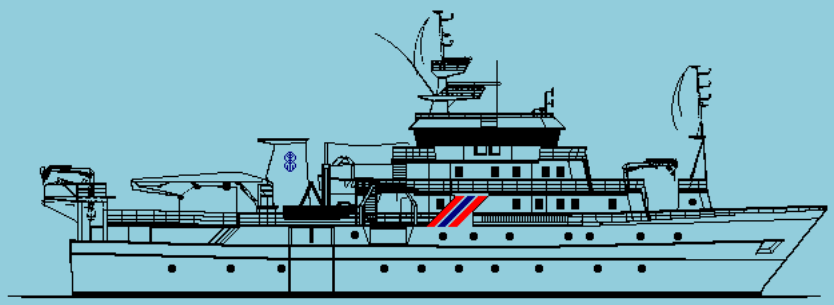

SURVEY OF THE FISH RESOURCES OF ANGOLA

Cruise Report No 4/2012

Survey of the demersal resources

2 – 29 April 2012

Institute of Marine Research
IMR, Bergen
Norway

Instituto Nacional de Investigação das Pescas
INIP, Luanda
Angola

The DR FRIDTJOF NANSEN RESEARCH PROGRAMME is sponsored by the Norwegian Agency for Development Cooperation (NORAD). The Food and Agriculture Organization of the United Nations (FAO) provides support to the Programme through Project GCP/INT/730/NOR: International Cooperation with the Nansen Programme: Fisheries Management and Marine Environment. This project is the follow-up to the Project NORAD/FAO/UNDP GLO/92/013. The Institute of Marine Research (IMR), Bergen, Norway is responsible for the implementation of the Programme in cooperation with FAO Fisheries Department and the local fisheries administrations. The aim of the Nansen Programme is to assist developing countries in fisheries research, management and institutional strengthening.

The programme has previously conducted the following demersal surveys in the area:

January 1985	-	June 1986	(6 surveys)
January 1989	-	December 1989	(3 surveys)
May 1991	-	September 1992	(3 surveys)
January 1994	-	March 2012	(20 surveys)

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF ANGOLA

Survey of the demersal resources
2 - 29 April 2012

Final report

by

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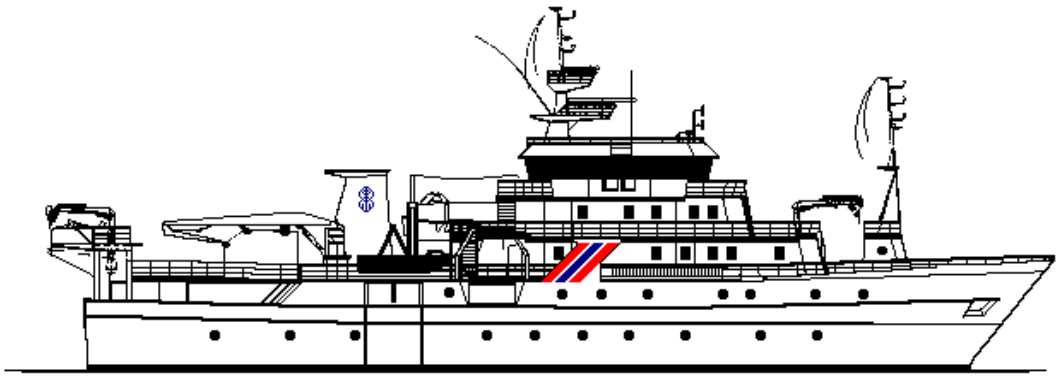
Bergen, 2012



SURVEY OF THE FISH RESOURCES OF ANGOLA

Cruise Report No 2/2012

Survey of the demersal resources
02 – 29 April 2012

Final report

Institute of Marine Research
IMR, Bergen
Norway

Instituto Nacional de Investigação das Pescas
INIP, Luanda
Angola

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CHAPTER 1 INTRODUCTION

1.1 Objectives

The objectives of the cruise have been previously discussed and agreed upon by the responsible scientists from the Demersal Programme of the Instituto Nacional de Investigação Pesqueira (INIP), Angola, and the Institute of Marine Research (IMR), Norway, for the Angolan Demersal Programme, and were the following:

- To survey, map and describe the distribution, composition and abundance of the main demersal species, with special emphasis on sea breams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), hakes (Merlucciidae), cephalopods and shrimps (*Parapenaeus longirostris* and *Aristeus varidens*) on the Angolan shelf and slope (down to 800 m), from Cunene River (17°14'S) to Tombua* (15°40'S), and from Benguela (12°35'S) to Congo River (06°00'S) using bottom trawl and the swept-area method.

- To collect biological data such as length, weight, sex and maturity stage of *Dentex macrophthalmus, D. angolensis, Pagellus bellottii, Umbrina canariensis, Merluccius polli, M. capensis, M. paradoxus, Brachydeuterus auritus, A. varidens, Parapenaeus longirostris* and *Chaceon maritae*.

- To collect the stomach contents for some species such as *U. canariensis* and *B. auritus* and *Merluccius polli* for subsequent analyses in the INIP Lab.

- To monitor the general hydrographical conditions using CTD-sonde on each trawl station and map the temperature, salinity and oxygen.

- To carry out a monitoring line at Cunene River using INIP's new standard hydrographical profiles for collection of temperature, salinity and oxygen, water nutrients and phytoplankton.

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

1.2 Participation

The scientific staff consisted of:

From INIP, Angola:

01.04-23.04: Silvi Nsiangango (local cruise leader), Antonio Buco, Fátima Delicado, Domingos Pedro, María Margarida, Nilsa Alves, Eridson Sequenha, Noémia Nganga, Enoque Canganjo, Bernardo Fernandes.

25.04-29.04:

Silvi Nsiangango (local cruise leader), Antonio Buco, Fátima Delicado, María Margarida, Noémia Nganga, Marisa Macueira, Gisela Ramos, José Francisco Amaro, João Morais, Pedro Tchipalanga

From IMR, Norway:

Diana Zaera (cruise leader), Arved Staby, Jan Frode Wilhelmsen, Ole Sverre Fossheim.

1.3 Narrative

R/V "Dr Fridtjof Nansen" departed Luanda, at 14:30 (UTC) the 2nd April steaming southwards to the border between Namibia and Angola, at Cunene River. We reached our working position the 4th April at 19:30 (UTC), starting the sampling right away off Cunene River with trawl and hydrographic stations. A standard geographical allocation of the trawl stations to be taken during the Angolan demersal trawl surveys was implemented in 2003, and the station positions in the southern region have been similar in the 2000 and 2003-2010 surveys. The slope off Baía dos Tigres has not been adequately surveyed as the bottom is very steep and rough between 200 and 600 m. The southern region was completed by April 9th 18:30 UTC and the vessel headed to Benguela to start surveying the central region. No trawling was carried out between Tombua and Benguela as the shelf and slope is very steep and the bottom conditions are therefore, not suitable for trawling.

The survey of the central region started late April the 10h (20:30 UTC), was completed April the 18th at 16:00 UTC and continued to survey the northern area. No monitoring lines were carried out in these regions since the vessel had just completed a pelagic survey (01-30.03.2012). The vessel called on Luanda the 23rd of April at noon, to change crew and Angolan scientists. It departed the 25th of April, at noon, to complete the coverage of the northern region. The survey of the northern region was completed in the morning 28th April and R/V "Dr. Fridtjof Nansen" called port in Luanda 29th April in the morning.

Due to time constraints, the northern region was covered up to 6°25, with a reduced number of stations (65).

During the present survey only one monitoring line, at Cunene River, was carried out in accordance with the new standards for monitoring lines run by INIP, given that the preceding survey was carried out in the same region between the 1st and 30th March 2012.

CHAPTER 2 METHODS

2.1 Survey effort

Table 2.1 presents the surveyed area by depth strata, allocation of trawl stations, total number of successful swept-area hauls, number of hauls failed, number of CTD stations, and the distance surveyed. Table 2.1 also shows the allocation of effort relative to the stratum size as percentage hauls versus percentage area, by depth, by region, and by total area. The overall average coverage was 1 valid trawl station per 97 square nautical miles (NM²). Figures 2.1-2.3 show the cruise tracks in the southern, central and northern regions, respectively, and the locations of bottom trawl and hydrographical stations.

Table 2.1 Effort Distribution (design) for the 2012 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, are shown for the southern region (Cunene to Tombua), central region (Benguela to Luanda) and northern region (Luanda to Congo River).

	Depth strata (m)												
Region	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	Valid	Failures	CTD	Distance
Cunene-Tombua													
Area (NM^2)	507	591	594	100	77	48	39			**1956**			
# hauls (BT)	6	7	7		1		1	2	1	**25**	2	30	685.9
%area	25.9	30.2	30.4	5.1	3.9	2.5	2	0	0	11.83			
%hauls	24.0	28.0	28.0	0.0	4.0	0.0	4.0	8.0	4.0				
Benguela-Luanda													
Area (NM^2)	1068	1586	1439	407	372	343	346	268	357	**6186**			
# hauls (BT)	16	19	16	2	6	4	5	4	4	**76**	2	77	1023.6
%area	17.3	25.6	23.3	6.6	6	5.5	5.6	4.3	5.8	37.41			
%hauls	21.1	25.0	21.1	2.6	7.9	5.3	6.6	5.3	5.3				
Luanda-Congo River													
Area (NM^2)	1379	1969	1940	601	550	437	409	408	702	**8395**			
# hauls (BT)	11	14	13	4	4	5	3	4	7	**65**	1	65	1037.7
%area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4	50.76			
%hauls	16.9	21.5	20.0	6.1	6.1	7.6	4.6	6.1	10.7				
Grand total													
Area (NM^2)	2954	4146	3973	1108	999	828	794	676	1059	**16537**			
# hauls (BT)	43	44	39	7	14	9	9	9	14	**166**	5	172	2747.2
%area	17.9	25.1	24	6.7	6	5	4.8	4.1	6.4				
%hauls	19.9	24	21.7	3.6	6.6	5.4	5.4	5.4	7.8	**Total hauls: 171**			

A stratified semi-random survey design was applied, with depth and area as stratifying variables. Trawling was carried out on transects perpendicular to the coast, which were approximately 15 NM apart (Figures 2.1-2.3), and the allocation of trawl stations was proportional to stratum size. Trawling at depths shallower than 300m was mainly done during daytime while hauls deeper than 300 m were carried out during dark hours. The survey design (distribution of effort) was adjusted when bottom conditions were unsuitable for trawling, or, as in the northern region, when areas were non-accessible due to oil exploitation.

Based on a decision made in 2003 that the trawl positions of the 2000 demersal survey should be used as the standard for future surveys in the southern region as the survey had a reasonable good coverage. Furthermore, it was decided that the trawl positions of the 2002 demersal survey should be used as the standard for future surveys in the central and northern regions, as the survey had a good coverage of these regions. Therefore, the station positions

and effort have been similar during the 2000 and 2003-2010 surveys in the southern region and during the 2002-2009 surveys in the central and northern regions (see Annex VIII). Nevertheless, and as mentioned before, due to time limitations, the northern region was covered with around 29% less stations.

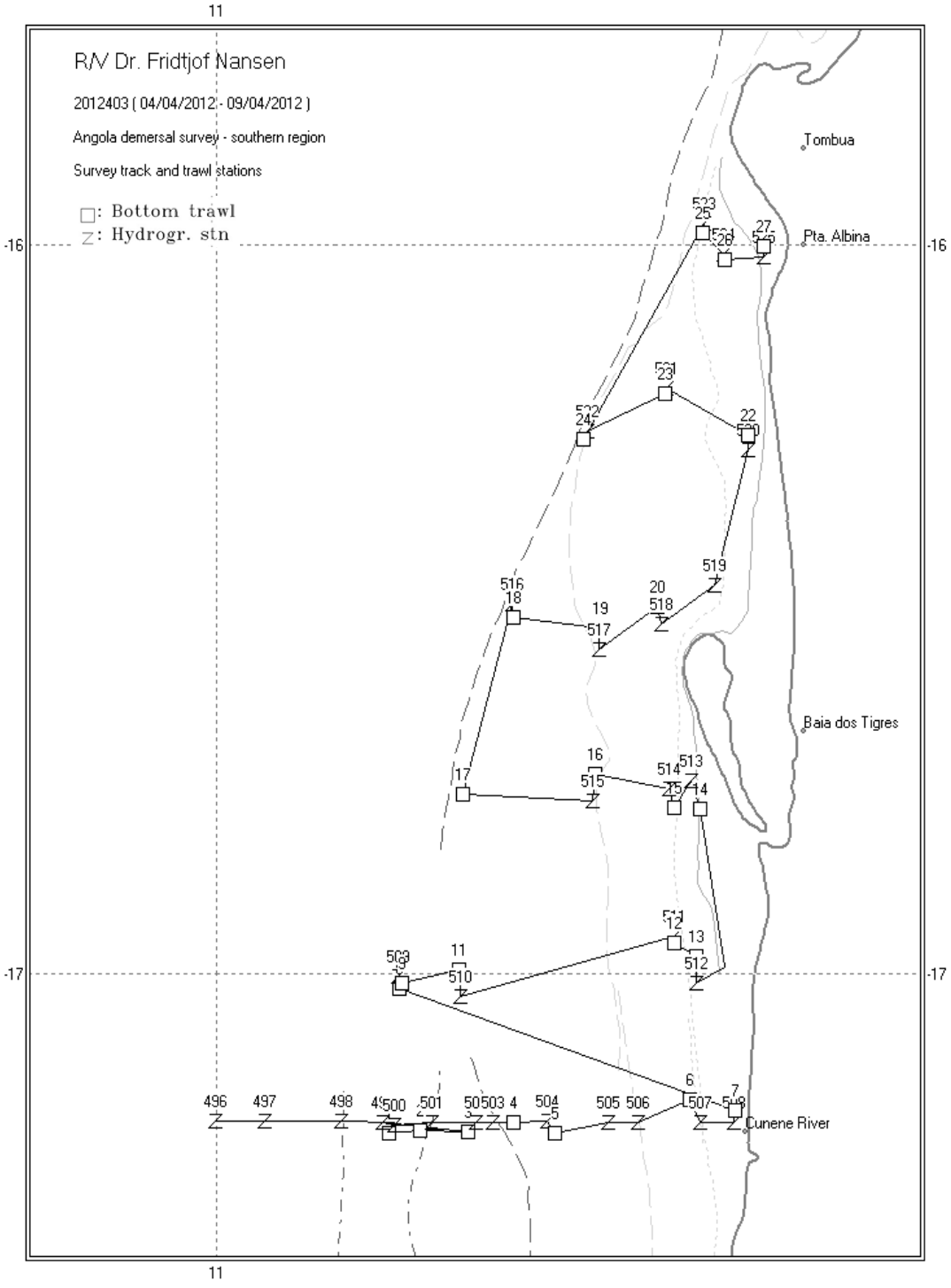


Figure 2.1 Angola south: Cunene - Tombua. Course track with trawl stations (□) and hydrographical stations (Z). Depth contours at 20, 50, 100, 200, 500 and 1000 m.

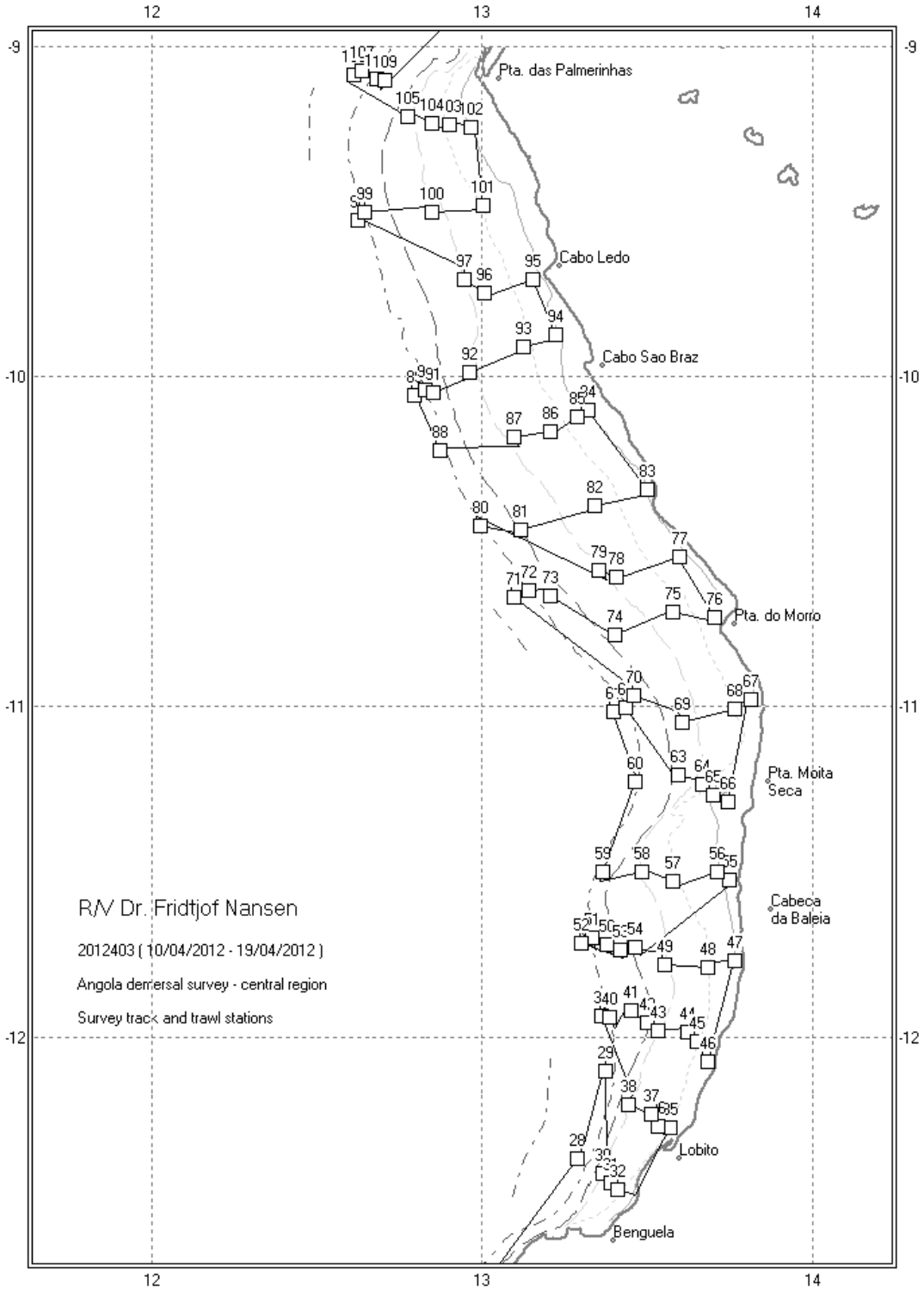


Figure 2.2 Angola Central: Benguela - Ponta das Palmerinhas. Course track with trawl stations (□). Hydrographical stations were taken before or after each trawl station, starting at # 526 (trawl station 28) and ending at # 606 (trawl station 109). Depth contours at 20, 50, 100, 200 and 500 m.

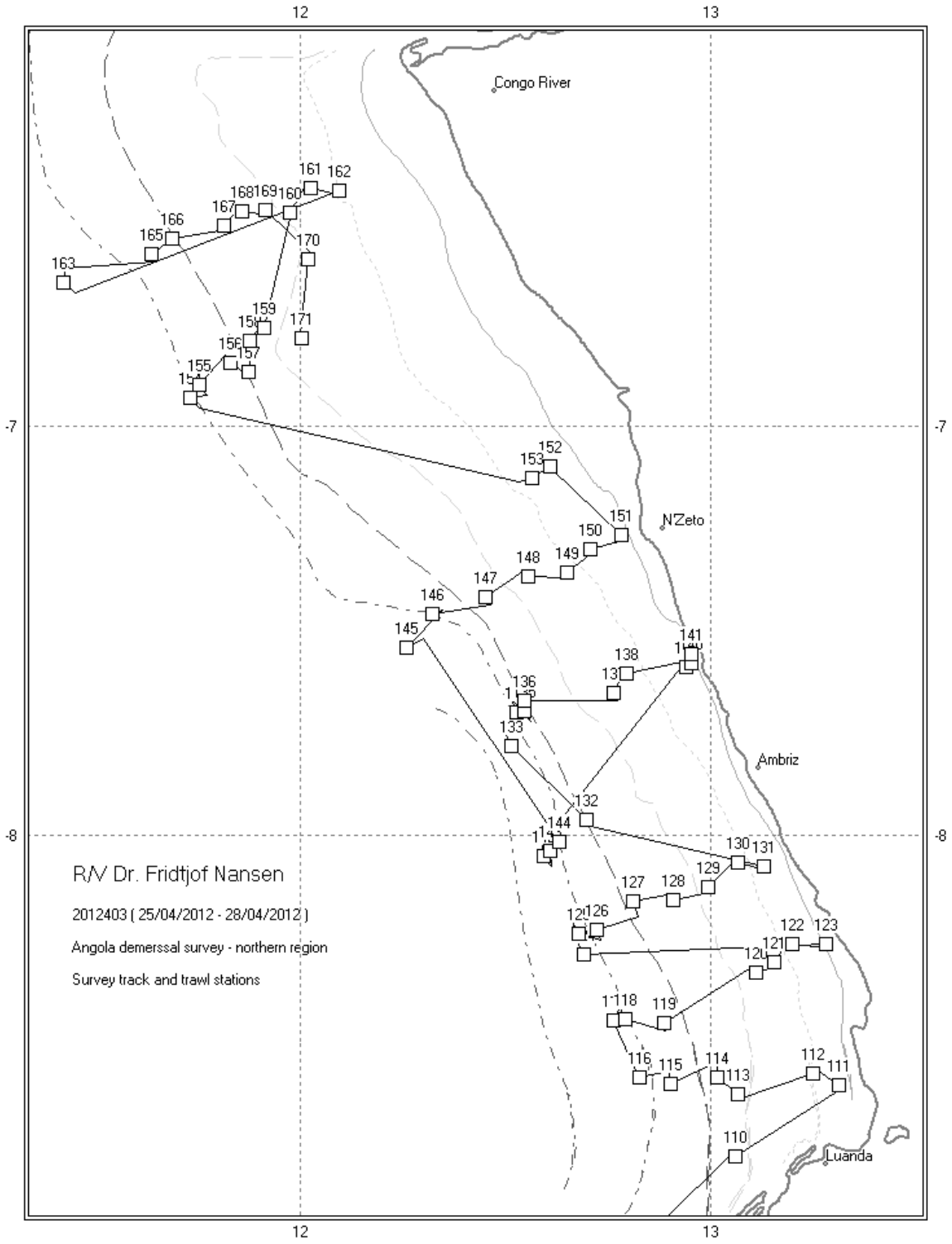


Figure 2.3 Angola North: Luanda - Congo River. Course track with trawl station (□). Hydrographical stations were taken before or after each trawl station, starting at # 607 (trawl station 110) and ending at # 668 (trawl station 171). Depth contours at 20, 50, 100, 200 and 500 m.

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. Profile data were logged down to a few meters above the bottom. A Chelsea fluorometer of the type Mk III Aquatrack, measuring chlorophyll *a*, in microgram per litre, with an uncertainty of 3%, was attached to the CTD (factory slope and offset was 0.921 and -0.02 respectively).

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

Meteorological observations including wind direction and speed, air temperature, global radiation and sea surface temperature (SST) were automatically logged from the Norwegian Meteorological Institute's (DNMI) and averaged by every nautical mile distance sailed.

A vessel-mounted Acoustic Doppler Current Profiler (VMADCP) from RD Instruments logged continuously the current profiles, 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 4m vertical bins in shallow water to approximately 400 m bottom depth and 8 m bins deeper than this.

2.3 Biological sampling

Sampling gear

A Gisund Super bottom trawl with a headline height of about 4.5 m was used during the survey, and the doors were of the Thyborøn' combi type. The distance between the front parts of the wings was about 21 m during deployment at a speed of 3 knots (kn). These settings have been the standard on all swept area surveys with R/V "Dr. Fridtjof Nansen".

As in previous surveys, a 44 m long tickler chain was attached to the footrope for stations deeper than 300 m in order to catch more of the bottom dwelling deep-water shrimps. During all tows deeper than 80 m, a 9 m long constraining rope was attached between the wires 120m in front of the trawl doors. This kept a constant distance between the doors of about 50 m during trawling. In shallow stations with depths less than 80 m, the door-to-door distance could show bigger variations, depending on bottom type and currents. Data from the door and depth/trawl-height sensors were logged for all tows and are stored in files with CMG format, which makes it possible to study the trawl performance in more detail. A detailed description of the fishing gear is given in Annex VII.

Trawl duration was standardized to 30 minutes. Start time, *i.e.* landing of the trawl on the bottom, is registered with the aid of SCANMAR sensors. The stop-time of a tow is defined as the time when the wires start to haul the net. In some cases towing was interrupted, either due to poor bottom conditions or too high catches observed with catch sensors. Interrupted stations were flagged as invalid in the Nansis database and not considered for biomass

estimates when these were assumed to give an unrealistic reflection of the density and composition of fish on the bottom. Table 2.1 shows the number of valid and invalid stations.

Trawl catch sampling

Catches were sampled for species composition by weight and number. The total body length of selected fish species 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. All biological data records entered in the Nansis database are quality controlled during the survey.

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

2.4 Plankton sampling

Zooplankton

No zooplankton samples were taken during the present survey since they were taken in the preceding pelagic survey carried out between the 1st and 31st of March 2012 (Report 2012402 Angola pelagic)

Phytoplankton

Phytoplankton samples were taken at each CTD station of the Cunene River monitoring line, 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 for further analysis in the INIP.

2.5 Acoustic sampling

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

2.6 Areas and depth strata

Table 2.1 shows the areas, in NM^2, for the southern region (Cunene - Tombua: 17°14' S - 16°00' S), the central region (Benguela - Ponta das Palmerinhas: 12°40' S - 09°00' S) and the northern region (Ponta das Palmeirinhas - Congo River: 09°00' S - 06°00' S) for each depth strata. These strata are used to calculate the swept-area biomass estimates. All valid stations are treated as representative for the relevant depth intervals where the species or group of species were caught.

2.7 Calculations

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

coefficient (q), *i.e*. the fraction of the fish encountered by the trawl that was actually caught, equal to 1.

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

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

Relevant data for biomass estimation were exported from the Nansis database to a flat ASCII text file. A script written in R (software R 2.2.1[⊗]) used this file to calculate biomass estimates by survey, stratified by depth and survey area (region). Biomass estimates by species or species groups were obtained from a stratified mean density estimator using the equations in Annex IV. The R-script was updated with new species codes, and corrected for old and incorrect codes. The new codes added to the script will increase the estimates calculated for the cephalopod families Ommastrephidae (SQUOM 10, 21, 30, 31, 33, 51) and Sepiidae (SQUSE 10, 11, 12, 13, 15), but will have no consequence for the combined estimate calculated for Cephalopods (SQU0000). Previously used codes SQUOM12, SQUOM13, and SQUOM15 were deleted since they are not found in the species table.

[⊗] 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.

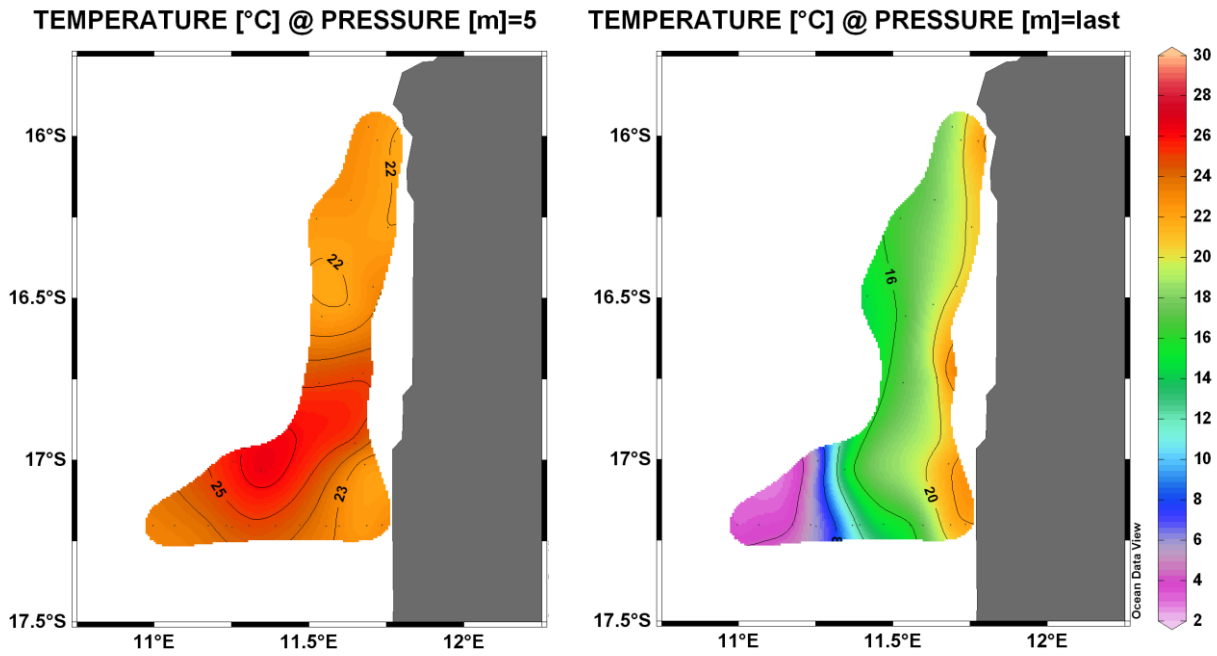
CHAPTER 3 OCEANOGRAPHIC CONDITIONS

3.1 Environment at the surface on off the bottom

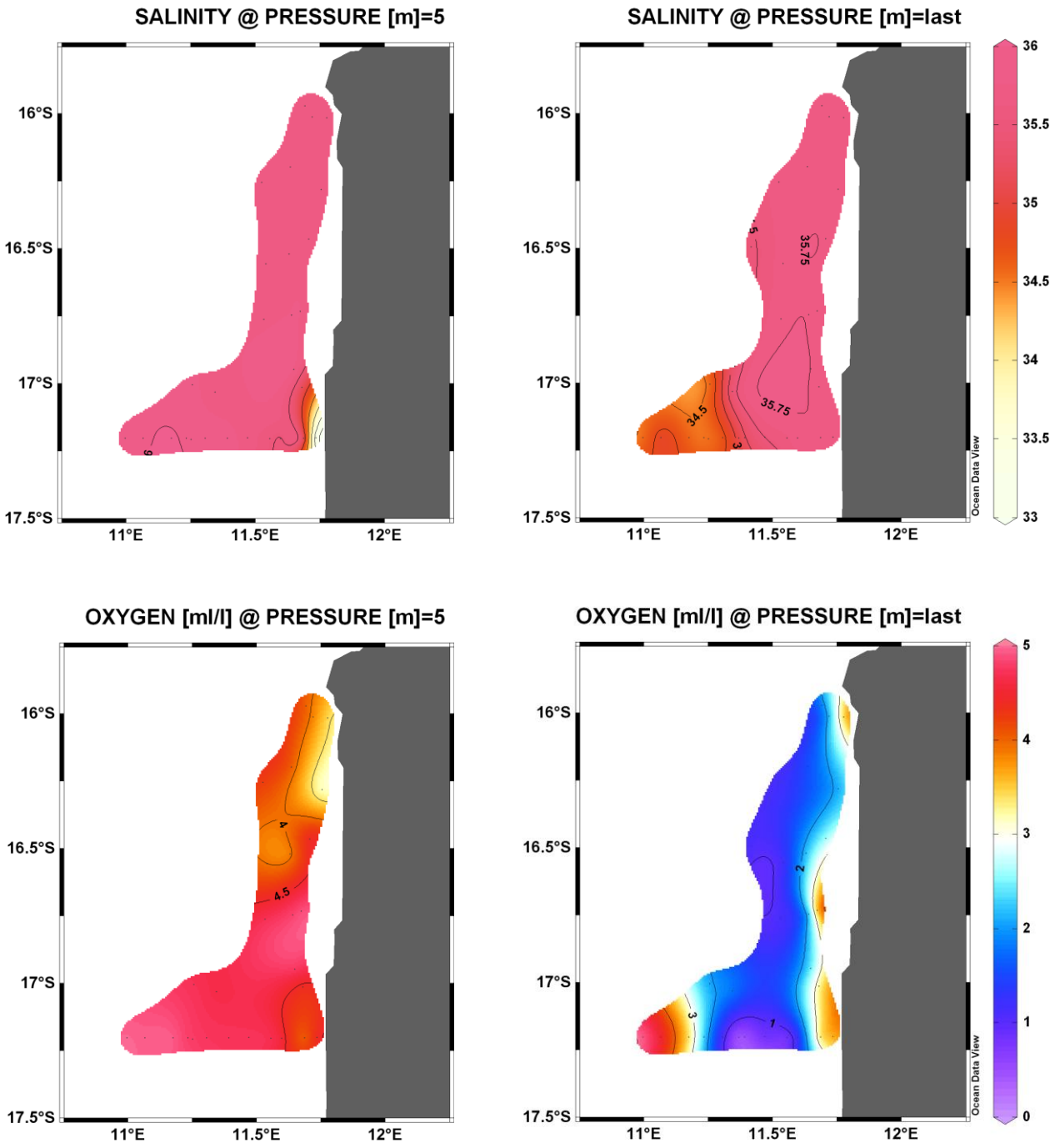
Temperature, salinity, and oxygen measurements were used to produce horizontal contour plots of these parameters at 5m below the surface and 10m off the bottom (last depth recorded) for each of the regions (Figures 3.1-3.3). Included in these figures are also the surface distributions of fluorescence (chlorophyll), collected with the thermosalingraph.

Southern Region (Kunene – Tombua).

Surface temperature (at 5m depth) ranged between 22 and 26.5^{0}C, generally with higher values further offshore. Temperature off the bottom decreased from app. 22^{0}C inshore to 5^{0}C at 700m. On the shelf, bottom temperature was between 13 and 23^{0}C. Bottom salinity was 35.75 inshore and decreased to 34.5 offshore. Offshore surface salinity was nearly homogeneous above 35.75, while inshore it was lowest at the Cunene River mouth, due to freshwater run-off. Dissolved oxygen was mostly above 3.5 ml/l at the surface, while hypoxic (< 1ml/l) bottom conditions prevailed in an area between 150 – 320 m north of Cunene. Along the mid-shelf up to Tombua dissolved bottom oxygen was generally above 1.5 ml/l, and above 2 – 2.5 ml/l on the inner shelf.



Figures 3.1a – Isolines (contour plots) of temperature recorded at 5m depth and app. 10m above the seabed (Cunene – Tombua).

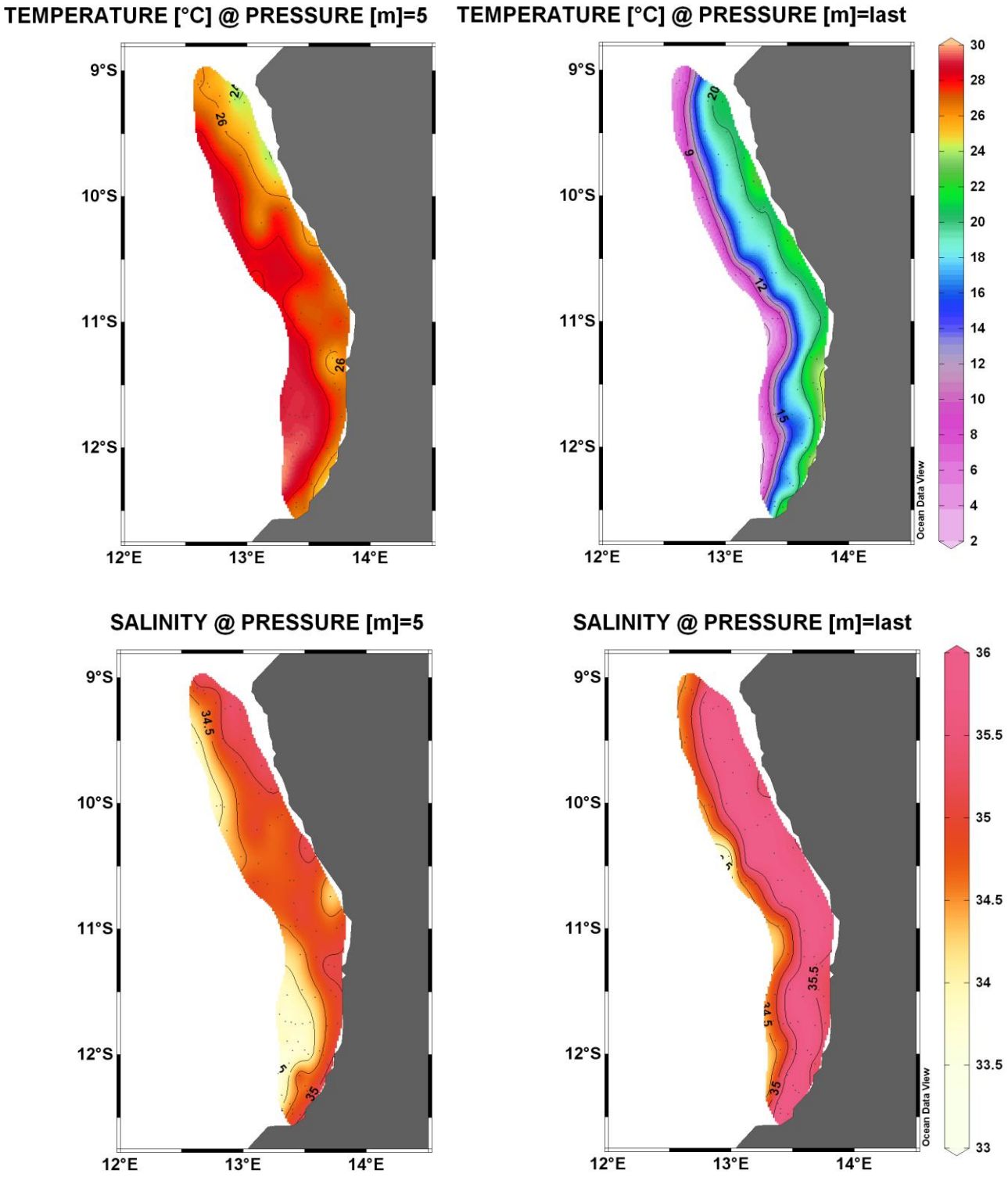


Figures 3.1b – Isolines (contour plots) of salinity and oxygen recorded at 5m depth and app. 10m above the seabed (Cunene – Tombua).

Central region (Benguela – Ponta das Palmerinhas)

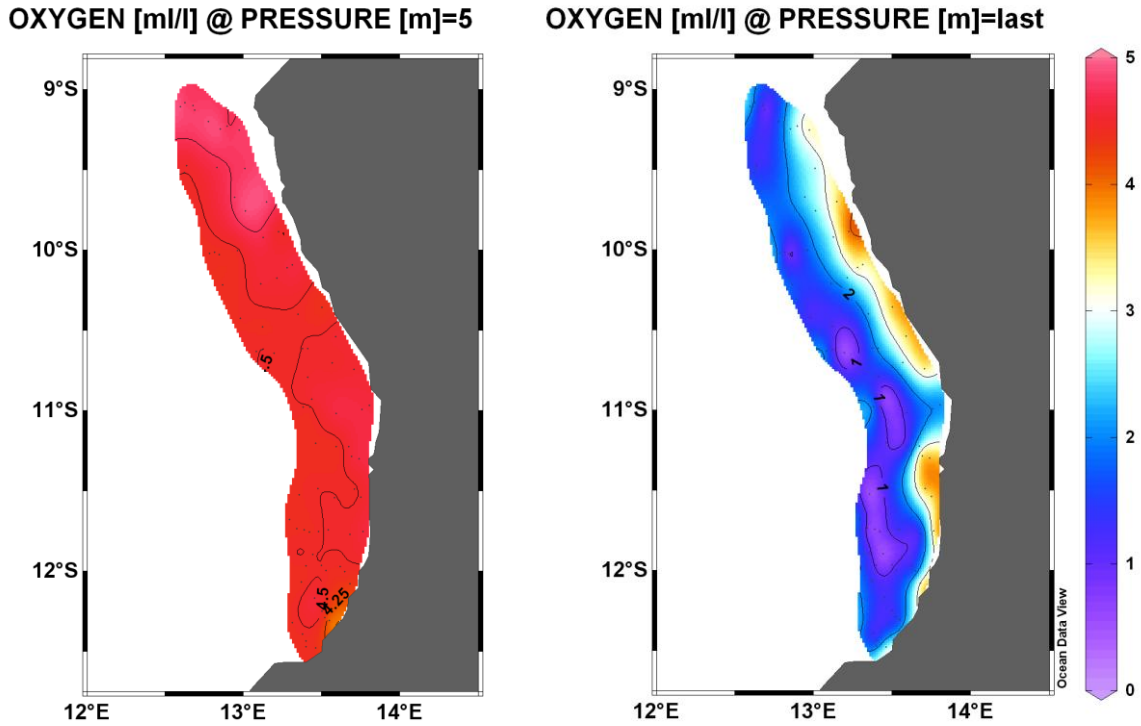
Surface temperature (at 5m) was lowest on the upper shelf with a minimum (24.0 ºC) off Ponta das Palmerinhas, increased offshore, reaching a maximum (29 ºC) in the southern part of the region. Surface salinity was highest inshore (> 34.5 – 35), decreased offshore to (< 34.0) and was consistently lower than bottom salinity (> 35.5), indicating an inshore transport of low salinity surface waters. There were no signs of reduced inshore surface salinity as a result of freshwater run-off from river, nor any indication of costal upwelling of lower-

salinity and temperature. The presence of low salinity surface water offshore (<34) is possibly an indication of the southward intrusion of surface water transported by the Angola current from the Congo River.



Figures 3.2a – Isolines (contour plots) of temperature and salinity recorded at 5m depth and app. 10m above the seabed (Benguela – Pt. das Palmerinhas).

Dissolved oxygen concentration at the surface was generally above 4ml/l over the entire region. Bottom oxygen concentrations were higher inshore and decreased offshore, with a belt of low oxygen water (< 2 ml/l) stretching northwards from Namibe to Ponta das Palmerinhas. Slope areas with hypoxic bottom water masses (< 1 ml/l) were especially visible between Namibe and Ponta do Morro.



Figures 3.2b – Isolines (contour plots) of salinity and oxygen recorded at 5m depth and app. 10m above the seabed (Benguela – Pt. das Palmerinhas).

Northern Region (Das Palmerinhas – Congo River)

The dynamic and characteristics of surface waters of the northern region were similar to those of the central Angolan coast. This similarity consisted of the transport of low salinity, high temperature surface water towards the coast. However this zonal transport met counter-current carrying inshore coastal water offshore.

Similarly also to the central region surface oxygen was > 4 ml/l across the entire northern region, but decreased to < 1.5 ml/l off the bottom on the shelf and upper slope. The area covered by low oxygen extended parallel with the depth contours from Pta. das Palmerinhas towards the northern area of the region.

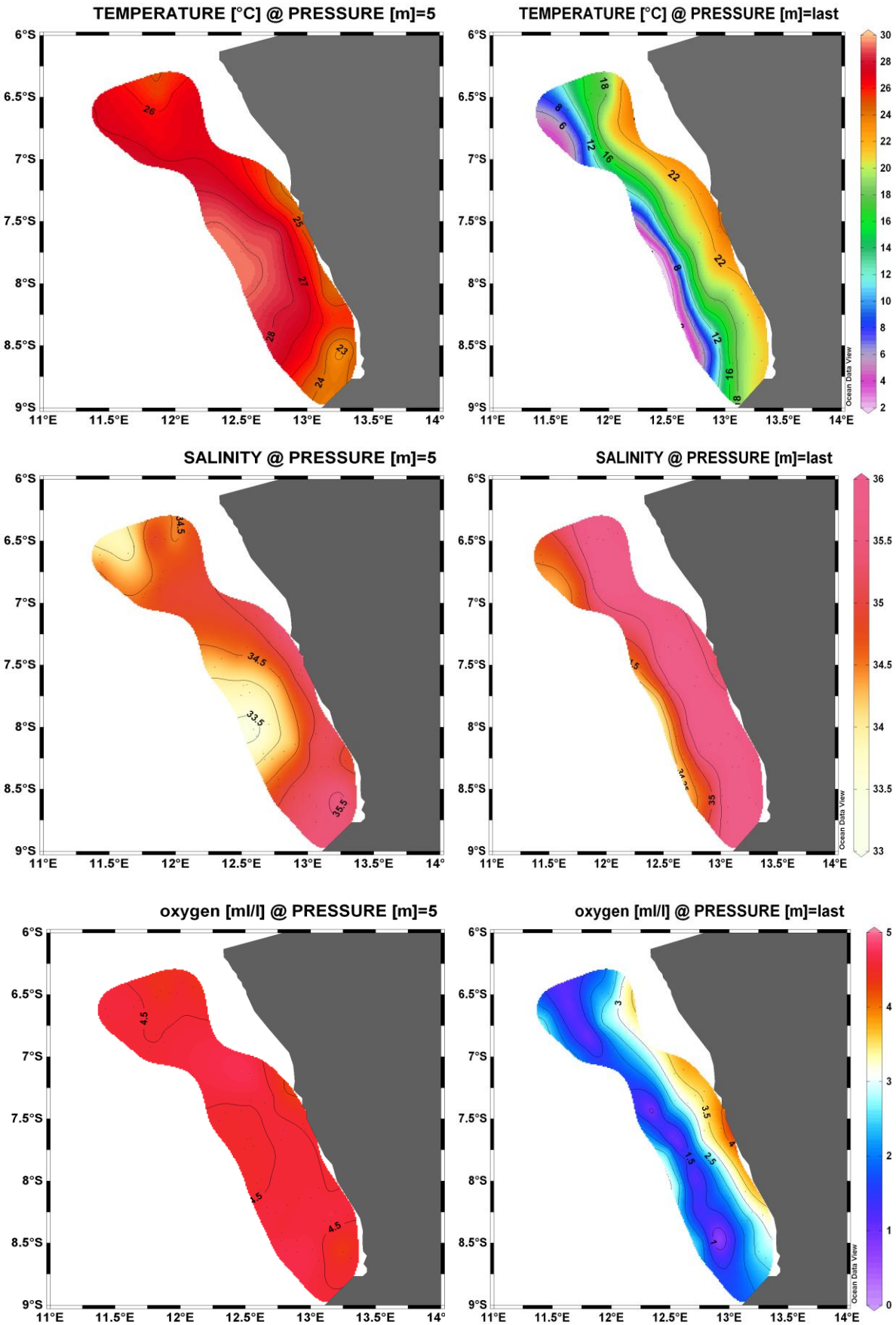


Figure 3.3.- Isolines (contour plots) of salinity and oxygen recorded at 5m depth and app. 10m above ocean bottom (Pt. das Palmerinhas – Congo River)

Vertical sections

During the present survey only one transect was carried out: off Cunene River in southern Angola, given that the vessel undertook a survey in the same region between the 1st and 31st March. For a description of the hydrographical conditions other than that off Cunene, see Cruise Report No 2/2012, Survey of the pelagic resources, 1 March – 31 March 2012.

The vertical profiles of temperature, salinity and oxygen from the Cunene River section are shown in figure 3.4. The temperature ranged between 20.0 ºC – 22.0 ºC at surface layers, salinity from 35.5 to 36.0 and the surface oxygen concentration between 3.5 ml/l to 5.0 ml/l. If compared to the previous March survey, no clear signal of upwelling is observed. The lowest value of oxygen (0.5ml/l) was found between 250m and 500m depth. The thermocline was located below 30m depth.

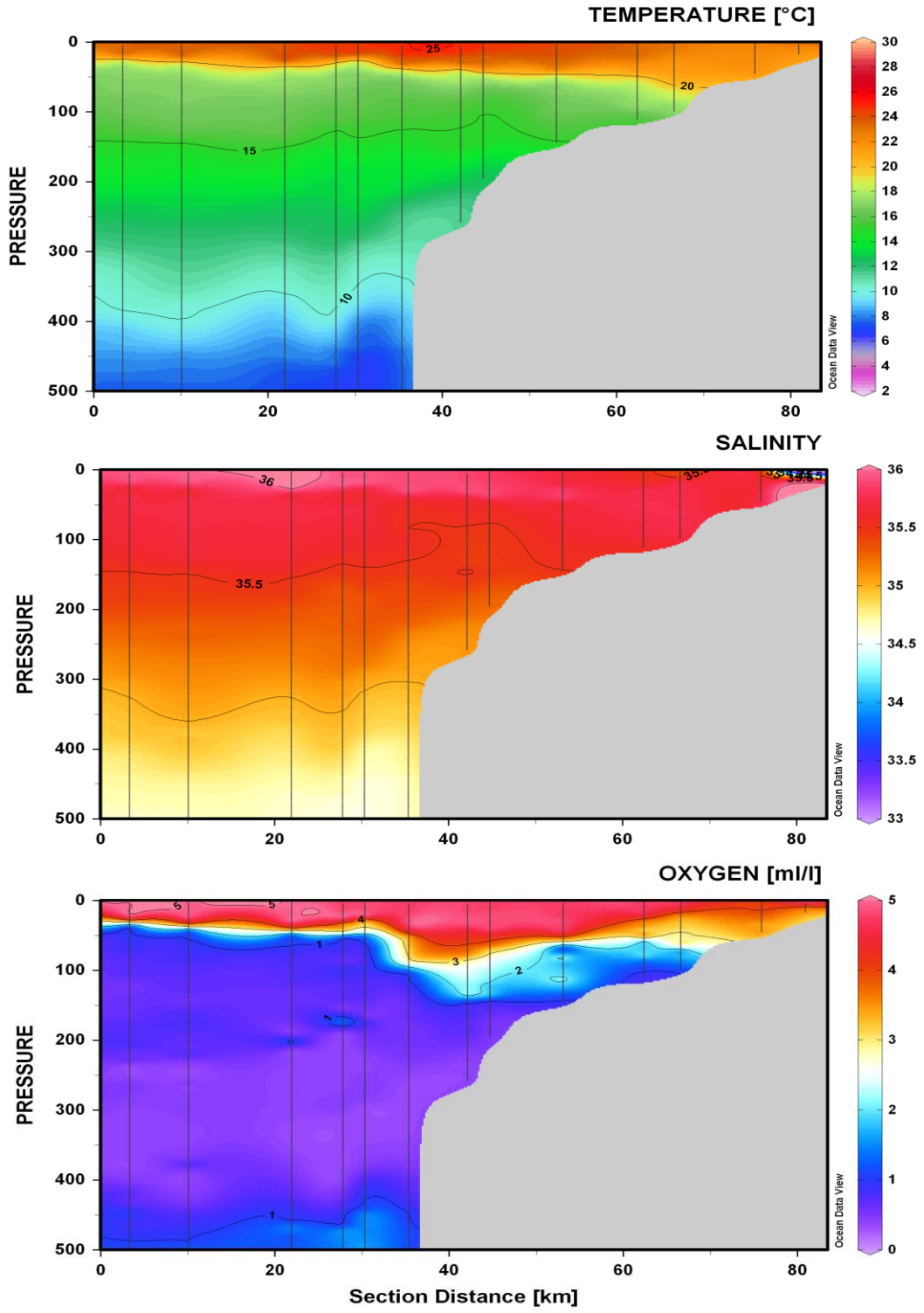


Figure 3.4. Angola south. Vertical sections of a) temperature, b) salinity and c) oxygen off Cunene River.

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

The inner shelf is defined as the area between 20 and 70 m bottom depth, and the outer shelf between 70 to 200 m depth. Several of the species, inhabiting the shelf, particularly the seabreams (Sparidae) and hakes (Merluciidae), are also found in deeper waters. These are presented in Chapter 5.

The trawl positions in the three regions are mapped in Figures 2.1-2.3, and the station and catch by species information 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 ($t \cdot NM^{-2}$) and the frequency of occurrence (per catch class) 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.

4.1 Cunene-Tombua shelf

A total of 27 trawl stations were sampled on the southern shelf, of which 25 were valid. Strong winds and currents delayed surveying in the region. The southern region has not been regularly sampled throughout the years, except for the 2000 and 2003-2010 surveys. Other survey results from the time series should therefore be interpreted with caution, as the strategy and design of these surveys were not standardized.

The average total catch per hour (kg/h) on the inner shelf was 2 750 kg/h and 1 655 kg/h on the outer shelf (Annex VI). The 'pelagic' group contributed with 76% to the mean catch rate on the inner shelf and 13% on the outer shelf. The mean catch rates of the 'demersal' group were respectively 313 kg/h (11%) on the inner shelf and 323 kg/h (19%) on outer shelf. Shrimps were only caught in low numbers at one station both on the inner and outer shelf. The average catch rate were 29 kg/h for cephalopods and 70 kg/h for sharks on the inner shelf, and 25 kg/h for cephalopods and 18 kg/h for sharks on the outer shelf. The "other" species group contributed with 9% to the average catch rate on the inner shelf and 65 % on the outer shelf.

Pelagic fish species were dominant on the inner shelf. *Trachurus trecae* dominated with 32% of the total catch, with an average catch rate of 887 kg/hour, followed by *Sardinella aurita* with a mean catch rate of 945 kg/h (due to one big catch). Seabreams (except *Boops boops*) were the most dominant demersal fish species, with both *D. macrophthalmus* and *P. bellottii* as the most abundant. The average catch rate of croakers (mainly *Atractoscion aequidens*) was 125.9 kg/h. *Merluccius capensis* was not found in this depth range on the upper shelf.

Among the demersal species on the outer shelf, seabreams were the most abundant, with *D. macrophthalmus,* and *P. bellottii* as the most common. This group had an average catch rate of 186 kg/h. Cape hake (*M. capensis*) was caught at four out of nine stations, with an average catch rate of 124 kg/h. The average catch rate of croakers (mainly *Atractoscion aequidens*) was 1.5 kg/h. No grunts, snappers or groupers were caught on the shelf in the south.

Biomass estimates

Table 4.1 shows the time series from 1986 to 2012 of swept-area biomass estimates for commercial species in the southern shelf region. The biomass estimates were calculated by stratifying depth (20-49, 50-99 and 100-199 m). The sampling intensity in the southern region has varied throughout the years and only strata with at least two stations are included in Table 4.1. High coefficients of variation (CV) shown in Table 4.1 indicate that the biomass estimates and its time series trends should be interpreted with care.

The 2012 estimate of 31 000 tonnes of horse mackerel for the southern region was an order of magnitude lower than the 2010 estimate (286 000 tonnes). *T. trecae* contributed with 29 000 tonnes, with the remainder belonging to *T. capensis*. The 2012 horse mackerel biomass is the lowest since 1989. However, the swept-area estimates of meso-pelagic fish species are unreliable as the bottom trawl predominantly catches fish close to the seabed. The contribution of *T. trecae* was similarly high (97%) as in 2007 to 2009 (78 - 99%), and considerably higher than the contribution of 27% in 2010. Small fish / juveniles (<25 cm total length, TL) dominated the catches of both horse mackerel species also this year. Mean lengths of 17 and 22 cm TL for *T. trecae* and or *T. capensis* respectively, were visibly larger in 2012 than in 2010.

The biomass estimate of seabreams was 8 700 tonnes. *D. macrophthalmus* contributed 53% and *P. bellottii* 19% to the abundance at depths > 50 m, while *L. mormyrus* was the dominating species between 20 and 50m. The 2012 estimate of seabreams was similar to estimates for the period 2008 to 2010, which were all lower than estimates prior to 2007. But considering the confidence intervals of the estimates from the last 7 years, it may appear that the seabreams biomass is fairly stable. The mean length of *D. macrophthalmus* was 16 cm TL and that of *P. bellottii* 17cm TL (Annex II), both similar to 2010 average lengths. However, a smaller length class (7 cm TL mode) of *P. bellottii* was caught in 2012, seemingly absent in 2010, possibly indicating recruitment to the stock in the southern area.

Estimates of croakers have varied considerably between previous surveys, and the 2012 estimate of 3 700 tonnes is evident of this species' biomass fluctuations. This makes it difficult to establish a clear trend in the biomass of the group. Whereas the 2010 estimate of 321 tonnes was the lowest in the time series, preceded by two low estimates in 2009 and 2008, the 2012 estimate indicates more than a tenfold increase in biomass, and is the third highest recorded since 1990. *A. aequidens* was the most abundant croaker species, and occurred predominantly in the 20 to 50 m depth range.

The biomass estimate of hakes (includes only *M. capensis* and not *M. paradoxus*, since this species was only caught beyond 600 m depth) was 3 500 tonnes, a slight increase from 2010. With the exception of the unusually high estimates of 31 000 tonnes in 2009 and 11 860 tonnes in 2004, the biomass is similar to previous estimates of *M. capensis*. *M. polli* (Benguela hake) was not caught on the southern shelf during the present survey. Mean length of *M. capensis* in 2012 was lower (25 cm TL) than in 2010 (31 cm TL), and few fish > 40 cm TL were caught (Annex II). However large numbers of small fish (mode of 13 cm TL) were caught, which is a good indication of possible future recruitment.

The biomass estimate of cephalopods in 2012 was 1 532 tonnes, similar to the 2010 estimate, but about half of the 2008 estimate (3200 tonnes).

Biomass estimates of pelagic fish species are unreliable, as the bottom trawl is not a suitable sampling tool for these species. The 2012 biomass estimates of clupeids was of 27 000 tonnes, and is the third highest in the time series, but fluctuations are large, illustrated by the very low biomass estimates (all <3 000 tonnes) between 2007-2009. The large fluctuations in the time series may not reflect the true change of abundance. Similarly, the fluctuations in the scombrids' biomass estimates over time are unlikely to represent a reliable reflection of changes in the stock.

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

Survey	T.treace		Horsemackerel		Carangids		D.macrophtalmus		D. angolensis		Seabreams		Croakers		Hake	
1986.1	14235	(0.6)	23059	(0.5)	23059	(0.5)	8304	(0.3)	81	(1.2)	9736	(0.3)	1560	(0.9)	1099	(0.5)
1986.2	69542	(0.5)	78132	(0.5)	78165	(0.5)	17055	(0.5)	5	(1.7)	19201	(0.5)	3960	(1.0)	3709	(0.8)
1989.1	2883	(1.1)	15681	(0.9)	15681	(0.9)	17020	(0.5)	139	(1.6)	17853	(0.5)	1492	(0.6)	349	(0.9)
1989.2	979	(0.9)	13706	(0.7)	13706	(0.7)	31615	(0.4)	16	(1.7)	32669	(0.4)	3601	(0.9)	1121	(1.3)
1989.3	11636	-	39225	-	39225	-	15509	-	27	-	15594	-	1443	-	6740	-
1991.1	21429	(0.6)	50458	(0.5)	50459	(0.5)	20180	(0.4)	6	(1.7)	22333	(0.3)	1341	(0.5)	2920	(1.3)
1991.2	25595	(0.6)	62961	(0.6)	62961	(0.6)	21994	(0.4)	7	(1.7)	22536	(0.4)	567	(0.5)	4385	(0.7)
1992	8106	(0.9)	95433	(0.4)	95436	(0.4)	31822	(0.6)	118	(1.7)	32666	(0.5)	576	(0.9)	6756	(0.5)
1993	52839	(0.9)	64235	(0.7)	64235	(0.7)	57722	(0.5)	238	(1.6)	58399	(0.5)	2744	(0.6)	4023	(0.4)
2000	185345	(1.0)	218410	(0.9)	218473	(0.9)	58637	(1.0)	63	(1.3)	61693	(1.0)	3623	(0.6)	3559	(0.8)
2002	116985	(1.3)	237050	(0.6)	237058	(0.6)	23819	(1.0)	0	-	24802	(1.0)	1046	(1.2)	3779	(0.8)
2003	76533	(0.8)	113879	(0.7)	114293	(0.7)	13313	(0.4)	0	-	15856	(0.4)	1115	(0.4)	7014	(0.6)
2004	72982	(0.6)	237659	(0.8)	237659	(0.8)	24702	(0.7)	1	(1.7)	26947	(0.7)	518	(1.2)	11860	(0.6)
2005	114	(1.8)	129070	(0.5)	129088	(0.5)	12121	(0.5)	221	(1.7)	12654	(0.5)	6164	(0.7)	5067	(0.7)
2006	126892	(0.5)	184129	(0.5)	184129	(0.5)	11058	(0.3)	0	-	11470	(0.3)	924	(0.6)	3713	(0.4)
2007	100468	(0.5)	107896	(0.5)	107918	(0.5)	14579	(0.4)	70	(1.7)	15520	(0.4)	4168	(1.2)	3006	(0.5)
2008	169349	(0.6)	215814	(0.5)	215814	(0.5)	7276	(0.4)	113	(1.7)	9147	(0.4)	404	(0.9)	1722	(1.0)
2009	322270	(0.8)	322460	(0.8)	322460	(0.8)	9619	(0.5)	1	(1.7)	9804	(0.5)	695	(0.7)	31018	(0.3)
2010	76870	(0.7)	286228	(0.5)	286240	(0.5)	8118	(0.4)	0	-	9218	(0.4)	321	(0.9)	2495	(0.8)
2012	29627	(0.7)	30978	(0.7)	35344	(0.8)	5151	(0.7)	0	-	8703	(0.6)	3713	(1.7)	3550	(0.9)

Survey	Ommastrephidae		Sepiidae		Cephalopod		Scombrids		Clupeids		Hairtails		U. cariensis		Sharks	
1986.1	31	(0.6)	138	(0.9)	1188	(1.0)	43	(1.0)	51	(1.8)	334	(0.9)	135	(1.3)	618	(0.6)
1986.2	0	-	726	(0.7)	1555	(0.5)	173	(0.9)	0	-	1694	(1.3)	86	(1.5)	2593	(0.9)
1989.1	61	(0.5)	159	(1.1)	776	(0.6)	60	(0.8)	0	-	965	(1.4)	361	(1.0)	188	(0.9)
1989.2	7	(1.7)	0	-	6114	(0.8)	35	(1.1)	0	-	510	(1.0)	442	(0.8)	12200	(1.4)
1989.3	192	-	17	-	2087		155	-	0	-	1746	-	86	-	551	-
1991.1	25	(1.1)	20	(1.6)	732	(0.4)	106	(1.5)	6	(1.7)	1335	(0.7)	118	(0.9)	4005	(1.5)
1991.2	25	(0.9)	31	(1.0)	2192	(1.7)	0	-	444	(1.6)	255	(0.6)	102	(1.1)	957	(0.5)
1992	428	(1.2)	148	(0.7)	745	(0.6)	0	-	70	(1.5)	13	(1.4)	30	(1.0)	2220	(0.6)
1993	145	(0.4)	126	(1.6)	2502	(0.8)	347	(1.0)	8	(1.6)	361	(1.4)	496	(0.9)	2278	(0.7)
2000	9	(1.7)	400	(0.5)	1934	(0.3)	28	(0.9)	43	(1.8)	1008	(1.5)	306	(0.7)	2051	(0.5)
2002	21	(1.7)	1043	(1.6)	1937	(1.0)	711	(1.8)	1217	(1.7)	0	-	12	(1.7)	69	(0.9)
2003	397	(0.7)	53	(1.4)	1630	(0.9)	546	(1.8)	3601	(1.5)	48	(1.2)	172	(0.8)	1163	(1.2)
2004	549	(0.9)	920	(1.5)	2547	(0.7)	6	(1.8)	12998	(1.8)	2	(1.7)	8	(1.8)	348	(0.7)
2005	1655	(0.9)	63	(1.4)	2309	(0.6)	1	(1.8)	2410	(0.7)	274	(1.5)	330	(1.2)	1067	(0.4)
2006	98	(0.9)	199	(0.9)	1545	(0.7)	2221	(1.7)	308909	(1.0)	26	(1.7)	229	(1.1)	3631	(1.4)
2007	555	(1.0)	15	(1.7)	1459	(0.5)	95	(1.3)	1747	(0.8)	93	(1.2)	563	(1.0)	2016	(0.5)
2008	6	(1.7)	504	(1.2)	3235	(0.6)	1124	(0.8)	43	(1.3)	85	(0.7)	44	(0.9)	278	(1.1)
2009	371	(0.9)	0	(1.7)	1017	(0.5)	50	(1.7)	2148	(1.8)	27	(0.7)	118	(1.2)	271	(0.6)
2010	46	(1.1)	0	-	1732	(0.7)	605	(1.1)	100656	(1.2)	148	(1.4)	99	(1.5)	190	(1.0)
2012	136	(1.1)	996	(0.4)	1532	(0.5)	52	(1.4)	27010	(1.7)	659	(0.5)	12	(1.0)	2616	(0.7)

The biomass estimate for hairtails (*Trichiurus lepturus*) of about 660 tonnes is the highest since 2002 and had a comparatively low CV. Although this may indicate a significant increase in biomass since 2002, the biomass trend may not be a reliable reflection of changes in the stock, since the species is benthopelagic and thus its vertical distribution varies, thereby affecting its catchability by a bottom trawl.

The biomass estimate of sharks (which includes Chimaeriformes) was about 2 600 tonnes in 2012, which is more than a ten-fold increase compared to 2010 (190 tonnes), the highest since 2007, but probably the result of a single big catch. The estimate is similar to several previous estimates (1992-2000, 2006-2007), indicating that the biomass after a series of low estimates seems to be stabilizing. Nonetheless this figure should be carefully interpreted, as they do neither reflect the real species composition nor their biomass due to inadequate sampling gear.

Distribution

Figure 4.1 shows the distribution of seabreams in the southern region. As in previous years, seabreams were found in a continuous low-density patch throughout the region. Along the Baía dos Tigres a narrow band, close to the shore, with a medium-low concentration was observed.

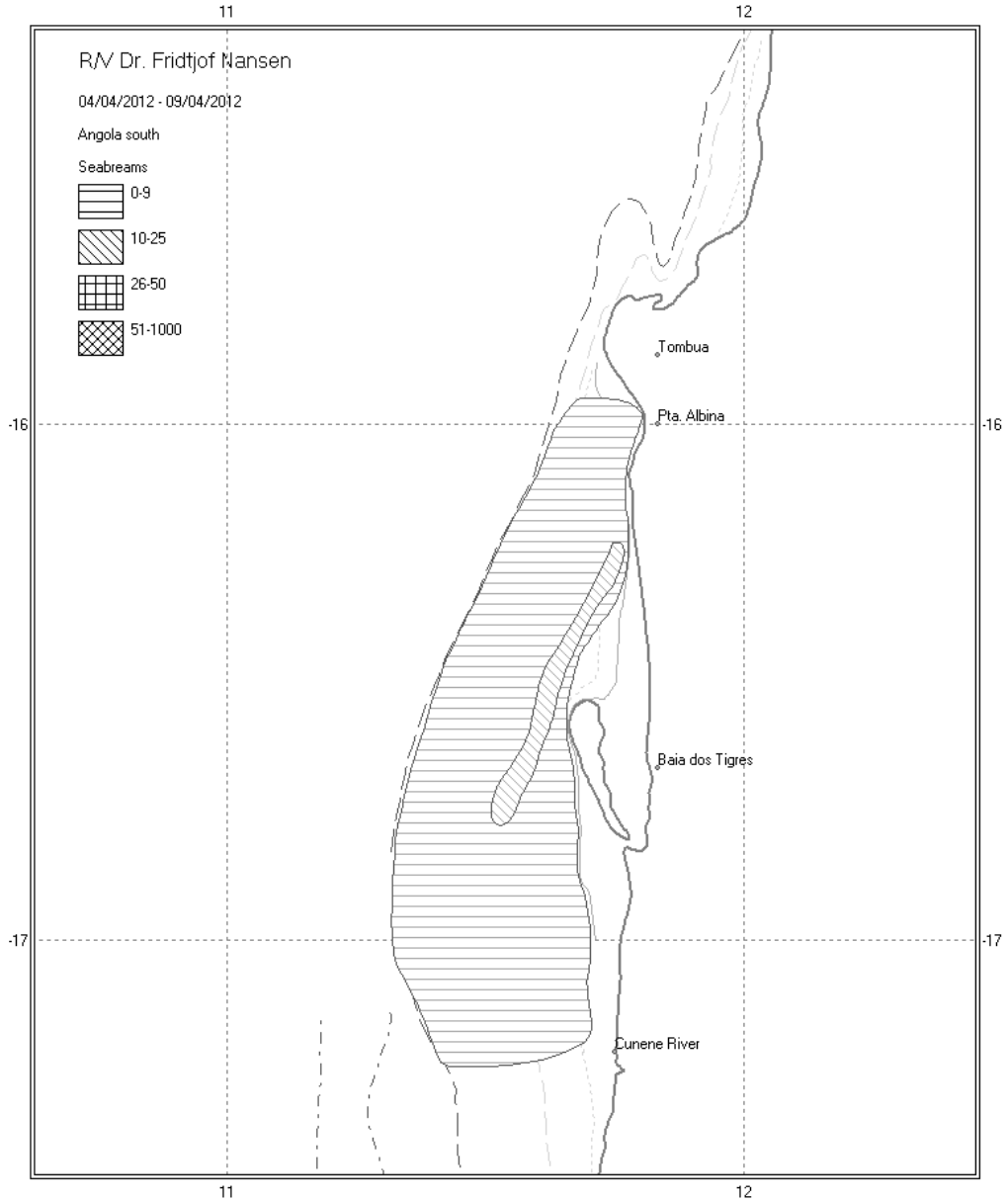


Figure 4.1 Distribution of seabreams (family Sparidae) in the southern region, Cunene-Tombua. Depth contours at 20, 50, 100, 200 and 500 m.

4.2 Benguela - Ponta das Palmerinhas shelf

The central region of Angolan waters stretches from Benguela to Ponta das Palmerinhas. A total of 76 successful swept-area trawl stations were accomplished in the region (Table 2.1).

The average catch rates in the central region were 1 495 kg/h on the inner shelf and 1064 kg/h on the outer shelf, both higher than in 2011 (Annex VI). On the inner shelf, the pelagic group was the most abundant and contributed with 57% to the overall catch, mainly due to big catches of *S. maderensis*. The 'demersal' group contributed with 31% to the mean total catch rate, whereas cephalopods contributed with 1.3 %, shrimps with less than 1%. Sharks were not caught on the inner shelf. These contributions differ from last year, when the 'demersal' group contributed with 58% and the 'pelagic' with 15% to the total catch.

On the outer shelf pelagic fish were slightly more abundant than demersal fish, due to big catches of *S. aurita*, representing 30% of the average total catch rate, whilst the 'demersal' group contributed with 26%. In previous years, including 2011, demersal fish were more abundant. Similar to the situation in the inner shelf, in the outer shelf cephalopods contributed with 2.2 % to the total average catch, while both shrimps and sharks contributed with less than 1%. These contributions are comparable with those of previous years. As in previous years, seabreams (except *B. boops*) were caught in most trawl stations on the inner and outer shelf, and had average catch rates of 46 kg/h and 59 kg/h respectively. The most common seabreams on the inner shelf were *P. bellottii* (64%) and *D. barnardi* (25%), while *D. angolensis* (36%), *P. bellottii* (25%) and *D. macrophthalmus* (20%) were common on the outer shelf.

Snappers were found neither in the inner nor on the outer shelf. Groupers had an average catch rate of 12.5 kg/h on the inner shelf and 0.9 kg/h on the outer shelf. Similarly grunts (*Pomadasys* spp.) were caught at approximately half of the stations on the inner shelf, with an average catch rate of 166.8 kg/h due to a big catch of *P. incisus*. On the outer shelf they were less abundant and the average catch rate was of 37.4 kg/h. In both regions *P. incisus* and *P. jubelini* were the dominant grunt species. Contributions from other species were negligible. Croakers had average catch rates of 13 kg/h on the inner shelf and 36 kg/h on the outer shelf. Catches consisted mainly of *U. canariensis* (canary drum).

The most common pelagic groups on the inner shelf were clupeids and carangids, with average catch rates of 507.9 kg/h, 258.4 kg/h respectively. The high clupeid catch rates were due to several big sardinella catches (mainly *S. aurita*). Hairtails (benthopelagic species) had an average catch rate of 83.9 kg/h. On the outer shelf the main pelagic groups were clupeids (136 kg/h), carangids (100 kg/h) and scombrids (41 kg/k); for hairtails it was 30.2 kg/h. Barracudas (*Sphyraena guachancho* and *S. sphyraena*) were not found within this depth range.

Biomass estimates

Table 4.2 shows the time series (1985 to 2012) of swept-area biomass estimates for commercial species and groups of species on the central shelf off Angola. The biomass estimates were calculated by allocating catch data to depth ranges (20-49, 50-99 and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the number of conducted trawls by strata and survey. It must be

noted that the biomass estimates presented for the pelagic species may not reflect the true biomass trends, as pelagic species are often unavailable to the bottom trawl. Therefore, its biomass estimates may rather reflect their availability to the trawl than their abundance. Some of the biomass estimates in Table 4.2 have a high coefficient of variation (CV), implying that the trends in the time series should be interpreted with care.

T. trecae is the only horse mackerel species caught in the central region in 2012. Its biomass on the central shelf has been below 30 000 tonnes since 2003, proceeded by a very high estimate of 78 646 tonnes in 2002. The 2010 estimate (2 300 tonnes) is among the lowest, but both last year and this year's estimates indicate a possible recovery (11 000 tonnes in 2011 and 17 000 tonnes in 2012).

M. polli was the only hake species caught north of Benguela, and estimates for this species have been generally low, less than 200 tonnes since 2004. This years' estimate of 13 tonnes is the third lowest in the time series, and is about half of the 2010 estimate. The average length of *M. polli* was 30.4 cm TL, similar to that of 2010.

Seabreams are the most important commercial demersal fish group in Angola. Biomass estimates for the group in the central shelf have fluctuated greatly throughout the years. Between 1991 to 2002 total biomass estimates ranged from 20 000 to 30 000 tonnes, peaking in 1998 with 63 200 tonnes. Since 2002 (22 200 tonnes), estimates have varied between 5 600 and 11 200 tonnes, which are all lower than estimates from the 1990s. On average the seabreams biomass has been fairly steady the last 5 years and the 2012 estimate of 7 300 tonnes follows the same trend. Co-efficients of variation (CVs) are low for this group, supporting the reliability of the time series trends. The average length of seabreams species ranged between 17.6 and 21.1 cm TL, and was similar to the one found in 2011 for *D. macrophthalmus*, and somewhat lower for both *D. angolensis* and *P. bellottii* (Annex II).

In 2007 the biomass of croakers increased from 4 850 tonnes (2006) to about 8 000 tonnes, which was the highest estimate since 1999 but decreased to 3 600 tonnes in 2008 and further to 2 000 tonnes in 2009 and 2010. In 2011 it increased to 6 500 tonnes just to decrease again this year to 3 300 tonnes. *U. canariensis* was the most abundant croaker, and contributed to about 79% of the total croaker' biomass. The average length of this species was 26.8 cm TL, somewhat longer than in 2011 (24.1 cm TL).

The 2011 biomass estimate of grunts (*Pomadasys incisus, P. jubelini*, *P. rogeri* and *P. peroteti*) was 8 600 tonnes, similar to the 2010 estimate and a slight increase from the 5 000-6000 tonnes estimated for 2008 and 2009. This years' estimate of 15 500 tones, the highest ever recorded for this group, is nearly twice as high as the 2011 estimate. Despite the high CV (1.12), the estimate implies that the grunt biomass has been robust the last three years. The estimate excludes the non-commercial species *B. auritus* (18 700 tonnes), which combined gives an estimate for all grunts of 34 200 tonnes. The mean length of *P. incisus* of 20.5 cm TL was comparable to 2011 (19.4 cm TL).

Catches of snappers are low and infrequent 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. This year no snappers were caught in the region.

Groupers, mainly *Epinephelus aeneus,* were found on the inner shelf and are coastal rocky and sandy shore dwellers. The 2012 survey gave an estimated biomass of 992 tonnes, which

is an increase from previous years, and the highest value since 1998. The high CVs (especially in 2012) indicate that the biomass estimates of *E. aeneus* should be considered with care.

The 2012 biomass estimate for *P. longirostris* (deep water rose shrimp) was of 386 tonnes, which is similar to the 2002 estimate (402 tonnes). *P. longirostris* is mainly distributed in the deeper parts of the shelf and slope.

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

Survey	T.treace		Carangids		M.polli		D.macrophthal.		D.angolensis		Seabreams		U.canariensis		Croakers	
1985.4	74892	(0.98)	75408	(0.98)	124	(0.93)	6123	(1.31)	2697	(0.31)	18407	(0.72)	6271	(1.83)	10235	(1.45)
1986.1	17875	(0.62)	20440	(0.54)	276	(1.02)	220	(1.25)	1314	(1.16)	9161	(0.46)	2327	(0.86)	4649	(0.50)
1986.2	22596	(0.79)	24625	(0.72)	207	(0.97)	1268	(1.46)	4010	(0.39)	13819	(0.46)	2018	(1.15)	4510	(0.77)
1989.1	6999	(0.41)	12736	(0.49)	121	(1.62)	6498	(0.66)	956	(0.48)	11443	(0.48)	885	(0.88)	1395	(0.72)
1989.2	21473	(0.51)	26453	(0.47)	1013	(0.80)	1115	(0.93)	3628	(0.48)	12167	(0.36)	1130	(0.82)	2972	(0.72)
1989.3	9579	(0.94)	12816	(0.90)	480	(1.10)	1530	(1.50)	1667	(0.52)	4531	(0.56)	0	-	595	(1.38)
1991.1	86136	(0.77)	87396	(0.76)	0	(1.69)	2210	(0.88)	1212	(0.40)	9068	(0.31)	1160	(1.44)	2048	(0.85)
1991.2	47927	(0.85)	48814	(0.83)	618	(1.20)	17098	(0.54)	956	(0.39)	25675	(0.36)	18422	(1.45)	20081	(1.33)
1992	32878	(0.46)	35314	(0.46)	1641	(0.62)	18182	(0.58)	1514	(0.32)	25033	(0.44)	1023	(0.98)	1546	(0.70)
1994	61886	(0.53)	63569	(0.51)	2393	(1.35)	20365	(0.52)	2383	(0.45)	29548	(0.37)	3280	(1.27)	10292	(0.99)
1995.1	4875	(0.99)	12635	(0.51)	167	(0.77)	7719	(0.81)	1877	(0.79)	14161	(0.47)	11538	(1.16)	15510	(1.05)
1996	51220	(0.77)	55750	(0.71)	713	(1.09)	11195	(0.43)	1546	(0.43)	18323	(0.27)	1077	(0.96)	5866	(0.51)
1997.1	27729	(0.74)	38605	(0.59)	4557	(1.20)	12220	(1.03)	1497	(0.37)	21952	(0.58)	4599	(0.60)	9033	(0.60)
1997.2	68984	-	70873	-	7635	-	24404	-	1260	-	31763	-	4995	-	7099	-
1998	4630	(0.89)	7606	(0.64)	375	(1.45)	50924	(1.50)	1990	(0.38)	63225	(1.22)	2239	(0.77)	8609	(0.86)
1999	12977	(0.53)	20379	(0.43)	15	(1.69)	5178	(0.79)	1163	(0.40)	17435	(0.39)	7999	(1.08)	9891	(0.90)
2000	19114	(0.49)	25052	(0.41)	240	(1.53)	6060	(0.76)	1639	(0.59)	19310	(0.31)	2499	(0.51)	5391	(0.44)
2001	16510	(0.48)	20942	(0.42)	123	(1.15)	5680	(0.72)	1670	(0.44)	12617	(0.53)	1076	(1.04)	1744	(0.70)
2002	78646	(0.41)	85797	(0.38)	1189	(0.83)	11512	(1.16)	923	(0.47)	22198	(0.61)	3492	(0.54)	6334	(0.42)
2003	25494	(0.54)	29369	(0.47)	1774	(0.85)	557	(0.66)	1046	(0.50)	5595	(0.33)	1001	(0.51)	5369	(0.41)
2004	12263	(0.58)	15324	(0.47)	174	(1.53)	3525	(1.27)	1015	(0.41)	9583	(0.55)	5700	(1.21)	6602	(1.08)
2005	7137	(0.52)	9357	(0.44)	44	(1.42)	879	(0.59)	991	(0.39)	7752	(0.31)	2279	(0.64)	5530	(0.55)
2006	9622	(0.37)	13434	(0.35)	44	(1.07)	2802	(0.42)	1982	(0.39)	11187	(0.31)	4329	(0.65)	4850	(0.58)
2007	7649	(0.49)	13485	(0.59)	55	(0.84)	1532	(0.86)	1312	(0.64)	8013	(0.36)	5224	(1.39)	8081	(1.07)
2008	3703	(0.51)	5636	(0.38)	22	(1.17)	1496	(0.87)	1135	(0.34)	5763	(0.32)	1801	(0.97)	3668	(0.72)
2009	10073	(0.50)	14765	(0.44)	4	(1.51)	699	(0.62)	1756	(0.56)	7443	(0.31)	1419	(0.53)	2104	(0.56)
2010	2354	(0.57)	13526	(1.34)	22	(1.69)	572	(0.80)	2250	(0.40)	8732	(0.27)	1097	(0.80)	2661	(0.56)
2011	10895	(1.22)	13231	(1.01)	0	-	497	(1.19)	2805	(0.51)	9550	(0.37)	4003	(1.19)	6496	(0.88)
2012	17294	(0.51)	21586	(0.46)	13	(0.96)	887	(1.22)	1725	(0.41)	7297	(0.25)	2651	(0.60)	3315	(0.51)

Survey	B.auritus		Grunts		Snappers		Groupers		P.longirostris		Shrimps		Ommastreph.		Sepiidae	
1985.4	5065	(1.03)	5706	(1.37)	0	-	1253	(0.95)	58	(1.61)	58	(1.61)	0	-	0	-
1986.1	38045	(0.49)	2237	(0.73)	36	(1.96)	411	(0.81)	1483	(1.01)	1632	(0.92)	273	(1.68)	525	(0.64)
1986.2	21342	(0.56)	5301	(0.66)	0	-	518	(1.15)	0	-	371	(1.12)	0	-	1132	(1.00)
1989.1	15038	(0.75)	3681	(1.02)	0	-	580	(0.78)	235	(1.05)	237	(1.05)	1236	(0.86)	65	(0.93)
1989.2	50016	(0.80)	1126	(0.92)	20	(1.96)	3093	(1.55)	667	(0.76)	677	(0.75)	750	(0.51)	1168	(0.41)
1989.3	37091	(0.51)	82	(1.18)	0	-	660	(1.62)	445	(1.43)	453	(1.41)	1476	(0.98)	124	(1.12)
1991.1	19833	(0.57)	425	(0.51)	106	(1.96)	176	(1.12)	10	(1.19)	39	(1.11)	344	(0.63)	235	(0.46)
1991.2	1862	(0.86)	1882	(0.87)	0	-	1021	(0.93)	117	(1.11)	125	(1.04)	693	(0.71)	561	(1.00)
1992	27200	(1.32)	765	(1.13)	0	-	1140	(0.88)	106	(1.13)	106	(1.13)	2163	(0.35)	159	(1.16)
1994	2633	(1.10)	68	(0.81)	262	(1.96)	417	(0.62)	168	(0.70)	292	(0.92)	1041	(0.57)	1192	(0.70)
1995.1	27645	(0.57)	3105	(1.12)	113	(1.96)	376	(0.77)	258	(0.95)	323	(0.80)	2	(1.69)	385	(0.70)
1996	18842	(0.70)	3095	(0.65)	109	(1.96)	690	(0.81)	25	(1.34)	116	(0.98)	210	(0.52)	28	(1.32)
1997.1	6964	(0.85)	1592	(1.54)	0	-	233	(1.10)	1087	(0.94)	1088	(0.94)	1324	(0.47)	1323	(0.94)
1997.2	1953	-	293	-	0	-	1023	-	1265	-	1391	-	(418.00)	-	1251	-
1998	22014	(0.95)	9117	(0.82)	0	-	198	(1.24)	186	(0.84)	365	(0.82)	376	(0.65)	1295	(0.58)
1999	93522	(0.61)	3289	(0.87)	526	(1.86)	631	(0.77)	9	(0.93)	15	(0.74)	201	(1.28)	113	(0.64)
2000	56245	(0.84)	6824	(0.51)	98	(1.50)	882	(0.87)	290	(0.98)	314	(0.91)	586	(0.61)	418	(0.71)
2001	41122	(0.69)	1329	(0.60)	3	(1.96)	64	(1.08)	198	(1.36)	212	(1.28)	186	(0.96)	178	(0.83)
2002	66053	(0.75)	2982	(0.57)	0	(1.96)	233	(1.01)	402	(0.88)	531	(0.74)	2363	(0.70)	173	(0.91)
2003	38312	(0.49)	8649	(1.12)	44	(1.96)	702	(0.73)	449	(0.80)	515	(0.70)	230	(0.58)	101	(0.82)
2004	26743	(0.42)	3494	(0.95)	42	(1.96)	175	(0.99)	969	(1.11)	974	(1.11)	310	(0.89)	206	(0.65)
2005	36621	(0.77)	5980	(0.77)	6	(1.96)	608	(0.84)	50	(0.87)	84	(0.71)	233	(0.61)	565	(0.27)
2006	33546	(0.86)	4082	(0.85)	35	(1.96)	446	(0.81)	178	(1.07)	188	(1.01)	128	(0.54)	123	(1.00)
2007	40402	(0.53)	9275	(0.86)	31	(1.73)	491	(0.99)	36	(0.79)	54	(0.59)	43	(0.53)	245	(1.53)
2008	17736	(0.40)	5926	(0.93)	11	(1.96)	151	(0.78)	233	(0.98)	257	(0.90)	327	(0.46)	38	(1.07)
2009	22188	(0.83)	4983	(0.59)	124	(1.96)	192	(0.58)	195	(1.15)	195	(1.14)	110	(0.82)	124	(1.41)
2010	8156	(0.66)	7676	(0.65)	69	(0.70)	284	(0.82)	183	(0.93)	204	(0.84)	179	(0.63)	2	(0.91)
2011	10841	(0.88)	8638	(1.06)	190	(1.96)	444	(0.55)	24	(0.77)	42	(0.83)	28	(1.20)	539	(0.76)
2012	18724	(0.56)	15517	(1.12)	0	-	992	(1.33)	386	(1.21)	434	(1.09)	477	(0.86)	1713	(0.33)

The 2012 estimate of Sepiidae (1 700 tonnes) is the highest in the time series. The biomass estimate of Ommastrephidae was 477 tonnes. This is an increase from previous years and among the highest value in the time series. The combined cephalopod biomass was app. 3000 tonnes (CV 0.22), indicating a stable population considering previous estimates.

Estimates of the pelagic clupeids (35 500 tonnes) and scombrids (3 090 tonnes) are the highest since 1985, indicating a 70 – 100 times increase in biomass (Table 4.2). However, the spatial heterogeneity of pelagic fish species and consequently their availability to bottom trawl gear significantly influences their catch rates, and as such above mentioned increases must be treated cautiously.

The biomass of the benthopelagic hairtails increased since 2011, but was similar to the 2010 estimate and less than half of the 2009 estimate. Shark biomass has been declining since 2010 and in 2012 was the lowest since 1989.

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

Survey	Cephalopod		Clupeids		Scombrids		Hairtails		Barracudas		Sharks	
1985.4	5372	(0.77)	423	(1.33)	0		2568	(1.16)	253	(1.26)	0	-
1986.1	1439	(0.47)	717	(0.69)	34	(1.29)	15125	(0.67)	1019	(0.62)	228	(1.47)
1986.2	1423	(0.78)	328	(0.89)	16	(1.61)	1089	(0.70)	1117	(0.77)	0	-
1989.1	1864	(0.59)	560	(1.54)	155	(0.67)	9992	(0.60)	1936	(1.34)	148	(0.94)
1989.2	2206	(0.33)	359	(0.94)	95	(0.50)	2128	(0.80)	701	(0.60)	105	(1.06)
1989.3	2015	(0.79)	1707	(0.81)	310	(1.21)	8488	(1.45)	704	(0.74)	285	(1.29)
1991.1	850	(0.31)	508	(0.94)	277	(0.81)	7664	(0.72)	583	(0.72)	746	(1.00)
1991.2	2021	(0.50)	36	(1.61)	126	(1.30)	3174	(0.45)	82	(0.85)	115	(1.69)
1992	2597	(0.30)	70	(1.16)	64	(0.89)	11105	(0.58)	89	(1.29)	483	(1.11)
1994	2696	(0.41)	22	(0.96)	580	(0.80)	24185	(1.44)	4	(1.96)	269	(0.83)
1995.1	807	(0.42)	245	(0.59)	213	(1.06)	3885	(0.43)	2113	(0.65)	121	(0.88)
1996	2402	(0.41)	589	(0.89)	53	(1.77)	3443	(0.44)	946	(0.87)	496	(1.08)
1997.1	3268	(0.44)	3442	(1.89)	46	(1.61)	21454	(0.60)	496	(1.80)	208	(0.99)
1997.2	2531	-	125	-	279	-	13839	-	0	-	149	-
1998	2587	(0.34)	2860	(1.57)	52	(1.35)	29020	(1.52)	454	(0.82)	310	(0.96)
1999	890	(0.38)	1961	(0.92)	34	(1.28)	8210	(0.66)	1605	(0.53)	107	(1.15)
2000	1744	(0.30)	1594	(0.90)	275	(1.20)	11002	(0.41)	3321	(0.58)	560	(0.82)
2001	1374	(1.06)	80	(1.01)	97	(0.77)	5595	(0.54)	957	(0.41)	343	(0.78)
2002	2930	(0.57)	1625	(0.64)	745	(1.51)	8190	(0.45)	667	(0.63)	120	(0.81)
2003	1327	(0.44)	1439	(0.64)	55	(0.85)	12067	(0.52)	480	(0.61)	266	(0.78)
2004	1026	(0.34)	2193	(0.79)	41	(1.03)	12405	(1.01)	401	(0.85)	586	(0.85)
2005	1427	(0.16)	1535	(0.84)	216	(1.30)	31672	(0.84)	258	(0.75)	201	(0.66)
2006	1674	(0.27)	2275	(0.84)	134	(0.69)	6453	(0.49)	991	(0.93)	475	(0.72)
2007	1822	(0.30)	2078	(0.67)	18	(1.15)	22472	(0.91)	749	(0.46)	802	(1.19)
2008	1295	(0.22)	945	(1.10)	17	(1.18)	5098	(0.63)	1224	(1.26)	132	(0.68)
2009	1678	(0.37)	8854	(1.26)	21	(1.57)	20812	(0.85)	152	(0.93)	94	(0.90)
2010	1628	(0.27)	1420	(1.46)	79	(0.84)	7315	(0.40)	350	(0.83)	157	(0.67)
2011	1956	(0.35)	268	(0.97)	48	(1.28)	4874	(1.24)	313	(0.79)	74	(1.96)
2012	2983	(0.22)	35480	(0.71)	3086	(1.52)	8349	(0.87)	132	(1.06)	21	(1.17)

Distribution

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

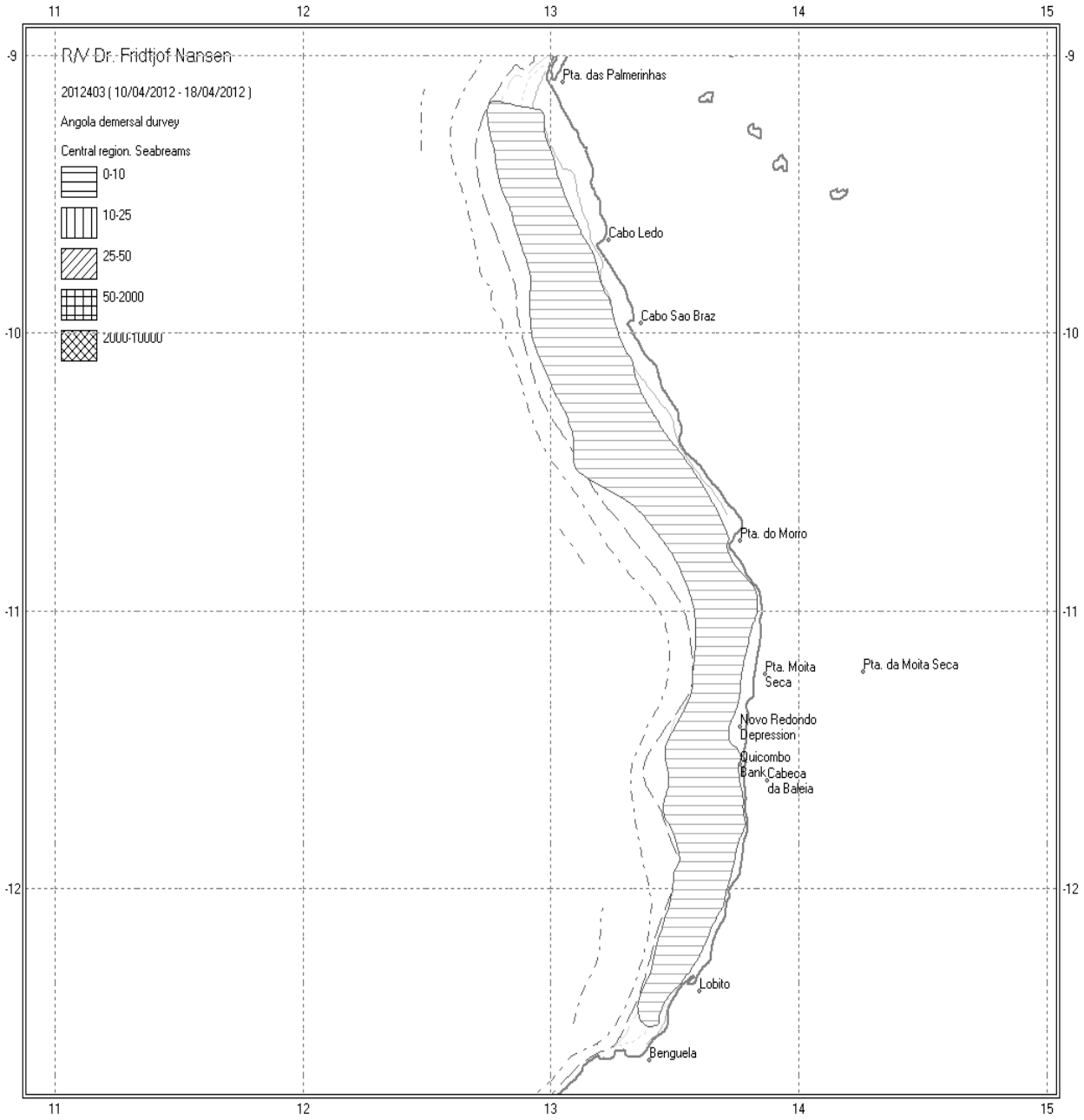


Figure 4.2 Distribution of seabreams (Sparidae) in the central region, Benguela – Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

4.3 Ponta das Palmerinhas – Congo River shelf

The survey covered the northern region of Angolan waters from Ponta das Palmerinhas to south of Congo River. The area north of Congo River is inaccessible to fisheries surveys due to restricted oil exploitation areas. During some of the previous surveys the area north of Congo River, Cabinda, has been covered but to make plausible comparisons the biomass estimates in Table 4.3 only include trawl stations south of Congo River. A total of 65 successful swept-area trawl stations were accomplished on the shelf area in 2012 (Table 2.1).

The average catch per hour on the inner shelf was 1 700 kg/h, while in the outer shelf it was 729kg/h. The 'pelagic' group dominated the catches on the inner shelf with an average catch rate of 792 kg/h and a relative contribution of 47%, mainly due to two hauls with large catches of *S. aurita*. The 'demersal' group had an average catch rate of 631 kg/h contributing with 37% to the total catch (one trawl with a big catch of *B. auritus*), cephalopods contributed with 1.4% while shrimps contributed with less that 1% and sharks were not caught. On the outer shelf, the 'demersal' group contributed with almost 20% to the mean catch rate, while the 'pelagic' group with 9%. Shrimps sharks and cephalopods contributed with less than 2% altogether.

Seabreams (except *B. boops*) had a mean catch rate of 46 kg/h (3% of the total) on the inner shelf. On the outer shelf catch rates were 58 kg/h (8% of the total). The most abundant seabream on the inner shelf was *P. bellottii*, while *D. angolensis* dominated the outer shelf. Snappers were caught only on one station in the inner shelf. The catch rates of groupers were low, with 2.1 kg/h on the inner and 1.2 kg/h on outer shelf. Grunts (*Pomadasys incisus* and *P. rogeri*) were caught more often on the inner shelf; on the outer shelf they were found in only one station. The average catch rate of grunts on the inner shelf was of 79 kg/h (0.5 kg/h on the outer shelf). Croakers were relatively frequent on the shelf and the average catch rates were 28 kg/h on the inner shelf and 30 kg/h on outer shelf. *Pseudotolithus typus* was the most abundant species in the inner shelf and *U. canariensis* on the outer shelf.

The most common pelagic groups caught on the inner shelf were clupeids, 599 kg/h (35% of the total average catch rate) and carangids, 137 kg/h (8%). Barracudas and hairtails had low average catch rates, 16 kg/h and 4 kg/h respectively, while scombrids were found only on two stations (0.4 kg/h). On the outer shelf carangids were the most important group with 48 kg/h, followed by hairtails (15 kg/h). In opposition to what was found on the inner shelf, clupeids were caught in small amounts (0.1 kg/h) in the outer shelf, the same applies to scombrids (0.2 kg/h), while barracudas were not found.

Biomass estimates

Table 4.3 shows swept-area biomass estimates from 1985 to 2012 for the commercial species and fish groups found on the shelf off northern Angola. The biomass estimates were calculated by depth stratification (20-49m, 50-99m and 100-199m). The different strata have been sampled with different intensity throughout the time series and Annex VIII shows the numbers of trawls that have been carried out by strata and survey. Again, it must be noted that the biomass estimates presented for the pelagic species cannot be trusted as a good reflection of the true biomass as the species are often unavailable to the bottom trawl. Some of the biomass estimates in Table 4.3 have a high coefficient of variations (CV), indicating that the trends in the time series should be interpreted with care.

The biomass estimate of *T. trecae* was 7 160 tonnes, an increase of 3 000 tonnes from 2011. The highest estimate (37 000 tonnes) was registered in 1997 and the estimates have been below 10 000 tonnes the last 15 years.

As in 2008, 2009 and 2011 *M. polli* was not caught on the northern shelf. In 2010 the estimated biomass was 26 tonnes.

The biomass estimate of seabreams was 11 480 tonnes in 2012. This is a small increase from the 9 800 tonnes estimated in 2010 but similar to the estimates from 2004 to 2007, indicating that the seabream population is stable. As in previous years, *D. angolensis* (5 570 tonnes) was the dominant sea bream species in the north.

The biomass estimate of croakers was 4 700 tonnes, less than last year's estimate (7 200 tonnes) but comparable to estimates from earlier surveys. *U. canariensis* was the most common species and contributed with 31% of the total estimate.

The grunt biomass (*Pomadasys incisus*, *P. jubelini* and *P. peroteti*) was 5 020 tonnes, which is somewhat lower than in 2011 and 2007 (8 000 tonnes), but otherwise higher than all other estimates since 2000.

Snappers are rarely caught as they inhabit rocky and often unavailable areas, hence the biomass estimates of snappers may not adequately reflect the state of the stock. The estimate for this year (8 tonnes) is among the lowest in the time series.

As in previous years, groupers, mainly *Epinephelus aeneus*, were most abundant on the inner shelf, though in low abundance. The biomass estimates since 2000 have been fluctuating around 500 tonnes and this year the estimate is the lowest in the time series (258 tonnes).

The biomass estimate of the deep water shrimp *P. longirostris* in 2012 (42 tonnes) was higher than last year's estimate (11 tonnes) but much lower than the 2010 estimate (590 tonnes), which had a similarly high CV. Part of the biomass for this species was found in shallower waters than usual.

The 2012 biomass of Sepiidae was 2 000 tonnes, the highest values since 1999, but the estimates show large fluctuations from year to year. Ommastrephidae abundance seemingly increased compared to 2011, from 44 to 230 tonnes, but is at the same level as in 2008 (220 tonnes). The annual biomass estimates vary and no clear trends in the abundance of the group can be seen in the time series.

The biomass estimate for sharks in 2012 was of 31 tonnes, the lowest value in the time series.

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

Survey	T.treace		Carangids		M.polli		D.macrophtha.		D.angolensis		Seabreams		U.canariensis		Croakers	
1985.1	4,496	(1.11)	9,986	(0.92)	9	(1.65)	200	(1.65)	2,196	(0.55)	14,690	(0.57)	1,132	(1.21)	1,519	(1.00)
1985.2	3,324	(1.17)	3,740	(1.04)	0	-	0	-	2,495	(0.57)	12,881	(0.34)	521	(1.46)	1,302	(1.10)
1985.3	16,486	(1.20)	17,742	(1.09)	3,459	(1.65)	0	-	2,949	(0.69)	20,897	(0.67)	602	(1.14)	8,695	(0.94)
1985.4	36,044	(1.14)	42,506	(1.02)	7,415	(1.65)	125	(1.64)	6,371	(0.97)	31,078	(0.45)	2,650	(0.95)	3,692	(0.93)
1986.1	13,438	(0.81)	17,950	(0.62)	56	(1.64)	2,058	(0.56)	3,814	(0.54)	17,193	(0.40)	279	(0.74)	2,307	(0.97)
1986.2	8,053	(0.37)	10,364	(0.32)	290	(1.21)	1,483	(0.48)	11,220	(0.35)	25,098	(0.28)	1,350	(0.48)	5,049	(0.37)
1989.1	12,681	(0.90)	13,264	(0.86)	62	(1.46)	0		1,612	(0.34)	12,958	(0.37)	542	(0.80)	4,469	(0.88)
1989.2	11,535	(0.66)	13,966	(0.57)	250	(1.65)	222	(0.87)	2,299	(0.57)	7,283	(0.34)	172	(0.54)	3,231	(0.34)
1989.3	39,959	(0.58)	46,704	(0.59)	1,029	(1.62)	100	(0.95)	2,614	(0.46)	15,344	(0.58)	1,194	(1.37)	4,214	(0.70)
1991.1	21,484	(0.57)	43,605	(0.68)	0	-	158	(1.06)	1,317	(0.37)	4,769	(0.23)	496	(0.72)	3,797	(0.83)
1991.2	14,727	(0.71)	14,928	(0.70)	312	(1.14)	690	(0.95)	3,198	(0.41)	15,741	(0.39)	4,375	(1.32)	6,450	(0.93)
1992	15,520	(0.65)	17,942	(0.59)	1,304	(1.04)	1,532	(1.10)	5,112	(0.26)	14,551	(0.22)	680	(0.65)	2,778	(0.59)
1994	14,309	(0.81)	21,225	(0.62)	51	(1.21)	1,740	(0.78)	3,451	(0.37)	19,599	(0.47)	2,740	(1.13)	4,095	(0.80)
1995.1	305	(0.80)	7,078	(0.69)	127	(1.17)	197	(1.11)	2,143	(0.38)	8,341	(0.30)	342	(1.15)	2,882	(0.73)
1996	32,155	(0.54)	33,700	(0.51)	0	-	2,169	(0.80)	4,303	(0.40)	19,985	(0.68)	2,073	(1.15)	9,292	(0.49)
1997.1	37,094	(0.51)	130,055	(0.87)	25	(1.50)	324	(0.78)	2,837	(0.41)	9,009	(0.28)	1,161	(0.79)	12,451	(0.53)
1999	4,106	(0.47)	16,570	(0.54)	6	(1.17)	146	(0.76)	2,881	(0.19)	13,304	(0.25)	3,582	(1.45)	8,528	(0.91)
2000	6,583	(0.56)	22,483	(0.88)	12	(1.65)	65	(0.86)	4,053	(0.77)	13,424	(0.35)	1,271	(1.08)	2,450	(0.66)
2001	5,502	(0.87)	9,560	(0.71)	6	(1.65)	417	(0.85)	1,228	(0.39)	8,927	(0.40)	188	(1.36)	1,458	(0.80)
2002	9,765	(0.52)	13,125	(0.41)	0	-	102	(1.18)	2,089	(0.52)	9,187	(0.35)	835	(0.83)	2,835	(0.53)
2003	9,995	(0.54)	28,515	(0.94)	0	-	16	(0.80)	3,201	(0.27)	9,889	(0.29)	769	(0.67)	5,571	(0.52)
2004	9,146	(0.49)	12,764	(0.42)	0	(1.65)	79	(1.12)	5,214	(0.39)	11,924	(0.28)	1,236	(0.53)	5,545	(0.74)
2005	3,792	(0.52)	10,292	(0.63)	0	-	136	(0.84)	6,727	(0.17)	18,282	(0.25)	3,640	(0.76)	7,949	(0.59)
2006	5,078	(0.42)	11,445	(0.37)	0	-	7	(1.34)	4,630	(0.20)	10,872	(0.25)	2,151	(0.93)	4,087	(0.57)
2007	2,983	(0.38)	9,442	(0.47)	37	(1.63)	11	(1.38)	5,980	(0.24)	12,758	(0.25)	622	(0.73)	3,901	(0.58)
2008	1,938	(0.49)	17,154	(0.71)	0	-	0	NA	4,809	(0.28)	12,833	(0.28)	3,171	(0.64)	8,771	(0.67)
2009	4,412	(0.36)	9,792	(0.73)	0	-	8	(1.31)	4,418	(0.28)	9,974	(0.36)	985	(0.57)	3,936	(0.59)
2010	2,073	(0.59)	5,966	(0.40)	26	(1.65)	20	(1.11)	7,293	(0.24)	13,161	(0.23)	3,389	(0.86)	5,518	(0.62)
2011	4,108	(0.91)	10,792	(0.66)	0	-	1	(1.65)	5,888	(0.22)	9,832	(0.20)	1,975	(0.89)	7,243	(0.71)
2012	7,164	(0.51)	13,824	(0.42)	0	-	46	(1.65)	5,571	(0.32)	11,479	(0.27)	1,474	(0.88)	4,703	(0.63)

Survey	Grunts		Snappers		Groupers		P.longirostris		Shrimps		Ommastreph.		Sepiidae		Cephalopod	
1985.1	248	(1.02)	0		479	(1.09)	117	(1.38)	302	(0.79)	10,273	(1.27)	0		10,463	(1.25)
1985.2	381	(1.31)	63	(1.26)	1,771	(0.78)	0		139	(1.88)	0		0		694	(0.57)
1985.3	3,629	(0.94)	62	(1.96)	1,978	(0.84)	0		1,448	(1.38)	0		154	(0.97)	2,046	(0.67)
1985.4	14,806	(1.14)	0		3,054	(0.63)	10	(1.65)	107	(1.37)	84	(1.34)	215	(1.28)	436	(0.72)
1986.1	1,231	(0.98)	434	(1.96)	676	(0.80)	521	(1.09)	1,445	(0.90)	1,531	(1.23)	808	(0.72)	2,853	(0.87)
1986.2	1,694	(0.59)	0		1,515	(0.51)	0		486	(0.72)	0		696	(0.60)	1,179	(0.38)
1989.1	135	(0.96)	0		989	(1.17)	60	(1.29)	92	(1.08)	506	(0.85)	288	(0.93)	931	(0.53)
1989.2	1,102	(0.72)	33	(1.64)	841	(0.68)	22	(0.90)	509	(0.61)	161	(0.53)	272	(0.72)	549	(0.38)
1989.3	1,788	(0.86)	316	(1.96)	315	(0.73)	31	(1.50)	256	(1.04)	1,661	(0.93)	45	(1.08)	1,715	(0.90)
1991.1	822	(0.85)	0		642	(0.92)	0		381	(1.69)	368	(0.53)	282	(0.76)	935	(0.37)
1991.2	860	(1.21)	0		1,022	(0.69)	129	(0.94)	2,554	(1.79)	2,718	(0.88)	226	(0.74)	4,225	(0.60)
1992	932	(0.90)	0		1,844	(0.80)	49	(1.65)	79	(1.19)	1,071	(0.40)	901	(0.64)	3,114	(0.38)
1994	612	(0.83)	0		2,474	(0.75)	478	(1.40)	478	(1.40)	441	(0.35)	1,910	(0.45)	3,643	(0.48)
1995.1	2,921	(1.08)	481	(1.50)	807	(0.70)	477	(1.13)	951	(0.98)	72	(0.58)	236	(0.48)	451	(0.40)
1996	5,161	(0.90)	0		2,002	(0.97)	10	(1.60)	347	(0.64)	589	(0.27)	106	(1.19)	2,203	(0.33)
1997.1	4,836	(1.05)	73	(1.96)	549	(0.76)	124	(1.38)	474	(0.89)	1,017	(0.71)	4,468	(0.68)	6,218	(0.50)
1999	5,600	(0.80)	5	(1.64)	1,011	(0.60)	113	(0.79)	326	(0.96)	391	(0.45)	254	(0.55)	1,202	(0.35)
2000	388	(0.98)	196	(1.64)	620	(0.48)	18	(0.91)	150	(0.92)	214	(0.83)	46	(0.66)	609	(0.65)
2001	2,271	(1.04)	723	(1.91)	793	(0.97)	101	(0.86)	212	(0.80)	176	(0.51)	196	(0.63)	866	(0.88)
2002	241	(0.54)	63	(1.96)	509	(0.88)	21	(1.00)	52	(0.52)	660	(0.72)	75	(0.59)	956	(0.51)
2003	1,376	(0.60)	142	(1.96)	340	(0.68)	65	(1.42)	501	(0.80)	121	(0.80)	206	(1.37)	501	(0.57)
2004	3,316	(0.86)	37	(1.87)	502	(0.63)	6	(1.28)	196	(1.14)	344	(0.42)	185	(0.83)	1,059	(0.26)
2005	5,754	(0.96)	278	(1.27)	568	(0.40)	5	(0.87)	146	(0.66)	146	(0.33)	427	(0.51)	1,674	(0.31)
2006	2,839	(0.77)	16	(1.82)	372	(0.71)	176	(1.42)	320	(0.99)	174	(0.77)	94	(0.61)	1,024	(0.33)
2007	7,966	(1.40)	83	(1.35)	460	(0.47)	135	(1.21)	243	(0.71)	42	(0.57)	190	(0.70)	703	(0.26)
2008	1,485	(0.69)	79	(1.96)	614	(0.54)	40	(0.89)	331	(1.25)	226	(0.50)	268	(0.87)	1,204	(0.37)
2009	3,209	(0.92)	168	(1.34)	586	(0.55)	84	(1.07)	108	(0.86)	163	(0.41)	98	(0.83)	1,010	(0.27)
2010	3,197	(0.83)	0	NA	358	(0.66)	596	(1.31)	638	(1.24)	137	(0.40)	206	(1.08)	906	(0.35)
2011	6,039	(0.54)	78	(1.96)	261	(0.84)	11	(0.94)	106	(0.69)	44	(0.30)	420	(0.45)	970	(0.26)
2012	5,022	(0.90)	8	(1.95)	258	(0.61)	42	(1.56)	71	(1.09)	211	(0.69)	2,000	(0.56)	2,484	(0.45)

Table 4.4 Biomass estimates (t) of important species on the shelf (20-200 m) in the northern region. CVs are indicated in brackets.

Survey	Clupeids		Scombrids		Hairtails		Barracudas		Sharks		B.auritus	
1985.1	364	(1.16)	44	(1.96)	15,711	(0.87)	254	(0.90)	498	(0.93)	40,729	(1.15)
1985.2	3,907	(1.91)	30	(1.64)	1,200	(1.65)	75	(0.81)	451	(0.64)	6,842	(1.40)
1985.3	205	(1.94)	146	(1.30)	2,709	(0.73)	26	(1.65)	870	(1.23)	9,182	(1.20)
1985.4	483	(1.15)	88	(1.26)	3,608	(0.70)	780	(1.46)	78	(1.55)	64,007	(1.08)
1986.1	2,053	(0.73)	30	(1.96)	8,078	(1.11)	2,080	(0.67)	496	(0.76)	95,679	(0.32)
1986.2	1,365	(0.67)	210	(0.97)	8,640	(0.82)	756	(0.51)	825	(0.56)	15,408	(0.45)
1989.1	1,578	(1.87)	97	(1.18)	2,277	(0.71)	345	(0.80)	497	(0.97)	5,450	(0.97)
1989.2	1,924	(0.53)	220	(0.98)	3,712	(0.46)	2,973	(0.89)	729	(0.85)	14,252	(0.46)
1989.3	5,043	(0.73)	208	(0.59)	21,132	(1.13)	364	(1.02)	15,984	(1.10)	51,225	(0.66)
1991.1	1,841	(0.96)	96	(1.36)	11,448	(0.88)	2,739	(1.40)	705	(0.67)	28,701	(0.70)
1991.2	55	(0.78)	318	(0.74)	4,949	(0.57)	79	(1.27)	107	(0.82)	1,661	(1.75)
1992	8	(1.96)	158	(0.87)	4,588	(0.47)	14	(1.29)	298	(1.10)	7,599	(1.38)
1994	184	(1.96)	337	(0.87)	4,423	(0.45)	325	(1.03)	52	(1.09)	7,572	(1.14)
1995.1	1,369	(0.79)	181	(0.81)	7,208	(0.58)	2,109	(1.10)	679	(0.64)	12,801	(0.74)
1996	782	(1.62)	137	(1.14)	3,939	(0.43)	89	(1.35)	256	(0.67)	26,804	(1.21)
1997.1	6,391	(1.14)	288	(1.18)	6,323	(0.41)	57	(1.70)	758	(0.67)	39,107	(0.51)
1999	6,392	(0.60)	36	(1.65)	14,001	(0.39)	2,712	(0.70)	1,297	(0.54)	37,727	(0.43)
2000	619	(1.54)	69	(1.20)	4,216	(0.75)	1,231	(1.37)	3,302	(1.70)	23,205	(0.70)
2001	517	(0.71)	37	(0.93)	17,036	(0.94)	856	(0.86)	391	(0.74)	13,842	(0.59)
2002	1,442	(0.57)	75	(0.61)	19,374	(0.60)	1,651	(0.78)	178	(0.64)	15,791	(0.65)
2003	2,816	(0.60)	81	(1.64)	6,818	(0.56)	2,345	(1.34)	250	(0.51)	66,412	(0.88)
2004	1,567	(0.70)	22	(1.00)	4,668	(0.47)	1,455	(1.15)	492	(0.44)	24,512	(1.00)
2005	599	(0.79)	116	(1.11)	5,632	(0.54)	705	(1.35)	734	(0.31)	52,045	(1.02)
2006	2,388	(0.90)	50	(0.86)	11,299	(0.39)	1,570	(0.61)	556	(0.84)	61,138	(0.66)
2007	1,797	(0.64)	195	(0.93)	9,102	(0.58)	1,587	(1.16)	432	(0.47)	12,523	(0.61)
2008	1,754	(0.88)	151	(0.80)	10,986	(0.53)	428	(0.51)	464	(0.45)	52,481	(0.95)
2009	2,961	(1.27)	100	(0.88)	7,272	(0.64)	1,591	(0.87)	381	(0.80)	23,822	(1.20)
2010	1,818	(1.69)	85	(1.08)	2,984	(0.46)	852	(0.95)	316	(0.43)	16,682	(0.73)
2011	3,639	(0.78)	76	(0.92)	4,827	(0.47)	2,919	(0.81)	510	(0.55)	25,797	(0.85)
2012	39588	(1.65)	52	(0.42)	1805	(0.71)	954	(1.09)	97	(0.58)	32819	(0.77)

Distribution

Seabreams were distributed on the whole northern shelf (Figure 4.3). The densities were <10 t/NM^2 along the area of distribution.

Figure 4.3 Distribution of seabreams (Sparidae) in the northern region, Ponta das Palmerinhas –south of 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

For the purpose of this report the slope is defined as the area between 200 and 800 m bottom depth. The trawl positions are mapped in Figures 2.1-2.3. Station information and catch by species are presented in Annex I.

Pooled length distributions weighted by the catch of the main species by region are shown in Annex II. Further, the mean densities ($t \cdot NM^{-2}$) 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 Cunene – Tombua slope

The slope is very steep, uneven and rocky in the south, making it difficult to have 30 minute long trawls. Five trawl stations were carried out on the southern slope (Annex VI). The average catch per hour was 702 kg/hr, which is about half of last year's value for the region (1 109 kg/hour). The 'demersal' group contributed 19% while the 'pelagic' group was absent. The "other" group (non-commercial species) dominated the catches and contributed with 79% to the mean catch rate. Shrimps and cephalopods contributed with almost 1% each, while sharks contributed with 0.3%. Seabreams were not caught in the slope area. Cape hake (mainly *M. capensis*) was caught at all five stations with an average catch rate of 117 kg/hr. Striped red shrimp (*Aristeus varidens*) was found at three stations with a mean catch of 3.9 kg/h, which is considerably less than previous years catch rates (18 kg/hour in 2010 and 79 kg/hour in 2009).

Table 5.1 shows the time series from 1986 to 2012 of the swept-area biomass estimates for different species and species groups on the southern shelf. The number of trawl stations on the southern slope was very low due to the difficult trawling conditions, therefore catch rates data were no stratified by depth. This, combined with the fact that only two stations were carried out on the depth interval 200-600m makes the biomass estimates not reliable (the same situation has occurred in previous surveys).

Biomass estimates for hake have fluctuated over time (
Table 5.1). The 2012 estimate of 1 959 tonnes is lower than in 2011. The lack of any clear trend in the time series is probably caused by the low sampling effort on the southern slope. The contribution of the two hake species (*M. capensis* and *M. polli*) has varied throughout the years, and it is reasonable to believe that, in some surveys, a misidentification of the hakes could have happened. On recent surveys, increased focus was put on correct species identification. During the present survey both *M. capensis* and *M. paradoxus* were caught between 200 and 600 m and generally not together, but each species separately in its depth range. However, only *M. paradoxus* was caught deeper than 600 m (these stations are not included in the biomass estimate).

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

Survey	Hake		Horsemackerel		Shrimps		Cephalopod		Sharks		Seabreams		P.longirostris		A.varidens	
1986.1	2754	(0.84)	26	(1.00)	182	(0.16)	15	(1.00)	66	(0.40)	1261	(0.95)	0		106	(1.00)
1991.1	3285	(0.52)	62	(0.02)	47	(0.43)	43	(0.14)	463	(0.33)	325	(0.83)	21	(0.77)	0	
1991.2	19798	(0.62)	549	(0.48)	0		0		506	(0.68)	2669	(0.08)	0		0	
1992	10793	(0.82)	58	(1.00)	235	(0.88)	0		49	(0.19)	2035	(1.00)	15	(1.00)	161	(1.00)
1997.2	3411		13		13		0		917		413		13		0	
2000	3358	(0.86)	0		44	(0.84)	0		73	(0.47)	0		44	(0.84)	0	
2002	1245		0		20		14		104		0		0		0	
2003	454	(1.00)	0		156	(0.91)	0		226	(0.34)	0		79	(1.00)	0	
2004	5749	(0.53)	50	(0.62)	97	(0.40)	34	(0.93)	40	(0.97)	579	(0.57)	57	(0.75)	30	(1.00)
2005	882	(0.48)	24	(0.84)	134	(0.71)	15	(1.00)	56	(0.62)	0		3	(0.55)	57	(0.87)
2006	4507	(0.96)	169	(0.66)	72	(1.00)	0		5	(1.00)	0		0		0	
2007	1528		0		27		0		4323		0		0		0	
2008	964	(0.38)	563	(1.00)	280	(0.61)	9	(1.00)	188	(0.42)	232	(1.00)	45	(1.00)	225	(1.00)
2009	2751	(0.69)	0		705	(0.03)	51	(0.38)	192	(0.93)	0		0		607	(0.13)
2010	2336	(0.36)	921	(1.00)	729	(1.00)	36	(0.55)	4	(1.00)	0		0		196	(1.00)
2012	1959	(0.80)	0		33	(1.00)	30	(1.00)	47	(1.00)	0		0		25	(1.00)

The biomass of horse mackerel greatly fluctuates in this region mainly due to the low number of stations and the variability in the vertical and horizontal distribution pattern of this species. This year the species was not found on the slope. As on previous surveys neither seabreams nor *P. longirostris* were caught on the southern slope. The biomass estimate for *A. varidens* is 25 tonnes, which is much lower than in 2010 (196 tonnes). Cephalopods had a biomass of 30 tonnes, which is similar to the 2010 estimate (36 tonnes). As earlier mentioned, these estimates are highly unreliable since only two hauls make the basis for the estimates.

Distribution

Figure 5.1 shows the distribution of hake (*Merluccius spp.*) in the southern region. Hake was found in a continuous-low-concentration area covering large parts of the outer shelf and slope, from Cunene to Baía dos Tigres, with a smaller medium-low concentration area off Cunene River. The distribution area was similar to the ones found in previous years.

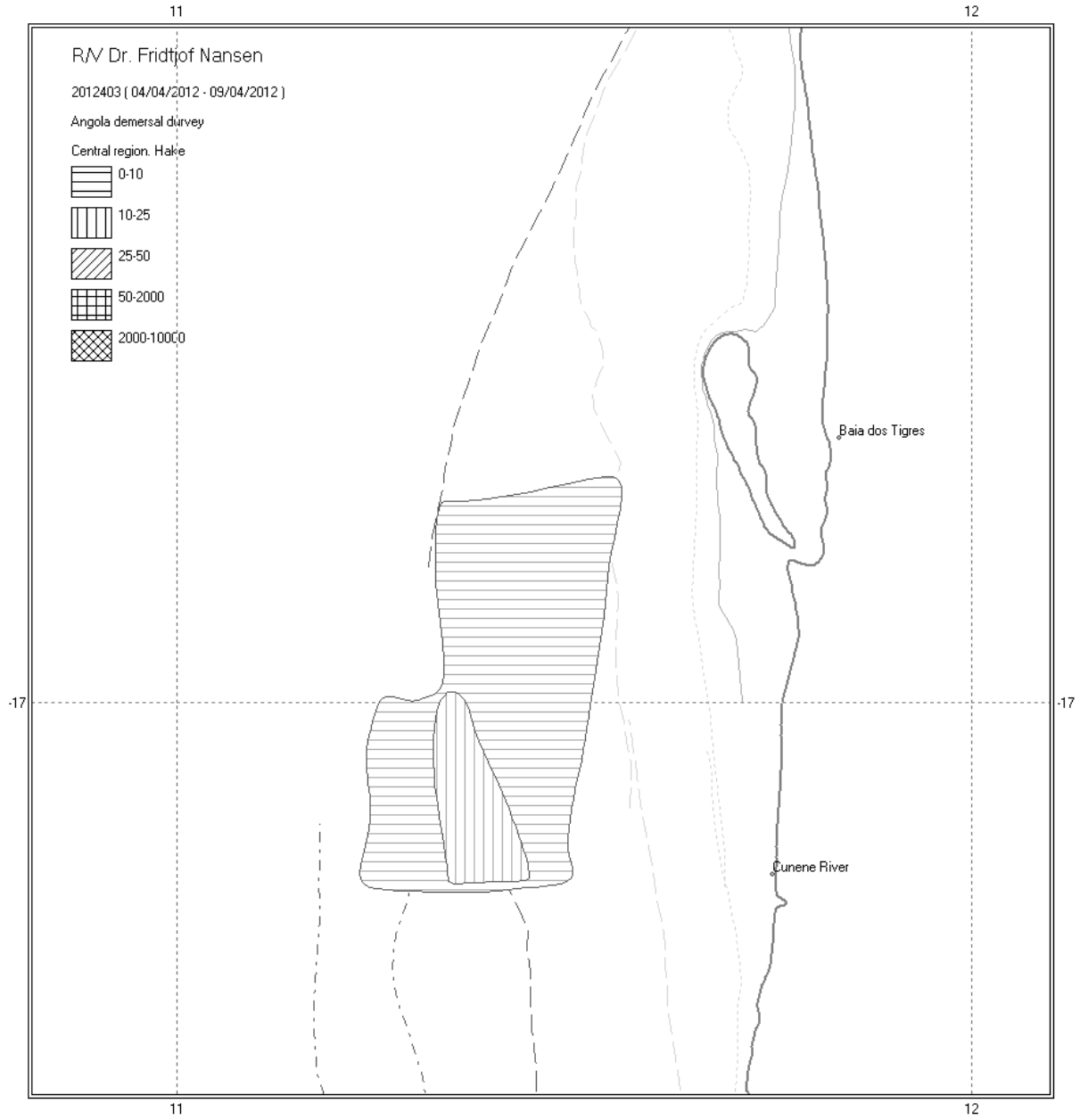


Figure 5.1 Distribution of hake (*Merluccius spp.*) in the southern region, between 200 and 800m depth, Cunene - Tombua. Depth contours at 20, 50, 100 and 200 m.

5.2 Benguela – Ponta das Palmerinhas slope

The central coastal region of Angolan covers from Benguela to Ponta das Palmerinhas, and a total of 25 successful swept-area trawl stations were accomplished (Table 2.1).

The average catch rate on the slope was 767 kg/hour, higher than in 2011 (425 kg/h) and 2010 (453 kg/h) (Annex VI). The 'demersal' group contributed with 122 kg/hour, representing 32% of the total mean catch rate, while the 'pelagic' group had an average catch rate of 7 kg/h or 4%. The shrimps contributed with 149 kg/h (8%), sharks had a mean catch rate of 4.2 kg/h (1.6%) and cephalopods 6.4 kg/h (0.8%). The "other" group, represented by

non-commercial species, dominated the catches and contributed with 478 kg/h (53%) to the total mean catch rate. The catch rate of *M. polli*, the only hake species caught, was 38 kg/h, while seabreams (*D. macrophthalmus*) were only caught on one station (16 kg/h). The average catch rate of *P. longirostris* (deep water rose shrimp) and *A. varidens* (red striped shrimp), which are the two most commercially important deep-water shrimp species, were 11.4 kg/h and 18.6 kg/h, respectively. *Nematocarcinus africana* was caught in most stations and had an average catch rate of 113 kg/h.

Biomass estimates

Biomass estimates of the most important groups are presented in Table 5.2. The biomasses were calculated by stratifying by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799m). The CVs 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 in each stratum by survey. The biomass estimates of the pelagic species may not reflect the true biomass, as pelagic species are often distributed too high in the water column to be available for the bottom trawl. Some of the biomass estimates in Table 5.2 have a high coefficient of variations (CV), which indicates that the trends in the time series should be interpreted with care.

The 2012 biomass estimate for hake (*M. polli*) was 4 230 tonnes, which is similar to estimates from previous years (4 300 tonnes in 2011 and 3 800 tonnes in 2010) but lower than the high values recorded earlier in the time series. In 2004, the biomass estimate of *M. polli* showed a peak of 16 100 tonnes, and since then the biomass has been decreasing. The reasons for this reduction are not clear, but the constant decline is of concern.

The biomass estimate of seabreams (*D. macrophthalmus* was the only sea bream species caught on the slope this year) was 2 700 tonnes, higher than in 2011 (270 tonnes) but about the same as in 2010 (2 400 tonnes). The biomass estimates of seabreams on the central slope have fluctuated considerably in recent years and the CVs of the estimates have also been relatively high due to the low number of non-zero stations..

P. longirostris was, unlike in previous years, found along the entire depth range. Its biomass estimates increased from 220 tonnes to about 1 300 tonnes between 2003 to 2006. Since then estimates have decreased. Nevertheless, this year the biomass was estimated at 1 560 tonnes, which is slightly higher than the 2006 value, probably because the species was found in a wider depth range. High CVs imply that estimates are relatively imprecise.

The biomass estimate of *A. varidens*, for 2012, was 1 070 tonnes, higher than in previous years (620 tonnes in 2011 and 750 tonnes in 2010), but comparable with the 2009's estimate (1 300 tonnes).

In contrast with the two previous shrimp species, *N. africana* is not commercially important. The 2012 estimate was 6 086 tonnes, which is nearly a double last year's biomass estimate (3400 t) but similar to 2010 estimate (6 800 tonnes). The biomass trend indicates that this species has been fairly stable since 2004.

The biomass estimate of Ommastrephidae on the central slope was estimated this year at 675 tonnes, which is the highest value in the time series. The previous highest value was

estimated in 2005 (510 tonnes). There has been a continuous and considerable decline of the biomass during the period 2005-2010.

Trichiurus lepturus was caught in the shallower depth range of the slope, while *Benthodesmus tenuis* in deeper waters, both species belonging to the hairtails. There had been a continuous increase in the biomass of the group from 200 tonnes (2007) 2 400 tonnes (2010). In 2011 the biomass declined to 600 tonnes to increase again this year to 880 tonnes. Overall CVs for 2010 to 2012 were very high, and estimates should therefore be treated cautiously.

The biomass estimate of sharks for 2012 was of 200 tonnes, approximately the same as last year (230 tonnes) but lower than in 2010 (350 tonnes). Estimates for shark show considerable fluctuations in the time series, a fact which is also reflected in the high CV values, giving no clear trend of shark abundance. It is important to note that the sampling gear used during these surveys is not adequate for this group, and the estimates presented here may reflect neither the species composition nor the true biomass.

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

Survey	M.polli		D.macrophthal.		D.angolensis		Seabreams		Ommastrephidae		Cephalopod	
1985.4	18790	(1.03)	39	(2.37)	215	(1.41)	253	(1.25)	-	-	301	(1.10)
1986.1	17757	(0.74)	499	(2.10)	474	(2.18)	972	(2.14)	74	(1.13)	1003	(0.85)
1986.2	24611	(0.00)	6446	(0.00)	0	-	6446	(0.00)	-	-	57	(0.00)
1989.1	2803	(1.26)	804	(2.17)	0	-	804	(2.17)	39	(0.76)	39	(0.76)
1989.2	4940	(0.81)	26	(2.37)	33	(2.27)	58	(1.64)	240	(1.66)	277	(1.34)
1989.3	12633	(1.00)	324	(1.14)	110	(2.13)	435	(0.98)	409	(0.77)	410	(0.76)
1991.1	11939	(0.33)	706	(2.09)	74	(1.79)	780	(2.05)	195	(0.75)	315	(0.45)
1991.2	10540	(0.52)	249	(1.79)	239	(1.88)	488	(1.12)	114	(0.82)	114	(0.82)
1992	6999	(0.28)	358	(1.42)	138	(1.87)	496	(1.03)	141	(0.61)	189	(0.51)
1994	3803	(0.71)	1113	(1.55)	40	(2.27)	1188	(1.50)	168	(0.59)	219	(0.60)
1995.1	4391	(0.41)	6037	(1.30)	226	(0.98)	6264	(1.24)	30	(1.34)	214	(0.79)
1995.2	4781	(0.38)	1196	(0.73)	95	(1.42)	1291	(0.66)	85	(0.64)	153	(0.46)
1996	6440	(0.74)	974	(0.48)	42	(2.27)	1016	(0.47)	41	(0.67)	97	(0.90)
1997.1	10375	(0.59)	1700	(1.29)	158	(1.61)	1858	(1.14)	474	(0.65)	538	(0.64)
1997.2	8363	(0.34)	4864	(1.25)	180	(1.10)	5045	(1.25)	134	(0.24)	166	(0.28)
1998	9991	(0.50)	1549	(1.15)	94	(2.23)	1643	(1.06)	389	(0.84)	428	(0.76)
1999	2995	(0.74)	2806	(0.87)	94	(1.60)	2900	(0.82)	315	(0.61)	344	(0.63)
2000	5482	(0.60)	1954	(1.01)	105	(1.44)	2059	(1.01)	426	(0.57)	717	(0.50)
2001	4763	(0.81)	663	(1.70)	102	(2.27)	767	(1.43)	339	(1.08)	623	(0.66)
2002	3012	(0.65)	2307	(2.19)	111	(2.27)	2418	(1.98)	242	(0.77)	469	(0.64)
2003	7155	(0.90)	514	(1.97)	92	(2.27)	606	(1.55)	409	(0.65)	420	(0.64)
2004	16127	(0.77)	10265	(2.24)	572	(2.27)	10840	(2.00)	350	(1.04)	444	(0.85)
2005	10074	(0.58)	6260	(2.19)	208	(1.43)	6468	(2.11)	510	(1.15)	578	(1.03)
2006	6967	(0.71)	2138	(2.23)	284	(2.27)	2422	(1.85)	457	(1.08)	623	(1.02)
2007	6947	(0.97)	612	(1.09)	196	(2.27)	808	(0.42)	138	(1.51)	446	(1.20)
2008	6032	(0.66)	1681	(2.09)	322	(2.27)	2003	(1.39)	138	(0.76)	363	(0.97)
2009	5302	(0.48)	168	(0.00)	-	-	168	-	37	(1.16)	644	(1.22)
2010	3837	(0.56)	1803	(2.23)	613	(2.27)	2416	(1.09)	21	(1.29)	179	(0.43)
2011	4318	(1.44)	274	-	-	-	274	-	44	(0.33)	223	(0.95)
2012	4230	(0.91)	2738	(2.27)	-	-	2738	(2.27)	675	(1.24)	741	(1.14)

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

Survey	P.longirostris		A.varidens		N.africanus		Shrimps		Hairtails		Sharks	
1985.4	886	(1.47)	942	(2.08)	714	(1.21)	2915	(1.20)	420	(1.56)	17	(2.47)
1986.1	653	(0.89)	492	(0.90)	3173	(1.25)	6306	(0.70)	16	(2.27)	557	(0.88)
1986.2	-	-	-	-	-	-	13247	(0.00)	498917	(0.00)	-	-
1989.1	181	(1.22)	194	(1.13)	592	(1.86)	1008	(0.95)	60	(2.06)	65	(0.69)
1989.2	505	(0.84)	228	(0.74)	1020	(1.45)	1963	(0.84)	142	(0.59)	263	(1.17)
1989.3	375	(0.32)	194	(0.68)	958	(1.01)	1546	(0.57)	35703	(0.01)	3247	(0.34)
1991.1	204	(0.75)	653	(0.21)	3879	(0.45)	4950	(0.35)	2606	(2.13)	732	(0.54)
1991.2	190	(0.57)	105	(1.53)	2659	(0.63)	3016	(0.55)	395	(1.25)	1487	(0.88)
1992	610	(0.95)	366	(0.63)	3224	(0.79)	4436	(0.60)	410	(1.28)	2920	(0.88)
1994	579	(0.85)	647	(0.67)	2199	(1.07)	3457	(0.69)	1213	(0.82)	707	(0.60)
1995.1	425	(0.95)	753	(0.45)	2460	(1.32)	4480	(0.69)	1145	(0.53)	1216	(0.91)
1995.2	479	(0.45)	698	(0.23)	2763	(0.37)	4295	(0.25)	2234	(1.21)	1064	(0.44)
1996	114	(0.53)	671	(0.37)	4971	(0.71)	6457	(0.59)	244	(0.62)	1581	(0.89)
1997.1	685	(0.50)	305	(0.54)	4093	(0.68)	6969	(0.37)	902	(1.01)	1214	(0.87)
1997.2	2679	(0.54)	-	-	11	(2.27)	2690	(0.53)	1013	(0.21)	42	(1.23)
1998	556	(0.63)	1192	(1.10)	7000	(0.52)	9048	(0.39)	1840	(1.46)	812	(0.63)
1999	214	(0.87)	337	(1.06)	1206	(0.75)	1806	(0.49)	728	(0.61)	728	(0.91)
2000	455	(1.05)	379	(0.35)	1043	(1.02)	2445	(0.45)	871	(0.91)	639	(0.74)
2001	186	(0.44)	456	(0.63)	517	(2.35)	2575	(0.72)	297	(1.05)	818	(1.77)
2002	341	(1.23)	243	(0.52)	3039	(0.75)	3749	(0.60)	269	(0.57)	212	(0.92)
2003	223	(0.44)	498	(1.07)	3284	(1.02)	4087	(0.83)	178	(1.33)	104	(1.02)
2004	419	(1.08)	576	(0.44)	6204	(0.47)	7350	(0.42)	1581	(1.06)	476	(1.51)
2005	574	(0.71)	792	(0.41)	5640	(0.46)	7135	(0.37)	2655	(1.55)	307	(0.46)
2006	1330	(1.36)	359	(0.35)	5351	(0.38)	7180	(0.38)	954	(0.86)	366	(0.85)
2007	191	(1.32)	653	(0.17)	7913	(0.39)	8939	(0.35)	185	(0.96)	1054	(0.94)
2008	415	(1.35)	880	(0.27)	5085	(0.44)	6490	(0.33)	762	(0.51)	389	(1.34)
2009	182	(1.03)	1290	(0.38)	6009	(0.51)	8079	(0.35)	1947	(0.83)	1382	(1.24)
2010	479	(1.03)	746	(0.55)	6806	(0.60)	8072	(0.54)	2387	(1.90)	350	(1.28)
2011	319	(0.21)	619	(0.20)	3413	(0.95)	4416	(0.75)	626	(1.97)	229	(0.34)
2012	1563	(0.57)	1076	(0.59)	6086	(0.44)	9063	(0.33)	882	(1.74)	201	(1.19)

Distribution

Figure 5.2 shows the distribution of hake (*M. polli*) in the central region. The distribution covered the whole central slope, had low concentration and was similar to the observations made in previous surveys.

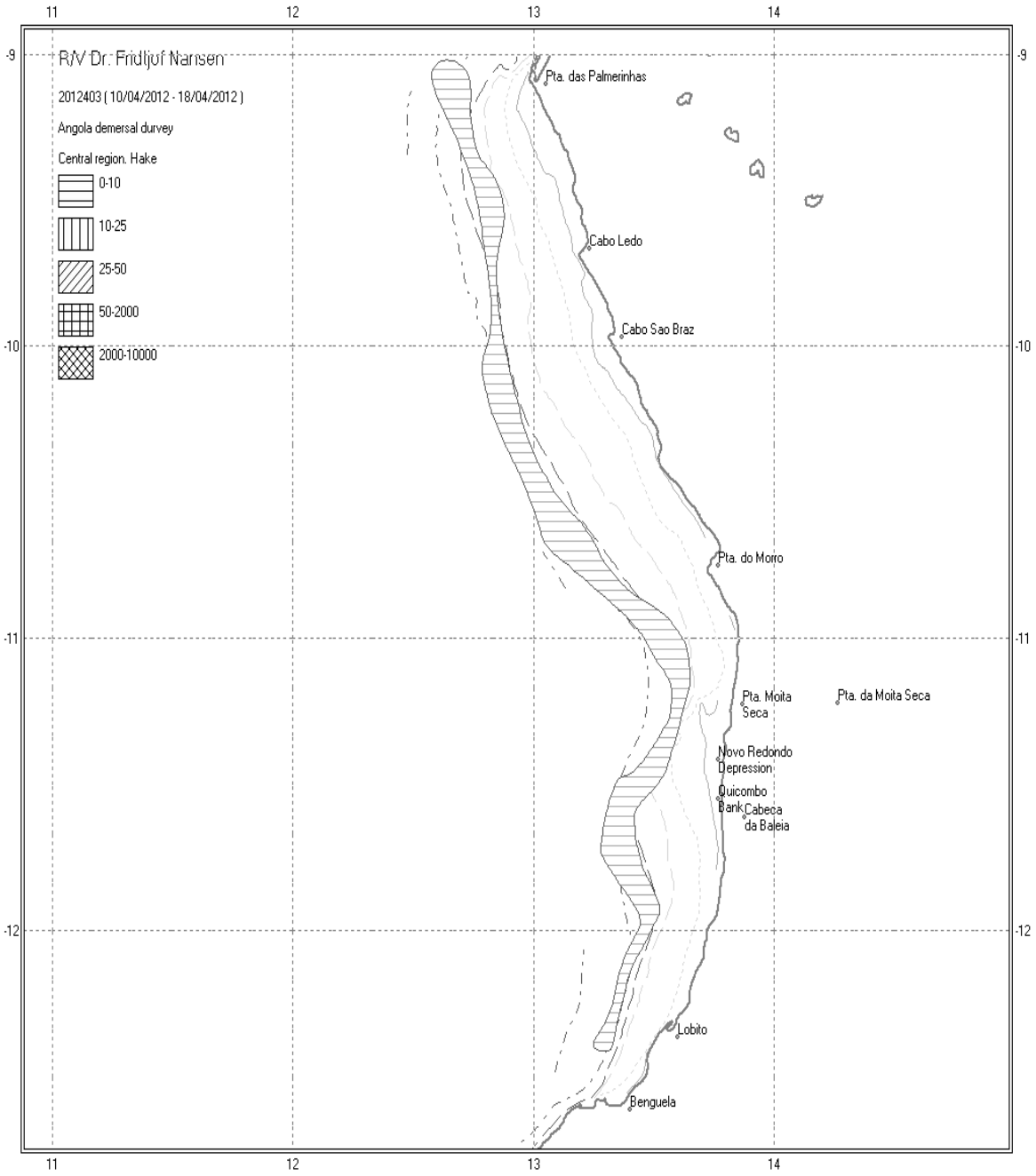


Figure 5.2 Distribution of Benguela hake (*Merluccius polli*) in the central region, Benguela- Ponta das Palmerinhas. Depth contours at 20, 50, 100, 200 and 500 m.

5.3 Ponta das Palmerinhas – Congo River slope

The survey covered the northern region of Angolan waters from Ponta das Palmerinhas to south of Congo River, and a total of 27 successful swept-area trawl stations were accomplished (Table 2.1). The area north of Congo River is at present inaccessible to fishery surveys due to restricted oil exploitation areas and only stations south of the Congo River were included in the time series estimates of biomass (Table 5.3). The various strata have been sampled with variable intensity throughout the years and Annex VIII shows the numbers of trawls by strata and by survey.

The average catch rate for all species was 800 kg/hour (Annex VI). The contribution to the total mean catch rate by groups was: 14% for the 'demersal' group, 14% for the shrimps, 1.4% for the 'pelagic' group, 0.6% for cephalopods, and 0.4% for sharks. The "other" group dominated the catches and contributed with 70% to the total mean catch rate. *M. polli* was frequently caught on the outer shelf with an average catch rate of 86.5 kg/hour. Seabreams were caught only in two stations (only *D. angolensis*) with and the average catch rate of 1.5 kg/hour. The average catch rates of the three shrimp species *P. longirostris*, *A. varidens* and *N. africana* were 13.6, 5.6 and 91 kg/hour, respectively.

Biomass estimates

Biomass estimates of the most important species groups are presented in Table 5.3. Estimates were calculated by stratifying trawl catches by depth (200-299, 300-399, 400-499, 500-599, 600-699 and 700-799 m). Some of the biomass estimates in Table 5.3 have a high coefficient of variation (CV), indicating that the trends in the time series should be interpreted with care.

The biomass estimate of seabreams was about 205 tonnes, the lowest since 2003. However, the estimate has a high CV (1.67) and should thus be treated cautiously. *D. angolensis* was the only sea bream caught on the northern slope.

The biomass estimate for *M. polli* was 9 700 tonnes, a fourfold increase of the 2011 biomass and the highest estimate since 2005. In 2008 the biomass was 5 900 tonnes, after continuously decreasing between 2004 (15 300 tonnes) and 2007 (4 117 tonnes). The length of hake caught this year was notably smaller (20.9 cm TL) than in 2011 (27.5 cm TL), indicating that the increase in biomass is largely a result of high recruitment of fish < 25 cm TL.

This years' estimate of *P. longirostris* (2 000 tonnes) is the highest recorded since 1985, and is nearly twice as high as the 2011 biomass. Between 2005 and 2011 the biomass appeared to be stable at approximately 1 000 tonnes, with the exception of 2010 (390 tonnes).

The 2012 biomass estimate of *A. varidens* was about 450 tonnes, a slight decrease compared to 2011, but fairly similar to the estimates from previous years, which ranged between 390 and 650 tonnes, with the exception of 2009, when the biomass was estimated at 915 tonnes.

N. africana is not a commercially important species. The 2012 biomass estimate, of about 10200 tonnes, is similar to previous estimates and indicates a relatively stable abundance.

The biomass estimate of *Ommastrephidae* was 302 tonnes, which is the highest in recent years and similar to the estimate from 2005 (330 tonnes).

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

Survey	M.polli		D.angolensis		Seabreams		Croakers		Ommastreph.		Cephalopod	
1985.1	202	(0.00)	0		0		0		976	(0.00)	976	(0.00)
1985.3	3,065	(0.86)	1,541	(0.00)	1,541	(0.00)	285	(0.87)	0		251	(0.68)
1985.4	28,753	(0.95)	0		0		8	(2.38)	142	(1.78)	260	(1.25)
1986.1	11,409	(0.39)	98	(2.27)	108	(2.02)	0		261	(0.33)	1,630	(0.81)
1986.2	27,562	(0.67)	269	(2.27)	288	(2.27)	19	(2.27)	0		277	(0.85)
1989.1	13,518	(0.78)	0		66	(2.27)	0		1,429	(1.40)	1,631	(1.23)
1989.2	8,168	(0.42)	4,038	(2.26)	4,061	(2.24)	1,624	(1.21)	135	(1.37)	166	(1.11)
1989.3	11,265	(0.91)	496	(1.80)	497	(1.79)	3	(2.27)	645	(1.07)	657	(1.05)
1991.1	19,597	(0.65)	49	(1.66)	49	(1.66)	3	(2.27)	129	(1.47)	135	(1.45)
1991.2	19,498	(0.67)	510	(0.66)	527	(0.66)	64	(1.82)	619	(1.11)	991	(1.05)
1992	13,290	(0.44)	465	(0.85)	510	(0.90)	244	(1.41)	143	(0.73)	209	(0.69)
1994	4,096	(0.48)	1,045	(0.91)	1,045	(0.91)	134	(1.36)	281	(0.55)	328	(0.48)
1995.1	5,892	(1.01)	449	(1.08)	506	(0.98)	0		61	(1.16)	316	(1.55)
1996	5,065	(0.31)	345	(1.50)	597	(1.43)	34	(1.36)	228	(0.66)	566	(1.03)
1997.1	6,954	(0.28)	826	(1.13)	871	(1.08)	0		622	(0.37)	659	(0.35)
1997.2	8,101	(0.39)	876	(2.27)	878	(2.27)	35	(2.27)	317	(1.85)	330	(1.80)
1999	3,624	(0.52)	339	(0.69)	389	(0.58)	113	(1.07)	1,121	(1.52)	1,142	(1.49)
2000	4,385	(0.54)	1,588	(2.14)	1,650	(2.05)	0		509	(0.64)	709	(0.47)
2001	4,840	(0.71)	481	(2.27)	494	(2.27)	0		1,001	(2.17)	1,477	(1.55)
2002	3,479	(0.60)	200	(1.54)	213	(1.45)	27	(1.73)	364	(1.27)	625	(0.87)
2003	5,310	(0.76)	135	(1.08)	141	(1.10)	27	(1.70)	216	(0.83)	421	(0.61)
2004	15,327	(1.33)	284	(0.71)	299	(0.69)	49	(1.91)	316	(0.56)	871	(0.70)
2005	10,994	(0.60)	547	(0.85)	562	(0.81)	19	(1.05)	330	(0.53)	382	(0.53)
2006	7,553	(0.51)	340	(0.95)	343	(0.95)	18	(1.79)	184	(0.49)	407	(0.55)
2007	4,117	(0.55)	595	(0.77)	612	(0.73)	9	(2.27)	125	(0.89)	316	(0.66)
2008	5,925	(0.37)	593	(0.64)	629	(0.66)	246	(1.28)	205	(0.78)	716	(0.76)
2009	2,814	(0.76)	523	(0.87)	523	(0.87)	24	(1.49)	131	(0.92)	984	(0.63)
2010	3,166	(0.73)	1,404	(0.96)	1,404	(0.96)	7	(2.27)	92	(0.78)	502	(0.51)
2011	2,433	(0.78)	1,211	(0.88)	1,215	(0.88)	146	(1.43)	74	(1.09)	609	(0.94)
2012	9,696	(0.72)	205	(1.67)	205	(1.67)	55	(1.85)	302	(0.78)	534	(0.63)

Survey	P.longirostris		A.varidens		N.africanus		Shrimps		Sharks		Hairtails	
1985.1	21	(0.00)	0		0		21	(0.00)	344	(0.00)	0	
1985.3	0		0		0		767	(1.27)	209	(1.36)	511	(2.38)
1985.4	2,108	(0.88)	6,691	(0.69)	2,864	(0.90)	11,989	(0.48)	0		1,342	(0.67)
1986.1	1,166	(1.29)	538	(2.09)	12,631	(0.23)	14,960	(0.25)	3,724	(1.41)	3,383	(0.64)
1986.2	0		1,008	(0.48)	4,643	(0.88)	7,854	(0.56)	4,431	(0.75)	3,228	(0.61)
1989.1	419	(1.15)	204	(0.50)	6,953	(1.48)	7,772	(1.34)	2,376	(1.44)	795	(0.81)
1989.2	366	(1.01)	164	(1.14)	3,682	(0.81)	4,370	(0.67)	375	(1.39)	352	(1.45)
1989.3	243	(0.67)	91	(0.40)	4,699	(0.38)	5,137	(0.36)	2,372	(0.57)	1,579	(1.97)
1991.1	88	(1.00)	70	(1.37)	8,315	(0.72)	8,671	(0.68)	1,376	(1.25)	65	(1.03)
1991.2	205	(0.98)	15	(2.67)	2,445	(0.37)	2,732	(0.34)	2,381	(0.80)	699	(0.61)
1992	170	(1.05)	272	(0.80)	8,439	(0.80)	8,992	(0.74)	1,462	(1.01)	1,148	(0.55)
1994	532	(0.58)	370	(0.75)	6,602	(0.69)	7,529	(0.61)	841	(0.66)	1,753	(0.37)
1995.1	860	(0.88)	326	(0.67)	7,269	(0.73)	9,641	(0.56)	1,367	(0.52)	2,284	(0.72)
1996	162	(0.62)	267	(0.45)	3,859	(0.50)	4,435	(0.43)	307	(0.71)	1,627	(0.69)
1997.1	605	(1.14)	333	(0.35)	13,096	(0.40)	14,107	(0.38)	824	(1.12)	3,399	(1.26)
1997.2	1,317	(1.41)	0		4,088	(1.92)	5,676	(1.67)	10	(2.27)	1,972	(1.37)
1999	542	(0.43)	237	(0.42)	10,540	(0.58)	11,539	(0.52)	1,060	(0.43)	3,088	(0.83)
2000	497	(0.44)	222	(0.50)	3,777	(0.63)	4,683	(0.49)	597	(0.89)	1,978	(1.04)
2001	535	(0.53)	243	(0.47)	6,746	(0.90)	8,283	(0.73)	1,966	(1.23)	1,531	(0.74)
2002	800	(1.04)	127	(0.57)	5,337	(0.89)	6,415	(0.74)	118	(0.74)	3,022	(1.01)
2003	629	(1.01)	383	(0.83)	6,873	(0.42)	7,986	(0.38)	1,305	(1.29)	1,237	(1.15)
2004	749	(0.98)	359	(0.39)	10,930	(0.37)	12,343	(0.33)	1,571	(0.78)	1,695	(0.57)
2005	984	(0.63)	639	(0.51)	8,535	(0.42)	10,285	(0.35)	1,180	(1.00)	1,468	(0.44)
2006	923	(0.67)	391	(0.39)	11,073	(0.43)	12,526	(0.37)	931	(1.59)	2,143	(0.74)
2007	981	(0.78)	373	(0.31)	13,285	(0.52)	14,856	(0.47)	501	(1.01)	749	(0.49)
2008	933	(0.71)	615	(0.30)	15,267	(0.45)	16,979	(0.40)	846	(0.67)	1,365	(0.79)
2009	971	(0.68)	914	(0.32)	13,121	(0.45)	15,238	(0.39)	1,152	(0.69)	1,077	(0.50)
2010	389	(0.63)	388	(0.42)	9,207	(0.48)	10,135	(0.43)	382	(0.78)	2,202	(0.84)
2011	1,138	(1.07)	653	(0.28)	8,793	(0.64)	11,151	(0.51)	669	(0.91)	1,062	(0.76)
2012	1,980	(1.03)	448	(0.47)	10,197	(0.61)	12,707	(0.50)	313	(0.94)	502	(1.41)

The 2012 biomass estimate for hairtails was 500 tonnes, about half of the 2011 biomass and the lowest since 1991. The high CVs and the annual variability in the biomass estimates make it difficult to conclude something on the trend in biomass in recent years.

The biomass estimate of sharks (313 tonnes) is the lowest since 2002.

Distribution

Figure 5.3 shows the estimated distribution of hake (*M. polli*) in the northern region. The stock distribution covers the slope from Luanda to Congo River, with densities <10 t/NM^2 with the exception of a small area between N'Zeto and Ambriz with densities upto 25 t/NM^2.

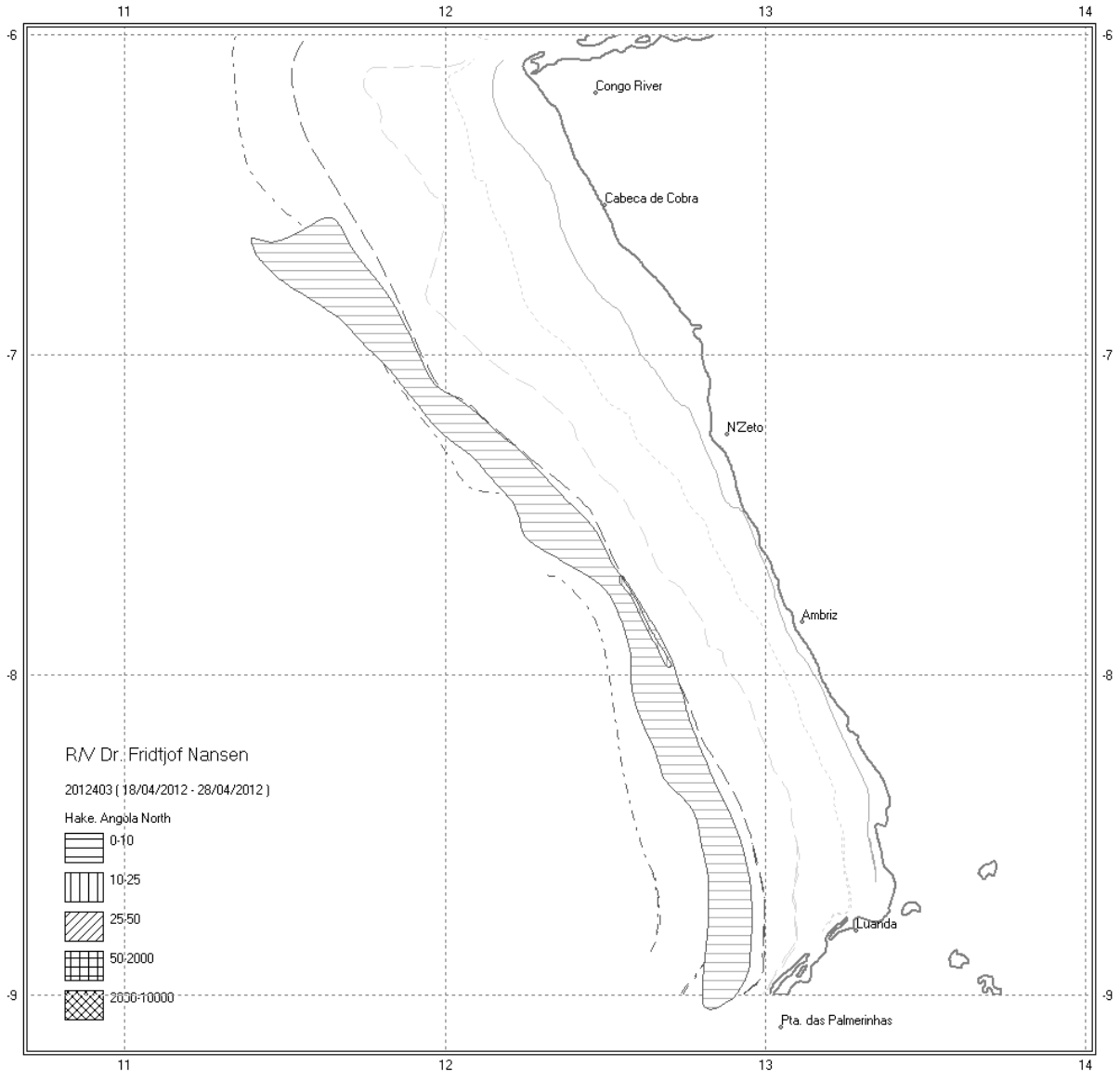


Figure 5.3 Distribution of hake (*Merluccius polli*) in the northern region, Ponta das Palmerinhas – Congo River. Depth contours at 20, 50, 100, 200 and 500 m.

CHAPTER 6 SUMMARY

Between the 1st and 29th of April the demersal resource survey off Angola was carried out onboard the R/V "Dr. Fridtjof Nansen". The whole coastal area was covered (from Cunene River to south of Congo River), except from the area between Tombua and Benguela, which is unsuitable for trawling due to poor bottom conditions. The area was divided in shelf (20-200m) and upper slope (200-800m). Due to time constraints the number of trawl stations taken in the northern region was reduced by around 30-35%.

In total, 171 trawl stations were carried out, of which 166 were valid and used in the biomass estimation. To map the oceanographic conditions 172 CTD stations were taken.

6.1 Hydrographical conditions

The demersal surveys, carried out in March/April, typically coincide with the late phase of the wet season, which generally correspond with low salinity in the surface waters on the shelf off northern and central Angola due to the freshwater coming for the coastal rivers. Such conditions did not prevail during the 2012 survey.

In general oceanographic conditions can be summarised as follows: 1) high inshore surface temperatures, oxygen and salinity, 2) low offshore salinity corresponding with high temperatures, 3) down sloping isotherms shorewards, 4) a thermocline above 50 m inshore. These characteristics suggest a southward intrusion of Equatorial waters (Ostrowski 2007), corresponding with coastal downwellig conditions. The relatively shallow thermocline depth (often less than 30 m) however suggests that the remote forcing of coastally-trapped Kelvin waves was relaxing.

6.2 Biomass estimates

Table 6.1 presents the time series from 1985 to 2012 of the biomass estimates for the most important species on the shelf and slope in the central and northern regions of Angola. The southern region is not included, as the surveys in this region have not been properly standardized throughout the years. However, the effort, *i.e*. the number of stations by stratum on the southern shelf, has been relatively similar between 2000 to 2010 (Annex VIII), making comparable the estimates in this period. In addition and due to difficult trawling conditions on the southern slope, the estimates for this region are not reliable as the number of tows is low. Tables 4.1 and 5.1 show the biomass estimates of the important species on the southern shelf and slope, respectively.

General trend

Angola has high marine biodiversity, both in terms of fish and invertebrates species. These species, despite having low individual biomasses, together 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 (patchiness) in catch rates. This is reflected in high CV values for some of the biomass estimates. Both high and low biomass estimates with individually large CVs may not necessarily reflect realistic changes in

biomass, and we have therefore chosen to look at the overall trend in catch rates for this year and compare it with the catch trends for the last ten years, when the survey methodology has been kept fairly 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 numbers, when caught, misleading the overall tendency for the demersal species.

Seabreams

The 2012seabreams' biomass estimate in the southern region was 8 700 tonnes. Their abundance continues the decline trend observed every year since 2007. *D. macrophthalmus* was the species which contributed the most to the estimate. The combined seabream estimate for the northern and central region was 21 700 tonnes (Table 6.1), a slight increase from 2011, but otherwise similar to the estimates since 2006, indicating a stable abundance. However, biomass estimates for this period are still lower than estimates from the latest 1990s'. *D. angolensis* and *D. macrophthalmus* were the most abundant seabream species.

Hakes

M. capensis is generally the dominant hake species in the south, and it is a stock shared with Namibia. The proportion of *M. polli* in the region varies and this year it was not caught, while *M. paradoxus* was only caught at depths greater than 600m. This year's estimate of 3 500 tonnes (*M. capensis*) is in line with last year's estimate and confirms the declining trend observed with exception of an outstandingly high biomass in 2009 (31 000 tonnes). *M. polli* is the only hake species found in the central and northern regions, and its biomass was estimated in 13 940 tonnes, which is twice as high as the 2010 and 2011 estimates. This may suggest that the species is back to pre 2006 levels, when the biomass was above 14 000 tonnes.

Shrimps

The two commercially important shrimp species, *P. longirostris* and *A. varidens*, are never found in high densities south of Tombua. Neither in 2006 nor in 2007 these species were caught and since 2009 only *A. varidens* has been found in the southern region, with the highest biomass (600 tonnes) observed in that year. This year the biomass was estimated in 25 tonnes, which is the lowest estimate in the time series. The biomass of *P. longirostris* for the central and northern regions combined was 3 970 tonnes. This is around two to three times higher than the estimates from the last five years. The CV for 2012 is not any higher than for previous estimates, indicating that the increase in biomass may be realistic. The combined estimate for shrimps is slightly higher than in 2010 and 2011, but similar to estimates from 2006 to 2009.

Grunts

Commercially important grunt species are *P. incisus* and *P. rogeri*, which were caught in low quantities and at few stations in the southern region. The biomass estimate of grunts in the central and northern regions in 2012 was 20 540 tonnes, the highest since the mid 80s, and twice as high as the 2010 estimate (10 873 tonnes). The CV for the estimate is however high (1.64), though accordingly the increase should be treated with caution.

Croakers

South of Tombua estimates of croakers have varied considerably between surveys during the last years. However, the 2010 estimate of 320 tonnes is the lowest in the time series following

a decreasing trend since 2007. Nevertheless the 2012 biomass estimate of 3 700 tonnes is comparable with the one in 2007. The biomass estimate for the central and northern regions, mainly *U. canariensis, A. aequidens, P .senegalensis* and *P. typus*, was about 8 070 tonnes, similar to the 2010 estimate and a slight decrease since 2011. *U. canariensis* contributed about half of the biomass (4 125 tonnes). The estimates since 2003 have been similar (with few exceptions) but are somewhat lower (about half) than the estimates from the mid 1990s (1994-1998).

Groupers and snappers

Groupers and snappers were not caught in the region south of Tombua. In the central and northern regions the biomass estimates for both groups are relatively imprecise as suggested by the high CVs. The biomass estimate for groupers (1 250 tonnes) was similar to the estimate from 2005 and 2008, but had a much higher CV in 2012 than in the previous years. Snapper's biomass declined to 8 tonnes (270 tonnes in 2011), but most CVs for this group are above 2, which makes it impossible to identify any trend, and reach a conclusion on the current state of this group.

Pelagic species

For the pelagic species, the estimates of the biomass are characterized by the high variability throughout the years, particularly for clupeids (sardines), carangids (mainly horse mackerels), hairtails and barracudas. The bottom trawl is not an adequate sampling gear for these species; therefore their estimates do not allow a reliable trend. More adequate results are achieved from the acoustic surveys conducted earlier this year.

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

Survey	Seabreams		D.macrophtha.		D.angolensis		M.polli		Shrimps		A.varidens		N.africanus		P.longirostris	
1985.1	14,690	(0.94)	200	(2.74)	2,196	(0.92)	211	(0.12)	323	(1.22)	0		0		138	(1.93)
1985.2	12,881	(0.57)	0		2,495	(0.94)	0		139	(3.12)	0		0		0	
1985.3	22,438	(1.03)	0		4,490	(0.75)	6,524	(1.70)	2,215	(1.77)	0		0		0	
1985.4	49,738	(0.69)	6,286	(2.41)	9,283	(1.12)	55,083	(1.46)	15,069	(1.04)	7,633	(1.47)	3,578	(1.69)	3,062	(1.72)
1986.1	27,435	(0.54)	2,787	(1.22)	5,700	(0.92)	29,498	(1.21)	24,342	(0.60)	1,030	(2.63)	15,804	(0.77)	3,823	(1.22)
1986.2	45,651	(0.36)	9,215	(0.40)	15,499	(0.47)	52,670	(0.76)	21,957	(0.43)	1,485	(0.90)	4,643	(1.90)	0	
1989.1	25,271	(0.55)	7,302	(1.28)	2,568	(0.49)	16,503	(1.50)	9,110	(2.48)	397	(1.56)	7,545	(2.98)	895	(1.44)
1989.2	23,569	(0.92)	1,386	(1.44)	9,997	(2.01)	14,371	(0.90)	7,519	(1.03)	400	(1.50)	4,702	(1.61)	1,559	(1.07)
1989.3	20,807	(0.76)	1,956	(2.27)	4,888	(0.68)	25,407	(1.58)	7,393	(0.65)	285	(1.25)	5,657	(0.81)	1,094	(1.18)
1991.1	14,666	(0.48)	3,075	(1.74)	2,651	(0.49)	31,536	(0.93)	14,041	(0.97)	723	(0.58)	12,194	(1.13)	302	(1.48)
1991.2	42,431	(0.47)	18,054	(0.97)	4,903	(0.54)	30,968	(1.03)	8,426	(1.07)	119	(3.61)	5,104	(0.95)	640	(0.95)
1992	40,589	(0.52)	20,117	(0.99)	7,229	(0.37)	23,233	(0.60)	13,613	(1.17)	638	(1.21)	11,662	(1.38)	935	(1.71)
1994	51,379	(0.51)	23,219	(0.88)	6,918	(0.52)	10,343	(1.00)	11,756	(1.00)	1,017	(1.28)	8,801	(1.33)	1,757	(1.05)
1995.1	29,271	(0.83)	14,010	(1.70)	4,695	(0.71)	10,577	(1.30)	15,395	(0.93)	1,078	(0.95)	9,729	(1.47)	2,020	(1.09)
1995.2	11,363	(0.86)	10,083	(0.99)	1,280	(0.74)	6,880	(0.81)	4,499	(0.65)	698	(0.62)	2,763	(0.97)	680	(1.02)
1996	39,921	(0.62)	14,591	(0.66)	6,236	(0.54)	12,219	(1.08)	11,356	(0.96)	938	(0.76)	8,830	(1.16)	310	(0.89)
1997.1	33,690	(0.75)	14,289	(1.72)	5,318	(0.57)	21,911	(0.90)	22,638	(0.60)	639	(0.79)	17,189	(0.79)	2,501	(1.05)
1997.2	49,236	(0.63)	31,595	(0.96)	5,712	(0.90)	25,581	(0.71)	9,977	(2.10)	0		4,098	(4.15)	5,481	(1.07)
1998	64,867	(2.24)	52,473	(2.75)	2,084	(0.74)	10,366	(1.27)	9,412	(0.98)	1,192	(2.89)	7,000	(1.37)	742	(1.32)
1999	34,029	(0.45)	8,181	(1.23)	4,476	(0.32)	6,640	(1.08)	13,687	(0.97)	574	(1.68)	11,746	(1.14)	878	(0.82)
2000	36,443	(0.45)	8,086	(1.25)	7,385	(1.25)	10,118	(1.00)	7,592	(0.76)	601	(0.71)	4,820	(1.21)	1,259	(1.15)
2001	22,805	(0.64)	6,772	(1.22)	3,482	(0.84)	9,732	(1.30)	11,282	(1.23)	699	(1.14)	7,263	(1.87)	1,020	(0.83)
2002	34,016	(0.85)	13,935	(2.04)	3,323	(0.66)	7,680	(0.93)	10,747	(1.11)	371	(0.99)	8,375	(1.42)	1,565	(1.41)
2003	16,230	(0.39)	1,092	(2.52)	4,474	(0.42)	14,240	(1.35)	13,089	(0.85)	881	(1.78)	10,157	(1.06)	1,366	(1.14)
2004	32,647	(1.79)	13,884	(4.41)	7,084	(0.69)	31,628	(1.73)	20,863	(0.59)	935	(0.78)	17,133	(0.68)	2,143	(1.33)
2005	33,064	(1.12)	7,290	(4.97)	8,473	(0.29)	21,112	(0.99)	17,650	(0.59)	1,431	(0.77)	14,188	(0.73)	1,613	(1.07)
2006	24,824	(0.57)	4,950	(2.58)	7,236	(0.39)	14,563	(1.06)	20,214	(0.61)	750	(0.63)	16,424	(0.71)	2,607	(1.92)
2007	22,191	(0.35)	2,157	(1.41)	8,083	(0.41)	11,157	(1.66)	24,092	(0.71)	1,026	(0.38)	21,198	(0.81)	1,342	(1.35)
2008	21,227	(0.48)	3,176	(3.01)	6,860	(0.46)	11,979	(0.96)	24,057	(0.65)	1,508	(0.49)	20,352	(0.78)	1,622	(1.30)
2009	18,108	(0.41)	876	(0.93)	6,697	(0.44)	8,120	(1.00)	23,619	(0.63)	2,204	(0.66)	19,130	(0.79)	1,432	(1.10)
2010	25,714	(0.39)	2,395	(4.44)	11,561	(0.50)	7,051	(1.08)	19,050	(0.79)	1,134	(1.01)	16,013	(0.90)	1,648	(1.18)
2011	20,872	(0.37)	777	(1.44)	9,905	(0.42)	6,751	(2.52)	15,715	(0.96)	1,272	(0.40)	12,206	(1.22)	1,492	(1.76)
2012	21,718	(0.81)	3,617	(4.50)	7,501	(0.44)	13,939	(1.31)	22,275	(0.72)	1,525	(1.15)	16,283	(0.94)	3,971	(1.28)

Survey	Grunts		B.auritus		Croakers		U.canariensis		Snappers		Groupers		Carangids		T.treace	
1985.1	248	(1.69)	40,729	(1.90)	1,519	(1.67)	1,132	(2.01)	0		479	(1.81)	9,986	(1.52)	4,496	(1.85)
1985.2	381	(2.18)	6,842	(2.33)	1,302	(1.82)	521	(2.43)	63	(2.09)	1,771	(1.30)	3,740	(1.73)	3,324	(1.94)
1985.3	3,629	(1.56)	9,182	(1.99)	8,979	(1.52)	602	(1.89)	62	(3.25)	1,978	(1.39)	17,742	(1.81)	16,486	(1.99)
1985.4	20,511	(1.54)	69,072	(1.67)	13,935	(2.05)	8,921	(2.47)	0	NA	4,307	(0.91)	117,929	(1.33)	110,950	(1.39)
1986.1	3,468	(1.06)	133,723	(0.46)	6,956	(0.82)	2,606	(1.45)	470	(3.02)	1,087	(1.01)	38,390	(0.72)	31,313	(0.88)
1986.2	6,995	(0.98)	36,750	(0.69)	9,578	(0.76)	3,387	(1.33)	0		2,033	(0.84)	34,989	(0.97)	30,649	(1.11)
1989.1	3,816	(1.85)	20,488	(1.13)	5,864	(1.15)	1,427	(1.14)	0		1,569	(1.34)	26,000	(0.85)	19,681	(1.00)
1989.2	2,228	(1.06)	64,268	(1.18)	7,826	(0.78)	1,302	(1.34)	53	(2.19)	3,937	(2.31)	40,419	(0.66)	33,008	(0.74)
1989.3	1,870	(1.37)	88,316	(0.76)	4,812	(1.06)	1,194	(2.28)	316	(3.25)	1,107	(1.95)	59,519	(0.85)	49,538	(0.85)
1991.1	1,247	(0.99)	48,534	(0.82)	5,848	(1.05)	1,657	(1.94)	106	(3.69)	817	(1.28)	131,007	(1.03)	107,626	(1.18)
1991.2	2,742	(1.29)	3,524	(1.62)	26,595	(1.93)	22,849	(2.25)	0		2,043	(1.05)	63,901	(1.23)	62,772	(1.25)
1992	1,698	(1.27)	34,799	(2.01)	4,772	(0.76)	1,719	(1.18)	0		3,359	(1.08)	53,311	(0.67)	48,453	(0.69)
1994	680	(1.25)	10,205	(1.51)	18,320	(1.46)	6,075	(1.55)	262	(3.69)	2,908	(1.07)	86,549	(0.75)	77,944	(0.83)
1995.1	6,027	(1.40)	40,468	(0.83)	18,472	(1.67)	11,929	(2.11)	594	(2.14)	1,397	(1.05)	19,756	(0.74)	5,224	(1.74)
1995.2	0		0		245	(1.89)	209	(2.22)	45	(3.18)	348	(3.18)	11,370	(1.15)	11,258	(1.17)
1996	8,256	(1.04)	45,646	(1.30)	15,215	(0.62)	3,150	(1.40)	109	(3.69)	2,692	(1.26)	89,864	(0.89)	83,774	(0.95)
1997.1	6,427	(1.49)	46,071	(0.75)	21,483	(0.69)	5,760	(0.94)	73	(3.25)	781	(1.08)	168,669	(1.14)	64,832	(0.77)
1997.2	500	(0.84)	1,966	(0.64)	36,999	(1.82)	33,214	(2.03)	0		2,840	(1.33)	99,747	(0.56)	97,858	(0.58)
1998	9,117	(1.56)	22,014	(1.79)	8,609	(1.62)	2,239	(1.46)	0		198	(2.33)	7,606	(1.20)	4,630	(1.67)
1999	8,888	(1.03)	131,249	(0.85)	18,534	(1.14)	11,581	(1.59)	531	(3.49)	1,642	(0.83)	36,949	(0.60)	17,083	(0.78)
2000	7,213	(0.91)	79,452	(1.18)	7,842	(0.67)	3,771	(0.88)	294	(2.04)	1,647	(1.01)	47,540	(0.80)	25,701	(0.72)
2001	3,600	(1.17)	54,964	(1.01)	3,203	(0.94)	1,264	(1.70)	726	(3.16)	859	(1.50)	30,501	(0.66)	22,012	(0.77)
2002	3,223	(0.99)	81,844	(1.16)	9,196	(0.61)	4,326	(0.86)	251	(4.74)	742	(1.17)	98,922	(0.63)	88,411	(0.70)
2003	10,025	(1.83)	104,724	(0.99)	10,967	(0.58)	1,791	(0.72)	186	(2.63)	1,043	(0.99)	57,888	(0.89)	35,489	(0.77)
2004	6,810	(1.15)	51,255	(0.90)	12,196	(1.24)	6,977	(1.87)	79	(2.44)	681	(0.91)	28,088	(0.58)	21,409	(0.71)
2005	11,735	(1.08)	88,667	(1.17)	13,501	(0.72)	5,933	(0.91)	284	(2.07)	1,176	(0.88)	20,025	(0.67)	10,931	(0.70)
2006	6,921	(1.09)	94,684	(0.91)	8,956	(0.73)	6,483	(0.96)	51	(2.69)	819	(0.99)	25,200	(0.45)	14,925	(0.52)
2007	17,242	(1.38)	52,925	(0.80)	11,991	(1.40)	5,846	(2.35)	113	(1.86)	950	(1.04)	22,928	(0.73)	10,633	(0.69)
2008	7,411	(1.43)	70,217	(1.19)	12,684	(0.87)	5,058	(0.93)	90	(2.88)	1,187	(1.53)	22,856	(0.91)	5,640	(0.69)
2009	8,192	(0.90)	46,010	(1.28)	6,064	(0.74)	2,409	(0.71)	292	(2.03)	779	(0.73)	24,557	(0.69)	14,485	(0.68)
2010	10,873	(0.95)	24,838	(0.91)	8,256	(0.77)	4,493	(1.14)	69	(1.32)	643	(0.92)	19,492	(1.77)	4,427	(0.73)
2011	14,677	(1.23)	36,639	(1.11)	13,884	(0.99)	6,038	(1.57)	267	(2.79)	705	(0.83)	24,065	(1.16)	15,045	(1.73)
2012	20,539	(1.64)	51,543	(0.90)	8,073	(0.72)	4,125	(0.89)	8	(3.25)	1,249	(2.00)	35,799	(0.59)	24,458	(0.73)

Table 6.2 (continued) Biomass estimates (t) of important species in the central and northern regions. CVs are in brackets

Survey	Clupeids		Scombrids		Sharks		Cephalopod		Ommastreph.		Sepiidae		Hairtails		Barracudas	
1985.1	364	(1.93)	44	(3.25)	841	(0.92)	11,438	(1.90)	11,249	(1.93)	0		15,711	(1.45)	254	(1.50)
1985.2	3,907	(3.17)	30	(2.72)	451	(1.06)	694	(0.95)	0		0		1,200	(2.75)	75	(1.35)
1985.3	205	(3.23)	146	(2.16)	1,079	(1.74)	2,297	(1.00)	0		154	(1.61)	3,219	(1.31)	26	(2.74)
1985.4	906	(1.55)	88	(2.09)	96	(2.42)	6,369	(1.24)	225	(2.56)	215	(2.12)	7,937	(0.94)	1,033	(1.93)
1986.1	2,770	(0.96)	64	(2.00)	5,004	(2.30)	6,925	(0.81)	2,140	(1.52)	1,334	(0.86)	26,602	(0.92)	3,099	(0.84)
1986.2	1,693	(0.95)	226	(1.51)	5,256	(1.38)	2,935	(0.78)	0		1,828	(1.23)	511,874	(0.02)	1,874	(0.93)
1989.1	2,137	(2.42)	252	(1.08)	3,086	(2.42)	4,465	(1.10)	3,209	(1.51)	356	(1.29)	13,125	(0.89)	2,281	(2.15)
1989.2	2,282	(0.79)	333	(1.16)	1,472	(1.18)	3,198	(0.56)	1,286	(1.04)	1,440	(0.67)	6,333	(0.70)	3,674	(1.21)
1989.3	6,749	(0.99)	518	(1.43)	21,887	(1.35)	4,797	(0.90)	4,191	(0.98)	169	(1.63)	66,901	(0.69)	1,068	(1.09)
1991.1	2,349	(1.31)	373	(1.28)	3,559	(1.18)	2,235	(0.43)	1,036	(0.74)	522	(0.79)	21,783	(1.13)	3,322	(1.93)
1991.2	91	(1.43)	444	(1.13)	4,090	(1.31)	7,351	(0.70)	4,144	(1.05)	793	(1.38)	9,218	(0.61)	161	(1.32)
1992	82	(1.92)	223	(1.14)	5,163	(1.47)	6,109	(0.41)	3,519	(0.46)	1,074	(0.95)	17,251	(0.74)	103	(2.12)
1994	206	(2.91)	926	(1.08)	1,869	(0.91)	6,886	(0.52)	1,931	(0.63)	3,167	(0.67)	31,574	(2.09)	329	(1.69)
1995.1	1,679	(1.09)	393	(1.24)	3,382	(1.00)	1,789	(0.76)	164	(1.21)	637	(0.86)	14,521	(0.59)	4,222	(1.10)
1995.2	0		201	(1.88)	1,289	(1.01)	979	(1.08)	730	(0.84)	219	(2.48)	5,112	(1.63)	0	
1996	1,371	(1.69)	190	(1.65)	2,641	(1.47)	5,268	(0.49)	1,069	(0.45)	143	(1.55)	9,254	(0.51)	1,035	(1.51)
1997.1	9,833	(1.75)	335	(1.74)	3,004	(1.18)	10,684	(0.56)	3,437	(0.56)	5,824	(0.95)	32,077	(0.82)	554	(3.05)
1997.2	132	(2.45)	289	(2.20)	500	(1.73)	6,260	(0.42)	2,491	(0.88)	1,885	(0.33)	23,555	(0.55)	0	
1998	2,860	(2.97)	52	(2.54)	1,122	(1.30)	3,016	(0.62)	765	(1.28)	1,300	(1.09)	30,861	(2.71)	454	(1.54)
1999	8,353	(0.87)	69	(1.84)	3,192	(0.73)	3,577	(1.08)	2,028	(1.86)	375	(0.72)	26,027	(0.57)	4,317	(0.82)
2000	2,215	(1.41)	349	(1.83)	5,098	(1.86)	3,778	(0.44)	1,735	(0.69)	501	(1.14)	18,068	(0.62)	4,556	(1.00)
2001	598	(1.06)	139	(1.11)	3,519	(1.85)	4,340	(1.36)	1,702	(2.83)	376	(0.92)	24,459	(1.12)	1,818	(0.79)
2002	3,067	(0.78)	820	(2.58)	629	(0.97)	4,980	(0.71)	3,629	(0.94)	248	(1.23)	30,855	(0.70)	2,318	(0.99)
2003	4,255	(0.78)	137	(1.75)	1,925	(1.92)	2,668	(0.56)	975	(0.88)	307	(1.61)	20,301	(0.67)	2,825	(1.86)
2004	3,760	(1.00)	63	(1.39)	3,125	(1.09)	3,400	(0.54)	1,319	(0.89)	394	(0.92)	20,349	(1.20)	1,856	(1.54)
2005	2,134	(1.19)	332	(1.72)	2,421	(1.08)	4,061	(0.47)	1,219	(1.33)	992	(0.46)	41,427	(1.25)	963	(1.68)
2006	4,663	(1.09)	183	(1.03)	2,328	(1.48)	3,728	(0.54)	943	(1.43)	217	(1.16)	20,849	(0.49)	2,561	(0.92)
2007	3,875	(0.84)	214	(1.42)	2,789	(1.21)	3,287	(0.56)	347	(1.74)	435	(1.70)	32,508	(1.22)	2,336	(1.34)
2008	2,700	(1.20)	168	(1.22)	1,831	(1.03)	3,577	(0.49)	896	(0.62)	306	(1.29)	18,211	(0.64)	1,652	(1.78)
2009	11,816	(1.85)	121	(1.31)	3,009	(1.61)	4,317	(0.64)	441	(0.79)	222	(1.60)	31,108	(1.11)	1,743	(1.33)
2010	3,238	(1.99)	164	(1.20)	1,205	(1.14)	3,215	(0.36)	429	(0.67)	208	(1.78)	14,888	(0.94)	1,202	(1.21)
2011	3,907	(1.22)	124	(1.32)	1,482	(0.97)	3,757	(0.51)	190	(1.01)	958	(0.87)	11,390	(1.11)	3,232	(1.22)
2012	75,068	(1.57)	3,138	(2.80)	659	(1.30)	6,742	(0.48)	1,667	(1.44)	3,712	(0.58)	12,125	(1.21)	1,085	(1.60)

ANNEX I FISHING STATIONS

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 1
DATE :05/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
17°13.10
start stop duration Lon E
11°14.70
TIME :00:11:49 00:42:00 30.1 (min) Purpose : 3
LOG : 9511.13 9512.75 1.6 Region : 4050
FDEPTH: 656 661 Gear cond.: 0
BDEPTH: 656 661 Validity : 0
Towing dir: 0° Wire out : 1600 m Speed : 3.6 kn
Sorted : 0 Total catch: 209.66 Catch/hour: 417.93

	SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
	Merluccius paradoxus	86.11	96	20.60
1	Trachyrincus scabrus	73.89	363	17.68
	Nezumia micronychodon	51.75	1710	12.38
	Hoplostethus cadenati	35.08	307	8.39
	Dead coral	27.75	88	6.64
	Chaceon maritae, male	24.00	78	5.74
	Lophiodes kempi	21.17	6	5.07
	Talismania longifilis	20.17	648	4.83
	Stomias boa boa	17.88	3345	4.28
	Ebinania costaecanarie	12.50	12	2.99
	Chaceon maritae, female	12.40	66	2.97
	Selachophidium guentheri	9.21	122	2.20
	Loligo vulgaris	7.14	22	1.71
	HALOSAURIDAE	4.17	12	1.00
	Yarrella blackfordi	3.63	153	0.87
	SALPS	2.53	56	0.61
	Raja confundens	2.19	0	0.52
	Lamprogrammus exutus	1.53	44	0.37
	Notacanthus cf sexspinus	1.32	22	0.31
	Parapenaeus longirostris	1.20	110	0.29
	Lithodes ferox	0.78	12	0.19
	MYCTOPHIDAE	0.66	351	0.16
	Heterocarpus grimaldi	0.44	12	0.10
	Nemichthys sp.	0.22	12	0.05
	Starfish	0.22	12	0.05
	Total	417.93		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 2
DATE :05/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
17°12.92
start stop duration Lon E
11°17.29
TIME :02:25:03 02:55:07 30.1 (min) Purpose : 3
LOG : 9521.69 9523.22 1.5 Region : 4050
FDEPTH: 546 548 Gear cond.: 0
BDEPTH: 546 548 Validity : 0
Towing dir: 0° Wire out : 1300 m Speed : 3.1 kn
Sorted : 55 Total catch: 317.01 Catch/hour: 632.54

	SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
	Trachyrincus scabrus	249.46	1634	39.44
	Hoplostethus cadenati	181.58	16887	28.71
	Nezumia micronychodon	81.57	2319	12.90
	Merluccius paradoxus	44.66	104	7.06
2	Helicolenus dactylopterus	30.03	265	4.75
	Chaceon maritae, male	25.98	56	4.11
	Chaceon maritae, female	6.70	42	1.06
	Aristeus varidens	5.73	615	0.91
	Shrimps, small, non comm.	1.96	712	0.31
	Yarrella blackfordi	1.82	154	0.29
	Coelorinchus coelorhincus	1.12	28	0.18
	Triplophos hemingi	0.98	223	0.15
	Selachophidium guentheri	0.56	14	0.09
	MYCTOPHIDAE	0.28	140	0.04
	Starfish	0.14	56	0.02
	Total	632.54		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 3
DATE :05/04/2012 GEAR TYPE: BT NO: 6 POSITION:Lat S
17°13.00
start stop duration Lon E
11°21.35
TIME :04:25:49 04:56:12 30.4 (min) Purpose : 3
LOG : 9529.45 9531.09 1.7 Region : 4050
FDEPTH: 320 323 Gear cond.: 0
BDEPTH: 320 323 Validity : 0
Towing dir: 0° Wire out : 820 m Speed : 3.2 kn
Sorted : 116 Total catch: 462.00 Catch/hour: 911.84

	SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
	Merluccius capensis	435.08	1224	47.71
3	Chlorophthalmus atlanticus	222.16	6482	24.36
	Helicolenus dactylopterus	135.79	5384	14.89
	Bathynectes piperitus	36.63	1082	4.02
	Laemonema laureysi	22.89	1066	2.51
	Pterothrissus belloci	21.00	103	2.30
	Galeus polli	11.61	142	1.27
	Zenopsis conchifer	6.32	8	0.69
	B I V A L V E S	4.26	608	0.47
	Loligo vulgaris	4.26	24	0.47
	Gadella imberbis	3.79	47	0.42
	Todaropsis eblanae	3.16	8	0.35
	MYCTOPHIDAE	2.21	1500	0.24
	Nezumia aequalis	1.11	71	0.12
	Hymenocephalus italicus	0.63	16	0.07
	Bassanago albescens	0.47	8	0.05
	Lophiodes kempi	0.47	8	0.05
	Total	911.84		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 4
DATE :05/04/2012 GEAR TYPE: BT NO: 6 POSITION:Lat S
17°12.21
start stop duration Lon E
11°25.19
TIME :09:18:42 09:48:42 30.0 (min) Purpose : 3
LOG : 9552.87 9554.30 1.4 Region : 4050
FDEPTH: 177 185 Gear cond.: 0
BDEPTH: 177 185 Validity : 0
Towing dir: 0° Wire out : 450 m Speed : 2.9 kn
Sorted : 140 Total catch: 617.93 Catch/hour: 1235.86

	SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
	Merluccius capensis	651.90	4642	52.75
4	Chlorophthalmus atlanticus	180.92	18436	14.64
	Dentex macrophthalmus	87.82	678	7.11
5	Synagrops microlepis	77.44	7532	6.27
	Helicolenus dactylopterus	64.94	2350	5.25
	SALPS	26.26	1038	2.12
	Pterothrissus belloci	26.04	264	2.11
	L O B S T E R S	24.02	2174	1.94
	Trachurus capensis	21.30	202	1.72
6	Trichiurus lepturus	12.66	238	1.02
	Zenopsis conchifer	10.82	26	0.88
	Dicologoglossa cuneata	10.12	404	0.82
	Scyllarides herklotsii	9.24	1092	0.75
	Parapenaeus longirostris	7.66	2032	0.62
	Trigla lyra	5.64	52	0.46
	Macropipus australis	3.52	202	0.28
	Squalus megalops	3.16	8	0.26
	Uranoscopus polli	2.46	8	0.20
	Bembrops greyi	2.28	26	0.18
	Squilla mantis	1.84	70	0.15
	Hymenocephalus italicus	1.32	140	0.11
	Sepia orbignyana	1.32	114	0.11
	Lophiodes kempi	1.14	18	0.09
	Monolene microstoma	0.80	26	0.06
	G A S T R O P O D S	0.80	62	0.06
	Bathynectes piperitus	0.44	8	0.04
	Total	1235.86		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 5
DATE :05/04/2012 GEAR TYPE: BT NO: 6 POSITION:Lat S
17°13.06
start stop duration Lon E
11°28.74
TIME :10:58:24 11:28:33 30.1 (min) Purpose : 3
LOG : 9560.39 9561.88 1.5 Region : 4050
FDEPTH: 151 149 Gear cond.: 0
BDEPTH: 151 149 Validity : 0
Towing dir: 0° Wire out : 370 m Speed : 3.0 kn
Sorted : 38 Total catch: 647.87 Catch/hour: 1289.72

	SPECIES	CATCH/HOUR weight	% OF TOT. C numbers	SAMP
	Dentex macrophthalmus	321.82	4316	24.95
	Trachurus capensis	230.78	2349	17.89
	Etrumeus whiteheadi	210.02	322	16.28
	Merluccius capensis	176.18	1439	13.66
9	Synagrops microlepis	174.13	34825	13.50
	Squalus megalops	70.47	177	5.46
	Trichiurus lepturus	33.76	940	2.62
	Zeus faber	17.90	30	1.39
	Scomber japonicus	14.39	30	1.12
	Pterothrissus belloci	12.62	147	0.98
	G A S T R O P O D S	7.35	3024	0.57
	Dicologoglossa cuneata	7.35	322	0.57
	SALPS	2.95	265	0.23
	Bathynectes piperitus	2.95	30	0.23
	Octopus vulgaris	2.35	60	0.18
	Trigla lyra	2.35	60	0.18
	Helicolenus dactylopterus	1.77	60	0.14
	L O B S T E R S	0.60	88	0.05
	Total	1289.72		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 6
DATE :05/04/2012 GEAR TYPE: BT NO: 6 POSITION:Lat S
17°10.38
start stop duration Lon E
11°40.27
TIME :13:50:07 14:20:36 30.5 (min) Purpose : 3
LOG : 9577.67 9579.17 1.5 Region : 4050
FDEPTH: 65 68 Gear cond.: 0
BDEPTH: 65 68 Validity : 0
Towing dir: 0° Wire out : 175 m Speed : 2.9 kn
Sorted : 89 Total catch: 425.85 Catch/hour: 838.01

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Myliobatis aquila	311.83	65	37.21
	Trachurus trecae	163.96	3617	19.57
10	Callorhinchus capensis	150.68	94	17.98
	Sepia orbignyana	68.99	85	8.23
	Rhinobatos albomaculatus	35.15	10	4.19
	Atractoscion aequidens	28.59	20	3.41
	Arius parkii	21.78	65	2.60
	Mustelus mustelus	16.65	10	1.99
	Chelidonichthys capensis	13.36	47	1.59
	Raja miraletus	7.95	28	0.95
	Trichiurus lepturus	5.14	132	0.61
	Dentex macrophthalmus	3.64	178	0.43
11	G A S T R O P O D S	3.09	1149	0.37
	Loligo vulgaris	2.52	57	0.30
	Starfish	1.12	94	0.13
	Trigla lyra	0.85	10	0.10
	Pterothrissus belloci	0.75	10	0.09
	Umbrina canariensis	0.75	10	0.09
	B I V A L V E S	0.65	65	0.08
	Antennarius occidentalis	0.57	10	0.07
	Total	838.01		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 7
DATE :05/04/2012 GEAR TYPE: BT NO: 6 POSITION:Lat S
17°11.23
start stop duration Lon E
11°44.11
TIME :15:21:18 15:51:51 30.6 (min) Purpose : 3
LOG : 9584.08 9585.71 1.6 Region : 4050
FDEPTH: 23 25 Gear cond.: 0
BDEPTH: 23 25 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
Sorted : 155 Total catch: 1557.80 Catch/hour: 3059.51

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Atractoscion aequidens	1317.05	354	43.05
12	Trachurus trecae	597.45	15064	19.53
13	Arius parkii	247.86	825	8.10
	RHINOPTERIDAE	162.27	177	5.30
	Mustelus palumbes	111.55	8	3.65
	Pomadasys jubelini	108.41	530	3.54
	Pomatomus saltatrix	105.27	98	3.44
	J E L L Y F I S H	90.34	1237	2.95
	Stromateus fiatola	74.63	157	2.44
	Rhinobatos albomaculatus	60.69	16	1.98
	Gymnura altavela	59.08	2	1.93
	Mustelus mustelus	38.30	10	1.25
	Engraulis encrasicolus	30.25	2396	0.99
	Sphyrna zygaena	28.28	16	0.92
	Selene dorsalis	10.02	236	0.33
	Sepia orbignyana	8.45	20	0.28
	Trichiurus lepturus	4.91	1453	0.16
	Dicologoglossa cuneata	4.71	157	0.15
	Total	3059.51		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 8
DATE :05/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
17°1.23
start stop duration Lon E
11°15.49
TIME :22:53:41 23:19:39 26.0 (min) Purpose : 3
LOG : 9629.70 9630.89 1.2 Region : 4050
FDEPTH: 709 739 Gear cond.: 0
BDEPTH: 709 739 Validity : 0
Towing dir: 0° Wire out : 1450 m Speed : 2.8 kn
Sorted : 0 Total catch: 532.89 Catch/hour: 1231.17

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Coelorinchus coelorhincus	415.26	20331	33.73
	Trachyrincus scabrus	318.69	1398	25.89
	SALPS	180.44	5616	14.66
	Hoplostethus cadenati	60.99	2211	4.95
	Selachophidium guentheri	53.05	280	4.31
	Chaceon maritae	52.81	864	4.29
	Talismania longifilis	28.21	915	2.29
	Dead coral	23.13	76	1.88
	Yarrella blackfordi	20.08	1372	1.63
	OPISTHOTEUTHIDAE	15.76	25	1.28
	Aristeus varidens	11.18	940	0.91
	Starfish	10.17	51	0.83
	Raja confundens	8.64	152	0.70
	Lithodes ferox	8.13	102	0.66
	Lamprogrammus exutus	4.83	51	0.39
	Stomias boa boa	3.81	229	0.31
	MYCTOPHIDAE	3.56	1271	0.29
	Merluccius paradoxus	3.28	5	0.27
	Bassanago albescens	3.05	152	0.25
	Caristius sp	2.29	25	0.19
	Hoplobrotula sp.	2.03	25	0.17
	Notacanthus cf sexspinus	1.02	25	0.08
	Heterocarpus grimaldi	0.76	25	0.06
	Total	1231.17		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 9
DATE :06/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
17°0.75
start stop duration Lon E
11°15.80
TIME :01:43:45 01:57:04 13.3 (min) Purpose : 3
LOG : 9641.38 9641.94 0.6 Region : 4050
FDEPTH: 671 673 Gear cond.: 0
BDEPTH: 671 673 Validity : 0
Towing dir: 0° Wire out : 1420 m Speed : 2.5 kn
Sorted : 28 Total catch: 69.98 Catch/hour: 315.23

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Trachyrincus scabrus	105.41	473	33.44
	SALPS	72.97	1500	23.15
	Coelorinchus coelorhincus	57.43	2446	18.22
	Merluccius paradoxus	19.14	23	6.07
	Chaceon maritae, male	16.80	36	5.33
	Talismania longifilis	10.95	315	3.47
	Zenopsis conchifer	8.92	14	2.83
	Hoplostethus atlanticus	5.72	293	1.81
	Chaceon maritae, female	4.19	23	1.33
	Notacanthus cf sexspinus	3.38	126	1.07
	Aristeus varidens	2.61	225	0.83
	Stomias boa boa	1.94	104	0.61
	Lamprogrammus exutus	1.71	126	0.54
	Gonostoma sp.	0.90	14	0.29
	MYCTOPHIDAE	0.68	396	0.21
	Shrimps, small, non comm.	0.59	261	0.19
	Triplophos hemingi	0.45	36	0.14
	Borostomias sp.	0.36	23	0.11
	Monomitopus metriostoma	0.36	14	0.11
	Yarrella blackfordi	0.36	14	0.11
	J E L L Y F I S H	0.23	23	0.07
	Raja confundens	0.14	14	0.04
	Total	315.23		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 10
DATE :06/04/2012 GEAR TYPE: BT NO: 6 POSITION:Lat S
16°58.45
start stop duration Lon E
11°18.27
TIME :05:26:18 05:34:24 8.1 (min) Purpose : 3
LOG : 9668.27 9668.67 0.4 Region : 4050
FDEPTH: 281 282 Gear cond.: 8
BDEPTH: 281 282 Validity : 9
Towing dir: 0° Wire out : 680 m Speed : 3.0 kn
Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 11
DATE :06/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°59.70
start stop duration Lon E
11°20.59
TIME :16:00:15 16:30:17 30.0 (min) Purpose : 3
LOG : 9692.55 9693.96 1.4 Region : 4050
FDEPTH: 150 155 Gear cond.: 0
BDEPTH: 150 155 Validity : 0
Towing dir: 0° Wire out : 370 m Speed : 2.8 kn
Sorted : 145 Total catch: 522.52 Catch/hour: 1043.65

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Merluccius capensis	264.75	1266	25.37
15	Synagrops microlepis	255.40	57617	24.47
	Trachurus capensis	207.66	2920	19.90
14	Dentex macrophthalmus	156.31	1438	14.98
	SALPS	39.41	639	3.78
	Pterothrissus belloci	38.97	360	3.73
	Trigla lyra	31.50	338	3.02
	Helicolenus dactylopterus	19.91	274	1.91
	Zeus faber	10.43	36	1.00
	Sardinops ocellatus	4.09	58	0.39
	Octopus vulgaris	3.87	8	0.37
	Chelidonichthys gabonensis	3.74	8	0.36
	Dicologoglossa cuneata	1.72	188	0.16
	Trichiurus lepturus	1.66	44	0.16
	Lophiodes kempi	1.52	14	0.15
	Saurida brasiliensis	1.30	324	0.12
	Sepia orbignyana	1.00	8	0.10
	Squalus megalops	0.28	8	0.03
	Todarodes sp.	0.14	8	0.01
	Total	1043.65		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 12
DATE :07/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°57.49
start stop duration Lon E
11°38.93
TIME :05:26:39 05:57:05 30.4 (min) Purpose : 3
LOG : 9762.12 9763.67 1.6 Region : 4050
FDEPTH: 60 62 Gear cond.: 0
BDEPTH: 60 62 Validity : 0
Towing dir: 0° Wire out : 170 m Speed : 3.1 kn
Sorted : 153 Total catch: 919.71 Catch/hour: 1813.44

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	1593.96	32216	87.90
17	Trichiurus lepturus	48.60	560	2.68
	Illex coindetii	20.13	858	1.11
	Dicologoglossa cuneata	17.96	572	0.99
	Myliobatis aquila	16.48	10	0.91
	Engraulis encrasicolus	15.44	1258	0.85
	Chelidonichthys gabonensis	14.51	41	0.80
	Starfish	13.72	2516	0.76
	Sepia orbignyana	12.15	24	0.67
	Callorhinchus capensis	10.53	6	0.58
	Dentex macrophthalmus	9.84	1177	0.54
18	Lagocephalus laevigatus	9.05	126	0.50
	Arius parkii	7.67	24	0.42
	Dasyatis marmorata	7.45	2	0.41
	Raja miraletus	4.06	14	0.22
	Lithognathus mormyrus	4.00	12	0.22
	Mustelus mustelus	3.79	2	0.21
	Umbrina canariensis	2.52	34	0.14
	Brotula barbata	0.55	12	0.03
	Calappa pelii	0.55	12	0.03
	Helicolenus dactylopterus	0.45	12	0.03
	Total	1813.44		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 13
DATE :07/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°58.50
start stop duration Lon E
11°40.77
TIME :07:12:47 07:43:24 30.6 (min) Purpose : 3
LOG : 9769.80 9771.39 1.6 Region : 4050
FDEPTH: 35 37 Gear cond.: 0
BDEPTH: 35 37 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.1 kn
Sorted : 95 Total catch: 297.43 Catch/hour: 582.82

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	311.38	10867	53.43
19	Starfish red A	41.27	31	7.08
	Sepia orbignyana	40.56	0	6.96
	Engraulis encrasicolus	40.19	3127	6.90
	Illex coindetii	22.16	184	3.80
	Dasyatis marmorata	22.10	2	3.79
	Myliobatis aquila	21.34	6	3.66
	Dicologoglossa cuneata	19.87	188	3.41
	Arius parkii	10.39	31	1.78
	Trichiurus lepturus	8.50	121	1.46
	Lagocephalus laevigatus	7.64	112	1.31
	Sea urchin	7.33	535	1.26
	Rhinobatos annulatus	5.96	10	1.02
	Starfish	5.41	847	0.93
	Pomatomus saltatrix	4.10	2	0.70
	Mustelus mustelus	3.41	2	0.59
	Lithognathus mormyrus	3.31	10	0.57
	Dentex macrophthalmus	2.29	433	0.39
	Balistes capriscus	2.19	6	0.38
	Maja squinado	1.53	153	0.26
	Sardinella aurita	1.53	20	0.26
	Calappa pelii	0.35	6	0.06
	Total	582.82		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 14
DATE :07/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°46.43
start stop duration Lon E
11°41.17
TIME :09:48:14 10:18:22 30.1 (min) Purpose : 3
LOG : 9788.19 9789.89 1.7 Region : 4050
FDEPTH: 25 29 Gear cond.: 0
BDEPTH: 25 29 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.4 kn
Sorted : 184 Total catch: 6483.45 Catch/hour: 12910.95

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Sardinella aurita	9922.82	405646	76.86
21	Trachurus trecae	1676.69	36169	12.99
20	Myliobatis aquila	616.85	70	4.78
	Mustelus mustelus	349.07	350	2.70
	Dasyatis marmorata	174.52	70	1.35
	Pomatomus saltatrix	69.38	139	0.54
	J E L L Y F I S H	46.96	281	0.36
	Sepia orbignyana	34.35	139	0.27
	Maja squinado	17.52	1332	0.14
	Dicologoglossa cuneata	2.09	70	0.02
	Starfish	0.70	139	0.01
	Total	12910.95		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 15
DATE :07/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°46.32
start stop duration Lon E
11°38.90
TIME :11:37:03 12:07:05 30.0 (min) Purpose : 3
LOG : 9796.23 9797.89 1.7 Region : 4050
FDEPTH: 58 63 Gear cond.: 0
BDEPTH: 58 63 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.3 kn
Sorted : 29 Total catch: 174.22 Catch/hour: 348.09

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	98.78	1858	28.38
22	Dicologoglossa cuneata	65.21	1870	18.73
	Trichiurus lepturus	52.15	444	14.98
	Pomatomus saltatrix	50.35	24	14.46
	Sepia orbignyana	21.22	24	6.10
	Callorhinchus capensis	19.66	24	5.65
	Chelidonichthys capensis	9.59	36	2.76
	Mustelus mustelus	6.31	4	1.81
	Pagellus bellottii	6.11	444	1.76
23	Lithognathus mormyrus	5.03	12	1.45
	Atractoscion aequidens	3.60	12	1.03
	Raja miraletus	3.00	24	0.86
	Mystriophis rostellatus	2.40	12	0.69
	Brotula barbata	1.32	24	0.38
	Pythonichthys microphthalmus	1.20	36	0.34
	Umbrina canariensis	0.72	12	0.21
	Citharus linguatula	0.60	12	0.17
	Boops boops	0.36	12	0.10
	Calappa pelii	0.24	24	0.07
	Bathygobius paganellus	0.24	24	0.07
	Total	348.09		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 16
DATE :07/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°43.51
start stop duration Lon E
11°32.18
TIME :13:40:49 14:11:40 30.9 (min) Purpose : 3
LOG : 9807.77 9809.28 1.5 Region : 4050
FDEPTH: 103 103 Gear cond.: 0
BDEPTH: 103 103 Validity : 0
Towing dir: 0° Wire out : 280 m Speed : 2.9 kn
Sorted : 0 Total catch: 969.61 Catch/hour: 1885.79

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	821.91	13692	43.58
24	Dentex macrophthalmus	643.76	12642	34.14
26	Loligo vulgaris	104.83	564	5.56
	Chelidonichthys capensis	98.80	350	5.24
	Etrumeus whiteheadi	84.02	1420	4.46
	Sepia orbignyana	47.53	60	2.52
	Zeus faber	24.51	117	1.30
	Merluccius capensis	20.03	128	1.06
25	Dicologoglossa cuneata	11.47	292	0.61
	Atractoscion aequidens	9.67	10	0.51
	Trichiurus lepturus	7.39	78	0.39
	Lagocephalus laevigatus	6.22	58	0.33
	Brotula barbata	4.28	19	0.23
	Citharus linguatula	1.36	78	0.07
	Total	1885.79		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 17
DATE :07/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°45.21
start stop duration Lon E
11°20.98
TIME :16:13:00 16:42:51 29.9 (min) Purpose : 3
LOG : 9823.82 9825.37 1.6 Region : 4050
FDEPTH: 134 136 Gear cond.: 0
BDEPTH: 134 136 Validity : 0
Towing dir: 0° Wire out : 330 m Speed : 3.1 kn
Sorted : 47 Total catch: 3999.80 Catch/hour: 8037.11

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	SALPS	7396.12	531522	92.02
	Trachurus trecae	211.99	2413	2.64
	Trigla lyra	182.65	1897	2.27
	Merluccius capensis	87.81	173	1.09
	Helicolenus dactylopterus	56.87	346	0.71
	Dentex macrophthalmus	53.45	689	0.67
	Dicologoglossa cuneata	32.75	1724	0.41
	Engraulis encrasicolus	10.25	173	0.13
	Trichiurus lepturus	5.22	173	0.07
	Total	8037.11		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 18
DATE :08/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°30.67
start stop duration Lon E
11°25.25
TIME :08:43:59 09:15:15 31.3 (min) Purpose : 3
LOG : 9874.64 9876.25 1.6 Region : 4050
FDEPTH: 114 113 Gear cond.: 0
BDEPTH: 114 113 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.1 kn
Sorted : 52 Total catch: 320.72 Catch/hour: 615.39

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	SALPS	478.46	16826	77.75
	Dentex macrophthalmus	37.99	817	6.17
27	SEA URCHINS	32.81	4306	5.33
	Chelidonichthys capensis	9.67	23	1.57
	Trigla lyra	8.86	31	1.44
	Octopus vulgaris	8.25	6	1.34
	Lagocephalus laevigatus	8.17	12	1.33
	Zeus faber	7.91	13	1.28
	Trichiurus lepturus	7.37	230	1.20
	Sepia orbignyana	7.25	46	1.18
	Raja miraletus	4.61	6	0.75
	B I V A L V E S	2.07	150	0.34
	Scorpaena normani	1.73	12	0.28
	Dicologoglossa cuneata	0.23	46	0.04
	Total	615.39		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 19
DATE :08/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°31.49
start stop duration Lon E
11°32.66
TIME :10:39:19 11:09:33 30.2 (min) Purpose : 3
LOG : 9885.75 9887.16 1.4 Region : 4050
FDEPTH: 97 98 Gear cond.: 0
BDEPTH: 97 98 Validity : 0
Towing dir: 0° Wire out : 240 m Speed : 2.8 kn
Sorted : 0 Total catch: 45.65 Catch/hour: 90.61

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Chelidonichthys capensis	28.46	234	31.41
	Trigla lyra	13.14	79	14.50
	Squalus megalops	11.27	16	12.44
	Zeus faber	8.42	28	9.29
	Raja miraletus	8.16	16	9.00
	Sepia orbignyana	6.99	18	7.71
	SALPS	3.22	65	3.55
	Dentex gibbosus	2.48	16	2.74
	Dentex barnardi	2.30	14	2.54
	Trachurus trecae	1.31	8	1.45
	Pagellus bellottii	1.19	14	1.31
	Spondyliosoma cantharus	1.09	2	1.20
	Loligo vulgaris	0.99	6	1.10
	Lagocephalus laevigatus	0.95	6	1.05
	Brotula barbata	0.22	2	0.24
	Cepola sp.	0.20	2	0.22
	Calappa pelii	0.10	2	0.11
	Citharus linguatula	0.06	2	0.07
	Scorpaena stephanica	0.06	2	0.07
	Total	90.61		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 20
DATE :08/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°29.77
start stop duration Lon E
11°37.52
TIME :12:36:36 12:58:46 22.2 (min) Purpose : 3
LOG : 9895.99 9896.95 1.0 Region : 4050
FDEPTH: 84 84 Gear cond.: 0
BDEPTH: 84 84 Validity : 0
Towing dir: 0° Wire out : 210 m Speed : 2.6 kn
Sorted : 44 Total catch: 200.60 Catch/hour: 542.90

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex macrophthalmus	343.92	10181	63.35
28	Chelidonichthys capensis	62.84	268	11.58
	Dicologoglossa cuneata	27.77	720	5.11
	Sepia orbignyana	27.28	62	5.02
	Trichiurus lepturus	25.33	487	4.67
	Brotula barbata	10.83	160	1.99
	Dentex barnardi	9.26	62	1.70
	Zeus faber	9.12	49	1.68
	Thorogobius angolensis	8.28	14	1.53
	Pagellus bellottii	6.01	24	1.11
	Atractoscion aequidens	3.63	3	0.67
	Trachurus trecae	3.27	111	0.60
	Ophichthus bennettai	1.35	24	0.25
	Spondyliosoma cantharus	1.22	14	0.22
	Citharus linguatula	1.22	1	0.22
	Thyrsites atun	1.08	3	0.20
	Arnoglossus imperialis	0.49	14	0.09
	Total	542.90		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 21
DATE :08/04/2012 GEAR TYPE: BT NO: 21 POSITION:Lat S
16°28.51
start stop duration Lon E
11°42.46
TIME :14:23:04 14:38:24 15.3 (min) Purpose : 3
LOG : 9904.95 9905.76 0.8 Region : 4050
FDEPTH: 59 58 Gear cond.: 8
BDEPTH: 59 58 Validity : 9
Towing dir: 0° Wire out : 150 m Speed : 3.2 kn
Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 22
DATE :09/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
16°15.67
start stop duration Lon E
11°45.23
TIME :05:22:05 05:52:21 30.3 (min) Purpose : 3
LOG : 9948.40 9950.00 1.6 Region : 4050
FDEPTH: 40 40 Gear cond.: 0
BDEPTH: 40 40 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.2 kn
Sorted : 96 Total catch: 807.33 Catch/hour: 1600.26

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lithognathus mormyrus	710.45	2515	44.40
	Trachurus trecae	629.38	6825	39.33
29	Myliobatis aquila	60.54	42	3.78
	Dasyatis pastinaca	48.76	2	3.05
	Pagellus bellottii	47.45	678	2.97
30	Mustelus mustelus	33.97	48	2.12
	Pomadasys jubelini	12.05	75	0.75
	Rhinobatos albomaculatus	10.35	4	0.65
	Starfish	8.13	151	0.51
	Pomatomus saltatrix	6.32	30	0.40
	J E L L Y F I S H	5.87	59	0.37
	Dicologoglossa cuneata	5.71	331	0.36
	Auxis thazard	4.06	16	0.25
	Engraulis encrasicolus	3.17	422	0.20
	Pomadasys incisus	3.01	65	0.19
	Sea urchin	2.70	272	0.17
	Sardinella aurita	1.96	30	0.12
	Alloteuthis africana	1.65	121	0.10
	Raja miraletus	1.63	2	0.10
	Spondyliosoma cantharus	0.91	16	0.06
	Trachinus armatus	0.75	16	0.05
	Trichiurus lepturus	0.75	16	0.05
	Sepia orbignyana	0.69	2	0.04
	Total	1600.26		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 23
DATE :09/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
16°12.19
start stop duration Lon E
11°38.19
TIME :07:42:25 08:12:52 30.5 (min) Purpose : 3
LOG : 9960.79 9962.25 1.5 Region : 4050
FDEPTH: 67 70 Gear cond.: 0
BDEPTH: 67 70 Validity : 0
Towing dir: 0° Wire out : 170 m Speed : 2.9 kn
Sorted : 91 Total catch: 206.80 Catch/hour: 407.49

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pagellus bellottii	155.67	1326	38.20
31	Trachurus trecae	145.56	2597	35.72
32	Sea urchin	41.75	1775	10.25
	Raja miraletus	22.54	39	5.53
	Sepia orbignyana	20.59	55	5.05
	Dentex barnardi	7.13	55	1.75
	Illex coindetii	2.96	18	0.73
	Alloteuthis africana	2.70	396	0.66
	Trigla lyra	2.23	18	0.55
	Zeus faber	1.52	4	0.37
	Octopus vulgaris	1.14	4	0.28
	B I V A L V E S	1.04	67	0.26
	Squalus megalops	0.91	2	0.22
	Antennarius occidentalis	0.67	4	0.16
	Scorpaena stephanica	0.59	4	0.15
	Citharus linguatula	0.45	12	0.11
	Maja squinado	0.04	8	0.01
	Total	407.49		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 24
DATE :09/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
16°15.93
start stop duration Lon E
11°31.18
TIME :09:30:16 10:00:41 30.4 (min) Purpose : 3
LOG : 9970.15 9971.55 1.4 Region : 4050
FDEPTH: 102 100 Gear cond.: 0
BDEPTH: 102 100 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 2.8 kn
Sorted : 0 Total catch: 79.12 Catch/hour: 156.06

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Squalus megalops	76.73	91	49.17
	Zeus faber	16.06	26	10.29
	Sepia orbignyana	14.67	69	9.40
	Citharus linguatula	9.76	318	6.26
	Dentex macrophthalmus	8.82	199	5.65
33	Lagocephalus laevigatus	8.28	28	5.31
	Raja miraletus	6.17	10	3.96
	Chelidonichthys capensis	3.45	20	2.21
	Etrumeus whiteheadi	2.60	30	1.67
	Trachurus trecae	2.25	36	1.44
	B I V A L V E S	1.97	201	1.26
	SEA URCHINS	1.93	195	1.24
	Octopus vulgaris	1.12	6	0.72
	Trigla lyra	0.79	6	0.51
	Loligo vulgaris	0.71	4	0.46
	Scorpaena stephanica	0.43	2	0.28
	Pagellus bellottii	0.30	2	0.19
	Total	156.06		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 25
DATE :09/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
15°58.98
start stop duration Lon E
11°41.34
TIME :13:22:10 13:52:14 30.1 (min) Purpose : 3
LOG : 9999.82 1.27 1.5 Region : 4050
FDEPTH: 58 63 Gear cond.: 0
BDEPTH: 58 63 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 2.9 kn
Sorted : 0 Total catch: 174.62 Catch/hour: 348.43

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Pagellus bellottii	220.29	1937	63.22
34				
	Starfish - dark	21.35	4210	6.13
	Citharus linguatula	19.83	902	5.69
	Sepia orbignyana	15.18	34	4.36
	Loligo vulgaris	14.11	126	4.05
	Trachurus trecae	10.54	214	3.02
35	Cranchia sp.	7.94	2	2.28
	Chelidonichthys capensis	6.94	86	1.99
	Raja miraletus	6.01	8	1.72
	Dasyatis sp.	5.21	2	1.49
	Dentex barnardi	4.61	28	1.32
	Calappa pelii	4.51	94	1.29
	Myliobatis aquila	2.99	4	0.86
	Spondyliosoma cantharus	2.12	12	0.61
	SALPS	1.84	64	0.53
	Arnoglossus imperialis	1.24	70	0.36
	Dicologoglossa cuneata	1.10	148	0.31
	Fistularia petimba	0.92	4	0.26
	Ephippion guttifer	0.82	36	0.23
	Pythonichthys microphthalmus	0.38	10	0.11
	Lagocephalus laevigatus	0.26	2	0.07
	Starfish - purple	0.20	4	0.06
	Ophichthus bennettai	0.06	2	0.02
	Total	348.43		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 26
DATE :09/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
16°1.24
start stop duration Lon E
11°43.20
TIME :14:29:54 15:00:06 30.2 (min) Purpose : 3
LOG : 4.18 5.71 1.5 Region : 4050
FDEPTH: 42 46 Gear cond.: 0
BDEPTH: 42 46 Validity : 0
Towing dir: 0° Wire out : 140 m Speed : 3.0 kn
Sorted : 69 Total catch: 213.26 Catch/hour: 423.70

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Starfish	177.02	49566	41.78
	Pagellus bellottii	147.58	2199	34.83
36	Trachurus trecae	45.02	751	10.63
37	Sepia orbignyana	12.56	26	2.96
	Chelidonichthys capensis	11.92	89	2.81
	Dicologoglossa cuneata	10.73	358	2.53
	Loligo vulgaris	7.57	36	1.79
	Atractoscion aequidens	2.25	2	0.53
	Lagocephalus laevigatus	1.85	12	0.44
	Spondyliosoma cantharus	1.73	6	0.41
	Citharus linguatula	1.67	72	0.39
	Dentex barnardi	0.89	6	0.21
	Ephippion guttifer	0.89	18	0.21
	Cepola pauciradiatus	0.60	12	0.14
	Pseudupeneus prayensis	0.60	6	0.14
	Trachinus armatus	0.42	12	0.10
	Arnoglossus imperialis	0.42	24	0.10
	Total	423.70		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 27
DATE :09/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
16°0.05
start stop duration Lon E
11°46.59
TIME :15:58:32 16:28:52 30.3 (min) Purpose : 3
LOG : 11.61 13.49 1.9 Region : 4050
FDEPTH: 23 24 Gear cond.: 0
BDEPTH: 23 24 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.7 kn
Sorted : 101 Total catch: 3999.45 Catch/hour: 7911.87

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Trachurus trecae	5164.47	88408	65.27
38	Decapterus rhonchus	1908.17	14000	24.12
	Sardinella aurita	468.78	3383	5.93
	Pomadasys jubelini	110.11	235	1.39
	Lithognathus mormyrus	106.19	550	1.34
	Pagellus bellottii	63.70	1573	0.81
	Atractoscion aequidens	29.10	77	0.37
	Starfish	22.02	6607	0.28
	Pomadasys incisus	20.45	156	0.26
	Spondyliosoma cantharus	10.23	235	0.13
	Dicologoglossa cuneata	3.94	156	0.05
	Penaeus kerathurus	3.15	77	0.04
	Trachinus arenatus	1.56	77	0.02
	Total	7911.87		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 28
DATE :10/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°21.99
start stop duration Lon E
13°17.19
TIME :20:39:56 21:10:12 30.3 (min) Purpose : 3
LOG : 257.45 258.97 1.5 Region : 4040
FDEPTH: 725 729 Gear cond.: 0
BDEPTH: 725 729 Validity : 0
Towing dir: 0° Wire out : 1470 m Speed : 3.0 kn
Sorted : 0 Total catch: 293.70 Catch/hour: 582.16

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Lamprogrammus exutus	229.59	1481	39.44
	Hoplostethus cadenati	129.16	2918	22.19
	Talismania longifilis	48.70	1223	8.37
	Nezumia aequalis	47.00	1187	8.07
	Yarrella blackfordi	33.26	1570	5.71
	Bathyuroconger vicinus	24.62	375	4.23
	Chaceon maritae, female	12.09	50	2.08
	Centrolophus niger	10.53	10	1.81
	Triplophos hemingi	10.53	1213	1.81
	Merluccius polli	9.18	10	1.58
	Halosaurus ovenii	7.93	107	1.36
	Stereomastis sp.	5.35	250	0.92
	MELANOSTOMIATIDAE	3.49	71	0.60
	Coelorinchus coelorhincus	2.58	36	0.44
	Caristius sp	1.25	46	0.21
	OMMASTREPHIDAE	1.25	10	0.21
	Lophius vaillanti	0.99	10	0.17
	Munida sp.	0.89	71	0.15
	ALEPOCEPHALIDAE	0.71	10	0.12
	Phrynichthys wedli	0.71	36	0.12
	Dibranchus atlanticus	0.61	28	0.11
	Gadella imberbis	0.44	36	0.07
	Etmopterus pusillus	0.44	10	0.07
	MYCTOPHIDAE	0.44	71	0.07
	Aristeus varidens	0.36	36	0.06
	Nemichthys scolopaceus	0.08	89	0.01
	Total	582.16		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 29
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°6.29
start stop duration Lon E
13°22.53
TIME :00:46:22 01:16:30 30.1 (min) Purpose : 3
LOG : 279.02 280.52 1.5 Region : 4040
FDEPTH: 624 630 Gear cond.: 0
BDEPTH: 624 630 Validity : 0
Towing dir: 0° Wire out : 1440 m Speed : 3.0 kn
Sorted : 0 Total catch: 160.29 Catch/hour: 319.20

	SPECIES	CATCH/HOUR		% OF TOT. C
SAMP		weight	numbers	
	Chaceon maritae	82.88	303	25.97
	Yarrella blackfordi	55.76	1965	17.47
	Hoplostethus cadenati	40.42	14	12.66
	Parapenaeus longirostris	36.38	15180	11.40
	Lamprogrammus exutus	17.84	98	5.59
	Stomias boa boa	16.87	181	5.28
	Triplophos hemingi	12.69	1464	3.97
	Nezumia aequalis	6.83	167	2.14
	Bathyuroconger vicinus	6.69	223	2.10
	POLYCHAELIDAE	6.69	808	2.10
	Octopoteuthis sicula	4.32	14	1.35
	Xenodermichthys copei	4.04	293	1.27
	Lophius vaillanti	3.78	2	1.19
	Halosaurus ovenii	3.48	70	1.09
	Illex coindetii	3.48	14	1.09
	Melanonus zugmayeri	2.65	223	0.83
	Dicrolene intronigra	2.65	348	0.83
	Benthodesmus tenuis	2.37	84	0.74
	Merluccius polli	1.97	2	0.62
	Talismania longifilis	1.81	84	0.57
	Shrimps unidentified	1.53	418	0.48
	Crujiraja sp.	0.98	14	0.31
	Aristeus varidens	0.84	42	0.26
	Diastobranchus sp	0.70	14	0.22
	Dibranchus atlanticus	0.56	42	0.17
	Nemichthys scolopaceus	0.42	14	0.13
	Etmopterus pusillus	0.28	4	0.09
	MYCTOPHIDAE	0.14	84	0.04
	Munida sp.	0.14	139	0.04
	Total	319.20		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 30
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°24.79
start stop duration Lon E
13°22.07
TIME :05:17:47 05:48:05 30.3 (min) Purpose : 3
LOG : 307.36 308.88 1.5 Region : 4040
FDEPTH: 107 106 Gear cond.: 0
BDEPTH: 107 106 Validity : 0
Towing dir: 0° Wire out : 270 m Speed : 3.0 kn
Sorted : 119 Total catch: 596.00 Catch/hour: 1180.20

	SPECIES	CATCH/HOUR		% OF TOT. C
SAMP		weight	numbers	
	SALPS	486.93	77000	41.26
	Dentex macrophthalmus	215.84	1485	18.29
39	Trigla lyra	115.45	931	9.78
	Boops boops	91.88	980	7.79
	Trachurus trecae	88.12	2406	7.47
40	Scomber japonicus	70.69	129	5.99
	Scorpaena normani	38.22	396	3.24
	Sepia orbignyana	17.92	89	1.52
	Raja miraletus	7.92	10	0.67
	Lagocephalus laevigatus	7.62	50	0.65
	Umbrina canariensis	6.14	10	0.52
	SEA URCHINS	5.94	505	0.50
	Lophiodes kempi	4.46	10	0.38
	Citharus linguatula	4.36	347	0.37
	Uranoscopus cadenati	4.26	20	0.36
	Pagellus bellottii	3.86	20	0.33
	Lophius vaillanti	3.17	10	0.27
	Pontinus accraensis	2.87	20	0.24
	Sardinella aurita	2.38	20	0.20
	Dicologoglossa hexophthalma	1.98	50	0.17
	Squilla mantis	0.20	10	0.02
	Total	1180.20		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 31
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°26.55
start stop duration Lon E
13°23.37
TIME :06:41:05 07:11:36 30.5 (min) Purpose : 3
LOG : 313.50 315.06 1.6 Region : 4040
FDEPTH: 93 98 Gear cond.: 0
BDEPTH: 93 98 Validity : 0
Towing dir: 0° Wire out : 240 m Speed : 3.1 kn
Sorted : 133 Total catch: 348.59 Catch/hour: 685.30

	SPECIES	CATCH/HOUR		% OF TOT. C
SAMP		weight	numbers	
	Trigla lyra	169.56	1704	24.74
	Citharus linguatula	74.88	1571	10.93
	Sepia orbignyana	72.62	643	10.60
	Trachurus trecae	65.52	659	9.56
42	Raja miraletus	60.26	83	8.79
	Lagocephalus laevigatus	43.68	140	6.37
	Pentheroscion mbizi	38.53	124	5.62
	Dentex macrophthalmus	27.70	191	4.04
41	Scorpaena normani	26.89	340	3.92
	Umbrina canariensis	17.30	17	2.52
	Brotula barbata	15.55	31	2.27
	Pontinus accraensis	12.37	118	1.80
	Pterothrissus belloci	12.31	124	1.80
	Uranoscopus cadenati	11.89	41	1.74
	Torpedo torpedo	8.24	67	1.20
	Dentex barnardi	7.73	31	1.13
	Zeus faber	6.02	41	0.88
	Pagellus bellottii	4.38	20	0.64
	Trichiurus lepturus	3.97	6	0.58
	Chaetodon hoefleri	1.85	10	0.27
	Calappa pelii	1.55	51	0.23
	C R A B S	0.77	283	0.11
	Antennarius occidentalis	0.47	16	0.07
	B I V A L V E S	0.35	57	0.05
	Saurida brasiliensis	0.35	45	0.05
	Bathyuroconger vicinus	0.35	12	0.05
	Dicologoglossa hexophthalma	0.20	10	0.03
	Total	685.30		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 32
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°27.63
start stop duration Lon E
13°24.56
TIME :07:59:47 08:30:29 30.7 (min) Purpose : 3
LOG : 318.61 320.24 1.6 Region : 4040
FDEPTH: 67 68 Gear cond.: 0
BDEPTH: 67 68 Validity : 0
Towing dir: 0° Wire out : 170 m Speed : 3.2 kn
Sorted : 87 Total catch: 163.56 Catch/hour: 319.66

	SPECIES	CATCH/HOUR		% OF TOT. C
SAMP		weight	numbers	
	Trichiurus lepturus	71.63	219	22.41
	Pagellus bellottii	52.18	295	16.32
44	Raja miraletus	24.43	33	7.64
	Pomadasys incisus	23.96	145	7.50
	Citharus linguatula	21.95	494	6.87
	Trachurus trecae	19.62	149	6.14
43	Scomber japonicus	12.64	39	3.96
	Torpedo torpedo	10.87	14	3.40
	Bembrops heterurus	10.77	160	3.37
	Octopus vulgaris	9.54	12	2.98
	Dentex barnardi	8.33	33	2.60
	Brachydeuterus auritus	8.11	47	2.54
45	Sepia orbignyana	6.80	10	2.13
	Trigla lyra	5.71	43	1.79
	Brotula barbata	5.16	63	1.61
	Zeus faber	4.89	12	1.53
	Umbrina canariensis	4.57	25	1.43
	Chaetodon hoefleri	4.48	25	1.40
	Stromateus fiatola	2.83	4	0.89
	Fistularia petimba	2.70	12	0.84
	Serranus cabrilla	2.21	43	0.69
	Sardinella maderensis	2.03	18	0.64
	GOBIIDAE	1.95	203	0.61
	Selene dorsalis	0.80	4	0.25
	Antennarius occidentalis	0.55	18	0.17
	Pterothrissus belloci	0.55	8	0.17
	C R A B S	0.18	64	0.06
	Ephippion guttifer	0.12	8	0.04
	Shrimps, small, non comm.	0.12	25	0.04
	Total	319.66		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 33
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°29.61
start stop duration Lon E
13°27.39
TIME :09:23:27 09:33:00 9.6 (min) Purpose : 3
LOG : 324.92 325.41 0.5 Region : 4040
FDEPTH: 24 25 Gear cond.: 9
BDEPTH: 24 25 Validity : 8
Towing dir: 0° Wire out : 0 m Speed : 3.1 kn
Sorted : 18 Total catch: 25.73 Catch/hour: 161.65

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Epinephelus aeneus	46.62	44	28.84
	Selene dorsalis	28.77	182	17.80
	Trichiurus lepturus	13.01	371	8.05
	Raja miraletus	8.92	13	5.52
	Dicologoglossa cuneata	8.54	163	5.29
	Chloroscombrus chrysurus	7.85	57	4.86
	GOBIIDAE	6.22	2073	3.85
	Rhinoptera marginata	6.22	6	3.85
	Torpedo torpedo	5.97	31	3.69
	Stromateus fiatola	5.15	19	3.19
	Starfish	4.90	1508	3.03
	Bembrops heterurus	4.46	69	2.76
	Sardinella aurita	2.76	31	1.71
	Citharus linguatula	2.45	31	1.52
	Sardinella maderensis	2.39	31	1.48
	Sepia orbignyana	2.32	44	1.44
	Galeoides decadactylus	1.45	19	0.89
	Atractoscion aequidens	1.38	19	0.86
	Brachydeuterus auritus	1.26	6	0.78
	Eucinostomus melanopterus	0.57	6	0.35
	Penaeus notialis	0.44	19	0.27
	Total	161.65		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 34
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°29.96
start stop duration Lon E
13°27.02
TIME :09:33:17 09:33:20 0.1 (min) Purpose : 3
LOG : 325.42 325.42 0.0 Region : 4040
FDEPTH: 25 25 Gear cond.: 9
BDEPTH: 25 25 Validity : 8
Towing dir: 0° Wire out : 120 m Speed : 0.0 kn
Sorted : 0 Total catch: 0.00 Catch/hour: 0.00

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 35
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°16.56
start stop duration Lon E
13°34.26
TIME :11:56:25 12:16:35 20.2 (min) Purpose : 3
LOG : 343.80 344.81 1.0 Region : 4040
FDEPTH: 54 55 Gear cond.: 0
BDEPTH: 54 55 Validity : 0
Towing dir: 0° Wire out : 150 m Speed : 3.0 kn
Sorted : 85 Total catch: 1200.31 Catch/hour: 3570.58

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	1236.11	9519	34.62
46	Trichiurus lepturus	461.02	2511	12.91
	Pomadasys incisus	349.32	2960	9.78
48E	pinephelus aeneus	279.44	59	7.83
	Pomadasys jubelini	233.87	413	6.55
47	Selene dorsalis	190.41	1237	5.33
	Trachurus trecae	159.68	1648	4.47
50	Gymnura altavela	122.56	3	3.43
	Pagrus africanus	92.19	113	2.58
	Sardinella maderensis	86.95	788	2.44
49	Argyrosomus hololepidotus	77.19	113	2.16
	Umbrina canariensis	46.11	226	1.29
	Pagellus bellottii	44.23	262	1.24
	Bembrops heterurus	40.49	750	1.13
	Citharus linguatula	31.47	1538	0.88
	Galeoides decadactylus	28.11	39	0.79
	Pseudotolithus senegalensis	27.72	39	0.78
	Chaetodon hoefleri	21.75	113	0.61
	Sepia orbignyana	11.63	187	0.33
	Dentex barnardi	8.98	39	0.25
	Brotula barbata	6.37	74	0.18
	Scorpaena stephanica	5.24	39	0.15
	Calappa pelii	4.49	74	0.13
	Serranus accraensis	2.23	74	0.06
	Lagocephalus laevigatus	1.87	74	0.05
	Boops boops	0.74	39	0.02
	Antennarius occidentalis	0.39	39	0.01
	Total	3570.58		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 36
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°16.25
start stop duration Lon E
13°31.91
TIME :13:07:35 13:37:37 30.0 (min) Purpose : 3
LOG : 348.94 350.49 1.6 Region : 4040
FDEPTH: 75 73 Gear cond.: 0
BDEPTH: 75 73 Validity : 0
Towing dir: 0° Wire out : 220 m Speed : 3.1 kn
Sorted : 118 Total catch: 657.38 Catch/hour: 1313.01

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	351.65	3791	26.78
52	Brachydeuterus auritus	271.12	2225	20.65
53	Pomadasys incisus	270.12	1935	20.57
51	Pagellus bellottii	146.30	805	11.14
	Citharus linguatula	43.96	3759	3.35
	Raja miraletus	40.39	56	3.08
	Loligo vulgaris	29.64	34	2.26
	Chelidonichthys gabonensis	21.25	202	1.62
	Dentex barnardi	19.23	34	1.46
	Pseudupeneus prayensis	18.24	134	1.39
	Trichiurus lepturus	17.46	44	1.33
	Zeus faber	17.34	22	1.32
	Torpedo torpedo	13.08	22	1.00
	Lagocephalus lagocephalus	11.07	12	0.84
	Pomadasys jubelini	10.07	22	0.77
	Umbrina canariensis	8.39	12	0.64
	Serranus accraensis	5.37	112	0.41
	Chaetodon hoefleri	5.03	34	0.38
	Sepia orbignyana	3.14	78	0.24
	Boops boops	2.68	44	0.20
	Torpedo marmorata	1.90	12	0.14
	Sardinella maderensis	1.34	12	0.10
	Sardinella aurita	1.34	12	0.10
	Brotula barbata	1.24	12	0.09
	Dentex macrophthalmus	1.12	12	0.09
	Bembrops heterurus	0.56	12	0.04
	Fishing gears	0.00	4	0.00
	Total	1313.01		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 37
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°13.98
start stop duration Lon E
13°30.85
TIME :14:30:39 15:00:41 30.0 (min) Purpose : 3
LOG : 356.06 357.81 1.8 Region : 4040
FDEPTH: 89 86 Gear cond.: 0
BDEPTH: 89 86 Validity : 0
Towing dir: 0° Wire out : 240 m Speed : 3.5 kn
Sorted : 116 Total catch: 556.76 Catch/hour: 1112.04

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pomadasys incisus	349.93	1650	31.47
54	Umbrina canariensis	323.29	767	29.07
55	Chelidonichthys gabonensis	121.76	1035	10.95
	Boops boops	53.21	835	4.78
	Dentex barnardi	51.01	220	4.59
	Trachurus trecae	42.46	949	3.82
57	Raja miraletus	33.08	48	2.97
	Pagellus bellottii	31.26	192	2.81
56	Citharus linguatula	25.41	795	2.28
	Zeus faber	19.93	28	1.79
	Lagocephalus lagocephalus	15.54	20	1.40
	Dentex macrophthalmus	10.55	316	0.95
58	Fistularia petimba	9.01	28	0.81
	Pseudupeneus prayensis	8.25	48	0.74
	Sepia orbignyana	6.91	68	0.62
	Torpedo torpedo	4.79	20	0.43
	Chaetodon hoefleri	2.02	10	0.18
	Dentex angolensis	1.72	20	0.15
	Sardinella aurita	1.44	10	0.13
	Bembrops heterurus	0.48	10	0.04
	Fishing gears	0.00	2	0.00
	Total	1112.04		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 38
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°12.31
start stop duration Lon E
13°26.59
TIME :16:06:48 16:36:48 30.0 (min) Purpose : 3
LOG : 365.96 367.55 1.6 Region : 4040
FDEPTH: 106 106 Gear cond.: 0
BDEPTH: 106 106 Validity : 0
Towing dir: 0° Wire out : 270 m Speed : 3.2 kn
Sorted : 154 Total catch: 2375.27 Catch/hour: 4752.12

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Sardinella aurita	3523.37	29762	74.14
59 Scomber japonicus	982.93	4868	20.68
Brotula barbata	62.24	62	1.31
Boops boops	60.38	586	1.27
Octopus vulgaris	31.11	30	0.65
Raja miraletus	20.65	30	0.43
Dentex angolensis	20.33	124	0.43
Zeus faber	18.49	30	0.39
Dentex macrophthalmus	15.71	92	0.33
Lepidotrigla cadmani	11.70	124	0.25
Citharus linguatula	1.84	62	0.04
Illex coindetii	1.84	30	0.04
G A S T R O P O D S	0.62	154	0.01
Umbrina canariensis	0.62	30	0.01
Arnoglossus imperialis	0.30	30	0.01
Total	4752.12		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 39
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°56.12
start stop duration Lon E
13°21.65
TIME :18:58:37 19:28:50 30.2 (min) Purpose : 3
LOG : 383.49 384.99 1.5 Region : 4040
FDEPTH: 572 576 Gear cond.: 0
BDEPTH: 572 576 Validity : 0
Towing dir: 0° Wire out : 1250 m Speed : 3.0 kn
Sorted : 62 Total catch: 286.84 Catch/hour: 569.50

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Lamprogrammus exutus	220.94	2561	38.80
Hoplostethus cadenati	107.41	1630	18.86
Shrimps, small, non comm.	91.87	1870	16.13
Chaceon maritae	37.76	151	6.63
Yarrella blackfordi	35.26	1195	6.19
Stomias boa boa	15.45	349	2.71
Triplophos hemingi	13.14	1289	2.31
Ariomma bondi	9.57	189	1.68
Bathyuroconger vicinus	9.57	727	1.68
Aristeus varidens, female	8.87	469	1.56
Stereomastis sp.	4.78	584	0.84
Aristeus varidens, male	2.14	264	0.38
Dicrolene intronigra	2.05	244	0.36
Halosaurus ovenii	1.71	60	0.30
Talismania longifilis	1.47	137	0.26
Gadella imberbis	1.37	18	0.24
Malacocephalus occidentalis	1.37	8	0.24
Benthodesmus tenuis	1.19	26	0.21
NETTASTOMATIDAE	1.19	8	0.21
Nezumia aequalis	0.93	34	0.16
Nemichthys curvirostris	0.60	68	0.10
Ebinania costaecanarie	0.52	34	0.09
Bathynectes piperitus	0.26	44	0.05
Dibranchus atlanticus	0.08	8	0.01
Plastic bags	0.00	0	0.00
Metal waste	0.00	0	0.00
Total	569.50		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 40
DATE :11/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°56.38
start stop duration Lon E
13°23.22
TIME :22:01:03 22:31:15 30.2 (min) Purpose : 3
LOG : 399.98 401.56 1.6 Region : 4040
FDEPTH: 480 482 Gear cond.: 0
BDEPTH: 480 482 Validity : 0
Towing dir: 0° Wire out : 1060 m Speed : 3.1 kn
Sorted : 25 Total catch: 283.03 Catch/hour: 562.31

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Nematocarcinus africanus	280.17	38660	49.83
Hoplostethus cadenati	74.30	2950	13.21
Yarrella blackfordi	45.68	1574	8.12
Stomias boa boa	30.38	721	5.40
Aristeus varidens	22.73	1246	4.04
Dicrolene intronigra	21.20	1377	3.77
Lamprogrammus exutus	19.01	262	3.38
Chaceon maritae, female	12.16	50	2.16
Benthodesmus tenuis	12.02	459	2.14
Triplophos hemingi	8.09	1071	1.44
Chlorophthalmus atlanticus	6.34	175	1.13
Illex coindetii	4.59	22	0.82
Ariomma bondi	3.93	66	0.70
Halosaurus ovenii	3.50	16	0.62
Bathyuroconger vicinus	3.50	240	0.62
Chaunax pictus	3.50	153	0.62
Chaceon maritae, male	3.10	8	0.55
ASTRONESTHIDAE	2.40	44	0.43
Xenodermichthys copei	1.97	350	0.35
Malacocephalus occidentalis	1.75	44	0.31
Caristius sp	0.87	22	0.16
Nezumia aequalis	0.44	44	0.08
Stereomastis sp.	0.22	44	0.04
Hymenocephalus italicus	0.22	22	0.04
Nemichthys curvirostris	0.22	22	0.04
Etmopterus polli	0.04	2	0.01
Plastic bags	0.00	0	0.00
Total	562.31		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 41
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°55.21
start stop duration Lon E
13°27.11
TIME :00:48:24 01:19:54 31.5 (min) Purpose : 3
LOG : 410.84 412.41 1.6 Region : 4040
FDEPTH: 334 337 Gear cond.: 0
BDEPTH: 334 337 Validity : 0
Towing dir: 0° Wire out : 825 m Speed : 3.0 kn
Sorted : 24 Total catch: 197.34 Catch/hour: 375.89

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Laemonema laureysi	155.73	1859	41.43
Chlorophthalmus atlanticus	133.18	2712	35.43
Bathyuroconger vicinus	21.94	533	5.84
Coelorinchus coelorhinc. polli	12.65	411	3.36
Merluccius polli	9.71	25	2.58
60 Parapenaeus longirostris	8.08	792	2.15
Acanthocarpus brevipinnis	7.77	152	2.07
Dibranchus atlanticus	7.62	442	2.03
Bathynectes piperitus	6.40	213	1.70
Helicolenus dactylopterus	3.81	46	1.01
Munidopsis sp.	2.29	396	0.61
Todaropsis eblanae	1.68	15	0.45
Aristeus varidens	1.68	76	0.45
MYCTOPHIDAE	0.91	579	0.24
Dicologoglossa cuneata	0.76	61	0.20
Synagrops microlepis	0.46	46	0.12
Lophiodes kempi	0.46	15	0.12
Chaunax pictus	0.30	30	0.08
Gadella imberbis	0.30	15	0.08
Hymenocephalus italicus	0.15	15	0.04
Total	375.89		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 42
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°57.39
start stop duration Lon E
13°30.11
TIME :05:25:38 05:56:04 30.4 (min) Purpose : 3
LOG : 426.21 427.74 1.5 Region : 4040
FDEPTH: 257 262 Gear cond.: 0
BDEPTH: 257 262 Validity : 0
Towing dir: 0° Wire out : 630 m Speed : 3.0 kn
Sorted : 197 Total catch: 1046.54 Catch/hour: 2062.83

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex macrophthalmus	405.34	1934	19.65
61	Merluccius polli	312.58	1055	15.15
62	Chlorophthalmus atlanticus	298.56	5610	14.47
	Chaceon maritae	254.07	1171	12.32
	Zenopsis conchifer	170.50	1263	8.27
	Synagrops microlepis	137.90	3343	6.68
	Trichiurus lepturus	99.88	158	4.84
	Brotula barbata	68.95	146	3.34
	Gephyroberyx darwini	57.04	63	2.77
	Parapenaeus longirostris, male	47.01	9570	2.28
	Laemonema laureysi	34.57	554	1.68
	Pterothrissus belloci	32.29	187	1.57
	Bembrops heterurus	30.08	564	1.46
	Parapenaeus longirostris,femal	29.25	4711	1.42
	Raja alba	19.95	10	0.97
	Illex coindetii	14.63	134	0.71
	Pontinus accraensis	11.81	114	0.57
	Malacocephalus occidentalis	8.77	53	0.43
	Conger conger	7.84	32	0.38
	Scorpaena normani	6.17	10	0.30
	Helicolenus dactylopterus	4.59	63	0.22
	Calappa pelii	3.13	53	0.15
	Citharus linguatula	1.87	73	0.09
	MYCTOPHIDAE	1.77	753	0.09
	Echelus myrus	1.46	10	0.07
	Bathyuroconger vicinus	1.04	32	0.05
	Bathynectes piperitus	0.95	32	0.05
	G A S T R O P O D S	0.41	126	0.02
	NETTASTOMATIDAE	0.41	10	0.02
	Total	2062.83		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 43
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°58.92
start stop duration Lon E
13°32.00
TIME :07:04:26 07:34:38 30.2 (min) Purpose : 3
LOG : 431.75 433.28 1.5 Region : 4040
FDEPTH: 102 102 Gear cond.: 0
BDEPTH: 102 102 Validity : 0
Towing dir: 0° Wire out : 260 m Speed : 3.0 kn
Sorted : 0 Total catch: 104.49 Catch/hour: 207.60

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex angolensis	28.97	145	13.95
65	Sepia orbignyana	25.87	34	12.46
	Lagocephalus laevigatus	23.80	32	11.47
	Pagellus bellottii	21.66	117	10.43
66	Dentex barnardi	19.03	75	9.17
64	Raja miraletus	18.52	26	8.92
	Zeus faber	12.44	18	5.99
	Dentex macrophthalmus	11.44	58	5.51
63	Umbrina canariensis	10.13	4	4.88
	Trigla lyra	8.44	79	4.07
	Rhinobatos albomaculatus	6.04	2	2.91
	Zenopsis conchifer	4.77	22	2.30
	Umbrina canariensis	3.12	10	1.50
	Chaetodon hoefleri	2.94	20	1.42
	Chaceon maritae, female	2.84	10	1.37
	Illex coindetii	1.19	6	0.57
	Citharus linguatula	1.17	64	0.56
	Trachinus arenatus	1.07	8	0.52
	Scorpaena normani	1.01	2	0.49
	Trichiurus lepturus	1.01	2	0.49
	Ariomma bondi	0.83	4	0.40
	Branchiostegus semifasciatus *	0.77	2	0.37
	B I V A L V E S	0.52	66	0.25
	Total	207.60		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 44
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°58.99
start stop duration Lon E
13°37.27
TIME :08:34:15 09:05:13 31.0 (min) Purpose : 3
LOG : 439.16 440.76 1.6 Region : 4040
FDEPTH: 71 71 Gear cond.: 0
BDEPTH: 71 71 Validity : 0
Towing dir: 0° Wire out : 200 m Speed : 3.1 kn
Sorted : 0 Total catch: 295.08 Catch/hour: 571.68

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pomadasys incisus	282.35	2371	49.39
68	Pseudupeneus prayensis	83.69	854	14.64
	Sepia orbignyana	41.61	180	7.28
	Sea urchin	29.76	3237	5.21
	Pagellus bellottii	24.12	198	4.22
67	Torpedo torpedo	18.71	12	3.27
	Citharus linguatula	17.78	1174	3.11
	Trachurus trecae	15.58	779	2.72
69	Octopus vulgaris	10.93	4	1.91
	Alloteuthis africana	8.95	4214	1.57
	Chilomycterus spinosus mauret.	7.15	6	1.25
	Trichiurus lepturus	6.04	23	1.06
	Lepidotrigla cadmani	5.35	93	0.94
	Bembrops heterurus	4.59	81	0.80
	Uranoscopus cadenati	4.24	12	0.74
	Atractoscion aequidens	3.55	6	0.62
	Chaetodon hoefleri	2.09	12	0.37
	Scorpaena stephanica	1.28	12	0.22
	Illex coindetii	1.28	35	0.22
	Arnoglossus imperialis	0.93	70	0.16
	Boops boops	0.81	29	0.14
	Saurida brasiliensis	0.76	529	0.13
	GOBIIDAE	0.12	64	0.02
	Fishing gears	0.00	0	0.00
	Total	571.68		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 45
DATE :12/04/2012 GEAR TYPE: NO: 25 POSITION:Lat S
12°0.73
start stop duration Lon E
13°39.07
TIME :09:43:14 10:13:57 30.7 (min) Purpose : 3
LOG : 443.60 445.25 1.7 Region : 4040
FDEPTH: 59 51 Gear cond.: 0
BDEPTH: 59 51 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.2 kn
Sorted : 0 Total catch: 286.24 Catch/hour: 559.06

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pagellus bellottii	108.61	783	19.43
73	Trachurus trecae	98.96	1758	17.70
72	Trichiurus lepturus	59.24	309	10.60
	Sardinella aurita	48.95	369	8.75
74	Raja miraletus	44.20	70	7.91
	Sepia orbignyana	27.77	63	4.97
	Pseudupeneus prayensis	22.85	229	4.09
	Citharus linguatula	21.52	1459	3.85
	Bembrops greyi	21.52	449	3.85
	Umbrina canariensis	21.27	211	3.80
71	Dentex barnardi	21.17	203	3.79
	Pomadasys incisus	14.84	123	2.66
70	Alloteuthis africana	11.43	2471	2.04
	Brachydeuterus auritus	7.38	17	1.32
	Loligo vulgaris	5.10	18	0.91
	Torpedo marmorata	4.59	10	0.82
	Torpedo torpedo	3.59	10	0.64
	Lithognathus mormyrus	3.52	10	0.63
	Argyrosomus hololepidotus	3.22	4	0.58
	Pseudotolithus senegalensis	2.05	4	0.37
	Chaetodon hoefleri	1.58	10	0.28
	Chelidonichthys gabonensis	1.31	10	0.23
	Serranus accraensis	1.23	123	0.22
	GOBIIDAE	1.05	607	0.19
	Brotula barbata	0.88	10	0.16
	Antennarius occidentalis	0.53	10	0.09
	Arnoglossus imperialis	0.43	35	0.08
	Lagocephalus laevigatus	0.25	10	0.05
	Total	559.06		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 46
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
12°4.52
start stop duration Lon E
13°41.00
TIME :10:59:37 11:12:31 12.9 (min) Purpose : 3
LOG : 449.89 450.61 0.7 Region : 4040
FDEPTH: 31 30 Gear cond.: 0
BDEPTH: 31 30 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.3 kn
Sorted : 0 Total catch: 425.46 Catch/hour: 1978.88

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Sardinella aurita	1362.23	23995	68.84
	Sardinella maderensis	197.30	7195	9.97
	Trachurus trecae	97.02	1758	4.90
	Brachydeuterus auritus	81.07	1270	4.10
76	Gymnura micrura	41.35	33	2.09
	Pomadasys incisus	38.09	391	1.92
75	Rhinobatos albomaculatus	27.02	33	1.37
	Raja miraletus	21.16	33	1.07
	Lagocephalus laevigatus	18.23	33	0.92
	Bembrops greyi	16.60	195	0.84
	Selene dorsalis	13.67	33	0.69
	Citharus linguatula	10.74	98	0.54
	Dentex barnardi	10.42	163	0.53
	Dicologoglossa cuneata	10.09	163	0.51
	Torpedo marmorata	9.44	33	0.48
	Pagellus bellottii	8.47	65	0.43
	Trichiurus lepturus	8.47	98	0.43
	Boops boops	4.23	33	0.21
	Sepia orbignyana	3.26	33	0.16
	Plastic bags	0.00	0	0.00
	Total	1978.88		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 47
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°46.08
start stop duration Lon E
13°46.00
TIME :13:32:03 13:52:50 20.8 (min) Purpose : 3
LOG : 470.75 471.92 1.2 Region : 4040
FDEPTH: 23 24 Gear cond.: 0
BDEPTH: 23 24 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.4 kn
Sorted : 0 Total catch: 1878.45 Catch/hour: 5423.82

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Sardinella aurita	2678.00	48679	49.37
77	Trachurus trecae	758.08	19678	13.98
79	Sardinella maderensis	644.78	22103	11.89
78	Brachydeuterus auritus	376.49	29218	6.94
80	Ephippion guttifer	237.66	87	4.38
	Decapterus rhonchus	155.02	1577	2.86
	Dentex barnardi	115.84	2599	2.14
	Rhinobatos albomaculatus	97.51	87	1.80
	Pseudupeneus prayensis	92.83	1109	1.71
	Sepia orbignyana	58.76	87	1.08
	Gymnura altavela	48.97	43	0.90
	Balistes capriscus	40.02	87	0.74
	Eucinostomus melanopterus	37.88	554	0.70
	Sphyraena sphyraena	33.64	297	0.62
	Selene dorsalis	19.14	257	0.35
	Chloroscombrus chrysurus	12.36	87	0.23
	Pagellus bellottii	7.25	808	0.13
	Pomadasys incisus	3.84	127	0.07
	Bembrops greyi	2.97	43	0.05
	Epinephelus aeneus	1.91	3	0.04
	Boops boops	0.87	43	0.02
	Total	5423.82		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 48
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°47.44
start stop duration Lon E
13°40.93
TIME :14:56:24 15:26:24 30.0 (min) Purpose : 3
LOG : 478.41 479.85 1.4 Region : 4040
FDEPTH: 63 65 Gear cond.: 0
BDEPTH: 63 65 Validity : 0
Towing dir: 0° Wire out : 162 m Speed : 2.9 kn
Sorted : 109 Total catch: 790.87 Catch/hour: 1581.74

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Trichiurus lepturus	1364.74	5060	86.28
	Trachurus trecae	85.56	696	5.41
81	Bembrops heterurus	27.84	536	1.76
	Citharus linguatula	22.92	1958	1.45
	Torpedo marmorata	20.30	14	1.28
	Sepia orbignyana	15.96	102	1.01
	Alloteuthis africana	13.34	4974	0.84
	Pseudupeneus prayensis	12.18	88	0.77
	Pagellus bellottii	5.12	30	0.32
	Serranus accraensis	4.64	88	0.29
	Scorpaena stephanica	2.90	14	0.18
	Chelidonichthys capensis	1.88	14	0.12
	Chelidonichthys gabonensis	1.74	30	0.11
	Dentex barnardi	1.46	14	0.09
	Saurida brasiliensis	0.58	58	0.04
	Arnoglossus imperialis	0.44	30	0.03
	GOBIIDAE	0.14	102	0.01
	Total	1581.74		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 49
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°46.80
start stop duration Lon E
13°33.09
TIME :16:23:27 16:53:28 30.0 (min) Purpose : 3
LOG : 487.89 489.44 1.6 Region : 4040
FDEPTH: 110 110 Gear cond.: 0
BDEPTH: 110 110 Validity : 0
Towing dir: 0° Wire out : 280 m Speed : 3.1 kn
Sorted : 58 Total catch: 221.77 Catch/hour: 443.24

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Boops boops	290.21	3164	65.47
	Dentex angolensis	33.74	188	7.61
82	SALPS	22.64	2125	5.11
	Lepidotrigla cadmani	18.89	180	4.26
	Lagocephalus laevigatus	16.41	22	3.70
	Umbrina canariensis	12.21	60	2.76
	Brotula barbata	7.40	6	1.67
	Citharus linguatula	7.20	338	1.62
	Trachurus trecae	5.26	68	1.19
	Illex coindetii	4.72	120	1.06
	G A S T R O P O D S	4.20	706	0.95
	Atractoscion aequidens	3.62	2	0.82
	Pterothrissus belloci	3.00	16	0.68
	Sepia orbignyana	2.26	16	0.51
	Pagellus bellottii	2.18	22	0.49
	Dentex barnardi	1.96	16	0.44
	Uranoscopus cadenati	1.96	8	0.44
	Trichiurus lepturus	1.58	8	0.36
	Saurida brasiliensis	1.28	736	0.29
	Erythrocles monodi	0.90	22	0.20
	Dentex macrophthalmus	0.90	8	0.20
	Ariomma bondi	0.76	8	0.17
	Total	443.24		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 50
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°43.14
start stop duration Lon E
13°22.64
TIME :19:05:52 19:36:11 30.3 (min) Purpose : 3
LOG : 504.10 505.58 1.5 Region : 4040
FDEPTH: 352 353 Gear cond.: 0
BDEPTH: 352 353 Validity : 0
Towing dir: 0° Wire out : 820 m Speed : 2.9 kn
Sorted : 29 Total catch: 320.32 Catch/hour: 633.88

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Hymenocephalus italicus	191.56	22987	30.22
	Laemonema laureysi	128.87	2003	20.33
	Hoplostethus cadenati	127.56	4811	20.12
	Etmopterus polli	54.42	1502	8.59
	Shrimps, small, non comm.	31.13	13409	4.91
	Chaunax pictus	24.16	1589	3.81
	Aristeus varidens, female	15.67	704	2.47
	Parapenaeus longirostris,femal	13.28	1741	2.09
	Todarodes sagittatus	11.97	65	1.89
	Aristeus varidens, male	9.58	1284	1.51
	Chlorophthalmus atlanticus	6.31	131	1.00
	Lophius vaillanti	5.66	131	0.89
	Stereomastis sp.	3.05	1872	0.48
	Bathyuroconger vicinus	2.83	109	0.45
	Gadella imberbis	2.18	65	0.34
	MYCTOPHIDAE	1.52	1350	0.24
	Bathynectes piperitus	1.52	87	0.24
	Nezumia aequalis	0.87	44	0.14
	NETTASTOMATIDAE	0.65	44	0.10
	Benthodesmus tenuis	0.65	22	0.10
	Raja alba	0.44	22	0.07
	Total	633.88		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 51
DATE :12/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°42.08
start stop duration Lon E
13°20.02
TIME :21:31:35 22:01:55 30.3 (min) Purpose : 3
LOG : 515.23 516.79 1.6 Region : 4040
FDEPTH: 484 483 Gear cond.: 0
BDEPTH: 484 483 Validity : 0
Towing dir: 0° Wire out : 1070 m Speed : 3.1 kn
Sorted : 28 Total catch: 427.20 Catch/hour: 844.83

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Nematocarcinus africanus	348.25	9852	41.22
Hoplostethus cadenati	236.12	0	27.95
Lamprogrammus exutus	53.10	920	6.29
Stomias boa boa	35.60	712	4.21
Chaceon maritae, female	30.26	119	3.58
Aristeus varidens, male	28.48	4034	3.37
Dicrolene intronigra	26.40	2017	3.13
Aristeus varidens, female	16.61	949	1.97
Chlorophthalmus atlanticus	15.72	386	1.86
Laemonema laureysi	14.54	178	1.72
Yarrella blackfordi	13.35	445	1.58
Benthodesmus tenuis	8.60	326	1.02
Halosaurus ovenii	6.53	237	0.77
Gadella imberbis	5.93	297	0.70
Triplophos hemingi	4.15	445	0.49
Xenodermichthys copei	0.89	89	0.11
MYCTOPHIDAE	0.30	30	0.04
Total	844.83		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 52
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°42.89
start stop duration Lon E
13°18.04
TIME :00:32:30 01:03:17 30.8 (min) Purpose : 3
LOG : 527.24 528.79 1.6 Region : 4040
FDEPTH: 670 676 Gear cond.: 0
BDEPTH: 670 676 Validity : 0
Towing dir: 0° Wire out : 1600 m Speed : 3.0 kn
Sorted : 0 Total catch: 272.30 Catch/hour: 530.80

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Chaceon maritae, female	175.05	273	32.98
Nematocarcinus africanus	118.44	20823	22.31
Hoplostethus cadenati	101.25	2538	19.07
Lamprogrammus exutus	27.29	123	5.14
Yarrella blackfordi	22.79	682	4.29
Chaceon maritae, male	17.47	41	3.29
Triplophos hemingi	10.64	1214	2.01
Stomias boa boa	9.55	218	1.80
Opisthoteuthis agassizi	7.91	14	1.49
Nezumia aequalis	7.37	259	1.39
Stereomastis sp.	6.41	955	1.21
Aristeus varidens	5.05	355	0.95
Etmopterus polli	4.78	27	0.90
Todaropsis eblanae	4.50	14	0.85
Bathyuroconger vicinus	2.18	96	0.41
Talismania longifilis	2.05	96	0.39
Xenodermichthys copei	1.91	123	0.36
Merluccius polli	1.38	2	0.26
Lophiodes kempi	1.23	14	0.23
Laemonema laureysi	1.23	14	0.23
Selachophidium guentheri	0.82	14	0.15
Acanthephyra sp.	0.41	41	0.08
Phrynichthys wedli	0.41	14	0.08
Dicrolene intronigra	0.14	14	0.03
Dibranchus atlanticus	0.14	14	0.03
Plastic bags	0.00	0	0.00
Total	530.39		99.92

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 53
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°44.10
start stop duration Lon E
13°25.03
TIME :05:24:40 05:54:52 30.2 (min) Purpose : 3
LOG : 550.91 552.43 1.5 Region : 4040
FDEPTH: 260 265 Gear cond.: 0
BDEPTH: 260 265 Validity : 0
Towing dir: 0° Wire out : 620 m Speed : 3.0 kn
Sorted : 65 Total catch: 2411.28 Catch/hour: 4789.04

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Chlorophthalmus atlanticus	3831.54	84435	80.01
Synagrops microlepis	283.65	20209	5.92
Zenopsis conchifer	115.37	1543	2.41
Parapenaeus longirostris, male	91.86	166	1.92
Bembrops greyi	87.45	1323	1.83
Merluccius polli	82.30	808	1.72
83 Brotula barbata	74.22	73	1.55
Todaropsis eblanae	54.38	588	1.14
Parapenaeus longirostris,femal	40.42	5805	0.84
Parasudis fraser-bruenneri	39.68	735	0.83
Laemonema laureysi	24.25	367	0.51
Echelus myrus	19.84	73	0.41
Todarodes sagittatus	14.70	73	0.31
Malacocephalus sp.	9.55	73	0.20
Calappa pelii	6.61	147	0.14
Monolene microstoma	5.14	441	0.11
Munidopsis sp.	5.14	514	0.11
Coloconger sp.	1.47	73	0.03
MYCTOPHIDAE	1.47	1249	0.03
Total	4789.06		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 54
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°43.59
start stop duration Lon E
13°27.90
TIME :06:44:02 07:15:38 31.6 (min) Purpose : 3
LOG : 556.83 558.47 1.6 Region : 4040
FDEPTH: 163 166 Gear cond.: 0
BDEPTH: 163 166 Validity : 0
Towing dir: 0° Wire out : 430 m Speed : 3.1 kn
Sorted : 62 Total catch: 681.01 Catch/hour: 1293.06

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Synagrops microlepis	743.96	100399	57.54
Trichiurus lepturus	141.61	480	10.95
Brotula barbata	134.72	125	10.42
Parasudis fraser-bruenneri	42.82	8187	3.31
Scyliorhinus cervigoni	40.10	8	3.10
Pterothrissus belloci	33.84	209	2.62
SALPS	28.20	3258	2.18
Illex coindetii	22.14	376	1.71
Parapenaeus longirostris, male	16.71	1044	1.29
Lagocephalus laevigatus	14.41	42	1.11
Dentex angolensis	10.03	21	0.78
Bembrops greyi	9.40	84	0.73
Dentex macrophthalmus	8.98	42	0.69
Lophiodes kempi	8.35	21	0.65
Monolene microstoma	7.94	272	0.61
Pentheroscion mbizi	6.68	21	0.52
Parapenaeus longirostris,femal	6.27	355	0.48
Trigla lyra	5.22	21	0.40
Zenopsis conchifer	4.18	84	0.32
G A S T R O P O D S	3.34	668	0.26
Dicologoglossa cuneata	2.09	21	0.16
GOBIIDAE	1.67	647	0.13
Squilla mantis	0.21	21	0.02
Calappa rubroguttata	0.21	21	0.02
Total	1293.06		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 55
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°31.37
start stop duration Lon E
13°44.90
TIME :10:01:13 10:31:23 30.2 (min) Purpose : 3
LOG : 580.55 582.17 1.6 Region : 4040
FDEPTH: 22 21 Gear cond.: 0
BDEPTH: 22 21 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.2 kn
Sorted : 0 Total catch: 954.29 Catch/hour: 1897.83

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Sardinella aurita	1266.26	24032	66.72
84 Rhinobatos albomaculatus	138.65	60	7.31
Trachurus trecae	121.71	4093	6.41
86 Brachydeuterus auritus	76.37	2255	4.02
88 Gymnura micrura	52.72	4	2.78
Galeoides decadactylus	39.26	1122	2.07
Ephippion guttifer	30.79	36	1.62
Selene dorsalis	27.56	3448	1.45
Raja miraletus	24.22	36	1.28
Sardinella maderensis	19.21	525	1.01
85 Pomadasys incisus	15.75	453	0.83
87 Sphyraena sphyraena	15.39	72	0.81
Sepia orbignyana	13.60	24	0.72
Umbrina canariensis	12.53	131	0.66
88 Drepane africana	12.29	12	0.65
Torpedo marmorata	8.71	48	0.46
Cynoglossus senegalensis	8.23	12	0.43
Pteroscion peli	7.99	453	0.42
Trichiurus lepturus	4.06	36	0.21
Dentex barnardi	1.67	24	0.09
Pseudupeneus prayensis	0.84	12	0.04
Total	1897.83		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 56
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°30.05
start stop duration Lon E
13°42.73
TIME :11:18:09 11:40:13 22.1 (min) Purpose : 3
LOG : 585.78 586.93 1.1 Region : 4040
FDEPTH: 28 28 Gear cond.: 0
BDEPTH: 28 28 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.1 kn
Sorted : 0 Total catch: 439.97 Catch/hour: 1196.11

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Sardinella aurita	832.17	21526	69.57
90 Sardinella maderensis	232.01	5831	19.40
91 Rhinobatos albomaculatus	48.83	43	4.08
Alectis alexandrinus	40.72	35	3.40
Sepia orbignyana	10.79	16	0.90
Raja miraletus	8.02	11	0.67
J E L L Y F I S H	5.52	3	0.46
Caranx crysos	4.95	5	0.41
Trachinotus goreensis	4.68	11	0.39
Eucinostomus melanopterus	2.58	16	0.22
Epinephelus aeneus	1.82	3	0.15
Citharus linguatula	1.82	16	0.15
Grammoplites gruveli	0.98	46	0.08
Trachurus trecae	0.76	106	0.06
Dicologoglossa cuneata	0.46	16	0.04
Plastic bags	0.00	0	0.00
Total	1196.11		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 57
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°31.79
start stop duration Lon E
13°34.76
TIME :13:14:42 13:45:07 30.4 (min) Purpose : 3
LOG : 596.61 598.01 1.4 Region : 4040
FDEPTH: 62 62 Gear cond.: 0
BDEPTH: 62 62 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 2.8 kn
Sorted : 148 Total catch: 1891.08 Catch/hour: 3729.94

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pomadasys incisus	3417.59	15692	91.63
92	Lagocephalus laevigatus	81.97	51	2.20
	Pagellus bellottii	36.45	327	0.98
93	Raja miraletus	35.72	51	0.96
	Citharus linguatula	27.65	1635	0.74
	Dentex barnardi	26.41	152	0.71
	Octopus vulgaris	19.86	26	0.53
	Grammoplites gruveli	17.61	79	0.47
	Trachurus trecae	16.61	26	0.45
	Pseudupeneus prayensis	14.34	51	0.38
	Chelidonichthys capensis	9.31	51	0.25
	Serranus accraensis	8.80	51	0.24
	Dentex angolensis	8.30	176	0.22
	Arnoglossus imperialis	8.05	126	0.22
	Ephippion guttifer	1.26	51	0.03
	Total	3729.94		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 58
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°29.90
start stop duration Lon E
13°28.95
TIME :14:43:27 15:14:14 30.8 (min) Purpose : 3
LOG : 604.68 606.29 1.6 Region : 4040
FDEPTH: 104 105 Gear cond.: 0
BDEPTH: 104 105 Validity : 0
Towing dir: 0° Wire out : 260 m Speed : 3.1 kn
Sorted : 73 Total catch: 588.81 Catch/hour: 1147.78

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trichiurus lepturus	489.36	3025	42.64
	Synagrops microlepis	189.63	87563	16.52
	Sphoeroides sp.	167.80	0	14.62
	Sphoeroides sp.	167.80	250	14.62
	Citharus linguatula	48.34	1669	4.21
	Brotula barbata	14.81	14	1.29
	Chelidonichthys lastoviza	10.60	218	0.92
	GOBIIDAE	7.64	8717	0.67
	Dentex angolensis	6.86	62	0.60
	Pontinus accraensis	5.93	62	0.52
	Brachydeuterus auritus	5.77	31	0.50
	Scorpaena normani	5.77	47	0.50
	Uranoscopus polli	5.46	16	0.48
	SALPS	3.74	561	0.33
	Zeus faber	3.27	62	0.29
	Octopus vulgaris	2.96	16	0.26
	Alloteuthis africana	2.81	1263	0.24
	Sepia orbignyana	2.65	125	0.23
	Bembrops heterurus	1.87	16	0.16
	Boops boops	1.56	16	0.14
	Cynoponticus ferox	1.42	2	0.12
	Illex coindetii	0.78	16	0.07
	Merluccius polli	0.47	31	0.04
	Saurida brasiliensis	0.47	62	0.04
	Total	1147.78		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 59
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°30.10
start stop duration Lon E
13°21.84
TIME :16:50:01 17:20:39 30.6 (min) Purpose : 3
LOG : 616.16 617.53 1.4 Region : 4040
FDEPTH: 371 397 Gear cond.: 0
BDEPTH: 371 397 Validity : 0
Towing dir: 0° Wire out : 770 m Speed : 2.7 kn
Sorted : 30 Total catch: 360.24 Catch/hour: 705.66

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	225.19	66476	31.91
	Hoplostethus cadenati	125.29	4278	17.75
	Aristeus varidens, female	94.26	6088	13.36
	Chaunax pictus	41.61	9638	5.90
	Laemonema laureysi	34.55	517	4.90
	Aristeus varidens, male	31.03	4725	4.40
	Chlorophthalmus atlanticus	25.15	635	3.56
	SALPS	18.57	1316	2.63
	Cynoponticus ferox	17.39	24	2.47
	Etmopterus polli	15.28	423	2.17
	Dicrolene intronigra	14.57	447	2.07
	Stomias boa boa	11.52	212	1.63
	Merluccius polli	9.64	24	1.37
	Benthodesmus tenuis	8.93	329	1.27
	Nezumia aequalis	6.35	329	0.90
	Galeus polli	5.41	141	0.77
	Yarrella blackfordi	5.17	165	0.73
	Bathynectes piperitus	4.94	94	0.70
	Lophius vaillanti	4.00	24	0.57
	Todaropsis eblanae	3.76	376	0.53
	Plesionika martia	1.65	588	0.23
	Hymenocephalus italicus	0.94	118	0.13
	Raja alba	0.47	24	0.07
	Total	705.66		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 60
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°13.67
start stop duration Lon E
13°27.82
TIME :19:31:15 19:56:40 25.4 (min) Purpose : 3
LOG : 633.76 635.02 1.3 Region : 4040
FDEPTH: 521 538 Gear cond.: 0
BDEPTH: 521 538 Validity : 0
Towing dir: 0° Wire out : 1130 m Speed : 3.0 kn
Sorted : 27 Total catch: 259.67 Catch/hour: 613.15

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	210.81	52449	34.38
	Lamprogrammus exutus	147.06	1466	23.98
	Hoplostethus cadenati	56.53	1870	9.22
	Yarrella blackfordi	37.19	1190	6.07
	Aristeus varidens, female	36.13	2083	5.89
	Chaceon maritae	30.65	85	5.00
	Stomias boa boa	27.20	553	4.44
	Aristeus varidens, male	21.46	2954	3.50
	SALPS	19.76	1296	3.22
	Lophius vaillanti	7.01	21	1.14
	Chlorophthalmus atlanticus	4.04	106	0.66
	Nezumia aequalis	2.34	106	0.38
	R A Y S	2.13	213	0.35
	Dicrolene intronigra	1.49	43	0.24
	Benthodesmus tenuis	1.28	43	0.21
	Triplophos hemingi	1.28	170	0.21
	Etmopterus spinax	1.06	21	0.17
	Satyrichthys sp.	0.85	149	0.14
	Halosaurus ovenii	0.85	43	0.14
	Gadella imberbis	0.85	128	0.14
	Talismania longifilis	0.64	64	0.10
	Bathyuroconger vicinus	0.64	43	0.10
	Raja alba	0.43	21	0.07
	Nemichthys curvirostris	0.43	43	0.07
	Glyphus marsupialis	0.43	21	0.07
	Plesionika martia	0.43	149	0.07
	Bathynectes sp.	0.21	21	0.03
	Total	613.15		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 61
DATE :13/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°0.77
start stop duration Lon E
13°23.89
TIME :23:16:02 23:46:32 30.5 (min) Purpose : 3
LOG : 653.87 655.38 1.5 Region : 4040
FDEPTH: 726 727 Gear cond.: 0
BDEPTH: 726 727 Validity : 0
Towing dir: 0° Wire out : 1580 m Speed : 3.0 kn
Sorted : 52 Total catch: 258.50 Catch/hour: 508.52

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nezumia micronychodon	123.93	2380	24.37
	Lamprogrammus exutus	97.97	126	19.26
	Chaceon maritae, female	49.87	197	9.81
	Hoplostethus cadenati	42.30	1092	8.32
	L O B S T E R S	34.23	2705	6.73
	Yarrella blackfordi	34.13	905	6.71
	Bathyuroconger vicinus	25.97	443	5.11
	SALPS	21.54	1889	4.24
	Parapenaeus longirostris	17.51	2951	3.44
	Chaceon maritae, male	12.98	20	2.55
	Dibranchus atlanticus	8.36	423	1.64
	Dicrolene intronigra	7.38	374	1.45
	Stomias boa boa	6.69	177	1.32
	Raja confundens	4.72	20	0.93
	Ebinania costaecanarie	4.23	10	0.83
	Munida sp.	3.54	1830	0.70
	Talismania longifilis	2.07	89	0.41
	Aristeus varidens	2.07	177	0.41
	Gadella imberbis	1.77	20	0.35
	Halosaurus ovenii	1.77	59	0.35
	Chlorophthalmus atlanticus	1.48	10	0.29
	Melanonus sp.	1.38	10	0.27
	Lophiodes kempi	1.18	10	0.23
	Triplophos hemingi	1.08	138	0.21
	Xenodermichthys copei	0.39	20	0.08
	Plastic bags	0.00	0	0.00
	Total	508.52		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 62
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°0.23
start stop duration Lon E
13°26.15
TIME :01:42:46 02:12:48 30.0 (min) Purpose : 3
LOG : 664.18 665.74 1.6 Region : 4040
FDEPTH: 532 529 Gear cond.: 0
BDEPTH: 532 529 Validity : 0
Towing dir: 0° Wire out : 1240 m Speed : 3.1 kn
Sorted : 0 Total catch: 142.08 Catch/hour: 283.88

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	96.38	15057	33.95
	Chaceon maritae, female	37.04	144	13.05
	Lamprogrammus exutus	34.53	575	12.16
	SALPS	14.03	1403	4.94
	Yarrella blackfordi	12.83	432	4.52
	Hoplostethus cadenati	12.23	468	4.31
	Lophiodes kempi	12.11	72	4.27
	Bathyuroconger vicinus	11.63	707	4.10
	Stomias boa boa	10.79	216	3.80
	Todaropsis eblanae	6.35	24	2.24
	Xenodermichthys copei	5.87	731	2.07
	Chaceon maritae, male	4.08	12	1.44
	Lophius vaillanti	3.96	12	1.39
	L O B S T E R S	3.84	408	1.35
	Dicrolene intronigra	3.60	563	1.27
	Dibranchus atlanticus	2.64	144	0.93
	Chaunax pictus	2.52	36	0.89
	Laemonema laureysi	1.80	24	0.63
	Malacocephalus occidentalis	1.20	12	0.42
	Triplophos hemingi	1.08	312	0.38
	Gadella imberbis	0.84	96	0.30
	Benthodesmus tenuis	0.72	24	0.25
	GONOSTOMATIDAE	0.60	12	0.21
	Ophichthus sp.	0.60	12	0.21
	Halosaurus ovenii	0.60	12	0.21
	Nemichthys scolopaceus	0.48	24	0.17
	CONGER SP	0.48	12	0.17
	Munida sp.	0.48	480	0.17
	Bathynectes piperitus	0.36	60	0.13
	MYCTOPHIDAE	0.12	12	0.04
	PANDALIDAE	0.12	12	0.04
	Total	283.88		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 63
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°12.39
start stop duration Lon E
13°35.74
TIME :05:16:58 05:47:33 30.6 (min) Purpose : 3
LOG : 683.96 685.52 1.6 Region : 4040
FDEPTH: 154 155 Gear cond.: 0
BDEPTH: 154 155 Validity : 0
Towing dir: 0° Wire out : 175 m Speed : 3.1 kn
Sorted : 117 Total catch: 547.53 Catch/hour: 1073.94

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brotula barbata	467.41	8683	43.52
	Synagrops microlepis	317.16	36055	29.53
	Parapenaeus longirostris,femal	62.59	15654	5.83
	Bembrops greyi	48.31	645	4.50
	Parapenaeus longirostris, male	31.19	15627	2.90
	Dentex angolensis	30.42	120	2.83
94	Pterothrissus belloci	22.03	120	2.05
	Scorpaena normani	17.69	194	1.65
	Sepia orbignyana	15.12	277	1.41
	J E L L Y F I S H	13.73	212	1.28
	Trichiurus lepturus	12.16	202	1.13
	GOBIIDAE	10.89	3742	1.01
	Saurida brasiliensis	5.26	728	0.49
	Octopus vulgaris	4.71	18	0.44
	Lagocephalus lagocephalus	3.24	10	0.30
	Laemonema sp.	2.59	82	0.24
	Merluccius polli	2.31	82	0.22
	Zeus faber	2.02	10	0.19
	Torpedo torpedo	1.75	10	0.16
	G A S T R O P O D S	1.20	996	0.11
	Todaropsis eblanae	0.75	18	0.07
	Dibranchus atlanticus	0.37	18	0.03
	Citharus linguatula	0.33	129	0.03
	Ophichthus sp.	0.27	10	0.03
	Squilla mantis	0.18	18	0.02
	C R A B S	0.18	82	0.02
	Nettenchelys sp.	0.10	10	0.01
	Total	1073.94		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 64
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°14.00
start stop duration Lon E
13°40.14
TIME :07:22:23 07:53:00 30.6 (min) Purpose : 3
LOG : 697.47 698.98 1.5 Region : 4040
FDEPTH: 68 59 Gear cond.: 0
BDEPTH: 68 59 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.0 kn
Sorted : 30 Total catch: 532.77 Catch/hour: 1043.96

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	588.56	16274	56.38
95	Raja miraletus	186.35	323	17.85
	Sepia orbignyana	75.87	127	7.27
	Lagocephalus laevigatus	44.36	39	4.25
	Chilomycterus spinosus mauret.	42.80	24	4.10
	Citharus linguatula	18.65	1123	1.79
	Zeus faber	17.69	47	1.69
	Torpedo torpedo	14.42	24	1.38
	Octopus vulgaris	10.54	12	1.01
	Dentex angolensis	9.80	25	0.94
96	Pagellus bellottii	9.33	216	0.89
	Dentex barnardi	8.37	96	0.80
	Scomber japonicus	6.70	120	0.64
	Trigla lyra	3.82	286	0.37
	Saurida brasiliensis	2.39	96	0.23
	Bembrops greyi	1.92	47	0.18
	Zenopsis conchifer	1.43	24	0.14
	G A S T R O P O D S	0.96	24	0.09
	Total	1043.96		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 65
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°16.03
start stop duration Lon E
13°42.03
TIME :08:48:55 09:18:16 29.4 (min) Purpose : 3
LOG : 703.57 705.14 1.6 Region : 4040
FDEPTH: 22 23 Gear cond.: 0
BDEPTH: 22 23 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.2 kn
Sorted : 0 Total catch: 236.16 Catch/hour: 482.78

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Balistes capriscus	258.73	654	53.59
	Lagocephalus laevigatus	109.41	106	22.66
	Aluterus heudelotii	33.20	98	6.88
	Octopus vulgaris	17.34	12	3.59
	Uraspis secunda	12.02	16	2.49
	Pseudupeneus prayensis	11.20	65	2.32
	Trachinocephalus myops	11.04	41	2.29
	Pagellus bellottii	7.11	41	1.47
	Chilomycterus spinosus mauret.	5.56	25	1.15
	Lithognathus mormyrus	3.93	8	0.81
	Pomadasys peroteti	3.13	2	0.65
	Xyrichtys novacula	2.86	33	0.59
	Auxis thazard	2.29	8	0.47
	Lagocephalus sp.	2.11	2	0.44
	Scorpaena normani	1.14	8	0.24
	Bothus podas africanus	1.06	16	0.22
	Citharus linguatula	0.65	33	0.14
	Total	482.78		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 66
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°17.33
start stop duration Lon E
13°44.61
TIME :10:16:19 10:35:51 19.5 (min) Purpose : 3
LOG : 711.51 712.64 1.1 Region : 4040
FDEPTH: 22 23 Gear cond.: 0
BDEPTH: 22 23 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.5 kn
Sorted : 122 Total catch: 2461.17 Catch/hour: 7561.20

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Sardinella aurita	3557.33	57376	47.05
98	Trachurus trecae	1887.19	25195	24.96
97	Brachydeuterus auritus	1197.42	20270	15.84
	Chloroscombrus chrysurus	365.47	3493	4.83
	Sardinella maderensis	194.59	3432	2.57
99	Lithognathus mormyrus	91.06	187	1.20
	Pseudupeneus prayensis	66.73	624	0.88
	Pomadasys incisus	38.03	1060	0.50
	Raja miraletus	38.03	61	0.50
	Pagellus bellottii	36.80	313	0.49
	Galeoides decadactylus	28.69	811	0.38
	Chilomycterus spinosus mauret.	28.05	61	0.37
	Dentex barnardi	15.58	249	0.21
	Selene dorsalis	10.60	313	0.14
	Decapterus rhonchus	5.62	61	0.07
	Total	7561.20		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 67
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°58.78
start stop duration Lon E
13°48.77
TIME :13:14:34 13:44:38 30.1 (min) Purpose : 3
LOG : 733.18 734.73 1.6 Region : 4040
FDEPTH: 35 35 Gear cond.: 0
BDEPTH: 35 35 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.1 kn
Sorted : 150 Total catch: 1263.34 Catch/hour: 2520.80

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Sardinella aurita	1048.49	18283	41.59
103	Brachydeuterus auritus	677.74	10990	26.89
10	Trachurus trecae	272.05	5988	10.79
102	Sardinella maderensis	144.16	1662	5.72
104	Galeoides decadactylus	51.72	170	2.05
	Trichiurus lepturus	42.74	1070	1.70
	Pagellus bellottii	37.47	339	1.49
105	Pteroscion peli	36.30	1714	1.44
	Raja miraletus	33.58	68	1.33
	Dentex barnardi	27.82	391	1.10
	Umbrina canariensis	23.74	221	0.94
106	Lagocephalus laevigatus	22.55	18	0.89
	Torpedo marmorata	21.71	34	0.86
	Selene dorsalis	16.44	237	0.65
	Grammoplites gruveli	12.89	271	0.51
	Sepia orbignyana	10.85	68	0.43
	Penaeus notialis	10.68	305	0.42
	Dicologoglossa cuneata	9.84	170	0.39
	Pomadasys incisus	5.27	52	0.21
	Chloroscombrus chrysurus	2.37	18	0.09
	Brotula barbata	2.37	18	0.09
	Pseudotolithus typus	2.37	18	0.09
	GOBIIDAE	1.86	764	0.07
	Pseudupeneus prayensis	1.70	18	0.07
	Epinephelus aeneus	1.50	2	0.06
	Ilisha africana	1.36	18	0.05
	Octopus vulgaris	0.68	18	0.03
	Panulirus regius	0.56	2	0.02
	Plastic bags	0.00	0	0.00
	Total	2520.80		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 68
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°0.35
start stop duration Lon E
13°45.81
TIME :14:45:27 15:03:05 17.6 (min) Purpose : 3
LOG : 740.79 741.68 0.9 Region : 4040
FDEPTH: 54 54 Gear cond.: 0
BDEPTH: 54 54 Validity : 0
Towing dir: 0° Wire out : 150 m Speed : 3.0 kn
Sorted : 36 Total catch: 286.40 Catch/hour: 974.70

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Brachydeuterus auritus	343.05	4628	35.20
107	Rhinobatos albomaculatus	125.24	54	12.85
	Pagellus bellottii	107.54	681	11.03
109	Raja miraletus	103.46	299	10.61
	Trachurus trecae	60.17	1470	6.17
108	Sepia orbignyana	52.82	218	5.42
	Trichiurus lepturus	44.11	1334	4.53
	Citharus linguatula	28.86	2968	2.96
	Galeoides decadactylus	21.51	54	2.21
	Umbrina canariensis	20.69	163	2.12
	GOBIIDAE	16.88	1933	1.73
	Dentex barnardi	13.61	109	1.40
	Grammoplites gruveli	11.16	354	1.15
	Selene dorsalis	5.45	82	0.56
	Torpedo torpedo	3.81	27	0.39
	Pteroscion peli	3.54	54	0.36
	Pseudotolithus typus	2.72	27	0.28
	Serranus accraensis	2.72	54	0.28
	Brotula barbata	2.45	27	0.25
	Pomadasys jubelini	2.18	27	0.22
	Dicologoglossa cuneata	1.09	82	0.11
	Calappa pelii	0.82	27	0.08
	Bathyuroconger vicinus	0.82	27	0.08
	Plastic bags	0.00	0	0.00
	Total	974.70		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 69
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
11°2.91
start stop duration Lon E
13°36.26
TIME :16:21:47 16:52:41 30.9 (min) Purpose : 3
LOG : 752.77 754.30 1.5 Region : 4040
FDEPTH: 131 133 Gear cond.: 0
BDEPTH: 131 133 Validity : 0
Towing dir: 0° Wire out : 340 m Speed : 3.0 kn
Sorted : 44 Total catch: 340.85 Catch/hour: 661.63

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	MYCTOPHIDAE	314.97	148773	47.60
	Synagrops microlepis	135.06	10897	20.41
	Brotula barbata	54.78	52	8.28
	Trichiurus lepturus	28.26	258	4.27
	Pterothrissus belloci	25.00	190	3.78
	Lagocephalus laevigatus	13.04	27	1.97
	Sepia orbignyana	11.96	122	1.81
	Lepidotrigla cadmani	10.19	68	1.54
	Illex coindetii	10.05	258	1.52
	Dentex angolensis	8.72	37	1.32
110	Bembrops heterurus	8.02	204	1.21
	Citharus linguatula	8.02	435	1.21
	GOBIIDAE	6.79	149	1.03
	Pontinus accraensis	6.39	313	0.97
	Parapenaeus longirostris,femal	5.71	435	0.86
	Uranoscopus albesca	5.30	41	0.80
	Parapenaeus longirostris, male	2.45	245	0.37
	Octopus vulgaris	2.31	14	0.35
	Saurida brasiliensis	1.90	340	0.29
	Dentex macrophthalmus	1.63	14	0.25
	Merluccius polli	0.95	27	0.14
	Squilla mantis	0.14	14	0.02
	Total	661.63		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 70
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°57.91
start stop duration Lon E
13°27.58
TIME :18:28:11 18:58:30 30.3 (min) Purpose : 3
LOG : 763.93 765.52 1.6 Region : 4040
FDEPTH: 373 374 Gear cond.: 0
BDEPTH: 373 374 Validity : 0
Towing dir: 0° Wire out : 850 m Speed : 3.1 kn
Sorted : 26 Total catch: 150.77 Catch/hour: 298.55

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Nematocarcinus africanus	111.49	37990	37.34
	Merluccius polli	39.96	71	13.38
	Yarrella blackfordi	28.91	911	9.68
	Hoplostethus cadenati	25.84	12	8.66
	Chaunax pictus	18.12	1356	6.07
	Hymenocephalus italicus	13.47	1663	4.51
	Laemonema laureysi	10.30	366	3.45
	Conger conger	5.74	99	1.92
	Aristeus varidens, female	4.85	277	1.62
	Malacocephalus occidentalis	4.26	40	1.43
	Gadella imberbis	4.16	198	1.39
	Todaropsis eblanae	4.06	50	1.36
	Chaceon maritae	3.94	12	1.32
	Benthodesmus tenuis	3.76	149	1.26
	Lamprogrammus exutus	3.76	20	1.26
	Stomias boa boa	3.66	69	1.23
	Aristeus varidens, male	2.57	356	0.86
	Etmopterus spinax	2.48	99	0.83
	Etmopterus polli	2.28	198	0.76
	Lophius vaillanti	1.88	40	0.63
	Coelorinchus coelorhincus	0.69	10	0.23
	Parapenaeus longirostris	0.59	59	0.20
	MYCTOPHIDAE	0.50	178	0.17
	Dibranchus atlanticus	0.40	30	0.13
	Bathynectes piperitus	0.40	20	0.13
	PARALEPIDIDAE	0.20	10	0.07
	Munidopsis sp.	0.10	20	0.03
	Triplophos hemingi	0.10	10	0.03
	Solenocera africana	0.10	20	0.03
	Total	298.55		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 71
DATE :14/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°40.14
start stop duration Lon E
13°5.90
TIME :22:37:34 23:08:09 30.6 (min) Purpose : 3
LOG : 792.34 793.87 1.5 Region : 4040
FDEPTH: 735 734 Gear cond.: 0
BDEPTH: 735 734 Validity : 0
Towing dir: 0° Wire out : 1480 m Speed : 3.0 kn
Sorted : 0 Total catch: 410.49 Catch/hour: 805.67

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Lamprogrammus exutus	234.74	1327	29.14
Nezumia aequalis	93.64	1403	11.62
Hoplostethus cadenati	85.48	2424	10.61
Anemones, pink	70.68	153	8.77
Yarrella blackfordi	67.87	1761	8.42
Anemones, yellow	52.31	71	6.49
L O B S T E R S	43.12	71	5.35
Bathyuroconger vicinus	38.78	612	4.81
Talismania longifilis	25.52	510	3.17
Dibranchus atlanticus	15.82	689	1.96
SALPS	15.56	1582	1.93
Raja confundens	7.91	51	0.98
Ebinania costaecanarie	7.40	26	0.92
Trachyrincus scabrus	6.63	26	0.82
Xenodermichthys copei	6.63	306	0.82
Scopelosaurus sp.	5.61	26	0.70
Aristeus varidens	4.59	281	0.57
Laemonema laureysi	4.08	230	0.51
Munida sp.	4.08	2245	0.51
Starfish	2.81	71	0.35
Halosaurus ovenii	2.55	26	0.32
Merluccius polli	2.41	2	0.30
Raja alba	1.57	26	0.19
S H R I M P S	1.53	102	0.19
Stomias boa boa	1.28	26	0.16
Triplophos hemingi	1.28	153	0.16
Benthodesmus tenuis	1.02	26	0.13
Synaphobranchus kaupii	0.51	26	0.06
Chaunax pictus	0.26	26	0.03
Total	805.67		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 72
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°38.91
start stop duration Lon E
13°8.60
TIME :01:11:17 01:42:14 31.0 (min) Purpose : 3
LOG : 800.09 801.59 1.5 Region : 4040
FDEPTH: 513 508 Gear cond.: 0
BDEPTH: 513 508 Validity : 0
Towing dir: 0° Wire out : 1250 m Speed : 2.9 kn
Sorted : 27 Total catch: 319.25 Catch/hour: 618.90

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Nematocarcinus africanus	160.98	39920	26.01
Lamprogrammus exutus	157.26	2001	25.41
SALPS	102.13	8282	16.50
Hoplostethus cadenati	74.91	2768	12.10
Chaceon maritae, female	24.58	116	3.97
Aristeus varidens, female	16.05	954	2.59
Bathyuroconger vicinus	14.19	721	2.29
Raja confundens	12.10	23	1.95
Aristeus varidens, male	9.77	1349	1.58
Laemonema laureysi	7.91	70	1.28
Dicrolene intronigra	6.75	442	1.09
Munida sp.	5.12	3350	0.83
Neoharriotta pinnata	4.36	2	0.70
Chaunax pictus	4.19	47	0.68
Dibranchus atlanticus	3.72	186	0.60
L O B S T E R S	3.02	279	0.49
Stomias boa boa	2.56	47	0.41
Gadella imberbis	2.09	70	0.34
Yarrella blackfordi	2.09	47	0.34
Halosaurus ovenii	1.16	23	0.19
Todaropsis eblanae	1.16	23	0.19
Chlorophthalmus atlanticus	0.93	23	0.15
Nezumia aequalis	0.93	47	0.15
Triplophos hemingi	0.70	47	0.11
Xenodermichthys copei	0.23	23	0.04
Total	618.90		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 73
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°39.78
start stop duration Lon E
13°12.50
TIME :03:39:54 04:10:03 30.2 (min) Purpose : 3
LOG : 810.28 811.75 1.5 Region : 4040
FDEPTH: 362 359 Gear cond.: 0
BDEPTH: 362 359 Validity : 0
Towing dir: 0° Wire out : 860 m Speed : 2.9 kn
Sorted : 35 Total catch: 557.76 Catch/hour: 1109.60

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Merluccius polli	355.86	1241	32.07
111Laemonema laureysi	211.35	1719	19.05
Hymenocephalus italicus	184.30	21899	16.61
Chlorophthalmus atlanticus	133.69	2960	12.05
Chaunax pictus	100.27	5443	9.04
SALPS	49.02	6748	4.42
Nematocarcinus africanus	20.37	7416	1.84
Coelorinchus coelorhincus	10.82	286	0.98
Hoplostethus atlanticus	10.50	32	0.95
Aristeus varidens, female	8.59	414	0.77
Dibranchus atlanticus	7.00	573	0.63
Lophiodes kempi	6.68	127	0.60
MYCTOPHIDAE	3.82	5125	0.34
Gadella imberbis	3.50	127	0.32
Munidopsis sp.	1.59	541	0.14
Malacocephalus laevis	1.27	32	0.11
Epigonus telescopus	0.64	32	0.06
Conger conger	0.32	32	0.03
Total	1109.60		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 74
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°46.85
start stop duration Lon E
13°24.07
TIME :06:08:57 06:27:35 18.6 (min) Purpose : 3
LOG : 826.14 827.04 0.9 Region : 4040
FDEPTH: 147 145 Gear cond.: 0
BDEPTH: 147 145 Validity : 0
Towing dir: 0° Wire out : 375 m Speed : 2.9 kn
Sorted : 35 Total catch: 1405.89 Catch/hour: 4527.83

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Synagrops microlepis	4067.95	446502	89.84
Citharus linguatula	91.95	1105	2.03
SALPS	84.73	559414	1.87
Illex coindetii	80.91	1472	1.79
Pterothrissus belloci	58.85	367	1.30
Dibranchus atlanticus	44.14	4045	0.97
C R A B S	36.78	367	0.81
Bembrops heterurus	36.78	734	0.81
Chlorophthalmus atlanticus	22.07	5150	0.49
Monolene microstoma	3.68	367	0.08
Total	4527.84		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 75
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°42.77
start stop duration Lon E
13°34.64
TIME :08:23:39 08:55:04 31.4 (min) Purpose : 3
LOG : 841.82 843.38 1.6 Region : 4040
FDEPTH: 71 70 Gear cond.: 0
BDEPTH: 71 70 Validity : 0
Towing dir: 0° Wire out : 190 m Speed : 3.0 kn
Sorted : 56 Total catch: 183.24 Catch/hour: 350.03

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Brachydeuterus auritus	116.22	1049	33.20
114Sepia orbignyana	37.94	201	10.84
Citharus linguatula	36.33	1817	10.38
Dentex angolensis	25.79	1112	7.37
112Lagocephalus laevigatus	24.76	17	7.07
Dentex barnardi	22.81	401	6.52
Raja miraletus	16.50	23	4.72
Dasyatis marmorata	11.81	6	3.37
Pagellus bellottii	11.40	138	3.26
113Brotula barbata	11.12	8	3.18
Bembrops heterurus	9.80	166	2.80
Octopus vulgaris	7.51	17	2.14
Serranus accraensis	5.85	92	1.67
Trachurus trecae	4.58	69	1.31
115Dicologoglossa cuneata	2.98	11	0.85
Lepidotrigla cadmani	1.66	29	0.47
Pseudupeneus prayensis	1.55	40	0.44
Zeus faber	1.09	17	0.31
Fistularia petimba	0.34	6	0.10
Total	350.03		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 76
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°43.86
start stop duration Lon E
13°42.23
TIME :10:05:09 10:35:06 30.0 (min) Purpose : 3
LOG : 851.02 852.61 1.6 Region : 4040
FDEPTH: 39 40 Gear cond.: 0
BDEPTH: 39 40 Validity : 0
Towing dir: 0° Wire out : 140 m Speed : 3.2 kn
Sorted : 40 Total catch: 236.23 Catch/hour: 473.25

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Chloroscombrus chrysurus	174.17	1370	36.80
	Grammoplites gruveli	33.36	1244	7.05
	Raja miraletus	28.31	54	5.98
	Sepia orbignyana	25.60	108	5.41
	Dicologoglossa cuneata	24.16	793	5.11
	Pagellus bellottii	23.80	649	5.03
120	Sardinella maderensis	22.90	325	4.84
119	Stromateus fiatola	16.31	24	3.45
	Dentex barnardi	16.23	270	3.43
	Brachydeuterus auritus	15.15	433	3.20
116	Sardinella aurita	15.15	180	3.20
117	Trichiurus lepturus	13.16	36	2.78
	Ephippion guttifer	12.62	18	2.67
	Galeoides decadactylus	9.50	14	2.01
	Citharus linguatula	8.47	307	1.79
	Trachurus trecae	6.67	775	1.41
118	Pseudupeneus prayensis	6.49	54	1.37
	GOBIIDAE	6.49	1983	1.37
	Sphyraena sphyraena	2.94	4	0.62
	Epinephelus aeneus	2.76	4	0.58
	Umbrina canariensis	2.52	18	0.53
	Penaeus notialis	2.52	72	0.53
	Brotula barbata	1.98	36	0.42
	Selene dorsalis	0.90	18	0.19
	Scale worms	0.90	54	0.19
	Scyllarides herklotsii	0.18	18	0.04
	Plastic bags	0.00	0	0.00
	Fishing gears	0.00	0	0.00
	Total	473.25		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 77
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°32.82
start stop duration Lon E
13°35.80
TIME :12:07:53 12:38:05 30.2 (min) Purpose : 3
LOG : 865.07 866.54 1.5 Region : 4040
FDEPTH: 32 33 Gear cond.: 0
BDEPTH: 32 33 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 2.9 kn
Sorted : 0 Total catch: 868.69 Catch/hour: 1725.87

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	1164.38	24407	67.47
121	Trachurus trecae	244.07	13021	14.14
125	Sardinella aurita	86.56	8658	5.02
122	Rhinobatos albomaculatus	50.07	52	2.90
	Pagellus bellottii	40.33	904	2.34
124	Sardinella maderensis	18.42	523	1.07
123	Gymnura micrura	17.80	2	1.03
	Selene dorsalis	17.21	505	1.00
	Galeoides decadactylus	14.78	523	0.86
	Grammoplites gruveli	11.82	314	0.68
	Sepia orbignyana	11.46	36	0.66
	Penaeus notialis	8.34	157	0.48
	Cynoglossus senegalensis	6.12	4	0.35
	Dentex barnardi	5.90	70	0.34
	Chloroscombrus chrysurus	4.87	36	0.28
	Dicologoglossa cuneata	4.69	139	0.27
	E C H I N O D E R M A T A	3.48	36	0.20
	Alectis alexandrinus	3.46	4	0.20
	Dasyatis marmorata	2.94	2	0.17
	Trichiurus lepturus	1.91	18	0.11
	Citharus linguatula	1.57	52	0.09
	Epinephelus aeneus	1.25	2	0.07
	Pomadasys incisus	1.21	18	0.07
	Stromateus fiatola	1.19	2	0.07
	Sphyraena sphyraena	1.17	2	0.07
	Boops boops	0.87	36	0.05
	Plastic bags	0.00	0	0.00
	Total	1725.87		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 78
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°36.32
start stop duration Lon E
13°24.34
TIME :15:23:38 15:53:08 29.5 (min) Purpose : 3
LOG : 886.59 888.10 1.5 Region : 4040
FDEPTH: 96 96 Gear cond.: 0
BDEPTH: 96 96 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 3.1 kn
Sorted : 96 Total catch: 354.83 Catch/hour: 721.93

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	479.86	17314	66.47
126	Chelidonichthys gabonensis	82.50	661	11.43
	Raja miraletus	22.42	45	3.11
	SALPS	20.49	2346	2.84
	Alloteuthis africana	18.76	8444	2.60
	Umbrina canariensis	17.64	45	2.44
	Sepia orbignyana	15.65	224	2.17
	Citharus linguatula	9.46	104	1.31
	Scorpaena normani	7.81	81	1.08
	Zeus faber	7.75	22	1.07
	Uranoscopus polli	7.37	22	1.02
	Euthynnus alletteratus	5.51	8	0.76
	Torpedo torpedo	5.43	8	0.75
	Trichiurus lepturus	3.80	14	0.53
	Brachydeuterus auritus	3.58	37	0.50
	Squatina oculata	3.50	4	0.48
	Peristedion cataphractum	3.19	53	0.44
	Dentex angolensis	2.97	59	0.41
	Chaetodon hoefleri	1.34	8	0.19
	Saurida brasiliensis	1.12	313	0.16
	Pagellus bellottii	0.81	22	0.11
	Sea urchin	0.37	31	0.05
	Boops boops	0.37	31	0.05
	Antennarius occidentalis	0.22	8	0.03
	Total	721.93		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 79
DATE :15/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°35.15
start stop duration Lon E
13°21.30
TIME :16:27:19 16:57:38 30.3 (min) Purpose : 3
LOG : 891.42 892.93 1.5 Region : 4040
FDEPTH: 107 107 Gear cond.: 0
BDEPTH: 107 107 Validity : 0
Towing dir: 0° Wire out : 260 m Speed : 3.0 kn
Sorted : 119 Total catch: 533.67 Catch/hour: 1056.08

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	658.38	4587	62.34
127	Chelidonichthys gabonensis	87.27	730	8.26
	Umbrina canariensis	44.53	125	4.22
128	Trichiurus lepturus	35.09	259	3.32
	Citharus linguatula	33.48	17685	3.17
	Raja miraletus	27.17	36	2.57
	Octopus vulgaris	20.22	28	1.92
	Boops boops	19.51	366	1.85
	Uranoscopus cadenati	15.14	71	1.43
	Pagellus bellottii	14.53	321	1.38
130	Scorpaena normani	12.82	142	1.21
	Brotula barbata	12.39	28	1.17
	Dentex angolensis	10.69	117	1.01
129	Trachurus trecae	10.61	277	1.00
131	Zeus faber	10.51	28	0.99
	Sepia orbignyana	9.18	196	0.87
	Pterothrissus belloci	8.19	71	0.78
	Peristedion cataphractum	7.66	135	0.73
	Pteroscion peli	4.81	18	0.46
	Branchiostegus semifasciatus *	4.63	10	0.44
	Lagocephalus laevigatus	4.45	18	0.42
	Dicologoglossa cuneata	2.41	53	0.23
	Illex coindetii	2.32	28	0.22
	Cepola pauciradiatus	0.10	10	0.01
	Total	1056.08		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 80
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°27.15
start stop duration Lon E
12°59.80
TIME :00:55:22 01:25:23 30.0 (min) Purpose : 3
LOG : 931.36 932.83 1.5 Region : 4040
FDEPTH: 476 478 Gear cond.: 0
BDEPTH: 476 478 Validity : 0
Towing dir: 0° Wire out : 1150 m Speed : 2.9 kn
Sorted : 23 Total catch: 229.90 Catch/hour: 459.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP			
Nematocarcinus africanus	326.18	76449	70.99
Laemonema laureysi	40.17	460	8.74
Hoplostethus cadenati	17.79	560	3.87
Dibranchus atlanticus	11.99	640	2.61
Chaceon maritae, male	10.79	20	2.35
Lamprogrammus exutus	9.99	280	2.17
Chaceon maritae, female	6.80	20	1.48
Aristeus varidens, female	6.80	420	1.48
MYCTOPHIDAE	4.40	4277	0.96
Anemones, pink	4.00	20	0.87
Aristeus varidens, male	3.60	280	0.78
Merluccius polli	3.20	4	0.70
L O B S T E R S	2.80	280	0.61
Halosaurus ovenii	2.00	60	0.43
SALPS	2.00	80	0.43
Etmopterus polli	1.80	40	0.39
Stomias boa boa	1.40	20	0.30
Yarrella blackfordi	1.00	40	0.22
Triplophos hemingi	1.00	60	0.22
Xenodermichthys copei	0.80	40	0.17
Bathyuroconger vicinus	0.80	40	0.17
Ebinania costaecanarie	0.20	20	0.04
Plastic bags	0.00	0	0.00
Total	459.49		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 81
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°27.74
start stop duration Lon E
13°6.91
TIME :05:19:50 05:50:03 30.2 (min) Purpose : 3
LOG : 943.93 945.42 1.5 Region : 4040
FDEPTH: 192 186 Gear cond.: 0
BDEPTH: 192 186 Validity : 0
Towing dir: 0° Wire out : 480 m Speed : 3.0 kn
Sorted : 35 Total catch: 237.11 Catch/hour: 470.77

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAM			
Synagrops microlepis	340.94	35952	72.42
Dentex angolensis	53.29	191	11.32
132SALPS	23.59	1680	5.01
Zenopsis conchifer	16.92	226	3.59
Todaropsis eblanae	5.72	48	1.21
Brotula barbata	5.06	6	1.08
Raja alba	4.53	12	0.96
Pterothrissus belloci	4.53	24	0.96
Bembrops heterurus	3.69	36	0.78
Uranoscopus cadenati	3.22	12	0.68
Dibranchus atlanticus	3.10	191	0.66
Malacocephalus laevis	2.86	24	0.61
Illex coindetii	2.14	36	0.46
Conger conger	0.60	12	0.13
Saurida brasiliensis	0.24	60	0.05
Parapenaeus longirostris	0.24	119	0.05
Sepia orbignyana	0.12	12	0.03
Total	470.77		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 82
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°23.43
start stop duration Lon E
13°20.55
TIME :07:56:40 08:26:41 30.0 (min) Purpose : 3
LOG : 961.38 962.90 1.5 Region : 4040
FDEPTH: 77 79 Gear cond.: 0
BDEPTH: 77 79 Validity : 0
Towing dir: 0° Wire out : 210 m Speed : 3.0 kn
Sorted : 0 Total catch: 148.75 Catch/hour: 297.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAM			
Trachurus trecae	205.46	9380	69.11
13UUmbrina canariensis	15.51	44	5.22
134Pomadasys incisus	11.29	48	3.80
137Boops boops	11.13	602	3.74
Chelidonichthys gabonensis	8.61	88	2.90
Alloteuthis africana	6.96	1605	2.34
Raja miraletus	6.66	10	2.24
Zeus faber	5.42	12	1.82
Zenopsis conchifer	4.14	22	1.39
Pagellus bellottii	3.38	62	1.14
136Sepia orbignyana	2.92	24	0.98
Fistularia petimba	2.86	6	0.96
Pseudupeneus prayensis	2.50	30	0.84
Dentex angolensis	2.44	56	0.82
135Dentex barnardi	2.36	22	0.79
Torpedo torpedo	1.68	2	0.56
Trichiurus lepturus	1.28	4	0.43
Illex coindetii	0.92	8	0.31
Sardinella aurita	0.56	52	0.19
Saurida brasiliensis	0.54	144	0.18
Citharus linguatula	0.48	8	0.16
Dibranchus atlanticus	0.12	8	0.04
Blennius normani	0.10	2	0.03
Total	297.30		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 83
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°20.63
start stop duration Lon E
13°29.93
TIME :10:01:53 10:32:03 30.2 (min) Purpose : 3
LOG : 975.08 976.81 1.7 Region : 4040
FDEPTH: 23 25 Gear cond.: 0
BDEPTH: 23 25 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.4 kn
Sorted : 0 Total catch: 261.86 Catch/hour: 520.77

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP			
Sardinella aurita	192.11	6304	36.89
139Brachydeuterus auritus	83.65	6837	16.06
138Alectis alexandrinus	70.72	76	13.58
Rhinobatos albomaculatus	33.37	20	6.41
Trachurus trecae	27.56	2017	5.29
141Engraulis encrasicolus	23.15	3407	4.45
Ephippion guttifer	17.78	18	3.41
Raja miraletus	14.08	24	2.70
Pseudotolithus senegalensis	11.97	20	2.30
Selene dorsalis	8.95	626	1.72
Torpedo marmorata	7.28	6	1.40
Sphyraena sphyraena	5.31	48	1.02
Dasyatis margarita	5.25	6	1.01
Chloroscombrus chrysurus	4.83	30	0.93
Galeoides decadactylus	4.24	30	0.81
Sardinella maderensis	4.12	185	0.79
140Sepia orbignyana	2.80	6	0.54
Cynoglossus senegalensis	2.25	2	0.43
Eucinostomus melanopterus	0.95	6	0.18
Trichiurus lepturus	0.18	18	0.03
Pteroscion peli	0.18	12	0.03
Boops boops	0.04	6	0.01
Total	520.77		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 84
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°6.13
start stop duration Lon E
13°19.25
TIME :12:32:46 13:02:54 30.2 (min) Purpose : 3
LOG : 994.47 996.03 1.6 Region : 4040
FDEPTH: 23 24 Gear cond.: 0
BDEPTH: 23 24 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
Sorted : 0 Total catch: 67.90 Catch/hour: 135.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP			
Decapterus rhonchus	101.87	1733	75.39
Raja miraletus	12.02	24	8.90
Sepia orbignyana	5.55	14	4.11
Ephippion guttifer	5.53	6	4.09
Pagellus bellottii	2.81	36	2.08
142Sardinella aurita	2.11	14	1.56
Eucinostomus melanopterus	1.35	12	1.00
Pseudupeneus prayensis	1.35	12	1.00
Citharus linguatula	1.33	10	0.99
Dentex barnardi	0.44	6	0.32
Chloroscombrus chrysurus	0.36	2	0.27
Epinephelus aeneus	0.18	2	0.13
Dicologoglossa cuneata	0.12	2	0.09
Selene dorsalis	0.10	2	0.07
Fishing gears	0.00	0	0.00
Total	135.12		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 85
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°7.20
start stop duration Lon E
13°17.24
TIME :13:55:26 14:25:03 29.6 (min) Purpose : 3
LOG : 1001.61 1003.21 1.6 Region : 4040
FDEPTH: 34 34 Gear cond.: 0
BDEPTH: 34 34 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.3 kn
Sorted : 0 Total catch: 21.03 Catch/hour: 42.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP			
Caranx crysos	11.02	12	25.87
Lagocephalus laevigatus	9.03	28	21.21
Raja miraletus	7.74	16	18.16
Dentex barnardi	5.55	77	13.03
Pagellus bellottii	2.49	24	5.85
Stromateus fiatola	1.99	2	4.66
Epinephelus aeneus	1.50	2	3.52
Citharus linguatula	1.26	14	2.95
Decapterus rhonchus	0.49	8	1.14
Dicologoglossa cuneata	0.36	6	0.86
GOBIIDAE	0.34	122	0.81
Alloteuthis africana	0.28	75	0.67
Sepia orbignyana	0.20	2	0.48
Sardinella maderensis	0.20	2	0.48
Grammoplites gruveli	0.12	10	0.29
Penaeus notialis	0.02	4	0.05
Total	42.60		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 86
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°9.92
start stop duration Lon E
13°12.49
TIME :15:26:47 15:57:11 30.4 (min) Purpose : 3
LOG : 1010.07 1011.61 1.5 Region : 4040
FDEPTH: 76 76 Gear cond.: 0
BDEPTH: 76 76 Validity : 0
Towing dir: 0° Wire out : 210 m Speed : 3.0 kn
Sorted : 131 Total catch: 856.15 Catch/hour: 1689.21

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	1024.10	15313	60.63
143	Trachurus trecae	462.97	10274	27.41
145	Chelidonichthys gabonensis	51.04	513	3.02
	Trichiurus lepturus	24.76	51	1.47
	Boops boops	20.01	539	1.18
	Pagellus bellottii	19.89	385	1.18
144	Sepia orbignyana	15.13	65	0.90
	Lagocephalus laevigatus	12.31	26	0.73
	Pomadasys incisus	11.03	39	0.65
	Saurida brasiliensis	7.69	103	0.46
	Serranus accraensis	5.90	14	0.35
	Pseudupeneus prayensis	5.78	65	0.34
	Scomber japonicus	5.50	39	0.33
	Caranx crysos	4.91	4	0.29
	Dentex angolensis	4.50	142	0.27
	Dentex barnardi	3.59	51	0.21
	Citharus linguatula	3.08	180	0.18
	Brotula barbata	2.19	14	0.13
	Sardinella aurita	2.05	26	0.12
	Alloteuthis africana	1.03	270	0.06
	Fistularia petimba	0.97	2	0.06
	Blennius normani	0.77	26	0.05
	Total	1689.21		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 87
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°11.04
start stop duration Lon E
13°5.74
TIME :16:47:48 17:17:47 30.0 (min) Purpose : 3
LOG : 1018.73 1020.13 1.4 Region : 4040
FDEPTH: 102 102 Gear cond.: 0
BDEPTH: 102 102 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 2.8 kn
Sorted : 104 Total catch: 521.80 Catch/hour: 1044.30

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	596.60	11348	57.13
149	Chelidonichthys gabonensis	72.85	881	6.98
	Umbrina canariensis	71.05	180	6.80
146	Pagellus bellottii	64.54	440	6.18
148	Scorpaena normani	34.52	450	3.31
	Raja miraletus	33.82	50	3.24
	Dentex barnardi	32.32	110	3.10
	Dentex angolensis	26.22	250	2.51
147	Zeus faber	17.01	60	1.63
	Boops boops	15.81	290	1.51
	Citharus linguatula	15.21	981	1.46
	Saurida brasiliensis	15.21	2652	1.46
	Brotula barbata	12.21	10	1.17
	Alloteuthis africana	9.21	2692	0.88
	Torpedo torpedo	6.70	10	0.64
	Dentex macrophthalmus	6.30	20	0.60
	Octopus vulgaris	3.60	10	0.34
	Sepia orbignyana	3.30	80	0.32
	Illex coindetii	2.60	50	0.25
	Brachydeuterus auritus	1.70	10	0.16
	Sardinella aurita	1.60	110	0.15
	Conger conger	1.60	20	0.15
	Scomber japonicus	0.30	10	0.03
	Total	1044.30		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 88
DATE :16/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°13.38
start stop duration Lon E
12°52.26
TIME :20:45:40 21:15:57 30.3 (min) Purpose : 3
LOG : 1041.98 1043.49 1.5 Region : 4040
FDEPTH: 635 636 Gear cond.: 0
BDEPTH: 635 636 Validity : 0
Towing dir: 0° Wire out : 1280 m Speed : 3.0 kn
Sorted : 30 Total catch: 273.08 Catch/hour: 541.11

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	303.17	60634	56.03
	Chaceon maritae	105.22	339	19.44
	Lamprogrammus exutus	45.30	0	8.37
	Merluccius polli	16.94	18	3.13
	Aristeus varidens	10.92	553	2.02
	Yarrella blackfordi	9.99	285	1.85
	J E L L Y F I S H	9.63	18	1.78
	Hoplostethus cadenati	8.03	214	1.48
	Etmopterus polli	7.13	107	1.32
	Stomias boa boa	6.78	125	1.25
	Stereomastis sp.	5.89	820	1.09
	Todaropsis eblanae	3.57	18	0.66
	Benthodesmus tenuis	2.68	339	0.49
	Triplophos hemingi	1.78	250	0.33
	Talismania longifilis	1.78	71	0.33
	Conger conger	1.07	36	0.20
	Gadella imberbis	0.71	143	0.13
	Halosaurus ovenii	0.54	18	0.10
	Total	541.11		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 89
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°3.51
start stop duration Lon E
12°47.73
TIME :00:25:32 00:55:37 30.1 (min) Purpose : 3
LOG : 1062.85 1064.39 1.6 Region : 4040
FDEPTH: 712 717 Gear cond.: 0
BDEPTH: 712 717 Validity : 0
Towing dir: 0° Wire out : 1620 m Speed : 3.1 kn
Sorted : 35 Total catch: 304.30 Catch/hour: 606.98

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	ANTHOZOA (Sea anemones)	144.69	395	23.84
	Nematocarcinus africanus	123.51	26856	20.35
	Lophius vaillanti	92.63	18	15.26
	L O B S T E R S	53.86	2980	8.87
	Nezumia aequalis	40.39	916	6.65
	Yarrella blackfordi	21.36	664	3.52
	Lamprogrammus exutus	15.98	72	2.63
	Dibranchus atlanticus	12.93	449	2.13
	Stomias boa boa	12.03	251	1.98
	Talismania longifilis	11.67	108	1.92
	Chaceon maritae, female	10.23	36	1.69
	Aristeus varidens, female	9.51	126	1.57
	Triplophos hemingi	8.08	987	1.33
	Todaropsis eblanae	7.72	36	1.27
	Bathyuroconger vicinus	7.36	126	1.21
	Hoplostethus cadenati	6.82	126	1.12
	Loligo vulgaris	6.10	18	1.01
	Halosaurus ovenii	4.13	72	0.68
	Malacocephalus laevis	3.41	36	0.56
	LOLIGINIDAE	3.05	18	0.50
	Merluccius polli	2.35	2	0.39
	Dicrolene sp.	2.15	108	0.35
	Raja confundens	1.80	18	0.30
	Benthodesmus tenuis	1.80	72	0.30
	Dicrolene intronigra	0.90	72	0.15
	Xenodermichthys copei	0.90	90	0.15
	STOMIIDAE	0.54	18	0.09
	Aristeus varidens, male	0.54	90	0.09
	Chauliodus sloani	0.36	18	0.06
	MYCTOPHIDAE	0.18	233	0.03
	Metal waste	0.00	0	0.00
	Fishing gears	0.00	0	0.00
	Total	606.98		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 90
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°2.35
start stop duration Lon E
12°49.56
TIME :03:28:21 03:58:25 30.1 (min) Purpose : 3
LOG : 1074.18 1075.76 1.6 Region : 4040
FDEPTH: 479 486 Gear cond.: 0
BDEPTH: 479 486 Validity : 0
Towing dir: 0° Wire out : 1160 m Speed : 3.2 kn
Sorted : 24 Total catch: 267.20 Catch/hour: 533.51

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	235.61	27574	44.16
	Chaunax pictus	59.90	80	11.23
	Hoplostethus cadenati	56.11	2097	10.52
	Lamprogrammus exutus	52.51	1058	9.84
	Merluccius polli	38.74	40	7.26
	Laemonema laureysi	32.35	1777	6.06
	Aristeus varidens, male	22.96	4592	4.30
	Aristeus varidens, female	11.98	1198	2.25
	Beryx decadactylus	4.79	20	0.90
	Malacocephalus occidentalis	2.60	40	0.49
	Yarrella blackfordi	2.20	80	0.41
	Stomias boa boa	1.80	40	0.34
	Talismania longifilis	1.60	140	0.30
	Dibranchus atlanticus	1.20	40	0.22
	Xenodermichthys copei	1.00	60	0.19
	Benthodesmus tenuis	1.00	40	0.19
	Nezumia aequalis	1.00	80	0.19
	Plesiopenaeus edwardsianus	1.00	359	0.19
	Etmopterus pusillus	0.80	20	0.15
	Etmopterus polli	0.80	20	0.15
	Bathyuroconger vicinus	0.80	60	0.15
	Triplophos hemingi	0.80	80	0.15
	MYCTOPHIDAE	0.60	559	0.11
	Starfish	0.60	20	0.11
	Gadella imberbis	0.40	20	0.07
	Symphurus sp.	0.20	20	0.04
	Chauliodus sloani	0.20	20	0.04
	Plastic bags	0.00	2	0.00
	Total	533.51		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 91
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
10°2.81
start stop duration Lon E
12°51.07
TIME :05:20:30 05:49:36 29.1 (min) Purpose : 3
LOG : 1081.71 1083.15 1.5 Region : 4040
FDEPTH: 380 375 Gear cond.: 0
BDEPTH: 380 375 Validity : 0
Towing dir: 0° Wire out : 840 m Speed : 3.0 kn
Sorted : 24 Total catch: 189.56 Catch/hour: 390.85

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	214.43	50606	54.86
	Merluccius polli	71.51	175	18.29
150	Benthodesmus tenuis	22.12	685	5.66
	Hymenocephalus italicus	19.71	1810	5.04
	Hoplostethus cadenati	14.47	336	3.70
	Plesiopenaeus edwardsianus	13.81	81	3.53
	Gadella imberbis	8.45	309	2.16
	Aristeus varidens, female	8.04	348	2.06
	Aristeus varidens, male	3.48	390	0.89
	Dibranchus atlanticus	3.09	202	0.79
	Synagrops microlepis	2.41	122	0.62
	PARALEPIDIDAE	2.14	95	0.55
	Malacocephalus laevis	1.88	27	0.48
	MYCTOPHIDAE	1.22	751	0.31
	Laemonema laureysi	1.22	14	0.31
	Chauliodus sloani	1.22	14	0.31
	Coelorinchus braueri	0.54	27	0.14
	Setarches guentheri	0.54	54	0.14
	Conger conger	0.27	14	0.07
	Glyphus marsupialis	0.14	14	0.04
	Saurida brasiliensis	0.14	161	0.04
	Total	390.85		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 92
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°59.31
start stop duration Lon E
12°57.65
TIME :07:21:29 07:51:52 30.4 (min) Purpose : 3
LOG : 1092.05 1093.60 1.6 Region : 4040
FDEPTH: 111 111 Gear cond.: 0
BDEPTH: 111 111 Validity : 0
Towing dir: 0° Wire out : 280 m Speed : 3.1 kn
Sorted : 0 Total catch: 38.04 Catch/hour: 75.13

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lagocephalus lagocephalus	16.63	28	22.13
	Brotula barbata	7.13	4	9.49
	Trachurus trecae	6.58	97	8.75
152	Dentex angolensis	6.14	79	8.18
151	Lepidotrigla carolae	4.76	41	6.34
	Dentex congoensis	4.40	81	5.86
	Zeus faber	4.25	8	5.65
	Selene dorsalis	3.59	6	4.78
	Lagocephalus laevigatus	3.24	2	4.31
	Torpedo torpedo	3.00	8	4.00
	Rhinobatos albomaculatus	2.92	2	3.89
	Fistularia petimba	2.09	4	2.79
	Illex coindetii	1.68	59	2.23
	Dibranchus atlanticus	1.40	120	1.87
	Raja miraletus	1.32	2	1.76
	Sepia orbignyana	1.01	6	1.34
	Spicara alta	0.91	45	1.21
	Saurida brasiliensis	0.77	140	1.03
	Scorpaena normani	0.73	6	0.97
	Ariomma bondi	0.73	12	0.97
	Uranoscopus polli	0.73	4	0.97
	Citharus linguatula	0.71	49	0.95
	Dentex barnardi	0.39	2	0.53
	Total	75.13		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 93
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°54.53
start stop duration Lon E
13°7.52
TIME :09:35:45 10:05:56 30.2 (min) Purpose : 3
LOG : 1106.73 1108.34 1.6 Region : 4040
FDEPTH: 62 60 Gear cond.: 0
BDEPTH: 62 60 Validity : 0
Towing dir: 0° Wire out : 180 m Speed : 3.2 kn
Sorted : 0 Total catch: 103.92 Catch/hour: 206.67

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lagocephalus laevigatus	113.36	113	54.85
	Pagellus bellottii	47.25	475	22.86
153	Pseudupeneus prayensis	21.16	147	10.24
	Dentex barnardi	4.81	64	2.33
	Alloteuthis africana	4.77	1138	2.31
	Sepia officinalis	4.41	6	2.14
	Pomadasys incisus	3.54	16	1.71
	Raja miraletus	2.66	8	1.29
	Trichiurus lepturus	1.33	4	0.64
	Zeus faber	1.17	2	0.57
	Lepidotrigla cadmani	0.80	6	0.38
	Citharus linguatula	0.72	6	0.35
	Chaetodon hoefleri	0.22	2	0.11
	Caranx crysos	0.14	2	0.07
	Serranus accraensis	0.08	2	0.04
	Illex coindetii	0.08	2	0.04
	Saurida brasiliensis	0.08	16	0.04
	Arnoglossus imperialis	0.02	4	0.01
	Priacanthus arenatus	0.02	2	0.01
	Nemichthys scolopaceus	0.02	12	0.01
	Monolene microstoma	0.02	6	0.01
	Total	206.67		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 94
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°52.36
start stop duration Lon E
13°13.42
TIME :11:10:43 11:40:43 30.0 (min) Purpose : 3
LOG : 1115.97 1117.52 1.6 Region : 4040
FDEPTH: 23 22 Gear cond.: 0
BDEPTH: 23 22 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.1 kn
Sorted : 0 Total catch: 26.84 Catch/hour: 53.68

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pagellus bellottii	12.60	96	23.47
154	Decapterus rhonchus	8.36	28	15.57
	Chloroscombrus chrysurus	8.12	52	15.13
	Raja miraletus	6.74	14	12.56
	Balistes capriscus	6.46	16	12.03
	Sepia orbignyana	5.92	14	11.03
	Caranx crysos	2.38	10	4.43
	Citharus linguatula	1.72	16	3.20
	Eucinostomus melanopterus	0.96	10	1.79
	Pseudupeneus prayensis	0.18	2	0.34
	Alloteuthis africana	0.12	40	0.22
	Penaeus kerathurus	0.06	2	0.11
	Bothus podas africanus	0.06	2	0.11
	Total	53.68		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 95
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°42.36
start stop duration Lon E
13°9.18
TIME :13:53:34 14:23:37 30.1 (min) Purpose : 3
LOG : 1135.66 1137.20 1.5 Region : 4040
FDEPTH: 32 32 Gear cond.: 0
BDEPTH: 32 32 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.1 kn
Sorted : 0 Total catch: 198.05 Catch/hour: 395.31

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Decapterus rhonchus	233.85	3489	59.16
	Pagellus bellottii	63.07	758	15.96
155	Pseudupeneus prayensis	25.75	192	6.51
	Balistes capriscus	12.57	28	3.18
	Stromateus fiatola	11.02	10	2.79
	Sepia orbignyana	10.54	20	2.67
	Chloroscombrus chrysurus	10.14	84	2.57
	Loligo vulgaris	6.11	8	1.55
	Raja miraletus	5.11	8	1.29
	Aluterus heudelotii	4.27	12	1.08
	Eucinostomus melanopterus	4.15	36	1.05
	Chilomycterus spinosus mauret.	2.08	8	0.53
	Sardinella maderensis	2.08	24	0.53
	Citharus linguatula	1.84	20	0.46
	Sphyraena sphyraena	0.72	4	0.18
	Lagocephalus laevigatus	0.64	4	0.16
	Trachinocephalus myops	0.40	4	0.10
	Rypticus saponaceus	0.38	6	0.10
	Grammoplites gruveli	0.32	4	0.08
	Dentex barnardi	0.28	4	0.07
	Total	395.31		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 96
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°44.71
start stop duration Lon E
13°0.54
TIME :15:40:26 16:11:02 30.6 (min) Purpose : 3
LOG : 1147.28 1148.84 1.6 Region : 4040
FDEPTH: 93 92 Gear cond.: 0
BDEPTH: 93 92 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 3.0 kn
Sorted : 312 Total catch: 312.14 Catch/hour: 612.04

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex barnardi	125.76	569	20.55
	Umbrina canariensis	113.92	347	18.61
158	Dentex angolensis	90.82	1100	14.84
156	Lagocephalus laevigatus	71.88	63	11.74
	Trachurus trecae	57.57	2198	9.41
157	Raja miraletus	33.22	49	5.43
	Pagellus bellottii	28.47	233	4.65
159	Lepidotrigla cadmani	24.75	190	4.04
	Epinephelus aeneus	12.20	2	1.99
	Brotula barbata	7.80	8	1.28
	Scorpaena stephanica	6.80	12	1.11
	Dentex congoensis	5.86	112	0.96
	Zeus faber	4.82	12	0.79
	Branchiostegus semifasciatus *	4.06	4	0.66
	Sepia orbignyana	3.75	8	0.61
	Chaetodon hoefleri	3.75	20	0.61
	Zenopsis conchifer	3.73	6	0.61
	Trichiurus lepturus	3.41	4	0.56
	Citharus linguatula	3.16	67	0.52
	Decapterus rhonchus	1.90	25	0.31
	Octopus vulgaris	1.35	2	0.22
	Sardinella maderensis	1.04	6	0.17
	Uranoscopus polli	0.63	2	0.10
	Illex coindetii	0.55	8	0.09
	Alloteuthis africana	0.41	106	0.07
	Saurida brasiliensis	0.18	27	0.03
	Boops boops	0.14	6	0.02
	Arnoglossus imperialis	0.12	8	0.02
	Total	612.04		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 97
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°42.39
start stop duration Lon E
12°56.69
TIME :16:44:37 17:14:40 30.1 (min) Purpose : 3
LOG : 1152.62 1154.19 1.6 Region : 4040
FDEPTH: 106 103 Gear cond.: 0
BDEPTH: 106 103 Validity : 0
Towing dir: 0° Wire out : 262 m Speed : 3.1 kn
Sorted : 87 Total catch: 259.59 Catch/hour: 518.32

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Umbrina canariensis	154.18	359	29.75
161	Trachurus trecae	123.99	4157	23.92
162	Chelidonichthys gabonensis	55.71	359	10.75
	Brotula barbata	37.68	30	7.27
	Dentex angolensis	34.14	311	6.59
160	Raja miraletus	13.90	18	2.68
	Saurida brasiliensis	11.44	2420	2.21
	Citharus linguatula	10.78	317	2.08
	Dentex congoensis	10.18	162	1.96
	Illex coindetii	9.94	234	1.92
	Uranoscopus polli	8.87	48	1.71
	Boops boops	8.57	216	1.65
	Ariomma bondi	7.13	84	1.38
	Pagellus bellottii	7.01	66	1.35
	Octopus vulgaris	6.53	12	1.26
	Branchiostegus semifasciatus *	4.55	6	0.88
	Zeus faber	3.47	6	0.67
	Alloteuthis africana	3.00	827	0.58
	Pterothrissus belloci	2.16	12	0.42
	Selene dorsalis	2.16	6	0.42
	Scorpaena normani	1.50	12	0.29
	Arnoglossus imperialis	1.14	84	0.22
	Echelus myrus	0.30	6	0.06
	Total	518.32		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 98
DATE :17/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°31.54
start stop duration Lon E
12°37.47
TIME :20:58:40 21:28:42 30.0 (min) Purpose : 3
LOG : 1181.02 1182.55 1.5 Region : 4040
FDEPTH: 634 635 Gear cond.: 0
BDEPTH: 634 635 Validity : 0
Towing dir: 0° Wire out : 1300 m Speed : 3.0 kn
Sorted : 31 Total catch: 93.60 Catch/hour: 187.01

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	47.35	23994	25.32
	Yarrella blackfordi	26.01	887	13.91
	Lamprogrammus exutus	18.58	336	9.94
	Aristeus varidens, female	12.29	264	6.57
	Nezumia aequalis	10.13	336	5.42
	Stomias boa boa	10.07	186	5.38
	Chaceon maritae, female	8.63	24	4.62
	L O B S T E R S	8.27	965	4.42
	Aristeus varidens, male	7.73	378	4.13
	Xenodermichthys copei	7.73	635	4.13
	Talismania longifilis	6.83	270	3.65
	Triplophos hemingi	6.23	845	3.33
	Laemonema laureysi	2.40	18	1.28
	Chaceon maritae, male	2.22	6	1.19
	MYCTOPHIDAE	1.50	1247	0.80
	Benthodesmus tenuis	1.44	48	0.77
	Bathyuroconger vicinus	1.38	66	0.74
	Glyphus marsupialis	1.32	54	0.71
	Hoplostethus cadenati	1.26	36	0.67
	Gadella imberbis	0.96	30	0.51
	Phrynichthys wedli	0.72	108	0.38
	Raja confundens	0.72	18	0.38
	Ebinania costaecanarie	0.48	12	0.26
	Selachophidium guentheri	0.42	6	0.22
	Trachyrincus scabrus	0.42	6	0.22
	Dicrolene sp.	0.36	66	0.19
	S H R I M P S	0.36	144	0.19
	Plesiopenaeus edwardsianus	0.30	6	0.16
	Etmopterus polli	0.24	6	0.13
	Caristius sp	0.18	12	0.10
	Melanonus zugmayeri	0.18	6	0.10
	Dibranchus atlanticus	0.18	6	0.10
	Halosaurus ovenii	0.12	6	0.06
	Total	187.01		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 99
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°30.03
start stop duration Lon E
12°38.65
TIME :02:18:06 02:34:20 16.2 (min) Purpose : 3
LOG : 1195.53 1196.35 0.8 Region : 4040
FDEPTH: 530 534 Gear cond.: 0
BDEPTH: 530 534 Validity : 0
Towing dir: 0° Wire out : 1260 m Speed : 3.0 kn
Sorted : 32 Total catch: 63.82 Catch/hour: 235.93

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lamprogrammus exutus	75.56	1789	32.03
	Yarrella blackfordi	29.65	969	12.57
	Laemonema laureysi	14.86	481	6.30
	Aristeus varidens, female	10.94	843	4.64
	Chaunax pictus	10.87	222	4.61
	Stomias boa boa	9.83	207	4.17
	Benthodesmus tenuis	9.17	348	3.89
	L O B S T E R S	8.72	762	3.70
	Triplophos hemingi	8.72	1309	3.70
	Aristeus varidens, male	6.95	843	2.95
	MYCTOPHIDAE	5.84	5841	2.48
	Synaphobranchus kaupii	5.03	222	2.13
	Coloconger cadenati	4.44	7	1.88
	Xenodermichthys copei	3.92	362	1.66
	Chaceon maritae, female	3.84	15	1.63
	Etmopterus polli	3.77	74	1.60
	Hoplostethus cadenati	3.33	111	1.41
	Nezumia aequalis	2.14	170	0.91
	Lophiodes kempi	1.77	37	0.75
	Dibranchus atlanticus	1.70	52	0.72
	Trachipterus sp.	1.48	7	0.63
	Melanonus zugmayeri	1.40	30	0.60
	Opisthoteuthis agassizi	1.26	22	0.53
	Phrynichthys wedli	1.18	81	0.50
	Conger conger	1.18	52	0.50
	Gadella imberbis	1.11	52	0.47
	Parapenaeus longirostris	1.04	421	0.44
	Talismania longifilis	0.96	74	0.41
	NETTASTOMATIDAE	0.74	22	0.31
	Caristius sp	0.59	37	0.25
	Stoloteuthis sp	0.52	7	0.22
	LINOPHRYNIDAE	0.37	7	0.16
	Selachophidium guentheri	0.37	7	0.16
	J E L L Y F I S H	0.30	7	0.13
	Plesiopenaeus edwardsianus	0.30	7	0.13
	Chlorophthalmus atlanticus	0.30	7	0.13
	Peristedion sp.	0.22	15	0.09
	Melanostomias sp.	0.22	7	0.09
	Malacocephalus occidentalis	0.22	7	0.09
	Glyphus marsupialis	0.22	67	0.09
	GONOSTOMATIDAE	0.22	7	0.09
	Dicrolene intronigra	0.15	15	0.06
	Symphurus sp.	0.15	15	0.06
	Bathynectes piperitus	0.15	44	0.06
	Avocettina sp.	0.07	15	0.03
	Halosaurus ovenii	0.07	15	0.03
	Ebinania costaecanarie	0.07	30	0.03
	Total	235.93		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 100
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°30.17
start stop duration Lon E
12°50.77
TIME :05:16:07 05:45:16 29.2 (min) Purpose : 3
LOG : 1210.84 1212.32 1.5 Region : 4040
FDEPTH: 111 113 Gear cond.: 0
BDEPTH: 111 113 Validity : 0
Towing dir: 0° Wire out : 320 m Speed : 3.0 kn
Sorted : 84 Total catch: 156.61 Catch/hour: 322.35

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Saurida brasiliensis	131.98	22335	40.94
	Lepidotrigla cadmani	51.85	35	16.08
	Dentex angolensis	25.54	140	7.92
163	Pterothrissus belloci	16.49	84	5.11
	Trachurus trecae	15.68	580	4.87
164	Raja clavata	9.30	4	2.89
	Illex coindetii	7.60	171	2.36
	Citharus linguatula	7.55	216	2.34
	Sepia orbignyana	6.94	76	2.15
	Octopus vulgaris	6.71	12	2.08
	Fistularia petimba	5.23	6	1.62
	Parapenaeus longirostris,femal	4.84	895	1.50
	Scorpaena normani	4.69	25	1.46
	Zeus faber	4.63	12	1.44
	Brotula barbata	4.49	4	1.39
	Trichiurus lepturus	4.28	6	1.33
	Dentex congoensis	3.09	66	0.96
	Uranoscopus cadenati	2.45	10	0.76
	Dentex barnardi	1.71	4	0.53
	Boops boops	1.44	66	0.45
	Brachydeuterus auritus	1.19	6	0.37
	Parapenaeus longirostris, male	1.05	350	0.33
	CONGER SP	0.64	6	0.20
	Merluccius polli	0.60	39	0.19
	Conger conger	0.56	10	0.17
	Bembrops heterurus	0.54	6	0.17
	Ariomma bondi	0.49	4	0.15
	Cepola pauciradiatus	0.39	19	0.12
	GOBIIDAE	0.35	140	0.11
	Arnoglossus imperialis	0.06	6	0.02
	Total	322.35		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 101
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°28.87
start stop duration Lon E
13°0.30
TIME :07:15:27 07:46:43 31.3 (min) Purpose : 3
LOG : 1223.22 1224.96 1.7 Region : 4040
FDEPTH: 50 51 Gear cond.: 0
BDEPTH: 50 51 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.3 kn
Sorted : 87 Total catch: 86.83 Catch/hour: 166.71

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pagellus bellottii	33.79	192	20.27
167	Raja miraletus	21.77	42	13.06
	Trichiurus lepturus	21.47	27	12.88
	Alectis alexandrinus	20.66	25	12.39
	Brachydeuterus auritus	16.70	109	10.02
166	Chloroscombrus chrysurus	9.70	44	5.82
	Lagocephalus laevigatus	9.08	12	5.45
	Sphyraena guachancho	4.97	8	2.98
	Octopus vulgaris	4.49	6	2.69
	Trachurus trecae	4.42	513	2.65
165	Dasyatis marmorata	3.92	6	2.35
	Alloteuthis africana	2.78	601	1.67
	Lepidotrigla carolae	2.11	10	1.27
	Pomadasys jubelini	1.98	4	1.19
	Pseudupeneus prayensis	1.48	15	0.89
	Stromateus fiatola	1.38	2	0.83
	Cynoglossus senegalensis	1.32	4	0.79
	Galeoides decadactylus	1.23	2	0.74
	Sepia orbignyana	1.11	2	0.67
	Torpedo torpedo	1.08	2	0.64
	Fistularia petimba	0.54	2	0.32
	Citharus linguatula	0.42	2	0.25
	Illex coindetii	0.31	6	0.18
	Total	166.71		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 102
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°14.65
start stop duration Lon E
12°57.94
TIME :09:53:08 10:23:50 30.7 (min) Purpose : 3
LOG : 1243.95 1245.74 1.8 Region : 4040
FDEPTH: 24 24 Gear cond.: 0
BDEPTH: 24 24 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.5 kn
Sorted : 111 Total catch: 345.32 Catch/hour: 674.89

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Alectis alexandrinus	143.43	193	21.25
	Balistes capriscus	130.79	258	19.38
	Chloroscombrus chrysurus	124.42	2025	18.44
	Decapterus rhonchus	107.96	1180	16.00
	Arius parkii	26.07	18	3.86
	Pagellus bellottii	23.86	25	3.54
	Pseudotolithus senegalensis	19.35	78	2.87
	Brachydeuterus auritus	18.90	213	2.80
239	Pomadasys rogeri	14.05	74	2.08
	Caranx crysos	12.25	45	1.82
	Trachurus trecae	8.83	336	1.31
240	Sardinella maderensis	7.74	297	1.15
168	Sardinella aurita	7.04	536	1.04
169	Raja miraletus	6.96	14	1.03
	Lagocephalus laevigatus	6.39	33	0.95
	Sepia orbignyana	4.96	14	0.74
	Galeoides decadactylus	4.46	45	0.66
	Pomadasys incisus	4.12	109	0.61
	Citharus linguatula	2.13	14	0.32
	Pteroscion peli	0.59	6	0.09
	Selene dorsalis	0.59	199	0.09
	Total	674.89		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 103
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°14.23
start stop duration Lon E
12°54.05
TIME :11:02:41 11:32:44 30.1 (min) Purpose : 3
LOG : 1248.96 1250.35 1.4 Region : 4040
FDEPTH: 41 45 Gear cond.: 0
BDEPTH: 41 45 Validity : 0
Towing dir: 0° Wire out : 140 m Speed : 2.8 kn
Sorted : 0 Total catch: 70.15 Catch/hour: 140.07

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	33.94	303	24.23
170	Pagellus bellottii	27.39	359	19.56
171	Selene dorsalis	21.56	395	15.40
	Raja miraletus	19.45	36	13.88
	Balistes capriscus	8.99	16	6.41
	Ephippion guttifer	5.81	4	4.15
	Alectis alexandrinus	5.37	6	3.83
	Trachurus trecae	4.93	104	3.52
172	Trichiurus lepturus	3.59	433	2.57
	Lagocephalus laevigatus	2.88	8	2.05
	Torpedo marmorata	1.68	2	1.20
	Citharus linguatula	1.68	12	1.20
	Decapterus rhonchus	1.22	14	0.87
	J E L L Y F I S H	0.80	2	0.57
	Chloroscombrus chrysurus	0.32	4	0.23
	Grammoplites gruveli	0.20	4	0.14
	Galeoides decadactylus	0.14	2	0.10
	Boops boops	0.12	2	0.09
	Total	140.07		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 104
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°13.87
start stop duration Lon E
12°50.99
TIME :12:19:35 12:49:52 30.3 (min) Purpose : 3
LOG : 1255.14 1256.53 1.4 Region : 4040
FDEPTH: 78 83 Gear cond.: 0
BDEPTH: 78 83 Validity : 0
Towing dir: 0° Wire out : 210 m Speed : 2.8 kn
Sorted : 0 Total catch: 140.43 Catch/hour: 278.26

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex angolensis	99.79	380	35.86
175	Trachurus trecae	61.43	1756	22.08
174	Umbrina canariensis	45.57	392	16.38
176	Brachydeuterus auritus	30.67	226	11.02
173	Selene dorsalis	6.58	52	2.36
	Octopus vulgaris	4.06	4	1.46
	Citharus linguatula	3.76	159	1.35
	Alloteuthis africana	3.69	1062	1.32
	Sepia orbignyana	3.61	24	1.30
	Saurida brasiliensis	3.25	674	1.17
	Raja miraletus	2.50	4	0.90
	Trichiurus lepturus	2.10	111	0.75
	Argyrosomus hololepidotus	1.68	8	0.61
	GOBIIDAE	1.55	1415	0.56
	Pentheroscion mbizi	1.41	2	0.51
	Brotula barbata	1.19	8	0.43
	Torpedo nobiliana	1.11	8	0.40
	Boops boops	0.99	63	0.36
	Scorpaena stephanica	0.83	2	0.30
	Antennarius occidentalis	0.59	12	0.21
	Dentex barnardi	0.59	4	0.21
	Loligo vulgaris	0.48	8	0.17
	Fistularia petimba	0.32	4	0.11
	Dicologoglossa hexophthalma	0.28	4	0.10
	Pagellus bellottii	0.24	4	0.09
	Total	278.26		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 105
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°12.69
start stop duration Lon E
12°46.56
TIME :13:41:06 14:11:26 30.3 (min) Purpose : 3
LOG : 1261.57 1263.11 1.5 Region : 4040
FDEPTH: 117 117 Gear cond.: 0
BDEPTH: 117 117 Validity : 0
Towing dir: 0° Wire out : 290 m Speed : 3.0 kn
Sorted : 0 Total catch: 292.90 Catch/hour: 579.43

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Synagrops microlepis	473.59	47875	81.73
	Dentex angolensis	34.46	204	5.95
177	Chelidonichthys gabonensis	19.76	259	3.41
	Brotula barbata	11.47	12	1.98
	Uranoscopus polli	10.33	53	1.78
	Trichiurus lepturus	7.93	10	1.37
	Citharus linguatula	6.69	295	1.15
	Saurida brasiliensis	5.80	882	1.00
	Lagocephalus lagocephalus	4.19	10	0.72
	Scorpaena normani	1.96	18	0.34
	Arius parkii	1.50	2	0.26
	Boops boops	0.63	18	0.11
	Arnoglossus imperialis	0.63	71	0.11
	Dicologoglossa hexophthalma	0.28	10	0.05
	Peristedion cataphractum	0.10	10	0.02
	Bembrops greyi	0.10	10	0.02
	Total	579.43		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 106
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°5.13
start stop duration Lon E
12°36.64
TIME :17:01:30 17:31:20 29.8 (min) Purpose : 3
LOG : 1282.95 1284.33 1.4 Region : 4054
FDEPTH: 741 739 Gear cond.: 0
BDEPTH: 741 739 Validity : 0
Towing dir: 0° Wire out : 1380 m Speed : 2.8 kn
Sorted : 60 Total catch: 156.38 Catch/hour: 314.54

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Coelorinchus coelorhincus	81.06	1585	25.77
	Yarrella blackfordi	59.74	2404	18.99
	Lamprogrammus exutus	48.68	101	15.48
	Talismania longifilis	17.36	151	5.52
	Hoplostethus cadenati	15.69	292	4.99
	Nezumia micronychodon	14.78	1690	4.70
	Bathyuroconger braueri	11.67	2	3.71
	Raja confundens	11.36	40	3.61
	Benthodesmus tenuis	8.75	322	2.78
	J E L L Y F I S H	7.95	16	2.53
	Stomias boa boa	5.53	97	1.76
	Aristeus varidens, female	5.13	181	1.63
	Raja miraletus	4.99	10	1.59
	Octopoteuthis sicula	4.89	20	1.55
	Merluccius polli	4.59	6	1.46
	Solenocera africana	2.82	207	0.90
	Bathyuroconger vicinus	1.97	46	0.63
	Coloconger sp.	1.41	76	0.45
	Halosaurus ovenii	1.31	16	0.42
	Todaropsis eblanae	1.11	6	0.35
	Aristeus varidens, male	0.76	91	0.24
	Dibranchus atlanticus	0.66	26	0.21
	Synaphobranchus kaupii	0.50	16	0.16
	Setarches guentheri	0.46	6	0.15
	Glyphus marsupialis	0.36	16	0.12
	Caristius sp	0.30	6	0.10
	Melanostomias sp.	0.26	20	0.08
	Avocettina sp.	0.20	6	0.06
	Dicrolene intronigra	0.16	6	0.05
	Starfish	0.10	6	0.03
	Total	314.54		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 107
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°4.42
start stop duration Lon E
12°38.11
TIME :19:48:00 20:18:29 30.5 (min) Purpose : 3
LOG : 1292.67 1294.19 1.5 Region : 4054
FDEPTH: 670 678 Gear cond.: 0
BDEPTH: 670 678 Validity : 0
Towing dir: 0° Wire out : 1340 m Speed : 3.0 kn
Sorted : 69 Total catch: 243.71 Catch/hour: 479.59

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lamprogrammus exutus	187.75	1364	39.15
	Nezumia micronychodon	86.51	1909	18.04
	Yarrella blackfordi	67.77	1923	14.13
	Hoplostethus cadenati	36.17	765	7.54
	Stomias boa boa	12.87	242	2.68
	Triplophos hemingi	11.30	1096	2.36
	Diceratias pileatus	10.82	8	2.26
	Talismania longifilis	10.53	77	2.20
	Benthodesmus tenuis	6.69	16	1.40
	Aristeus varidens, female	6.14	0	1.28
	Merluccius polli	5.79	8	1.21
	Nematocarcinus africanus	5.45	1226	1.14
	Stereomastis sp.	4.27	303	0.89
	Malacocephalus laevis	3.66	14	0.76
	Plesiopenaeus edwardsianus	3.11	228	0.65
	Himantolophus sp.	3.07	2	0.64
	Aristeus varidens, male	2.48	193	0.52
	Melanostomias sp.	2.48	83	0.52
	Halosaurus ovenii	2.07	41	0.43
	Octopoteuthis sicula	2.01	8	0.42
	Xenodermichthys copei	1.44	110	0.30
	Dicrolene intronigra	1.44	132	0.30
	Todaropsis eblanae	1.32	8	0.27
	Laemonema laureysi	1.24	14	0.26
	Bathyuroconger vicinus	1.18	41	0.25
	Snyderidia sp.	0.63	14	0.13
	Raja confundens	0.49	8	0.10
	Dibranchus atlanticus	0.35	14	0.07
	Photonectes braueri	0.22	22	0.05
	Gadella imberbis	0.20	14	0.04
	Glyphus marsupialis	0.08	22	0.02
	OMOSUDIDAE	0.08	8	0.02
	Total	479.59		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 108
DATE :18/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°5.91
start stop duration Lon E
12°40.80
TIME :22:52:30 23:23:13 30.7 (min) Purpose : 3
LOG : 1303.97 1305.53 1.6 Region : 4054
FDEPTH: 435 434 Gear cond.: 0
BDEPTH: 435 434 Validity : 0
Towing dir: 0° Wire out : 950 m Speed : 3.0 kn
Sorted : 0 Total catch: 178.14 Catch/hour: 348.04

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	61.90	12379	17.78
	Chaunax pictus	42.08	973	12.09
	ANTHOZOA (Sea anemones)	36.34	223	10.44
	Stomias boa boa	20.75	387	5.96
	Merluccius polli	20.40	25	5.86
178	Dibranchus atlanticus	19.46	1078	5.59
	Aristeus varidens, female	19.23	24	5.52
	B I V A L V E S	18.05	59	5.19
	Yarrella blackfordi	14.07	434	4.04
	Etmopterus polli	12.31	305	3.54
	Laemonema laureysi	12.07	117	3.47
	Conger conger	12.07	12	3.47
	Chaceon maritae, male	11.96	23	3.44
	Xenodermichthys copei	7.39	1301	2.12
	Aristeus varidens, male	7.15	996	2.05
	Hymenocephalus italicus	5.86	668	1.68
	Benthodesmus tenuis	4.45	141	1.28
	Triplophos hemingi	3.75	528	1.08
	Coelorinchus coelorhinc. polli	3.75	141	1.08
	Plesiopenaeus edwardsianus	3.63	94	1.04
	Halosaurus ovenii	2.81	176	0.81
	Hoplostethus cadenati	2.81	141	0.81
	Gadella imberbis	1.99	106	0.57
	Chlorophthalmus atlanticus	1.52	35	0.44
	MYCTOPHIDAE	0.70	668	0.20
	Coloconger sp.	0.59	12	0.17
	Gonostoma elongatum	0.35	12	0.10
	Bathynectes piperitus	0.23	35	0.07
	S H R I M P S	0.12	94	0.03
	Avocettina sp.	0.12	12	0.03
	Ebinania costaecanarie	0.12	94	0.03
	Plastic bags	0.00	0	0.00
	Total	348.04		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 109
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
9°6.26
start stop duration Lon E
12°42.36
TIME :01:25:45 01:56:21 30.6 (min) Purpose : 3
LOG : 1319.21 1320.76 1.5 Region : 4054
FDEPTH: 363 362 Gear cond.: 0
BDEPTH: 363 362 Validity : 0
Towing dir: 0° Wire out : 900 m Speed : 3.0 kn
Sorted : 0 Total catch: 196.14 Catch/hour: 384.59

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Merluccius polli	261.37	906	67.96
179	Chlorophthalmus atlanticus	54.75	933	14.23
	Chaunax pictus	7.61	376	1.98
	Nematocarcinus africanus	6.98	2620	1.82
	Malacocephalus laevis	5.80	39	1.51
	Dibranchus atlanticus	5.49	361	1.43
	Chelidonichthys sp.	5.02	8	1.31
	Aristeus varidens, female	4.63	220	1.20
	Hymenocephalus italicus	4.47	784	1.16
	Pterothrissus belloci	4.39	24	1.14
	Coelorinchus coelorhinc. polli	3.69	86	0.96
	Helicolenus dactylopterus	3.53	16	0.92
	Parapenaeus longirostris,femal	3.37	337	0.88
	Lophiodes kempi	2.67	24	0.69
	Aristeus varidens, male	2.59	400	0.67
	Benthodesmus tenuis	2.51	125	0.65
	Gadella imberbis	1.80	55	0.47
	Laemonema laureysi	1.10	8	0.29
	Stomias boa boa	0.86	16	0.22
	Nezumia aequalis	0.39	24	0.10
	Epigonus sp.	0.39	8	0.10
	Bathynectes piperitus	0.31	16	0.08
	Symphurus sp.	0.24	8	0.06
	Etmopterus polli	0.24	8	0.06
	MYCTOPHIDAE	0.16	188	0.04
	NETTASTOMATIDAE	0.16	8	0.04
	Fishing gears	0.08	8	0.02
	Metal waste	0.00	0	0.00
	Total	384.59		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 110
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°46.96
start stop duration Lon E
13°3.58
TIME :09:02:37 09:32:44 30.1 (min) Purpose : 3
LOG : 1380.27 1381.80 1.5 Region : 4054
FDEPTH: 120 116 Gear cond.: 0
BDEPTH: 120 116 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.1 kn
Sorted : 0 Total catch: 178.65 Catch/hour: 355.88

SAMP	SPECIES	CATCH/HOUR weight	number	% OF TOT. C
	Dentex angolensis	97.57	452	27.42
180	Selene dorsalis	81.63	149	22.94
	Trachurus trecae	35.66	141	10.02
237	Lepidotrigla cadmani	29.72	195	8.35
	Umbrina canariensis	24.74	72	6.95
238	Pterothrissus belloci	20.76	120	5.83
	Brotula barbata	15.30	22	4.30
	Scorpaena normani	13.67	147	3.84
	Zeus faber	7.51	22	2.11
	Sepia orbignyana	5.04	20	1.42
	Pteroscion peli	3.84	14	1.08
	Octopus vulgaris	3.47	6	0.97
	Fistularia petimba	2.69	4	0.76
	Citharus linguatula	2.59	74	0.73
	Pontinus kuhlii	2.45	16	0.69
	Dentex barnardi	2.13	4	0.60
	Zenopsis conchifer	1.12	10	0.31
	Bembrops heterurus	1.02	16	0.29
	Dentex congoensis	1.00	16	0.28
	Illex coindetii	0.70	12	0.20
	Spicara alta	0.64	4	0.18
	Unidentified fish	0.44	2	0.12
	Scorpaena stephanica	0.40	2	0.11
	G A S T R O P O D S	0.40	64	0.11
	Trichiurus lepturus	0.34	6	0.10
	Saurida brasiliensis	0.30	40	0.08
	Chaetodon hoefleri	0.28	2	0.08
	Dibranchus atlanticus	0.28	18	0.08
	Dicologoglossa hexophthalma	0.16	4	0.04
	Blennius normani	0.06	2	0.02
	Total	355.88		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 111
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°36.58
start stop duration Lon E
13°18.79
TIME :11:46:23 12:16:23 30.0 (min) Purpose : 3
LOG : 1401.93 1403.41 1.5 Region : 4054
FDEPTH: 33 32 Gear cond.: 0
BDEPTH: 33 32 Validity : 0
Towing dir: 0° Wire out : 120 m Speed : 3.0 kn
Sorted : 40 Total catch: 4077.37 Catch/hour: 8157.46

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Sardinella aurita	7880.63	156804	96.61
181	Sepia orbignyana	113.16	202	1.39
	Brachydeuterus auritus	62.64	5658	0.77
	Citharus linguatula	34.35	202	0.42
	Trachurus trecae	32.33	2223	0.40
	Selene dorsalis	18.19	606	0.22
	Chloroscombrus chrysurus	14.14	404	0.17
	Penaeus notialis	2.02	202	0.02
	Total	8157.46		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 112
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°34.82
start stop duration Lon E
13°15.04
TIME :13:10:04 13:41:19 31.3 (min) Purpose : 3
LOG : 1408.17 1409.73 1.6 Region : 4054
FDEPTH: 54 56 Gear cond.: 0
BDEPTH: 54 56 Validity : 0
Towing dir: 0° Wire out : 147 m Speed : 3.0 kn
Sorted : 136 Total catch: 1666.37 Catch/hour: 3199.43

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	2091.40	33469	65.37
183	Trachurus trecae	220.15	7809	6.88
184	Chloroscombrus chrysurus	140.41	1801	4.39
	Dasyatis marmorata	103.95	23	3.25
	Pomadasys incisus	99.26	588	3.10
186	Galeoides decadactylus	85.84	399	2.68
	Argyrosomus hololepidotus	59.27	48	1.85
	Selene dorsalis	55.51	1340	1.73
	Rhinobatos albomaculatus	49.63	23	1.55
	Pagellus bellottii	45.16	659	1.41
185	Torpedo torpedo	38.34	94	1.20
	Alectis alexandrinus	37.38	48	1.17
	Sepia orbignyana	36.21	94	1.13
	Raja miraletus	34.81	117	1.09
	Zeus faber	25.88	71	0.81
	Dentex barnardi	18.59	282	0.58
	Lagocephalus laevigatus	13.63	23	0.43
	Stromateus fiatola	13.40	23	0.42
	Citharus linguatula	7.76	541	0.24
	Sphyraena sphyraena	7.30	23	0.23
	Pseudupeneus prayensis	5.64	71	0.18
	Grammoplites gruveli	3.07	165	0.10
	Alloteuthis africana	2.82	188	0.09
	Serranus accraensis	1.65	71	0.05
	Umbrina canariensis	1.65	23	0.05
	GOBIIDAE	0.71	188	0.02
	Total	3199.43		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 113
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°37.82
start stop duration Lon E
13°3.99
TIME :15:19:51 15:50:50 31.0 (min) Purpose : 3
LOG : 1422.15 1423.77 1.6 Region : 4054
FDEPTH: 114 113 Gear cond.: 0
BDEPTH: 114 113 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.1 kn
Sorted : 63 Total catch: 241.41 Catch/hour: 467.55

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	187.55	6995	40.11
188	Brachydeuterus auritus	106.33	610	22.74
189	Dentex angolensis	69.10	567	14.78
187	Sepia orbignyana	43.81	29	9.37
	Selene dorsalis	31.94	48	6.83
	Brotula barbata	8.72	12	1.86
	Stromateus fiatola	5.93	6	1.27
	Pterothrissus belloci	4.47	17	0.96
	Lepidotrigla cadmani	4.07	35	0.87
	Citharus linguatula	1.10	41	0.24
	Pontinus accraensis	0.93	6	0.20
	Chaetodon hoefleri	0.87	6	0.19
	Zeus faber	0.76	6	0.16
	Scorpaena normani	0.64	6	0.14
	Pagellus bellottii	0.52	12	0.11
	Boops boops	0.35	6	0.07
	Spicara alta	0.17	6	0.04
	Physiculus huloti	0.17	6	0.04
	Arnoglossus imperialis	0.12	6	0.02
	Plastic bags	0.00	2	0.00
	Total	467.55		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 114
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°35.31
start stop duration Lon E
13°0.97
TIME :16:41:46 17:12:30 30.7 (min) Purpose : 3
LOG : 1428.06 1429.65 1.6 Region : 4054
FDEPTH: 149 146 Gear cond.: 0
BDEPTH: 149 146 Validity : 0
Towing dir: 0° Wire out : 360 m Speed : 3.1 kn
Sorted : 77 Total catch: 230.79 Catch/hour: 450.62

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Synagrops microlepis	129.22	14286	28.68
	Trichiurus lepturus	84.23	644	18.69
	Pterothrissus belloci	53.42	633	11.85
	Dentex angolensis	50.73	182	11.26
190	Brotula barbata	42.41	76	9.41
	Lepidotrigla cadmani	18.86	53	4.19
	Bembrops greyi	15.58	258	3.46
	Illex coindetii	9.78	141	2.17
	Parapenaeus longirostris	8.32	1646	1.85
	Uranoscopus polli	7.50	47	1.66
	Citharus linguatula	6.79	164	1.51
	Zeus faber	6.33	18	1.40
	Torpedo torpedo	5.74	6	1.27
	Pontinus kuhlii	3.92	41	0.87
	Monolene microstoma	3.69	234	0.82
	Sepia orbignyana	2.46	18	0.55
	Unidentified fish	1.35	6	0.30
	GOBIIDAE	0.29	23	0.06
	Total	450.62		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 115
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°36.35
start stop duration Lon E
12°54.12
TIME :18:49:14 19:19:26 30.2 (min) Purpose : 3
LOG : 1439.74 1441.24 1.5 Region : 4054
FDEPTH: 415 409 Gear cond.: 0
BDEPTH: 415 409 Validity : 0
Towing dir: 0° Wire out : 920 m Speed : 3.0 kn
Sorted : 39 Total catch: 347.67 Catch/hour: 690.51

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	419.34	102673	60.73
	Merluccius polli	199.48	268	28.89
191	Chaceon maritae	14.12	18	2.05
	Hymenocephalus italicus	11.44	1537	1.66
	Chaunax pictus	8.94	715	1.29
	Etmopterus polli	8.04	375	1.16
	Laemonema laureysi	6.26	107	0.91
	Benthodesmus tenuis	5.54	197	0.80
	Dibranchus atlanticus	4.65	465	0.67
	Halosaurus ovenii	4.29	340	0.62
	Aristeus varidens, female	3.75	375	0.54
	Nezumia aequalis	1.43	89	0.21
	Chlorophthalmus atlanticus	1.25	18	0.18
	Gadella imberbis	1.07	36	0.16
	MYCTOPHIDAE	0.71	626	0.10
	Gonostoma elongatum	0.18	18	0.03
	Total	690.51		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 116
DATE :19/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°35.38
start stop duration Lon E
12°49.65
TIME :21:03:44 21:33:58 30.2 (min) Purpose : 3
LOG : 1448.53 1449.99 1.5 Region : 4054
FDEPTH: 699 699 Gear cond.: 0
BDEPTH: 699 699 Validity : 0
Towing dir: 0° Wire out : 1400 m Speed : 2.9 kn
Sorted : 30 Total catch: 347.92 Catch/hour: 690.55

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	294.86	59805	42.70
	Triplophos hemingi	63.59	7217	9.21
	Lamprogrammus exutus	59.54	429	8.62
	Chaceon maritae, male	57.40	95	8.31
	L O B S T E R S	54.30	3096	7.86
	Stomias boa boa	38.35	905	5.55
	Nezumia aequalis	18.58	500	2.69
	Bathyuroconger vicinus	15.72	667	2.28
	Yarrella blackfordi	15.24	429	2.21
	Dicrolene sp.	11.19	1215	1.62
	Hoplostethus cadenati	10.96	429	1.59
	Xenodermichthys copei	6.67	453	0.97
	Halosaurus ovenii	6.43	119	0.93
	Malacocephalus occidentalis	6.19	48	0.90
	Aristeus varidens	5.72	286	0.83
	Dibranchus atlanticus	4.53	405	0.66
	Talismania sp.	4.53	238	0.66
	Chaceon maritae, female	3.81	24	0.55
	Plesiopenaeus edwardsianus	2.62	119	0.38
	Merluccius polli	1.98	2	0.29
	Gonostoma elongatum	1.91	71	0.28
	Selachophidium guentheri	1.43	24	0.21
	Etmopterus polli	1.19	24	0.17
	Melanonus zugmayeri	0.95	24	0.14
	Lampadena sp.	0.95	48	0.14
	Glyphus marsupialis	0.95	95	0.14
	Dicrolene intronigra	0.48	48	0.07
	PARALEPIDIDAE	0.48	24	0.07
	Total	690.55		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 117
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°27.02
start stop duration Lon E
12°45.86
TIME :00:14:24 00:44:55 30.5 (min) Purpose : 3
LOG : 1458.87 1460.39 1.5 Region : 4054
FDEPTH: 721 718 Gear cond.: 0
BDEPTH: 721 718 Validity : 0
Towing dir: 0° Wire out : 1600 m Speed : 3.0 kn
Sorted : 30 Total catch: 305.41 Catch/hour: 600.41

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Yarrella blackfordi	169.54	6574	28.24
Nematocarcinus africanus	66.17	14424	11.02
L O B S T E R S	65.74	6488	10.95
Hoplostethus cadenati	50.39	1276	8.39
Anemones, pink	48.87	108	8.14
Nezumia aequalis	47.14	1038	7.85
Lamprogrammus exutus	36.11	216	6.01
Triplophos hemingi	30.71	3698	5.11
Bathyuroconger vicinus	12.98	303	2.16
Talismania longifilis	10.38	173	1.73
Stomias boa boa	8.00	151	1.33
Xenodermichthys copei	6.49	476	1.08
Dicrolene sp.	5.62	433	0.94
Munida sp.	5.29	6	0.88
NETTASTOMATIDAE	4.97	22	0.83
Todaropsis eblanae	4.97	22	0.83
Munida sp.	3.46	2227	0.58
Aristeus varidens, female	3.46	130	0.58
Dibranchus atlanticus	3.03	216	0.50
Halosaurus ovenii	2.38	43	0.40
Ebinania costaecanarie	2.38	22	0.40
Raja confundens	2.38	87	0.40
PARAPAGURIDAE *	2.16	22	0.36
Lophiodes kempi	1.73	22	0.29
Phrynichthys wedli	1.73	108	0.29
Etmopterus polli	1.30	65	0.22
Gonostoma elongatum	0.87	43	0.14
Dicrolene intronigra	0.65	87	0.11
Plesiopenaeus edwardsianus	0.43	65	0.07
Starfish	0.43	43	0.07
S H R I M P S	0.22	151	0.04
Bathypterois phenax *	0.22	22	0.04
MYCTOPHIDAE	0.22	22	0.04
Total	600.41		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 118
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°26.94
start stop duration Lon E
12°47.62
TIME :02:25:04 02:57:45 32.7 (min) Purpose : 3
LOG : 1466.01 1467.65 1.6 Region : 4054
FDEPTH: 525 534 Gear cond.: 0
BDEPTH: 525 534 Validity : 0
Towing dir: 0° Wire out : 1250 m Speed : 3.0 kn
Sorted : 24 Total catch: 243.63 Catch/hour: 447.30

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Aristeus varidens	288.98	63176	64.61
Lamprogrammus exutus	51.77	2497	11.57
Aristeus varidens, male	20.93	1854	4.68
Lophiodes kempi	12.12	18	2.71
Stomias boa boa	11.38	239	2.54
Triplophos hemingi	10.10	1267	2.26
L O B S T E R S	9.91	202	2.22
Hoplostethus cadenati	7.34	202	1.64
Yarrella blackfordi	4.77	165	1.07
Avocettina sp.	4.59	4186	1.03
Chaceon maritae, male	3.49	18	0.78
Xenodermichthys copei	3.49	294	0.78
Todaropsis eblanae	3.49	18	0.78
Benthodesmus tenuis	2.75	73	0.62
Raja confundens	2.39	55	0.53
Merluccius polli	1.89	2	0.42
Dibranchus atlanticus	1.84	147	0.41
Melanostomias sp.	1.84	37	0.41
Bathyuroconger vicinus	1.29	110	0.29
Nezumia aequalis	1.10	37	0.25
Gadella imberbis	0.73	18	0.16
Avocettina sp.	0.37	18	0.08
Phrynichthys wedli	0.37	37	0.08
Dicrolene intronigra	0.37	73	0.08
Total	447.30		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 119
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°27.33
start stop duration Lon E
12°53.21
TIME :04:33:01 05:03:24 30.4 (min) Purpose : 3
LOG : 1474.89 1476.37 1.5 Region : 4054
FDEPTH: 310 315 Gear cond.: 0
BDEPTH: 310 315 Validity : 0
Towing dir: 0° Wire out : 720 m Speed : 2.9 kn
Sorted : 34 Total catch: 382.42 Catch/hour: 754.78

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Hoplostethus cadenati	311.76	20538	41.31
Chlorophthalmus atlanticus	259.66	5775	34.40
Pontinus accraensis	40.38	369	5.35
Parapenaeus longirostris	39.30	4883	5.21
Laemonema laureysi	26.05	326	3.45
Bembrops greyi	20.41	499	2.70
Merluccius polli	16.11	128	2.13
192Hoplostethus atlanticus	13.03	22	1.73
Gadella imberbis	7.82	304	1.04
Pterothrissus belloci	4.78	43	0.63
Lophiodes kempi	4.16	12	0.55
Zenopsis conchifer	3.45	6	0.46
Bathynectes piperitus	3.26	87	0.43
Nezumia aequalis	2.17	43	0.29
Bathyuroconger braueri	1.58	43	0.21
Malacocephalus occidentalis	0.87	22	0.12
Total	754.78		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 120
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°20.03
start stop duration Lon E
13°6.60
TIME :12:26:48 12:56:58 30.2 (min) Purpose : 3
LOG : 1508.71 1510.19 1.5 Region : 4054
FDEPTH: 83 83 Gear cond.: 0
BDEPTH: 83 83 Validity : 0
Towing dir: 0° Wire out : 200 m Speed : 2.9 kn
Sorted : 136 Total catch: 135.52 Catch/hour: 269.51

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Trachurus trecae	97.89	6137	36.32
194Dentex angolensis	45.46	328	16.87
195Brachydeuterus auritus	33.37	221	12.38
193Sepia orbignyana	15.61	52	5.79
Citharus linguatula	14.00	324	5.19
Lagocephalus laevigatus	13.72	12	5.09
Selene dorsalis	11.97	117	4.44
Fistularia petimba	8.71	16	3.23
Galeoides decadactylus	3.66	14	1.36
Brotula barbata	3.38	16	1.25
Trichiurus lepturus	3.22	58	1.20
Pterothrissus belloci	2.88	44	1.07
Pagellus bellottii	2.19	28	0.81
196Saurida brasiliensis	1.69	511	0.63
Chelidonichthys capensis	1.63	6	0.61
Branchiostegus semifasciatus *	1.47	2	0.55
Loligo vulgaris	1.31	575	0.49
Pseudotolithus senegalensis	1.25	2	0.46
Grammoplites gruveli	0.80	10	0.30
Zeus faber	0.68	4	0.25
Microchirus sp.	0.66	14	0.24
Octopus vulgaris	0.56	2	0.21
Dicologoglossa cuneata	0.54	4	0.20
Sardinella aurita	0.54	60	0.20
197Uranoscopus albesca	0.50	4	0.18
GOBIIDAE	0.46	107	0.17
Antennarius occidentalis	0.44	10	0.16
Bembrops heterurus	0.28	6	0.10
Sea cucumber	0.16	2	0.06
Boops boops	0.16	6	0.06
Peristedion cataphractum	0.12	10	0.04
Priacanthus arenatus	0.10	6	0.04
Arnoglossus imperialis	0.08	16	0.03
B I V A L V E S	0.02	2	0.01
Ephippion guttifer	0.02	2	0.01
Total	269.51		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 121
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°18.42
start stop duration Lon E
13°9.31
TIME :13:52:59 14:23:20 30.3 (min) Purpose : 3
LOG : 1516.15 1517.69 1.5 Region : 4054
FDEPTH: 66 63 Gear cond.: 0
BDEPTH: 66 63 Validity : 0
Towing dir: 0° Wire out : 170 m Speed : 3.0 kn
Sorted : 133 Total catch: 132.90 Catch/hour: 262.82

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	100.94	904	38.40
198	Pomadasys incisus	39.43	206	15.00
202	Dentex angolensis	33.50	227	12.75
200	Trachurus trecae	29.19	1570	11.11
201	Galeoides decadactylus	13.41	36	5.10
	Torpedo torpedo	7.57	36	2.88
	Selene dorsalis	5.08	69	1.93
	Zeus faber	4.49	6	1.71
	Umbrina canariensis	4.35	40	1.66
203	Fistularia petimba	4.31	20	1.64
	Pagellus bellottii	3.46	45	1.32
199	Grammoplites gruveli	2.02	30	0.77
	Pseudupeneus prayensis	1.94	16	0.74
	Sepia orbignyana	1.70	6	0.65
	Pentheroscion mbizi	1.68	6	0.64
	Lagocephalus laevigatus	1.68	2	0.64
	Raja miraletus	1.64	2	0.62
	Epinephelus aeneus	1.56	2	0.59
	Trichiurus lepturus	1.56	10	0.59
	Citharus linguatula	1.48	44	0.56
	Chaetodon hoefleri	0.87	8	0.33
	GOBIIDAE	0.32	79	0.12
	Scomber japonicus	0.32	2	0.12
	Dentex barnardi	0.20	4	0.08
	Arnoglossus imperialis	0.12	10	0.05
	Total	262.82		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 122
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°15.91
start stop duration Lon E
13°11.94
TIME :15:07:32 15:37:34 30.0 (min) Purpose : 3
LOG : 1521.70 1523.26 1.6 Region : 4054
FDEPTH: 47 49 Gear cond.: 0
BDEPTH: 47 49 Validity : 0
Towing dir: 0° Wire out : 150 m Speed : 3.1 kn
Sorted : 98 Total catch: 1462.35 Catch/hour: 2921.78

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	2027.17	60659	69.38
204	Trachurus trecae	318.88	7163	10.91
205	Galeoides decadactylus	106.69	779	3.65
	Chloroscombrus chrysurus	103.40	1139	3.54
	Selene dorsalis	63.24	2038	2.16
	Pseudotolithus typus	37.46	150	1.28
	Pagellus bellottii	36.26	210	1.24
	Pomadasys jubelini	35.36	450	1.21
	Sepia orbignyana	35.06	60	1.20
	Trichiurus lepturus	33.57	689	1.15
	Stromateus fiatola	29.07	30	0.99
	Atractoscion aequidens	22.78	30	0.78
	Raja miraletus	21.28	30	0.73
	Sardinella aurita	18.28	150	0.63
	Sphyraena sphyraena	13.49	120	0.46
	Pseudupeneus prayensis	5.09	120	0.17
	Citharus linguatula	4.80	210	0.16
	Dentex barnardi	4.20	90	0.14
	GOBIIDAE	2.40	1109	0.08
	Grammoplites gruveli	1.50	60	0.05
	Loligo vulgaris	0.60	240	0.02
	Soft corals	0.60	599	0.02
	Ilisha africana	0.60	30	0.02
	Total	2921.78		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 123
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°15.78
start stop duration Lon E
13°16.97
TIME :16:29:36 16:59:39 30.1 (min) Purpose : 3
LOG : 1529.18 1530.97 1.8 Region : 4054
FDEPTH: 24 23 Gear cond.: 0
BDEPTH: 24 23 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.6 kn
Sorted : 138 Total catch: 670.29 Catch/hour: 1338.35

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Ilisha africana	278.90	15842	20.84
	Brachydeuterus auritus	164.43	5976	12.29
207	Pteroscion peli	153.64	3702	11.48
	Drepane africana	132.44	172	9.90
	Galeoides decadactylus	131.72	395	9.84
	Pseudotolithus typus	115.47	234	8.63
	Pomadasys jubelini	71.16	359	5.32
206	Stromateus fiatola	45.74	108	3.42
	Torpedo marmorata	41.43	46	3.10
	Gymnura altavela	40.01	4	2.99
	Raja miraletus	34.42	64	2.57
	Cynoglossus canariensis	21.56	28	1.61
	Sphyraena sphyraena	21.20	82	1.58
	Trichiurus lepturus	19.59	162	1.46
	Dicologoglossa cuneata	11.32	208	0.85
	Chloroscombrus chrysurus	10.34	108	0.77
	Sardinella maderensis	9.34	359	0.70
208	Pomadasys rogeri	8.91	46	0.67
	Selene dorsalis	7.29	485	0.54
	Penaeus notialis	5.75	136	0.43
	Trachurus trecae	5.49	72	0.41
	Sepia orbignyana	3.05	10	0.23
	Pomadasys incisus	2.52	18	0.19
	Eucinostomus melanopterus	1.72	28	0.13
	Pentanemus quinquarius	0.90	10	0.07
	Total	1338.35		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 124
DATE :20/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°17.33
start stop duration Lon E
12°41.40
TIME :21:21:40 21:52:02 30.4 (min) Purpose : 3
LOG : 1567.41 1568.88 1.5 Region : 4054
FDEPTH: 701 704 Gear cond.: 0
BDEPTH: 701 704 Validity : 0
Towing dir: 0° Wire out : 1400 m Speed : 2.9 kn
Sorted : 30 Total catch: 338.07 Catch/hour: 667.90

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	195.59	38357	29.28
	Triplophos hemingi	127.13	14213	19.03
	Lamprogrammus exutus	88.23	500	13.21
	L O B S T E R S	44.99	2043	6.74
	Yarrella blackfordi	39.99	1021	5.99
	Xenodermichthys copei	34.77	2521	5.21
	Stomias boa boa	23.47	413	3.51
	Melanostomias sp.	22.38	43	3.35
	Merluccius polli	19.48	18	2.92
209	Anemones, pink	13.04	22	1.95
	Nezumia aequalis	12.82	261	1.92
	Hoplostethus cadenati	11.95	304	1.79
	Raja miraletus	11.08	22	1.66
	Dicrolene intronigra	5.87	348	0.88
	Halosaurus ovenii	4.56	65	0.68
	Bathyuroconger vicinus	3.91	130	0.59
	Aristeus varidens, female	3.04	130	0.46
	Chaceon maritae, male	2.69	4	0.40
	Chaceon maritae, female	0.73	2	0.11
	Raja confundens	0.65	22	0.10
	Dibranchus atlanticus	0.65	22	0.10
	Phrynichthys wedli	0.43	22	0.07
	Coelorinchus coelorhincus	0.43	22	0.07
	Total	667.90		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 125
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°14.31
start stop duration Lon E
12°40.75
TIME :00:08:28 00:38:31 30.1 (min) Purpose : 3
LOG : 1576.49 1578.02 1.5 Region : 4054
FDEPTH: 611 609 Gear cond.: 0
BDEPTH: 611 609 Validity : 0
Towing dir: 0° Wire out : 1340 m Speed : 3.1 kn
Sorted : 0 Total catch: 185.33 Catch/hour: 370.04

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	237.04	46612	64.06
	Lamprogrammus exutus	37.04	335	10.01
	Hoplostethus cadenati	15.37	433	4.15
	Triplophos hemingi	15.09	1859	4.08
	Stomias boa boa	14.54	252	3.93
	Aristeus varidens	10.76	713	2.91
	L O B S T E R S	10.62	1034	2.87
	Yarrella blackfordi	8.11	210	2.19
	Todaropsis eblanae	3.21	14	0.87
	Xenodermichthys copei	2.52	140	0.68
	Dicrolene intronigra	2.10	280	0.57
	Trachyrincus scabrus	1.82	14	0.49
	Merluccius polli	1.62	2	0.44
	CARIDEA	1.54	98	0.42
	Nezumia aequalis	1.40	182	0.38
	Ectreposebastes imus	1.40	14	0.38
	GONOSTOMATIDAE	1.26	70	0.34
	Opisthoteuthis agassizi	1.12	14	0.30
	Bathyuroconger vicinus	0.98	42	0.26
	Dicrolene sp.	0.70	140	0.19
	Lampadena sp.	0.56	14	0.15
	J E L L Y F I S H	0.42	14	0.11
	Ebinania costaecanarie	0.28	14	0.08
	Melanostomias sp.	0.28	14	0.08
	Dibranchus atlanticus	0.14	14	0.04
	MYCTOPHIDAE	0.14	210	0.04
	Total	370.04		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 126
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°13.68
start stop duration Lon E
12°43.35
TIME :02:02:39 02:32:42 30.1 (min) Purpose : 3
LOG : 1582.67 1584.23 1.6 Region : 4054
FDEPTH: 421 420 Gear cond.: 0
BDEPTH: 421 420 Validity : 0
Towing dir: 0° Wire out : 1000 m Speed : 3.1 kn
Sorted : 22 Total catch: 262.94 Catch/hour: 525.00

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	243.11	57552	46.31
	Merluccius polli	170.24	409	32.43
210	Chaunax pictus	38.98	1118	7.42
	Benthodesmus tenuis	34.82	1182	6.63
	Hymenocephalus italicus	9.90	847	1.89
	Stomias boa boa	5.91	112	1.13
	Dibranchus atlanticus	3.83	335	0.73
	Aristeus varidens	3.19	288	0.61
	B I V A L V E S	2.72	16	0.52
	Laemonema laureysi	2.56	32	0.49
	L O B S T E R S	1.76	160	0.33
	Gadella imberbis	1.60	80	0.30
	Halosaurus ovenii	1.60	96	0.30
	Ancistrocheirus lesueuri	1.44	16	0.27
	Bathynectes piperitus	0.80	16	0.15
	Triplophos hemingi	0.48	48	0.09
	Etmopterus polli	0.32	16	0.06
	Nezumia aequalis	0.32	48	0.06
	Bathyuroconger vicinus	0.32	16	0.06
	Ariomma bondi	0.32	32	0.06
	Ectreposebastes imus	0.32	32	0.06
	MYCTOPHIDAE	0.32	192	0.06
	Avocettina sp.	0.16	16	0.03
	Total	525.00		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 127
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°9.66
start stop duration Lon E
12°48.63
TIME :05:21:40 05:52:08 30.5 (min) Purpose : 3
LOG : 1599.88 1601.50 1.6 Region : 4054
FDEPTH: 138 139 Gear cond.: 0
BDEPTH: 138 139 Validity : 0
Towing dir: 0° Wire out : 380 m Speed : 3.2 kn
Sorted : 54 Total catch: 54.48 Catch/hour: 107.28

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trichiurus lepturus	36.04	47	33.59
	Dentex angolensis	24.61	134	22.94
211	Brotula barbata	11.70	14	10.90
	Pterothrissus belloci	7.31	49	6.81
	Illex coindetii	5.42	79	5.05
	Uranoscopus polli	5.38	51	5.01
	Citharus linguatula	3.52	116	3.29
	Raja alba	3.35	2	3.12
	Lophiodes kempi	2.60	2	2.42
	Dibranchus atlanticus	1.83	148	1.71
	Octopus vulgaris	1.48	4	1.38
	Sepia orbignyana	1.26	10	1.17
	Monolene microstoma	1.16	83	1.08
	Microchirus sp.	0.28	8	0.26
	G A S T R O P O D S	0.28	28	0.26
	Spicara alta	0.22	2	0.20
	Synodus sp.	0.22	2	0.20
	Lepidotrigla cadmani	0.20	6	0.18
	Dentex congoensis	0.20	4	0.18
	Serranus africana	0.12	4	0.11
	Peristedion cataphractum	0.10	2	0.09
	Sea urchin	0.04	2	0.04
	Total	107.28		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 128
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°9.49
start stop duration Lon E
12°54.62
TIME :07:21:58 07:51:06 29.1 (min) Purpose : 3
LOG : 1610.56 1612.13 1.6 Region : 4054
FDEPTH: 116 115 Gear cond.: 0
BDEPTH: 116 115 Validity : 0
Towing dir: 0° Wire out : 290 m Speed : 3.2 kn
Sorted : 66 Total catch: 66.27 Catch/hour: 136.50

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex angolensis	77.90	371	57.07
212	Trichiurus lepturus	15.45	25	11.32
	Lepidotrigla cadmani	11.04	95	8.09
	Lagocephalus laevigatus	6.67	6	4.89
	Zeus faber	6.10	21	4.47
	Brotula barbata	3.65	2	2.67
	Octopus vulgaris	2.84	2	2.08
	Trachurus trecae	2.60	103	1.90
213	Citharus linguatula	2.10	54	1.54
	Dentex barnardi	1.59	6	1.16
	Raja miraletus	1.54	2	1.13
	Pagellus bellottii	1.15	8	0.85
	Chaetodon hoefleri	1.13	8	0.83
	Dentex congoensis	0.82	16	0.60
	Sepia orbignyana	0.66	6	0.48
	Todaropsis eblanae	0.60	4	0.44
	Dibranchus atlanticus	0.33	27	0.24
	G A S T R O P O D S	0.21	51	0.15
	Arnoglossus imperialis	0.06	4	0.05
	Monolene microstoma	0.06	4	0.05
	Total	136.50		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 129
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°7.46
start stop duration Lon E
12°59.66
TIME :09:11:25 09:42:20 30.9 (min) Purpose : 3
LOG : 1620.39 1622.05 1.7 Region : 4054
FDEPTH: 93 94 Gear cond.: 0
BDEPTH: 93 94 Validity : 0
Towing dir: 0° Wire out : 240 m Speed : 3.2 kn
Sorted : 84 Total catch: 83.84 Catch/hour: 162.69

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Decapterus rhonchus	99.51	87	61.16
	Dentex angolensis	23.32	161	14.34
214	Sepia orbignyana	6.85	14	4.21
	Zeus faber	6.05	12	3.72
	Octopus vulgaris	5.45	10	3.35
	Lepidotrigla cadmani	5.16	33	3.17
	Raja miraletus	3.75	6	2.30
	Dentex barnardi	3.51	14	2.16
	Fistularia petimba	2.31	8	1.42
	Uranoscopus polli	1.96	4	1.20
	Citharus linguatula	1.90	37	1.17
	Pagellus bellottii	1.07	10	0.66
	Chaetodon hoefleri	0.56	4	0.35
	Torpedo torpedo	0.49	4	0.30
	Brachydeuterus auritus	0.31	2	0.19
	Brotula barbata	0.25	2	0.16
	Trachurus trecae	0.23	8	0.14
	Total	162.69		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 130
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°3.95
start stop duration Lon E
13°3.96
TIME :10:44:47 11:14:56 30.2 (min) Purpose : 3
LOG : 1628.84 1630.46 1.6 Region : 4054
FDEPTH: 64 65 Gear cond.: 0
BDEPTH: 64 65 Validity : 0
Towing dir: 0° Wire out : 180 m Speed : 3.2 kn
Sorted : 144 Total catch: 717.45 Catch/hour: 1427.76

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pomadasys jubelini	397.11	1124	27.81
217	Brachydeuterus auritus	382.49	4657	26.79
215	Trachurus trecae	228.46	10637	16.00
216	Galeoides decadactylus	177.51	468	12.43
	Stromateus fiatola	61.79	90	4.33
	Decapterus rhonchus	33.43	129	2.34
	Dentex angolensis	28.06	169	1.97
218	Sardinella aurita	26.77	3353	1.87
230	Raja miraletus	18.71	40	1.31
	Pagellus bellottii	17.41	149	1.22
219	Torpedo torpedo	8.76	50	0.61
	Selene dorsalis	8.66	100	0.61
	Pomadasys incisus	8.36	40	0.59
	Alectis alexandrinus	8.16	10	0.57
	Dentex barnardi	7.36	60	0.52
	Chloroscombrus chrysurus	3.38	20	0.24
	Pseudupeneus prayensis	2.69	40	0.19
	Trichiurus lepturus	2.29	10	0.16
	Citharus linguatula	1.59	80	0.11
	Grammoplites gruveli	1.09	20	0.08
	Saurida brasiliensis	0.90	249	0.06
	Brotula barbata	0.90	10	0.06
	Sepia orbignyana	0.80	10	0.06
	Fistularia petimba	0.70	10	0.05
	Priacanthus arenatus	0.40	10	0.03
	Total	1427.76		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 131
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°4.54
start stop duration Lon E
13°7.89
TIME :12:24:13 12:54:36 30.4 (min) Purpose : 3
LOG : 1636.20 1637.59 1.4 Region : 4054
FDEPTH: 43 44 Gear cond.: 0
BDEPTH: 43 44 Validity : 0
Towing dir: 0° Wire out : 140 m Speed : 2.7 kn
Sorted : 66 Total catch: 327.50 Catch/hour: 646.81

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	320.14	46570	49.50
231	Galeoides decadactylus	141.80	2054	21.92
	Pomadasys jubelini	54.61	138	8.44
233	Alectis alexandrinus	27.55	39	4.26
	Pteroscion peli	27.35	1847	4.23
	Raja miraletus	13.73	30	2.12
	Stromateus fiatola	12.94	20	2.00
	Dasyatis margarita	12.74	20	1.97
	Trachurus trecae	9.58	484	1.48
232	Sardinella aurita	8.20	1294	1.27
234	Sepia orbignyana	4.94	20	0.76
	Cynoglossus senegalensis	3.65	59	0.56
	Selene dorsalis	2.17	30	0.34
	Engraulis encrasicolus	1.78	257	0.27
	Grammoplites gruveli	1.58	20	0.24
	Citharus linguatula	1.38	39	0.21
	Ilisha africana	0.89	10	0.14
	Pagellus bellottii	0.89	39	0.14
	Trichiurus lepturus	0.79	10	0.12
	GOBIIDAE	0.10	10	0.02
	Total	646.81		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 132
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°57.74
start stop duration Lon E
12°41.86
TIME :16:01:20 16:31:52 30.5 (min) Purpose : 3
LOG : 1664.15 1665.81 1.7 Region : 4054
FDEPTH: 213 217 Gear cond.: 0
BDEPTH: 213 217 Validity : 0
Towing dir: 0° Wire out : 500 m Speed : 3.3 kn
Sorted : 105 Total catch: 2704.72 Catch/hour: 5315.53

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Synagrops microlepis	4189.19	309512	78.81
	Merluccius polli	404.06	4848	7.60
235	Zenopsis conchifer	358.60	4445	6.75
	Chlorophthalmus atlanticus	317.20	18941	5.97
	Illex coindetii	23.74	405	0.45
	Bembrops heterurus	12.64	151	0.24
	Parapenaeus longirostris	8.08	1667	0.15
	Coelorinchus sp.	2.02	51	0.04
	Total	5315.53		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 133
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°46.94
start stop duration Lon E
12°30.92
TIME :18:29:18 18:59:30 30.2 (min) Purpose : 3
LOG : 1679.65 1681.08 1.4 Region : 4054
FDEPTH: 714 719 Gear cond.: 0
BDEPTH: 714 719 Validity : 0
Towing dir: 0° Wire out : 1440 m Speed : 2.8 kn
Sorted : 31 Total catch: 222.51 Catch/hour: 442.07

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	127.11	34101	28.75
	Anemones, pink	121.27	223	27.43
	Yarrella blackfordi	57.72	1154	13.06
	Stereomastis sp.	33.66	1238	7.61
	Nezumia aequalis	23.36	445	5.29
	Stomias boa boa	21.42	389	4.84
	Talismania longifilis	17.80	181	4.03
	Hoplostethus cadenati	11.40	250	2.58
	Chaceon maritae	6.91	16	1.56
	Todaropsis eblanae	5.42	42	1.23
	Dibranchus atlanticus	3.06	139	0.69
	Triplophos hemingi	2.78	348	0.63
	Zenopsis conchifer	2.09	70	0.47
	Dicrolene intronigra	1.95	139	0.44
	Halosaurus sp.	1.67	28	0.38
	Xenodermichthys copei	1.39	97	0.31
	Diastobranchus capensis	0.70	28	0.16
	Glyphus marsupialis	0.56	56	0.13
	MYCTOPHIDAE	0.28	320	0.06
	Neobythites analis	0.28	28	0.06
	Photonectes braueri	0.28	28	0.06
	CARAPIDAE	0.14	14	0.03
	Plesiopenaeus edwardsianus	0.14	83	0.03
	Gadella imberbis	0.14	14	0.03
	Parapagurus pilosimanus	0.14	14	0.03
	Sternoptyx diaphana	0.14	14	0.03
	Synchiropus sp.	0.14	14	0.03
	Epigonus denticulatus	0.14	14	0.03
	Total	442.07		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 134
DATE :21/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°42.00
start stop duration Lon E
12°31.71
TIME :20:51:13 21:16:44 25.5 (min) Purpose : 3
LOG : 1686.88 1688.17 1.3 Region : 4054
FDEPTH: 357 361 Gear cond.: 0
BDEPTH: 357 361 Validity : 0
Towing dir: 0° Wire out : 820 m Speed : 3.0 kn
Sorted : 0 Total catch: 157.10 Catch/hour: 369.36

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	144.83	42414	39.21
	Caranx crysos	64.89	47	17.57
	Merluccius polli	31.27	150	8.47
236	Hymenocephalus italicus	24.45	2974	6.62
	Chaunax pictus	20.81	3186	5.63
	Gadella imberbis	16.81	670	4.55
	Centrophorus granulosus	9.40	2	2.55
	Conger conger	8.70	94	2.36
	Hoplostethus cadenati	6.47	223	1.75
	Munidopsis sp.	6.23	1528	1.69
	Coelorinchus sp.	5.53	129	1.50
	Dibranchus atlanticus	4.58	482	1.24
	Lophius vaillanti	3.88	59	1.05
	Laemonema laureysi	3.64	364	0.99
	Aristeus varidens	2.70	282	0.73
	MYCTOPHIDAE	2.70	1916	0.73
	Epigonus telescopus	2.59	188	0.70
	Anemones, pink	2.47	12	0.67
	Stomias boa boa	1.88	35	0.51
	Stereomastis sp.	1.88	59	0.51
	Parapenaeus longirostris	1.76	165	0.48
	Chlorophthalmus atlanticus	1.06	12	0.29
	Setarches guentheri	0.82	82	0.22
	Total	369.36		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 135
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°41.70
start stop duration Lon E
12°32.85
TIME :07:11:13 07:42:32 31.3 (min) Purpose : 3
LOG : 1713.86 1715.34 1.5 Region : 4054
FDEPTH: 236 245 Gear cond.: 0
BDEPTH: 236 245 Validity : 0
Towing dir: 0° Wire out : 570 m Speed : 2.8 kn
Sorted : 66 Total catch: 836.87 Catch/hour: 1603.20

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Merluccius polli	687.57	10981	42.89
241	Synagrops microlepis	479.75	35393	29.92
	Chlorophthalmus atlanticus	311.03	14822	19.40
	Parapenaeus longirostris	41.25	7540	2.57
	Trichiurus lepturus	40.11	54	2.50
	Bembrops heterurus	9.66	354	0.60
	OPHICHTHIDAE	9.16	71	0.57
	Zenopsis conchifer	6.59	236	0.41
	Munidopsis sp.	6.36	2215	0.40
	Chascanopsetta lugubris	2.36	48	0.15
	MYCTOPHIDAE	1.88	1579	0.12
	Dibranchus atlanticus	1.65	259	0.10
	Parapenaeus longirostris	1.63	2	0.10
	Parasudis fraser-bruenneri	1.42	142	0.09
	Pontinus accraensis	0.71	71	0.04
	Bathyuroconger braueri	0.71	48	0.04
	Zenion hololepis	0.71	142	0.04
	Monolene microstoma	0.23	48	0.01
	Peristedion cataphractum	0.23	92	0.01
	Nezumia aequalis	0.23	23	0.01
	Total	1603.22		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 136
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°40.20
start stop duration Lon E
12°32.83
TIME :08:35:50 09:06:31 30.7 (min) Purpose : 3
LOG : 1717.54 1718.99 1.4 Region : 4054
FDEPTH: 175 185 Gear cond.: 0
BDEPTH: 175 185 Validity : 0
Towing dir: 0° Wire out : 430 m Speed : 2.8 kn
Sorted : 39 Total catch: 536.56 Catch/hour: 1048.65

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Synagrops microlepis	936.00	84250	89.26
	Zeus faber	24.90	76	2.37
	Trachurus trecae	24.55	25	2.34
251	Dentex angolensis	15.36	49	1.46
242	Brotula barbata	15.32	16	1.46
	Saurida brasiliensis	14.48	3227	1.38
	Uranoscopus cadenati	7.88	25	0.75
	Pterothrissus belloci	4.32	25	0.41
	Sepia orbignyana	3.56	25	0.34
	Lepidotrigla cadmani	2.29	25	0.22
	Total	1048.65		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 137
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°39.10
start stop duration Lon E
12°45.83
TIME :11:01:07 11:32:34 31.5 (min) Purpose : 3
LOG : 1733.46 1735.02 1.6 Region : 4054
FDEPTH: 86 87 Gear cond.: 0
BDEPTH: 86 87 Validity : 0
Towing dir: 0° Wire out : 230 m Speed : 3.0 kn
Sorted : 0 Total catch: 51.23 Catch/hour: 97.74

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Chelidonichthys gabonensis	20.22	145	20.69
	Zeus faber	15.07	11	15.42
	Sepia orbignyana	11.77	27	12.04
	Pomadasys peroteti	10.21	10	10.44
	Dentex congoensis	8.39	244	8.59
	Trichiurus lepturus	7.63	8	7.81
	Squatina oculata	4.20	2	4.29
	Dentex angolensis	4.14	76	4.24
250	Fistularia petimba	2.82	11	2.89
	Alloteuthis africana	2.69	828	2.75
	Raja miraletus	2.12	2	2.17
	Chelidonichthys capensis	2.00	10	2.05
	Citharus linguatula	1.68	65	1.72
	Lagocephalus laevigatus	0.97	2	1.00
	Saurida brasiliensis	0.95	244	0.98
	Trachurus trecae	0.65	29	0.66
	Pagellus bellottii	0.65	4	0.66
	Dentex barnardi	0.52	2	0.53
	Todaropsis eblanae	0.42	10	0.43
	Chaetodon hoefleri	0.38	2	0.39
	Illex coindetii	0.11	2	0.12
	Arnoglossus imperialis	0.11	10	0.12
	Spicara alta	0.02	2	0.02
	Total	97.74		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 138
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°36.29
start stop duration Lon E
12°47.71
TIME :12:24:37 12:54:38 30.0 (min) Purpose : 3
LOG : 1739.57 1741.18 1.6 Region : 4054
FDEPTH: 71 73 Gear cond.: 0
BDEPTH: 71 73 Validity : 0
Towing dir: 0° Wire out : 180 m Speed : 3.2 kn
Sorted : 0 Total catch: 63.16 Catch/hour: 126.24

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pagellus bellottii	59.48	937	47.12
243	Sepia orbignyana	21.75	52	17.23
	Raja miraletus	7.93	18	6.29
	Caranx crysos	7.87	8	6.24
	Rhinobatos albomaculatus	7.44	2	5.89
	Alloteuthis africana	7.14	3837	5.65
	Pseudupeneus prayensis	2.44	20	1.93
	Fistularia petimba	2.20	6	1.74
	Seriola carpenteri	2.12	2	1.68
	Trichiurus lepturus	1.52	2	1.20
	Chelidonichthys gabonensis	1.34	8	1.06
	Trachurus trecae	1.00	110	0.79
	Lagocephalus laevigatus	0.78	2	0.62
	Chelidonichthys capensis	0.78	10	0.62
	Brachydeuterus auritus	0.38	4	0.30
	Octopus vulgaris	0.34	2	0.27
	Chaetodon hoefleri	0.32	2	0.25
	Dentex barnardi	0.28	4	0.22
	Citharus linguatula	0.22	14	0.17
	Decapterus rhonchus	0.22	4	0.17
	Saurida brasiliensis	0.16	40	0.13
	Priacanthus arenatus	0.16	4	0.13
	Sardinella aurita	0.14	2	0.11
	Dentex angolensis	0.14	24	0.11
	Illex coindetii	0.10	2	0.08
	Total	126.24		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 139
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°35.38
start stop duration Lon E
12°56.38
TIME :14:10:59 14:33:29 22.5 (min) Purpose : 3
LOG : 1750.97 1752.33 1.4 Region : 4054
FDEPTH: 32 33 Gear cond.: 0
BDEPTH: 32 33 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.6 kn
Sorted : 165 Total catch: 164.88 Catch/hour: 439.48

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Chloroscombrus chrysurus	208.28	1410	47.39
	Pagellus bellottii	140.79	1037	32.04
244	Lagocephalus laevigatus	17.65	83	4.02
	Pseudupeneus prayensis	15.73	123	3.58
	Sepia orbignyana	15.03	29	3.42
	Aluterus heudelotii	10.50	11	2.39
	Raja miraletus	8.72	19	1.98
	Sphyraena sphyraena	6.80	11	1.55
	Pagrus caeruleostictus	4.45	19	1.01
	Caranx crysos	4.45	5	1.01
	Pomadasys peroteti	2.96	3	0.67
	Fistularia petimba	1.44	8	0.33
	Epinephelus aeneus	1.36	3	0.31
	Alloteuthis africana	0.53	141	0.12
	Dentex barnardi	0.37	5	0.08
	Decapterus punctatus	0.29	5	0.07
	Sardinella aurita	0.13	3	0.03
	Total	439.48		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 140
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°34.72
start stop duration Lon E
12°57.23
TIME :15:07:41 15:37:51 30.2 (min) Purpose : 3
LOG : 1755.35 1757.00 1.7 Region : 4054
FDEPTH: 26 27 Gear cond.: 0
BDEPTH: 26 27 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.3 kn
Sorted : 117 Total catch: 556.34 Catch/hour: 1106.78

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	285.90	5176	25.83
246	Sardinella aurita	167.49	17113	15.13
245	Galeoides decadactylus	119.42	1395	10.79
	Stromateus fiatola	111.35	171	10.06
	Chloroscombrus chrysurus	108.66	849	9.82
	Sepia orbignyana	88.81	153	8.02
	Sphyraena sphyraena	69.13	143	6.25
	Hemicaranx bicolor	41.64	143	3.76
	Ephippion guttifer	19.10	20	1.73
	Decapterus rhonchus	15.08	76	1.36
	Rhinobatos rhinobatos	14.70	20	1.33
	Selene dorsalis	12.99	324	1.17
	Pagellus bellottii	11.84	86	1.07
	Pomadasys rogeri	8.02	20	0.72
	Pomadasys incisus	6.68	48	0.60
	Lagocephalus laevigatus	6.58	38	0.59
	Pseudupeneus prayensis	4.87	76	0.44
	Epinephelus aeneus	3.44	10	0.31
	Sardinella maderensis	3.34	86	0.30
	Pomadasys peroteti	2.01	10	0.18
	Engraulis encrasicolus	1.81	277	0.16
	Pagrus caeruleostictus	1.53	10	0.14
	Trachurus trecae	1.05	76	0.10
	Caranx senegallus	0.86	10	0.08
	Eucinostomus melanopterus	0.48	10	0.04
	Total	1106.78		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 141
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°33.39
start stop duration Lon E
12°57.25
TIME :16:13:44 16:43:46 30.0 (min) Purpose : 3
LOG : 1758.86 1760.70 1.8 Region : 4054
FDEPTH: 23 22 Gear cond.: 0
BDEPTH: 23 22 Validity : 0
Towing dir: 0° Wire out : 125 m Speed : 3.7 kn
Sorted : 184 Total catch: 3240.95 Catch/hour: 6473.27

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	2153.49	44856	33.27
247	Galeoides decadactylus	1540.41	14658	23.80
	Sardinella aurita	1036.32	157240	16.01
	Stromateus fiatola	370.37	633	5.72
	Pomadasys jubelini	340.29	879	5.26
248	Chloroscombrus chrysurus	299.50	3128	4.63
	Pomadasys incisus	186.31	1019	2.88
249	Sphyraena guachancho	147.28	1091	2.28
	Engraulis encrasicolus	74.52	11249	1.15
	Ephippion guttifer	60.12	36	0.93
	Sardinella maderensis	50.27	3375	0.78
	Selene dorsalis	43.58	915	0.67
	Raja miraletus	42.88	70	0.66
	Caranx crysos	28.12	106	0.43
	Pseudotolithus typus	23.21	36	0.36
	Sepia orbignyana	20.73	36	0.32
	Ilisha africana	18.97	527	0.29
	Decapterus rhonchus	13.70	316	0.21
	Pagellus bellottii	7.03	36	0.11
	Pseudupeneus prayensis	6.67	106	0.10
	Dicologoglossa cuneata	3.87	70	0.06
	Epinephelus aeneus	3.16	36	0.05
	Trachurus trecae	2.46	176	0.04
	Total	6473.27		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 142
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°2.91
start stop duration Lon E
12°35.55
TIME :21:23:25 21:48:40 25.3 (min) Purpose : 3
LOG : 1797.78 1798.98 1.2 Region : 4054
FDEPTH: 730 723 Gear cond.: 0
BDEPTH: 730 723 Validity : 0
Towing dir: 0° Wire out : 1460 m Speed : 2.9 kn
Sorted : 0 Total catch: 82.51 Catch/hour: 195.99

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nezumia aequalis	33.92	691	17.31
	L O B S T E R S	28.93	869	14.76
	Anemones, pink	24.87	93	12.69
	Opisthoteuthis agassizi	20.52	7	10.47
	Trachyrincus scabrus	15.11	71	7.71
	Hoplostethus cadenati	9.12	78	4.65
	Yarrella blackfordi	8.91	86	4.54
	Talismania longifilis	8.12	43	4.14
	Stomias boa boa	6.20	100	3.16
	Chaceon maritae, male	5.27	21	2.69
	Octopoteuthis sicula	4.20	21	2.15
	Merluccius polli	3.87	5	1.98
	Lamprogrammus exutus	3.63	7	1.85
	Dibranchus atlanticus	3.35	135	1.71
	S H R I M P S	3.21	641	1.64
	Glyphus marsupialis	2.64	178	1.35
	Scymnodon obscurus	2.42	7	1.24
	Raja confundens	2.14	43	1.09
	Dicrolene intronigra	2.07	107	1.05
	Aristeus varidens	1.92	86	0.98
	ALEPOCEPHALIDAE	1.78	50	0.91
	Bathyuroconger vicinus	1.78	14	0.91
	Coelorinchus braueri	0.57	7	0.29
	Nephropsis atlantica	0.29	29	0.15
	Plesiopenaeus edwardsianus	0.29	50	0.15
	MYCTOPHIDAE	0.21	86	0.11
	GONOSTOMATIDAE	0.21	14	0.11
	Synaphobranchus kaupii	0.21	7	0.11
	Munida sp.	0.14	86	0.07
	Parapagurus pilosimanus	0.07	7	0.04
	Total	195.99		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 143
DATE :22/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°2.22
start stop duration Lon E
12°36.62
TIME :23:35:17 00:05:42 30.4 (min) Purpose : 3
LOG : 1802.90 1804.44 1.5 Region : 4054
FDEPTH: 639 638 Gear cond.: 0
BDEPTH: 639 638 Validity : 0
Towing dir: 0° Wire out : 1340 m Speed : 3.0 kn
Sorted : 0 Total catch: 137.98 Catch/hour: 272.15

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Xenodermichthys copei	163.31	32213	60.01
	Stomias boa boa	28.76	580	10.57
	Yarrella blackfordi	24.73	533	9.09
	L O B S T E R S	9.35	757	3.44
	Xenodermichthys copei	8.99	485	3.30
	Hoplostethus cadenati	6.04	201	2.22
	Chaceon maritae, male	5.33	24	1.96
	Triplophos hemingi	4.14	485	1.52
	Aristeus varidens	2.96	130	1.09
	Todaropsis eblanae	2.25	12	0.83
	Dibranchus atlanticus	2.13	95	0.78
	Illex coindetii	1.78	12	0.65
	Nezumia aequalis	1.78	47	0.65
	Merluccius polli	1.32	2	0.49
	Scymnodon obscurus	1.30	12	0.48
	Taonius pavo	1.30	24	0.48
	Dicrolene intronigra	1.07	189	0.39
	Glyphus marsupialis	1.07	71	0.39
	Laemonema laureysi	1.07	12	0.39
	Photonectes braueri	0.71	24	0.26
	Epigonus telescopus	0.59	47	0.22
	Nealotus tripes	0.47	24	0.17
	Lampadena sp.	0.36	12	0.13
	Bathypterois sp	0.24	12	0.09
	CENTROLOPHIDAE	0.24	12	0.09
	Gonostoma elongatum	0.24	24	0.09
	Bathyuroconger vicinus	0.24	12	0.09
	ALEPOCEPHALIDAE	0.12	12	0.04
	Nephropsis atlantica	0.12	12	0.04
	Arnoglossus sp.	0.12	12	0.04
	MYCTOPHIDAE	0.06	39	0.02
	Total	272.15		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 144
DATE :23/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
8°0.91
start stop duration Lon E
12°37.94
TIME :02:38:12 03:08:14 30.0 (min) Purpose : 3
LOG : 1809.11 1810.61 1.5 Region : 4054
FDEPTH: 518 518 Gear cond.: 0
BDEPTH: 518 518 Validity : 0
Towing dir: 0° Wire out : 1250 m Speed : 3.0 kn
Sorted : 0 Total catch: 157.26 Catch/hour: 314.21

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nematocarcinus africanus	226.09	32296	71.96
	Stomias boa boa	14.75	252	4.69
	Careproctus griseldea	12.23	12	3.89
	Octopoteuthis sicula	8.63	12	2.75
	Hoplostethus cadenati	8.39	264	2.67
	Aristeus varidens	7.07	563	2.25
	Scymnodon obscurus	5.75	60	1.83
	Merluccius polli	5.03	8	1.60
	L O B S T E R S	4.08	468	1.30
	Benthodesmus tenuis	3.96	108	1.26
	Yarrella blackfordi	2.40	72	0.76
	Gonostoma elongatum	2.40	132	0.76
	Chaunax pictus	2.28	24	0.72
	Caristius sp	1.68	12	0.53
	Triplophos hemingi	1.68	252	0.53
	Cubiceps 'pale tophead'	1.56	12	0.50
	Lophius vaillanti	1.20	12	0.38
	Dibranchus atlanticus	1.20	36	0.38
	Dicrolene intronigra	1.20	216	0.38
	Xenodermichthys copei	0.72	24	0.23
	Halosaurus ovenii	0.72	12	0.23
	Bathynectes piperitus	0.60	72	0.19
	MYCTOPHIDAE	0.48	180	0.15
	Glyphus marsupialis	0.12	12	0.04
	Total	314.21		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 145
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°32.38
start stop duration Lon E
12°15.52
TIME :00:50:54 01:20:03 29.2 (min) Purpose : 3
LOG : 1979.60 1980.93 1.3 Region : 4054
FDEPTH: 701 709 Gear cond.: 0
BDEPTH: 701 709 Validity : 0
Towing dir: 0° Wire out : 1600 m Speed : 2.7 kn
Sorted : 21 Total catch: 260.61 Catch/hour: 536.42

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Nezumia aequalis	151.90	3606	28.32
	Yarrella blackfordi	99.79	23597	18.60
	Lamprogrammus exutus	60.51	123	11.28
	L O B S T E R S	35.32	2099	6.58
	Hoplostethus cadenati	29.39	568	5.48
	Raja confundens	26.43	148	4.93
	Starfish red B	15.81	494	2.95
	Opisthoteuthis agassizi	14.33	25	2.67
	Dibranchus atlanticus	13.83	617	2.58
	J E L L Y F I S H	13.83	25	2.58
	Dicrolene sp.	10.87	692	2.03
	Anemones, pink	9.14	49	1.70
	Etmopterus polli	8.89	25	1.66
	Lithodes ferox	7.97	2	1.48
	Stomias boa boa	7.90	148	1.47
	Aristeus varidens	5.68	593	1.06
	Bathyuroconger vicinus	5.43	148	1.01
	Todaropsis eblanae	5.19	25	0.97
	GERYONIDAE	5.19	25	0.97
	Merluccius polli	4.08	4	0.76
	Talismania longifilis	1.98	25	0.37
	Lophius vaillanti	1.23	25	0.23
	Munidopsis sp.	0.74	222	0.14
	Dicrolene intronigra	0.49	25	0.09
	Munida sp.	0.25	74	0.05
	Xenodermichthys copei	0.25	25	0.05
	Total	536.42		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 146
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°27.46
start stop duration Lon E
12°19.26
TIME :03:39:23 04:10:35 31.2 (min) Purpose : 3
LOG : 1993.57 1995.11 1.5 Region : 4054
FDEPTH: 427 426 Gear cond.: 0
BDEPTH: 427 426 Validity : 0
Towing dir: 0° Wire out : 1000 m Speed : 3.0 kn
Sorted : 20 Total catch: 124.48 Catch/hour: 239.38

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Merluccius polli	83.62	271	34.93
252	Nematocarcinus africanus	65.54	27154	27.38
	Hymenocephalus italicus	17.00	2038	7.10
	Chaunax pictus	11.38	300	4.76
	Laemonema laureysi	9.08	185	3.79
	Dibranchus atlanticus	7.46	385	3.12
	Lophius vaillanti	6.92	31	2.89
	Aristeus varidens, female	6.62	754	2.76
	Aristeus varidens, male	5.92	592	2.47
	Etmopterus polli	5.38	600	2.25
	Pteroctopus tetracirrhus	3.15	8	1.32
	MYCTOPHIDAE	2.62	2400	1.09
	Munida sp.	2.54	1700	1.06
	Stereomastis sp.	2.31	285	0.96
	Coelorinchus coelorhincus	1.15	15	0.48
	Bathyuroconger braueri	1.15	31	0.48
	G A S T R O P O D S	1.08	15	0.45
	Raja alba	1.00	31	0.42
	Halosaurus ovenii	0.92	54	0.39
	Glyphus marsupialis	0.77	15	0.32
	Gadella imberbis	0.69	31	0.29
	Munidopsis sp.	0.62	200	0.26
	Solenocera africana	0.54	123	0.22
	Starfish	0.54	15	0.22
	NETTASTOMATIDAE	0.38	15	0.16
	Yarrella blackfordi	0.23	8	0.10
	Triplophos hemingi	0.23	38	0.10
	Histioteuthis miranda	0.15	8	0.06
	Zenion hololepis	0.08	8	0.03
	Symphurus sp.	0.08	2	0.03
	Nezumia aequalis	0.08	23	0.03
	Photonectes braueri	0.08	8	0.03
	Melanonus zugmayeri	0.08	8	0.03
	Total	239.38		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 147
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°24.96
start stop duration Lon E
12°27.14
TIME :06:19:17 06:46:44 27.5 (min) Purpose : 3
LOG : 2008.22 2009.76 1.6 Region : 4054
FDEPTH: 117 116 Gear cond.: 0
BDEPTH: 117 116 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.4 kn
Sorted : 205 Total catch: 205.23 Catch/hour: 448.59

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lagocephalus laevigatus	306.71	302	68.37
	Dentex angolensis	40.87	238	9.11
253	Dentex congoensis	40.22	616	8.97
254	Spicara alta	21.11	304	4.71
	Trachurus trecae	14.03	293	3.13
255	Umbrina canariensis	8.13	13	1.81
	Decapterus rhonchus	5.73	13	1.28
	Lepidotrigla cadmani	4.15	28	0.93
	Zeus faber	2.30	9	0.51
	Boops boops	1.62	39	0.36
	Dentex barnardi	1.51	4	0.34
	Trichiurus lepturus	1.20	2	0.27
	Ariomma bondi	0.79	13	0.18
	Illex coindetii	0.13	4	0.03
	Citharus linguatula	0.09	4	0.02
	Total	448.59		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 148
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°21.95
start stop duration Lon E
12°33.29
TIME :08:06:14 08:31:37 25.4 (min) Purpose : 3
LOG : 2017.87 2019.20 1.3 Region : 4054
FDEPTH: 87 86 Gear cond.: 0
BDEPTH: 87 86 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 3.2 kn
Sorted : 0 Total catch: 232.93 Catch/hour: 550.66

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Atractoscion aequidens	164.73	47	29.91
	Dentex congoensis	109.27	1007	19.84
	Dentex angolensis	42.60	272	7.74
256	Trachurus trecae	32.72	903	5.94
	Dentex barnardi	28.56	64	5.19
	Lagocephalus laevigatus	27.75	21	5.04
	Boops boops	25.11	660	4.56
	Lepidotrigla cadmani	24.07	139	4.37
	Pagellus bellottii	16.55	33	3.01
	Umbrina canariensis	10.59	21	1.92
	Fistularia tabacaria	10.12	33	1.84
	Pagrus caeruleostictus	9.46	21	1.72
	Zeus faber	9.41	31	1.71
	Alloteuthis africana	5.86	1641	1.06
	Dasyatis marmorata	5.79	2	1.05
	Sepia orbignyana	5.18	7	0.94
	Raja miraletus	4.14	2	0.75
	Chaetodon hoefleri	2.79	19	0.51
	Scorpaena stephanica	2.72	5	0.49
	Octopus vulgaris	2.46	2	0.45
	Citharus linguatula	2.34	95	0.43
	Branchiostegus semifasciatus *	2.13	5	0.39
	Brotula barbata	2.03	2	0.37
	Saurida brasiliensis	1.25	307	0.23
	Peristedion cataphractum	0.78	17	0.14
	Sardinella aurita	0.61	12	0.11
	Priacanthus arenatus	0.57	19	0.10
	Illex coindetii	0.54	9	0.10
	Sepia officinalis	0.33	5	0.06
	Arnoglossus imperialis	0.21	17	0.04
	Total	550.66		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 149
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°21.47
start stop duration Lon E
12°39.04
TIME :09:34:11 10:01:49 27.6 (min) Purpose : 3
LOG : 2025.24 2026.81 1.6 Region : 4054
FDEPTH: 65 57 Gear cond.: 0
BDEPTH: 65 57 Validity : 0
Towing dir: 0° Wire out : 200 m Speed : 3.4 kn
Sorted : 0 Total catch: 134.49 Catch/hour: 292.05

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Rhinobatos albomaculatus	137.98	7	47.25
	Pagellus bellottii	77.44	775	26.51
257	Sepia orbignyana	16.20	28	5.55
	Lepidotrigla carolae	12.75	83	4.36
	Pagrus caeruleostictus	10.64	37	3.64
	Raja miraletus	10.38	17	3.55
	Alloteuthis africana	5.10	1902	1.75
	Epinephelus aeneus	3.08	4	1.06
	Balistes capriscus	2.95	4	1.01
	Dactylopterus volitans	2.61	4	0.89
	Fistularia petimba	2.56	28	0.88
	Zeus faber	1.89	4	0.65
	Dentex barnardi	1.85	11	0.63
	Citharus linguatula	1.63	7	0.56
	Lagocephalus laevigatus	1.54	2	0.53
	Sardinella aurita	0.76	2	0.26
	Decapterus rhonchus	0.72	4	0.25
	Saurida brasiliensis	0.69	22	0.24
	Arnoglossus imperialis	0.67	17	0.23
	Bembrops heterurus	0.61	2	0.21
	Total	292.05		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 150
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°18.02
start stop duration Lon E
12°42.45
TIME :10:58:07 11:28:26 30.3 (min) Purpose : 3
LOG : 2032.20 2033.86 1.7 Region : 4054
FDEPTH: 41 42 Gear cond.: 0
BDEPTH: 41 42 Validity : 0
Towing dir: 0° Wire out : 150 m Speed : 3.3 kn
Sorted : 0 Total catch: 31.56 Catch/hour: 62.45

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Rhinobatos albomaculatus	18.76	16	30.04
	Pagrus caeruleostictus	9.58	30	15.34
	Sepia orbignyana	6.69	10	10.71
	Dentex barnardi	5.96	14	9.54
	Caranx crysos	3.50	2	5.61
	Dasyatis marmorata	3.03	2	4.85
	Ephippion guttifer	3.03	2	4.85
	Raja miraletus	2.65	4	4.25
	Citharus linguatula	2.51	12	4.02
	Balistes capriscus	2.06	4	3.30
	Xyrichtys novacula	1.13	8	1.81
	Fistularia petimba	1.03	12	1.65
	Chelidonichthys sp.	0.91	4	1.46
	Chilomycterus spinosus mauret.	0.91	4	1.46
	Trachinocephalus myops	0.28	2	0.44
	Dactylopterus volitans	0.24	2	0.38
	Bothus podas africanus	0.20	2	0.32
	Total	62.45		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 151
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°15.99
start stop duration Lon E
12°46.97
TIME :12:31:32 13:02:10 30.6 (min) Purpose : 3
LOG : 2041.07 2042.66 1.6 Region : 4054
FDEPTH: 25 25 Gear cond.: 0
BDEPTH: 25 25 Validity : 0
Towing dir: 0° Wire out : 130 m Speed : 3.1 kn
Sorted : 0 Total catch: 190.45 Catch/hour: 373.07

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Pagrus caeruleostictus	147.66	329	39.58
	Pseudupeneus prayensis	64.25	2558	17.22
	Balistes punctatus	44.35	59	11.89
	Aluterus heudelotii	18.22	22	4.88
	Pagellus bellottii	11.83	161	3.17
258	Epinephelus aeneus	11.05	6	2.96
	Dentex congoensis	9.99	588	2.68
	Pagrus africanus	9.54	18	2.56
	Rhinobatos albomaculatus	8.17	4	2.19
	Scomberomorus tritor	6.72	20	1.80
	Octopus vulgaris	5.29	6	1.42
	Chaetodon hoefleri	5.25	86	1.41
	Dentex barnardi	4.90	10	1.31
	Dactylopterus volitans	4.49	6	1.20
	Ephippion guttifer	4.39	2	1.18
	Bodianus speciosus	4.25	4	1.14
	Sepia orbignyana	3.68	12	0.99
	Lutjanus fulgens	2.08	4	0.56
	Acanthurus monroviae	1.59	2	0.43
	RAJIDAE	1.29	2	0.35
	Chilomycterus spinosus mauret.	1.06	2	0.28
	Balistes capriscus	1.02	2	0.27
	Scyllarides elisabethae	0.71	2	0.19
	Fistularia tabacaria	0.53	2	0.14
	Rypticus saponaceus	0.33	2	0.09
	Scorpaena scrofa	0.31	4	0.08
	Fistularia petimba	0.14	2	0.04
	Total	373.07		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 152
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°5.83
start stop duration Lon E
12°36.60
TIME :14:38:33 15:08:10 29.6 (min) Purpose : 3
LOG : 2055.99 2057.71 1.7 Region : 4054
FDEPTH: 37 38 Gear cond.: 0
BDEPTH: 37 38 Validity : 0
Towing dir: 0° Wire out : 150 m Speed : 3.5 kn
Sorted : 0 Total catch: 72.63 Catch/hour: 147.17

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lagocephalus laevigatus	53.13	184	36.10
	Balistes capriscus	41.09	91	27.92
	Chloroscombrus chrysurus	21.24	118	14.43
	Pagellus bellottii	8.43	36	5.73
259	Pseudupeneus prayensis	5.15	26	3.50
	Trachinocephalus myops	4.78	16	3.25
	Sepia orbignyana	4.09	10	2.78
	Octopus vulgaris	3.57	4	2.42
	Xyrichtys novacula	1.58	8	1.07
	Raja miraletus	1.54	2	1.05
	Aluterus heudelotii	0.77	8	0.52
	Trachinus radiatus	0.69	2	0.47
	Bothus podas africanus	0.45	6	0.30
	Citharus linguatula	0.36	2	0.25
	Chilomycterus spinosus mauret.	0.16	2	0.11
	Rypticus saponaceus	0.14	2	0.10
	Total	147.17		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 153
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
7°7.67
start stop duration Lon E
12°33.92
TIME :15:51:54 16:21:54 30.0 (min) Purpose : 3
LOG : 2062.27 2063.87 1.6 Region : 4054
FDEPTH: 44 48 Gear cond.: 0
BDEPTH: 44 48 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.2 kn
Sorted : 59 Total catch: 58.48 Catch/hour: 116.96

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Pagrus caeruleostictus	35.84	108	30.64
Dentex barnardi	28.76	76	24.59
Balistes capriscus	26.44	40	22.61
Trachinocephalus myops	6.72	22	5.75
Pseudupeneus prayensis	4.62	22	3.95
Citharus linguatula	3.70	24	3.16
Sepia orbignyana	3.38	10	2.89
Chelidonichthys gabonensis	2.24	12	1.92
Chloroscombrus chrysurus	1.32	8	1.13
Trachinus armatus	1.26	10	1.08
Bothus podas africanus	1.10	14	0.94
Pagellus bellottii	0.92	4	0.79
Pegusa lascaris	0.40	2	0.34
Fistularia petimba	0.26	2	0.22
Total	116.96		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 154
DATE :26/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°55.86
start stop duration Lon E
11°43.91
TIME :22:47:06 23:18:17 31.2 (min) Purpose : 3
LOG : 2121.34 2122.91 1.6 Region : 4054
FDEPTH: 525 525 Gear cond.: 0
BDEPTH: 525 525 Validity : 0
Towing dir: 0° Wire out : 1250 m Speed : 3.0 kn
Sorted : 0 Total catch: 104.63 Catch/hour: 201.34

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Nematocarcinus africanus	51.96	12	25.81
Triplophos hemingi	38.10	5825	18.92
Lophius vaillanti	18.28	2	9.08
Chlamydoselachus anguineus	15.93	2	7.91
Stomias boa boa	15.18	312	7.54
Hoplostethus cadenati	14.95	606	7.43
Aristeus varidens, female	10.45	629	5.19
L O B S T E R S	9.70	889	4.82
Aristeus varidens, male	6.70	548	3.33
Yarrella blackfordi	4.39	133	2.18
Laemonema laureysi	3.77	185	1.87
Merluccius polli	2.00	4	0.99
Lamprogrammus exutus	1.67	81	0.83
Benthodesmus tenuis	1.21	46	0.60
Gadella imberbis	0.98	35	0.49
Dicrolene intronigra	0.75	196	0.37
Xenodermichthys copei	0.58	40	0.29
Bathyuroconger vicinus	0.52	58	0.26
Etmopterus polli	0.52	6	0.26
Diastobranchus capensis	0.46	29	0.23
Nezumia aequalis	0.46	81	0.23
Bathynectes piperitus	0.40	6	0.20
STOMIIDAE	0.40	17	0.20
Malacocephalus laevis	0.40	6	0.20
Chaunax pictus	0.29	12	0.14
Lampadena sp.	0.29	17	0.14
Coelorinchus sp.	0.23	6	0.11
Gonostoma elongatum	0.23	6	0.11
Ariomma bondi	0.12	6	0.06
Trachyrincus scabrus	0.12	6	0.06
Histioteuthis meleagroteuthis	0.06	6	0.03
Taonius pavo	0.06	6	0.03
CYNOGLOSSIDAE	0.06	6	0.03
Ectreposebastes sp.	0.06	6	0.03
Dicrolene sp.	0.06	6	0.03
Total	201.34		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 155
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°54.01
start stop duration Lon E
11°45.09
TIME :01:02:11 01:31:38 29.5 (min) Purpose : 3
LOG : 2129.95 2131.49 1.5 Region : 4054
FDEPTH: 444 447 Gear cond.: 0
BDEPTH: 444 447 Validity : 0
Towing dir: 0° Wire out : 1050 m Speed : 3.1 kn
Sorted : 0 Total catch: 58.31 Catch/hour: 118.80

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Merluccius polli	18.87	31	15.88
260Nematocarcinus africanus	14.12	9162	11.88
Laemonema laureysi	12.77	244	10.75
Benthodesmus tenuis	11.49	318	9.67
Hymenocephalus italicus	11.43	1033	9.62
Lamprogrammus exutus	10.76	24	9.06
Gadella imberbis	10.08	324	8.49
Malacocephalus laevis	5.93	67	4.99
L O B S T E R S	4.34	293	3.65
Triplophos hemingi	4.03	544	3.40
Yarrella blackfordi	3.91	104	3.29
Chaunax pictus	2.93	128	2.47
Aristeus varidens, female	1.96	116	1.65
Coelorinchus coelorhinc. polli	1.34	67	1.13
Dicrolene sp.	1.16	73	0.98
Coloconger sp.	0.79	18	0.67
Nezumia micronychodon	0.73	12	0.62
Aristeus varidens, male	0.67	79	0.57
Bathyuroconger vicinus	0.49	6	0.41
Plesiopenaeus edwardsianus	0.43	6	0.36
Etmopterus polli	0.31	6	0.26
Galeus polli	0.24	6	0.21
Total	118.80		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 156
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°50.67
start stop duration Lon E
11°49.64
TIME :05:40:42 06:11:40 31.0 (min) Purpose : 3
LOG : 2140.74 2142.24 1.5 Region : 4054
FDEPTH: 268 275 Gear cond.: 0
BDEPTH: 268 275 Validity : 0
Towing dir: 0° Wire out : 700 m Speed : 2.9 kn
Sorted : 64 Total catch: 1340.61 Catch/hour: 2597.24

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Merluccius polli	1126.38	20552	43.37
262Parapenaeus longirostris, male	321.99	52762	12.40
Brotula barbata	250.89	198	9.66
Parapenaeus longirostris,femal	237.13	29049	9.13
Ariomma bondi	116.59	2174	4.49
Bembrops heterurus	100.78	1581	3.88
Munidopsis sp.	90.90	7707	3.50
Chlorophthalmus atlanticus	71.14	2767	2.74
MYCTOPHIDAE	69.16	29642	2.66
Parasudis fraser-bruenneri	43.47	988	1.67
Chascanopsetta lugubris	29.64	395	1.14
Erythrocles monodi	28.25	27	1.09
Gadella sp.	17.78	593	0.68
Peristedion cataphractum	15.81	790	0.61
Diastobranchus capensis	13.83	198	0.53
Illex coindetii	11.86	198	0.46
Peristedion sp.	11.86	198	0.46
Synagrops microlepis	10.05	20156	0.39
Argyrosomus hololepidotus	9.03	6	0.35
Dentex angolensis	8.83	21	0.34
261Synagrops microlepis	5.93	395	0.23
Raja straeleni	5.93	198	0.23
Total	2597.24		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 157
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°52.04
start stop duration Lon E
11°52.36
TIME :07:29:53 07:55:19 25.4 (min) Purpose : 3
LOG : 2146.62 2147.93 1.3 Region : 4054
FDEPTH: 184 190 Gear cond.: 0
BDEPTH: 184 190 Validity : 0
Towing dir: 0° Wire out : 450 m Speed : 3.1 kn
Sorted : 179 Total catch: 4000.16 Catch/hour: 9441.76

SPECIES	CATCH/HOUR		% OF TOT. C
SAMP	weight	numbers	
Synagrops microlepis	8184.85	594151	86.69
Zenopsis conchifer	392.67	946	4.16
Dentex angolensis	242.12	685	2.56
263Argyrosomus hololepidotus	148.96	210	1.58
Trichiurus lepturus	143.15	210	1.52
Zeus faber	120.00	543	1.27
Brotula barbata	71.59	52	0.76
Umbrina canariensis	36.33	52	0.38
Lagocephalus laevigatus	31.06	52	0.33
Illex coindetii	17.37	158	0.18
Pteroscion peli	14.73	52	0.16
Pterothrissus belloci	14.73	633	0.16
Dentex macrophthalmus	9.46	52	0.10
Citharus linguatula	9.46	52	0.10
Saurida brasiliensis	5.26	1685	0.06
Total	9441.76		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 158
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°47.60
start stop duration Lon E
11°52.48
TIME :08:49:58 09:20:35 30.6 (min) Purpose : 3
LOG : 2152.00 2153.64 1.6 Region : 4054
FDEPTH: 146 153 Gear cond.: 0
BDEPTH: 146 153 Validity : 0
Towing dir: 0° Wire out : 350 m Speed : 3.2 kn
Sorted : 65 Total catch: 65.25 Catch/hour: 127.86

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Spicara alta	33.31	282	26.05
	Dentex angolensis	33.04	163	25.84
264	Zenopsis conchifer	21.91	33	17.13
	Ariomma bondi	20.61	413	16.12
	Zeus faber	3.80	27	2.97
	Lepidotrigla cadmani	3.47	29	2.71
	Trachurus trecae	2.96	37	2.31
265	Torpedo torpedo	2.82	4	2.21
	Pterothrissus belloci	1.94	12	1.52
	Illex coindetii	1.76	59	1.38
	Citharus linguatula	1.06	29	0.83
	Trichiurus lepturus	0.80	2	0.63
	Saurida brasiliensis	0.20	33	0.15
	Bembrops heterurus	0.18	4	0.14
	Total	127.86		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 159
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°45.68
start stop duration Lon E
11°54.60
TIME :10:15:00 10:46:13 31.2 (min) Purpose : 3
LOG : 2158.09 2159.68 1.6 Region : 4054
FDEPTH: 117 112 Gear cond.: 0
BDEPTH: 117 112 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.0 kn
Sorted : 0 Total catch: 135.56 Catch/hour: 260.53

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex angolensis	119.12	513	45.72
266	Dentex congoensis	111.08	1268	42.64
	Rhinobatos albomaculatus	3.88	2	1.49
	Zeus faber	3.65	13	1.40
	Trigla lyra	3.25	17	1.25
	Raja miraletus	3.11	4	1.20
	Seriola carpenteri	2.84	2	1.09
	Fistularia petimba	2.36	4	0.91
	Dentex barnardi	2.27	2	0.87
	Pagellus bellottii	1.88	6	0.72
	Umbrina canariensis	1.61	2	0.62
	Scorpaena stephanica	1.52	2	0.58
	Trachurus trecae	0.88	2	0.34
	Ariomma bondi	0.86	4	0.33
	Sepia orbignyana	0.75	2	0.29
	Arnoglossus imperialis	0.73	8	0.28
	Citharus linguatula	0.71	4	0.27
	Total	260.53		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 160
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°28.67
start stop duration Lon E
11°58.53
TIME :13:04:00 13:35:39 31.7 (min) Purpose : 3
LOG : 2178.95 2180.60 1.7 Region : 4054
FDEPTH: 97 95 Gear cond.: 0
BDEPTH: 97 95 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 3.1 kn
Sorted : 0 Total catch: 128.77 Catch/hour: 244.11

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	115.37	4582	47.26
268	Brachydeuterus auritus	32.38	326	13.26
270	Dentex angolensis	26.46	119	10.84
267	Raja miraletus	12.95	21	5.30
	Umbrina canariensis	9.63	21	3.95
269	Selene dorsalis	6.60	8	2.70
	Brotula barbata	4.51	6	1.85
	Fistularia petimba	4.34	11	1.78
	Dentex congoensis	4.17	38	1.71
	Saurida brasiliensis	4.17	607	1.71
	Squatina oculata	4.06	2	1.66
	Torpedo torpedo	3.22	4	1.32
	Pterothrissus belloci	2.92	13	1.20
	Citharus linguatula	2.48	68	1.02
	Scorpaena stephanica	1.74	2	0.71
	Uranoscopus albesca	1.69	11	0.69
	Priacanthus arenatus	1.59	8	0.65
	Trichiurus lepturus	1.55	2	0.64
	Zeus faber	1.33	2	0.54
	Todarodes sagittatus	0.72	17	0.30
	Parapenaeus longirostris	0.53	51	0.22
	Sepia orbignyana	0.49	8	0.20
	Todaropsis eblanae	0.45	6	0.19
	Boops boops	0.38	4	0.16
	Arnoglossus imperialis	0.36	4	0.15
	Total	244.11		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 161
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°25.17
start stop duration Lon E
12°1.46
TIME :14:31:52 15:01:40 29.8 (min) Purpose : 3
LOG : 2185.56 2187.09 1.5 Region : 4054
FDEPTH: 81 81 Gear cond.: 0
BDEPTH: 81 81 Validity : 0
Towing dir: 0° Wire out : 220 m Speed : 3.1 kn
Sorted : 156 Total catch: 318.00 Catch/hour: 640.27

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Brachydeuterus auritus	265.17	3471	41.42
272	Umbrina canariensis	168.24	282	26.28
271	Selene dorsalis	59.84	105	9.35
	Trachurus trecae	41.96	1546	6.55
274	Dentex angolensis	25.13	129	3.92
273	Trichiurus lepturus	16.39	36	2.56
	Torpedo torpedo	8.34	16	1.30
	Raja miraletus	7.89	12	1.23
	Dentex congoensis	7.29	109	1.14
	Epinephelus aeneus	7.27	4	1.14
	Zeus faber	7.09	24	1.11
	Alloteuthis africana	6.12	2187	0.96
	Dasyatis marmorata	3.95	2	0.62
	Lagocephalus laevigatus	3.34	4	0.52
	Mustelus mustelus	3.30	2	0.52
	Pagrus africanus	2.09	4	0.33
	Citharus linguatula	1.85	60	0.29
	Saurida brasiliensis	1.73	507	0.27
	Fistularia petimba	1.33	4	0.21
	Cynoglossus canariensis	0.85	4	0.13
	Pagellus bellottii	0.77	4	0.12
	Uranoscopus albesca	0.18	4	0.03
	Arnoglossus imperialis	0.16	44	0.03
	Total	640.27		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 162
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°25.48
start stop duration Lon E
12°5.73
TIME :15:56:41 16:27:08 30.5 (min) Purpose : 3
LOG : 2191.86 2193.41 1.6 Region : 4054
FDEPTH: 53 54 Gear cond.: 0
BDEPTH: 53 54 Validity : 0
Towing dir: 0° Wire out : 160 m Speed : 3.1 kn
Sorted : 120 Total catch: 119.56 Catch/hour: 235.59

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lagocephalus laevigatus	163.86	169	69.56
	Pagellus bellottii	20.97	126	8.90
275	Pagrus caeruleostictus	10.33	28	4.38
	Epinephelus aeneus	8.51	6	3.61
	Balistes punctatus	8.28	16	3.51
	Citharus linguatula	5.79	43	2.46
	Raja miraletus	4.77	8	2.02
	Caranx crysos	3.98	4	1.69
	Seriola carpenteri	2.29	4	0.97
	Brachydeuterus auritus	1.71	20	0.73
	Dactylopterus volitans	1.48	4	0.63
	Chelidonichthys gabonensis	1.28	6	0.54
	Trichiurus lepturus	0.81	2	0.34
	Chaetodon hoefleri	0.43	2	0.18
	Bothus podas africanus	0.26	6	0.11
	Trachinocephalus myops	0.22	2	0.09
	Alloteuthis africana	0.18	65	0.08
	Saurida brasiliensis	0.16	39	0.07
	Bembrops greyi	0.16	14	0.07
	Fistularia petimba	0.12	2	0.05
	Monolene microstoma	0.02	6	0.01
	Total	235.59		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 163
DATE :27/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°38.91
start stop duration Lon E
11°25.23
TIME :22:04:37 22:37:16 32.7 (min) Purpose : 3
LOG : 2238.02 2239.77 1.8 Region : 4054
FDEPTH: 708 707 Gear cond.: 0
BDEPTH: 708 707 Validity : 0
Towing dir: 0° Wire out : 1750 m Speed : 3.2 kn
Sorted : 37 Total catch: 193.79 Catch/hour: 355.90

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	WASTE00	97.34	73	27.35
	Lophius vaillanti	77.69	9	21.83
	Nezumia aequalis	63.18	1469	17.75
	Hoplostethus cadenati	28.74	230	8.08
	Yarrella blackfordi	20.20	358	5.68
	Merluccius polli	16.60	20	4.66
276	Bathyuroconger vicinus	13.13	64	3.69
	L O B S T E R S	5.88	321	1.65
	Etmopterus polli	4.78	18	1.34
	Anemones, pink	3.95	9	1.11
	Triplophos hemingi	3.76	422	1.06
	Halosaurus ovenii	3.31	101	0.93
	Glyphus marsupialis	2.30	55	0.65
	Plesiopenaeus edwardsianus	2.02	110	0.57
	Xenodermichthys copei	1.74	46	0.49
	Talismania longifilis	1.56	28	0.44
	Lithodes ferox	1.47	9	0.41
	Trachyrincus scabrus	1.38	9	0.39
	Stomias boa boa	1.19	18	0.34
	Munida sp.	1.01	514	0.28
	Parapagurus pilosimanus	0.92	46	0.26
	Dicrolene sp.	0.92	37	0.26
	Benthodesmus tenuis	0.83	9	0.23
	Dicrolene intronigra	0.83	129	0.23
	Dibranchus atlanticus	0.64	28	0.18
	Triplophos sp.	0.55	28	0.15
	Total	355.90		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 165
DATE :28/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°34.76
start stop duration Lon E
11°38.10
TIME :03:13:56 03:44:05 30.2 (min) Purpose : 3
LOG : 2258.59 2260.11 1.5 Region : 4054
FDEPTH: 333 317 Gear cond.: 0
BDEPTH: 333 317 Validity : 0
Towing dir: 0° Wire out : 850 m Speed : 3.0 kn
Sorted : 27 Total catch: 194.09 Catch/hour: 386.25

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Benthodesmus tenuis	64.50	2299	16.70
	Parapenaeus longirostris	62.97	850	16.30
	Laemonema laureysi	27.72	529	7.18
	Malacocephalus laevis	25.49	320	6.60
	Hoplostethus cadenati	23.82	56	6.17
	Chaceon maritae, female	23.40	56	6.06
	Hoplostethus atlanticus	17.27	14	4.47
	Hymenocephalus italicus	16.58	2117	4.29
	Raja alba	15.88	14	4.11
	Synagrops microlepis	12.82	460	3.32
	Gadella imberbis	11.98	70	3.10
	Coelorinchus coelorhincus	11.42	209	2.96
	UNIDENTIFIED FISH	10.73	14	2.78
	Chlorophthalmus atlanticus	9.33	209	2.42
	Nematocarcinus africanus	8.92	9361	2.31
	Pterothrissus belloci	7.94	42	2.06
	Bathyuroconger vicinus	6.41	42	1.66
	Munidopsis sp.	5.57	543	1.44
	Pontinus accraensis	5.29	42	1.37
	Merluccius polli	5.11	34	1.32
277	Epigonus telescopus	3.06	111	0.79
	Bathynectes piperitus	2.93	42	0.76
	Dibranchus atlanticus	1.67	167	0.43
	Chaunax pictus	1.67	111	0.43
	Lophius vaillanti	1.67	28	0.43
	Cyttopsis rosea	1.11	42	0.29
	MYCTOPHIDAE	0.42	195	0.11
	Peristedion cataphractum	0.28	42	0.07
	Munida sp.	0.28	70	0.07
	Total	386.25		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 166
DATE :28/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°32.59
start stop duration Lon E
11°41.14
TIME :05:37:38 06:10:31 32.9 (min) Purpose : 3
LOG : 2267.26 2268.93 1.7 Region : 4054
FDEPTH: 216 227 Gear cond.: 0
BDEPTH: 216 227 Validity : 0
Towing dir: 0° Wire out : 500 m Speed : 3.0 kn
Sorted : 104 Total catch: 439.77 Catch/hour: 802.26

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Synagrops microlepis	600.24	63442	74.82
	Trichiurus lepturus	53.30	84	6.64
	Dentex angolensis	32.03	99	3.99
278	Parapenaeus longirostris	25.69	201	3.20
	Zenopsis conchifer	16.35	161	2.04
	Pterothrissus belloci	12.81	108	1.60
	Brotula barbata	12.73	9	1.59
	Illex coindetii	12.15	181	1.51
	Bembrops greyi	9.07	148	1.13
	Uranoscopus polli	8.01	33	1.00
	Peristedion cataphractum	6.00	13	0.75
	Heptranchias perlo	4.16	2	0.52
	Parasudis fraser-bruenneri	3.27	354	0.41
	Chlorophthalmus atlanticus	2.86	327	0.36
	Pteroscion peli	1.66	13	0.21
	Monolene microstoma	0.66	60	0.08
	Epigonus telescopus	0.38	33	0.05
	Ariomma bondi	0.38	7	0.05
	MYCTOPHIDAE	0.18	113	0.02
	Saurida brasiliensis	0.11	13	0.01
	Peristedion sp.	0.11	13	0.01
	Peristedion sp.	0.11	13	0.01
	Total	802.26		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 167
DATE :28/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°30.73
start stop duration Lon E
11°48.79
TIME :07:35:44 08:06:36 30.9 (min) Purpose : 3
LOG : 2278.23 2279.86 1.6 Region : 4054
FDEPTH: 123 124 Gear cond.: 0
BDEPTH: 123 124 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.2 kn
Sorted : 87 Total catch: 173.40 Catch/hour: 337.03

	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
SAMP				
	Dentex congoensis	128.36	1835	38.09
280	Dentex angolensis	82.02	431	24.34
279	Trachurus trecae	57.61	2507	17.09
281	Spicara alta	16.37	210	4.86
	Zeus faber	11.20	19	3.32
	Ariomma bondi	10.92	225	3.24
	Pterothrissus belloci	5.79	47	1.72
	Boops boops	5.01	214	1.49
	TRICHUIRUS lepturus	4.20	12	1.25
	Lepidotrigla cadmani	3.38	51	1.00
	Scorpaena stephanica	2.29	4	0.68
	Torpedo torpedo	2.18	4	0.65
	Illex coindetii	1.90	39	0.57
	Zenopsis conchifer	1.75	8	0.52
	Priacanthus arenatus	1.67	4	0.50
	Citharus linguatula	0.78	31	0.23
	Scomber japonicus	0.43	4	0.13
	Peristedion cataphractum	0.43	8	0.13
	Scorpaena normani	0.31	4	0.09
	Sepia officinalis	0.23	4	0.07
	Saurida brasiliensis	0.19	51	0.06
	Total	337.03		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 168
DATE :28/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°28.63
start stop duration Lon E
11°51.47
TIME :09:00:35 09:32:51 32.3 (min) Purpose : 3
LOG : 2284.54 2286.15 1.6 Region : 4054
FDEPTH: 114 115 Gear cond.: 0
BDEPTH: 114 115 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.0 kn
Sorted : 0 Total catch: 108.24 Catch/hour: 201.25

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	58.79	2542	29.21
283	Dentex angolensis	47.78	305	23.74
282	Ariomma bondi	30.20	827	15.00
	Brotula barbata	8.98	7	4.46
	Dentex congoensis	8.78	208	4.36
284	Dasyatis marmorata	8.48	2	4.21
	Lepidotrigla cadmani	6.23	59	3.09
	Epinephelus aeneus	5.04	2	2.50
	Zeus faber	4.16	11	2.07
	Scomber japonicus	3.72	45	1.85
	Seriola carpenteri	3.66	2	1.82
	Citharus linguatula	2.68	113	1.33
	Dentex barnardi	2.27	7	1.13
	Torpedo torpedo	1.93	4	0.96
	Fistularia petimba	1.67	4	0.83
	Umbrina canariensis	1.41	2	0.70
	Priacanthus arenatus	1.19	4	0.59
	Pagrus caeruleostictus	1.13	2	0.56
	Illex coindetii	0.73	22	0.36
	Pagellus bellottii	0.59	4	0.30
	Saurida brasiliensis	0.56	126	0.28
	Chaetodon hoefleri	0.37	2	0.18
	Arnoglossus imperialis	0.33	37	0.17
	Boops boops	0.32	11	0.16
	Sepia officinalis	0.22	7	0.11
	Monolene microstoma	0.02	4	0.01
	Total	201.25		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 169
DATE :28/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°28.37
start stop duration Lon E
11°54.77
TIME :10:27:23 10:58:45 31.4 (min) Purpose : 3
LOG : 2290.63 2292.37 1.7 Region : 4054
FDEPTH: 110 108 Gear cond.: 0
BDEPTH: 110 108 Validity : 0
Towing dir: 0° Wire out : 300 m Speed : 3.3 kn
Sorted : 0 Total catch: 151.04 Catch/hour: 288.88

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Trachurus trecae	62.93	2645	21.78
287	Saurida brasiliensis	59.71	174	20.67
	Dentex angolensis	37.49	187	12.98
285	Umbrina canariensis	31.14	34	10.78
286	Zeus faber	24.50	134	8.48
	Epinephelus aeneus	13.16	2	4.56
	Trichiurus lepturus	11.82	17	4.09
	Fistularia petimba	9.98	21	3.46
	Raja miraletus	7.23	13	2.50
	Torpedo torpedo	6.02	13	2.09
	Pterothrissus belloci	4.75	27	1.65
	Raja alba	4.15	2	1.44
	Mustelus mustelus	3.56	2	1.23
	Citharus linguatula	3.08	128	1.07
	Illex coindetii	2.74	80	0.95
	Ariomma bondi	2.08	27	0.72
	Dentex congoensis	1.87	19	0.65
	Sepia officinalis	0.80	40	0.28
	Scomber japonicus	0.74	67	0.25
	Pagellus bellottii	0.52	2	0.18
	Boops boops	0.47	13	0.16
	Arnoglossus imperialis	0.13	13	0.05
	Total	288.88		100.00

R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 170
DATE :28/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°35.53
start stop duration Lon E
12°1.01
TIME :12:48:54 13:19:36 30.7 (min) Purpose : 3
LOG : 2305.55 2307.14 1.6 Region : 4054
FDEPTH: 91 99 Gear cond.: 0
BDEPTH: 91 99 Validity : 0
Towing dir: 0° Wire out : 250 m Speed : 3.1 kn
Sorted : 0 Total catch: 99.49 Catch/hour: 194.44

SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Dentex congoensis	101.32	1950	52.11
	Umbrina canariensis	21.77	21	11.20
289	Lagocephalus laevigatus	19.07	20	9.81
	Fistularia petimba	12.78	29	6.57
	Trachurus trecae	9.34	727	4.80
290	Dentex angolensis	9.30	94	4.78
288	Spicara alta	4.18	702	2.15
	Trichiurus lepturus	3.93	6	2.02
	Lepidotrigla cadmani	3.42	39	1.76
	Squatina oculata	3.32	4	1.71
	Alloteuthis africana	3.26	1294	1.68
	Zeus faber	1.66	6	0.85
	Cynoglossus canariensis	0.68	2	0.35
	Saurida brasiliensis	0.20	45	0.10
	Todaropsis eblanae	0.12	2	0.06
	Citharus linguatula	0.08	18	0.04
	Total	194.44		100.00

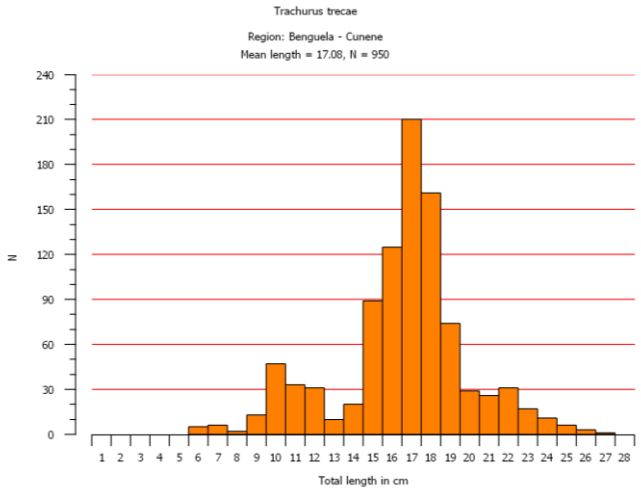
R/V Dr. Fridtjof Nansen SURVEY:2012403 STATION: 171
DATE :28/04/2012 GEAR TYPE: BT NO: 25 POSITION:Lat S
6°47.19
start stop duration Lon E
12°0.16
TIME :14:49:14 15:19:05 29.9 (min) Purpose : 3
LOG : 2318.47 2320.02 1.6 Region : 4054
FDEPTH: 89 90 Gear cond.: 0
BDEPTH: 89 90 Validity : 0
Towing dir: 0° Wire out : 240 m Speed : 3.1 kn
Sorted : 0 Total catch: 44.99 Catch/hour: 90.43

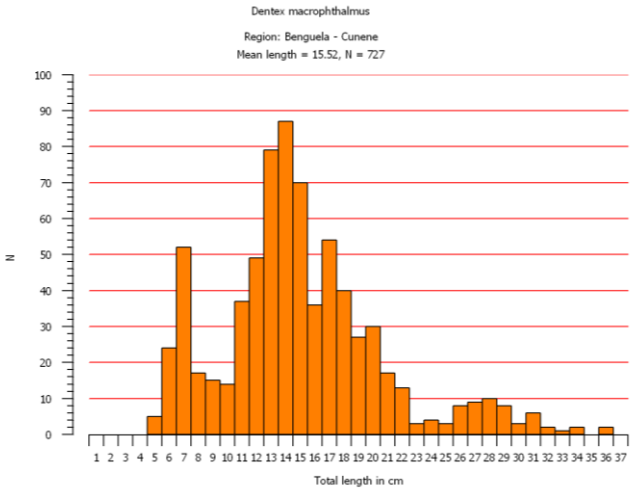
SAMP	SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C
	Lagocephalus laevigatus	34.25	0	37.88
	Chelidonichthys gabonensis	29.11	127	32.18
	Lepidotrigla cadmani	9.77	74	10.80
	Pagellus bellottii	7.88	52	8.71
291	Squatina oculata	2.91	2	3.22
	Dentex barnardi	1.61	4	1.78
	Raja miraletus	0.96	2	1.07
	Illex coindetii	0.94	96	1.04
	Alloteuthis africana	0.84	322	0.93
	Fistularia petimba	0.64	6	0.71
	Saurida brasiliensis	0.56	145	0.62
	Dentex angolensis	0.40	2	0.44
	Sepia orbignyana	0.28	6	0.31
	Dentex congoensis	0.12	2	0.13
	Arnoglossus imperialis	0.08	16	0.09
	Citharus linguatula	0.06	24	0.07
	Total	90.43		100.00

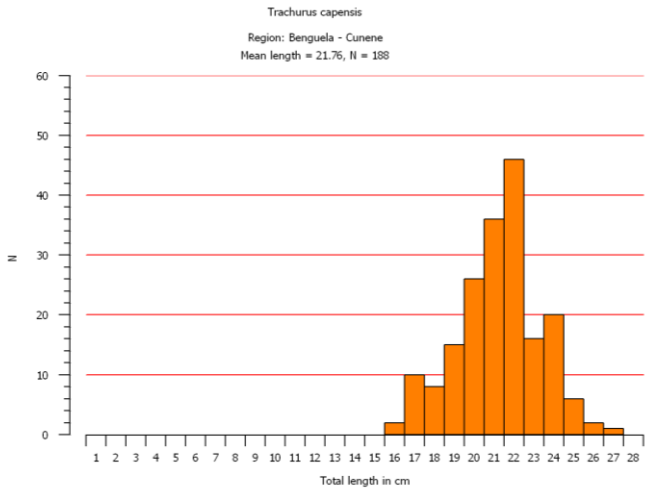
ANNEX II LENGTH DISTRIBUTIONS OF MAJOR SPECIES

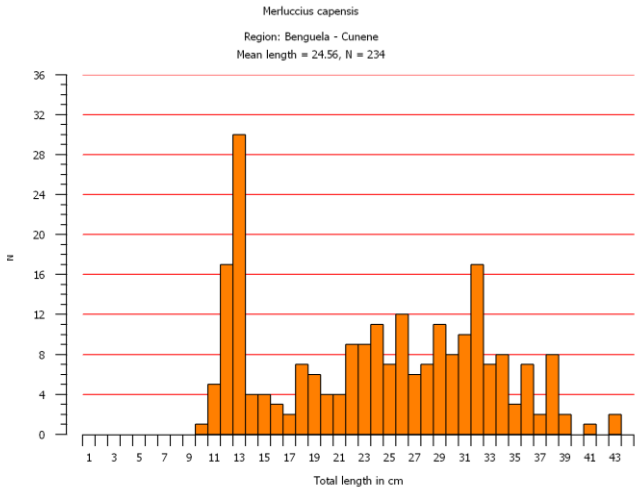
Southern Angola

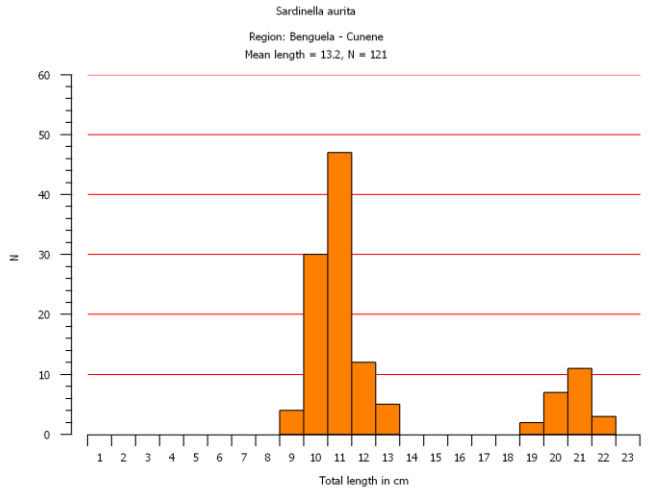
Pooled length frequency distributions of the main species weighted by the catch.

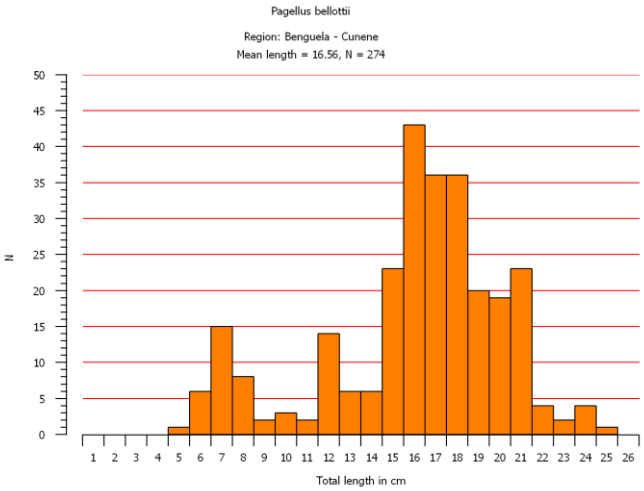






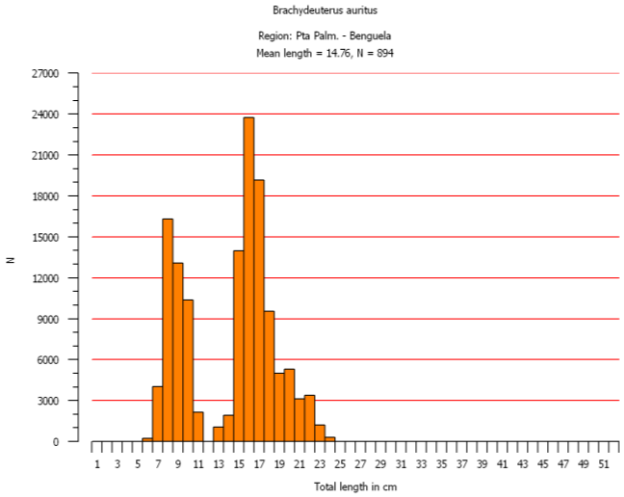


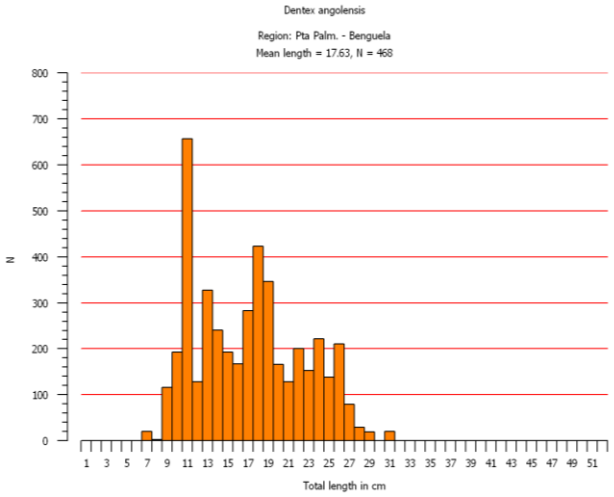


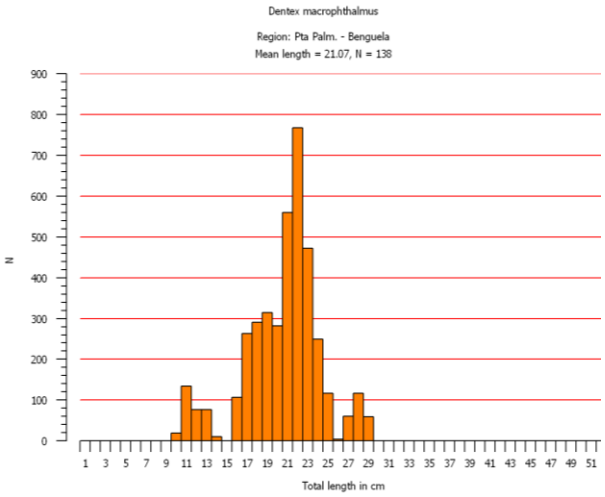


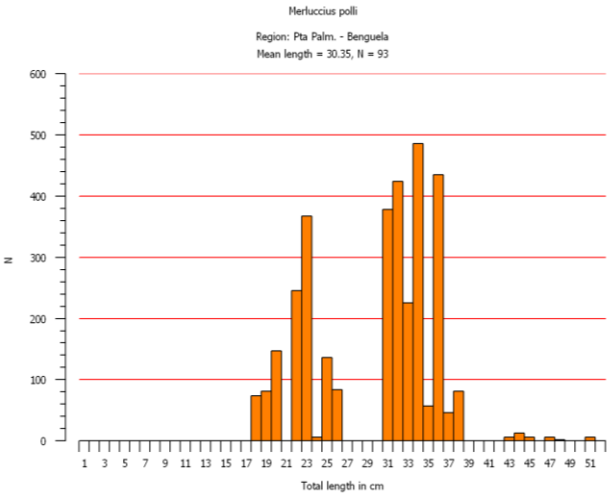
Central Angola

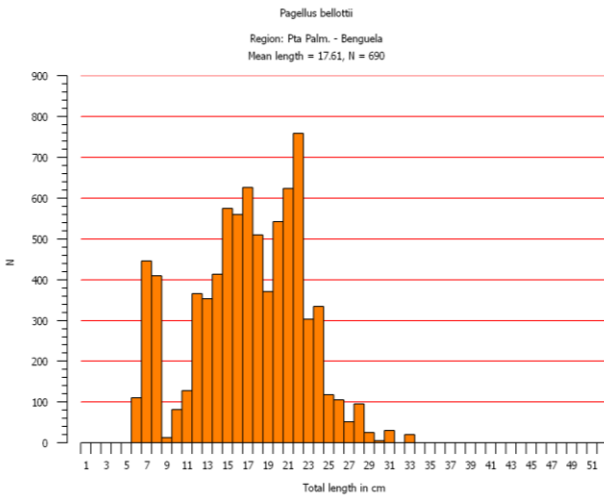
Pooled length frequency distributions of the main species weighted by the catch.

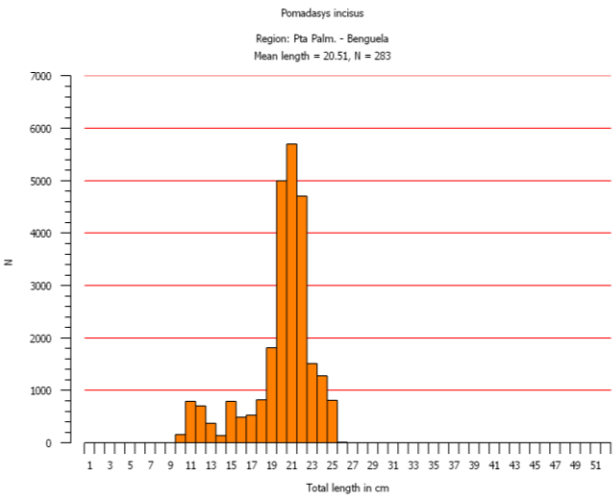






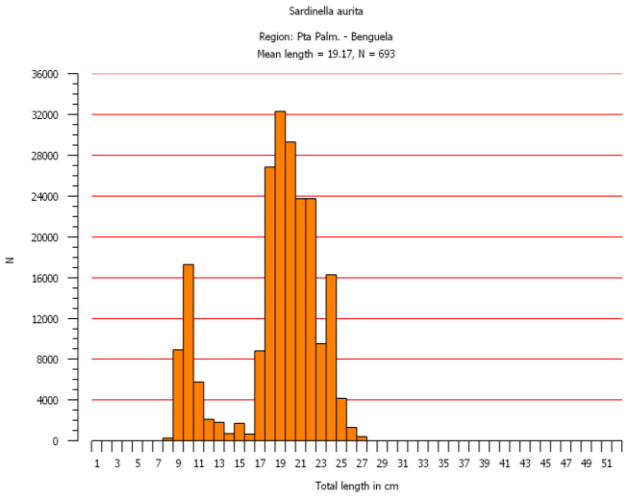


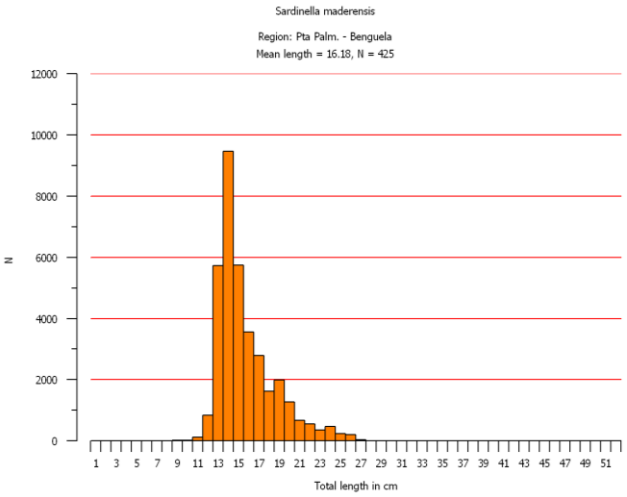


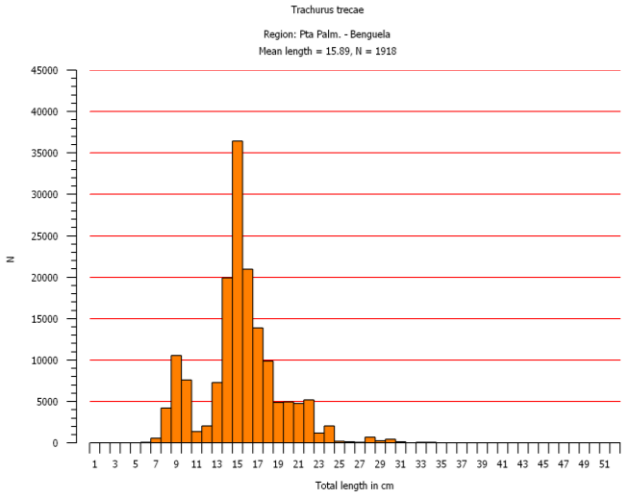


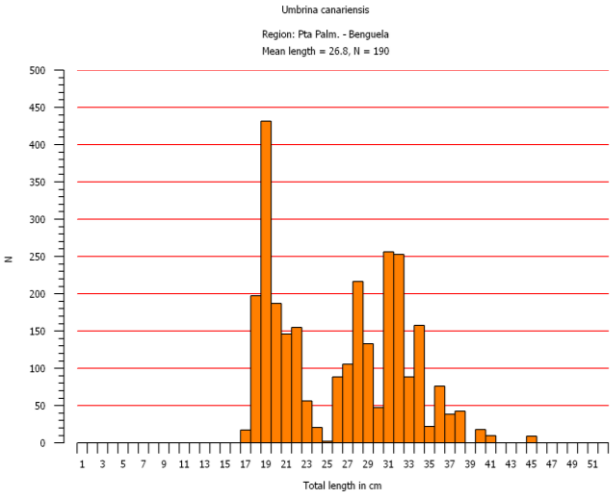
Central Angola (continued)

Pooled length frequency distributions of the main species weighted by the catch.



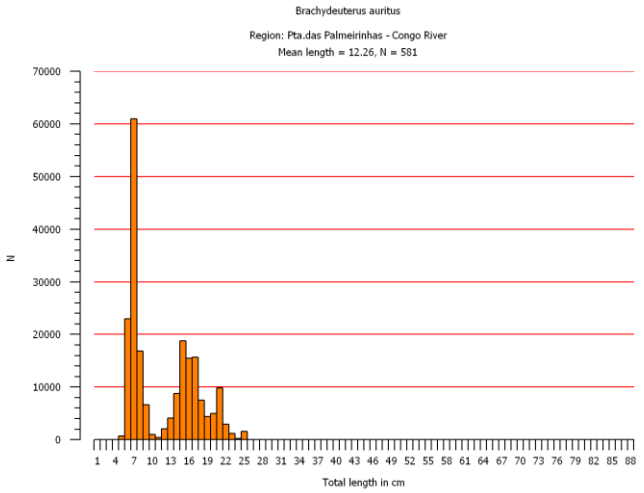


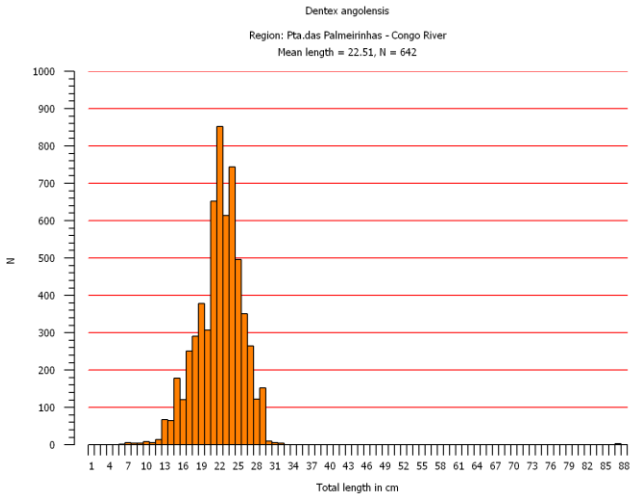


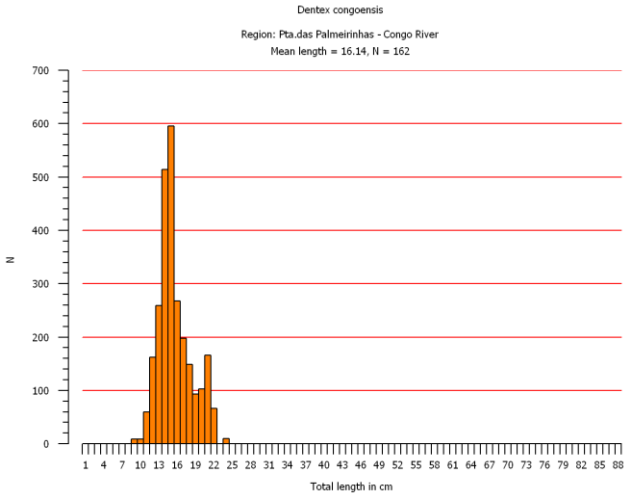


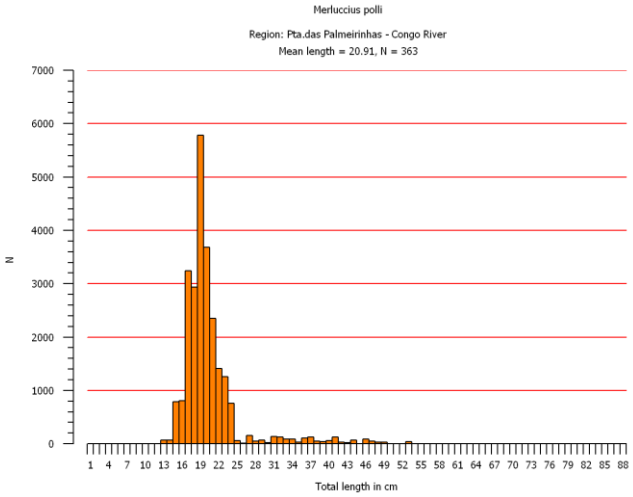
Northern Angola

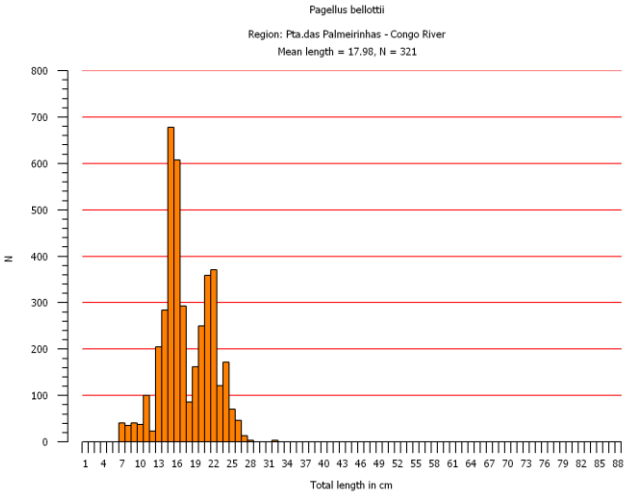
Pooled length frequency distribution of the main species weighted by the catch

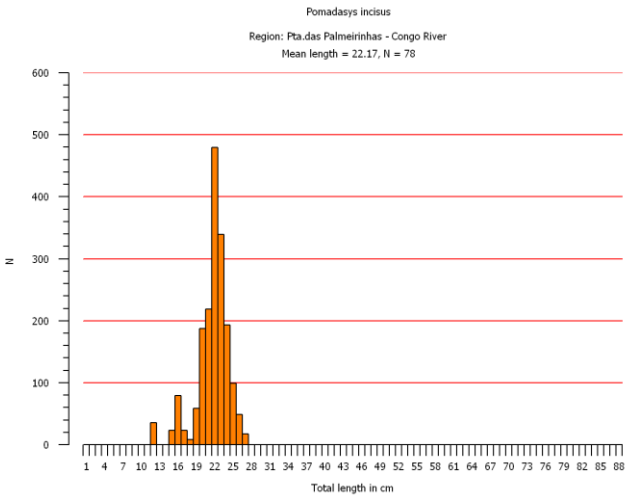






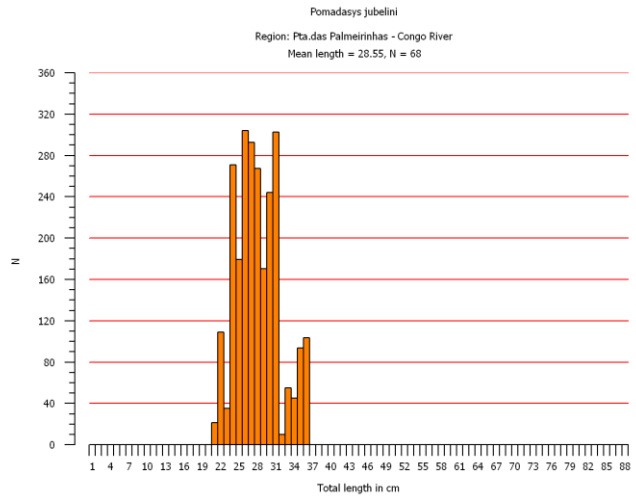


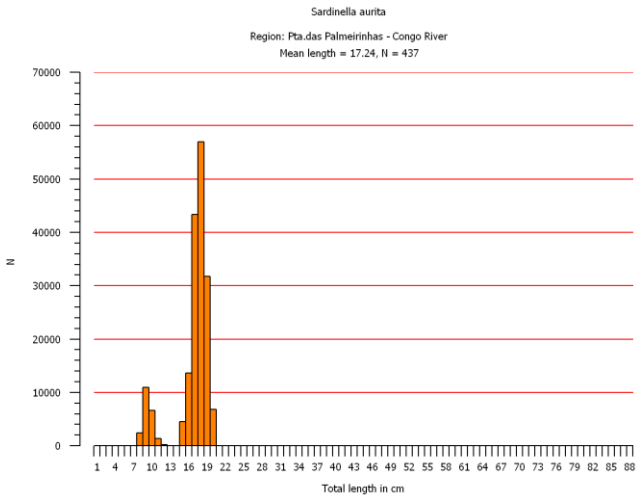


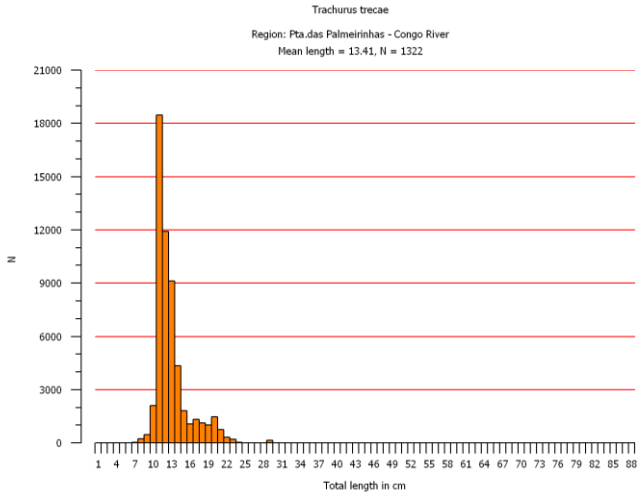


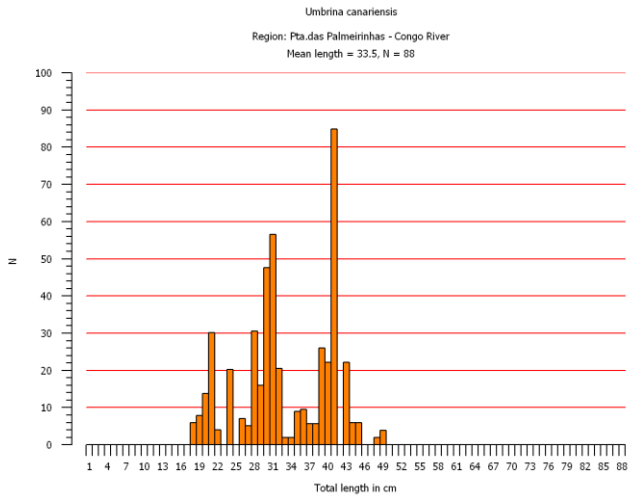
Northern Angola (continued)

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









ANNEX III SWEPT AREA ESTIMATES

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

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% inci-dence	Mean dens.	Mean densities by bottom depth strata t/nm²		
	>0	10	30	100	300	1000		t/nm²	20-50m	50-100m	100-200m
Brachydeuterus auritus	12	6	3	3	2		43.33	2.931	1.407	6.336	0.805
Dentex angolensis	16	12	9				61.67	1.186		0.739	2.783
Galeoides decadactylus	7	4	3	1			25	0.86	2.527	0.171	
Synagrops microlepis	1		2	2			8.33	0.713			2.14
Umbrina canariensis	12	3	1	1			28.33	0.566	0.004	1.393	0.232
Trichiurus lepturus	29	7	2				63.33	0.549	0.633	0.577	0.44
Stromateus fiatola	7	1	5				21.67	0.514	0.615	0.912	
Pagellus bellottii	42		2				73.33	0.393	0.612	0.508	0.065
Trachurus trecae	21	5	1				45	0.371		0.54	0.545
Ilisha africana	3			1			6.67	0.359	1.135		
Dentex congoensis	15	10	1				43.33	0.358		0.482	0.568
Chloroscombrus chrysurus	6	4	2				20	0.312	0.839	0.131	
Selene dorsalis	19	2	2				38.33	0.308	0.118	0.186	0.618
Pseudotolithus senegalensis	4	2	2				13.33	0.29	0.436	0.435	
Raja miraletus	45	2					78.33	0.273	0.391	0.353	0.078
Brotula barbata	25	3	1				48.33	0.271	0.002	0.135	0.67
Pomadasys incisus	7			1			13.33	0.247	0.061	0.652	
Zeus faber	39	2	1				70	0.23	0.015	0.178	0.489
Sphyraena guachancho	6	2	1				15	0.19	0.601		
Pomadasys jubelini	2	2	1				8.33	0.189	0.53	0.06	
Pterothrissus belloci	15	1	1				28.33	0.173		0.023	0.494
Trigla lyra	15	1	1				28.33	0.147		0.025	0.414
Pomadasys peroteti	3	1	1				8.33	0.146	0.051	0.371	
Pagrus caeruleostictus	13	2	1				26.67	0.145	0.423	0.03	0.001
Decapterus rhonchus	11		1				20	0.12	0.008	0.332	0.004
Lagocephalus laevigatus	22		1				38.33	0.119	0.045	0.249	0.052
Dentex barnardi	29	2					51.67	0.104	0.102	0.169	0.039
Alectis alexandrinus	6	3					15	0.103	0.31	0.015	
Chelidonichthys gabonensis	4		1				8.33	0.101	0.004	0.283	0.001
Drepane africana	4	2					10	0.099	0.314		
Citharus linguatula	49						81.67	0.09	0.045	0.115	0.106
Lepidotrigla cadmani	11	1					20	0.08		0.121	0.114
Rhinobatos albomaculatus	17						28.33	0.077	0.152	0.082	
Epinephelus aeneus	12						20	0.067	0.092	0.109	
Bembrops greyi	5		1				10	0.067	0.001	0.001	0.2
Grammoplites gruveli	18	1					31.67	0.063	0.036	0.036	0.119
Parapenaeus longirostris,femal	5	1					10	0.063			0.19
Sepia orbignyana	45						75	0.063	0.058	0.119	0.01
G A S T R O P O D S	20	1					35	0.061	0.005	0.001	0.178
Ephippion guttifer	11						18.33	0.06	0.173	0.014	
Dasyatis margarita	6	1					11.67	0.059	0.186		
Chelidonichthys capensis	7	1					13.33	0.058		0.021	0.153
Spicara alta	10	1					18.33	0.056			0.169
Dasyatis marmorata	5	2					11.67	0.053	0.16	0.008	
Miracorvina angolensis	4	1					8.33	0.051	0.003	0.109	0.037
Pagrus auriga	1	1					3.33	0.049	0.013		0.135

Sepia officinalis hierredda	10	1	18.33	0.046	0.134	0.01	
Torpedo torpedo	23		38.33	0.043	0.012	0.091	0.022
Pseudotolithus typus	2	1	5	0.043	0.134		
Squatina oculata	9		15	0.034		0.004	0.098
Fistularia petimba	23		38.33	0.033	0.006	0.049	0.042
Arius parkii	6		10	0.032	0.091	0.009	
Sardinella aurita	16		26.67	0.031	0.08	0.017	
Caelorinchus coelorhincus		1	1.67	0.03			0.091
Parapenaeus longirostris, male	5	1	10	0.029			0.086
Saurida brasiliensis	33		55	0.028		0.037	0.045
Gymnura micrura	3	1	6.67	0.026	0.081		
Alloteuthis africana	22		36.67	0.022	0.006	0.056	0.001
Scorpaena stephanica	13		21.67	0.021	0.003	0.007	0.053
Cynoglossus canariensis	15		25	0.021	0.051	0.014	
Illex coindetii	25		41.67	0.021		0.003	0.059
Cynoponticus ferox	6		10	0.02		0.01	0.049
Pseudupeneus prayensis	12		20	0.02	0.049	0.011	
Sardinella maderensis	11		18.33	0.019	0.04	0.018	
Octopus vulgaris	14		23.33	0.018	0.009	0.03	0.015
Uranoscopus polli	15		25	0.018	0.001	0.003	0.048
Branchiostegus semifasciatus *	8		13.33	0.017		0.006	0.044
Zenopsis conchifer	4		6.67	0.016			0.049
Raja clavata	4		6.67	0.015			0.046
Atractoscion aequidens	4		6.67	0.015		0.031	0.013
Caranx crysos	6		10	0.014	0.023	0.019	
Gymnura altavela	1		1.67	0.014	0.044		
Chaetodon hoefleri	18		30	0.014	0.005	0.028	0.006
Dicologoglossa cuneata	11		18.33	0.013	0.012	0.027	0.001
Helicolenus dactylopterus	6		10	0.013		0.001	0.038
Scomberomorus tritor	3		5	0.013	0.016	0.022	
Mustelus mustelus	5		8.33	0.011	0.004	0.015	0.014
penaeus notialis,female	3		5	0.005	0.017		
Penaeus notialis	6		10	0.001	0.004		
penaeus notialis,male	3		5	0.001	0.003		
Solenocera africana	1		1.67	0.001			0.003
Parapenaeopsis atlantica	1		1.67		0.001		
Parapenaeus longirostris	4		6.67				
Other fish				0.284	0.388	0.186	0.288
Sum all species				14.393	13.322	16.726	12.959
Sum SNAPPERS, JOBFISHES							
Sum GROUPERS, SEABASSES				0.068	0.094	0.11	
Sum GRUNTS, SWEETLIPS				3.527	2.071	7.425	0.817
Sum CROAKERS, DRUMS, WEAKF., KOBS				0.972	0.577	1.974	0.294
Sum PANDORAS, PORGIES, SEABREAMS,				2.258	1.158	1.972	3.605
Sum SHARKS, CHIMAERAS				0.052	0.02	0.019	0.115
Sum BATOID FISHES, RAYS				0.587	1.097	0.535	0.156
Sum CEPHALOPODS				0.172	0.208	0.217	0.089
Numbers of stations included in analysis, total and by depth strata				60	19	21	20

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

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% inci-dence	Mean dens.	Mean densities by bottom depth strata t/nm²		
	>0	10	30	100	300	1000		t/nm²	200-300m	300-400m	400-500m
Synagrops microlepis	5	2	2	2			64.71	3.333	10.951	0.315	0.002
Nematocarcinus africanus	1	1	3	1			35.29	2.304		1.689	4.84
Merluccius polli	4	8	3				88.24	1.959	1.778	1.633	2.434
Chlorophthalmus atlanticus	7	1	5				76.47	1.666	0.842	3.987	0.033
Trichiurus lepturus	10	1	2				76.47	0.968	2.623	0.15	0.407
Dentex angolensis	1	3	1				29.41	0.686	2.334		
Laemonema laureysi	11	2					76.47	0.476	0.009	0.812	0.53
Pterothrissus belloci	7		1				47.06	0.368	1.062	0.139	0.019
Brotula barbata	4		1				29.41	0.323	1.058	0.034	
Zenopsis conchifer	4	2					35.29	0.247	0.835		0.004
Parasudis fraser-bruenneri	3	1					23.53	0.181	0.49	0.104	
Chaunax pictus	9						52.94	0.178		0.101	0.403
MYCTOPHIDAE	13	1					82.35	0.178	0.525	0.024	0.041
Parapenaeus longirostris,femal	14						82.35	0.176	0.241	0.21	0.088
Hymenocephalus italicus	12						70.59	0.15	0.003	0.1	0.322
Grammoplites gruveli	3	1					23.53	0.148	0.495	0.007	
Malacocephalus occidentalis	9	1					58.82	0.144	0.021	0.345	0.045
Benthodesmus sp.		1					5.88	0.129			0.366
Caelorinchus coelorhincus	9	1					58.82	0.098	0.271	0.043	0.009
Gephyroberyx darwini	3	1					23.53	0.093	0.006	0.257	
Triplophos hemingi	4	1					29.41	0.081			0.23
Benthodesmus tenuis	8						47.06	0.062		0.026	0.148
Yarrella blackfordi	3						17.65	0.053			0.15
Stereomastis sp.	11						64.71	0.05		0.016	0.126
Gadella imberbis	11						64.71	0.049	0.016	0.083	0.043
Lophius vaillanti	3						17.65	0.048	0.016		0.122
Parapenaeus longirostris, male	11						64.71	0.047	0.119	0.033	0.001
Dibranchus atlanticus	9						52.94	0.046		0.005	0.126
Centrophorus granulosus	2						11.76	0.044		0.08	0.044
Epigonus telescopus	10						58.82	0.042	0.062	0.063	0.004
Pontinus accraensis	3						17.65	0.041	0.091	0.041	
Aristeus varidens, female	8						47.06	0.041		0.007	0.108
Gadella sp.	2						11.76	0.04			0.112
Heptranchias perlo	1						5.88	0.033	0.114		
OMMASTREPHIDAE	3						17.65	0.031			0.088
Aristeus varidens, male	8						47.06	0.031		0.01	0.076
Centrophorus squamosus	1						5.88	0.028		0.08	
Todaropsis eblanae	7						41.18	0.025	0.066	0.015	
Bembrops greyi	2						11.76	0.024	0.073	0.008	
L O B S T E R S	3						17.65	0.024	0.074	0.007	
Helicolenus dactylopterus	4						23.53	0.024	0.034	0.038	
G A S T R O P O D S	2						11.76	0.023	0.078		
Illex coindetii	4						23.53	0.022	0.067	0.006	
Malacocephalus laevis	4						23.53	0.021	0.016	0.01	0.035
Raja alba	4						23.53	0.019	0.029	0.012	0.019
Raja clavata	3						17.65	0.018	0.061		
Peristedion cataphractum	10						58.82	0.018	0.044	0.012	0.001
Conger conger	2						11.76	0.017		0.048	

Coloconger cadenati	2		11.76	0.016		0.017	0.03
Bembrops heterurus	2		11.76	0.015	0.051		
Lophiodes kempi	6		35.29	0.014		0.03	0.01
THYSANOTEUTHIDAE	1		5.88	0.014			0.04
Cunene - Tombua. Slope (200-500m)							
Zeus faber	2		11.76	0.014	0.032	0.012	
Torpedo nobiliana	1		5.88	0.013			0.038
CONGRIDAE	3		17.65	0.013		0.032	0.005
Dicologoglossa cuneata	2		11.76	0.013	0.043		
Mystriophis rostellatus	2		11.76	0.011		0.032	
Bassanago albescens	4		23.53	0.011	0.002	0.003	0.027
Shrimps, small, non comm.	4		23.53	0.011		0.007	0.024
Stomias boa boa	5		29.41	0.011			0.03
Chascanopsetta lugubris	4		23.53	0.01	0.015	0.017	
Solenocera africana	8		47.06	0.004		0.003	0.009
Glyphus marsupialis	1		5.88	0.004			0.012
S H R I M P S	2		11.76	0.001		0.003	0.001
Aristeus varidens	2		11.76	0.001		0.002	
Plesiopenaeus edwardsianus	1		5.88	0.001			0.002
Other fish				0.136	0.128	0.149	0.13
Sum all species				15.12	24.777	10.859	11.334
Sum SNAPPERS, JOBFISHES							
Sum GROUPERS, SEABASSES							
Sum GRUNTS, SWEETLIPS							
Sum CROAKERS, DRUMS, WEAKF., KOBS				0.003	0.011		
Sum PANDORAS, PORGIES, SEABREAMS,				0.686	2.334		
Sum SHARKS, CHIMAERAS				0.129	0.114	0.189	0.082
Sum BATOID FISHES, RAYS				0.051	0.091	0.012	0.057
Sum CEPHALOPODS				0.093	0.137	0.021	0.128
Numbers of stations included in analysis, total and by depth strata				17	5	6	6

C.- Cunene - Tombua. Slope (500-800m)

	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% incidence	Mean dens.	Mean densities by bottom depth strata t/nm²		
	>0	10	30	100	300	1000		t/nm²	500-600m	600-700m	700-800m
Nematocarcinus africanus	2	2	9	1			77.78	4.107	6.405	4.687	2.31
Yarrella blackfordi	10	8					100	0.862	0.692	1.058	0.847
Triplophos hemingi	16	1	1				100	0.776	0.29	2.01	0.308
Lamprogrammus exutus	8	4	1				72.22	0.731	0.72	1.218	0.433
Stereomastis sp.	14	3					94.44	0.53	0.324	0.38	0.752
Stomias boa boa	18						100	0.376	0.394	0.492	0.291
Hoplostethus cadenati	16	2					100	0.369	0.584	0.421	0.201
Nezumia micronychodon	7	1					44.44	0.167	0.006	0.015	0.362
Aristeus varidens, female	18						100	0.153	0.178	0.116	0.159
OMMASTREPHIDAE	12						66.67	0.14	0.033	0.16	0.193
E C H I N O D E R M A T A		1					5.56	0.109			0.246
Bathyuroconger vicinus	14						77.78	0.102	0.002	0.025	0.212
Nezumia aequalis	1	1					11.11	0.099			0.223
Merluccius polli	11						61.11	0.089	0.194	0.088	0.024
Xenodermichthys copei	18						100	0.079	0.124	0.107	0.034
THYSANOTEUTHIDAE	4						22.22	0.076	0.002		0.17
Stereomastis sculpta		1					5.56	0.06			0.135
Sea cucumbers	1						5.56	0.053			0.119
Trichiurus lepturus	7						38.89	0.05	0.04	0.104	0.022
Shrimps, small, non comm.	4						22.22	0.048	0.002		0.107
Centrophorus granulosus	3						16.67	0.048	0.123	0.05	
Aristeus varidens, male	17						94.44	0.043	0.099	0.03	0.016
Centroscymnus crepidater	1						5.56	0.037		0.133	
Talismania longifilis	6						33.33	0.037		0.004	0.081
Gadella sp.	3						16.67	0.036			0.082
Benthodesmus tenuis	11						61.11	0.033	0.101	0.007	0.007
Dicrolene intronigra	11						61.11	0.033	0.002	0.045	0.045
Chaunax pictus	5						27.78	0.03	0.082	0.027	
Chaceon maritae	2						11.11	0.029	0.093		0.006
Caelorinchus coelorhincus	3						16.67	0.02	0.015	0.058	
Halosaurus ovenii	9						50	0.02	0.012	0.006	0.033
Gadella imberbis	7						38.89	0.019	0.049	0.019	0.001
CARISTIIDAE	6						33.33	0.017		0.005	0.036
MYCTOPHIDAE	12						66.67	0.017	0.021	0.012	0.017
Deania calcea	3						16.67	0.015			0.034
Laemonema laureysi	6						33.33	0.014	0.042	0.01	
Dibranchus atlanticus	13						72.22	0.014	0.021	0.013	0.01
J E L L Y F I S H	2						11.11	0.013			0.03
Scopelosaurus meadi	10						55.56	0.012	0.001	0.018	0.015
Nezumia cyrano	1						5.56	0.012			0.026
Alepocephalus rostratus	2						11.11	0.011		0.004	0.022
Plesiopenaeus edwardsianus	6						33.33	0.009	0.022	0.003	0.004
S H R I M P S	3						16.67	0.009	0.014	0.008	0.006
Glyphus marsupialis	8						44.44	0.008		0.002	0.016
Acanthephyra sp.	5						27.78	0.004	0.002	0.009	0.002
Sergestes sp.	1						5.56	0.001	0.004		
Solenocera africana	1						5.56		0.001		
Other fish								0.192	0.129	0.211	0.219

Sum all species	9.708	10.824	11.553	7.858
Sum SHARKS, CHIMAERAS	0.117	0.135	0.225	0.037
Sum BATOID FISHES, RAYS	0.014	0.001	0.003	0.029
Sum CEPHALOPODS	0.227	0.037	0.183	0.373
Numbers of stations included in analysis, total and by depth strata	18	5	5	8

A. Benguela - Palmerinhas. Shelf (20-200m)

SPECIES NAME	Lower limits, Kg/nm						% inci-dence	Mean dens.	Mean densities by bottom depth strata t/nm²			
	>0	10	30	100	300	1000		t/nm²	0-20m	20-50m	50-100m	100-200m
Chloroscombrus chrysurus	5	1				1	14.89	2.85		8.371		
Brachydeuterus auritus	15	2	8		1		55.32	2.027		0.917	4.312	0.229
Trichiurus lepturus	18	5	8	1			68.09	1.688		0.746	2.338	1.948
Pagellus bellottii	20	10	4				72.34	1.023		0.666	1.931	0.206
Pomadasys incisus	9	4	4	1			38.3	0.958		0.308	2.228	
Pomadasys peroteti		2	2		1		10.64	0.921		2.282	0.376	
Synagrops microlepis	3		5	1			19.15	0.77			0.48	2.119
MYCTOPHIDAE	1			1			4.26	0.61				2.206
Trachurus trecae	21	2	4				57.45	0.586		0.311	1.171	0.113
Raja miraletus	38	6					93.62	0.527		0.427	0.871	0.173
Pseudupeneus prayensis	12	3	1	1			36.17	0.472		0.773	0.544	
Dentex angolensis	17	5	1				48.94	0.457			0.321	1.208
Citharus linguatula	34	6					85.11	0.416		0.033	0.876	0.25
Galeoides decadactylus	10	1	2				27.66	0.368		0.965	0.101	0.003
Decapterus rhonchus	2		2				8.51	0.363		1.067		
Trigla lyra	14	4	1				40.43	0.333		0.001	0.32	0.76
Brotula barbata	15	5					42.55	0.298		0.002	0.23	0.756
Sardinella maderensis	5			1			12.77	0.295		0.864	0.002	
Dentex barnardi	18	1	2				44.68	0.292		0.275	0.251	0.371
Rhinobatos albomaculatus	15	2	1				38.3	0.273		0.561	0.214	
Umbrina canariensis	22		1				48.94	0.232		0.029	0.229	0.488
Alectis alexandrinus	7	2	1				21.28	0.214		0.576	0.046	
Pteroscion peli	1	2	1				8.51	0.19		0.557		
Sepia orbignyana	38	1					82.98	0.183		0.045	0.361	0.105
Pterothrissus belloci	13	2					31.91	0.148		0.001	0.049	0.468
Grammoplites gruveli	23	2					53.19	0.141		0.056	0.318	
Pseudotolithus senegalensis	3	2					10.64	0.131		0.177	0.184	
Torpedo torpedo	21		1				46.81	0.13		0.025	0.275	0.059
Zeus faber	19						40.43	0.116			0.191	0.156
Dentex macrophthalmus	6	2					17.02	0.113			0.044	0.349
Octopus vulgaris	18	1					40.43	0.105		0.031	0.174	0.102
Pomadasys rogeri	5		1				12.77	0.103		0.259	0.038	
Pomadasys jubelini	8	1					19.15	0.099		0.058	0.208	
Ephippion guttifer	9						19.15	0.096		0.238	0.04	
Ilisha africana	2		1				6.38	0.093		0.273		
Dasyatis marmorata	4		1				10.64	0.091		0.226	0.036	
Gymnura micrura	2	2					8.51	0.088		0.171	0.078	
G A S T R O P O D S	20						42.55	0.088		0.101	0.044	0.132
Merluccius capensis	4	1					10.64	0.085			0.111	0.153
Lagocephalus laevigatus	16	1					36.17	0.082		0.019	0.05	0.202
Pagrus caeruleostictus			1				2.13	0.081		0.239		
Sphyraena guachancho	6	1					14.89	0.078		0.164	0.056	
Lithognathus mormyrus	7	1					17.02	0.076		0.162	0.056	
Selene dorsalis	11						23.4	0.076		0.061	0.145	
Epinephelus aeneus	4	1					10.64	0.072		0.12	0.082	
Pseudotolithus typus	7	1					17.02	0.071		0.162	0.04	
Balistes capriscus	3	1					8.51	0.071		0.207		
Anthias anthias	2	1					6.38	0.064				0.233
Sardinella aurita	7	1					17.02	0.063		0.177	0.008	
Chelidonichthys capensis	4	1					10.64	0.062			0.161	0.002
Erythrocles monodi		1					2.13	0.059				0.212
Torpedo marmorata	9	1					21.28	0.054		0.118	0.037	
Drepane africana	1	1					4.26	0.052		0.154		
Alloteuthis africana	21						44.68	0.052		0.011	0.112	0.017
Scorpaena normani	9	1					21.28	0.042			0.012	0.136
Dasyatis margarita	7						14.89	0.039		0.114		
Illex coindetii	16						34.04	0.038			0.052	0.065
Chilomycterus spinosus mauret.	15						31.91	0.036		0.076	0.026	

Stromateus fiatola	4		8.51	0.035		0.096	0.009
Lepidochelys olivacea		1	2.13	0.035			0.127
Dicologoglossa cuneata	13		27.66	0.034		0.084	0.015
Pontinus accraensis	10		21.28	0.034		0.001	0.029	0.081
Atractoscion aequidens	5		10.64	0.032		0.008	0.025	0.07
Cynoglossus canariensis	12		25.53	0.032		0.089	0.003	
Cynoponticus ferox	5		10.64	0.029		0.02		0.081
Squatina oculata	4		8.51	0.029			0.068	0.011
Bembrops greyi	9		19.15	0.029		0.001		0.103
Uranoscopus polli	6		12.77	0.029			0.031	0.061
Sphyraena sphyraena	4		8.51	0.027		0.079		
Saurida brasiliensis	14		29.79	0.026		0.004	0.019	0.062
Fistularia petimba	12		25.53	0.026		0.011	0.045	0.017
Uranoscopus cadenati	8		17.02	0.024		0.001	0.027	0.048
Parapenaeus longirostris,femal	6		12.77	0.021			0.014	0.057
Lepidotrigla cadmani	1		2.13	0.02			0.052	
Chaetodon hoefleri	14		29.79	0.02		0.01	0.037	0.007
Caranx crysos	5		10.64	0.019		0.034	0.02	
Perulibatrachus rossignoli	2		4.26	0.017			0.044	0.001
Bembrops heterurus	3		6.38	0.016				0.058
Scomberomorus tritor	4		8.51	0.015		0.044		
Dentex congoensis	4		8.51	0.015			0.004	0.048
Sphoeroides pachgaster	3		6.38	0.014			0.022	0.02
Eucinostomus melanopterus	6		12.77	0.014		0.041		
Gymnura altavela	3		6.38	0.014		0.03	0.01	
Sea urchins (strong spines)	2		4.26	0.014			0.036	
Miracorvina angolensis	2		4.26	0.013			0.033	0.001
Plectorhinchus mediterraneus	3		6.38	0.012		0.027		0.01
Syacium micrurum	6		12.77	0.011		0.022		0.014
Lutjanus sp.	7		14.89	0.011			0.029	
Chelidonichthys gabonensis	4		8.51	0.011		0.002	0.018	0.012
Zenopsis conchifer	2		4.26	0.01				0.037
Parapenaeus longirostris	6		12.77	0.009			0.004	0.027
Parapenaeus longirostris, male	5		10.64	0.007			0.004	0.019
S H R I M P S	1		2.13	0.003		0.009		
penaeus notialis,female	1		2.13	0.002		0.005		
penaeus notialis,male	1		2.13	0.001		0.003		
Penaeus notialis	5		10.64	0.001		0.001		
Parapenaeopsis atlantica	1		2.13			0.001		
Other fish				0.231	0	0.302	0.188	0.205
Sum all species				20.082	0	24.102	20.607	14.406
Sum SNAPPERS, JOBFISHES				0.017		0.003	0.042	
Sum GROUPERS, SEABASSES				0.078		0.12	0.098	
Sum GRUNTS, SWEETLIPS				4.12		3.851	7.162	0.239
Sum CROAKERS, DRUMS, WEAKF., KOBS				0.68		0.939	0.537	0.559
Sum PANDORAS, PORGIES, SEABREAMS,				2.063		1.346	2.611	2.185
Sum SHARKS, CHIMAERAS				0.036		0.005	0.072	0.026
Sum BATOID FISHES, RAYS				1.232		1.679	1.523	0.281
Sum CEPHALOPODS				0.379		0.089	0.7	0.292
Numbers of stations included in analysis, total and by depth strata				47	0	16	18	13

B. Benguela - Palmerinhas. Slope (200-500m)

SPECIES NAME	Lower limits, Kg/nm						% inci-dence	Mean dens.	Mean densities by bottom depth strata t/nm²		
	>0	10	30	100	300	1000		t/nm²	200-300m	300-400m	400-500m
Merluccius polli	1	4	5				90.91	3.965	2.388	5.356	2.233
Chlorophthalmus atlanticus	6	1	1	2			90.91	3.66	1.634	6.115	0.1
Nematocarcinus africanus		2	3	1			54.55	3.427		2.459	7.649
Trichiurus lepturus	2	1		1			36.36	1.091	5.365	0.01	0.406
Dentex macrophthalmus	1		1				18.18	0.804	4.425		
Hoplostethus cadenati	5		1				54.55	0.424		0.037	1.482
Hymenocephalus italicus	8	1					81.82	0.411	0.057	0.587	0.294
Synagrops microlepis	5	1					54.55	0.3	0.937	0.231	0.013
Gadella sp.	7						63.64	0.292	0.15	0.345	0.282
Gephyroberyx darwini	1	2					27.27	0.289	0.726	0.289	
Dentex angolensis			1				9.09	0.274	1.505		
Parapenaeus longirostris,femal	5	1					54.55	0.188	0.645	0.129	
Laemonema laureysi	3	1					36.36	0.174		0.263	0.111
Yarrella blackfordi	6						54.55	0.154		0.038	0.488
Stomias boa boa	4						36.36	0.154		0.009	0.546
Zeus faber		1					9.09	0.147	0.811		
Brotula barbata	1	1					18.18	0.144	0.791		
Aristeus varidens, female	7						63.64	0.141		0.045	0.427
Pterothrissus belloci	4						36.36	0.107	0.308	0.094	
Lophiodes kempi	4						36.36	0.107		0.097	0.197
Gadella imberbis	8						72.73	0.104		0.064	0.254
Helicolenus dactylopterus	4						36.36	0.103		0.19	
Parapenaeus longirostris, male	5						45.45	0.077	0.4	0.007	
Pentheroscion mbizi	1						9.09	0.074		0.136	
Bembrops greyi	2						18.18	0.072	0.397		
Chaunax pictus	6						54.55	0.066		0.062	0.117
Triplophos hemingi	3						27.27	0.066			0.241
Lamprogrammus exutus	2						18.18	0.064			0.235
MYCTOPHIDAE	9						81.82	0.064	0.158	0.054	0.022
Aristeus varidens, male	7						63.64	0.053		0.037	0.119
Raja miraletus	1						9.09	0.052	0.284		
Malacocephalus occidentalis	2						18.18	0.052	0.267	0.005	
Malacocephalus laevis	4						36.36	0.051		0.062	0.061
Scorpaena normani	2						18.18	0.044	0.082	0.054	
Etmopterus polli	3						27.27	0.044		0.08	
Cynoponticus ferox	2						18.18	0.029	0.125	0.011	
Raja clavata	1						9.09	0.018	0.101		
Zenopsis conchifer	2						18.18	0.018	0.004	0.031	
Halosaurus ovenii	5						45.45	0.017		0.012	0.036
Bathyuroconger vicinus	3						27.27	0.011		0.02	0.001
Pontinus accraensis	1						9.09	0.011	0.06		
Solenocera africana	3						27.27	0.005		0.002	0.013
Parapenaeus longirostris	2						18.18	0.004		0.008	
Plesiopenaeus edwardsianus	2						18.18	0.002			0.006
S H R I M P S	1						9.09	0.001			0.002
Other fish								0.137	0.263	0.071	0.186
Sum all species								17.49	21.883	17.015	15.519
Sum SNAPPERS, JOBFISHES											
Sum GROUPERS, SEABASSES											
Sum GRUNTS, SWEETLIPS											
Sum CROAKERS, DRUMS, WEAKF., KOBS								0.083	0.049	0.136	
Sum PANDORAS, PORGIES, SEABREAMS,								1.078	5.93		
Sum SHARKS, CHIMAERAS								0.046		0.08	0.01
Sum BATOID FISHES, RAYS								0.071	0.385		0.004
Sum CEPHALOPODS								0.019	0.014	0.005	0.048
Numbers of stations included in analysis, total and by depth strata								11	2	6	3

C. Benguela - Palmerinhas. Slope (500-800m)

	Lower limits, Kg/nm						% inci-dence	Mean dens.	Mean densities by bottom depth strata t/nm²		
	>0	10	30	100	300	1000		t/nm²	500-600m	600-700m	700-800m
Nematocarcinus africanus	2	3	3	1			81.82	3.396	6.762	2.801	0.477
Hoplostethus cadenati	5	2	4				100	1.757	2.357	1.576	1.292
Lamprogrammus exutus	6	3	1				90.91	1.229	2.147	1.214	0.321
Yarrella blackfordi	6	3	1				90.91	1.196	0.919	0.9	1.696
Stomias boa boa	7	3					90.91	0.678	0.718	0.937	0.443
Triplophos hemingi	7	2					81.82	0.544	0.702	0.373	0.514
Aristeus varidens, female	10	1					100	0.472	0.897	0.153	0.287
Stereomastis sp.	11						100	0.293	0.183	0.125	0.531
Carcharhinus signatus		1					9.09	0.197	0.542		
Gadella maraldi		1					9.09	0.182	0.502		
Talismania longifilis	4	1					45.45	0.18	0.008		0.486
Nezumia aequalis	1	1					18.18	0.154			0.423
Merluccius polli	7						63.64	0.107	0.213	0.066	0.032
OMMASTREPHIDAE	9						81.82	0.105	0.094	0.122	0.103
Bathygadus melanobranchus		1					9.09	0.102			0.281
Aristeus varidens, male	11						100	0.077	0.153	0.025	0.039
Centrophorus granulosus	3						27.27	0.074	0.103	0.133	
Xenodermichthys copei	10						90.91	0.065	0.101	0.047	0.043
Nezumia micronychodon	3						27.27	0.061		0.086	0.103
Yarrella corythaeola	1						9.09	0.055		0.203	
Benthodesmus tenuis	6						54.55	0.054	0.133	0.019	0.002
Chaceon maritae, female	2						18.18	0.047	0.123		0.006
Bathyuroconger vicinus	7						63.64	0.044	0.013	0.042	0.078
Gadella imberbis	10						90.91	0.044	0.071	0.034	0.023
Nezumia sp.	3						27.27	0.04	0.035		0.076
Etmopterus polli	4						36.36	0.038	0.002	0.138	
Chaunax pictus	4						36.36	0.036	0.097	0.002	
Halosaurus ovenii	7						63.64	0.035	0.025	0.014	0.061
Gadella sp.	4						36.36	0.027	0.059		0.014
Nephropsis atlantica	1						9.09	0.023			0.064
Laemonema laureysi	3						27.27	0.022	0.036	0.003	0.023
Ebinania costaecanarie	1						9.09	0.022			0.061
Chlorophthalmus atlanticus	3						27.27	0.021	0.049	0.012	
Synaphobranchus kaupii	2						18.18	0.02			0.054
Todarodes sp.	1						9.09	0.019			0.053
E C H I N O D E R M A T A	1						9.09	0.017			0.048
Plesiopenaeus edwardsianus	5						45.45	0.016	0.006		0.038
Opisthoteuthis agassizi	1						9.09	0.015			0.042
MYCTOPHIDAE	5						45.45	0.015	0.008		0.033
Stomias affinis	1						9.09	0.015	0.041		
Tetragonurus cuvieri	1						9.09	0.015			0.04
Hymenocephalus italicus	2						18.18	0.014	0.038	0.001	
Lophiodes kempi	1						9.09	0.014			0.039
Dicrolene intronigra	2						18.18	0.014			0.038
Merluccius capensis	1						9.09	0.013			0.037
Scopelosaurus meadi	7						63.64	0.012	0.012	0.016	0.01
Conger conger	3						27.27	0.012	0.019	0.002	0.012
THYSANOTEUTHIDAE	2						18.18	0.012	0.03	0.004	

Nemichthys scolopaceus	6	54.55	0.012	0.015	0.013	0.008
DICERATIIDAE	4	36.36	0.012		0.015	0.021
Gonostoma denudata	1	9.09	0.011			0.031
Centrophorus squamosus	3	27.27	0.011	0.002	0.018	0.016
S H R I M P S	4	36.36	0.009	0.002	0.003	0.022
Acanthephyra sp.	3	27.27	0.003	0.003	0.008	
Heterocarpus grimaldii	1	9.09	0.003			0.007
Plesionika martia	1	9.09	0.002		0.008	
Other fish			0.133	0.067	0.082	0.236
Sum all species			11.799	17.287	9.197	8.263
Sum SNAPPERS, JOBFISHES						
Sum GROUPERS, SEABASSES						
Sum GRUNTS, SWEETLIPS						
Sum CROAKERS, DRUMS, WEAKF., KOBS						
Sum PANDORAS, PORGIES, SEABREAMS,						
Sum SHARKS, CHIMAERAS			0.329	0.667	0.292	0.019
Sum BATOID FISHES, RAYS			0.013			0.037
Sum CEPHALOPODS			0.159	0.131	0.126	0.212
Numbers of stations included in analysis, total and by depth strata			11	4	3	4

A. Palmerinhas-Congo River. Shelf 20-200

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% inci-dence	Mean dens.	Mean densities by bottom depth strata t/nm²		
	>0	10	30	100	300	1000		t/nm²	20-50m	50-100m	100-200m
Sardinella aurita	8		1	1		1	28.95	7.975	27.468	0.064	
Synagrops microlepis			1		1	1	7.89	7.95			23.24
Brachydeuterus auritus	3	3	5	2	3		42.11	6.559	13.676	6.815	0.261
Galeoides decadactylus	2	1	5		1		23.68	1.757	5.26	0.637	
Trachurus trecae	14	7	5	1			71.05	1.35	1.079	1.794	1.101
Dentex angolensis	10	11	3				63.16	0.993		0.55	2.31
Pomadasys jubelini		3	1	1			13.16	0.703	1.308	0.88	
Chloroscombrus chrysurus	5		5				26.32	0.701	1.989	0.34	
Lagocephalus laevigatus	12	3	2				44.74	0.569	0.201	0.653	0.79
Stromateus fiatola	4	2	1	1			21.05	0.492	1.469	0.169	0.015
Dentex congoensis	10	1	4				39.47	0.447	0.029	0.528	0.714
Sepia orbignyana	24	4	1				76.32	0.397	0.86	0.269	0.142
Pagellus bellottii	20	4	1				65.79	0.376	0.568	0.563	0.011
Zenopsis conchifer	3			1			10.53	0.355			1.036
Selene dorsalis	8	6					36.84	0.343	0.409	0.345	0.284
Trichiurus lepturus	16	3	1				52.63	0.323	0.15	0.091	0.721
Umbrina canariensis	10	1	1				31.58	0.27		0.5	0.251
Pomadasys incisus	3	1	2				15.79	0.268	0.486	0.346	
Zeus faber	21		1				57.89	0.246		0.172	0.535
Ilisha africana	3		1				10.53	0.221	0.765		
Raja miraletus	20	2					57.89	0.199	0.335	0.251	0.028
Pagrus caeruleostictus	7	1	1				23.68	0.192	0.572	0.068	0.003
Rhinobatos albomaculatus	4	1	1				15.79	0.181	0.076	0.423	0.01
Argyrosomus hololepidotus		1	1				5.26	0.179		0.14	0.371
Brotula barbata	11	2					34.21	0.162		0.026	0.445
Pteroscion peli	2	1	1				10.53	0.156	0.484		0.046
Atractoscion aequidens	1		1				5.26	0.156	0.066	0.371	
Decapterus rhonchus	5	1	1				18.42	0.136	0.076	0.297	0.013
Pseudotolithus typus	1	1	1				7.89	0.134	0.461		
Dasyatis marmorata	4		1				13.16	0.109	0.008	0.269	0.022
Citharus linguatula	31	1					84.21	0.107	0.143	0.101	0.083
Lepidotrigla cadmani	14						36.84	0.106		0.096	0.206
Sphyraena guachancho			1				2.63	0.105	0.364		
Pterothrissus belloci	10	1					28.95	0.105		0.014	0.291
Drepane africana			1				2.63	0.098	0.339		
Dentex barnardi	19						50	0.097	0.126	0.142	0.024
Pseudupeneus prayensis	10	1					28.95	0.097	0.297	0.029	
Sphyraena sphyraena	4	1					13.16	0.094	0.302	0.017	
Saurida brasiliensis	17	1					47.37	0.077		0.029	0.194
Torpedo torpedo	10	1					28.95	0.073		0.156	0.045
Alectis alexandrinus	1	2					7.89	0.066	0.092	0.107	
Balistes capriscus	5	1					15.79	0.065	0.191	0.026	
Ephippion guttifer	4	1					13.16	0.065	0.223		
Spicara alta	7	1					21.05	0.062		0.01	0.17

Engraulis encrasicolus	2	1	7.89	0.057	0.195		
Ariomma bondi	5	1	15.79	0.055			0.162
Fistularia petimba	20		52.63	0.052	0.008	0.099	0.04
Epinephelus aeneus	10		26.32	0.047	0.053	0.047	0.043
Chelidonichthys gabonensis	5		13.16	0.047	0.006	0.121	
Sardinella maderensis	2	1	7.89	0.046	0.158		
Balistes punctatus		1	2.63	0.037	0.129		
Caranx crysos	5		13.16	0.036	0.09	0.027	
Illex coindetii	13		34.21	0.035		0.004	0.1
Hemicaranx bicolor		1	2.63	0.033	0.115		
Torpedo marmorata		1	2.63	0.031	0.106		
Gymnura altavela		1	2.63	0.03	0.102		
Alloteuthis africana	10		26.32	0.029	0.001	0.077	
Aluterus heudelotii	3		7.89	0.023	0.081		
Octopus vulgaris	9		23.68	0.021	0.025	0.02	0.019
Cynoglossus canariensis	3		7.89	0.017	0.055	0.004	
Bembrops greyi	2		5.26	0.013			0.038
Pomadasys rogeri	2		5.26	0.013	0.045		
Pomadasys peroteti	3		7.89	0.013	0.013	0.024	
Scorpaena normani	3		7.89	0.013			0.037
Squatina oculata	4		10.53	0.012		0.034	
Uranoscopus polli	3		7.89	0.012		0.004	0.032
Dasyatis margarita	1		2.63	0.012	0.042		
Rhinobatos rhinobatos	1		2.63	0.012	0.041		
Dicologoglossa cuneata	3		7.89	0.012	0.039	0.001	
Chaetodon hoefleri	11		28.95	0.011	0.015	0.012	0.006
Parapenaeus longirostris	2		5.26	0.007		0.001	0.02
Penaeus notialis	2		5.26	0.006	0.021		
Other fish				0.189	0.197	0.174	0.2
Sum all species				36.036	61.408	17.936	34.06
Sum SNAPPERS, JOBFISHES				0.002	0.006		
Sum GROUPERS, SEABASSES				0.049	0.053	0.051	0.044
Sum GRUNTS, SWEETLIPS				7.556	15.528	8.066	0.261
Sum CROAKERS, DRUMS, WEAKF., KOBS				0.897	1.012	1.019	0.668
Sum PANDORAS, PORGIES, SEABREAMS,				2.123	1.322	1.856	3.087
Sum SHARKS, CHIMAERAS				0.018		0.041	0.008
Sum BATOID FISHES, RAYS				0.653	0.714	1.099	0.123
Sum CEPHALOPODS				0.487	0.888	0.377	0.265
Numbers of stations included in analysis, total and by depth strata				38	11	14	13

B. Palmerinhas-Congo River. Slope 200-500

	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% inci-	Mean	Mean densities by bottom depth strata t/nm²		
	>0	10	30	100	300	1000	dence	dens. t/nm²	200-300m	300-400m	400-500m
Synagrops microlepis	2			2		2	46.15	21.539	69.896	0.105	
Merluccius polli	4	2	3	3			92.31	5.853	12.36	2.6	3.251
Chlorophthalmus atlanticus	6	1	2	1			76.92	2.522	5.413	2.761	0.018
Nematocarcinus africanus	3	2	2	1			61.54	2.449		1.316	5.315
Parapenaeus longirostris	4	3	1				61.54	0.954	2.233	0.868	
Zenopsis conchifer	3			1			30.77	0.919	2.958	0.03	
Hoplostethus cadenati	3			1			30.77	0.905		2.917	0.018
Chaunax pictus	6	2					61.54	0.338		0.247	0.682
Benthodesmus tenuis	4	2					46.15	0.309		0.55	0.363
Laemonema laureysi	9						69.23	0.258		0.489	0.28
Hymenocephalus italicus	8						61.54	0.256		0.373	0.367
Brotula barbata	1	1					15.38	0.251	0.814		
Trichiurus lepturus		2					15.38	0.244	0.794		
Caranx crysos		1					7.69	0.163		0.531	
Bembrops heterurus	2	1					23.08	0.144	0.467		
Gadella imberbis	9						69.23	0.136		0.318	0.099
Munidopsis sp.	4	1					38.46	0.128	0.313	0.097	0.004
Dibranchus atlanticus	8						61.54	0.124	0.015	0.097	0.234
Pontinus accraensis	2	1					23.08	0.122	0.006	0.389	
Dentex angolensis	1	1					15.38	0.105	0.34		
Ariomma bondi	2	1					23.08	0.103	0.333		0.002
Illex coindetii	3						23.08	0.097	0.317		
Malacocephalus laevis	3						23.08	0.094		0.257	0.038
ANTHOZOA (Sea anemones)		1					7.69	0.092			0.238
Aristeus varidens, female	4						30.77	0.087		0.038	0.196
MYCTOPHIDAE	10						76.92	0.085	0.214	0.027	0.029
Hoplostethus atlanticus	2						15.38	0.078		0.253	
Bembrops greyi	2						15.38	0.077	0.075	0.175	
Pterothrissus belloci	4						30.77	0.076	0.106	0.142	
Erythrocles monodi	1						7.69	0.075	0.243		
Stomias boa boa	4						30.77	0.074		0.023	0.174
Etmopterus polli	6						46.15	0.068		0.002	0.175
Chaceon maritae, female	1						7.69	0.059		0.192	
Conger conger	2						15.38	0.052		0.071	0.079
B I V A L V E S	2						15.38	0.052			0.136
Parasudis fraser-bruenneri	3						23.08	0.05	0.162		
Yarrella blackfordi	3						23.08	0.046			0.119
Raja alba	2						15.38	0.043		0.13	0.007
Aristeus varidens, male	3						23.08	0.04		0.021	0.087
Chaceon maritae	1						7.69	0.036			0.095
Chascanopsetta lugubris	2						15.38	0.032	0.105		
Lophius vaillanti	3						23.08	0.032		0.045	0.047
Coelorinchus coelorhincus	2						15.38	0.032		0.094	0.008
Peristedion cataphractum	4						30.77	0.03	0.096	0.002	
Chaceon maritae, male	1						7.69	0.03			0.078

UNIDENTIFIED FISH	1	7.69	0.027		0.088	
Lamprogrammus exutus	1	7.69	0.026			0.069
OPHICHTHIDAE	1	7.69	0.025	0.081		
Halosaurus ovenii	4	30.77	0.025			0.064
Argyrosomus hololepidotus	1	7.69	0.024	0.078		
Centrophorus granulosus	1	7.69	0.024		0.077	
Coelorinchus coelorhinc. polli	3	23.08	0.022		0.031	0.033
Triplophos hemingi	4	30.77	0.021			0.055
Aristeus varidens	3	23.08	0.021		0.022	0.037
Uranoscopus polli	1	7.69	0.02	0.066		
Bathynectes piperitus	5	38.46	0.019		0.054	0.007
Coelorinchus sp.	2	15.38	0.019	0.016	0.045	
Xenodermichthys copei	1	7.69	0.019			0.048
Bathyuroconger vicinus	3	23.08	0.018		0.053	0.005
Lophiodes kempi	2	15.38	0.018		0.058	
Gadella sp.	1	7.69	0.015	0.05		
Epigonus telescopus	3	23.08	0.015	0.003	0.046	
L O B S T E R S	2	15.38	0.015			0.039
Chelidonichthys sp.	1	7.69	0.013		0.042	
Diastobranchus capensis	1	7.69	0.012	0.039		
Nezumia aequalis	6	46.15	0.012	0.002	0.022	0.012
Peristedion sp.	2	15.38	0.011	0.035		
Stereomastis sp.	2	15.38	0.011		0.015	0.016
Heptranchias perlo	1	7.69	0.011	0.034		
Plesiopenaeus edwardsianus	2	15.38	0.01			0.027
Parapenaeus longirostris,femal	1	7.69	0.009		0.028	
Glyphus marsupialis	1	7.69	0.002			0.005
Solenocera africana	1	7.69	0.001			0.004
S H R I M P S	1	7.69				0.001
Other fish			0.085	0.051	0.096	0.103
Sum all species			39.81	97.714	15.836	12.664
Sum SNAPPERS, JOBFISHES						
Sum GROUPERS, SEABASSES						
Sum GRUNTS, SWEETLIPS						
Sum CROAKERS, DRUMS, WEAKF., KOBS			0.028	0.091		
Sum PANDORAS, PORGIES, SEABREAMS,			0.105	0.34		
Sum SHARKS, CHIMAERAS			0.103	0.034	0.079	0.177
Sum BATOID FISHES, RAYS			0.048	0.017	0.13	0.007
Sum CEPHALOPODS			0.11	0.317		0.032
Numbers of stations included in analysis, total and by depth strata			13	4	4	5

C. Palmerinhas-Congo River. Slope 500-800

	SAMPLE DISTRIB. BY CATCH CLASSES						% inci-	Mean	Mean densities by bottom		
	Lower limits, Kg/nm						dence	dens.	depth strata t/nm²		
	>0	10	30	100	300	1000		t/nm²	500-600m	600-700	700-800
Nematocarcinus africanus	1	2	5	1			64.29	3.601	6.291	4.53	1.918
Yarrella blackfordi	8	4	2				100	1.435	0.128	0.973	2.26
Lamprogrammus exutus	2	6	2				71.43	1.407	0.592	2.396	1.191
Nezumia aequalis	7	3	1				78.57	0.882	0.017	0.186	1.649
Triplophos hemingi	7	3	1				78.57	0.749	0.554	0.802	0.803
L O B S T E R S	6	5					78.57	0.683	0.263	0.633	0.891
Hoplostethus cadenati	11	3					100	0.619	0.341	0.575	0.765
Xenodermichthys copei	11	1	1				92.86	0.554	0.053	1.518	0.218
Anemones, pink	4	1	1				42.86	0.549			1.097
Stomias boa boa	13	1					100	0.51	0.459	0.796	0.367
Nezumia micronychodon	1	1					14.29	0.246		0.728	0.076
Lophius vaillanti	3	1					28.57	0.222	0.216		0.352
			1				7.14	0.216			0.433
Coelorinchus coelorhincus	1	1					14.29	0.21			0.419
Chaceon maritae, male	4	1					35.71	0.182	0.039	0.539	0.04
Talismania longifilis	7						50	0.169		0.089	0.286
Merluccius polli	12						85.71	0.164	0.099	0.09	0.234
Bathyuroconger vicinus	12						85.71	0.142	0.02	0.156	0.187
Aristeus varidens	7						50	0.132	0.31	0.162	0.039
Raja confundens	7						50	0.118	0.026	0.004	0.222
Stereomastis sp.	1	1					14.29	0.095		0.036	0.169
Opisthoteuthis agassizi	3						21.43	0.091		0.009	0.178
Dibranchus atlanticus	13						92.86	0.089	0.034	0.061	0.128
Dicrolene sp.	6						42.86	0.073	0.001	0.102	0.088
Aristeus varidens, female	5						35.71	0.069	0.116	0.052	0.058
Melanostomias sp.	5						35.71	0.067	0.02	0.023	0.111
Todaropsis eblanae	8						57.14	0.066	0.039	0.056	0.084
Benthodesmus tenuis	6						42.86	0.059	0.088	0.056	0.049
J E L L Y F I S H	3						21.43	0.058		0.003	0.113
Halosaurus ovenii	7						50	0.05	0.008	0.073	0.055
Octopoteuthis sicula	4						28.57	0.049	0.096	0.017	0.046
Dicrolene intronigra	14						100	0.047	0.026	0.042	0.059
Trachyrincus scabrus	4						28.57	0.045	0.001	0.015	0.082
Starfish red B	1						7.14	0.041			0.082
Etmopterus polli	5						35.71	0.041	0.006	0.01	0.074
Raja miraletus	2						14.29	0.04			0.08
Chlamydoselachus anguineus	1						7.14	0.038	0.177		
Lophiodes kempi	2						14.29	0.033	0.134		0.008
Bathyuroconger braueri	1						7.14	0.03			0.06
Careproctus griseldea	1						7.14	0.029	0.136		
Diceratias pileatus	1						7.14	0.026		0.091	
Munida sp.	4						28.57	0.024			0.048
Lithodes ferox	2						14.29	0.024			0.048
Aristeus varidens, male	3						21.43	0.024	0.074	0.021	0.004
Scymnodon obscurus	3						21.43	0.023	0.064	0.011	0.012
Plesiopenaeus edwardsianus	6						42.86	0.021		0.049	0.013
Glyphus marsupialis	8						57.14	0.019	0.001	0.018	0.028
Chaceon maritae	1						7.14	0.017			0.035
Malacocephalus occidentalis	1						7.14	0.015		0.053	

Laemonema laureysi	3	21.43	0.014	0.042	0.019	
Gonostoma elongatum	5	35.71	0.014	0.029	0.018	0.004
GERYONIDAE	1	7.14	0.014			0.027
Avocettina sp.	2	14.29	0.012	0.055		0.001
NETTASTOMATIDAE	1	7.14	0.012			0.024
Chaceon maritae, female	2	14.29	0.011		0.033	0.004
Talismania sp.	1	7.14	0.011		0.039	
S H R I M P S	2	14.29	0.009			0.017
Solenocera africana	1	7.14	0.007			0.014
CARIDEA	1	7.14	0.004		0.013	
Other fish			0.133	0.128	0.179	0.108
Sum all species			14.33	10.682	15.28	15.361
Sum SNAPPERS, JOBFISHES						
Sum GROUPERS, SEABASSES						
Sum GRUNTS, SWEETLIPS						
Sum CROAKERS, DRUMS, WEAKF., KOBS						
Sum PANDORAS, PORGIES, SEABREAMS,						
Sum SHARKS, CHIMAERAS			0.102	0.247	0.021	0.086
Sum BATOID FISHES, RAYS			0.158	0.026	0.004	0.302
Sum CEPHALOPODS			0.214	0.136	0.108	0.308
Numbers of stations included in analysis, total and by depth strata			14	3	4	7

ANNEX IV EQUATIONS

1. Biomass estimates

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

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

where

L is the number of strata,

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

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

$y_{i,k}$ is the density [tonnes/NM^2] 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

$$B = \bar{y}_{st} \cdot total\ area \tag{2}$$

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

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

where

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

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

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

The precision for the estimates (CV) was calculated by (Zar 1999[1]):

$$CV = \frac{SE}{biomass} \tag{5}$$

If the sample size is "large" enough, then the Central Limit Theorem states that each time a survey is conducted there is a 95% chance that the true mean is in the interval (see Cochran[2], 1977)

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

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 family and species codes used in defining the 'grouped species' tables

MAIN GROUPS

Demersal fish	Pelagic fish	Shrimp	Cephalopod	Sharks
Sparidae (SPA0000)	Engraulididae (ENG0000)	SHR0000	SQU0000	SHA0000
Pomadasyidae (POD0000)	Clupeidae (CLU0000)			
Sciaenidae (SCI0000)	Carangidae (CAR0000)			
Ariidae (ARD0000)	Scombridae (SCM0000)			
Serranidae (SER0000)	Sphyraenidae (SPH0000)			
Lutjanidae (LUT0000)	Trichiuridae (TRI0000)			
Ophidiidae (OPDAA00)	Stromateidae (STRAA00)			
Merluccius sp (MERME00)				

PELAGIC

Clupeids	Carangids	Scombrids	Hairtails	Barracudas
ENG0000	CAR0000	SCM0000	TRI0000	SPH0000
CLU0000				

DEMERSAL

Seabream	Snappers	Groupers	Grunts	Croakers
Dentex (SPADE00)	LUT0000	SER0000	POD0000	SCI0000
Diplodus sp (SPADI00)			(all species)	
Lithognathus sp (SPALI00)			PODPO00	
Pagellus sp (SPAPA00)			(commercial species)	
Pagrus sp (SPAPR00)				
Sparus sp (SPASA00)				
Spicara sp (SPASP00)				

DEEP WATER

Seabream	Hakes	Shrimps
SPADE00	M. polli (MERME03)	P. longirsostirs (SHRPE31,SHRPEP1, SHREPP2
SPADI00	M. capensis(MERME04)	A.varidens (SHRAR22, SHRARA1,SHRARA2)
SPALI00		N.africanus (SHRNE21)
SPAPA00		
SPAPR00		
SPASA00		
SPASP00		

ANNEX VI CATCH RATES

Families included under each group:
Demersal: Sciaenidae, Sparidae, Pomadasyidae, Ariidae, Serranidae, Lutjanidae, Merlucciidae, Ophidiidae, Lethrinidae.
Pelagic: Scombridae, Sphyrnidae, Trichiuridae, Clupeidae, Engraulidae, Carangidae.
Cephalopods: squids and octopuses.

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

A. Inner shellf (20-70 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
6	66.5	71.5	54.8	169.1	167.3		375.3	838
7	24	8.4	1673.3	687	178.1		512.6	3059.5
12	61	32.3	24.6	1642.6	14.3		99.7	1813.4
13	36	62.7	16	321.4	3.4		179.3	582.8
14	27	34.4		11599.5	349.1		928	12911
15	60.5	21.2	17.1	150.9	26		132.8	348.1
22	40	2.3	773.9	636.2	34		153.9	1600.3
23	68.5	27.4	162.8	145.6	0.9		70.8	407.5
25	60.5	37.2	227	10.5			73.6	348.4
26	44	20.1	152.4	45			206.1	423.7
27	23.5		339.8	7541.4		3.1	27.5	7911.9
Mean	46.5	28.9	312.9	2086.3	70.3	0.3	250.9	2749.5
Std dev		22.7	504.3	3837.9	113.7	0.9	266.4	4037
% Catch		1.1	11.4	75.9	2.6		9.1	100.0

B. Outer shelf (70-200 m).

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
4	181	1.3	739.7	34	3.2	7.7	450	1235.9
5	150	2.3	498	489	70.5		229.9	1289.7
11	152.5	5	421.1	213.4	0.3		403.9	1043.6
16	103	152.4	677.7	913.3			142.4	1885.8
17	135		141.3	217.2			7678.6	8037.1
18	113.5	15.5	38	7.4			554.5	615.4
19	97.5	8	7.3	1.3	11.3		62.8	90.6
20	84	27.3	374.9	28.6			112.2	542.9
24	101	16.5	9.1	4.9	76.7		48.9	156.1
Mean	124.2	25.4	323	212.1	18	0.9	1075.9	1655.2
Std dev		48.4	286.1	308.8	31.8	2.6	2482.7	2461.7
% Catch		1.5	19.5	12.8	1.1	0.1	65.0	100.0

C. Slope (200-800 m) – southern region continued.

Station	Gear depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
1	658.5	7.1	96.9			1.6	312.3	417.9
2	547		45.2			7.7	579.6	632.5
3	321.5	7.4	435.1		11.6		457.7	911.8
8	724	15.8	63.2			11.9	1140.3	1231.2
9	672		21.2			3.2	290.8	315.2
Mean	584.6	6.1	132.3		2.3	4.9	556.2	701.7
Std dev		6.5	171.5		5.2	4.9	346.9	373.9
% Catch		0.9	18.9		0.3	0.7	79.3	100.0

Catch rates (kg/hour) by **main demersal groups** caught in valid swept area bottom trawl hauls on the shelf. **Southern region**.

A. Inner shellf (20-70 m).

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
6	66.5	29.3			3.6		805	838
7	24	1317.1		108.4			1634	3059.5
12	61	2.5			13.8		1797.1	1813.4
13	36				5.6		577.2	582.8
14	27						12911	12911
15	60.5	4.3			11.1		332.6	348.1
22	40			15.1	758.8		826.4	1600.3
23	68.5				162.8		244.7	407.5
25	60.5				227		121.4	348.4
26	44	2.2			150.2		271.3	423.7
27	23.5	29.1		130.6	180.1		7572.1	7911.9
Mean	46.5	125.9		23.1	137.6		2463	2749.5
Std dev		395.2		48.1	223.8		4063.5	4037
% Catch		4.6		0.8	5.0		89.6	100.0

B. Outer shelf (70-200 m) – southern region continued.

Station	Gear depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
4	181				87.8		1148	1235.9
5	150				321.8		967.9	1289.7
11	152.5				156.3		887.3	1043.6
16	103	9.7			643.8		1232.4	1885.8
17	135				53.4		7983.7	8037.1
18	113.5				38		577.4	615.4
19	97.5				7.1		83.5	90.6
20	84	3.6			360.4		178.9	542.9
24	101				9.1		146.9	156.1
Mean	124.2	1.5			186.4		1467.3	1655.2
Std dev		3.3			215.6		2482.8	2461.7
% Catch		0.1			11.3		88.6	100.0

Catch rates (kg/hour) by **main pelagic groups** caught in valid swept area bottom trawl hauls on the shelf. **Southern region.**

A: Inner shelf (20-70 m).

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
6	66.5		164		5.1		668.9	838
7	24		607.5	30.2	4.9		2416.9	3059.5
12	61		1594	15.4	48.6		155.4	1813.4
13	36		311.4	41.7	8.5		221.2	582.8
14	27		1676.7	9922.8			1311.4	12911
15	60.5		98.8		52.1		197.2	348.1
22	40		629.4	5.1	0.8	4.1	960.9	1600.3
23	68.5		145.6				261.9	407.5
25	60.5		10.5				337.9	348.4
26	44		45				378.7	423.7
27	23.5		7072.6	468.8			370.4	7911.9
Mean	46.5		1123.2	953.1	10.9	0.4	661.9	2749.5
Std dev			2059.6	2978.1	19.7	1.2	684.7	4037
% Catch			40.9	34.7	0.4		24.1	100.0

B: Outer shelf (71-200 m).

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
4	181		21.3		12.7		1201.9	1235.9
5	150		230.8	210	33.8	14.4	800.8	1289.7
11	152.5		207.7	4.1	1.7		830.2	1043.6
16	103		821.9	84	7.4		972.5	1885.8
17	135		212	10.2	5.2		7809.6	8037.1
18	113.5				7.4		608	615.4
19	97.5		1.3				89.3	90.6
20	84		3.3		25.3		514.3	542.9
24	101		2.2	2.6			151.2	156.1
Mean	124.2		166.7	34.6	10.4	1.6	1442	1655.2
Std dev			266.3	71.2	11.8	4.8	2415.1	2461.7
% Catch			10.1	2.1	0.6	0.1	87.1	100.0

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

Slope (201-800 m).

Station	Depth	*A.varidens*	Hake	*N.africana*	*P.longirostris*	Seabream	Other	Total
1	658.5		86.1		1.2		330.6	417.9
2	547	5.7	44.7				582.2	632.5
3	321.5		435.1				476.8	911.8
8	724	11.2	3.3				1216.7	1231.2
9	672	2.6	19.1				293.5	315.2
Mean	584.6	3.9	117.7		0.2		579.9	701.7
Std dev	160.6	4.7	180.2		0.5		374.3	373.9
% Catch		0.6	16.8				82.6	100.0

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

A. Inner shelf (20-70 m).

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
	67.5	16.3	104.5	109.6		0.1	89.1	319.7
35	54.5	11.6	2404.5	898.1			256.4	3570.6
45	55	44.3	184.2	207.1			123.4	559.1
46	30.5	3.3	142.3	1678.7			154.7	1978.9
47	23.5	58.8	506.2	4301			557.8	5423.8
48	64	29.3	11.2	1450.3			90.9	1581.7
55	21.5	13.6	114.3	1454.2			315.7	1897.8
56	28	10.8	1.8	1115.3			68.2	1196.1
57	62	19.9	3497.6	16.6			195.9	3729.9
64	63.5	86.4	27.5	595.3			334.8	1044
65	22.5	17.3	14.2	14.3			437	482.8
66	22.5		1378.9	6020.8			161.5	7561.2
67	35	11.5	814.6	1527.6		10.7	156.4	2520.8
68	54	52.8	498.5	109.7			313.6	974.7
76	39.5	25.6	62.4	252.2		2.5	130.5	473.2
77	32.5	11.5	1213.9	378.9		8.3	113.3	1725.9
83	24	2.8	95.8	313.8			108.3	520.8
84	23.5	5.6	3.4	104.4			21.7	135.1
85	34	0.5	9.5	13.7			18.9	42.6
93	61	9.3	55.7	1.5			140.2	206.7
94	22.5	6	12.6	18.9		0.1	16.1	53.7
95	32	16.6	63.4	257.8			57.5	395.3
101	50.5	8.7	52.5	62.6			43	166.7
102	24	5	106.9	412.3			150.7	674.9
103	43		61.5	37			41.6	140.1
Mean	39.6	18.7	457.5	854.1		0.9	163.9	1495
Std dev		21.1	852.5	1427.6		2.7	136.5	1849.1
% Catch		1.3	30.6	57.1		0.1	11.0	100.0

B. Outer shelf (70-200 m).

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
30	106.5	17.9	317.7	161.2			683.4	1180.2
31	95.5	72.6	111.2	69.5			432	685.3
36	74	32.8	735.6	371.8			172.8	1313
37	87.5	6.9	821	43.9			240.3	1112
38	106	33	159.3	4506.3			53.6	4752.1
43	102	27.1	94.4	1			85.2	207.6
44	71	62.8	310.8	21.6			176.5	571.7
49	110	7	352.2	6.8			77.2	443.2
54	164.5	22.1	160.4	141.6	3.6	23	905.8	1256.6
58	104.5	9.2	29.5	489.4			619.7	1147.8
63	154.5	20.6	500.1	12.2		93.8	447.3	1073.9
69	132	24.3	66.1	28.3		8.2	534.8	661.6
74	146	80.9					4446.9	4527.8
78	96	34.4	25.4	489.2	3.5		169.5	721.9
79	107	31.7	764.8	45.7			213.8	1056.1
81	189	8	58.4			0.2	404.2	470.8
82	78	10.8	46.1	207.3			33.1	297.3
86	76	16.2	1091.2	500.2			81.6	1689.2
87	102	18.7	230.2	598.5			196.9	1044.3
92	111	2.7	18.1	10.2			44.2	75.1
96	92.5	6.1	385	63.9			157.1	612
97	104.5	19.5	251.8	126.1			120.9	518.3
100	112	21.2	38.1	20		5.9	237.2	322.4
104	80.5	11.8	182.1	70.1			14.2	278.3
105	117		48.1	7.9			523.4	579.4
Mean	108.8	23.9	271.9	319.7	0.3	5.2	442.9	1063.9
Std dev		20.8	295.8	892.1	1	19.1	866.2	1149.6
% Catch		2.2	25.6	30.0		0.5	41.6	100.0

C. Slope (200-800 m).

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
28	727	1.2	238.8		0.4	0.4	341.3	582.2
29	627	7.8	22.5	2.4	0.3	38.8	247.5	319.2
39	574		223	1.2		102.9	242.4	569.5
40	481	4.6	40.2	12		302.9	202.5	562.3
41	335.5	1.7	9.7			9.8	354.7	375.9
42	259.5	14.6	786.9	99.9		76.3	1085.2	2062.8
50	352.5	12		0.7	54.4	69.7	497.2	633.9
51	483.5		79.5	8.6		393.3	363.4	844.8
52	673	12.4	29.6		4.8	123.9	359.7	530.4
53	262.5	69.1	156.5			132.3	4431.2	4789.1
59	384	3.8	24.2	8.9	20.7	352.1	295.9	705.7
60	529.5		148.5	1.3	1.1	269.3	193	613.2
61	726.5		105.3			19.6	383.6	508.5

C. Slope (200-800 m) continued

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
62	530.5	6.4	38.1	0.7		101.2	142.2	288.6
70	373.5	4.1	43.7	3.8	4.8	119.6	122.7	298.6
71	734.5		237.2	1		6.1	561.4	805.7
72	510.5	1.2	164		4.4	186.8	262.6	618.9
73	360.5		355.9			29	724.8	1109.6
80	477		13.2		1.8	336.6	107.9	459.5
88	635.5	3.6	62.2	2.7	7.1	314.1	151.4	541.1
89	714.5	16.9	21.4	1.8		133.6	433.4	607
90	482.5		91.2	1	1.6	271.5	168.1	533.5
91	377.5		71.5	22.1		239.9	57.3	390.8
98	634.5		19.4	1.4	0.2	69.4	96.6	187
99	532	1.8	76.1	9.2	3.8	19.4	125.7	235.9
Mean	511.1	6.4	122.3	7.1	4.2	148.7	478.1	766.9
Std dev		14	165.4	20	11.3	124.6	854.1	914.5
% Catch		0.8	32.3	3.9	1.6	8.2	53.3	100.0

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

A. Inner shelf (20-70 m)

Station	Depth	Croakers	Groupers	Grunts	Seabreams	Snappers	Other	Total
32	67.5	4.6	2.2	24	60.5		228.4	319.7
35	54.5	151	281.7	583.2	53.2		2501.5	3570.6
45	55	26.5	1.2	14.8	133.3		383.1	559.1
46	30.5			38.1	18.9		1921.9	1978.9
47	23.5		1.9	3.8	123.1		5295	5423.8
48	64		4.6		6.6		1570.5	1581.7
55	21.5	20.5		15.8	1.7		1859.9	1897.8
56	28		1.8				1194.3	1196.1
57	62		8.8	3417.6	71.2		232.4	3729.9
64	63.5				27.5		1016.5	1044
65	22.5			3.1	11		468.6	482.8
66	22.5			38	143.4		7379.7	7561.2
67	35	62.4	1.5	5.3	65.3		2386.3	2520.8
68	54	27	2.7	2.2	121.2		821.7	974.7
76	39.5	2.5	2.8		40		427.9	473.2
77	32.5		1.3	1.2	46.2		1677.2	1725.9
83	24	12.2					508.6	520.8
84	23.5		0.2		3.2		131.7	135.1
85	34		1.5		8		33.1	42.6
93	61		0.1	3.5	52.1		151	206.7
94	22.5				12.6		41.1	53.7
95	32				63.4		332	395.3
101	50.5			2	33.8		130.9	166.7

A. Inner shelf (20-70 m) central region continued

102	24	19.9		18.2	23.9	612.9	674.9
103	43				27.4	112.7	140.1
Mean	39.6	13.1	12.5	166.8	45.9	1256.8	1495
Std dev		32.2	56.1	687	43.7	1732.1	1849.1
% Catch		0.9	0.8	11.2	3.1	84.1	100.0

B. Outer shelf (71-200 m).

Station	Depth	Croakers	Groupers	Grunts	Seabreams	Snappers	Other	Total
30	106.5	6.1			219.7		954.4	1180.2
31	95.5	55.8			39.8		589.7	685.3
36	74	8.4	5.4	280.2	166.7		852.4	1313
37	87.5	323.3		349.9	94.5		344.3	1112
38	106	0.6			36		4715.5	4752.1
43	102	13.3			81.1		113.2	207.6
44	71	3.5		282.4	24.1		261.7	571.7
49	110	15.8			38.8		388.6	443.2
54	164.5	6.7			19		1267.4	1293.1
58	104.5				6.9		1140.9	1147.8
63	154.5				30.4		1043.5	1073.9
69	132				10.3		651.3	661.6
74	146						4527.8	4527.8
78	96	17.6			3.8		700.5	721.9
79	107	49.3			25.2		981.5	1056.1
81	189				53.3		417.5	470.8
82	78	15.5		11.3	8.2		262.3	297.3
86	76		5.9	11	28		1644.3	1689.2
87	102	71			129.4		843.9	1044.3
92	111				6.5		68.6	75.1
96	92.5	113.9	12.2		245.1		240.9	612
97	104.5	154.2			41.2		323	518.3
100	112				27.3		295.1	322.4
104	80.5	48.7			100.6		129	278.3
105	117				34.5		545	579.4
Mean	108.8	36.2	0.9	37.4	58.8		932.1	1065.4
Std dev		71.5	2.8	101.2	66.6		1180.7	1149.9
% Catch		3.4	0.1	3.5	5.5		87.5	100.0

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

A. Inner shelf (20-70 m).

Station	Gear depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
32	67.5		20.4	2	71.6	12.6	212.9	319.7
35	54.5		350.1	87	461		2672.5	3570.6
45	55		99	48.9	59.2		351.9	559.1
46	30.5		110.7	1559.5	8.5		300.2	1978.9
47	23.5	33.6	944.6	3322.8			1122.8	5423.8
48	64		85.6		1364.7		131.4	1581.7
55	21.5	15.4	149.3	1285.5	4.1		443.6	1897.8
56	28		51.1	1064.2			80.8	1196.1
57	62		16.6				3713.3	3729.9
64	63.5		588.6			6.7	448.7	1044
65	22.5		12			2.3	468.5	482.8
66	22.5		2268.9	3751.9			1540.4	7561.2
67	35		290.9	1194	42.7		993.2	2520.8
68	54		65.6		44.1		865	974.7
76	39.5	2.9	181.7	38	13.2		237.4	473.2
77	32.5	1.2	269.6	105	1.9		1348.2	1725.9
83	24	5.3	112.1	219.4	0.2		183.8	520.8
84	23.5		102.3	2.1			30.7	135.1
85	34		11.5	0.2			30.9	42.6
93	61		0.1		1.3		205.2	206.7
94	22.5		18.9				34.8	53.7
95	32	0.7	244	2.1			148.5	395.3
101	50.5	5	34.8		21.5		105.5	166.7
102	24		397.5	14.8			262.6	674.9
103	43		33.4		3.6		103.1	140.1
Mean	39.6	2.6	258.4	507.9	83.9	0.9	641.4	1495
Std dev		7.3	471.4	1028.4	282.3	2.8	889.3	1849.1
		0.2	17.3	34.0	5.6	0.1	42.9	100.0

B. Outer shelf (71-200 m).

Station	Depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
30	106.5		88.1	2.4		70.7	1019	1180.2
31	95.5		65.5		4		615.8	685.3
36	74		351.7	2.7	17.5		941.2	1313
37	87.5		42.5	1.4			1068.1	1112
38	106			3523.4		982.9	245.8	4752.1
43	102				1		206.6	207.6
44	71		15.6		6		550.1	571.7
49	110		5.3		1.6		436.4	443.2
54	164.5				141.6		1151.4	1293.1
58	104.5				489.4		658.4	1147.8
63	154.5				12.2		1061.8	1073.9

Outer shelf (71-200 m) continued

Station	Depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
69	132				28.3		633.4	661.6
74	146						4527.8	4527.8
75	70.5		4.6				345.4	350
78	96		479.9		3.8	5.5	232.8	721.9
79	107		10.6		35.1		1010.4	1056.1
81	189						470.8	470.8
82	78		205.5	0.6	1.3		90	297.3
86	76		467.9	2.1	24.8	5.5	1189	1689.2
87	102		596.6	1.6		0.3	445.8	1044.3
92	111		10.2				65	75.1
96	92.5		59.5	1	3.4		548.1	612
97	104.5		126.1				392.2	518.3
100	112		15.7		4.3		302.4	322.4
104	80.5		68		2.1		208.2	278.3
105	117				7.9		571.5	579.4
Mean	107.3		100.5	136	30.2	41	730.3	1037.9
Std dev			172.9	690.9	97.8	192.6	846.6	1135.4
% Catch			9.7	13.1	2.9	4.0	70.4	100.0

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

Slope (200-800 m).

Station	Depth	A.varidens	Hake	N.africana	P.longirostris	Seabreams	Other	Total
28	727	0.4	9.2				572.6	582.2
29	627	0.8	2		36.4		280	319.2
39	574	11					558.5	569.5
40	481	22.7		280.2			259.4	562.3
41	335.5	1.7	9.7		8.1		356.4	375.9
42	259.5		312.6		76.3	405.3	1268.7	2062.8
50	352.5	25.3			13.3		595.3	633.9
51	483.5	45.1		348.3			451.5	844.8
52	673	5	1.4	118.4			405.5	530.4
53	262.5		82.3		132.3		4574.5	4789.1
59	384	125.3	9.6	225.2			345.5	705.7
60	529.5	57.6		210.8			344.7	613.2
61	726.5	2.1			17.5		489	508.5
62	530.5	4.7		96.4			187.5	288.6
70	373.5	7.4	40	111.5	0.6		139.1	298.6
71	734.5	4.6	2.4				798.7	805.7
72	510.5	25.8		161			432.1	618.9
73	360.5	8.6	355.9	20.4			724.8	1109.6
80	477	10.4	3.2	326.2			119.7	459.5
88	635.5	10.9	16.9	303.2			210.1	541.1
89	714.5	10.1	2.4	123.5			471.1	607
90	482.5	34.9	38.7	235.6			224.2	533.5
91	377.5	11.5	71.5	214.4			93.4	390.8
98	634.5	20		47.4			119.6	187
99	532	17.9			1		217	235.9
Mean	511.1	18.6	38.3	112.9	11.4	16.2	569.6	766.9
Std dev		26.6	92	121.7	30.2	81.1	874.2	914.5
% Catch		2.4	5.0	14.7	1.5	2.1	74.3	100.0

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

A. Inner shelf (20-70 m).

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
111	32.5	113.2	62.6	7945.3		2	34.4	8157.5
112	55	39	2317	474.1			369.3	3199.4
121	64.5	1.7	185.1	36.2			39.8	262.8
122	48	35.7	2163.2	580.5			142.4	2921.8
123	23.5	3.1	516.1	397.9		5.8	415.5	1338.3
130	64.5	0.8	841.7	372.9			212.3	1427.8
131	43.5	4.9	403	62.1			176.8	646.8
139	32.5	15.6	149.9	220			54	439.5
140	26.5	88.8	319.4	531.6			167	1106.8
141	22.5	20.7	2713.5	2010.6			1728.5	6473.3
149	61	21.3	93	1.5			176.3	292.1
150	41.5	6.7	15.5	3.5			36.7	62.5
151	25	9	197	6.7			160.3	373.1
152	37.5	7.7	8.4	21.2			109.8	147.2
153	46	3.4	65.5	1.3			46.7	117
162	53.5	0.2	41.5	7.1			186.8	235.6
Mean	42.3	23.2	630.8	792		0.5	253.5	1700.1
Std dev		32.9	909.2	1972		1.5	408.7	2408.7
% Catch		1.4	37.1	46.6			14.9	100.0

B. Outer shelf (71-200 m).

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
110	118	9.2	144.6	117.6			84.5	355.9
113	113.5	43.8	185	225.4			13.3	467.5
114	147.5	12.2	93.1	84.2		8.3	252.7	450.6
120	83	17.5	85.8	113.6			52.6	269.5
127	138.5	8.2	36.6	36			26.5	107.3
128	115.5	4.1	85.1	18			29.2	136.5
129	93.5	12.3	28.5	99.7			22.2	162.7
136	180	3.6	30.7	24.5			989.9	1048.7
137	86.5	15	23.9	8.3	4.2		46.4	97.7
138	72	29.3	60.3	12.9			23.8	126.2
147	116.5	0.1	92.3	21			335.1	448.6
148	86.5	14.4	408.9	33.3			94.1	550.7
157	187	17.4	523.2	143.2			8758	9441.8
158	149.5	1.8	33	3.8			89.3	127.9
159	114.5	0.7	236	3.7			20.1	260.5
160	96	1.7	77.5	123.5	4.1	0.5	36.8	244.1
161	81	6.1	476	118.2	3.3		36.7	640.3
167	123.5	2.1	215.4	62.2			57.3	337
168	114.5	0.9	76.3	66.2			57.8	201.3
169	109	3.5	84.6	75.5	3.6		121.6	288.9

Outer shelf (71-200 m) continued

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
170	95	3.4	132.4	13.3	3.3		42.1	194.4
171	89.5	2.1	10		2.9		75.4	90.4
Mean	114.1	9.5	142.7	63.8	1	0.4	512.1	729.5
Std dev		10.7	147	58.9	1.6	1.8	1853.6	1958.9
% Catch		1.3	19.6	8.7	0.1	0.1	70.2	100.0

Slope (201-800 m).

Station	Depth	Cephalopods	Demersal	Pelagic	Sharks	Shrimps	Other	Total
106	740	6	53.4	8.7	0	9.1	237.3	314.5
107	674	3.3	195	6.7	0	17.3	257.3	479.6
108	434.5	0	20.4	4.5	12.3	92	218.9	348
109	362.5	0	261.4	2.5	0.2	17.6	102.9	384.6
115	412	0	199.5	5.5	8	423.1	54.3	690.5
116	699	0	74.6	0	1.2	304.1	310.6	690.5
117	719.5	5	42.4	0	1.3	70.3	481.5	600.4
118	529.5	3.5	54	2.8	0	309.9	77.1	447.3
119	312.5	0	16.1	0	0	39.3	699.4	754.8
124	702.5	0	113.6	0	0	198.6	355.7	667.9
125	610	4.3	41.5	0	0	249.3	74.9	370
126	420.5	1.4	170.2	34.8	0.3	246.3	71.9	525
132	215	23.7	404.1	0	0	8.1	4879.7	5315.5
133	716.5	5.4	2.2	0	0	127.8	306.6	442.1
134	359	0	31.3	64.9	9.4	149.3	114.5	369.4
135	240.5	0	687.6	40.1	0	42.9	832.7	1603.2
142	726.5	24.7	9.6	0	2.4	8.1	151.2	196
143	638.5	5.3	2.4	0	1.3	4	259.1	272.1
144	518	8.6	6.2	4	5.8	233.3	56.3	314.2
145	705	19.5	76	0	8.9	5.7	426.4	536.4
146	426.5	3.3	83.6	0	5.4	79.4	67.7	239.4
154	525	0.1	4.5	1.2	16.5	69.1	110	201.3
155	445.5	0	30.8	11.5	0.6	17.2	58.8	118.8
156	271.5	3.9	470.2	0	0	183.7	3523.9	4181.7
163	707.5	0	18.3	0.8	4.8	4.3	327.6	355.9
165	325	0	5.1	64.5	0	71.9	244.8	386.2
166	221.5	12.1	46.4	53.3	4.2	25.7	660.5	802.3
Mean	505.9	4.8	115.6	11.3	3.1	111.4	554.1	800.3
Std dev		7.2	166.1	20.5	4.5	117.1	1088.1	1183.6
% Catch		0.6	14.4	1.4	0.4	13.9	69.2	100.0

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

A. Inner shelf (20-70 m)

Station	Depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
111	32.5						8157.5	8157.5
112	55	60.9	1.7	99.3	63.7		2973.8	3199.4
121	64.5	6	1.6	39.4	37.2		178.6	262.8
122	48	60.2		35.4	40.5		2785.7	2921.8
123	23.5	269.1		82.6			986.7	1338.3
130	64.5			405.5	52.8		969.5	1427.8
131	43.5	27.4		54.6	0.9		564	646.8
139	32.5		1.4	3	145.6		289.6	439.5
140	26.5		3.4	16.7	13.4		1073.3	1106.8
141	22.5	23.2	3.2	526.6	7		5913.3	6473.3
149	61		3.1		89.9		199	292.1
150	41.5				15.5		46.9	62.5
151	25		11		164.4	2.1	195.6	373.1
152	37.5				8.4		138.7	147.2
153	46				65.5		51.4	117
162	53.5		8.5		31.3		195.8	235.6
Mean	42.3	27.9	2.1	78.9	46	0.1	1545	1700.1
Std dev		67.6	3.3	155.9	50.4	0.5	2360.3	2408.7
% Catch		1.6	0.1	4.6	2.7		90.9	100.0

B. Outer shelf (71-200 m)

Station	Depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
110	118	28.6			99.7		227.6	355.9
113	113.5				69.6		397.9	467.5
114	147.5				50.7		399.9	450.6
120	83	1.3			47.6		220.6	269.5
127	138.5		0.1		24.6		82.5	107.3
128	115.5				80.6		55.9	136.5
129	93.5				27.9		134.8	162.7
136	180				15.4		1033.3	1048.7
137	86.5			10.2	5.3		82.2	97.7
138	72				59.9		66.3	126.2
147	116.5	8.1			42.4		398.1	448.6
148	86.5	175.3			97.2		278.2	550.7
157	187	200			251.6		8990.2	9441.8
158	149.5				33		94.8	127.9
159	114.5	1.6			123.3		135.6	260.5
160	96	9.6			26.5		208	244.1
161	81	168.2	7.3		25.9		438.9	640.3
167	123.5				82		255	337
168	114.5	1.4	5		51.8		143	201.3
169	109	31.1	13.2		38		206.6	288.9
170	95	21.8			9.3		163.4	194.4

Outer shelf (71-200 m) continued

Station	Depth	Croakers	Groupers	Grunts	Seabream	Snappers	Other	Total
171	89.5				9.9		80.5	90.4
Mean	114.1	29.4	1.2	0.5	57.8		640.6	729.5
Std dev		62.7	3.2	2.2	53.9		1876.9	1958.9
% Catch		4.0	0.2	0.1	7.9		87.8	100.0

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

A. Inner shelf (20-70 m)

Station	Depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
111	32.5		64.7	7880.6			212.2	8157.5
112	55	7.3	453.4				2738.7	3199.4
121	64.5		34.3		1.6	0.3	226.7	262.8
122	48	13.5	485.5	18.9	33.6		2370.3	2921.8
123	23.5	21.2	23.1	288.2	19.6		986.2	1338.3
130	64.5		282.1	26.8	2.3		1116.6	1427.8
131	43.5		39.3	10.9	0.8		595.9	646.8
139	32.5	6.8	213	0.1			219.5	439.5
140	26.5	69.1	180.3	172.6			684.7	1106.8
141	22.5	147.3	387.4	1180.1			4758.5	6473.3
149	61		0.7	0.8			290.6	292.1
150	41.5		3.5				59	62.5
151	25					6.7	366.3	373.1
152	37.5		21.2				125.9	147.2
153	46		1.3				115.6	117
162	53.5		6.3		0.8		228.5	235.6
Mean	42.3	16.6	137.3	598.7	3.7	0.4	943.5	1700.1
Std dev		39	174.2	1964.3	9.3	1.7	1291.3	2408.7
% Catch		1.0	8.1	35.2	0.2		55.5	100.0

B: Outer shelf (71-200 m).

Station	Depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
110	118		117.3		0.3		238.2	355.9
113	113.5		219.5				248.1	467.5
114	147.5				84.2		366.4	450.6
120	83		109.9	0.5	3.2		155.9	269.5
127	138.5				36		71.2	107.3
128	115.5		2.6		15.4		118.5	136.5
129	93.5		99.7				62.9	162.7
136	180		24.5				1024.1	1048.7
137	86.5		0.6		7.6		89.5	97.7
138	72		11.2	0.1	1.5		113.4	126.2

Outer shelf (71-200 m) continued

Station	Depth	Barracuda	Carangids	Clupeoids	Hairtails	Scombrids	Other	Total
147	116.5		19.8		1.2		427.6	448.6
148	86.5		32.7	0.6			517.3	550.7
157	187				143.2		9298.6	9441.8
158	149.5		3		0.8		124.1	127.9
159	114.5		3.7				256.8	260.5
160	96		122		1.6		120.6	244.1
161	81		101.8		16.4		522.1	640.3
167	123.5		57.6		4.2	0.4	274.8	337
168	114.5		62.5			3.7	135.1	201.3
169	109		62.9		11.8	0.7	213.4	288.9
170	95		9.3		3.9		181.2	194.4
171	89.5						90.4	90.4
Mean	114.1		48.2	0.1	15.1	0.2	665.9	729.5
Std dev			58.4	0.2	34.3	0.8	1940.5	1958.9
% Catch			6.6		2.1		91.3	100.0

Catch rates (kg/hour) by **main deep-water groups** caught in valid swept area bottom trawl hauls on the shelf. **Northern region**. Slope (200-800 m).

Station	Depth	*A.varidens*	Hake	*N.africana*	*P.longirostris*	Seabream	Other	Total
106	740	5.9	4.6	0	0	0	304.1	314.5
107	674	8.6	5.8	5.5	0	0	459.7	479.6
108	434.5	26.4	20.4	61.9	0	0	239.4	348
109	362.5	7.2	261.4	7	3.4	0	105.6	384.6
115	412	3.8	199.5	419.3	0	0	67.9	690.5
116	699	5.7	2	294.9	0	0	388	690.5
117	719.5	3.5	0	66.2	0	0	530.8	600.4
118	529.5	20.9	1.9	289	0	0	135.5	447.3
119	312.5	0	16.1	0	39.3	0	699.4	754.8
124	702.5	3	19.5	195.6	0	0	449.8	667.9
125	610	10.8	1.6	237	0	0	120.6	370
126	420.5	3.2	170.2	243.1	0	0	108.5	525
132	215	0	404.1	0	8.1	0	4903.4	5315.5
133	716.5	0	0	127.1	0	0	315	442.1
134	359	2.7	31.3	144.8	1.8	0	188.8	369.4
135	240.5	0	687.6	0	42.9	0	872.8	1603.2
142	726.5	1.9	3.9	0	0	0	190.2	196
143	638.5	3	1.3	0	0	0	267.9	272.1
144	518	7.1	5	226.1	0	0	76	314.2
145	705	5.7	4.1	0	0	0	526.7	536.4
146	426.5	12.5	83.6	65.5	0	0	77.7	239.4
154	525	17.1	2	52	0	0	130.2	201.3
155	445.5	2.6	18.9	14.1	0	0	83.2	118.8
156	271.5	0	369.9	0	183.7	8.8	3619.3	4181.7
163	707.5	0	16.6	0	0	0	339.3	355.9
165	325	0	5.1	8.9	63	0	309.3	386.2

Slope (200-800 m) continued

Station	Depth	*A.varidens*	Hake	*N.africana*	*P.longirostris*	Seabream	Other	Total
166	221.5	0	0	0	25.7	32	744.5	802.3
Mean	505.9	5.6	86.5	91	13.6	1.5	602	800.3
Std dev		6.8	166.1	120.9	37.6	6.3	1091.7	1183.6
% Catch		0.7	10.8	11.4	1.7	0.2	75.2	100.0

ANNEX VII INSTRUMENTS AND FISHING GEAR USED

Fishing gear

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

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm mesh size in the codend with an inner net of 10 mm mesh size. The trawl height was about 4.5 m and distance between wings during towing about 21 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. Since 19.02.08 new and heavier "Thyborøn" combi trawl doors (7.41 m^2, 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 was carried out the 08.03.2012 in Baía dos Elefantes using Cu-64, Cu-60, WC-38.1 add WC-38.1 spheres for 18, 38, 120 and 200 kHz, respectively. The details of the settings for the 38 kHz echo sounder were as follows:

Transceiver-2 menu (38 kHz)

Transducer depth	5.50 m
Absorbtion coeff.	9.6 dB/km
Pulse duration	medium (1,024ms)
Bandwidth	2.43 kHz
Max power	2000 Watt
2-way beam angle	-20,6dB
gain	25,24 dB
SA correction	-0.46 dB
Angle sensitivity	21.9
3 dB beamwidth	7.31º along ship
	7.34º athwardship
Alongship offset	0.10º
Athwardship offset	0.04º

Bottom detection menu Minimum level -40 dB

ANNEX VIII STATION ALLOCATION BY SURVEY AND DEPTH STRATA

Numbers of valid bottom trawl stations by depth strata. Angolan demersal surveys 2000-2012.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
OUTSIDE	1	0	0	1	0	3	0	1	0	0	0	0	0
20-50south	8	0	2	4	8	7	8	5	6	9	8	0	6
50-100south	9	0	5	7	7	5	5	8	8	6	6	0	7
100-200south	7	0	3	7	5	7	7	7	7	7	7	0	7
200-300south	1	0	0	0	1	1	1	0	0	0	0	0	0
300-400south	1	0	1	2	2	1	1	1	2	2	2	0	1
400-500south	0	0	0	0	1	0	0	0	0	0	0	0	0
500-600south	0	0	0	0	1	1	0	0	0	0	0	0	1
600-700south	2	0	1	2	3	1	2	2	1	1	1	0	2
700-800south	1	0	0	0	0	1	1	1	2	2	2	0	1
20-50central	23	12	16	16	17	16	16	15	17	16	16	11	16
50-100central	27	18	18	19	18	20	18	20	18	18	18	15	19
100-200central	22	16	15	13	14	14	16	15	14	14	13	9	16
200-300central	12	4	2	3	2	6	3	2	2	1	2	2	2
300-400central	10	4	6	4	6	6	6	6	6	6	6	3	6
400-500central	8	6	2	3	3	4	3	2	3	3	3	2	4
500-600central	9	3	5	3	3	5	4	5	4	4	4	4	5
600-700central	6	3	4	4	4	6	4	4	3	1	3	0	4
700-800central	7	4	4	4	4	6	4	5	5	6	4	4	4
20-50north	11	11	16	13	15	14	14	17	17	17	19	13	11
50-100north	24	14	23	20	24	20	18	21	19	20	20	18	14
100-200north	24	18	23	20	21	21	17	23	23	20	19	17	13
200-300north	11	7	7	7	8	7	6	7	7	7	5	7	4
300-400north	10	11	6	6	6	6	5	5	4	5	6	4	4
400-500north	8	5	6	6	6	6	5	6	6	6	6	6	5
500-600north	7	8	6	6	6	7	4	6	6	7	5	6	3
600-700north	7	5	6	6	7	8	4	8	6	6	5	4	4
700-800north	8	3	9	9	8	9	7	6	7	7	8	6	7
TOTAL	264	152	186	185	200	208	179	198	193	191	188	131	166

ANNEX IX SHARK SAMPLING

Shark sampling

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

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

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

Methodology

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

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

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

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

Morphometric measurements. All specimens caught were measured, weighed (g) and sexed. Total length (TL, cm) was taken as the length from the snout tip to the upper tip of the upper caudal fin lobe, measured to nearest centimeter below; taken in the natural position without depressing the tail to place it in line with body axis. All fish length data are given as total lengths, since this is the measurement most often used as an independent variable and it is a standard measurement in the shark literature.

Reproductive information. Maturity was assessed using the scale shown below.

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

Feeding habits. The determination of stomach content was made macroscopically on board the vessel. The prey was identified to the lowest taxa possible. To describe the stomach fullness, the following scale was used:

Empty (except for some water)
Some content (content appears clearly)
Full (filled, but not expanded)
Expanded (stomach very expanded and tight)
Everted (turned inside out)

Results

We have included some preliminary results.

A total of 591 individuals, belonging to 10 families, were caught: Chlamydoselachidae (frilled sharks), Hexanchidae (cow sharks), Squalidae (dogfish sharks), Centrophoridae (gulper shark), Etmopteridae (lanternshark), Somniosidae (sleeper sharks), Squatinidae

(angelsharks), Scyliorhinidae (catsharks), Triakidae (houndsharks) and Sphyrnidae (hammerhead sharks).

The depth interval where they were found ranged from 28 to762 m.

About their distribution

Southern region (Cunene River - Tombua): sharks were found in 16 out of the 27 (59.2%) trawl stations worked out in this region. A total of 170 individuals were sampled, belonging to 5 different species. *Galeus polli*, *Squalus megalops* and *Mustelus mustelus* were the most abundant species. The depth interval where they were found ranged between 23 and 323 m.

Central region (Benguela – Ponta das Palmerinhas): sharks were found in 16 (20.5%) out of the 78 trawl stations worked out in this region. A total of 219 individuals were sampled, belonging to 7 different species, with *Etmopterus polli* as the most abundant species. The depth interval where they were found ranged from 96 to727 m.

Northern region (Ponta das Palmerinhas – Congo River): sharks were found in 22 (34.9%) out of the 63 trawl stations worked out in this region. A total of 193 individuals were sampled belonging to 12 different species, with *Etmopterus spinax* as the most abundant species. The depth interval where found ranged from 95 to739 m.