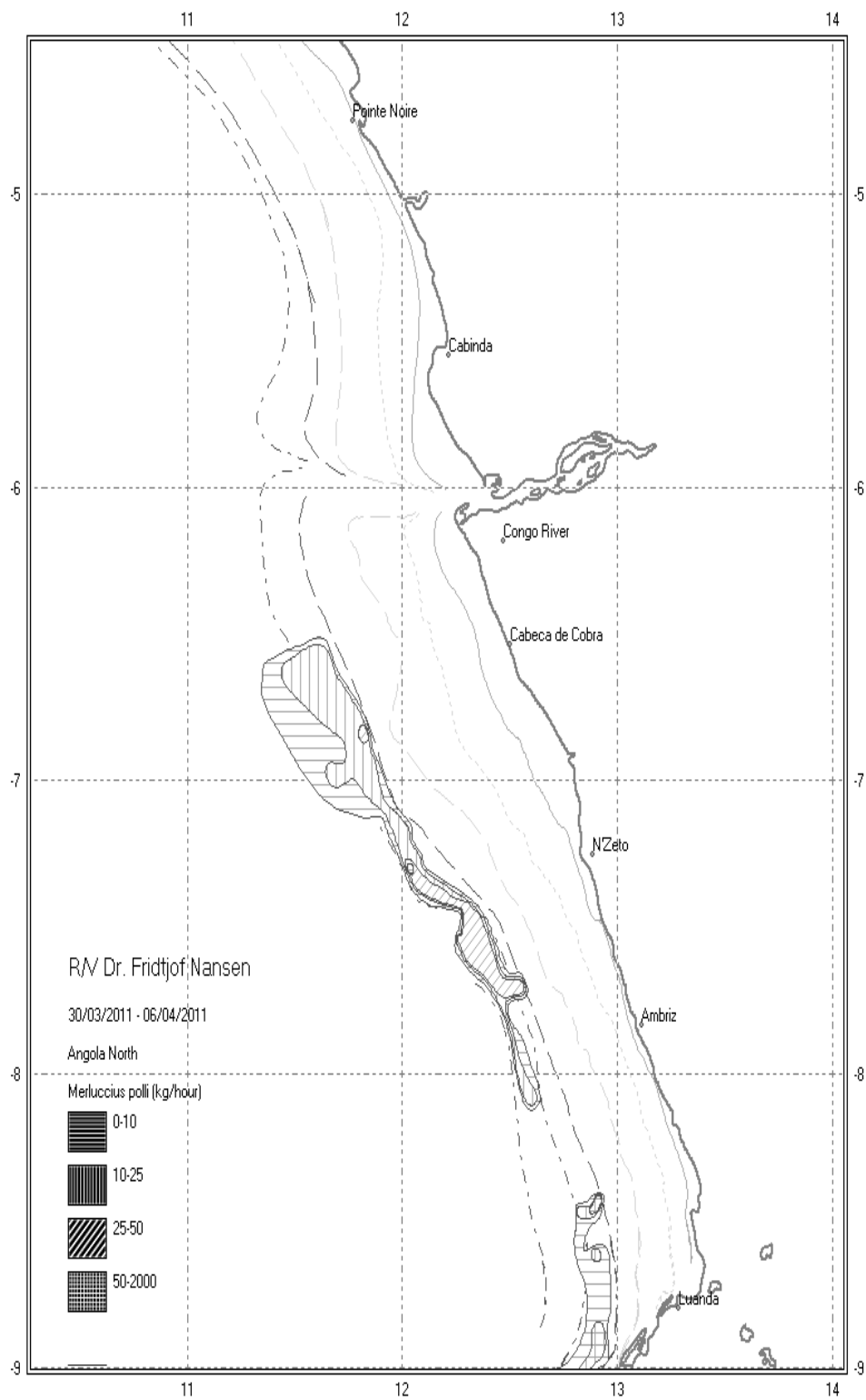


Figure 5.2 Distribution of hake (*Merluccius polli*) in the Northern Region, Ponta das Palmerinhas – Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

CHAPTER 6 SUMMARY

From 23 March to 8 April the 2011 demersal fish resources survey, off Angola, was carried out using R/V “Dr. Fridtjof Nansen”. Due to time constraints, only the shelf and upper slope (20-800m) from Benguela to Congo River was covered. In the Central Region the number of trawl stations was reduced by almost 30%, while in the Northern Region the number of stations was reduced by 15%.

In total, 133 trawl stations were carried out, of which 131 were valid and used in the biomass estimation of the demersal stocks. To map the oceanographic conditions 110 CTD stations were taken.

6.1 Hydrographical conditions

The demersal surveys in March are coincident with the late phase of the wet season, which causes low salinity in the surface waters on the shelf off Northern and Central Angola due to the freshwater coming from the coastal rivers. This can be observed clearly in the Central Region; the temperature ranged from 26°C to 30°C rising from coast to offshore, with salinity 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 also characterized by transport of surface water flowing towards the coast. The surface temperature ranged from 29°C to 30°C, while salinity was about 33.0 to 33.5, but lower in at the Congo River outlet ($S < 30$). Oxygen showed normal values over the whole region.

6.2 Biomass estimates

Table 6.1 presents the time series from 1985 to 2011 of the biomass estimates for the most important species on the shelf and slope in the Central and Northern regions of Angola. Angola has a high biodiversity regarding fish and invertebrate marine species. These species, despite having a low biomass individually, constitute 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 by a high CV connected to the biomass estimate. These low biomass estimates with individually large CVs may sometimes obscure the greater picture. We have therefore chosen to look at the overall trend in catch rates this year and compare these with the catch trends the last ten years when the survey methodology has been kept reasonably constant. The pelagic species (*Trachurus capensis*, *T. trecae*, *Sardinella aurita*, *S. maderensis*, *Sardina pilchardus* and *Engraulis capensis*) have been excluded from the analyses as these species are schooling pelagic species and may be caught in great abundance where they are caught, obscuring the overall tendency for the demersal species.

Overall on the shelf (Fig 6.1), there has been a declining trend in catch rates since the recent peak in 2003 when the average catch rate was approximately 630 kg/hour. In 2011, this catch rate (excluding the pelagic species) had decreased to below 400 kg/hour. The situation on the shelf should be closely monitored, being the declining catches reason for concern.

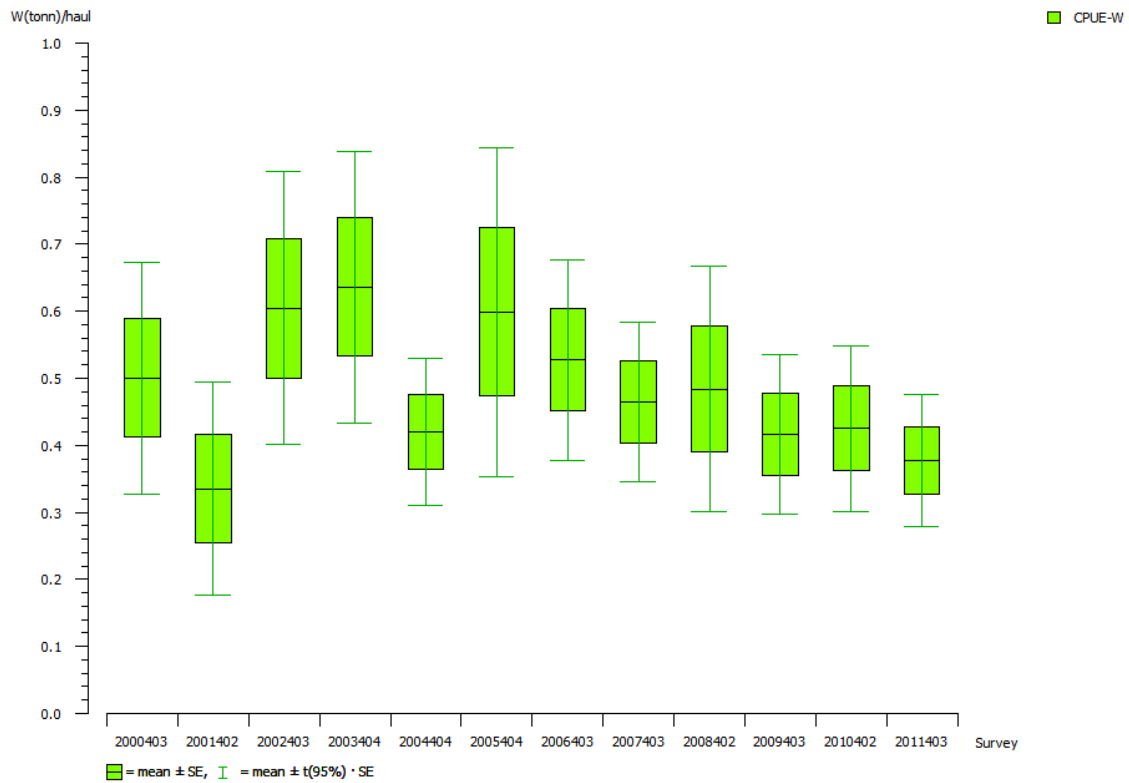


Figure 6.1. Average total catch/hour for all species (except the pelagic group) on the Angolan shelf (20-200 m depth) in 2000-2011.

On the slope between 200 and 800 m depth (Fig 6.2), the average catch rates have been more stable around 200 kg/hour. In 2003 the average catch rate was almost 500 kg/hour, being thus an exception to this trend. Also, the 2010 and 2011 estimates were lower than in the previous years and well below 200 kg/hour.

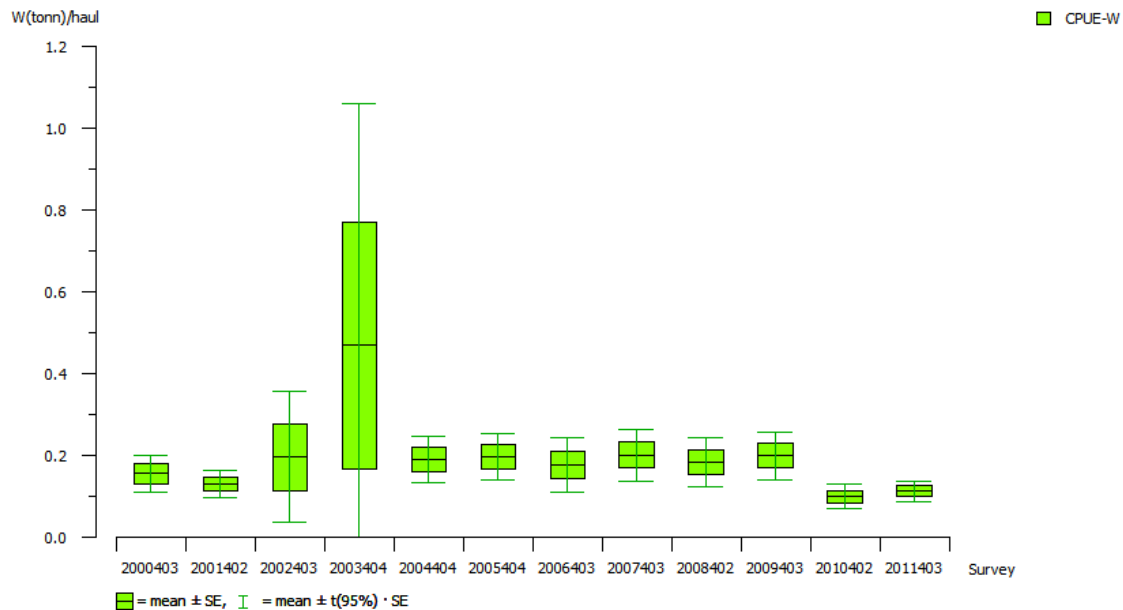


Figure 6.2. Average total catch/hour for all species (except the pelagic group) on the Angolan slope (>200 m depth) in 2000-2011.

Seabreams

In the Central and Northern regions, the biomass estimate of seabreams in 2011 was 20 900 tonnes, a decrease from the 2010 estimate of 25 700 tonnes. The 2010 estimate was, however, the highest estimated biomass since 2005. *D. angolensis* and *D. macrophthalmus* were the most abundant species.

Hakes

M. polli was the only hake species caught in the trawl. The estimated biomass in 2011 was 6 700 tonnes, slightly below the 7 000 tonnes estimated the previous year. There has been a continuous declining abundance of hake in the two regions since 2004 and this year's estimate is the lowest since 1999.

Shrimps

The biomass estimate of *P. longirostris* in 2011 was 1 500 tonnes, which is about the same as in the four previous surveys. A high CV value indicates that the estimate is relatively uncertain. The 2011 estimate for *A. varidens* was 1 300 tonnes, similar to 2010, 2008 and 2007 but lower than the estimate of 2 200 tonnes in 2009.

Grunts

The biomass estimate of grunts in the Central and Northern regions in 2011 was 14 700 tonnes, higher than the 2010 estimate (10 900 tonnes).

Croakers

The biomass estimate of croakers, mainly *U. canariensis*, *A. aequidens*, *P. senegalensis* and *P. typus*, was about 13 900 tonnes in 2011. This is an increase from 2010 when 8 300 tonnes was estimated. *U. canariensis* contributed about 43% of the total biomass of croakers in 2011.

Groupers and snappers

In the Central and Northern regions the biomass estimates for these groups are relatively imprecise as shown by the high CV values. The biomass estimate of groupers decreased from 1 200 in 2008 to 800 tonnes in 2009 and to 640 tonnes in 2010, while the 2011 estimate was 700 tonnes. The biomass estimate of snappers increased from 90 tonnes in 2008 to 290 tonnes in 2009, decreased to 70 tonnes in 2010 and increased again to 270 tonnes in 2011. The estimates in the time series show large fluctuations, making it difficult to identify any trends and conclude on the current state of these stocks.

Pelagic species

For the pelagic species, the estimates of biomasses are characterized by high variability throughout the years, particularly for horse mackerel, hairtail and barracuda. The bottom trawl is not an adequate sampling gear for the pelagic fish species; therefore these species estimates do not allow establishing reliable trends for these resources.

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

Survey	M.polli	T.treace	Shrimps	Cephalopod	Sharks	Clupeids	Carangids	Scombrids
1985.1	211 (0.12)	4,496 (1.85)	323 (1.22)	11,438 (1.90)	841 (0.92)	364 (1.93)	9,986 (1.52)	44 (3.25)
1985.2	0	3,324 (1.94)	139 (3.12)	694 (0.95)	451 (1.06)	3,907 (3.17)	3,740 (1.73)	30 (2.72)
1985.3	6,524 (1.70)	16,486 (1.99)	2,215 (1.77)	2,297 (1.00)	1,079 (1.74)	205 (3.23)	17,742 (1.81)	146 (2.16)
1985.4	55,083 (1.46)	110,950 (1.39)	15,069 (1.04)	6,369 (1.24)	96 (2.42)	906 (1.55)	117,929 (1.33)	88 (2.09)
1986.1	29,498 (1.21)	31,313 (0.88)	24,342 (0.60)	6,925 (0.81)	5,004 (2.30)	2,770 (0.96)	38,390 (0.72)	64 (2.00)
1986.2	52,670 (0.76)	30,649 (1.11)	21,957 (0.43)	2,935 (0.78)	5,256 (1.38)	1,693 (0.95)	34,989 (0.97)	226 (1.51)
1989.1	16,503 (1.50)	19,681 (1.00)	9,110 (2.48)	4,465 (1.10)	3,086 (2.42)	2,137 (2.42)	26,000 (0.85)	252 (1.08)
1989.2	14,371 (0.90)	33,008 (0.74)	7,519 (1.03)	3,198 (0.56)	1,472 (1.18)	2,282 (0.79)	40,419 (0.66)	333 (1.16)
1989.3	25,407 (1.58)	49,538 (0.85)	7,393 (0.65)	4,797 (0.90)	21,887 (1.35)	6,749 (0.99)	59,519 (0.85)	518 (1.43)
1991.1	31,536 (0.93)	107,626 (1.18)	14,041 (0.97)	2,235 (0.43)	3,559 (1.18)	2,349 (1.31)	131,007 (1.03)	373 (1.28)
1991.2	30,968 (1.03)	62,772 (1.25)	8,426 (1.07)	7,351 (0.70)	4,090 (1.31)	91 (1.43)	63,901 (1.23)	444 (1.13)
1992	23,233 (0.60)	48,453 (0.69)	13,613 (1.17)	6,109 (0.41)	5,163 (1.47)	82 (1.92)	53,311 (0.67)	223 (1.14)
1994	10,343 (1.00)	77,944 (0.83)	11,756 (1.00)	6,886 (0.52)	1,869 (0.91)	206 (2.91)	86,549 (0.75)	926 (1.08)
1995.1	10,577 (1.30)	5,224 (1.74)	15,395 (0.93)	1,789 (0.76)	3,382 (1.00)	1,679 (1.09)	19,756 (0.74)	393 (1.24)
1995.2	6,880 (0.81)	11,258 (1.17)	4,499 (0.65)	979 (1.08)	1,289 (1.01)	0	11,370 (1.15)	201 (1.88)
1996	12,219 (1.08)	83,774 (0.95)	11,356 (0.96)	5,268 (0.49)	2,641 (1.47)	1,371 (1.69)	89,864 (0.89)	190 (1.65)
1997.1	21,911 (0.90)	64,832 (0.77)	22,638 (0.60)	10,684 (0.56)	3,004 (1.18)	9,833 (1.75)	168,669 (1.14)	335 (1.74)
1997.2	25,581 (0.71)	97,858 (0.58)	9,977 (2.10)	6,260 (0.42)	500 (1.73)	132 (2.45)	99,747 (0.56)	289 (2.20)
1998	10,366 (1.27)	4,630 (1.67)	9,412 (0.98)	3,016 (0.62)	1,122 (1.30)	2,860 (2.97)	7,606 (1.20)	52 (2.54)
1999	6,640 (1.08)	17,083 (0.78)	13,687 (0.97)	3,577 (1.08)	3,192 (0.73)	8,353 (0.87)	36,949 (0.60)	69 (1.84)
2000	10,118 (1.00)	25,701 (0.72)	7,592 (0.76)	3,778 (0.44)	5,098 (1.86)	2,215 (1.41)	47,540 (0.80)	349 (1.83)
2001	9,732 (1.30)	22,012 (0.77)	11,282 (1.23)	4,340 (1.36)	3,519 (1.85)	598 (1.06)	30,501 (0.66)	139 (1.11)
2002	7,680 (0.93)	88,411 (0.70)	10,747 (1.11)	4,980 (0.71)	629 (0.97)	3,067 (0.78)	98,922 (0.63)	820 (2.58)
2003	14,240 (1.35)	35,489 (0.77)	13,089 (0.85)	2,668 (0.56)	1,925 (1.92)	4,255 (0.78)	57,888 (0.89)	137 (1.75)
2004	31,628 (1.73)	21,409 (0.71)	20,863 (0.59)	3,400 (0.54)	3,125 (1.09)	3,760 (1.00)	28,088 (0.58)	63 (1.39)
2005	21,112 (0.99)	10,931 (0.70)	17,650 (0.59)	4,061 (0.47)	2,421 (1.08)	2,134 (1.19)	20,025 (0.67)	332 (1.72)
2006	14,563 (1.06)	14,925 (0.52)	20,214 (0.61)	3,728 (0.54)	2,328 (1.48)	4,663 (1.09)	25,200 (0.45)	183 (1.03)
2007	11,157 (1.66)	10,633 (0.69)	24,092 (0.71)	3,287 (0.56)	2,789 (1.21)	3,875 (0.84)	22,928 (0.73)	214 (1.42)
2008	11,979 (0.96)	5,640 (0.69)	24,057 (0.65)	3,577 (0.49)	1,831 (1.03)	2,700 (1.20)	22,856 (0.91)	168 (1.22)
2009	8,120 (1.00)	14,485 (0.68)	23,619 (0.63)	4,317 (0.64)	3,009 (1.61)	11,816 (1.85)	24,557 (0.69)	121 (1.31)
2010	7,051 (1.08)	4,427 (0.73)	19,050 (0.79)	3,215 (0.36)	1,205 (1.14)	3,238 (1.99)	19,492 (1.77)	164 (1.20)
2011	6,751 (2.52)	15,045 (1.73)	15,715 (0.96)	3,757 (0.51)	1,482 (0.97)	3,907 (1.22)	24,065 (1.16)	124 (1.32)

Table 6.1 continue

Survey	Hairtails	Barracudas	Snappers	Groupers	Grunts	Croakers	Seabreams	P.longirostris
1985.1	15,711 (1.45)	254 (1.50)	0	479 (1.81)	248 (1.69)	1,519 (1.67)	14,690 (0.94)	138 (1.93)
1985.2	1,200 (2.75)	75 (1.35)	63 (2.09)	1,771 (1.30)	381 (2.18)	1,302 (1.82)	12,881 (0.57)	0
1985.3	3,219 (1.31)	26 (2.74)	62 (3.25)	1,978 (1.39)	3,629 (1.56)	8,979 (1.52)	22,438 (1.03)	0
1985.4	7,937 (0.94)	1,033 (1.93)	0 NA	4,307 (0.91)	20,511 (1.54)	13,935 (2.05)	49,738 (0.69)	3,062 (1.72)
1986.1	26,602 (0.92)	3,099 (0.84)	470 (3.02)	1,087 (1.01)	3,468 (1.06)	6,956 (0.82)	27,435 (0.54)	3,823 (1.22)
1986.2	511,874 (0.02)	1,874 (0.93)	0	2,033 (0.84)	6,995 (0.98)	9,578 (0.76)	45,651 (0.36)	0
1989.1	13,125 (0.89)	2,281 (2.15)	0	1,569 (1.34)	3,816 (1.85)	5,864 (1.15)	25,271 (0.55)	895 (1.44)
1989.2	6,333 (0.70)	3,674 (1.21)	53 (2.19)	3,937 (2.31)	2,228 (1.06)	7,826 (0.78)	23,569 (0.92)	1,559 (1.07)
1989.3	66,901 (0.69)	1,068 (1.09)	316 (3.25)	1,107 (1.95)	1,870 (1.37)	4,812 (1.06)	20,807 (0.76)	1,094 (1.18)
1991.1	21,783 (1.13)	3,322 (1.93)	106 (3.69)	817 (1.28)	1,247 (0.99)	5,848 (1.05)	14,666 (0.48)	302 (1.48)
1991.2	9,218 (0.61)	161 (1.32)	0	2,043 (1.05)	2,742 (1.29)	26,595 (1.93)	42,431 (0.47)	640 (0.95)
1992	17,251 (0.74)	103 (2.12)	0	3,359 (1.08)	1,698 (1.27)	4,772 (0.76)	40,589 (0.52)	935 (1.71)
1994	31,574 (2.09)	329 (1.69)	262 (3.69)	2,908 (1.07)	680 (1.25)	18,320 (1.46)	51,379 (0.51)	1,757 (1.05)
1995.1	14,521 (0.59)	4,222 (1.10)	594 (2.14)	1,397 (1.05)	6,027 (1.40)	18,472 (1.67)	29,271 (0.83)	2,020 (1.09)
1995.2	5,112 (1.63)	0	45 (3.18)	348 (3.18)	0	245 (1.89)	11,363 (0.86)	680 (1.02)
1996	9,254 (0.51)	1,035 (1.51)	109 (3.69)	2,692 (1.26)	8,256 (1.04)	15,215 (0.62)	39,921 (0.62)	310 (0.89)
1997.1	32,077 (0.82)	554 (3.05)	73 (3.25)	781 (1.08)	6,427 (1.49)	21,483 (0.69)	33,690 (0.75)	2,501 (1.05)
1997.2	23,555 (0.55)	0	0	2,840 (1.33)	500 (0.84)	36,999 (1.82)	49,236 (0.63)	5,481 (1.07)
1998	30,861 (2.71)	454 (1.54)	0	198 (2.33)	9,117 (1.56)	8,609 (1.62)	64,867 (2.24)	742 (1.32)
1999	26,027 (0.57)	4,317 (0.82)	531 (3.49)	1,642 (0.83)	8,888 (1.03)	18,534 (1.14)	34,029 (0.45)	878 (0.82)
2000	18,068 (0.62)	4,556 (1.00)	294 (2.04)	1,647 (1.01)	7,213 (0.91)	7,842 (0.67)	36,443 (0.45)	1,259 (1.15)
2001	24,459 (1.12)	1,818 (0.79)	726 (3.16)	859 (1.50)	3,600 (1.17)	3,203 (0.94)	22,805 (0.64)	1,020 (0.83)
2002	30,855 (0.70)	2,318 (0.99)	251 (4.74)	742 (1.17)	3,223 (0.99)	9,196 (0.61)	34,016 (0.85)	1,565 (1.41)
2003	20,301 (0.67)	2,825 (1.86)	186 (2.63)	1,043 (0.99)	10,025 (1.83)	10,967 (0.58)	16,230 (0.39)	1,366 (1.14)
2004	20,349 (1.20)	1,856 (1.54)	79 (2.44)	681 (0.91)	6,810 (1.15)	12,196 (1.24)	32,647 (1.79)	2,143 (1.33)
2005	41,427 (1.25)	963 (1.68)	284 (2.07)	1,176 (0.88)	11,735 (1.08)	13,501 (0.72)	33,064 (1.12)	1,613 (1.07)
2006	20,849 (0.49)	2,561 (0.92)	51 (2.69)	819 (0.99)	6,921 (1.09)	8,956 (0.73)	24,824 (0.57)	2,607 (1.92)
2007	32,508 (1.22)	2,336 (1.34)	113 (1.86)	950 (1.04)	17,242 (1.38)	11,991 (1.40)	22,191 (0.35)	1,342 (1.35)
2008	18,211 (0.64)	1,652 (1.78)	90 (2.88)	1,187 (1.53)	7,411 (1.43)	12,684 (0.87)	21,227 (0.48)	1,622 (1.30)
2009	31,108 (1.11)	1,743 (1.33)	292 (2.03)	779 (0.73)	8,192 (0.90)	6,064 (0.74)	18,108 (0.41)	1,432 (1.10)
2010	14,888 (0.94)	1,202 (1.21)	69 (1.32)	643 (0.92)	10,873 (0.95)	8,256 (0.77)	25,714 (0.39)	1,648 (1.18)
2011	11,390 (1.11)	3,232 (1.22)	267 (2.79)	705 (0.83)	14,677 (1.23)	13,884 (0.99)	20,872 (0.37)	1,492 (1.76)

Survey	A.varidens	N.africanus	Ommastrephidae	Sepiidae	B.auritus	D.angolensis	U.canariensis	D.macrophthalmus
1985.1	0	0	11,249 (1.93)	0	40,729 (1.90)	2,196 (0.92)	1,132 (2.01)	200 (2.74)
1985.2	0	0	0	0	6,842 (2.33)	2,495 (0.94)	521 (2.43)	0
1985.3	0	0	0	154 (1.61)	9,182 (1.99)	4,490 (0.75)	602 (1.89)	0
1985.4	7,633 (1.47)	3,578 (1.69)	225 (2.56)	215 (2.12)	69,072 (1.67)	9,283 (1.12)	8,921 (2.47)	6,286 (2.41)
1986.1	1,030 (2.63)	15,804 (0.77)	2,140 (1.52)	1,334 (0.86)	133,723 (0.46)	5,700 (0.92)	2,606 (1.45)	2,787 (1.22)
1986.2	1,485 (0.90)	4,643 (1.90)	0	1,828 (1.23)	36,750 (0.69)	15,499 (0.47)	3,387 (1.33)	9,215 (0.40)
1989.1	397 (1.56)	7,545 (2.98)	3,209 (1.51)	356 (1.29)	20,488 (1.13)	2,568 (0.49)	1,427 (1.14)	7,302 (1.28)
1989.2	400 (1.50)	4,702 (1.61)	1,286 (1.04)	1,440 (0.67)	64,268 (1.18)	9,997 (2.01)	1,302 (1.34)	1,386 (1.44)
1989.3	285 (1.25)	5,657 (0.81)	4,191 (0.98)	169 (1.63)	88,316 (0.76)	4,888 (0.68)	1,194 (2.28)	1,956 (2.27)
1991.1	723 (0.58)	12,194 (1.13)	1,036 (0.74)	522 (0.79)	48,534 (0.82)	2,651 (0.49)	1,657 (1.94)	3,075 (1.74)
1991.2	119 (3.61)	5,104 (0.95)	4,144 (1.05)	793 (1.38)	3,524 (1.62)	4,903 (0.54)	22,849 (2.25)	18,054 (0.97)
1992	638 (1.21)	11,662 (1.38)	3,519 (0.46)	1,074 (0.95)	34,799 (2.01)	7,229 (0.37)	1,719 (1.18)	20,117 (0.99)
1994	1,017 (1.28)	8,801 (1.33)	1,931 (0.63)	3,167 (0.67)	10,205 (1.51)	6,918 (0.52)	6,075 (1.55)	23,219 (0.88)
1995.1	1,078 (0.95)	9,729 (1.47)	164 (1.21)	637 (0.86)	40,468 (0.83)	4,695 (0.71)	11,929 (2.11)	14,010 (1.70)
1995.2	698 (0.62)	2,763 (0.97)	730 (0.84)	219 (2.48)	0	1,280 (0.74)	209 (2.22)	10,083 (0.99)
1996	938 (0.76)	8,830 (1.16)	1,069 (0.45)	143 (1.55)	45,646 (1.30)	6,236 (0.54)	3,150 (1.40)	14,591 (0.66)
1997.1	639 (0.79)	17,189 (0.79)	3,437 (0.56)	5,824 (0.95)	46,071 (0.75)	5,318 (0.57)	5,760 (0.94)	14,289 (1.72)
1997.2	0	4,098 (4.15)	2,491 (0.88)	1,885 (0.33)	1,966 (0.64)	5,712 (0.90)	33,214 (2.03)	31,595 (0.96)
1998	1,192 (2.89)	7,000 (1.37)	765 (1.28)	1,300 (1.09)	22,014 (1.79)	2,084 (0.74)	2,239 (1.46)	52,473 (2.75)
1999	574 (1.68)	11,746 (1.14)	2,028 (1.86)	375 (0.72)	131,249 (0.85)	4,476 (0.32)	11,581 (1.59)	8,181 (1.23)
2000	601 (0.71)	4,820 (1.21)	1,735 (0.69)	501 (1.14)	79,452 (1.18)	7,385 (1.25)	3,771 (0.88)	8,086 (1.25)
2001	699 (1.14)	7,263 (1.87)	1,702 (2.83)	376 (0.92)	54,964 (1.01)	3,482 (0.84)	1,264 (1.70)	6,772 (1.22)
2002	371 (0.99)	8,375 (1.42)	3,629 (0.94)	248 (1.23)	81,844 (1.16)	3,323 (0.66)	4,326 (0.86)	13,935 (2.04)
2003	881 (1.78)	10,157 (1.06)	975 (0.88)	307 (1.61)	104,724 (0.99)	4,474 (0.42)	1,791 (0.72)	1,092 (2.52)
2004	935 (0.78)	17,133 (0.68)	1,319 (0.89)	394 (0.92)	51,255 (0.90)	7,084 (0.69)	6,977 (1.87)	13,884 (4.41)
2005	1,431 (0.77)	14,188 (0.73)	1,219 (1.33)	992 (0.46)	88,667 (1.17)	8,473 (0.29)	5,933 (0.91)	7,290 (4.97)
2006	750 (0.63)	16,424 (0.71)	943 (1.43)	217 (1.16)	94,684 (0.91)	7,236 (0.39)	6,483 (0.96)	4,950 (2.58)
2007	1,026 (0.38)	21,198 (0.81)	347 (1.74)	435 (1.70)	52,925 (0.80)	8,083 (0.41)	5,846 (2.35)	2,157 (1.41)
2008	1,508 (0.49)	20,352 (0.78)	896 (0.62)	306 (1.29)	70,217 (1.19)	6,860 (0.46)	5,058 (0.93)	3,176 (3.01)
2009	2,204 (0.66)	19,130 (0.79)	441 (0.79)	222 (1.60)	46,010 (1.28)	6,697 (0.44)	2,409 (0.71)	876 (0.93)
2010	1,134 (1.01)	16,013 (0.90)	429 (0.67)	208 (1.78)	24,838 (0.91)	11,561 (0.50)	4,493 (1.14)	2,395 (4.44)
2011	1,272 (0.40)	12,206 (1.22)	190 (1.01)	958 (0.87)	36,639 (1.11)	9,905 (0.42)	6,038 (1.57)	777 (1.44)

ANNEX I. FISHING STATIONS

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 1
 DATE :23/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°52.34
 start stop duration Lon E 12°58.23
 TIME :12:58:16 13:17:52 19.6 (min) Purpose : 3
 LOG : 1063.54 1064.60 1.1 Region : 4054
 FDEPTH: 218 217 Gear cond.: 0
 BDEPTH: 218 217 Validity : 0
 Towing dir: 0° Wire out : 550 m Speed : 3.2 kn
 Sorted : 97 Total catch: 341.12 Catch/hour: 1043.71

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 3
 DATE :24/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°4.99
 start stop duration Lon E 12°36.78
 TIME :05:59:16 06:33:12 33.9 (min) Purpose : 3
 LOG : 1159.26 1160.79 1.5 Region : 4040
 FDEPTH: 724 731 Gear cond.: 0
 BDEPTH: 724 731 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 2.7 kn
 Sorted : 99 Total catch: 195.90 Catch/hour: 346.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus belloci	231.52	1123	22.18	
MYCTOPHIDAE	193.77	155440	18.57	
Dentex angolensis	177.77	217	17.03	1
Synagrops microlepis	90.17	682	8.64	
Bembrops heterurus	85.06	918	8.15	
Brotula barbata	69.61	73	6.67	
G A S T R O P O D S	61.13	23553	5.86	
Trichiurus lepturus	36.23	138	3.47	
Parapenaeus longirostris, femal	23.83	4843	2.28	2
MACROURIDAE	13.03	300	1.25	
Dicologlossa cuneata	12.70	171	1.22	
Zenopsis conchifer	8.44	24	0.81	
Trachurus trecae	8.38	12	0.80	
Parapenaeus longirostris, male	7.50	2246	0.72	3
Gadella maraldi	5.94	300	0.57	
Syacium micurum	4.96	205	0.47	
OPHICHTHIDAE	4.96	49	0.47	
Peristedion cataphractum	4.47	4363	0.43	
Gobiidae	2.20	147	0.21	
Scorpaena normani	1.32	15	0.13	
Squilla mantis	0.73	15	0.07	
Total	1043.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 2
 DATE :23/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°53.09
 start stop duration Lon E 12°54.28
 TIME :14:18:43 14:48:06 29.4 (min) Purpose : 3
 LOG : 8287.17 8288.71 1.5 Region : 4054
 FDEPTH: 319 317 Gear cond.: 0
 BDEPTH: 319 317 Validity : 0
 Towing dir: 0° Wire out : 765 m Speed : 3.1 kn
 Sorted : 63 Total catch: 226.52 Catch/hour: 462.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spatangus capensis	107.53	1015	23.25	
Merluccius polli	93.97	451	20.32	4
Trichiurus lepturus	63.96	157	13.83	
Lophiodes kempii	52.53	80	11.36	
Coelorinchus coelorrhincus	23.44	614	5.07	
Gadella maraldi	22.58	286	4.88	
Pontinus accraensis	19.15	308	4.14	
Bembrops heterurus	16.29	408	3.52	
Centroprorus granulosus	14.09	2	3.05	
Bathyrroconger vicinus	12.94	143	2.80	
Callinectes sp.	9.00	151	1.95	
Chlorophthalmus atlanticus	8.86	186	1.92	
Trachurus trecae	4.51	8	0.98	
Synagrops microlepis	3.00	114	0.65	
Malacocephalus occidentalis	3.00	22	0.65	
Gadella imberbis	2.86	57	0.62	
Illex coindetii	1.35	14	0.29	
Parapenaeus longirostris, femal	0.80	122	0.17	5
Calappa pelii	0.71	8	0.15	
Peristedion cataphractum	0.65	29	0.14	
Chaunax pictus	0.57	14	0.12	
Parapenaeus longirostris, male	0.29	29	0.06	6
Dibranchius atlanticus	0.22	8	0.05	
Solenocera africana	0.14	14	0.03	
Total	462.44		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia aequalis	128.75	2928	37.17	
Yarellia blackfordi	40.90	1286	11.81	
Anemones, pink	29.80	64	8.60	
Opistotheutis rossi	22.83	12	6.59	
Lophiodes kempii	19.98	4	5.77	
Talimania longifilis	17.67	95	5.10	
Lamprogrammus exutus	16.00	48	4.62	
Stereomastis sp.	13.37	561	3.86	
Aristeus varidens, female	7.89	385	2.28	16
Dibranchius atlanticus	6.14	262	1.77	
Chaceon maritae	5.04	14	1.45	
Raja sp.	5.00	60	1.44	
E C H I N O D E R M A T A	4.30	175	1.24	
Xenodermichthys copei	3.70	278	1.07	
Paramola cuvieri	3.09	4	0.89	
UNIDENTIFIED FISH	2.94	7	0.85	
Ebinania costaeacarie	2.85	2	0.82	
Halosaurus ovenii	2.23	83	0.64	
Gadella imberbis	1.87	143	0.54	
Stomias affinis	1.68	39	0.48	
Merluccius polli	1.68	4	0.48	
Hoplostethus cadenati	1.66	51	0.48	
Triplophos hemingi	1.15	104	0.33	
Bathyrroconger vicinus	0.99	55	0.29	
Ommastrephes pteropus	0.87	4	0.25	
Diastobranthus capensis	0.67	23	0.19	
Etmopterus pusillus	0.60	9	0.17	
Plesiopenaeus edwardsianus	0.57	35	0.16	
Aristeus varidens, male, male	0.51	55	0.15	17
Dicrolene intronigra	0.34	4	0.10	
Parapagurus cf pilosimanus	0.25	9	0.07	
Gonostoma sp.	0.23	4	0.07	
Diaphus effulgens	0.23	23	0.07	
Ariomma bondi	0.19	4	0.06	
Chlorophthalmus atlanticus	0.16	4	0.05	
Hymenocephalus italicus	0.12	4	0.04	
Melanostomias sp.	0.09	9	0.03	
Bathypterois guentheri	0.09	4	0.03	
Total	346.42		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 4
 DATE :24/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°6.35
 start stop duration Lon E 12°40.51
 TIME :08:04:02 08:26:32 22.5 (min) Purpose : 3
 LOG : 1167.98 1169.09 1.1 Region : 4040
 FDEPTH: 430 426 Gear cond.: 0
 BDEPTH: 430 426 Validity : 0
 Towing dir: 0° Wire out : 950 m Speed : 2.9 kn
 Sorted : 137 Total catch: 254.26 Catch/hour: 678.03

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	432.64	1520	63.81	7
Trichiurus lepturus	84.85	384	12.51	
Chaunax pictus	25.15	435	3.71	
Dibranchius atlanticus	22.75	1421	3.35	
Hymenocephalus italicus	22.05	2309	3.25	
Gadella maraldi	16.61	152	2.45	
Anemones, pink	11.60	104	1.71	
Etmopterus pusillus	11.15	355	1.64	
Aristeus varidens, female	9.57	597	1.41	
Malacocephalus laevis	8.93	80	1.32	
Zenopsis conchifer	7.68	11	1.13	
Nezumia aequalis	4.43	139	0.65	
Chaceon maritae	3.60	13	0.53	
Aristeus varidens, male	3.15	168	0.46	
Gadella imberbis	2.64	99	0.39	
Benthodesmus tenuis	2.11	83	0.31	
Parapandalus narval	1.81	341	0.27	
Halosaurus ovenii	1.73	115	0.26	
Hoplostethus cadenati	1.73	40	0.26	
Callinectes amnicola	1.41	35	0.21	
Rossia enigmatica	0.75	5	0.11	
Synagrops microlepis	0.53	29	0.08	
Stomias boa boa	0.53	11	0.08	
Stereomastis sp.	0.24	35	0.04	
Plesiopenaeus edwardsianus	0.24	11	0.04	
PARALEPIDIDAE	0.13	5	0.02	
Total	678.03		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 5
 DATE :24/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°13.36
 start stop duration Lon E 12°46.67
 TIME :10:01:34 10:31:46 30.2 (min) Purpose : 3
 LOG : 1179.31 1181.06 1.8 Region : 4040
 FDEPTH: 113 114 Gear cond.: 0
 BDEPTH: 113 114 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.5 km
 Sorted : 50 Total catch: 50.12 Catch/hour: 99.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	44.69	411	44.89	
Dentex angolensis	26.91	224	27.04	8
Octopus vulgaris	4.15	4	4.17	
G A S T R O P O D S	4.11	357	4.13	
Lagocephalus laevigatus	3.46	4	3.47	
Raja miraletus	3.24	4	3.25	
Citharus linguatula	3.00	95	3.01	
Zeus faber	2.05	8	2.06	
G A S T R O P O D S	1.91	497	1.92	
Zenopsis conchifer	1.17	2	1.18	
Dentex congoensis	1.11	24	1.12	
Bembrops greyi	0.95	10	0.96	
Monolene microstoma	0.54	20	0.54	
Sepia orbignyana	0.48	4	0.48	
Selene dorsalis	0.46	14	0.46	
Umbriina canariensis	0.44	4	0.44	
Uranoscopus cadenati	0.42	2	0.42	
Illex coindetii	0.22	6	0.22	
Callinectes amnicola	0.18	6	0.18	
Dicologlossa hexopthalma	0.08	2	0.08	
Total	99.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 6
 DATE :24/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°14.18
 start stop duration Lon E 12°51.14
 TIME :11:24:24 11:54:15 29.9 (min) Purpose : 3
 LOG : 1186.77 1188.41 1.6 Region : 4040
 FDEPTH: 74 78 Gear cond.: 0
 BDEPTH: 74 78 Validity : 0
 Towing dir: 0° Wire out : 205 m Speed : 3.3 km
 Sorted : 102 Total catch: 101.61 Catch/hour: 204.23

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	83.82	818	41.04	10
Dentex angolensis	40.00	306	19.59	9
Trachurus trecae	23.92	985	11.71	11
Alloteuthis africana	8.76	3268	4.29	
Citharus linguatula	7.36	129	3.60	
Raja miraletus	5.87	8	2.87	
Selene dorsalis	5.23	42	2.56	
Sepia orbignyana	3.90	103	1.91	
Decapterus rhonchus	3.52	109	1.72	
Lagocephalus laevigatus	3.24	4	1.58	
Octopus vulgaris	3.20	2	1.56	
Zenopsis conchifer	2.49	2	1.22	
Torpedo torpedo	2.13	4	1.04	
G A S T R O P O D S	1.51	167	0.74	
Ephippion guttifer	1.39	8	0.68	
Trichiurus lepturus	1.39	2	0.68	
Brotula barbata	1.37	4	0.67	
Saurida brasiliensis	1.33	185	0.65	
GOBIIDAE	0.78	84	0.38	
Dibranchius atlanticus	0.68	12	0.33	
C R A B S	0.52	318	0.26	
Dentex congoensis	0.50	8	0.25	
Chaetodon hoefleri	0.40	2	0.20	
Dentex barnardi	0.32	2	0.16	
Pagellus bellottii	0.26	2	0.13	
Parapenaeus longirostris, femal	0.18	52	0.09	
Dicologlossa hexopthalma	0.16	4	0.08	
Parapenaeus longirostris, male	0.00	16	0.00	
Total	204.22		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 7
 DATE :24/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°18.45
 start stop duration Lon E 12°59.31
 TIME :13:25:26 13:47:13 21.8 (min) Purpose : 3
 LOG : 1200.37 1201.58 1.2 Region : 4040
 FDEPTH: 25 25 Gear cond.: 0
 BDEPTH: 25 25 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.3 km
 Sorted : 26 Total catch: 25.52 Catch/hour: 70.27

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrinus	15.83	17	22.53	
Epinephelus aeneus	12.39	6	17.63	
Raja miraletus	11.32	17	16.11	
Lagocephalus laevigatus	7.46	8	10.62	
Ephippion guttifer	3.80	3	5.41	
Chilomycterus spinosus mauret.	3.55	8	5.05	
Balistes caprisicus	3.55	6	5.05	
Brachydeuterus auritus	2.92	30	4.15	
Chloroscombrus chrysurus	2.04	8	2.90	
Pseudupeneus prayensis	2.01	11	2.86	
Seriola carpenteri	1.84	3	2.63	
Sepia orbignyana	0.69	3	0.98	
Trachinocephalus myops	0.50	8	0.71	
Xyrichtys novacula	0.44	3	0.63	
Eucinostomus melanopterus	0.41	3	0.59	
Syacium micrum	0.41	3	0.59	
Rypticus saponaceus	0.39	6	0.55	
Trachurus trecae	0.28	14	0.39	
Trachinus arenatus	0.22	3	0.31	
Scorpaena stephanica	0.14	3	0.20	
Decapterus rhonchus	0.08	3	0.12	
Total	70.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 8
 DATE :24/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°25.78
 start stop duration Lon E 13°3.70
 TIME :15:06:27 15:22:06 15.7 (min) Purpose : 3
 LOG : 1212.08 1212.89 0.8 Region : 4040
 FDEPTH: 24 22 Gear cond.: 0
 BDEPTH: 24 22 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.1 km
 Sorted : 67 Total catch: 67.33 Catch/hour: 258.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lutjanus gorensis	50.80	8	19.68	
Sparus caeruleostictus *	50.61	242	19.60	
Dentex barnardi	36.42	157	14.11	
Bodianus speciosus	28.56	19	11.06	
Cynoponticus ferox	13.50	19	5.23	
Sparus pagrus pagrus *	10.35	8	4.01	
Chaetodon hoefleri	10.35	138	4.01	
Lutjanus fulgens	9.78	27	3.79	
Acanthurus monroviae	8.51	12	3.30	
Balistes caprisicus	6.48	8	2.51	
Epinephelus gorensis	6.48	4	2.51	
Rhinobatos albomaculatus	5.56	4	2.15	
Fistularia tabacaria	4.52	8	1.75	
Aluterus heudelotii	4.22	8	1.63	
Pagellus bellottii	3.49	12	1.35	
Scorpaena stephanica	2.22	31	0.86	
Raja miraletus	2.19	4	0.85	
Epinephelus aeneus	1.53	4	0.59	
Fistularia petimba	1.46	15	0.56	
Rypticus saponaceus	0.77	12	0.30	
Pseudupeneus prayensis	0.35	19	0.13	
Total	258.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 9
 DATE :24/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°29.15
 start stop duration Lon E 13°0.42
 TIME :16:18:52 16:49:04 30.2 (min) Purpose : 3
 LOG : 1218.99 1220.65 1.7 Region : 4040
 FDEPTH: 49 50 Gear cond.: 0
 BDEPTH: 49 50 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.3 km
 Sorted : 95 Total catch: 221.40 Catch/hour: 439.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	186.49	713	42.41	
Pomadasy incisus	170.35	755	38.74	
Galeoides decadactylus	11.76	28	2.67	
Sphyraena guachancho	10.41	18	2.37	
Syacium micrum	7.13	56	1.62	
Raja miraletus	7.07	24	1.61	
Cynoglossus canariensis	5.46	28	1.24	
Grammolites gruvelli	5.00	121	1.14	
Sepia orbignyana	4.67	32	1.06	
Chelidichthys gabonensis	4.53	28	1.03	
Pomadasy rogeri	4.25	4	0.97	
Brachydeuterus auritus	4.21	24	0.96	
Rhinobatos albomaculatus	3.89	4	0.89	
Pseudotolithus senegalensis	3.56	4	0.81	
Alectis alexandrinus	2.96	4	0.67	
Chilomycterus spinosus mauret.	1.57	10	0.36	
Chaetodon hoefleri	1.47	10	0.33	
Lagocephalus laevigatus	1.15	4	0.26	
Sardinella maderensis	1.11	4	0.25	
Alloteuthis africana	1.05	306	0.24	
Citharus linguatula	0.56	24	0.13	
Saurida brasiliensis	0.42	107	0.09	
Penaeus notialis	0.36	4	0.08	
Monolene microstoma	0.10	14	0.02	
GOBIIDAE	0.10	32	0.02	
Bothus podas africanus	0.10	14	0.02	
Total	439.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 10
 DATE :24/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°30.49
 start stop duration Lon E 12°50.83
 TIME :18:07:11 18:39:03 31.9 (min) Purpose : 3
 LOG : 1231.37 1232.93 1.6 Region : 4040
 FDEPTH: 110 113 Gear cond.: 0
 BDEPTH: 110 113 Validity : 0
 Towing dir: 0° Wire out : 300 m Speed : 2.9 km
 Sorted : 164 Total catch: 164.46 Catch/hour: 309.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus bellocci	52.45	350	16.93	
Trigla lyra	47.18	245	15.23	
B I V A L V E S	35.69	2669	11.52	
Chelidichthys gabonensis	25.52	104	8.24	
Conger conger	17.04	154	5.50	
Brotula barbata	16.85	23	5.44	
Uranoscopus polli	13.47	92	4.35	
Bembrops heterurus	12.71	147	4.10	
Citharus linguatula	11.32	200	3.65	
Zeus faber	9.70	36	3.13	
Cynoponticus ferox	9.23	9	2.98	
Dentex angolensis	8.95	73	2.89	
Pontinus accraensis	8.27	66	2.67	12
NETTASTOMATIDAE	7.01	90	2.26	
Octopus sp.	6.31	41	2.04	
Raja miraletus	6.21	11	2.01	
CORAL	3.60	2	1.16	
Sepia orbignyana	2.81	19	0.91	
Lagocephalus laevigatus	2.34	2	0.75	
Scorpaena stephanica	1.94	4	0.63	
Branchiostegus semifasciatus *	1.86	2	0.60	
GOBIIDAE	1.79	234	0.58	
Bothus podas africanus	1.24	55	0.40	
Fistularia petimba	1.17	2	0.38	
Trachurus trecae	0.94	38	0.30	
Dentex barnardi	0.75	2	0.24	
Parapenaeus longirostris, femal	0.64	124	0.21	
Loligo vulgaris	0.62	13	0.20	
Boops boops	0.49	13	0.16	
G A S T R O P O D S	0.36	6	0.12	
Calappa sp.	0.26	13	0.09	
Gadella imberbis	0.26	17	0.09	
Pagellus bellottii	0.26	2	0.09	
Torpedo torpedo	0.23	8	0.07	
Saurida brasiliensis	0.09	23	0.03	
ECHENEIDIDAE	0.08	4	0.02	
Squilla mantis	0.08	2	0.02	
Parapenaeus longirostris, male	0.02	9	0.01	
Total	309.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 11
 DATE :24/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°37.42
 start stop duration Lon E 12°39.59
 TIME :21:05:04 21:31:15 26.2 (min) Purpose : 3
 LOG : 1248.31 1249.58 1.3 Region : 4040
 FDEPTH: 527 528 Gear cond.: 0
 BDEPTH: 527 528 Validity : 0
 Towing dir: 0° Wire out : 1160 m Speed : 2.9 kn
 Sorted : 22 Total catch: 94.27 Catch/hour: 216.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Gadella maraldi	35.89	248	16.61	
Merluccius polli	35.06	55	16.23	13
Lamprogrammus exutus	20.83	172	9.64	
Yarella blackfordi	17.26	667	7.99	
Hoplostethus cademati	16.36	564	7.57	
Aristeus varidens, female	15.61	935	7.22	
Chaceon maritae, female	14.44	55	6.68	
Dibranchius atlanticus	10.66	578	4.93	
Aristeus varidens, male	8.73	1238	4.04	
Chaceon maritae, male	8.02	23	3.71	
Centrophorus granulosus	5.27	2	2.44	
Stomias boa boa	5.23	110	2.42	
Anemones, white	4.40	14	2.04	
Benthodesmus tenuis	3.64	138	1.69	
Chaunax pictus	2.89	28	1.34	
Scymnodon squamulosus	2.68	28	1.24	
Triplophos hemingi	1.24	179	0.57	
Bathyroconger vicinus	1.24	76	0.57	
OPHIIDIIDAE	1.17	83	0.54	
Dicrolene intronigra	1.10	144	0.51	
Halosaurus ovenii	0.83	34	0.38	
Stereomastis sp.	0.83	619	0.38	
Callinectes amnicola	0.76	21	0.35	
Chlorophthalmus atlanticus	0.76	14	0.35	
Nezumia aequalis	0.69	55	0.32	
Gadella imberbis	0.28	14	0.13	
Nemichthys scolopaceus	0.21	7	0.10	
Total	216.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 12
 DATE :25/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 9°56.96
 start stop duration Lon E 12°44.30
 TIME :00:13:39 00:45:35 31.9 (min) Purpose : 3
 LOG : 1268.62 1270.31 1.7 Region : 4040
 FDEPTH: 739 737 Gear cond.: 0
 BDEPTH: 739 737 Validity : 0
 Towing dir: 0° Wire out : 1690 m Speed : 3.2 kn
 Sorted : 39 Total catch: 132.23 Catch/hour: 248.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi *	61.88	1364	24.91	
Nezumia aequalis	52.19	1116	21.01	
Talismania longifilis	21.98	192	8.85	
Stereomastis sp.	20.06	845	8.08	
Merluccius polli	14.75	17	5.94	
Chaceon maritae, male	9.58	15	3.86	
Stomias boa boa	7.78	180	3.13	
Aristeus varidens, male	7.55	440	3.04	
Opisthoteuthis agassizi	7.21	11	2.90	
Lamprogrammus exutus	6.42	11	2.59	
Anemones, pink	6.31	180	2.54	
Monomitus metriostoma	5.52	90	2.22	
Dibranchius atlanticus	4.96	225	2.00	
Hymenocephalus italicus	2.82	23	1.13	
Lophiodes kemp	2.71	11	1.09	
Plesiopenaeus edwardsianus	2.71	68	1.09	
Todaropsis eblanae	2.14	11	0.86	
Bathyroconger vicinus	1.92	23	0.77	
Chaceon maritae, female	1.80	8	0.73	
Scymnodon squamulosus	1.47	23	0.59	
Hoplostethus cademati	1.35	34	0.54	
Triplophos hemingi	1.13	79	0.45	
Melanonus zugmayeri	1.01	79	0.41	
Benthodesmus tenuis	0.90	34	0.36	
Bathypterois phenax *	0.90	90	0.36	
Raja clavata	0.68	11	0.27	
Aristeus varidens, female	0.56	56	0.23	
Halosaurus ovenii	0.11	11	0.05	
Total	248.40		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 13
 DATE :25/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°5.43
 start stop duration Lon E 12°52.95
 TIME :02:32:23 03:03:57 31.6 (min) Purpose : 3
 LOG : 1281.17 1282.77 1.6 Region : 4040
 FDEPTH: 297 306 Gear cond.: 0
 BDEPTH: 297 306 Validity : 0
 Towing dir: 0° Wire out : 760 m Speed : 3.1 kn
 Sorted : 28 Total catch: 318.24 Catch/hour: 604.83

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	342.86	5310	56.69	
Gephyroberyx darwini	152.40	188	25.20	
CONGRIDAE	23.85	2	3.94	
Synagrops microlepis	18.82	1213	3.11	
Laemonema laureysi	15.89	251	2.63	
Pontinus kuhlii	11.08	84	1.83	
MYCTOPHIDAE	9.62	4934	1.59	
Bembrops heterurus	7.11	125	1.18	
Parapenaeus longirostris, femal	3.34	523	0.55	
Peristedion cataphractum	2.93	21	0.48	
Pterothrissus belloti	2.72	21	0.45	
Parapandalus narval	2.72	962	0.45	
Dibranchius atlanticus	2.09	63	0.35	
Coelorrhinus braueri	1.67	42	0.28	
Lophiodes kemp	1.46	42	0.24	
Merluccius polli	1.46	21	0.24	
Monomitus metriostoma	1.25	63	0.21	
Parasudis fraser-bruenneri	1.25	21	0.21	
Starfish	0.84	42	0.14	
Parapenaeus longirostris, male	0.63	84	0.10	
GALATHEIDAE *	0.42	230	0.07	
Hymenocephalus italicus	0.42	63	0.07	
Total	604.83		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 14
 DATE :25/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°48.00
 start stop duration Lon E 13°0.88
 TIME :05:53:09 06:23:57 30.8 (min) Purpose : 3
 LOG : 1304.22 1305.73 1.5 Region : 4040
 FDEPTH: 93 94 Gear cond.: 0
 BDEPTH: 93 94 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 2.9 kn
 Sorted : 62 Total catch: 170.53 Catch/hour: 332.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	51.14	483	15.39	14
Sepia orbignyana	39.21	39	11.80	
Raja miraletus	34.58	49	10.41	
Trigla lyra	26.30	298	7.92	
Boops boops	25.13	828	7.56	
E C H I N O D E R M A T A	20.90	2382	6.29	
Pagellus bellottii	18.76	249	5.65	15
Uranoscopus polli	18.47	97	5.56	
Zeus faber	11.79	10	3.55	
Citharus linguatula	11.16	395	3.36	
Lagocephalus laevigatus	11.01	10	3.31	
Epinephelus aeneus	11.01	2	3.31	
SEPIIDAE	7.99	259	2.40	
Octopus vulgaris	6.92	16	2.08	
Chelidonichthys gabonensis	6.88	39	2.07	
Rhinobatos albomaculatus	6.43	2	1.94	
B I V A L V E S	5.22	458	1.57	
Dentex congoensis	3.37	113	1.01	
Alloteuthis africana	2.63	1106	0.79	
Chaetodon hoefleri	2.63	16	0.79	
Branchiostegus semifasciatus *	2.53	6	0.76	
Pseudupeneus prayensis	2.49	39	0.75	
Scorpaena normani	1.52	16	0.46	
Trachurus trecae	1.36	16	0.41	
Brotula barbata	1.27	6	0.38	
Saurida brasiliensis	0.78	146	0.23	
Monolene microstoma	0.55	49	0.16	
Dentex barnardi	0.19	6	0.06	
Total	332.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 15
 DATE :25/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°42.50
 start stop duration Lon E 13°9.23
 TIME :07:50:20 08:16:45 26.4 (min) Purpose : 3
 LOG : 1317.04 1318.42 1.4 Region : 4040
 FDEPTH: 32 31 Gear cond.: 0
 BDEPTH: 32 31 Validity : 0
 Towing dir: 0° Wire out : 98 m Speed : 3.1 kn
 Sorted : 146 Total catch: 907.04 Catch/hour: 2059.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1529.25	33983	74.24	18
Selene dorsalis	72.72	1685	3.53	
Chloroscombrus chrysurus	69.54	540	3.38	
Pseudupeneus prayensis	53.87	711	2.62	
Galeoides decadactylus	45.31	475	2.20	
Pagellus bellottii	42.81	291	2.08	19
Decapterus rhonchus	40.45	1712	1.96	
Sphyræna guachancho	35.95	329	1.75	
Pseudotolithus senegalensis	26.12	57	1.27	20
Pomadasy incisus	21.73	395	1.06	
Eucinostomus melanopterus	19.62	79	0.95	
Pteroscion peli	17.51	225	0.85	
Epinephelus aeneus	13.22	5	0.64	
Pomadasy peroteti	12.38	39	0.60	
Rhinobatos albomaculatus	10.90	5	0.53	
Raja miraletus	8.70	14	0.42	
Arius parkii	6.45	14	0.31	
Ephippion guttifer	5.90	2	0.29	
Syacium micrurum	5.27	79	0.26	
Dasyatis margarita	5.22	2	0.25	
Dasyatis marmorata	4.88	2	0.24	
Lagocephalus laevigatus	2.63	14	0.13	
Grammolites gruvelli	2.63	52	0.13	
Chilomycterus spinosus mauret.	2.63	14	0.13	
Trachinocephalus myops	2.50	66	0.12	
Serranus cabrilla	0.79	27	0.04	
Dicologlossa cuneata	0.52	14	0.03	
Squilla mantis	0.39	27	0.02	
Total	2059.89		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 16
 DATE :25/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 9°58.69
 start stop duration Lon E 13°12.45
 TIME :10:22:19 10:50:37 28.3 (min) Purpose : 3
 LOG : 1333.52 1334.93 1.4 Region : 4040
 FDEPTH: 34 34 Gear cond.: 0
 BDEPTH: 34 34 Validity : 0
 Towing dir: 0° Wire out : 112 m Speed : 3.0 kn
 Sorted : 122 Total catch: 209.96 Catch/hour: 445.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	312.87	5902	70.26	21
Pomadasy peroteti	39.34	38	8.84	
Galeoides decadactylus	34.89	1058	7.83	
Trichiurus lepturus	16.29	34	3.66	
Ephippion guttifer	10.56	8	2.37	
Chloroscombrus chrysurus	4.22	4	0.95	
Cynoglossus senegalensis	4.18	21	0.94	
Pseudotolithus senegalensis	3.58	11	0.80	
Citharus linguatula	3.03	34	0.68	
Selene dorsalis	2.93	40	0.66	
Lagocephalus laevigatus	2.84	8	0.64	
Torpedo marmorata	2.40	19	0.54	
Dicologlossa cuneata	1.78	30	0.40	
Pisodonophis semicinctus	1.48	4	0.33	
Grammolites gruvelli	1.21	49	0.27	
Chilomycterus spinosus mauret.	1.19	4	0.27	
Decapterus rhonchus	0.47	21	0.10	
Pagellus bellottii	0.45	4	0.10	
Squilla mantis	0.40	15	0.09	
Calappa rubroguttata	0.40	8	0.09	
Trachurus trecae	0.40	4	0.09	
Sphyræna guachancho	0.21	8	0.05	
Ilisha africana	0.17	4	0.04	
Total	445.30		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 17
 DATE :25/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°0.85
 start stop duration Lon E 13°10.01
 TIME :11:51:02 12:21:10 30.1 (min) Purpose : 3
 LOG : 1339.13 1340.78 1.7 Region : 4040
 FDEPTH: 59 61 Gear cond.: 0
 BDEPTH: 59 61 Validity: 0
 Towing dir: 0° Wire out : 170 m Speed : 3.3 kn
 Sorted : 72 Total catch: 71.99 Catch/hour: 143.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	42.52	448	29.66	22
Chelidonichthys capensis	38.04	345	26.53	
Raja miraletus	37.44	66	26.11	
Seriola carpenteri	6.77	6	4.72	
Trichiurus lepturus	4.26	12	2.97	
Grammolites gruvelli	3.86	114	2.69	
Brachydeuterus auritus	2.59	34	1.81	23
Lagocephalus laevigatus	1.91	6	1.33	
Zeus faber	1.35	8	0.94	
Sepia orbignyana	1.14	24	0.79	
Alloteuthis africana	0.70	201	0.49	
Vanstraelenia chirophthalmus	0.42	2	0.29	
Saurida brasiliensis	0.36	86	0.25	
Citharus linguatula	0.34	16	0.24	
Torpedo torpedo	0.22	2	0.15	
Torpedo marmorata	0.20	2	0.14	
Arnoglossus imperialis	0.18	28	0.13	
Decapterus rhonchus	0.16	2	0.11	
Sphyrna sphyraena	0.16	2	0.11	
Liocarcinus corrugatus	0.14	20	0.10	
Pseudupeneus prayensis	0.14	2	0.10	
G A S T R O P O D S	0.14	12	0.10	
Dentex barnardi	0.12	2	0.08	
E C H I N O D E R M A T A	0.08	8	0.06	
Chaceon maritae	0.06	2	0.04	
Parapenaeus longirostris	0.04	4	0.03	
GOBIIDAE	0.02	4	0.01	
Scyllarides herklotsii	0.02	12	0.01	
Total	143.36		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 18
 DATE :25/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°1.88
 start stop duration Lon E 13°5.03
 TIME :13:25:19 13:55:21 30.0 (min) Purpose : 3
 LOG : 1346.79 1348.51 1.7 Region : 4040
 FDEPTH: 84 84 Gear cond.: 0
 BDEPTH: 84 84 Validity: 0
 Towing dir: 0° Wire out : 230 m Speed : 3.4 kn
 Sorted : 66 Total catch: 280.52 Catch/hour: 560.29

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	235.99	9951	42.12	35
Trigla lyra	143.47	1520	25.61	
Raja miraletus	50.51	68	9.02	
Saurida brasiliensis	32.00	4923	5.71	
Starfish	15.36	1706	2.74	
Citharus linguatula	13.24	577	2.36	
Alloteuthis africana	10.19	5281	1.82	
Lagocephalus laevigatus	9.85	26	1.76	
Pagellus bellottii	9.59	204	1.71	25
Grammolites gruvelli	7.99	196	1.43	
Rhinobatos albomaculatus	7.05	8	1.26	
Pseudupeneus prayensis	6.97	144	1.24	
Dentex angolensis	4.07	144	0.73	24
Zeus faber	2.90	8	0.52	
Sepia orbignyana	2.46	238	0.44	
Uranoscopus polli	2.38	8	0.42	
Boops boops	2.38	94	0.42	
Fistularia tabacaria	2.04	8	0.36	
Chilomycterus spinosus mauret.	1.70	8	0.30	
Arnoglossus imperialis	0.18	18	0.03	
Total	560.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 19
 DATE :25/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°5.95
 start stop duration Lon E 13°0.06
 TIME :15:19:41 15:34:11 14.5 (min) Purpose : 3
 LOG : 1357.15 1357.90 0.8 Region : 4040
 FDEPTH: 104 105 Gear cond.: 0
 BDEPTH: 104 105 Validity: 0
 Towing dir: 0° Wire out : 320 m Speed : 3.1 kn
 Sorted : 59 Total catch: 59.38 Catch/hour: 245.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	62.28	654	25.35	
Trachurus trecae	45.52	1953	18.52	
Dentex congoensis	22.34	579	9.09	
Dentex angolensis	21.52	418	8.76	26
Raja miraletus	16.84	29	6.85	
Lagocephalus laevigatus	11.09	12	4.51	
Zeus faber	10.14	29	4.13	
Citharus linguatula	8.57	476	3.49	
G A S T R O P O D S	7.82	505	3.18	
Sepia orbignyana	7.82	62	3.18	
Zenopsis conchifer	6.74	4	2.75	
E C H I N O D E R M A T A	5.38	124	2.19	
Scorpaena normani	4.84	62	1.97	
Boops boops	4.22	95	1.72	
Uranoscopus polli	3.68	21	1.50	
Pagellus bellottii	1.53	21	0.62	
Alloteuthis africana	1.49	621	0.61	
Torpedo torpedo	1.45	4	0.59	
Illex coindetii	0.58	12	0.24	
Saurida brasiliensis	0.58	91	0.24	
Chelidonichthys gabonensis	0.37	4	0.15	
Spicara alta	0.29	46	0.12	
Dicologlossa hexophthalma	0.25	4	0.10	
Parapagurus dimorphus	0.21	17	0.08	
Bleinius normani	0.08	4	0.03	
Arnoglossus imperialis	0.08	4	0.03	
Total	245.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 20
 DATE :25/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°38.94
 start stop duration Lon E 13°5.09
 TIME :19:36:56 20:09:01 32.1 (min) Purpose : 3
 LOG : 1392.96 1394.51 1.6 Region : 4040
 FDEPTH: 739 730 Gear cond.: 0
 BDEPTH: 739 730 Validity: 0
 Towing dir: 0° Wire out : 1600 m Speed : 2.9 kn
 Sorted : 30 Total catch: 77.71 Catch/hour: 145.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nezumia aequalis	34.41	698	23.68	
Anemones, pink	16.38	30	11.27	
Yarrella blackfordi	15.60	410	10.73	
Bathyrcongiger vicinus	13.90	95	9.56	
Stereomastis sp.	11.05	1132	7.61	
Talismania longifilis	8.49	30	5.84	
Chaceon maritae, male	8.23	11	5.66	
Dibranchius atlanticus	4.92	191	3.38	
Aristeus varidens, female, male	4.10	187	2.82	27
Barbourisia rufa	3.83	4	2.64	
Merluccius polli	3.18	6	2.19	
Ommastrephes sp.	3.05	13	2.10	
Hoplostethus cadenati	2.39	52	1.65	
Chaceon maritae, female	2.24	9	1.54	
Etmopterus spinax	2.21	30	1.52	
Plesiopeneus edwardsianus	1.95	200	1.34	
Stomias boa boa	1.87	34	1.29	
Lamprogrammus exutus	1.48	41	1.02	
Parapandalus narval	1.35	252	0.93	
Ebinania costaecanarie	1.03	4	0.71	
Gadella imberbis	0.95	112	0.66	
Triplophos hemingi	0.73	82	0.50	
Aristeus varidens, male, male	0.69	101	0.48	28
Halosaurus ovenii	0.64	26	0.44	
Starfish	0.64	17	0.44	
Lampadena anomala	0.04	4	0.03	
Total	145.34		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 21
 DATE :25/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°39.18
 start stop duration Lon E 13°8.70
 TIME :22:04:04 22:34:19 30.3 (min) Purpose : 3
 LOG : 1400.76 1402.18 1.4 Region : 4040
 FDEPTH: 514 511 Gear cond.: 0
 BDEPTH: 514 511 Validity: 0
 Towing dir: 0° Wire out : 1150 m Speed : 2.8 kn
 Sorted : 35 Total catch: 241.85 Catch/hour: 479.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	205.22	50110	42.80	
Lamprogrammus exutus	77.81	2498	16.22	
Yarrella blackfordi	70.67	2195	14.74	
Stomias boa boa	22.84	518	4.76	
Aristeus varidens, female, female	18.56	1053	3.87	30
Hoplostethus cadenati	15.70	535	3.27	
Aristeus varidens, male, male	8.03	785	1.67	29
Chaceon maritae, female	8.01	30	1.67	
Centrophorus granulosus	7.53	2	1.57	
Benthodesmus tenuis	7.14	268	1.49	
Xenodermichthys copei	6.07	1196	1.27	
Stereomastis sp.	5.35	750	1.12	
Chaunax pictus	4.64	107	0.97	
Bathyrcongiger vicinus	3.21	196	0.67	
Gadella maraldi	2.86	321	0.60	
Chaceon maritae, male	2.70	6	0.56	
Malacocephalus laevis	2.68	54	0.56	
Gadella imberbis	2.50	161	0.52	
Dibranchius atlanticus	1.78	71	0.37	
L O B S T E R S	1.61	1570	0.33	
Plesiopeneus edwardsianus	1.07	250	0.22	
Triplophos hemingi	1.07	303	0.22	
MYCTOPHIDAE	1.07	1089	0.22	
Etmopterus spinax	0.71	18	0.15	
Chlorophthalmus atlanticus	0.54	18	0.11	
Ceratiias tentaculatus	0.18	18	0.04	
Total	479.54		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 22
 DATE :25/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°37.09
 start stop duration Lon E 13°10.39
 TIME :23:58:20 00:29:33 31.2 (min) Purpose : 3
 LOG : 1407.54 1409.13 1.6 Region : 4040
 FDEPTH: 338 340 Gear cond.: 0
 BDEPTH: 338 340 Validity: 0
 Towing dir: 0° Wire out : 880 m Speed : 3.1 kn
 Sorted : 92 Total catch: 396.63 Catch/hour: 762.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	268.25	5531	35.18	
Merluccius polli	230.31	1057	30.20	31
Synagrops microlepis	137.97	8109	18.09	
Laemonea laureysi	41.99	621	5.51	
MYCTOPHIDAE	24.39	902	3.20	
Gadella imberbis	12.57	413	1.65	
Hymenocephalus italicus	11.90	2067	1.56	
L O B S T E R S	10.00	1719	1.31	
Parapenaeus longirostris, femal	9.92	1736	1.30	
Pontinus accraensis	2.89	42	0.38	
Aristeus varidens, male	2.65	323	0.35	
Parapenaeus longirostris, male	2.07	108	0.27	
Chaceon maritae	1.74	8	0.23	
Pterothrissus belloci	1.57	8	0.21	
Nezumia aequalis	1.07	42	0.14	
Lophiodes kempi	1.07	25	0.14	
Malacocephalus laevis	0.74	17	0.10	
Etmopterus granulosus	0.41	8	0.05	
Benthodesmus tenuis	0.25	25	0.03	
Chaunax pictus	0.25	17	0.03	
Hoplostethus cadenati	0.17	8	0.02	
NETTASTOMATIDAE	0.17	25	0.02	
Solenocera africana	0.08	8	0.01	
Aristeus varidens, female	0.08	8	0.01	
Total	762.51		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 23
 DATE :26/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°34.87
 start stop duration Lon E 13°14.32
 TIME :04:49:45 05:20:33 30.8 (min) Purpose : 3
 LOG : 1417.10 1418.61 1.5 Region : 4040
 FDEPTH: 129 129 Gear cond.: 0
 BDEPTH: 129 129 Validity : 0
 Towing dir: 0° Wire out : 350 m Speed : 2.9 kn
 Sorted : 207 Total catch: 207.47 Catch/hour: 404.29

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	157.06	1006	38.85	32
Trigla lyra	36.05	362	8.92	
Pterothrissus belloci	31.18	205	7.71	
Spicara alta	26.50	573	6.56	
Pagellus bellottii	26.11	263	6.46	33
Brotula barbata	23.48	18	5.81	
Citharus linguatula	15.98	487	3.95	
Peristedion cataphractum	10.04	193	2.48	34
Dentex macrophthalmus	8.83	82	2.18	
Bembrops heterurus	7.74	95	1.91	
Lagocephalus laevigatus	7.07	18	1.75	
Trichiurus lepturus	7.07	12	1.75	
Raja miraletus	6.78	18	1.68	
Uranoscopus polli	5.55	55	1.37	
B I V A L V E S	4.85	649	1.20	
Sepia orbignyana	4.44	90	1.10	
Bothus podas africanus	4.33	148	1.07	
Boops boops	4.25	80	1.05	
Torpedo torpedo	2.81	8	0.69	
Zeus faber	2.77	8	0.68	
Octopus vulgaris	2.73	10	0.67	
Pontinus accraensis	2.69	14	0.67	
Umbriina canariensis	1.89	2	0.47	
Branchiostegus semifasciatus *	1.52	2	0.38	
Microchirus frechhopsi	1.19	19	0.29	
Illex coindetii	0.68	6	0.17	
Bathyrcongus vicinus	0.60	6	0.15	
Arnoglossus imperialis	0.10	23	0.02	
Total	404.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 26
 DATE :26/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°25.78
 start stop duration Lon E 13°30.26
 TIME :09:18:32 09:47:52 29.3 (min) Purpose : 3
 LOG : 1442.63 1444.10 1.5 Region : 4040
 FDEPTH: 30 28 Gear cond.: 0
 BDEPTH: 30 28 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 3.0 kn
 Sorted : 315 Total catch: 314.62 Catch/hour: 643.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudotolithus senegalensis	487.83	943	75.82	39
Brachydeuterus auritus	40.29	4082	6.26	
Stromateus fiatola	22.60	35	3.51	
Gymnura micrura	22.49	2	3.50	
Alectis alexandrinus	16.16	33	2.51	
Cynoglossus senegalensis	12.58	8	1.95	
Galeoides decadactylus	10.35	35	1.61	
Raja miraletus	6.34	8	0.99	
Selene dorsalis	3.50	2	0.54	
Drepane africana	3.01	4	0.47	
Eucinostomus melanopterus	2.64	16	0.41	
Pagellus bellottii	2.35	27	0.37	
Trichiurus lepturus	2.00	2	0.21	
Syacium micrurum	1.78	12	0.28	
Aluterus heudelotii	1.37	2	0.21	
Cynoglossus canariensis	1.29	2	0.20	
Chloroscombrus chrysurus	1.17	6	0.18	
Sardinella maderensis	1.15	4	0.18	
Rhinobatos albomaculatus	1.02	2	0.16	
Torpedo marmorata	0.96	2	0.15	
Sardinella aurita	0.90	12	0.14	
Dicologlossa cuneata	0.86	2	0.13	
Ilisha africana	0.78	2	0.12	
Total	643.39		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 27
 DATE :26/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°53.40
 start stop duration Lon E 13°46.54
 TIME :13:01:22 13:21:33 20.2 (min) Purpose : 3
 LOG : 1474.49 1475.47 1.0 Region : 4040
 FDEPTH: 34 34 Gear cond.: 0
 BDEPTH: 34 34 Validity : 0
 Towing dir: 0° Wire out : 100 m Speed : 2.9 kn
 Sorted : 58 Total catch: 365.12 Catch/hour: 1086.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	278.43	14993	25.64	41
Dicologlossa cuneata	175.81	4605	16.19	
Trichiurus lepturus	149.03	821	13.72	
Pseudotolithus senegalensis	115.12	607	10.60	40
Pteroscion peli	37.12	1249	3.42	
Galeoides decadactylus	35.16	821	3.24	
Gymnura micrura	33.61	3	3.09	
Dasyatis margarita	29.45	18	2.71	
Cynoponticus ferox	28.74	18	2.65	
Pomadasyes peroteti	25.70	107	2.37	
Rhizoprionodon acutus	22.31	6	2.05	
Grammolites gruvelli	18.58	428	1.71	
Chloroscombrus chrysurus	18.21	125	1.68	
Ilisha africana	18.21	339	1.68	
E C H I N O D E R M A T A	14.10	36	1.30	
Sphyræna sphyraena	13.92	54	1.28	
Selene dorsalis	10.17	214	0.94	
Sepia orbignyana	10.00	107	0.92	
Sardinella maderensis	9.46	411	0.87	
Torpedo marmorata	9.10	36	0.84	
Lagocephalus laevigatus	8.57	71	0.79	
Octopus vulgaris	6.78	18	0.62	
Pisodonophis semicinctus	6.43	18	0.59	
Penaeus notialis	4.64	125	0.43	
Pomadasyes jubelini	3.93	18	0.36	
G A S T R O P O D S	1.96	18	0.18	
GOBIIDAE	0.89	71	0.08	
B I V A L V E S	0.36	18	0.03	
SEA URCHINS	0.36	36	0.03	
Total	1086.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 28
 DATE :26/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°54.88
 start stop duration Lon E 13°43.95
 TIME :14:13:55 14:30:19 16.4 (min) Purpose : 3
 LOG : 1479.29 1480.13 0.8 Region : 4040
 FDEPTH: 50 51 Gear cond.: 0
 BDEPTH: 50 51 Validity : 0
 Towing dir: 0° Wire out : 130 m Speed : 3.1 kn
 Sorted : 21 Total catch: 104.36 Catch/hour: 381.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	144.15	15907	37.75	44
Brotula barbata	67.46	117	17.67	
Trachurus trecae	20.20	966	5.29	43
Dicologlossa cuneata	18.29	307	4.79	
Caranx crysos	15.95	15	4.18	
Octopus vulgaris	15.80	15	4.14	
Grammolites gruvelli	14.93	527	3.91	
GOBIIDAE	13.02	1976	3.41	
Selene dorsalis	9.95	176	2.61	
Pagellus bellottii	9.07	102	2.38	42
Ephippion guttifer	8.78	4	2.30	
Dentex barnardi	7.76	146	2.03	
Citharus linguatula	7.76	293	2.03	
Sepia officinalis	6.00	29	1.57	
Sepia orbignyana	5.56	73	1.46	
Chelidnichthys capensis	3.95	15	1.03	
Serranus cabrilla *	3.51	307	0.92	
Sufflogobius bibarbatatus	3.07	512	0.80	
Raja miraletus	1.90	29	0.50	
Aluterus heudelotii	1.17	15	0.31	
Sphyræna sphyraena	0.88	29	0.23	
Scorpaena angolensis	0.73	15	0.19	
G A S T R O P O D S	0.59	351	0.15	
Sardinella aurita	0.29	15	0.08	
Alloteuthis africana	0.29	88	0.08	
Scorpaena stephanica	0.29	44	0.08	
Torpedo marmorata	0.15	15	0.04	
Parapenaeus longirostris	0.15	29	0.04	
Antennarius sp.	0.15	15	0.04	
Total	381.80		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 25
 DATE :26/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°28.58
 start stop duration Lon E 13°27.69
 TIME :08:16:46 08:36:45 20.0 (min) Purpose : 3
 LOG : 1437.34 1438.43 1.1 Region : 4040
 FDEPTH: 51 49 Gear cond.: 0
 BDEPTH: 51 49 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.3 kn
 Sorted : 20 Total catch: 19.72 Catch/hour: 59.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	31.10	93	52.48	
Ephippion guttifer	8.14	3	13.74	
Octopus vulgaris	8.02	6	13.54	
Grammolites gruvelli	3.03	9	5.12	
J E L Y F I S H	2.31	3	3.90	
Epinephelus aeneus	1.83	3	3.09	
Alloteuthis africana	1.29	427	2.18	
Pagellus bellottii	1.05	6	1.77	
Alectis alexandrinus	0.63	3	1.06	
Saurida brasiliensis	0.60	12	1.01	
Syacium micrurum	0.48	6	0.81	
Sepia orbignyana	0.30	6	0.51	
Citharus linguatula	0.18	15	0.30	
Aluterus heudelotii	0.15	3	0.25	
Pseudupeneus prayensis	0.12	3	0.20	
Total	59.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 29
 DATE :26/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 10°55.19
 start stop duration Lon E 13°35.41
 TIME :16:05:42 16:08:49 3.1 (min) Purpose : 3
 LOG : 1490.26 1490.42 0.2 Region : 4040
 FDEPTH: 113 113 Gear cond.: 0
 BDEPTH: 113 113 Validity : 9
 Towing dir: 0° Wire out : 260 m Speed : 3.2 kn
 Sorted : 6 Total catch: 6.38 Catch/hour: 122.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbriina canariensis	29.23	250	23.82	
Pontinus accraensis	21.35	154	17.40	
Zeus faber	18.85	19	15.36	
Pterothrissus bellocci	17.88	135	14.58	
Brachydeuterus auritus	16.73	135	13.64	
Uranoscopus cadenati	8.46	58	6.90	
Bembrops heterurus	4.04	38	3.29	
Citharus linguatula	2.50	38	2.04	
Illex coindetii	2.12	19	1.72	
Trichiurus lepturus	1.54	19	1.25	
Total	122.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 30
 DATE :26/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 10°56.73
 start stop duration Lon E 13°26.71
 TIME :18:22:40 18:53:36 30.9 (min) Purpose : 3
 LOG : 1502.18 1503.72 1.5 Region : 4040
 FDEPTH: 372 370 Gear cond.: 0
 BDEPTH: 372 370 Validity : 0
 Towing dir: 0° Wire out : 930 m Speed : 3.0 kn
 Sorted : 55 Total catch: 165.33 Catch/hour: 320.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	122.79	855	38.29	45
Nematocarcinus africanus	81.77	27556	25.49	
Chaceon maritae, female	29.80	116	9.29	
Gadella maraldi	19.73	355	6.15	
Chaunax pictus	19.38	902	6.04	
Hymenoccephalus italicus	12.10	1426	3.77	
Gadella imberbis	8.38	349	2.61	
Bathyrcongiger vicinus	5.99	169	1.87	
Yarrella blackfordi	2.85	93	0.89	
Lophiodes kempi	2.50	35	0.78	
Aristeus varidens, female, female	2.27	140	0.71	47
Callinectes sp.	1.86	41	0.58	
Aristeus varidens, male, male	1.51	192	0.47	46
Chlorophthalmus atlanticus	1.45	41	0.45	
Stomias boa boa	1.40	23	0.44	
Parapenaeus longirostris, femal	1.16	169	0.36	
Dibranchius atlanticus	0.87	70	0.27	
Etmopterus spinax	0.87	76	0.27	
Malacocephalus occidentalis	0.76	6	0.24	
Synagrops microlepis	0.76	29	0.24	
MYCTOPHIDAE	0.64	675	0.20	
Nezumia aequalis	0.58	12	0.18	
Aponogon sp.	0.47	12	0.15	
Trichiurus lepturus	0.47	23	0.15	
Munidopsis sp.	0.35	70	0.11	
Total	320.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 31
 DATE :26/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°12.41
 start stop duration Lon E 13°28.03
 TIME :23:28:57 23:59:51 30.9 (min) Purpose : 3
 LOG : 1518.51 1520.15 1.6 Region : 4040
 FDEPTH: 511 511 Gear cond.: 0
 BDEPTH: 511 511 Validity : 0
 Towing dir: 0° Wire out : 1180 m Speed : 3.2 kn
 Sorted : 33 Total catch: 301.87 Catch/hour: 586.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	255.15	40282	43.53	
Lamprogrammus exutus	104.68	1311	17.86	
Hoplostethus cadenati	60.99	2097	10.41	
Aristeus varidens, female	30.76	1660	5.25	
Laemonema laureysi	22.72	909	3.88	
OCETOPODIDAE	20.80	17	3.55	
Stomias boa boa	15.03	297	2.56	
Yarrella blackfordi	13.81	402	2.36	
Triplophos hemingi	13.28	297	2.27	
Chaceon maritae, female	8.54	37	1.46	
Aristeus varidens, male	5.94	804	1.01	
Chaceon maritae, male	5.44	14	0.93	
Chaunax pictus	5.42	87	0.92	
Stereomastis sp.	4.37	682	0.75	
Chlorophthalmus atlanticus	2.62	52	0.45	
Nezumia aequalis	2.27	175	0.39	
Gadella imberbis	2.10	280	0.36	
Dibranchius atlanticus	1.75	210	0.30	
Merluccius polli	1.24	2	0.21	
Xenodermichthys copei	1.22	192	0.21	
Nemichthys scolopaceus	1.22	52	0.21	
Benthodesmus tenuis	1.22	192	0.21	
Halosaurus ovenii	1.05	35	0.18	
J E L L Y F I S H	0.87	17	0.15	
Bassanago albescens	0.70	35	0.12	
OPHIIDAE	0.70	35	0.12	
Cataetx laticeps	0.52	140	0.09	
Hymenoccephalus italicus	0.52	122	0.09	
S H R I M P S	0.35	70	0.06	
Plesionenaeus edwardsianus	0.35	105	0.06	
MYCTOPHIDAE	0.17	280	0.03	
Peristedion cataphractum	0.17	17	0.03	
Parasudis fraser-bruenneri	0.17	17	0.03	
Total	586.16		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 32
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°12.47
 start stop duration Lon E 13°35.85
 TIME :04:51:17 05:21:38 30.3 (min) Purpose : 3
 LOG : 1530.73 1532.31 1.6 Region : 4040
 FDEPTH: 150 150 Gear cond.: 0
 BDEPTH: 150 150 Validity : 0
 Towing dir: 0° Wire out : 350 m Speed : 3.1 kn
 Sorted : 114 Total catch: 310.07 Catch/hour: 613.19

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brotula barbata	187.57	285	30.59	
Synagrops microlepis	132.64	23179	21.63	
Dentex angolensis	106.12	498	17.31	48
Bembrops heterurus	61.52	805	10.03	
Pterothrissus bellocci	38.05	247	6.21	
Trichiurus lepturus	19.12	229	3.12	
Zeus faber	13.55	32	2.21	
Sepia orbignyana	11.15	156	1.82	
Scorpaena normani	9.81	138	1.60	
G O B I I D A E	6.17	949	1.01	
Brachydeuterus auritus	5.20	32	0.85	
Torpedo torpedo	4.39	6	0.72	
Lophiodes kempi	4.07	10	0.66	
Citharus linguatula	3.48	38	0.57	
Bathyrcongiger vicinus	3.05	22	0.50	
Bothus podas africanus	2.67	176	0.44	
Octopus vulgaris	2.10	16	0.34	
C R A B S	0.79	107	0.13	
Parapenaeus longirostris, femal	0.79	194	0.13	
G A S T R O P O D S	0.47	150	0.08	
Dicologlossa cuneata	0.47	6	0.08	
Total	613.19		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 33
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°13.58
 start stop duration Lon E 13°37.95
 TIME :06:58:10 07:28:14 30.1 (min) Purpose : 3
 LOG : 1539.05 1540.61 1.6 Region : 4040
 FDEPTH: 114 115 Gear cond.: 0
 BDEPTH: 114 115 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.1 kn
 Sorted : 54 Total catch: 210.42 Catch/hour: 419.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pontinus kuhlii	59.56	521	14.19	
Brachydeuterus auritus	58.06	371	13.83	49
Dentex angolensis	40.41	208	9.62	51
Umbriina canariensis	36.22	190	8.63	50
Sepia officinalis	35.08	24	8.35	
Lagocephalus laevigatus	21.97	36	5.23	
Pterothrissus bellocci	20.53	263	4.89	
Brotula barbata	19.75	30	4.70	
Uranoscopus polli	19.33	90	4.61	
B I V A L V E S	17.72	2843	4.22	
Citharus linguatula	14.01	443	3.34	
Raja miraletus	13.35	18	3.18	
Trigla lyra	11.61	78	2.77	
Stromateus fiatola	10.06	12	2.40	
Selene dorsalis	6.94	12	1.65	
Lophiodes kempi	5.81	12	1.38	
Scorpaena stephanica	5.45	30	1.30	
Octopus vulgaris	4.55	8	1.08	
E C H I N O D E R M A T A	4.01	269	0.96	
Sepia orbignyana	3.95	108	0.94	
Zeus faber	2.99	12	0.71	
G A S T R O P O D S	2.87	509	0.68	
Dentex macrophthalmus	2.10	18	0.50	
Branchiostegus semifasciatus *	1.62	6	0.38	
Pagellus bellottii	1.20	6	0.29	
Dicologlossa cuneata	0.72	18	0.17	
Total	419.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 34
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°14.80
 start stop duration Lon E 13°42.36
 TIME :08:26:58 08:57:15 30.3 (min) Purpose : 3
 LOG : 1547.11 1548.58 1.5 Region : 4040
 FDEPTH: 21 22 Gear cond.: 0
 BDEPTH: 21 22 Validity : 0
 Towing dir: 0° Wire out : 95 m Speed : 2.9 kn
 Sorted : 35 Total catch: 34.83 Catch/hour: 68.99

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	20.80	95	30.15	
Trachinocephalus myops	9.81	63	14.21	
Chilomycterus spinosus mauret.	9.23	32	13.38	
Pagellus bellottii	5.57	40	8.07	52
Ephippion guttifer	4.79	2	6.95	
Balistes caprisicus	4.18	8	6.06	
Xyrichtys novacula	3.03	24	4.39	
Pseudupeneus prayensis	2.61	16	3.79	
B I V A L V E S	2.32	450	3.36	
Scorpaena stephanica	1.80	14	2.61	
Aluterus heudelotii	1.70	10	2.47	
Sepia orbignyana	1.41	4	2.04	
Bothus podas africanus	0.75	20	1.09	
Rypticus nigripinnis *	0.55	10	0.80	
Syacium micurum	0.22	2	0.32	
Fistularia tabacaria	0.22	2	0.32	
Total	68.99		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 35
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°17.26
 start stop duration Lon E 13°44.53
 TIME :09:37:09 10:06:24 29.3 (min) Purpose : 3
 LOG : 1552.67 1554.26 1.6 Region : 4040
 FDEPTH: 22 24 Gear cond.: 0
 BDEPTH: 22 24 Validity : 0
 Towing dir: 0° Wire out : 96 m Speed : 3.3 kn
 Sorted : 120 Total catch: 301.76 Catch/hour: 618.79

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 37
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°31.58
 start stop duration Lon E 13°38.74
 TIME :13:13:41 13:43:18 29.6 (min) Purpose : 3
 LOG : 1576.62 1578.26 1.6 Region : 4040
 FDEPTH: 42 42 Gear cond.: 0
 BDEPTH: 42 42 Validity : 0
 Towing dir: 0° Wire out : 125 m Speed : 3.3 kn
 Sorted : 62 Total catch: 62.27 Catch/hour: 126.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	131.95	5631	21.32	54
Chloroscombrus chrysurus	115.71	4101	18.70	
Ephippion guttifer	40.33	41	6.52	
Alectis alexandrinus	35.46	27	5.73	
Gymnura micrura	33.63	12	5.43	
Pseudupeneus prayensis	33.09	521	5.35	
Pseudotolithus senegalensis	28.40	86	4.59	53
Cynoglossus canariensis	26.39	27	4.26	
Sphyræna sphyræna	21.59	47	3.49	
Stromateus fiatola	20.17	41	3.26	
Galeoides decadactylus	14.95	386	2.42	
Rhinobatos albomaculatus	13.74	6	2.22	
Selene dorsalis	12.45	373	2.01	
Pomadourus incisus	12.05	285	1.95	
Dasyatis margarita	11.37	14	1.84	
Decapterus rhonchus	7.71	197	1.25	
Lithognathus mormyrus	7.65	14	1.24	
Epinephelus aeneus	7.28	8	1.18	
Chilomycterus spinosus mauret.	6.23	14	1.01	
Lagocephalus laevisgatus	4.94	27	0.80	
Chaetodon hoefleri	4.60	41	0.74	
Sepia orbignyana	4.47	21	0.72	
Dentex barnardi	3.99	88	0.65	
Ballistes capriscus	3.65	6	0.59	
G A S T R O P O D S	3.32	535	0.54	
Pagellus bellottii	3.11	21	0.50	
Scorpaena angolensis	2.57	53	0.42	
Pteroscion peli	2.44	62	0.39	
Eucinostomus melanopterus	2.30	14	0.37	
Sardinella aurita	1.02	21	0.16	
Aluterus heudelotii	0.74	6	0.12	
Peneaus notialis	0.68	14	0.11	
Trachinocephalus myops	0.34	6	0.05	
Fistularia petimba	0.20	6	0.03	
Sardinella maderensis	0.14	6	0.02	
Octopus vulgaris	0.14	6	0.02	
Total	618.79		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectis alexandrinus	63.81	91	50.59	
Raja miraletus	16.10	32	12.77	
Caranx crysos	11.95	16	9.47	
Pseudupeneus prayensis	7.25	126	5.75	
Sepia officinalis	4.96	6	3.93	
Epinephelus aeneus	4.70	2	3.73	
Aluterus heudelotii	3.02	4	2.39	
Lagocephalus laevisgatus	2.98	4	2.36	
Alloteuthis africana	2.47	8	1.96	
Ballistes capriscus	2.15	2	1.70	
Fistularia petimba	1.34	10	1.06	
Syacium micrurum	1.22	16	0.96	
Grammolites gruvelli	0.79	38	0.63	
Pagellus bellottii	0.55	8	0.43	
Dentex barnardi	0.53	12	0.42	
Citharus linguatula	0.41	34	0.32	
Boops boops	0.41	34	0.32	
Chaetodon hoefleri	0.30	2	0.24	
Torpedo marmorata	0.20	2	0.16	
Ephippion guttifer	0.20	6	0.16	
Dicologlossa cuneata	0.16	2	0.13	
Decapterus punctatus	0.16	10	0.13	
Chelidichthys gabonensis	0.12	2	0.10	
G A S T R O P O D S	0.10	26	0.08	
Decapterus rhonchus	0.08	16	0.06	
E C H I N O D E R M A T A	0.06	22	0.05	
UNIDENTIFIED FISH	0.06	30	0.05	
Arnoglossus imperialis	0.04	2	0.03	
Saurida brasiliensis	0.02	8	0.02	
Total	126.14		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 36
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°30.49
 start stop duration Lon E 13°42.82
 TIME :12:00:13 12:30:14 30.0 (min) Purpose : 3
 LOG : 1570.04 1571.66 1.6 Region : 4040
 FDEPTH: 27 28 Gear cond.: 0
 BDEPTH: 27 28 Validity : 0
 Towing dir: 0° Wire out : 85 m Speed : 3.2 kn
 Sorted : 66 Total catch: 66.41 Catch/hour: 132.73

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 38
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°31.02
 start stop duration Lon E 13°34.51
 TIME :14:25:21 14:54:41 29.3 (min) Purpose : 3
 LOG : 1582.90 1584.38 1.5 Region : 4040
 FDEPTH: 61 62 Gear cond.: 0
 BDEPTH: 61 62 Validity : 0
 Towing dir: 0° Wire out : 150 m Speed : 3.0 kn
 Sorted : 68 Total catch: 67.73 Catch/hour: 138.51

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Rhinobatos albomaculatus	27.68	32	20.86	
Alectis alexandrinus	23.78	62	17.92	
Gymnura micrura	12.79	2	9.64	
Dasyatis margarita	9.55	10	7.20	
Lagocephalus laevisgatus	6.84	34	5.15	
Sepia officinalis	6.36	6	4.79	
Sepia orbignyana	6.10	14	4.59	
Raja miraletus	5.76	8	4.34	
Octopus vulgaris	4.18	2	3.15	
Chilomycterus spinosus mauret.	3.94	12	2.97	
Aluterus heudelotii	3.82	10	2.88	
Chloroscombrus chrysurus	3.12	26	2.35	
Brachydeuterus auritus	2.94	114	2.21	55
Trachinotus goreensis	2.60	6	1.96	
Grammolites gruvelli	2.52	114	1.90	
Syacium micrurum	2.32	66	1.75	
Epinephelus aeneus	1.06	8	0.80	
Caranx crysos	0.98	6	0.74	
Torpedo marmorata	0.96	2	0.72	
Sardinella maderensis	0.82	8	0.62	
Eucinostomus melanopterus	0.76	4	0.57	
Selene dorsalis	0.64	4	0.48	
Pagellus bellottii	0.62	4	0.47	
Cynoglossus canariensis	0.60	4	0.45	
Fistularia petimba	0.52	6	0.39	
Sardinella aurita	0.44	4	0.33	
Dicologlossa cuneata	0.36	12	0.27	
Galeoides decadactylus	0.22	4	0.17	
Pseudupeneus prayensis	0.14	2	0.11	
Decapterus rhonchus	0.12	2	0.09	
Torpedo torpedo	0.08	4	0.06	
PORIFERA (Sponges)	0.06	2	0.05	
Decapterus punctatus	0.04	2	0.03	
Ephippion guttifer	0.02	2	0.02	
P O L Y C H A E T A	0.02	4	0.02	
Total	132.73		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	47.14	90	34.03	
Pagellus bellottii	43.25	78	31.23	
Grammolites gruvelli	8.18	335	5.91	56
Alloteuthis africana	5.36	2730	3.87	
Ommastrephes pteropus	4.62	6	3.34	
Pseudupeneus prayensis	4.34	92	3.13	
Citharus linguatula	3.39	184	2.45	
Lagocephalus laevisgatus	2.70	2	1.95	
J E L Y F I S H	2.27	2	1.64	
Fistularia petimba	2.09	4	1.51	
E C H I N O D E R M A T A	2.00	624	1.45	
Dentex barnardi	1.92	35	1.39	
Sphyræna guachancho	1.92	35	1.39	
Serranus cabrilla	1.66	33	1.20	
Sepia officinalis	1.57	2	1.14	
Chelidichthys capensis	1.04	14	0.75	
Epinephelus aeneus	0.96	2	0.69	
Torpedo marmorata	0.86	2	0.62	
Saurida brasiliensis	0.76	139	0.55	
Chilomycterus spinosus mauret.	0.65	4	0.47	
Sepia orbignyana	0.49	67	0.35	
Arnoglossus imperialis	0.35	25	0.25	
Dentex angolensis	0.25	27	0.18	57
Syacium micrurum	0.22	8	0.16	
Brotula barbata	0.20	2	0.15	
Dicologlossa cuneata	0.16	2	0.12	
Decapterus punctatus	0.08	4	0.06	
Boops boops	0.02	2	0.01	
Maja squinado	0.02	2	0.01	
Ephippion guttifer	0.02	4	0.01	
Total	138.51		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 39
 DATE :27/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°32.56
 start stop duration Lon E 13°30.21
 TIME :15:45:13 16:15:07 29.9 (min) Purpose : 3
 LOG : 1589.93 1591.58 1.6 Region : 4040
 FDEPTH: 103 104 Gear cond.: 0
 BDEPTH: 103 104 Validity: 0
 Towing dir: 0° Wire out : 270 m Speed : 3.3 kn
 Sorted : 135 Total catch: 674.35 Catch/hour: 1353.66

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 41
 DATE :27/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°54.91
 start stop duration Lon E 13°21.40
 TIME :22:22:13 22:54:35 32.4 (min) Purpose : 3
 LOG : 1626.52 1628.11 1.6 Region : 4040
 FDEPTH: 572 577 Gear cond.: 0
 BDEPTH: 572 577 Validity: 0
 Towing dir: 0° Wire out : 1250 m Speed : 2.9 kn
 Sorted : 22 Total catch: 181.75 Catch/hour: 336.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	723.15	1827	53.42	
Trigla lyra	120.94	933	8.93	
Brotula barbata	91.33	110	6.75	
Lagocephalus laevigatus	75.28	100	5.56	
Brachydeuterus auritus	60.22	381	4.45	59
Selene dorsalis	42.56	120	3.14	
Sepia officinalis	34.73	30	2.57	
Dentex angolensis	28.30	191	2.09	58
Octopus vulgaris	25.49	30	1.88	
Citharus linguatula	21.88	442	1.62	
Raja miraletus	21.28	40	1.57	
Saurida brasiliensis	18.47	3854	1.36	
Pagellus bellottii	17.56	90	1.30	
Pterothrissus belloti	12.04	141	0.89	
Umbriina canariensis	11.54	90	0.85	
Scorpaena normani	9.94	90	0.73	
Zeus faber	9.84	20	0.73	
Chelidonichthys gabonensis	7.13	50	0.53	
Bembrops heterurus	5.92	80	0.44	
Illex coindetii	4.22	191	0.31	
Peristedion cataphractum	3.71	70	0.27	
Fistularia petimba	3.21	10	0.24	
Sepia orbignyana	2.41	141	0.18	
Uranoscopus albesca	1.51	10	0.11	
Boops boops	1.00	10	0.07	
Total	1353.66		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	116.77	32048	34.66	
Lamprogrammus exutus	42.04	727	12.48	
Chaceon maritae, female	38.00	158	11.28	
Stomias boa boa	36.33	740	10.78	
Yarrella blackfordi	21.02	571	6.24	
Hoplostethus cadenati	16.22	519	4.81	
Aristeus varidens, male	12.97	428	3.85	
Merluccius polli	9.03	11	2.68	63
Aristeus varidens, female	7.66	804	2.27	
Malacocephalus occidentalis	6.10	130	1.81	
Stereomastis sp.	4.02	571	1.19	
Gadella imberbis	2.59	130	0.77	
Chaceon maritae, male	2.59	9	0.77	
Chlorophthalmus atlanticus	2.34	65	0.69	
Bathyrcongus vicinus	2.34	91	0.69	
Benthodesmus tenuis	1.69	78	0.50	
Peristedion cataphractum	1.56	363	0.46	
Dicrolene intronigra	1.43	259	0.42	
Halosaurus ovenii	1.30	39	0.39	
Laemonema laureysi	1.30	13	0.39	
Lophiodes kemp	1.17	13	0.35	
Cataetix laticeps	0.91	117	0.27	
THYSANOTEUTHIDAE	0.91	13	0.27	
Trichiurus lepturus	0.78	39	0.23	
Shrimps, small, non comm.	0.78	428	0.23	
Dibranchius atlanticus	0.78	117	0.23	
Etmopterus spinax	0.65	26	0.19	
Ebinania costaecanarie	0.65	26	0.19	
Chaunax pictus	0.65	39	0.19	
Xenodermichthys copei	0.65	78	0.19	
Gonostoma elongatum	0.52	221	0.15	
Acanthephyra sp.	0.39	78	0.12	
MYCTOPHIDAE	0.39	428	0.12	
Bathynectes piperitus	0.26	13	0.08	
Glyphus marsupialis	0.13	26	0.04	
Total	336.89		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 40
 DATE :27/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°29.39
 start stop duration Lon E 13°22.06
 TIME :18:08:08 18:37:04 28.9 (min) Purpose : 3
 LOG : 1600.62 1602.08 1.5 Region : 4040
 FDEPTH: 386 378 Gear cond.: 0
 BDEPTH: 386 378 Validity: 0
 Towing dir: 0° Wire out : 950 m Speed : 3.0 kn
 Sorted : 90 Total catch: 130.81 Catch/hour: 271.20

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 42
 DATE :28/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 11°57.19
 start stop duration Lon E 13°23.44
 TIME :00:09:09 00:39:42 30.6 (min) Purpose : 3
 LOG : 1632.99 1634.63 1.6 Region : 4040
 FDEPTH: 481 479 Gear cond.: 0
 BDEPTH: 481 479 Validity: 0
 Towing dir: 0° Wire out : 1120 m Speed : 3.2 kn
 Sorted : 29 Total catch: 246.27 Catch/hour: 483.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	127.71	516025	47.09	
Gadella maraldi	42.71	655	15.75	
Chaceon maritae, female	29.46	129	10.86	
Merluccius polli	14.10	33	5.20	60
Hymenocephalus italicus	14.02	2969	5.17	
Chaunax pictus	11.44	821	4.22	
Lophiodes kemp	5.89	33	2.17	
Yarrella blackfordi	3.32	83	1.22	
Parapenaeus longirostris, femal	3.32	365	1.22	
Halosaurus sp.	3.23	315	1.19	
Callinectes sp.	3.07	66	1.13	
Chlorophthalmus atlanticus	1.99	66	0.73	
MYCTOPHIDAE	1.49	1153	0.55	
Trichiurus lepturus	1.33	58	0.49	
Etmopterus spinax	1.08	108	0.40	
Aristeus varidens, male	0.91	133	0.34	
Parapenaeus longirostris, male	0.91	124	0.34	
Aristeus varidens, female	0.83	75	0.31	
C R A B S	0.75	348	0.28	
Pontinus accraensis	0.66	8	0.24	
Malacocephalus occidentalis	0.66	8	0.24	
Solenocera africana	0.58	108	0.21	
Coelrorinchus braueri	0.50	58	0.18	
Stomias boa boa	0.50	8	0.18	
Gadella imberbis	0.41	17	0.15	
Peristedion cataphractum	0.17	33	0.06	
Triplophos hemingi	0.08	8	0.03	
Gonostoma denudata	0.08	8	0.03	
Total	271.20		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	205.04	55322	42.39	
Lamprogrammus exutus	57.82	2828	11.95	
Yarrella blackfordi	56.25	5483	11.63	
Hoplostethus cadenati	32.68	1226	6.76	
Stomias boa boa	22.78	566	4.71	
Dicrolene intronigra	20.58	1430	4.26	
Merluccius polli	15.32	22	3.17	66
Aristeus varidens, female	14.93	0	3.09	
Centrophorus granulosus	7.86	2	1.62	
Malacocephalus occidentalis	7.70	47	1.59	
Laemonema laureysi	7.23	79	1.49	
Xenodermichthys copei	6.60	1006	1.36	
Etmopterus spinax	5.97	141	1.23	
Aristeus varidens, male	5.03	0	1.04	
Halosaurus ovenii	4.87	251	1.01	
Chaceon maritae, female	3.91	18	0.81	
Stereomastis sp.	1.41	220	0.29	
Gadella imberbis	1.10	63	0.23	
Trichiurus lepturus	0.94	47	0.19	
Benthodesmus tenuis	0.79	47	0.16	
Shrimps, small, non comm.	0.63	251	0.13	
Triplophos hemingi	0.63	377	0.13	
MYCTOPHIDAE	0.47	566	0.10	
Chlorophthalmus atlanticus	0.47	16	0.10	
Hymenocephalus italicus	0.47	126	0.10	
Nemichthys scolopaceus	0.47	16	0.10	
Plesiopenaeus edwardsianus	0.31	16	0.06	
Galeus polli	0.31	16	0.06	
Dibranchius atlanticus	0.31	16	0.06	
Cataetix laticeps	0.16	31	0.03	
APOGONIDAE	0.16	16	0.03	
Peristedion cataphractum	0.16	31	0.03	
Nezumia aequalis	0.16	16	0.03	
Bathyrcongus vicinus	0.16	31	0.03	
Total	483.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 43
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°58.24
 start stop duration Lon E 13°29.85
 TIME :04:51:50 05:22:42 30.9 (min) Purpose : 3
 LOG : 1643.90 1645.45 1.6 Region : 4040
 FDEPTH: 260 268 Gear cond.: 0
 BDEPTH: 260 268 Validity : 0
 Towing dir: 0° Wire out : 640 m Speed : 3.0 kn
 Sorted : 98 Total catch: 362.52 Catch/hour: 704.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zenopsis conchifer	211.56	925	30.03	
Chlorophthalmus atlanticus	189.80	4000	26.94	
Gephyroberyx darwini	121.09	272	17.19	
Gadella maraldi	28.84	511	4.09	
Merluccius polli	27.56	62	3.91	
Dentex macrophthalmus	20.41	93	2.90	67
Malacocephalus occidentalis	18.37	117	2.61	
Bembrops heterurus	14.97	259	2.12	
Pontinus accraensis	13.61	163	1.93	
Parapenaeus longirostris, male	10.75	0	1.53	
Raja alba	9.60	8	1.36	
Parapenaeus longirostris, femal	8.16	0	1.16	
Brotula barbata	6.47	14	0.92	
Nezumia aequalis	5.11	150	0.73	
Trichurus lepturus	4.14	8	0.59	
Calappa sp.	2.86	177	0.41	
Todaropsis eblanae	2.80	14	0.40	
G A S T R O P O D S	2.18	321	0.31	
MYCTOPHIDAE	2.04	1837	0.29	
Gadella imberbis	1.63	54	0.23	
Pterothrissus belloci	1.09	8	0.15	
Synagrops microlepis	0.82	54	0.12	
Dicologlossa cuneata	0.27	8	0.04	
Peristedion cataphractum	0.21	27	0.03	
Conger conger	0.14	8	0.02	
Monolene microstoma	0.14	14	0.02	
Total	704.61		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 46
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°1.15
 start stop duration Lon E 13°38.99
 TIME :08:43:44 09:12:26 28.7 (min) Purpose : 3
 LOG : 1661.72 1663.16 1.5 Region : 4040
 FDEPTH: 58 51 Gear cond.: 0
 BDEPTH: 58 51 Validity : 0
 Towing dir: 0° Wire out : 190 m Speed : 3.0 kn
 Sorted : 65 Total catch: 218.09 Catch/hour: 455.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	82.16	357	18.02	75
Pomadasyx incisus	60.21	502	13.21	
Pagellus bellottii	55.51	236	12.17	74
Gymnura micrura	47.46	4	10.41	
Dicologlossa cuneata	38.76	740	8.50	
Bembrops heterurus	21.07	552	4.62	
Rhinobatos albomaculatus	16.93	19	3.71	
Trachurus trecae	16.12	109	3.54	76
Pseudupeneus prayensis	12.86	176	2.82	
Lagocephalus laevigatus	11.67	69	2.56	
Lithognathus mormyrus	11.67	31	2.56	
Galeoides decadactylus	10.16	63	2.23	
Sepia officinalis	9.97	38	2.19	
Citharus linguatula	9.09	452	1.99	
Torpedo torpedo	8.97	19	1.97	
Selene dorsalis	8.22	194	1.80	
Sphyræna guachancho	8.15	113	1.79	
Sepia orbignyana	7.34	113	1.61	
Scorpaena stephanica	3.95	44	0.87	
Chaetodon hoefleri	3.07	19	0.67	
Dasyatis margarita	2.38	6	0.52	
Boops boops	2.26	19	0.50	
Pomadasyx rogeri	2.07	6	0.45	
Chelidonichthys gabonensis	1.69	19	0.37	
Trigla lyra	1.57	13	0.34	
Torpedo marmorata	1.51	13	0.33	
Scomber japonicus	0.88	6	0.19	
Arnoglossus imperialis	0.25	19	0.06	
Total	455.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 44
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°59.17
 start stop duration Lon E 13°31.91
 TIME :06:15:04 06:45:05 30.0 (min) Purpose : 3
 LOG : 1649.14 1650.59 1.5 Region : 4040
 FDEPTH: 101 101 Gear cond.: 0
 BDEPTH: 101 101 Validity : 0
 Towing dir: 0° Wire out : 260 m Speed : 2.9 kn
 Sorted : 140 Total catch: 285.10 Catch/hour: 569.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex barnardi	184.68	672	32.41	
Anthias anthias	80.35	544	14.10	
Dentex macrophthalmus	63.96	324	11.22	68
Erythrocles monodi	44.69	96	7.84	
Pagellus bellottii	41.97	264	7.37	70
Dentex angolensis	34.38	188	6.03	69
Lagocephalus laevigatus	23.74	80	4.17	
Umbrina canariensis	17.75	64	3.11	71
Boops boops	14.91	136	2.62	
Gephyroberyx darwini	14.15	24	2.48	
Zeus faber	8.87	16	1.56	
Rhinobatos albomaculatus	8.79	2	1.54	
Raja miraletus	7.99	12	1.40	
Chaetodon hoefleri	6.56	44	1.15	
Chelidonichthys gabonensis	5.04	48	0.88	
Trigla lyra	3.08	24	0.54	
Torpedo sp.	2.64	4	0.46	
Perulibatrachus elminensis	2.32	16	0.41	
Sparus pagrus pagrus *	1.28	4	0.22	
B I V A L V E S	1.00	128	0.18	
Peristedion cataphractum	0.84	12	0.15	
Sepia orbignyana	0.84	36	0.15	
Total	569.82		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 47
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°16.88
 start stop duration Lon E 13°34.03
 TIME :10:59:11 11:22:16 23.1 (min) Purpose : 3
 LOG : 1678.32 1679.49 1.2 Region : 4040
 FDEPTH: 55 57 Gear cond.: 0
 BDEPTH: 55 57 Validity : 0
 Towing dir: 0° Wire out : 145 m Speed : 3.0 kn
 Sorted : 112 Total catch: 393.04 Catch/hour: 1022.21

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Rhinobatos albomaculatus	206.19	83	20.17	
Trachurus trecae	181.25	538	17.73	82
Pomadasyx incisus	152.02	1657	14.87	
Umbrina canariensis	82.83	455	8.10	80
Pomadasyx jubelini	48.43	164	4.74	
Grammolites gruvelli	43.51	1012	4.26	
Selene dorsalis	42.16	10	4.12	
Brachydeuterus auritus	40.34	320	3.95	81
Atractoscion aequidens	28.87	211	2.82	77
Citharus linguatula	22.03	910	2.15	
Galeoides decadactylus	20.13	127	1.97	
Sepia officinalis	19.30	10	1.89	
Pagellus bellottii	16.93	127	1.66	79
Torpedo torpedo	14.38	55	1.41	
Lagocephalus laevigatus	12.12	47	1.19	
Sardinella aurita	10.01	73	0.98	78
Raja miraletus	9.57	10	0.94	
Chloroscomber chrysurus	9.47	65	0.93	
Dentex barnardi	8.37	127	0.82	
Chelidonichthys capensis	8.19	65	0.80	
Pseudotolithus semegalensis	7.83	10	0.77	
Torpedo marmorata	7.72	10	0.76	
Chaetodon hoefleri	6.11	36	0.60	
Serranus cabrilla	4.73	109	0.46	
Chilomycterus spinosus mauret.	3.38	10	0.33	
Dicologlossa cuneata	3.28	65	0.32	
GOBIIDAE	3.20	502	0.31	
Sepia orbignyana	2.47	47	0.24	
Trachinotus ovatus	2.00	10	0.20	
Scorpaena stephanica	2.00	18	0.20	
Pseudupeneus prayensis	1.72	10	0.17	
Rypticus saponaceus	0.83	10	0.08	
Antennarius sp.	0.65	18	0.06	
Ephippion guttifer	0.18	73	0.02	
Total	1022.21		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 45
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 11°59.90
 start stop duration Lon E 13°37.03
 TIME :07:39:20 07:58:44 19.4 (min) Purpose : 3
 LOG : 1656.68 1657.67 1.0 Region : 4040
 FDEPTH: 71 71 Gear cond.: 0
 BDEPTH: 71 71 Validity : 0
 Towing dir: 0° Wire out : 190 m Speed : 3.1 kn
 Sorted : 170 Total catch: 1463.94 Catch/hour: 4525.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2460.74	44680	54.38	72
Pomadasyx incisus	1662.29	12798	36.73	
Pseudupeneus prayensis	130.48	2170	2.88	
Pagellus bellottii	99.88	918	2.21	73
Boops boops	32.83	445	0.73	
Sardinella aurita	22.81	2003	0.50	
Rhinobatos albomaculatus	22.26	6	0.49	
Citharus linguatula	15.30	584	0.34	
Chaetodon hoefleri	12.80	83	0.28	
Sardinella maderensis	11.41	56	0.25	
Scomber japonicus	11.13	83	0.25	
Grammolites gruvelli	11.13	278	0.25	
Uranoscopus polli	7.51	28	0.17	
Chilomycterus spinosus mauret.	6.68	28	0.15	
Lagocephalus laevigatus	6.12	28	0.14	
Sphyræna guachancho	5.56	28	0.12	
Pontinus kuhlii	2.78	28	0.06	
Sepia orbignyana	1.95	56	0.04	
Sepia officinalis	1.67	28	0.04	
Total	4525.32		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 48
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°16.78
 start stop duration Lon E 13°31.60
 TIME :12:05:46 12:35:06 29.3 (min) Purpose : 3
 LOG : 1682.52 1684.11 1.6 Region : 4040
 FDEPTH: 75 74 Gear cond.: 0
 BDEPTH: 75 74 Validity : 0
 Towing dir: 0° Wire out : 190 m Speed : 3.2 kn
 Sorted : 111 Total catch: 332.19 Catch/hour: 679.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy jubelini	198.53	393	29.22	
Trichurus lepturus	186.57	841	27.45	
Pomadasy incisus	80.40	700	11.83	
Brachydeuterus auritus	36.82	362	5.42	83
Torpedo torpedo	33.88	49	4.99	
Octopus vulgaris	18.04	12	2.66	
Trigla lyra	17.98	203	2.65	
Pagellus bellottii	14.12	135	2.08	85
Trachurus trecae	13.44	178	1.98	84
Raja miraletus	11.41	31	1.68	
Zeus faber	11.35	12	1.67	
Citharus linguatula	9.82	522	1.44	
Atractoscion aequidens	8.35	43	1.23	
Pseudupeneus prayensis	8.16	98	1.20	
Serranus cabrilla	7.36	135	1.08	
Dentex barnardi	6.38	129	0.94	
Lagocephalus laevigatus	3.25	12	0.48	
Chaetodon hoefleri	2.76	18	0.41	
Torpedo nobiliana	2.58	6	0.38	
Grammolites gruvelli	2.15	37	0.32	
Pterothrissus bellocci	1.41	18	0.21	
Brotula barbata	1.17	12	0.17	
Sardinella maderensis	1.10	6	0.16	
Umbrina canariensis	0.80	12	0.12	
Selene dorsalis	0.55	6	0.08	
Sepia orbignyana	0.55	25	0.08	
Pontinus kuhlii	0.18	6	0.03	
Boops boops	0.12	6	0.02	
Arnoglossus imperialis	0.12	6	0.02	
Alloteuthis africana	0.12	37	0.02	
Parapenaeus longirostris	0.06	18	0.01	
Total	679.56		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 49
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°16.63
 start stop duration Lon E 13°27.05
 TIME :13:38:31 13:58:28 20.0 (min) Purpose : 3
 LOG : 1691.54 1692.64 1.1 Region : 4040
 FDEPTH: 97 98 Gear cond.: 0
 BDEPTH: 97 98 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.3 kn
 Sorted : 50 Total catch: 180.97 Catch/hour: 544.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	179.01	1145	32.91	87
Umbrina canariensis	99.65	307	18.32	88
Lepidochelys olivacea	48.10	3	8.84	
Dentex angolensis	39.23	262	7.21	86
Raja miraletus	30.48	45	5.60	
Torpedo marmorata	25.25	9	4.64	
Zeus faber	22.36	36	4.11	
Epinephelus aeneus	20.74	3	3.81	
Trigla lyra	19.48	180	3.58	
Dentex barnardi	18.76	135	3.45	
Dentex macrophthalmus	18.49	117	3.40	89
Plectorhinchus mediterraneus	7.12	18	1.31	
Sphoeroides spengleri	4.60	6	0.85	
Chaetodon hoefleri	3.97	27	0.73	
G A S T R O P O D S	2.43	316	0.45	
Scomber japonicus	2.07	18	0.38	
Chelidonicichthys capensis	0.90	9	0.17	
Citharus linguatula	0.81	18	0.15	
Pontinus accraensis	0.36	9	0.07	
Ephippion guttifer	0.18	9	0.03	
Total	544.00		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 50
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°15.38
 start stop duration Lon E 13°24.99
 TIME :14:38:00 15:07:41 29.7 (min) Purpose : 3
 LOG : 1696.09 1697.76 1.7 Region : 4040
 FDEPTH: 109 108 Gear cond.: 0
 BDEPTH: 109 108 Validity : 0
 Towing dir: 0° Wire out : 270 m Speed : 3.4 kn
 Sorted : 121 Total catch: 584.97 Catch/hour: 1182.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	598.71	2238	50.63	91
Dentex barnardi	173.33	712	14.66	
Anthias anthias	115.71	1096	9.79	
Gephyroberyx darwini	85.37	154	7.22	
Erythrocles monodi	54.44	87	4.60	
Pagellus bellottii	51.29	412	4.34	90
Zeus faber	24.10	38	2.04	
Dentex gibbosus	17.65	8	1.49	
Trigla lyra	10.75	97	0.91	
Scorpaena angolensis	10.65	20	0.90	
G A S T R O P O D S	9.50	835	0.80	
Dentex canariensis	7.86	20	0.66	
Sphoeroides spengleri	6.73	28	0.57	
Dentex macrophthalmus	5.48	20	0.46	
Dentex angolensis	3.74	28	0.32	
Chaetodon hoefleri	2.97	20	0.25	
Sepia orbignyana	1.64	59	0.14	
Citharus linguatula	0.97	28	0.08	
Chelidonicichthys capensis	0.97	10	0.08	
PORIFERA (Sponges)	0.28	20	0.02	
Arnoglossus imperialis	0.20	67	0.02	
Pontinus accraensis	0.20	10	0.02	
Total	1182.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 51
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°26.64
 start stop duration Lon E 13°25.28
 TIME :16:21:28 16:49:54 28.4 (min) Purpose : 3
 LOG : 1707.74 1709.22 1.5 Region : 4040
 FDEPTH: 68 67 Gear cond.: 0
 BDEPTH: 68 67 Validity : 0
 Towing dir: 0° Wire out : 185 m Speed : 3.1 kn
 Sorted : 129 Total catch: 586.18 Catch/hour: 1236.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	482.91	11734	39.05	93
Trachurus trecae	166.84	1293	13.49	92
Brotula barbata	97.70	622	7.90	
Pomadasy incisus	63.63	331	5.15	
Torpedo torpedo	58.42	150	4.72	
Bembrops heterurus	51.50	932	4.16	
Pagellus bellottii	41.69	422	3.37	
Serranus cabrilla	37.47	6570	3.03	
Chelidonicichthys gabonensis	36.48	310	2.95	
Raja miraletus	27.15	40	2.20	
Citharus linguatula	25.95	1082	2.10	
Selene dorsalis	25.34	200	2.05	
Dicologlossa cuneata	22.05	289	1.78	
Rhinobatos albomaculatus	14.14	4	1.14	
Trichurus lepturus	13.52	91	1.09	
Sepia orbignyana	10.82	70	0.88	
Dentex angolensis	9.62	230	0.78	94
GORIIDAE	7.51	871	0.61	
Sepia officinalis	6.50	30	0.53	
Erythrocles monodi	4.70	4	0.38	
Trigla lyra	4.70	30	0.38	
Antennarius sp.	4.60	61	0.37	
Atractoscion aequidens	2.81	4	0.23	
Chilomycterus spinosus mauret.	2.70	4	0.22	
Branchiostegus semifasciatus *	2.59	4	0.21	
Torpedo marmorata	2.19	4	0.18	
Pseudupeneus prayensis	2.09	203	0.17	
Umbrina canariensis	2.09	30	0.17	
Parapenaeus longirostris, femal	1.79	390	0.15	
Chaetodon hoefleri	1.60	4	0.13	
Chloroscombrus chrysurus	1.60	4	0.13	
G A S T R O P O D S	1.10	302	0.09	
Calappa pelii	0.99	11	0.08	
B I V A L V E S	0.59	51	0.05	
Octopus vulgaris	0.59	11	0.05	
Lagocephalus laevigatus	0.40	21	0.03	
Dentex barnardi	0.30	11	0.02	
Total	1236.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 52
 DATE :28/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 12°27.09
 start stop duration Lon E 13°22.65
 TIME :17:29:31 18:00:35 31.1 (min) Purpose : 3
 LOG : 1712.74 1714.30 1.6 Region : 4040
 FDEPTH: 95 90 Gear cond.: 0
 BDEPTH: 95 90 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.0 kn
 Sorted : 400 Total catch: 411.43 Catch/hour: 794.27

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	154.21	1376	19.42	
Pontinus accraensis	138.28	2216	17.41	
Citharus linguatula	99.48	2230	12.52	
Pagellus bellottii	94.40	942	11.89	
Umbrina canariensis	55.46	174	6.98	96
Sepia orbignyana	49.09	579	6.18	
Zeus faber	38.09	58	4.80	
Pterothrissus bellocci	20.14	363	2.54	
Brotula barbata	18.40	102	2.32	
Chelidonicichthys gabonensis	16.51	116	2.08	
Uranoscopus polli	15.93	102	2.01	
Dentex angolensis	15.64	334	1.97	
Dicologlossa cuneata	11.29	58	1.42	
Trachurus trecae	10.87	347	1.37	
Raja miraletus	7.68	73	0.97	
Torpedo torpedo	7.10	58	0.89	
Lagocephalus laevigatus	6.37	15	0.80	
Rhinobatos albomaculatus	6.18	2	0.78	
B I V A L V E S	4.92	1232	0.62	
Bathyrcongiger vicinus	4.50	58	0.57	
Octopus vulgaris	4.50	15	0.57	
C R A B S	3.47	204	0.44	
Antennarius sp.	2.61	131	0.33	
Calappa pelii	2.18	58	0.27	
Parapenaeus longirostris, femal	2.18	434	0.27	
PARALEPIDIDAE	1.74	58	0.22	
Bembrops heterurus	1.60	145	0.20	
Boops boops	1.16	44	0.15	
Parapenaeus longirostris, male	0.29	58	0.04	
G A S T R O P O D S	0.00	0	0.00	
Octopus vulgaris	0.00	0	0.00	0
Lagocephalus laevigatus	0.00	0	0.00	0
Calappa pelii	0.00	0	0.00	0
Parapenaeus longirostris, femal	0.00	0	0.00	0
Trichurus lepturus	0.00	0	0.00	0
B I V A L V E S	0.00	0	0.00	0
Dentex barnardi	0.00	0	0.00	0
Total	794.27		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 53
 DATE :28/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 12°22.55
 start stop duration Lon E 13°16.87
 TIME :22:32:48 23:02:59 30.2 (min) Purpose : 3
 LOG : 1726.47 1727.98 1.5 Region : 4040
 FDEPTH: 729 729 Gear cond.: 0
 BDEPTH: 729 729 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 3.0 kn
 Sorted : 18 Total catch: 95.96 Catch/hour: 190.71

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 55
 DATE :30/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°34.90
 start stop duration Lon E 13°15.06
 TIME :13:41:29 13:59:38 18.2 (min) Purpose : 3
 LOG : 2015.27 2016.29 1.0 Region : 4054
 FDEPTH: 54 55 Gear cond.: 0
 BDEPTH: 54 55 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.4 kn
 Sorted : 118 Total catch: 1819.78 Catch/hour: 6015.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	34.50	954	18.09	
Hoplostethus cadematii	30.61	1153	16.05	
Chaceon maritae, female	29.41	133	15.42	
Stomias boa boa	18.05	541	9.46	
Alepocephalus rostratus	9.94	175	5.21	
Aristeus varidens, female	8.51	493	4.46	
Raja confundens	6.36	8	3.33	
Chaceon maritae, male	5.45	16	2.86	
Nezumia micronychodon	5.41	151	2.83	
Merluccius polli	5.15	6	2.70	
Stereomastis sp.	5.09	326	2.67	
Centropristis striata	4.67	2	2.45	
Lamprogrammus exutus	3.97	24	2.08	
Halosaurus ovenii	3.26	48	1.71	
Bathyrcongus vicinus	2.54	151	1.33	
THYSANOTEUTHIDAE	2.54	16	1.33	
Aristeus varidens, male	2.46	326	1.29	
Nezumia sp.	2.23	40	1.17	
Triplophos hemingi	1.59	207	0.83	
Shrimps, small, non comm.	1.51	596	0.79	
E C H I N O D E R M A T A	1.51	16	0.79	
SQUALIDAE	1.19	8	0.63	
S H R I M P S	1.03	87	0.54	
MELANOCETIDAE	0.64	32	0.33	
Glyphus marsupialis	0.56	56	0.29	
Xenodermichthys copei	0.48	32	0.25	
Dibranchius atlanticus	0.40	16	0.21	
Scopelosaurus meadi	0.32	8	0.17	
Gadella imberbis	0.32	24	0.17	
Chlorophthalmus atlanticus	0.24	8	0.13	
Cataetyx laticeps	0.24	16	0.13	
MYCTOPHIDAE	0.24	310	0.13	
Bathypterois phenax *	0.16	16	0.08	
Bathyraxia smithii	0.16	8	0.08	
Total	190.71		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	4009.26	113402	66.65	98
Galeoides decadactylus	370.78	0	6.16	
Rhinobatos albomaculatus	357.02	106	5.93	
Trichiurus lepturus	322.64	952	5.36	
Pomadasy incisus	183.01	1005	3.04	
Chloroscombrus chrysurus	168.20	1957	2.80	
Selene dorsalis	107.37	2433	1.78	
Trachurus trecae	96.79	1534	1.61	100
Sphyræna guachancho	60.83	264	1.01	
Alectis alexandrinus	57.12	53	0.95	
Pagellus bellottii	54.48	582	0.91	99
Dicologlossa cuneata	51.83	1269	0.86	
Raja miraletus	38.61	53	0.64	
Pomadasy jubelini	22.21	106	0.37	
Sardinella aurita	21.16	106	0.35	
GOBIIDAE	17.45	1640	0.29	
Arius parkii	16.20	7	0.27	
Torpedo torpedo	10.58	53	0.18	
Sepia orbignyana	10.58	53	0.18	
Pseudopenus prayensis	10.58	53	0.18	
Dentex barnardi	10.58	53	0.18	
Citharus linguatula	8.99	635	0.15	
Grammolites gruvelli	7.93	370	0.13	
Small crabs	1.06	317	0.02	
Scorpaena normani	0.53	159	0.01	
Total	6015.80		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 54
 DATE :30/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°36.94
 start stop duration Lon E 13°18.81
 TIME :12:19:50 12:50:38 30.8 (min) Purpose : 3
 LOG : 2008.50 2009.99 1.5 Region : 4054
 FDEPTH: 33 31 Gear cond.: 0
 BDEPTH: 33 31 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 2.9 kn
 Sorted : 70 Total catch: 245.36 Catch/hour: 478.13

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 56
 DATE :30/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°37.35
 start stop duration Lon E 13°4.13
 TIME :16:15:27 16:45:51 30.4 (min) Purpose : 3
 LOG : 2029.29 2030.81 1.5 Region : 4054
 FDEPTH: 112 112 Gear cond.: 0
 BDEPTH: 112 112 Validity : 0
 Towing dir: 0° Wire out : 280 m Speed : 3.0 kn
 Sorted : 79 Total catch: 185.08 Catch/hour: 365.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	190.97	13826	39.94	97
Drepane africana	47.06	49	9.84	
Alectis alexandrinus	37.86	35	7.92	
Ephippion guttifer	26.27	14	5.49	
Selene dorsalis	21.36	505	4.47	
Galeoides decadactylus	20.32	62	4.25	
Sphyræna sphyraena	19.86	90	4.15	
Chloroscombrus chrysurus	18.96	191	3.97	
Gymnura micrura	18.96	8	3.97	
Dasyatis margarita	12.00	8	2.51	
Pomadasy peroteti	10.91	21	2.28	
Euclinostomus melanopterus	10.58	158	2.21	
Raja miraletus	9.55	14	2.00	
Epinephelus aeneus	7.31	21	1.53	
Pseudolithus senegalensis	6.08	21	1.27	
Sepia orbignyana	5.67	76	1.19	
penaeus notialis, female	5.13	144	1.07	
penaeus notialis, male	2.05	131	0.43	
Chelidichthys capensis	1.85	8	0.39	
Torpedo marmorata	1.31	8	0.27	
Grammolites gruvelli	1.09	55	0.23	
Lagocephalus laevisgatus	0.90	14	0.19	
Dicologlossa cuneata	0.82	27	0.17	
Citharus linguatula	0.41	14	0.09	
Antennarius occidentalis	0.41	8	0.09	
GOBIIDAE	0.14	109	0.03	
Small crabs	0.08	41	0.02	
Bassanago albescens	0.08	8	0.02	
Trichiurus lepturus	0.08	14	0.02	
Torpedo torpedo	0.08	8	0.02	
Total	478.13		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	173.96	2160	47.64	102
Dentex angolensis	37.98	387	10.40	101
Trichiurus lepturus	24.86	93	6.81	
Pterothrissus belloci	14.17	122	3.88	
Zeus faber	11.82	22	3.24	
Trigla lyra	10.24	104	2.80	
Raja miraletus	9.69	16	2.65	
Brotula barbata	9.57	8	2.62	
Citharus linguatula	8.42	215	2.31	
Sepia officinalis	8.41	10	2.30	
Pomadasy incisus	7.42	8	2.03	
Stromateus fiatola	6.37	6	1.75	
Ubrina canariensis	5.78	37	1.58	104
Trachurus trecae	5.35	122	1.46	103
Octopus vulgaris	5.23	30	1.43	
Saurida brasiliensis	3.93	771	1.08	
Lagocephalus laevisgatus	3.28	4	0.90	
Squatina oculata	2.86	2	0.78	
Chloroscombrus chrysurus	2.45	26	0.67	
Selene dorsalis	1.78	8	0.49	
Sepia officinalis	1.48	41	0.41	
G A S T R O P O D S	1.48	93	0.41	
B I V A L V E S	1.18	221	0.32	
Sardinella aurita	1.14	12	0.31	
Boops boops	1.14	30	0.31	
Dicologlossa cuneata	1.05	22	0.29	
Scorpaena normani	0.93	12	0.25	
Uranoscopus polli	0.75	4	0.21	
Pagellus bellottii	0.63	16	0.17	
Illex coindetii	0.59	8	0.16	
Peristedion cataphractum	0.30	4	0.08	
Spicara alta	0.26	8	0.07	
PORIFERA (Sponges)	0.26	8	0.07	
Parapenaeus longirostris	0.26	75	0.07	
Arnoglossus imperialis	0.18	26	0.05	
Total	365.17		100.00	

R/V Dr. Fridtjof Nansen		SURVEY:2011403		STATION: 57	
DATE :30/03/2011		GEAR TYPE: BT NO: 24		POSITION:Lat S 8°35.77	
start stop duration		Lon E 13°1.07		Purpose : 3	
TIME :17:32:58 18:03:46		30.8 (min)		Region : 4054	
LOG : 2035.21 2036.74		1.5		Gear cond.: 0	
FDEPTH: 148 146				Validity: 0	
BDEPTH: 148 146				Speed : 3.0 km	
Towing dir: 0°		Wire out : 380 m		Catch/hour: 780.70	
Sorted : 136		Total catch: 400.63		CATCH/HOUR	
SPECIES		weight numbers		% OF TOT. C SAMP	
Brotula barbata	143.48	123	18.38		
Dentex angolemsis	138.65	649	17.76	105	
Pterothrissus belloci	96.83	559	12.40		
Cynoponticus ferox	76.72	10	9.83		
B I V A L V E S	66.29	8570	8.49		
Bembrops heterurus	64.87	778	8.31		
Synagrops microlepis	39.07	3467	5.00		
Spicara alta	27.94	138	3.58		
Trigla lyra	22.25	142	2.85		
Uranoscopus polli	16.43	166	2.10		
Selene dorsalis	14.44	33	1.85		
Pontinus accraensis	12.41	119	1.59		
G A S T R O P O D S	7.11	294	0.91		
Raja miraletus	7.09	10	0.91		
Octopus vulgaris	5.26	33	0.67		
Peristedion cataphractum	4.64	90	0.59		
Zeus faber	3.98	23	0.51		
Citharus linguatula	3.78	66	0.48		
Umbrina canariensis	3.78	10	0.48		
Trachurus trecae	3.68	0	0.47		
Dicologlossa cuneata	3.37	14	0.43		
Bothus podas africanus	3.37	185	0.43		
Torpedo torpedo	3.22	10	0.41		
BathYROconger vicinus	2.22	43	0.28		
Miracorvina angolensis	2.18	10	0.28		
PARALEPIDIDAE	1.66	109	0.21		
GOBIIDAE	1.52	189	0.19		
Sepia orbignyana	1.42	19	0.18		
Illex coindetii	1.13	10	0.14		
Parapenaeus longirostris, femal	0.70	136	0.09		
Brachydeuterus auritus	0.62	4	0.08		
Gadella imberbis	0.53	29	0.07		
Squilla mantis	0.04	4	0.00		
Total	780.70		100.00		

R/V Dr. Fridtjof Nansen		SURVEY:2011403		STATION: 59	
DATE :30/03/2011		GEAR TYPE: BT NO: 21		POSITION:Lat S 8°35.11	
start stop duration		Lon E 12°51.21		Purpose : 3	
TIME :21:45:25 22:15:56		30.5 (min)		Region : 4054	
LOG : 2055.76 2057.23		1.5		Gear cond.: 0	
FDEPTH: 522 530				Validity: 0	
BDEPTH: 522 530				Speed : 2.9 km	
Towing dir: 0°		Wire out : 1200 m		Catch/hour: 391.21	
Sorted : 30		Total catch: 198.93		CATCH/HOUR	
SPECIES		weight numbers		% OF TOT. C SAMP	
Nematocarcinus africanus	295.97	29597	75.65		
Hoplostethus cadenati	14.73	468	3.77		
Lamprogrammus exutus	13.08	1335	3.34		
Stomias boa boa	10.19	303	2.60		
Aristeus varidens, female	7.43	372	1.90		
Chaunax pictus	6.33	14	1.62		
Malacocephalus laevis	6.06	55	1.55		
Yarella blackfordi *	5.78	165	1.48		
Triplophos hemingi	5.78	867	1.48		
Aristeus varidens, male	3.17	413	0.81		
Chaceon maritae, female	3.15	12	0.80		
Halosaurus ovenii	2.89	138	0.74		
HISTIOTEUTHIDAE	2.75	14	0.70		
Dibranchius atlanticus	2.20	220	0.56		
Laemonema laureysi	1.79	14	0.46		
Gadella imberbis	1.65	69	0.42		
Stereomastis sp.	1.51	220	0.39		
Chaceon maritae, male	1.38	2	0.35		
Plesionepaeus edwardsianus	0.96	206	0.25		
BathYROconger vicinus	0.69	69	0.18		
Chlorophthalmus atlanticus	0.69	14	0.18		
Melanonus zugmayeri	0.55	14	0.14		
DICERATIIDAE	0.55	55	0.14		
Benthodesmus tenuis	0.41	14	0.11		
GOBIIDAE	0.28	179	0.07		
Xenodermichthys copei	0.28	14	0.07		
Galeus polli	0.28	14	0.07		
Unidentified fish	0.28	55	0.07		
Nemichthys scolopaceus	0.14	41	0.04		
Peristedion cataphractum	0.14	14	0.04		
Centroscyttus crepidater	0.14	14	0.04		
Total	391.21		100.00		

R/V Dr. Fridtjof Nansen		SURVEY:2011403		STATION: 58	
DATE :30/03/2011		GEAR TYPE: BT NO: 21		POSITION:Lat S 8°36.66	
start stop duration		Lon E 12°54.06		Purpose : 3	
TIME :19:58:42 20:29:12		30.5 (min)		Region : 4054	
LOG : 2047.95 2049.52		1.6		Gear cond.: 0	
FDEPTH: 417 416				Validity: 0	
BDEPTH: 417 416				Speed : 3.1 km	
Towing dir: 0°		Wire out : 950 m		Catch/hour: 233.25	
Sorted : 28		Total catch: 118.57		CATCH/HOUR	
SPECIES		weight numbers		% OF TOT. C SAMP	
Nematocarcinus africanus	164.07	46379	70.34		
Chaunax pictus	13.61	803	5.84		
Gadella imberbis	11.88	220	5.09		
Merluccius polli	9.29	24	3.98	106	
Aristeus varidens, female	5.59	338	2.40		
BathYROconger vicinus	4.56	31	1.96		
Dibranchius atlanticus	3.30	275	1.42		
Triplophos hemingi	2.99	472	1.28		
Hymenocephalus italicus	2.20	283	0.94		
Callinectes sp.	2.20	39	0.94		
Coelorinchus coelorhinc. polli	2.20	63	0.94		
Lophiodes kempii	1.65	24	0.71		
Yarella blackfordi *	1.57	39	0.67		
Etmopterus pusillus	1.50	39	0.64		
Gadella imberbis	1.26	47	0.54		
Aristeus varidens, male	1.26	150	0.54		
Chaceon maritae, male	1.04	2	0.45		
Halosaurus ovenii	0.94	47	0.40		
Malacocephalus occidentalis	0.87	8	0.37		
Stomias boa boa	0.47	8	0.20		
Benthodesmus tenuis	0.39	8	0.17		
MYCTOPHIDAE	0.39	244	0.17		
Total	233.25		100.00		

R/V Dr. Fridtjof Nansen		SURVEY:2011403		STATION: 60	
DATE :30/03/2011		GEAR TYPE: BT NO: 21		POSITION:Lat S 8°35.45	
start stop duration		Lon E 12°49.65		Purpose : 3	
TIME :23:28:41 23:59:21		30.7 (min)		Region : 4054	
LOG : 2062.23 2063.84		1.6		Gear cond.: 0	
FDEPTH: 704 698				Validity: 0	
BDEPTH: 704 698				Speed : 3.1 km	
Towing dir: 0°		Wire out : 1590 m		Catch/hour: 590.14	
Sorted : 27		Total catch: 301.76		CATCH/HOUR	
SPECIES		weight numbers		% OF TOT. C SAMP	
Nematocarcinus africanus	234.49	51716	39.73		
Yarella blackfordi	77.66	1463	13.16		
Stereomastis sp.	67.33	2001	11.41		
Lamprogrammus exutus	45.82	194	7.76		
Talissmania longifilis	35.71	452	6.05		
Malacocephalus occidentalis	18.72	409	3.17		
J E L Y F I S H	16.78	22	2.84		
Hoplostethus cadenati	15.49	301	2.62		
Aristeus varidens, female	14.84	667	2.52		
Stomias affinis	12.05	374	2.04		
Triplophos hemingi	11.40	1312	1.93		
Trichiurus lepturus	9.47	22	1.60		
Bathylagus sp.	6.45	194	1.09		
Paramola cuvieri	3.44	2	0.58		
Merluccius polli	3.36	4	0.57		
Dibranchius atlanticus	2.37	172	0.40		
Lophius vaillanti	2.35	2	0.40		
Trachyrincus scabrus	1.94	22	0.33		
Chaceon maritae	1.88	6	0.32		
Xenodermichthys copei	1.51	86	0.26		
NETTASTOMATIDAE	1.51	22	0.26		
BathYPTerois phenax *	1.08	172	0.18		
Monomitus metriostoma	1.08	65	0.18		
Synaphobranchus kaupii	0.86	22	0.15		
MYCTOPHIDAE	0.65	215	0.11		
Unidentified fish	0.65	129	0.11		
MELAMPHAIDAE	0.43	22	0.07		
Aristeus varidens, male	0.43	65	0.07		
AcanthePHYRA sp.	0.43	22	0.07		
Total	590.14		100.00		

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 61
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°28.38
 start stop duration Lon E 12°47.50
 TIME :01:54:41 02:24:44 30.1 (min) Purpose : 3
 LOG : 2070.98 2072.59 1.6 Region : 4054
 FDEPTH: 597 599 Gear cond.: 0
 BDEPTH: 597 599 Validity : 0
 Towing dir: 0° Wire out : 1385 m Speed : 3.2 kn
 Sorted : 27 Total catch: 325.55 Catch/hour: 650.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	237.50	6048	36.54	
Nematocarcinus africanus	237.50	45243	36.54	
Hoplostethus cadenati	49.32	1298	7.59	
Stereomastis sp.	24.14	2102	3.71	
Stomias boa boa	22.84	441	3.51	
Opisthoteuthis agassizi	17.13	26	2.64	
Aristeus varidens, female	12.20	623	1.88	
Triplophos hemingi	9.34	1350	1.44	
Lamprogrammus exutus	4.73	389	0.73	
Chaceon maritae	4.67	14	0.72	
Bathyroconger vicinus	3.89	104	0.60	
Scopelosaurus meadi	3.63	78	0.56	
Xenodermichthys copei	3.37	286	0.52	
Aristeus varidens, male	3.11	337	0.48	
Malacocephalus occidentalis	3.11	104	0.48	
Chaunax pictus	2.08	26	0.32	
S H R I M P S	1.82	104	0.28	
Talismaania longifilis	1.82	130	0.28	
Melanostomias sp.	1.56	208	0.24	
Gonostoma elongatum	1.56	52	0.24	
Dibranchius atlanticus	1.04	52	0.16	
DICERATIIDAE	0.78	26	0.12	
Glyphus marsupialis	0.78	52	0.12	
Acanthephyra sp.	0.52	52	0.08	
Melanocetus johnsoni	0.52	26	0.08	
Parasudis fraser-bruenneri	0.52	26	0.08	
MYCTOPHIDAE	0.26	156	0.04	
CYNOGLOSSIDAE	0.26	26	0.04	
Total	650.02		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 63
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°28.05
 start stop duration Lon E 12°49.35
 TIME :04:55:25 05:25:16 29.9 (min) Purpose : 3
 LOG : 2080.11 2081.63 1.5 Region : 4054
 FDEPTH: 450 445 Gear cond.: 0
 BDEPTH: 450 445 Validity : 0
 Towing dir: 0° Wire out : 1080 m Speed : 3.1 kn
 Sorted : 32 Total catch: 257.78 Catch/hour: 517.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	260.90	68741	50.37	
Chaunax pictus	83.11	508	16.04	
Callorhynchus capensis	38.16	16	7.37	
Yarella blackfordi	18.49	522	3.57	
Merluccius polli	15.97	36	3.08	108
Gadella maraldi	15.61	201	3.01	
Chaceon maritae, male	11.55	16	2.23	
Gadella imberbis	9.71	400	1.87	
Aristeus varidens, female	9.24	430	1.78	
Trichiurus lepturus	8.84	16	1.71	
Centrophorus squamosus	7.64	2	1.47	
Stomias boa boa	7.07	201	1.37	
Triplophos hemingi	5.22	770	1.01	
Chaceon maritae, female	4.00	16	0.77	
Dibranchius atlanticus	3.86	277	0.74	
Aristeus varidens, male	3.24	400	0.62	
Halosaurus ovenii	3.07	123	0.59	
Stereomastis sp.	2.77	370	0.54	
Todarodes sagittatus	1.99	30	0.38	
Hymenocephalus italicus	1.69	139	0.33	
Etmopterus spinax	1.39	30	0.27	
Malacocephalus occidentalis	1.39	30	0.27	
Bathyroconger vicinus	0.76	16	0.15	
Plesiopenaeus edwardsianus	0.62	46	0.12	
Nemichthys scolopaceus	0.46	16	0.09	
Nezumia aequalis	0.46	30	0.09	
Synagrops microlepis	0.46	46	0.09	
Xenodermichthys copei	0.30	30	0.06	
Total	517.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 62
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°26.65
 start stop duration Lon E 12°47.49
 TIME :03:26:52 03:57:39 30.8 (min) Purpose : 3
 LOG : 2075.51 2077.07 1.6 Region : 4054
 FDEPTH: 524 523 Gear cond.: 0
 BDEPTH: 524 523 Validity : 0
 Towing dir: 0° Wire out : 1260 m Speed : 3.1 km
 Sorted : 31 Total catch: 405.99 Catch/hour: 791.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	347.06	66980	43.87	
Yarella blackfordi	94.49	2559	11.94	
Hoplostethus cadenati	64.70	1824	8.18	
Chaceon maritae, male	57.51	101	7.27	
Lamprogrammus exutus	44.33	2584	5.60	
Stomias boa boa	44.33	861	5.60	
Chaceon maritae, female	43.83	152	5.54	
Trichiurus lepturus	25.59	51	3.23	
Aristeus varidens, female	11.65	583	1.47	
Stereomastis sp.	11.15	1444	1.41	
Triplophos hemingi	10.64	1267	1.34	
Malacocephalus occidentalis	7.85	101	0.99	
Gadella imberbis	3.96	127	0.50	
Aristeus varidens, male	3.80	431	0.48	
Etmopterus spinax	2.79	51	0.35	
GONOSTOMATIDAE	2.53	25	0.32	
Xenodermichthys copei	2.28	177	0.29	
Chaunax pictus	2.03	25	0.26	
Caristius groenlandicus	1.77	76	0.22	
Bassanago albescens	1.52	25	0.19	
Raja alba	1.01	51	0.13	
Nezumia aequalis	1.01	127	0.13	
Gonostoma denudata	0.76	25	0.10	
Setarches guentheri	0.76	25	0.10	
MYCTOPHIDAE	0.76	456	0.10	
Lampadena sp.	0.76	51	0.10	
DICERATIIDAE	0.76	76	0.10	
Halosaurus ovenii	0.76	25	0.10	
Benthodesmus tenuis	0.25	25	0.03	
Dibranchius atlanticus	0.25	25	0.03	
Bathyroconger vicinus	0.25	76	0.03	
Total	791.15		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 64
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°28.05
 start stop duration Lon E 12°49.35
 TIME :04:55:25 05:25:16 29.9 (min) Purpose : 3
 LOG : 2080.11 2081.63 1.5 Region : 4054
 FDEPTH: 450 445 Gear cond.: 0
 BDEPTH: 450 445 Validity : 0
 Towing dir: 0° Wire out : 1080 m Speed : 3.1 km
 Sorted : 89 Total catch: 207.04 Catch/hour: 416.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	132.96	2982	31.96	
Trichiurus lepturus	77.94	3862	18.74	
Merluccius polli	58.05	267	13.95	109
Nematocarcinus africanus	33.58	16007	8.07	
Pontinus accraensis	27.77	127	6.68	
Gadella maraldi	18.87	249	4.54	
Malacocephalus occidentalis	18.16	155	4.37	
Hymenocephalus italicus	17.84	3113	4.29	
Bembrops heterurus	4.68	141	1.13	
Synagrops microlepis	4.58	215	1.10	
Gadella imberbis	3.38	145	0.81	
Pterothrissus belloci	2.99	14	0.72	
Ommastrephes pteropus	2.49	4	0.60	
Parapenaeus longirostris, female	2.43	309	0.58	
Dibranchius atlanticus	2.25	151	0.54	
Callinectes sp.	1.37	28	0.33	
Solenocera africana	1.27	207	0.30	
MYCTOPHIDAE	1.23	918	0.29	
Raja alba	1.17	4	0.28	
Gephyroberyx darwini	1.13	4	0.27	
Bathyroconger vicinus	0.66	18	0.16	
Coelorrinchus coelorrhinc. polli	0.60	14	0.14	
Lophiodes kempii	0.32	4	0.08	
Nezumia micronychodon	0.10	4	0.02	
Calappa sp.	0.10	4	0.02	
Stereomastis sp.	0.10	14	0.02	
Total	416.02		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 65
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°25.50 Lon E 12°54.64
 start stop duration Purpose : 3
 LOG : 2091.47 2092.65 1.2 Region : 4054
 FDEPTH: 228 227 Gear cond.: 0
 BDEPTH: 228 227 Validity : 0
 Towing dir: 0° Wire out : 500 m Speed : 2.8 kn
 Sorted : 60 Total catch: 241.67 Catch/hour: 576.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brotula barbata	112.89	93	19.57	
Synagrops microlepis	102.63	6881	17.79	
Squatina oculata	71.60	2	12.41	
Bembrops heterurus	47.73	437	8.28	
Merluccius polli	39.21	437	6.80	111
Pterothrissus bellocci	36.87	263	6.39	
Chlorophthalmus atlanticus	33.41	699	5.79	
Dentex angolensis	33.05	138	5.73	110
Zenopsis conchifer	25.37	126	4.40	
Miracorvina angolensis	18.57	19	3.22	
Umbrina canariensis	12.65	31	2.19	
Nezumia micromychodon	6.80	191	1.18	
Torpedo torpedo	4.65	12	0.72	
Lophiodes kempi	4.13	7	0.72	
Zeus faber	3.58	7	0.62	
Trichiurus lepturus	3.41	7	0.59	
Scorpaena normani	3.05	24	0.53	
Bembrops greyi	2.39	24	0.41	
Parapenaeus longirostris, femal	2.10	251	0.36	
Raja alba	2.10	7	0.36	
Loligo sp.	2.03	699	0.35	
Parapenaeus longirostris, male	2.03	465	0.35	
Bothus podas africanus	1.62	91	0.28	
Malacocephalus occidentalis	1.43	19	0.25	
Dentex macrophthalmus	1.31	7	0.23	
MYCTOPHIDAE	0.95	926	0.17	
Illex coindetii	0.95	12	0.17	
Squilla mantis	0.24	7	0.04	
Total	576.78		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 66
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°23.89 Lon E 12°56.57
 start stop duration Purpose : 3
 LOG : 2096.49 2096.63 0.1 Region : 4054
 FDEPTH: 163 162 Gear cond.: 0
 BDEPTH: 163 162 Validity : 9
 Towing dir: 0° Wire out : 370 m Speed : 2.9 kn
 Sorted : 18 Total catch: 18.48 Catch/hour: 373.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L Y F I S H	132.12	1333	35.39	
Bembrops heterurus	66.46	384	17.80	
Dentex angolensis	56.57	202	15.15	112
Raja alba	40.61	40	10.88	
Brotula barbata	24.24	20	6.49	
Zenopsis conchifer	17.37	141	4.65	
Loligo sp.	9.70	3697	2.60	
Synagrops microlepis	6.67	404	1.79	
Chlorophthalmus atlanticus	5.45	162	1.46	
Chelidonichthys capensis	4.65	40	1.24	
Pterothrissus bellocci	4.04	40	1.08	
Sepia orbignyana	2.22	20	0.60	
Peristedion cataphractum	1.82	81	0.49	
Citharus linguatula	1.41	61	0.38	
Total	373.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 67
 DATE :31/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°20.24 Lon E 13°6.60
 start stop duration Purpose : 3
 LOG : 2109.21 2110.84 1.6 Region : 4054
 FDEPTH: 83 88 Gear cond.: 0
 BDEPTH: 83 88 Validity : 0
 Towing dir: 0° Wire out : 240 m Speed : 3.3 kn
 Sorted : 122 Total catch: 1365.67 Catch/hour: 1365.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	797.29	19238	58.38	114
Stromateus fiatola	167.97	291	12.30	
Selene dorsalis	82.86	796	6.07	
Trichiurus lepturus	82.31	470	6.03	
Trachurus trecae	51.61	1926	3.78	115
Dentex angolensis	45.91	281	3.36	113
Galeoides decadactylus	29.34	112	2.15	
Torpedo marmorata	24.41	102	1.79	
Raja miraletus	21.28	35	1.56	
Citharus linguatula	10.20	224	0.75	
Pterothrissus bellocci	8.41	179	0.62	
Zeus faber	6.72	12	0.49	
Dicologlossa cuneata	5.15	35	0.38	
Chloroscombrus chrysurus	4.38	22	0.32	
Grammolites gruvelli	3.93	45	0.29	
B I V A L V E S	3.81	224	0.28	
Uranoscopus cadenati	3.71	22	0.27	
Scorpaena normani	3.26	57	0.24	
Chelidonichthys capensis	2.91	12	0.21	
Sepia orbignyana	2.91	134	0.21	
Pagellus bellottii	2.46	45	0.18	
Pteroscion pelli	1.47	12	0.11	
Saurida brasiliensis	0.90	168	0.07	
GOBIIDAE	0.67	157	0.05	
Sardinella aurita	0.57	22	0.04	
Alloteuthis africana	0.45	112	0.03	
Small crabs	0.35	297	0.03	
Parapenaeus longirostris	0.22	79	0.02	
Arnoglossus imperialis	0.22	22	0.02	
Total	1365.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 68
 DATE :31/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°18.12 Lon E 13°9.32
 start stop duration Purpose : 3
 LOG : 2116.61 2118.15 1.5 Region : 4054
 FDEPTH: 64 59 Gear cond.: 0
 BDEPTH: 64 59 Validity : 0
 Towing dir: 0° Wire out : 170 m Speed : 3.2 kn
 Sorted : 85 Total catch: 474.95 Catch/hour: 990.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	470.82	12079	47.52	116
Trichiurus lepturus	267.54	736	27.00	
Pomadasy jubelini	73.60	129	7.43	
Stromateus fiatola	49.07	117	4.95	
Chloroscombrus chrysurus	25.35	175	2.56	
Raja miraletus	18.57	35	1.87	
Dentex angolensis	14.02	104	1.41	117
Selene dorsalis	13.66	188	1.38	
Pomadasy incisus	13.56	71	1.37	
Trachurus trecae	8.18	152	0.83	118
Alectis alexandrinus	8.18	13	0.83	
Galeoides decadactylus	5.38	13	0.54	
Sphyræna sphyraena	4.21	13	0.43	
Torpedo torpedo	4.09	25	0.41	
Citharus linguatula	4.09	117	0.41	
Grammolites gruvelli	2.69	35	0.27	
Chaetodon hoefleri	2.21	13	0.22	
Sardinella aurita	1.88	25	0.19	
Sepia officinalis	1.52	35	0.15	
Ilisha africana	0.94	13	0.09	
Penaeus notialis	0.58	13	0.06	
C R A B S	0.23	152	0.02	
G A S T R O P O D S	0.23	13	0.02	
GOBIIDAE	0.13	46	0.01	
Saurida brasiliensis	0.13	13	0.01	
Total	990.86		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 69
 DATE :31/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°16.86 Lon E 13°12.03
 start stop duration Purpose : 3
 LOG : 2122.60 2123.59 1.0 Region : 4054
 FDEPTH: 48 45 Gear cond.: 0
 BDEPTH: 48 45 Validity : 0
 Towing dir: 0° Wire out : 125 m Speed : 2.9 kn
 Sorted : 90 Total catch: 358.68 Catch/hour: 1058.05

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	483.78	33581	45.72	119
Pomadasy incisus	211.21	1817	19.96	
Pagellus bellottii	67.49	767	6.38	120
Chloroscombrus chrysurus	58.76	484	5.55	
Galeoides decadactylus	56.99	212	5.39	
Sphyræna sphyraena	36.70	106	3.47	
Raja miraletus	31.86	153	3.01	
Pseudupeneus prayensis	21.24	319	2.01	
Sepia orbignyana	19.12	71	1.81	
Dentex barnardi	10.27	47	0.97	
Eucinostomus melanopterus	9.79	165	0.93	
Lagocephalus laevigatus	9.20	35	0.87	
Alectis alexandrinus	8.85	12	0.84	
Pomadasy jubelini	7.08	24	0.67	
Sardinella maderensis	4.13	24	0.39	
Cynoglossus canariensis	3.07	12	0.29	
Grammolites gruvelli	3.07	83	0.29	
Selene dorsalis	2.83	35	0.27	
Torpedo torpedo	2.48	12	0.23	
Citharus linguatula	2.48	106	0.23	
Sparus caeruleostictus *	2.12	12	0.20	
Decapterus rhonchus	1.89	47	0.18	
Trachurus trecae	1.77	12	0.17	
Penaeus notialis	1.06	35	0.10	
Ephippion guttifer	0.47	12	0.04	
Alloteuthis africana	0.35	94	0.03	
Total	1058.05		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 70
 DATE :31/03/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°16.07 Lon E 13°15.69
 start stop duration Purpose : 3
 LOG : 2128.84 2130.44 1.6 Region : 4054
 FDEPTH: 30 29 Gear cond.: 0
 BDEPTH: 30 29 Validity : 0
 Towing dir: 0° Wire out : 103 m Speed : 3.3 kn
 Sorted : 150 Total catch: 881.93 Catch/hour: 1809.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ilisha africana	357.91	1465	19.78	
Sphyræna sphyraena	343.65	632	18.99	
Galeoides decadactylus	322.78	1512	17.84	
Pteroscion pelli	177.19	3014	9.79	
Pomadasy jubelini	134.86	552	7.45	
Pseudotolithus senegalensis	133.17	497	7.36	122
Brachydeuterus auritus	89.71	13756	4.96	121
Dasyatis margarita	59.24	45	3.27	
Torpedo torpedo	40.63	125	2.25	
Chloroscombrus chrysurus	35.99	417	1.99	
Drepane africana	34.86	123	1.93	
Raja miraletus	19.29	80	1.07	
Dicologlossa cuneata	10.94	238	0.60	
Cynoglossus canariensis	10.16	103	0.56	
Alectis alexandrinus	8.80	12	0.49	
Penaeus notialis	5.75	382	0.32	
Sepia orbignyana	5.42	23	0.30	
Selene dorsalis	5.29	113	0.29	
Trichiurus lepturus	5.29	451	0.29	
Grammolites gruvelli	5.19	68	0.29	
Calappa sp.	1.35	35	0.07	
Sardinella maderensis	1.01	45	0.06	
Antennarius striatus	0.68	12	0.04	
Pentanezum quinquarius	0.45	12	0.02	
Squilla mantis	0.10	12	0.01	
Total	1809.71		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 71
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°35.56
 start stop duration Lon E 12°35.65
 TIME :20:32:46 21:03:27 30.7 (min) Purpose : 3
 LOG : 2172.87 2174.43 1.6 Region : 4054
 FDEPTH: 740 737 Gear cond.: 0
 BDEPTH: 740 737 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 3.0 km
 Sorted : 38 Total catch: 167.55 Catch/hour: 327.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lamprogrammus exotus	53.80	196	16.41	
Yarella blackfordi	52.72	1457	16.08	
Hoplostethus cadenati	29.83	763	9.10	
Chaceon maritae, male	25.82	78	7.88	
Anemones, pink	21.32	59	6.51	
Nezumia aequalis	20.15	401	6.15	
Stereomastis sp.	16.14	538	4.92	
Stomias boa boa	16.04	303	4.89	
Opistotheutis rossi	15.26	20	4.66	
Trachyrincus scabrus	14.28	59	4.36	
Triplophos hemingi	14.09	1868	4.30	
Merluccius polli	11.35	16	3.46	
Parapandalus narval	7.92	1937	2.42	
Bathyrcongus vicinus	5.38	88	1.64	
Todarodes sp.	4.40	20	1.34	
Dibranchius atlanticus	3.33	127	1.01	
Xenodermichthys copei	3.23	205	0.98	
Ebinania costaeoanarie	3.03	10	0.93	
Dicrolene intronigra	2.74	137	0.84	
Aristeus varidens, female	1.57	68	0.48	
Chaceon maritae, female	1.27	10	0.39	
Halosaurus ovenii	1.17	20	0.36	
Raja alba	1.08	20	0.33	
GONOSTOMATIDAE	0.88	10	0.27	
Plesiopenaeus edwardsianus	0.49	49	0.15	
Glyphus marsupialis	0.20	20	0.06	
Photomectes braueri	0.20	39	0.06	
Nephropsis atlantica	0.10	10	0.03	
Total	327.78		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 72
 DATE :31/03/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 8°1.59
 start stop duration Lon E 12°36.71
 TIME :23:07:09 23:37:42 30.6 (min) Purpose : 3
 LOG : 2181.55 2183.19 1.6 Region : 4054
 FDEPTH: 624 658 Gear cond.: 0
 BDEPTH: 624 658 Validity : 0
 Towing dir: 0° Wire out : 1470 m Speed : 3.2 km
 Sorted : 26 Total catch: 294.48 Catch/hour: 578.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	262.40	99346	45.39	
Yarella blackfordi	126.13	3607	21.81	
Lamprogrammus exotus	45.79	324	7.92	
Hoplostethus cadenati	41.47	1231	7.17	
Stomias boa boa	29.16	799	5.04	
Raja confundens	15.98	65	2.76	
Triplophos hemingi	14.47	2397	2.50	
Stereomastis sp.	10.80	1058	1.87	
J E L Y F I S H	10.58	43	1.83	
Aristeus varidens, female	7.34	302	1.27	
Trichiurus lepturus	3.26	2	0.56	
Lophius vaillanti	2.65	2	0.46	
Benthodesmus tenuis	2.38	86	0.41	
Merluccius polli	1.67	2	0.29	
Dibranchius atlanticus	1.30	65	0.22	
Aristeus varidens, male	0.86	108	0.15	
Malacocephalus laevis	0.65	22	0.11	
MYCTOPHIDAE	0.22	367	0.04	
GALATHEIDAE *	0.22	302	0.04	
DICERATIIDAE	0.22	22	0.04	
Bathyrcongus vicinus	0.22	22	0.04	
Xenodermichthys copei	0.22	43	0.04	
S H R I M P S	0.22	22	0.04	
Total	578.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 73
 DATE :01/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°59.08
 start stop duration Lon E 12°37.51
 TIME :00:51:58 01:23:02 31.1 (min) Purpose : 3
 LOG : 2187.94 2189.50 1.6 Region : 4054
 FDEPTH: 536 527 Gear cond.: 0
 BDEPTH: 536 527 Validity : 0
 Towing dir: 0° Wire out : 1290 m Speed : 3.0 km
 Sorted : 24 Total catch: 269.56 Catch/hour: 520.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	288.99	61856	55.50	
Yarella blackfordi	70.97	1976	13.63	
Hoplostethus cadenati	49.94	2444	9.59	
Lamprogrammus exotus	21.87	595	4.20	
Stomias boa boa	12.11	340	2.33	
Stereomastis sp.	10.20	1487	1.96	
Triplophos hemingi	9.56	1020	1.84	
Todaropsis eblanae	8.71	42	1.67	
PORIFERA (Sponges)	8.50	3549	1.63	
Aristeus varidens, female	5.74	297	1.10	
Chaceon maritae	5.54	15	1.06	
Aristeus varidens, male	4.89	680	0.94	
Malacocephalus laevis	3.61	64	0.69	
Laemonema laureysi	3.19	21	0.61	
Lophius vaillanti	2.53	2	0.49	
Gadella imberbis	2.12	106	0.41	
Nezumia micromychodon	1.70	64	0.33	
Monomitopus metriostoma	1.70	64	0.33	
Raja confundens	1.49	21	0.29	
Cataetx laticeps	1.49	319	0.29	
Benthodesmus tenuis	1.27	42	0.24	
Bathyrcongus vicinus	1.27	42	0.24	
Trichiurus lepturus	0.99	2	0.19	
Chaunax pictus	0.85	42	0.16	
Etmopterus brachyurus	0.64	21	0.12	
SEPIOLIDAE	0.42	42	0.08	
MYCTOPHIDAE	0.21	234	0.04	
Nemichthys scolopaceus	0.21	21	0.04	
Total	520.72		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 74
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 8°1.17
 start stop duration Lon E 12°44.27
 TIME :04:57:15 05:27:07 29.9 (min) Purpose : 3
 LOG : 2199.93 2201.45 1.5 Region : 4054
 FDEPTH: 166 163 Gear cond.: 0
 BDEPTH: 166 163 Validity : 0
 Towing dir: 0° Wire out : 425 m Speed : 3.0 km
 Sorted : 61 Total catch: 300.12 Catch/hour: 602.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	439.16	32245	72.87	
Brotula barbata	24.50	22	4.07	
Lagocephalus laevigatus	24.40	18	4.05	
Dentex angolemsis	22.59	108	3.75	123
Uranoscopus polli	20.42	173	3.39	
Bembrops heterurus	18.07	380	3.00	
Pterothrissus bellocci	15.54	118	2.58	
Citharus linguatula	9.84	173	1.63	
Cynoponticus ferox	7.41	10	1.23	
Zenopsis conchifer	6.22	18	1.03	
Zeus faber	3.80	18	0.63	
Bothus podas africanus	3.25	361	0.54	
Illex coindetii	1.63	18	0.27	
B I V A L V E S	1.63	72	0.27	
Parapeneus longirostris	1.63	1022	0.27	
Bembrops greyi	0.80	10	0.13	
G A S T R O P O D S	0.54	28	0.09	
J E L Y F I S H	0.44	10	0.07	
Squilla mantis	0.44	10	0.07	
Dicologlossa cuneata	0.18	28	0.03	
C R A B S	0.08	18	0.01	
GOBIIDAE	0.08	18	0.01	
Total	602.65		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 75
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°57.27
 start stop duration Lon E 12°50.12
 TIME :07:03:00 07:29:56 26.9 (min) Purpose : 3
 LOG : 2210.71 2212.08 1.4 Region : 4054
 FDEPTH: 107 108 Gear cond.: 0
 BDEPTH: 107 108 Validity : 0
 Towing dir: 0° Wire out : 285 m Speed : 3.1 km
 Sorted : 55 Total catch: 55.37 Catch/hour: 123.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	60.18	428	48.76	124
Trichiurus lepturus	22.73	53	18.42	
Dentex angolemsis	7.80	82	6.32	125
Trachurus trecae	6.11	203	4.95	126
Selene dorsalis	4.66	9	3.77	
Brotula barbata	4.19	2	3.40	
Boops boops	3.12	167	2.53	
Trigla lyra	3.10	31	2.51	
Dentex congoensis	2.54	74	2.06	
Citharus linguatula	2.21	42	1.79	
B I V A L V E S	1.63	105	1.32	
Uranoscopus polli	1.03	7	0.83	
Zeus faber	0.85	2	0.69	
Scorpaena normani	0.82	9	0.67	
Anthias anthias	0.51	4	0.42	
Pontinus accraensis	0.51	4	0.42	
Pagellus bellottii	0.36	4	0.29	
Illex coindetii	0.33	9	0.27	
Sea cucumber	0.27	7	0.22	
Saurida brasiliensis	0.20	58	0.16	
Sepia orbignyana	0.13	7	0.11	
Octopus vulgaris	0.07	2	0.05	
Antennarius striatus	0.04	2	0.04	
Spicara alta	0.02	4	0.02	
Total	123.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 76
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°57.36
 start stop duration Lon E 12°54.90
 TIME :08:43:27 09:11:27 28.0 (min) Purpose : 3
 LOG : 2218.89 2220.34 1.5 Region : 4054
 FDEPTH: 86 86 Gear cond.: 0
 BDEPTH: 86 86 Validity: 0
 Towing dir: 0° Wire out : 215 m Speed : 3.1 kn
 Sorted : 93 Total catch: 92.64 Catch/hour: 198.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Boops boops	25.83	1125	13.01	
Raja miraleletus	19.40	41	9.77	
Dentex barnardi	17.94	60	9.03	
Pagellus bellottii	17.68	94	8.91	129
Rhinobatos albomaculatus	13.50	4	6.80	
Trichiurus lepturus	11.79	21	5.94	
Trachurus trecae	9.30	362	4.68	127
Uranoscopus polli	8.75	54	4.40	
Umbrina canariensis	8.51	19	4.29	
Dentex angolensis	7.89	191	3.97	128
Citharus linguatula	6.43	529	3.24	
Lagocephalus laevigatus	6.05	17	3.04	
Pseudupeneus prayensis	5.96	118	3.00	
Trigla lyra	5.64	71	2.84	
Dentex congoensis	5.62	159	2.83	
Decapterus rhonchus	5.55	6	2.80	
Brotula barbata	4.44	2	2.23	
Alloteuthis africana	2.19	815	1.10	
Pomadasy inciscus	1.99	11	1.00	
Epinephelus aeneus	1.91	2	0.96	
Pomadasy jubelini	1.59	2	0.80	
Zeus faber	1.54	4	0.78	
Saurida brasiliensis	1.18	281	0.59	
Dicolloglossa cuneata	1.18	6	0.59	
Grammoplites gruvelli	1.01	15	0.51	
CORAL	0.96	4	0.49	
Fistularia petimba	0.71	2	0.36	
Serranus accraensis	0.69	11	0.35	
Chelidonichthys gabonensis	0.64	21	0.32	
Octopus vulgaris	0.62	4	0.31	
Chaetodon hoefleri	0.36	2	0.18	
Chaetodon marcellae	0.30	6	0.15	
Illex coindetii	0.28	6	0.14	
Arnoglossus imperialis	0.26	28	0.13	
Chloroscombrus chrysurus	0.26	2	0.13	
Antennarius occidentalis	0.15	4	0.08	
Ephippion guttifer	0.13	11	0.06	
G A S T R O P O D S	0.11	4	0.05	
CONGRIDAE	0.09	6	0.04	
Starfish	0.06	2	0.03	
Scorpaena normani	0.04	2	0.02	
Calappa pelli	0.04	2	0.02	
Squilla mantis	0.02	2	0.01	
Total	198.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 77
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°54.41
 start stop duration Lon E 12°57.02
 TIME :10:06:38 10:37:34 30.9 (min) Purpose : 3
 LOG : 2225.18 2226.80 1.6 Region : 4054
 FDEPTH: 71 69 Gear cond.: 0
 BDEPTH: 71 69 Validity: 0
 Towing dir: 0° Wire out : 180 m Speed : 3.2 kn
 Sorted : 102 Total catch: 101.98 Catch/hour: 197.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	47.32	72	23.93	
Brachydeuterus auritus	25.31	304	12.80	131
Pagellus bellottii	25.21	392	12.75	130
Raja miraleletus	22.30	60	11.28	
Dentex barnardi	7.80	45	3.94	
Dasysatis marmorata	7.37	6	3.73	
Trachurus trecae	6.88	221	3.48	132
Octopus vulgaris	6.59	6	3.33	
Pseudupeneus prayensis	5.33	80	2.70	
Citharus linguatula	5.24	206	2.65	
Grammoplites gruvelli	4.15	76	2.10	
Alloteuthis africana	3.70	1654	1.87	
Torpedo torpedo	2.93	12	1.48	
Umbrina canariensis	2.75	4	1.39	
Zeus faber	2.73	6	1.38	
Lagocephalus laevigatus	2.70	10	1.36	
Trigla lyra	2.52	21	1.27	
Sepia orbignyana	2.11	14	1.07	
Selene dorsalis	2.07	14	1.05	
Holothuria sp	1.84	52	0.93	
Pomadasy jubelini	1.69	4	0.85	
Dentex congoensis	1.69	27	0.85	
Chelidonichthys capensis	1.38	8	0.70	
Rhinobatos albomaculatus	1.34	2	0.68	
Fistularia petimba	0.99	2	0.50	
Serranus accraensis	0.70	14	0.35	
Chaetodon hoefleri	0.68	4	0.34	
Dicolloglossa cuneata	0.56	4	0.28	
Scomber japonicus	0.54	2	0.27	
Cynoglossus senegalensis	0.48	4	0.25	
Uranoscopus polli	0.39	2	0.20	
Dentex angolensis	0.14	4	0.07	
Saurida brasiliensis	0.14	31	0.07	
C R A B S	0.08	8	0.04	
Boops boops	0.06	6	0.03	
Arnoglossus imperialis	0.04	4	0.02	
Sphyrna sphyraena	0.02	2	0.01	
Total	197.76		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 78
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°51.75
 start stop duration Lon E 12°58.80
 TIME :11:25:13 11:55:32 30.3 (min) Purpose : 3
 LOG : 2230.86 2232.57 1.7 Region : 4054
 FDEPTH: 56 58 Gear cond.: 0
 BDEPTH: 56 58 Validity: 0
 Towing dir: 0° Wire out : 165 m Speed : 3.4 kn
 Sorted : 129 Total catch: 717.72 Catch/hour: 1420.29

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	702.01	4474	49.43	135
Chloroscombrus chrysurus	258.50	2111	18.20	
Sardinella aurita	185.03	1579	13.03	134
Trichiurus lepturus	61.50	131	4.33	
Pomadasy inciscus	37.88	239	2.67	
Selene dorsalis	33.86	273	2.38	
Pagellus bellottii	32.22	273	2.27	133
Sepia officinalis	19.81	22	1.39	
Raja miraleletus	12.63	44	0.89	
Alectis alexandrinus	11.66	12	0.82	
Galeoides decadactylus	11.00	44	0.77	
Umbrina canariensis	8.83	12	0.62	
Brachydeuterus auritus	7.62	87	0.54	
Rhinobatos albomaculatus	7.22	2	0.51	
Dentex canariensis	7.08	12	0.50	
Pomadasy jubelini	6.75	12	0.48	
Scomberomorus tritor	5.05	2	0.36	
Sardinella maderensis	4.57	22	0.32	
Pseudupeneus prayensis	3.38	34	0.24	
Scomber japonicus	2.83	12	0.20	
Citharus linguatula	0.87	34	0.06	
Total	1420.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 79
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°51.59
 start stop duration Lon E 13°2.01
 TIME :12:40:17 13:10:38 30.3 (min) Purpose : 3
 LOG : 2236.92 2238.52 1.6 Region : 4054
 FDEPTH: 39 41 Gear cond.: 0
 BDEPTH: 39 41 Validity: 0
 Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
 Sorted : 162 Total catch: 657.99 Catch/hour: 1301.23

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pteroscion pelli	474.23	10893	36.44	
Galeoides decadactylus	192.62	1456	14.80	
Ilisha africana	178.77	5798	13.74	
Trichiurus lepturus	74.36	546	5.71	
Brachydeuterus auritus	69.61	2966	5.35	137
Pomadasy inciscus	48.65	396	3.74	
Pseudotolithus senegalensis	48.09	127	3.70	136
Chloroscombrus chrysurus	38.76	506	2.98	
Pomadasy peroteti	26.90	111	2.07	
Drepane africana	25.55	24	1.96	
Dasysatis marmorata	18.35	8	1.41	
Selene dorsalis	17.64	324	1.36	
Ephippion guttifer	15.27	8	1.17	
Cynoglossus senegalensis	12.34	16	0.95	
Arius parkii	11.27	4	0.87	
Raja miraleletus	7.91	16	0.61	
Sphyrna sphyraena	7.44	24	0.57	
Carcharhinus leucas	5.64	2	0.43	
Sepia officinalis	5.14	8	0.40	
penaeus notialis,female	4.43	119	0.34	
Stromateus fiatola	3.88	8	0.30	
Torpedo marmorata	3.72	16	0.29	
penaeus notialis,male	3.72	214	0.29	
Sepia orbignyana	2.61	16	0.20	
Trachurus trecae	1.66	8	0.13	
Dasysatis margarita	1.42	8	0.11	
Argyrosomus hololepidotus	0.87	8	0.07	
Dicolloglossa cuneata	0.40	8	0.03	
Total	1301.23		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 80
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°50.27
 start stop duration Lon E 13°3.19
 TIME :14:08:14 14:34:03 25.8 (min) Purpose : 3
 LOG : 2241.65 2242.97 1.3 Region : 4054
 FDEPTH: 24 24 Gear cond.: 0
 BDEPTH: 24 24 Validity: 0
 Towing dir: 0° Wire out : 100 m Speed : 3.1 kn
 Sorted : 140 Total catch: 738.43 Catch/hour: 1715.95

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	680.15	22215	39.64	
Galeoides decadactylus	262.31	1562	15.29	
Brachydeuterus auritus	173.24	8967	10.10	138
Sphyrna sphyraena	154.95	416	9.03	
Gymnura micrura	123.83	49	7.22	
Ilisha africana	95.76	6637	5.58	
Pseudotolithus senegalensis	68.20	184	3.97	139
Trichiurus lepturus	50.64	318	2.95	
Pteroscion pelli	24.17	402	1.41	
Arius parkii	19.52	60	1.14	
Ephippion guttifer	15.24	12	0.89	
Sardinella maderensis	10.02	195	0.58	
Pentaneumus quinquarius	6.95	98	0.40	
Scomberomorus tritor	6.67	9	0.39	
Lagocephalus laevigatus	6.46	37	0.38	
Pomadasy inciscus	4.02	26	0.23	
Stromateus fiatola	3.30	37	0.19	
Selene dorsalis	2.93	37	0.17	
Euclinostomus melanopterus	2.56	37	0.15	
Drepane africana	1.72	12	0.10	
Penaeus notialis	1.58	244	0.09	
Sardinella aurita	0.74	12	0.04	
Dicolloglossa cuneata	0.74	12	0.04	
Torpedo torpedo	0.26	12	0.01	
Total	1715.95		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 81
 DATE :01/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°47.12 Lon E 12°30.71
 start stop duration Purpose : 3
 TIME :19:31:20 20:05:43 34.4 (min) Region : 4054
 LOG : 2277.36 2278.80 1.4 Gear cond.: 0
 FDEPTH: 739 737 Validity : 0
 BDEPTH: 739 737 Speed : 2.5 kn
 Towing dir: 0° Wire out : 1600 m Catch/hour: 360.89
 Sorted : 29 Total catch: 206.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
J E L Y F I S H	131.90	34208	36.55	
Anemones, pink	47.63	85	13.20	
Yarella blackfordi	26.01	757	7.21	
Nezumia micronychodon	23.69	525	6.57	
Stereomastis sp.	17.59	879	4.87	
Parapandalus narval	17.46	3981	4.84	
Hoplostethus atlanticus	17.22	403	4.77	
Ateleopus natalensis	14.41	12	3.99	
Triplophos hemingi	14.29	1368	3.96	
Stomias boa boa	10.87	281	3.01	
Aristeus varidens, female	8.30	305	2.30	
Todarodes sp.	6.59	37	1.83	
Chaceon maritae, male	3.66	12	1.02	
Dibranchius atlanticus	3.66	147	1.02	
Bathyroconger vicinus	3.30	98	0.91	
Raja alba	2.32	37	0.64	
Lamprogrammus exutus	2.20	24	0.61	
Etmopterus spinax	1.59	12	0.44	
Malacocephalus laevis	1.47	12	0.41	
Starfish	1.34	72	0.37	
Halosaurus ovenii	1.34	24	0.37	
Caristius groenlandicus	1.22	12	0.34	
Gadella imberbis	1.10	49	0.30	
ALEPOCEPHALIDAE	0.85	37	0.24	
Xenodermichthys copei	0.73	37	0.20	
Plesiopeneus edwardsianus	0.12	12	0.03	
Total	360.89		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 82
 DATE :01/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°46.85 Lon E 12°31.78
 start stop duration Purpose : 1
 TIME :21:19:38 21:50:19 30.7 (min) Region : 4054
 LOG : 2282.86 2284.39 1.5 Gear cond.: 0
 FDEPTH: 618 622 Validity : 0
 BDEPTH: 618 622 Speed : 3.0 kn
 Towing dir: 0° Wire out : 1400 m Catch/hour: 420.06
 Sorted : 31 Total catch: 214.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	258.06	52911	61.44	
Yarella blackfordi *	48.17	1345	11.47	
Hoplostethus cademati	38.01	115	9.05	
Lamprogrammus exutus	16.11	78	3.84	
Stereomastis sp.	13.45	1283	3.20	
Chaceon maritae, female	8.41	18	2.00	
Aristeus varidens, female	7.98	360	1.90	
Todaropsis eblanae	5.16	31	1.23	
Stomias affinis	3.75	109	0.89	
Gadella imberbis	3.44	282	0.82	
Aristeus varidens, male	2.82	344	0.67	
Triplophos hemingi	2.19	282	0.52	
Malacocephalus occidentalis	1.88	31	0.45	
Gonostoma sp.	1.88	156	0.45	
Caristius maderensis	1.56	16	0.37	
Opistotheutis rossi	1.56	16	0.37	
Etmopterus spinax	1.56	31	0.37	
Bathyroconger vicinus	0.94	78	0.22	
Astronesthes richardsoni	0.63	16	0.15	
Alepocephalus rostratus	0.47	47	0.11	
PASIPHAELIDAE	0.47	31	0.11	
Gonostoma elongatum	0.47	16	0.11	
Nezumia aequalis	0.47	16	0.11	
Dicrolene intronigra	0.31	16	0.07	
ALEPOCEPHALIDAE	0.16	16	0.04	
GOBIIDAE	0.16	125	0.04	
Total	420.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 83
 DATE :01/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°42.38 Lon E 12°31.95
 start stop duration Purpose : 3
 TIME :23:35:06 00:06:10 31.1 (min) Region : 4054
 LOG : 2291.63 2293.25 1.6 Gear cond.: 0
 FDEPTH: 364 362 Validity : 0
 BDEPTH: 364 362 Speed : 3.1 kn
 Towing dir: 0° Wire out : 850 m Catch/hour: 661.37
 Sorted : 28 Total catch: 342.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	379.42	89615	57.37	
Laemonema laureysi	96.50	1275	14.59	
Chaunax pictus	32.52	1488	4.92	
Merluccius polli	31.40	73	4.75	140
Bassanago albescens	15.30	213	2.31	
Malacocephalus occidentalis	14.88	106	2.25	
Centrophorus granulosus	14.49	4	2.19	
Torpedo nobiliana	9.37	2	1.42	
Parapeneus longirostris, femal	9.14	1127	1.38	
Stomias boa boa	8.29	191	1.25	
Hymenocephalus italicus	6.80	829	1.03	
Aristeus varidens, male	5.74	701	0.87	
Neoharriotta pinnata	5.02	2	0.76	
Gadella imberbis	4.25	170	0.64	
Yarella blackfordi	3.40	106	0.51	
Benthodesmus tenuis	3.40	191	0.51	
Epigonus telescopus	3.40	149	0.51	
Dibranchius atlanticus	2.98	298	0.45	
Bembrops greyi	2.98	43	0.45	
Peristedion cataphractum	2.13	21	0.32	
Stereomastis sp.	1.91	340	0.29	
Aristeus varidens, female	1.49	149	0.22	
Bathymectes piperitus	1.49	21	0.22	
Trichiurus lepturus	1.24	4	0.19	
Lophiodes kemp	1.06	21	0.16	
UNIDENTIFIED FISH	0.64	21	0.10	
Triplophos hemingi	0.64	85	0.10	
MYCTOPHIDAE	0.43	319	0.06	
Sergestes sp.	0.43	64	0.06	
Solenocera africana	0.43	43	0.06	
Dicrolene intronigra	0.21	43	0.03	
Total	661.37		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 84
 DATE :02/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°41.72 Lon E 12°32.70
 start stop duration Purpose : 3
 TIME :04:50:11 05:19:33 29.4 (min) Region : 4054
 LOG : 2303.95 2305.49 1.5 Gear cond.: 0
 FDEPTH: 254 254 Validity : 0
 BDEPTH: 254 254 Speed : 3.1 kn
 Towing dir: 0° Wire out : 650 m Catch/hour: 405.74
 Sorted : 83 Total catch: 198.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	165.84	4490	40.87	
Merluccius polli	58.57	913	14.44	141
Synagrops microlepis	34.52	1729	8.51	
Zenopsis conchifer	25.81	53	6.36	
Parapeneus longirostris, male	25.42	5262	6.27	
L O B S T E R S	21.91	14438	5.40	
Parapeneus longirostris, femal	13.39	2532	3.30	
Gadella imberbis	10.48	323	2.58	
Trichiurus lepturus	9.71	20	2.39	
MYCTOPHIDAE	8.38	3791	2.07	
Lophiodes kemp	8.09	233	1.99	
Calappa pelli	7.42	476	1.83	
Brotula barbata	3.33	4	0.82	
Pterothrissus belloci	3.25	25	0.80	
Chascanopsetta lugubris	2.04	53	0.50	
Bembrops greyi	1.96	90	0.48	
Parasudis fraser-bruenneri	1.02	125	0.25	
Bathyroconger vicinus	1.00	29	0.25	
Pontinus accraensis	0.90	90	0.22	
Hymenocephalus italicus	0.72	61	0.18	
Bassanago albescens	0.67	4	0.17	
Solenocera africana	0.57	110	0.14	
Gephyroberyx darwini	0.25	4	0.06	
RAJIDAE	0.14	14	0.04	
Electrona risso	0.14	29	0.04	
PARALEPIDIDAE	0.10	10	0.03	
Peristedion cataphractum	0.10	29	0.03	
Total	405.74		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 85
 DATE :02/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°42.36 Lon E 12°38.33
 start stop duration Purpose : 3
 TIME :07:15:13 07:45:34 30.4 (min) Region : 4054
 LOG : 2311.74 2313.30 1.6 Gear cond.: 0
 FDEPTH: 115 115 Validity : 0
 BDEPTH: 115 115 Speed : 3.1 kn
 Towing dir: 0° Wire out : 290 m Catch/hour: 246.29
 Sorted : 125 Total catch: 124.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	120.36	787	48.87	144
Trigla lyra	25.40	235	10.31	
Dentex barnardi	13.54	43	5.50	
B I V A L V E S	8.86	605	3.60	
Sepia officinalis	8.50	8	3.45	
Pagellus bellottii	7.99	67	3.24	143
Dentex congensis	7.59	111	3.08	
Brachydeuterus auritus	6.31	36	2.56	142
Raja miraletus	6.29	10	2.55	
Citharus linguatula	6.17	188	2.50	
Uranoscopus polli	6.07	24	2.46	
Trachurus trecae	4.80	164	1.95	145
Zeus faber	3.00	8	1.22	
Ariomma bondi	2.71	45	1.10	
Brotula barbata	2.63	2	1.07	
Trichiurus lepturus	2.33	4	0.95	
Chelidomichthys gabonensis	2.15	12	0.87	
Octopus vulgaris	1.88	2	0.76	
Sepia orbignyana	1.62	43	0.66	
Chaetodon hoefleri	1.38	10	0.56	
Boops boops	1.07	40	0.43	
Lophiodes kemp	0.91	2	0.37	
Scorpaena stephanica	0.79	2	0.32	
Serranus cabrilla	0.67	4	0.27	
Spicara alta	0.65	20	0.26	
Zenopsis conchifer	0.63	14	0.26	
G A S T R O P O D S	0.61	4	0.25	
Dicologlossa hexopthalma	0.36	6	0.14	
Saurida brasiliensis	0.30	97	0.12	
Arnoglossus imperialis	0.26	26	0.10	
XENOCONGRIDAE	0.22	2	0.09	
Illex coindetii	0.18	2	0.07	
Antennarius sp.	0.04	2	0.02	
Anthias anthias	0.02	2	0.01	
Total	246.29		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 86
 DATE :02/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°38.61
 start stop duration Lon E 12°45.60
 TIME :09:11:16 09:18:22 7.1 (min) Purpose : 3
 LOG : 2323.32 2323.65 0.3 Region : 4054
 FDEPTH: 86 86 Gear cond.: 0
 BDEPTH: 86 86 Validity : 0
 Towing dir: 0° Wire out : 190 m Speed : 2.8 kn
 Sorted : 81 Total catch: 81.31 Catch/hour: 687.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy jubelini	363.38	448	52.88	
Boops boops	150.00	8138	21.83	
Dasyatis marmorata	30.42	8	4.43	
Zeus faber	18.08	51	2.63	
Trigla lyra	18.00	152	2.62	
Rhinobatos albomaculatus	14.54	8	2.12	
Pagellus bellottii	11.32	76	1.65	
Dentex congoensis	10.99	406	1.60	
Chaetodon hoefleri	9.21	59	1.34	
Trichiurus lepturus	8.79	8	1.28	
Seriola carpenteri	8.37	8	1.22	
Argyrosomus hololepidotus	7.44	8	1.08	
Brachydeuterus auritus	4.14	25	0.60	
Sepia orbignyana	3.97	8	0.58	
Scorpaena stephanica	3.46	8	0.50	
Dentex barnardi	3.21	17	0.47	
Umbrina canariensis	3.04	8	0.44	
Dentex angolensis	2.45	68	0.36	
Ariomma bondi	2.28	8	0.33	
Trachurus trecae	2.11	68	0.31	
Pomadasy incisus	1.86	8	0.27	
Uranoscopus polli	1.69	8	0.25	
Citharus linguatula	1.69	68	0.25	
Chelidonichthys gabonensis	1.52	8	0.22	
Saurida brasiliensis	1.44	152	0.21	
Octopus vulgaris	1.44	8	0.21	
Grammolites gruvelli	0.93	8	0.14	
Loligo vulgaris	0.68	287	0.10	
Lagocephalus laevigatus	0.42	17	0.06	
Arnoglossus imperialis	0.25	17	0.04	
Total	687.13		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 88
 DATE :02/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°35.37
 start stop duration Lon E 12°56.39
 TIME :12:17:02 12:38:16 21.2 (min) Purpose : 3
 LOG : 2343.79 2344.96 1.2 Region : 4054
 FDEPTH: 32 31 Gear cond.: 0
 BDEPTH: 32 31 Validity : 0
 Towing dir: 0° Wire out : 95 m Speed : 3.3 kn
 Sorted : 165 Total catch: 584.17 Catch/hour: 1650.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pteroscion peli	444.38	6172	26.93	
Brachydeuterus auritus	348.16	6876	21.10	149
Ilisha africana	227.97	12455	13.81	
Sphyræna sphyraena	166.33	48	10.08	
Pseudotolithus senegalensis	137.01	254	8.30	148
Galeoides decadactylus	132.60	709	8.04	
Gymnura micrura	39.97	11	2.42	
Pomadasy incisus	26.69	257	1.62	
Chloroscombrus chrysurus	20.93	169	1.27	
Trichiurus lepturus	19.86	302	1.20	
Raja miraletus	19.77	54	1.20	
Dasyatis marmorata	10.37	8	0.63	
Drepane africana	6.75	17	0.41	
Selene dorsalis	6.67	107	0.40	
Scomberomorus tritor	5.88	3	0.36	
Stromateus fiatola	5.51	8	0.33	
J E L Y F I S H	5.43	0	0.33	
Ephippion guttifer	5.42	8	0.33	
Chilomycterus spinosus mauret.	4.52	8	0.27	
CARCHARHINIDAE	3.81	3	0.23	
Torpedo marmorata	2.49	8	0.15	
Pentaneumus quinquarius	1.86	25	0.11	
Arius parkii	1.86	8	0.11	
Portunus validus	1.33	8	0.08	
penaeus notialis, female	1.16	71	0.07	
Dasyatis margarita	1.16	8	0.07	
penaeus notialis, male	0.99	45	0.06	
Euclinostomus melanopterus	0.71	8	0.04	
Dicologlossa cuneata	0.62	8	0.04	
Total	1650.21		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 87
 DATE :02/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°36.80
 start stop duration Lon E 12°47.97
 TIME :10:18:49 10:47:39 28.8 (min) Purpose : 3
 LOG : 2330.69 2332.24 1.6 Region : 4054
 FDEPTH: 70 70 Gear cond.: 0
 BDEPTH: 70 70 Validity : 0
 Towing dir: 0° Wire out : 182 m Speed : 3.2 kn
 Sorted : 223 Total catch: 222.62 Catch/hour: 463.47

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasy jubelini	283.76	656	61.23	
Raja miraletus	37.58	142	8.11	
Galeoides decadactylus	36.33	94	7.84	
Trichiurus lepturus	32.89	65	7.10	
Rhinobatos albomaculatus	23.63	19	5.10	
Squatina oculata	10.62	2	2.29	
Dasyatis marmorata	6.43	12	1.39	
Zeus faber	4.75	12	1.02	
Pagellus bellottii	3.54	83	0.76	147
Octopus vulgaris	3.06	10	0.66	
Sepia orbignyana	2.85	15	0.62	
Brachydeuterus auritus	2.79	23	0.60	146
Lagocephalus laevigatus	2.48	8	0.53	
Cynoglossus canariensis	2.23	12	0.48	
Alloteuthis africana	2.04	1133	0.44	
Decapterus rhonchus	1.79	29	0.39	
Grammolites gruvelli	1.27	29	0.27	
Fistularia petimba	1.17	2	0.25	
Citharus linguatula	1.12	42	0.24	
Dactylopterus volitans	0.77	2	0.17	
Chelidonichthys capensis	0.73	6	0.16	
Uranoscopus polli	0.50	2	0.11	
Boops boops	0.37	21	0.08	
Dentex congoensis	0.27	19	0.06	
Saurida brasiliensis	0.25	73	0.05	
Serranus accraensis	0.06	2	0.01	
Starfish	0.06	4	0.01	
Decapterus punctatus	0.04	2	0.01	
Ephippion guttifer	0.04	2	0.01	
GOBIIDAE	0.02	6	0.00	
Arnoglossus imperialis	0.02	2	0.00	
Total	463.47		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 89
 DATE :02/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°33.44
 start stop duration Lon E 12°56.29
 TIME :13:34:51 14:04:53 30.0 (min) Purpose : 3
 LOG : 2349.77 2351.44 1.7 Region : 4054
 FDEPTH: 28 27 Gear cond.: 0
 BDEPTH: 28 27 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.3 kn
 Sorted : 143 Total catch: 546.31 Catch/hour: 1091.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	594.30	6326	54.43	150
Galeoides decadactylus	148.48	1147	13.60	
Pomadasy peroteti	73.29	228	6.71	
Sphyræna sphyraena	70.25	372	6.43	
Drepane africana	64.56	182	5.91	
Chloroscombrus chrysurus	58.26	478	5.34	
Ephippion guttifer	11.55	16	1.06	
Selene dorsalis	9.71	206	0.89	
Pseudotolithus senegalensis	8.05	8	0.74	
Torpedo nobiliana	7.81	16	0.72	
Arius parkii	6.54	22	0.60	
Cynoglossus canariensis	6.38	8	0.58	
Raja miraletus	5.10	8	0.47	
Rhinobatos albomaculatus	5.10	8	0.47	
Euclinostomus melanopterus	4.10	60	0.38	
Pomadasy incisus	3.04	60	0.28	
CARCHARHINIDAE	2.90	2	0.27	
Scomberomorus tritor	2.16	2	0.20	
Sardinella maderensis	1.74	8	0.16	
Dasyatis marmorata	1.74	8	0.16	
Epinephelus aeneus	1.68	8	0.15	
Sparus caeruleostictus *	1.14	8	0.10	
Portunus validus	1.06	8	0.10	
Lagocephalus laevigatus	0.98	8	0.09	
E C H I N O D E R M A T A	0.92	957	0.08	
Chilomycterus spinosus mauret.	0.60	8	0.05	
G A S T R O P O D S	0.46	22	0.04	
Total	1091.89		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 90
 DATE :02/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°15.81
 start stop duration Lon E 12°46.88
 TIME :16:41:00 17:00:38 19.6 (min) Purpose : 3
 LOG : 2373.74 2374.72 1.0 Region : 4054
 FDEPTH: 25 25 Gear cond.: 0
 BDEPTH: 25 25 Validity : 0
 Towing dir: 0° Wire out : 90 m Speed : 3.0 kn
 Sorted : 120 Total catch: 119.56 Catch/hour: 365.44

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 92
 DATE :02/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°29.58
 start stop duration Lon E 12°14.39
 TIME :23:32:11 00:02:28 30.3 (min) Purpose : 3
 LOG : 2417.34 2418.93 1.6 Region : 4054
 FDEPTH: 527 527 Gear cond.: 0
 BDEPTH: 527 527 Validity : 0
 Towing dir: 0° Wire out : 1230 m Speed : 3.1 kn
 Sorted : 27 Total catch: 296.91 Catch/hour: 588.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadoury jubelini	81.92	691	22.42	
Sparus caeruleostictus *	68.62	452	18.78	
Galeoides decadactylus	33.93	134	9.28	
Rhinobatos albomaculatus	33.93	12	9.28	
Drepane africana	23.69	55	6.48	
Lutjanus goreensis	18.64	3	5.10	
Pseudotolithus typus	13.75	3	3.76	
Chilomycterus spinosus mauret.	9.78	9	2.68	
Carcharhinus falciformis *	8.71	6	2.38	
Ilisha africana	7.67	425	2.10	
Brachydeuterus auritus	7.58	379	2.07	151
Sphyrna guachancho	6.51	9	1.78	
Scyllarides herklotsii	6.51	15	1.78	
Pseudupeneus prayensis	5.13	180	1.41	
Elops lacerta	4.74	12	1.30	
Pseudotolithus senegalensis	4.62	6	1.26	
Balistes capriscus	4.49	9	1.23	
Lutjanus fulgens	3.24	6	0.89	
Epinephelus aeneus	3.06	3	0.84	
Chaetodon hoefleri	2.60	49	0.71	
Panulirus regius	2.32	6	0.64	
Scorpaena angolensis	2.02	31	0.55	
Pteroscion peli	1.99	21	0.54	
Raja miraletus	1.83	3	0.50	
Syacium micrum	1.80	12	0.49	
Dentex barnardi	1.41	6	0.38	
Trichiurus lepturus	1.10	40	0.30	
Zanobatus shoeneleini	0.92	3	0.25	
Selene dorsalis	0.70	9	0.19	
Rypticus saponaceus *	0.64	6	0.18	
Chloroscombrus chrysurus	0.46	3	0.13	
Trachinotus ovatus	0.43	3	0.12	
Boops boops	0.34	15	0.09	
Penaeus kerathurus	0.24	6	0.07	
Penaeus notialis	0.12	6	0.03	
Total	365.44		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	270.28	63297	45.94	
Yarrella blackfordi	82.61	2158	14.04	
PORIFERA (Sponges)	49.26	17067	8.37	
Hoplostethus cadenati	49.26	1504	8.37	
Triplophos hemingi	22.23	2637	3.78	
Lamprogrammus exutus	20.05	1221	3.41	
Aristeus varidens, female	13.51	697	2.30	
Stereomastis sp.	11.99	1613	2.04	
Stomias boa boa	11.12	218	1.89	
Starfish	8.28	218	1.41	
Benthodesmus tenuis	8.06	262	1.37	
Centrophorus squamosus	7.23	2	1.23	
VITRELEDONELLIDAE	7.19	22	1.22	
Aristeus varidens, male	5.23	610	0.89	
Chaceon maritae	4.80	14	0.82	
Gadella imberbis	3.27	131	0.56	
Scymnodon squamulosus	2.83	22	0.48	
Photomectes braueri	2.83	349	0.48	
Halosaurus ovenii	1.96	87	0.33	
Xenodermichthys copei	1.09	44	0.19	
Raja confundens	1.09	44	0.19	
GALATHEIDAE *	0.87	327	0.15	
Malacocephalus occidentalis	0.87	22	0.15	
Ariomma bondi	0.87	22	0.15	
Shrimps, small, non comm.	0.65	436	0.11	
Chaunax pictus	0.22	22	0.04	
Conger conger	0.22	44	0.04	
DICERATIIDAE	0.22	22	0.04	
Hymenocephalus italicus	0.22	22	0.04	
Total	588.33		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 91
 DATE :02/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°32.35
 start stop duration Lon E 12°15.60
 TIME :21:47:49 22:21:22 33.6 (min) Purpose : 3
 LOG : 2410.74 2412.26 1.5 Region : 4054
 FDEPTH: 703 711 Gear cond.: 0
 BDEPTH: 703 711 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 2.7 kn
 Sorted : 34 Total catch: 377.08 Catch/hour: 674.16

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 93
 DATE :03/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°27.93
 start stop duration Lon E 12°17.25
 TIME :01:17:02 01:48:34 31.5 (min) Purpose : 3
 LOG : 2422.92 2424.61 1.7 Region : 4054
 FDEPTH: 430 429 Gear cond.: 0
 BDEPTH: 430 429 Validity : 0
 Towing dir: 0° Wire out : 1030 m Speed : 3.2 kn
 Sorted : 19 Total catch: 153.40 Catch/hour: 292.01

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarrella blackfordi	187.81	4543	27.86	
PORIFERA (Sponges)	151.43	98430	22.46	
Triplophos hemingi	63.52	6805	9.42	
Merluccius polli	58.02	79	8.61	
Nezumia micromyodon	38.94	964	5.78	
Hoplostethus cadenati	30.09	787	4.46	
Stereomastis sp.	25.17	2183	3.73	
Lamprogrammus exutus	21.44	39	3.18	
Chaceon maritae	12.78	20	1.90	
Aristeus varidens, female	12.59	492	1.87	
Stomias boa boa	12.39	275	1.84	
Dicrolene intronigra	7.47	472	1.11	
J E L Y F I S H	5.31	138	0.79	
Shrimps, small, non comm.	4.72	944	0.70	
Dibranchius atlanticus	4.72	315	0.70	
Anemones, pink	4.52	20	0.67	
Photomectes braueri	4.33	197	0.64	
THYSANOTEUTHIDAE	4.33	20	0.64	
Halosaurus ovenii	4.33	59	0.64	
Xenodermichthys copei	4.33	216	0.64	
Bassanago albescens	3.74	118	0.55	
Etmopterus pusillus	2.56	39	0.38	
Taonius pavo	2.36	59	0.35	
Raja confundens	1.97	59	0.29	
Synaphobranchus kaupii	1.38	39	0.20	
MYCTOPHIDAE	1.18	39	0.18	
Aristeus varidens, male	0.79	98	0.12	
Glyphus marsupialis	0.79	79	0.12	
Nephropsis atlantica	0.59	98	0.09	
Melanocetus johnsoni	0.39	20	0.06	
CHLOROPHTHALMIDAE	0.20	20	0.03	
Total	674.16		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
PORIFERA (Sponges)	108.86	55645	37.28	
Shrimps, small, non comm.	36.24	35031	12.41	
Merluccius polli	32.17	74	11.02	152
Stomias boa boa	14.92	386	5.11	
Nematocarcinus africanus	10.13	2572	3.47	
Laemonea laureysi	8.26	67	2.83	
Centrophorus squamosus	8.09	2	2.77	
Aristeus varidens, female	7.33	320	2.51	
Dibranchius atlanticus	7.06	533	2.42	
Yarrella blackfordi	6.53	227	2.24	
Triplophos hemingi	6.13	879	2.10	
Chaunax pictus	5.33	107	1.83	
Aristeus varidens, male	5.20	586	1.78	
Gadella imberbis	4.53	320	1.55	
Photomectes braueri	4.53	280	1.55	
Ruvettus pretiosus	4.26	13	1.46	
Coelorrhinchus coelorrhinchus	3.60	40	1.23	
Benthodesmus tenuis	2.27	93	0.78	
Stereomastis sp.	1.73	200	0.59	
Hymenocephalus italicus	1.73	160	0.59	
Sergestes sp.	1.60	173	0.55	
THYSANOTEUTHIDAE	1.47	27	0.50	
Xenodermichthys copei	1.33	93	0.46	
Trichiurus lepturus	1.22	4	0.42	
Malacocephalus laevis	1.20	27	0.41	
Chaceon maritae	1.09	4	0.37	
Munidopsis sp.	1.07	200	0.37	
Taonius pavo	0.93	40	0.32	
Nezumia aequalis	0.93	53	0.32	
Raja confundens	0.67	13	0.23	
Plesiopenaeus edwardsianus	0.40	13	0.14	
Halosaurus ovenii	0.27	13	0.09	
G A S T R O P O D S	0.27	27	0.09	
Monomitopus metriostoma	0.27	27	0.09	
Nemichthys scolopaceus	0.27	13	0.09	
Etmopterus spinax	0.13	13	0.05	
Total	292.01		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 94
 DATE :03/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°25.36
 start stop duration Lon E 12°27.42
 TIME :04:49:12 05:12:56 23.7 (min) Purpose : 3
 LOG : 2435.54 2436.76 1.2 Region : 4054
 FDEPTH: 116 116 Gear cond.: 0
 BDEPTH: 116 116 Validity : 0
 Towing dir: 0° Wire out : 310 m Speed : 3.1 km
 Sorted : 177 Total catch: 176.79 Catch/hour: 447.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Dentex angolensis	122.38	625	27.38
Trachurus trecae	102.02	131	22.82
Brotula barbata	37.93	33	8.48
Dentex congoensis	33.00	574	7.38
Lagocephalus laevigatus	22.28	30	4.98
Pagellus bellottii	17.57	187	3.93
Sepia officinalis	16.31	13	3.65
Spicara alta	15.98	453	3.57
Chelidonichthys gabonensis	14.08	86	3.15
Umbrina canariensis	9.89	23	2.21
Raja miraletus	9.68	15	2.17
Brachydeuterus auritus	8.14	40	1.82
Octopus vulgaris	5.99	8	1.34
Citharus linguatula	4.40	200	0.98
Torpedo torpedo	4.02	3	0.90
Trigla lyra	3.92	35	0.88
Uranoscopus polli	3.39	15	0.76
Chaetodipterus lippei	3.36	3	0.75
Zeus faber	3.26	8	0.73
Boops boops	2.96	86	0.66
Scorpaena stephanica	2.53	8	0.57
Perulibatrachus rossignoli	1.42	8	0.32
Bathyroconger vicinus	0.96	10	0.21
Arnoglossus imperialis	0.78	86	0.18
Sepia orbignyana	0.46	8	0.10
Serranus cabrilla	0.28	3	0.06
Squilla mantis	0.03	3	0.01
Total	447.00		100.00

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 95
 DATE :03/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°22.27
 start stop duration Lon E 12°33.43
 TIME :07:19:22 07:48:51 29.5 (min) Purpose : 3
 LOG : 2444.88 2446.42 1.5 Region : 4054
 FDEPTH: 86 85 Gear cond.: 0
 BDEPTH: 86 85 Validity : 0
 Towing dir: 0° Wire out : 216 m Speed : 3.1 km
 Sorted : 105 Total catch: 104.59 Catch/hour: 212.80

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Dentex congoensis	58.29	714	27.39
Dentex angolensis	25.43	256	11.95
Trigla lyra	18.92	163	8.89
Brachydeuterus auritus	12.21	293	5.74
Trachurus trecae	11.29	362	5.31
Pseudupeneus prayensis	11.21	175	5.27
Squatina oculata	10.99	2	5.16
Pagellus bellottii	10.44	104	4.90
Sepia officinalis	9.03	8	4.25
Trichiurus lepturus	8.75	14	4.11
Raja miraletus	5.74	8	2.70
Brotula barbata	5.19	4	2.44
Zeus faber	4.64	12	2.18
Chelidonichthys gabonensis	3.56	20	1.67
Dentex barnardi	3.50	10	1.64
Uranoscopus polli	3.15	18	1.48
Citharus linguatula	2.93	114	1.38
Umbrina canariensis	1.57	4	0.74
Fistularia petimba	1.32	4	0.62
Octopus vulgaris	1.00	2	0.47
Lagocephalus laevigatus	0.92	10	0.43
Illex coindetii	0.75	10	0.35
Sepia orbignyana	0.61	20	0.29
Cephalopholis nigri	0.39	2	0.18
Arnoglossus imperialis	0.37	41	0.17
Saurida brasiliensis	0.26	79	0.12
Chaetodon hoefleri	0.20	4	0.10
Loligo vulgaris	0.12	22	0.06
Lophiodes kempii	0.02	2	0.01
Total	212.80		100.00

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 96
 DATE :03/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°21.50
 start stop duration Lon E 12°39.16
 TIME :09:22:15 09:50:45 28.5 (min) Purpose : 3
 LOG : 2453.35 2454.73 1.4 Region : 4054
 FDEPTH: 63 57 Gear cond.: 0
 BDEPTH: 63 57 Validity : 0
 Towing dir: 0° Wire out : 160 m Speed : 2.9 km
 Sorted : 48 Total catch: 48.16 Catch/hour: 101.39

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagellus bellottii	31.79	347	31.35
Trichiurus lepturus	11.05	25	10.90
Raja miraletus	10.13	29	9.99
Sepia officinalis	8.91	17	8.78
Chilomycterus spinosus mauret.	7.43	2	7.33
Decapterus rhonchus	3.66	4	3.61
Sparus caeruleostictus *	2.84	8	2.80
Octopus vulgaris	2.67	8	2.64
Torpedo torpedo	2.38	6	2.35
J E L Y F I S H	2.36	2	2.33
Chelidonichthys gabonensis	2.29	13	2.26
Fistularia petimba	2.27	6	2.24
Loligo vulgaris	1.81	1539	1.79
Rhinobatos albomaculatus	1.79	2	1.76
Bembrops heterurus	1.49	40	1.47
Lycondontis afer	1.47	2	1.45
Zeus faber	1.37	2	1.35
Cynoglossus canariensis	1.33	6	1.31
Lagocephalus laevigatus	1.09	4	1.08
Brachydeuterus auritus	0.61	4	0.60
Citharus linguatula	0.55	27	0.54
Dentex barnardi	0.53	2	0.52
Arnoglossus imperialis	0.48	76	0.48
Syacium micrurum	0.34	2	0.33
Sepia orbignyana	0.25	4	0.25
Pseudupeneus prayensis	0.21	2	0.21
Trachurus trecae	0.11	2	0.10
Decapterus rhonchus	0.08	2	0.08
Saurida brasiliensis	0.08	29	0.08
Total	101.39		100.00

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 97
 DATE :03/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°18.23
 start stop duration Lon E 12°42.53
 TIME :10:36:42 11:06:24 29.7 (min) Purpose : 3
 LOG : 2459.91 2461.50 1.6 Region : 4054
 FDEPTH: 41 41 Gear cond.: 0
 BDEPTH: 41 41 Validity : 0
 Towing dir: 0° Wire out : 145 m Speed : 3.2 km
 Sorted : 56 Total catch: 56.07 Catch/hour: 113.23

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagellus bellottii	19.39	109	17.12
Sphyræna sphyraena	13.03	44	11.50
Trichiurus lepturus	12.60	22	11.13
Sparus caeruleostictus *	10.80	34	9.54
Raja miraletus	10.50	18	9.27
Pomadasy jubelini	7.75	8	6.85
Dentex barnardi	5.84	20	5.15
Bothus podas africanus	4.85	32	4.28
Dentex canariensis	4.69	8	4.14
Rhinobatos albomaculatus	4.64	4	4.10
Chilomycterus spinosus mauret.	3.86	18	3.41
Chelidonichthys capensis	2.28	12	2.02
Alloteuthis africana	1.72	1006	1.52
Caranx crysos	1.60	2	1.41
Seriola carpenteri	1.58	2	1.39
Epinephelus aeneus	1.58	4	1.39
Fistularia petimba	1.17	4	1.03
Trachinus armatus	0.95	10	0.84
Balistes caprisicus	0.91	2	0.80
Trachinocephalus myops	0.91	6	0.80
Lagocephalus laevigatus	0.50	2	0.45
Heart urchin	0.44	12	0.39
Xyrichtys novacula	0.34	2	0.30
Sepia orbignyana	0.30	10	0.27
Uranoscopus polli	0.26	2	0.23
Grammolites gruvelli	0.24	6	0.21
Starfish	0.14	4	0.12
Dactylopterus volitans	0.12	2	0.11
Citharus linguatula	0.08	6	0.07
Pseudupeneus prayensis	0.06	4	0.05
Arnoglossus imperialis	0.04	6	0.04
Selene dorsalis	0.02	4	0.02
Saurida brasiliensis	0.02	10	0.02
G A S T R O P O D S	0.02	8	0.02
Total	113.23		100.00

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 98
 DATE :03/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°06.07
 start stop duration Lon E 12°36.72
 TIME :12:37:18 13:07:11 29.9 (min) Purpose : 3
 LOG : 2473.45 2475.03 1.6 Region : 4054
 FDEPTH: 37 38 Gear cond.: 0
 BDEPTH: 37 38 Validity : 0
 Towing dir: 0° Wire out : 125 m Speed : 3.2 km
 Sorted : 20 Total catch: 20.38 Catch/hour: 40.92

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagellus bellottii	10.36	60	25.32
Raja miraletus	6.47	10	15.80
Trachinocephalus myops	3.59	10	8.78
Sepia orbignyana	3.27	8	8.00
Pegusa triophthalmus	2.31	14	5.64
Rhinobatos albomaculatus	2.17	2	5.30
Bothus podas africanus	1.61	28	3.93
Dactylopterus volitans	1.39	2	3.39
Balistes caprisicus	1.22	2	2.99
CORAL	1.20	50	2.94
Uranoscopus polli	1.04	2	2.55
Albula vulpes	1.00	2	2.45
Sparus caeruleostictus *	0.90	2	2.21
Selar crumenophthalmus	0.62	2	1.52
Vanstraelenia chirophthalmus	0.56	2	1.37
MONACANTHIDAE	0.52	4	1.28
Decapterus rhonchus	0.48	8	1.18
Chelidonichthys capensis	0.48	2	1.18
Sphyræna sphyraena	0.42	2	1.03
Lagocephalus laevigatus	0.38	2	0.93
Chilomycterus spinosus mauret.	0.34	2	0.83
Xyrichtys novacula	0.34	2	0.83
B I V A L V E S	0.20	24	0.49
Calappa pelii	0.02	2	0.05
Total	40.92		100.00

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 99
 DATE :03/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°08.37
 start stop duration Lon E 12°32.75
 TIME :14:15:18 14:44:59 29.7 (min) Purpose : 3
 LOG : 2484.05 2485.70 1.6 Region : 4054
 FDEPTH: 47 44 Gear cond.: 0
 BDEPTH: 47 44 Validity : 0
 Towing dir: 0° Wire out : 135 m Speed : 3.3 km
 Sorted : 35 Total catch: 34.87 Catch/hour: 70.52

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pagellus bellottii	34.98	233	49.61
Lagocephalus laevigatus	9.24	36	13.11
Balistes caprisicus	7.52	14	10.67
Sepia orbignyana	2.85	4	4.04
Chelidonichthys capensis	2.10	10	2.98
Trachinocephalus myops	1.68	8	2.38
Chilomycterus spinosus mauret.	1.60	8	2.27
Decapterus rhonchus	1.23	12	1.75
Pegusa triophthalmus	1.21	4	1.72
Seriola carpenteri	1.19	2	1.69
Raja miraletus	1.15	2	1.63
Citharus linguatula	1.11	4	1.58
Sphyræna sphyraena	1.07	6	1.52
Vanstraelenia chirophthalmus	0.91	8	1.29
Bothus podas africanus	0.79	14	1.12
Priacanthus arenatus	0.55	2	0.77
Fistularia petimba	0.47	2	0.66
CORAL	0.42	28	0.60
MONACANTHIDAE	0.18	2	0.26
Trachinus armatus	0.14	2	0.20
B I V A L V E S	0.06	8	0.09
G A S T R O P O D S	0.02	8	0.03
Calappa pelii	0.02	2	0.03
Total	70.52		100.00

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 100
 DATE :03/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°11.55
 start stop duration Lon E 12°17.94
 TIME :17:13:38 17:43:55 30.3 (min) Purpose : 3
 LOG : 2506.54 2508.11 1.6 Region : 4054
 FDEPTH: 120 121 Gear cond.: 0
 BDEPTH: 120 121 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.1 kn
 Sorted : 0 Total catch: 120.21 Catch/hour: 238.20

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 102
 DATE :03/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°11.37
 start stop duration Lon E 11°52.40
 TIME :23:33:11 00:03:52 30.7 (min) Purpose : 3
 LOG : 2544.73 2546.32 1.6 Region : 4054
 FDEPTH: 620 621 Gear cond.: 0
 BDEPTH: 620 621 Validity : 0
 Towing dir: 0° Wire out : 1420 m Speed : 3.1 kn
 Sorted : 26 Total catch: 110.28 Catch/hour: 215.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	46.27	442	19.42	166
Spicara alta	32.10	1005	13.48	
Trichiurus lepturus	30.91	50	12.98	
Trigla lyra	20.71	299	8.69	
Brotula barbata	15.36	16	6.45	
Sepia officinalis	14.96	14	6.28	
Pterothrissus belloci	13.39	93	5.62	
Trachurus trecae	10.48	404	4.40	167
Citharus linguatula	10.28	254	4.32	
Boops boops	7.63	345	3.20	
Torpedo torpedo	4.22	2	1.77	
Zeus faber	4.12	8	1.73	
Scorpaena stephanica	3.76	8	1.58	
Umbrina canariensis	2.91	6	1.22	
Dentex congouensis	2.42	107	1.01	
Raja miraletus	2.40	4	1.01	
Fistularia petimba	2.18	6	0.92	
Lagocephalus laevis	2.16	2	0.91	
Uranoscopus polli	2.12	14	0.89	
Chelidonichthys gabonensis	2.12	10	0.89	
Sepia orbignyana	1.62	38	0.68	
Pagellus bellottii	1.31	8	0.55	
Octopus vulgaris	1.09	8	0.46	
Saurida brasiliensis	1.07	135	0.45	
Bathyrcongus vicinus	1.03	8	0.43	
Lophiodes kemp	0.57	2	0.24	
Illex coindetii	0.48	12	0.20	
B I V A L V E S	0.30	32	0.12	
Arnoglossus imperialis	0.22	24	0.09	
Total	238.20		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	28.54	9908	13.24	
Triplophos hemingi	28.23	1642	13.09	
Lamprogrammus exutus	26.04	109	12.08	
Stereomastis sp.	15.33	1486	7.11	
Nezumia aequalis	13.45	328	6.24	
Yarrella blackfordi	12.43	352	5.77	
Phrynichthys wedli	11.18	16	5.19	
Stomias boa boa	10.79	227	5.01	
Hoplostethus cadenati	10.48	289	4.86	
Aristeus varidens, female	6.73	289	3.12	
Opisthoteuthis agassizi	5.47	8	2.54	
OMMASTREPHIDAE	5.08	63	2.36	
Shrimps, small, non comm.	4.61	1580	2.14	
Chaceon maritae	4.07	10	1.89	
Bathyrcongus vicinus	3.91	78	1.81	
Centrophorus granulosus	3.81	2	1.77	
Benthodesmus tenuis	3.36	125	1.56	
Dibranchius atlanticus	3.05	297	1.41	
Trichiurus lepturus	2.13	4	0.99	
Dicrroleme intronigra	2.11	172	0.98	
Chaunax pictus	1.80	16	0.83	
Xenodermichthys copei	1.80	109	0.83	
Aristeus varidens, male	1.56	196	0.73	
Todaropsis eblanae	1.33	8	0.62	
PORIFERA (Sponges)	1.25	461	0.58	
CONGRIDAE	1.09	8	0.51	
Gonostoma elongatum	0.94	63	0.44	
Gadella imberbis	0.70	23	0.33	
Hymenocephalus italicus	0.70	70	0.33	
Taonius pavo	0.55	16	0.25	
Photomectes braueri	0.47	16	0.22	
Halosaurus ovenii	0.47	8	0.22	
Etmopterus pusillus	0.39	8	0.18	
NETTASTOMATIDAE	0.39	8	0.18	
Heterocarpus grimaldii	0.39	23	0.18	
Cataetx laticeps	0.31	70	0.15	
Synaphobranchus kaupii	0.16	8	0.07	
Caristius maderensis	0.16	16	0.07	
Ectreposebastes sp.	0.16	8	0.07	
Raja confundens	0.08	8	0.04	
CHLOROPHTHALMIDAE	0.08	8	0.04	
Total	215.60		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 101
 DATE :03/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°18.07
 start stop duration Lon E 12°2.05
 TIME :20:35:47 21:03:16 27.5 (min) Purpose : 3
 LOG : 2529.10 2530.34 1.2 Region : 4054
 FDEPTH: 436 429 Gear cond.: 0
 BDEPTH: 436 429 Validity : 0
 Towing dir: 0° Wire out : 1050 m Speed : 2.7 kn
 Sorted : 54 Total catch: 283.10 Catch/hour: 618.12

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 103
 DATE :04/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 7°56.25
 start stop duration Lon E 11°56.68
 TIME :01:40:03 02:10:43 30.7 (min) Purpose : 3
 LOG : 2555.01 2556.63 1.6 Region : 4054
 FDEPTH: 312 318 Gear cond.: 0
 BDEPTH: 312 318 Validity : 0
 Towing dir: 0° Wire out : 745 m Speed : 3.2 kn
 Sorted : 29 Total catch: 120.70 Catch/hour: 236.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	241.27	677	39.03	168
Hymenocephalus italicus	92.47	8352	14.96	
Gadella maraldi	47.60	611	7.70	
J E L L Y F I S H	45.09	19039	7.29	
Chaceon maritae, female	42.58	218	6.89	
Chaceon maritae, male	39.85	98	6.45	
Torpedo nobiliana	31.55	2	5.10	
Benthodesmus tenuis	15.83	546	2.56	
Dibranchius atlanticus	12.12	1026	1.96	
Chaunax pictus	8.95	66	1.45	
Nezumia aequalis	6.99	328	1.13	
Histioteuthis miranda	6.66	33	1.08	
Stereomastis sp.	6.55	524	1.06	
Malacocephalus occidentalis	5.02	33	0.81	
Gadella imberbis	4.15	142	0.67	
Callinectes sp.	3.17	44	0.51	
NETTASTOMATIDAE	2.84	87	0.46	
Halosaurus ovenii	1.42	66	0.23	
Conger conger	1.20	11	0.19	
Yarrella blackfordi	1.09	33	0.18	
Aristeus varidens, female	0.87	44	0.14	
Parapandalus narval	0.66	175	0.11	
Glyphus marsupialis	0.22	11	0.04	
Total	618.12		100.00	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophtalmus atlanticus	113.50	2012	48.05	
Pontinus kuhlii	20.35	211	8.62	
Paramola cuvieri	15.73	8	6.66	
Laemonema laureysi	15.03	172	6.36	
Merluccius polli	10.84	63	4.59	169
Hymenocephalus italicus	7.91	1096	3.35	
Parasudis fraser-bruenneri	7.20	149	3.05	
Munidopsis sp.	5.79	603	2.45	
Malacocephalus occidentalis	5.01	31	2.12	
Parapenaeus longirostris, femal	4.15	462	1.76	
Coelorrhinchus coelorrhinchus	3.21	70	1.36	
Gadella imberbis	2.90	117	1.23	
Shrimps, small, non comm.	2.82	720	1.19	
Pterothrissus belloci	2.74	16	1.16	
Stereomastis sp.	2.66	266	1.13	
MYCTOPHIDAE	2.50	1722	1.06	
Dibranchius atlanticus	2.35	164	0.99	
Synagrops microlepis	2.27	70	0.96	
Triplophos hemingi	1.80	235	0.76	
Benthodesmus tenuis	1.17	55	0.50	
Stomias boa boa	1.10	23	0.46	
Peristedion cataphractum	1.10	70	0.46	
Chascanopsetta lugubris	0.78	16	0.33	
TRIGLIDAE	0.55	16	0.23	
Bathymectes piperitus	0.47	8	0.20	
Bassanago albescens	0.39	8	0.17	
Lophiodes kemp	0.39	16	0.17	
Raja confundens	0.23	16	0.10	
Solenocera africana	0.23	47	0.10	
Bembrops heterurus	0.16	8	0.07	
Parapenaeus longirostris, male	0.16	16	0.07	
Epigonus telescopus	0.16	8	0.07	
Setarches guentheri	0.16	8	0.07	
Aristeus varidens	0.08	8	0.03	
Nemichthys scolopaceus	0.08	8	0.03	
G A S T R O P O D S	0.08	16	0.03	
Chaunax pictus	0.08	8	0.03	
Heterocarpus grimaldii	0.08	8	0.03	
Total	236.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 104
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°5.21 Lon E 11°57.01
 start stop duration Purpose : 3
 TIME :05:07:24 05:37:54 30.5 (min) Region : 4054
 LOG : 2562.01 2563.55 1.5 Gear cond.: 0
 FDEPTH: 265 240 Validity: 0
 BDEPTH: 265 240 Speed : 3.0 km
 Towing dir: 0° Wire out : 660 m Catch/hour: 260.28
 Sorted : 30 Total catch: 132.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	97.38	258	37.41	170
Squatina oculata	24.51	2	9.42	
Chlorophthalmus atlanticus	23.84	738	9.16	
Parapenaeus longirostris, male	22.47	3722	8.63	
Synagrops microlepis	20.40	816	7.84	
Parapenaeus longirostris, femal	18.10	2498	6.95	
MYCTOPHIDAE	14.12	15529	5.43	
Bembrops heterurus	11.41	220	4.38	
Zenopsis conchifer	6.75	10	2.59	
Merluccius polli	3.09	67	1.19	171
Bembrops greyi	2.75	83	1.06	
Trichiurus lepturus	2.48	10	0.95	
Calappa sp.	2.14	96	0.82	
Pontinus accraensis	1.93	31	0.74	
Lophiodes kemp	1.51	14	0.58	
Peristedion cataphractum	1.14	37	0.44	
B I V A L V E S	1.00	128	0.39	
Gephyroberyx darwini	1.00	4	0.39	
Gadella imberbis	0.92	31	0.36	
Nezumia aequalis	0.83	10	0.32	
Malacocephalus occidentalis	0.69	14	0.26	
Pterothrissus bellocci	0.69	4	0.26	
Conger conger	0.51	10	0.20	
Dibranchius atlanticus	0.37	14	0.14	
Microchirus wittei	0.14	4	0.05	
Dicologlossa cuneata	0.10	4	0.04	
Total	260.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 105
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°14.25 Lon E 12°9.29
 start stop duration Purpose : 3
 TIME :07:45:17 08:12:20 27.0 (min) Region : 4054
 LOG : 2580.37 2581.77 1.4 Gear cond.: 0
 FDEPTH: 226 212 Validity: 0
 BDEPTH: 226 212 Speed : 3.1 km
 Towing dir: 0° Wire out : 500 m Catch/hour: 299.09
 Sorted : 31 Total catch: 134.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	105.62	282	35.31	172
Synagrops microlepis	103.58	6175	34.63	
Brotula barbata	38.28	33	12.80	
Zenopsis conchifer	17.31	36	5.79	
Bembrops heterurus	6.79	71	2.27	
Umbrina canariensis	5.72	16	1.91	
Pterothrissus bellocci	4.48	36	1.50	
Gephyroberyx darwini	2.53	16	0.85	
Uranoscopus polli	2.53	16	0.85	
Trichiurus lepturus	2.49	4	0.83	
B I V A L V E S	2.44	40	0.82	
Spicara alta	2.44	11	0.82	
Parapenaeus longirostris, femal	1.20	164	0.40	
Squatina oculata	0.91	11	0.30	
Pontinus accraensis	0.84	4	0.28	
Peristedion cataphractum	0.69	20	0.23	
Octopus vulgaris	0.49	4	0.16	
Parapenaeus longirostris, male	0.33	80	0.11	
Bembrops greyi	0.24	71	0.08	
Monolene microstoma	0.13	4	0.04	
GOBIIDAE	0.04	4	0.01	
Total	299.09		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 106
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°5.24 Lon E 12°0.82
 start stop duration Purpose : 3
 TIME :09:57:46 10:27:27 29.7 (min) Region : 4054
 LOG : 2595.50 2597.02 1.5 Gear cond.: 0
 FDEPTH: 150 150 Validity: 0
 BDEPTH: 150 150 Speed : 3.1 km
 Towing dir: 0° Wire out : 350 m Catch/hour: 234.75
 Sorted : 116 Total catch: 116.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	141.06	669	60.09	173
Spicara alta	24.76	598	10.55	
Raja clavata	15.56	14	6.63	
Brotula barbata	9.03	10	3.85	
Trigla lyra	8.02	55	3.42	
Sphoeroides pachaster	7.98	8	3.40	
Citharus linguatula	3.82	75	1.63	
Zenopsis conchifer	3.72	10	1.58	
Zeus faber	2.93	8	1.25	
Pterothrissus bellocci	2.45	16	1.04	
Branchiostegus semifasciatus *	2.18	2	0.93	
Trachurus trecae	2.12	28	0.90	174
Uranoscopus polli	1.80	8	0.77	
Peristedion cataphractum	1.50	38	0.64	
Ariomma bondi	1.46	24	0.62	
G A S T R O P O D S	1.25	127	0.53	
Trichiurus lepturus	1.19	2	0.51	
Dentex congoensis	1.01	14	0.43	
Umbrina canariensis	0.95	2	0.40	
URCHINS	0.38	2	0.16	
Saurida brasiliensis	0.34	89	0.15	
Boops boops	0.32	14	0.14	
Illex coindetii	0.28	20	0.12	
Dicologlossa cuneata	0.22	4	0.09	
Bembrops heterurus	0.18	2	0.08	
Parapenaeus longirostris	0.10	46	0.04	
Monolene microstoma	0.06	8	0.03	
Octopus vulgaris	0.04	2	0.02	
Starfish	0.02	4	0.01	
Total	234.75		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 107
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°1.63 Lon E 12°3.70
 start stop duration Purpose : 3
 TIME :11:25:35 11:55:07 29.5 (min) Region : 4054
 LOG : 2603.13 2604.70 1.6 Gear cond.: 0
 FDEPTH: 117 120 Validity: 0
 BDEPTH: 117 120 Speed : 3.2 km
 Towing dir: 0° Wire out : 310 m Catch/hour: 368.04
 Sorted : 181 Total catch: 181.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	152.95	1012	41.56	175
Trigla lyra	69.67	642	18.93	
Dentex congoensis	40.32	514	10.95	
Umbrina canariensis	23.36	43	6.35	177
Trachurus trecae	12.57	244	3.42	176
Brotula barbata	9.65	8	2.62	
Squatina oculata	8.23	6	2.24	
Fistularia petimba	7.62	16	2.07	
Branchiostegus semifasciatus *	7.27	6	1.98	
Rhinobatos albomaculatus	5.59	2	1.52	
Citharus linguatula	4.45	136	1.21	
Zeus faber	3.72	8	1.01	
Raja miraletus	3.53	6	0.96	
Dentex barnardi	3.45	8	0.94	
Spicara alta	2.97	112	0.81	
Trichiurus lepturus	2.46	4	0.67	
Saurida brasiliensis	2.44	756	0.66	
Sepia orbignyana	1.75	14	0.47	
Sepia officinalis	1.54	2	0.42	
Zenopsis conchifer	0.97	2	0.26	
Pterothrissus bellocci	0.79	2	0.22	
Ariomma bondi	0.75	14	0.20	
Illex coindetii	0.75	47	0.20	
Scorpaena stephanica	0.30	2	0.08	
Boops boops	0.28	14	0.08	
G A S T R O P O D S	0.26	43	0.07	
Peristedion cataphractum	0.24	4	0.07	
Arnoglossus imperialis	0.14	16	0.04	
Starfish	0.02	2	0.01	
Total	368.04		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 108
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 7°2.05 Lon E 12°6.99
 start stop duration Purpose : 3
 TIME :12:43:54 13:13:06 29.2 (min) Region : 4054
 LOG : 2608.52 2610.15 1.6 Gear cond.: 0
 FDEPTH: 113 111 Validity: 0
 BDEPTH: 113 111 Speed : 3.3 km
 Towing dir: 0° Wire out : 290 m Catch/hour: 278.70
 Sorted : 62 Total catch: 135.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	96.75	1541	34.71	178
Dentex congoensis	55.26	497	19.83	
Trigla lyra	30.81	193	11.06	
Trachurus trecae	21.65	583	7.77	179
Rhinobatos albomaculatus	16.12	6	5.79	
Sepia orbignyana	8.63	53	3.10	
Squatina oculata	7.50	2	2.69	
Saurida brasiliensis	7.44	2005	2.67	
Zeus faber	5.87	16	2.11	
Brotula barbata	5.67	4	2.03	
Citharus linguatula	4.31	136	1.55	
Spicara alta	3.20	115	1.15	
Raja miraletus	3.12	4	1.12	
Fistularia petimba	3.04	8	1.09	
Pterothrissus bellocci	2.92	16	1.05	
Lagocephalus laevigatus	1.68	4	0.60	
Uranoscopus polli	1.36	4	0.49	
Illex coindetii	1.19	62	0.43	
Dentex barnardi	1.11	4	0.40	
Lophiodes kemp	0.58	2	0.21	
Boops boops	0.16	12	0.06	
Octopus vulgaris	0.12	4	0.04	
G A S T R O P O D S	0.12	16	0.04	
Arnoglossus imperialis	0.08	12	0.03	
Total	278.70		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 109
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°56.78 Lon E 12°10.88
 start stop duration Purpose : 3
 TIME :14:18:17 14:47:37 29.3 (min) Region : 4054
 LOG : 2617.93 2619.41 1.5 Gear cond.: 0
 FDEPTH: 87 88 Validity: 0
 BDEPTH: 87 88 Speed : 3.0 km
 Towing dir: 0° Wire out : 221 m Catch/hour: 32.94
 Sorted : 16 Total catch: 16.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	5.26	51	15.95	181
Umbrina canariensis	4.81	8	14.59	
Lagocephalus laevigatus	3.33	2	10.12	
Trichiurus lepturus	3.01	4	9.12	
Trigla lyra	2.56	22	7.76	
Sparus caeruleostictus *	2.21	4	6.70	
Dentex congoensis	2.09	31	6.33	
Trachurus trecae	2.00	70	6.08	180
Torpedo marmorata	1.80	2	5.46	
Pagellus bellottii	1.43	10	4.35	
Raja miraletus	1.41	2	4.28	
Dentex barnardi	1.39	4	4.22	
Uranoscopus polli	0.45	2	1.37	
Citharus linguatula	0.37	12	1.12	
Branchiostegus semifasciatus *	0.35	2	1.06	
G A S T R O P O D S	0.16	29	0.50	
Illex coindetii	0.14	12	0.43	
Saurida brasiliensis	0.08	25	0.25	
Arnoglossus imperialis	0.04	4	0.12	
Sepia orbignyana	0.04	2	0.12	
C R A B S	0.02	2	0.06	
Total	32.94		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 110
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°57.29
 start stop duration Lon E 12°13.78
 TIME :15:25:30 15:54:16 28.8 (min) Purpose : 3
 LOG : 2622.79 2624.36 1.6 Region : 4054
 FDEPTH: 82 81 Gear cond.: 0
 BDEPTH: 82 81 Validity : 0
 Towing dir: 0° Wire out : 210 m Speed : 3.3 km
 Sorted : 188 Total catch: 318.47 Catch/hour: 664.17

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	312.26	707	47.02	182
Pomadasyus incisus	90.95	377	13.69	
Pagellus bellottii	65.94	471	9.93	183
Dentex angolensis	60.23	332	9.07	184
Raja miraletus	25.28	42	3.81	
Trachurus trecae	23.19	31	3.49	
Dentex congoensis	13.91	148	2.09	
Dentex barnardi	13.18	56	1.98	
Squatina oculata	12.72	4	1.92	
Trachurus trecae	7.72	277	1.16	185
Sepia officinalis	6.19	6	0.93	
Sparus pagrus africanus *	5.82	6	0.88	
Dentex canariensis	3.71	4	0.56	
Cynoglossus canariensis	3.67	15	0.55	
Sparus caeruleostictus *	3.52	6	0.53	
Priacanthus arenatus	2.09	4	0.31	
Fistularia petimba	2.00	6	0.30	
Rhinobatos albomaculatus	1.98	2	0.30	
Zeus faber	1.94	4	0.29	
Chaetodon hoefleri	1.84	10	0.28	
Trigla lyra	1.56	15	0.24	
Citharus linguatula	1.27	46	0.19	
B I V A L V E S	1.27	121	0.19	
Chelidonichthys gabonensis	0.79	4	0.12	
Saurida brasiliensis	0.58	184	0.09	
Sepia orbignyana	0.27	15	0.04	
Pseudupeneus prayensis	0.27	6	0.04	
Total	664.17		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 111
 DATE :04/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°48.63
 start stop duration Lon E 12°0.75
 TIME :17:45:30 18:16:01 30.5 (min) Purpose : 3
 LOG : 2639.03 2640.55 1.5 Region : 4054
 FDEPTH: 90 89 Gear cond.: 0
 BDEPTH: 90 89 Validity : 0
 Towing dir: 0° Wire out : 230 m Speed : 3.0 km
 Sorted : 33 Total catch: 130.20 Catch/hour: 255.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chelidonichthys gabonensis	136.04	629	53.15	
Pagellus bellottii	30.67	912	11.98	
Rhinobatos albomaculatus	25.95	8	10.14	
Trigla lyra	23.98	181	9.37	
Raja miraletus	20.76	39	8.11	
Trachinus aeneatus	4.40	47	1.72	
Sepia orbignyana	4.40	181	1.72	
Uranoscopus polli	4.09	16	1.60	
Citharus linguatula	2.75	582	1.08	
Arnoglossus imperialis	1.57	322	0.61	
Grammoplites gruvelli	0.55	8	0.22	
Illex coindetii	0.47	16	0.18	
Brotula barbata	0.24	24	0.09	
Saurida brasiliensis	0.08	16	0.03	
Total	255.96		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 112
 DATE :04/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°58.13
 start stop duration Lon E 11°40.42
 TIME :21:43:57 22:18:13 34.3 (min) Purpose : 3
 LOG : 2665.14 2666.71 1.6 Region : 4054
 FDEPTH: 721 723 Gear cond.: 0
 BDEPTH: 721 723 Validity : 0
 Towing dir: 0° Wire out : 1600 m Speed : 2.8 km
 Sorted : 36 Total catch: 154.25 Catch/hour: 270.06

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
HOLUTHUROIDEA	86.35	49	31.97	
Coelorinchus coelorhincus	37.75	784	13.98	
Yarella blackfordi	22.83	553	8.45	
Stereomastis sp.	21.64	2871	8.01	
Merluccius polli	14.36	21	5.32	186
Triplophos hemingi	10.50	1275	3.89	
Bathyroconger vicinus	9.03	63	3.35	
Shrimps, small, non comm.	7.77	1716	2.88	
Hoplostethus cadenati	7.07	182	2.62	
Stomias boa boa	6.37	140	2.36	
FORTIFERA (Sponges)	5.46	1541	2.02	
Sea cucumber	5.46	28	2.02	
Raja confundens	5.11	14	1.89	
Chaceon maritae	3.24	7	1.20	
THYSANOTEUTHIDAE	3.01	14	1.12	
Anemones, pink	2.87	7	1.06	
Aristeus varidens, female	2.73	112	1.01	
Dicrolene intronigra	2.52	217	0.93	
Halosaurus ovenii	2.45	49	0.91	
Lophius vaillanti	1.75	7	0.65	
Xenodermichthys copei	1.68	77	0.62	
GONOSTOMATIDAE	1.68	168	0.62	
Dibranchius atlanticus	1.40	56	0.52	
Melanocetus johnsoni	1.26	28	0.47	
Gonostoma denudata	0.77	70	0.29	
CONGRIDAE	0.70	7	0.26	
Monomitopus metriostoma	0.56	7	0.21	
MYCTOPHIDAE	0.56	28	0.21	
GALATHEIDAE *	0.49	224	0.18	
Glyphus marsupialis	0.49	28	0.18	
E C H I N O D E R M A T A	0.49	140	0.18	
Nephropsis atlantica	0.42	28	0.16	
Cataetyx laticeps	0.28	14	0.10	
SCORPAENIDAE	0.28	7	0.10	
Munidopsis sp.	0.28	21	0.10	
ALEPOCEPHALIDAE	0.28	7	0.10	
OPHIDIIDAE	0.07	7	0.03	
Aristeus varidens, male	0.07	7	0.03	
Total	270.06		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 113
 DATE :04/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°54.00
 start stop duration Lon E 11°43.05
 TIME :23:43:09 00:13:20 30.2 (min) Purpose : 3
 LOG : 2674.20 2675.80 1.6 Region : 4054
 FDEPTH: 512 512 Gear cond.: 0
 BDEPTH: 512 512 Validity : 0
 Towing dir: 0° Wire out : 1170 m Speed : 3.2 km
 Sorted : 26 Total catch: 66.19 Catch/hour: 131.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	38.03	17282	28.90	
Stereomastis sp.	12.29	1123	9.34	
Lamprogrammus exutus	12.23	20	9.29	
Aristeus varidens, female	10.99	682	8.35	
Triplophos hemingi	9.70	1113	7.37	
Chaunax pictus	9.05	95	6.87	
Aristeus varidens, male	4.57	179	3.47	
Stomias boa boa	4.33	109	3.29	
Malacocephalus occidentalis	3.28	50	2.49	
Laemonema laureysi	2.98	125	2.27	
Benthodesmus tenuis	2.88	89	2.19	
Yarella blackfordi	2.74	60	2.08	
GALATHEIDAE *	1.85	1093	1.41	
THYSANOTEUTHIDAE	1.75	16	1.33	
Halosaurus ovenii	1.65	40	1.25	
Gadella imberbis	1.55	56	1.18	
Dicrolene intronigra	1.45	145	1.10	
Nezumia aequalis	1.39	40	1.06	
Hoplostethus cadenati	1.15	30	0.88	
Merluccius polli	1.05	2	0.80	
Chaceon maritae	1.05	6	0.80	
Etmopterus spinax	0.76	16	0.57	
J E L Y F I S H	0.76	10	0.57	
Photomectes braueri	0.66	46	0.50	
Glyphus marsupialis	0.40	195	0.30	
Bathymectes piperitus	0.36	6	0.27	
Dibranchius atlanticus	0.36	26	0.27	
Synaphobranchus kaupii	0.36	36	0.27	
PORIFERA (Sponges)	0.26	70	0.20	
NETTASTOMATIDAE	0.26	6	0.20	
Monomitopus metriostoma	0.26	26	0.20	
MYCTOPHIDAE	0.20	155	0.15	
Raja confundens	0.20	10	0.15	
Lophius vaillanti	0.20	6	0.15	
Ectreposebastes sp.	0.10	6	0.08	
GONOSTOMATIDAE	0.10	30	0.08	
Lampadena pontifex	0.10	6	0.08	
CHLOROPHTHALMIDAE	0.06	6	0.05	
Nemichthys scolopaceus	0.06	6	0.05	
Argyropelecus aculeatus	0.06	6	0.05	
CYNGLOSSIDAE	0.06	6	0.05	
Xenodermichthys copei	0.06	6	0.05	
Total	131.59		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 114
 DATE :05/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°53.97
 start stop duration Lon E 11°45.17
 TIME :01:18:09 01:48:40 30.5 (min) Purpose : 3
 LOG : 2680.17 2681.70 1.5 Region : 4054
 FDEPTH: 439 447 Gear cond.: 0
 BDEPTH: 439 447 Validity : 0
 Towing dir: 0° Wire out : 1010 m Speed : 3.0 km
 Sorted : 35 Total catch: 140.72 Catch/hour: 276.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
HISTIOTEUTHIDAE	85.91	10	31.05	
Lophius vaillanti	28.94	18	10.46	
Stereomastis sp.	17.67	1818	6.39	
Merluccius polli	17.60	41	6.36	187
Laemonema laureysi	17.18	163	6.21	
Aristeus varidens, female	13.88	981	5.02	
Yarella blackfordi	11.76	366	4.25	
Nematocarcinus africanus	11.52	4518	4.16	
Benthodesmus tenuis	9.36	299	3.38	
Chaunax pictus	8.41	153	3.04	
Centrophorus granulosus	7.27	2	2.63	
Guentherus altivela	6.88	4	2.49	
Triplophos hemingi	5.39	751	1.95	
Chaceon maritae, male	4.97	10	1.80	
Trichiurus lepturus	3.87	4	1.40	
Hymenocephalus italicus	3.30	317	1.19	
Aristeus varidens, male	3.20	431	1.16	
Malacocephalus occidentalis	2.81	18	1.02	
Etmopterus spinax	2.75	49	0.99	
Stomias boa boa	2.08	41	0.75	
Chaceon maritae, female	1.85	10	0.67	
Dibranchius atlanticus	1.53	108	0.55	
Dicrolene intronigra	1.40	87	0.50	
Lamprogrammus exutus	1.08	4	0.39	
Halosaurus ovenii	1.08	45	0.39	
Galeus polli	0.94	14	0.34	
CONGRIDAE	0.77	14	0.28	
Plesiopenaeus edwardsianus	0.63	14	0.23	
Bathymectes sp.	0.41	4	0.15	
Shrimps, small, non comm.	0.35	185	0.13	
Gadella imberbis	0.35	14	0.13	
NETTASTOMATIDAE	0.31	18	0.11	
Nezumia aequalis	0.31	18	0.11	
L O B S T E R S	0.22	145	0.08	
Chlorophthalmus atlanticus	0.18	4	0.06	
Hoplostethus cadenati	0.14	4	0.05	
G A S T R O P O D S	0.14	28	0.05	
Photomectes braueri	0.10	10	0.04	
Cynoglossus senegalensis	0.04	4	0.01	
MYCTOPHIDAE	0.04	35	0.01	
Total	276.64		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 115
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°50.54
 start stop duration Lon E 11°49.42
 TIME :05:00:32 05:28:52 28.3 (min) Purpose : 3
 LOG : 2689.29 2690.72 1.4 Region : 4054
 FDEPTH: 272 268 Gear cond.: 0
 BDEPTH: 272 268 Validity: 0
 Towing dir: 0° Wire out : 650 m Speed : 3.0 kn
 Sorted : 92 Total catch: 189.49 Catch/hour: 401.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	166.62	7550	41.53	
Chlorophthalmus atlanticus	44.88	965	11.19	
Merluccius polli	33.24	792	8.29	
Parapanaeus longirostris, femal	31.16	3663	7.77	
Bembrops greyi	15.58	275	3.88	
Parapanaeus longirostris, male	14.99	2663	3.74	
Pontinus accraensis	14.40	157	3.59	
Bembrops heterurus	13.89	233	3.46	
Miracorvina angolensis	10.06	6	2.51	
Malacocephalus occidentalis	9.53	59	2.37	
Zeus faber	7.37	8	1.84	
Trichiurus lepturus	5.21	8	1.30	
Brotula barbata	4.49	4	1.12	
Callappa sp.	4.49	114	1.12	
Dentex angolensis	4.15	13	1.03	
L O B S T E R S	4.06	330	1.01	
Pterothrissus bellocci	2.24	13	0.56	
Peristedion cataphractum	2.20	195	0.55	
Nezumia aequalis	2.03	38	0.51	
MYCTOPHIDAE	1.57	1097	0.39	
B I V A L V E S	1.40	135	0.35	
Chascanopsetta lugubris	1.23	17	0.31	
TRIGLIDAE	1.10	13	0.27	
Raja miraletus	1.02	4	0.25	
Lophiodes kempfi	0.68	21	0.17	
Gadella maraldi	0.64	4	0.16	
Gadella imberbis	0.55	25	0.14	
Mystriophis rostellatus	0.42	4	0.11	
Monolene microstoma	0.42	13	0.11	
Dicologlossa cuneata	0.38	17	0.09	
Raja alba	0.38	17	0.09	
Hypoclydonia bella *	0.34	34	0.08	
Ariomma bondi	0.21	13	0.05	
Bathyraconger vicinus	0.17	4	0.04	
Cyttopsis roseus	0.08	4	0.02	
Total	401.18		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 116
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°51.68
 start stop duration Lon E 11°52.21
 TIME :07:13:34 07:43:26 29.9 (min) Purpose : 3
 LOG : 2695.25 2696.80 1.6 Region : 4054
 FDEPTH: 184 195 Gear cond.: 0
 BDEPTH: 184 195 Validity: 0
 Towing dir: 0° Wire out : 405 m Speed : 3.1 kn
 Sorted : 37 Total catch: 154.46 Catch/hour: 310.37

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	144.37	9934	46.52	
Dentex angolensis	42.10	139	13.56	188
Zenopsis conchifer	27.55	48	8.88	
Centrophorus squamosus	18.99	8	6.12	
Squatina oculata	17.68	8	5.70	
Brotula barbata	13.92	18	4.49	
Trichiurus lepturus	9.71	12	3.13	
Zeus faber	6.09	24	1.96	
Miracorvina angolensis	5.55	6	1.79	
Pterothrissus bellocci	5.37	36	1.73	
Umbrina canariensis	4.50	8	1.45	
Centrophorus uyato	3.88	2	1.25	
Torpedo torpedo	3.80	6	1.22	
Spicara alta	2.77	18	0.89	
Lophiodes kempfi	1.69	6	0.54	
Pentheroscion mbizi	0.78	6	0.25	
Octopus vulgaris	0.72	6	0.23	
Citharus linguatula	0.36	6	0.12	
Illex coindetii	0.24	6	0.08	
Starfish	0.18	6	0.06	
GOBIIDAE	0.06	6	0.02	
Monolene microstoma	0.06	12	0.02	
Total	310.37		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 117
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°47.26
 start stop duration Lon E 11°52.52
 TIME :08:45:46 09:15:57 30.2 (min) Purpose : 3
 LOG : 2701.15 2702.77 1.6 Region : 4054
 FDEPTH: 143 148 Gear cond.: 0
 BDEPTH: 143 148 Validity: 0
 Towing dir: 0° Wire out : 335 m Speed : 3.2 kn
 Sorted : 125 Total catch: 124.62 Catch/hour: 247.67

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	108.51	489	43.81	190
Spicara alta	60.52	489	24.43	
Trachurus trecae	15.30	227	6.18	189
Ariomma bondi	12.62	250	5.10	
Zenopsis conchifer	9.48	14	3.83	
Trigla lyra	8.94	72	3.61	
Raja punctatus	8.63	10	3.48	
Mustelus mustelus	4.23	2	1.71	
Trichiurus lepturus	3.97	6	1.60	
Lagocephalus laevigatus	3.30	4	1.33	
Citharus linguatula	2.56	78	1.04	
Bembrops heterurus	1.79	28	0.72	
Illex coindetii	1.45	34	0.59	
Torpedo torpedo	1.41	2	0.57	
Erythrocles monodi	1.19	10	0.48	
Zeus faber	0.83	4	0.34	
Saurida brasiliensis	0.78	185	0.31	
Peristedion cataphractum	0.60	10	0.24	
Pterothrissus bellocci	0.60	4	0.24	
Dentex macrophthalmus	0.42	2	0.17	
B I V A L V E S	0.22	8	0.09	
Sepia orbignyana	0.16	2	0.06	
Monolene microstoma	0.16	8	0.06	
Total	247.67		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 118
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°46.48
 start stop duration Lon E 11°55.11
 TIME :10:10:25 10:40:43 30.3 (min) Purpose : 3
 LOG : 2708.53 2710.22 1.7 Region : 4054
 FDEPTH: 112 117 Gear cond.: 0
 BDEPTH: 112 117 Validity: 0
 Towing dir: 0° Wire out : 280 m Speed : 3.3 kn
 Sorted : 84 Total catch: 171.99 Catch/hour: 340.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	125.59	721	36.86	191
Dentex congoensis	110.53	1086	32.44	
Trachurus trecae	46.55	1478	13.66	193
Trigla lyra	13.55	143	3.98	
Trichiurus lepturus	8.08	16	2.37	
Ariomma bondi	5.15	99	1.51	
Spicara alta	5.11	238	1.50	
Squatina oculata	4.95	4	1.45	
Brotula barbata	4.20	4	1.23	
Pagellus bellottii	3.09	24	0.91	192
Zenopsis conchifer	1.98	4	0.58	
Fistularia petimba	1.70	4	0.50	
Umbrina canariensis	1.62	4	0.48	
Chelidonichthys capensis	1.55	8	0.45	
Branchiostegus semifasciatus *	1.53	2	0.45	
Zeus faber	1.51	4	0.44	
Raja miraletus	1.27	4	0.37	
Uranoscopus polli	0.99	4	0.29	
Citharus linguatula	0.75	28	0.22	
G A S T R O P O D S	0.32	63	0.09	
Peristedion cataphractum	0.24	8	0.07	
Arnoglossus imperialis	0.12	16	0.03	
Illex coindetii	0.08	4	0.02	
Boops boops	0.08	12	0.02	
Sepia orbignyana	0.08	12	0.02	
C R A B S	0.04	4	0.01	
Saurida brasiliensis	0.04	12	0.01	
Total	340.69		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 119
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°28.38
 start stop duration Lon E 11°54.88
 TIME :12:32:39 13:02:45 30.1 (min) Purpose : 3
 LOG : 2727.04 2728.71 1.7 Region : 4054
 FDEPTH: 109 108 Gear cond.: 0
 BDEPTH: 109 108 Validity: 0
 Towing dir: 0° Wire out : 290 m Speed : 3.3 kn
 Sorted : 137 Total catch: 136.90 Catch/hour: 272.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	108.18	694	39.63	194
Trichiurus lepturus	40.58	38	14.86	
Dentex angolensis	33.10	166	12.13	197
Umbrina canariensis	23.93	54	8.77	195
Raja miraletus	15.03	26	5.51	
Trachurus trecae	14.26	341	5.22	196
Pterothrissus bellocci	5.36	36	1.86	
Trigla lyra	5.14	86	1.88	
Citharus linguatula	4.77	154	1.75	
Fistularia petimba	3.19	8	1.17	
Saurida brasiliensis	2.55	706	0.93	
Zeus faber	2.47	14	0.91	
Sepia orbignyana	2.39	96	0.88	
Raja clavata	2.33	2	0.85	
Torpedo torpedo	2.29	6	0.84	
Ariomma bondi	2.15	36	0.79	
Dentex congoensis	1.50	14	0.55	
G A S T R O P O D S	1.22	239	0.45	
Illex coindetii	0.58	16	0.21	
Uranoscopus cadenati	0.40	12	0.15	
Pagellus bellottii	0.36	2	0.13	
HOLUTHUROIDEA	0.28	6	0.10	
Arnoglossus imperialis	0.24	10	0.09	
Scorpaena normani	0.24	2	0.09	
Boops boops	0.20	8	0.07	
Parapanaeus longirostris	0.10	30	0.04	
C R A B S	0.06	30	0.02	
GOBIIDAE	0.06	12	0.02	
Starfish	0.02	2	0.01	
Total	272.98		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 120
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°29.10
 start stop duration Lon E 11°52.02
 TIME :13:52:59 14:23:04 30.1 (min) Purpose : 3
 LOG : 2732.80 2734.40 1.6 Region : 4054
 FDEPTH: 115 114 Gear cond.: 0
 BDEPTH: 115 114 Validity: 0
 Towing dir: 0° Wire out : 310 m Speed : 3.2 kn
 Sorted : 52 Total catch: 52.35 Catch/hour: 104.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	45.26	271	43.36	199
Trigla lyra	10.87	211	10.41	
Raja miraletus	10.33	20	9.89	
Trachurus trecae	7.40	140	7.09	198
Dentex congoensis	6.94	86	6.65	
Citharus linguatula	4.69	211	4.49	
Trichiurus lepturus	2.81	4	2.69	
Pterothrissus bellocci	2.69	16	2.58	
Torpedo torpedo	1.87	4	1.80	
Sepia officinalis	1.85	2	1.78	
Ariomma bondi	1.73	34	1.66	
Brachydeuterus auritus	1.66	10	1.59	
Pagellus bellottii	1.48	6	1.41	
Umbrina canariensis	1.30	2	1.24	
Sepia orbignyana	1.08	36	1.03	
G A S T R O P O D S	0.52	78	0.50	
Arnoglossus imperialis	0.46	54	0.44	
Illex coindetii	0.34	14	0.32	
Uranoscopus polli	0.32	2	0.31	
Starfish	0.20	12	0.19	
Saurida brasiliensis	0.20	64	0.19	
Boops boops	0.06	2	0.06	
GOBIIDAE	0.04	2	0.04	
C R A B S	0.02	8	0.02	
Total	104.39		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 121
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°30.60
 start stop duration Lon E 11°48.69
 TIME :15:14:59 15:44:46 29.8 (min) Purpose : 3
 LOG : 2739.35 2740.89 1.5 Region : 4054
 FDEPTH: 123 124 Gear cond.: 0
 BDEPTH: 123 124 Validity : 0
 Towing dir: 0° Wire out : 310 m Speed : 3.1 kn
 Sorted : 0 Total catch: 96.04 Catch/hour: 193.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	79.80	467	41.25	200
Dentex congoensis	26.59	314	13.74	
Spicara alta	18.53	195	9.58	
Trichurus lepturus	16.01	22	8.28	
Trachurus trecae	8.82	147	4.56	201
Brotula barbata	7.25	6	3.75	
Trigla lyra	5.64	109	2.92	
Pterothrissus bellocci	3.50	24	1.81	
Dentex barnardi	3.32	10	1.72	
Sepia officinalis	3.16	2	1.63	
Citharus linguatula	2.90	141	1.50	
Dentex barnardi	2.56	2	1.32	
Raja miraletus	2.50	6	1.29	
G A S T R O P O D S	1.89	276	0.98	
Sepia orbignyana	1.55	42	0.80	
Boops boops	1.51	60	0.78	
Sphoeroides sp.	1.41	2	0.73	
Uranoscopus polli	0.99	8	0.51	
Anthias anthias	0.97	4	0.50	
Zeus faber	0.73	2	0.37	
Octopus vulgaris	0.70	4	0.36	
Saurida brasiliensis	0.66	205	0.34	
Ariomma bondi	0.54	40	0.28	
Illex coindetii	0.34	18	0.18	
Pagellus bellottii	0.34	2	0.18	
Peristedion cataphractum	0.32	6	0.17	
Arnoglossus imperialis	0.28	36	0.15	
Dicologlossa hexopthalma	0.22	6	0.11	
Starfish	0.16	6	0.08	
Scorpaena normani	0.14	2	0.07	
Parapandalus narval	0.06	12	0.03	
Parapenaeus longirostris	0.02	4	0.01	
Total	193.43		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 122
 DATE :05/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°33.54
 start stop duration Lon E 11°41.43
 TIME :17:10:27 17:41:32 31.1 (min) Purpose : 3
 LOG : 2749.86 2751.37 1.5 Region : 4054
 FDEPTH: 227 235 Gear cond.: 0
 BDEPTH: 227 235 Validity : 0
 Towing dir: 0° Wire out : 570 m Speed : 2.9 kn
 Sorted : 41 Total catch: 372.33 Catch/hour: 718.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	403.54	20947	56.16	
Parapenaeus longirostris, femal	127.80	16535	17.79	
Parapenaeus longirostris, male	72.68	3346	10.11	
Brotula barbata	26.34	23	3.67	
Trichurus lepturus	24.28	50	3.38	
Dentex angolensis	18.72	56	2.61	202
Parasudis fraser-bruenneri	15.57	459	2.17	
Bembrops heterurus	8.36	181	1.16	
Pterothrissus bellocci	4.09	33	0.57	
Uranoscopus polli	3.44	17	0.48	
Chlorophthalmus atlanticus	3.11	149	0.43	
Umbrina canariensis	1.97	50	0.27	
Solenocera africana	1.97	427	0.27	
Peristedion cataphractum	1.97	33	0.27	
MYCTOPHIDAE	1.64	575	0.23	
Illex coindetii	1.14	17	0.16	
Epigonus telescopus	0.81	66	0.11	
Monolene microstoma	0.66	33	0.09	
NETTASTOMATIDAE	0.48	17	0.07	
Total	718.55		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 123
 DATE :05/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°34.83
 start stop duration Lon E 11°38.13
 TIME :18:41:20 19:12:54 31.6 (min) Purpose : 3
 LOG : 2756.90 2758.46 1.6 Region : 4054
 FDEPTH: 336 319 Gear cond.: 0
 BDEPTH: 336 319 Validity : 0
 Towing dir: 0° Wire out : 800 m Speed : 3.0 kn
 Sorted : 28 Total catch: 141.10 Catch/hour: 268.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	110.27	2348	41.11	
Parasudis fraser-bruenneri	44.58	932	16.62	
Malacocephalus occidentalis	30.32	219	11.30	
Gadella maraldi	19.39	466	7.23	
Benthodesmus tenuis	11.98	624	4.46	
Merluccius polli	9.22	95	3.44	
PARALEPIDIDAE	6.65	48	2.48	
Nezumia aequalis	5.99	124	2.23	
Parapenaeus longirostris, femal	5.23	542	1.95	
Trichurus lepturus	3.61	19	1.35	
Illex coindetii	3.33	10	1.24	
L O B S T E R S	3.14	304	1.17	
Hymenocephalus italicus	2.76	371	1.03	
Gephyroberyx darwini	2.09	2	0.78	
Pontinus accraensis	1.90	29	0.71	
Callinectes amnicola	1.62	19	0.60	
Stereomastis sp.	1.52	181	0.57	
Epigonus telescopus	0.95	19	0.35	
Chaunax pictus	0.95	38	0.35	
Gadella imberbis	0.95	38	0.35	
Bembrops greyi	0.86	19	0.32	
NETTASTOMATIDAE	0.29	48	0.11	
Lophiodes kempii	0.29	19	0.11	
Dibranchius atlanticus	0.29	29	0.11	
Solenocera africana	0.10	19	0.04	
Total	268.25		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 124
 DATE :05/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°37.32
 start stop duration Lon E 11°27.67
 TIME :21:15:25 21:46:44 31.3 (min) Purpose : 3
 LOG : 2772.55 2774.01 1.5 Region : 4054
 FDEPTH: 653 648 Gear cond.: 0
 BDEPTH: 653 648 Validity : 0
 Towing dir: 0° Wire out : 1400 m Speed : 2.8 kn
 Sorted : 28 Total catch: 176.27 Catch/hour: 337.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	179.37	5174	53.10	
Parapandalus narval	50.48	299	14.94	
Stereomastis sp.	14.60	644	4.32	
Yarrella blackfordi	14.03	299	4.15	
Lamprogrammus exutus	12.65	46	3.74	
Merluccius polli	12.46	19	3.69	203
Paramola cuvieri	11.96	11	3.54	
Triplophos hemingi	10.00	1299	2.96	
Aristeus varidens, female	5.75	264	1.70	
Gadella imberbis	4.02	264	1.19	
OMMASTREPHIDAE	3.79	23	1.12	
Xenodermichthys copei	3.33	138	0.99	
Stomias oregonii	3.10	34	0.92	
Stomias boa boa	2.76	46	0.82	
Dibranchius atlanticus	2.07	172	0.61	
Nezumia aequalis	1.95	46	0.58	
MYCTOPHIDAE	1.49	11	0.44	
Chaceon maritae	0.86	2	0.26	
Malacocephalus occidentalis	0.80	11	0.24	
Bathyrcongonger vicinus	0.80	11	0.24	
Phrynychthys wedli	0.69	11	0.20	
Chascanopsetta lugubris	0.57	11	0.17	
Plesiopeneaus edwardsianus	0.23	11	0.07	
Total	337.79		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 125
 DATE :05/04/2011 GEAR TYPE: BT NO: 21 POSITION:Lat S 6°38.91
 start stop duration Lon E 11°24.90
 TIME :23:41:30 00:12:15 30.8 (min) Purpose : 3
 LOG : 2781.84 2783.47 1.6 Region : 4054
 FDEPTH: 714 711 Gear cond.: 0
 BDEPTH: 714 711 Validity : 0
 Towing dir: 0° Wire out : 1650 m Speed : 3.2 kn
 Sorted : 32 Total catch: 289.58 Catch/hour: 564.85

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
HOLTHUROIDEA	233.49	351	41.34	
Hoplostethus cadenati	91.64	1949	16.22	
Nezumia micronychodon	50.91	1124	9.01	
Yarrella blackfordi	45.29	966	8.02	
Bathyrcongonger vicinus	26.86	140	4.76	
Stereomastis sp.	12.29	737	2.18	
Shrimps, small, non comm.	11.59	1931	2.05	
Dicrolene intronigra	11.59	772	2.05	
Halosaurus oregonii	10.71	579	1.90	
Aristeus varidens, female	8.25	298	1.46	
ALEPOCEPHALIDAE	7.72	702	1.37	
Xenodermichthys copei	7.37	351	1.31	
Stomias boa boa	7.37	228	1.31	
Merluccius polli	6.94	8	1.23	
OMMASTREPHIDAE	6.14	18	1.09	
MACROURIDAE	5.27	18	0.93	
Lophius vaillanti	5.17	4	0.92	
Triplophos hemingi	4.04	386	0.71	
Glyphus marsupialis	2.81	158	0.50	
Trachyrincus scabrus	2.28	18	0.40	
Lamprogrammus exutus	1.93	18	0.34	
Raja confundens	1.05	35	0.19	
Chaceon maritae	0.98	2	0.17	
Gadella maraldi	0.88	246	0.16	
Dibranchius atlanticus	0.70	18	0.12	
Melanocetus johnsoni	0.53	18	0.09	
Nephropsis atlantica	0.53	18	0.09	
Benthodesmus tenuis	0.53	18	0.09	
Total	564.85		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 126
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°28.00
 start stop duration Lon E 11°58.54
 TIME :04:46:37 05:17:15 30.6 (min) Purpose : 3
 LOG : 2820.66 2822.30 1.6 Region : 4054
 FDEPTH: 97 95 Gear cond.: 0
 BDEPTH: 97 95 Validity : 0
 Towing dir: 0° Wire out : 250 m Speed : 3.2 kn
 Sorted : 92 Total catch: 183.76 Catch/hour: 359.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	87.26	656	24.25	206
Pterothrissus belloci	36.91	219	10.26	
Brotula barbata	31.90	31	8.86	
Dentex angolensis	28.79	190	8.00	207
Saurida brasiliensis	28.32	6913	7.87	
Trachurus trecae	25.44	817	7.07	204
Trichiurus lepturus	24.56	61	6.82	
Uranoscopus polli	22.23	151	6.18	
Citharus linguatula	15.59	423	4.33	
Raja miraletus	13.39	25	3.72	
Umbrina canariensis	8.75	18	2.43	
Pagellus bellottii	4.88	43	1.36	205
Sepia orbignyana	4.70	147	1.31	
Zeus faber	4.52	8	1.26	
Dentex congoensis	3.27	25	0.91	
Squatina oculata	2.94	2	0.82	
Fistularia petimba	2.62	8	0.73	
Cynoponticus ferox	2.41	4	0.67	
B I V A L V E S	2.08	133	0.58	
Scorpaena stephanica	1.90	4	0.53	
Chelidonichthys gabonensis	0.94	4	0.26	
Trigla lyra	0.90	29	0.25	
Bathyrcongus vicinus	0.86	10	0.24	
Zenopsis conchifer	0.82	25	0.23	
Torpedo torpedo	0.74	4	0.21	
Sepia officinalis	0.65	4	0.18	
Shrimps, small, non comm.	0.51	108	0.14	
Pontinus accraensis	0.35	18	0.10	
Ariomma bondi	0.31	4	0.09	
Arnoglossus imperialis	0.29	25	0.08	
Boops boops	0.25	10	0.07	
Goneplax angulata	0.18	8	0.05	
C R A B S	0.14	14	0.04	
GOBIIDAE	0.10	14	0.03	
Squilla mantis	0.10	10	0.03	
Dicologlossa hexophthalma	0.10	4	0.03	
Gadella imberbis	0.08	8	0.02	
Calappa pelii	0.08	4	0.02	
Total	359.84		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 127
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°24.98
 start stop duration Lon E 12°1.36
 TIME :06:59:36 07:29:16 29.7 (min) Purpose : 3
 LOG : 2826.85 2828.34 1.5 Region : 4054
 FDEPTH: 79 81 Gear cond.: 0
 BDEPTH: 79 81 Validity : 0
 Towing dir: 0° Wire out : 200 m Speed : 3.0 kn
 Sorted : 29 Total catch: 212.87 Catch/hour: 430.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	139.84	334	32.48	
Stromateus fiatola	97.45	89	22.64	
Selene dorsalis	50.35	85	11.70	
Dentex angolensis	31.14	198	7.23	208
Umbrina canariensis	28.41	47	6.60	211
Brachydeuterus auritus	26.31	354	6.11	209
Pagellus bellottii	14.50	99	3.37	210
Dentex barnardi	9.69	20	2.25	
Squatina oculata	9.20	2	2.14	
Trachurus trecae	4.71	170	1.09	212
Brotula barbata	4.15	8	0.96	
Sepia officinalis	3.42	6	0.79	
Erythrocles monodi	2.83	6	0.66	
Dentex congoensis	1.96	34	0.46	
Cynoglossus canariensis	1.19	6	0.28	
Zeus faber	1.11	6	0.26	
Fistularia petimba	1.03	2	0.24	
Saurida brasiliensis	0.71	210	0.16	
Lagocephalus laevigatus	0.59	2	0.14	
Citharus linguatula	0.53	18	0.12	
Uranoscopus polli	0.47	2	0.11	
Boops boops	0.36	12	0.08	
Calappa sp.	0.36	2	0.08	
Trigla lyra	0.16	2	0.04	
Total	430.48		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 128
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°25.59
 start stop duration Lon E 12°5.90
 TIME :08:22:59 08:53:27 30.5 (min) Purpose : 3
 LOG : 2834.07 2835.62 1.6 Region : 4054
 FDEPTH: 51 53 Gear cond.: 0
 BDEPTH: 51 53 Validity : 0
 Towing dir: 0° Wire out : 140 m Speed : 3.0 kn
 Sorted : 38 Total catch: 38.19 Catch/hour: 75.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lagocephalus laevigatus	55.63	104	73.97	
Selene dorsalis	10.22	24	13.59	
Trichiurus lepturus	4.67	10	6.21	
Sepia officinalis	1.32	2	1.75	
Citharus linguatula	1.10	10	1.47	
Chelidonichthys gabonensis	0.95	4	1.26	
Bothus podas africanus	0.51	8	0.68	
Trachinus radiatus	0.33	2	0.45	
Bembrops greyi	0.30	14	0.39	
Alloteuthis africana	0.14	173	0.18	
Sepia orbignyana	0.04	2	0.05	
Total	75.20		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 129
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°5.22
 start stop duration Lon E 12°8.48
 TIME :11:03:52 11:33:05 29.2 (min) Purpose : 3
 LOG : 2855.43 2857.02 1.6 Region : 4054
 FDEPTH: 29 32 Gear cond.: 0
 BDEPTH: 29 32 Validity : 0
 Towing dir: 0° Wire out : 105 m Speed : 3.3 kn
 Sorted : 59 Total catch: 58.64 Catch/hour: 120.41

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	48.15	357	39.99	
Galeoides decadactylus	18.69	113	15.52	
Brachydeuterus auritus	11.70	433	9.72	213
Carcharhinus leucas	10.06	4	8.36	
Pseudotolithus senegalensis	9.28	31	7.71	214
Ilisha africana	8.97	207	7.45	
Trichiurus lepturus	5.79	103	4.81	
Albula vulpes	1.77	4	1.47	
Panulirus regius	1.07	4	0.89	
Raja miraletus	0.99	6	0.82	
Pteroscion pelli	0.90	23	0.75	
Pagellus bellottii	0.57	2	0.48	
Calappa rubroguttata	0.39	6	0.32	
Uranoscopus polli	0.33	6	0.27	
Sardinella aurita	0.33	6	0.27	
Sparus caeruleostictus *	0.31	2	0.26	
Callinectes pallidus	0.29	53	0.24	
Penaeus notialis	0.27	80	0.22	
Dicologlossa hexophthalma	0.16	2	0.14	
Pseudupeneus prayensis	0.12	2	0.10	
Trachinocephalus myops	0.06	2	0.05	
Citharus linguatula	0.06	2	0.05	
Sphyræna sphyraena	0.04	2	0.03	
Bothus podas africanus	0.04	4	0.03	
Trachinus armatus	0.02	2	0.02	
Penaeus kerathurus	0.02	2	0.02	
Cynoglossus senegalensis	0.02	2	0.02	
Total	120.41		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 130
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°6.15
 start stop duration Lon E 12°3.52
 TIME :12:07:25 12:37:05 29.7 (min) Purpose : 3
 LOG : 2860.44 2861.99 1.6 Region : 4054
 FDEPTH: 40 42 Gear cond.: 0
 BDEPTH: 40 42 Validity : 0
 Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
 Sorted : 10 Total catch: 10.03 Catch/hour: 20.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja miraletus	5.70	12	28.12	
Alectis alexandrinus	3.52	2	17.35	
Caranx hippos	2.83	2	13.96	
Sepia officinalis	2.71	4	13.36	
Epinephelus aeneus	1.48	2	7.28	
Uranoscopus polli	0.95	4	4.69	
Trichiurus lepturus	0.81	2	3.99	
Brachydeuterus auritus	0.28	12	1.40	
Selene dorsalis	0.28	2	1.40	
Galeoides decadactylus	0.22	2	1.10	
Calappa rubroguttata	0.22	2	1.10	
Grammoplites gruvelli	0.22	4	1.10	
Ilisha africana	0.18	6	0.90	
Sepia orbignyana	0.18	2	0.90	
Pagellus bellottii	0.14	2	0.70	
Torpedo marmorata	0.14	2	0.70	
Starfish	0.10	2	0.50	
Psettodes belcheri	0.10	2	0.50	
Callinectes pallidus	0.06	14	0.30	
Alloteuthis africana	0.06	20	0.30	
Saurida brasiliensis	0.04	12	0.20	
Scyllarides herklotsii	0.02	2	0.10	
C R A B S	0.02	4	0.10	
Total	20.28		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 131
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°7.74
 start stop duration Lon E 11°57.07
 TIME :13:24:47 13:54:21 29.6 (min) Purpose : 3
 LOG : 2867.08 2868.61 1.5 Region : 4054
 FDEPTH: 68 71 Gear cond.: 0
 BDEPTH: 68 71 Validity : 0
 Towing dir: 0° Wire out : 185 m Speed : 3.1 kn
 Sorted : 49 Total catch: 48.99 Catch/hour: 99.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	44.35	262	44.60	215
Epinephelus aeneus	26.18	10	26.33	
Pagellus bellottii	7.79	67	7.84	216
Trichiurus lepturus	4.30	10	4.33	
Sepia officinalis	3.09	37	3.10	
Brachydeuterus auritus	2.23	47	2.25	217
Raja miraletus	1.83	2	1.84	
Selene dorsalis	1.71	4	1.71	
Cynoglossus senegalensis	1.54	4	1.55	
Saurida brasiliensis	1.28	404	1.29	
Brotula barbata	0.83	4	0.84	
Dentex congoensis	0.73	8	0.73	
Lagocephalus laevigatus	0.71	2	0.71	
B I V A L V E S	0.67	120	0.67	
Pomadasy incisus	0.47	2	0.47	
Citharus linguatula	0.41	41	0.41	
Grammoplites gruvelli	0.41	14	0.41	
Trachurus trecae	0.37	14	0.37	218
Trigla lyra	0.24	18	0.24	
Arnoglossus imperialis	0.08	6	0.08	
Gadella maraldi	0.08	2	0.08	
Starfish	0.04	2	0.04	
Calappa rubroguttata	0.02	2	0.02	
Callinectes pallidus	0.02	4	0.02	
SQUILLIDAE	0.02	2	0.02	
Parapenaeus longirostris	0.02	6	0.02	
Alloteuthis africana	0.02	10	0.02	
Total	99.44		100.00	

R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 132
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°9.66
 start stop duration Lon E 11°49.37
 TIME :14:57:27 15:27:03 29.6 (min) Purpose : 3
 LOG : 2875.18 2876.70 1.5 Region : 4054
 FDEPTH: 89 95 Gear cond.: 0
 BDEPTH: 89 95 Validity : 0
 Towing dir: 0° Wire out : 210 m Speed : 3.1 kn
 Sorted : 96 Total catch: 96.30 Catch/hour: 195.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	93.95	184	48.13	220
Epinephelus aeneus	27.77	4	14.23	
Dentex angolensis	22.70	132	11.63	219
Dentex congoensis	11.76	124	6.02	
Trichiurus lepturus	8.61	8	4.41	
Trachurus trecae	7.84	134	4.02	221
Raja miraletus	6.61	10	3.39	
Dentex barnardi	4.05	12	2.08	
Brotula barbata	2.53	2	1.30	
Trigla lyra	2.09	24	1.07	
Zeus faber	1.66	4	0.85	
Sparus caeruleostictus *	1.50	2	0.77	
Branchiostegus semifasciatus *	1.36	2	0.70	
Selene dorsalis	0.71	2	0.36	
Ariomma bondi	0.53	10	0.27	
Illex coindetii	0.39	51	0.20	
Pagellus bellottii	0.34	2	0.18	
Brachydeuterus auritus	0.16	4	0.08	
Sepia orbignyana	0.16	8	0.08	
Dicologlossa hexophthalma	0.14	2	0.07	
Citharus linguatula	0.12	6	0.06	
Alloteuthis africana	0.06	20	0.03	
PALINURIDAE	0.06	2	0.03	
Saurida brasiliensis	0.02	8	0.01	
Arnoglossus imperialis	0.02	2	0.01	
C R A B S	0.02	6	0.01	
Calappa rubroguttata	0.02	2	0.01	
Total	195.20		100.00	

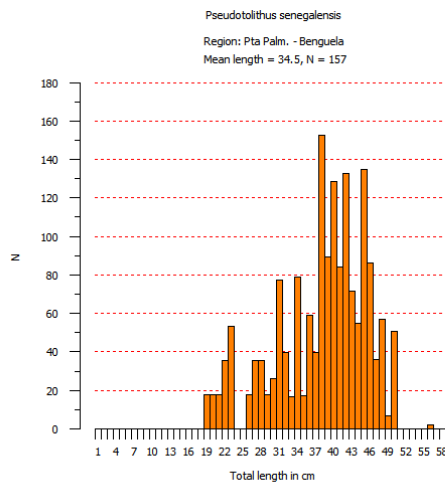
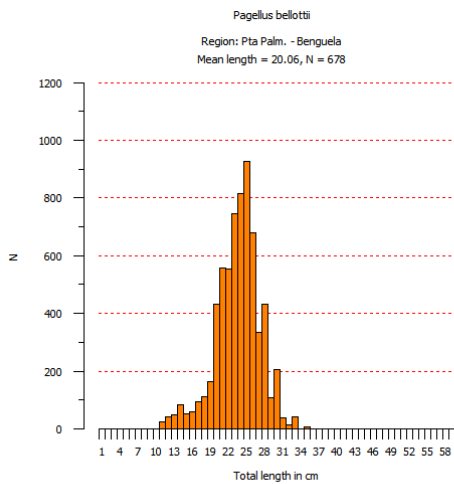
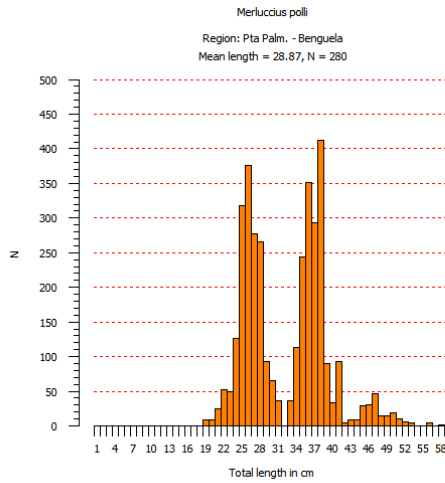
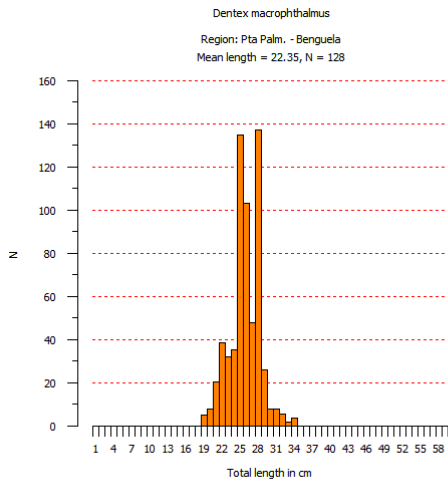
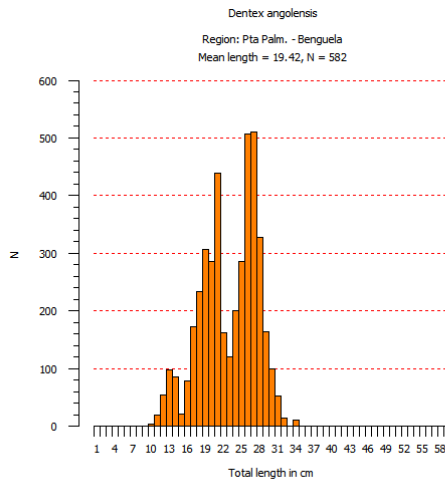
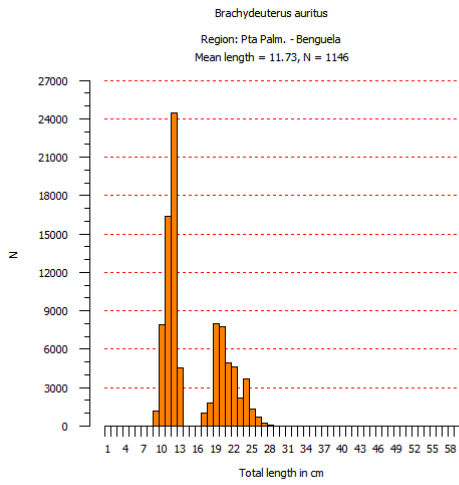
R/V Dr. Fridtjof Nansen SURVEY:2011403 STATION: 133
 DATE :06/04/2011 GEAR TYPE: BT NO: 24 POSITION:Lat S 6°10.35
 start stop duration Lon E 11°38.22
 TIME :16:42:40 17:12:48 30.1 (min) Purpose : 3
 LOG : 2886.89 2888.39 1.5 Region : 4054
 FDEPTH: 121 123 Gear cond.: 0
 BDEPTH: 121 123 Validity : 0
 Towing dir: 0° Wire out : 290 m Speed : 3.0 kn
 Sorted : 115 Total catch: 115.18 Catch/hour: 229.29

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spicara alta	77.54	685	33.82	
Trichiurus lepturus	35.63	42	15.54	
Pentheroscion mbizi	26.68	70	11.63	
Dentex angolensis	25.88	161	11.29	223
Umbrina canariensis	21.10	64	9.20	222
Dentex congoensis	18.71	229	8.16	
Trachurus trecae	6.51	84	2.84	224
Brotula barbata	5.39	8	2.35	
Branchiostegus semifasciatus *	3.03	6	1.32	
Zeus faber	2.81	6	1.22	
Trigla lyra	2.29	30	1.00	
Raja miraletus	1.17	2	0.51	
Dentex barnardi	0.68	2	0.30	
Illex coindetii	0.42	12	0.18	
Boops boops	0.32	8	0.14	
Citharus linguatula	0.26	16	0.11	
Pagellus bellottii	0.20	2	0.09	
Serranus accraensis	0.18	2	0.08	
Ariomma bondi	0.14	2	0.06	
Sepia orbignyana	0.12	6	0.05	
Peristedion cataphractum	0.10	2	0.04	
G A S T R O P O D S	0.06	2	0.03	
Saurida brasiliensis	0.06	32	0.03	
Arnoglossus imperialis	0.02	6	0.01	
Total	229.29		100.00	

ANNEX II. Length distribution of main species

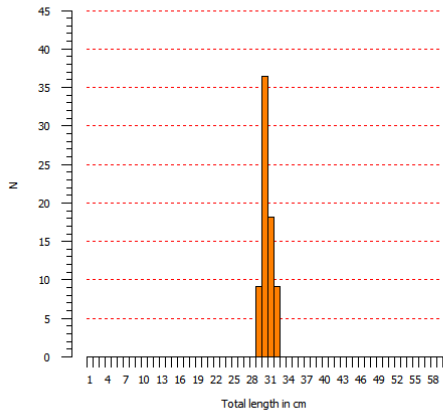
Central Angola

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



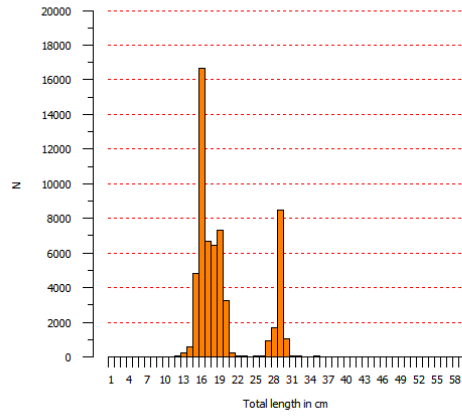
Sardinella aurita

Region: Pta Palm. - Benguela
Mean length = 26.88, N = 8



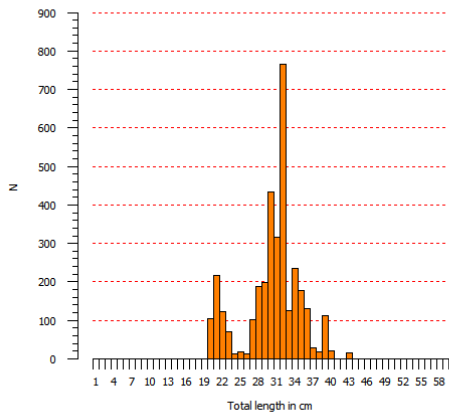
Trachurus trecae

Region: Pta Palm. - Benguela
Mean length = 16.05, N = 550



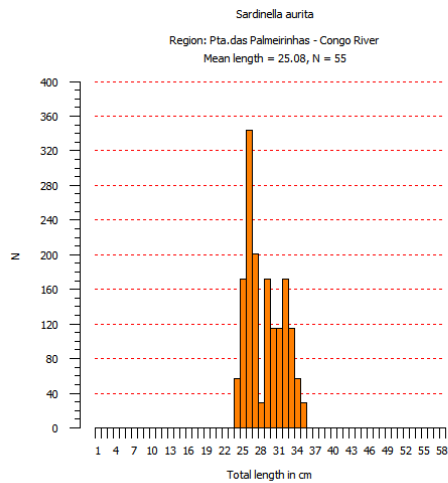
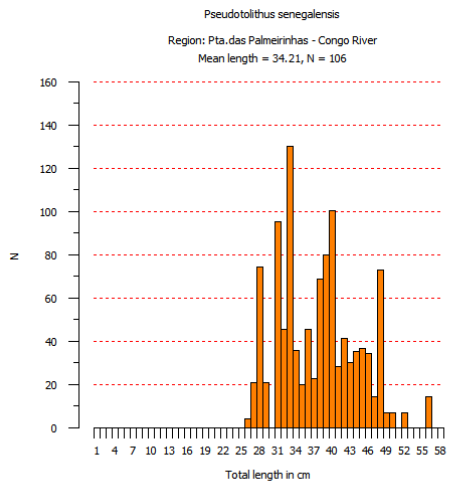
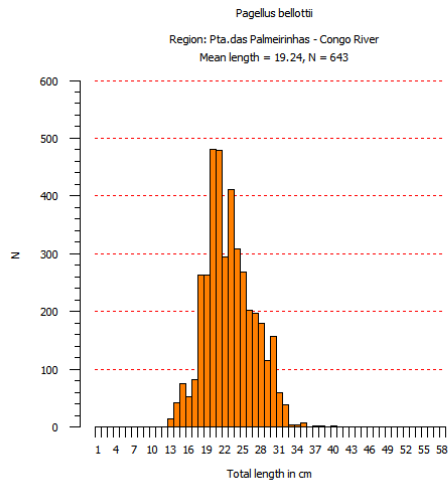
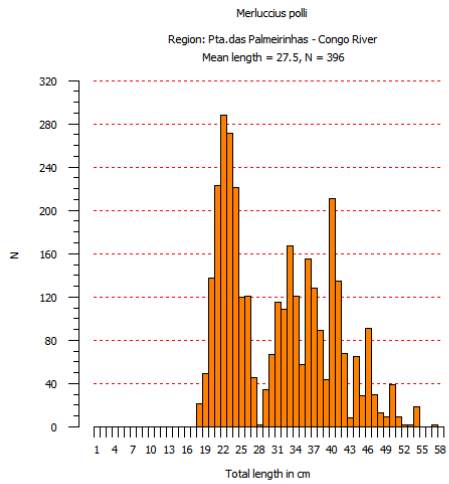
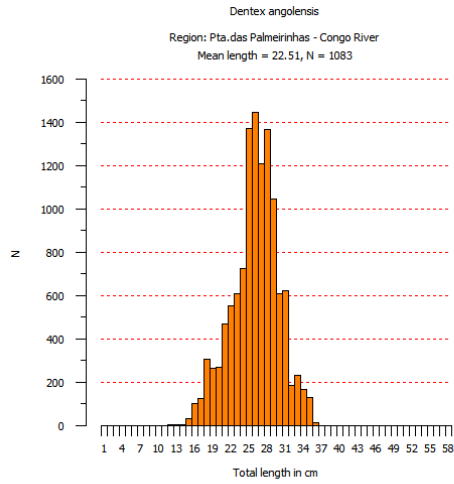
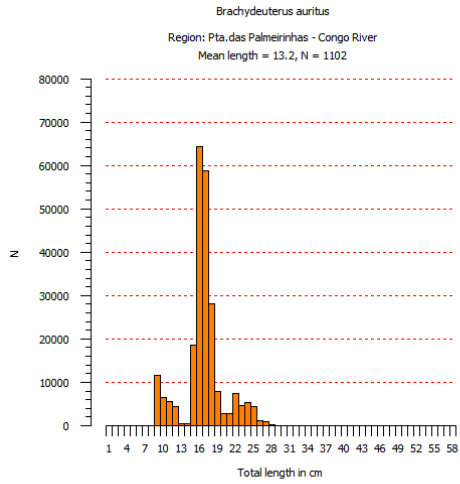
Umbrina canariensis

Region: Pta Palm. - Benguela
Mean length = 26.8, N = 154



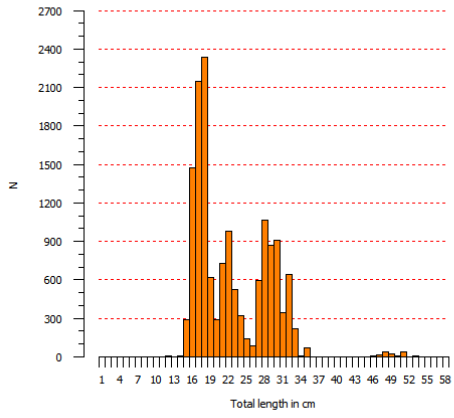
Northern Angola

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



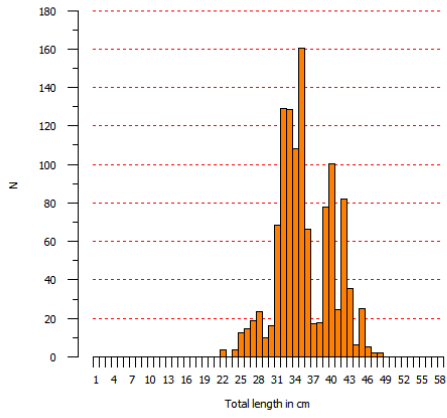
Trachurus trecae

Region: Pta. das Palmeirinhas - Congo River
Mean length = 18.95, N = 1687



Umbrina canariensis

Region: Pta. das Palmeirinhas - Congo River
Mean length = 31.98, N = 171



ANNEX III. Swept area estimates

BENGUELA - PALMERINHAS

A. 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							0-50m	50-100m	100-200m
	>0	10	30	100	300					
Brachydeuterus auritus	6	7	3	2	1	54.29	3.044	6.762	1.886	0.429
Trachurus trecae	10	1	3		1	42.86	2.919	0.002	6.71	0.167
Pomadasys incisus	2	3	2		1	22.86	2.044	0.569	4.351	
Trichiurus lepturus	8		2	1		31.43	0.995	0.516	0.423	2.535
Pagellus bellottii	20	7	4			88.57	0.926	0.689	1.356	0.498
Umbrina canariensis	6	3	1	1		31.43	0.789		0.511	2.215
Trigla lyra	8	5	3			45.71	0.663		0.841	1.177
Pseudotolithus senegalensis	5		1	1		20	0.638	2.006	0.017	
Dentex angolensis	10	5	2			48.57	0.553		0.359	1.551
Brotula barbata	8	2	2			34.29	0.481		0.404	1.198
Dentex barnardi	14	1	2			48.57	0.407	0.119	0.094	1.281
Raja miraletus	23	4				77.14	0.402	0.162	0.658	0.27
Rhinobatos albomaculatus	13		1			40	0.326	0.178	0.609	0.034
Citharus linguatula	25		1			74.29	0.297	0.012	0.514	0.283
Dicologlossa cuneata	13	1	1			42.86	0.27	0.554	0.222	0.004
Lagocephalus laevigatus	27	1				80	0.254	0.172	0.159	0.51
Pseudupeneus prayensis	14	2	1			48.57	0.245	0.283	0.364	
Pomadasys jubelini	1	1	1			8.57	0.224	0.012	0.513	
Selene dorsalis	11	3				40	0.222	0.298	0.198	0.168
Chloroscombrus chrysurus	7	1	1			25.71	0.202	0.609	0.024	
Sepia orbignyana	27	2				82.86	0.185	0.08	0.298	0.127
Anthias anthias		1	1			5.71	0.177			0.689
Galeoides decadactylus	6	3				25.71	0.171	0.452	0.066	
Zeus faber	15	1				45.71	0.169		0.218	0.295
Pterothrissus belloci	4	3				20	0.166		0.047	0.565
Bembrops heterurus	5	2				20	0.15		0.16	0.316
Pontinus accraensis	4		1			14.29	0.142		0.307	0.042
Gymnura micrura	2	3				14.29	0.139	0.301	0.104	
Alectis alexandrinus	5	2				20	0.139	0.44	0.001	
Torpedo torpedo	11	2				37.14	0.122		0.266	0.032
Synagrops microlepis			1			2.86	0.121			0.472
Grammoplites gruvelli	13	1				40	0.116	0.092	0.204	
Sepia officinalis	8	2				28.57	0.114	0.031	0.098	0.242
Octopus vulgaris	16					45.71	0.104	0.033	0.139	0.133
Chelidonichthys gabonensis	9	1				28.57	0.098	0.013	0.134	0.141
Erythrocles monodi	1	2				8.57	0.094		0.01	0.351
Dentex macrophthalmus	4	1				14.29	0.094		0.037	0.304
Uranoscopus polli	9					25.71	0.09		0.118	0.154
Gephyroberyx darwini	1	1				5.71	0.086			0.335
Boops boops	12	1				37.14	0.084	0.001	0.14	0.094
Ephippion guttifer	12	1				37.14	0.076	0.187	0.039	
Pomadasys peroteti	2	1				8.57	0.074	0.235		
B I V A L V E S	9	1				28.57	0.071	0.008	0.027	0.22
Epinephelus aeneus	10					28.57	0.067	0.113	0.073	
Pontinus kuhlii	2	1				8.57	0.057		0.006	0.213
Sphyræna guachancho	6	1				20	0.057	0.134	0.036	
Chaetodon hoefleri	14					40	0.055	0.048	0.072	0.035
Pteroscion peli	2	1				8.57	0.054	0.172		
Dasyatis margarita	4	1				14.29	0.054	0.164	0.005	

Benguela - Palmerinhas shelf cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							0-50m	50-100m	100-200m
	>0	10	30	100	300					
Saurida brasiliensis	12					34.29	0.053	0.001	0.085	0.065
Cynoponticus ferox	3					8.57	0.049	0.128		0.035
ECHINODERMATA	8					22.86	0.049	0.044	0.061	0.034
Stromateus fiatola	3					8.57	0.048	0.124		0.036
Serranus cabrilla	4	1				14.29	0.047	0.002	0.109	
Decapterus rhonchus	7	1				22.86	0.047	0.141	0.007	
Lutjanus goreensis		1				2.86	0.047	0.149		
Torpedo marmorata	12					34.29	0.047	0.042	0.078	
Sparus caeruleostictus *		1				2.86	0.047	0.148		
Lepidochelys olivacea		1				2.86	0.042		0.097	
Chilomycterus spinosus maure	12					34.29	0.04	0.082	0.032	
Atractoscion aequidens	3					8.57	0.037		0.086	
GASTROPODS	15					42.86	0.034	0.016	0.012	0.092
Sphyræna sphyraena	4					11.43	0.033	0.103	0.002	
Chelidonichthys capensis		1				2.86	0.033		0.077	
Sardinella aurita	6					17.14	0.033	0.007	0.072	
Scorpaena normani	5					14.29	0.032		0.022	0.086
Alloteuthis africana	12					34.29	0.031	0.01	0.062	0.005
GOBIIDAE	9					25.71	0.031	0.003	0.053	0.029
Cynoglossus canariensis	4					11.43	0.029	0.094		
Spicara alta	3					8.57	0.026			0.103
Bodianus speciosus	1					2.86	0.026	0.084		
Caranx crysos	3					8.57	0.026	0.035	0.035	
Dentex congoensis	4					11.43	0.025		0.009	0.084
Sardinella maderensis	7					20	0.024	0.038	0.027	
Eucinostomus melanopterus	5					14.29	0.023	0.075		
Rhizoprionodon acutus	1					2.86	0.022	0.069		
Ilisha africana	3					8.57	0.019	0.059		
Balistes capriscus	5					14.29	0.018	0.058		
Lithognathus mormyrus	2					5.71	0.018	0.021	0.026	
Syacium micrurum	9					25.71	0.017	0.052	0.001	
Scorpaena stephanica	8					22.86	0.017	0.013	0.014	0.027
Conger conger	1					2.86	0.017			0.064
Cynoglossus senegalensis	2					5.71	0.016	0.051		
Dentex gibbosus	1					2.86	0.015			0.058
Aluterus heudelotii	8					22.86	0.015	0.043	0.003	
Chelidonichthys capensis	5					14.29	0.014		0.031	0.003
Peristedion cataphractum	3					8.57	0.014			0.054
Scomber japonicus	3					8.57	0.013		0.03	
Starfish	1					2.86	0.013		0.03	
Trachinocephalus myops	4					11.43	0.013	0.04		
Fistularia petimba	8					22.86	0.012	0.01	0.012	0.015
Scorpaena angolensis	3					8.57	0.012	0.007	0.002	0.035
Sparus pagrus pagrus *	2					5.71	0.011	0.03		0.005
Lophiodes kempfi	3					8.57	0.01		0.002	0.035
Penaeus notialis	3					8.57	0.005	0.017		
Parapenaeus longirostris, fema	5					14.29	0.005		0.009	0.005
Parapenaeus longirostris, male	3					8.57			0.001	
Parapenaeus longirostris	3					8.57			0.001	
Other fish							0.21	0.202	0.18	0.269
Sum all species							20.49	17.443	24.087	18.221
Sum SNAPPERS, JOBFISHES							0.056	0.177		
Sum GROUPERS, SEABASSES							0.123	0.134	0.189	
Sum GRUNTS, SWEETLIPS							5.396	7.59	6.769	0.429
Sum CROAKERS, DRUMS, WEAKE., KOBES							1.518	2.178	0.615	2.215
Sum PANDORAS, PORGIES, SEABREAMS,							2.187	1.009	2.022	3.901
Sum SHARKS, CHIMAERAS							0.022	0.069		
Sum BATOID FISHES, RAYS							1.099	0.86	1.726	0.346
Sum CEPHALOPODS							0.459	0.154	0.625	0.554
Numbers of stations included in analysis, total and by depth strata							35	11	15	9

BENGUELA - PALMERINHAS

B. Slope 200-500 m.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	Lower limits, Kg/nm							200-300m	300-400m	400-500m	
	>0	10	30	100	300						
Merluccius polli	4		2	1		100	4.035	0.909	3.028	7.612	
Chlorophthalmus atlanticus	3		2	1		85.71	3.759	6.26	5.01	0.007	
Nematocarcinus africanus		1	2			42.86	1.903		1.739	3.183	
Gephyroberyx darwini			2			28.57	1.282	3.994	1.245		
Zenopsis conchifer	1		1			28.57	1.034	6.978		0.131	
Synagrops microlepis	4		1			71.43	0.739	0.027	1.281	0.009	
Gadella maraldi	3	1				57.14	0.513	0.951	0.518	0.283	
Trichiurus lepturus	4	1				71.43	0.445	0.137	0.015	1.461	
Laemonema laureysi	2	1				42.86	0.301		0.471	0.112	
Chaceon maritae, female	3					42.86	0.299		0.493	0.061	
Hymenocephalus italicus	6					85.71	0.291		0.317	0.383	
Yarella blackfordi	2	1				42.86	0.279		0.051	0.873	
Chaunax pictus	4					57.14	0.27		0.259	0.429	
Lamprogrammus exutus		1				14.29	0.256			0.898	
MYCTOPHIDAE	6					85.71	0.18	0.067	0.294	0.007	
Hoplostethus cadenati	2	1				42.86	0.154		0.001	0.537	
Aristeus varidens, female	5					71.43	0.128		0.027	0.395	
Malacocephalus occidentalis	4					57.14	0.127	0.606	0.012	0.12	
Dibranchius atlanticus	4					57.14	0.126		0.024	0.393	
Gadella imberbis	6					85.71	0.126	0.054	0.176	0.062	
Parapenaeus longirostris, femal	5					71.43	0.121	0.269	0.145		
Stomias boa boa	4					57.14	0.113		0.016	0.363	
CONGRIDAE	1					14.29	0.111		0.195		
Bembrops heterurus	2					28.57	0.104	0.494	0.058		
Dentex macrophthalmus	1					14.29	0.096	0.673			
Dicrolene intronigra	1					14.29	0.091			0.32	
Pontinus accraensis	3					42.86	0.081	0.449	0.029		
Parapenaeus longirostris, male	4					57.14	0.067	0.354	0.029		
Aristeus varidens, male	5					71.43	0.061		0.042	0.132	
Anemones, pink	1					14.29	0.056			0.198	
Etmopterus pusillus	1					14.29	0.054			0.19	
Nezumia aequalis	5					71.43	0.054	0.169	0.014	0.078	
Pontinus kuhlii	1					14.29	0.052		0.091		
Lophiodes kempfi	4					57.14	0.052		0.09		
Malacocephalus laevis	2					28.57	0.047		0.006	0.152	
LOBSTERS	1					14.29	0.046		0.081		
Raja alba	1					14.29	0.045	0.317			
Etmopterus spinax	3					42.86	0.036		0.016	0.093	
Centrophorus granulosus	1					14.29	0.035			0.122	
Brotula barbata	1					14.29	0.03	0.213			
Halosaurus ovenii	2					28.57	0.03			0.105	
Bathyroconger vicinus	2					28.57	0.029		0.05	0.002	
Xenodermichthys copei	1					14.29	0.029			0.102	
Chaceon maritae	2					28.57	0.026		0.014	0.061	
Pterothrissus belloci	3					42.86	0.025	0.036	0.035		
Callinectes sp.	2					28.57	0.023		0.041		
Parapandalus narval	2					28.57	0.022		0.022	0.031	
Peristedion cataphractum	4					57.14	0.016	0.007	0.025	0.002	
Halosaurus sp.	1					14.29	0.015		0.027		
Benthodesmus tenuis	3					42.86	0.015		0.002	0.048	
Calappa sp.	1					14.29	0.013	0.094			
Todaropsis eblanae	1					14.29	0.013	0.092			
GASTROPODS	1					14.29	0.01	0.072			
Coelorinchus braueri	2					28.57	0.01		0.018		
Solenocera africana	2					28.57	0.003		0.005		
Shrimps, small, non comm.	1					14.29	0.003			0.01	
Plesiopenaeus edwardsianus	2					28.57	0.003			0.009	
Other fish							0.057	0.018	0.05	0.092	
Sum all species							17.946	23.238	16.063	19.066	
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES											
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAFF., KOBBS											
Sum PANDORAS, PORGIES, SEABREAMS,							0.096	0.673			
Sum SHARKS, CHIMAERAS							0.128		0.02	0.41	
Sum BATOID FISHES, RAYS							0.045	0.317			
Sum CEPHALOPODS							0.017	0.092		0.013	
Numbers of stations included in analysis, total and by depth strata							7	2	3	2	

BENGUELA - PALMERINHAS
C. 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 >0	10	30	100	300			500-600m	600-700m	700-800m
Nematocarcinus africanus			3			37.5	2.414	4.828		
Lamprogrammus exutus	5	2	1			100	1.149	2.053		0.244
Nezumia aequalis	2	2	1			62.5	0.96	0.024		1.896
Yarella blackfordi	4	3				87.5	0.931	1.063		0.799
Hoplostethus cadenati	6	2				100	0.6	0.899		0.301
Stomias boa boa	6	1				87.5	0.451	0.675		0.228
Chaceon maritae, female	6	1				87.5	0.432	0.585		0.278
Aristeus varidens, female	8					100	0.395	0.607		0.183
Merluccius polli	6	1				87.5	0.295	0.388		0.202
Stereomastis sp.	8					100	0.271	0.123		0.419
Yarella blackfordi *		1				12.5	0.244			0.487
Anemones, pink	2	1				37.5	0.233			0.465
Talismania longifilis	3					37.5	0.205			0.409
Aristeus varidens, male	8					100	0.197	0.303		0.091
Chaceon maritae, male	7					87.5	0.175	0.158		0.191
Gadella maraldi	1	1				25	0.167	0.334		
Dibranchius atlanticus	8					100	0.134	0.128		0.141
Bathyroconger vicinus	7					87.5	0.112	0.059		0.165
Lophiodes kempfi	3					37.5	0.108	0.01		0.206
Opisthoteuthis rossi	1					12.5	0.105			0.211
Laemonema laureysi	2					25	0.095	0.19		
OCTOPODIDAE	1					12.5	0.082	0.164		
Triplophos hemingi	6					75	0.079	0.125		0.033
Centrophorus granulosus	3					37.5	0.076	0.112		0.039
Benthodesmus tenuis	5					62.5	0.063	0.119		0.007
Chaunax pictus	4					50	0.057	0.114		
Xenodermichthys copei	5					62.5	0.054	0.069		0.038
Gadella imberbis	7					87.5	0.046	0.063		0.028
Alepocephalus rostratus	1					12.5	0.041			0.083
Halosaurus ovenii	7					87.5	0.04	0.026		0.054
Opisthoteuthis agassizi	1					12.5	0.028			0.057
Plesiopenaeus edwardsianus	5					62.5	0.028	0.012		0.043
Chlorophthalmus atlanticus	6					75	0.028	0.052		0.003
Raja confundens	1					12.5	0.026			0.053
E C H I N O D E R M A T A	2					25	0.026			0.052
Malacocephalus occidentalis	1					12.5	0.026	0.052		
Chaceon maritae	1					12.5	0.023			0.047
Raja sp.	1					12.5	0.023			0.046
Nezumia micronychodon	1					12.5	0.023			0.045
Monomitopus metriostoma	1					12.5	0.022			0.043
Ebinania costaecanariae	3					37.5	0.02	0.006		0.035
Anemones, white	1					12.5	0.019	0.038		
Scymnodon squamulosus	2					25	0.017	0.023		0.012
Barbourisia rufa	1					12.5	0.016			0.033
Etmopterus spinax	3					37.5	0.015	0.012		0.019
THYSANOTEUTHIDAE	2					25	0.014	0.008		0.021
Paramola cuvieri	1					12.5	0.014			0.029
Hymenocephalus italicus	3					37.5	0.014	0.004		0.023
UNIDENTIFIED FISH	1					12.5	0.014			0.027
Ommastrephes sp.	1					12.5	0.013			0.026
Dicrolene intronigra	3					37.5	0.012	0.022		0.003
Malacocephalus laevis	1					12.5	0.012	0.024		
Shrimps, small, non comm	2					25	0.01	0.007		0.013
Parapandalus narval	1					12.5	0.006			0.012
S H R I M P S	2					25	0.006	0.003		0.009
Glyphus marsupialis	2					25	0.003	0.001		0.005
Acanthephyra sp.	1					12.5	0.002	0.003		
Other fish							0.127	0.117	0	0.138
Sum all species							10.796	13.601	0	7.991
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKF., KOBS										
Sum PANDORAS, PORGIES, SEABREAMS,										
Sum SHARKS, CHIMAERAS							0.116	0.147		0.085
Sum BATOID FISHES, RAYS							0.053			0.106
Sum CEPHALOPODS							0.256	0.172		0.34
Numbers of stations included in analysis, total and by depth strata							8	4	0	4

PALMERINHAS - CONGO RIVER

A. 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								0-50m	50-100m	100-200m
	>0	10	30	100	300	1000					
Brachydeuterus auritus	16	4	4	5		1	62.5	4.937	4.818	9.043	0.68
Dentex angolensis	12	10	7				60.42	1.082		0.504	2.52
Galeoides decadactylus	6	3	5	1			31.25	1.058	2.868	0.75	
Trichiurus lepturus	27	8	3				79.17	0.916	0.415	1.785	0.379
Chloroscombrus chrysurus	7	4	2	1			29.17	0.9	2.273	0.753	0.005
Trachurus trecae	27	3	1	1			66.67	0.774	0.009	1.589	0.496
Pteroscion peii	4		1	2			14.58	0.724	2.67	0.002	
Pomadasys jubelini	6	2	2	1			22.92	0.675	0.564	1.393	
Ilisha africana	4		3	1			16.67	0.565	2.085	0.002	
Sphyræna sphyræna	8	2	2	1			27.08	0.529	1.945	0.007	
Synagrops microlepis		1	1	1			6.25	0.423			1.195
Pomadasys incisus	8	3	2				27.08	0.415	0.754	0.55	0.015
Umrina canariensis	19		2				43.75	0.373		0.819	0.186
Rhinobatos albomaculatus	13	1		1			31.25	0.327	0.115	0.751	0.039
Pagellus bellottii	26	6					66.67	0.319	0.332	0.552	0.063
Raja miraletus	36	3					81.25	0.294	0.296	0.442	0.135
Selene dorsalis	18	4	1				47.92	0.283	0.28	0.513	0.041
Dentex congoensis	18	4	1				47.92	0.272		0.198	0.557
Pseudotolithus senegalensis	4	2	2				16.67	0.267	0.987		
Brotula barbata	19	1	1				43.75	0.234		0.086	0.568
Stromateus fiatola	4	1	2				14.58	0.217	0.031	0.544	0.012
Trigla lyra	25	1					54.17	0.212		0.142	0.447
Spicara alta	11	3					29.17	0.184			0.519
Boops boops	19		1				41.67	0.143	0.001	0.347	0.036
Pterothrissus belloci	12	1	1				29.17	0.142		0.078	0.319
Drepane africana	4	3					14.58	0.135	0.497		
Sardinella aurita	6		1				14.58	0.13	0.003	0.343	0.002
Gymnura micrura	1	1	1				6.25	0.123	0.453		
Chelidonicichthys gabonensis	10		1				22.92	0.115		0.272	0.035
Lagocephalus laevigatus	22	1					47.92	0.107	0.069	0.134	0.109
Citharus linguatula	40						83.33	0.094	0.011	0.111	0.14
Alectis alexandrinus	5	2					14.58	0.089	0.152	0.127	
Sepia officinalis	18						37.5	0.078	0.019	0.094	0.107
Dentex barnardi	18						37.5	0.076	0.045	0.127	0.046
Zeus faber	27						56.25	0.072		0.09	0.109
Pomadasys peroteti	2	1					6.25	0.071	0.263		
Uranoscopus polli	25						52.08	0.067	0.006	0.074	0.107
Sparus caeruleostictus *	9	1					20.83	0.065	0.213	0.018	
Sepia orbignyana	34						70.83	0.062	0.1	0.058	0.038
B I V A L V E S	12	1					27.08	0.061	0.001	0.013	0.158
Cynoponticus ferox	2	1					6.25	0.061		0.004	0.167
Bembrops heterurus	4	1					10.42	0.06		0.003	0.167
Squatina oculata	10						20.83	0.057		0.081	0.076
Torpedo torpedo	15	1					33.33	0.055	0.103	0.035	0.039
Dasyatis marmorata	5	1					12.5	0.051	0.073	0.085	
Ephippion guttifer	8						16.67	0.05	0.185		
Dicologlossa cuneata	12	1					27.08	0.048	0.032	0.097	0.01
Epinephelus aeneus	8						16.67	0.048	0.038	0.1	
Dasyatis margarita	3	1					8.33	0.048	0.177		
Pseudupeneus prayensis	11						22.92	0.043	0.07	0.064	
Sphyræna guachancho	1	1					4.17	0.042	0.017	0.1	
Saurida brasiliensis	30						62.5	0.036		0.062	0.037
Arius parkii	5						10.42	0.036	0.096	0.027	
Zenopsis conchifer	8						16.67	0.034		0.001	0.095
Octopus vulgaris	16						33.33	0.025		0.028	0.041
Torpedo marmorata	6						12.5	0.022	0.019	0.044	
Grammolites gruvelli	14						29.17	0.021	0.024	0.039	
Fistularia petimba	15						31.25	0.021	0.004	0.022	0.032
Ariomma bondi	12						25	0.02		0.006	0.05
Eucinostomus melanopterus	5						10.42	0.019	0.071		
Pentheroscion mbizi	2						4.17	0.019			0.054
Chilomycterus spinosus mauret.	7						14.58	0.019	0.051	0.014	
Cynoglossus canariensis	7						14.58	0.018	0.047	0.015	
Sardinella maderensis	5						10.42	0.014	0.042	0.008	
Chaetodon hoeferli	8						16.67	0.013	0.007	0.027	0.003
Lutjanus goreensis	1						2.08	0.013	0.048		

Palmerinhas – Congo River shelf 20-200 m cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							20-50m	50-100m	100-200m
	>0	10	30	100	300					
Scomberomorus tritor		4				8.33	0.013	0.035	0.008	
GOBIIDAE		11				22.92	0.013		0.03	0.003
Centrophorus squamosus		1				2.08	0.013			0.036
Raja clavata		2				4.17	0.012			0.034
G A S T R O P O D S		18				37.5	0.011	0.001	0.001	0.03
Branchiostegus semifasciatus *		6				12.5	0.01		0.003	0.026
Carcharhinus leucas		2				4.17	0.01	0.037		
Decapterus rhonchus		6				12.5	0.01	0.009	0.02	
penaeus notialis,female		3				6.25	0.007	0.027		
Penaeus notialis		6				12.5	0.006	0.021	0.001	
penaeus notialis,male		3				6.25	0.005	0.017		
Parapenaeus longirostris		7				14.58	0.002			0.004
Parapenaeus longirostris,femal		1				2.08				0.001
Shrimps, small, non comm.		1				2.08			0.001	
Penaeus kerathurus		2				4.17		0.001		
Parapandalus narval		1				2.08				
Other fish							0.246	0.39	0.176	0.209
Sum all species							18.862	23.914	23.416	10.176
Sum SNAPPERS, JOBFISHES							0.015	0.056		
Sum GROUPERS, SEABASSES							0.05	0.038	0.104	0.002
Sum GRUNTS, SWEETLIPS							6.099	6.399	10.986	0.695
Sum CROAKERS, DRUMS, WEAKE., KOBES							1.404	3.695	0.836	0.254
Sum PANDORAS, PORGIES, SEABREAMS,							1.97	0.602	1.774	3.223
Sum SHARKS, CHIMAERAS							0.096	0.075	0.081	0.126
Sum BATOID FISHES, RAYS							0.942	1.255	1.358	0.262
Sum CEPHALOPODS							0.182	0.124	0.203	0.205
Numbers of stations included in analysis, total and by depth strata							48	13	18	17

PALMERINHAS - CONGO RIVER

B. Slope 200-500 m.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							200-300m	300-400m	400-500m
	>0	10	30	100	300					
Synagrops microlepis	5	2	3	1		64.71	1.838	4.415	0.042	0.027
Nematocarcinus africanus	2	1	2	1		35.29	1.632		3.03	2.603
Merluccius polli	7	5	2			82.35	1.313	0.636	1.166	2.2
Chlorophthalmus atlanticus	4	2	4			58.82	1.219	1.262	1.89	0.722
Dentex angolensis	2	1	3			35.29	0.829	2.013		
Perothrissus bellocci	7	1	1			52.94	0.536	1.276	0.022	0.016
Brotula barbata	3	2	1			35.29	0.503	1.222		
Parapenaeus longirostris, femal	10	1	1			70.59	0.47	1.041	0.156	0.013
Trichiurus lepturus	11	3				82.35	0.465	0.388	0.552	0.498
MYCTOPHIDAE	10		1			64.71	0.412	0.979	0.023	0.009
Bembrops heterurus	7	2				52.94	0.373	0.809	0.132	0.025
Chaunax pictus	7	2				52.94	0.295		0.273	0.654
Parapenaeus longirostris, male	8	1				52.94	0.287	0.694	0.004	
Hymenocephalus italicus	9		1			58.82	0.286	0.003	0.14	0.714
Gadella maraldi	6	1				41.18	0.262	0.029	0.343	0.48
Laemonema laureysi	3		1			23.53	0.258		0.889	0.138
Spatangus capensis			1			5.88	0.202		0.861	
Squatina oculata	2	1				17.65	0.199	0.484		
PORIFERA (Sponges)			1			5.88	0.198			0.561
Malacocephalus occidentalis	11	1				70.59	0.181	0.055	0.436	0.157
HISTIOTEUTHIDAE		1				5.88	0.168			0.476
Zenopsis conchifer	5					29.41	0.163	0.395		
Parasudis fraser-bruenneri	3	1				23.53	0.135	0.081	0.43	
Lophiodes kempi	9	1				58.82	0.134	0.068	0.434	0.011
Pontinus accraensis	7					41.18	0.128	0.085	0.169	0.151
Chaceon maritae, male	3	1				23.53	0.12			0.341
GASTROPODS	3	1				23.53	0.112	0.269	0.001	0.002
Gadella imberbis	13					76.47	0.111	0.055	0.088	0.193
Chaceon maritae, female	2	1				17.65	0.104			0.294
JELLYFISH		1				5.88	0.098			0.278
Benthodesmus tenuis	7					41.18	0.09		0.137	0.163
Torpedo nobiliana	1	1				11.76	0.086		0.075	0.194
Yarella blackfordi	5					29.41	0.079		0.027	0.206
Aristeus varidens, female	6					35.29	0.074		0.012	0.2
Callorhynchus capensis		1				5.88	0.073			0.207
Dibranchius atlanticus	11					64.71	0.072	0.002	0.046	0.171
Shrimps, small, non comm.	2	1				17.65	0.072		0.022	0.189
Stereomastis sp.	8					47.06	0.069		0.049	0.163
Centrophorus granulosus	3					17.65	0.068		0.228	0.04
Stomias boa boa	6					35.29	0.063		0.075	0.129
Miracorvina angolensis	2					11.76	0.058	0.142		
Coelorhynchus coelorhynchus	3					17.65	0.057		0.213	0.019
Lophius vaillanti	1					5.88	0.057			0.16
LOBSTERS	4					23.53	0.055	0.119	0.026	0.001
Bembrops greyi	7					41.18	0.052	0.109	0.031	
Triplophos hemingi	6					35.29	0.042		0.019	0.106
Umbrina canariensis	3					17.65	0.041	0.1		
Bathyroconger vicinus	6					35.29	0.038	0.005	0.104	0.033
Pontinus kuhlii	1					5.88	0.038		0.16	
Nezumia aequalis	7					41.18	0.036	0.014	0.05	0.052
Aristeus varidens, male	5					29.41	0.035		0.046	0.069
Bassanago albescens	3					17.65	0.031	0.003	0.125	
Callinectes sp.	4					23.53	0.031		0.072	0.039
Centrophorus squamosus	2					11.76	0.029			0.083
Paramola cuvieri	1					5.88	0.029		0.124	
Peristedion cataphractum	9					52.94	0.027	0.049	0.031	
Dicologlossa cuneata	3					17.65	0.024	0.058		
Trachurus trecae	2					11.76	0.024	0.037	0.036	
MACROURIDAE	1					5.88	0.024	0.057		
Zeus faber	2					11.76	0.022	0.053		
Calappa pelii	2					11.76	0.015	0.034	0.006	
Histioteuthis miranda	1					5.88	0.014			0.041
Nezumia micronychodon	2					11.76	0.014	0.035		0.001
Gephyroberyx darwini	5					29.41	0.014	0.018	0.018	0.006
Guentherus altivela	1					5.88	0.013			0.038
Illex coindetii	4					23.53	0.013	0.01	0.039	

Palmerinhas – Congo River slope 200-500 m cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²		
	Lower limits, Kg/nm							200-300m	300-400m	400-500m
	>0	10	30	100	300					
Halosaurus ovenii	5					29.41	0.013			0.038
PARALEPIDIDAE	2					11.76	0.013		0.056	
Calappa sp.	3					17.65	0.013	0.031		0.001
Munidopsis sp.	2					11.76	0.013		0.046	0.005
Uranoscopus polli	2					11.76	0.012	0.029		
Epigonus telescopus	4					23.53	0.01	0.004	0.036	
Solenocera africana	7					41.18	0.009	0.012	0.007	0.007
Sergestes sp.	2					11.76	0.004		0.003	0.008
Plesiopenaeus edwardsianus	3					17.65	0.003			0.009
Parapandalus narval	1					5.88	0.001			0.004
Glyphus marsupialis	1					5.88				0.001
Aristeus varidens	1					5.88			0.001	
Heterocarpus grimaldii	1					5.88			0.001	
Other fish							0.192	0.219	0.093	0.226
Sum all species							14.895	17.401	13.093	13.172
Sum SNAPPERS, JOBFISHES										
Sum GROUPERS, SEABASSES										
Sum GRUNTS, SWEETLIPS										
Sum CROAKERS, DRUMS, WEAKE., KOBES							0.1	0.242		
Sum PANDORAS, PORGIES, SEABREAMS,							0.832	2.02		
Sum SHARKS, CHIMAERAS							0.392	0.484	0.269	0.367
Sum BATOID FISHES, RAYS							0.107	0.042	0.077	0.204
Sum CEPHALOPODS							0.214	0.023	0.039	0.554
Numbers of stations included in analysis, total and by depth strata							17	7	4	6

PALMERINHAS - CONGO RIVER slope

C. 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					
Nematocarcinus africanus	1	1	6	2		62.5	4.599	8.066	4.435	1.241
Yarella blackfordi	4	6	4			87.5	2.175	2.593	1.211	2.4
Hoplostethus cadenati	6	8	1			93.75	1.406	1.238	2.339	0.953
Lamprogrammus exutus	11	4				93.75	0.701	0.633	0.814	0.693
HOLUTHUROIDEA			2			12.5	0.655			1.747
Stereomastis sp.	15	1				100	0.597	0.379	0.451	0.912
Triplophos hemingi	15	1				100	0.512	0.361	0.447	0.707
PORIFERA (Sponges)	4	1	1			37.5	0.479	0.309	0.01	0.962
Stomias boa boa	13	1				87.5	0.415	0.568	0.339	0.313
JELLY FISH	4		1			31.25	0.398	0.004	0.083	1.003
Aristeus varidens, female	16					100	0.286	0.331	0.23	0.28
Nezumia micronychodon	2	2				25	0.253	0.009		0.664
Merluccius polli	7	1				50	0.243	0.006	0.125	0.559
Chaceon maritae, male	3	1				25	0.183	0.321		0.166
Anemones, pink	3	1				25	0.18			0.48
Parapandalus narval	2	1				18.75	0.174		0.454	0.16
Bathyroconger vicinus	12					75	0.117	0.033	0.048	0.247
Chaceon maritae, female	3	1				25	0.117	0.257	0.07	0.007
Yarella blackfordi *	1	1				12.5	0.113	0.033	0.403	
Coelorrhinus coelorrhinus		1				6.25	0.086			0.229
Chaceon maritae	10					62.5	0.085	0.086	0.04	0.113
Trichiurus lepturus	5					31.25	0.084	0.145	0.042	0.05
Nezumia aequalis	6					37.5	0.078	0.013	0.129	0.11
Talismania longifilis	1	1				12.5	0.074	0.009		0.189
Malacocephalus occidentalis	7					43.75	0.073	0.081	0.023	0.099
Xenodermichthys copei	14					87.5	0.065	0.038	0.046	0.106
Halosaurus ovenii	11					68.75	0.065	0.04	0.032	0.113
Aristeus varidens, male	12					75	0.064	0.134	0.043	0.008
Shrimps, small, non comm.	5					31.25	0.062	0.003	0.037	0.137
Dicrolene intronigra	7					43.75	0.059	0.008	0.019	0.137
Dibranchius atlanticus	13					81.25	0.057	0.021	0.053	0.096
Raja confundens	8					50	0.055	0.015	0.125	0.049
Gadella imberbis	9					56.25	0.046	0.068	0.071	0.007
Chaunax pictus	7					43.75	0.045	0.112	0.014	
Opisthoteuthis agassizi	2					12.5	0.044	0.089	0.044	
Hoplostethus atlanticus	1					6.25	0.043			0.115
Benthodesmus tenuis	8					50	0.038	0.069	0.045	0.003
Trachyrincus scabrus	3					18.75	0.038			0.1
Ateleopus natalensis	1					6.25	0.036			0.096
Opisthoteuthis rossi	2					12.5	0.035		0.013	0.083
Paramola cuvieri	2					12.5	0.034		0.108	0.018
Stomias affinis	2					12.5	0.032		0.031	0.064
Todaropsis eblanae	3					18.75	0.032	0.048	0.054	
OMMASTREPHIDAE	3					18.75	0.031		0.075	0.032
Lophius vaillanti	6					37.5	0.03	0.015	0.021	0.05
Malacocephalus laevis	4					25	0.026	0.055	0.005	0.01
Todarodes sp.	2					12.5	0.026			0.068
Phrynichthys wedli	2					12.5	0.024		0.096	
THYSANOTEUTHIDAE	3					18.75	0.02	0.009		0.045
Starfish	2					12.5	0.02	0.044		0.009
ALEPOCEPHALIDAE	4					25	0.018		0.001	0.048
Photoneustes braueri	5					31.25	0.018	0.018	0.004	0.028
Laemonema laureysi	3					18.75	0.016	0.044		
Etmopterus spinax	4					25	0.014	0.019	0.013	0.011
Centrophorus squamosus	1					6.25	0.014	0.038		
VITRELEDONELLIDAE	1					6.25	0.014	0.038		
Bathylagus sp.	1					6.25	0.013			0.034
Sea cucumber	1					6.25	0.012			0.033
MYCTOPHIDAE	9					56.25	0.012	0.008	0.015	0.014
Bassanago albescens	2					12.5	0.012	0.008		0.023
Glyphus marsupialis	6					37.5	0.011	0.006		0.024
GONOSTOMATIDAE	4					25	0.011	0.014		0.015
MACROURIDAE	1					6.25	0.01			0.028
Raja alba	3					18.75	0.01	0.006		0.021

Palmerinhas – Congo River slope 500-800 m cont

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²				
	Lower limits, Kg/nm							500-600m	600-700m	700-800m		
	>0	10	30	100	300	1000						
SHRIMPS		2					12.5	0.004	0.009	0.002		
Plesiopenaeus edwardsianus		4					25	0.004	0.006	0.002	0.003	
Acanthephyra sp.		2					12.5	0.002	0.003		0.002	
PASIPHAIDAE		1					6.25	0.001		0.004		
Heterocarpus grimaldii		1					6.25	0.001		0.003		
Other fish								0.151	0.176	0.122	0.145	
Sum all species								15.457	16.636	12.79	16.058	
Sum SNAPPERS, JOBFISHES												
Sum GROUPERS, SEABASSES												
Sum GRUNTS, SWEETLIPS												
Sum CROAKERS, DRUMS, WEAKEF., KOBS												
Sum PANDORAS, PORGIES, SEABREAMS,												
Sum SHARKS, CHIMAERAS								0.051	0.078	0.047	0.026	
Sum BATOID FISHES, RAYS								0.065	0.021	0.125	0.07	
Sum CEPHALOPODS								0.215	0.203	0.19	0.243	
Numbers of stations included in analysis, total and by depth strata								16	6	4	6	

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 Species codes

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

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

ANNEX VI. Catch rates

Families included under each group:

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

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

Cephalopods: squids and octopuses.

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

A. Inner shelf (20-70 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
7	25	0.7	15.3	20.1	0.0	0.0	34.2	70.3
8	23	0.0	169.5	0.0	0.0	0.0	88.7	258.1
9	50	5.7	368.9	14.5	0.0	0.4	50.3	439.7
15	32	0.0	1670.3	218.7	0.0	0.0	171.0	2059.9
16	34	0.0	356.2	24.7	0.0	0.0	64.4	445.3
17	60	1.8	45.2	11.4	0.0	0.0	84.9	143.4
25	50	9.6	2.9	0.6	0.0	0.0	46.1	59.2
26	29	0.0	530.5	48.2	0.0	0.0	64.7	643.4
27	34	16.8	460.3	219.0	22.3	4.6	363.1	1086.1
28	51	27.7	232.0	47.3	0.0	0.1	74.8	381.8
34	22	1.4	5.6	0.0	0.0	0.0	62.0	69.0
35	23	4.6	196.9	214.2	0.0	0.7	202.4	618.8
36	28	16.6	4.6	32.5	0.0	0.0	78.9	132.7
37	42	7.4	6.2	76.0	0.0	0.0	36.5	126.1
38	62	12.0	48.3	2.0	0.0	0.0	76.2	138.5
46	55	17.3	213.9	33.4	0.0	0.0	191.4	455.9
47	56	21.8	390.4	244.9	0.0	0.0	365.2	1022.2
51	68	17.9	738.2	207.3	0.0	1.8	271.5	1236.7
Mean	41	9.0	303.0	78.6	1.2	0.4	129.2	521.5
Std dev		8.8	403.1	93.1	5.3	1.1	107.7	531.2
%Catch		1.7	58.1	15.1	0.2	0.1	24.8	

B. Outer shelf (71-200 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
5	114	4.8	28.5	0.0	0.0	0.0	66.2	99.5
6	76	15.9	126.3	34.1	0.0	0.2	27.9	204.2
10	112	9.7	27.3	0.9	0.0	0.7	271.1	309.7
14	94	56.7	110.9	1.4	0.0	0.0	163.2	332.2
18	84	12.6	16.0	236.0	0.0	0.0	295.6	560.3
19	105	9.9	49.6	45.5	0.0	0.0	140.7	245.7
23	129	7.9	221.6	7.1	0.0	0.0	167.7	404.3
24	94	20.1	35.5	5.1	0.0	0.0	132.2	192.9
32	150	13.2	298.9	19.1	0.0	0.8	281.1	613.2
33	115	43.6	157.7	17.0	0.0	0.0	201.5	419.9
39	104	66.8	210.0	765.7	0.0	0.0	311.1	1353.7
44	101	0.8	358.9	0.0	0.0	0.0	210.1	569.8
45	71	3.6	1795.0	2511.7	0.0	0.0	215.1	4525.3
48	75	18.7	354.0	201.7	0.0	0.1	105.1	679.6
49	98	0.0	383.0	2.1	0.0	0.0	158.9	544.0
50	109	1.6	858.1	0.0	0.0	0.0	322.9	1182.6
52	93	53.6	185.1	10.9	0.0	2.5	542.3	794.3
Mean	101	20.0	306.8	226.9	0.0	0.2	212.5	766.5
Std dev		21.4	435.5	618.4	0.0	0.6	120.4	1025.3
% Catch		2.6	40.0	29.6	0.0	0.0	27.7	

C. Slope (201-800 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
3	728	23.7	18.0	0.0	0.6	9.0	295.1	346.4
4	428	0.7	432.6	87.0	11.1	14.8	131.8	678.0
11	528	0.0	58.2	3.6	8.0	24.3	121.9	216.1
12	738	9.4	26.7	0.9	1.5	10.8	199.2	248.4
13	302	0.0	2.7	0.0	0.0	6.7	595.4	604.8
20	735	3.0	4.7	0.0	2.2	8.1	127.4	145.3
21	513	0.0	77.8	7.1	8.2	232.9	153.5	479.5
22	339	0.0	230.3	0.2	0.4	14.8	516.7	762.5
30	371	0.0	122.8	0.5	0.9	86.7	109.9	320.7
31	511	20.8	106.6	1.2	0.0	292.5	165.0	586.2
40	382	0.0	14.1	1.3	1.1	134.3	120.4	271.2
41	575	0.9	52.5	2.5	0.6	138.7	141.7	336.9
42	480	0.0	93.7	1.7	14.1	225.9	148.1	483.7
43	264	2.8	54.4	4.1	0.0	18.9	624.3	704.6
53	729	2.5	9.1	0.0	5.9	14.1	159.1	190.7
Mean	508	4.3	87.0	7.3	3.6	82.2	240.6	425.0
Std dev		7.7	112.9	22.1	4.6	98.7	181.8	203.1
% Catch		1.0	20.5	1.7	0.8	19.3	56.6	

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	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
7	25	0.0	12.4	0.0	0.0	0.0	57.9	70.3
8	23	0.0	8.0	0.0	39.9	60.6	149.6	258.1
9	50	3.6	0.0	174.6	186.5	0.0	75.1	439.7
15	32	43.6	14.0	34.1	42.8	0.0	1925.3	2059.9
16	34	3.6	0.0	39.3	0.4	0.0	401.9	445.3
17	60	0.0	0.0	0.0	42.6	0.0	100.7	143.4
25	50	0.0	1.8	0.0	1.1	0.0	56.4	59.2
26	29	487.8	0.0	0.0	2.4	0.0	153.2	643.4
27	34	152.2	0.0	29.6	0.0	0.0	904.3	1086.1
28	51	0.0	3.5	0.0	16.8	0.0	361.5	381.8
34	22	0.0	0.0	0.0	5.6	0.0	63.4	69.0
35	23	30.8	7.3	12.0	14.8	0.0	553.9	618.8
36	28	0.0	1.1	0.0	0.6	0.0	131.1	132.7
37	42	0.0	4.7	0.0	1.1	0.0	120.4	126.1
38	62	0.0	2.6	0.0	45.4	0.0	90.5	138.5
46	55	0.0	0.0	62.3	67.2	0.0	326.5	455.9
47	56	119.5	4.7	200.4	25.3	0.0	672.2	1022.2
51	68	4.9	37.5	63.6	51.6	0.0	1079.1	1236.7
Mean	41	47.0	5.4	34.2	30.2	3.4	401.3	521.5
Std dev		118.5	9.1	60.0	44.7	14.3	488.7	531.2
%Catch		9.0	1.0	6.6	5.8	0.7	77.0	

B. Outer shelf (71-200 m).

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
5	114	0.4	0.0	0.0	26.9	0.0	72.2	99.5
6	76	0.0	0.0	0.0	40.6	0.0	163.6	204.2
10	112	0.0	0.0	0.0	10.0	0.0	299.8	309.7
14	94	0.0	11.0	0.0	70.1	0.0	251.1	332.2
18	84	0.0	0.0	0.0	13.7	0.0	546.6	560.3
19	105	0.0	0.0	0.0	23.0	0.0	222.7	245.7
23	129	1.9	0.0	0.0	192.0	0.0	210.4	404.3
24	94	0.0	0.0	0.0	24.7	0.0	168.1	192.9
32	150	0.0	0.0	0.0	106.1	0.0	507.1	613.2
33	115	36.2	0.0	0.0	43.7	0.0	339.9	419.9
39	104	11.5	0.0	0.0	45.9	0.0	1296.3	1353.7
44	101	17.7	0.0	0.0	325.0	0.0	227.1	569.8
45	71	0.0	0.0	1662.3	99.9	0.0	2763.2	4525.3
48	75	9.1	7.4	278.9	20.5	0.0	363.6	679.6
49	98	99.6	20.7	7.1	255.5	0.0	161.0	544.0
50	109	598.7	0.0	0.0	259.3	0.0	324.5	1182.6
52	93	55.5	0.0	0.0	110.0	0.0	628.8	794.3
Mean	101	48.9	2.3	114.6	98.1	0.0	502.7	766.5
Std dev		144.2	5.7	404.5	99.4	0.0	647.5	1025.3
%Catch		6.4	0.3	15.0	12.8	0.0	65.6	

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	Clupeids	Hairtails	Scomberids	Other	Total
7	25	0.0	20.1	0.0	0.0	0.0	50.2	70.3
8	23	0.0	0.0	0.0	0.0	0.0	258.1	258.1
9	50	10.4	3.0	1.1	0.0	0.0	425.2	439.7
15	32	36.0	182.7	0.0	0.0	0.0	1841.2	2059.9
16	34	0.2	8.0	0.2	16.3	0.0	420.6	445.3
17	60	0.2	6.9	0.0	4.3	0.0	132.0	143.4
25	50	0.0	0.6	0.0	0.0	0.0	58.6	59.2
26	29	0.0	20.8	2.8	2.0	0.0	617.8	643.4
27	34	13.9	28.4	27.7	149.0	0.0	867.1	1086.1
28	51	0.9	46.1	0.3	0.0	0.0	334.5	381.8
34	22	0.0	0.0	0.0	0.0	0.0	69.0	69.0
35	23	21.6	171.3	1.2	0.0	0.0	424.7	618.8
36	28	0.0	31.3	1.3	0.0	0.0	100.2	132.7
37	42	0.0	76.0	0.0	0.0	0.0	50.1	126.1
38	62	1.9	0.1	0.0	0.0	0.0	136.5	138.5
46	55	8.2	24.3	0.0	0.0	0.9	422.6	455.9
47	56	0.0	234.9	10.0	0.0	0.0	777.3	1022.2
51	68	0.0	193.8	0.0	13.5	0.0	1029.4	1236.7
Mean	41	5.2	58.2	2.5	10.3	0.0	445.3	521.5
Std dev		9.8	78.8	6.7	35.0	0.2	458.4	531.2
%Catch		1.0	11.2	0.5	2.0	0.0	85.4	

B. Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeids	Hairtails	Scomberids	Other	Total
5	114	0.0	0.0	0.0	0.0	0.0	99.5	99.5
6	76	0.0	32.7	0.0	1.4	0.0	170.2	204.2
10	112	0.0	0.9	0.0	0.0	0.0	308.8	309.7
14	94	0.0	1.4	0.0	0.0	0.0	330.8	332.2
18	84	0.0	236.0	0.0	0.0	0.0	324.3	560.3
19	105	0.0	45.5	0.0	0.0	0.0	200.2	245.7
23	129	0.0	0.0	0.0	7.1	0.0	397.2	404.3
24	94	0.7	4.4	0.0	0.0	0.0	187.8	192.9
32	150	0.0	0.0	0.0	19.1	0.0	594.1	613.2
33	115	0.0	6.9	0.0	0.0	0.0	412.9	419.9
39	104	0.0	42.6	0.0	723.2	0.0	588.0	1353.7
44	101	0.0	0.0	0.0	0.0	0.0	569.8	569.8
45	71	5.6	2460.7	34.2	0.0	11.1	2013.7	4525.3
48	75	0.0	14.0	1.1	186.6	0.0	477.9	679.6
49	98	0.0	0.0	0.0	0.0	2.1	541.9	544.0
50	109	0.0	0.0	0.0	0.0	0.0	1182.6	1182.6
52	93	0.0	10.9	0.0	0.0	0.0	783.4	794.3
Mean	101	0.4	168.0	2.1	55.1	0.8	540.2	766.5
Std dev		1.3	593.5	8.3	177.9	2.7	461.3	1025.3
%Catch		0.1	21.9	0.3	7.2	0.1	70.5	

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

Slope (201-800 m).

Station	Gear depth	<i>A.varidens</i>	Hake	<i>N.africana</i>	<i>P.longirostris</i>	Seabream	Other	Total
3	728	8.4	1.7	0.0	0.0	0.0	336.3	346.4
4	428	12.7	432.6	0.0	0.0	0.0	232.7	678.0
11	528	24.3	35.1	0.0	0.0	0.0	156.6	216.1
12	738	8.1	14.7	0.0	0.0	0.0	225.5	248.4
13	302	0.0	1.5	0.0	4.0	0.0	599.4	604.8
20	735	4.8	3.2	0.0	0.0	0.0	137.4	145.3
21	513	26.6	0.0	205.2	0.0	0.0	247.7	479.5
22	339	2.7	230.3	0.0	12.0	0.0	517.5	762.5
30	371	3.8	122.8	81.8	1.2	0.0	111.2	320.7
31	511	36.7	1.2	255.1	0.0	0.0	293.1	586.2
40	382	1.7	14.1	127.7	4.2	0.0	123.4	271.2
41	575	20.6	9.0	116.8	0.0	0.0	190.5	336.9
42	480	20.0	15.3	205.0	0.0	0.0	243.4	483.7
43	264	0.0	27.6	0.0	18.9	20.4	637.7	704.6
53	729	11.0	5.1	0.0	0.0	0.0	174.6	190.7
Mean	508	12.1	61.0	66.1	2.7	1.4	281.8	425.0
Std dev		11.2	120.2	92.7	5.5	5.3	170.1	203.1
%Catch		2.8	14.4	15.6	0.6	0.3	66.3	

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
54	32	5.7	215.3	98.1	0.0	7.2	151.9	478.1
55	55	10.6	4295.7	834.1	0.0	0.0	875.4	6015.8
68	62	1.5	572.0	379.0	0.0	0.6	37.7	990.9
69	47	19.5	781.9	114.9	0.0	1.1	140.6	1058.1
70	30	5.4	534.9	757.9	0.0	5.7	505.7	1809.7
77	70	12.4	65.3	56.8	0.0	0.0	63.2	197.8
78	57	19.8	100.4	1265.0	0.0	0.0	35.1	1420.3
79	40	7.8	679.6	322.5	5.6	8.1	277.6	1301.2
80	24	0.0	289.1	1005.2	0.0	1.6	420.1	1715.9
87	70	8.0	290.8	34.7	10.6	0.0	119.4	463.5
88	32	0.0	958.1	453.1	3.8	2.1	233.0	1650.2
89	28	0.0	688.0	142.1	2.9	0.0	258.8	1091.9
90	25	0.0	205.2	16.9	8.7	0.4	134.3	365.4
96	60	13.6	35.8	14.9	0.0	0.0	37.1	101.4
97	41	2.0	50.0	28.8	0.0	0.0	32.4	113.2
98	38	3.3	11.3	1.5	0.0	0.0	24.9	40.9
99	46	2.9	35.0	3.5	0.0	0.0	29.2	70.5
128	52	1.5	0.0	14.9	0.0	0.0	58.8	75.2
129	31	0.0	22.8	63.3	10.1	0.3	24.0	120.4
130	41	3.0	1.9	7.6	0.0	0.0	7.8	20.3
131	70	3.1	82.6	6.4	0.0	0.0	7.3	99.4
Mean	45	5.7	472.2	267.7	2.0	1.3	165.4	914.3
Std dev		6.2	925.5	379.6	3.6	2.5	213.5	1327.7
%Catch		0.6	51.6	29.3	0.2	0.1	18.1	

B. Outer shelf (71-200 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
56	112	15.7	236.5	41.9	2.9	0.3	67.9	365.2
57	147	7.8	288.7	18.1	0.0	0.7	465.3	780.7
67	86	3.4	847.1	389.7	0.0	0.2	125.3	1365.7
74	165	1.6	47.1	0.0	0.0	1.6	552.3	602.7
75	108	0.5	78.2	33.5	0.0	0.0	11.2	123.4
76	86	3.1	94.1	26.9	0.0	0.0	74.5	198.6
85	115	12.2	160.2	7.1	0.0	0.0	66.8	246.3
86	86	6.1	557.8	19.3	0.0	0.0	103.9	687.1
94	116	22.8	232.1	102.0	0.0	0.0	90.1	447.0
95	86	11.5	117.0	20.0	11.0	0.0	53.2	212.8
100	121	18.2	75.9	41.4	0.0	0.0	102.8	238.2
106	150	0.3	152.4	3.3	0.0	0.1	78.6	234.7
107	119	4.0	230.0	15.0	8.2	0.0	110.7	368.0
108	112	9.9	158.9	21.7	7.5	0.0	80.7	278.7
109	88	0.2	17.2	5.0	0.0	0.0	10.6	32.9
110	82	6.5	569.5	30.9	12.7	0.0	44.5	664.2
111	90	4.9	30.9	0.0	0.0	0.0	220.2	256.0
116	190	1.0	66.9	9.7	40.5	0.0	192.3	310.4
117	146	1.6	108.9	19.3	4.2	0.0	113.6	247.7
118	115	0.2	245.1	54.6	5.0	0.0	35.8	340.7
119	109	3.0	167.3	54.8	0.0	0.1	47.8	273.0
120	115	3.3	56.7	10.2	0.0	0.0	34.2	104.4
121	124	5.8	121.4	24.8	0.0	0.1	41.4	193.4
126	96	5.3	165.1	50.0	2.9	0.5	136.0	359.8
127	80	3.4	116.5	292.4	9.2	0.0	9.0	430.5
132	92	0.6	164.8	17.2	0.0	0.0	12.6	195.2
133	122	0.5	99.1	42.1	0.0	0.0	87.5	229.3
Mean	113	5.7	192.8	50.0	3.9	0.1	110.0	362.5
Std dev		5.9	186.9	87.7	8.3	0.3	126.5	269.7
%Catch		1.6	53.2	13.8	1.1	0.0	30.3	

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
54	32	6.1	7.3	10.9	0.0	0.0	453.8	478.1
55	55	0.0	0.0	205.2	65.1	0.0	5745.5	6015.8
68	62	0.0	0.0	87.2	14.0	0.0	889.7	990.9
69	47	0.0	0.0	218.3	77.8	0.0	762.0	1058.1
70	30	310.4	0.0	134.9	0.0	0.0	1364.5	1809.7
77	70	2.8	0.7	1.7	33.1	0.0	159.5	197.8
78	57	8.8	0.0	44.6	39.3	0.0	1327.5	1420.3
79	40	523.2	0.0	75.5	0.0	0.0	702.5	1301.2
80	24	92.4	0.0	4.0	0.0	0.0	1619.6	1715.9
87	70	0.0	0.1	283.8	3.5	0.0	176.1	463.5
88	32	581.4	0.0	26.7	0.0	0.0	1042.1	1650.2
89	28	8.1	1.7	76.3	0.0	0.0	1005.8	1091.9
90	25	20.4	3.1	81.9	1.4	21.9	236.8	365.4
96	60	0.0	0.0	0.0	32.3	0.0	69.1	101.4
97	41	0.0	1.6	7.8	29.9	0.0	74.0	113.2
98	38	0.0	0.0	0.0	10.4	0.0	30.6	40.9
99	46	0.0	0.0	0.0	35.0	0.0	35.5	70.5
128	52	0.0	0.0	0.0	0.0	0.0	75.2	75.2
129	31	10.2	0.0	0.0	0.6	0.0	109.7	120.4
130	41	0.0	1.5	0.0	0.1	0.0	18.7	20.3
131	70	0.0	26.2	0.5	52.1	0.0	20.6	99.4
Mean	45	74.5	2.0	60.0	18.8	1.0	758.0	914.3
Std dev		173.3	5.8	84.2	24.2	4.8	1255.1	1327.7
%Catch		8.1	0.2	6.6	2.1	0.1	82.9	

B. Outer shelf (71-200 m)

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
56	112	5.8	0.0	7.4	38.6	0.0	313.4	365.2
57	147	6.0	0.0	0.0	138.6	0.0	636.1	780.7
67	86	1.5	0.0	0.0	48.4	0.0	1315.8	1365.7
74	165	0.0	0.0	0.0	22.6	0.0	580.1	602.7
75	108	0.0	0.0	0.0	8.2	0.0	115.3	123.4
76	86	8.5	2.6	3.6	43.5	0.0	140.4	198.6
85	115	0.0	0.7	0.0	141.9	0.0	103.7	246.3
86	86	10.5	0.0	365.2	17.0	0.0	294.4	687.1
94	116	9.9	0.3	0.0	139.9	0.0	296.9	447.0
95	86	1.6	0.4	0.0	39.4	0.0	171.5	212.8
100	121	2.9	0.0	0.0	47.6	0.0	187.7	238.2
106	150	0.9	0.0	0.0	141.1	0.0	92.7	234.7
107	119	23.4	0.0	0.0	156.4	0.0	188.3	368.0
108	112	0.0	0.0	0.0	97.9	0.0	180.8	278.7
109	88	4.8	0.0	0.0	8.1	0.0	20.1	32.9
110	82	312.3	0.0	90.9	143.1	0.0	117.9	664.2
111	90	0.0	0.0	0.0	30.7	0.0	225.3	256.0
116	190	10.8	0.0	0.0	42.1	0.0	257.4	310.4
117	146	0.0	0.0	0.0	108.9	0.0	138.7	247.7
118	115	1.6	0.0	0.0	128.7	0.0	210.4	340.7
119	109	23.9	0.0	0.0	33.5	0.0	215.6	273.0
120	115	1.3	0.0	0.0	46.7	0.0	56.4	104.4
121	124	0.0	0.0	0.0	86.0	0.0	107.4	193.4
126	96	8.8	0.0	0.0	33.7	0.0	317.4	359.8
127	80	28.4	0.0	0.0	55.3	0.0	346.7	430.5
132	92	94.0	27.8	0.0	27.1	0.0	46.4	195.2
133	122	47.8	0.2	0.0	26.8	0.0	154.6	229.3
Mean	113	22.4	1.2	17.3	68.6	0.0	253.0	362.5
Std dev		61.3	5.3	71.7	49.7	0.0	256.1	269.7
%Catch		6.2	0.3	4.8	18.9	0.0	69.8	

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	Scombrids	Other	Total
54	32	19.9	78.2	0.0	0.1	0.0	380.0	478.1
55	55	60.8	429.5	21.2	322.6	0.0	5181.7	6015.8
68	62	4.2	55.4	2.8	267.5	0.0	660.9	990.9
69	47	36.7	74.1	4.1	0.0	0.0	943.1	1058.1
70	30	343.6	50.1	358.9	5.3	0.0	1051.8	1809.7
77	70	0.0	9.0	0.0	47.3	0.5	140.9	197.8
78	57	0.0	1006.0	189.6	61.5	7.9	155.3	1420.3
79	40	7.4	58.1	178.8	74.4	0.0	982.6	1301.2
80	24	154.9	683.1	106.5	50.6	6.7	714.1	1715.9
87	70	0.0	1.8	0.0	32.9	0.0	428.7	463.5
88	32	166.3	27.6	228.0	19.9	5.9	1202.6	1650.2
89	28	70.3	68.0	1.7	0.0	2.2	949.8	1091.9
90	25	6.5	1.6	7.7	1.1	0.0	348.6	365.4
96	60	0.0	3.9	0.0	11.1	0.0	86.5	101.4
97	41	13.0	3.2	0.0	12.6	0.0	84.4	113.2
98	38	0.4	1.1	0.0	0.0	0.0	39.4	40.9
99	46	1.1	2.4	0.0	0.0	0.0	67.0	70.5
128	52	0.0	10.2	0.0	4.7	0.0	60.3	75.2
129	31	0.0	48.2	9.3	5.8	0.0	57.1	120.4
130	41	0.0	6.6	0.2	0.8	0.0	12.7	20.3
131	70	0.0	2.1	0.0	4.3	0.0	93.1	99.4
Mean	45	42.2	124.8	52.8	43.9	1.1	649.6	914.3
Std dev		84.6	261.2	100.5	86.9	2.5	1113.0	1327.7
%Catch		4.6	13.6	5.8	4.8	0.1	71.0	

B: Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
56	112	0.0	9.6	1.1	24.9	0.0	329.6	365.2
57	147	0.0	18.1	0.0	0.0	0.0	762.6	780.7
67	86	0.0	138.9	0.6	82.3	0.0	1143.9	1365.7
74	165	0.0	0.0	0.0	0.0	0.0	602.7	602.7
75	108	0.0	10.8	0.0	22.7	0.0	89.9	123.4
76	86	0.0	15.1	0.0	11.8	0.0	171.7	198.6
85	115	0.0	4.8	0.0	2.3	0.0	239.1	246.3
86	86	0.0	10.5	0.0	8.8	0.0	667.9	687.1
94	116	0.0	102.0	0.0	0.0	0.0	345.0	447.0
95	86	0.0	11.3	0.0	8.7	0.0	192.8	212.8
100	121	0.0	10.5	0.0	30.9	0.0	196.8	238.2
106	150	0.0	2.1	0.0	1.2	0.0	231.4	234.7
107	119	0.0	12.6	0.0	2.5	0.0	353.0	368.0
108	112	0.0	21.7	0.0	0.0	0.0	257.0	278.7
109	88	0.0	2.0	0.0	3.0	0.0	27.9	32.9
110	82	0.0	30.9	0.0	0.0	0.0	633.3	664.2
111	90	0.0	0.0	0.0	0.0	0.0	256.0	256.0
116	190	0.0	0.0	0.0	9.7	0.0	300.7	310.4
117	146	0.0	15.3	0.0	4.0	0.0	228.4	247.7
118	115	0.0	46.6	0.0	8.1	0.0	286.1	340.7
119	109	0.0	14.3	0.0	40.6	0.0	218.1	273.0
120	115	0.0	7.4	0.0	2.8	0.0	94.2	104.4
121	124	0.0	8.8	0.0	16.0	0.0	168.6	193.4
126	96	0.0	25.4	0.0	24.6	0.0	309.8	359.8
127	80	0.0	55.1	0.0	139.8	0.0	235.6	430.5
132	92	0.0	8.6	0.0	8.6	0.0	178.0	195.2
133	122	0.0	6.5	0.0	35.6	0.0	187.1	229.3
Mean	113	0.0	21.8	0.1	18.1	0.0	322.5	362.5
Std dev		0.0	31.7	0.2	30.3	0.0	242.5	269.7
%Catch		0.0	6.0	0.0	5.0	0.0	89.0	

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	Other	Total
1	218	0.0	0.0	0.0	31.3	177.8	834.6
2	318	0.0	94.0	0.0	1.1	0.0	367.4
58	417	6.8	9.3	164.1	0.0	0.0	53.1
59	526	10.6	0.0	296.0	0.0	0.0	84.6
60	701	15.3	3.4	234.5	0.0	0.0	337.0
61	598	15.3	0.0	237.5	0.0	0.0	397.2
62	524	15.5	0.0	347.1	0.0	0.0	428.6
63	448	12.5	16.0	260.9	0.0	0.0	228.6
64	448	0.0	58.1	33.6	2.4	0.0	322.0
65	228	0.0	39.2	0.0	4.1	34.4	499.1
71	739	1.6	11.3	0.0	0.0	0.0	314.9
72	641	8.2	1.7	262.4	0.0	0.0	305.9
73	532	10.6	0.0	289.0	0.0	0.0	221.1
81	738	8.3	0.0	0.0	0.0	0.0	352.6
82	620	10.8	0.0	258.1	0.0	0.0	151.2
83	363	7.2	31.4	379.4	9.1	0.0	234.2
84	254	0.0	58.6	0.0	38.8	0.0	308.4
91	707	13.4	58.0	0.0	0.0	0.0	602.8
92	527	18.7	0.0	270.3	0.0	0.0	299.3
93	430	12.5	32.2	10.1	0.0	0.0	237.2
101	433	0.9	241.3	0.0	0.0	0.0	376.0
102	621	8.3	0.0	28.5	0.0	0.0	178.8
103	315	0.1	10.8	0.0	4.3	0.0	221.0
104	253	0.0	3.1	0.0	40.6	97.4	119.3
105	219	0.0	0.0	0.0	1.5	105.6	191.9
112	722	2.8	14.4	0.0	0.0	0.0	252.9
113	512	15.6	1.1	38.0	0.0	0.0	76.9
114	443	17.1	17.6	11.5	0.0	0.0	230.4
115	270	0.0	33.2	0.0	46.2	4.1	317.6
122	231	0.0	0.0	0.0	200.5	18.7	499.4
123	328	0.0	9.2	0.0	5.2	0.0	253.8
124	651	5.7	12.5	0.0	0.0	0.0	319.6
125	713	8.3	6.9	0.0	0.0	0.0	549.7
Mean	475	6.8	23.1	94.6	11.7	13.3	308.1
Std dev		6.4	45.3	132.2	36.3	38.7	161.3
%Catch		1.5	5.0	20.7	2.6	2.9	67.3

ANNEX VII Instruments and fishing gear used

Fishing gear

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

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm 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.

Acoustic instruments

The Simrad ER-60/18, 38, 120 and 200 kHz scientific sounder was run during the survey only for observation of fish and bottom conditions. No scrutinizing of the recordings was done. Last standard sphere calibrations were carried out 23.07.2010 in Baia dos Elefantes using Cu-64, Cu-60, WC-38.1 and WC-38.1 spheres for 18, 38, 120 and 200 kHz, respectively. The details of the settings of the 38 kHz echo sounder were as follows:

Transceiver-2 menu (38 kHz)

Transducer depth	5.50 m
Absorbtion coeff.	8,5 dB/km
Pulse duration	medium (1,024ms)
Bandwidth	2,43 kHz
Max power	2000 Watt
2-way beam angle	-20,6dB
gain	25,99 dB
SA correction	-0,59 dB
Angle sensitivity	21.9
3 dB beamwidth	6,74° along ship 6,77° athwardship
Alongship offset	0.13°
Athwardship offset	0.04°

Bottom detection menu Minimum level -40 dB

ANNEX VIII. Station allocation by survey and depth strata

Table 1 - Numbers of valid bottom trawl stations by depth strata. Angolan demersal surveys 1985-2011.

	1985.1	1985.2	1985.3	1985.4	1986.1	1986.2	1989.1	1989.2	1989.3	1991.1	1991.2	1992	1993	1994	1995.1	1995.2	1996	1997.1	1997.2	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
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	
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	8
50-100south	0	1	0	0	8	6	8	8	1	14	12	20	11	0	0	0	0	0	4	0	0	9	0	5	7	7	5	8	8	8	6	6	5
100-200south	0	0	0	0	8	3	9	8	6	10	12	7	9	0	0	0	0	6	0	0	7	0	3	7	5	7	7	7	7	7	7	6	
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
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	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
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
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
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	2
20-50central	0	0	0	3	8	11	17	24	5	17	13	15	0	9	14	0	10	6	1	9	14	23	12	16	16	17	16	16	15	17	16	16	11
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
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
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
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
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
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
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
700-800central	0	0	0	0	0	0	0	0	0	0	0	4	0	2	4	1	4	0	3	0	7	4	4	4	4	6	4	5	5	5	6	4	4
20-50north	5	4	7	6	14	13	3	14	3	7	8	12	0	9	9	0	9	8	0	0	14	11	11	16	13	15	14	14	17	17	17	19	13
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
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
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
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
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
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
600-700north	0	0	0	0	1	0	0	1	0	1	0	3	0	2	3	0	0	0	0	0	1	7	5	6	6	7	8	4	8	6	6	5	4
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
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	155 ¹

¹ The total number of bottom trawl stations include the trawl stations taken at the Southern region of Angola, during the 2011 transboundary pelagic survey.

ANNEX IX Angolan Monitoring Lines 2011

#	Location	Estação	Latitude (S)	Longitude (E)	Depth (multinet)	Depth (bottles)
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	06°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