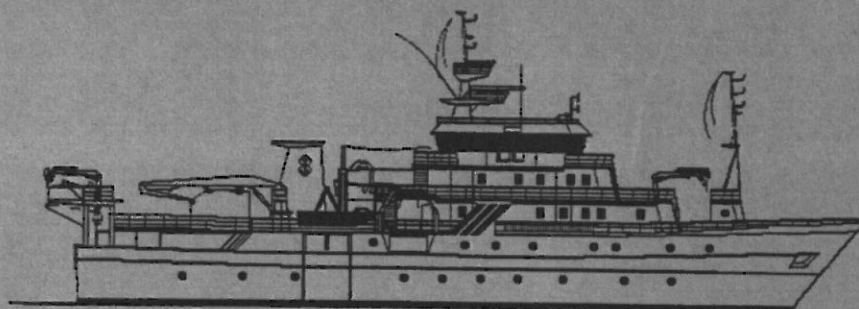


GCP/INT/730/NOR

CRUISE REPORTS "DR. FRIDTJOF NANSEN"



SURVEYS OF THE FISH RESOURCES OF ANGOLA

Survey of the Demersal Resources

9 March - 13 April 2000

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

**Instituto de Investigação Pesqueira
IIP, 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 2001	(8 surveys)

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF ANGOLA

Survey of the Demersal Resources

9 March - 13 April 2000

by

J. Kolding, S. Mehl, M. Olsen and H. Einarsson

Institute of Marine Research
P. O. Box 1870 Nordnes
N-5817 Bergen, Norway

K. Kilongo and M. de Lourdes Sardinha

Instituto de Investigação Pesqueira
Luanda, Angola

Bergen, 2001

Executive summary

The present survey of the demersal resources in Angola covered the area from Cunene (17° 14' S) to the Congo River (6° 00' S) within the depth range 20-800 m. Transects were set approximately at every 10-15 NM (in contrast to previous cruises with an inter-transect distance of about 20 NM), and the total survey effort was 263 successful trawl hauls representing an average coverage of 1 station per 62 NM².

Anomalous oceanographic conditions were found along the whole coast, characterized by a stable structure of unusual warm, low salinity, water all the way from Pta. do Morro to Congo River. There was no evidence of upwelling over the whole survey area, and the general conditions, although not as extreme, resembled the 1995 situation that has been referred to as “Benguela Niño”.

For the ‘demersal’ species, seabreams, grunts, croakers, and groupers, the estimates of this survey are close to all the previous years, with a few exceptions that may represent previous overestimations. There is perhaps a slightly increasing trend in the overall demersal biomass over the past 5 years, but all the valuable species seem to have remained stable.

For the ‘semi-pelagic’ species included in the analysis, there is more variation, particularly for horse mackerel, barracudas, and hairtail, although few of the changes are statistically significant. Still, the pelagic species appear to be more influenced by the oceanographic conditions, with horse mackerel fluctuating negatively with the “warm water” events in 1995 and this year, while ‘other’ carangids and barracudas are fluctuating in opposite phase. Apart from these fluctuations, there appear to be no systematic changes in the stock sizes.

For the deep-water resources, shrimps and hake, the overall results of this survey are among the lowest observed since 1985, although again there are few significant differences. These resources, like the semi-pelagic, appear to have been fluctuating synchronously with a peak around 1997-1998, and there are indications that most deep water stocks are distributed deeper this year compared with the peak period. An overall decreasing trend was only observed for striped red shrimp, but this is the only species where the distribution may not have been fully covered, as it is found deeper than 800 m.

The area sizes, depth stratification, and distribution ranges, used for biomass calculations have changed between surveys over time. Due to these inconsistencies, and because for some species there appear to be strong deviations between the observed catch rates and the reported biomass figures, there is a need for reviewing the time series with a standardized approach.

TABLE OF CONTENTS

CHAPTER 1	INTRODUCTION.....	1
1.1	Objectives	1
1.2	Participation	1
1.3	Narrative	2
CHAPTER 2	METHODS.....	3
2.1	Survey effort	3
2.2	Meteorological and hydrographic sampling	7
2.3	Biological sampling	9
2.4	Areas and depth strata	9
2.5	Calculations.....	9
CHAPTER 3	OCEANOGRAPHIC CONDITIONS	11
3.1	Surface distribution	11
3.2	Vertical sections.....	11
CHAPTER 4	CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEMERSAL RESOURCES (SHELF)	21
4.1	Cunene-Tombua shelf	21
4.2	Pelagic groups	22
4.3	Demersal groups	24
4.4	Benguela-Luanda shelf	28
4.5	Pelagic groups	32
4.6	Demersal groups	38
4.7	Luanda-Congo River shelf	47
4.8	Pelagic groups	50
4.9	Demersal groups	54
4.10	Review of results.....	61
CHAPTER 5	CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEEP-WATER SHRIMP AND HAKE (SLOPE).....	62
5.1	Deep water shrimp	64
5.2	Benguela hake	72
CHAPTER 6	CONCLUSIONS	78
REFERENCES	79
Annex I	Records of fishing stations	
Annex II	Length distributions of main species	
Annex III	Swept-areas estimates	
Annex IV	Calculations	
Annex V	Confidence intervals	
Annex VI	NAN-SIS species codes used	
Annex VII	Instruments and fishing gear	

CHAPTER 1 INTRODUCTION

1.1 Objectives

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

To survey, map, and describe the distribution, composition and abundance of the main demersal species, with special emphasis on sea breams (Sparidae), croakers (Sciaenidae), grunts (Haemulidae), groupers (Serranidae), hake (Merluccidae) and shrimp (*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 (BT) and the swept-area method.

Collect biological data (length, weight, sex and maturity) of *Dentex macrophthalmus*, *D. angolensis*, *Pagellus bellottii*, *Merluccius polli*, *Aristeus varidens* and *Parapenaeus longirostris*.

Collect samples of deep-sea crab *Chaceon maritae* to be analysed separately at IIP.

To monitor the general hydrographic conditions using a CTD-sonde on each trawl station all over the survey area, and map the temperature, salinity and oxygen along standard IIP hydrographic profiles, as well as collecting water samples for nutrient- and phytoplankton analysis at the hydrographic profiles.

1.2 Participation

The scientific staff consisted of:

From IIP, Angola: From 09/3 to 30/3: Kumbi KILONGO (Local Cruise Leader), Pedro PANZO, Guilherme CAMARADA, Nilsa ALVES, Vanequissa JONICO, Marcelo TCHICULUPITI, Bomba BAZICA, Pedro TCHIPALANGA. From 30/3 to 15/4: Maria de Lourdes SARDINHA (Local Cruise Leader), Kumbi KILONGO, Lia NETO, Manuel DOMINGOS, David KISSUNGO, Geraldina de ASSUNÇÃO, Catarina RUBI, Enoque CANGAJO.

From IMR, Norway: Jeppe KOLDING (Cruise Leader 9/3-30/3), Sigbjørn MEHL (Cruise Leader 30/3-14/4), Magne OLSEN, Haraldur EINARSSON, Terje HAUGLAND, and Tore NILSEN.

From ODU, USA: Forrest CROCK (Old Dominion University).

1.3 Narrative

The vessel left Walvis Bay, Namibia, in the afternoon of 9 March and steamed north to reach the border of Angola at Cunene River. Along the way 4 hydrographic stations within Namibia were repeated upon request from the previous survey. In the morning of 11 March, the survey commenced, and during the next 4 days the southernmost trawlable shelf from Cunene River ($17^{\circ} 14' S$) to Tombua ($15^{\circ} 40' S$) was covered. The slope in this area is extremely steep and it was difficult to find trawlable bottom between 200 and 600 m and this area was therefore not adequately sampled. From north of Tombua to Benguela the shelf and slope are very narrow and with rough bottom conditions not suitable for swept area surveys. Consequently, this area of the coast was bypassed apart from a standard hydrographic profile at Namibe. Benguela ($12^{\circ} 35' S$) was reached on the 15 March in the afternoon and during the next 14 days the central region of the Angolan coast from Benguela to Luanda ($9^{\circ} 00' S$) was covered. The vessel called into port at Luanda in the afternoon of 29 March to exchange scientists and departed in the early evening of 30 March to resume the survey of the northern sector.

On the evening of 30 March the coverage of the northern region from Luanda to Congo River ($9^{\circ} 00'$ to $6^{\circ} 00' S$) started with the same survey design. The coverage of the northern part of the northern sector was partly impeded by the many restrictions in this area due to oil exploitation, but also from large areas of rough bottom conditions, and the inshore areas from N'zeto to the Congo River was not satisfactorily covered. The survey ended on 12 April when completing the last course track at $6^{\circ} 00' S$ (the Congo River), and the cruise finished in the morning of 13 March when 'Dr. Fridtjof Nansen' called at Luanda.

Course tracks were set between 10 and 15 nautical miles (NM) apart, covering the shelf and the slope from 20 to 800 m depth. Semi-random swept-area hauls, allocated according to the area of each 100 m depth interval (stratum), were carried out on the shelf during daytime, and on the slope deeper than 300 m also during dark hours. Continuous acoustic registration of the resources was done throughout the survey.

CHAPTER 2 METHODS

2.1 Survey effort

Table 2.1 presents the survey 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 viz. percentage area, by depth, region, and by the total area. The average coverage varied from 1 trawl station per 50 NM² in the central region to 1 per 74 NM² in the northern, with overall average coverage of 1 trawl station per 62 NM². This is the densest overall coverage of the Angolan demersal resources so far by the Fridtjof Nansen Programme. Figures 2.1 - 2.3 show the cruise tracks in the southern, central and northern regions, respectively, and the locations of bottom trawl stations and hydrographic transects.

Table 2.1 Survey design and effort. 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 distance surveyed, divided into the southern region (Cunene-Tombua), the central (Benguela to Luanda), and the northern: (Luanda to Congo River).

Region	Depth strata (m)										total failures	CTD	Distance
	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800				
Cunene-Tombua												35	428
area (NM ²)	507	591	594	100	77	48	39				1956		
# hauls (BT)	8	9	6	1	1	0	0	2	1		28	1	
% area	25.9	30.2	30.4	5.1	3.9	2.5	2.0	0.0	0.0		11.8		
% hauls	28.6	32.1	21.4	3.6	3.6	0.0	0.0	7.1	3.6		10.6		
Benguela-Luanda												135	1 490
area (NM ²)	1 068	1 586	1 439	407	372	343	346	268	357		6186		
# hauls (BT)	23	27	22	12	10	8	9	6	7		124	1	
% area	17.3	25.6	23.3	6.6	6.0	5.5	5.6	4.3	5.8		37.4		
% hauls	18.5	21.8	17.7	9.7	8.1	6.5	7.3	4.8	5.6		47.1		
Luanda-Congo River												113	1 677
area (NM ²)	1379	1969	1940	601	550	437	409	408	702		8395		
# hauls (BT)	12	24	24	11	10	8	7	7	8		111	2	
% area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4		50.8		
% hauls	10.8	21.6	21.6	9.9	9.0	7.2	6.3	6.3	7.2		42.2		
Grand total												283	3595
area (NM ²)	2954	4146	3973	1108	999	828	794	676	1059		16537		
# hauls (BT)	43	60	52	24	21	16	16	15	16		263	4	
% area	17.9	25.1	24.0	6.7	6.0	5.0	4.8	4.1	6.4				
% hauls	16.3	22.8	19.8	9.1	8.0	6.1	6.1	5.7	6.1		267		total hauls

A stratified semi-random survey design was used in the cruise (Table 2.1, Figures 2.1 - 2.3), with depth and area as stratifying variables. Trawl hauls were taken along transects perpendicular to the coast and with a distance of 10-15 NM apart. Allocation of trawl stations began with a sampling effort proportional to the stratum size (100 m depth intervals by region, Table 2.1). The planned design was sometimes slightly changed due to adverse

conditions such as untrawlable bottom conditions, or non-accessible areas due to oil exploitation in the northern region.

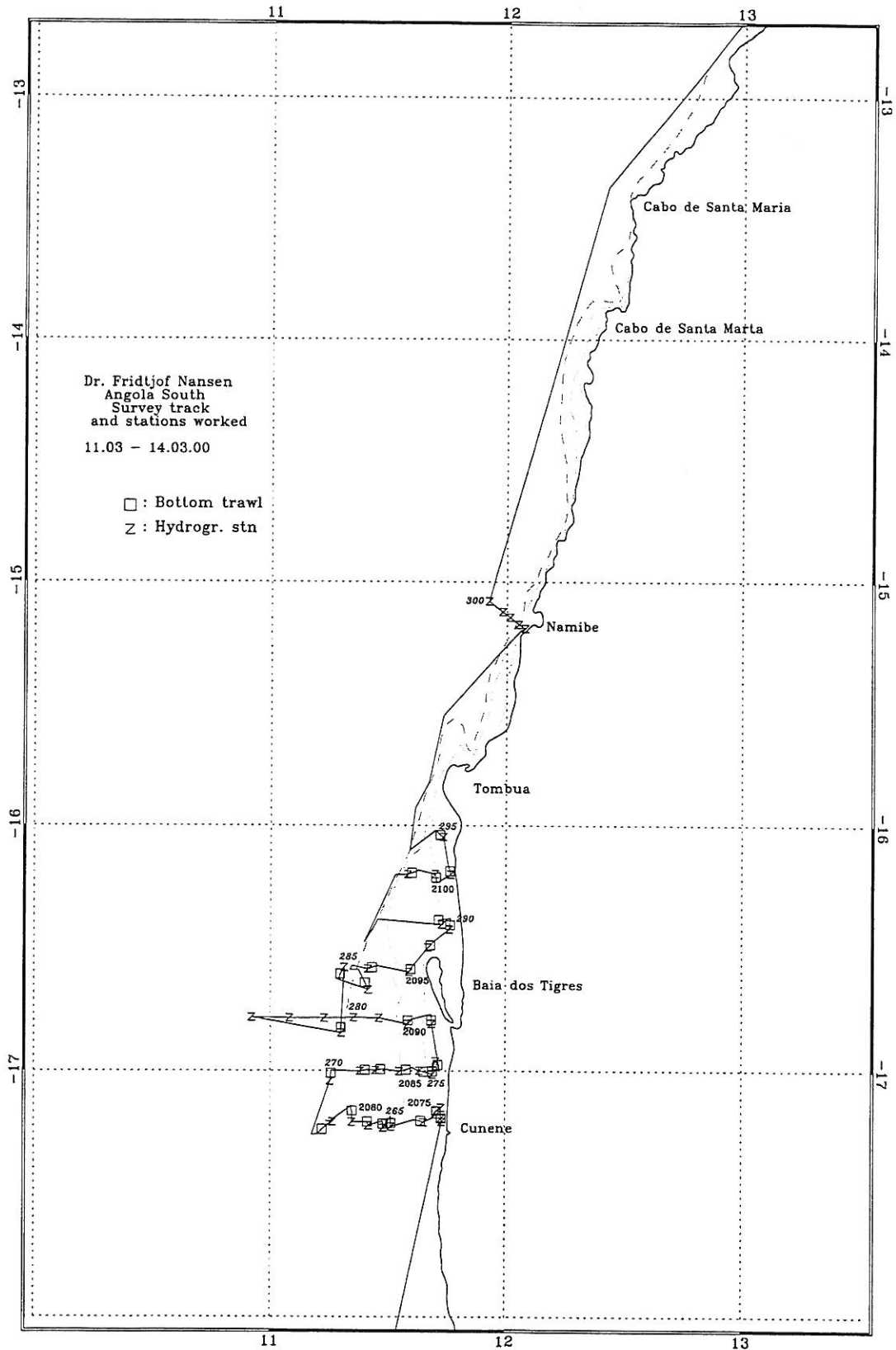


Figure 2.1 Southern Angola: Cunene to Tombua. Course track with fishing stations and hydrographic transects. Hydrographic stations were also taken at all the fishing stations. Depth contours at 20, 50 and 100 m are included.

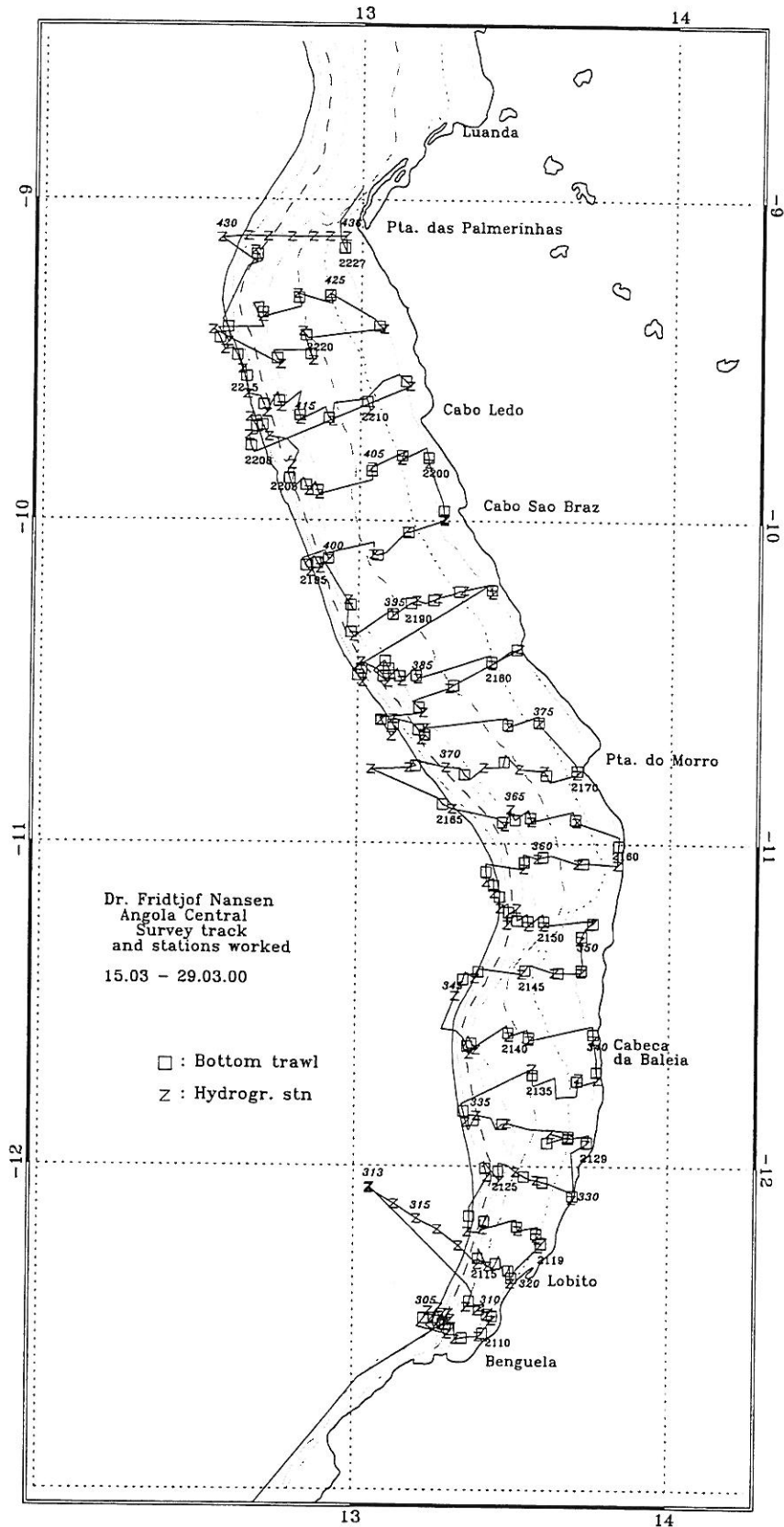


Figure 2.2 Central Angola: Benguela to Luanda. Course track with fishing stations and hydrographic transects. Hydrographic stations were also taken at all the fishing stations. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m are included.

2.2 Meteorological and hydrographic sampling

Meteorological observations including wind direction and speed, air temperature, global radiation and sea surface temperature (SST) were automatically logged every nautical mile using an Aanderaa meteorological station. CTD-stations and current profiles with ADCP were recorded at all trawl stations, and at the standard hydrographic transects.

ADCP current measurements

A ship-borne Acoustic Doppler Current Profiler (ADCP) from RD Instruments was activated on every CTD station. The ADCP was set to ping every 4 seconds, the depth cell was chosen to 8 m and the number of cells to 40. As a routine the data were averaged over 300 seconds. Averaged data were stored on files. The data have not been analysed in this report, but this can be done by e.g. the PC software UMS (Underway Mapping System), supported by the Sea Fisheries Research Institute, Cape Town, South Africa.

Conductivity, salinity and oxygen measurements and water sampling

A Seabird 911+ CTD probe was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the customised Seabird Seasave software installed on a PC. The profiles were in general taken down to a few meters above the bottom. In deep stations however, data logging was interrupted at 700 m. At each station on the standard hydrographic transects three Niskin bottles were triggered for water samples, one near the surface and one near the bottom, to calibrate the oxygen sensor. In addition one Niskin bottle was triggered at the pycnocline to get water samples for nutrient- and phytoplankton analysis. The water samples were analysed for dissolved oxygen using the Winkler method (Carrit and Carpenter, 1966) and for salinity using a Guildline Portasal salinometer. A total of 98 samples were accepted for oxygen calibration. A linear regression of the Winkler determinations on the CTD values, gave the results shown in Figure 2.4.

For the salinity calibration, only 10 samples were accepted due to problems with the salinometer. The result is presented in Figure 2.5. Due to the low number of samples the CTD values were accepted and used.

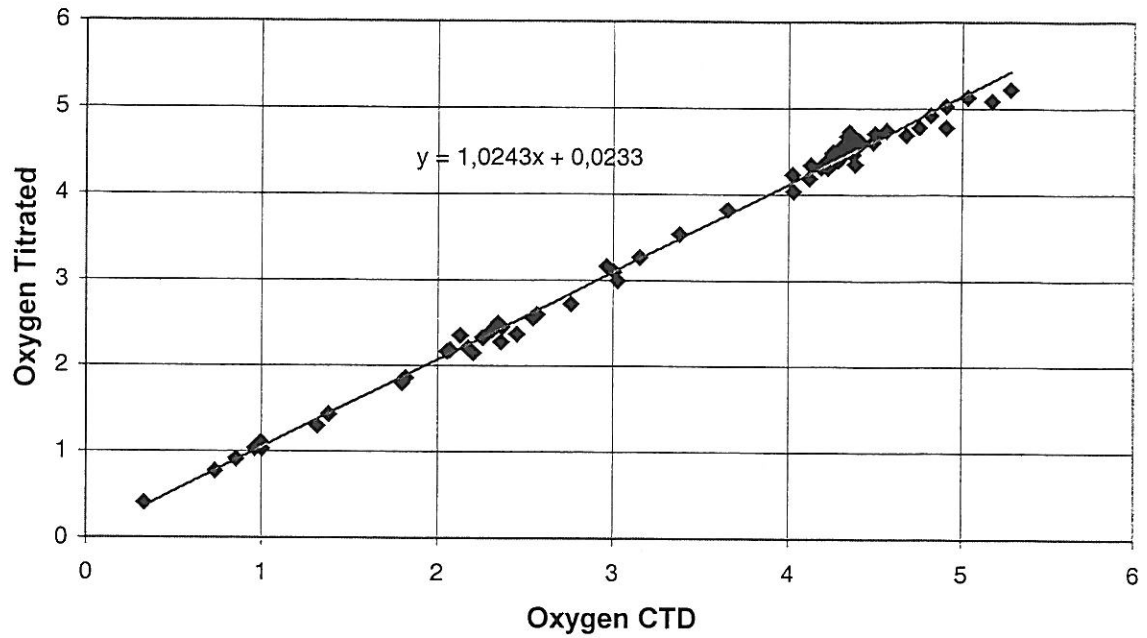


Figure 2.4 A regression of the Winkler determinate oxygen concentrations from the Niskin bottles (ml/l) against inear the CTD values obtained from 98 hydrographic stations between stations no. 258 and 549.

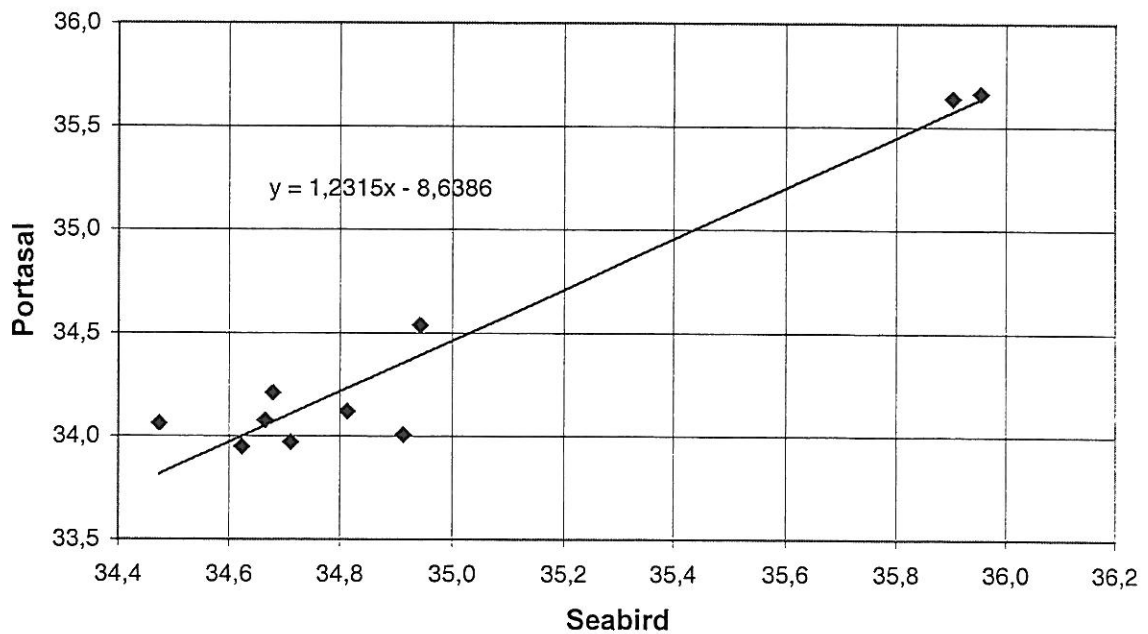


Figure 2.5 A linear regression of the salinometer determinate salinity concentrations (psu) from the Niskin bottles against the CTD values obtained from hydrographic stations 469 – 473.

2.3 Biological sampling

Sampling gear

A Gisund super bottom trawl (Annex VII) was used during this survey with a headline height of 5-6 m and a distance between wings during towing of about 21 m. In samples taken deeper than 300 m, a tickler chain was attached to the footrope to improve the catchability of deep-water shrimp. During trawling deeper than 70-80 m, a 9.5 m long strapping-rope was fastened between the wires 130 m in front of the trawl doors, giving a constant distance between the doors of 49-50 m, irrespective of depth trawled. All trawl hauls were monitored by SCANMAR trawl sensors on the doors and on top of the trawl to accurately determine the door spread, the headline height, and the actual time the trawl was fishing on the bottom. A more detailed description of the fishing gear is given in Annex VII. Acoustic recordings were done with a SIMRAD EK500 Echo sounder, and the echo recordings were stored by 5 NM intervals on both paper and on files in the Bergen Echo Integrator (BEI) system for future analysis if necessary.

Sampling the catches

Catches were sampled (or sub-sampled for large catches) for species composition by weight and numbers. The records of fishing stations are presented in Annex I. A total of 439 length samples were measured during the cruise. Length measurements were taken as follows: for fish total body length (cm) was measured to the nearest 1 cm below the longest lobe of caudal fin, and for shrimp carapace length in mm was recorded. Both total and carapace length were recorded for *Parapenaeus longirostris* and *Aristeus varidens*. Pooled length frequency distributions, where individual samples are raised to total catch, of commercially important species by area are shown in Annex II.

The additional biological data collected for some species consisted of body weight (to nearest gram), sex and reproductive stages by macroscopic examination.

2.4 Areas and depth strata

Table 2.1 shows the areas (NM²) in the northern region (Luanda-Congo River), in the central region (Benguela-Luanda), and the southern region (Cunene-Tombua) by depth strata. These are the strata used in this report for the swept-area biomass estimates. All biomass estimates have been integrated over all depths where the species, or species group, was found.

2.5 Calculations

All equations and some theoretical background for the calculations are given in Annex IV. For conversion of catch rates (kg/hour) to fish densities (t/NM²), a distance between the wings of 18.5 m was assumed to be the effective fishing area and the length of a haul, recorded as distance over the bottom, measured by the SCANMAR and GPS (Global Positioning System). The area swept (ak) for each haul was thus 18.5 times the distance trawled, raised to NM²/hour. The catchability coefficient (q), i.e. the fraction of the fish encountered by the trawl that was actually caught, was conservatively (and for comparison with previous surveys) assumed equal to 1. Mean fish densities by species and strata, were calculated by the swept-area module in NAN-SIS. Total biomass estimates by species, and their confidence intervals, were obtained from a stratified mean density estimator (using

equations 1, 2, and 4 in Annex IV on a spread-sheet, Annex V) and raised to total area. Since NAN-SIS (Strømme, 1992) does not produce variance estimates of the mean densities (Annex III), the 95% confidence limits for the biomass estimates were calculated with the underlying assumption that the coefficient of variation ($CV = SD/mean$) is constant when catch rates in kg/hour are converted to densities (t/NM^2). In other words that the area swept (normalised per hour) was approximately constant for each haul. Coefficients of variation of the catch rates, by depth strata for each species or group, were obtained using the NAN-SIS GRAFER module, which is linked to the output of grouped species tables from NAN-SIS (i.e. single or aggregated catch rates by stations). Variance of the densities were estimated from the mean and the CV, and equations 2, 3, 6 and 7 in Annex IV were used to calculate standard error (SE) on the arithmetic mean and confidence intervals (see the spreadsheet BIOMASS.xls, and example in Annex V). GRAFER was also used to produce the figures and tables with grouped catch-rates and time-series presented in this report. SE and confidence intervals in the figures are based on both the arithmetic mean and the lognormal based Pennington's estimator (Pennington, 1996) (equations 8 to 12 in Annex IV).

3.1 Surface distribution

The horizontal distributions of surface temperature and surface salinity (5 m depth) are shown in Figs. 3.1(a and b), 3.2(a and b) and 3.3(a and b) for the three areas, respectively. In the southern region, Cunene–Namibe, the surface sea temperatures were between 21 and 26° C, lowest in the south and near the shore. The temperatures in the central region, Benguela–Luanda, and the northern region, Luanda–Congo River, were more uniform ranging from 27°C near the shore to 29–30° C in the slope area.

In the south the surface salinity distribution (Fig. 3.1b) was characterised by oceanic water and a weak gradient parallel to the coast. The salinity was around 35.8 – 36.1 psu off Cunene and 36.3 – 36.4 psu off Namibe, and lowest near the shore. In the central region (Fig. 3.2b) the salinity distribution showed a stronger north south gradient with values below 33 psu in the slope area off Cabo Ledo and up to 35.8 psu off Benguela. In the northern region (Fig. 3.3b) the salinity distribution was uniform in the north-south direction, but with a slight east west gradient of 34.5–35 psu near the shore to 34 offshore.

This ‘flat’ structure with relatively high, nearly constant temperatures is typical for the summer situation in the area. The horizontal salinity distribution was this year more saline to the north compared with the 1999 cruise, indicating a lesser impact from the fresh water discharge plume of the Congo River.

3.2 Vertical sections

Figs. 3.4a-b show the two sections worked in the southern region, off Baia dos Tigres and Namibe. Both transects had a relative flat structure. A thermocline was found at about 30 m depth with a temperature of 19–23° C, and temperatures decreased gradually to about 8° C at 400 m depth. Salinity ranged from above 36 psu at the surface to below 35 psu at 400 m depth. There were no signs of low bottom oxygen content at the shelf, while at about 300 m depth there was an intermediate layer with little oxygen.

In Figs. 3.4c-e, the vertical distributions of temperature, salinity and oxygen are shown for the 3 sections worked in the Central region during the survey, i.e. off Lobito, Pta. do Morro and Pta. das Palmerinhas. Also in this region the transects had a relative flat structure. The surface temperature was higher than in the south (28° C), and the temperature in the thermocline at 25–30 m was 22–26° C. Salinity was characterised by a low salinity layer above the thermocline from north of Lobito, and a subsequent gradient from around 36 psu under the thermocline to below 35 psu at 400m depth. Off Lobito there was an intermediate layer at 300 m depth with little oxygen, though of smaller extension than in the southern region.

Figs. 3.4f-g show the two sections worked in the Northern region, off Ambriz and Pta. da Moita Seca. Again the relatively flat structure, with a warm low salinity layer above the thermocline at around 30 m, as in the central region, is repeated.

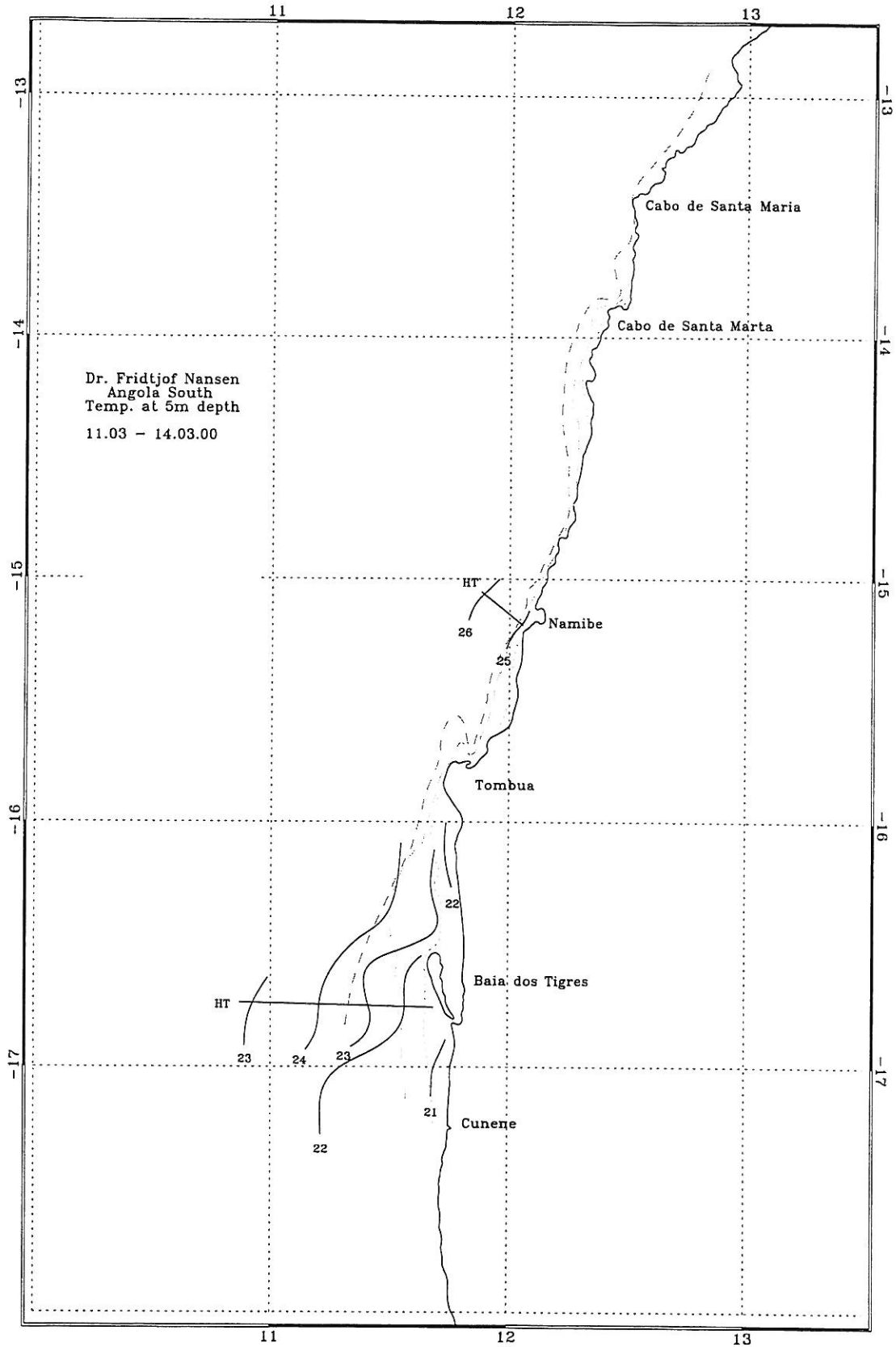


Figure 3.1a Southern Angola. Horizontal distribution of surface temperature, in °C and at 5 m depth. HT = hydrographic transect. Depth contours as in Fig. 2.1

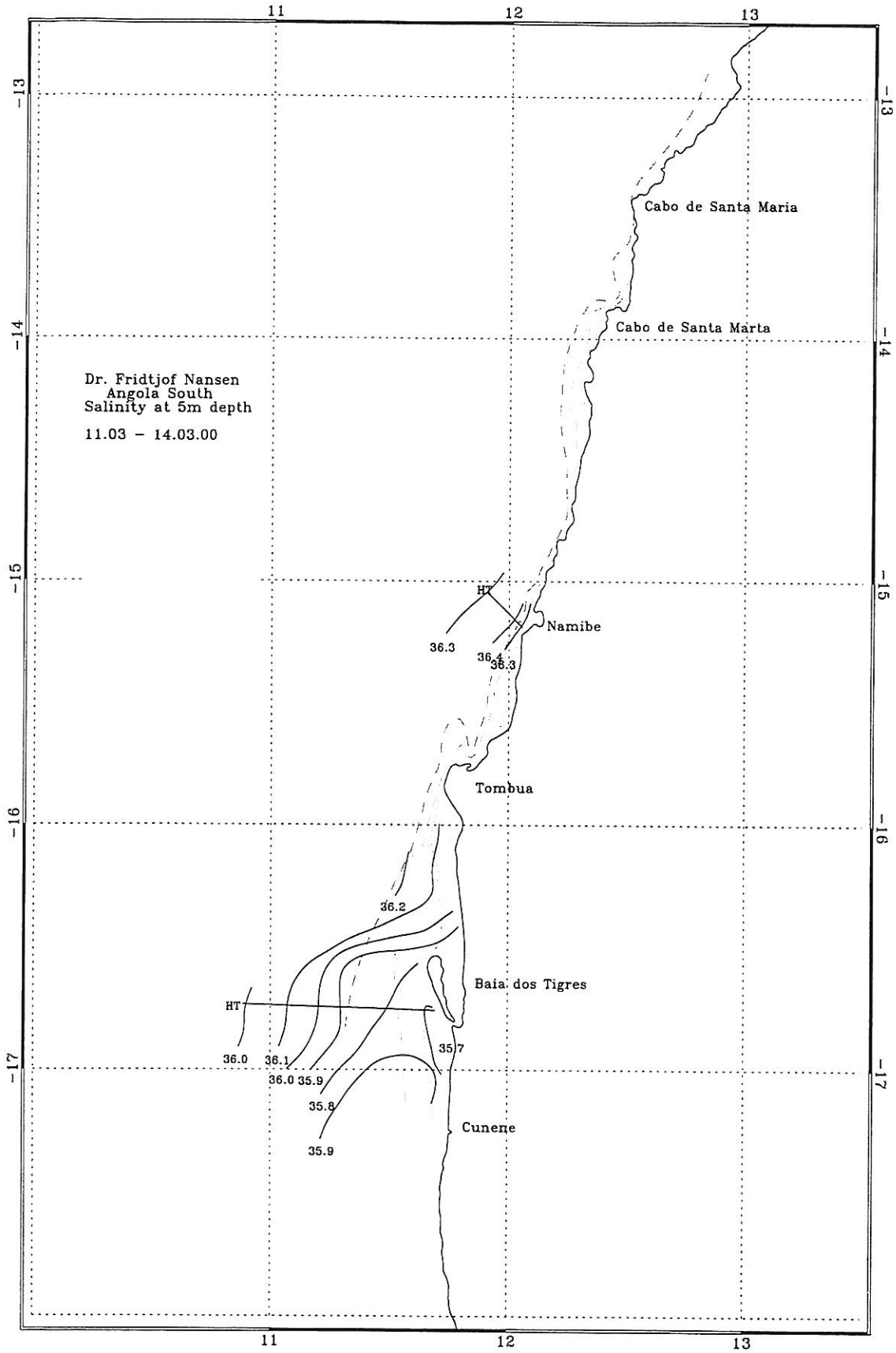


Figure 3.1b Southern Angola. Horizontal distribution of surface salinity, in psu and at 5 m depth. HT = hydrographic transect. Depth contours as in Fig. 2.1.

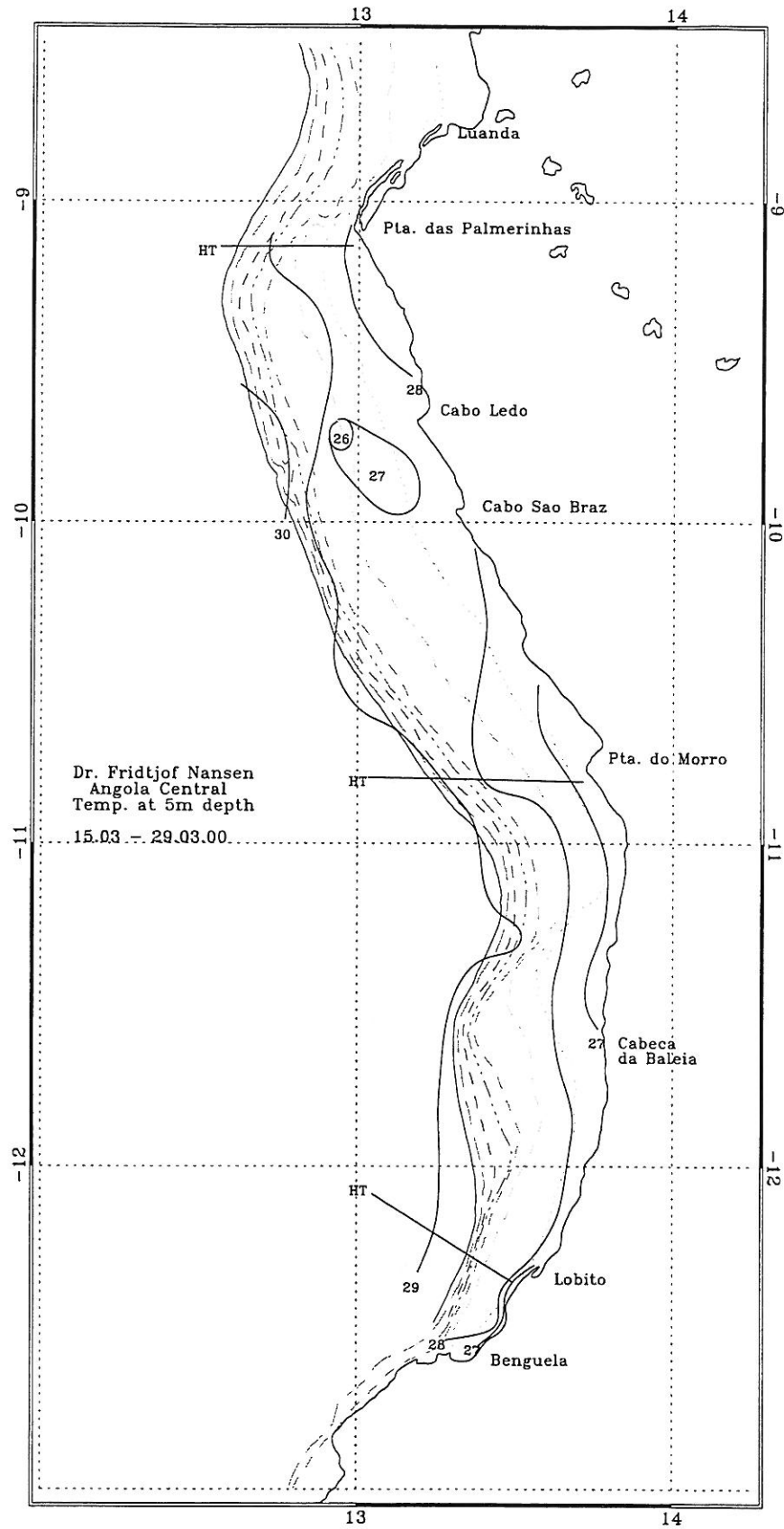


Figure 3.2a Central Angola. Horizontal distribution of surface temperature, in °C at 5 m depth. HT = hydrographic transect. Depth contours as in Fig. 2.2.

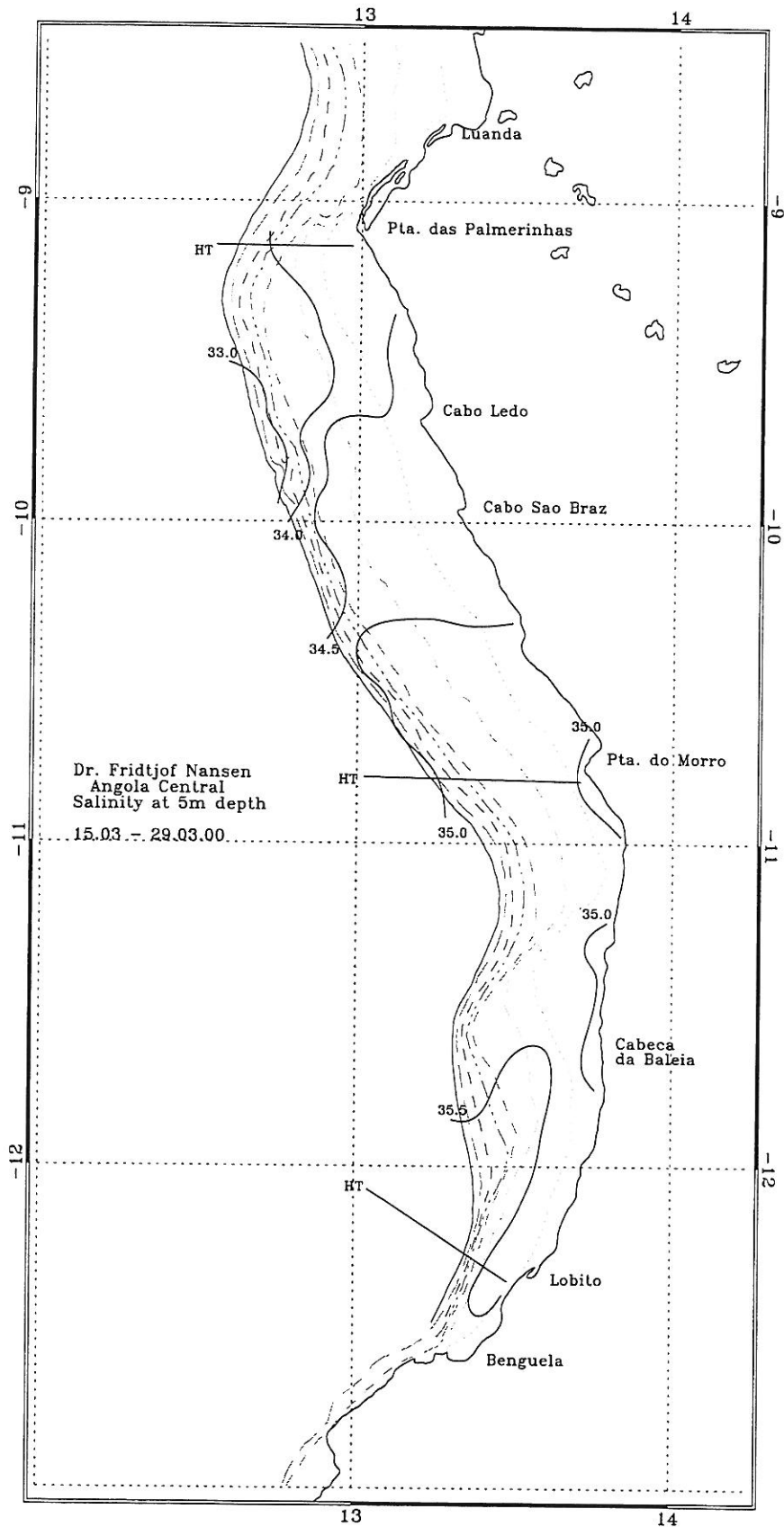


Figure 3.2b Central Angola. Horizontal distribution of surface salinity, in psu and at 5 m depth. HT = hydrographic transect. Depth contours as in Fig. 2.2.

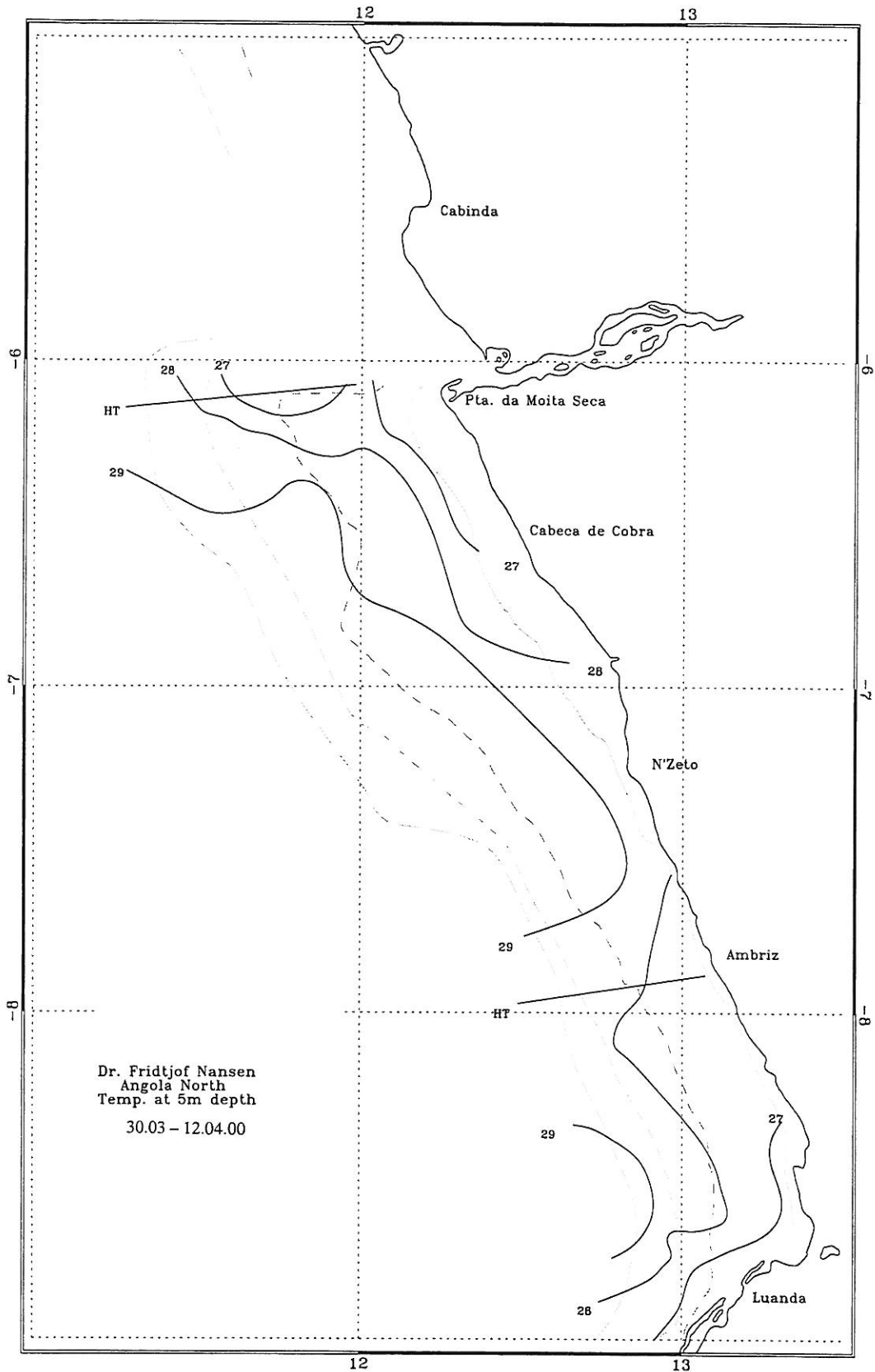


Figure 3.3a Northern Angola. Horizontal distribution of surface temperature, in °C and at 5 m depth. HT = hydrographic transect. Depth contours at 20, 100, 200, and 500 m are included.

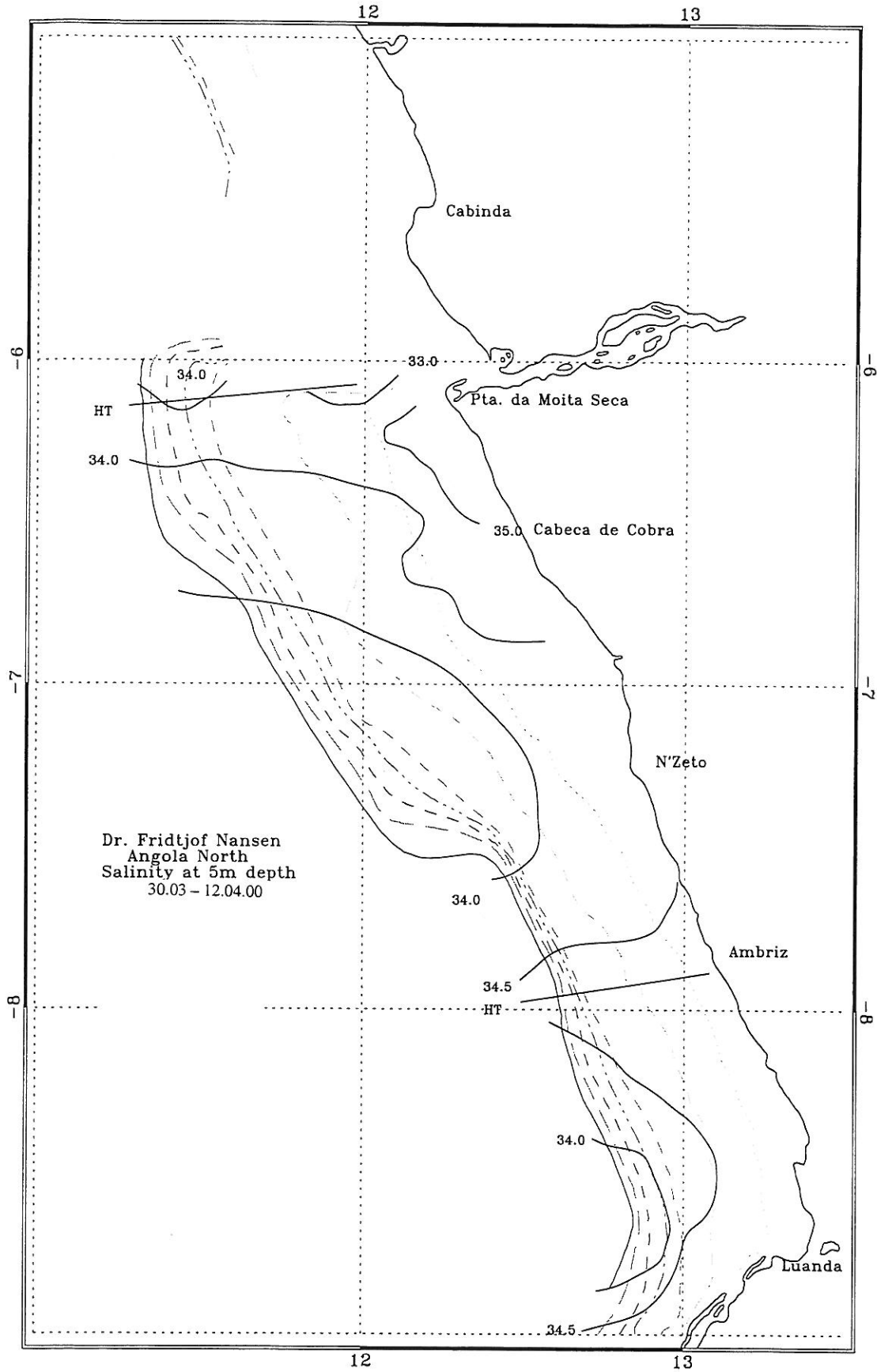


Figure 3.3b Northern Angola. Horizontal distribution of surface salinity, in psu and at 5 m depth. HT = hydrographic transect. Depth contours as in Fig. 2.3.

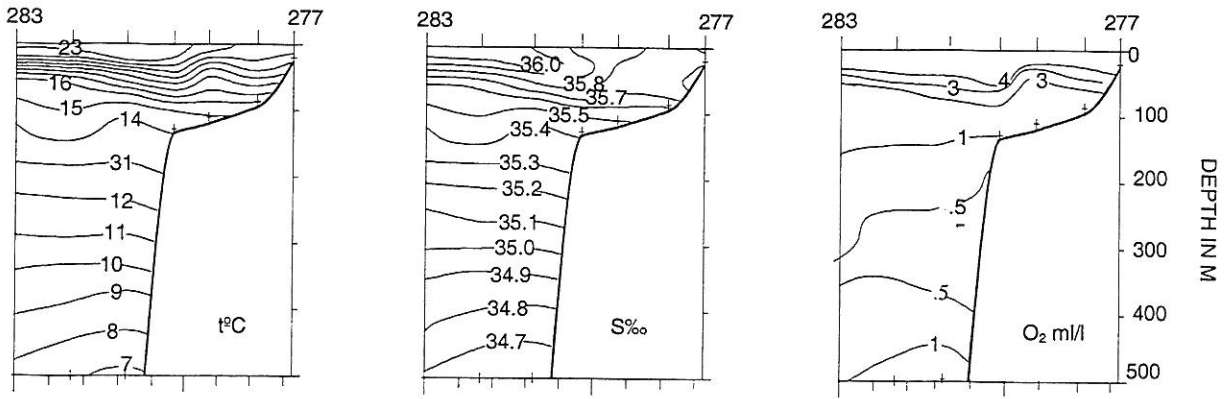


Figure 3.4a Baía dos Tigres. Vertical sections.

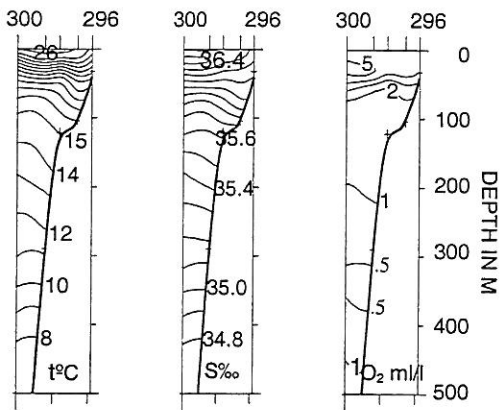


Figure 3.4b Namibe. Vertical sections.

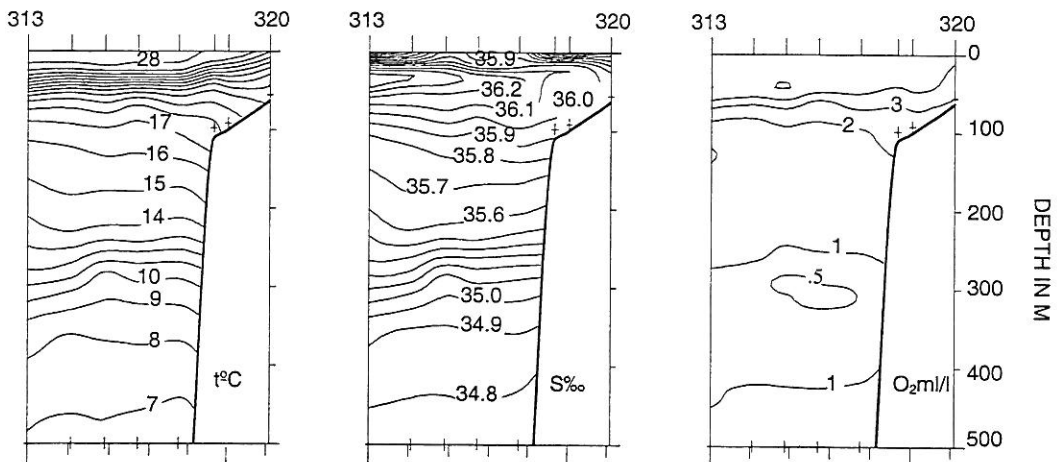


Figure 3.4c Lobito. Vertical sections.

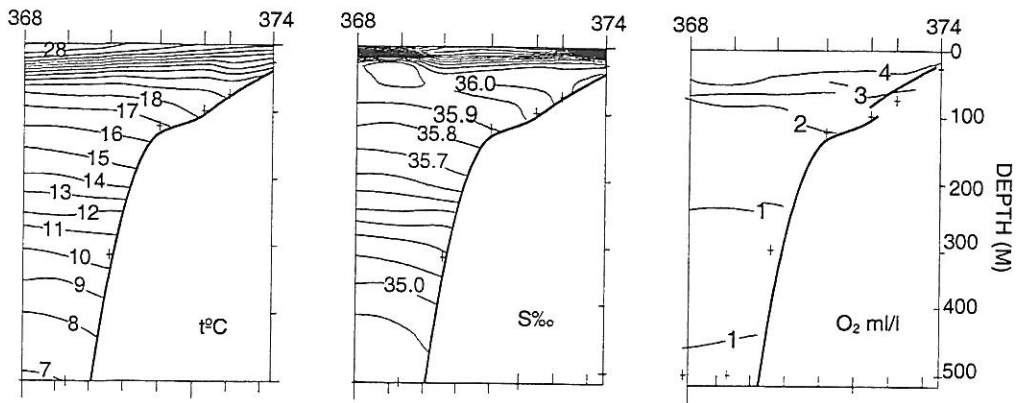


Figure 3.4d Pta do Morro. Vertical sections.

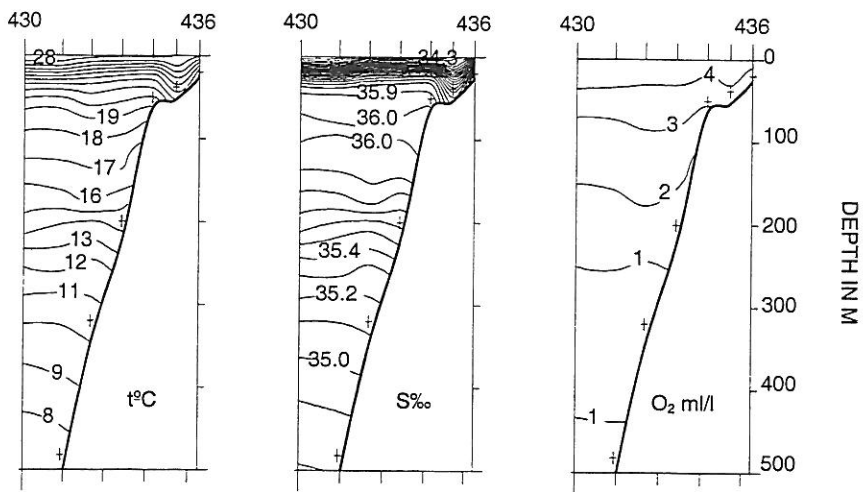


Figure 3.4e Pta. das Palmerinhas. Vertical sections.

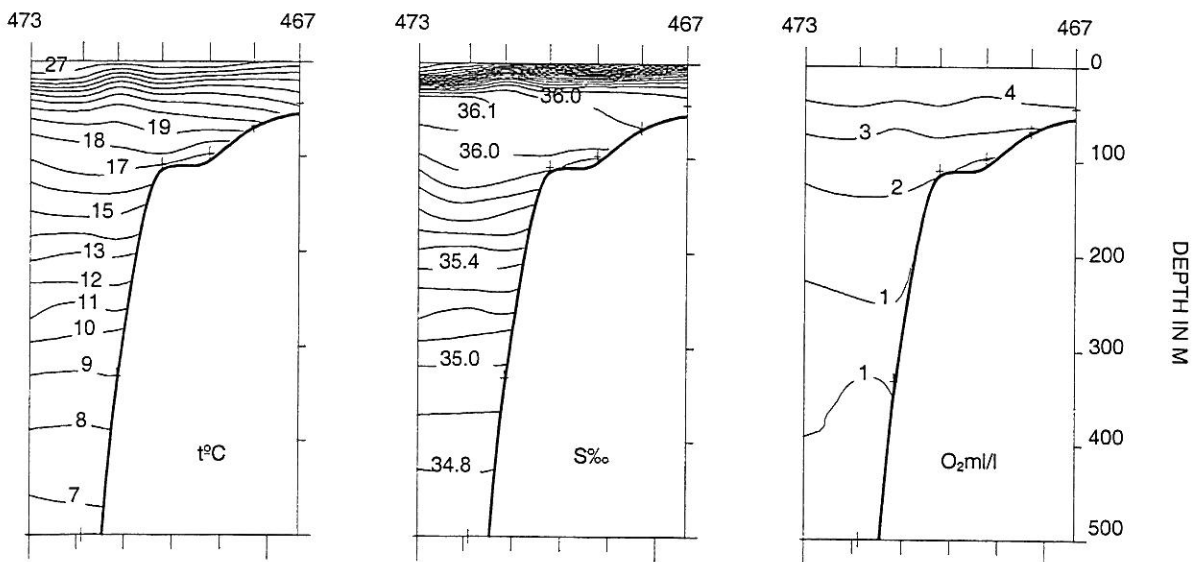


Figure 3.4f Ambriz. Vertical sections.

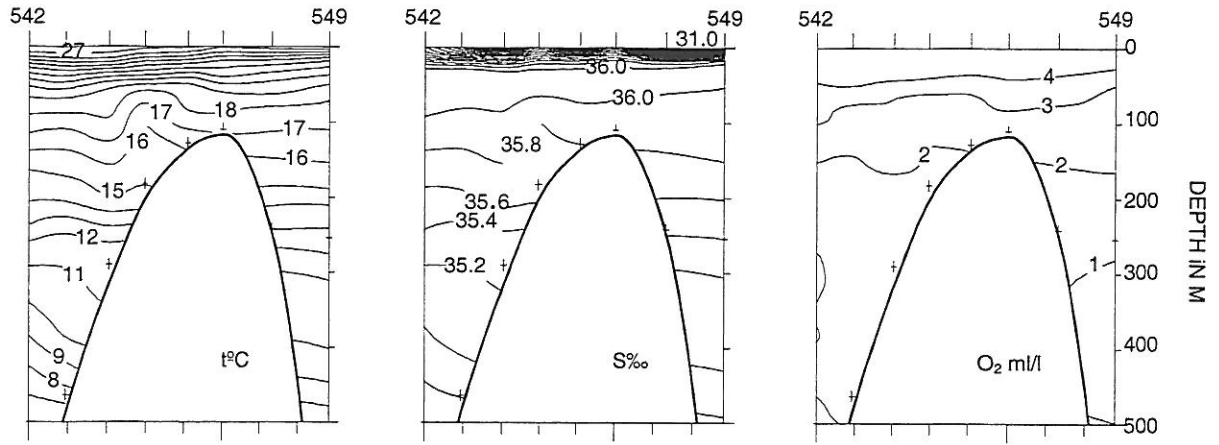


Figure 3.4g Pta. da Moita Seca. Vertical sections.

CHAPTER 4 CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEMERSAL RESOURCES (SHELF)

Two different depth strata, i.e. the inner shelf (20-70 m depth) and the outer shelf (71-200 m depth), are used to present the total catches and species compositions on the Angolan shelf. However, it should be noted that several of the 'shelf'-species, particularly the Sparidae and the Sciaenidae, have a distribution beyond the 200 m isobath.

The locations of the trawl stations are shown in Figs. 2.1 - 2.3. Records of fishing stations and catches are presented in Annex I, and pooled length distributions (weighted by the catch) of main species by sector are shown in Annex II. Mean densities (t/NM²) of the main species sorted by abundance and depth strata, the frequency of occurrence, and the catch distributions are output from NAN-SIS and shown in Annex III.

4.1 Cunene-Tombua shelf

23 successful swept-area trawl stations were accomplished on the small shelf area of this region (Table 2.1). Table 4.1 shows the catch rates by main species groups for the inner (20-70 m) and the outer shelf (71- 200 m). The group 'Demersal' comprises the commercially important families Sparidae, Sciaenidae, Haemulidae (=Pomadasyidae), Serranidae, Lutjanidae, Merluccidae, Ophidiidae, and Ariidae, while the group 'Pelagic' includes the families Engraulidae, Clupeidae, Carangidae, Scombridae, Sphyraenidae, Stromateidae, and the benthopelagic family Trichiuridae. Annex VI give the NAN-SIS species codes used to extract the information in the various tables.

On the inner shelf the group of non-commercial species had the highest average catch rate with a relative contribution of about 40%. The jellyfish *Chrysaora* sp. and sea cucumbers dominated due to a few large catches. Among the other groups the 'Demersal' had relative contribution of 33%, the 'Pelagic' group 15%, while cephalopods and sharks contributed 6–7% each. Shrimps were not found in the catches.

The 'Pelagic' group dominated on the outer shelf with a relative contribution of 73%. The 'Demersal' group made up 20% of the average catch, while cephalopods and sharks contributed less than 1% each. Like on the inner shelf no shrimps were caught. One interrupted haul (St. 2078) with a large catch of *Trachurus trecae* and *D. macrophtalmus* (45 and 14 t/hour, respectively) are not included in the analysis, leaving this station out the relative contributions of the two largest groups does not change much.

Table 4.1 Southern region March 2000. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the shelf. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2074	28	332.2	147.7		14.4	45.6	73.6	613.6
2075	38	0.8	2.4		3.2		104.5	110.9
2086	50	953.7	232.7		82.1	54.9	560.8	1 884.2
2087	31	1.8	1.3		60.9	56.9	337.5	458.4
2088	23	1.0	9.4		41.6	9.4	67.1	128.6
2089	26	5.2	9.6		12.9	3.4	990.1	1 021.1
2096	68	29.0	10.2		72.0	77.4	66.5	255.0
2097	20	1.1	53.2		8.9		1.2	64.4
2098	54	115.0	43.0		48.5	60.4	26.6	293.4
2099	70	31.5	0.1		29.9	0.9	7.8	70.1
2100	56	32.2	14.2		36.5		9.0	91.9
2101	39	142.4	298.1		2.4	0.8	0.3	444.0
2102	45	303.1	44.5		27.2	14.6	6.6	396.0
MEAN	42.2	149.9	66.7	0.0	33.9	24.9	173.2	448.6
SE		74.1	27.1	0.0	7.3	8.1	81.8	141.3
% CATCH		33.4	14.9	0.0	7.6	5.6	38.6	

b) Outer shelf 71-200 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2076	88	1.0	1.6		2.9		62.2	67.7
2077	130	4 208.9	14 932.7			67.8	51.1	19 260.6
2079	186	1 317.0	5 920.6		12.4	104.1	487.9	7 842.0
2083	125	1 821.1	12 712.1				1 482.1	16 015.2
2084	110	1 316.3	2 043.4		61.2	33.3	296.9	3 751.1
2085	89	260.8	167.3		133.0	22.3	33.8	617.2
2090	95	128.5	52.3		56.7	1.8	88.5	327.8
2093	125	156.4	44.8		6.3	5.9	13.4	226.7
2094	116	366.1	288.2		26.7	40.0	98.6	819.5
2095	91	464.0	157.5		76.8	10.4	122.6	831.2
MEAN	115.5	1 004.0	3 632.1		37.6	28.6	273.7	4 975.9
SE		406.6	1 801.3		13.9	10.9	142.0	2 254.2
% CATCH		20.2	73.0		0.8	0.6	5.5	

4.2 Pelagic groups

Catch rates of the most important pelagic fish families, caught with bottom trawl during this survey, are presented in Table 4.2 (a and b). Carangids, with Cunene horse mackerel (*T. trecae*) as the dominating species (5-6 times more abundant than the Cape horse mackerel, *T. capensis*), was the most common pelagic family, particularly on the outer shelf. Only a few small catches with clupeids were found on the inner shelf, while scombrids and hairtails were slightly more common and were found on both the inner and outer shelf. Barracudas were not caught in this region.

Table 4.2 Southern region March 2000. Catch rates (kg/hour) of main pelagic families on the shelf obtained with bottom trawl hauls. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
2074	28	23.6	58.1	7.6	58.4		465.9	613.6
2075	38	0.4	0.4	1.6			108.5	110.9
2086	50		232.7				1 651.5	1 884.2
2087	31			1.3			457.1	458.4
2088	23		9.1	0.2			119.2	128.6
2089	26		9.6				1 011.5	1 021.1
2096	68		10.2				244.8	255.0
2097	20		53.2				11.2	64.4
2098	54		42.4	0.6			250.4	293.4
2099	70		0.1				70.0	70.1
2100	56		9.0		5.3		77.7	91.9
2101	39		297.1	1.0			145.9	444.0
2102	45		44.5				351.5	396.0
MEAN	42	1.9	59.0	1.0	4.9		381.9	448.6
SE		1.8	26.3	0.6	4.5		128.7	141.3
% CATCH		0.4	13.1	0.2	1.1		85.1	

b) Outer shelf 71-200 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other	Total
2076	88			1.6			66.1	67.7
2077	130		14 927.0		5.7		4 327.8	19 260.6
2079	186		5 594.1		326.5		1 921.4	7 842.0
2083	125		12 712.1				3 303.1	16 015.2
2084	110		2 043.4				1 707.7	3 751.1
2085	89		167.3				449.9	617.2
2090	95		52.3				275.4	327.8
2093	125		42.3		2.5		182.0	226.7
2094	116		288.2				531.3	819.5
2095	91		155.1		2.4		673.7	831.2
MEAN	115		3 598.2	0.2	33.7		1 343.8	4 975.9
SE			1 796.8	0.2	32.5		462.4	2 254.2
% CATCH			72.3		0.7		27.0	

4.3 Demersal groups

Table 4.3 (a and b) presents catch rates of the most valuable demersal species grouped into 'families': seabreams (all Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *Brachydeuterus auritus*), and croakers (Sciaenidae). Seabreams was the most important family on both the inner and outer shelf, and the average catch rate was about ten times higher on the outer shelf (800 kg/h). The dominating species was *D. macrophtalmus*, followed by *P. bellottii*. Croakers were second in abundance, and the main species in this family were *Atractoscion aequidens* and *Umbrina canariensis*. The grouper *Epinephelus aeneus* was caught on one station on the inner shelf, while grunts and snappers were not found on any station in the region.

Table 4.3 Southern region March 2000. Catch rates (kg/hour) of valuable demersal species grouped by families. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2074	28					305.7	307.9	613.6
2075	38						110.9	110.9
2086	50	396.0				46.2	1 442.0	1 884.2
2087	31	1.5					456.9	458.4
2088	23	1.0					127.6	128.6
2089	26	1.6				3.6	1 015.9	1 021.1
2096	68	27.8				1.2	226.0	255.0
2097	20	1.1					63.3	64.4
2098	54	102.2				12.8	178.4	293.4
2099	70	12.2				19.3	38.7	70.1
2100	56	18.4		1.8		12.0	59.7	91.9
2101	39	139.4				3.0	301.6	444.0
2102	45	299.0				4.0	92.9	396.0
MEAN	42	76.9		0.1		31.4	340.1	448.6
SE		35.8		0.1		23.1	116.9	141.3
% CATCH		17.2		0.0		7.0	75.8	

b) Outer shelf 71-200 m

STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2076	88	0.0					67.7	67.7
2077	130	3 669.3				329.4	15 261.8	19 260.6
2079	186	640.6				9.3	7 192.1	7 842.0
2083	125	1 456.2				219.6	14 339.5	16 015.2
2084	110	1 240.3				13.6	2 497.2	3 751.1
2085	89	168.1				66.2	382.9	617.2
2090	95	66.7				2.5	258.6	327.8
2093	125	106.7				10.8	109.2	226.7
2094	116	320.2				17.1	482.2	819.5
2095	91	397.8				26.9	406.5	831.2
MEAN	115	806.6				69.5	4 099.8	4 975.9
SE		354.8				35.6	1 912.1	2 254.2
% CATCH		16.2				1.4	82.4	

Table 4.4 presents swept-area biomass estimates for valuable demersal groups (seabreams, croakers, and groupers) and other commercial groups (Cunene horse mackerel *T. trecae*, other carangids, and hairtail) that occurred in sizeable quantities. The estimates from the present survey (2000) are given with 95% confidence intervals. In the seabream biomass estimate of 61 600 tonnes the large catch of *D. macrophtalmus* at station 2078 is included and therefore the confidence interval spans from 0 to 133 000 tonnes. Excluding this catch the estimate is of 28 000 tonnes, which is within the previous estimates of 18 000 to 45 000 tonnes. The biomass of croakers was estimated in 3 600 tonnes, which is also within the estimates from previous years. The Cunene horse mackerel estimate of 185 000 tonnes is much higher than the results from previous surveys, partly due to the large catch at station 2078 as with seabreams. Excluding this station resulted in an estimate of 76 000 tonnes, which is still much higher than the previous estimates of 8 000 – 21 000 tonnes. The 33 000 tonnes biomass estimate of other carangids, mainly Cape horse mackerel (*T. capensis*), is less than half of what was found in 1992 but somewhat higher than the estimates from 1991.

Table 4.4 Biomass estimates (tones) of valuable demersal and pelagic fish by main groups on the shelf, by year of investigation. Cunene - Benguela.

	1986/I ☉	1989/I ☉	1989/II ◆	1991/I ◆	1991/II ◆	1992 ◆	1997 ◆	2000 ☉	2000 95% confidence limits
Seabreams	21 000	17 700	35 400	20 700	26 600	40 000	45 000	61 633 3	0 132 934
Croakers		1 570	4 370	1 700	1 600	2 100		621 995	6 247
Groupers								6	0 18
Sum demersal		19 270	39 770	22 400	28 200	42 100		65 260	0 138 456
Horse mackerel				21 300	12 700	8 000		185 150	0 417 317
Other carangids				20 800	26 700	82 000		33 097	0 75 482
Hairtail								1 004	0 2 139

☉ summer season (February-March)

◆ winter season (May-September)

Note that different surveys have used different areas, depth strata, and depth limits in the biomass estimations. Note also that all the confidence intervals in this region are large mainly due to the limited number of observations and the high variation in catch rates.

Figure 4.1 shows the distribution of seabreams in the region between Cunene and Tombua. The highest concentrations were found on the outer shelf from Cunene to north of Baía dos Tigres.

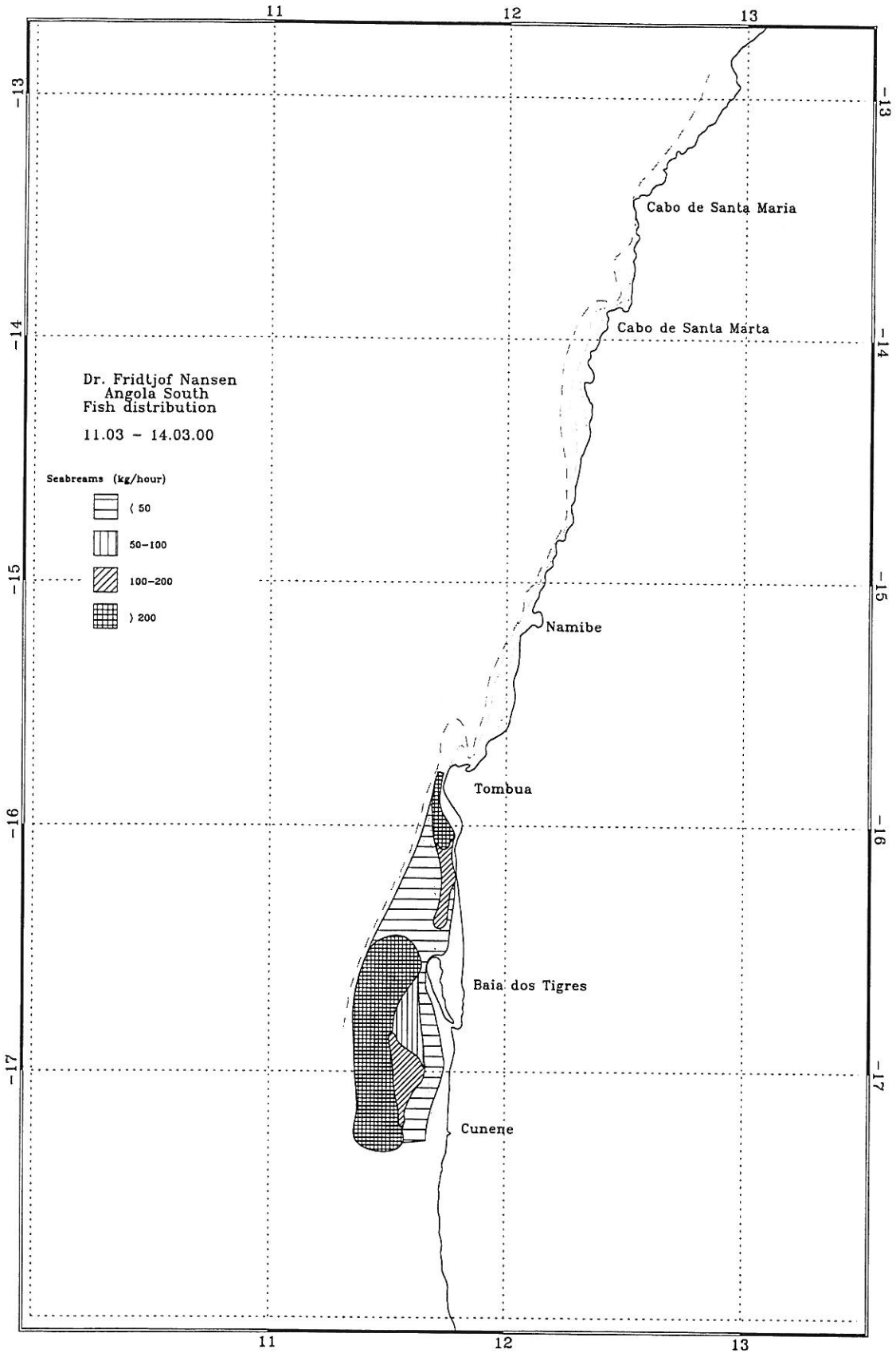


Figure 4.1 Estimated distribution of seabreams (Sparidae). Cunene-Tombua. Depth contours as shown in Fig. 2.1.

4.4 Benguela-Luanda shelf

A total of 72 successful swept-area trawl stations were accomplished on the shelf area from 20 to 200 m (Table 2.1). Table 4.5(a and b) presents the catch rates by main species groups on the inner and outer shelf. The 'Demersal' group dominated on the inner shelf with an average catch rate of almost 1 t/hour and a relative contribution of 68% of the total catch. In this group, the most abundant species were *Brachydeuterus auritus* with around 50% of the catch. The 'Pelagic' group contributed 21%, while shrimps, cephalopods and sharks contributed less than 1% each and were much less frequent. These results are very similar to last year's estimates.

Table 4.5 Central region March 2000. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the shelf. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2109	62	502.3	274.3			8.2	126.9	911.7
2110	37	1 070.7	6.4		85.0		665.2	1 827.3
2111	47	44.6	9.8		2.3		10.1	66.8
2112	57	12 838.0	2 089.8				68.1	14 995.9
2119	38	486.6	563.4	3.1	1.0		137.1	1 191.2
2120	61	1 814.3	445.0		8.6		167.8	2 435.7
2127	68	1 444.6	261.7		6.8		135.8	1 848.8
2128	20	1 049.5	610.2	0.2	13.5	1.0	208.5	1 882.9
2129	22	504.9	323.0	6.0	9.4		178.8	1 022.0
2130	56	2 423.5	588.7		17.2		176.9	3 206.3
2136	42	639.3	105.0		24.6		93.7	862.6
2137	23	39.1	529.7	1.6			55.6	626.0
2138	21	891.6	437.1		2.9		383.7	1 715.4
2145	56	56.6	1.9		7.8		13.5	79.8
2146	35	19.4	174.7		35.9		41.8	271.8
2147	21	19.3	8.0		3.6		94.5	125.4
2148	23	177.7	184.3		0.4	1.8	60.0	424.3
2149	24	684.4	397.0		9.2	7.6	302.1	1 400.3
2159	68	311.2	57.2	1.4	20.2		50.8	440.8
2160	25	313.5	977.6	4.8	1.2	5.8	335.8	1 638.7
2161	64	4 608.4	1 232.3				765.7	6 606.4
2170	40	948.9	172.4	0.5			327.8	1 449.5
2171	49	375.8	230.6				143.1	749.6
2179	29	10.0	5.2		1.5	6.6	11.2	34.4
2180	60	282.7	280.3		5.3		106.2	674.5
2187	23	67.4	5.4	0.8		2.3	6.0	81.9
2188	58	781.2	324.0		20.5		78.1	1 203.7
2198	64	998.9	222.0			35.5	325.4	1 581.8
2199	18	3.4	8.3				5.7	17.4
2200	21	12.4	2.1		1.6		7.1	23.2
2201	46	258.7	91.2		9.7		103.3	462.8
2209	24	2.5	5.0				0.6	8.1
2221	23	47.1	14.1				5.2	66.4
2222	57	287.4	55.6		0.8		13.7	357.4
2227	26	39.8	53.6	0.2	0.5		20.1	114.2
MEAN	40	973.0	307.1	0.5	8.3	2.0	149.3	1 440.1
SE		380.1	71.4	0.2	2.7	1.1	30.2	451.3
% CATCH		67.6	21.3	0.0	0.6	0.1	10.4	

On the outer shelf (71 to 200 m) the group of non-commercial species (others) had the highest average catch rate, but closely followed by the 'Pelagic' and 'Demersal' groups with about one third each. The most abundant species was *Synagrops microlepis* contributing around 23% of the catch. The average catch rate of the 'Demersal' group was only about 25% of the catch rate on the inner shelf and less than one third of last year's estimate, while the average catch rate of the 'Pelagic' group was close to that obtained on the inner shelf and somewhat higher than what was found last year. Both cephalopods, shrimps and sharks were more abundant than on the inner shelf, and their average catch rates were higher than in the 1999 survey.

Table 4.5 continued

b) Outer shelf 71-200 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2108	107	195.1	55.2		1.9		62.8	314.9
2113	83	1 324.0	838.0		0.3		195.8	2 358.0
2114	106	1 400.6	646.6		4.3		102.5	2 154.0
2115	113	872.8	2.3				111.3	986.5
2116	95	68.9	600.6		4.2		72.0	745.7
2117	79	601.8	133.4		5.6		96.4	837.2
2118	71	734.9	211.6		0.2		123.8	1 070.4
2121	91	41.3	215.6		17.2		89.0	363.2
2126	88	46.3	273.1		12.3		52.2	383.8
2131	81	61.2	73.5		2.8		85.0	222.5
2135	96	169.5	77.1		50.4		15.5	312.5
2139	94	589.1	267.3		1.3		84.3	942.0
2140	113	324.1	1 993.0		54.9		212.2	2 584.2
2150	148	49.5	202.7	31.4	16.8		1 746.3	2 046.6
2158	126	157.3	457.4	3.2	12.4		78.8	709.1
2162	126	447.1	580.8		21.5		1 857.6	2 907.1
2163	181	110.5	2.6	70.1	75.8		301.6	560.5
2168	112	123.2	139.3		37.9	7.0	164.5	471.9
2169	78	23.5	1 003.4				38.1	1 064.9
2172	81	224.4	132.0		7.4		45.7	409.6
2177	180	3.7	79.4		0.2		16.5	99.8
2178	103	5.9	0.8		2.7		25.1	34.5
2181	123	279.2	2.2		13.2	4.7	300.4	599.8
2182	173	178.7	7.8		12.7	5.8	958.4	1 163.5
2189	86	55.6	447.8		17.3	151.7	190.7	863.1
2190	100	29.0	17.0		10.6	6.1	75.3	138.0
2191	109	48.0	918.9		21.0	12.3	391.7	1 391.9
2193	166	52.2	17.8		12.6	14.4	316.9	413.9
2197	97	660.8	8.3		13.9		38.4	721.4
2202	88	221.0	188.5		13.9	15.2	83.7	522.4
2203	177	14.8	11.5		16.1		64.6	107.0
2210	77		291.9				5.2	297.2
2211	116	300.9	191.8		5.8		88.2	586.7
2212	195	64.1	34.8	21.4	81.9	4.8	2 078.2	2 285.2
2218	178	30.3	7.0	4.8	22.8		666.6	731.4
2220	104	70.0	1.6		2.3		19.0	92.9
2223	108	20.8	15.2	0.8	1.3		19.6	57.6
MEAN	114	259.5	274.3	3.6	15.6	6.0	293.9	852.7
SE		57.7	65.9	2.1	3.3	4.1	85.3	126.6
% CATCH		30.4	32.2	0.4	1.8	0.7	34.5	

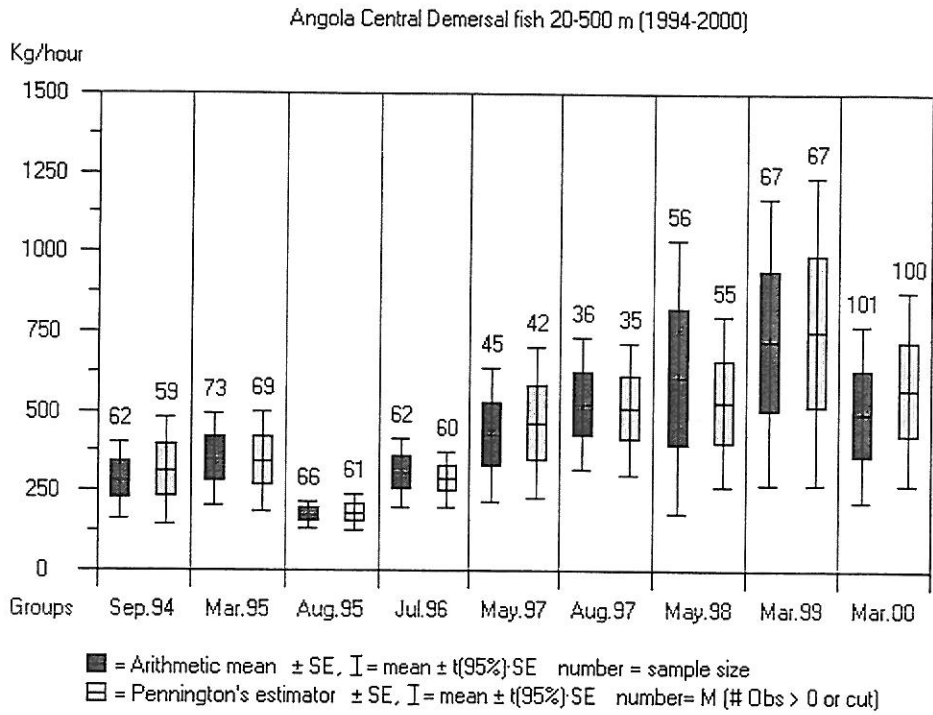


Figure 4.2 A time series of the mean catch rates of the main group "Demersal" from 20 to 500m in the

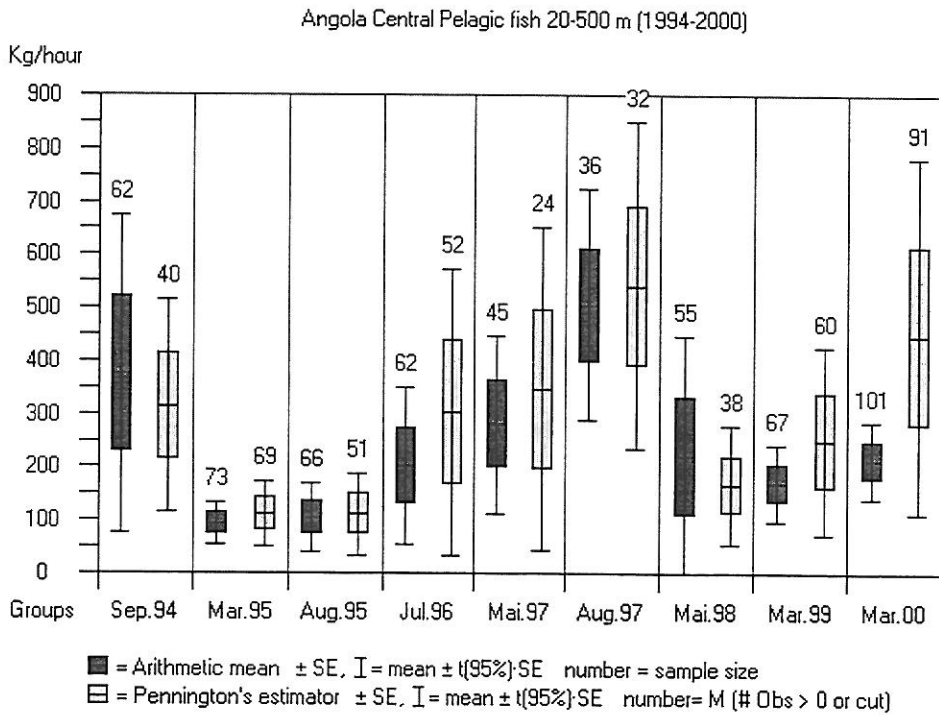


Figure 4.3 A time series of the mean catch rates of the main group "Pelagic" from 20 to 500m in the central region from 1994 to 2000. For calculations of confidence intervals see Annex IV.

Figures 4.2 and 4.3 show that there seem to be some long-term trends in the main groups 'Demersal' and 'Pelagic', with an overall slight increase in the first and a cyclic fluctuation in the second. The year-to-year variation, however, is generally small, and very few point estimates are actually significantly different. It should be noted that the August 1995 survey was specifically aimed at the deep-water shrimp and hake resources with sampling only deeper than 150 m, and that the August 1997 survey was specifically aimed at the large-eye Dentex (*Dentex macrophthalmus*) with sampling between 50 and 300 m only. When disregarding these two surveys, none of the annual point estimates are significantly different from each other (although the trends still seem valid).

Concerning the variance of the catch rates and the statistical confidence intervals of the means, it appears that the precision is more influenced by the highly skewed distribution than by the sample size which in this years survey was higher than usual. Particularly, there may be a problem in dealing with 'short' trawl stations of less than the standard 30 minutes where the raising to kg/hour may produce some rather enormous figures. Figure 4.4 shows a frequency plot of the catch rates in all the bottom trawl surveys in the central region from 1994 to 2000. As can be seen, station 2112 of this survey, stations 1822 and 1860 of last year's survey, and station 1691 of the 1998 survey, are among the four highest recorded in the area. These stations are all 'short' interrupted stations of 8-20 minute duration where the linear extrapolation to kg/hour strongly contributes to their magnitude. It is a question whether these are truly representative and it therefore seems legitimate to consider these stations as out-liers in the overall context and investigate their effect on the estimates.

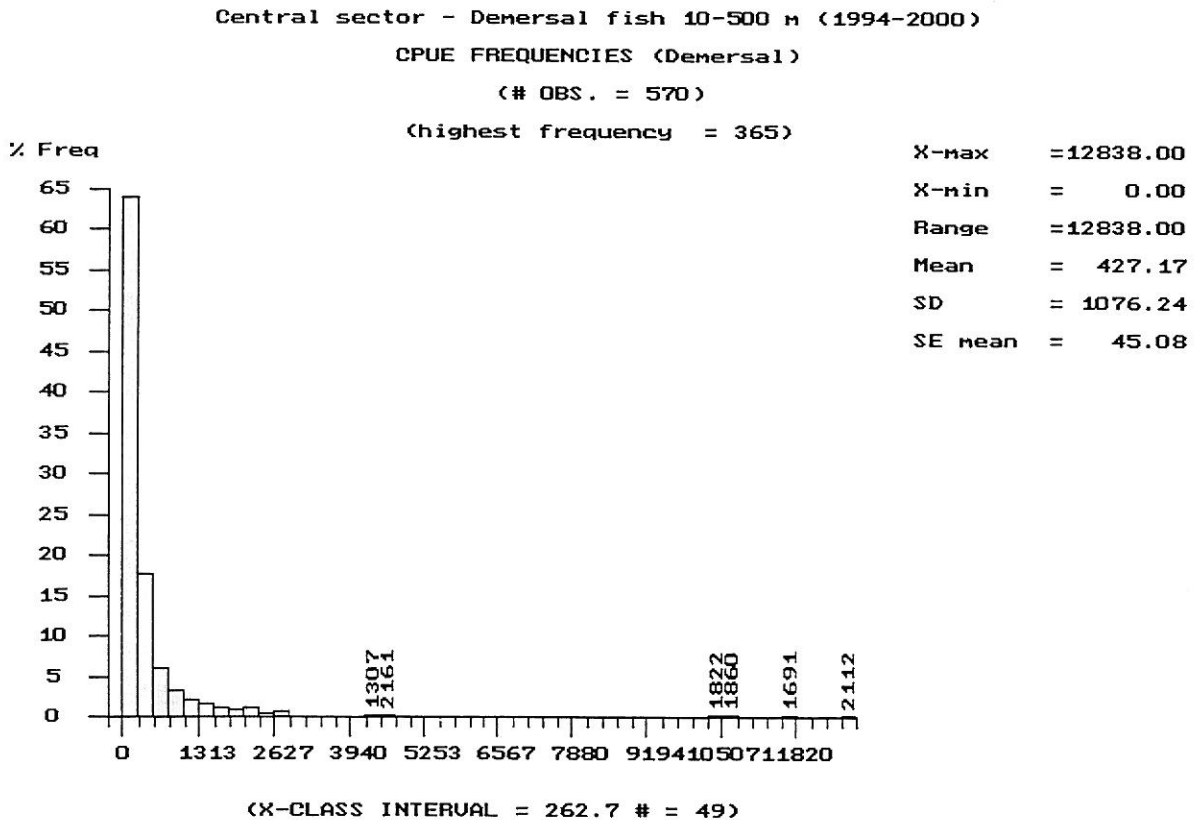


Figure 4.4 Frequency plot of catch rates of the main group "Demersal" on the central shelf over the years 1994 to 2000 with station numbers of the six highest recorded catch rates.

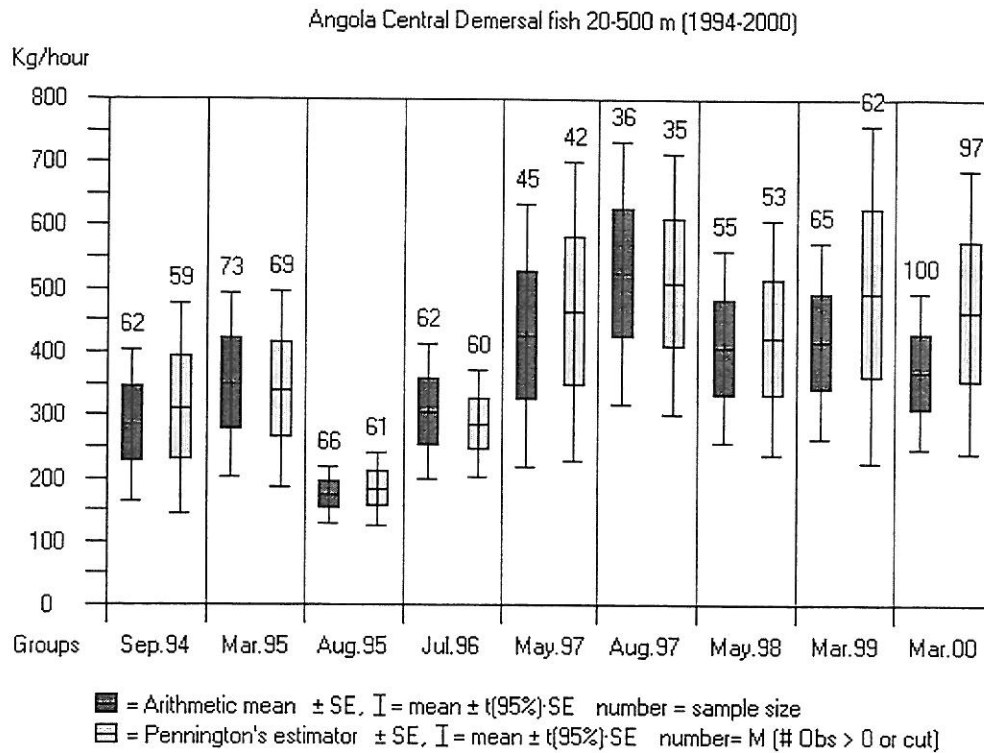


Figure 4.5 Same as Fig. 4.2, but with station 1691 in May 1998, stations 1822 and 1860 in March 1999, and station 2112 of this survey removed.

Figure 4.5 is the same time series as Fig. 4.2 but with exclusion of the 4 largest catches in Fig. 4.4. As can be seen the removal of these stations did change the pattern slightly over the last three years to a more constant trend, but not significantly. The nearly two-fold increase in sample size from 55 to 100 observations over the last three years does not seem to increase the precision to any significant degree.

4.5 Pelagic groups

Catch rates of the most important pelagic fish families, caught with bottom trawl during this survey, are presented in Table 4.6 (a and b). Carangids dominated on both the inner and outer shelf. Like last year the most abundant species were, in order of magnitude: Cunene horse mackerel (*Trachurus trecae*), Atlantic bumper (*Chloroscombrus chrysurus*) and African lookdown (*Selene dorsalis*). The highest catches of "Clupeids" were obtained on the inner shelf and consisted mainly of West African ilisha, *Ilisha africana*, and small amounts of sardinellas: *Sardinella aurita* and *S. maderensis* as in the 1998 survey. In 1999 anchovies (*Engraulis encrasicolus*) was the most abundant clupeid, while this species was not encountered in the present survey. Also barracudas (mainly *Sphyraena guachancho*) were caught on the inner shelf, while hairtail (*Trichiurus lepturus*) was found both on the inner and outer shelf, with highest average catch rate on the latter. Both groups had higher average catch rates than last year's estimate. Like in the previous survey scombrids were scarce.

Table 4.6 Central region March 2000. Catch rates (kg/hour) of main pelagic families on the shelf obtained with bottom trawl hauls. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
2109	62	0.2	175.9		13.9	84.2	637.4	911.7
2110	37		6.4				1 820.9	1 827.3
2111	47	6.0	3.7				57.1	66.8
2112	57	54.8	1 609.5	8.4		417.1	12 906.1	14 995.9
2119	38	39.2	457.8		4.9	61.6	627.7	1 191.2
2120	61		399.4		42.7	2.9	1 990.8	2 435.7
2127	68	9.6	143.9	5.5	99.0	3.6	1 587.1	1 848.8
2128	20	432.9	115.2		18.0	44.1	1 272.7	1 882.9
2129	22	56.2	72.9		17.0	176.9	699.0	1 022.0
2130	56	9.2	182.8		368.3	28.4	2 617.6	3 206.3
2136	42	13.3	46.8	2.2	22.8	20.0	757.6	862.6
2137	23	71.6	173.5		36.6	248.0	96.3	626.0
2138	21	161.8	126.4		43.1	105.8	1 278.3	1 715.4
2145	56			1.9			77.9	79.8
2146	35	0.3	163.5			11.0	97.0	271.8
2147	21	0.0	5.2		2.7	0.0	117.4	125.4
2148	23		144.6	17.2		22.4	240.0	424.3
2149	24	80.2	255.0	0.4	2.3	59.1	1 003.4	1 400.3
2159	68	0.6	25.9		20.5	10.3	383.6	440.8
2160	25		734.4		9.6	233.6	661.1	1 638.7
2161	64		408.2		763.6	60.5	5 374.1	6 606.4
2170	40	2.1	95.7		58.6	16.1	1 277.1	149.5
2171	49		79.1		122.7	28.8	519.0	749.6
2179	29	0.0	4.3			0.9	29.2	34.4
2180	60	2.0	273.8	2.1		2.4	394.2	674.5
2187	23	0.4	3.2			1.7	76.5	81.9
2188	58		192.9		1.4	129.7	879.8	1 203.7
2198	64		100.3		118.8	2.9	1 359.8	1 581.8
2199	18	0.4	7.9				9.2	17.4
2200	21		2.1				21.1	23.2
2201	46		60.7		9.7	20.7	371.6	462.8
2209	24	2.8	0.8			1.4	3.1	8.1
2221	23	3.3	10.8				52.2	66.4
2222	57		49.2			6.4	301.9	357.4
2227	26	3.3	32.4	3.5	1.1	13.4	60.6	114.2
MEAN	40	27.2	176.1	1.2	50.8	51.8	1 133.1	1 440.1
SE		13.2	50.1	0.6	23.9	15.3	387.7	451.3
% CATCH		1.9	12.2	0.1	3.5	3.6	78.7	

Table 4.6 continued

b) Outer shelf 71-200 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other	Total
2108	107		29.3		25.9		259.7	314.9
2113	83	0.3	194.5		639.4	3.7	1 520.1	2 358.0
2114	106	0.6	544.6		101.4		1 507.4	2 154.0
2115	113				2.3		984.2	986.5
2116	95	24.3	292.0		284.3		145.1	745.7
2117	79	1.1	49.7		82.6		703.8	837.2
2118	71	1.0	195.7		14.9		858.9	1 070.4
2121	91	0.8	38.5	3.0	172.6	0.7	147.5	363.2
2126	88	0.2	241.5		31.4		110.7	383.8
2131	81	0.2	15.3		45.4	12.6	149.0	222.5
2135	96		71.7			5.4	235.4	312.5
2139	94		250.6		16.7		674.7	942.0
2140	113		1 993.0				591.3	2 584.2
2150	148				202.7		1 843.9	2 046.6
2158	126	0.4	390.8		66.2		251.7	709.1
2162	126		52.8	91.1	436.9		2 326.3	2 907.1
2163	181				2.6		558.0	560.5
2168	112		129.7		9.6		332.6	471.9
2169	78		25.5		977.8		61.6	1 064.9
2172	81		92.4		39.6		277.6	409.6
2177	180				79.4		20.3	99.8
2178	103		0.8				33.7	34.5
2181	123		0.6		1.6		597.5	599.8
2182	173				7.8		1 155.6	1 163.5
2189	86		409.7		37.0	1.1	415.3	863.1
2190	100		9.4		7.5		121.0	138.0
2191	109		915.8		3.2		473.0	1 391.9
2193	166				17.8		396.1	413.9
2197	97		3.1		5.3		713.0	721.4
2202	88		149.4		39.1		333.9	522.4
2203	177				11.5		95.4	107.0
2210	77		1.5		290.4		5.2	297.2
2211	116		170.3		21.5		395.0	586.7
2212	195				34.8		2 250.5	2 285.2
2218	178				7.0		724.4	731.4
2220	104	0.9	0.8				91.3	92.9
2223	108		9.0		6.2		42.4	57.6
MEAN	114	0.8	169.7	2.5	100.6	0.6	578.5	852.7
SE		0.7	59.6	2.5	33.1	0.4	100.4	126.6
% CATCH		0.1	19.9	0.3	11.8	0.1	67.8	

Figures 4.6, 4.7 and 4.8 show the average catch rates of Cunene horse mackerel (*Trachurus trecae*), Atlantic bumper (*Chloroscombrus chrysurus*), and all “other carangids”, respectively, on the shelf (20-200 m) back to 1994. Figures 4.9 and 4.10 show the average catch rates of barracudas, mainly *Sphyraena guachancho*, on the shelf, and the hairtails, mainly *Trichiurus lepturus*, (down to 600 m as this group is found at all depths).

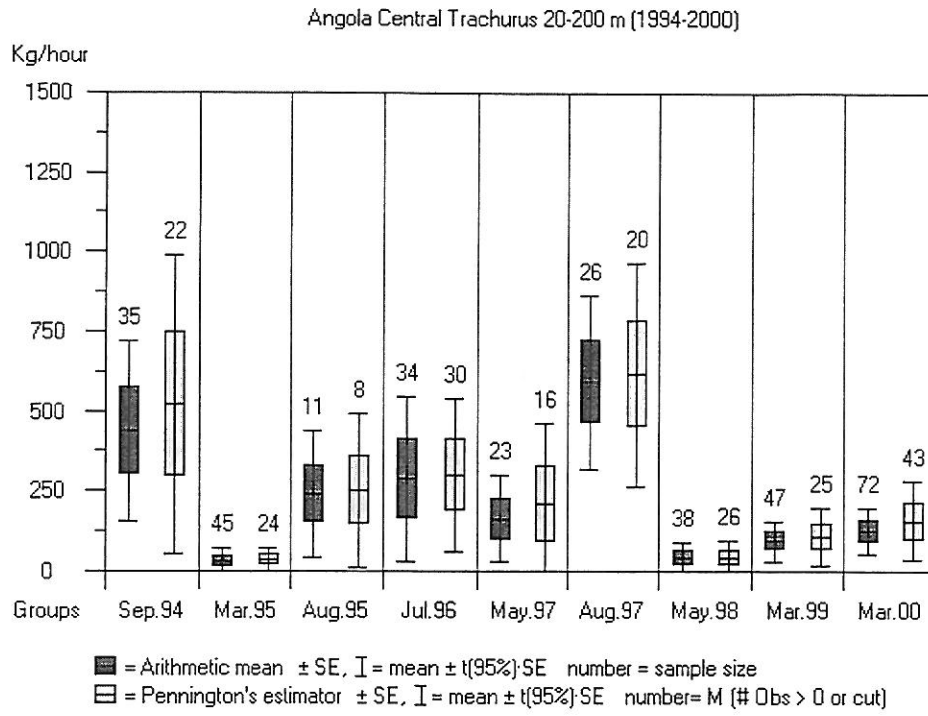


Figure 4.6 Mean catch rates of Cunene horse mackerel (*Trachurus trecae*) in bottom trawls on the central shelf.

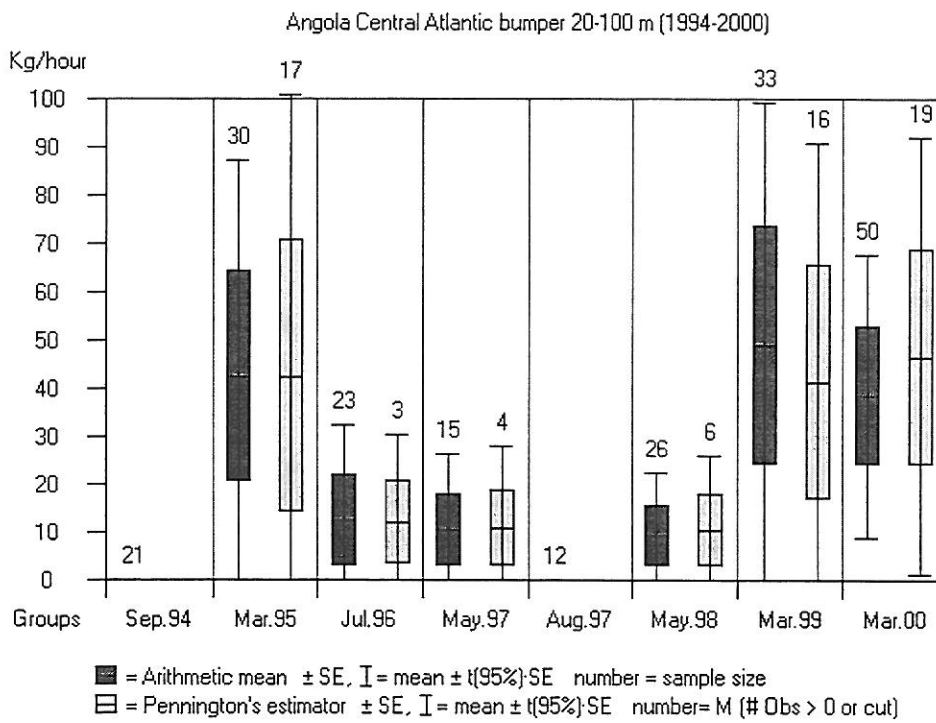


Figure 4.7 Mean catch rates of Atlantic bumper (*Chloroscombrus chrysurus*) on the central shelf (20-100 m).

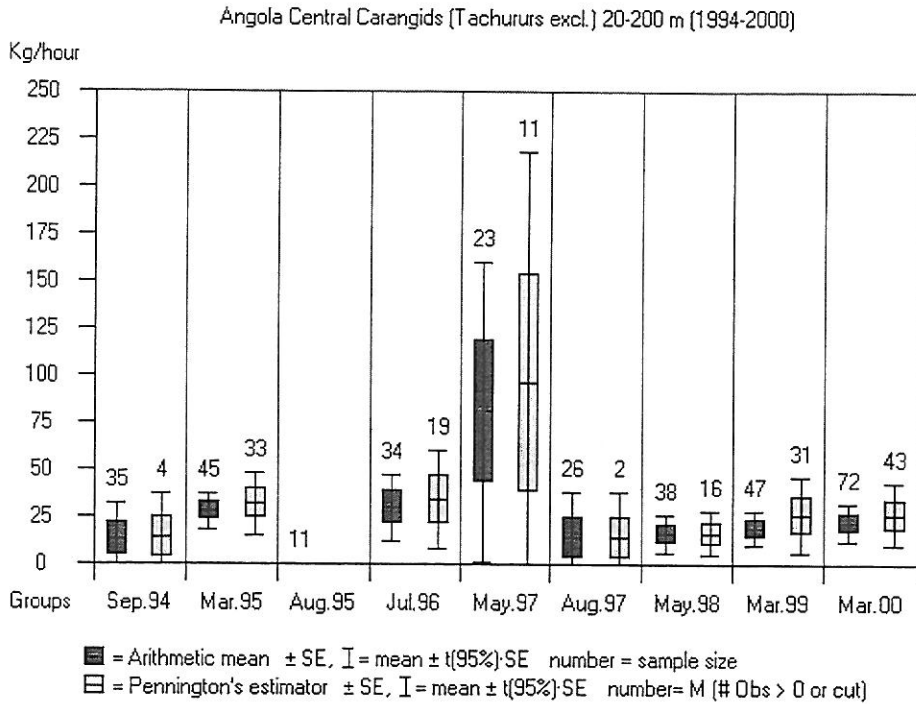


Figure 4.8 Mean catch rates of the family Carangidae, not including Cunene horse mackerel (*Trachurus trecae*), on the central shelf (20-200 m).

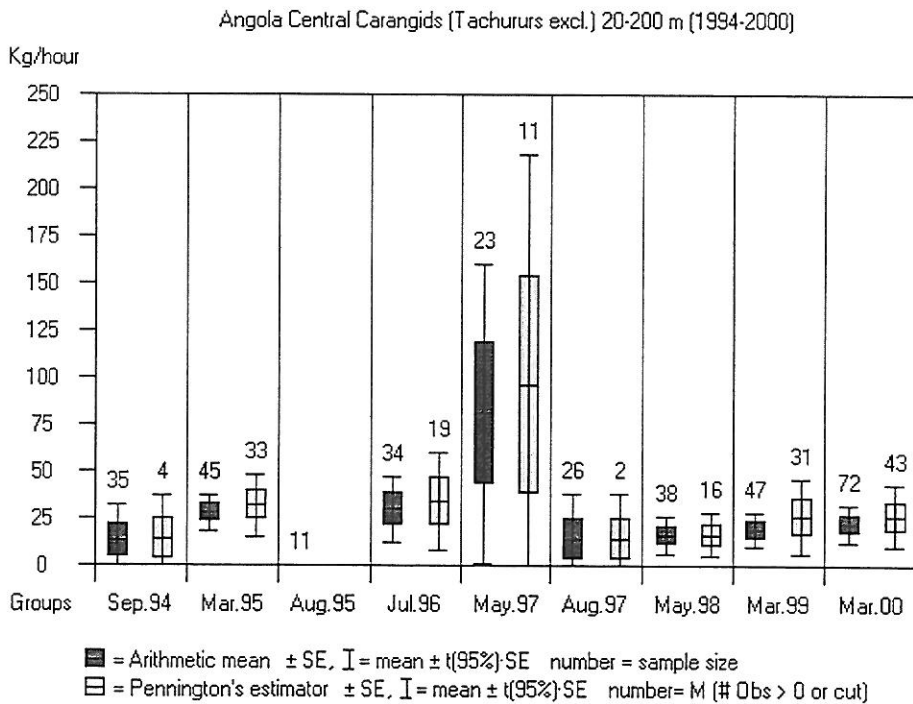


Figure 4.9 Mean catch rates of the family Sphyraenidae (barracudas), on the central shelf (20-200 m).

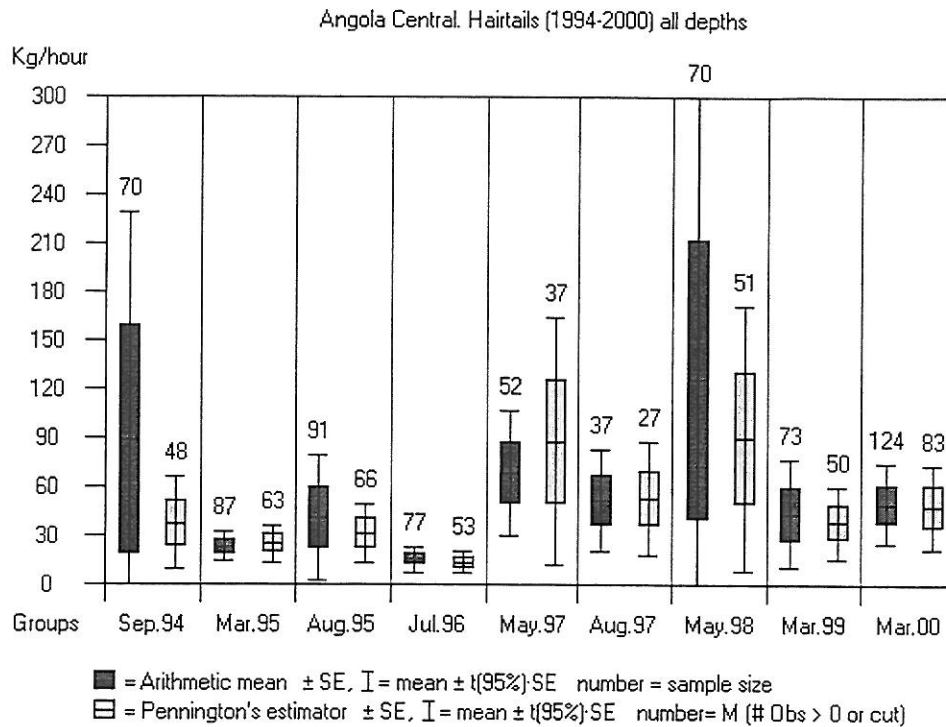


Figure 4.10 Mean catch rates of the family Trichiuridae (hairtail), central region (all depths down to 600 m).

All Figures 4.7-4.10 of the pelagic groups show large confidence intervals, and few clear trends, other than the resources may not have changed much over the past 5 years. The Cunene horse mackerel (Fig. 4.6), again recalling that the cruises in August 1995 and August 1997 had special purposes, may seem to have a cyclic fluctuating trend with a present increase, but this is far from statistically significant. However, the catch rates of Cunene horse mackerel seem to explain most of the variation in the overall "Pelagic group" (Fig. 4.3). The 'other' carangids (i.e. all except Cunene horse mackerel) seem to have a more stable pattern than the horse mackerel. Barracudas seem to be increasing over the past three years, whereas hairtail seem to have changed little.

It should be noted that the "sample number" given in the figures above the Pennington estimator indicates the number of observations above zero (or above the truncate level of very small catches, see Annex IV for explanation). In other words this number, compared with sample number given above the arithmetic mean estimator, provides an indication of the encounter rate relative to the total number of samples (i.e. frequency of occurrence). For many of the previous cruises (not taking into account the August 1995 and August 1997 surveys) the 'encounter rate' of both 'other carangids' and barracudas seems very low, but with higher catches during the warm season (March). This could indicate seasonal migration in and out of the area for these species that no longer can be validated since the winter surveys terminated in 1996.

4.6 Demersal groups

Table 4.7 (a and b) presents the catch rates of the most valuable demersal species on the central shelf down to 200 m grouped into 'families': seabreams (*Sparidae* except *Boops boops*), snappers (*Lutjanidae*), groupers (*Serranidae*), grunts (*Haemulidae* except *Brachydeuterus auritus*), and croakers (*Sciaenidae*).

Table 4.7 Central region March 2000. Catch rates (kg/hour) of valuable demersal species grouped by families.
a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m								
STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2109	62	109.0		2.4	55.4	31.2	713.7	911.7
2110	37	753.4		224.1	22.6		827.2	1 827.3
2111	47	2.9		35.0	1.3		27.7	66.8
2112	57	733.1					14 262.8	14 995.9
2119	38	108.2		19.1	3.2	60.2	1 000.3	1 191.2
2120	61	210.2			265.0	11.0	1 949.6	2 435.7
2127	68	540.8		5.1	552.1	21.7	729.1	1 848.8
2128	20	7.2			127.3	30.5	1 717.9	1 882.9
2129	22	26.3	45.0	9.4	74.6	286.2	580.5	1 022.0
2130	56	238.9	1.7	22.0	203.3	161.8	2 578.6	3 206.3
2136	42	90.6		2.8	213.4	10.3	545.5	862.6
2137	23	10.8		1.4	11.4	0.4	602.0	626.0
2138	21				214.6	462.4	1 038.4	1 715.4
2145	56	52.1					27.7	79.8
2146	35	0.5			3.4	1.7	266.1	271.8
2147	21	1.0			0.9		123.5	125.4
2148	23	102.6		29.0		37.5	255.2	424.3
2149	24	82.8		17.5	101.6	318.8	879.6	1 400.3
2159	68	15.3				9.8	415.7	440.8
2160	25	10.8		10.8	58.4	119.8	1 438.9	1 638.7
2161	64	81.0					6 525.4	6 606.4
2170	40	11.7		23.2	65.3	226.7	1 122.6	1 449.5
2171	49	35.6		1.2		6.7	706.2	749.6
2179	29	4.3					30.1	34.4
2180	60	277.6		0.8		1.1	395.0	674.5
2187	23	4.8		0.0			77.0	81.9
2188	58	70.5		1.2			1 132.1	1 203.7
2198	64	266.4		3.4			1 312.0	1 581.8
2199	18	2.4					15.0	17.4
2200	21	12.1					11.1	23.2
2201	46	91.9		11.9	12.5	72.9	273.6	462.8
2209	24					2.4	5.7	8.1
2221	23	9.0	12.0		22.2		23.2	66.4
2222	57	21.2		4.0		14.2	318.0	357.4
2227	26	2.7			1.2	5.8	104.5	114.2
MEAN	40	113.9	1.7	12.1	57.4	54.1	1 200.9	1 440.1
SE		32.6	1.3	6.4	19.2	18.3	431.9	451.3
% CATCH		7.9	0.1	0.8	4.0	3.8	83.4	

Table 4.7 continued

b) Outer shelf 71-200 m

STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2108	107	140.7				46.9	127.3	314.9
2113	83	241.5		0.4	705.5	344.6	1 066.0	2 358.0
2114	106	1 247.3				134.5	772.1	2 154.0
2115	113	548.0		19.0		27.9	391.6	986.5
2116	95	54.5				12.9	678.3	745.7
2117	79	176.0			411.7	4.9	244.6	837.2
2118	71	336.1	1.7		268.5	110.1	354.0	1 070.4
2121	91	30.7			6.5		326.0	363.2
2126	88	46.1					337.8	383.8
2131	81	33.3			12.3	5.0	171.9	222.5
2135	96	141.8		1.3		2.7	166.8	312.5
2139	94	440.3					501.7	942.0
2140	113	293.4				30.8	2 260.1	2 584.2
2150	148	24.8				17.9	2 003.9	2 046.6
2158	126	118.8				10.6	579.8	709.1
2162	126	302.8		2.9		51.7	2 549.7	2 907.1
2163	181	7.1				3.5	549.9	560.5
2168	112	71.3				2.9	397.8	471.9
2169	78	1.1			8.1	8.8	1 046.9	1 064.9
2172	81	35.7				8.7	365.2	409.6
2177	180	0.4				3.3	96.1	99.8
2178	103	5.8					28.7	34.5
2181	123	276.9					322.9	599.8
2182	173	166.1				12.6	984.7	1 163.5
2189	86	54.5			1.1		807.5	863.1
2190	100	26.4					111.6	138.0
2191	109	48.0					1 343.9	1 391.9
2193	166	52.2					361.7	413.9
2197	97	307.5		15.8		231.5	166.6	721.4
2202	88	220.9					301.5	522.4
2203	177	14.8					92.2	107.0
2210	77						297.2	297.2
2211	116	104.9		52.0		98.4	331.4	586.7
2212	195	64.1					2 221.2	2 285.2
2218	178	30.3					701.2	731.4
2220	104	63.3		0.9		4.5	24.3	92.9
2223	108	2.2				0.2	55.2	57.6
MEAN	114	154.9	0.1	2.5	38.2	31.8	625.4	852.7
SE		37.6	0.1	1.5	22.7	11.7	108.6	126.6
% CATCH		18.2	0.0	0.3	4.5	3.7	73.3	

Seabreams was the main demersal group on both the inner and outer shelf, and the average catch rates were similar to those obtained during the previous survey. *Pagellus bellottii* and *Dentex macrophthalmus* were the dominating species on the inner and outer shelf respectively, followed by *D. barnardi* and *D. angolensis* respectively (Annex III). Excluding the bigeye grunt (*Brachydeuterus auritus*), the second most important demersal family was that of the grunts, and consisted mainly of *Pomadasyus jubelini*, *P. incisus*, and *P. rogeri*. Croakers, mainly *Umbrina canariensis*, *Pseudotolithus typus* and *Atractoscion aequidens* were also common. This group appears consistently to have an extremely skewed, or sometimes bimodal, catch distribution, resulting in very large confidence intervals (Fig. 4.11). The overall picture is, however, fairly stable over the past 7 years. Like in previous

surveys snappers were rare. Groupers, mainly *Epinephelus aeneus*, were like in the previous year common, especially on the inner shelf (Fig. 4.12).

Figure 4.13 shows a time series of the catch rates of the family Haemulidae (grunts, except *Brachydeuterus auritus*) in the central region from 20 to 100 m (the range of their distribution) over the past 7 years (the August 1995 deep-water survey not included). There seems to be some variation in the abundance of this group but the patchy distribution of these species, resulting in an often bimodal distribution of low and high catch rates, makes the confidence intervals very difficult to define. It appears that the sampling and survey design for this group is not the most adequate to draw firm conclusions on biomass level changes.

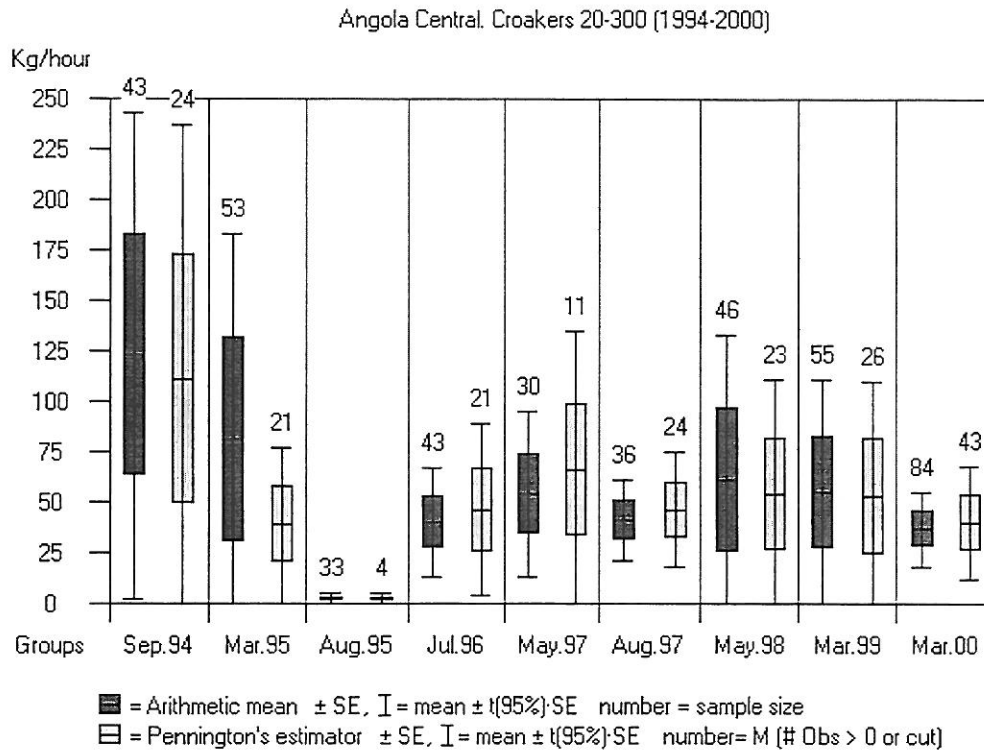


Figure 4.11 Mean catch rates of the family Sciaenidae (croakers) in the central region from 20 to 300 m.

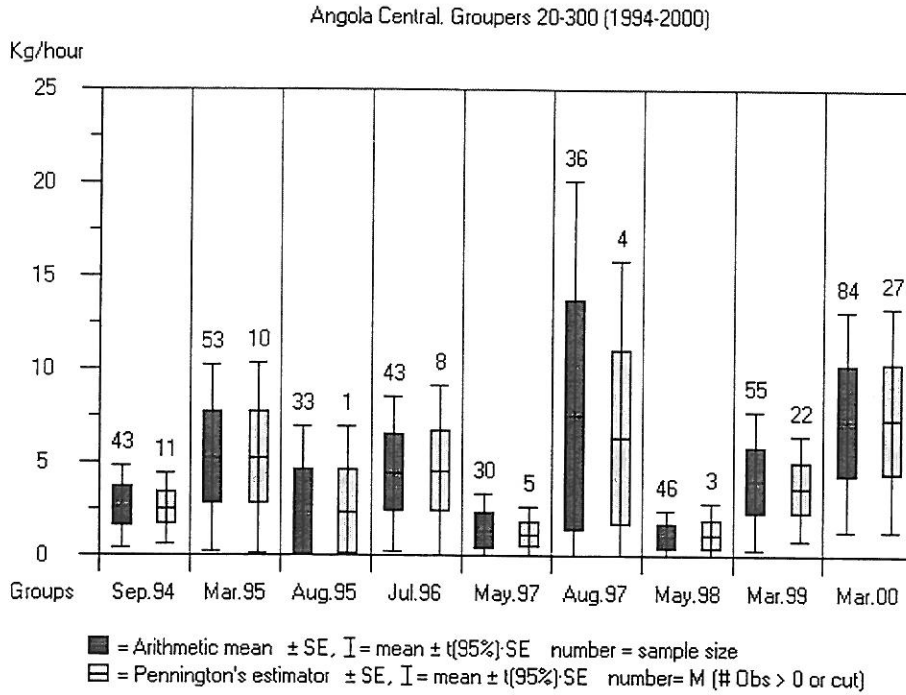


Figure 4.12 Mean catch rates of the family Serranidae (groupers) in the central region from 20 to 300 m over the past 5 years.

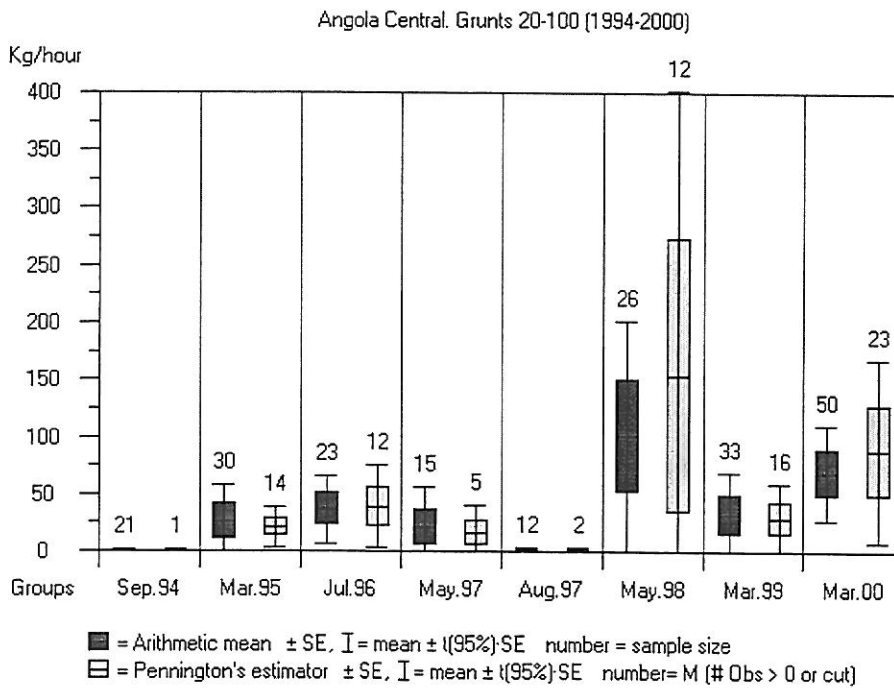


Figure 4.13 Mean catch rates of the family Haemulidae (grunts) in the central region from 20 to 100m.

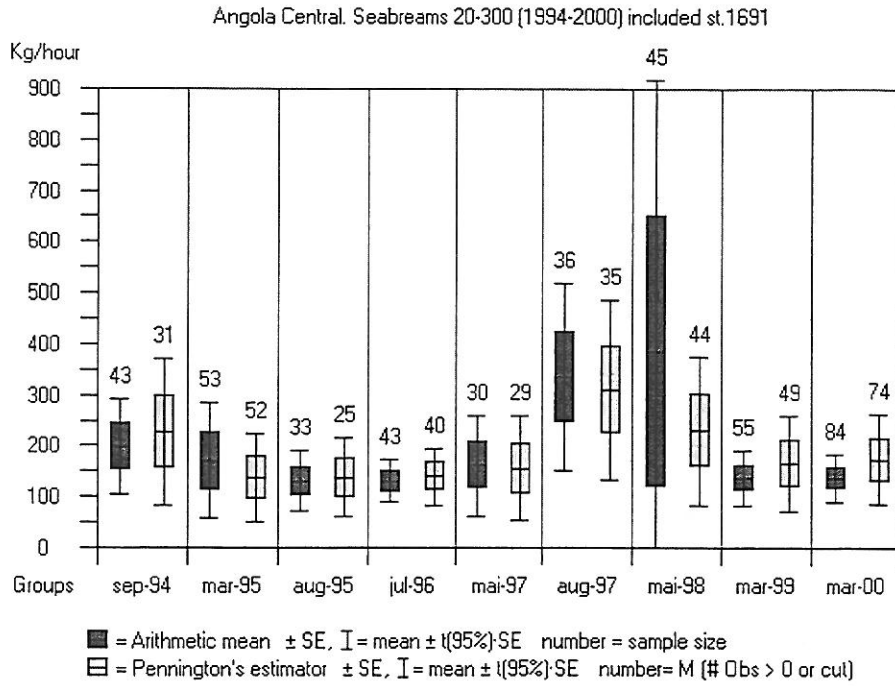


Figure 4.14 Mean catch rates of the valuable seabreams in the central region from 10 to 300 m with station 1691 from the May 1998 survey included.

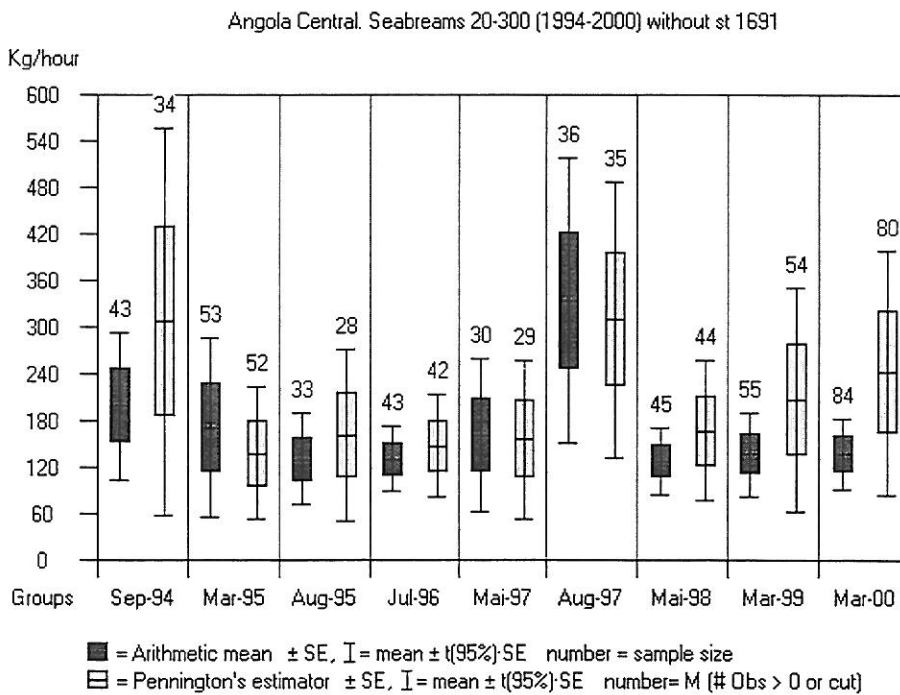


Figure 4.15 Mean catch rates of the valuable seabreams in the central region from 10 to 300 m with station 1691 from the May 1998 survey excluded.

Figures 4.14 and 4.15 show the mean catch rates of valuable seabreams (all Sparidae except *Boops boops*) over the past 7 years with, and without, station 1691 from the May 1998 survey included. The reason for this presentation is because this station, of 8 minutes duration, generated biomass estimation about 3 times higher than usual in the 1998 report (Table 4.8). Station 1691 (containing the highest catch of demersal fish on record since station 2112 of this survey, Fig 4.4) was an 8 minutes station that had to be interrupted due to bad bottom conditions, but which landed 1.6 tonnes of mainly *D. macrophthalmus*. When raised to catch per hour it resulted in the staggering record. With the station excluded (Fig. 4.15) it would have resulted in a biomass estimate of 19 500 tonnes (with 95% confidence interval from 13 000 to 26 000 tonnes), which is in line with this and previous surveys (Table 4.8). This example illustrates the danger of just operating with mean catch densities, as well as the already mentioned problem of linearly raising 'short' stations to per hour. When operating with time series, with a small probability of hitting areas of very dense fish concentrations, there seems to be a difficult trade off between accuracy (with high variance) and a biased but more precise index of abundance. This is a region that needs more investigation.

Figures 4.14 and 4.15 also illustrate the mean catch rates of the August 1997 survey, which, although not significantly different (statistically), are considerably higher than all the other surveys. The August 1997 survey was aimed specifically at *D. macrophthalmus* in order to establish its distribution and biomass levels, and was therefore conducted within the 50 and 350 m isobaths (Note that although Figs. 4.14 and 4.15 cover the range 20 to 300 m, the general picture does not change if all surveys were delimited by the 50 to 350 m depth interval). The August 1997 Report concluded that the biomass of *D. macrophthalmus* in the central region was 22000 tonnes (Note this estimate has not been included in the time series, Table 4.8). The discrepancy between the May 1997 survey and the August 1997 survey raises the important question on what is the 'true' density of seabreams, calculated from bottom trawl surveys, when different surveys with different aims, but covering the same area, with approximately the same intensity, and with the same gear and methods, arrive at strikingly different results in the catch rates. It also needs to be clarified how, given the differences in catch rates, the August 1997 survey resulted in a biomass estimate not much different from previous surveys.

Another problem, when evaluating and comparing the seabreams biomass estimates from previous surveys, is an inconsistency in how these have been derived in terms of depth strata and their respective areas. It appears that most reports, but not all, only have been using the catch rates on the shelf, i.e. down to 200 m for calculating biomass estimates of the 'shelf species'. However, as seen from Figure 4.16, the distribution of seabreams extends down to at least 300 m. If the distribution beyond 200 m is not included, then on average around a third of the seabreams catches, and 8% of the area, have not been accounted for (Fig. 4.16). Furthermore, some reports have used the area in the shallowest strata from 0 to 50 m, while others are using the area from 20 to 50 m.

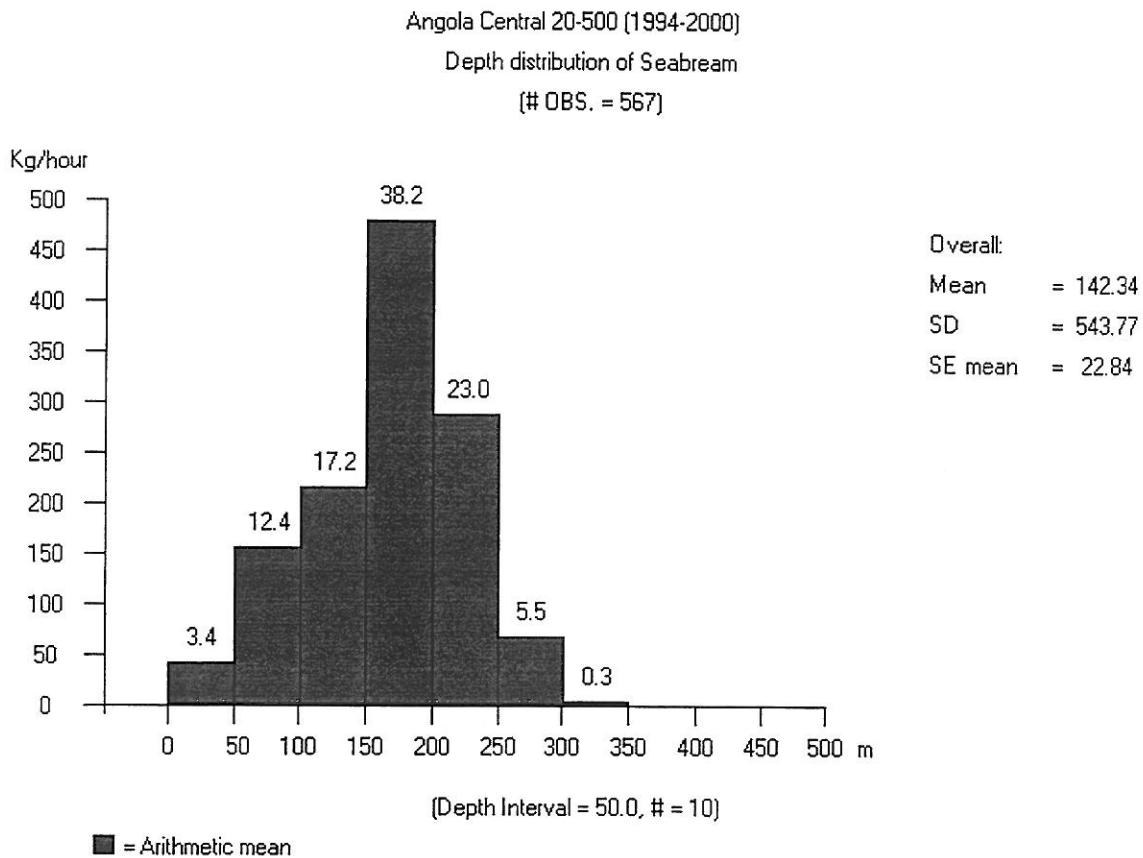


Figure 4.16 Depth distribution in percent catches rates of seabreams in the pooled catches of all surveys in the central region from 1994 to 2000.

Despite the stated problems when evaluating and comparing the results of the different cruises, the overall conclusion is that the seabreams in the Benguela- Luanda region seems not to have changed much during the past 8 years. Table 4.8 shows that except for 1998 (see above), the biomass estimates have been between 19 000 and 29 000 tonnes since 1991. This year's estimate of 22 500 tonnes is a little higher than last year's estimate of 20 000 tonnes. Also the biomass estimates of the other demersal families are within the estimates from previous years. The estimated 6 800 tonnes of grunts is twice the 1999 estimate, while the croakers estimate of 5 400 tonnes is only about half of what was obtained last year. The small biomass estimate of groupers (1 000 tonnes) is somewhat higher than last year's estimate, but within the confidence limits. The sum of biomass estimates of valuable demersal species is 35 700 tonnes. This is only 2 000 tonnes higher than in 1999, and in most years since 1992 this sum has been between 31 000 and 39 000 tonnes.

Concerning the biomass estimates of the other groups and species presented in Table 4.8, most of the results from the present survey are within the confidence limits of last year's estimates and comparable to what has been obtained in most previous years.

Figure 4.17 shows the distribution of the seabreams in the region between Benguela and Luanda. The general distribution, and areas with high concentration, is very similar to the three previous years.

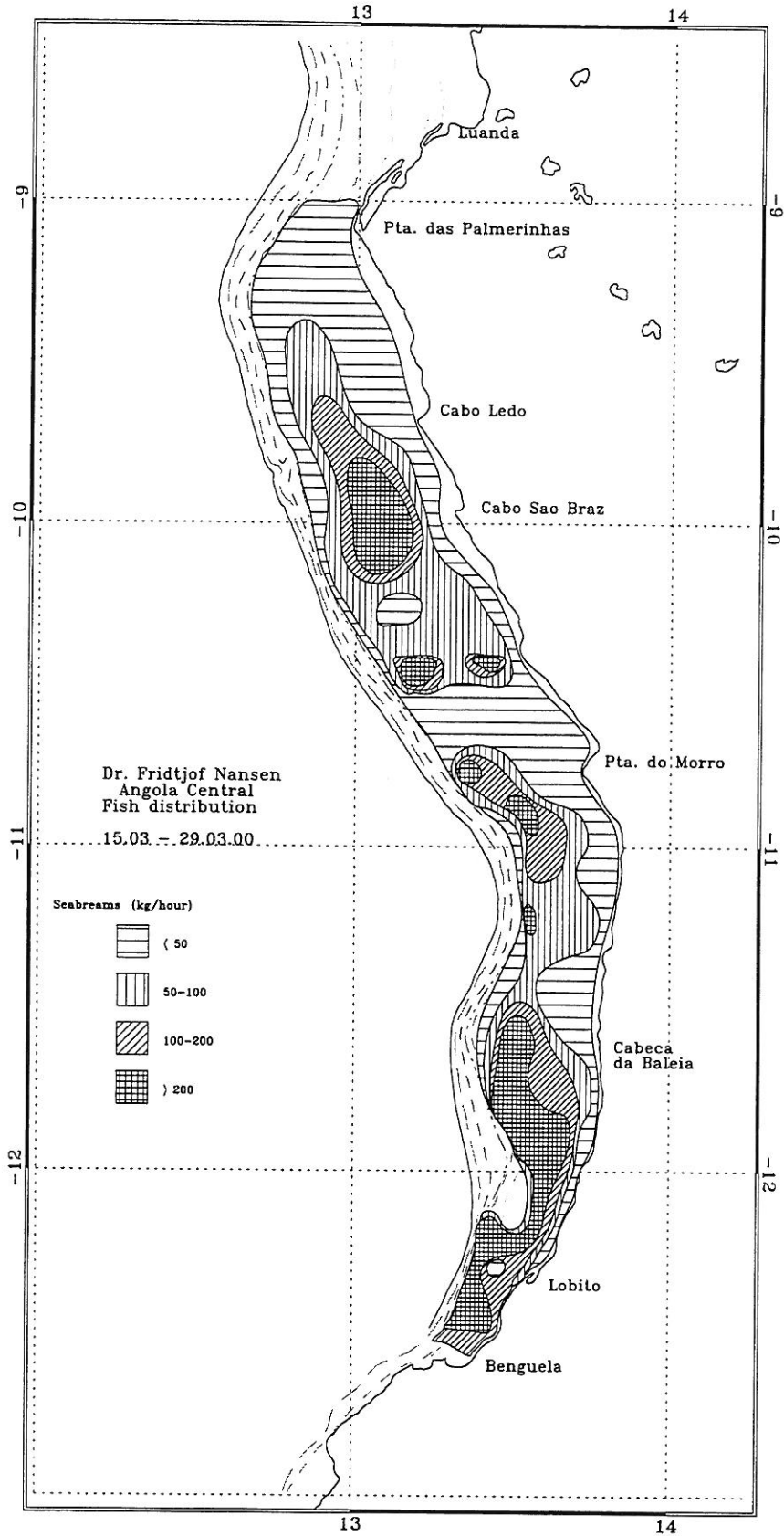


Figure 4.17 Estimated distribution of seabreams (Sparidae). Benguela-Luanda. Depth contours as shown in Fig.2.2

Table 4.8 Biomass estimates (tonnes) of valuable demersal and pelagic fish by main groups on the shelf, by year of investigation. Benguela-Luanda.

	Biomass tonnes													
	1986/I ☉	1989/I ☉	1991/II ◆	1992 ◆	1994 ◆	1995 ☉	1996 ◆	1997 ◆	1998 ◆	1999 ☉	1999① 95% confidence limits	2000 ☉	2000① 95% confidence limits	
Seabreams	9 300	11 100	24 580	28 000	29 200	21 800	19 000	21 650	*56 110	19 960	8 224	22 452	14 731	30 173
Grunts	2 700	5 600	5 500	2 000	120	3 400	5 230	2 320	*12 700	3 246	0	6 815	2 587	11 043
Croakers	5 500	1 450	19 000	2 000	4010	13 290	6 140	8 490		9 907	0	5 435	2 787	8 084
Groupers	470	550	1 000	1 000	350	470	830	300	330	624	18	1 039	226	1 851
Sum demersal	17 970	18 700	50 080	33 000	33 680	38 960	31 200	32 760	*78 830	33 737	9 449	35 741	24 839	46 644
Bigeye grunt	44 600	18 500	18 500	52 000	2990	29 500	31 120	44 110	34 765	93 415	13 100	173 730	55 819	0 111 911
Horse mackerel	21 000	7 200	48 500	75 000	65100	4 200	37 090	42 480	5 500	12 880	2 941	22 819	19 094	8 061 30 128
Other carangids	3 100	8 500	290	1 640	2790	8 400	5 360	16 120	2 360	7 484	1 556	13 412	5 912	3 058 8 765
Barracudas	1 900	3 000			740	2 700	1 540	4 810	755	1 573	647	2 499	3 304	1 652 4 956
Hairtail	17 300	12 500	4 100	1 300	26200	5 300	5 080	23 120	47 351	7 882	0	18 081	11 810	6 113 17 507

✦ Note that different surveys have used different areas, depth strata, and depth limits in the biomass estimations (see text)

☉ summer season (February-March)

◆ winter season (May-September)

* Note these figures are overestimated (see Figures 4.13, 4.15, 4.16)

① Stratified biomass estimates are made from equations (1) and (4), Annex IV, covering the whole depth range of the distribution, Annex IV. Since NAN-SIS does not produce variance estimates of the mean densities (Annex III), the 95% confidence limits for this survey were calculated from the assumption that the coefficient of variation (SD/mean) is constant between catch rates in kg/hour and t/NM^2 , in other words that the area swept (normalised per hour) is approximately constant during the survey. Coefficients of variation by depth strata for the various groups were obtained from the GRAFER module which is linked to NAN-SIS and equations (2), (3), (6) and (7) in Annex IV were used to calculate SE and confidence limits.

4.7 Luanda-Congo River shelf

The present survey covered the northern region of Angola from Luanda to Congo River (Fig. 2.3) like the 1999 survey, whereas most of the surveys up to 1997 in this region also have covered the Cabinda area north of the Congo River. However, the Cabinda area is now practically inaccessible to fisheries surveys due to the increased restrictions from the oil exploitation. This difference in the survey designs should be remembered when comparing the biomass tables presented.

A total of 60 successful swept-area trawl stations were accomplished on the shelf area (20-200 m) in the northern region (Table 2.1). Table 4.9 shows the catch rates by main species groups for the inner (20-70 m) and the outer shelf (71-200 m). The group definitions are the same as for the central region and are given in Annex VI.

Table 4.9 Northern region, April 2000. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the shelf. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2235	26	413.2	2 656.7	8.4		686.6	146.8	3 911.6
2236	70	757.7	1 247.3			24.7	92.7	2 122.5
2246	38	75.2	119.9	0.9	0.2	31.4	4.5	232.1
2247	46	642.2	36.7	4.8			106.8	790.5
2257	28	200.9	129.8	0.1		11.0	12.4	354.3
2265	70	77.8	35.4		7.4		3.5	124.0
2267	69	41.4	12.5		1.9		17.9	73.7
2276	24	59.9					19.9	79.8
2277	67	131.4	10.7		0.7		12.8	155.6
2282	61	573.9				3.4	3.2	580.5
2283	20	66.5					2.7	69.2
2300	40	7.4						7.4
2301	60	367.8	33.4		0.8		14.8	416.8
2313	20	14.4	0.2	0.1	0.5		3.7	18.9
2314	27	25.0	62.8					87.8
2315	58	59.8	12.0		1.4		14.0	87.2
2321	49	24.9	1.3	0.0	2.6		7.2	36.1
2330	31	0.7	2.3	0.1	0.3		34.8	38.2
2331	45	2.4			0.4		1.6	4.3
MEAN	44.7	186.4	229.5	0.8	0.9	39.9	26.3	483.7
SE		55.3	149.6	0.5	0.4	36.0	9.6	221.3
% CATCH		38.5	47.5	0.2	0.2	8.2	5.4	

On the inner shelf (Table 4.9a) the “Demersal” group did not dominate in the overall catches and the mean catch rates of this group were 5 times lower than in the central region and less than half of the previous year. The mean catch rates of the remaining major groups were not very different from the central region or from the previous year. On the outer shelf, however, the mean catch rates of the “Demersal” group were quite similar with the central region, whereas the catch rates of the “Pelagic” group were less than half. Both groups had a slightly lower catch rate than the previous year. Also “Shrimps” had a lower catch rate on both inner and outer shelf compared with the central region and the previous year.

Table 4.9 continued

b) Outer shelf 71-200 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2228	171	169.8	46.4	26.7			537.9	780.8
2233	146	36.1	44.0	3.6	9.0		433.7	526.3
2234	79	242.9	322.5		1.2		31.2	597.9
2237	122	13.6	197.8	0.0	6.1		8.8	226.3
2244	138	6.2			0.6		6.9	13.6
2245	81	2 661.8	596.5		5.3	5.9	23.4	3 293.0
2248	86	2 388.6	581.8		0.0		170.4	3 140.8
2249	108	614.7	741.3			5.2	53.4	1 414.7
2255	114	1 471.6	58.8		73.3		25.4	1 629.1
2256	84	94.3	79.9		2.3		23.4	199.9
2258	82	65.8	148.8		1.0		101.4	317.0
2259	104	40.3	57.0	0.2	0.4		66.7	164.7
2264	106	319.9	483.4	0.3		10.0	27.0	840.6
2274	116	79.1	70.0		3.0	12.0	35.3	199.3
2275	73	78.9	8.6		8.1		6.3	101.9
2278	121	96.6	51.5		4.2	2.2	36.5	191.0
2284	92	484.9	97.8		2.2		116.7	701.6
2285	116	15.7	7.1		0.9		25.4	49.1
2286	151	12.8	83.6		3.0	4.5	18.2	122.0
2291	75	392.7	101.1		2.4		8.6	504.8
2292	90	12.1	26.8		0.2		9.6	48.7
2293	111	54.2	15.4		3.4		21.8	94.8
2294	127	66.7	134.2				90.3	291.1
2302	89	27.7	1.0		0.6		11.1	40.5
2303	105	70.0	109.3		3.6	1.9	25.8	210.6
2304	197	121.7	25.0	1.0	48.0	18.0	523.0	736.7
2310	141	42.2	6.0		2.6		35.9	86.7
2311	88	68.2	36.2		0.2		3.0	107.7
2312	73	271.5	9.6		2.3		14.1	297.4
2316	120	31.5	42.7				10.6	84.8
2317	165	8.6	15.3	0.0	2.5		11.3	37.7
2322	73	16.6	14.3		1.8		18.1	50.7
2323	91	125.2	0.0		2.9		12.0	140.1
2324	118	260.5	101.8		1.5	15.3	27.7	406.7
2325	180	33.2	34.8	0.0	4.0		22.2	94.2
2332	74	92.7	0.1		0.5		6.5	99.8
2333	96	101.6	13.6		0.4		3.9	119.5
2334	119	220.0	28.7		3.4		13.7	265.8
2335	172	32.5	13.1	1.1	3.6		26.8	77.0
2339	165	32.2	17.3	0.3	3.0		44.0	96.8
2340	78	110.2	601.8	0.1			4.4	716.5
MEAN	113.1	270.4	122.6	0.8	5.1	1.8	65.7	466.3
SE		89.8	30.1	0.7	2.1	0.7	20.0	113.4
% CATCH		58.0	26.3	0.2	1.1	0.4	14.1	

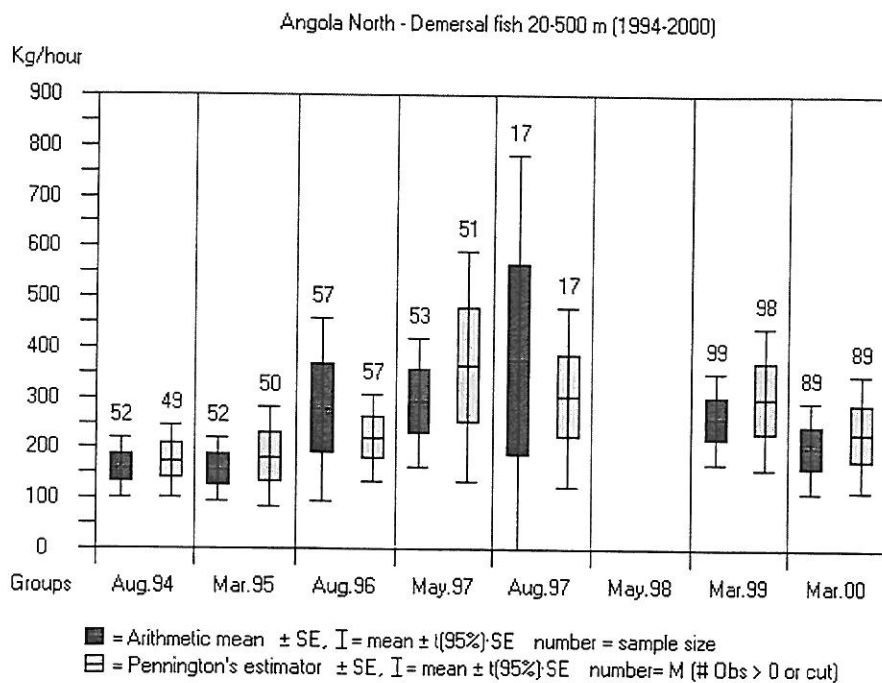


Figure 4.18 A time series of the mean catch rates of the main group "Demersal" from 20 to 500 m in the northern region from 1994 to 2000.

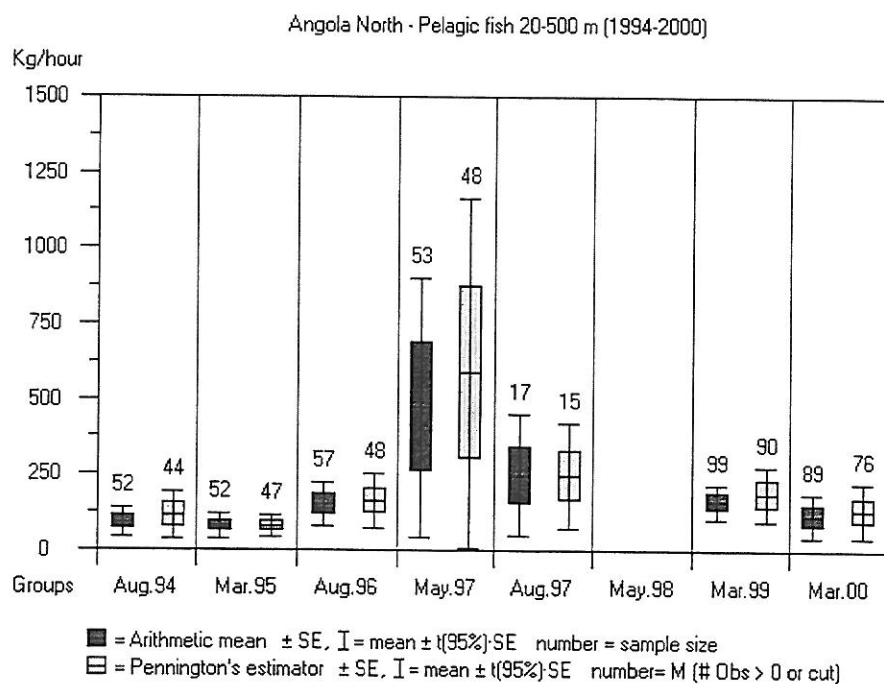


Figure 4.19 A time series of the mean catch rates of the main group "Pelagic" from 20 to 500 m in the northern region from 1994 to 2000.

Figures 4.18 and 4.19 show the time series of catch rates (20-500 m) for the two main groups: “Demersal” and “Pelagic” in the northern region for the bottom trawl surveys back to 1994. There was no bottom trawl survey of the demersal resources in 1998, and again it should be noted that the August 1997 survey was specifically aimed at the large-eye dentex (*Dentex macrophthalmus*) with sampling between 50 and 300 m only. The two figures show approximately the same trends, i.e. a slightly fluctuating trend over time with a peak around 1997, but the changes are not statistically significant. The overall trend is consistent with the one observed in the central region (Figs. 4.3 and 4.5), as well as the overall reduced catch rates of demersal fish, of around half of those in the central region. For the “Pelagic” group, the overall catch rates are almost the same in the two regions

4.8 Pelagic groups

Catch rates of the most important pelagic fish families, caught with bottom trawls during this survey, are presented in Table 4.10 (a and b).

Table 4.10 Northern region April 2000. Catch rates (kg/hour) of main pelagic families on the shelf obtained with bottom trawl hauls. a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
2235	26	117.0	2 316.7		17.3	205.7	1 255.0	3 911.6
2236	70		1 193.3		3.2	50.8	875.1	2 122.5
2246	38	3.5	97.7	2.8	7.6	8.4	112.2	232.1
2247	46		18.3		18.3		753.8	790.5
2257	28	5.7	101.4	4.6	5.7	12.3	224.5	354.3
2265	70	5.6	17.2			12.6	88.6	124.0
2267	69		0.6			11.9	61.2	73.7
2276	24						79.8	79.8
2277	67		4.4		2.6	3.7	144.9	155.6
2282	61						580.5	580.5
2283	20						69.2	69.2
2300	40						7.4	7.4
2301	60		15.6		2.0	15.8	383.4	416.8
2313	20		0.2				18.8	18.9
2314	27	0.0	50.4	12.4			25.0	87.8
2315	58		2.3		9.7		75.3	87.2
2321	49					1.3	34.8	36.1
2330	31		1.2			1.1	35.9	38.2
2331	45						4.3	4.3
MEAN	44.7	6.9	201.0	1.0	3.5	17.0	254.2	483.7
SE		6.1	133.0	0.7	1.3	10.8	81.7	221.3
% CATCH		1.4	41.6	0.2	0.7	3.5	52.6	

Carangids dominated on the inner and outer shelf with predominantly Atlantic bumper (*Chloroscombrus chrysurus*) on the inner shelf and the Cunene horse mackerel (*Trachurus trecae*) on the outer shelf. Figures 4.20 and 4.21 show the average catch rates of Cunene horse mackerel and all “other carangids” on the northern shelf (20-200 m) back to 1994. Figure 4.22 and 4.23 show the average catch rates of barracudas, mainly *Sphyræna guachancho*, on the northern shelf, and the hairtails, mainly *Trichiurus lepturus*, (down to 600 m as this group is found at all depths).

Table 4.10 continued

b) Outer shelf 71-200 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other	Total
2228	171		36.1		10.4		734.4	780.8
2233	146				44.0		482.3	526.3
2234	79		17.0		298.4	7.1	275.4	597.9
2237	122	0.3	1.8		195.1	0.6	28.5	226.3
2244	138						13.6	13.6
2245	81	14.4	560.2		15.8	6.1	2 696.5	3 293.0
2248	86		558.4		23.4		2 559.0	3 140.8
2249	108		2.1		739.3		673.3	1 414.7
2255	114		49.4		9.4		1 570.3	1 629.1
2256	84	0.2	75.3		4.4		120.0	199.9
2258	82	0.4	148.0			0.4	168.2	317.0
2259	104		8.5		48.6		107.7	164.7
2264	106		483.4				357.2	840.6
2274	116		70.0				129.4	199.3
2275	73		8.6				93.3	101.9
2278	121		46.7		4.8		139.5	191.0
2284	92	4.4	93.3				603.8	701.6
2285	116	1.3	5.9				42.0	49.1
2286	151				83.6		38.4	122.0
2291	75		101.1				403.7	504.8
2292	90	4.7	22.1				21.9	48.7
2293	111	0.7	14.7				79.4	94.8
2294	127		131.8		2.4		157.0	291.1
2302	89		0.4			0.7	39.5	40.5
2303	105	1.4	107.9				101.2	210.6
2304	197		0.6		24.4		711.7	736.7
2310	141		0.8		5.2		80.7	86.7
2311	88	1.9	34.3				71.5	107.7
2312	73	0.2	9.4				287.8	297.4
2316	120		38.6		4.1		42.1	84.8
2317	165	0.1	1.8		13.5		22.4	37.7
2322	73	0.0	10.0		3.5	0.8	36.4	50.7
2323	91		0.0				140.1	140.1
2324	118		97.7		4.1		304.9	406.7
2325	180	0.1	0.6		34.0		59.4	94.2
2332	74	0.1					99.7	99.8
2333	96	1.6	12.0				105.9	119.5
2334	119		28.7				237.1	265.8
2335	172		0.8		12.3		64.0	77.0
2339	165				17.3		79.5	96.8
2340	78		586.1		15.7		114.7	716.5
MEAN	113.1	0.8	82.0		39.4	0.4	343.7	466.3
SE		0.4	25.0		19.5	0.2	93.6	113.4
% CATCH		0.2	17.6		8.4	0.1	73.7	

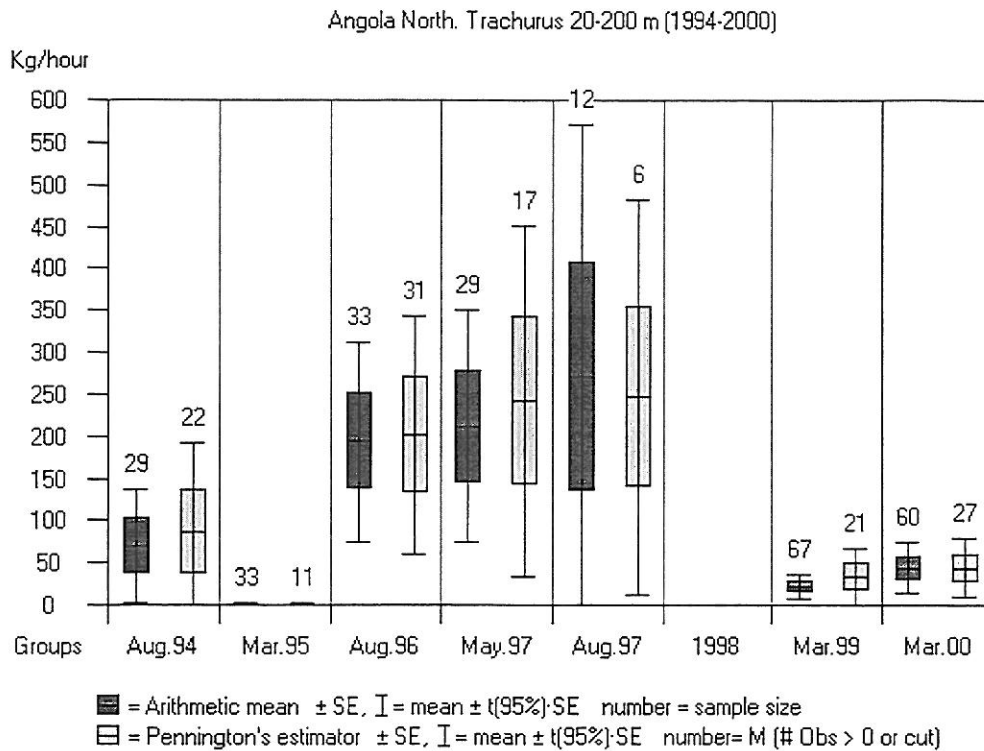


Figure 4.20 Mean catch rates of horse mackerel (*Trachurus trecae*) on the northern shelf.

The pattern in catch rates of the Cunene horse mackerel over time in the northern and central regions (Figs. 4.6 and 4.20) is very similar with a slight increase from 1994 to 1997 (although with a strange drop in 1995), but then very low catch rates from 1997 to the present. There is perhaps a tendency of a slight increase again after the drop in 1998. For the “other carangids” (Figs. 4.8 and 4.21) there is less similarity, probably because the proportion of different species is different in the two ‘groups’. However, the considerably higher mean catch rates observed in the northern region in 1997 (also reflected in the estimated biomass, Table 4.12), is probably an overestimation resulting from a single huge catch (around 10 t/hr) of *Selene dorsalis* obtained during 14 minutes trawling at station 1346.

For the barracudas (Figs. 4.9 and 4.22) and the hairtails (Figs. 4.10 and 4.23), there are no clear patterns or similarity in the catch rates. These two groups have increased in the central region since last year, but decreased in the northern region. However, none of the changes are significant over time. Biomass estimates for all the pelagic groups are presented in Table 4.12.

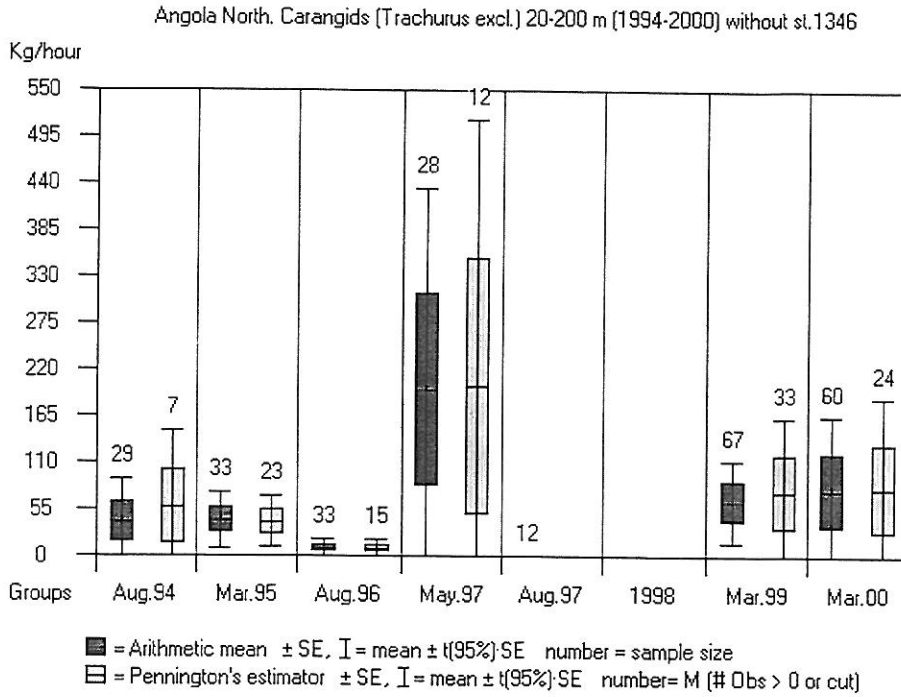


Figure 4.21 Mean catch rates of the family Carangidae, excluding Cunene horse mackerel (*Trachurus trecae*), on the northern shelf.

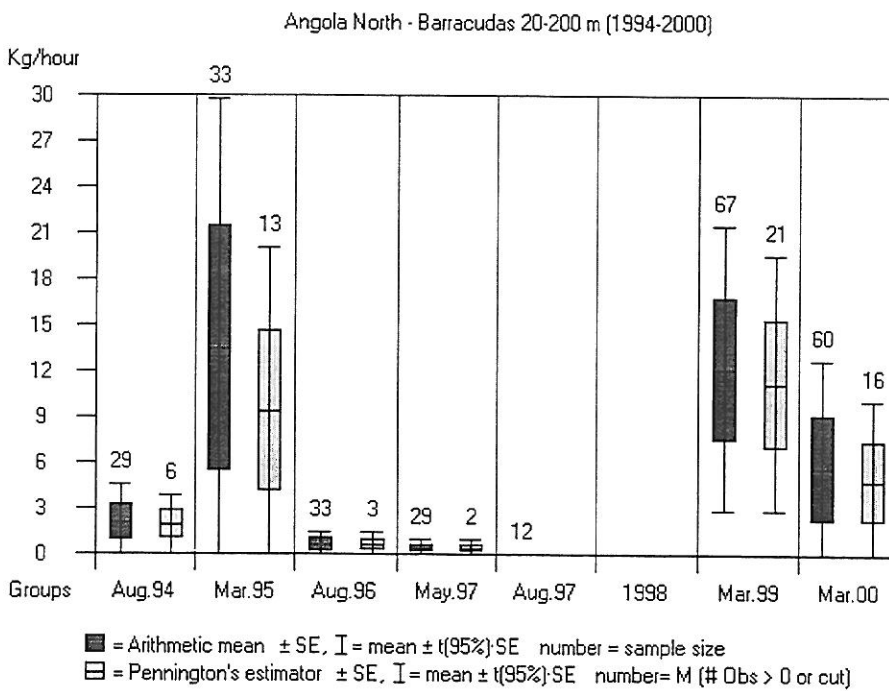


Figure 4.22 Mean catch rates of the family Sphyraenidae (barracudas), on the northern shelf.

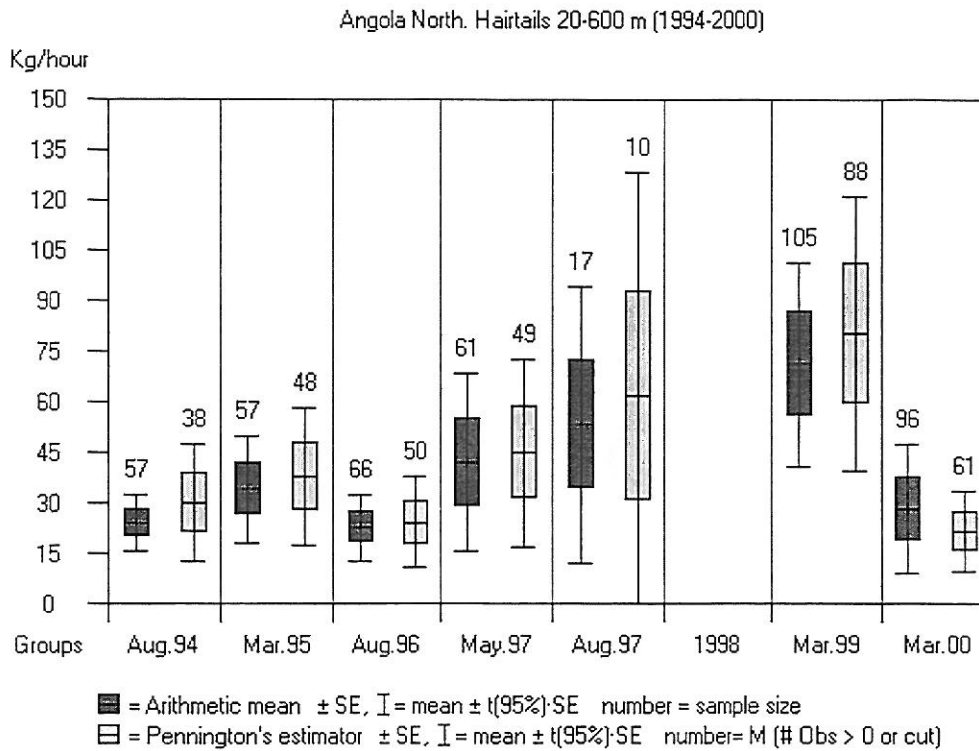


Figure 4.23 Mean catch rates of the family Trichiuridae (hairtails) in the northern region (all depths down to 600 m).

4.9 Demersal groups

Table 4.11 (a and b) presents the catch rates of the most valuable demersal species on the shelf down to 200 m grouped into 'families': seabreams (all Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *Brachydeuterus auritus*), and croakers (Sciaenidae).

Among the seabreams, as during the 1999 demersal survey, *Pagellus bellottii*, was the dominating species in the north (Annex III) followed by *Dentex angolensis*, *D. congoensis* and *D. barnardi*. Also *Pagrus caeruleostictus* and *D. gibbosus* were present in small quantities. *D. macrophthalmus*, the most important seabream species in the central region, was scarce in the northern region during this cruise. Snappers (*Lutjanus fulgens*) were found in only one trawl station in the northern region. Groupers, mainly *Epinephelus aeneus*, were less common than in the central region but occurred in 23% of the catches from 20 to 300 m (Fig. 4.25). Among the grunts, the non-commercial bigeye grunt (*Brachydeuterus auritus*) was still the overall most important demersal species in the north with approximately the same density as in the 1999 cruise. However, the mean density was only about half of what was found in the central region. Among the commercially important grunts, *Pomadasys jubelini* was the most abundant in the north as in the central region, followed by *P. incisus* and *P. peroteti*. The time series of grunts in the two regions (Figs. 4.13 and 4.24) are quite similar in the two regions, except for this year where the abundance has increased in the

central region but significantly decreased in the northern region (Table 4.12). Croakers, mainly *Umbrina canariensis* and *Pseudotolithus typus*, were still common in the north, but with slightly lower catch rates than in the central region. *Argyrosomus hololepidotus* was not found during this cruise.

The catch rates of seabreams in the northern sector (Fig 4.27) were as usual generally less than half of those found in the central region. Otherwise, apart from the apparently distinct seasonal variation in the north, the time series indicate, like in the central region, a remarkable stable situation. Also the distribution pattern (Fig. 4.28) seems pretty consistent with previous surveys.

Biomass estimates of the commercially important demersal groups in the northern region are presented in Table 4.12. It should be noted that the time series of the biomass estimates (previous values taken from earlier reports) and those of the catch rates (presented in this report) do some times not correspond. For example the seabreams had biomass estimates in 1994 and 1996 around 3 times higher than those of 1995, 1997 and the present survey, while the catch rates (Fig. 4.27) were only 16% and 30% higher in 1995 and 1996, respectively, compared to the present survey. Similarly, the mean catch rates of seabreams in 1995 and 1997 were identical (48 kg/hr), while the biomass estimates of these two years differ with 2000 tonnes. Also for grunts there seems to be apparent inconsistencies between the biomass figures and the catch rates (Fig. 4.24). As already mentioned, this calls for a reassessment of the biomass figures.

Table 4.11 Northern region, April 2000. Catch rates (kg/hour) of valuable demersal species grouped by families.
a: Inner shelf (20-70 m), b: Outer shelf (71-200 m).

a) Inner shelf 20-70 m

STAT	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
2235	26	11.3			19.8	70.2	3810.4	3911.6
2236	70					25.1	2097.4	2122.5
2246	38	5.4		3.1	3.3	2.6	217.7	232.1
2247	46				3.4	26.6	760.5	790.5
2257	28	3.5			6.0	23.0	321.8	354.3
2265	70	75.2					48.8	124.0
2267	69	41.3					32.4	73.7
2276	24	58.5		1.4			19.9	79.8
2277	67	131.4					24.2	155.6
2282	61	478.7	69.6	8.1	14.1		10.0	580.5
2283	20	66.5					2.7	69.2
2300	40	7.4						7.4
2301	60	21.7		33.9		312.2	49.0	416.8
2313	20					13.2	5.7	18.9
2314	27			24.8			63.1	87.8
2315	58	49.9		10.0			27.4	87.2
2321	49	12.3		12.6			11.2	36.1
2330	31	0.3					38.0	38.2
2331	45	2.4					2.0	4.3
MEAN	44.7	50.8	3.7	4.9	2.5	24.9	397.0	483.7
SE		25.1	3.7	2.2	1.3	16.5	220.8	221.3
% CATCH		10.5	0.8	1.0	0.5	5.2	82.1	

b) Outer shelf 71-200 m

STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2228	171	19.5				150.3	611.0	780.8
2233	146	28.3				7.8	490.2	526.3
2234	79	153.3		9.3		44.1	391.2	597.9
2237	122	13.2					213.2	226.3
2244	138	6.2					7.5	13.6
2245	81	10.0				4.6	3 278.4	3 293.0
2248	86	19.9				7.0	3 113.8	3 140.8
2249	108	4.6				18.0	1 392.1	1 414.7
2255	114	743.6				66.0	819.5	1 629.1
2256	84	7.8				8.0	184.0	199.9
2258	82	60.8				4.8	251.4	317.0
2259	104	35.1				1.2	128.4	164.7
2264	106	284.9		16.7			539.0	840.6
2274	116	79.1					120.3	199.3
2275	73	58.5				19.5	23.8	101.9
2278	121	94.0				1.9	95.1	191.0
2284	92	428.8		3.8			268.9	701.6
2285	116	14.6					34.5	49.1
2286	151	12.8					109.2	122.0
2291	75	286.7		2.7	77.7	19.2	118.5	504.8
2292	90	11.1			0.6		37.0	48.7
2293	111	51.4					43.4	94.8
2294	127	66.0				0.6	224.4	291.1
2302	89	27.7					12.8	40.5
2303	105	70.0					140.6	210.6
2304	197	103.9				17.8	615.0	736.7
2310	141	42.2					44.5	86.7
2311	88	67.7					40.0	107.7
2312	73	250.1		12.9			34.4	297.4
2316	120	21.2					63.6	84.8
2317	165	8.3				0.2	29.2	37.7
2322	73	7.3		9.3			34.1	50.7
2323	91	115.1				7.7	17.3	140.1
2324	118	260.5					146.2	406.7
2325	180	32.7				0.5	61.0	94.2
2332	74	53.3		21.9	0.5	17.1	7.0	99.8
2333	96	62.6		39.0			17.9	119.5
2334	119	209.8		10.2			45.8	265.8
2335	172	30.1				2.4	44.6	77.0
2339	165	32.0				0.2	64.7	96.8
2340	78	98.3					618.1	716.5
MEAN	113.1	97.1		3.1	1.9	9.7	354.4	466.3
SE		22.1		1.2	1.9	4.1	110.8	113.4
% CATCH		20.8		0.7	0.4	2.1	76.0	

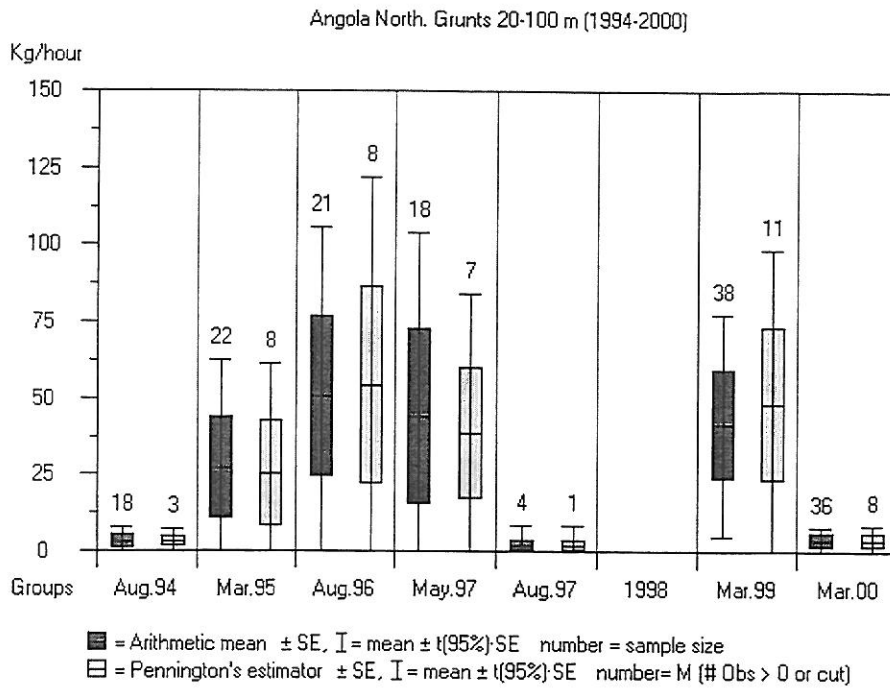


Figure 4.24 Mean catch rates of the family Haemulidae (grunts, except *Brachydeuterus auritus*) in the northern region from 20 to 100 m.

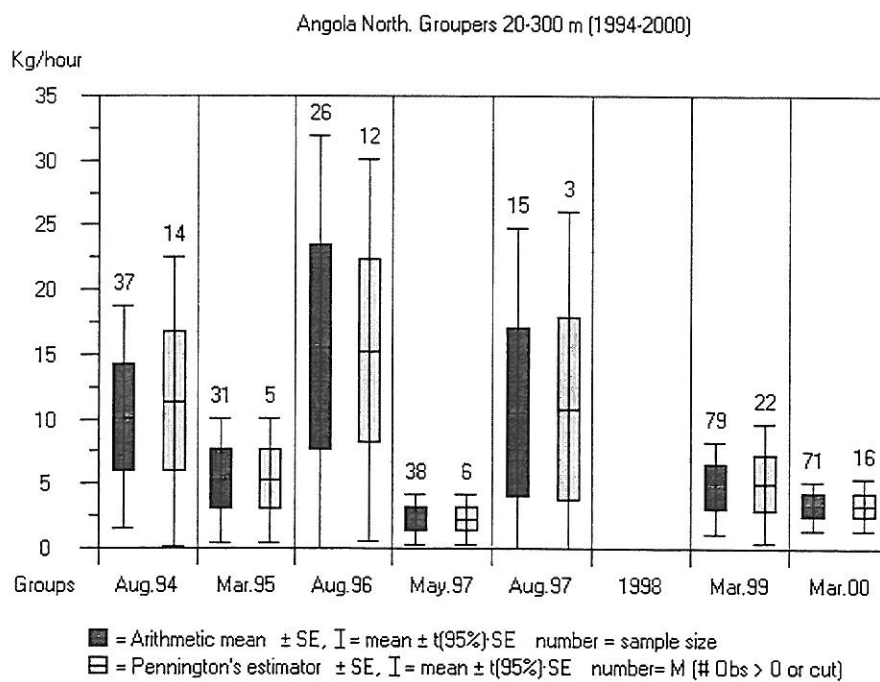


Figure 4.25 Mean catch rates of the family Serranidae (groupers) in the northern region from 20 to 300 m over the past 5 years.

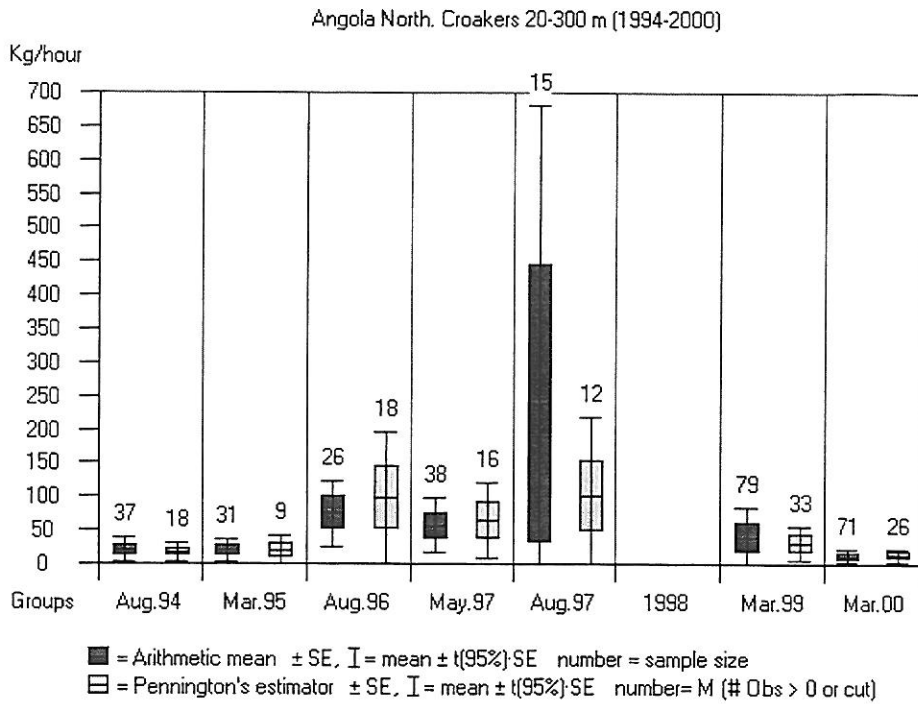


Figure 4.26 Mean catch rates of the family Sciaenidae (croakers) in the northern region from 20 to 300 m.

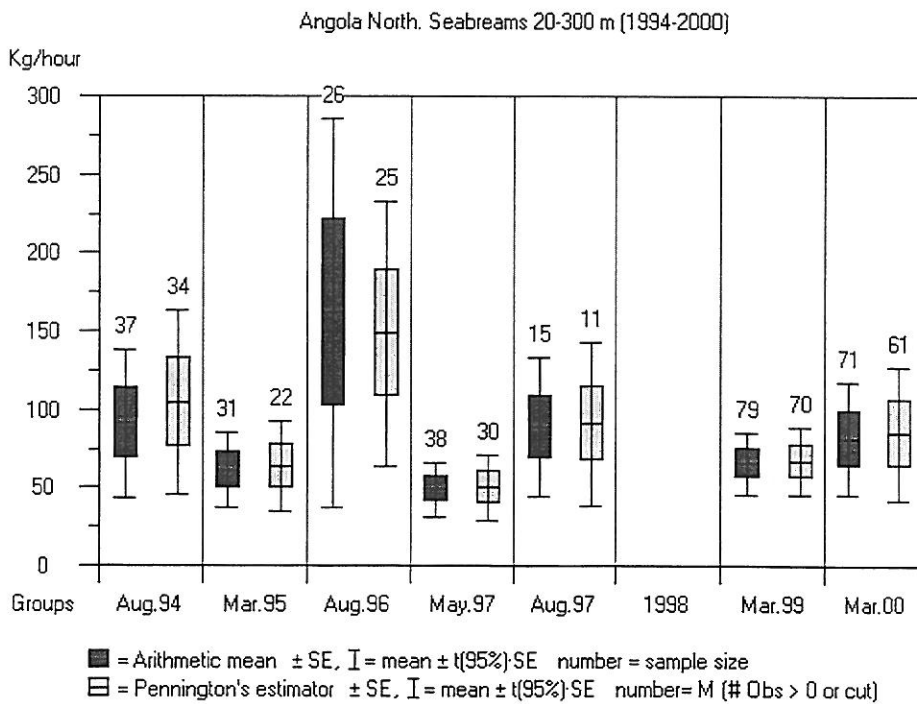


Figure 4.27 Mean catch rates of the valuable seabreams in the northern region from 20 to 300 m.

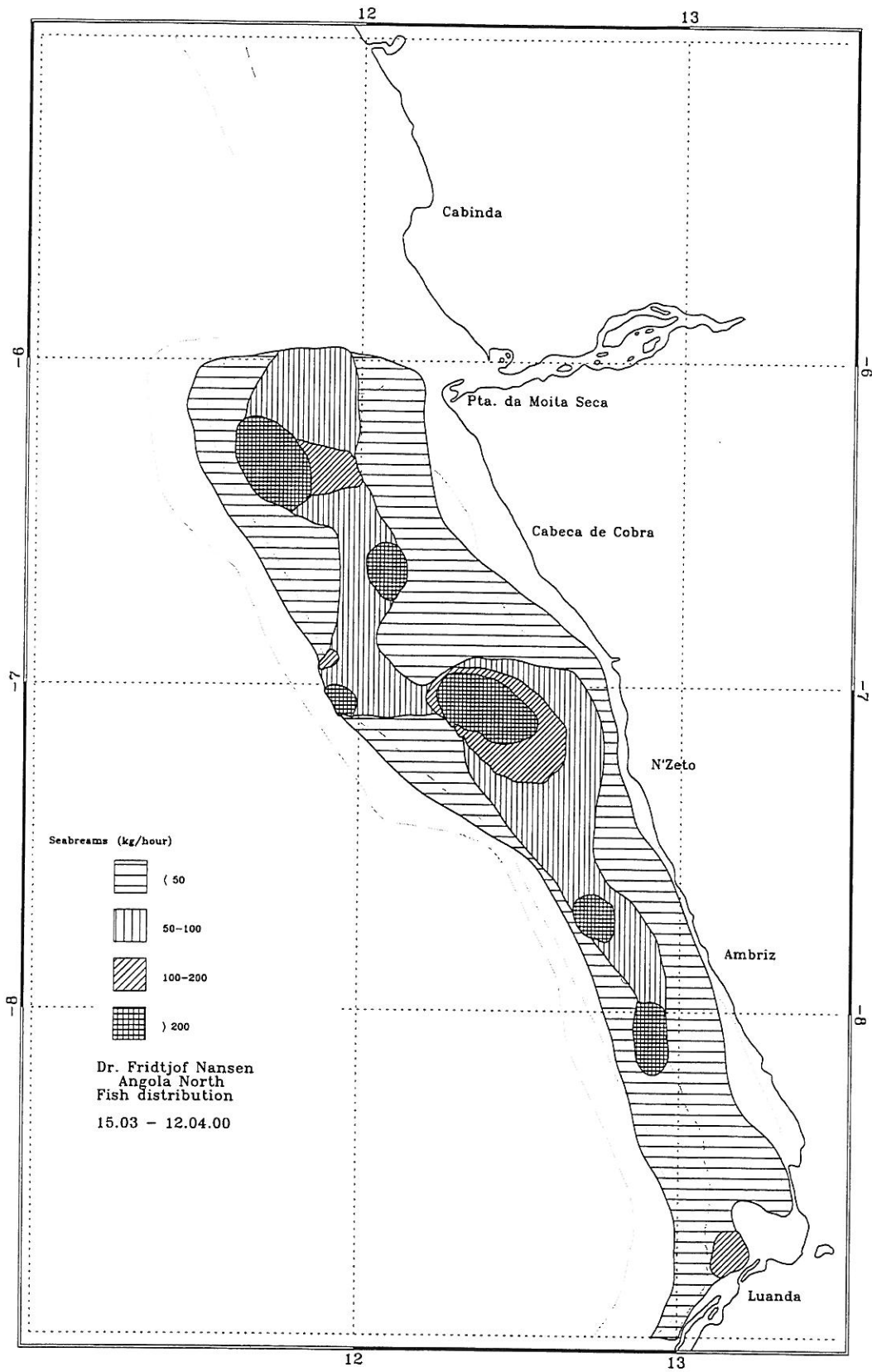


Figure 4.28 Estimated distribution of seabreams (Sparidae). Luanda-Congo River. Depth contours as shown in Fig. 2.1

Table 4.12 Biomass estimates (tonnes) of valuable demersal and pelagic fish by main groups on the shelf, by year of investigation. The surveys between 1986-1997 covered the area from Luanda to Cabinda. The 1999 and 2000 surveys covered the area Luanda to Congo River

	Biomass tonnes [⊕]												
	1986/I ⊙	1989/I ⊙	1991/II ◆	1992 ◆	1994 ◆	1995 ⊙	1996 ◆	1997 ◆	1998 ◆	1999 ⊙	2000 ⊙	2000 ⊙ confidence limits	95% confidence limits
Seabreams	14 700	9 500	16 500	16 000	*31 200	10 100	*30 200	12 130	◆	13 670	15 211	8 983	21 439
Grunts	1 400	840	2 900	1 000	900	4 200	11 200	10 460	No	5 630	380	0	838
Croakers	5 200	4 600	15 600	14 000	6 100	4 100	11 600	10 050	Survey	8 641	2 476	557	4 396
Groupers	740	950	940	3 000	3 200	900	3 700	670		1 020	639	288	991
Sum demersal	22 040	15 900	35 940	34 000	41 400	19 300	56 700	33 310		28 961	18 707	12 427	24 987
Bigeye grunt	42 800	6 900	19 700	21 000	17 100	21 200	57 800	76 610		37 669	22 774	3 705	41 844
Horse mackerel	11 900	9 300	12 000	20 000	18 500	600	44 700	50 950		4 170	5 373	1 634	9 113
Other carangids	8 900	1 650	860	4 000	13 300	11 800	3 200	*14		12 409	17 850	0	37 491
Barracudas	1 800	900	-	1 000	820	4 100	200	790		2 371	1 164	0	2761
Hairtail	9 600	2 200	8 300	7 000	8 900	11 200	6 700	120		16 931	5 690	1 384	9 995

⊕ Note that different surveys have used different areas, depth strata, and depth limits in the biomass estimations (see text)

⊙ summer season (February-March)

◆ winter season (May-September)

* Note these figures are probably overestimated (see Figures 4.25 and 4.28)

⊙ Stratified biomass estimates are made from equations (1) and (4), Annex IV, covering the whole depth range of the distribution, Annex IV. Since NAN-SIS does not produce variance estimates of the mean densities (Annex III), the 95% confidence limits for this survey were calculated from the assumption that the coefficient of variation (SD/mean) is constant between catch rates in kg/hour and t/NM², in other words that the area swept (normalised per hour) is approximately constant during the survey. Coefficients of variation by depth strata for the various groups were obtained from the GRAFER module which is linked to NAN-SIS and equations (2), (3), (6) and (7) in Annex IV were used to calculate SE and confidence limits.

4.10 Review of results

Tables 4.4, 4.8 and 4.12 give the time series of biomass estimates of the most important 'inshore' species for the southern, central and northern region, respectively. For the 'demersal' species, seabreams, grunts, croakers, and groupers, the estimates of this survey are close to all the previous years, except for seabreams and grunts in 1998 in the central region, and for seabreams in 1994 and 1996 in the northern region, which had considerably higher estimates. As explained in the text (and in the 1999 demersal report), all these higher figures are probably over-estimations. All other figures in the time series (except for grunts in the northern region which are significantly lower than 1999) are contained within the 95% confidence intervals estimated for this year in both the northern and central region. There is perhaps a slightly increasing trend in the overall demersal biomass over the past 5 years, but all the valuable species seem to have remained stable.

For the 'pelagic' species there is more variation, particularly for horse mackerel, barracudas, and hairtail, although few of the changes are statistically significant. Still, the pelagic species appear to be more influenced by the oceanographic conditions, with horse mackerel fluctuating negatively with the warm, low salinity events in 1995, 1999 and this year, while 'other' carangids and barracudas are fluctuating oppositely.

As emphasized in this and the 1999 report, there is an urgent need to reassess the biomass figures in a standardised way, using the same areas, depth stratification, distribution ranges, and with proper confidence intervals. This work has now been initiated as a separate activity within the co-operation between IIP and IMR. For this reason, no attempt has been made in this report to extend the traditionally presented summary of the biomass estimates for valuable demersal fish as in the reports from the 1985 – 1998 period.

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

The slope (from 201 to 800 m) of the central region (Benguela-Luanda) was covered with 52 swept-area hauls, and the slope of the northern region (Luanda-Congo River) was covered with 51 hauls. Due to bad bottom conditions there were too few hauls (only 5) on the slope in the southern region for any meaningful interpretation. The distribution of the hauls by region, position and depth intervals are shown in Table 2.1 and Figures 2.2 and 2.3. The results from the swept-area analysis by region and depth intervals are presented in Annex III.

Tables 5.1 and 5.2 show the composition of the catches on the slope by region and by main groups, using the same group definitions as in Table 4.1 (see Annex VI).

Table 5.1 Central region March 2000. Catch rates (kg/hour) by main groups in swept-area bottom trawl hauls on the slope (201-800 m).

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2103	290	46.0	1.9	38.8		37.8	226.0	350.6
2104	398	2.0	1.2	1.6	0.9	7.8	207.6	221.0
2105	498	31.3	1.5	16.8	1.5	1.5	140.7	193.3
2106	592	94.7	5.4	25.2	2.8	1.4	643.3	772.9
2107	714	5.6	9.1	15.5		1.2	181.8	213.1
2122	246	282.7	1.5	0.7	17.8	16.8	198.8	518.3
2123	666	2.7	12.7	9.7		0.6	217.2	242.8
2124	450	30.5	1.2	131.4			380.5	543.6
2125	354	329.4		1.4	5.3	2.7	335.5	674.3
2132	288	232.0	3.2	0.2	21.8		619.4	876.5
2133	474	26.4	1.1	50.3	0.9	6.2	151.4	236.4
2134	549	3.2	11.8	23.4	1.6	1.6	168.6	210.2
2141	275	5.8	1.4	18.2	80.4		189.3	295.1
2142	358	166.3		30.7	16.5	25.5	246.9	485.9
2143	748	4.8		11.5		3.6	187.0	206.9
2144	577	0.3	35.8	77.4	64.6		206.1	384.3
2151	247	1 544.4		28.1	39.5		362.3	1 974.3
2152	350	524.4	109.0	77.4		59.6	382.6	1 153.1
2153	436	3.4	16.5	238.6	3.2	2.6	71.2	335.5
2154	559			77.0	5.3		80.5	162.8
2155	649			30.6		0.7	184.6	216.0
2156	748	19.6		2.5	2.8	2.8	105.4	133.1
2157	251	304.3	256.1	47.6	1.2		392.8	1 001.9
2164	316	239.0		9.2	4.6	0.2	77.8	330.9
2165	701	3.1		4.8	16.4	4.5	210.9	239.7
2166	649	4.0	5.6	128.0	4.6	2.8	114.6	259.5
2167	263	1 139.0		47.9	60.5		2 681.3	3 928.7
2173	343	85.2		6.6	1.6		148.8	242.2
2174	374	42.6		26.6	0.5		22.8	92.4
2175	596	1.8	23.5	62.6			50.7	138.6
2176	703	4.6	9.6	3.6	15.9	3.4	114.6	151.7
2183	224	66.3	7.4	1.1	2.2		119.9	197.0
2184	313	15.4		12.5	10.9		1 028.4	1 067.1
2185	436	16.4	5.4	26.2	6.8	11.2	165.3	231.2

Table 5.1 continued

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2186	523	0.2	14.4	41.8	2.1	1.0	42.0	101.4
2192	370	99.1	76.7	0.2	6.7	66.8	200.9	450.5
2194	440	21.9	7.9	137.9	1.7	0.5	159.8	329.6
2195	670		9.2	2.9	15.3	5.0	97.4	129.7
2196	263	121.5	19.1	7.2	25.9		361.9	535.6
2204	274	16.1	9.7	4.0	3.4		184.2	217.3
2205	440	229.1		145.7	3.1	6.5	183.6	567.9
2206	513	7.7		0.9	0.5	0.4	8.4	18.0
2207	601	1.5	1.8	11.5		81.0	56.8	152.5
2208	730	3.5		3.1	12.2	4.3	183.6	206.8
2213	257	372.6	14.1	12.3	28.2		1 067.3	1 494.4
2214	456	44.5		6.8	6.7	24.9	57.9	140.6
2215	549	12.6		17.6	5.7	1.2	102.4	139.6
2216	641	3.5		10.4	3.4	4.1	59.7	81.1
2217	756	7.7	2.2	7.4	10.4	3.0	161.0	191.7
2224	222	10.2	3.3	1.0	12.0		82.8	109.2
2225	599	7.5		14.2	1.8	5.0	99.8	128.3
2226	363	28.8		15.1	10.4	64.4	212.7	331.4
MEAN	467	120.5	13.1	33.1	10.4	8.9	268.0	454.0
SE		38.2	5.4	6.6	2.3	2.6	55.7	85.9
% CATCH		26.5	2.9	7.3	2.3	2.0	59.0	

Table 5.2 Northern region April 2000. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the slope (201-800 m).

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2229	447	32.1	22.2	16.5	8.2	16.8	131.0	226.8
2230	669	5.1	6.8	102.2	6.1	1.0	151.8	273.1
2231	350	97.7	43.7	17.2	5.4		72.0	236.1
2232	270	192.2		34.0	4.6		616.1	846.9
2238	338	56.9	1.7	5.0			92.4	156.0
2239	531	0.5		199.4	2.2	1.0	70.4	273.5
2240	728	8.8		142.4	9.4	1.8	374.6	536.9
2241	633	3.4	1.8	230.0	53.6	1.8	163.1	453.8
2242	452	88.4	4.2	281.9	12.6	8.8	74.7	470.5
2243	248	463.7		22.5	16.8		645.9	1 148.8
2250	346	63.7	228.0	11.1	1.6		95.9	400.3
2251	551	0.9	23.4	170.5	2.3		74.3	271.3
2252	755	10.6		5.3	3.1		215.7	234.7
2253	263	64.2	3.8	7.4	9.8		398.8	484.0
2260	335	349.2		71.4	4.4	7.3	84.2	516.6
2261	427	119.5	25.8	252.5	0.3		63.0	461.1
2262	647	2.2	16.9	144.4	2.6	2.6	113.3	282.0
2263	254	26.1	1.7	13.5	6.8		274.8	322.9
2268	359	185.2	3.6	3.3	4.0	7.2	66.2	269.5
2269	413	18.3	2.6	84.2	6.1		62.3	173.5
2270	506	3.2	7.6	29.8	7.3	13.4	148.2	209.5
2271	629	8.6	0.6	42.0	3.6	1.0	206.6	262.5
2272	736	23.0	1.8	5.4	4.3		793.4	827.9
2273	220	47.0	2.7	8.4	33.6	28.7	608.9	729.4
2279	441	108.7	13.2	4.3			29.5	155.7
2280	524	5.2	66.3	6.4	2.0		138.3	218.2
2281	748		2.8	5.3	10.4	9.8	333.3	361.6

Table 5.2. continued

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2287	260	36.9	5.2	14.9	5.9		404.7	467.6
2288	353	68.4	4.3	27.7	12.2		379.4	492.1
2289	462	14.1	3.3	20.1	1.8	80.9	62.0	182.2
2290	556	6.0	5.8	15.7	4.0	0.7	159.9	192.0
2295	261	868.7	425.6	20.5	31.9		996.4	2 343.1
2296	346	61.4	35.7	13.4	5.4		289.7	405.7
2297	757	0.3	3.2	1.5	6.5		427.3	438.8
2298	661	1.7	1.8	10.4	7.0	4.8	207.3	233.0
2299	556	3.5	46.6	3.2	2.2	18.0	216.2	289.7
2305	276	3.0		1.0	3.0		72.5	79.5
2306	352	10.2		6.4	0.8		187.2	204.6
2307	648	4.0	1.3	24.5		1.4	157.2	188.5
2308	742		1.5	14.1	2.9		162.9	181.3
2309	257	30.4	2.3	7.2	16.2		571.4	627.5
2318	338	0.3	0.3	14.1	0.4		305.4	320.4
2319	488	26.5	5.5	6.7	0.1	60.3	49.2	148.3
2320	753			9.0		10.6	138.0	157.6
2326	252	4.6	28.8	1.7	0.7		29.2	65.0
2327	348	3.6	7.3	31.1	2.0		186.7	230.7
2328	588	18.7	1.4	129.0	6.5	1.6	172.6	329.8
2329	737	1.4		1.4			283.6	286.3
2336	250	14.6	5.8	23.0	11.6		252.6	307.6
2337	487	209.3	0.9	61.2	1.6	5.2	65.3	343.4
2338	670			50.5	4.7	11.8	168.8	235.7
MEAN	474.9	66.1	20.9	47.5	6.8	5.8	236.2	383.4
SE		20.4	9.4	9.8	1.3	2.1	29.2	48.7
% CATCH		17.2	5.5	12.4	1.8	1.5	61.6	

As seen from Tables 5.1 and 5.2, the general trends found on the shelf are to a large extent repeated on the slopes. The overall catch rates of the “Demersal” group in the northern region are only about half of those found in the central region, while the “Shrimp” had generally higher catch rates in the north. Also the “Pelagic” group had relatively higher catch rates in the northern region than in the central, while on the shelf they were almost the same. This general picture seems consistent with previous surveys. In terms of “by-catch” of the commercial shrimp fisheries, the central region ‘shrimps’ contributed only 7.3% of the total catches on the slope, while in the northern region this proportion is increased to 12.4%.

5.1 Deep water shrimp

Tables 5.3 and 5.4 show the catch rates of the commercially most important demersal fish (seabream and hake), the most important shrimp species (*Parapenaeus longirostris*, *Aristeus varidens*, and *Nematocarcinus africanus*), and ‘other’ (i.e. by-catch) species on the slopes of the central and northern regions. As elaborated in Chapter 4, seabream is a major component on the slope down to 350 m. In the central region the average catch rate of *P. longirostris* was almost twice last year’s estimate, while the average catch rate of *A. varidens* was almost the same as found in 1999. *N. africanus* was less abundant than in the previous survey.

Table 5.3 Central region March 2000. Catch rates (kg/hour) by main commercial groups in swept-area bottom trawl hauls on the slope (201-800 m).

STAT	Depth	Seabreams	Hake	<i>P. longirostris</i>	<i>A. varidens</i>	<i>N. africanus</i>	Other	Total
2103	290	0.4	45.6	15.8	20.9		267.9	350.6
2104	398		2.0		1.6		217.4	221.0
2105	498		31.3		14.7		147.3	193.3
2106	592		94.7		25.2		653.0	772.9
2107	714		5.5		9.3		198.3	213.1
2122	246	280.7	1.8	0.7			235.1	518.3
2123	666		2.0		2.9	0.6	237.3	242.8
2124	450		30.5		19.2		493.9	543.6
2125	354		329.4			1.2	343.7	674.3
2132	288	212.8	15.3	0.2			648.2	876.5
2133	474		24.1		17.7		194.6	236.4
2134	549		1.4		4.5		204.3	210.2
2141	275		5.8	2.4			286.9	295.1
2142	358		166.3	6.8	16.5	1.6	294.7	485.9
2143	748		4.8		2.5		199.6	206.9
2144	577				14.1		370.2	384.3
2151	247	753.4	703.0	28.1			489.8	1 974.3
2152	350		524.4	27.4	4.2	42.2	554.8	1 153.1
2153	436		3.4		13.1	210.5	108.4	335.5
2154	559				7.3	67.2	88.4	162.8
2155	649					29.9	186.1	216.0
2156	748		3.9		2.0		127.2	133.1
2157	251	87.1	217.2	47.6			650.0	1 001.9
2164	316		239.0	7.9	0.5		83.4	330.9
2165	701		1.9			4.4	233.4	239.7
2166	649		1.6		0.2	127.8	130.0	259.5
2167	263	282.2	856.8	47.9			2 741.8	3 928.7
2173	343		85.2	4.0	1.9	0.5	150.6	242.2
2174	374		42.6	1.7	0.6	24.1	23.5	92.4
2175	596				2.4	59.0	77.2	138.6
2176	703				1.6	1.2	148.9	151.7
2183	224	64.0	2.3				130.7	197.0
2184	313		15.4	8.3	3.8		1 039.6	1 067.1
2185	436		16.4		6.6		208.3	231.2
2186	523				3.1		98.3	101.4
2192	370		99.1	0.1	0.1		351.1	450.5
2194	440		21.9	0.5	14.4	122.3	170.6	329.6
2195	670				1.7	1.0	127.0	129.7
2196	263	51.3	70.2	7.2			406.9	535.6
2204	274	1.0	15.1	3.4			197.8	217.3
2205	440		229.1	132.1	6.1	5.0	195.6	567.9
2206	513		7.7		0.1		10.2	18.0
2207	601				6.5		146.1	152.5
2208	730		3.5		3.1		200.2	206.8
2213	257	7.1	365.5	12.3			1 109.5	1 494.4
2214	456		44.3		2.3	0.9	93.2	140.6
2215	549		12.6		15.3		111.8	139.6
2216	641		2.9		3.7	2.4	72.1	81.1
2217	756		7.7		7.0		177.0	191.7
2224	222	7.3	0.6				101.3	109.2
2225	599		7.5		7.4	0.7	112.7	128.3
2226	363		28.8	8.7	6.4		287.5	331.4
MEAN	467.35	33.6	84.4	7.0	5.2	13.5	310.3	454.0
SE		16.6	24.6	2.9	0.9	5.4	57.0	85.9
% CATCH		7.4	18.6	1.5	1.2	3.0	68.3	

Table 5.4 Northern region April 2000. Catch rates (kg/hour) by main commercial groups in swept-area bottom trawl hauls on the slope (201-800 m).

STAT	Depth	Seabreams	Hake	<i>P. longirostris</i>	<i>A. varidens</i>	<i>N. africanus</i>	Other	Total
2229	447		32.1			14.1	0.7	180.0
2230	669		2.2				101.9	169.0
2231	350		97.7	17.2				121.2
2232	270		192.2	34.0				620.7
2238	338		56.9	4.3	0.1			94.9
2239	531				0.5	198.5	74.5	273.5
2240	728		4.1		0.5	140.8	391.5	536.9
2241	633		3.4		1.4	227.9	221.1	453.8
2242	452		88.4		2.4	276.5	103.3	470.5
2243	248	4.2	459.5	22.3			662.9	1 148.8
2250	346		63.7	8.4	1.1	1.4	325.8	400.3
2251	551		0.9		0.6	167.6	102.2	271.3
2252	755		6.8		0.2		227.7	234.7
2253	263		64.2	7.3			412.4	484.0
2260	335		341.6	3.2	0.4	67.6	103.8	516.6
2261	427		119.5			251.6	90.1	461.1
2262	647		2.2		1.0	140.6	138.2	282.0
2263	254		25.9	12.8			284.2	322.9
2268	359		185.2	1.0	1.0	1.2	81.1	269.5
2269	413		18.3		5.7	77.6	71.9	173.5
2270	506		3.2	19.8		8.2	178.3	209.5
2271	629		7.2		3.0	37.2	215.0	262.5
2272	736		23.0				805.0	827.9
2273	220	35.8	11.2	8.4			673.9	729.4
2279	441		108.7		4.2		42.9	155.7
2280	524		5.2		3.3	2.2	207.5	218.2
2281	748				2.5		359.1	361.6
2287	260	0.7	36.2	14.9			415.8	467.6
2288	353		68.4	20.9	0.7		402.1	492.1
2289	462		13.0		19.6	0.2	149.4	182.2
2290	556		5.7		8.8	5.8	171.8	192.0
2295	261	802.6	48.6	20.5			1 471.4	2 343.1
2296	346		61.4	12.9			331.4	405.7
2297	757				1.4		437.5	438.8
2298	661		1.7		4.2	2.3	224.8	233.0
2299	556		3.5		1.6	1.2	283.4	289.7
2305	276		3.0	0.8			75.7	79.5
2306	352		10.2	5.4	0.0		189.0	204.6
2307	648		4.0		4.8	14.9	164.8	188.5
2308	742				1.0	12.0	168.4	181.3
2309	257	26.8	3.6	6.5			590.6	627.5
2318	338		0.3	13.3			306.8	320.4
2319	488		24.6		4.4		119.2	148.3
2320	753				1.4		156.2	157.6
2326	252	4.4	0.2	1.7			58.7	65.0
2327	348		3.6	1.8		28.5	196.8	230.7
2328	588		18.7		7.0	117.8	186.4	329.8
2329	737				0.8		285.5	286.3
2336	250	1.6	13.0	21.0			272.0	307.6
2337	487		209.3		8.3	52.2	73.6	343.4
2338	670				6.0	42.2	187.6	235.7
MEAN	474.9	17.2	48.1	5.1	2.2	38.8	272.1	383.4
SE		15.7	12.5	1.2	0.5	10.2	34.4	48.7
% CATCH		4.5	12.5	1.3	0.6	10.1	71.0	

In the northern region the average catch rate of *P. longirostris* was only 60% of last year's estimate, while the average catch rate of *A. varidens* was almost the same as found in 1999. The average catch rate of *N. africanus* was less than half of what was obtained in the previous survey.

Figures 5.1 to 5.6 show the time series of catch rates of the three main shrimp species, Rose shrimp (*P. longirostris*), Striped red shrimp (*A. varidens*), and African spider shrimp (*N. africanus*) in the depth intervals of their distribution by region since 1994. As seen, the catch rates are low for all three species during this survey in both the northern and central region, but (again not considering the two specialised surveys in August 1995, central region, and August 1997) few of the changes are significantly different. Still, there seems to be some general trends: *P. longirostris* appears to have been fluctuating with low catches in 1996 and perhaps a peak in 1997.

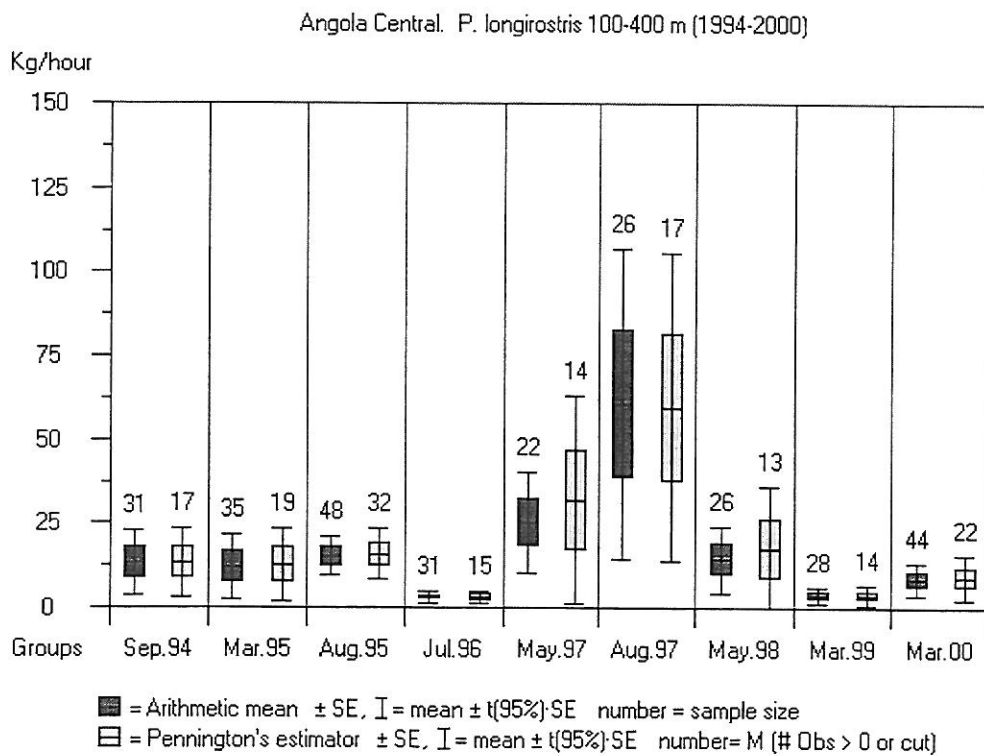


Figure 5.1 Mean catch rates (kg/hour) of the Rose shrimp (*Parapenaeus longirostris*), on the central shelf in the depth interval 100-400 m.

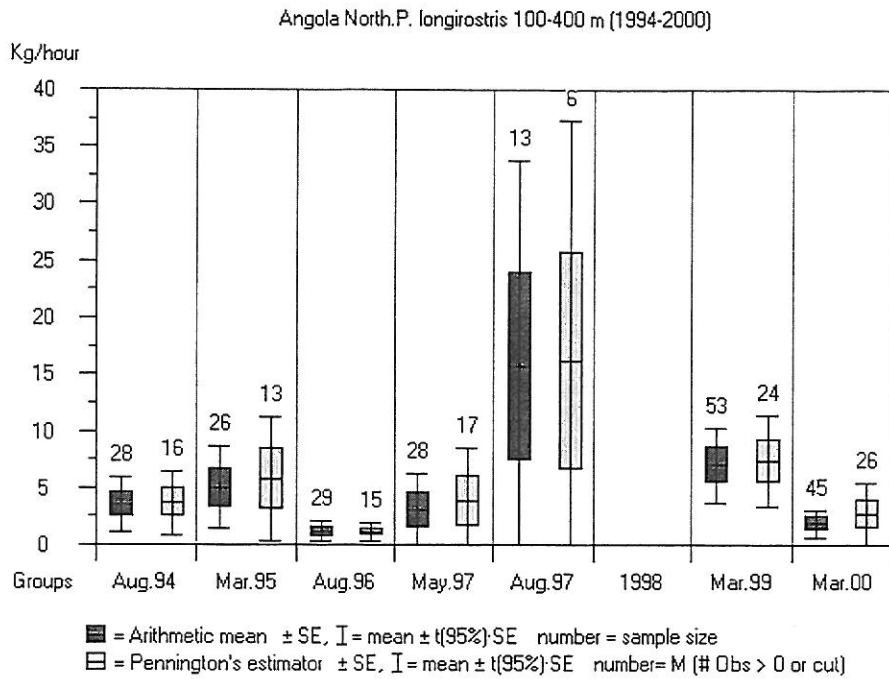


Figure 5.2 Mean catch rates (kg/hour) of the Rose shrimp (*Parapenaeus longirostris*), on the northern shelf in the depth interval 100-400 m.

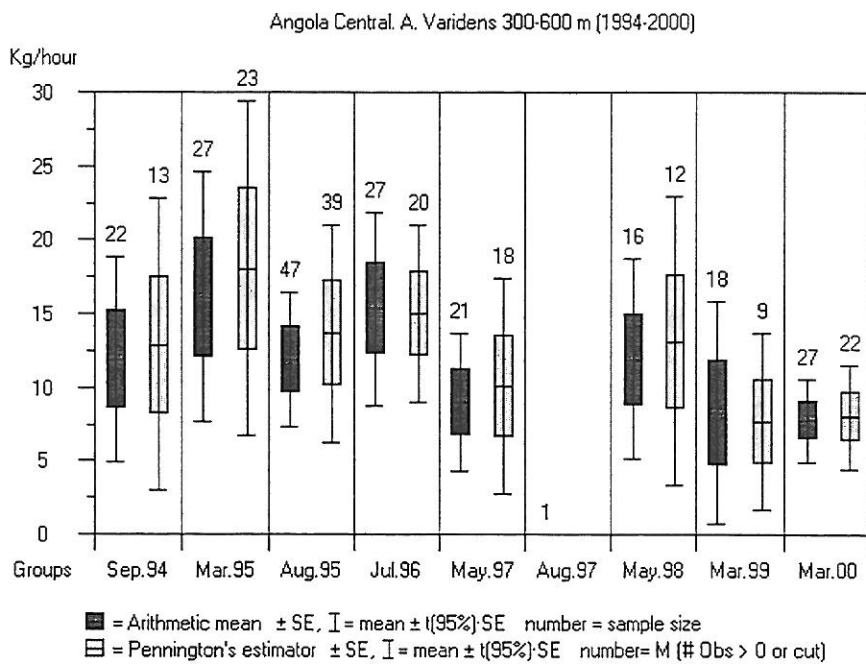


Figure 5.3 Mean catch rates (kg/hour) of the striped red shrimp (*Aristeus varidens*), on the central shelf in the depth interval 300-600 m.

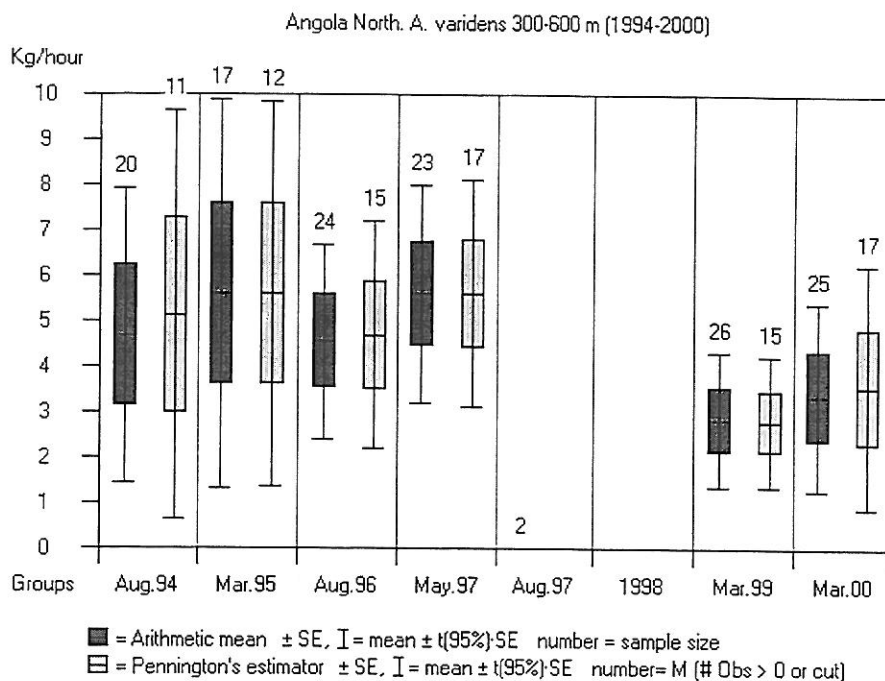


Figure 5.4 Mean catch rates (kg/hour) of the striped red shrimp (*Aristeus varidens*), on the northern shelf in the depth interval 300-600 m.

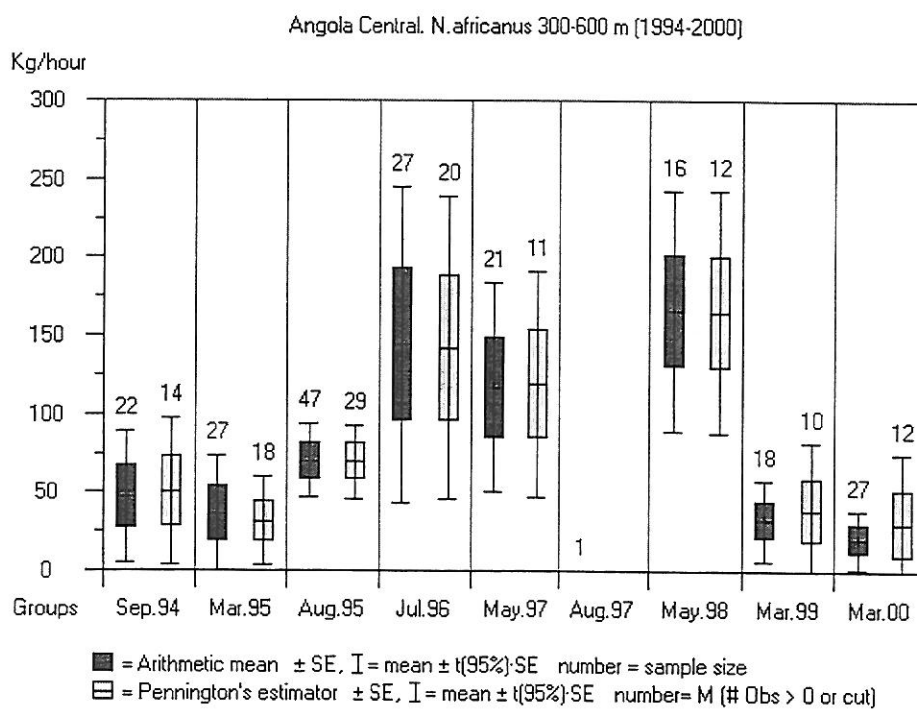


Figure 5.5 Mean catch rates (kg/hour) of the African spider shrimp (*Nematocarcinus africanus*), on the central shelf in the depth interval 300-600 m.

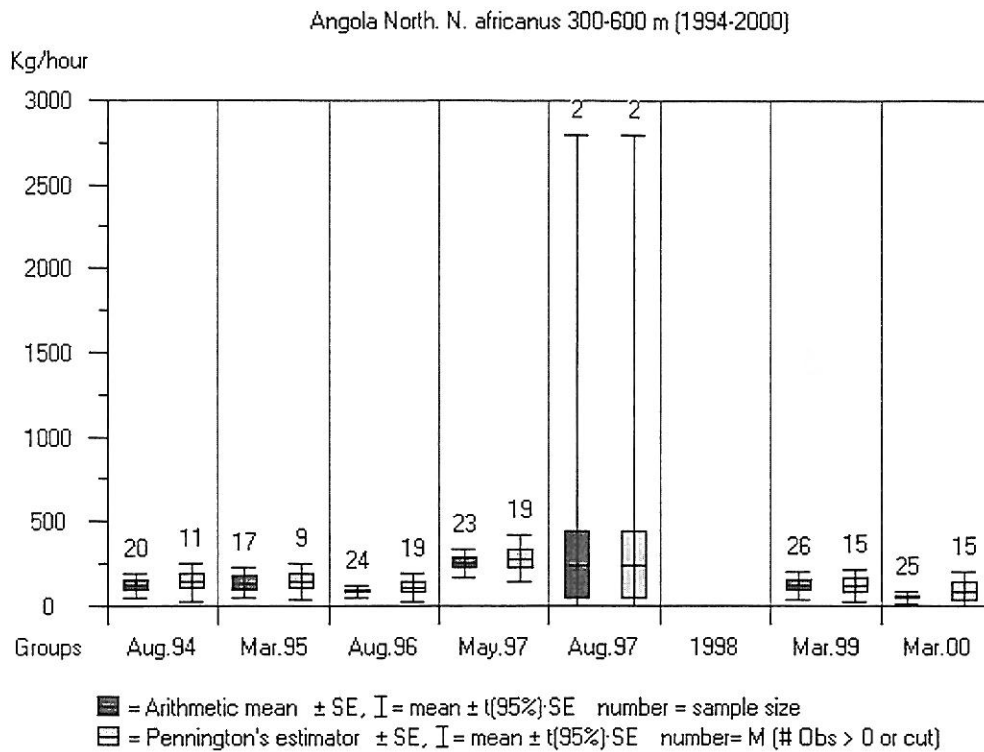


Figure 5.6 Mean catch rates (kg/hour) of the African spider shrimp (*Nematocarcinus africanus*), on the northern shelf in the depth interval 300-600 m.

A. varidens (Figs. 5.3 and 5.4) is generally more abundant in the central region than in the northern, but may have had a slight downward decline in both regions since 1994-95. *N. africanus* (Figs. 5.5 and 5.6) seems also to have been slightly fluctuating like rose shrimp with a peak from 1997 to 1998.

Table 5.5 Rose shrimp (*Parapenaeus longirostris*). Mean catch rates (kg/hour) by region, depth range and year of investigation. Note that the overall mean appears not to have been weighted before 1999 (Figs. 5.1 and 5.2).

Region/Depth	Year of investigation											
	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000
Luanda-Cabinda*												
100-200 m	4	+	+	2	3	8	No	+	2	No	2	+
200-300 m	60	10	8	18	15	34	Survey	6	26	Survey	21	14
300-400 m	4	5	1	+	12	10		1	4		6	9
Mean	19	5	2	8	10	16		3	10		7	4
Benguela-Luanda												
100-200 m	32	5	-	2	3	6	6	1	23	3	+	6
200-300 m	38	14	14	26	30	16	21	6	51	39	7	14
300-400 m	11	26	2	1	14	18	13	3	1	4	8	7
Mean	25	11	4	8	13	12	15	3	25	15	4	8

* From 1997 the surveys did not cover the Cabinda area north of the Congo River.

Mean catch rates (kg/hour) of *P. longirostris* by depth are shown in Table 5.5. In the central region, this species had a shallower depth distribution than in 1999. The overall mean catch rate was twice last year's estimate. In the northern region the depth distribution was a little deeper than previous year, and the average catch rate was over 40% lower than last year's estimate.

Table 5.6 Striped red shrimp (*Aristeus varidens*). Mean catch rates (kg/hour) by region, depth range and year of investigation. Note that the overall mean appears not to have been weighted before 1999 (Figs. 5.3 and 5.4).

Area/Depth	Year of investigation											
	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000
Luanda-Cabinda*												
300-400 m	3	+	+	1	+	2	No	1	1	No	1	+
400-500 m	1	3	4	6	6	14	Survey	9	10	Survey	3	7
500-600 m	37	5	1	7	10	3		6	7		5	3
600-800 m	-	3	-	4	5	3		2	4		-	2
Mean	13	3	2	4	5	5		5	5		3	3
Benguela-Luanda												
300-400 m	1	1	3	1	1	17	11	3	7	7	5	4
400-500 m	22	10	19	2	23	13	22	23	16	24	4	12
500-600 m	16	6	32	5	15	17	4	21	4	10	16	9
600-800 m	-	-	-	15	10	9	7	7	-	26	-	3
Mean	13	6	12	6	12	14	12	13	9	22	8	6

* From 1997 the surveys did not cover the Cabinda area north of the Congo River.

Mean catch rates of striped red shrimp (*A. varidens*) are presented in Table 5.6. The highest catch rate was observed in within the stratum 400-500 m. In the previous years (1998, 1999) this species seems to have moved deeper, especially in the central region with the highest mean catch rate observed within stratum 500-800 m in 1998. There seems to be a declining trend in the catch rates (Figs. 5.3 and 5.4).

Biomass estimates of the main commercial shrimp species are presented in Table 5.7. Scarlet shrimp (*Plesiopenaeus edwardsianus*) is also included, although the abundance of this species has always been relatively small. In the central sector the estimated biomass of *P. longirostris* is more than three times higher than last year's estimate and at same level as in most previous surveys. The biomass estimate of *A. varidens* is one of the lowest in the time series, though it is within the confidence limits of last year's estimate.

Table 5.7 Biomass (tonnes) of commercial deep water shrimps by sector and year of investigation.

Sector/Species	Year of investigation													
	1985/I	1986/I	1989	1992	1994	1995/I	1995/2	1996	1997	1998	1999	95% CL	2000	95% CL
Luanda-Cabinda*														
Rose shrimp	380	150	550	615	1 110	1 580	No	210	830	No	540	305-775	503	326-680
Striped red shrimp	-	1 200	400	515	610	500	Survey	440	590	Survey	148	75-222	180	103-256
Scarlet shrimp	-	+	+	130	+	+		50	10		42	5-78	8	0-17
Luanda-Benguela														
Rose shrimp	-	3 400	700	680	710	460	750	130	1 780	847	227	82-372	758	232-1 283
Striped red shrimp	-	1 000	370	570	890	940	730	850	370	1493	503	102-903	382	270-494
Scarlet shrimp	-	100	+	+	+	+	+	90	10	187	14	0-30	3	0-10
Total		5 850	2 020	2 570	3 410	3 480		1 770	3 580		1 474		1 834	

* From 1997 the surveys did not cover the Cabinda area north of the Congo River.

5.2 Benguela hake

Figures 5.7 and 5.8 show the time series of catch rates of Benguela hake (*Merluccius polli*) in the central and northern region for the period 1994-2000 in the depth range 100-600 m, and Table 5.8 shows the mean catch rates in both regions by depth zones. The overall trend in the two regions seems to be identical with a general slow increase until 1997, followed by a fast decrease and perhaps a slight increase again since 1999. In the central region the mean catch rate obtained in the present survey was almost 50% higher than the one obtained in 1999 and the frequency of occurrence in the trawl hauls was also higher than during the previous survey. In the northern region the average catch rate was only about half of what was obtained in the central region and only slightly higher than last year's estimate.

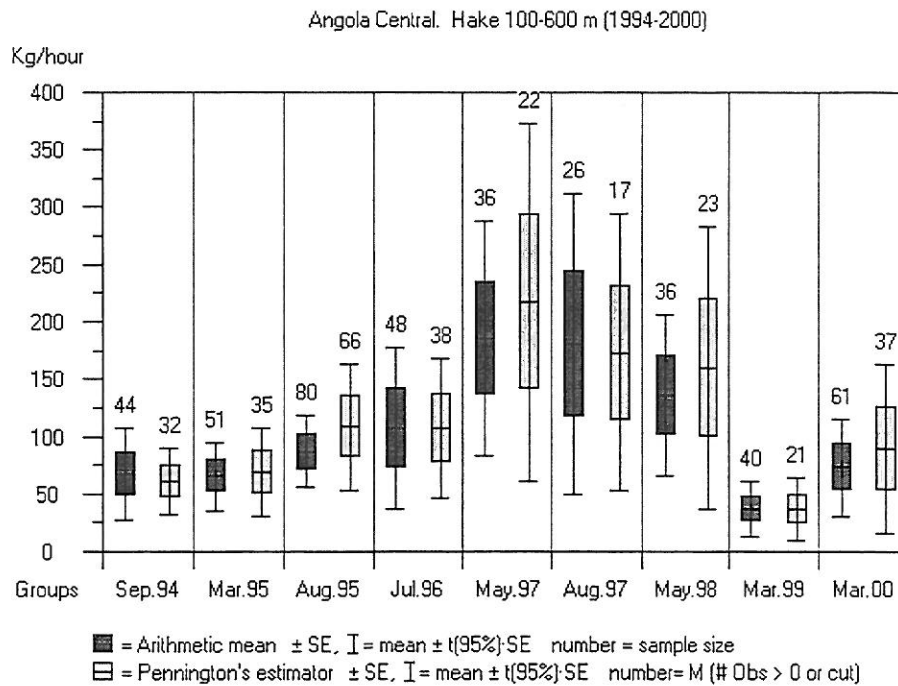


Figure 5.7 Mean catch rates (kg/hour) of the Benguela hake (*Merluccius polli*), on the central shelf in the depth interval 100-600 m.

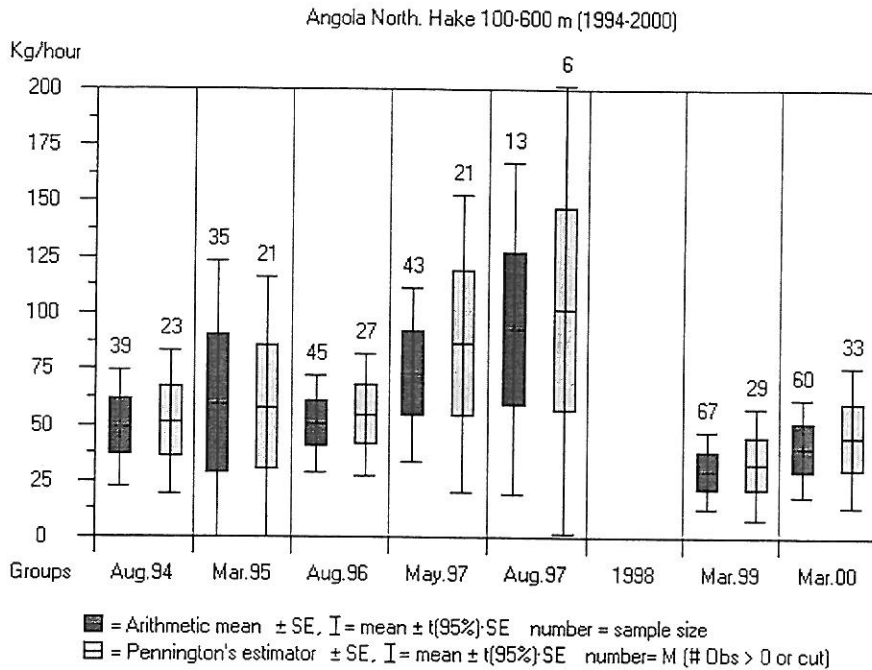


Figure 5.8 Mean catch rates (kg/hour) of the Benguela hake (*Merluccius polli*), on the northern shelf in the depth interval 100-600 m.

There seems to be a positive correlation between the catch rates of hake and shrimps, particularly with *Parapenaeus longirostris* (Figs. 5.1 and 5.2). The distribution appears to have been largely covered within the 600 m isobath and the decrease in overall catch rates and biomass is mainly due to stock changes on the upper part of the slope from 200 to 400 m.

Table 5.8 Benguela hake (*Merluccius polli*). Mean catch rates (kg/hour) by region, depth range and year of investigation.

Area/depth	Year of investigation											
	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000
Luanda-Cabinda*												
100-200 m	+	3	1	13	+	2	No	-	+	No	+	+
200-300 m	59	44	11	104	28	9	Survey	43	63	Survey	4	78
300-400 m	289	145	382	264	134	194		136	302		121	89
400-500 m	258	223	564	224	43	86		96	17		74	76
500-600 m	83	25	28	21	12	6		7	3		6	5
600-800 m	-	56	-	12	1	10		8	2		-	4
Mean	114	72	203	90	40	47		48	65		30	27
Benguela-Luanda												
100-200 m	6	8	+	31	49	3	39	15	98	8	+	5
200-300 m	161	167	30	112	122	23	51	31	301	149	25	192
300-400 m	822	82	384	220	55	196	197	330	44	423	87	153
400-500 m	433	291	394	174	64	80	121	116	93	247	88	50
500-600 m	45	44	180	39	52	27	8	44	2	9	1	13
600-800 m	-	-	-	10	5	30	3	10	-	5	-	2
Mean	378	93	138	91	63	61	74	95	185	140	32	47

* From 1997 the surveys did not cover the Cabinda area north of the Congo River.

Biomass estimates of hake are presented in Table 5.9. In the central region the estimated biomass is almost two times higher than last year's result with a mean above the confidence limits of that estimate. Still, the present estimate is only about one third of the biomass estimate from 1997.

Table 5.9 Biomass estimates (tonnes) of hake by sector and year of investigation.

Sector	Year of investigation													
	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	95% CL	2000	95% CL
Luanda-Cabinda ¹	17 000	15 300	18 000	14 000	4 700	7 100	No survey	6 170	8 500	No survey	3 431	1 947 - 4 915	4 430	1 579 - 7 227
Benguela-Luanda	31 400	5 300	11 000	8 100	6 670	4 950	6 830	7 510	15 230	11 370	2 987	1 158 - 4 816	5 600	2 752 - 8 449
Benguela-Cabinda	48 400	20 600	29 000	22 100	11 370	12 050		13 680	23 730		6 418		10 030	
Cunene-Tombua ²	1 100	1 200	4 000	5 600	No survey	No survey	No survey	No survey	No survey	No survey	No survey		6 057	2 374 - 9 740

1) From 1997 the surveys did not cover the Cabinda area north of the Congo River.

2) Includes *M. polli* and *M. capensis*

Figures 5.9 - 5.11 show the distribution of hake in the southern, central and northern region, respectively. Apart from the generally lower catch rates, the geographical distribution and areas of concentrations are similar to previous surveys.

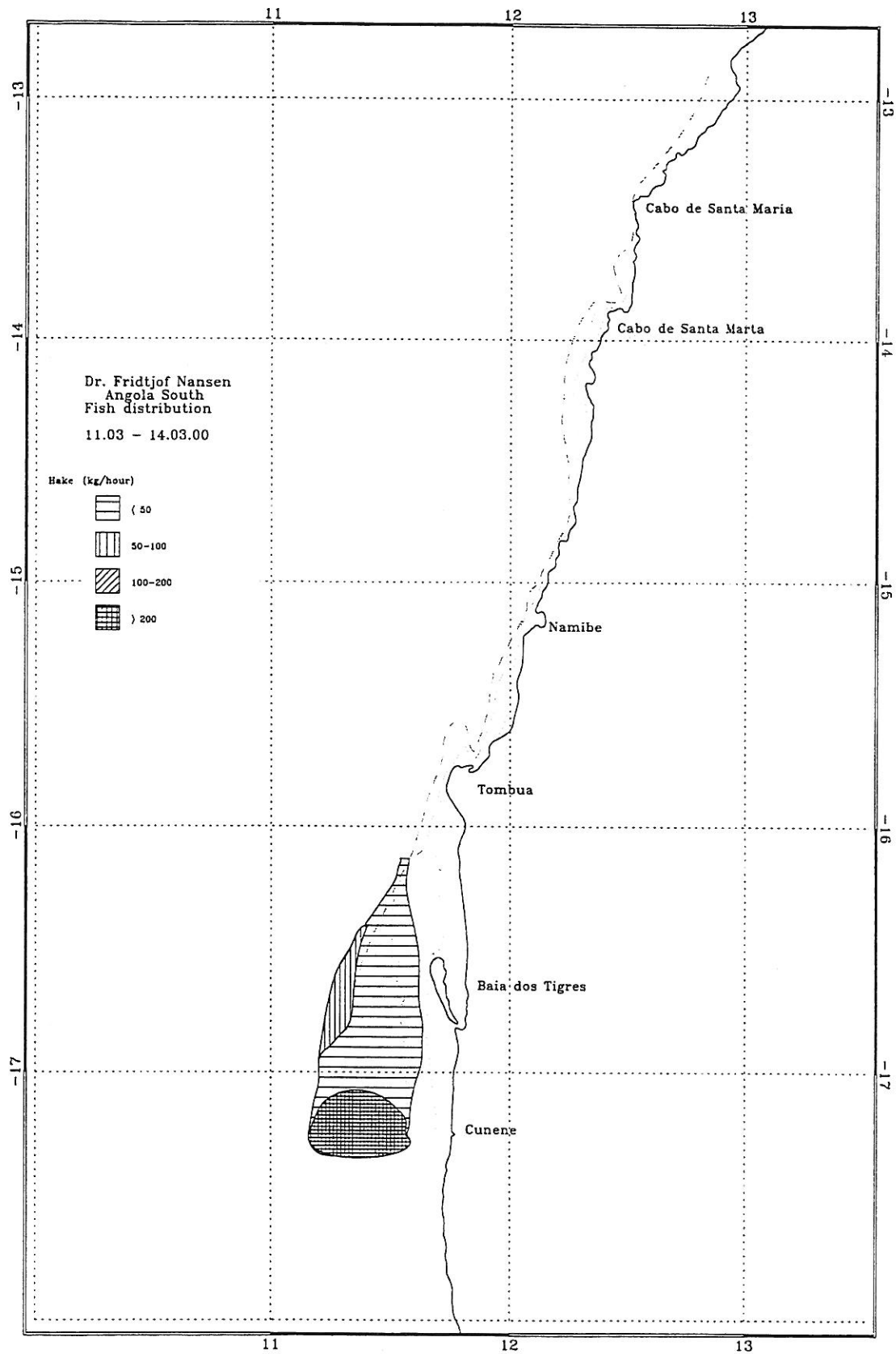


Figure 5.9 Estimated distribution of Benguela hake (*Merluccius polli*). Cunene-Tombua. Depth contours as shown in Fig. 2.1.

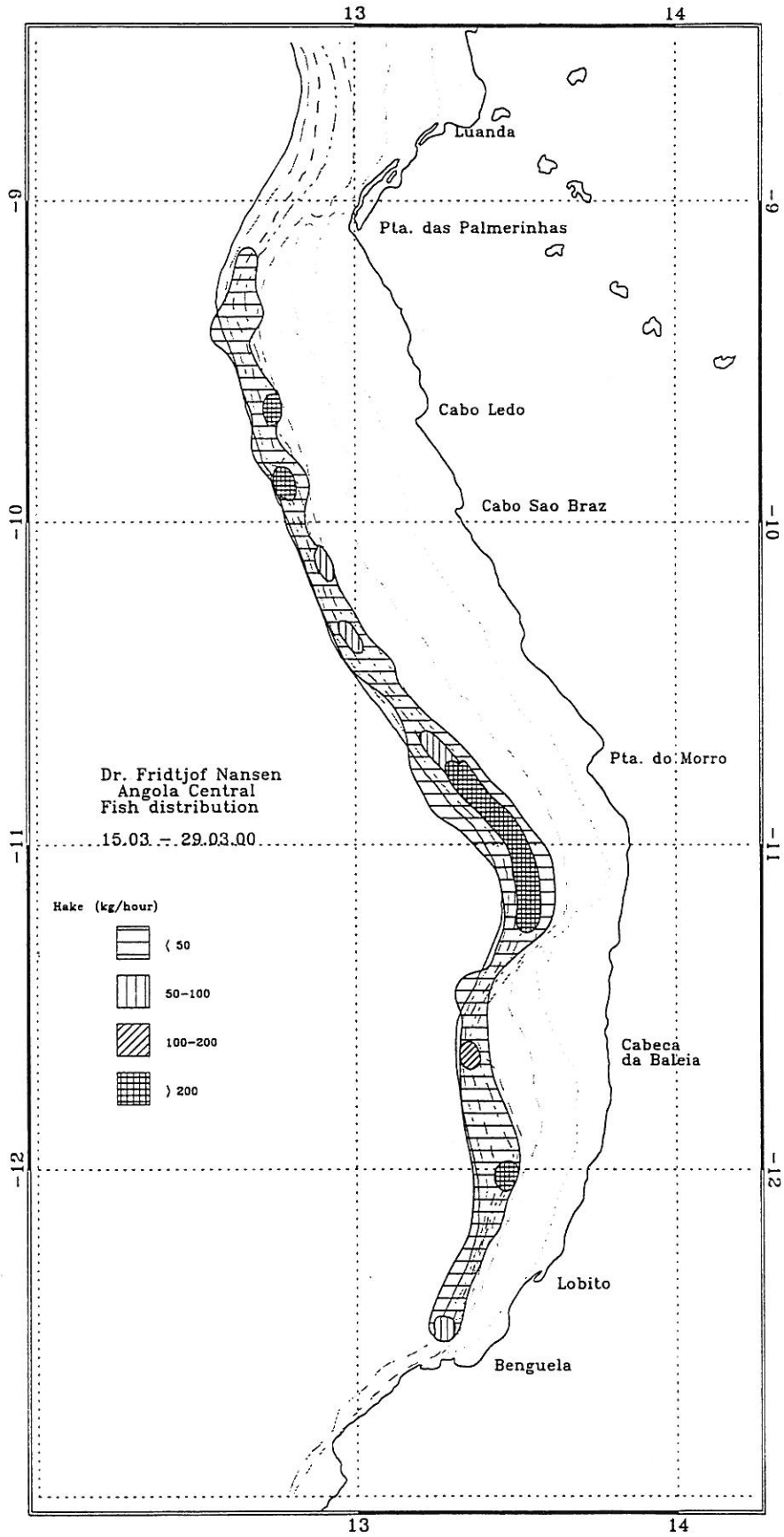


Figure 5.10 Estimated distribution of Benguela hake (*Merluccius polli*). Benguela-Luanda. Depth contours as shown in Fig. 2.2.

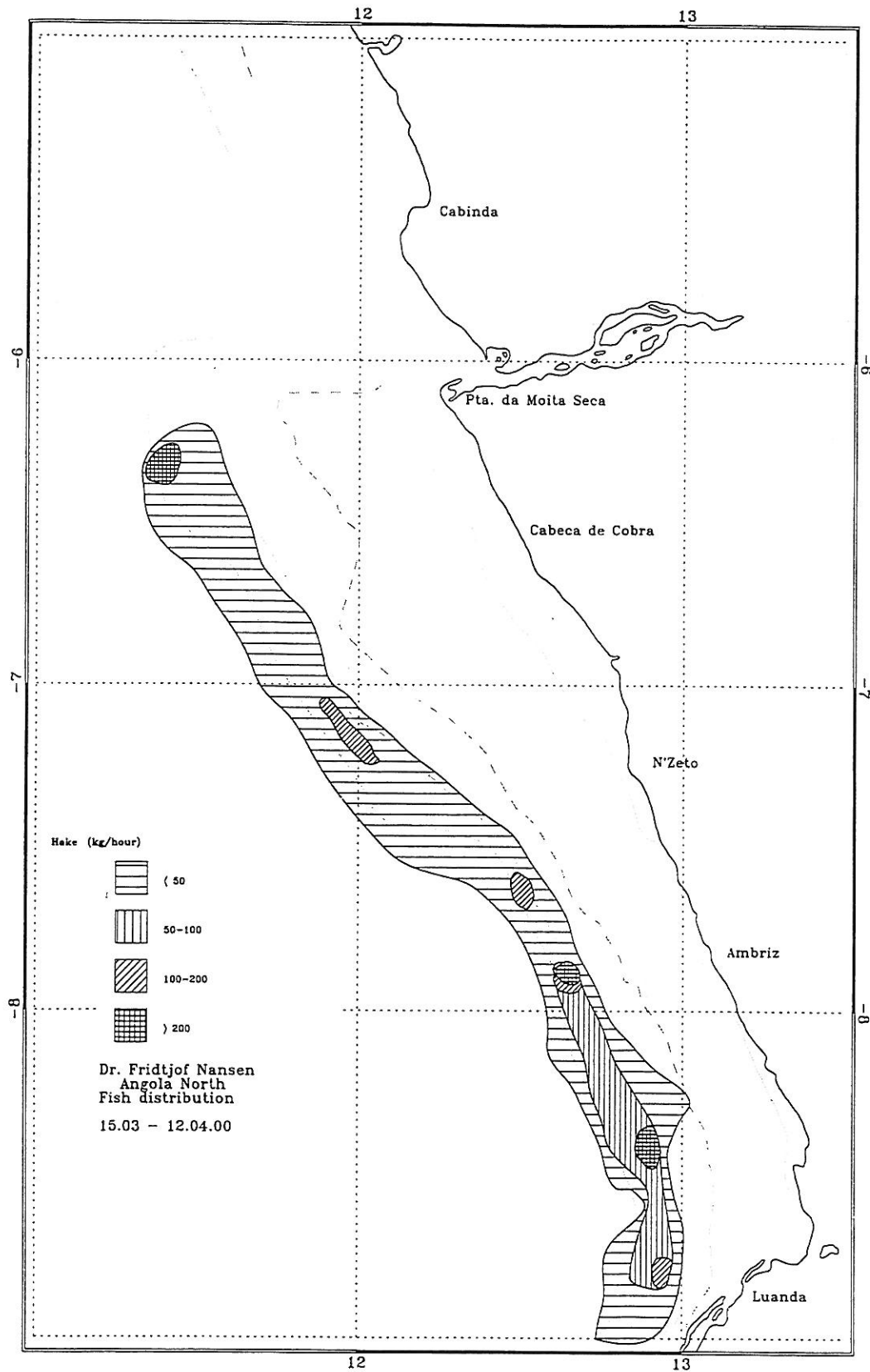


Figure 5.11 Estimated distribution of Benguela hake (*Merluccius polli*). Luanda-Congo River. Depth contours at 20, 100, 300 and 500 m are included.

CHAPTER 6 CONCLUSIONS

The overall general impression is that few, if any, of the examined stocks have changed significantly over the past 5 years. The majority of previous biomass estimations lie within the estimated 95% confidence limits obtained during this survey, which had the highest sampling intensity and smallest distance between transects than in any of the previous surveys. Still, the increased sampling intensity did not seem to improve the precision level of the mean catch rates compared with the surveys of less intensive sampling intensity. Consequently, with the present stratification, sampling intensity, and distribution of the catch rates, it seems that the precision level is too low to definitively associate the observed changes in the catch rates between surveys, with real changes in the stocks.

Still, judging from the observed general trends, it appears that most stocks showing fluctuations seem to have peaked around 1997 that may indicate that a common external factor is causing these. Warm, low salinity, water masses on the surface, was found along the whole coast during this survey as in 1999 (partly resembling the conditions found in 1995). In contrast, the 1996-1998 period in general had higher catch rates together with colder, higher salinity water along shore indicating slight upwelling. The possible association between catches and the seasonal and/or annual oceanographic conditions should be further examined.

Future recommendations

The possible trends in the catch rates and biomass estimates cannot be properly understood or explained without knowledge of the corresponding trends in the catch rates. There is an urgent need to compile a historic time series of catch rates of the major stocks in order to evaluate the possible impact on the biomass levels.

REFERENCES

- Carrit, D. E. and Carpenter, J. H. 1966. Comparison and Evaluation of currently Employed Modifications of the Winkler Method for Determining Dissolved Oxygen in Seawater. NASCO Report. *Journal of Marine Research*, 24:286-31.
- Cochran, W. G., 1977. Sampling Techniques, 3rd Ed. John Wiley and Sons, New York, NY, 428 pp.
- Conquest, L., Burr, R., Donnelly, J., Chavarria, J. and Gallucci, V., 1996. Sampling methods for stock assessment for small-scale fisheries in developing countries. In: *Stock Assessment: Quantitative Methods and Applications for Small Scale Fisheries*, pp. 179-225. Edited by V. F. Gallucci, S. B. Salia, D. J. Gustafson and B. J. Rothschild. CRC Press, New York, NY.
- McConnaughey, R. A. and Conquest, L. L., 1992. Trawl survey estimation using a comparative approach based on lognormal theory. *Fish. Bull.*, 91:107-118.
- Pennington, M. 1983. Efficient estimators of abundance, for fish and plankton surveys. *Biometrics*, 39:281-286.
- Pennington, M. 1996. Estimating the mean and variance from highly skewed marine data. *Fish. Bull.*, 94: 498-505.
- Pennington, M., and Grosslein, M. 1978. Accuracy of abundance indices based on stratified random trawl surveys. *International Council for the Sea (ICES) C.M.* 1978/D:13.
- Strømme, T. 1992. NAN-SIS: Software for fishery survey data logging and analysis. User's manual. *FAO Computerized Information Series (Fisheries)*. No. 4. Rome, FAO. 1992. 103 p.

Annex I. Records of fishing stations

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2074
 DATE:11/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 1712
 start stop duration Long E 1144
 TIME :07:30:51 08:00:41 30 (min) Purpose code: 3
 LOG :2371.25 2373.08 1.80 Area code : 1
 FDEPTH: 28 27 GearCond.code:
 BDEPTH: 28 27 Validity code:
 Towing dir: 200° Wire out: 120 m Speed: 30 kn*10
 Sorted: 198 Kg Total catch: 306.90 CATCH/HOUR: 613.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Argyrosomus hololepidotus	233.96	104	38.12	
Trichiurus lepturus	58.44	1754	9.52	
Atractoscion aequidens	58.20	252	9.48	4793
Trachurus trecae	58.08	372	9.46	
Leptocharias smithii	44.44	24	7.24	
Pomatomus saltatrix	29.40	60	4.79	
Stromateus fiatola	27.00	36	4.40	
Arius heudeloti	26.52	84	4.32	
Engraulis encrasicolus	21.00	3150	3.42	
Sepia orbignyana	12.60	66	2.05	
Ubrina canariensis	11.40	186	1.86	
Dicologlossa cuneata	8.76	312	1.43	
Sarda sarda	7.56	12	1.23	
Rhinobatos albomaculatus	4.24	2	0.69	
Myliobatis aquila	3.44	2	0.56	
Etrumeus whiteheadi	2.64	60	0.43	
Pteroscion pelli	2.16	36	0.35	
Loligo vulgaris	1.80	6	0.29	
Ginglymostoma cirratum	1.20	6	0.20	
Raja miraletus	0.76	2	0.12	
Total	613.60		99.96	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2075
 DATE:11/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 1710
 start stop duration Long E 1142
 TIME :08:20:04 09:16:55 57 (min) Purpose code: 3
 LOG :2375.73 2377.49 1.75 Area code : 1
 FDEPTH: 31 45 GearCond.code:
 BDEPTH: 31 45 Validity code:
 Towing dir: 200° Wire out: 150 m Speed: 30 kn*10
 Sorted: 7 Kg Total catch: 105.38 CATCH/HOUR: 110.93

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chrysaora sp.	103.16	125	93.00	
Loligo vulgaris	1.92	2	1.73	
Pomatomus saltatrix	1.31	2	1.18	
Sepia orbignyana	1.26	1	1.11	
Ectonurus alletteratus	0.97	1	0.87	
Arius heudeloti	0.80	3	0.72	
Sarda sarda	0.67	1	0.60	
Trachurus trecae	0.42	9	0.38	
Etrumeus whiteheadi	0.38	5	0.34	
Fistularia tabacaria	0.04	1	0.04	
Total	110.93		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2076
 DATE:11/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 1712
 start stop duration Long E 1135
 TIME :10:24:07 10:56:24 32 (min) Purpose code: 3
 LOG :2381.61 2383.27 1.63 Area code : 1
 FDEPTH: 81 94 GearCond.code:
 BDEPTH: 81 94 Validity code:
 Towing dir: 270° Wire out: 290 m Speed: 30 kn*10
 Sorted: 3 Kg Total catch: 36.10 CATCH/HOUR: 67.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chrysaora sp.	61.88	38	91.42	
Sepia officinalis hierredda	2.85	2	4.21	
Sarda sarda	1.61	2	2.38	
Merluccius polli	0.94	8	1.39	
Dicologlossa cuneata	0.19	8	0.28	
Thorogobius angolensis	0.11	54	0.16	
Octopus vulgaris	0.08	2	0.12	
Dentex macrophthalmus	0.04	2	0.06	
Total	67.70		100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2077
 DATE:11/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 1713
 start stop duration Long E 1131
 TIME :12:14:13 12:44:09 30 (min) Purpose code: 3
 LOG :2391.89 2393.58 1.68 Area code : 1
 FDEPTH: 133 126 GearCond.code:
 BDEPTH: 133 126 Validity code:
 Towing dir: 360° Wire out: 440 m Speed: 30 kn*10
 Sorted: 136 Kg Total catch: 9630.28 CATCH/HOUR: 19260.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	14927.04	232808	77.50	4795
Dentex macrophthalmus	3669.28	32062	19.05	4794
Atractoscion aequidens	329.44	568	1.71	
Merluccius polli	210.16	1420	1.09	
Squalus megalops	56.80	142	0.29	
Pterothrissus belloci	51.12	850	0.27	
Leptocharias smithii	11.04	2	0.06	
Trichiurus lepturus	5.68	142	0.03	
Total	19260.56		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2078
 DATE:11/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 1713
 start stop duration Long E 1129
 TIME :13:53:45 13:54:47 13 (min) Purpose code: 3
 LOG :2399.52 2400.22 0.70 Area code : 1
 FDEPTH: 148 145 GearCond.code: 9
 BDEPTH: 148 145 Validity code: 2
 Towing dir: 360° Wire out: 480 m Speed: 31 kn*10
 Sorted: 102 Kg Total catch: 13155.64 CATCH/HOUR: 60718.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	45501.00	666323	74.94	4797
Dentex macrophthalmus	14188.80	99498	23.37	4796
Atractoscion aequidens	394.15	646	0.65	
Merluccius polli	284.31	1292	0.47	
Squalus megalops	219.69	646	0.36	
Myxirophidius sp.	64.62	646	0.11	
Pterothrissus belloci	64.62	646	0.11	
Total	60717.19		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2079
 DATE:11/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 1710
 start stop duration Long E 1125
 TIME :15:48:04 16:05:00 17 (min) Purpose code: 3
 LOG :2406.19 2407.10 0.91 Area code : 1
 FDEPTH: 184 188 GearCond.code:
 BDEPTH: 184 188 Validity code:
 Towing dir: 350° Wire out: 550 m Speed: 30 kn*10
 Sorted: 91 Kg Total catch: 2221.89 CATCH/HOUR: 7841.97

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	5594.12	27088	71.34	4799
Merluccius polli	667.06	1941	8.51	4800
Dentex macrophthalmus	640.59	3706	8.17	4798
Lepidopus caudatus	326.47	353	4.16	
Synagrops microlepis	225.88	26471	2.88	
Zenopsis conchifer	157.06	176	2.00	
Squalus megalops	104.12	265	1.33	
Pterothrissus belloci	72.35	618	0.92	
Chlorophthalmus atlanticus	21.18	2735	0.27	
Cmmastrephes bartrami	12.35	88	0.16	
Pontinus kuhlii	11.47	176	0.15	
Atractoscion aequidens	9.32	7	0.12	
Total	7841.97		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2080
 DATE:11/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 1712
 start stop duration Long E 1121
 TIME :18:13:50 18:22:34 9 (min) Purpose code: 3
 LOG :2415.00 2415.46 0.45 Area code : 1
 FDEPTH: 295 293 GearCond.code: 8
 BDEPTH: 295 293 Validity code: 1
 Towing dir: 340° Wire out: 950 m Speed: 30 kn*10
 Sorted: 134 Kg Total catch: 186.30 CATCH/HOUR: 1242.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	707.73	1407	56.98	4801
Pontinus kuhlii	495.60	4400	39.90	
Lophius vaillanti	11.07	7	0.89	
Coelorinchus coelorhincus	9.20	260	0.74	
Malacocephalus laevis	7.20	80	0.58	
Oxymotus shubnikov	4.40	20	0.35	
Portunus validus	1.20	20	0.10	
Farapanemus longirostris	0.80	140	0.06	
OBHIDIIDAE	0.80	20	0.06	
GOBIIDAE	0.40	20	0.03	
Total	1238.40		99.69	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2081
 DATE:11/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1714
 start stop duration Long E 1113
 TIME :21:13:05 21:43:52 31 (min) Purpose code: 3
 LOG :2431.00 2432.66 1.64 Area code : 1
 FDEPTH: 703 796 GearCond.code:
 BDEPTH: 703 796 Validity code:
 Towing dir: 210° Wire out: 1950 m Speed: 30 kn*10
 Sorted: 302 Kg Total catch: 705.05 CATCH/HOUR: 1364.61

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius capensis	451.20	505	33.06	4803
Malacocephalus laevis	428.40	16961	31.39	
Coelorinchus coelorhincus	97.06	362	7.11	
Illex sp.	56.59	132	4.15	
Gonostoma sp.	52.32	1488	3.83	
Coloconger cadenati	51.66	99	3.79	
RAJIDAE	47.71	33	3.50	
Hoplostethus cadenati	46.06	1235	3.38	
Emmopterus spinax	28.30	99	2.07	
Aristeus varians	24.68	2369	1.81	
Bassanago albertens	19.41	248	1.42	
Merluccius polli	15.33	15	1.12	4802
OPHIDIIDAE	9.21	83	0.67	
Notacanthus sexspinis	8.55	83	0.63	
OCTOPODIDAE	7.90	17	0.58	
Centroscyllium crepidater	6.31	2	0.46	
C R A B S	3.75	2	0.27	
Dicrolene intronigra	2.63	66	0.19	
Glyphus marsupialis	2.13	112	0.16	
Plesiopeneus edwardsianus	1.78	95	0.13	
STROMATEIDAE	1.65	99	0.12	
Bathyroconger vicinus	0.99	33	0.07	
SEARSIIDAE	0.66	33	0.05	
Total	1364.28		99.96	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2082
 DATE:12/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1701
 start stop duration Long E 1116
 TIME :00:47:34 01:01:35 14 (min) Purpose code: 3
 LOG :2451.72 2452.41 0.52 Area code : 1
 FDEPTH: 684 701 GearCond.code:
 BDEPTH: 684 701 Validity code:
 Towing dir: 360e Wire out:1800 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 214.46 CATCH/HOUR: 919.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Coelorrhinus coelorhincus	365.83	11104	39.80	
Trachyrhinus scabrurus	153.69	566	16.72	
Ebinania costaeacanariae	123.51	141	13.44	
ALEPOCEPHALIDAE	41.96	309	4.57	
Merluccius capensis	39.51	47	4.30	4804
Illex sp.	36.37	64	3.74	
STROMATEIDAE	30.64	849	3.33	
Hoplostethus cadenati	29.70	1179	3.23	
RAJIDAE	24.51	26	2.67	
Lophius vaillanti	21.69	26	2.36	
Centrocyamus crepidater	14.14	4	1.54	
OPHIDIIDAE	12.26	73	1.33	
Deania calcea	10.71	4	1.17	
Merluccius polli	8.57	9	0.93	
Bassanago albescens	4.24	73	0.46	
OCTOPODIDAE	2.83	4	0.31	
Aristeus varidens	0.94	111	0.10	
Total	919.10		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2083
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1700
 start stop duration Long E 1124
 TIME :06:08:30 06:22:51 14 (min) Purpose code: 3
 LOG :2469.00 2469.72 0.70 Area code : 1
 FDEPTH: 123 126 GearCond.code:
 BDEPTH: 123 126 Validity code:
 Towing dir: 90e Wire out: 390 m Speed: 30 kn*10

Sorted: 99 Kg Total catch: 3736.88 CATCH/HOUR: 16015.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus capensis	6412.54	48596	40.04	4807
Trachurus trecae	6299.57	49080	39.33	4806
Dentex macrophthalmus	1291.54	9201	8.06	4805
Anthias Anthias	1275.39	484	7.96	
Chelidonichthys capensis	196.97	163	1.23	
Attractoscion aequidens	190.50	321	1.19	
Arius parkii	122.70	484	0.77	
Spondyliosoma cantharus	122.70	321	0.77	
Pagellus bellottii	41.96	163	0.26	
Umbrina canariensis	29.06	321	0.18	
Merluccius capensis	22.59	163	0.14	
Pterothrissus belloci	9.69	163	0.06	
Total	16015.21		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2084
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1700
 start stop duration Long E 1128
 TIME :07:45:41 07:54:17 9 (min) Purpose code: 3
 LOG :2470.39 2470.78 0.39 Area code : 1
 FDEPTH: 109 110 GearCond.code:
 BDEPTH: 109 110 Validity code:
 Towing dir: 90e Wire out: 350 m Speed: 30 kn*10

Sorted: 74 Kg Total catch: 562.67 CATCH/HOUR: 3751.13

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	2043.40	50380	54.47	4808
Dentex macrophthalmus	1066.47	8953	28.43	4809
Zeus faber	296.93	680	7.92	
Pagellus bellottii	149.60	853	3.99	4810
Loligo vulgaris	61.20	340	1.63	
Arius parkii	56.67	287	1.51	
Squalus megalops	24.93	60	0.66	
Spondyliosoma cantharus	24.27	47	0.65	
Umbrina canariensis	13.60	173	0.36	
Callorhynchus capensis	8.40	7	0.22	
Merluccius capensis	5.67	60	0.15	
Total	3751.14		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2085
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1700
 start stop duration Long E 1135
 TIME :09:20:26 09:49:27 29 (min) Purpose code: 3
 LOG :2481.95 2483.63 1.76 Area code : 1
 FDEPTH: 94 83 GearCond.code:
 BDEPTH: 94 83 Validity code:
 Towing dir: 90e Wire out: 310 m Speed: 30 kn*10

Sorted: 109 Kg Total catch: 298.27 CATCH/HOUR: 617.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	167.28	5555	27.11	4814
Dentex macrophthalmus	136.55	2441	22.13	4813
Loligo vulgaris	102.27	2592	16.57	
Attractoscion aequidens	54.25	103	8.79	4811
Pagellus bellottii	31.51	194	5.11	4812
Sepia officinalis hierredda	30.72	23	4.98	
Leptocharias smithii	20.65	8	3.35	
Merluccius capensis	20.48	147	3.32	
Chelidonichthys capensis	18.31	54	2.97	
Umbrina canariensis	11.96	178	1.94	
Zeus faber	6.99	54	1.13	
Arius parkii	6.06	31	0.98	
Pterothrissus belloci	3.72	54	0.60	
Dicologlossa cuneata	3.50	85	0.57	
Squalus megalops	1.61	2	0.26	
Raja miraletus	0.83	2	0.13	
Callapa pelii	0.48	17	0.08	
Total	617.17		100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2086
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1700
 start stop duration Long E 1139
 TIME :10:36:32 11:06:23 30 (min) Purpose code: 3
 LOG :2487.34 2488.93 1.58 Area code : 1
 FDEPTH: 61 40 GearCond.code:
 BDEPTH: 61 40 Validity code:
 Towing dir: 120e Wire out: 180 m Speed: 30 kn*10

Sorted: 191 Kg Total catch: 942.08 CATCH/HOUR: 1884.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Arius parkii	511.50	2516	27.15	
Sea cucumbers	406.56	40656	21.58	
Pagellus bellottii	353.10	3018	18.74	4815
Trachurus trecae, juvenile	232.66	64846	12.35	
Dasyatis marmorata	61.48	10	3.26	
Leptocharias smithii	54.88	76	2.91	
Illex sp.	51.86	24946	2.75	
Umbrina canariensis	46.20	594	2.45	
Myliobatis aquila	45.84	28	2.43	
Dentex macrophthalmus	42.90	6996	2.28	
Sepiella ornata	18.72	12	0.99	
Chelidonichthys capensis	18.48	100	0.98	
Zeus faber	15.52	16	0.82	
Sepia officinalis hierredda	11.56	18	0.61	
Chelidonichthys gabonensis	6.28	34	0.33	
Maja squinado	3.96	346	0.21	
Dicologlossa cuneata	2.32	66	0.12	
Squilla cadenati	0.34	16	0.02	
Total	1884.16		99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2087
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1700
 start stop duration Long E 1141
 TIME :11:54:46 12:25:07 30 (min) Purpose code: 3
 LOG :2491.04 2493.03 1.99 Area code : 1
 FDEPTH: 32 29 GearCond.code:
 BDEPTH: 32 29 Validity code:
 Towing dir: 360e Wire out: 140 m Speed: 32 kn*10

Sorted: 229 Kg Total catch: 229.19 CATCH/HOUR: 458.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sea cucumbers	330.00	33000	71.99	
Leptocharias smithii	52.68	100	11.49	
Sepia officinalis hierredda	36.20	62	7.90	
Illex sp.	24.68	112	5.38	
Myliobatis aquila	7.40	4	1.61	
Callorhynchus capensis	4.20	2	0.92	
Spondyliosoma cantharus	1.48	2	0.32	
Sarda sarda	1.32	2	0.29	
Arius parkii	0.32	2	0.07	
Lagocephalus laevigatus	0.08	2	0.02	
Fistularia petimba	0.02	2		
Total	458.38		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2088
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1659
 start stop duration Long E 1143
 TIME :13:15:12 13:45:15 30 (min) Purpose code: 3
 LOG :2495.09 2496.65 1.56 Area code : 1
 FDEPTH: 23 22 GearCond.code:
 BDEPTH: 23 22 Validity code:
 Towing dir: 180e Wire out: 130 m Speed: 30 kn*10

Sorted: 64 Kg Total catch: 64.30 CATCH/HOUR: 128.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chrysaora sp.	66.00	40	51.32	
Illex sp.	37.24	554	28.96	
Leptocharias smithii	9.44	10	7.34	
Trachurus trecae, juvenile	9.12	852	7.09	4816
Sepia officinalis hierredda	4.40	18	3.42	
Dentex macrophthalmus	0.80	146	0.62	
Torpedo torpedo	0.72	2	0.56	
Sarda sarda	0.24	2	0.19	
Spondyliosoma cantharus	0.20	16	0.16	
Trachinus armatus	0.12	4	0.08	
Lagocephalus laevigatus	0.12	4	0.09	
Fistularia petimba	0.08	2	0.06	
Dentex barnardi	0.04	2	0.03	
Dicologlossa cuneata	0.04	2	0.03	
Zeus faber	0.04	2	0.03	
Total	128.60		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2089
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1648
 start stop duration Long E 1141
 TIME :14:48:57 15:45:10 30 (min) Purpose code: 3
 LOG :2509.76 2511.30 1.53 Area code : 1
 FDEPTH: 26 26 GearCond.code:
 BDEPTH: 26 26 Validity code:
 Towing dir: 360e Wire out: 130 m Speed: 30 kn*10

Sorted: 508 Kg Total catch: 510.57 CATCH/HOUR: 1021.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chrysaora sp.	990.00	594	96.95	
Sepia orbignyana	10.88	22	1.07	
Trachurus trecae, juvenile	9.60	652	0.94	4817
Leptocharias smithii	3.36	2	0.33	
Attractoscion aequidens	3.20	12	0.31	
Illex sp.	2.00	20	0.20	
Pagellus bellottii	1.60	10	0.16	
Umbrina canariensis	0.40	2	0.04	
Dicologlossa cuneata	0.08	4	0.01	
Cynoglossus canariensis	0.02	2		
Total	1021.14		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2090
 DATE:12/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1648
 start stop duration Long E 1135
 TIME :16:52:10 17:06:52 15 (min) Purpose code: 3
 LOG :2518.24 2518.90 0.65 Area code : 1
 FDEPTH: 95 94 GearCond.code:
 BDEPTH: 95 94 Validity code:
 Towing dir: 180° Wire out: 320 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 81.94 CATCH/HOUR: 327.76

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex macrophthalmus	66.72 2544	20.36	4818
Trachurus trecae	52.32 2136	15.96	4819
Dicologlossa cuneata	32.64 1080	9.96	
Merluccius polli	31.68 180	9.67	4820
Sepia officinalis hierredda	31.20 144	9.52	
Arius parkii	27.60 100	8.42	
Raja miraletus	20.32 36	6.20	
Loligo vulgaris	18.24 192	5.57	
Echelycore nigricans	16.80 288	5.13	
Octopus vulgaris	7.20 4	2.22	
Calappa pelii	7.20 288	2.20	
Chelidonichthys gabonensis	7.20 216	2.20	
Pterothrissus belloci	4.32 24	1.32	
Squalus megalops	1.76 4	0.54	
Umbrina canariensis	1.44 24	0.44	
Atractoscion aequidens	1.04 4	0.32	
Total	327.76	100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2091
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1649
 start stop duration Long E 1118
 TIME :03:17:14 03:40:47 24 (min) Purpose code: 3
 LOG :2589.17 2590.38 1.19 Area code : 1
 FDEPTH: 315 286 GearCond.code:
 BDEPTH: 315 286 Validity code:
 Towing dir: 360° Wire out: 950 m Speed: 30 kn*10
 Sorted: 82 Kg Total catch: 352.21 CATCH/HOUR: 880.53

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Scorpaena normani	486.75 4620	55.28	
Chlorophthalmus atlanticus	195.80 4855	22.24	
Pterothrissus belloci	83.33 440	9.46	
Merluccius polli	54.28 160	6.16	4821
Laemonema laureysi	15.68 538	1.78	
Scylliorhinus stellaris	12.10 43	1.37	
Synagrops macrolepis	9.35 715	1.06	
Parapenaeus longirostris	9.08 1898	1.03	
Chelidonichthys gabonensis	3.85 15	0.44	
Mystriophis rostellatus	3.58 15	0.41	
C R A B S	2.48 70	0.28	
Coelorhynchus coelorhynchus	2.20 70	0.25	
Dicologlossa cuneata	1.10 28	0.12	
Zenopsis conchifer	0.95 3	0.11	
Total	880.53	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2092
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1636
 start stop duration Long E 1118
 TIME :06:34:11 07:54:09 30 (min) Purpose code: 3
 LOG :2607.38 2608.82 1.41 Area code : 1
 FDEPTH: 603 610 GearCond.code:
 BDEPTH: 603 610 Validity code:
 Towing dir: 200° Wire out: 1800 m Speed: 30 kn*10
 Sorted: 240 Kg Total catch: 1037.14 CATCH/HOUR: 2074.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus mediterraneus	1378.28 6400	66.45	
Merluccius polli	267.52 315	12.90	4823
Trachyrincus scabrus	92.58 600	4.46	
Malacocephalus occidentalis	83.42 3114	4.02	
Merluccius capensis	49.04 56	2.36	4822
Illex coindetii	38.76 84	1.87	
PSYCHROLUTIDAE	35.42 58	1.71	
Chaceon maritae	33.14 86	1.60	
Lamprogrammus exotus	22.84 86	1.10	
Scorpaena angolensis	17.14 58	0.83	
Lithodes ferox	14.80 12	0.71	
Raja springeri	13.14 28	0.63	
Alepocephalus sp.	9.72 28	0.47	
Beryx splendens	6.86 28	0.33	
Aristeus varidens, female	5.76 520	0.28	4824
Laemonema laureysi	5.14 58	0.25	
Glyphus marsupialis	0.48 18	0.02	
Aristeus varidens, male	0.20 28	0.01	4825
Total	2074.24	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2093
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1638
 start stop duration Long E 1124
 TIME :09:03:17 09:33:00 30 (min) Purpose code: 3
 LOG :2619.86 2621.50 1.62 Area code : 1
 FDEPTH: 125 125 GearCond.code:
 BDEPTH: 125 125 Validity code:
 Towing dir: 340° Wire out: 360 m Speed: 30 kn*10
 Sorted: 113 Kg Total catch: 113.36 CATCH/HOUR: 226.72

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex macrophthalmus	103.28 900	45.55	4827
Trachurus capensis	42.28 214	18.65	4828
Merluccius capensis	38.96 80	17.18	4826
Atractoscion aequidens	9.72 6	4.29	
Anthias anthias	6.36 78	2.81	
Squalus megalops	5.88 12	2.59	
Pterothrissus belloci	3.84 24	1.69	
Illex coindetii	3.56 6	1.57	
Loligo vulgaris	2.72 12	1.20	
Lepidopus caudatus	2.48 4	1.09	
Pagellus bellottii	2.40 10	1.06	
Chelidonichthys capensis	1.24 2	0.55	
Spondyliosoma cantharus	1.04 2	0.46	
Umbrina canariensis	1.04 6	0.46	
Chelidonichthys gabonensis	0.72 8	0.32	
Pontinus leda	0.44 6	0.19	
Citharus linguatula	0.36 12	0.16	
Dicologlossa cuneata	0.20 2	0.09	
Trigla lyra	0.20 2	0.09	
Total	226.72	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2094
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1635
 start stop duration Long E 1126
 TIME :11:06:46 11:36:14 29 (min) Purpose code: 3
 LOG :2632.00 2633.29 1.26 Area code : 1
 FDEPTH: 117 115 GearCond.code:
 BDEPTH: 117 115 Validity code:
 Towing dir: 90° Wire out: 360 m Speed: 30 kn*10
 Sorted: 77 Kg Total catch: 396.09 CATCH/HOUR: 819.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex macrophthalmus	297.77 2752	36.34	4829
Trachurus trecae	288.21 5247	35.17	4831
Anthias anthias	50.40 565	6.15	
Squalus megalops	39.97 58	4.88	
Illex sp.	26.65 203	3.25	
Merluccius polli	25.86 62	3.16	4830
Spicara alta	17.36 304	2.12	
Atractoscion aequidens	17.09 12	2.09	
Chelidonichthys gabonensis	15.35 261	1.87	
Chelidonichthys capensis	14.48 29	1.77	
Spondyliosoma cantharus	12.17 29	1.49	
Dentex gibbosus	6.37 14	0.78	
Arius parkii	2.90 14	0.35	
Pagellus bellottii	2.46 58	0.30	
Dentex angolensis	1.45 14	0.18	
Lagocephalus laevigatus	0.99 2	0.12	
Total	819.50	100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2095
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1635
 start stop duration Long E 1136
 TIME :13:05:46 13:13:32 8 (min) Purpose code: 3
 LOG :2642.76 2643.04 0.27 Area code : 1
 FDEPTH: 91 90 GearCond.code:
 BDEPTH: 91 90 Validity code:
 Towing dir: 40° Wire out: 320 m Speed: 30 kn*10
 Sorted: 62 Kg Total catch: 110.82 CATCH/HOUR: 831.15

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex macrophthalmus	378.30 3938	45.52	4834
Trachurus trecae, juvenile	155.10 9045	18.66	4832
Illex sp.	62.10 840	7.47	
Chelidonichthys capensis	43.80 705	5.27	
Merluccius capensis	39.30 158	4.73	4833
Dicologlossa cuneata	18.30 720	2.20	
Atractoscion aequidens	16.80 38	2.02	
Sepia officinalis hierredda	14.70 53	1.77	
Dentex angolensis	14.70 510	1.77	4835
Raja miraletus	14.55 30	1.75	
Pterothrissus belloci	12.00 60	1.44	
Squalus megalops	10.35 23	1.25	
Umbrina canariensis	10.05 135	1.21	
Zeus faber	9.00 30	1.08	
Citharus linguatula	8.70 210	1.05	
C R A B S	7.23 225	0.87	
Pagellus bellottii	4.80 45	0.58	
Echelycore nigricans	4.35 90	0.52	
Myliobatis aquila	3.15 8	0.38	
Trichiurus lepturus	2.40 15	0.29	
Spicara alta	0.90 60	0.11	
Atractoscion imperialis	0.60 60	0.07	
Total	831.15	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2096
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1629
 start stop duration Long E 1141
 TIME :14:26:02 14:41:25 15 (min) Purpose code: 3
 LOG :2650.69 2651.36 0.67 Area code : 1
 FDEPTH: 69 66 GearCond.code:
 BDEPTH: 69 66 Validity code:
 Towing dir: 45° Wire out: 210 m Speed: 30 kn*10
 Sorted: 35 Kg Total catch: 63.75 CATCH/HOUR: 255.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Squalus megalops	65.00 172	25.49	
Illex sp.	56.20 700	22.04	
Chelidonichthys capensis	32.00 460	12.55	
Sepia orbignyana	15.76 36	6.18	
Leptocharias smithii	12.40 24	4.86	
Pagellus bellottii	12.40 72	4.86	4836
Myliobatis aquila	11.68 16	4.58	
Trachurus trecae, juvenile	10.20 500	4.00	
Echelycore nigricans	9.60 232	3.76	
Dentex macrophthalmus	6.72 84	2.64	4837
Dicologlossa cuneata	6.60 260	2.59	
Spondyliosoma cantharus	4.40 12	1.73	
Dentex angolensis	4.24 192	1.66	
C R A B S	4.20 132	1.65	
Zeus faber	2.40 12	0.94	
Atractoscion aequidens	1.20 4	0.47	
Total	255.00	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2097
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1624
 start stop duration Long E 1146
 TIME :15:42:37 16:12:12 30 (min) Purpose code: 3
 LOG :2657.94 2659.56 1.55 Area code : 1
 FDEPTH: 20 20 GearCond.code:
 BDEPTH: 20 20 Validity code:
 Towing dir: 10° Wire out: 100 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 32.20 CATCH/HOUR: 64.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae, juvenile	53.20 4982	82.61	5031
Illex sp.	6.88 72	10.65	
Sepia orbignyana	2.04 6	3.17	
Torpedo torpedo	1.20 2	1.86	
Pagellus bellottii	0.96 38	1.49	
Dentex barnardi	0.12 8	0.19	
Total	64.40	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2098
 DATE:13/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1623 Long E 1143
 start stop duration
 TIME :16:52:42 17:22:01 29 (min) Purpose code: 3
 LOG :2663.62 2664.85 1.22 Area code : 1
 FDEPTH: 54 53 GearCond.code:
 BDEPTH: 54 53 Validity code:
 Towing dir: 180e Wire out: 200 m Speed: 30 kn*10
 Sorted: 74 Kg Total catch: 141.82 CATCH/HOUR: 293.42

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex macrophthalmus Juv.	50.90	10821	17.35 4839
Pagellus bellottii	44.07	641	15.02 4838
Trachurus trecae, juvenile	42.41	6010	14.45 5035
Sepia officinalis hierredda	34.59	56	11.79
Leptocharias smithii	24.33	19	8.29
Squalus megalops	15.60	27	5.32
Mustelus mustelus	14.65	17	4.99
Loligo vulgaris	13.86	207	4.72
Atractoscion aequidens	12.79	39	4.36
Chelidonichthys capensis	9.52	72	3.24
Raja miraletus	7.61	10	2.59
Mustelus palumbes	5.79	6	1.97
Lithognathus mormyrus	5.17	21	1.76
Zeus faber	4.97	10	1.69
Dicologlossa cuneata	3.62	724	1.23
Spondyliosoma cantharus	2.07	6	0.71
Fistularia petimba	0.74	2	0.25
Scomber japonicus	0.62	10	0.21
Maja squinado	0.10	10	0.03
Total	293.41	99.97	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2099
 DATE:14/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1612 Long E 1136
 start stop duration
 TIME :05:43:01 06:13:44 31 (min) Purpose code: 3
 LOG :2722.90 2724.38 1.46 Area code : 1
 FDEPTH: 73 67 GearCond.code:
 BDEPTH: 73 67 Validity code:
 Towing dir: 90e Wire out: 240 m Speed: 30 kn*10
 Sorted: 36 Kg Total catch: 36.23 CATCH/HOUR: 70.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Loligo vulgaris	28.90	439	41.22
Atractoscion aequidens	19.32	15	27.55
Pagellus bellottii	12.15	166	17.33 4840
Chelidonichthys capensis	2.21	12	3.15
Raja miraletus	1.74	2	2.48
Zeus faber	1.28	2	1.83
Chelidonichthys gabonensis	1.12	27	1.60
Sepia orbignyana	0.97	6	1.38
Squalus mitsukurii	0.85	2	1.21
Myliobatis aquila	0.70	2	1.00
Enchelycore nigricans	0.27	6	0.39
Citharus linguatula	0.23	6	0.33
Dicologlossa cuneata	0.23	21	0.33
Trachurus trecae	0.12	4	0.17
Calappa pelli	0.04	2	0.06
Total	70.13	100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2100
 DATE:14/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1613 Long E 1142
 start stop duration
 TIME :07:24:14 07:54:12 30 (min) Purpose code: 3
 LOG :2730.13 2731.50 1.35 Area code : 1
 FDEPTH: 56 56 GearCond.code:
 BDEPTH: 56 56 Validity code:
 Towing dir: 170e Wire out: 180 m Speed: 30 kn*10
 Sorted: 46 Kg Total catch: 45.97 CATCH/HOUR: 91.94

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Loligo vulgaris	22.96	2318	24.97
Sepia officinalis hierredda	12.70	24	13.81
Atractoscion aequidens	11.96	10	13.01
Seriola dumerili	8.84	6	9.61
Dicologlossa cuneata	7.76	104	8.44
Dentex barnardus	6.32	28	6.87
Pagellus bellottii	5.84	34	6.35 4841
Trichurus lepturus	5.28	8	5.74
Dentex gibbosus	4.04	38	4.39 4843
Spondyliosoma cantharus	2.24	28	2.44
Epinephelus aeneus	1.80	2	1.96
Raja miraletus	1.24	2	1.35
Alloteuthis africana	0.80	180	0.87
Trachurus trecae	0.12	2	0.13
CEPOLIDAE	0.04	2	0.04
Total	91.94	99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2101
 DATE:14/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1611 Long E 1146
 start stop duration
 TIME :08:54:55 09:24:01 29 (min) Purpose code: 3
 LOG :2737.58 2739.47 1.87 Area code : 1
 FDEPTH: 37 41 GearCond.code:
 BDEPTH: 37 41 Validity code:
 Towing dir: 348e Wire out: 120 m Speed: 30 kn*10
 Sorted: 215 Kg Total catch: 214.61 CATCH/HOUR: 444.02

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	290.61	950	65.45 4845
Lithognathus mormyrus	138.54	672	31.20 4844
Seriola dumerili	4.34	8	0.98
Atractoscion aequidens	2.98	8	0.67
Loligo vulgaris	2.40	19	0.54
Decapterus rhonchus	2.15	6	0.48
Scomber japonicus	0.99	2	0.22
Pagellus bellottii	0.87	12	0.20
Leptocharias smithii	0.83	2	0.19
Dicologlossa cuneata	0.29	6	0.07
Fistularia tabacaria	0.02	2	
Total	444.02	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2102
 DATE:14/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1602 Long E 1143
 start stop duration
 TIME :10:34:19 11:04:11 30 (min) Purpose code: 3
 LOG :2747.31 2748.99 1.65 Area code : 1
 FDEPTH: 44 46 GearCond.code:
 BDEPTH: 44 46 Validity code:
 Towing dir: 270e Wire out: 150 m Speed: 30 kn*10
 Sorted: 88 Kg Total catch: 197.97 CATCH/HOUR: 395.94

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pagellus bellottii	278.50	5426	70.36 4846
Trachurus trecae	28.30	828	7.15 4847
Illex sp.	17.00	96	4.29
Decapterus rhonchus	16.20	50	4.09
Lithognathus mormyrus	15.10	66	3.81
Sphyrna zygaena	14.64	2	3.70
Sepia orbignyana	10.16	14	2.57
Pomatomus saltatrix	6.60	10	1.67
Atractoscion aequidens	4.04	2	1.02
Dentex barnardus	3.22	10	0.81
Spondyliosoma cantharus	1.20	10	0.30
Dentex gibbosus	0.90	10	0.23
Total	395.96	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2103
 DATE:15/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1229 Long E 1318
 start stop duration
 TIME :16:00:24 16:30:18 30 (min) Purpose code: 3
 LOG :3024.96 3026.35 1.36 Area code : 2
 FDEPTH: 289 291 GearCond.code:
 BDEPTH: 289 291 Validity code:
 Towing dir: 220e Wire out: 900 m Speed: 30 kn*10
 Sorted: 117 Kg Total catch: 174.37 CATCH/HOUR: 348.74

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pterothrissus belloci	58.84	338	16.87
Pterothrissus belloci	58.84	338	16.87
Merluccius polli	45.58	474	13.07
Squalus megalops	30.88	60	8.85 4848
MYCTOPHIDAE	20.88	7528	5.99
Synagrops microlepis	20.46	1496	5.87
Coelorinchus coelorrhincus	16.86	642	4.83
Parapenaeus longirostris, fem.	12.44	1434	3.57 4849
Laemonema laureysi	12.04	568	3.45
Aristeus varidens, female	11.60	876	3.33 4851
Aristeus varidens, male	9.28	1234	2.66 4852
Haploblepharus pictus	6.94	168	1.99
Malacoccephalus occidentalis	6.12	148	1.75
Lophius vaillanti	4.64	2	1.33
Raja doutrei	4.56	2	1.31
Zenopsis conchifer	4.28	14	1.23
Yarella blackfordi	4.24	316	1.22
Parapenaeus longirostris, male	3.38	454	0.97 4850
Gephyroberyx darwini	3.04	2	0.87
Scopelosaurus sp.	2.90	116	0.83
Trigla lyra	2.24	6	0.64
Solenocera africana	2.12	476	0.61
Trichurus lepturus	1.90	104	0.54
Hoplostethus caenati	1.70	64	0.49
Hypargyris moselii	1.16	2	0.33
Halosaurus ovenii	1.04	52	0.30
Peristedion sp.	1.04	168	0.30
Dentex macrophthalmus	0.40	2	0.11
Cephaloscyllium	0.38	4	0.11
E R A B S	0.30	4	0.09
Promethichthys prometheus	0.28	2	0.08
Scorpaena sp.	0.24	2	0.07
Total	350.56	100.52	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2104
 DATE:15/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1229 Long E 1317
 start stop duration
 TIME :18:17:06 18:46:57 30 (min) Purpose code: 3
 LOG :3034.01 3035.49 1.46 Area code : 2
 FDEPTH: 390 406 GearCond.code:
 BDEPTH: 390 406 Validity code:
 Towing dir: 210e Wire out:1200 m Speed: 30 kn*10
 Sorted: 35 Kg Total catch: 110.50 CATCH/HOUR: 221.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Laemonema laureysi	109.40	1646	49.50
Yarella blackfordi	46.28	2816	20.94
Lophiodes kemp	10.40	6	4.71
Coelorinchus coelorrhincus	7.62	242	3.45
Pterothrissus belloci	7.62	34	3.45
Chaceon maritae	5.92	24	2.68
Raja doutrei	5.60	2	2.53
Haploblepharus pictus	5.54	104	2.51
Malacoccephalus occidentalis	4.16	44	1.88
Chlorophthalmus atlanticus	4.16	104	1.88
Halosaurus ovenii	2.42	138	1.10
Nezumia micronychodon	2.42	112	1.10
Merluccius polli	2.00	4	0.90
Aristeus varidens	1.56	190	0.71
Squalus megalops	1.22	356	0.55
Trichurus lepturus	1.22	96	0.55
Deania profundorum	1.04	8	0.47
Hoplostethus caenati	1.04	44	0.47
Todaropsis eblanae	0.86	8	0.39
OPHIURIDAE	0.52	18	0.24
Total	221.00	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2105
 DATE:15/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1229
 start stop duration Purpose code: 3
 LOG :3043.21 3045.17 1.95 Area code : 2
 FDEPTH: 503 493 GearCond.code:
 BDEPTH: 503 493 Validity code:
 Towing dir: 210e Wire out:1400 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 109.54 CATCH/HOUR: 193.31

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Yarella blackfordi	40.66	1177	21.03
Laemonema laureysi	33.16	259	17.15
Triplophus hemingi	32.70	3671	16.92
Merluccius polli	31.34	55	16.21 4853
Stomias boa boa	13.75	229	7.11
Aristeus varidens, male	7.48	1015	3.87 4855
Aristeus varidens, female	7.18	519	3.71 4854
Hoplostethus cadenati	4.89	161	2.53
Pterochirissus bellocci	3.07	14	1.59
Malacocephalus occidentalis	2.14	16	1.11
Plesionika martia	2.14	817	1.11
Coelorrhinchus coelorrhinchus	1.84	30	0.95
Miscellaneous fishes	1.54	46	0.80
Todaropsis eblanae	1.52	7	0.79
Lamprogrammus exutus	1.41	5	0.73
Zenopsis conchifer	1.34	5	0.69
Deania profundorum	1.22	46	0.63
Ebinania costaecanarie	1.22	23	0.63
Nezumia micronychodon	1.06	46	0.55
Trichiurus lepturus	0.92	115	0.48
POLYCHAELIDAE	0.62	85	0.32
Selene dorsalis	0.53	2	0.27
Gadella imberbis	0.46	7	0.24
Haploblepharus pictus	0.30	16	0.16
Peristedion sp.	0.30	46	0.16
Xenodermichthys copei	0.30	53	0.16
Epigonus telescopus	0.25	2	0.13
Total	193.34		100.03

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2105
 DATE:15/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1228
 start stop duration Purpose code: 3
 LOG :3054.41 3055.94 1.49 Area code : 2
 FDEPTH: 583 600 GearCond.code:
 BDEPTH: 583 600 Validity code:
 Towing dir: 210e Wire out:1700 m Speed: 30 kn*10

Sorted: 86 Kg Total catch: 386.46 CATCH/HOUR: 772.92

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Yarella blackfordi	378.00	10854	48.91
Hoplostethus cadenati	147.60	5238	19.10
Merluccius polli	94.72	140	12.25 4856
Laemonema laureysi	54.36	396	7.03
Stomias sp.	25.92	432	3.35
Aristeus Varidens, female	21.96	1206	2.84 4858
Chaceon maritae	14.76	36	1.91
Coelorrhinchus coelorrhinchus	12.96	612	1.68
Trichiurus lepturus	5.40	144	0.70
Gadella imberbis	3.50	144	0.47
Aristeus varidens, male	3.24	432	0.42 4857
Vitreledonella richardi	2.84	2	0.37
Halosaurus ovenii	2.16	36	0.28
POLYCHAELIDAE	1.80	180	0.23
Lamprogrammus exutus	1.44	36	0.19
Centroscymnus crepidater	1.44	18	0.19
Chlorophthalmus atlanticus	0.36	18	0.05
SYNAPHOBANCHIDAE	0.36	18	0.05
Total	772.92		100.02

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2107
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1228
 start stop duration Purpose code: 3
 LOG :3063.00 3064.38 1.35 Area code : 2
 FDEPTH: 700 727 GearCond.code:
 BDEPTH: 700 727 Validity code:
 Towing dir: 210e Wire out:1800 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 96.71 CATCH/HOUR: 214.91

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Yarella blackfordi	65.07	2049	30.28
Hoplostethus cadenati	44.40	1411	20.66
STOMIIDAE	35.67	1076	16.60
Laemonema laureysi	20.67	798	9.62
Trichiurus lepturus	9.07	187	4.22
Aristeus varidens, female	8.67	413	4.03 4859
Glyphus marsupialis	6.13	520	2.85
Merluccius polli	5.47	7	2.55
Raja confundens	3.24	7	1.51
Ebinania costaecanarie	3.20	20	1.49
Halosaurus ovenii	2.40	33	1.12
Triplophus hemingi	2.00	87	0.93
SYNAPHOBANCHIDAE	2.00	73	0.93
Etmopterus lucifer	1.20	20	0.56
Talismania sp.	0.93	33	0.43
POLYCHAELIDAE	0.93	73	0.43
Coelorrhinchus coelorrhinchus	0.93	7	0.43
Aristeus varidens, male	0.67	87	0.31
Lamprogrammus exutus	0.20	27	0.09
OPHIDIIDAE	0.13	13	0.06
Gadella imberbis	0.13	7	0.06
Total	213.11		99.16

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2108
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1230
 start stop duration Purpose code: 3
 LOG :3072.60 3074.28 1.67 Area code : 2
 FDEPTH: 104 109 GearCond.code:
 BDEPTH: 104 109 Validity code:
 Towing dir: 60e Wire out: 310 m Speed: 30 kn*10

Sorted: 108 Kg Total catch: 157.46 CATCH/HOUR: 314.92

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dentex macrophthalmus	140.70	972	44.68 4862
Umbrixa canariensis	46.88	124	14.89 4861
Trachurus trecae	27.56	46	8.75 4860
Trichiurus lepturus	25.88	34	8.22
Stromateus fiatola	24.40	24	7.75
Ephippion guttifer	8.56	16	2.72
Spicara alta	8.04	38	2.55
Raja miraletus	6.96	10	2.21
Sparus pagrus africanus *	3.90	6	1.24
Boops boops	3.58	36	1.14
Zeus faber	3.12	10	1.05
Scorpaena stephanica	2.72	6	0.86
Brotula barbata	2.52	4	0.80
Brotula barbata	2.52	4	0.80
Sepia officinalis hierredda	1.76	2	0.56
Torpedo torpedo	1.32	2	0.42
Selene dorsalis	1.12	2	0.36
Chelidichthys gabonensis	0.68	6	0.22
Trachurus trecae, juvenile	0.68	38	0.21
Anthias anthias	0.64	4	0.20
Parulibrachius rossignoli	0.48	2	0.15
Monolele microstoma	0.32	10	0.10
Chaetodon hoefleri	0.30	2	0.10
Illex coindetii	0.10	10	0.03
Total	314.92		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2109
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1231
 start stop duration Purpose code: 3
 LOG :3079.99 3081.54 1.52 Area code : 2
 FDEPTH: 67 56 GearCond.code:
 BDEPTH: 67 56 Validity code:
 Towing dir: 84e Wire out: 210 m Speed: 30 kn*10

Sorted: 88 Kg Total catch: 455.84 CATCH/HOUR: 911.68

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Brachydeuterus auritus	304.32	156	33.38
Trachurus trecae, juvenile	83.04	536	9.11
Sphyræna guachancho	76.08	96	8.35
Lithognathus mormyrus	47.04	216	5.16
Pagellus bellottii	41.52	876	4.55
Selene dorsalis	36.72	288	4.03
Chloroscombrus chrysurus	34.80	192	3.82
Pomadourus olivaceum	34.56	216	3.79
Umbrixa canariensis	31.20	384	3.42
Grammolites gruvelli	30.96	432	3.40
Citharus linguatula	23.76	1176	2.61
Trachurus trecae	21.36	84	2.34
Pomadourus rogeri	20.88	72	2.29
Rhinoptera marginata	20.44	2	2.24
Dentex barnardi	20.40	480	2.24
Brotula barbata	18.24	84	2.00
Trichiurus lepturus	13.92	72	1.53
Raja miraletus	9.84	12	1.08
Sphyræna sphyraena	8.16	36	0.90
Leptocharias smithii	8.16	2	0.90
Torpedo torpedo	6.96	48	0.76
Chelidichthys gabonensis	5.76	144	0.63
Chelidichthys capensis	5.28	144	0.58
Serranus accraensis	2.40	48	0.26
Pseudupeneus prayensis	2.40	36	0.26
Galeoides decadactylus	2.16	12	0.24
C R A B S	0.96	12	0.11
Sardinella aurita	0.24	12	0.03
Microchirus frechkopi	0.12	12	0.01
Total	911.68		100.02

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2110
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1231
 start stop duration Purpose code: 3
 LOG :3084.64 3085.15 0.50 Area code : 2
 FDEPTH: 32 42 GearCond.code:
 BDEPTH: 32 42 Validity code:
 Towing dir: 38e Wire out: 120 m Speed: 30 kn*10

Sorted: 165 Kg Total catch: 335.01 CATCH/HOUR: 1827.33

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dasyatis marmorata	294.87	44	16.14
Pseudupeneus prayensis	289.96	9993	15.87
Diplodus cervinus cervinus	254.24	322	13.91
Pagrus auriga	236.62	136	12.95
Pagrus caeruleostictus	229.42	475	12.55
Epinephelus aeneus	224.13	142	12.27
Sepia officinalis hierredda	85.04	196	4.65
Chaetodon hoefleri	36.55	333	2.06
Parapristipoma humile	35.95	71	1.97
Boops boops	34.58	1647	1.89
Pomadourus olivaceum	22.58	529	1.84
Dentex barnardi	19.80	305	1.06
Acanthurus monroviae	13.36	16	0.73
Spondyliosoma cantharus	13.36	349	0.73
Lagocephalus laevigatus	9.49	125	0.52
Torpedo torpedo	8.95	16	0.49
Bodianus speciosus	6.44	16	0.35
Trachurus trecae, juvenile	6.44	142	0.35
Fistularia petimba	5.56	76	0.36
Total	1827.34		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2111
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1228 Long E 1327
 start stop duration
 TIME :10:13:29 10:43:03 30 (min) Purpose code: 3
 LOG :3089.06 3090.58 1.50 Area code : 2
 FDEPTH: 39 55 GearCond.code:
 BDEPTH: 39 55 Validity code:
 Towing dir: 350e Wire out: 150 m Speed: 30 kn*10
 Sorted: 33 Kg Total catch: 33.42 CATCH/HOUR: 66.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Epinephelus aeneus	34.92	12	52.24	
Engraulis encrasicolus	5.80	580	8.68	
Brachydeuterus auritus	4.88	450	7.30	
Citharus linguatula	3.12	348	4.67	
Trachurus trecae, juvenile	2.32	496	3.47	
Chaetodon hoefleri	2.24	14	3.35	
Sepia orbignyana	2.04	4	3.05	
Pagellus bellottii	1.84	60	2.75	
Grammolites gruvelli	1.52	36	2.27	
Selene dorsalis	1.40	2	2.09	
Pomadasyx olivaceum	1.26	26	1.89	
Dentex barnardi	0.80	20	1.20	
Lagocephalus laevigatus	0.72	2	1.08	
Monolene microstoma	0.68	6	1.02	
Fistularia petimba	0.60	6	0.90	
Calappa pelii	0.40	2	0.60	
Boops boops	0.32	20	0.48	
Sepia officinalis hierredda	0.28	20	0.42	
Parapristipoma humile	0.28	2	0.42	
Sardinella aurita	0.24	6	0.36	
Spondyllosoma cantharus	0.24	6	0.36	
Sufflogobius bibarbatatus	0.20	4	0.30	
COBIIDAE	0.16	14	0.24	
Dicologlossa cuneata	0.16	4	0.24	
Pseudopneus prayensis	0.16	10	0.24	
ANTENNARIIDAE	0.12	4	0.18	
Serranus accraensis	0.10	26	0.15	
Chaetodon marcellae	0.04	2	0.06	
Total	66.84		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2112
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1227 Long E 1326
 start stop duration
 TIME :11:29:05 11:44:15 15 (min) Purpose code: 3
 LOG :3094.05 3094.67 0.62 Area code : 2
 FDEPTH: 56 58 GearCond.code:
 BDEPTH: 56 58 Validity code:
 Towing dir: 350e Wire out: 200 m Speed: 30 kn*10
 Sorted: 71 Kg Total catch: 3748.99 CATCH/HOUR: 14995.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	12104.88	188336	80.72	
Trachurus trecae	1314.56	29072	8.77	4863
Pagellus bellottii	585.64	5688	3.91	4864
Sphyraena guachancho	417.12	1684	2.78	
Selene dorsalis	231.72	1264	1.55	
Dentex barnardi	147.48	3372	0.98	
Chloroscombrus chrysurus	63.20	420	0.42	
Sardinella aurita	54.76	212	0.37	
Citharus linguatula	33.72	3160	0.22	
Brotula barbata	29.48	212	0.20	
Scomber japonicus	8.44	212	0.06	
Galeoides decadactylus	4.20	212	0.03	
Chaetodon hoefleri	0.72	4		
Total	14995.92		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2113
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1227 Long E 1324
 start stop duration
 TIME :13:06:05 13:36:05 30 (min) Purpose code: 3
 LOG :3098.78 3100.30 1.50 Area code : 2
 FDEPTH: 85 80 GearCond.code:
 BDEPTH: 85 80 Validity code:
 Towing dir: 50e Wire out: 300 m Speed: 30 kn*10
 Sorted: 329 Kg Total catch: 1179.08 CATCH/HOUR: 2358.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasyx jubolini	681.00	770	28.88	4869
Trichiurus lepturus	639.44	2884	27.12	
Umbrina canariensis	297.90	508	12.63	4867
Trachurus trecae, juvenile	183.56	11090	7.78	
Dentex barnardi	89.08	186	3.78	4868
Stromateus fiatola	75.94	98	3.22	
Pagellus bellottii	71.74	808	3.04	4865
Lithognathus mormyrus	64.72	112	2.74	4866
Argyrosomus hololepidotus	37.72	8	1.60	
Citharus linguatula	36.78	710	1.56	
Raja miraletus	32.58	44	1.38	
Brachydeuterus auritus	27.58	2542	1.17	
Pomadasyx incisus	24.52	90	1.04	
Torpedo torpedo	16.00	38	0.68	
Dentex macrophthalmus	12.86	98	0.55	
Chaetodon hoefleri	11.66	74	0.49	
Selene dorsalis	10.92	96	0.46	
Atractoscion aequidens	8.96	14	0.38	
Chelidonichthys capensis	6.88	44	0.29	
Galeoides decadactylus	4.78	8	0.20	
Plectorhynchus mediterraneus	3.88	8	0.16	
Sphyraena guachancho	3.74	14	0.16	
Pterochirus belloci	3.28	44	0.14	
Dentex angolensis	3.14	30	0.13	
Microchirus frechkopi	1.94	8	0.08	
Calappa pelii	1.20	8	0.05	
Synagrops microlepis	1.04	202	0.04	
Brotula barbata	1.04	8	0.04	
Scorpaena normani	1.04	8	0.04	
Zeus faber	0.90	8	0.04	
Grammolites gruvelli	0.74	8	0.03	
Boops boops	0.44	14	0.02	
Epinephelus gorensis	0.44	2	0.02	
Sepia orbignyana	0.30	8	0.01	
Sardinella aurita	0.30	8	0.01	
Total	2358.04		99.96	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2114
 DATE:16/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1225 Long E 1322
 start stop duration
 TIME :17:02:01 17:32:11 30 (min) Purpose code: 3
 LOG :3109.14 3110.77 1.62 Area code : 2
 FDEPTH: 106 106 GearCond.code:
 BDEPTH: 106 106 Validity code:
 Towing dir: 200e Wire out: 320 m Speed: 30 kn*10
 Sorted: 150 Kg Total catch: 1076.98 CATCH/HOUR: 2153.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	1240.42	11298	57.59	4870
Trachurus trecae, juvenile	458.20	28368	21.27	4871
Umbrina canariensis	124.70	332	5.79	4872
Trichiurus lepturus	101.38	144	4.71	
Selene dorsalis	86.40	230	4.01	
Raja miraletus	40.90	56	1.90	
Zeus faber	23.62	100	1.10	
Boops boops	18.72	244	0.87	
Fistularia petimba	14.68	14	0.68	
Ephippion guttifer	6.92	14	0.32	
Pagellus bellottii	6.92	44	0.32	
Fenheroscion mbizi	6.34	14	0.29	
Uranoscopus polli	5.48	14	0.25	
Illex coindetii	4.32	302	0.20	
Scorpaena normani	4.04	44	0.19	
Citharus linguatula	3.46	288	0.16	
Atractoscion aequidens	3.46	2	0.16	
Chelidonichthys gabonensis	1.72	14	0.08	
Monolene microstoma	0.86	14	0.04	
Microchirus frechkopi	0.86	14	0.04	
Sardinella aurita	0.58	14	0.03	
Total	2153.98		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2115
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1217 Long E 1324
 start stop duration
 TIME :05:40:59 06:12:06 31 (min) Purpose code: 3
 LOG :3170.81 3172.65 1.82 Area code : 2
 FDEPTH: 109 116 GearCond.code:
 BDEPTH: 109 116 Validity code:
 Towing dir: 10e Wire out: 330 m Speed: 30 kn*10
 Sorted: 113 Kg Total catch: 509.68 CATCH/HOUR: 986.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	523.37	2578	53.05	4873
Boops boops	274.94	586	27.87	
Erythrocles monodi	82.22	279	8.33	
Anchias anchias	25.08	190	2.54	
Epinephelus aeneus	19.01	2	1.93	
Dentex barnardi	16.49	14	1.67	
Umbrina canariensis	16.32	60	1.65	
Atractoscion aequidens	11.57	8	1.17	
Dentex gibbosus	7.16	10	0.73	
Parapristipoma octolineatum	2.95	10	0.30	
Zeus faber	2.67	4	0.27	
Trichiurus lepturus	2.32	2	0.24	
Raja miraletus	1.35	2	0.14	
Pagellus bellottii	0.99	10	0.10	
Total	986.47		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2116
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1218 Long E 1327
 start stop duration
 TIME :07:44:17 08:14:16 30 (min) Purpose code: 3
 LOG :3179.64 3181.25 1.59 Area code : 2
 FDEPTH: 95 95 GearCond.code:
 BDEPTH: 95 95 Validity code:
 Towing dir: 30e Wire out: 300 m Speed: 30 kn*10
 Sorted: 164 Kg Total catch: 372.85 CATCH/HOUR: 745.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	284.28	406	38.12	
Trachurus trecae, juvenile	239.44	15002	32.11	4874
Selene dorsalis	52.56	116	7.05	
Sardinella aurita	24.34	628	3.26	4878
Dentex gibbosus	18.92	16	2.54	
Stromateus fiatola	13.52	14	1.81	
Fistularia petimba	13.00	36	1.74	
Dentex macrophthalmus	11.56	82	1.55	4876
Dentex macrophthalmus Juv.	9.66	644	1.30	4875
Zenopsis conchifer	8.44	6	1.13	
Ephippion guttifer	7.66	22	1.03	
Pagellus bellottii	7.48	44	1.00	4877
Erythrocles monodi	7.24	12	0.97	
Dentex barnardi	6.92	22	0.93	
Atractoscion aequidens	6.78	6	0.91	
Umbrina canariensis	6.12	16	0.82	
Torpedo torpedo	5.72	8	0.77	
Raja miraletus	4.64	6	0.62	
Illex coindetii	4.20	494	0.56	
Zeus faber	3.68	2	0.49	
Chelidonichthys gabonensis	2.44	16	0.33	
Chaetodon hoefleri	2.34	16	0.31	
Scorpaena stephanica	2.00	6	0.27	
Brachydeuterus auritus	1.00	6	0.13	
Uranoscopus polli	0.76	2	0.10	
Scorpaena normani	0.56	6	0.08	
Boops boops	0.44	16	0.06	
Total	745.70		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2117
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1219 Long E 1330
 start stop duration Purpose code: 3
 TIME :09:27:14 09:41:46 15 (min) Area code : 2
 LOG :3187.51 3188.08 0.55 GearCond.code: 2
 FDEPTH: 78 79 Validity code:
 BDEPTH: 78 79
 Towing dir: 40e Wire out: 240 m Speed: 30 kn*10
 Sorted: 178 Kg Total catch: 209.31 CATCH/HOUR: 837.24

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pomadasy jubelini	327.84	156	39.16
Pagellus bellottii	144.24	1416	17.23
Pomadasy incisus	83.88	476	10.02
Trichiurus lepturus	82.64	196	9.87
Trachurus trecae, juvenile	37.08	2916	4.43
Raja miraletus	29.44	52	3.52
Lithognathus mormyrus	28.20	104	3.37
Pseudupeneus prayensis	18.48	320	2.21
Chelidonichthys gabonensis	14.04	168	1.68
Citharus linguatula	11.16	252	1.33
Selene dorsalis	9.48	120	1.13
Stromateus fiatola	9.12	12	1.09
Brachydeuterus auritus	9.12	80	1.09
Galeoides decadactylus	6.00	20	0.72
Alloteuthis africana	4.80	2040	0.57
Atractoscion aequidens	4.08	24	0.49
Ephippion guttifer	3.12	8	0.37
Saurida brasiliensis	2.64	568	0.32
Trachurus trecae	2.16	8	0.26
Dentex barnardi	1.32	12	0.16
Dentex angolensis	1.32	32	0.16
Sardinella aurita	1.08	32	0.13
Dentex macrophthalmus Juv.	0.96	72	0.11
Chloroscombrus chrysurus	0.96	8	0.11
Umbra canariensis	0.84	12	0.10
Chaetodon hoefleri	0.84	8	0.10
Perullibrachius rossignoli	0.84	8	0.10
Gobiidae	0.72	248	0.09
Sepia orbignyana	0.36	8	0.04
Illex coindetii	0.36	36	0.04
Sepia officinalis hierredda	0.12	8	0.01
Total	837.24		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2118
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1221 Long E 1330
 start stop duration Purpose code: 3
 TIME :10:47:06 11:19:46 33 (min) Area code : 2
 LOG :3193.27 3195.08 1.81 GearCond.code: 2
 FDEPTH: 70 71 Validity code:
 BDEPTH: 70 71
 Towing dir: 30e Wire out: 190 m Speed: 30 kn*10
 Sorted: 140 Kg Total catch: 591.65 CATCH/HOUR: 1075.73

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Pomadasy incisus	260.84	1662	24.25
Lithognathus mormyrus	211.09	785	19.62
Galeoides decadactylus	110.13	516	10.24
Umbra canariensis	110.13	1211	10.24
Pagellus bellottii	106.36	736	9.89
Selene dorsalis	67.09	1456	6.24
Trachurus trecae, juvenile	64.15	5040	5.96
Trachurus trecae	51.22	156	4.76
Brachydeuterus auritus	18.49	262	1.72
Dentex barnardi	16.20	107	1.51
Trichiurus lepturus	14.87	35	1.38
Chloroscombrus chrysurus	13.25	82	1.23
Pomadasy jubelini	7.69	16	0.71
Grammolites gruvelli	3.93	42	0.37
Raja miraletus	3.24	5	0.30
Dentex macrophthalmus	2.45	16	0.23
Scorpaena stephanica	1.96	16	0.18
Citharus linguatula	1.91	638	0.18
Lutjanus fulgens	1.67	4	0.16
Torpedo torpedo	1.47	9	0.14
Sardinella aurita	0.98	25	0.09
Brotula barbata	0.82	9	0.08
Sepia officinalis hierredda	0.16	9	0.01
ANTEENNARIIDAE	0.16	9	0.01
Fistularia petimba	0.15	16	0.01
Total	1070.41		99.51

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2119
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1214 Long E 1336
 start stop duration Purpose code: 3
 TIME :12:44:20 13:14:13 30 (min) Area code : 2
 LOG :3202.93 3204.55 1.57 GearCond.code: 2
 FDEPTH: 42 33 Validity code:
 BDEPTH: 42 33
 Towing dir: 50e Wire out: 190 m Speed: 30 kn*10
 Sorted: 105 Kg Total catch: 595.58 CATCH/HOUR: 1191.16

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Chloroscombrus chrysurus	393.98	10504	33.08
Brachydeuterus auritus	295.48	178	24.81
Pagellus bellottii	99.80	550	8.38
Galeoides decadactylus	90.08	356	7.56
Sphyræna guachancho	61.56	422	5.17
Selene dorsalis	47.30	1976	3.97
Pteroscion pelli	32.40	568	2.72
Pseudotolithus typus	27.84	30	2.34
Sardinella maderensis	25.28	858	2.12
Dasyatis marmorata	22.32	16	1.87
Epinephelus aeneus	19.12	16	1.61
Trachurus trecae, juvenile	16.52	1198	1.39
Rhinobatos albomaculatus	10.32	4	0.87
Engraulis encrasicolus	10.04	1846	0.84
Dentex barnardi	8.42	178	0.71
Trichiurus lepturus	4.86	130	0.48
Illex africana	3.88	82	0.33
Raja miraletus	3.64	6	0.31
Pomadasy incisus	3.24	16	0.27
Penaeus notialis	3.08	64	0.26
Gymnura micrura	2.64	2	0.22
Dasyatis margarita	2.64	2	0.22
Torpedo marmorata	1.88	4	0.16
Pseudupeneus prayensis	1.62	48	0.14
Monolepis microstoma	1.30	16	0.11
Octopus vulgaris	0.96	7	0.08
Fistularia petimba	0.64	324	0.05
Boops boops	0.32	16	0.03
Total	1191.16		100.03

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2120
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1213 Long E 1335
 start stop duration Purpose code: 3
 TIME :14:04:34 14:34:20 30 (min) Area code : 2
 LOG :3208.21 3209.63 1.41 GearCond.code: 2
 FDEPTH: 60 61 Validity code:
 BDEPTH: 60 61
 Towing dir: 20e Wire out: 210 m Speed: 30 kn*10
 Sorted: 120 Kg Total catch: 1217.86 CATCH/HOUR: 2435.72

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Brachydeuterus auritus	1327.68	21024	54.51
Trachurus trecae, juvenile	349.44	17016	14.35
Pomadasy incisus	264.96	2112	10.88
Lithognathus mormyrus	141.12	264	5.79
Galeoides decadactylus	138.24	672	5.68
Trichiurus lepturus	42.72	216	1.75
Selene dorsalis	42.24	984	1.71
Pagellus bellottii	39.36	480	1.62
Dentex barnardi	39.76	744	1.22
Chaetodon hoefleri	8.64	72	0.35
Pseudotolithus typus	8.52	6	0.35
Chloroscombrus chrysurus	7.68	48	0.32
Citharus linguatula	6.24	312	0.26
Raja miraletus	4.72	6	0.19
Octopus vulgaris	3.60	4	0.15
Sepia officinalis hierredda	3.56	4	0.15
Grammolites gruvelli	3.36	72	0.14
Sphyræna guachancho	2.88	48	0.12
Torpedo torpedo	2.68	6	0.11
Atractoscion aequidens	1.48	8	0.06
Sepiella ornata	1.44	72	0.06
Pseudupeneus prayensis	1.44	48	0.06
Fistularia petimba	1.08	2	0.04
Pteroscion pelli	0.96	24	0.04
Dicologlossa cuneata	0.96	24	0.04
Boops boops	0.48	24	0.02
Spherooides "marmor"	0.48	24	0.02
Total	2435.72		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2121
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1211 Long E 1331
 start stop duration Purpose code: 3
 TIME :15:42:31 16:12:18 30 (min) Area code : 2
 LOG :3216.19 3217.60 1.38 GearCond.code: 2
 FDEPTH: 90 91 Validity code:
 BDEPTH: 90 91
 Towing dir: 350e Wire out: 290 m Speed: 30 kn*10
 Sorted: 105 Kg Total catch: 181.59 CATCH/HOUR: 363.18

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Trichiurus lepturus	172.64	268	47.54
Trachurus trecae, juvenile	37.84	2268	10.42
Lagocephalus laevigatus	30.72	68	8.46
Stromateus fiatola	24.62	30	6.78
Dentex macrophthalmus	19.88	108	5.47
Zeus faber	11.60	28	3.19
Raja miraletus	10.48	12	2.89
Pagellus bellottii	9.64	94	2.65
Fistularia petimba	8.00	24	2.20
Illex sp.	6.72	484	1.85
Pomadasy incisus	6.48	24	1.78
Sepia officinalis hierredda	6.32	4	1.74
Sepiella ornata	4.16	4	1.15
Brachydeuterus auritus	4.00	28	1.10
Euthynnus alletteratus	3.00	4	0.83
Chaetodon hoefleri	1.28	8	0.35
Uranoscopus polli	1.12	4	0.31
Sardinella aurita	0.80	24	0.22
Chelidonichthys gabonensis	0.80	8	0.22
Sphyræna guachancho	0.72	8	0.20
Dentex angolensis	0.72	10	0.20
Selene dorsalis	0.64	4	0.18
Dentex barnardi	0.44	2	0.12
Microchirus frechkopi	0.24	4	0.07
Boops boops	0.16	8	0.04
Citharus linguatula	0.16	4	0.04
Total	363.18		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2122
 DATE:17/ 3/00 GEAR TYPE: BT No: 3 POSITION:Lat S 1210 Long E 1325
 start stop duration Purpose code: 3
 TIME :17:53:18 18:13:46 20 (min) Area code : 2
 LOG :3229.16 3230.18 0.98 GearCond.code: 8
 FDEPTH: 246 245 Validity code: 1
 BDEPTH: 246 245
 Towing dir: 10e Wire out: 750 m Speed: 30 kn*10
 Sorted: 61 Kg Total catch: 172.76 CATCH/HOUR: 518.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight numbers			
Dentex macrophthalmus	280.71	1992	54.16
Synagrops microlepis	96.15	7590	18.55
Gephyroberyx darwini	29.91	48	5.77
Epigonus telescopus	25.08	153	4.84
Chlorophthalmus atlanticus	23.10	4104	4.46
Illex coindetii	17.82	507	3.44
Centropristis granulosa	16.80	3	3.24
Pterothrissus belloci	7.92	45	1.53
Brotula barbata	6.36	6	1.23
Raja miraletus	3.60	6	0.69
Ophisurus serpens	2.46	12	0.47
MYCTOPHIDAE	1.98	771	0.38
Merluccius polli	1.77	21	0.34
Trachurus trecae, juvenile	1.53	99	0.30
Trigla lyra	1.32	12	0.25
Parapenaeus longirostris	0.66	309	0.13
PARALEPIDIDAE	0.45	21	0.09
Peristedion sp.	0.45	78	0.09
OPHIIDAE	0.21	33	0.04
Total	518.28		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2123
 DATE:17/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1209
 start stop duration Long E 1322
 TIME :20:52:27 21:22:11 30 (min) Purpose code: 3
 LOG :3241.53 3243.15 1.59 Area code : 2
 FDEPTH: 670 661 GearCond.code:
 BDEPTH: 670 661 Validity code:
 Towing dir: 20e Wire out:1800 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 121.38 CATCH/HOUR: 242.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Stomias boa boa	91.84	1904	37.83	
Yarella blackfordi	73.36	1932	30.22	
Hoplostethus cadenati	26.32	848	10.84	
Benthodesmus tenuis	12.74	378	5.25	
Triplophus hemingi	10.16	1254	4.19	
Lamprogrammus exultans	6.44	28	2.65	
Glyphus marsupialis	3.64	400	1.50	
Gadella imberbis	3.50	182	1.44	
Aristeus varidens, female	2.52	134	1.04	
Coelorinchus coelorhincus	2.52	106	1.04	
Merluccius polli	1.96	2	0.81	
PANDALIDAE	1.26	54	0.52	
Plesionika martia	1.26	532	0.52	
CERATIIDAE	0.98	8	0.40	
Nemichthys scolopaceus	0.98	14	0.40	
OPHIDIIDAE	0.70	8	0.29	
Nematocarcinus africanus	0.56	126	0.23	
Etmopterus lucifer	0.56	8	0.23	
Aristeus varidens, male	0.42	42	0.17	
Kenodermichthys copei	0.42	28	0.17	
Chaceon maritae	0.28	52	0.12	
POLYCHAETIDAE	0.14	58	0.06	
MYCTOPHIDAE	0.14	8	0.06	
ASTRONOTIDAE	0.08	8	0.03	
Total	242.78		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2124
 DATE:18/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1200
 start stop duration Long E 1325
 TIME :03:36:28 04:06:16 30 (min) Purpose code: 3
 LOG :3262.50 3263.86 1.39 Area code : 2
 FDEPTH: 450 450 GearCond.code:
 BDEPTH: 450 450 Validity code:
 Towing dir: 345e Wire out:1270 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 271.78 CATCH/HOUR: 543.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	185.40	6180	34.11	
Triplophus hemingi	161.40	18900	29.69	
Plesionika martia	112.20	42780	20.64	
Merluccius polli	30.48	50	5.61	4892
Hoplostethus cadenati	21.60	720	3.97	
Aristeus varidens, female	14.40	960	2.65	4893
Aristeus varidens, male	4.80	690	0.88	4894
Laemonema laureysi	4.80	240	0.88	
Chlorophthalmus atlanticus	1.80	30	0.33	
Conger conger	1.80	30	0.33	
Halosaurus ovenii	1.80	150	0.33	
Chaceon maritae	1.28	4	0.24	
Benthodesmus tenuis	1.20	60	0.22	
Coelorinchus coelorhincus	0.60	30	0.11	
Total	543.56		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2125
 DATE:18/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1201
 start stop duration Long E 1328
 TIME :05:55:58 06:26:00 30 (min) Purpose code: 3
 LOG :3272.21 3273.72 1.50 Area code : 2
 FDEPTH: 356 352 GearCond.code:
 BDEPTH: 356 352 Validity code:
 Towing dir: 360e Wire out: 950 m Speed: 30 kn*10

Sorted: 54 Kg Total catch: 337.15 CATCH/HOUR: 674.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	329.40	2604	48.85	4895
Hymenocephalus italicus	101.76	10464	15.09	
Laemonema laureysi	63.84	744	9.47	
Synagrops microlepis	54.24	2760	8.04	
Pterothrissus belloci	26.16	300	3.88	
Triplophus hemingi	24.00	36	3.56	
MYCTOPHIDAE	17.40	5664	2.58	
Malacocephalus occidentalis	13.68	144	2.03	
Hoplostethus cadenati	9.84	336	1.46	
Stomias boa boa	6.00	180	0.89	
Illex coindetii	5.28	84	0.78	
Muraenesox bagio	5.04	72	0.75	
GALATHEIDAE	4.56	876	0.68	
Coelorinchus coelorhincus	4.08	96	0.61	
Etmopterus lucifer	1.22	144	0.18	
Nematocarcinus africanus	1.20	30	0.18	
Chlorophthalmus atlanticus	1.20	36	0.18	
PORTUNIDAE	0.96	48	0.14	
Heptranchias perlo	0.96	12	0.14	
Zenopsis conchifer	0.96	12	0.14	
Halosaurus ovenii	0.96	84	0.14	
Lestidiops sp.	0.72	36	0.11	
Haploblepharus pictus	0.48	24	0.07	
Solenocera africana	0.24	60	0.04	
Peristedion sp.	0.12	12	0.02	
Total	674.30		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2126
 DATE:18/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1202
 start stop duration Long E 1333
 TIME :07:16:25 08:26:38 30 (min) Purpose code: 3
 LOG :3280.51 3282.09 1.57 Area code : 2
 FDEPTH: 92 84 GearCond.code:
 BDEPTH: 92 84 Validity code:
 Towing dir: 120e Wire out: 270 m Speed: 30 kn*10

Sorted: 85 Kg Total catch: 190.59 CATCH/HOUR: 381.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	239.46	14150	62.82	
Pagellus bellottii	37.86	310	9.93	
Trichurus lepturus	31.40	42	8.24	
Zenopsis conchifer	10.78	38	2.83	
Raja miraletus	9.84	14	2.58	
Chelidonichthys gabonensis	9.50	118	2.49	
Alloteuthis africana	7.78	2688	2.04	
Citharus linguatula	5.86	400	1.54	
Chaetodon hoefleri	5.22	16	1.37	
Ephippion guttifer	4.50	22	1.29	
Illex coindetii	4.06	326	1.07	
Dentex barnardi	2.78	10	0.73	
Saurida brasiliensis	2.46	666	0.65	
Dentex angolensis	2.24	26	0.59	
Dentex macrophthalmus	2.24	16	0.59	
Selene dorsalis	2.02	6	0.53	
Torpedo torpedo	1.76	4	0.46	
Fistularia petimba	1.00	2	0.26	
Dentex macrophthalmus Juv.	0.64	38	0.17	
Setarches guentheri	0.54	6	0.14	
GOBIIDAE	0.32	128	0.08	
Dentex congensis	0.32	6	0.08	
Sepia orbignyana	0.32	16	0.08	
Boops boops	0.22	6	0.06	
Sardinella aurita	0.22	6	0.06	
Sepia officinalis hierredda	0.10	6	0.03	
Total	381.18		100.71	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2127
 DATE:18/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1203
 start stop duration Long E 1336
 TIME :09:15:00 09:45:35 31 (min) Purpose code: 3
 LOG :3284.46 3286.11 1.65 Area code : 2
 FDEPTH: 75 60 GearCond.code:
 BDEPTH: 75 60 Validity code:
 Towing dir: 109e Wire out: 210 m Speed: 30 kn*10

Sorted: 196 Kg Total catch: 955.21 CATCH/HOUR: 1848.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadoury jubelini	392.17	458	21.21	4900
Brachydeuterus auritus	310.84	2460	16.81	
Pagellus bellottii	261.02	1661	14.12	4898
Lithognathus mormyrus	170.54	437	9.22	4896
Pomadoury incisus	159.89	1426	8.65	4897
Dentex barnardi	109.22	596	5.91	4899
Trachurus trecae, juvenile	108.79	8239	5.88	
Trichurus lepturus	99.00	298	5.35	
Pseudupeneus prayensis	41.30	724	2.23	
Raja miraletus	38.17	56	2.06	
Trachurus trecae	30.87	75	1.67	
Citharus linguatula	17.46	629	0.94	
Pseudolithus senegalensis	11.50	12	0.62	
Chaetodon hoefleri	10.43	75	0.56	
Ephippion guttifer	8.94	12	0.48	
Zeus faber	7.84	6	0.42	
Umbrina canariensis	7.66	85	0.41	
Engraulis encrasicolus	7.45	1161	0.40	
Parapristipoma octolineatum	6.81	21	0.37	
Fistularia petimba	6.60	21	0.36	
Plectorhynchus mediterraneus	5.96	12	0.32	
Auxis thazard	5.54	12	0.35	
Sepia officinalis hierredda	5.11	6	0.28	
Epinephelus gorensis	4.26	12	0.23	
Selene dorsalis	4.26	75	0.23	
Sphyræna guachancho	3.62	43	0.20	
Atractoscion aequidens	2.55	12	0.14	
Grammolites gruvelli	2.34	33	0.13	
Sardinella aurita	2.13	43	0.12	
Illex sp.	1.70	724	0.09	
Galeoides decadactylus	1.35	2	0.07	
Boops boops	1.28	12	0.05	
Serranus cabrilla	0.85	12	0.05	
Saurida brasiliensis	0.64	128	0.03	
Torpedo torpedo	0.48	4	0.03	
Arnoglossus imperialis	0.21	21	0.01	
Total	1848.78		99.97	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2128
 DATE:18/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1205
 start stop duration Long E 1342
 TIME :11:28:56 11:58:45 30 (min) Purpose code: 3
 LOG :3294.17 3295.69 1.45 Area code : 2
 FDEPTH: 19 21 GearCond.code:
 BDEPTH: 19 21 Validity code:
 Towing dir: 10e Wire out: 100 m Speed: 32 kn*10
 Sorted: 157 Kg Total catch: 929.76 CATCH/HOUR: 1859.52

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	873.90	99090	47.00
Ilisha africana	386.10	360	20.76
Pomadasy jubelini	101.40	120	5.45
Selene dorsalis	72.90	4590	3.92
Galeoides decadactylus	68.40	2024	3.68
Sphyræna guachancho	44.10	1080	2.37
Sardinella maderensis	40.50	3014	2.18
Chloroscombrus chrysurus	37.80	4724	2.03
Gymnura micrura	34.00	8	1.83
Pseudupeneus prayensis	31.50	900	1.69
Rhinobatos albomaculatus	30.60	18	1.65
Pseudotolithus typus	26.00	4	1.40
Pomadasy rogeri	25.92	56	1.39
Ballistes capriscus	24.00	8	1.29
Trichiurus lepturus	18.00	584	0.97
Sepia officinalis hierredda	13.50	44	0.73
Arius parkii	10.60	12	0.57
Pagellus bellottii	7.20	44	0.39
Cynoglossus browni	6.44	6	0.35
Engraulis encrasicolus	6.30	1214	0.34
Eucinostomus melanopterus	4.50	90	0.24
Pteroscion peli	4.50	270	0.24
Trachurus trecae, juvenile	3.60	224	0.19
Monolele microstoma	2.70	44	0.15
Dasyatis sp.	1.80	2	0.10
Raja miraletus	1.76	2	0.09
Cynoglossus canariensis	1.64	6	0.09
Ephippion guttifer	1.16	2	0.06
Rhizoprionodon acutus	1.04	2	0.06
Trachinotus ovatus	0.90	44	0.05
Penæus notialis	0.16	2	0.01
Total	1882.92	101.27	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2129
 DATE:18/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1155
 start stop duration Long E 1345
 TIME :14:01:15 14:31:12 30 (min) Purpose code: 3
 LOG :3306.26 3307.69 1.42 Area code : 2
 FDEPTH: 21 23 GearCond.code:
 BDEPTH: 21 23 Validity code:
 Towing dir: 10e Wire out: 100 m Speed: 32 kn*10
 Sorted: 175 Kg Total catch: 511.30 CATCH/HOUR: 1022.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sphyræna guachancho	176.88	564	17.30
Pseudotolithus typus	167.44	228	16.37
Galeoides decadactylus	132.96	408	13.00
Pteroscion peli	118.80	6780	11.62
Brachydeuterus auritus	56.16	4176	5.49
Pomadasy incisus	52.56	480	5.14
Ilisha africana	48.72	300	4.76
Chloroscombrus chrysurus	47.76	1608	4.67
Lutjanus agennes	45.00	2	4.40
Dasyatis margarita	27.12	24	2.65
Selene dorsalis	22.56	3468	2.71
Pagellus bellottii	19.32	72	1.89
Trichiurus lepturus	17.04	204	1.67
Pomadasy rogeri	13.68	36	1.34
Sepia officinalis hierredda	9.36	84	0.92
Epinephelus aeneus	9.36	12	0.92
Pomadasy jubelini	8.40	24	0.82
Cynoglossus canariensis	7.44	12	0.73
Sardinella maderensis	7.44	660	0.73
Arius parkii	7.20	12	0.70
Lithognathus mormyrus	6.96	12	0.68
Penæus notialis	6.00	144	0.59
Laemonema laureysi	4.80	12	0.47
Dicologlossa cuneata	2.64	36	0.26
Alectis alexandrinus	2.56	2	0.25
Eucinostomus melanopterus	2.16	12	0.21
Torpedo nobiliana	1.68	36	0.16
Total	1022.00	99.95	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2130
 DATE:18/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1154
 start stop duration Long E 1341
 TIME :15:29:00 15:49:00 20 (min) Purpose code: 3
 LOG :3313.60 3314.40 0.90 Area code : 2
 FDEPTH: 55 56 GearCond.code:
 BDEPTH: 55 56 Validity code:
 Towing dir: 360e Wire out: 200 m Speed: 30 kn*10
 Sorted: 109 Kg Total catch: 1068.76 CATCH/HOUR: 3206.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	1795.86	25113	56.01
Trichiurus lepturus	368.28	1122	11.49
Pomadasy incisus	203.28	891	6.34
Pagellus bellottii	184.80	1056	5.76
Umbrina canariensis	130.68	330	4.08
Trachurus trecae	119.46	4686	3.73
Selene dorsalis	63.36	891	1.98
Stromateus fiatola	50.16	66	1.56
Lithognathus mormyrus	44.22	66	1.38
Galeoides decadactylus	34.32	132	1.07
Raja miraletus	25.74	33	0.80
Sphyræna guachancho	22.44	132	0.70
Rhinobatos albomaculatus	19.80	33	0.62
OCTOPODIDAE	17.16	33	0.54
Epinephelus aeneus	16.68	3	0.52
Grammolites gruvelli	15.18	231	0.47
Pseudotolithus typus	12.60	9	0.39
Pteroscion peli	12.54	198	0.39
Citharus linguatula	11.22	231	0.35
Cynoglossus canariensis	10.56	33	0.33
Dentex barnardi	9.90	198	0.31
Torpedo marmorata	9.90	36	0.31
Sardinella maderensis	6.60	99	0.21
Atractoscion aequidens	5.94	33	0.19
Sphyræna sphyraena	5.94	33	0.19
Epinephelus alexandrinus	5.34	3	0.17
Sardinella aurita	2.64	33	0.08
Lutjanus goreensis	1.68	3	0.05
Total	3206.28	100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2131
 DATE:18/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1156
 start stop duration Long E 1337
 TIME :16:54:36 17:25:30 31 (min) Purpose code: 3
 LOG :3323.11 3324.57 1.45 Area code : 2
 FDEPTH: 80 82 GearCond.code:
 BDEPTH: 80 82 Validity code:
 Towing dir: 10e Wire out: 286 m Speed: 30 kn*10
 Sorted: 57 Kg Total catch: 114.96 CATCH/HOUR: 222.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	45.37	116	20.35
Pagellus bellottii	32.98	654	14.82
Citharus linguatula	21.87	232	9.83
Chelidichthys gabonensis	16.34	58	7.34
Trachurus trecae, juvenile	15.29	1374	6.87
Raja miraletus	14.63	27	6.58
GOBIIDAE	13.94	5075	6.27
Pomadasy incisus	12.31	70	5.53
Brachydeuterus auritus	10.53	66	4.73
Chelidichthys capensis	7.35	155	3.30
Sphyræna guachancho	6.43	4	2.89
Sphyræna sphyraena	6.19	43	2.78
Umbrina canariensis	5.03	27	2.26
Saurida brasiliensis	3.41	794	1.53
Ephippion guttifer	2.71	8	1.22
Sepia orbignyana	2.55	89	1.15
Uranoscopus polli	1.70	8	0.76
Pseudupeneus prayensis	1.16	27	0.52
Muraenesox bagio	0.54	15	0.24
Brotula barbata	0.46	4	0.21
Scorpaena normani	0.31	4	0.14
Dentex barnardi	0.31	4	0.14
Grammolites gruvelli	0.31	4	0.14
ANTENNARIIDAE	0.31	8	0.14
Octopus sp.	0.23	4	0.10
Engraulis encrasicolus	0.23	39	0.10
Total	222.49	99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2132
 DATE:18/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1152
 start stop duration Long E 1328
 TIME :19:26:13 19:55:50 30 (min) Purpose code: 3
 LOG :3335.53 3337.07 1.50 Area code : 2
 FDEPTH: 264 311 GearCond.code:
 BDEPTH: 264 311 Validity code:
 Towing dir: 240e Wire out: 750 m Speed: 30 kn*10
 Sorted: 62 Kg Total catch: 438.26 CATCH/HOUR: 876.52

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	492.32	12376	56.17
Dentex macrophthalmus	212.84	1190	24.28
Synagrops microlepis	50.66	2006	5.78
Laemonema laureysi	18.70	374	2.13
Todaropsis eblanae	16.32	136	1.86
Merluccius polli	15.30	170	1.75
Brotula barbata	14.32	16	1.61
Pontinus kuhlii	9.86	170	1.12
Pterothrissus belloci	9.52	52	1.09
Coelorinchus coelorhincus	9.18	340	1.05
Illex coindetii	5.44	34	0.62
Raja miraletus	5.04	10	0.58
Arius parkii	3.84	4	0.44
Trichiurus lepturus	3.16	4	0.36
CONGRIDAE	2.72	102	0.31
Hymenocephalus italicus	1.70	120	0.19
Portunus validus	1.36	34	0.16
Hyperophyle moselii	1.28	2	0.15
Muraenesox bagio	0.76	2	0.09
Epigonus telescopus	0.68	34	0.08
Peristedion sp.	0.68	52	0.08
Bassanago albescens	0.68	18	0.08
Dicologlossa cuneata	0.18	18	0.02
Parapenaeus longirostris	0.18	34	0.02
Total	876.52	100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2133
 DATE:18/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1151
 start stop duration Long E 1323
 TIME :21:40:14 21:41:29 31 (min) Purpose code: 3
 LOG :3345.25 3346.71 1.45 Area code : 2
 FDEPTH: 446 501 GearCond.code:
 BDEPTH: 446 501 Validity code:
 Towing dir: 220e Wire out: 1150 m Speed: 30 kn*10
 Sorted: 42 Kg Total catch: 122.14 CATCH/HOUR: 236.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Gonostoma sp.	36.70	1157	15.52
Triplophus hemingi	36.70	4188	15.52
Plesionika martia	32.67	7587	13.82
Hoplostethus cadenati	29.88	526	12.64
Laemonema laureysi	26.94	782	11.40
Merluccius polli	24.12	195	10.20
Aristeus variidens	17.65	232	7.47
Etmopterus lucifer	6.19	124	2.62
Lophius vaillanti	4.06	2	1.72
Bassanago albescens	3.72	77	1.57
Scorpaena normani	3.56	8	1.51
NETTASTOMATIDAE	2.32	77	0.98
SERRANIDAE	2.32	240	0.98
Lamprogrammus exitus	1.55	23	0.66
Halosaurus ovenii	1.24	70	0.52
Gadella imberbis	1.08	70	0.46
Benthodesmus tenuis	1.08	39	0.46
Illex sp.	0.93	8	0.35
OPHICHTHIDAE	0.77	8	0.33
Bathynectes piperitus	0.77	15	0.33
Chacoen maximus	0.74	4	0.31
Chlorophthalmus atlanticus	0.46	8	0.19
Coelorinchus coelorhincus	0.46	15	0.15
Nemichthys scolopaceus	0.15	8	0.06
Coloconger cadenati	0.15	8	0.06
Palalepis sp.	0.15	23	0.06
Total	236.36	99.97	

R/V "DR. FRIDTJOF NANSEN" PROJECT: A4 PROJECT STATION: 2134
 DATE: 19/ 3/00 GEAR TYPE: BT No: 7 POSITION: Lat S 1150 Long E 1321
 start stop duration
 TIME :23:21:22 00:01:28 30 (min) Purpose code: 3
 LOG :3351.44 3352.85 1.41 Area code : 2
 FDEPTH: 544 554 GearCond.code:
 BDEPTH: 544 554 Validity code:
 Towing dir: 340e Wire out: 1480 m Speed: 30 kn*10

Sorted: 14 Kg Total catch: 107.82 CATCH/HOUR: 215.64

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Genostoma sp.	76.16 1888	35.32	
Hoplostethus cadenati	42.88 1648	19.88	
Lamprogrammus exutus	29.12 800	13.50	
Plesionika martia	18.88 3072	8.76	
Triplophus hemingi	15.68 1648	7.27	
Benthodesmus tenuis	11.84 496	5.49	
Aristeus varidens	4.48 352	2.08	
Cadella imberbis	3.20 112	1.48	
SERRANIDAE	1.76 176	0.82	
Illex sp.	1.60 16	0.74	
Etmopterus lucifer	1.60 32	0.74	
Merluccius polli	1.40 2	0.65	
Ariomma bondi	0.96 16	0.45	
Nemichthys scolopaceus	0.64 48	0.30	
Total	210.20	97.48	

R/V "DR. FRIDTJOF NANSEN" PROJECT: A4 PROJECT STATION: 2135
 DATE: 19/ 3/00 GEAR TYPE: BT No: 4 POSITION: Lat S 1143 Long E 1334
 start stop duration
 TIME :05:41:09 06:11:17 30 (min) Purpose code: 3
 LOG :3375.22 3376.77 1.54 Area code : 2
 FDEPTH: 95 97 GearCond.code:
 BDEPTH: 95 97 Validity code:
 Towing dir: 180e Wire out: 270 m Speed: 30 kn*10

Sorted: 54 Kg Total catch: 156.35 CATCH/HOUR: 312.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pagellus bellottii	83.98 774	26.86	4913
Selene dorsalis	52.38 100	16.75	
Alloteuthis africana	48.42 18766	15.48	
Dentex angolensis	23.14 148	7.40	4911
Dentex macrophthalmus	19.36 122	6.19	4910
Trachurus trecae, juvenile	16.74 882	5.35	4912
Dentex barnardi	15.30 54	4.89	
Brachydeuterus auritus	11.70 72	3.74	
Boops boops	7.20 244	2.30	
Sphyraena sphyraena	5.40 18	1.73	
Brotula barbata	4.16 6	1.33	
Zeus faber	3.96 10	1.27	
Arius parkii	3.04 4	0.97	
Umbriina canariensis	2.70 10	0.86	
Caranx hippos	2.60 2	0.83	
Saurida brasiliensis	1.98 370	0.63	
Sparus pagrus africanus *	1.62 4	0.52	
Branchiostegus semifasciatus	1.48 2	0.47	
Illex coindetii	1.44 10	0.46	
Serranus accraensis	1.26 10	0.40	
Chelidonichthys gabonensis	1.08 10	0.35	
Citharus linguatula	0.90 72	0.29	
Pontinus kuhlii	0.90 18	0.29	
Sepia orbignyana	0.54 18	0.17	
Fistularia petimba	0.52 2	0.17	
Calappa pelii	0.18 10	0.06	
Merluccius polli	0.18 10	0.06	
Grammolites gruvelli	0.18 10	0.06	
Peristedion sp.	0.18 10	0.06	
Total	312.52	99.94	

R/V "DR. FRIDTJOF NANSEN" PROJECT: A4 PROJECT STATION: 2136
 DATE: 19/ 3/00 GEAR TYPE: BT No: 4 POSITION: Lat S 1144 Long E 1343
 start stop duration
 TIME :08:19:34 08:45:00 25 (min) Purpose code: 3
 LOG :3394.48 3395.57 1.10 Area code : 2
 FDEPTH: 39 44 GearCond.code:
 BDEPTH: 39 44 Validity code:
 Towing dir: 190e Wire out: 120 m Speed: 30 kn*10

Sorted: 80 Kg Total catch: 359.43 CATCH/HOUR: 862.63

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	274.66 569	31.84	
Pomadasys incisus	213.41 235	24.74	
Pseudupeneus prayensis	72.02 2597	8.35	
Lithognathus mormyrus	54.17 175	6.28	
Plectorhynchus mediterraneus	44.66 79	5.18	
Pagellus bellottii	24.38 254	2.83	
Selene dorsalis	23.76 665	2.75	
Trichiurus lepturus	22.80 60	2.64	
Sphyraena guachancho	18.38 48	2.13	
Sepia officinalis hierreda	17.62 14	2.04	
Chloroscombrus chrysurus	12.67 96	1.47	
Sardinella maderensis	12.36 142	1.43	
Dentex barnardi	12.05 286	1.40	
Pseudotolithus senegalensis	9.46 12	1.10	
Trachurus trecae, juvenile	9.41 516	1.09	4914
Citharus linguatula	7.92 254	0.92	
Alloteuthis africana	6.96 1870	0.81	
Galeoides decadactylus	5.71 48	0.66	
Rhinobatos albomaculatus	3.31 2	0.38	
Raja miraletus	3.17 7	0.37	
Sparus pagrus africanus *	2.86 17	0.33	
Epinephelus aeneus	2.83 2	0.33	
Scomberomorus tritor	2.16 2	0.25	
Sphyraena sphyraena	1.58 17	0.18	
Lagocephalus laevigatus	0.96 17	0.11	
Sardinella aurita	0.96 48	0.11	
Decapterus rhonchus	0.96 48	0.11	
Atractoscion aequidens	0.82 2	0.10	
Grammolites gruvelli	0.62 17	0.07	
Total	862.63	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT: A4 PROJECT STATION: 2137
 DATE: 19/ 3/00 GEAR TYPE: BT No: 4 POSITION: Lat S 1142 Long E 1346
 start stop duration
 TIME :11:05:23 10:35:11 30 (min) Purpose code: 3
 LOG :3402.03 3403.78 1.75 Area code : 2
 FDEPTH: 22 23 GearCond.code:
 BDEPTH: 22 23 Validity code:
 Towing dir: 354e Wire out: 70 m Speed: 30 kn*10

Sorted: 77 Kg Total catch: 313.00 CATCH/HOUR: 626.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Sphyraena guachancho	233.68 658	37.33	
Chloroscombrus chrysurus	164.10 1380	26.25	
Sardinella maderensis	71.02 3118	11.35	
Trichiurus lepturus	36.60 110	5.85	
Galeoides decadactylus	33.48 164	5.35	
Brachydeuterus auritus	15.08 1712	2.41	
Sphyraena sphyraena	14.34 46	2.29	
Stromateus fiatola	13.80 18	2.20	
Pomadasys incisus	11.40 276	1.82	
Lithognathus mormyrus	10.84 18	1.73	
Selene dorsalis	9.20 456	1.47	
Rhinobatos albomaculatus	3.76 4	0.60	
Gymnura micrura	2.68 2	0.43	
Panulirus regius	1.88 2	0.30	
Penaeus notialis	1.64 18	0.26	
Epinephelus aeneus	1.40 2	0.22	
Ilisha africana	0.54 54	0.09	
Pteroscion peli	0.36 36	0.06	
Total	626.00	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT: A4 PROJECT STATION: 2138
 DATE: 19/ 3/00 GEAR TYPE: BT No: 4 POSITION: Lat S 1135 Long E 1366
 start stop duration
 TIME :11:26:30 11:56:13 30 (min) Purpose code: 3
 LOG :3409.21 3410.79 1.55 Area code : 2
 FDEPTH: 21 21 GearCond.code:
 BDEPTH: 21 21 Validity code:
 Towing dir: 354e Wire out: 120 m Speed: 30 kn*10

Sorted: 116 Kg Total catch: 857.70 CATCH/HOUR: 1715.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pteroscion peli	301.84 17884	17.60	
Galeoides decadactylus	281.26 3870	16.40	
Pomadasys incisus	203.84 2496	11.88	4916
Brachydeuterus auritus	186.20 18520	10.85	
Ilisha africana	137.20 7154	8.00	
Pseudotolithus typus	113.48 296	6.62	4915
Sphyraena guachancho	105.84 932	6.17	
Chloroscombrus chrysurus	99.96 2694	5.83	
Umbriina canariensis	47.04 588	2.74	
Trichiurus lepturus	43.12 734	2.51	
Rhinobatos albomaculatus	35.28 8	2.06	
Arius parkii	28.42 48	1.66	
Selene dorsalis	26.46 1520	1.54	
Sardinella maderensis	24.56 1420	1.43	
Pentaneus quinquearius	17.64 244	1.03	
Dicologlossa cuneata	14.70 196	0.86	
Stromateus fiatola	12.74 48	0.74	
Pomadasys rogeri	10.78 48	0.63	
Gymnura micrura	9.32 6	0.54	
Ephippion guttifer	5.36 4	0.31	
Cynoglossus canariensis	4.90 48	0.29	
Sepiella ornata	2.94 98	0.17	
Rhinoptera marginata	1.44 2	0.08	
Dasyatis margarita	1.08 2	0.06	
Total	1715.40	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT: A4 PROJECT STATION: 2139
 DATE: 19/ 3/00 GEAR TYPE: BT No: 4 POSITION: Lat S 1136 Long E 1333
 start stop duration
 TIME :13:52:06 14:22:06 30 (min) Purpose code: 3
 LOG :3426.62 3428.17 1.52 Area code : 2
 FDEPTH: 95 93 GearCond.code:
 BDEPTH: 95 93 Validity code:
 Towing dir: 350e Wire out: 310 m Speed: 30 kn*10

Sorted: 62 Kg Total catch: 470.81 CATCH/HOUR: 941.62

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex macrophthalmus	408.24 1518	43.36	4917
Trachurus trecae, juvenile	250.58 14908	26.61	
Brachydeuterus auritus	148.06 904	15.72	
Trigla lyra	34.82 246	3.70	
Dentex angolensis	18.76 224	1.99	4918
Trichiurus lepturus	16.74 268	1.78	
Saurida brasiliensis	15.40 2110	1.64	
Pagellus bellottii	13.34 66	1.42	
Stromateus fiatola	10.00 22	1.06	
Zeus faber	8.70 68	0.92	
Chelidonichthys capensis	6.46 44	0.69	
Citharus linguatula	4.68 120	0.50	
Synagrops microlepis	4.02 34	0.43	
Sepiella ornata	1.34 34	0.14	
Boops boops	0.66 48	0.07	
Lagocephalus laevigatus	0.22 2	0.02	
Total	942.02	100.05	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2140
 DATE:19/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1135 Long E 1329
 start stop duration
 TIME :15:38:40 16:04:27 26 (min) Purpose code: 3
 LOG :3436.73 3438.12 1.38 Area code : 2
 FDEPTH: 112 113 GearCond.code:
 BDEPTH: 112 113 Validity code:
 Towing dir: 350o Wire out: 350 m Speed: 30 kn*10
 Sorted: 54 Kg Total catch: 1119.83 CATCH/HOUR: 2584.22

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae, juvenile	1992.97	94562	77.12
Dentex macrophthalmus	293.35	2139	11.35
Trigla lyra	81.65	803	3.16
Octopus vulgaris	42.83	134	1.66
Scorpaena normani	41.49	402	1.61
Raja miraletus	29.45	67	1.14
Umbra canariensis	17.40	67	0.67
Atractoscion aequidens	13.38	67	0.52
Lagocephalus laevigatus	13.38	268	0.52
Illex sp.	12.05	468	0.47
Pterothrissus belloci	9.81	44	0.38
Brotula barbata	8.35	9	0.32
Saurida brasiliensis	8.03	1338	0.31
Zeus faber	8.03	67	0.31
Bombrops heterurus	5.35	67	0.21
Citharus linguatula	4.02	134	0.16
Peristedion cataphractum	2.68	67	0.10
Total	2584.22	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2141
 DATE:19/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1137 Long E 1322
 start stop duration
 TIME :17:54:10 18:24:03 30 (min) Purpose code: 3
 LOG :3451.79 3453.33 1.51 Area code : 2
 FDEPTH: 258 292 GearCond.code:
 BDEPTH: 258 292 Validity code:
 Towing dir: 330o Wire out: 750 m Speed: 30 kn*10
 Sorted: 30 Kg Total catch: 147.55 CATCH/HOUR: 295.10

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	118.40	9430	40.12
Illex coindetii	64.60	660	21.89
Chlorophthalmus atlanticus	62.20	8740	21.08
Todaropsis eblanae	15.80	240	5.35
PANDALIDAE	15.60	7370	5.29
Merluccius polli	5.80	90	1.97
GALATHEIDAE	2.60	1330	0.88
Parapenaeus longirostris	2.40	520	0.81
Ophisurus serpens	2.40	40	0.61
Calappa peli	1.60	60	0.54
Trachurus trecae, juvenile	1.20	50	0.41
Epigonus telescopus	0.60	60	0.20
Zenion leptolepis	0.40	10	0.14
Portunus validus	0.40	10	0.14
Trichiurus lepturus	0.20	10	0.07
Hymenocephalus italicus	0.20	40	0.07
Chaceon maritae	0.20	40	0.07
Solenocera africana	0.20	30	0.07
Chelidonichthys gabonensis	0.20	2	0.07
Peristedion sp.	0.10	10	0.03
Total	295.10	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2142
 DATE:19/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1138 Long E 1321
 start stop duration
 TIME :20:19:50 20:52:10 32 (min) Purpose code: 3
 LOG :3461.07 3462.83 1.73 Area code : 2
 FDEPTH: 343 373 GearCond.code:
 BDEPTH: 343 373 Validity code:
 Towing dir: 340o Wire out:1000 m Speed: 30 kn*10
 Sorted: 59 Kg Total catch: 259.13 CATCH/HOUR: 485.87

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Merluccius polli	166.29	467	34.23
Laemonema laureysi	109.99	1142	22.64
Pterothrissus belloci	55.39	158	11.40
Hymenocephalus italicus	48.30	6668	9.94
Neoharjotta pinnata	18.38	2	3.78
Ophisurus serpens	12.60	210	2.59
Illex coindetii	11.29	105	2.32
Aristeus varidens, male	9.71	1260	2.00
Etmopterus lucifer	7.09	210	1.46
Aristeus varidens, female	6.83	473	1.41
Parapenaeus longirostris, fem.	6.56	1129	1.35
Gadella imberbis	5.78	144	1.19
Todaropsis eblanae	5.25	53	1.08
Plesionika martia	4.99	1470	1.03
Portunus validus	3.41	53	0.70
Trachipterus jacksonensis	2.36	13	0.49
Hoplostethus cadenati	1.84	66	0.38
Nematocarcinus africanus	1.58	656	0.33
MYCTOPHIDAE	1.58	512	0.33
Synagrops microlepis	1.58	79	0.33
Lophius vaillanti	1.16	2	0.24
Chlorophthalmus atlanticus	1.05	26	0.22
Coelorrhinchus coelorrhinchus	1.05	39	0.22
PANDALIDAE	0.79	499	0.16
Malacocephalus occidentalis	0.53	13	0.11
Parapenaeus longirostris, male	0.26	79	0.05
Halosaurus ovenii	0.26	13	0.05
Total	485.90	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2143
 DATE:20/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1125 Long E 1326
 start stop duration
 TIME :23:39:57 00:09:44 30 (min) Purpose code: 3
 LOG :3478.10 3479.61 1.49 Area code : 2
 FDEPTH: 744 752 GearCond.code:
 BDEPTH: 744 752 Validity code:
 Towing dir: 20o Wire out:1820 m Speed: 30 kn*10
 Sorted: 17 Kg Total catch: 103.48 CATCH/HOUR: 206.96

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Triplophus hemingi	84.84	6370	40.99
Photomectes braueri	45.36	1148	21.92
Yarrella blackfordi	33.04	980	15.96
Hoplostethus cadenati	8.68	308	4.19
Plesionika martia	8.40	238	4.06
Lamprogrammus exotus	5.32	28	2.57
Merluccius polli	4.80	6	2.32
Talismania bifurcata	3.64	56	1.76
Centroscymnus obscurus	3.04	14	1.47
Coelorrhinchus coelorrhinchus	2.52	84	1.22
Aristeus varidens	2.52	126	1.22
MYCTOPHIDAE	0.84	28	0.41
Halosaurus ovenii	0.56	14	0.27
Etmopterus pusillus	0.56	14	0.27
PARALEPIDIDAE	0.56	14	0.27
Bassanago albescens	0.56	14	0.27
Glyphus marsupialis	0.56	42	0.27
Chauliodus sloani	0.56	14	0.27
POLYCHALIDAE	0.28	14	0.14
Gadella imberbis	0.28	14	0.14
Total	206.92	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2144
 DATE:20/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1124 Long E 1323
 start stop duration
 TIME :01:45:51 02:00:44 15 (min) Purpose code: 3
 LOG :3485.89 3486.54 0.61 Area code : 2
 FDEPTH: 566 567 GearCond.code:
 BDEPTH: 566 567 Validity code:
 Towing dir: 30o Wire out:1550 m Speed: 30 kn*10
 Sorted: 12 Kg Total catch: 96.08 CATCH/HOUR: 384.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	69.76	2752	18.15
Illex sp.	64.64	416	16.82
Plesionika martia	63.36	17024	16.49
Triplophus hemingi	48.64	5120	12.66
Yarrella blackfordi	37.76	1120	9.83
Benthodesmus tenuis	35.84	1184	9.33
Lamprogrammus exotus	23.68	608	6.16
Photomectes braueri	14.08	320	3.66
Aristeus varidens	14.08	1088	3.66
Laemonema laureysi	3.84	32	1.00
POLYCHALIDAE	1.92	64	0.50
Xenodermichthys copei	1.92	128	0.50
Coelorrhinchus coelorrhinchus	1.92	128	0.50
Nemichthys scolopaceus	1.28	64	0.33
Bathuroconger vicinus	0.64	32	0.17
Halosaurus ovenii	0.64	32	0.17
OPHIDIIDAE	0.32	32	0.08
Total	384.32	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2145
 DATE:20/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1124 Long E 1333
 start stop duration
 TIME :05:37:56 06:07:07 29 (min) Purpose code: 3
 LOG :3499.96 3501.32 1.33 Area code : 2
 FDEPTH: 53 59 GearCond.code:
 BDEPTH: 53 59 Validity code:
 Towing dir: 40o Wire out: 180 m Speed: 30 kn*10
 Sorted: 39 Kg Total catch: 38.58 CATCH/HOUR: 79.82

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pagellus bellottii	52.14	267	65.32
Sepia officinalis hierredda	7.82	8	9.80
Trachinus armatus	7.45	97	9.33
Brachydeuterus auritus	4.43	87	5.55
Lagocephalus laevigatus	2.23	10	2.79
Chelidonichthys capensis	1.99	19	2.49
Euthynnus alletteratus	1.94	2	2.43
Torpedo torpedo	1.12	2	1.40
Ophisurus serpens	0.21	2	0.26
Fistularia petimba	0.21	6	0.26
Bothus podas africanus	0.17	2	0.21
Citharus linguatula	0.12	2	0.15
Total	79.83	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2146
 DATE:20/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1124 Long E 1339
 start stop duration
 TIME :07:20:45 07:50:06 29 (min) Purpose code: 3
 LOG :3507.62 3508.93 1.29 Area code : 2
 FDEPTH: 37 33 GearCond.code:
 BDEPTH: 37 33 Validity code:
 Towing dir: 90e Wire out: 115 m Speed: 30 kn*10
 Sorted: 58 Kg Total catch: 131.34 CATCH/HOUR: 271.74

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Selene dorsalis	161.38	403	59.39
Sepia officinalis hierredda	17.63	81	6.49
Alloteuthis africana	17.01	5766	6.26
Brachydeuterus auritus	13.78	596	5.07
Galeoides decadactylus	13.57	21	4.99
Sphyræna guachancho	10.97	23	4.04
Citharus linguatula	5.71	68	2.10
Stromateus fiatola	3.72	4	1.37
Pomadasy rogeri	3.39	6	1.25
Cynoglossus canariensis	3.35	12	1.23
Chelidonichthys gabonensis	3.27	14	1.20
Balistes caprisiscus	2.98	6	1.10
Grammolites gruveli	1.99	50	0.73
COBIIDAE	1.74	633	0.64
Pseudotolithus senegalensis	1.74	2	0.64
Lagocephalus laevigatus	1.66	4	0.61
Raja miraletus	1.49	2	0.55
Chloroscombrus chrysurus	1.37	6	0.50
Octopus sp.	1.24	12	0.46
Trachinus radiatus	1.24	6	0.46
Trachurus trecae, juvenile	0.74	174	0.27
Trachinus armatus	0.37	6	0.14
MAJIDAE	0.25	6	0.09
Dentex barnardi	0.25	6	0.09
Pagellus bellottii	0.25	31	0.09
Sardinella aurita	0.25	6	0.09
Fistularia petimba	0.17	4	0.06
Calappa pelii	0.12	6	0.04
Pseudupeneus prayensis	0.12	6	0.04
Total	271.75		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2147
 DATE:20/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1124 Long E 1343
 start stop duration
 TIME :08:42:47 09:12:09 29 (min) Purpose code: 3
 LOG :3512.80 3514.23 1.44 Area code : 2
 FDEPTH: 21 20 GearCond.code:
 BDEPTH: 21 20 Validity code:
 Towing dir: 360e Wire out: 65 m Speed: 30 kn*10
 Sorted: 61 Kg Total catch: 60.57 CATCH/HOUR: 125.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Cymnura altavella	40.34	8	32.19
Cymnura micrura	20.69	2	16.51
Arius parkii	17.38	8	13.87
Rhinobatos albomaculatus	10.84	10	8.65
Galeoides decadactylus	7.45	10	5.94
Lagocephalus laevigatus	6.83	31	5.45
Alectis alexandrinus	4.68	19	3.73
Sepia officinalis hierredda	3.60	10	2.87
Trichurus lepturus	2.69	4	2.15
Stromateus fiatola	2.07	2	1.65
Raja miraletus	1.57	2	1.25
Citharus linguatula	1.49	12	1.19
Pagellus bellottii	0.99	2	0.79
Pomadasy rogeri	0.91	2	0.73
Cynoglossus canariensis	0.87	2	0.69
Eucinostomus melanopterus	0.70	6	0.56
Decapterus rhonchus	0.54	31	0.43
Dasyatis marmorata	0.50	2	0.40
Balistes punctatus	0.46	4	0.37
Calappa rubropunctata	0.21	2	0.17
Pseudupeneus prayensis	0.17	6	0.14
Grammolites gruveli	0.17	10	0.14
Dicologlossa cuneata	0.12	2	0.10
Engraulis encrasicolus	0.04	6	0.03
Bothus podas africanus	0.04	2	0.03
Sphyræna guachancho	0.02	2	0.02
Total	125.37		100.05

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2148
 DATE:20/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1117 Long E 1343
 start stop duration
 TIME :10:09:51 10:39:55 30 (min) Purpose code: 3
 LOG :3519.44 3520.87 1.42 Area code : 2
 FDEPTH: 21 25 GearCond.code:
 BDEPTH: 21 25 Validity code:
 Towing dir: 30e Wire out: 65 m Speed: 30 kn*10
 Sorted: 211 Kg Total catch: 211.00 CATCH/HOUR: 422.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Alectis alexandrinus	92.60	92	21.94
Pagrus caeruleostictus	73.12	100	17.33
Hemicaranx bicolor	48.88	42	11.58
Pseudotolithus typus	37.48	50	8.88
Pagrus africanus	26.20	24	6.21
Sphyræna guachancho	22.44	16	5.32
Galeoides decadactylus	20.00	68	4.74
Scorpaenomor tritor	17.24	6	4.09
Epinephelus aeneus	14.28	6	3.38
Epinephelus aeneus	14.28	6	3.38
Lagocephalus laevigatus	14.00	50	3.32
Balistes punctatus	8.24	6	1.95
Arius parkii	7.64	10	1.81
MONACANTHIDAE	4.24	8	1.00
Ephippion guttifer	4.12	2	0.98
Balistes caprisiscus	3.24	4	0.77
Trachinus armatus	3.04	16	0.72
Trachinotus goreensis	2.48	4	0.59
Pagellus bellottii	2.08	4	0.49
Acanthurus monroviae	2.04	2	0.48
Rhizoprionodon acutus	1.76	2	0.42
Lithognathus mormyrus	1.24	2	0.29
Brachydeuterus auritus	0.96	20	0.23
Decapterus rhonchus	0.68	22	0.16
Rypticus saponaceus	0.52	10	0.12
Sepiella ornata	0.44	2	0.10
Vanstraelenia chirophthalmus	0.44	2	0.10
Epinephelus alexandrinus	0.44	2	0.10
Scorpaena stephanica	0.12	2	0.03
Fistularia petimba	0.04	2	0.01
Total	424.28		100.52

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2149
 DATE:20/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1115 Long E 1345
 start stop duration
 TIME :11:14:33 11:34:35 20 (min) Purpose code: 3
 LOG :3522.83 3523.79 0.95 Area code : 2
 FDEPTH: 24 24 GearCond.code:
 BDEPTH: 24 24 Validity code:
 Towing dir: 20e Wire out: m Speed: kn*10
 Sorted: 152 Kg Total catch: 466.78 CATCH/HOUR: 1400.34

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Galeoides decadactylus	228.69	447	16.33
Chloroscombrus chrysurus	201.63	1635	14.40
Pseudotolithus typus	135.12	150	9.65
Brachydeuterus auritus	122.43	8202	8.74
Pteroscopus peli	122.10	5973	8.72
Lithognathus mormyrus	71.28	117	5.09
Ilisha africana	69.63	2790	4.97
Sphyræna guachancho	59.07	183	4.22
Pomadasy rogeri	56.43	165	4.03
Argyrosomus hololepidotus	54.96	51	3.92
Arius parkii	41.16	42	2.94
Selene dorsalis	25.41	1650	1.81
Decapterus punctatus	24.42	942	1.74
Pomadasy incisus	24.42	84	1.74
Pomadasy jubelini	20.79	33	1.48
Gymnura micrura	19.47	18	1.39
Epinephelus aeneus	17.52	9	1.25
Pseudupeneus prayensis	13.53	148	0.97
Pagrus africanus	11.55	18	0.82
Sardinella maderensis	10.56	429	0.75
Sepiella ornata	9.24	33	0.66
Rhizoprionodon acutus	7.62	9	0.54
Umbrina canariensis	6.60	6	0.47
Rhinobatos albomaculatus	6.12	6	0.44
Chaetodipterus goreensis	5.94	18	0.42
Torpedo marmorata	5.94	6	0.42
Ephippion guttifer	5.52	3	0.35
Cynoglossus canariensis	3.84	12	0.27
Cynoglossus browni	3.12	3	0.22
C R A B S	2.97	33	0.21
Hemicaranx bicolor	2.58	3	0.18
Scorpaena normani	2.31	18	0.16
Trichurus lepturus	2.31	33	0.16
Paralichthys regius	2.04	3	0.15
Lagocephalus laevigatus	1.98	18	0.14
Alectis alexandrinus	0.96	3	0.07
Rypticus saponaceus	0.66	18	0.05
Scorpaenomor tritor	0.42	3	0.03
Total	1400.34		99.94

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2150
 DATE:20/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1114 Long E 1336
 start stop duration
 TIME :13:23:08 13:53:11 30 (min) Purpose code: 3
 LOG :3536.69 3538.13 1.44 Area code : 2
 FDEPTH: 147 148 GearCond.code:
 BDEPTH: 147 148 Validity code:
 Towing dir: 360e Wire out: 480 m Speed: 30 kn*10
 Sorted: 90 Kg Total catch: 1023.32 CATCH/HOUR: 2046.64

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	1579.20	146216	77.16
Trichurus lepturus	202.72	10416	9.91
Brotula barbata	71.92	122	3.51
Parapenaeus longirostris, fem.	21.28	2800	1.04
Scorpaena normani	21.28	224	1.04
Pterothrissus belloci	21.28	448	1.04
Trigla lyra	17.92	112	0.88
Umbrina canariensis	17.92	56	0.88
Dentex macrophthalmus	17.20	108	0.84
Illex sp.	16.80	504	0.82
Parapenaeus longirostris, male	10.08	2576	0.45
Bembrops heterurus	10.08	168	0.45
Monolele microstoma	8.96	336	0.44
Merluccius polli, juveniles	6.72	224	0.33
Raja straeleni	5.76	2	0.28
Pagellus bellottii	4.84	14	0.24
Lophiodes kempi	4.40	8	0.21
Raja miraletus	3.24	4	0.16
Dentex angolensis	2.80	24	0.14
C R A B S	1.12	56	0.05
Zenopsis conchifer	1.12	56	0.05
Total	2046.64		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2151
 DATE:20/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1114 Long E 1333
 start stop duration
 TIME :15:11:17 15:41:10 30 (min) Purpose code: 3
 LOG :3545.38 3546.81 1.41 Area code : 2
 FDEPTH: 246 248 GearCond.code:
 BDEPTH: 246 248 Validity code:
 Towing dir: 360e Wire out: 750 m Speed: 30 kn*10
 Sorted: 80 Kg Total catch: 987.16 CATCH/HOUR: 1974.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Merluccius polli, juveniles	703.04	15552	35.61
Dentex macrophthalmus	702.34	2062	35.57
Synagrops microlepis	198.64	13544	10.06
Epinephelus guaza ?	87.96	4	4.46
Brotula barbata	85.72	92	4.39
Dentex angolensis	55.06	118	2.59
Illex sp.	39.52	400	2.00
Bembrops heterurus	21.84	260	1.11
Scorpaena normani	20.60	208	1.05
Parapenaeus longirostris, fem.	19.24	2600	0.97
Coelorrhinus coelorrhinus	13.52	260	0.68
Parapenaeus longirostris, male	8.84	2132	0.45
Mystriophis rostellatus	8.32	52	0.42
Zenopsis conchifer	8.32	104	0.42
Malacocephalus laevis	4.16	260	0.21
Total	1974.32		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2152
 DATE:20/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1114
 start stop duration Purpose code: 3 Long E 1331
 TIME :16:50:50 17:20:11 29 (min) Area code : 2
 LOG :3553.02 3554.53 1.50 GearCond.code:
 FDEPTH: 346 353 Validity code:
 BDEPTH: 346 353
 Towing dir: 360e Wire out:1000 m Speed: 30 kn*10
 Sorted: 54 Kg Total catch: 557.33 CATCH/HOUR: 1153.10

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Merluccius polli	524.42	5557	45.48
Laemonema laureysi	118.88	1618	10.31
Trichiurus lepturus	109.03	114	9.46
Malacocephalus laevis	84.41	17059	7.32
Synagrops microlepis	67.53	3517	5.86
Pterothrissus bellocci	66.83	317	5.80
Etmopterus lucifer	46.43	2672	4.03
Nematocarcinus africanus	42.21	8195	3.66
Parapeneaus longirostris, fem.	27.43	4819	2.38
MYCTOPHIDAE	13.37	679	1.16
Centrophorus granulosus	13.20	2	1.14
Trachipterus jacksonensis	5.63	35	0.49
Chaunax pictus	4.92	106	0.43
Aristeus varidens	4.22	575	0.37
Bathymectes piperitus	4.22	35	0.37
Chlorophthalmus atlanticus	4.22	70	0.37
Solenocera africana	3.52	352	0.31
Lestidium atlanticum	2.81	106	0.24
Coelorinchus coelorhincus	2.81	70	0.24
Nozumia leonis	2.11	35	0.18
Coelorinchus sp.	2.11	35	0.18
Muraenesox bagie	1.41	35	0.12
Ruvettus pretiosus	1.37	2	0.12
Total	1153.09		100.02

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2153
 DATE:20/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1113
 start stop duration Purpose code: 3 Long E 1329
 TIME :20:12:16 20:43:59 32 (min) Area code : 2
 LOG :3563.32 3564.94 1.58 GearCond.code:
 FDEPTH: 431 440 Validity code:
 BDEPTH: 431 440
 Towing dir: 360e Wire out:1200 m Speed: 30 kn*10
 Sorted: 27 Kg Total catch: 178.92 CATCH/HOUR: 335.48

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	210.53	47421	62.75
Laemonema laureysi	35.18	761	10.49
Trichiurus lepturus	16.54	512	4.93
Plesionika martia	14.96	4226	4.46
Hoplostethus cadenati	12.08	512	3.60
Yarrella blackfordi	11.55	368	3.44
Aristeus varidens, female	9.71	643	2.89
Aristeus varidens, male	3.41	486	1.02
Merluccius polli	3.41	6	1.02
Todaropsis eblanae	3.15	26	0.94
Bathymectes piperitus	2.89	214	0.86
Etmopterus lucifer	2.63	92	0.78
Triplophus hemingi	2.63	1470	0.78
Xenodermichthys copei	2.10	144	0.63
Nozumia aequalis	1.31	53	0.39
Halosaurus ovenii	1.31	53	0.39
Zenopsis conchifer	1.31	13	0.39
Peristedion cataphractum	0.79	26	0.24
Total	335.49		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2154
 DATE:20/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1110
 start stop duration Purpose code: 3 Long E 1327
 TIME :22:26:46 22:56:40 30 (min) Area code : 2
 LOG :3571.36 3572.67 1.28 GearCond.code:
 FDEPTH: 563 554 Validity code:
 BDEPTH: 563 554
 Towing dir: 360e Wire out:1400 m Speed: 30 kn*10
 Sorted: 13 Kg Total catch: 81.42 CATCH/HOUR: 162.84

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	67.20	20160	41.27
Yarrella blackfordi	26.32	672	16.16
Photonectes braueri	19.60	364	12.04
Triplophus hemingi	10.92	742	6.71
Hoplostethus cadenati	7.28	238	4.47
Aristeus varidens, female	7.00	308	4.30
Lamprogrammus exotus	6.72	252	4.13
Illex sp.	5.32	42	3.27
Chaceon maritae	4.08	10	2.51
Ariomma bondi	3.36	28	2.06
Plesionika martia	2.52	70	1.55
Dicrolene intronigra	0.56	84	0.34
POLYCHAELIDAE	0.56	112	0.34
Nemichthys scolopaceus	0.28	28	0.17
PARALEPIDIDAE	0.28	14	0.17
Selachophidium guentheri	0.28	14	0.17
Aristeus varidens, male	0.28	42	0.17
Xenodermichthys copei	0.14	14	0.09
Coelorinchus coelorhincus	0.14	14	0.09
Total	162.84		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2155
 DATE:21/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1108
 start stop duration Purpose code: 3 Long E 1326
 TIME :00:25:22 00:55:11 30 (min) Area code : 2
 LOG :3577.01 3578.42 1.38 GearCond.code:
 FDEPTH: 650 648 Validity code:
 BDEPTH: 650 648
 Towing dir: 360e Wire out:1600 m Speed: 30 kn*10
 Sorted: 14 Kg Total catch: 107.98 CATCH/HOUR: 215.96

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Yarrella blackfordi	73.08	1908	33.84
Photonectes braueri	34.20	612	15.84
Nematocarcinus africanus	29.88	3096	13.84
Triplophus hemingi	24.84	2304	11.50
Hoplostethus cadenati	20.52	648	9.50
Talismania bifurcata	14.40	360	6.67
Lamprogrammus exotus	4.68	18	2.17
POLYCHAELIDAE	3.60	288	1.67
Chaceon maritae	3.20	14	1.48
Ebinania costaeannarie	2.16	2	1.00
Chauliodus sloani	1.44	54	0.67
Bathyroconger vicinus	1.08	18	0.50
Glyphus marsupialis	0.72	18	0.33
SQUALIDAE	0.72	36	0.33
Bassanago albescens	0.72	36	0.33
Xenodermichthys copei	0.72	18	0.33
Total	215.96		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2156
 DATE:21/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1105
 start stop duration Purpose code: 3 Long E 1325
 TIME :02:33:37 03:03:28 30 (min) Area code : 2
 LOG :3583.33 3584.80 1.46 GearCond.code:
 FDEPTH: 751 744 Validity code:
 BDEPTH: 751 744
 Towing dir: 360e Wire out:1800 m Speed: 30 kn*10
 Sorted: 11 Kg Total catch: 66.54 CATCH/HOUR: 133.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Triplophus hemingi	23.80	2576	17.88
OPHIDIIDAE	15.68	532	11.78
Bathyroconger vicinus	13.44	238	10.10
Yarrella blackfordi	12.60	280	9.47
POLYCHAELIDAE	12.32	1246	9.26
Talismania bifurcata	12.04	224	9.05
Lamprogrammus exotus	9.24	28	6.94
Coelorinchus coelorhincus	6.44	1232	4.84
Merluccius polli	3.92	4	2.95
Illex sp.	2.80	14	2.10
Dibranchius atlanticus	2.80	84	2.10
Etmopterus pusillus	2.80	28	2.10
Hoplostethus cadenati	2.80	70	2.10
Chaceon maritae	2.60	12	1.95
Synaphobranchus kaupii	2.52	14	1.89
Aristeus varidens	1.96	70	1.47
Halosaurus ovenii	1.68	28	1.26
GALATHEIDAE	1.40	784	1.05
Photonectes braueri	1.12	14	0.84
Xenodermichthys copei	0.56	14	0.42
Glyphus marsupialis	0.56	28	0.42
Total	133.08		99.97

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2157
 DATE:21/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1104
 start stop duration Purpose code: 3 Long E 1332
 TIME :05:47:45 06:18:43 31 (min) Area code : 2
 LOG :3596.19 3597.70 1.51 GearCond.code:
 FDEPTH: 255 247 Validity code:
 BDEPTH: 255 247
 Towing dir: 360e Wire out: 650 m Speed: 30 kn*10
 Sorted: 33 Kg Total catch: 517.65 CATCH/HOUR: 1001.90

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	351.87	24387	35.12
Trichiurus lepturus	256.06	6794	25.56
Merluccius polli juveniles	217.16	4384	21.67
Dentex macrophthalmus	87.10	435	8.69
Parapeneaus longirostris, male	28.45	5632	2.84
Parapeneaus longirostris, fem.	19.16	3571	1.91
Lophius vaillanti	9.87	29	0.99
Zenopsis conchifer	8.71	87	0.87
Pterothrissus bellocci	8.13	87	0.81
Chlorophthalmus atlanticus	5.81	958	0.58
CALAPPIDAE	3.48	29	0.35
MYCTOPHIDAE	2.90	1481	0.29
Todaropsis eblanae	1.16	29	0.12
Monoleme microstoma	0.58	29	0.06
Muraenesox bagie	0.58	29	0.06
Hoplostethus cadenati	0.29	29	0.03
Epigonus telescopus	0.29	29	0.03
Coelorinchus coelorhincus	0.29	29	0.03
Total	1001.89		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2158
 DATE:21/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1103 Long E 1336
 TIME :07:27:46 07:58:06 30 (min) Purpose code: 3
 LOG :3602.60 3604.18 1.56 Area code : 2
 FDEPTH: 134 117 GearCond.code:
 BDEPTH: 134 117 Validity code:
 Towing dir: 99e Wire out: 400 m Speed: 30 kn*10

Sorted: 97 Kg Total catch: 353.56 CATCH/HOUR: 707.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae, juvenile	390.78 12988	55.26	4945
Dentex angolensis	108.00 64	15.27	
Trichiurus lepturus	66.24 1240	9.37	
Brotula barbata	34.52 48	4.88	
Brachydeuterus auritus	25.38 162	3.59	
Synagrops microlepis	12.60 3268	1.78	
Zeus faber	12.48 52	1.76	
Todaropsis eblanae	10.98 378	1.55	
Dentex macrocephalus	10.80 54	1.53	
Umbrina canariensis	10.56 30	1.49	
Pontinus kuhlii	8.64 90	1.22	
Citharus linguatula	3.78 136	0.53	
Parapenaeus longirostris	3.24 640	0.46	
Merluccius polli, juveniles	2.52 208	0.36	
Uranoscopus polli	2.52 18	0.36	
Torpedo torpedo	1.96 2	0.28	
Sepiella ornata	1.26 10	0.18	
Lophius vaillanti	0.88 2	0.12	
Saurida brasiliensis	0.72 280	0.10	
Grammolites gruvelli	0.36 10	0.05	
Sardinella aurita	0.36 10	0.05	
Calappa polii	0.18 10	0.03	
Sepia orbignyana	0.18 10	0.03	
GOBIIDAE	0.18 226	0.03	
Total	709.12	100.28	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2159
 DATE:21/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1104 Long E 1344
 TIME :09:11:45 09:22:43 11 (min) Purpose code: 3
 LOG :3611.10 3611.59 0.48 Area code : 2
 FDEPTH: 69 66 GearCond.code:
 BDEPTH: 69 66 Validity code:
 Towing dir: 90e Wire out: 200 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 81.06 CATCH/HOUR: 442.15

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	385.09 8171	64.70	
Citharus linguatula	26.18 573	5.92	
Trachurus trecae, juvenile	25.91 1325	5.86	
Trichiurus lepturus	20.51 82	4.64	
Sepia orbignyana	11.73 398	2.65	
Sphyraena guachancho	10.25 16	2.32	
Pagellus bellottii	9.87 158	2.23	
Umbrina canariensis	9.82 136	2.22	
Galeoides decadactylus	7.09 11	1.60	
GOBIIDAE	5.18 1107	1.17	
Octopus vulgaris	4.91 5	1.11	
Dentex barnardi	4.36 16	0.99	
Brotula barbata	3.93 5	0.89	
Alloteuthis africana	1.91 616	0.43	
Raja miraletus	1.53 5	0.35	
Parapenaeus longirostris	1.36 218	0.31	
Pterothrissus belloci	1.36 82	0.31	
Dentex angolensis	1.09 71	0.25	
Chlorophthalmus atlanticus	1.09 5	0.25	
Fistularia petimba	1.09 5	0.25	
Pseudupeneus prayensis	0.82 27	0.19	
Zeus faber	0.82 16	0.19	
NAUIDAE	0.55 507	0.12	
Octopus sp.	0.55 16	0.12	
Sepiella ornata	0.55 55	0.12	
Todaropsis eblanae	0.55 27	0.12	
Saurida brasiliensis	0.55 180	0.12	
Engraulis encrasicolus	0.55 109	0.12	
ANTENNARIIDAE	0.33 11	0.07	
Peristedion sp.	0.27 44	0.06	
Total	440.80	99.68	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2160
 DATE:21/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1100 Long E 1350
 TIME :11:12:37 11:42:18 30 (min) Purpose code: 3
 LOG :3622.34 3624.02 1.66 Area code : 2
 FDEPTH: 27 22 GearCond.code:
 BDEPTH: 27 22 Validity code:
 Towing dir: 353e Wire out: 140 m Speed: 30 kn*10

Sorted: 235 Kg Total catch: 819.34 CATCH/HOUR: 1638.68

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chloroscombrus chrysurus	574.80 23580	35.08	
Sphyraena guachancho	230.00 520	14.04	
Rhinoptera marginata	217.16 16	13.25	
Selene dorsalis	129.60 6780	7.91	
Pseudolithus typus	113.76 192	6.94	4946
Galeoides decadactylus	69.60 160	4.25	
Brachydeuterus auritus	68.16 682	4.16	
Pomadasy jubelini	51.60 40	3.15	
Arius parkii	45.60 60	2.78	
Stromateus fiatola	17.04 28	1.04	
Alectis alexandrinus	16.80 60	1.03	
Lagocephalus laevigatus	10.80 40	0.66	
Pagellus bellottii	10.80 20	0.66	
Epinephelus aeneus	10.80 14	0.66	
Trichiurus lepturus	9.60 780	0.59	
Decapterus rhonchus	8.40 240	0.51	
Gymnura micrura	7.12 2	0.43	
Pomadasy incisus	6.80 20	0.41	
Atractoscion aequidens	6.00 60	0.37	
Trachurus trecae	4.80 360	0.29	
Perna notialis	4.80 180	0.29	
Sphyraena cowardi	4.12 2	0.25	
Dasyatis marmorata	4.04 2	0.25	
Pseudupeneus prayensis	3.60 60	0.22	
Sphyraena sphyraena	3.60 20	0.22	
MONACANTHIDAE	2.80 20	0.17	
Panulirus regius	2.44 4	0.15	
Rhizoprionodon acutus	1.64 2	0.10	
Sepiella ornata	1.20 120	0.07	
Grammolites gruvelli	1.20 60	0.07	
Total	1638.68	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2161
 DATE:21/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1056 Long E 1342
 TIME :13:11:59 13:41:33 30 (min) Purpose code: 3
 LOG :3634.90 3636.40 1.50 Area code : 2
 FDEPTH: 65 63 GearCond.code:
 BDEPTH: 65 63 Validity code:
 Towing dir: 350e Wire out: 200 m Speed: 30 kn*10

Sorted: 76 Kg Total catch: 3303.18 CATCH/HOUR: 6606.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	4527.36 42228	68.53	
Trichiurus lepturus	763.56 2214	11.56	
Stromateus fiatola	632.88 810	9.58	
Trachurus trecae	293.76 4536	4.45	
Chloroscombrus chrysurus	114.48 756	1.73	
Grammolites gruvelli	64.80 324	0.98	
Dentex barnardi	56.16 324	0.85	
Citharus linguatula	43.20 756	0.65	
Sphyraena guachancho	42.12 54	0.64	
Illex sp.	24.84 108	0.38	
Sphyraena sphyraena	18.36 54	0.28	
Fistularia petimba	16.20 54	0.25	
ANTENNARIIDAE	8.64 108	0.13	
Total	6606.36	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2162
 DATE:21/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1055 Long E 1333
 TIME :15:07:17 15:37:12 30 (min) Purpose code: 3
 LOG :3646.54 3648.09 1.55 Area code : 2
 FDEPTH: 128 123 GearCond.code:
 BDEPTH: 128 123 Validity code:
 Towing dir: 350e Wire out: 410 m Speed: 30 kn*10

Sorted: 97 Kg Total catch: 1453.54 CATCH/HOUR: 2907.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	1751.64 98354	60.25	
Trichiurus lepturus	436.92 1716	15.03	
Pagellus bellottii	252.12 2772	8.67	
Euthynnus alletteratus	91.08 66	3.13	
Brachydeuterus auritus	89.76 594	3.09	
Trachurus trecae, juvenile	52.80 2376	1.82	
Brotula barbata	30.76 16	1.06	
Atractoscion aequidens	29.04 132	1.00	
Dentex angolensis	27.32 100	0.94	4947
Dentex macrocephalus	23.36 114	0.80	4948
Umbrina canariensis	22.64 62	0.78	4949
Illex sp.	17.16 264	0.59	
Zeus faber	14.52 132	0.50	
Bembrops heterurus	13.20 198	0.45	
Uranoscopus polli	11.88 66	0.41	
Trigla lyra	7.92 66	0.27	
Scorpaena normani	7.92 66	0.27	
Pterothrissus belloci	7.92 132	0.27	
Saurida brasiliensis	5.28 1188	0.18	
Lagocephalus laevigatus	3.96 66	0.14	
Sepia officinalis hierredda	3.96 66	0.14	
Epinephelus sp.	2.88 2	0.10	
Monolene microstoma	1.32 66	0.05	
Raja miraletus	1.32 2	0.05	
Octopus vulgaris	0.40 2	0.01	
Total	2907.08	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2163
 DATE:21/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1056 Long E 1330
 TIME :16:40:07 17:10:21 30 (min) Purpose code: 3
 LOG :3654.43 3655.94 1.50 Area code : 2
 FDEPTH: 184 177 GearCond.code:
 BDEPTH: 184 177 Validity code:
 Towing dir: 330e Wire out: 560 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 280.26 CATCH/HOUR: 560.52

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	168.00 14572	29.97	
Merluccius polli, juveniles	99.84 2720	17.81	4950
Parapenaeus longirostris	70.08 15088	12.50	
Illex coincidii	62.72 896	11.19	
Zenopsis conchifer	44.80 736	7.99	
Brotula barbata	31.28 58	5.58	
Pterothrissus belloci	18.24 112	3.25	
Bembrops heterurus	9.28 144	1.66	
Monolene microstoma	8.96 528	1.60	
MYCTOPHIDAE	8.00 3808	1.43	
Todaropsis eblanae	7.04 16	1.26	
Sepia officinalis hierredda	6.08 720	1.08	
Dentex macrocephalus	5.24 22	0.93	
Chlorophthalmus atlanticus	5.12 752	0.92	
Pentheroscion mbizi	3.52 16	0.63	
Chelidonichthys gabonensis	3.52 32	0.63	
Trichiurus lepturus	2.56 32	0.46	
Dentex angolensis	1.68 2	0.34	
GOBIIDAE	1.28 496	0.23	
Calappa sp.	1.28 32	0.23	
Muraenesox bagio	0.64 16	0.11	
Lophius vaillanti	0.52 2	0.09	
Cubiceps sp.	0.32 16	0.06	
Squilla mantis	0.32 48	0.05	
Total	560.52	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2164
 DATE:21/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1056
 start stop duration
 TIME :19:04:14 19:34:07 30 (min) Purpose code: 3
 LOG :3662.14 3663.68 1.51 Area code : 2
 FDEPTH: 302 329 GearCond.code:
 BDEPTH: 302 329 Validity code:
 Towing dir: 310° Wire out: 800 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 165.70 CATCH/HOUR: 331.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli, juveniles	239.04	3372	72.13	4952
Laemonea laureysi	26.64	420	8.04	
Chlorophthalmus atlanticus	14.64	348	4.42	
Synagrops microlepis	11.28	612	3.40	
Pterothrissus bellocci	7.68	48	2.32	
Parapenaeus longirostris, fem.	5.52	696	1.67	4953
Illex coindetii	4.56	36	1.38	
Malacocephalus laevis	3.60	720	1.09	
MYCTOPHIDAE	3.24	2640	0.98	
Pontinus kuhlii	2.72	34	0.82	
Parapenaeus longirostris, male	2.40	264	0.72	4951
GALATHEIDAE *	2.16	3432	0.65	
Muraenesox bagio	1.68	60	0.51	
Bathymectes piperitus	1.44	24	0.43	
Coelorinchus coelorhincus	1.20	60	0.36	
POLYCHAELIDAE	0.84	48	0.25	
Solenocera africana	0.72	192	0.22	
Aristeus varidens	0.54	132	0.16	
Dicologlossa cuneata	0.24	12	0.07	
Etmopterus lucifer	0.24	60	0.07	
Dibranchus atlanticus	0.24	48	0.07	
Chaunax pictus	0.12	12	0.04	
Peristedion sp.	0.12	24	0.04	
Total	330.86		99.84	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2165
 DATE:21/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1053
 start stop duration
 TIME :22:06:48 22:37:09 30 (min) Purpose code: 3
 LOG :3679.48 3680.96 1.45 Area code : 2
 FDEPTH: 694 707 GearCond.code:
 BDEPTH: 694 707 Validity code:
 Towing dir: 310° Wire out:1800 m Speed: 30 kn*10

Sorted: 18 Kg Total catch: 119.85 CATCH/HOUR: 239.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lamprogrammus exutus	98.00	520	40.88	
Hoplostethus cadenati	51.60	1368	21.53	
Coelorinchus coelorhincus	17.20	340	7.18	
Illex sp.	16.40	80	6.84	
Yarrella blackfordi	15.20	34	6.34	
Bathyroconger vicinus	10.00	280	4.17	
Photonetes braueri	5.20	120	2.17	
Talismania bifurcata	4.80	140	2.00	
Nematocarcinus africanus	4.40	1560	1.84	
Etmopterus pusillus	4.00	40	1.67	
Triplophus hemingi	3.60	400	1.50	
Merluccius polli	1.88	2	0.78	
POLYCHAELIDAE	1.60	60	0.67	
Chaceon maritae	1.28	8	0.53	
OPHIDIIDAE	1.20	140	0.50	
Dibranchus atlanticus	1.20	20	0.50	
Chauliodus sloani	1.20	40	0.50	
Isistius brasiliensis	0.54	2	0.23	
Glyphus marsupialis	0.40	20	0.17	
Total	239.70		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2166
 DATE:22/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1046
 start stop duration
 TIME :02:46:11 03:16:14 30 (min) Purpose code: 3
 LOG :3707.17 3708.49 1.31 Area code : 2
 FDEPTH: 654 643 GearCond.code:
 BDEPTH: 654 643 Validity code:
 Towing dir: 330° Wire out:1600 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 129.76 CATCH/HOUR: 259.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	127.80	27960	49.24	
Lamprogrammus exutus	37.20	110	14.33	
Hoplostethus cadenati	24.00	680	9.25	
Photonetes braueri	20.60	430	7.94	
Yarrella blackfordi	13.80	420	5.32	
Benthodesmus tenuis	5.60	170	2.16	
Triplophus hemingi	5.00	570	1.93	
Illex sp.	4.60	20	1.77	
Bathyroconger vicinus	4.40	220	1.70	
POLYCHAELIDAE	3.40	300	1.31	
OPHIDIIDAE	2.40	270	0.92	
Coelorinchus coelorhincus	2.20	30	0.85	
Merluccius polli	1.56	2	0.60	
Centroscymnus obscurus	1.40	10	0.54	
Etmopterus lucifer	1.40	20	0.54	
RAJIDAE	1.32	2	0.51	
Chaceon maritae	1.24	4	0.48	
Talismania bifurcata	0.80	30	0.31	
Dibranchus atlanticus	0.40	20	0.15	
Chauliodus sloani	0.20	20	0.08	
Aristeus varidens	0.20	10	0.08	
Total	259.52		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2167
 DATE:22/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1047
 start stop duration
 TIME :05:45:03 06:15:28 30 (min) Purpose code: 3
 LOG :3721.09 3722.49 1.38 Area code : 2
 FDEPTH: 263 263 GearCond.code:
 BDEPTH: 263 263 Validity code:
 Towing dir: 140° Wire out: 600 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 1961.34 CATCH/HOUR: 3922.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	1332.08	28854	33.98	
Synagrops microlepis	947.52	62622	24.15	
Merluccius polli, juveniles	856.80	17010	21.84	4954
Zenopsis conchifer	287.28	504	7.32	
Dentex macrophthalmus	282.24	1638	7.20	4555
Todaropsis eblanae	52.92	630	1.35	
Pterothrissus bellocci	51.36	378	1.31	
Parapenaeus longirostris, fem.	30.24	6804	0.77	
Ophisurus serpens	19.20	60	0.49	
Parapenaeus longirostris, male	17.64	2646	0.45	
Pontinus kuhlii	17.64	126	0.45	
Coelorinchus coelorhincus	12.60	252	0.32	
Sepia officinalis hierredda	7.56	378	0.19	
Bembrops heterurus	7.56	126	0.19	
Lagocephalus laevigatus	5.04	126	0.13	
Total	3928.68		100.14	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2168
 DATE:22/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1045
 start stop duration
 TIME :07:55:53 08:26:04 30 (min) Purpose code: 3
 LOG :3731.33 3732.76 1.42 Area code : 2
 FDEPTH: 116 107 GearCond.code:
 BDEPTH: 116 107 Validity code:
 Towing dir: 20° Wire out: 320 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 235.96 CATCH/HOUR: 471.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	123.36	5592	26.14	4956
Saurida brasiliensis	68.16	13308	14.44	
Brachydeuterus auritus	48.12	312	10.20	
Dentex macrophthalmus	30.96	192	6.56	
Dentex angolensis	30.00	120	6.36	
Sepia orbignyana	28.32	276	6.00	
Raja miraletus	19.44	30	4.12	
Uranoscopus polli	16.08	96	3.41	
Citharus linguatula	13.20	420	2.80	
Stromateus fiatola	11.92	14	2.53	
Pagellus bellottii	10.32	84	2.19	
Trichiurus lepturus	9.56	22	2.03	
Pontinus accraensis	7.68	60	1.63	
Zeus faber	7.68	36	1.63	
Chelidichthys gabonensis	7.20	60	1.53	
Squatina oculata	7.00	4	1.48	
Selene dorsalis	6.36	12	1.35	
Peristedion sp.	4.32	96	0.92	
Illex coindetii	3.84	132	0.81	
Todaropsis eblanae	3.36	120	0.71	
Pentheroscion mbiri	2.88	12	0.61	
Lagocephalus laevigatus	2.64	48	0.56	
Octopus vulgaris	2.40	12	0.51	
Chelidichthys capensis	1.92	12	0.41	
Fistularia petimba	1.60	6	0.34	
Pterothrissus bellocci	1.20	24	0.25	
Boops boops	0.96	60	0.26	
Torpedo torpedo	0.88	2	0.19	
Lophius vaillanti	0.44	2	0.09	
Monolele microstoma	0.12	12	0.03	
Total	471.92		100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2169
 DATE:22/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1047
 start stop duration
 TIME :10:15:32 10:45:09 30 (min) Purpose code: 3
 LOG :3743.64 3745.12 1.49 Area code : 2
 FDEPTH: 78 78 GearCond.code:
 BDEPTH: 78 78 Validity code:
 Towing dir: 150° Wire out: 210 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 533.26 CATCH/HOUR: 1066.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	977.84	1802	91.69	
Stromateus fiatola	26.12	38	2.45	
Chloroscombrus chrysurus	13.60	68	1.28	
Pomadoury jubelini	8.12	10	0.76	
Selene dorsalis	5.44	34	0.51	
Atractoscion aequidens	5.44	34	0.51	
Brachydeuterus auritus	5.44	34	0.51	
Trachurus trecae, juvenile	4.76	170	0.45	
Citharus linguatula	4.76	68	0.45	
Umbrina canariensis	3.40	34	0.32	
Brotula barbata	2.76	4	0.26	
Raja miraletus	2.00	6	0.19	
Decapterus rhonchus	1.72	2	0.16	
Pagellus bellottii	0.72	6	0.07	
Hyperoglyphe moselii	0.68	2	0.06	
Lagocephalus laevigatus	0.48	2	0.05	
Scorpaena normani	0.44	4	0.04	
Peristedion cataphractum	0.44	10	0.04	
Chaetodon hoefleri	0.40	2	0.04	
Dentex angolensis	0.36	6	0.03	
Total	1066.52		99.87	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2170
 DATE:22/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1046 Long E 1342
 start stop duration
 TIME :12:00:20 12:30:07 30 (min) Purpose code: 3
 LOG :3752.43 3753.84 1.37 Area code : 2
 FDEPTH: 38 42 GearCond.code:
 BDEPTH: 38 42 Validity code:
 Towing dir: 350e Wire out: 170 m Speed: 30 km*10
 Sorted: 121 Kg Total catch: 722.13 CATCH/HOUR: 1444.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	621.92	55684	43.06	
Galeoides decadactylus	277.84	760	19.24	
Pseudotolithus typus	115.34	394	7.99	4957
Atractoscion aeguidens	78.66	116	5.45	
Chloroscombrus chrysurus	76.36	576	5.29	
Pomadoury rogeri	65.32	162	4.52	
Trichiurus lepturus	58.58	172	4.06	
Pteroscion peli	32.66	80	2.26	
Epinephelus aeneus	23.24	12	1.61	
Sphyræna guachancho	16.10	58	1.11	
Selene dorsalis	15.64	460	1.08	
Rhinobatos albomaculatus	10.56	4	0.73	
Dentex barnardi	8.28	150	0.57	
Citharus linguatula	7.36	208	0.51	
Dicologlossa cuneata	6.90	92	0.48	
Torpedo marmorata	6.28	8	0.43	
Raja miraletus	4.60	4	0.32	
Gymnura micrura	4.48	2	0.31	
Trachurus trecae, juvenile	3.68	184	0.25	
Pagellus bellottii	3.46	34	0.24	
Ephippion guttifer	3.24	2	0.22	
Grammolites gruvelli	2.76	46	0.19	
Dasyatis margarita	2.54	12	0.18	
Sardinella maderensis	2.08	24	0.14	
Chilomycterus spinosus mauret.	1.20	4	0.08	
Penaeus notialis	0.46	24	0.03	
Total	1449.54		100.35	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2171
 DATE:22/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1037 Long E 1335
 start stop duration
 TIME :14:23:56 14:53:32 30 (min) Purpose code: 3
 LOG :3767.86 3769.05 1.18 Area code : 2
 FDEPTH: 51 47 GearCond.code:
 BDEPTH: 51 47 Validity code:
 Towing dir: 360e Wire out: 190 m Speed: 30 km*10
 Sorted: 54 Kg Total catch: 374.00 CATCH/HOUR: 748.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	332.42	6930	44.44	
Trichiurus lepturus	122.66	458	16.40	
Lagocephalus laevigatus	95.06	44	12.71	
Trachurus trecae, juvenile	64.40	5964	8.61	
Sphyræna guachancho	28.82	44	3.85	
Dentex barnardi	19.62	352	2.62	4959
Raja miraletus	17.56	22	2.35	
Pagellus bellottii	15.94	274	2.13	4958
Torpedo marmorata	7.98	14	1.07	
Chloroscombrus chrysurus	7.66	44	1.02	
Cynoglossus canariensis	7.52	30	1.01	
Pseudupeneus prayensis	6.74	136	0.90	
Pseudotolithus typus	6.68	8	0.89	
Selene dorsalis	6.14	106	0.82	
Galeoides decadactylus	4.90	14	0.66	
Citharus linguatula	1.84	30	0.25	
Torpedo torpedo	1.54	14	0.21	
Epinephelus aeneus	1.16	2	0.16	
Decapterus rhonchus	0.92	14	0.12	
Total	749.56		100.22	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2172
 DATE:22/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1038 Long E 1329
 start stop duration
 TIME :15:00:31 16:40:39 30 (min) Purpose code: 3
 LOG :3777.60 3778.96 1.32 Area code : 2
 FDEPTH: 83 78 GearCond.code:
 BDEPTH: 83 78 Validity code:
 Towing dir: 350e Wire out: 270 m Speed: 30 km*10
 Sorted: 54 Kg Total catch: 204.81 CATCH/HOUR: 409.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	179.48	1764	43.82	
Trachurus trecae, juvenile	89.32	4200	21.81	4961
Trichiurus lepturus	39.64	64	9.68	
Dentex angolensis	24.36	238	5.95	4960
Pagellus bellottii	9.80	134	2.39	
Lagocephalus laevigatus	9.52	14	2.32	
Citharus linguatula	8.68	210	2.12	
Raja miraletus	6.36	10	1.55	
Penthoroscion mbihi	5.88	56	1.44	
Allotauhis africana	5.32	2324	1.30	
Chelidonichthys gabonensis	4.20	28	1.03	
Dicologlossa cuneata	3.92	28	0.96	
Zeus faber	3.92	14	0.96	
Brotula barbata	3.52	8	0.86	
Selene dorsalis	3.08	28	0.75	
Umbra canariensis	2.80	28	0.68	
Chelidonichthys capensis	2.24	14	0.55	
Octopus vulgaris	2.12	4	0.52	
Dentex barnardi	1.54	28	0.38	
Scorpaena noronhai	1.40	14	0.34	
Pseudupeneus prayensis	1.12	28	0.27	
Saurida brasiliensis	0.56	154	0.14	
Boops boops	0.56	42	0.14	
Bemdrops heterurus	0.28	14	0.07	
Total	409.62		100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2173
 DATE:22/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1040 Long E 1313
 start stop duration
 TIME :19:19:54 19:50:09 30 (min) Purpose code: 3
 LOG :3797.25 3798.70 1.45 Area code : 2
 FDEPTH: 352 334 GearCond.code:
 BDEPTH: 352 334 Validity code:
 Towing dir: 140e Wire out: 800 m Speed: 30 km*10
 Sorted: 40 Kg Total catch: 121.04 CATCH/HOUR: 242.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli, juveniles	63.84	712	26.37	4962
Laemonea laureysi	52.16	680	21.55	
Synagrops microlepis	47.68	2784	19.70	
Merluccius polli	21.36	80	8.62	4963
Chlorophthalmus atlanticus	9.76	192	4.03	
Malacocephalus occidentalis	9.12	80	3.77	
Pterothrissus belloci	8.32	40	3.44	
GALATHEIDAE *	5.76	936	2.38	
Malacocephalus laevis	5.28	840	2.18	
Parapanaeus longirostris	4.00	536	1.65	
Gephyroberyx darwini	2.92	4	1.21	
Aristeus varidens	1.92	184	0.79	
Gadella imberbis	1.60	40	0.66	
Illex coindetii	1.60	16	0.66	
MYCTOPHIDAE	1.28	1120	0.53	
Bathymectes piperitus	1.28	24	0.53	
Zenopsis conchifer	1.08	2	0.45	
Coeleorhynchus coeleorhynchus	0.80	24	0.33	
Chaunax pictus	0.48	24	0.20	
Nematocarcinus africanus	0.48	224	0.20	
POLYCHAETIDAE	0.40	32	0.17	
Peristedion sp.	0.32	72	0.13	
Helicolenus dactylopterus	0.16	24	0.07	
Halosaurus ovenii	0.16	8	0.07	
NETTASTOMATIDAE	0.16	8	0.07	
Solenocera africana	0.16	48	0.07	
GONEPLACIDAE	0.08	24	0.03	
Total	242.16		100.06	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2174
 DATE:22/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1039 Long E 1311
 start stop duration
 TIME :21:12:59 21:43:42 31 (min) Purpose code: 3
 LOG :3803.68 3805.35 1.64 Area code : 2
 FDEPTH: 376 372 GearCond.code:
 BDEPTH: 376 372 Validity code:
 Towing dir: 320e Wire out:1000 m Speed: 30 km*10
 Sorted: 48 Kg Total catch: 47.72 CATCH/HOUR: 92.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	26.25	89	28.42	4965
Nematocarcinus africanus	24.08	6978	26.07	
Merluccius polli, juveniles	16.30	209	17.65	4964
Laemonea laureysi	7.74	79	8.38	
Malacocephalus laevis	4.28	819	4.63	
Synagrops microlepis	3.43	207	3.71	
Parapanaeus longirostris	1.70	192	1.84	
Epigonus telescopus	1.47	15	1.59	
Pterothrissus belloci	1.43	8	1.55	
Malacocephalus occidentalis	1.32	12	1.43	
Helicolenus dactylopterus	1.05	2	1.14	
Yarrella blackfordi	0.97	17	1.05	
Aristeus varidens	0.56	64	0.61	
Illex coindetii	0.39	2	0.42	
Solenocera africana	0.29	14	0.31	
GALATHEIDAE *	0.29	50	0.31	
Raja miraletus	0.19	2	0.21	
MYCTOPHIDAE	0.14	221	0.15	
NETTASTOMATIDAE	0.08	2	0.09	
Bathymectes piperitus	0.08	4	0.09	
Gadella imberbis	0.08	4	0.09	
Octopus sp.	0.08	2	0.09	
Chlorophthalmus atlanticus	0.08	4	0.09	
Coeleorhynchus coeleorhynchus	0.08	2	0.09	
Halosaurus ovenii	0.04	2	0.04	
Total	92.40		100.05	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2175
 DATE:22/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1038 Long E 1307
 start stop duration
 TIME :23:24:37 23:54:21 30 (min) Purpose code: 3
 LOG :3812.34 3813.76 1.39 Area code : 2
 FDEPTH: 587 604 GearCond.code:
 BDEPTH: 587 604 Validity code:
 Towing dir: 160e Wire out:1500 m Speed: 30 km*10
 Sorted: 14 Kg Total catch: 69.30 CATCH/HOUR: 138.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	58.96	21054	42.54	
Photichthys argenteus	20.90	990	15.08	
Photichthys argenteus	12.32	286	8.89	
Lamprogrammus exultans	10.34	164	7.46	
Yarrella blackfordi	10.34	242	7.46	
Hoplostethus cadenati	5.94	158	4.29	
Triplophus heningi	3.74	572	2.70	
Trichiurus lepturus	2.64	164	1.90	
POLYCHAETIDAE	2.64	384	1.90	
Aristeus varidens	2.42	166	1.75	
Lophodes kempii	1.96	4	1.41	
OPHIDIIDAE	1.76	220	1.27	
Trachyrhynchus scabratus	1.32	10	0.95	
Plesionika maris	1.22	384	0.88	
Chauliodon sloani	0.66	44	0.48	
Xenodermichthys copei	0.44	44	0.32	
Bathymococcus vicinus	0.44	22	0.32	
Coeleorhynchus coeleorhynchus	0.44	10	0.32	
RAJIDAE	0.12	2	0.09	
Total	138.60		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2176
 DATE:23/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1038
 start stop duration Long E 1304
 TIME :01:23:00 01:53:00 30 (min) Purpose code: 3
 LOG :3818.00 3819.40 1.40 Area code : 2
 FDEPTH: 697 708 GearCond.code:
 BDEPTH: 697 708 Validity code:
 Towing dir: 340e Wire out:1750 m Speed: 30 kn*10
 Sorted: 15 Kg Total catch: 75.85 CATCH/HOUR: 151.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Photonetes braueri	25.80	490	17.01
Yarella blackfordi	19.60	520	12.92
C E P H A L O P O D A	15.90	90	10.48
Coelorrhinus coelorrhinus	13.60	260	8.97
POLYCHAETIDAE	11.80	760	7.78
Dibranchius atlanticus	9.00	300	5.93
OPHICHTHIDAE	7.40	260	4.88
Lamprogrammus exutus	6.80	20	4.48
Hoplostethus cadonati	6.20	160	4.09
Benthodesmus tenuis	5.80	160	3.82
Triplophus hemingi	4.80	410	3.16
OPHIDIIDAE	4.60	180	3.03
Trichiurus lepturus	3.80	160	2.50
Mystriophis rostellatus	3.80	50	2.50
Etmopterus lucifer	2.60	20	1.71
Talimania bifurcata	2.20	40	1.45
Aristeus varidensis, female	1.60	80	1.05
Chaceon maritae	1.20	10	0.79
Nematocarcinus africanus	1.20	120	0.79
Hoplostethus melanopus	0.80	10	0.53
Glyphus marsupialis	0.80	20	0.53
Centrocygnus obscurus	0.80	2	0.53
RAJIDAE	0.60	10	0.40
Chauliodus sloani	0.60	30	0.40
Xenodermichthys copei	0.40	10	0.26
Total	151.70		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2177
 DATE:23/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1035
 start stop duration Long E 1312
 TIME :05:48:12 06:19:14 31 (min) Purpose code: 3
 LOG :3834.79 3836.47 1.63 Area code : 2
 FDEPTH: 174 185 GearCond.code:
 BDEPTH: 174 185 Validity code:
 Towing dir: 320e Wire out: 500 m Speed: 30 kn*10
 Sorted: 51 Kg Total catch: 51.44 CATCH/HOUR: 99.56

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trichiurus lepturus	79.43	116	79.78
Synagrops microlepis	7.08	1053	7.11
Raja miraletus	3.33	6	3.34
Umbrina canariensis	3.25	8	3.26
Zenopsis conchifer	2.44	6	2.45
Brotula barbata	2.32	4	2.33
Torpedo torpedo	1.05	2	1.05
Dentex macropthalmus	0.43	2	0.43
Citharus linguatula	0.23	8	0.23
Illex coindetii	0.19	2	0.19
Total	99.75		100.17

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2178
 DATE:23/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1031
 start stop duration Long E 1318
 TIME :07:42:27 07:53:59 12 (min) Purpose code: 3
 LOG :3845.89 3846.39 0.49 Area code : 2
 FDEPTH: 105 101 GearCond.code: 9
 BDEPTH: 105 101 Validity code: 1
 Towing dir: 60e Wire out: 300 m Speed: 30 kn*10
 Sorted: 7 Kg Total catch: 6.90 CATCH/HOUR: 34.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Chelidonichthys gabonensis	10.40	75	30.14
Citharus linguatula	6.80	255	19.71
Dentex angolensis	4.20	40	12.17
Saurida brasiliensis	3.20	600	9.28
Sepia orbignyana	2.20	40	6.38
Peristedion sp.	1.80	35	5.22
Pagellus bellottii	1.60	20	4.64
Chelidonichthys capensis	1.50	10	4.35
Lagocephalus laevigatus	0.90	10	2.61
Trachurus trecae, juvenile	0.80	35	2.32
Uranoscopus polli	0.50	5	1.45
Sepia officinalis hierredda	0.30	15	0.87
Alloteuthis africana	0.20	55	0.58
Merluccius polli, juveniles	0.10	5	0.29
Total	34.50		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2179
 DATE:23/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1024
 start stop duration Long E 1330
 TIME :09:57:58 10:29:45 32 (min) Purpose code: 3
 LOG :3861.47 3863.04 1.53 Area code : 2
 FDEPTH: 24 34 GearCond.code:
 BDEPTH: 24 34 Validity code:
 Towing dir: 258e Wire out: 80 m Speed: 30 kn*10
 Sorted: 18 Kg Total catch: 18.28 CATCH/HOUR: 34.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Panulirus regius	7.01	8	20.45
Brachydeuterus auritus	5.70	51	16.63
Sphyrna couardi	4.39	2	12.51
Pagellus bellottii	3.45	6	10.06
Leptocharias smithii	2.18	2	6.36
Chloroscombrus chrysurus	2.03	13	5.92
Alectis alexandrinus	1.50	4	4.38
Sepia officinalis hierredda	1.39	4	4.05
Torpedo torpedo	1.31	4	3.82
Cynoglossus canariensis	1.16	4	3.38
Sphyrna guachancho	0.86	4	2.51
Pagellus bellottii	0.83	6	2.42
Trachurus trecae, juvenile	0.64	43	1.87
Zeus faber	0.53	2	1.55
Eucinostomus melanopterus	0.41	4	1.20
Chelidonichthys gabonensis	0.23	2	0.67
Citharus linguatula	0.23	8	0.67
Remora australis	0.11	2	0.32
Sepiella ornata	0.11	11	0.32
Selene dorsalis	0.11	4	0.32
Saurida brasiliensis	0.08	8	0.23
GOBIIDAE	0.08	19	0.23
Sardinella aurita	0.04	2	0.12
Total	34.38		100.29

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2180
 DATE:23/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1026
 start stop duration Long E 1325
 TIME :11:30:10 12:00:14 30 (min) Purpose code: 3
 LOG :3859.63 3870.93 1.29 Area code : 2
 FDEPTH: 61 58 GearCond.code:
 BDEPTH: 61 58 Validity code:
 Towing dir: 350e Wire out: 210 m Speed: 30 kn*10
 Sorted: 70 Kg Total catch: 337.72 CATCH/HOUR: 675.44

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trachurus trecae, juvenile	273.80	13210	40.54
Pagellus bellottii	225.00	10100	31.31
Pegusa lascaris	63.80	20	9.45
Dentex barnardi	43.80	1040	6.48
Pseudupeneus prayensis	16.40	680	2.72
Citharus linguatula	16.60	710	2.46
Dentex angolensis	8.80	150	1.30
Sepia officinalis hierredda	4.40	40	0.65
Sphyrna sphyraena	2.40	30	0.36
Cynoglossus canariensis	2.40	16	0.36
Brachydeuterus auritus	2.20	20	0.33
Scomberomorus tritor	2.12	2	0.31
Sardinella aurita	2.00	60	0.30
Grammolites gruvelli	1.60	30	0.24
Umbrina canariensis	1.12	2	0.17
Lagocephalus laevigatus	1.00	10	0.15
Boops boops	1.00	60	0.15
Panulirus regius	0.92	2	0.14
Octopus vulgaris	0.88	2	0.13
Armoglossus imperialis	0.80	80	0.12
Serranus cabrilla	0.80	20	0.12
Fistularia petimba	0.40	20	0.06
ANTENNARIIDAE	0.24	2	0.04
Total	674.48		99.89

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2181
 DATE:23/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1029
 start stop duration Long E 1311
 TIME :14:04:22 14:34:27 30 (min) Purpose code: 3
 LOG :3887.02 3888.40 1.37 Area code : 2
 FDEPTH: 124 123 GearCond.code:
 BDEPTH: 124 122 Validity code:
 Towing dir: 340e Wire out: 390 m Speed: 30 kn*10
 Sorted: 70 Kg Total catch: 300.24 CATCH/HOUR: 600.48

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trigla lyra	247.80	2050	41.27
Dentex angolensis	214.00	1520	35.64
Dentex macropthalmus	42.08	230	7.01
Pagellus bellottii	20.80	70	3.46
Raja miraletus	11.96	26	1.99
Peristedion cataphractum	11.00	230	1.83
Zeus faber	9.80	40	1.63
Sepia officinalis hierredda	8.40	70	1.40
Citharus linguatula	8.00	180	1.33
Illex coindetii	4.80	80	0.80
Squatina aculeata	4.68	2	0.78
Arius parkii	2.36	2	0.39
Branchiostegus semifasciatus	2.00	2	0.33
Zenopsis conchifer	1.80	10	0.30
Trichiurus lepturus	1.64	2	0.27
Torpedo marmorata	1.60	10	0.27
Brotula barbata	1.44	2	0.24
Lagocephalus laevigatus	1.40	10	0.23
Aranoscopus polli	1.20	10	0.20
Uranoscopus polli	1.20	30	0.20
Trachurus trecae, juvenile	0.60	30	0.10
Pseudupeneus prayensis	0.60	10	0.10
Monolele microstoma	0.40	10	0.07
Grammolites gruvelli	0.20	10	0.03
Total	599.76		99.87

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2182
 DATE:23/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1029
 start stop duration Long E 1308
 TIME :15:48:41 16:20:26 32 (min) Purpose code: 3
 LOG :3894.43 3895.93 1.48 Area code : 2
 FDEPTH: 175 170 GearCond.code:
 BDEPTH: 175 170 Validity code:
 Towing dir: 335e Wire out: 560 m Speed: 30 kn*10
 Sorted: 164 Kg Total catch: 620.44 CATCH/HOUR: 1163.33

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Synagrops microlepis	842.40	134355	72.41
Dentex angolensis	130.24	405	11.20
Zenopsis conchifer	47.29	122	4.07
Dentex macropthalmus	35.85	171	3.08
Brotula barbata	32.66	45	2.81
Illex coindetii	12.68	122	1.09
Umbrina canariensis	12.64	28	1.09
Pontinus accraensis	11.21	24	0.95
Scorpaena normani	9.45	60	0.81
Trichiurus lepturus	8.78	49	0.75
Hexanchus vitulus	7.84	8	0.67
Uranoscopus polli	5.78	2	0.50
Uranoscopus polli	4.39	24	0.38
Torpedo torpedo	1.31	2	0.11
Citharus linguatula	0.49	49	0.94
Raja miraletus	0.45	2	0.04
Total	1163.46		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2183
 DATE:23/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1028 Long E 1306
 start stop duration
 TIME :17:27:00 17:57:00 30 (min) Purpose code: 3
 LOG :3900.20 3901.90 1.69 Area code : 2
 FDEPTH: 227 221 GearCond.code:
 BDEPTH: 227 221 Validity code:
 Towing dir: 335e Wire out: 600 m Speed: 30 kn*10
 Sorted: 51 Kg Total catch: 98.49 CATCH/HOUR: 196.98

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dentex angolensis	34.72	94	17.63 4974
Synagrops microlepis	34.16	1372	17.34
Dentex macrophthalmus	29.32	152	14.88 4973
Pterothrissus belloni	14.84	140	7.53
Bembrops heterurus	14.00	182	7.11
Spicara alta	9.80	28	4.98
Trichurus lepturus	7.40	4	3.76
Uranoscopus polli	6.72	56	3.41
Trigla lyra	5.88	42	2.99
Torpedo torpedo	5.80	10	2.94
Monolene microstoma	4.90	98	2.49
Zenopsis conchifer	3.84	36	1.95
Peristedion sp.	3.08	98	1.56
Brotula barbata	2.88	4	1.46
Coelorinchus coelorhincus	2.80	98	1.42
Merluccius polli	2.28	10	1.16
Malacocephalus laevis	2.24	42	1.14
Sepia officinalis hierredda	2.24	84	1.14
MYCTOPHIDAE	2.24	476	1.14
Lestidium atlanticum	2.24	84	1.14
Chlorophthalmus atlanticus	1.40	42	0.71
Calappa rubroguttata	1.40	28	0.71
Solenocera africana	1.12	98	0.57
Squilla mantis	0.84	14	0.43
Citharus linguatula	0.84	14	0.43
Total	196.98		100.02

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2186
 DATE:24/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1029 Long E 1300
 start stop duration
 TIME :23:58:17 00:28:23 30 (min) Purpose code: 3
 LOG :3926.52 3927.97 1.42 Area code : 2
 FDEPTH: 518 528 GearCond.code:
 BDEPTH: 518 528 Validity code:
 Towing dir: 330e Wire out:1300 m Speed: 30 kn*10
 Sorted: 26 Kg Total catch: 50.72 CATCH/HOUR: 101.44

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Plesionika martia	38.64	1280	38.09
Yarellia blackfordi	16.96	484	16.72
Benthodesmus tenuis	14.40	30	14.20
Dibranchius atlanticus	6.32	484	6.23
Photonetes braueri	3.36	76	3.31
Lophius vaillanti	2.92	4	2.88
Lamprogrammus exotus	2.40	104	2.37
C E P H A L O P O D A	2.08	18	2.05
Xenodermichthys copei	2.08	292	2.05
Chaeoon maritae	1.92	6	1.81
Triplophus hemingi	1.92	244	1.89
Aristeus varidensis, female	1.84	108	1.81
Hoplostethus cadenati	1.76	72	1.74
Aristeus varidensis, male	1.28	56	1.26
POLYCHALIDAE	0.80	80	0.79
Centroscymnus obscurus	0.52	4	0.51
Etmopterus lucifer	0.48	8	0.47
Gadella imberbis	0.40	18	0.39
Bathymectes piperitus	0.32	4	0.32
Laemonema laureysi	0.32	18	0.32
OPHIDIIDAE	0.24	24	0.24
Nemichthys scolopaceus	0.24	8	0.24
Peristedion cataphractum	0.08	18	0.08
Halosaurus ovenii	0.08	4	0.08
Hymenocephalus italicus	0.08	8	0.08
Total	101.44		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2184
 DATE:23/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1029 Long E 1305
 start stop duration
 TIME :19:46:57 20:17:26 30 (min) Purpose code: 3
 LOG :3911.24 3912.74 1.46 Area code : 2
 FDEPTH: 314 311 GearCond.code:
 BDEPTH: 314 311 Validity code:
 Towing dir: 320e Wire out: 850 m Speed: 30 kn*10
 Sorted: 46 Kg Total catch: 533.54 CATCH/HOUR: 1067.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Chlorophthalmus atlanticus	760.32	16448	71.25
Synagrops microlepis	71.68	3584	6.72
Lagocephalus laevigatus	69.12	928	6.48
Malacocephalus occidentalis	34.56	288	3.24
Pontinus kuhlii	33.28	416	3.12
Gephyroberyx darwini	24.08	36	2.26
Merluccius polli, juveniles	15.36	256	1.44
Illex coindettii	10.88	64	1.02
Chaeoon maritae	8.96	32	0.84
Parapenaeus longirostris	8.32	1376	0.78
Ophidurus serpens	6.40	32	0.60
Pterothrissus belloni	6.40	32	0.60
Aristeus varidensis	3.84	384	0.36
MYCTOPHIDAE	3.20	2464	0.30
Trigla lyra	2.04	6	0.19
Dibranchius atlanticus	1.92	96	0.18
Gadella imberbis	1.92	32	0.18
POLYCHALIDAE	1.28	64	0.12
GALATHEIDAE	1.28	192	0.12
Coelorinchus coelorhincus	1.28	64	0.12
Peristedion sp.	0.64	64	0.06
Solenocera africana	0.32	32	0.03
Total	1067.08		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2187
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1013 Long E 1325
 start stop duration
 TIME :01:41:03 06:11:24 30 (min) Purpose code: 3
 LOG :3963.09 3964.23 1.15 Area code : 2
 FDEPTH: 24 21 GearCond.code:
 BDEPTH: 24 21 Validity code:
 Towing dir: 340e Wire out: 80 m Speed: 30 kn*10
 Sorted: 31 Kg Total catch: 41.18 CATCH/HOUR: 82.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Erachydeuterus auritus	63.56	21354	75.96
Pagellus bellottii	3.44	40	4.18
Lagocephalus laevigatus	3.08	14	3.74
Sphyrna couardi	2.32	2	2.82
Selene dorsalis	1.72	78	2.09
Sphyrna guanchancho	1.72	26	2.09
Dentex barnardi	1.40	22	1.70
Decapterus rhonchus	1.16	38	1.41
Peristedion sp.	1.04	30	1.26
Pertunus validus	0.84	2	1.02
Panaeus notialis	0.80	6	0.97
Eucinostomus melanopterus	0.56	4	0.68
Sardinella maderensis	0.44	12	0.53
Alectis alexandrinus	0.32	4	0.39
Ophidurus serpens	0.24	2	0.29
Uranoscopus polli	0.16	2	0.19
Chlorophthalmus atlanticus	0.04	6	0.05
Epinephelus aeneus	0.04	2	0.05
Total	81.88		99.42

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2185
 DATE:23/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 1028 Long E 1301
 start stop duration
 TIME :22:03:14 22:33:03 30 (min) Purpose code: 3
 LOG :3920.13 3921.61 1.47 Area code : 2
 FDEPTH: 432 439 GearCond.code:
 BDEPTH: 432 439 Validity code:
 Towing dir: 160e Wire out:1050 m Speed: 30 kn*10
 Sorted: 37 Kg Total catch: 115.80 CATCH/HOUR: 231.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Hymenocephalus italicus	80.80	6270	34.89
Dibranchius atlanticus	33.00	2290	14.25
Plesionika martia	19.60	40	8.46
Merluccius polli	16.36	32	7.06 4975
Laemonema laureysi	14.00	160	6.04
Etmopterus lucifer	11.20	270	4.84
Chaeoon maritae	9.60	38	4.15
B I V A L V E S	8.28	34	3.58
Lophius vaillanti	7.80	10	3.37
C E P H A L O P O D A	6.80	40	2.94
Aristeus varidensis, female	5.80	200	2.50
Coelorinchus coelorhincus	5.40	120	2.33
Benthodesmus tenuis	5.40	220	2.33
Chaunax pictus	2.20	80	0.95
RAJIDAE	1.00	20	0.43
Aristeus varidensis, male	0.80	110	0.35
Halosaurus ovenii	0.60	40	0.26
CONGRIDAE	0.60	30	0.26
ANGUILLIFORMES	0.60	10	0.26
Peristedion cataphractum	0.40	70	0.17
Bathymectes piperitus	0.40	20	0.17
Coloconger cadenati	0.40	10	0.17
POLYCHALIDAE	0.20	20	0.09
Total	231.24		99.85

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2188
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1013 Long E 1319
 start stop duration
 TIME :07:17:46 07:48:20 31 (min) Purpose code: 3
 LOG :3971.43 3972.83 1.38 Area code : 2
 FDEPTH: 53 62 GearCond.code:
 BDEPTH: 53 62 Validity code:
 Towing dir: 250e Wire out: 150 m Speed: 30 kn*10
 Sorted: 73 Kg Total catch: 621.92 CATCH/HOUR: 1203.72

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Brachydeuterus auritus	709.55	16548	58.95
Trachurus trecae, juvenile	181.94	8439	15.11 4977
Sphyrna guanchancho	129.68	348	10.77
Pagellus bellottii	56.90	1665	4.73 4976
Pseudupeneus prayensis	21.29	774	1.77
Citharus linguatula	15.10	542	1.25
Dentex barnardi	13.55	387	1.13
Alloteuthis africana	10.45	2884	0.87
Sepia orbignyana	10.06	58	0.84
Raja miraletus	8.94	14	0.74
Cynoglossus canariensis	8.13	39	0.68
Decapterus rhonchus	6.70	14	0.56
Dicologlossus cuneata	5.42	58	0.45
Stromateus fiatola	5.38	8	0.45
Grammolites gruvell	5.03	116	0.42
Galeoides decadactylus	5.03	19	0.42
Selene dorsalis	4.26	155	0.35
Chelidonichthys capensis	3.10	19	0.26
Trichurus lepturus	1.39	6	0.12
Serranus sacraensis	1.16	19	0.10
Fistularia petimba	0.66	2	0.05
Total	1203.72		100.02

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2189
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1015
 start stop duration Long E 1314
 TIME :08:41:29 09:11:22 30 (min) Purpose code: 3
 LOG :3977.09 3978.74 1.62 Area code : 2
 FDEPTH: 82 89 GearCond.code:
 BDEPTH: 82 89 Validity code:
 Towing dir: 254e Wire out: 240 m Speed: 30 kn*10
 Sorted: 185 Kg Total catch: 431.55 CATCH/HOUR: 863.10

SPECIES	weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	409.68	22446	47.47	4979
Leptocharias smithii	150.00	2	17.38	
Lepidochelys olivacea	93.20	2	10.80	
Pagellus bellottii	45.90	748	5.32	4978
Trichiurus lepturus	37.00	58	4.29	
Pseudupeneus preyanis	20.88	648	2.42	
Chelidonichthys gabonensis	19.80	288	2.29	
Citharus linguatula	18.36	1296	2.13	
Raja miraletus	13.84	24	1.60	
Sepia officinalis hierredda	8.28	36	0.96	
Fistularia petimba	6.64	8	0.77	
Lagocephalus laevigatus	6.12	36	0.71	
Saurida brasiliensis	5.04	414	0.58	
Alloteuthis africana	4.68	1512	0.54	
Dentex barnardi	4.32	90	0.50	
Dentex angolensis	4.32	72	0.50	
Grammolites gruvelli	2.52	54	0.29	
Sepia orbignyana	2.16	54	0.25	
Brotula barbata	2.16	36	0.25	
Illex coindetii	1.80	36	0.21	
Squatina oculata	1.68	2	0.19	
Sphyræna guachancho	1.12	2	0.13	
Fistularia tabacaria	1.08	18	0.13	
Pemadasys jubelini	1.08	90	0.13	
Arnoglossus imperialis	0.72	90	0.08	
Sepia elegans	0.36	18	0.04	
Scorpaena normani	0.36	18	0.04	
Total	863.10		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2190
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1015
 start stop duration Long E 1310
 TIME :10:09:03 10:39:22 30 (min) Purpose code: 3
 LOG :3981.95 3983.59 1.61 Area code : 2
 FDEPTH: 98 103 GearCond.code:
 BDEPTH: 98 103 Validity code:
 Towing dir: 254e Wire out: 300 m Speed: 30 kn*10
 Sorted: 43 Kg Total catch: 69.00 CATCH/HOUR: 138.00

SPECIES	weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trigla lyra	30.00	328	21.74	
Pagellus bellottii	21.00	408	15.22	4980
Citharus linguatula	19.44	540	14.09	
Raja miraletus	12.28	24	8.90	
Trachurus trecae, juvenile	9.44	440	6.84	
Trichiurus lepturus	7.52	10	5.45	
Squatina aculeata	6.08	4	4.41	
Alloteuthis africana	5.68	2036	4.12	
Sepia officinalis hierredda	4.08	96	2.96	
Saurida brasiliensis	3.60	720	2.61	
Dentex gibbosus	3.40	4	2.46	
Priacanthus arenatus	3.00	6	2.17	
Brachydeuterus auritus	2.48	16	1.80	
Lagocephalus laevigatus	2.44	4	1.77	
Zeus faber	2.08	12	1.51	
Dentex angolensis	2.00	20	1.45	
Illex coindetii	0.88	16	0.64	
Fistularia petimba	0.84	2	0.61	
Chaetodon hoefleri	0.64	4	0.46	
Chelidonichthys gabonensis	0.40	4	0.29	
ANTENNARIIDAE	0.24	2	0.17	
Torpedo torpedo	0.24	2	0.17	
Boops boops	0.16	8	0.12	
Arnoglossus imperialis	0.08	12	0.06	
Total	138.00		100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2191
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1017
 start stop duration Long E 1306
 TIME :11:38:49 11:58:28 20 (min) Purpose code: 3
 LOG :3988.28 3989.13 0.81 Area code : 2
 FDEPTH: 109 108 GearCond.code:
 BDEPTH: 109 108 Validity code:
 Towing dir: 340e Wire out: 320 m Speed: 30 kn*10
 Sorted: 52 Kg Total catch: 464.96 CATCH/HOUR: 1394.88

SPECIES	weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	915.75	42933	65.65	
Saurida brasiliensis	296.67	363	21.27	
Citharus linguatula	39.39	1446	2.82	
Dentex angolensis	25.20	267	1.81	
Fistularia petimba	21.69	228	1.55	
Squatina aculeata	12.30	6	0.88	
Lagocephalus laevigatus	12.18	30	0.87	
Illex sp.	10.44	240	0.75	
Sepia officinalis hierredda	9.66	162	0.69	
Pagellus bellottii	9.66	228	0.69	
Dentex barnardi	8.31	12	0.60	
Zeus faber	7.50	39	0.54	
Dentex congoensis	4.83	54	0.35	
Raja miraletus	3.72	6	0.27	
Brotula barbata	3.54	3	0.25	
Trichiurus lepturus	3.18	3	0.23	
Priacanthus arenatus	3.00	6	0.22	
Ariomma bondi	2.40	39	0.17	
Chelidonichthys gabonensis	1.35	12	0.10	
Octopus vulgaris	0.90	3	0.06	
MELANCONIDAE	0.27	12	0.02	
Total	1391.94		99.79	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2192
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1021
 start stop duration Long E 1259
 TIME :14:02:10 14:32:05 30 (min) Purpose code: 3
 LOG :4002.30 4003.54 1.21 Area code : 2
 FDEPTH: 361 379 GearCond.code:
 BDEPTH: 361 379 Validity code:
 Towing dir: 330e Wire out: 980 m Speed: 30 kn*10
 Sorted: 119 Kg Total catch: 225.25 CATCH/HOUR: 450.50

SPECIES	weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius polli	99.12	522	22.00	4981
Trichiurus lepturus	69.72	396	15.48	
Squatina aculeata	66.82	2	14.83	
Laemonema laureysi	60.60	714	13.45	
Pterothrissus bellocci	44.88	282	9.96	
Hymenocephalus italicus	41.76	4704	9.27	
Chlorophthalmus atlanticus	25.92	504	5.75	
Benthodesmus tenuis	6.96	336	1.54	
Illex coindetii	6.72	48	1.49	
Malacocephalus laevis	5.52	30	1.23	
Zenopsis conchifer	3.72	6	0.83	
Coelorinchus coelorhincus	3.48	78	0.77	
Chaceon maritae	3.36	16	0.75	
TRACHTERIDAE	3.24	6	0.72	
Gephyroberyx darwini	3.04	4	0.67	
GALATHEIDAE	1.92	288	0.43	
Raja straeleni	1.68	24	0.37	
Chaunax pictus	0.96	48	0.21	
Bathynectes piperitus	0.84	16	0.19	
Aristeus varidens	0.12	12	0.03	
Parapenaeus longirostris	0.12	12	0.03	
Total	450.50		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2193
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1016
 start stop duration Long E 1259
 TIME :16:13:43 16:43:25 30 (min) Purpose code: 3
 LOG :4012.74 4014.04 1.29 Area code : 2
 FDEPTH: 164 168 GearCond.code:
 BDEPTH: 164 168 Validity code:
 Towing dir: 150e Wire out: 470 m Speed: 30 kn*10
 Sorted: 103 Kg Total catch: 206.97 CATCH/HOUR: 413.94

SPECIES	weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Synagrops microlepis	164.80	15040	39.81	
Zenopsis conchifer	77.32	472	18.68	
Brotula barbata	43.48	50	10.50	
Dentex angolensis	39.10	150	9.45	4982
Trichiurus lepturus	17.84	30	4.31	
Squatina oculata	14.36	8	3.47	
Dentex macrophthalmus	13.10	86	3.16	
Illex coindetii	12.00	210	2.90	
Uranoscopus polli	9.20	60	2.22	
Torpedo torpedo	5.40	10	1.30	
Citharus linguatula	4.20	80	1.01	
Raja miraletus	3.96	6	0.96	
ANTENNARIIDAE	3.08	2	0.74	
Zeus faber	1.96	4	0.43	
Lophius vailanti	1.04	2	0.25	
Pontinus kuhlii	1.00	10	0.24	
Saurida brasiliensis	1.00	210	0.24	
Todaropsis eblanae	0.60	30	0.14	
Aulopus cadamati	0.40	2	0.10	
Bembrops heterurus	0.20	10	0.05	
Antigonia capros	0.10	10	0.02	
Total	413.94		99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2194
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1008
 start stop duration Long E 1252
 TIME :19:37:36 20:07:12 30 (min) Purpose code: 3
 LOG :4032.09 4033.59 1.45 Area code : 2
 FDEPTH: 426 454 GearCond.code:
 BDEPTH: 426 454 Validity code:
 Towing dir: 320e Wire out: 1100 m Speed: 30 kn*10
 Sorted: 41 Kg Total catch: 164.82 CATCH/HOUR: 329.64

SPECIES	weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	122.28	28344	37.10	
Laemonema laureysi	55.80	912	16.93	
Hoplostethus cadamati	31.44	1980	9.54	
Dibranchius atlanticus	22.92	1356	6.95	
Merluccius polli	21.92	60	6.65	4983
Yarellia blackfordi	14.16	456	4.30	
Aristeus varidens, female	8.04	888	2.44	4985
Trichiurus lepturus	7.44	288	2.26	
Aristeus varidens, male	6.36	552	1.93	4984
Malacocephalus laevis	5.28	564	1.60	
Gadella imberbis	5.04	144	1.53	
Helicolenus dactylopterus	4.68	10	1.42	
Chaceon maritae	4.28	8	1.30	
Malacocephalus occidentalis	4.08	36	1.24	
Chaunax pictus	4.08	12	1.24	
OPHICHTHIDAE	2.04	36	0.62	
Illex coindetii	1.68	12	0.51	
Zenopsis conchifer	1.44	4	0.44	
Stomias boa boa	1.44	24	0.44	
Portunus validus	1.44	24	0.44	
Plesionika martia	0.48	204	0.15	
Triplophus hemingi	0.48	48	0.15	
Peristedion sp.	0.48	84	0.15	
Etmopterus lucifer	0.48	12	0.15	
Parapenaeus longirostris	0.48	108	0.15	
Halosaurus ovenii	0.48	24	0.15	
Auxis rochei	0.44	2	0.13	
NETASTOMATIDAE	0.24	24	0.07	
Solenocera africana	0.24	48	0.07	
Total	329.64		100.05	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2195
 DATE:24/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1008 Long E 1250
 start stop duration
 TIME :21:54:50 22:28:13 33 (min) Purpose code: 3
 LOG :4041.67 4043.17 1.45 Area code : 2
 FDEPTH: 654 685 GearCond.code:
 BDEPTH: 654 685 Validity code:
 Towing dir: 330e Wire out:1500 m Speed: 30 kn*10
 Sorted: 16 Kg Total catch: 71.32 CATCH/HOUR: 129.67

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Yarellia blackfordi	34.91	924	26.92
STOMIIDEA	18.18	313	14.02
C E P H A L O P O D A	10.36	22	7.99
Hoplostethus cadonati	9.16	291	7.06
Benthodesmus tenuis	8.29	356	6.39
Dibranchius atlanticus	5.67	524	4.37
Triplophus hemingi	5.67	676	4.37
Talismania bifurcata	5.24	167	4.04
Lepidus sp.	5.13	2	3.96
Illex coindetii	4.95	15	3.82
Centroscyne obscurus	4.95	36	3.82
POLYCHAELIDAE	4.65	262	3.59
Lamprogrammus exatus	3.64	29	2.81
Coelorinchus coelorhincus	1.89	44	1.46
Aristeus varidens, female	1.53	80	1.18
MORIDAE	1.31	73	1.01
Nematocarcinus africanus	1.02	484	0.79
Xenodermichthys copei	1.02	73	0.79
Lepidopus caudatus	0.87	7	0.67
CONGRIDAE	0.44	29	0.34
Nemichthys scolopaceus	0.44	22	0.34
Glyphus marsupialis	0.15	18	0.12
Aristeus varidens, male	0.15	22	0.12
Trichiurus lepturus	0.07	7	0.05
Total	129.69	100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2196
 DATE:25/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1007 Long E 1254
 start stop duration
 TIME :05:50:19 06:10:43 20 (min) Purpose code: 3
 LOG :4057.89 4058.92 1.01 Area code : 2
 FDEPTH: 250 275 GearCond.code:
 BDEPTH: 250 275 Validity code:
 Towing dir: 330e Wire out: 760 m Speed: 30 kn*10
 Sorted: 45 Kg Total catch: 180.34 CATCH/HOUR: 541.02

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Syngnathus microlepis	278.28	19229	51.44
Merluccius polli juveniles	70.20	1458	12.98
Dentex macrocephalus	51.30	216	9.48
Chlorophthalmus atlanticus	50.76	2142	9.38
Trichiurus lepturus	19.08	54	3.53
Todaropsis eblanae	15.48	162	2.86
MYCTOPHIDAE	12.60	5364	2.33
Illex coindetii	7.20	126	1.33
Parapenaeus longirostris, male	4.32	972	0.80
Pterothrissus bellotti	3.24	18	0.60
Parapenaeus longirostris, fem.	2.88	522	0.53
Gephyroberyx darwini	2.88	3	0.53
Coelorinchus coelorhincus	2.88	72	0.53
Dibranchius atlanticus	2.52	198	0.47
Calappa sp.	2.52	36	0.47
Epigonus telescopus	2.16	18	0.40
Sepia officinalis hierredda	1.80	90	0.33
Loligo sp.	1.44	450	0.27
Pontinus kuhlii	1.20	9	0.22
Monolene microstoma	0.72	72	0.13
Gadella imberbis	0.72	18	0.13
Zenopsis conchifer	0.72	18	0.13
Lestidium atlanticum	0.36	18	0.07
Symphurus ligulatus	0.36	54	0.07
Total	535.62	99.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2197
 DATE:25/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1006 Long E 1304
 start stop duration
 TIME :08:36:06 09:06:18 30 (min) Purpose code: 3
 LOG :4072.55 4074.19 1.62 Area code : 2
 FDEPTH: 99 94 GearCond.code:
 BDEPTH: 99 94 Validity code:
 Towing dir: 80e Wire out: 260 m Speed: 30 kn*10
 Sorted: 110 Kg Total catch: 360.69 CATCH/HOUR: 721.38

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Pagellus bellottii	252.54	1458	35.01
Ubrina canariensis	167.76	306	23.26
Boops boops	95.40	7002	13.22
Dentex macrocephalus	37.26	126	5.17
Argyrosomus hololepidotus	34.96	2	4.85
Atractoscion aequidens	28.76	14	3.99
Epinephelus aeneus	15.80	2	2.19
Citharus linguatula	11.52	432	1.60
Saurida brasiliensis	11.52	2440	1.60
Dentex gibbosus	9.76	10	1.35
Sparus pagrus africanus *	9.40	8	1.30
Raja miraletus	8.04	14	1.11
Dentex barnardi	5.76	18	0.80
Todaropsis eblanae	5.58	100	0.77
Trichiurus lepturus	5.28	6	0.73
Alloteuthis sp.	4.50	1612	0.62
Trachurus trecae, juvenile	3.06	136	0.42
Zeus faber	2.52	10	0.35
Todarodes sagittatus	2.34	46	0.32
Dentex angolensis	2.16	28	0.30
Alloteuthis africana	1.44	424	0.20
Anthias anthias	1.26	226	0.17
Brachydeuterus auritus	1.26	10	0.17
Brotula barbata	1.20	2	0.17
Torpedo torpedo	1.12	2	0.16
Trigla lyra	0.54	10	0.07
Dibranchius atlanticus	0.36	36	0.05
Nemichthys scolopaceus	0.18	10	0.02
Erythrocles monodi	0.10	10	0.01
Total	721.38	99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2198
 DATE:25/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 1002 Long E 1309
 start stop duration
 TIME :11:34:52 12:04:27 30 (min) Purpose code: 3
 LOG :4081.53 4083.06 1.51 Area code : 2
 FDEPTH: 70 58 GearCond.code:
 BDEPTH: 70 58 Validity code:
 Towing dir: 73e Wire out: 240 m Speed: 30 kn*10
 Sorted: 103 Kg Total catch: 796.89 CATCH/HOUR: 1593.78

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Brachydeuterus auritus	727.68	6744	45.66
Pagellus bellottii	252.92	4548	15.93
Citharus linguatula	153.12	192	9.61
Trichiurus lepturus	118.80	672	7.45
Stromateus fiatola	106.56	166	6.69
Pseudupeneus prayensis	50.88	1800	3.19
Chloroscombrus chrysurus	46.08	336	2.89
Squatina aculeata	35.46	6	2.22
Trachurus trecae, juvenile	28.32	2424	1.78
Selene dorsalis	25.92	576	1.63
Dentex barnardi	12.48	372	0.78
Raja miraletus	7.20	24	0.45
Lagocephalus laevigatus	5.28	24	0.33
Serranus accraensis	3.36	48	0.21
Sphyræna sphyraena	2.88	24	0.18
Grammolites gruvelli	2.40	48	0.15
Boops boops	1.44	72	0.09
Total	1581.78	99.24	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2199
 DATE:26/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 956 Long E 1316
 start stop duration
 TIME :05:45:21 06:19:14 30 (min) Purpose code: 3
 LOG :4098.97 4100.70 1.72 Area code : 2
 FDEPTH: 20 20 GearCond.code:
 BDEPTH: 20 20 Validity code:
 Towing dir: 350e Wire out: 65 m Speed: 30 kn*10
 Sorted: 9 Kg Total catch: 8.71 CATCH/HOUR: 17.42

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Decapterus punctatus	5.00	134	28.70
Lagocephalus laevigatus	4.12	26	23.65
Dentex canariensis	2.40	10	13.78
Trachinotus ovatus	2.08	18	11.94
Brachydeuterus auritus	1.04	8	5.97
Portunus validus	0.96	2	5.51
Caranx crysos	0.58	6	3.33
Sardinella maderensis	0.36	2	2.07
Citharus linguatula	0.28	2	1.61
Eucinostomus melanopterus	0.24	2	1.38
Selene dorsalis	0.24	10	1.38
Pseudupeneus prayensis	0.12	2	0.69
Total	17.42	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2200
 DATE:25/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 948 Long E 1313
 start stop duration
 TIME :07:43:31 08:14:25 31 (min) Purpose code: 3
 LOG :4109.69 4111.61 1.93 Area code : 2
 FDEPTH: 20 22 GearCond.code:
 BDEPTH: 20 22 Validity code:
 Towing dir: 350e Wire out: 75 m Speed: 30 kn*10
 Sorted: 12 Kg Total catch: 11.99 CATCH/HOUR: 23.21

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Pagellus bellottii	12.10	112	52.13
Lagocephalus laevigatus	3.06	15	13.18
Sepia officinalis hierredda	1.59	4	6.85
Fistularia tabacaria	1.47	50	6.33
Portunus validus	1.39	8	5.99
Chloroscombrus chrysurus	0.77	4	3.32
Trachinotus ovatus	0.77	8	3.32
Citharus linguatula	0.70	6	3.02
Decapterus rhynchus	0.58	14	2.50
Calappa rubroguttata	0.50	4	2.15
Brachydeuterus auritus	0.27	2	1.16
Total	23.20	99.95	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2201
 DATE:26/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 948 Long E 1308
 start stop duration
 TIME :09:34:48 09:57:21 23 (min) Purpose code: 3
 LOG :4119.89 4121.00 1.08 Area code : 2
 FDEPTH: 49 43 GearCond.code:
 BDEPTH: 49 43 Validity code:
 Towing dir: 50e Wire out: 150 m Speed: 30 kn*10
 Sorted: 85 Kg Total catch: 177.42 CATCH/HOUR: 462.53

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Ubrina canariensis	72.94	141	15.76
Brachydeuterus auritus	69.50	563	15.02
Galeoides decadactylus	62.14	2160	13.43
Decapterus rhynchus	59.17	1503	12.78
Pagellus bellottii	35.06	783	7.56
Dentex barnardi	31.93	297	6.90
Pseudupeneus prayensis	25.36	657	5.48
Lithognathus mormyrus	20.35	47	4.40
Sphyræna sphyraena	18.37	57	3.97
Pomadourus jubelini	12.52	16	2.71
Trichiurus lepturus	9.70	16	2.10
Epinephelus aeneus	9.03	3	1.55
Sepia orbignyana	5.32	16	1.15
Balistes capricornis	4.64	10	1.00
Spondyliosema cantharus	4.54	5	0.95
Bodianus speciosus	3.86	8	0.83
Octopus vulgaris	3.13	8	0.68
Epinephelus alexandrinus *	2.82	3	0.61
Zeus faber	2.40	3	0.52
Sphyræna guacnacho	2.35	5	0.51
Citharus linguatula	2.19	16	0.47
Selene dorsalis	1.57	31	0.34
Fistularia tabacaria	1.30	8	0.28
Alloteuthis africana	1.25	407	0.27
Grammolites gruvelli	0.63	31	0.14
Cynoglossus canariensis	0.63	3	0.14
Calappa sp.	0.10	16	0.02
Total	462.80	100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2202
 DATE:26/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 951 Long E 1302
 start stop duration
 TIME :11:10:07 11:40:08 30 (min) Purpose code: 3
 LOG :4129.79 4131.48 1.67 Area code : 2
 FDEPTH: 88 88 GearCond.code:
 BDEPTH: 88 88 Validity code:
 Towing dir: 160° Wire out: 290 m Speed: 30 km*10
 Sorted: 101 Kg Total catch: 261.18 CATCH/HOUR: 522.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	149.38	6226	28.60	
Dentex congcoensis	122.10	188	23.37	5036
Pagellus bellottii	67.10	958	12.85	4997
Trichiurus lepturus	39.12	60	7.49	
Dentex angolensis	30.70	434	5.88	4996
Fistularia petimba	21.20	4	4.06	
Trigla lyra	15.62	188	2.99	
Squatina oculata	15.24	12	2.92	
Citharus linguatula	13.42	506	2.57	
Pseudopenus preyensis	12.98	320	2.48	
Alloteuthis africana	9.02	2882	1.73	
Raja miraletus	6.94	12	1.33	
Zeus faber	6.82	56	1.31	
Sepia orbignyana	4.92	4	0.94	
Uranoscopus polli	2.20	12	0.42	
Chaetodon hoefleri	1.76	12	0.34	
Scorpaena normani	1.76	22	0.34	
Dentex barnardi	1.00	22	0.19	
Arneglossus imperialis	0.44	44	0.08	
Saurida brasiliensis	0.44	34	0.08	
Brachydeuterus auritus	0.12	12	0.02	
Fistularia tabacaria	0.08	2	0.02	
Total	522.36		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2203
 DATE:26/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 954 Long E 1252
 start stop duration
 TIME :14:06:50 14:36:29 30 (min) Purpose code: 3
 LOG :4147.44 4149.12 1.66 Area code : 2
 FDEPTH: 160 193 GearCond.code:
 BDEPTH: 160 193 Validity code:
 Towing dir: 340° Wire out: 490 m Speed: 30 km*10
 Sorted: 53 Kg Total catch: 53.48 CATCH/HOUR: 106.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spicara alba	31.20	520	29.17	
Illex coindetii	16.12	334	15.07	
Zenopsis conchifer	15.12	14	14.14	
Dentex angolensis	12.08	60	11.29	4998
Trichiurus lepturus	11.52	10	10.77	
Zeus faber	7.40	10	6.92	
Raja miraletus	3.56	6	3.33	
Dentex macrophthalmus	1.76	10	1.65	
Brotula barbata	1.72	2	1.61	
Erythrocles monodi	1.40	10	1.31	
Lagocephalus laevigatus	1.28	4	1.20	
Citharus linguatula	1.08	24	1.01	
Trigla lyra	0.96	8	0.90	
Dentex congcoensis	0.92	14	0.86	
Peristedion cataphractum	0.20	8	0.19	
Bemrops heterurus	0.16	2	0.15	
Scorpaena normani	0.16	2	0.15	
Microchirus frechkopi	0.12	2	0.11	
Aricomma bondi	0.12	2	0.11	
Dicologlossa cuneata	0.08	6	0.07	
Total	106.96		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2204
 DATE:26/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 953 Long E 1250
 start stop duration
 TIME :15:43:58 16:05:47 22 (min) Purpose code: 3
 LOG :4154.65 4156.03 1.36 Area code : 2
 FDEPTH: 273 274 GearCond.code:
 BDEPTH: 273 274 Validity code:
 Towing dir: 340° Wire out: 810 m Speed: 30 km*10
 Sorted: 45 Kg Total catch: 79.69 CATCH/HOUR: 217.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	143.48	9125	66.02	
Zenopsis conchifer	24.00	65	11.04	
Merluccius polli	15.05	237	6.92	4999
Trichiurus lepturus	9.71	14	4.47	
Coelorinchus coelorhincus	7.06	164	3.25	
Illex coindetii	3.41	38	1.57	
Chlorophthalmus atlanticus	3.41	85	1.57	
Scorpaena normani	2.62	5	1.21	
Parapeneus longirostris, fem.	2.25	344	1.04	5000
Raja miraletus	1.58	3	0.73	
Parapeneus longirostris, male	1.17	202	0.54	5001
Dentex macrophthalmus	1.04	5	0.48	
Malacocephalus occidentalis	0.65	14	0.30	
Mystriophis rostellatus	0.60	3	0.28	
Plesionika martia	0.52	145	0.24	
Calappa sp.	0.38	5	0.17	
Bemrops heterurus	0.38	5	0.17	
Total	217.32		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2205
 DATE:26/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 952 Long E 1247
 start stop duration
 TIME :17:25:46 17:51:08 25 (min) Purpose code: 3
 LOG :4163.52 4164.86 1.32 Area code : 2
 FDEPTH: 395 485 GearCond.code:
 BDEPTH: 395 485 Validity code:
 Towing dir: 330° Wire out:1170 m Speed: 30 km*10
 Sorted: 45 Kg Total catch: 236.64 CATCH/HOUR: 567.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	229.06	912	40.33	5002
Parapeneus longirostris, fem.	78.51	10042	13.83	5003
PARALEPIDIDAE	56.83	2093	10.01	
Parapeneus longirostris, male	53.57	10042	9.43	5004
Pterothrissus belliois	45.70	269	8.05	
Laemonema laureysi	22.66	250	3.99	
Gadella imberbis	16.90	96	2.98	
Chaunax pictus	9.98	307	1.76	
Malacocephalus occidentalis	9.22	77	1.62	
Emtopterus lucifer	6.14	173	1.08	
Aristeus varidens	6.14	480	1.08	
Lophius vaillanti	6.10	12	1.07	
Nematocarcinus africanus	4.99	864	0.88	
Dibranchius atlanticus	4.22	557	0.74	
Coelorinchus coelorhincus	3.46	77	0.61	
Illex coindetii	3.07	19	0.54	
Zenopsis conchifer	2.74	5	0.48	
Plesionika martia	2.50	1286	0.44	
Stomias boa boa	1.15	38	0.20	
Lestidium atlanticum	1.15	38	0.20	
Bathymectes piperitus	0.77	19	0.14	
Chlorophthalmus atlanticus	0.77	19	0.14	
Halosaurus ovenii	0.38	19	0.07	
CONELACIDAE	0.38	19	0.07	
Peristedion sp.	0.38	96	0.07	
Malacocephalus laevis	0.38	96	0.07	
Haploblepharus pictus	0.38	19	0.07	
Triplophus hemingi	0.19	19	0.03	
Raja straeleni	0.19	2	0.03	
Total	567.93		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2206
 DATE:26/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 942 Long E 1242
 start stop duration
 TIME :21:05:41 21:37:03 31 (min) Purpose code: 3
 LOG :4181.30 4183.09 1.71 Area code : 2
 FDEPTH: 494 531 GearCond.code:
 BDEPTH: 494 531 Validity code:
 Towing dir: 320° Wire out:1400 m Speed: 30 km*10
 Sorted: 9 Kg Total catch: 9.38 CATCH/HOUR: 16.15

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	7.74	19	42.64	
PARALEPIDIDAE	2.48	110	13.66	
Triplophus hemingi	1.97	304	10.85	
Stomias boa boa	1.05	37	5.79	
Dibranchius atlanticus	0.89	91	4.90	
Lophius vaillanti	0.85	2	4.68	
Todarodes sagittatus	0.54	4	2.98	
Malacocephalus laevis	0.43	2	2.37	
Emtopterus pusillus	0.39	19	2.15	
Plesionika martia	0.35	176	1.93	
Plesioneneus edwardsianus	0.35	60	1.93	
Xenodermichthys copei	0.19	31	1.05	
Peristedion sp.	0.19	33	1.05	
Hoplostethus cadonati	0.15	4	0.83	
Aristeus varidens	0.12	2	0.66	
PANDALIDAE	0.08	25	0.44	
Chaunax pictus	0.08	2	0.44	
MYCTOPHIDAE	0.08	97	0.44	
Nemichthys scolopaceus	0.04	2	0.22	
CONELACIDAE	0.04	2	0.22	
Total	18.01		99.23	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2207
 DATE:26/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 943 Long E 1240
 start stop duration
 TIME :23:15:22 23:45:33 30 (min) Purpose code: 3
 LOG :4189.15 4190.63 1.44 Area code : 2
 FDEPTH: 576 625 GearCond.code:
 BDEPTH: 576 625 Validity code:
 Towing dir: 180° Wire out:1600 m Speed: 30 km*10
 Sorted: 59 Kg Total catch: 76.27 CATCH/HOUR: 152.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hexanchus griseus	80.00	2	52.45	
Yarella blackfordi	11.88	366	7.79	
Lophius vaillanti	8.00	2	5.24	
Ebinania costacamarie	7.80	30	5.11	
Aristeus varidens, female	5.16	262	3.38	5005
Glyphus marsupialis	4.80	1242	3.15	
POLYCHAELIDAE	4.80	420	3.15	
Coelorinchus coelorhincus	4.56	150	2.99	
Chaceon maritae	4.24	10	2.78	
Hoplostethus cadonati	3.72	156	2.44	
Lamprogrammus exultus	3.24	36	2.12	
Triplophus hemingi	2.04	222	1.34	
Stomias sp.	1.92	42	1.26	
Benthodesmus tenuis	1.80	78	1.18	
Merluccius capensis	1.48	2	0.97	
Aristeus varidens, male	1.32	162	0.87	5006
Halosaurus ovenii	1.20	30	0.79	
Emtopterus spinax	0.96	18	0.63	
Mystriophis rostellatus	0.84	6	0.55	
OPHICHTHIDAE	0.48	18	0.31	
Bathuroconger vicinus	0.48	24	0.31	
Malacocephalus occidentalis	0.36	6	0.24	
MYCTOPHIDAE	0.36	12	0.24	
Talismania bifurcata	0.36	24	0.24	
Chauliodus sloani	0.24	6	0.16	
Plesioneneus edwardsianus	0.20	2	0.13	
PARALEPIDIDAE	0.12	6	0.08	
Xenodermichthys copei	0.12	12	0.08	
Nemichthys scolopaceus	0.06	6	0.04	
Total	152.54		100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2208
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 946
 start stop duration
 TIME :01:17:40 01:47:16 30 (min) Purpose code: 3
 LOG :4195.58 4196.97 1.36 Area code : 2
 FDEPTH: 723 737 GearCond.code:
 BDEPTH: 723 737 Validity code:
 Towing dir: 180e Wire out:1750 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 103.38 CATCH/HOUR: 206.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Coelorinchus coelorhincus	28.98	262	14.02	
UNIDENTIFIED FISH	22.32	28	10.80	
Yarella blackfordi	21.78	486	10.53	
Lamprogrammus exutus	21.42	108	10.36	
POLYCHAELIDAE	17.64	982	8.53	
Synphobranchius kaupii	15.12	522	7.31	
Illex coindetii	12.24	64	5.92	
Ebinania costaeacanarie	10.62	36	5.14	
Chaceon maritae	10.28	20	4.97	
Trachyrhynchus scabrus	7.56	46	3.66	
R A Y S	5.76	10	2.79	
TRACHIPTERIDAE	5.40	2	2.61	
Etmopterus lucifer	4.32	46	2.09	
Stomias sp.	4.32	82	2.09	
Dibranchius atlanticus	4.14	144	2.00	
Merluccius polli	3.52	4	1.70	
Hoplostethus sp.	3.42	100	1.65	
Aristeus varidensis, female	3.06	154	1.48	
Talismania bifurcata	2.16	46	1.04	
Colecoaster cadmatii	1.26	10	0.51	
NETASTOMATIDAE	1.08	18	0.52	
Bathyrhynchus vicinus	0.36	10	0.17	
Total	206.76		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2209
 DATE:27/ 3/00 GEAR TYPE: BT No: 4 POSITION:Lat S 934
 start stop duration
 TIME :05:41:53 06:11:18 29 (min) Purpose code: 3
 LOG :4230.87 4232.78 1.88 Area code : 2
 FDEPTH: 22 26 GearCond.code:
 BDEPTH: 22 26 Validity code:
 Towing dir: 320e Wire out: 75 m Speed: 30 kn*10

Sorted: 4 Kg Total catch: 3.91 CATCH/HOUR: 8.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ethmalosa fimbriata	2.79	79	34.49	
Umbra canariensis	2.44	12	30.16	
Sphyrax guanchicho	1.41	4	17.43	
Selene dorsalis	0.46	23	5.69	
Pareukhlia macrophthalmus	0.37	8	4.57	
Chlorophthalmus atlanticus	0.25	21	3.09	
Decapterus rhonchus	0.17	6	2.10	
Decapterus punctatus	0.12	14	1.48	
Brachydeuterus auritus	0.04	8	0.49	
Sardinella aurita	0.04	2	0.49	
Total	8.09		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2210
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 938
 start stop duration
 TIME :08:18:28 08:29:12 11 (min) Purpose code: 3
 LOG :4246.02 4246.59 0.58 Area code : 2
 FDEPTH: 76 77 GearCond.code:
 BDEPTH: 76 77 Validity code:
 Towing dir: 350e Wire out: 240 m Speed: 30 kn*10

Sorted: 54 Kg Total catch: 54.48 CATCH/HOUR: 297.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	290.40	1691	97.73	
POLYCHAELIDAE	3.49	3065	1.17	
Selene dorsalis	1.53	11	0.51	
Dibranchius atlanticus	1.31	55	0.44	
Raja miraletus	0.44	11	0.15	
Total	297.17		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2211
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 941
 start stop duration
 TIME :10:02:02 10:32:00 30 (min) Purpose code: 3
 LOG :4258.10 4259.67 1.56 Area code : 2
 FDEPTH: 115 116 GearCond.code:
 BDEPTH: 115 116 Validity code:
 Towing dir: 340e Wire out: 330 m Speed: 30 kn*10

Sorted: 199 Kg Total catch: 293.37 CATCH/HOUR: 586.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae, juvenile	165.00	3786	28.12	
Umbra canariensis	98.40	300	16.77	5008
Dentex macrophthalmus	68.40	264	11.66	5009
Epinephelus goreensis	52.04	4	8.87	
Brachydeuterus auritus	29.64	120	5.05	
Trichiurus lepturus	21.48	36	3.66	
Trigla lyra	16.92	108	2.88	
Boops boops	15.96	726	2.72	
Dentex angolensis	15.84	102	2.70	5007
Brotula barbata	11.20	12	1.91	
Saurida brasiliensis	11.16	1512	1.90	
Dentex barnardi	9.72	18	1.66	
Citharus linguatula	8.40	126	1.43	
Raja miraletus	7.56	10	1.29	
Dentex gibbosus	7.44	6	1.27	
Pontinus accraensis	6.24	30	1.06	
Zeus faber	6.12	18	1.04	
Selene dorsalis	5.28	6	0.90	
Scorpaena normani	5.16	30	0.88	
Sepia officinalis hierredda	4.44	12	0.76	
Lagocephalus laevigatus	3.96	6	0.67	
Fagellus bellottii	3.48	12	0.59	
Uranoscopus polli	3.12	6	0.53	
Peristedion cataphractum	3.00	12	0.51	
Microchirus frechkopi	2.76	6	0.47	
Ariomma bondi	2.64	6	0.45	
Illex coindetii	1.38	24	0.24	
Total	586.74		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2212
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 940
 start stop duration
 TIME :11:51:31 12:21:24 30 (min) Purpose code: 3
 LOG :4268.54 4270.23 1.67 Area code : 2
 FDEPTH: 201 189 GearCond.code:
 BDEPTH: 201 189 Validity code:
 Towing dir: 350e Wire out: 610 m Speed: 30 kn*10

Sorted: 96 Kg Total catch: 1142.62 CATCH/HOUR: 2285.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	2018.52	164178	88.33	
Illex coindetii	81.90	1260	3.58	
Dentex angolensis	44.04	134	1.93	5010
Trichiurus lepturus	34.76	52	1.52	
Parapanaeus longirostris	21.42	4348	0.94	
Dentex macrophthalmus	20.04	92	0.88	5011
Brotula barbata	16.12	18	0.71	
Zenopsis conchifer	15.12	126	0.66	
Zeus faber	12.60	64	0.55	
Pterothrissus bellocci	12.60	64	0.55	
Squatina oculata	4.84	2	0.21	
Raja straeleni	1.36	2	0.06	
Torpedo sp.	0.96	2	0.04	
Raja miraletus	0.96	2	0.04	
Total	2285.24		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2213
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 938
 start stop duration
 TIME :14:06:45 14:38:25 30 (min) Purpose code: 3
 LOG :4282.49 4284.21 1.71 Area code : 2
 FDEPTH: 248 266 GearCond.code:
 BDEPTH: 248 266 Validity code:
 Towing dir: 340e Wire out: 760 m Speed: 30 kn*10

Sorted: 532 Kg Total catch: 747.21 CATCH/HOUR: 1494.42

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	732.42	54032	49.01	
Merluccius polli, juveniles	365.50	734	24.46	5012
Zenopsis conchifer	251.10	764	16.80	
Chlorophthalmus atlanticus	29.92	1144	2.00	
Illex coindetii	24.64	352	1.65	
Pterothrissus bellocci	22.88	176	1.53	
Coelorinchus coelorhincus	21.12	528	1.41	
Trichiurus lepturus	14.08	58	0.94	
Parapanaeus longirostris	12.32	1848	0.82	
Ophisurus serpens	5.28	88	0.35	
Dentex macrophthalmus	5.20	26	0.35	
Brotula barbata	4.56	2	0.31	
Sepia officinalis hierredda	3.52	176	0.24	
Dentex angolensis	1.88	4	0.13	
Total	1494.42		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2214
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 938
 start stop duration
 TIME :16:14:42 16:44:14 30 (min) Purpose code: 3
 LOG :4292.77 4294.37 1.58 Area code : 2
 FDEPTH: 457 455 GearCond.code:
 BDEPTH: 457 455 Validity code:
 Towing dir: 340e Wire out:1230 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 69.64 CATCH/HOUR: 139.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	44.28	158	31.79	5037
Lophius willanti	25.36	22	18.21	
Centrophorus granulosus	15.20	4	10.91	
Etmopterus lucifer	9.28	238	6.66	
Laemonema sp.	8.02	310	5.76	
Todaropsis eblanae	4.50	36	3.23	
Synagrops microlepis	4.06	300	2.91	
Chaceon maritae	3.80	10	2.73	
Plesiopeanaeus edwardsianus	3.60	4	2.58	
OPHICHTHIDAE	3.24	54	2.33	
ANTENNARIIDAE	3.06	22	2.20	
Hymenocephalus italicus	2.34	478	1.68	
Coelorinchus coelorhincus	2.26	40	1.62	
Illex sp.	2.16	18	1.55	
Aristeus varidensis, female	2.00	100	1.44	5014
POLYCHAELIDAE	1.26	158	0.90	
Malacocephalus laevis	1.00	8	0.72	
Peristedion sp.	0.90	4	0.65	
Nematocarcinus africanus	0.90	288	0.65	
Dibranchius atlanticus	0.64	40	0.46	
Pontinus sp.	0.54	10	0.39	
Hymenocephalus sp.	0.46	50	0.33	
Haploblepharus pictus	0.40	4	0.29	
Aristeus varidensis, male	0.28	40	0.20	5013
Lestidium atlanticum	0.28	10	0.20	
Zenopsis conchifer	0.28	4	0.20	
OPHIDIIDAE	0.18	4	0.13	
Yarella blackfordi	0.18	4	0.13	
Triplophos hemingi	0.18	10	0.13	
Total	140.64		100.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2215
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 933
 start stop duration Long E 1239
 TIME :18:43:07 19:14:23 31 (min) Purpose code: 3
 LOG :4301.22 4302.88 1.65 Area code : 2
 FDEPTH: 544 554 GearCond.code:
 BDEPTH: 544 554 Validity code:
 Towing dir: 350e Wire out:1450 m Speed: 30 kn*10
 Sorted: 40 Kg Total catch: 72.12 CATCH/HOUR: 139.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
PARALEPIDIDAE	55.94	1665	40.07	
Yarella blackfordi	25.63	697	18.36	
Aristeus varidens	15.25	1301	10.92	
Merluccius polli	12.58	23	9.01	
Hoplostethus cadonati	7.20	267	5.16	
LOPHIIDAE	3.64	2	2.61	
Todarodes sagittatus	3.25	19	2.33	
Plesionika martia	2.09	1030	1.50	
Illex coindetii	1.70	12	1.22	
Triplophos hemingi	1.35	236	0.97	
Etmopterus lucifer	1.24	27	0.89	
Lamprogrammus exotus	1.08	58	0.77	
Xenodermichthys copei	1.01	93	0.72	
NETTASTOMATIDAE	0.93	35	0.67	
Laemonema laureysi	0.77	147	0.55	
Halosaurus ovenii	0.77	19	0.55	
C E P H A L O P O D A	0.74	8	0.53	
Nezumia leonis	0.70	101	0.50	
Coloconger cadonati	0.54	4	0.39	
POLYCHAELIDAE	0.54	97	0.39	
Synphobranchus kaupii	0.46	19	0.33	
Gadella imberbis	0.46	15	0.33	
Dibranchus atlanticus	0.39	35	0.28	
Coelorrhinus coelorhincus	0.39	8	0.28	
Ebinania costaecanarie	0.31	8	0.22	
Plesiopaneus edwardsianus	0.15	19	0.11	
PANDALIDAE	0.15	58	0.11	
Talismania bifurcata	0.12	15	0.09	
UNIDENTIFIED FISH	0.04	4	0.03	
CERATIIDAE	0.04	4	0.03	
Bathycorogaster vicinus	0.04	8	0.03	
Peristedion sp.	0.04	8	0.03	
Nemichthys scolopaceus	0.04	15	0.03	
Total	139.58		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2216
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 929
 start stop duration Long E 1237
 TIME :21:11:44 21:41:19 30 (min) Purpose code: 3
 LOG :4310.39 4311.99 1.56 Area code : 2
 FDEPTH: 638 643 GearCond.code:
 BDEPTH: 638 643 Validity code:
 Towing dir: 340e Wire out:1750 m Speed: 30 kn*10
 Sorted: 19 Kg Total catch: 40.55 CATCH/HOUR: 81.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarella blackfordi	30.60	950	37.73	
Hoplostethus cadonati	7.70	270	9.49	
Etmopterus lucifer	4.10	40	5.06	
POLYCHAELIDAE	3.80	420	4.69	
Aristeus varidens	3.70	216	4.56	
Triplophos hemingi	3.40	496	4.19	
Lamprogrammus exotus	3.12	18	3.85	
Plesionika martia	3.10	1280	3.82	
Merluccius polli	2.88	6	3.55	
Gadella imberbis	2.40	80	2.96	
Nematocarcinus africanus	2.40	620	2.96	
Todarodes sagittatus	1.80	10	2.22	
Chaceon maritae	1.64	4	2.02	
Illex coindetii	1.60	10	1.97	
Talismania bifurcata	1.60	140	1.97	
R A Y S	1.40	8	1.73	
SYNPHOBANCHIDAE	0.80	30	0.99	
OPHIDIIDAE	0.64	6	0.79	
Malacocephalus occidentalis	0.64	4	0.79	
OPLOPHORIDAE	0.60	20	0.74	
LOPHIIDAE	0.56	2	0.69	
Laemonema laureysi	0.50	20	0.62	
Dibranchus atlanticus	0.30	20	0.37	
Glyphus marsupialis	0.30	25	0.37	
SERGESTIDAE	0.30	50	0.37	
Xenodermichthys copei	0.30	20	0.37	
NETTASTOMATIDAE	0.20	6	0.25	
Nezumia sp.	0.20	10	0.25	
Stomias sp.	0.20	20	0.25	
MYCTOPHIDAE	0.10	6	0.12	
Trachyrincus scabrus	0.10	6	0.12	
Nemichthys scolopaceus	0.06	10	0.07	
PARALEPIDIDAE	0.06	6	0.07	
Total	81.10		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2217
 DATE:27/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 926
 start stop duration Long E 1233
 TIME :23:16:26 23:46:23 30 (min) Purpose code: 3
 LOG :4316.93 4318.37 1.42 Area code : 2
 FDEPTH: 746 766 GearCond.code:
 BDEPTH: 746 766 Validity code:
 Towing dir: e Wire out:1820 m Speed: 30 kn*10
 Sorted: 31 Kg Total catch: 95.87 CATCH/HOUR: 191.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Coelorrhinus coelorhincus	39.00	800	20.34	
Synphobranchus kaupii	14.40	450	7.51	
POLYCHAELIDAE	14.40	320	7.51	
Yarella blackfordi	13.60	240	7.09	
Lamprogrammus exotus	13.50	30	7.04	
Talismania bifurcata	12.60	120	6.57	
Chaceon maritae	11.16	20	5.82	
Illex coindetii	10.40	60	5.42	
LOPHIIDAE	10.28	6	5.36	
Stomias sp.	8.80	210	4.59	
Merluccius polli	7.72	12	4.03	
R A Y S	7.60	30	3.96	
Aristeus varidens	7.00	360	3.65	
Hoplostethus cadonati	5.40	160	2.82	
Dibranchus atlanticus	3.40	100	1.77	
Etmopterus lucifer	3.00	50	1.56	
Hoplostethus mediterraneus	2.60	10	1.36	
Triplophos hemingi	1.80	210	0.94	
Benthodesmus tenuis	1.60	60	0.83	
Ebinania costaecanarie	1.08	2	0.56	
Halosaurus ovenii	1.00	10	0.52	
Trichiurus lepturus	0.60	20	0.31	
Nephropsis atlantica	0.40	10	0.21	
Glyphus marsupialis	0.40	30	0.21	
Total	191.74		99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2218
 DATE:28/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 930
 start stop duration Long E 1244
 TIME :05:49:52 06:20:15 30 (min) Purpose code: 3
 LOG :4339.07 4340.66 1.57 Area code : 2
 FDEPTH: 178 177 GearCond.code:
 BDEPTH: 178 177 Validity code:
 Towing dir: 320e Wire out: 480 m Speed: 30 kn*10
 Sorted: 75 Kg Total catch: 365.72 CATCH/HOUR: 731.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	598.40	57800	81.81	
Dentex angolensis	21.84	94	2.99	5015
Brotula barbat	20.20	28	2.76	
Illex coindetii	19.60	270	2.68	
Zenopsis conchifer	16.48	50	2.25	
Dentex macrophthalmus	8.44	54	1.15	5016
Pterothrissus bellotti	7.60	70	1.04	
Zeus faber	7.20	30	0.98	
Trichiurus lepturus	7.00	16	0.96	
Torpedo torpedo	5.40	8	0.74	
Lepidotrigla cadmani	5.20	40	0.71	
Parapaneus longirostris	4.80	860	0.66	
Todarodes sagittatus	2.40	20	0.33	
Monolele micrstroma	2.20	130	0.30	
Saurida brasiliensis	1.20	190	0.16	
Sphaeroides pachygaster	1.08	2	0.15	
Uranoscopus albesca	1.00	10	0.14	
Sepia officinalis hierreda	0.80	50	0.11	
Bombrops heterurus	0.60	10	0.08	
Total	731.44		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2219
 DATE:28/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 929
 start stop duration Long E 125:
 TIME :07:51:39 08:00:02 8 (min) Purpose code: 3
 LOG :4351.44 4351.88 0.42 Area code : 2
 FDEPTH: 109 108 GearCond.code: 7
 BDEPTH: 109 108 Validity code: 4
 Towing dir: 340e Wire out: 300 m Speed: 30 kn*10
 Sorted: 12 Kg Total catch: 11.56 CATCH/HOUR: 86.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	42.90	120	49.48	
Zenopsis conchifer	21.45	68	24.74	
Illex coindetii	16.35	368	18.86	
Synagrops microlepis	2.25	233	2.60	
Dentex macrophthalmus	1.50	8	1.73	
Selene dorsalis	1.35	8	1.56	
Citharus linguatula	0.45	23	0.52	
Peristedion cataphractum	0.30	8	0.35	
Parapaneus longirostris	0.08	8	0.09	
Chlorophthalmus atlanticus	0.08	8	0.09	
Total	86.71		100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2220
 DATE:28/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 925
 start stop duration Long E 1250
 TIME :08:51:53 09:05:34 14 (min) Purpose code: 3
 LOG :4357.17 4357.84 0.65 Area code : 2
 FDEPTH: 104 104 GearCond.code:
 BDEPTH: 104 104 Validity code:
 Towing dir: 160e Wire out: 320 m Speed: 30 kn*10
 Sorted: 22 Kg Total catch: 21.68 CATCH/HOUR: 92.91

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macrophthalmus	22.46	90	24.17	
Dentex barmardi	21.17	56	22.79	
Dentex angolensis	18.86	77	20.30	
Lepidotrigla cadmani	7.63	64	8.21	
Zeus faber	5.40	26	5.81	
Ubrina canariensis	4.54	9	4.89	
Citharus linguatula	2.66	34	2.86	
Chaetodon hoeffleri	2.57	17	2.77	
Sepia orbignyana	1.20	4	1.29	
Sardinella aurita	0.86	159	0.93	
Loligo vulgaris	0.86	4	0.93	
Serranus accraensis	0.86	4	0.93	
Brachydeuterus auritus	0.86	4	0.93	
Selene dorsalis	0.77	4	0.83	
Pagellus bellottii	0.77	4	0.83	
Boops boops	0.43	4	0.46	
Scorpaena normani	0.43	4	0.46	
Microchirus frecklepi	0.34	4	0.37	
Alloteuthis africana	0.26	47	0.28	
Total	92.93		100.04	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2221
 DATE:28/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 924 Long E 1303
 start stop duration
 TIME :10:53:19 11:23:13 30 (min) Purpose code: 3
 LOG :4373.88 4375.45 1.57 Area code : 2
 FDEPTH: 22 23 GearCond.code:
 BDEPTH: 22 23 Validity code:
 Towing dir: 305e Wire out: 70 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 33.18 CATCH/HOUR: 66.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pomadoury rogeri	22.16	24	33.39
Lutjanus fulgens	12.00	4	18.08
Alectis alexandrinus	10.80	10	16.27
Dentex macrophthalmus	8.72	20	13.14
Engraulis encrasicolus	3.32	774	5.00
Arius parkii	2.44	4	3.68
MONACANTHIDAE	1.72	2	2.59
Raja miraletus	1.56	2	2.35
Plectrohinchus mediterraneus	1.44	2	2.17
Fistularia petimba	0.96	2	1.45
Lagocephalus laevigatus	0.92	4	1.39
Pagellus bellottii	0.32	2	0.48
Total	66.36		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2222
 DATE:28/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 918 Long E 1254
 start stop duration
 TIME :12:43:05 13:13:05 30 (min) Purpose code: 3
 LOG :4386.34 4387.96 1.57 Area code : 2
 FDEPTH: 56 58 GearCond.code:
 BDEPTH: 56 58 Validity code:
 Towing dir: 160e Wire out: 200 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 179.44 CATCH/HOUR: 358.88

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	248.00	4920	69.10
Trachurus trecae	38.00	5100	10.59
Decapterus rhonchus	11.16	26	3.11
Lichognathus mormyrus	10.76	26	3.00
Arygrosomus hololepidotus	10.16	8	2.83
Galeoides decadactylus	9.20	30	2.56
Sphyræna guanchancho	6.40	10	1.78
Pagellus bellottii	6.20	42	1.73
Umbriina canariensis	4.00	10	1.11
Epinephelus aeneus	4.00	4	1.11
Pagrus africanus	2.36	2	0.66
Dentex angolensis	1.76	18	0.49
Zeus faber	1.20	10	0.33
Chaetodon hoefleri	1.00	6	0.28
Balistes caprisus	0.92	2	0.26
Allotautis africana	0.80	230	0.22
Citharus linguatula	0.60	10	0.17
Raja miraletus	0.56	2	0.16
Psoudupeneus prayensis	0.20	10	0.06
Dentex barnardi	0.16	4	0.04
Total	357.44		99.59

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2223
 DATE:28/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 918 Long E 1248
 start stop duration
 TIME :14:30:32 15:00:11 30 (min) Purpose code: 3
 LOG :4396.61 4398.34 1.73 Area code : 2
 FDEPTH: 109 107 GearCond.code:
 BDEPTH: 109 107 Validity code:
 Towing dir: 160e Wire out: 325 m Speed: 30 kn*10

Sorted: Kg Total catch: 28.79 CATCH/HOUR: 57.58

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	18.36	118	31.89
Trachurus trecae	9.00	352	15.63
Saurida brasiliensis	6.88	1262	11.95
Trichiurus lepturus	6.16	8	10.70
Raja miraletus	3.20	4	5.56
Pterothrissus bellocci	2.56	12	4.45
Zeus faber	2.00	8	3.47
Fistularia petimba	1.60	6	2.78
Trigla lyra	1.56	10	2.71
Dentex macrophthalmus	1.16	8	2.01
Dentex angolensis	1.12	16	1.95
Priacanthus arenatus	0.84	2	1.46
Parapeneus longirostris	0.76	178	1.32
Citharus linguatula	0.60	8	1.04
Lagocephalus laevigatus	0.40	2	0.69
Umbriina canariensis	0.24	2	0.42
Sepia officinalis hierredda	0.14	2	0.24
Total	57.58		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2224
 DATE:28/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 921 Long E 1241
 start stop duration
 TIME :16:40:30 17:05:30 25 (min) Purpose code: 3
 LOG :4410.37 4411.60 1.23 Area code : 2
 FDEPTH: 219 225 GearCond.code:
 BDEPTH: 219 225 Validity code:
 Towing dir: 350e Wire out: 600 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 45.50 CATCH/HOUR: 109.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Zenopsis conchifer	39.84	151	36.48
Synagrops microlepis	25.10	1819	22.99
Illex coindetii	9.84	158	9.01
Dentex angolensis	6.19	22	5.67
MYCTOPHIDAE	4.51	485	4.13
Brotula barbata	3.55	2	3.25
Trichiurus lepturus	2.64	5	2.42
Brachydeuterus auritus	2.26	14	2.07
Peristedion sp.	1.92	2	1.76
Loligo sp.	1.66	618	1.54
Raja miraletus	1.49	2	1.36
Uranoscopus polli	1.30	10	1.19
Pontinus accraensis	1.25	7	1.14
Pterothrissus bellocci	1.25	10	1.14
Dentex macrophthalmus	1.10	7	1.01
Parapeneopsis atlantica	1.01	170	0.92
Fistularia petimba	0.96	2	0.88
Trachurus trecae	0.62	24	0.57
Merluccius polli	0.62	12	0.57
Lophius vaillanti	0.58	5	0.53
Sepia officinalis hierredda	0.48	2	0.44
Chlorophthalmus atlanticus	0.48	103	0.44
Coelorrhinchus coelorrhinchus	0.43	10	0.39
Citharus linguatula	0.10	5	0.09
Total	109.20		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2225
 DATE:28/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 924 Long E 1235
 start stop duration
 TIME :20:42:53 21:13:07 30 (min) Purpose code: 3
 LOG :4438.97 4440.70 1.72 Area code : 2
 FDEPTH: 587 610 GearCond.code:
 BDEPTH: 587 610 Validity code:
 Towing dir: 330e Wire out:1750 m Speed: 30 kn*10

Sorted: 36 Kg Total catch: 64.16 CATCH/HOUR: 128.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Yarellia blackfordi	32.60	1064	25.41
POLYCHAELIDAE	20.64	1856	16.08
Stomias sp.	14.24	316	11.10
Merluccius polli	7.52	16	5.86
Aristeus varidens	7.36	444	5.74
Hoplostethus cadenati	6.16	272	4.80
Centroprorus granulatus	4.64	2	3.62
Nezumia leonis	4.08	92	3.18
Xenodermichthys copei	3.60	272	2.81
PALAEMONIDAE	3.52	198	2.74
Chaceon maritae	3.40	4	2.65
BTIIDAE	3.04	176	2.37
Plesionika martia	2.24	1052	1.75
Dibranchus atlanticus	2.16	80	1.68
Lamprogrammus exultans	2.16	40	1.68
Illex sp.	1.76	12	1.37
Laemonema leureysi	1.60	20	1.25
Triplophos hemingi	1.60	240	1.25
LOPHIIDAE	1.32	2	1.03
Malacocephalus laevis	0.96	8	0.75
Synaphobranchus kaupii	0.72	20	0.56
Nematocarcinus africanus	0.72	244	0.56
NETRACHTHIDAE	0.48	12	0.37
Trachyrhynchus scabrus	0.40	12	0.31
Halosaurus ovenii	0.32	8	0.25
Elmopterus lucifer	0.32	8	0.25
PANDALIDAE	0.32	64	0.25
Gadella imberbis	0.16	8	0.12
Raja sp.	0.08	4	0.06
SERGESTIDAE	0.08	12	0.06
Talismania bifurcata	0.08	8	0.06
C R A B S	0.04	4	0.03
Total	128.32		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2226
 DATE:29/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 910 Long E 1240
 start stop duration
 TIME :23:43:46 00:13:48 30 (min) Purpose code: 3
 LOG :4459.23 4460.77 1.51 Area code : 2
 FDEPTH: 368 357 GearCond.code:
 BDEPTH: 368 357 Validity code:
 Towing dir: 165e Wire out:1000 m Speed: 30 kn*10

Sorted: 74 Kg Total catch: 165.70 CATCH/HOUR: 331.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Gadella imberbis	95.76	1778	28.90
Squatina squatina	58.80	2	17.74
Malacocephalus occidentalis	29.40	42	8.87
Merluccius polli	28.80	116	8.69
Hymenocephalus italicus	18.48	2338	5.58
Coelorrhinchus coelorrhinchus	13.16	308	3.97
Illex coindetii	10.36	70	3.13
LOPHIIDAE	9.16	10	2.75
Parapeneus longirostris	8.68	1008	2.62
Chlorophthalmus atlanticus	8.12	98	2.45
Chauliodus sloani	7.28	168	2.20
Hoplostethus mediterraneus	6.76	6	2.04
Aristeus varidens	6.44	602	1.94
Pontinus accraensis	5.68	10	1.71
Centroprorus granulatus	5.60	2	1.69
Synagrops microlepis	5.60	224	1.69
Bassanago albescens	5.04	42	1.52
Gadella imberbis	2.52	126	0.76
Trigla lyra	2.12	6	0.64
Halosaurus ovenii	1.68	84	0.51
Stomias sp.	0.84	28	0.25
Dibranchus atlanticus	0.28	28	0.08
Epigonus pandionis	0.28	14	0.08
POLYCHAELIDAE	0.28	28	0.08
Peristedion cataphractum	0.14	28	0.04
GALATHEIDAE	0.14	42	0.04
Total	331.40		99.96

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2227
 DATE:29/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 909
 start stop duration
 TIME :06:03:49 06:36:20 33 (min) Purpose code: 3 Long E 1257
 LOG :4498.86 4500.86 1.92 Area code : 2
 FDEPTH: 22 29 GearCond.code:
 BDEPTH: 22 29 Validity code:
 Towing dir: 350e Wire out: 90 m Speed: 30 kn*10
 Sorted: 50 Kg Total catch: 62.81 CATCH/HOUR: 114.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Selene dorsalis	32.24	1698	28.23
Brachydeuterus auritus	24.05	4391	21.06
Sphyræna guachancho	13.38	91	11.72
Galeoides decadactylus	9.09	33	7.96
Arius parkii	6.04	5	5.29
Pseudoclichus senegalensis	5.82	5	5.10
Chlorophthalmus atlanticus	4.96	287	4.34
Zenopsis conchifer	4.00	13	3.50
Scomberomorus tritor	3.53	4	3.09
Sardinella maderensis	2.84	80	2.49
Pagellus bellottii	2.73	9	2.39
Stromateus fiatola	1.45	2	1.27
Trichiurus lepturus	1.05	2	0.92
Pomadasyx rogeri	0.91	2	0.80
Loligo sp.	0.38	431	0.33
Illex affricans	0.38	5	0.33
Rypticus saponaceus	0.33	5	0.29
Pomadasyx incisus	0.27	9	0.24
Uranoscopus polli	0.22	2	0.19
Decapterus rhonchus	0.16	5	0.14
Penaeus notialis	0.15	4	0.13
Sepiella ornata	0.11	42	0.10
PARALEPIDIDAE	0.05	9	0.04
Engraulis encrasicolus	0.05	5	0.04
Total	114.19	99.99	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2228
 DATE:29/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 856
 start stop duration
 TIME :09:06:21 09:36:33 30 (min) Purpose code: 3 Long E 1301
 LOG :4517.49 4519.12 1.57 Area code : 3
 FDEPTH: 171 171 GearCond.code:
 BDEPTH: 171 171 Validity code:
 Towing dir: 210e Wire out: 460 m Speed: 30 kn*10
 Sorted: 108 Kg Total catch: 390.42 CATCH/HOUR: 780.84

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	255.90	31966	32.77
Miracorvina angolensis	150.30	630	19.25
Pterothrissus belloci	149.40	976	19.13
Brotula barbata	44.56	32	5.71
Trachurus trecae	35.76	48	4.58
Pontinus accraensis	33.00	16	4.23
Penaeus notialis	26.70	6390	3.42
Zenopsis conchifer	18.36	20	2.35
Zeus faber	14.10	60	1.81
Dentex macrophthalmus	11.80	40	1.51
Trichiurus lepturus	10.36	16	1.33
Dentex angolensis	6.96	36	0.89
Raja straeleni	5.44	2	0.70
Trigla lyra	5.10	30	0.65
Scorpaena normani	4.80	16	0.61
Bembrops heterurus	4.20	30	0.54
Chlorophthalmus atlanticus	1.80	196	0.23
Pagellus bellottii	0.76	2	0.10
Uranoscopus polli	0.64	2	0.08
Gephyroberyx darwini	0.60	150	0.08
Chloroscombus chrysurus	0.30	16	0.04
Total	780.84	100.01	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2229
 DATE:30/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 855
 start stop duration
 TIME :21:35:16 22:12:57 38 (min) Purpose code: 3 Long E 1250
 LOG :4594.33 4596.19 1.81 Area code : 3
 FDEPTH: 447 446 GearCond.code:
 BDEPTH: 447 446 Validity code:
 Towing dir: 200e Wire out:1200 m Speed: 30 kn*10
 Sorted: 57 Kg Total catch: 143.65 CATCH/HOUR: 226.82

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Yarella blackfordi	32.83	477	14.47
Merluccius polli	32.08	39	14.14
Laemonema laureysi	25.58	960	11.28
Benthodesmus tenuis	22.17	739	9.77
Bathyroconger vicinus	16.06	242	7.08
Aristeus varidens	14.07	1265	6.20
Coelorhynchus coelorhynchus	10.80	256	4.76
Pterothrissus belloci	10.66	51	4.70
Etmopterus lucifer	10.52	213	4.64
LOPHIIDAE	6.03	13	2.66
Centrophorus uyato	5.87	2	2.59
Xenodermichthys copei	5.40	448	2.38
Halosaurus ovenii	5.34	327	2.35
Illex coindetii	4.83	28	2.13
Todaropsis eblanae	3.41	14	1.50
Hoplostethus cadenati	2.98	235	1.31
Coloconger cadenati	2.91	17	1.28
NETTASTOMATIDAE	2.70	79	1.19
Chaceon maritae	2.49	6	1.10
STOMIIDAE	2.13	51	0.94
Chaunax pictus	1.85	43	0.82
Bathynectes piperitus	1.28	28	0.56
Plesionaeus edwardsianus	0.99	22	0.44
Plesionika maritima	0.71	406	0.31
POLYCHAELIDAE	0.71	93	0.31
Nematocarcinus africanus	0.71	199	0.31
Chlorophthalmus atlanticus	0.57	14	0.25
Dibranchius atlanticus	0.57	36	0.25
SCYLIORHINIDAE	0.28	14	0.12
Gadella imberbis	0.14	8	0.06
SQUALIDAE	0.14	8	0.06
Total	226.81	99.96	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2230
 DATE:31/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 844
 start stop duration
 TIME :01:07:03 01:37:11 30 (min) Purpose code: 3 Long E 1248
 LOG :4616.32 4617.98 1.65 Area code : 3
 FDEPTH: 662 676 GearCond.code:
 BDEPTH: 662 676 Validity code:
 Towing dir: 10e Wire out:1650 m Speed: 30 kn*10
 Sorted: 34 Kg Total catch: 136.54 CATCH/HOUR: 273.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	101.88	19360	37.31
Yarella blackfordi	77.40	1864	28.34
Stomias sp.	23.22	144	8.50
Malacocephalus occidentalis	10.08	226	3.69
LOPHIIDAE	7.80	2	2.86
Lamprogrammus exotus	7.74	28	2.83
Hoplostethus cadenati	6.84	216	2.50
Talismania bifurcata	5.76	162	2.11
Triplophus hemingi	4.86	676	1.78
Trichiurus lepturus	4.50	10	1.66
C E P H A L O P O D A	4.32	18	1.58
POLYCHAELIDAE	4.32	504	1.58
OPHIDIIDAE	2.88	100	1.05
Benthodesmus tenuis	2.34	90	0.86
Merluccius polli	2.20	4	0.81
Illex coindetii	1.80	10	0.66
Halosaurus ovenii	1.26	46	0.46
Etmopterus lucifer	0.90	28	0.33
Xenodermichthys copei	0.72	18	0.26
UNIDENTIFIED FISH	0.54	10	0.20
Gadella imberbis	0.54	18	0.20
Bathyroconger vicinus	0.54	18	0.20
Glyphus marsupialis	0.36	18	0.13
Dibranchius atlanticus	0.18	10	0.07
SCYLIORHINIDAE	0.10	10	0.04
Total	273.08	100.00	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2231
 DATE:31/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 845
 start stop duration
 TIME :03:18:11 03:48:15 30 (min) Purpose code: 3 Long E 1255
 LOG :4627.56 4629.19 1.60 Area code : 3
 FDEPTH: 350 350 GearCond.code:
 BDEPTH: 350 350 Validity code:
 Towing dir: 190e Wire out:1005 m Speed: 30 kn*10
 Sorted: 40 Kg Total catch: 118.05 CATCH/HOUR: 236.10

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Merluccius polli	97.74	814	41.40
Trichiurus lepturus	26.46	1116	11.21
Synagrops microlepis	20.52	108	8.69
Laemonema laureysi	18.54	190	7.85
Benthodesmus tenuis	17.28	900	7.32
Parapanaeus longirostris, fem.	15.84	1540	6.71
Chaunax pictus	7.92	378	3.35
Halosaurus ovenii	7.92	100	3.35
Illex coindetii	5.40	36	2.29
Bathyroconger vicinus	4.40	4	1.86
Zenopsis conchifer	2.28	2	0.97
Malacocephalus occidentalis	1.80	10	0.76
Coelorhynchus coelorhynchus	1.80	46	0.76
LOPHIIDAE	1.62	36	0.69
Parapanaeus longirostris, male	1.36	18	0.58
Dibranchius atlanticus	1.26	144	0.53
Gadella imberbis	1.08	46	0.46
Hymenocephalus italicus	0.90	270	0.38
Epigonus telescopus	0.72	36	0.30
Bembrops greyi	0.72	10	0.30
Chlorophthalmus atlanticus	0.54	10	0.23
Total	236.10	99.99	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2232
 DATE:31/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 846
 start stop duration
 TIME :05:54:58 06:25:28 31 (min) Purpose code: 3 Long E 1257
 LOG :4636.79 4638.38 1.59 Area code : 3
 FDEPTH: 265 275 GearCond.code:
 BDEPTH: 265 275 Validity code:
 Towing dir: 360e Wire out: 750 m Speed: 30 kn*10
 Sorted: 93 Kg Total catch: 437.56 CATCH/HOUR: 846.89

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	232.55	3484	27.46
Zenopsis conchifer	126.54	223	14.94
Merluccius polli, juveniles	122.52	2948	14.47
Synagrops microlepis	114.10	7665	13.47
Pterothrissus belloci	107.13	683	12.65
Merluccius polli	69.68	277	8.23
Parapanaeus longirostris, male	21.48	3489	2.54
Parapanaeus longirostris, fem.	12.48	1874	1.47
Brotula barbata	12.04	10	1.42
Laemonema laureysi	9.87	87	1.17
Bembrops heterurus	6.10	116	0.72
Gadella imberbis	4.65	174	0.55
Illex coindetii	4.35	58	0.51
Mystriophis rostellatus	1.66	6	0.20
Monolepis microstoma	0.87	58	0.10
Coelorhynchus coelorhynchus	0.58	29	0.07
Todarodes sagittatus	0.29	15	0.03
Total	846.89	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2233
 DATE:31/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 846 Long E 1302
 start stop duration
 TIME :07:50:08 08:20:02 30 (min) Purpose code: 3
 LOG :4645.94 4647.51 1.56 Area code : 3
 FDEPTH: 145 146 GearCond.code:
 BDEPTH: 145 146 Validity code:
 Towing dir: 100 Wire out: 420 m Speed: 30 kn*10
 Sorted: 78 Kg Total catch: 263.74 CATCH/HOUR: 527.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	375.12	26736	71.12	
Trichurus lepturus	43.96	328	8.33	
Pterothrissus belloci	24.48	156	4.64	
Dentex angolensis	21.72	96	4.12	5027
Chelidonichthys gabonensis	13.92	96	2.64	
Zeus faber	7.44	48	1.41	
Pentheroscion mbizi	7.20	48	1.36	
Illex coindetii	6.24	60	1.18	
Zenopsis conchifer	5.40	10	1.02	
Saurida brasiliensis	4.56	660	0.86	
Pagellus bellottii	3.84	20	0.73	5029
Dentex macrophthalmus	2.72	12	0.52	5028
Sepia orbignyana	2.48	4	0.47	
Parapenaeus longirostris, male	2.16	744	0.41	5030
Brotula barbata	1.80	4	0.34	
Parapenaeus longirostris, fem.	1.44	372	0.27	5031
Citharus linguatula	0.72	12	0.14	
Umbria canariensis	0.60	2	0.11	
Todaropsis eblanae	0.24	36	0.05	
Calappa pelii	0.24	2	0.05	
Total	526.28		99.77	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2234
 DATE:31/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 846 Long E 1310
 start stop duration
 TIME :09:51:02 10:21:51 31 (min) Purpose code: 3
 LOG :4658.79 4660.48 1.69 Area code : 3
 FDEPTH: 80 78 GearCond.code:
 BDEPTH: 80 78 Validity code:
 Towing dir: 200 Wire out: 240 m Speed: 30 kn*10
 Sorted: 89 Kg Total catch: 308.90 CATCH/HOUR: 597.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	298.37	960	49.91	
Dentex barnardi	120.46	77	20.15	
Brachydeuterus auritus	36.23	705	6.06	
Umbria canariensis	32.52	263	5.44	5032
Trachurus trecae, juvenile	14.09	573	2.36	5033
Pagellus bellottii	12.70	77	2.12	
Lithognathus mormyrus	12.39	23	2.07	
Zeus faber	7.74	39	1.29	
Dentex angolensis	7.74	85	1.29	
Sphyræna guachancho	7.12	8	1.19	
Miracorvina angolensis	6.97	23	1.17	
Fistularia petimba	6.08	12	1.02	
Pterothrissus belloci	5.26	108	0.88	
Epinephelus goreensis	4.80	4	0.80	
Torpedo torpedo	4.65	6	0.78	
Atractoscion aequidens	4.61	6	0.77	
Epinephelus aeneus	4.45	2	0.74	
Stromateus fiatola	3.25	8	0.54	
Trachurus trecae	2.92	15	0.49	
Raja miraletus	1.82	2	0.30	
Sepia orbignyana	1.24	4	0.21	
Lagocephalus laevigatus	1.12	4	0.19	
Chaetodon hoefleri	0.85	6	0.14	
BATRACHOIDIDAE	0.35	2	0.06	
Chaetodon marcellae	0.12	2	0.02	
Total	597.85		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2235
 DATE:31/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 836 Long E 1320
 start stop duration
 TIME :12:17:34 12:22:10 5 (min) Purpose code: 3
 LOG :4674.77 4675.03 0.25 Area code : 3
 FDEPTH: 25 26 GearCond.code:
 BDEPTH: 25 26 Validity code:
 Towing dir: 350 Wire out: 130 m Speed: 30 kn*10
 Sorted: 128 Kg Total catch: 325.97 CATCH/HOUR: 3911.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	1990.80	25560	50.89	
Rhizoprionodon acutus	686.64	276	17.55	
Brachydeuterus auritus	264.60	16116	6.76	
Selene dorsalis	234.00	14400	5.98	
Sphyræna guachancho	205.68	576	5.26	
Sardinella maderensis	117.00	2880	2.99	
Alectis alexandrinus	91.92	120	2.35	
Galeoides decadactylus	85.92	132	2.20	
Pseudotolithus typus	70.20	96	1.79	
Arius parkii	47.28	60	1.21	
Drepane africana	27.00	96	0.69	
Pomadourus jubelini	19.80	96	0.51	
Gymnura micrura	19.44	12	0.50	
Trichurus lepturus	17.28	108	0.44	
Stromateus fiatola	14.40	96	0.37	
Dentex barnardi	11.28	24	0.29	
Penaeus notialis	8.40	216	0.21	
Total	3911.64		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2236
 DATE:31/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 837 Long E 1313
 start stop duration
 TIME :13:41:37 14:11:11 30 (min) Purpose code: 3
 LOG :4684.46 4686.08 1.62 Area code : 3
 FDEPTH: 69 70 GearCond.code:
 BDEPTH: 69 70 Validity code:
 Towing dir: 340 Wire out: 220 m Speed: 30 kn*10
 Sorted: 48 Kg Total catch: 1061.24 CATCH/HOUR: 2122.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	1166.88	14322	54.98	
Brachydeuterus auritus	732.60	18216	34.52	
Galeoides decadactylus	91.74	132	4.32	
Sphyræna guachancho	50.82	166	2.39	
Atractoscion aequidens	25.08	132	1.18	
Rhizoprionodon acutus	24.72	6	1.16	
Trachurus trecae, juvenile	15.84	990	0.75	
Selene dorsalis	10.56	330	0.50	
Trichurus lepturus	3.24	6	0.15	
Fistularia petimba	1.00	4	0.05	
Total	2122.48		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2237
 DATE:31/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 836 Long E 1303
 start stop duration
 TIME :15:39:04 16:09:08 30 (min) Purpose code: 3
 LOG :4697.38 4699.16 1.76 Area code : 3
 FDEPTH: 122 122 GearCond.code:
 BDEPTH: 122 122 Validity code:
 Towing dir: 360 Wire out: 390 m Speed: 30 kn*10
 Sorted: 113 Kg Total catch: 112.96 CATCH/HOUR: 225.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	195.12	1638	86.37	
Dentex congolensis	8.56	114	3.79	5038
Dentex angolensis	4.60	42	2.04	
Pterothrissus belloci	3.24	30	1.43	
Sepia officinalis hierredda	3.16	2	1.40	
Illex coindetii	2.96	44	1.31	
Brotula barbata	2.88	4	1.27	
Chloroscombrus chrysurus	1.80	20	0.80	
Uranoscopus polli	0.72	2	0.32	
Pontinus accraensis	0.68	6	0.30	
Sphyræna guachancho	0.64	2	0.28	
Chaetodon hoefleri	0.52	4	0.23	
Zeus faber	0.48	6	0.21	
Brachydeuterus auritus	0.40	8	0.18	
Sardinella maderensis	0.28	2	0.12	
Saurida brasiliensis	0.08	14	0.04	
Cynoglossus canariensis	0.08	4	0.04	
Trigla lyra	0.08	2	0.04	
Parapenaeus longirostris	0.04	10	0.02	
Total	226.32		100.19	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2238
 DATE:31/ 3/00 GEAR TYPE: BT No: 8 POSITION:Lat S 837 Long E 1256
 start stop duration
 TIME :17:58:41 18:28:06 29 (min) Purpose code: 3
 LOG :4711.59 4713.17 1.54 Area code : 3
 FDEPTH: 335 341 GearCond.code:
 BDEPTH: 335 341 Validity code:
 Towing dir: 340 Wire out: 900 m Speed: 30 kn*10
 Sorted: 30 Kg Total catch: 75.64 CATCH/HOUR: 156.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	41.46	192	26.49	5039
Laemonema sp.	26.57	329	16.98	
Merluccius polli, juveniles	15.39	242	9.83	5040
Lophius vaillanti	14.36	2	9.18	
Pterothrissus belloci	13.16	74	8.41	
Hymenocephalus italicus	12.41	2011	7.93	
Synagrops microlepis	10.92	466	6.98	
Parapenaeus longirostris, fem.	4.22	552	2.70	5042
Muraenesox bagio	2.61	81	1.67	
Lophiodon kempii	1.99	6	1.27	
ANTHIDAE	1.86	31	1.19	
Trichurus lepturus	1.74	99	1.11	
Dibranchius atlanticus	1.61	180	1.03	
Ceolorhynchus ceolorhynchus	1.49	37	0.95	
Pontinus accraensis	1.24	19	0.79	
Zenopsis conchifer	1.24	2	0.79	
Penaeus notialis	0.62	441	0.40	
Halosaurus ovenii	0.62	25	0.40	
Epigonus telescopus	0.62	25	0.40	
Nezumia aequalis	0.37	19	0.24	
Bembrops greyi	0.37	6	0.24	
Chlorophthalmus atlanticus	0.37	6	0.24	
Stomias boa boa	0.25	12	0.16	
Bathynectes piperitus	0.25	6	0.16	
Foristodion sp.	0.12	25	0.08	
Parapenaeus longirostris, male	0.06	6	0.04	
Aristeus varidens	0.06	12	0.04	5041
Solenocera africana	0.06	25	0.04	
Total	156.64		99.74	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2239
 DATE:31/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 835
 start stop duration
 TIME :20:13:44 20:44:11 30 (min) Purpose code: 3
 LOG :4722.15 4723.95 1.75 Area code : 3
 FDEPTH: 538 523 GearCond.code:
 BDEPTH: 538 523 Validity code:
 Towing dir: 340e Wire out:1400 m Speed: 30 kn*10
 Sorted: 23 Kg Total catch: 136.80 CATCH/HOUR: 273.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	198.48	57888	72.54	
STOMIIDAE	24.00	468	8.77	
Stomias sp.	22.80	3168	8.33	
Yarrella blackfordi	11.04	456	4.04	
Lamprogrammus exutus	5.76	48	2.11	
Talismania bifurcata	3.60	384	1.32	
Illex coindetii	2.16	12	0.79	
Etmopterus lucifer	0.96	12	0.35	
Hoplostethus cadenati	0.96	36	0.35	
OPHIIDAE	0.48	96	0.18	
Glyphus marsupialis	0.48	48	0.18	
ALEPOCEPHALIDAE	0.48	36	0.18	
POLYCHAELIDAE	0.48	96	0.18	
Coelorhynchus coelorhynchus	0.48	12	0.18	
Aristeus varidens	0.48	24	0.18	
Monomctopus sp.	0.24	72	0.09	
Nesumia sp.	0.24	36	0.09	
Nemichthys scolopaceus	0.24	12	0.09	
MELANOCETIDAE	0.12	24	0.04	
Total	273.48		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2240
 DATE:31/ 3/00 GEAR TYPE: BT No: 7 POSITION:Lat S 831
 start stop duration
 TIME :22:41:20 23:11:12 30 (min) Purpose code: 3
 LOG :4731.62 4733.29 1.66 Area code : 3
 FDEPTH: 714 741 GearCond.code:
 BDEPTH: 714 741 Validity code:
 Towing dir: 340e Wire out:1900 m Speed: 30 kn*10
 Sorted: 33 Kg Total catch: 268.45 CATCH/HOUR: 536.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Yarrella blackfordi	148.68	3366	27.69	
Nematocarcinus africanus	140.76	23832	26.22	
Lamprogrammus exutus	72.00	558	13.41	
Hoplostethus cadenati	41.76	1224	7.78	
POLYCHAELIDAE	38.88	2862	7.24	
Talismania bifurcata	24.48	558	4.56	
Nesumia leonis	20.88	414	3.89	
C E P H A L O P O D A	9.36	18	1.74	
Triplophus hemingi	7.20	1008	1.34	
Stomias sp.	6.12	162	1.14	
Bathyrroconger vicinus	5.40	162	1.01	
OPHIIDAE	4.68	360	0.87	
Chaceon maritae	4.16	12	0.77	
Merluccius polli	4.08	6	0.76	
Dibranchius atlanticus	2.88	144	0.54	
Etmopterus pusillus	1.80	36	0.34	
NETTASTOMATIDAE	1.08	18	0.20	
SYNAPHOBRANCHIDAE	1.08	18	0.20	
Glyphus marsupialis	1.08	36	0.20	
Aristeus varidens	0.54	54	0.10	
Total	536.90		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2241
 DATE: 1/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 827
 start stop duration
 TIME :00:56:05 01:26:27 30 (min) Purpose code: 3
 LOG :4738.95 4740.53 1.56 Area code : 3
 FDEPTH: 638 628 GearCond.code:
 BDEPTH: 638 628 Validity code:
 Towing dir: 340e Wire out:1650 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 226.90 CATCH/HOUR: 453.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	227.88	37026	50.22	
Illex coindetii	52.56	288	11.58	
Stomias sp.	36.36	558	8.01	
Yarrella blackfordi	26.28	684	5.79	
POLYCHAELIDAE	23.76	2448	5.24	
Triplophus hemingi	23.04	2948	5.08	
Hoplostethus cadenati	13.68	648	3.01	
Chaceon maritae	11.56	30	2.55	
Lamprogrammus exutus	10.08	90	2.22	
MACROURIDAE	5.04	72	1.11	
Talismania bifurcata	4.68	180	1.03	
Merluccius polli	3.40	6	0.75	
MORIDAE	2.52	468	0.56	
Xenodermichthys copei	2.16	126	0.48	
Etmopterus pusillus	1.80	36	0.40	
Benthodesmus tenuis	1.80	72	0.40	
Laemonema laureysi	1.44	18	0.32	
Aristeus varidens	1.44	144	0.32	
C E P H A L O P O D A	1.08	36	0.24	
Dibranchius atlanticus	1.08	72	0.24	
Epinania costaccanari	0.72	18	0.16	
Glyphus marsupialis	0.72	36	0.16	
UNIDENTIFIED FISH	0.36	18	0.08	
DICERATIIDAE	0.18	18	0.04	
NEMICHTHYIDAE	0.18	18	0.04	
Total	453.80		100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2242
 DATE: 1/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 826
 start stop duration
 TIME :02:54:47 03:24:42 30 (min) Purpose code: 3
 LOG :4747.06 4748.66 1.57 Area code : 3
 FDEPTH: 450 454 GearCond.code:
 BDEPTH: 450 454 Validity code:
 Towing dir: 340e Wire out:1200 m Speed: 30 kn*10
 Sorted: 72 Kg Total catch: 236.97 CATCH/HOUR: 473.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	276.46	45254	58.33	
Merluccius polli	89.40	276	18.65	5043
Triplophus hemingi	19.38	3298	4.09	
Stomias sp.	14.96	358	3.16	
Laemonema laureysi	13.26	136	2.80	
Illex coindetii	12.58	68	2.65	
Bathyrroconger vicinus	8.16	86	1.72	
Centrophorus granulosus	7.80	2	1.65	
B I V A L V E S	4.78	18	0.86	
Coelorhynchus coelorhynchus	2.72	34	0.57	
Benthodesmus tenuis	2.72	86	0.57	
Aristeus varidens	2.38	154	0.50	
MORIDAE	2.04	238	0.43	
Gadella imberbis	2.04	52	0.43	
Glyphus marsupialis	2.04	6	0.43	
Hymenocephalus italicus	2.04	272	0.43	
Halosaurus ovenii	1.70	68	0.36	
Trichiurus lepturus	1.44	2	0.30	
Chaunax pictus	1.02	18	0.22	
SEMGESTIDAE	1.02	86	0.22	
Etmopterus pusillus	1.02	18	0.22	
Dibranchius atlanticus	1.02	34	0.22	
POLYCHAELIDAE	1.02	154	0.22	
DICERATIIDAE	0.68	18	0.14	
Bathynectes piperitus	0.56	6	0.12	
Total	470.54		99.29	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2243
 DATE: 1/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 825
 start stop duration
 TIME :05:33:32 06:13:45 30 (min) Purpose code: 3
 LOG :4760.05 4761.67 1.64 Area code : 3
 FDEPTH: 245 250 GearCond.code:
 BDEPTH: 245 250 Validity code:
 Towing dir: 340e Wire out: 700 m Speed: 30 kn*10
 Sorted: 31 Kg Total catch: 577.57 CATCH/HOUR: 1155.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	512.40	34650	44.36	
Merluccius polli, juveniles	459.48	6300	39.78	5044
Pterothrissus belloci	46.20	336	4.00	
Zenopsis conchifer	40.74	106	3.53	
Chlorophthalmus atlanticus	34.44	1008	2.98	
Illex coindetii	15.98	168	1.38	
Parapenaeus longirostris, male	11.34	2204	0.98	5045
Parapenaeus longirostris, fem.	10.92	2100	0.95	5046
MYCTOPHIDAE	9.24	6006	0.80	
Dentex macrophthalmus	4.04	26	0.35	
Brotula barbata	2.00	2	0.17	
Monelene microstoma	0.84	84	0.07	
Sepia orbignyana	0.84	42	0.07	
Solenocera africana	0.22	22	0.02	
Dentex angolensis	0.16	2	0.01	
Total	1148.84		99.45	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2244
 DATE: 1/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 824
 start stop duration
 TIME :07:40:21 08:10:43 30 (min) Purpose code: 3
 LOG :4770.37 4772.06 1.66 Area code : 3
 FDEPTH: 125 150 GearCond.code:
 BDEPTH: 125 150 Validity code:
 Towing dir: 310e Wire out: 380 m Speed: 30 kn*10
 Sorted: 7 Kg Total catch: 6.81 CATCH/HOUR: 13.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	4.40	26	32.31	5047
Zenopsis conchifer	2.60	12	19.09	
Zeus faber	1.80	12	13.22	
Anthias anthias	1.64	126	12.04	
Dentex congoensis	1.32	16	9.69	5048
Scorpaena angolensis	0.80	2	5.87	
Illex coindetii	0.60	44	4.41	
Pagellus bellottii	0.44	2	3.23	
Monelene microstoma	0.02	4	0.15	
Total	13.62		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2245
 DATE: 1/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 823
 start stop duration
 TIME :08:20:29 10:01:27 29 (min) Purpose code: 3
 LOG :4784.83 4786.38 1.55 Area code : 3
 FDEPTH: 83 79 GearCond.code:
 BDEPTH: 83 79 Validity code:
 Towing dir: 20e Wire out: 250 m Speed: 30 kn*10
 Sorted: 59 Kg Total catch: 1592.64 CATCH/HOUR: 3295.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	2647.20	85920	80.34	
Trachurus trecae, juvenile	537.60	30854	16.32	5049
Chloroscombrus chrysurus	16.80	120	0.51	
Trichiurus lepturus	15.81	46	0.48	
Sardinella aurita	14.40	240	0.44	
Stromateus fiatola	12.50	41	0.38	
Dentex angolensis	8.11	50	0.25	5050
Sphyrna tiburo	6.08	12	0.18	
Squatina oculata	5.92	2	0.18	
Sepia officinalis hierredda	5.34	10	0.16	
Selene dorsalis	4.80	120	0.15	
Atractoscion aequidens	4.63	21	0.14	
Galeoides decadactylus	4.30	19	0.13	
Saurida brasiliensis	2.40	480	0.07	
Pterothrissus belloci	2.40	120	0.07	
Pagellus bellottii	1.90	23	0.06	
Torpedo torpedo	1.82	6	0.06	
Decapterus punctatus	1.03	4	0.03	
Total	3293.04		99.95	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2246
 DATE: 1/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 825
 start stop duration Long E 1317
 TIME :12:23:34 12:53:08 30 (min) Purpose code: 3
 LOG :4803.01 4804.54 1.52 Area code : 3
 FDEPTH: 37 38 GearCond.code:
 BDEPTH: 37 38 Validity code:
 Towing dir: 340e Wire out: 130 m Speed: 30 kn*10
 Sorted: 56 Kg Total catch: 116.05 CATCH/HOUR: 232.10

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chloroscombrus chrysurus	64.32 888	27.71	
Brachydeuterus auritus	60.84 8604	26.21	
Selene dorsalis	26.76 942	11.53	
Rhizoprionodon acutus	24.68 10	10.63	
Sphyræna guachancho	8.40 42	3.62	
Trichurus lepturus	7.56 522	3.26	
Leptocharias smithii	6.76 2	2.91	
Decapterus rhonchus	6.60 84	2.84	
Sardinella maderensis	3.48 210	1.50	
Pagellus bellottii	3.40 24	1.46	
Stromateus fiatola	3.16 4	1.36	
Epinephelus aeneus	3.08 4	1.33	
Scomber japonicus	2.80 6	1.21	
Pseudotolithus typus	2.64 4	1.14	
Dentex barnardi	1.96 14	0.84	
Pomadasy incisus	1.68 66	0.72	
Pomadasy jubelini	1.60 2	0.69	
Raja miraletus	1.32 2	0.57	
Penaeus notialis	0.88 124	0.38	
Sepia officinalis hierredda	0.18 42	0.08	
Total	232.10	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2247
 DATE: 1/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 818
 start stop duration Long E 1313
 TIME :13:53:13 14:04:20 11 (min) Purpose code: 3
 LOG :4811.33 4811.85 0.48 Area code : 3
 FDEPTH: 46 45 GearCond.code:
 BDEPTH: 46 45 Validity code:
 Towing dir: 340e Wire out: 190 m Speed: 30 kn*10
 Sorted: 56 Kg Total catch: 144.92 CATCH/HOUR: 790.47

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	612.22 17062	77.45	
Galeoides decadactylus	97.85 218	12.38	
Pseudotolithus typus	26.62 27	3.37	
Trichurus lepturus	18.33 393	2.32	
Selene dorsalis	17.02 458	2.15	
Raja miraletus	8.95 11	1.13	
Penaeus notialis	4.80 147	0.61	
Pomadasy jubelini	3.38 5	0.43	
Decapterus rhonchus	1.31 44	0.17	
Total	790.48	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2248
 DATE: 1/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 817
 start stop duration Long E 1305
 TIME :15:29:19 15:59:10 30 (min) Purpose code: 3
 LOG :4821.91 4823.55 1.63 Area code : 3
 FDEPTH: 87 85 GearCond.code:
 BDEPTH: 87 85 Validity code:
 Towing dir: 350e Wire out: 290 m Speed: 30 kn*10
 Sorted: 69 Kg Total catch: 1574.04 CATCH/HOUR: 3148.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	2361.60 51456	75.02	
Trachurus trecae juvenile	543.36 20832	17.26	5052
Stromateus fiatola	77.76 96	2.47	
Zeus faber	40.32 288	1.26	
Trichurus lepturus	23.44 158	0.74	
Trigla lyra	23.04 192	0.73	
Pseudupeneus prayensis	19.20 96	0.61	
Dentex angolensis	16.56 80	0.53	5053
Selene dorsalis	15.04 26	0.48	
Atractoscion aequidens	5.88 28	0.19	
Raja miraletus	3.84 6	0.12	
Pagellus bellottii	2.52 34	0.08	5051
Fistularia tabacaria	1.92 96	0.06	
Torpedo torpedo	1.36 4	0.04	
Fistularia petimba	1.36 4	0.04	
Pseudotolithus typus	1.16 4	0.04	
Dentex barnardi	0.84 6	0.03	
Uranoscopus polli	0.82 2	0.03	
Laemonema laureysi	0.52 2	0.02	
Chaetodon hoefleri	0.24 2	0.01	
Sepia officinalis hierredda	0.02 2		
Total	3140.80	99.78	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2249
 DATE: 1/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 816
 start stop duration Long E 1300
 TIME :16:49:45 17:22:21 33 (min) Purpose code: 3
 LOG :4829.24 4831.15 1.87 Area code : 3
 FDEPTH: 109 107 GearCond.code:
 BDEPTH: 109 107 Validity code:
 Towing dir: 350e Wire out: 340 m Speed: 30 kn*10
 Sorted: 61 Kg Total catch: 778.98 CATCH/HOUR: 1416.33

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichurus lepturus	739.27 5562	52.20	
Brachydeuterus auritus	587.27 5458	41.46	
Pentheroscion mbizi	17.96 138	1.27	
Pterothrissus bellocci	14.51 276	1.02	
Raja miraletus	11.53 15	0.81	
Uranoscopus albesca	5.35 24	0.38	
Fistularia petimba	5.31 11	0.37	
Leptocharias smithii	5.24 2	0.37	
Brotula barbata	4.98 4	0.35	
Merluccius polli	4.84 138	0.34	
Citharus linguatula	4.84 104	0.34	
Pontinus accraensis	4.15 35	0.29	
Saurida brasiliensis	2.76 484	0.19	
Pagellus bellottii	2.29 16	0.16	5055
Dentex angolensis	2.29 25	0.16	5054
Trachurus trecae	2.07 69	0.15	
Total	1414.66	99.86	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2250
 DATE: 1/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 814
 start stop duration Long E 1246
 TIME :20:05:58 20:37:03 31 (min) Purpose code: 3
 LOG :4848.04 4849.67 1.63 Area code : 3
 FDEPTH: 344 347 GearCond.code:
 BDEPTH: 344 347 Validity code:
 Towing dir: 330e Wire out: 900 m Speed: 30 kn*10
 Sorted: 33 Kg Total catch: 206.18 CATCH/HOUR: 399.06

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichurus lepturus	225.00 9172	57.13	
Merluccius polli	63.68 312	15.96	5056
Malacocephalus occidentalis	19.24 95	4.82	
Nezumia aequalis	18.97 271	4.75	
Hymenocephalus italicus	12.19 1409	3.05	
Chlorophthalmus atlanticus	11.38 149	2.85	
Parapenaeus longirostris, fem.	8.40 759	2.10	5058
Pterothrissus bellocci	7.59 41	1.90	
Synagrops microlepis	7.32 244	1.83	
Genopsis conchifer	5.15 14	1.29	
Lophius vaillanti	4.34 2	1.09	
ANTENNARIIDAE	2.44 95	0.61	
Gephyroberyx darwini	1.66 2	0.42	
Illex coindetii	1.63 14	0.41	
POLYCHAELIDAE	1.63 271	0.41	
Nematocarcinus africanus	1.35 285	0.34	
Raja straeleni	1.28 4	0.32	
Aristeus varidens	1.08 95	0.27	5057
Halosaurus ovenii	0.95 14	0.24	
Bembrops greyi	0.81 14	0.20	
Triplophus hemingi	0.27 14	0.07	
Saurida brasiliensis	0.27 14	0.07	
Solenocera africana	0.27 27	0.07	
Bathynectes piperitus	0.23 4	0.06	
MELANOCETIDAE	0.14 14	0.04	
Total	400.27	100.30	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2251
 DATE: 1/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 812
 start stop duration Long E 1249
 TIME :22:26:26 22:55:33 29 (min) Purpose code: 3
 LOG :4857.50 4858.98 1.48 Area code : 3
 FDEPTH: 544 558 GearCond.code:
 BDEPTH: 544 558 Validity code:
 Towing dir: 330e Wire out:1400 m Speed: 30 kn*10
 Sorted: 27 Kg Total catch: 131.12 CATCH/HOUR: 271.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	167.59 30724	61.78	
Stomias sp.	28.76 641	10.60	
Bontheademus tenuis	23.38 797	8.62	
Triplophus hemingi	22.76 2628	8.39	
Lamprogrammus exotus	13.24 52	4.88	
POLYCHAELIDAE	3.10 310	1.14	
Illex coindetii	2.28 10	0.84	
PARALEPIDIDAE	1.03 21	0.38	
Glyphus marsupialis	1.03 52	0.38	
Yarella blackfordi	1.03 31	0.38	
Merluccius polli	0.87 2	0.32	
OPLOPHORIDAE	0.83 72	0.31	
MACROURIDAE	0.83 10	0.31	
Chauliodus sloani	0.83 21	0.31	
MORIDAE	0.62 10	0.23	
Talismania bifurcata	0.62 41	0.23	
Hoplostethus cadenati	0.62 10	0.23	
Aristeus varidens	0.62 21	0.23	
DICERATIIDAE	0.41 21	0.15	
SERGESTIDAE	0.41 31	0.15	
Xenodermichthys copei	0.41 31	0.15	
Total	271.27	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2252
 DATE: 2/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 807
 start stop duration Long E 1236
 TIME :00:28:39 00:58:10 30 (min) Purpose code: 3
 LOG :4864.97 4866.49 1.51 Area code : 3
 FDEPTH: 755 755 GearCond.code:
 BDEPTH: 755 755 Validity code:
 Towing dir: 350e Wire out:1850 m Speed: 30 kn*10
 Sorted: 24 Kg Total catch: 117.96 CATCH/HOUR: 235.92

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Lamprogrammus exotus	98.64 348	41.81	
Nezumia leonis	49.44 228	20.96	
Hoplostethus cadenati	32.64 564	13.84	
Yarella blackfordi	9.60 216	4.07	
POLYCHAELIDAE	7.68 636	3.26	
Merluccius polli	6.76 10	2.87	
Glyphus marsupialis	4.80 84	2.03	
Talismania bifurcata	4.80 96	2.03	
Dibranchius atlanticus	3.84 144	1.63	
OPHIDIIDAE	3.84 228	1.63	
Geryon maritae	3.32 8	1.41	
C E P H A L O P O D A	3.12 12	1.32	
Ariomma bondi	1.20 24	0.51	
Halosaurus ovenii	1.20 12	0.51	
Triplophus hemingi	1.20 132	0.51	
Bathyrocongus vicinus	0.96 12	0.41	
Xenodermichthys copei	0.48 24	0.20	
Nephropsis atlantica	0.48 12	0.20	
SYNAPHOBRANCHIIDAE	0.24 24	0.10	
OPLOPHORIDAE	0.24 36	0.10	
Aristeus varidens	0.24 12	0.10	
Total	234.72	99.50	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2253
 DATE: 2/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 804
 start stop duration Long E 1246
 TIME :05:49:42 06:21:00 31 (min) Purpose code: 3
 LOG :4885.65 4887.35 1.69 Area code : 3
 FDEPTH: 256 269 GearCond.code:
 BDEPTH: 256 269 Validity code:
 Towing dir: 340e Wire out: 740 m Speed: 30 km*10
 Sorted: 63 Kg Total catch: 250.50 CATCH/HOUR: 484.84

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	289.12 20038	59.63	
Merluccius polli, juveniles	53.38 1192	11.01	5062
Zenopsis conchifer	48.04 143	9.91	
MYCTOPHIDAE	38.21 24306	7.88	
Pterothrissus belloci	12.19 68	2.51	
Merluccius polli	10.84 72	2.24	5061
Illex coindetii	9.75 135	2.01	
Parapanaeus longirostris, fem.	5.15 997	1.06	5060
Chlorophthalmus atlanticus	4.88 637	1.01	
Trichiurus lepturus	3.77 17	0.78	
Parapanaeus longirostris, male	2.17 414	0.45	5059
Gadella maraldi	1.90 81	0.39	
Mystriopsis rostellatus	1.90 8	0.39	
Raja miraletus	1.16 2	0.24	
Lestidium atlanticum	0.81 68	0.17	
Uranoscopus albesca	0.35 2	0.07	
Gephyroberyx darwini	0.27 27	0.06	
Solenocera africana	0.08 27	0.02	
Total	483.97	99.83	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2254
 DATE: 2/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 804
 start stop duration Long E 1246
 TIME :07:34:38 07:59:56 25 (min) Purpose code: 3
 LOG :4893.94 4895.48 1.52 Area code : 3
 FDEPTH: 132 208 GearCond.code: 4
 BDEPTH: 132 208 Validity code: 4
 Towing dir: 250e Wire out: 560 m Speed: 30 km*10
 Sorted: 23 Kg Total catch: 23.38 CATCH/HOUR: 56.11

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	34.75 3398	61.93	
Trichiurus lepturus	5.90 7	10.52	
Zenopsis conchifer	5.52 14	9.84	
MYCTOPHIDAE	4.42 2107	7.88	
Loligo sp.	2.78 914	4.95	
Merluccius polli	2.50 17	4.46	
Lestidium atlanticum	0.14 19	0.25	
Saurida brasiliensis	0.10 19	0.18	
Total	56.11	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2255
 DATE: 2/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 805
 start stop duration Long E 1254
 TIME :09:34:17 10:04:16 30 (min) Purpose code: 3
 LOG :4906.29 4907.66 1.37 Area code : 3
 FDEPTH: 114 114 GearCond.code:
 BDEPTH: 114 114 Validity code:
 Towing dir: 150e Wire out: 340 m Speed: 30 km*10
 Sorted: 70 Kg Total catch: 814.56 CATCH/HOUR: 1629.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	661.96 7384	40.63	
Dentex angolensis	642.72 2548	39.45	5063
Pagellus bellottii	100.88 780	6.19	5064
Sepia orbignyana	71.24 52	4.37	
Umrina canariensis	66.04 208	4.05	
Selene dorsalis	34.84 208	2.14	
Saurida brasiliensis	18.72 676	1.15	
Trachurus trecae	14.56 598	0.89	
Trichiurus lepturus	9.44 26	0.58	
Illex coindetii	2.08 52	0.13	
Scorpaena stephanica	1.72 2	0.11	
Chelidonicichthys gabonensis	1.60 2	0.10	
Fistularia petimba	1.24 2	0.08	
Uranoscopus albesca	0.88 2	0.05	
Torpedo torpedo	0.80 2	0.05	
Chaetodon hoefleri	0.40 4	0.02	
Total	1629.12	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2256
 DATE: 2/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 802
 start stop duration Long E 1258
 TIME :11:09:50 11:39:33 30 (min) Purpose code: 3
 LOG :4914.46 4915.96 1.47 Area code : 3
 FDEPTH: 87 81 GearCond.code:
 BDEPTH: 87 81 Validity code:
 Towing dir: 26e Wire out: 290 m Speed: 30 km*10
 Sorted: 42 Kg Total catch: 99.94 CATCH/HOUR: 199.88

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	78.40 1842	39.22	
Trachurus trecae, juvenile	75.28 3216	37.66	5065
Zeus faber	16.28 38	8.14	
Atractoscion aequidens	8.04 32	4.02	5066
Torpedo torpedo	4.88 8	2.44	
Dentex congoensis	4.48 64	2.24	
Trichiurus lepturus	4.44 6	2.22	
Sepia officinalis hierredda	2.32 2	1.16	
Dentex angolensis	1.84 24	0.92	
Pagellus bellottii	1.52 16	0.76	
Fistularia petimba	1.52 16	0.76	
Trigla lyra	0.72 12	0.36	
Sardinella aurita	0.16 4	0.08	
Total	199.88	99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2257
 DATE: 2/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 753
 start stop duration Long E 1304
 TIME :12:51:03 13:21:10 30 (min) Purpose code: 3
 LOG :4925.57 4927.28 1.68 Area code : 3
 FDEPTH: 31 25 GearCond.code:
 BDEPTH: 31 25 Validity code:
 Towing dir: 360e Wire out: 130 m Speed: 30 km*10
 Sorted: 70 Kg Total catch: 177.16 CATCH/HOUR: 354.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	150.70 3308	42.53	
Selene dorsalis	41.36 1006	11.67	
Chloroscombrus chrysurus	35.20 612	9.93	
Pseudotolithus typus	23.04 22	6.50	
Alectis alexandrinus	22.80 14	6.43	
Arius parkii	17.64 14	4.98	
Sphyræna guachancho	12.32 220	3.48	
Galeoides decadactylus	8.58 198	2.42	
Rhizoprionodon acutus	7.20 4	2.03	
Trichiurus lepturus	5.72 736	1.61	
Scomberomorus tritor	4.64 6	1.31	
Pomadasys rogeri	4.26 12	1.21	
Leptocharias smithii	3.84 4	1.08	
Sardinella maderensis	3.74 308	1.06	
Pagellus bellottii	3.52 66	0.99	
Seriola carpenteri	2.08 2	0.59	
Panulirus regius	2.00 2	0.56	
Ilisha africana	1.98 88	0.56	
Callinectes pallidus	1.84 4	0.52	
Pomadasys jubelini	1.72 2	0.49	
Penaeus notialis	0.12 6	0.03	
Total	354.32	99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2258
 DATE: 2/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 754
 start stop duration Long E 1254
 TIME :16:00:38 16:18:52 18 (min) Purpose code: 3
 LOG :4940.67 4941.70 1.02 Area code : 3
 FDEPTH: 82 81 GearCond.code:
 BDEPTH: 82 81 Validity code:
 Towing dir: 350e Wire out: 290 m Speed: 30 km*10
 Sorted: 46 Kg Total catch: 95.00 CATCH/HOUR: 316.67

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	148.00 7780	46.74	
Priacanthus arenatus	62.80 5210	19.83	
Dentex congoensis	40.53 513	12.80	5070
Zeus faber	18.40 110	5.81	
Pagellus bellottii	10.47 100	3.31	5068
Dentex angolensis	9.80 57	3.09	5069
Fistularia petimba	5.60 10	1.77	
Lagocephalus laevigatus	4.87 17	1.54	
Atractoscion aequidens	4.80 30	1.52	
Chelidonicichthys gabonensis	3.20 20	1.01	
Raja miraletus	2.73 3	0.86	
Citharus linguatula	2.00 10	0.63	
Pseudupeneus prayensis	1.80 40	0.57	
Illex coindetii	1.00 20	0.32	
Sphyræna sphyraena	0.40 10	0.13	
Sardinella aurita	0.40 20	0.13	
Boops boops	0.20 10	0.06	
Total	317.00	100.12	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2259
 DATE: 2/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 755
 start stop duration Long E 1250
 TIME :17:28:45 17:58:40 30 (min) Purpose code: 3
 LOG :4950.11 4951.79 1.67 Area code : 3
 FDEPTH: 105 103 GearCond.code:
 BDEPTH: 105 103 Validity code:
 Towing dir: 340e Wire out: 320 m Speed: 30 km*10
 Sorted: 43 Kg Total catch: 82.60 CATCH/HOUR: 165.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	48.56 256	29.39	
Saurida brasiliensis	23.84 4052	14.43	
Pagellus bellottii	20.40 608	12.35	5071
Dentex angolensis	10.40 172	6.30	5073
Trachurus trecae	8.48 412	5.13	
Citharus linguatula	7.68 564	4.65	
Chelidonicichthys gabonensis	7.68 248	4.65	
Scorpaena normani	6.96 96	4.21	
Uranoscopus polli	6.40 16	3.87	
Dentex congoensis	4.32 112	2.62	5072
Brachydeuterus auritus	3.60 32	2.18	
Pterothrissus belloci	3.04 48	1.84	
Priacanthus arenatus	2.96 252	1.79	
Protula barbata	2.72 6	1.65	
Raja miraletus	2.68 4	1.62	
Lagocephalus laevigatus	1.36 4	0.82	
Atractoscion aequidens	0.88 4	0.53	
Zeus faber	0.48 4	0.29	
Sepia orbignyana	0.40 36	0.24	
Umrina canariensis	0.32 4	0.19	
Muraenesox bagio	0.32 8	0.19	
Parapanaeus longirostris	0.24 36	0.15	
Boops boops	0.24 8	0.15	
Pseudupeneus prayensis	0.24 4	0.15	
Torpedo torpedo	0.20 2	0.12	
Sparus pagrus africanus	0.16 40	0.10	
Arnoglossus imperialis	0.16 16	0.10	
Total	164.72	99.71	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2260
 DATE: 2/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 754
 start stop duration Long E 1239
 TIME :20:30:24 21:00:10 30 (min) Purpose code: 3
 LOG :4966.04 4967.75 1.69 Area code : 3
 FDEPTH: 335 334 GearCond.code:
 BDEPTH: 335 334 Validity code:
 Towing dir: 340e Wire out: 950 m Speed: 30 kn*10
 Sorted: 30 Kg Total catch: 258.18 CATCH/HOUR: 516.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Merluccius polli	341.60	1240	66.16
Nematocarcinus africanus	67.60	21980	13.09
MYCTOPHIDAE	21.20	6340	4.11
Pterothrissus bellocci	14.40	80	2.79
Lestidium atlanticum	13.60	1160	2.63
OPHIDIIDAE	7.60	20	1.47
Centroscyllium fabricii	7.32	2	1.42
Synagrops microlepis	6.80	300	1.32
Laemonema laureysi	6.40	100	1.24
ANTENNARIIDAE	5.20	180	1.01
Illex coindetii	4.40	20	0.85
Parapanaeus longirostris, fem.	3.20	320	0.62
Raja straeleni	2.80	20	0.54
Muraenesox bagio	2.40	20	0.46
Lophius vailanti	2.40	20	0.46
Coelorinchus coelorhincus	2.20	20	0.43
Zenopsis conchifer	1.84	4	0.36
STOMIIDAE	1.60	20	0.31
Chlorophthalmus atlanticus	1.20	20	0.23
Hymenocephalus italicus	0.86	160	0.15
Dibranchius atlanticus	0.80	60	0.15
Bathymectes piperitus	0.40	20	0.08
Aristeus varidens	0.40	80	0.08
Solenocera africana	0.20	20	0.04
Peristedion sp.	0.20	20	0.04
Total	516.56	100.04	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2261
 DATE: 2/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 755
 start stop duration Long E 1238
 TIME :22:15:31 22:45:34 30 (min) Purpose code: 3
 LOG :4973.32 4974.91 1.56 Area code : 3
 FDEPTH: 415 439 GearCond.code:
 BDEPTH: 415 439 Validity code:
 Towing dir: 160e Wire out:1200 m Speed: 30 kn*10
 Sorted: 41 Kg Total catch: 230.56 CATCH/HOUR: 461.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	251.60	41090	54.56
Merluccius polli	119.46	390	25.91
Benthodesmus tenuis	25.84	900	5.60
Laemonema laureysi	18.70	392	4.06
Chaunax pictus	15.98	102	3.47
Dibranchius atlanticus	9.52	630	2.06
Triplophus hemingi	4.76	834	1.03
MACROURIDAE	4.08	34	0.88
Bathymectes piperitus	2.72	34	0.59
Zenopsis conchifer	2.16	6	0.47
POLYCHAELIDAE	1.36	136	0.29
MYCTOPHIDAE	1.02	442	0.22
Hymenocephalus italicus	1.02	136	0.22
Glyphus marsupialis	0.68	68	0.15
Gadella imberbis	0.68	18	0.15
Xenodermichthys copei	0.68	34	0.15
C E P H A L O P O D A	0.34	34	0.07
DICERATIIDAE	0.18	18	0.04
SERGESTIDAE	0.18	18	0.04
Stomias sp.	0.18	18	0.04
Total	461.14	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2262
 DATE: 3/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 757
 start stop duration Long E 1236
 TIME :23:55:09 00:25:11 30 (min) Purpose code: 3
 LOG :4980.84 4982.26 1.41 Area code : 3
 FDEPTH: 650 644 GearCond.code:
 BDEPTH: 650 644 Validity code:
 Towing dir: 350e Wire out:1520 m Speed: 30 kn*10
 Sorted: 36 Kg Total catch: 140.98 CATCH/HOUR: 281.96

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	140.60	22370	49.87
STOMIIDAE	33.20	810	11.77
Triplophus hemingi	18.40	1670	6.53
Benthodesmus tenuis	14.00	420	4.97
Geryon maritae	13.88	24	4.92
Yareella blackfordi	11.40	370	4.04
POLYCHAELIDAE	8.60	120	3.05
Halosaurus ovenii	5.40	130	1.92
Hoplostethus cadonati	5.40	210	1.92
Coelorinchus coelorhincus	3.60	130	1.28
MORIDAE	3.00	510	1.06
Trichiurus lepturus	2.88	4	1.02
Dibranchius atlanticus	2.80	190	0.99
Ebinania costaeacanarie	2.60	10	0.92
Illex coindetii	2.20	10	0.78
Merluccius polli	2.20	4	0.78
Glyphus marsupialis	1.60	100	0.57
Laemonema laureysi	1.60	20	0.57
Centroscymnus obscurus	1.40	10	0.50
OPHOPHORIDAE	1.20	140	0.43
Etmopterus lucifer	1.20	10	0.43
UNIDENTIFIED FISH	1.00	40	0.35
Xenodermichthys copei	1.00	70	0.35
SYNAPHOBANCHIDAE	1.00	40	0.35
Aristeus varidens	1.00	60	0.35
C E P H A L O P O D A	0.40	10	0.14
Talismania bifurcata	0.40	10	0.14
Total	281.96	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2263
 DATE: 3/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 747
 start stop duration Long E 1236
 TIME :05:43:08 06:13:50 31 (min) Purpose code: 3
 LOG :5009.16 5010.70 1.51 Area code : 3
 FDEPTH: 257 251 GearCond.code:
 BDEPTH: 257 251 Validity code:
 Towing dir: 150e Wire out: 700 m Speed: 30 kn*10
 Sorted: 37 Kg Total catch: 167.20 CATCH/HOUR: 323.61

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	230.13	14429	71.11
MYCTOPHIDAE	36.58	24842	11.30
Merluccius polli, juveniles	25.94	455	8.02
Parapanaeus longirostris, fem.	8.71	1326	2.69
Illex coindetii	5.81	58	1.80
Parapanaeus longirostris, male	4.06	648	1.25
Pterothrissus bellocci	2.44	15	0.75
Zenopsis conchifer	1.86	4	0.57
Gadella maraldi	1.74	58	0.94
Trichiurus lepturus	1.70	2	0.53
Solenocera africana	0.77	116	0.24
Loligo sp.	0.77	184	0.24
Chlorophthalmus atlanticus	0.77	213	0.24
Muraenesox bagio	0.39	10	0.12
OPHIDIIDAE	0.19	10	0.06
Arnoglossus capensis	0.19	29	0.06
Zenion sp.	0.19	29	0.06
CAPROIDAE	0.19	10	0.06
Lestidium atlanticum	0.19	19	0.06
Sepia orbignyana	0.19	19	0.06
POLYCHAELIDAE	0.10	19	0.03
Total	322.91	99.79	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2264
 DATE: 3/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 744
 start stop duration Long E 1244
 TIME :07:57:40 08:29:05 31 (min) Purpose code: 3
 LOG :5022.77 5024.48 1.65 Area code : 3
 FDEPTH: 102 109 GearCond.code:
 BDEPTH: 102 109 Validity code:
 Towing dir: 220e Wire out: 300 m Speed: 30 kn*10
 Sorted: 185 Kg Total catch: 434.24 CATCH/HOUR: 840.46

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus-trecae	481.41	21492	57.52
Dentex gibbosus	261.06	234	31.06
Zenopsis conchifer	26.32	77	3.13
Dentex barnardi	22.92	62	2.73
Boops boops	18.27	573	2.17
Epinephelus aeneus	16.68	2	1.98
Squatina oculata	10.03	2	1.19
Fistularia petimba	0.50	2	0.06
Dentex angolensis	0.50	4	0.06
Parapanaeus longirostris	0.31	15	0.04
Dentex congoensis	0.31	15	0.04
Spicara alta	0.15	15	0.02
Pagellus bellettii	0.12	4	0.01
Total	840.58	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2265
 DATE: 3/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 743
 start stop duration Long E 1250
 TIME :09:58:27 10:28:21 30 (min) Purpose code: 3
 LOG :5033.63 5035.31 1.67 Area code : 3
 FDEPTH: 75 65 GearCond.code:
 BDEPTH: 75 65 Validity code:
 Towing dir: 78e Wire out: 250 m Speed: 30 kn*10
 Sorted: 39 Kg Total catch: 62.00 CATCH/HOUR: 124.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pagellus bellettii	66.48	636	53.61
Decapterus rhonchus	12.56	272	10.13
Sphyraena guachancho	12.56	42	10.13
Alloteuthis africana	6.08	3920	4.90
Sardinella maderensis	5.60	108	4.52
Dentex barnardi	4.88	20	3.94
Decapterus punctatus	4.64	172	3.74
Brachydeuterus auritus	2.56	28	2.06
Pagrus africanus	1.92	4	1.55
Fistularia petimba	1.64	8	1.32
Illex coindetii	1.28	12	1.03
Dentex congoensis	1.04	20	0.84
Zeus faber	1.00	2	0.81
Dentex angolensis	0.88	8	0.71
Chelidonichthys capensis	0.64	4	0.52
Friacanthus arenatus	0.24	2	0.19
Total	124.00	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2266
 DATE: 3/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 740
 start stop duration Long E 1255
 TIME :11:36:04 11:38:01 2 (min) Purpose code: 3
 LOG :5043.47 5043.57 0.10 Area code : 3
 FDEPTH: 27 27 GearCond.code: 9
 BDEPTH: 27 27 Validity code: 4
 Towing dir: 340e Wire out: 130 m Speed: 30 kn*10
 Sorted: 34 Kg Total catch: 33.78 CATCH/HOUR: 1013.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Lutjanus agennes	743.40	90	73.36
Centrarchops chapini	135.00	300	13.32
Lutjanus goreensis	106.20	30	10.48
Chaetodipterus goreensis	15.00	30	1.48
Raja miraletus	13.80	30	1.36
Total	1013.40	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2267
 DATE: 3/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 733
 start stop duration Long E 1246
 TIME :14:09:56 14:39:39 30 (min) Purpose code: 3
 LOG :5063.23 5064.90 1.66 Area code : 3
 FDEPTH: 69 68 GearCond.code:
 BDEPTH: 69 68 Validity code:
 Towing dir: 340e Wire out: 240 m Speed: 31 kn*10

Sorted: 37 Kg Total catch: 36.75 CATCH/HOUR: 73.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	36.48	612	49.63	5081
Sphyræna sphyraena	11.88	60	16.16	
Rhinobatos albomaculatus	6.92	2	9.41	
Dentex congongensis	4.52	134	6.15	5118
Fistularia petimba	2.64	10	3.59	
Raja miraletus	1.28	4	3.48	
Zeus faber	0.96	6	1.31	
Chelidonicthys capensis	0.92	4	1.25	
Octopus vulgaris	0.80	4	1.09	
Pseudupeneus prayensis	0.72	10	0.98	
Trigla lyra	0.68	16	0.93	
Citharus linguatula	0.52	6	0.71	
Sepia officinalis hierredra	0.52	10	0.71	
Grammolites gruvelli	0.48	6	0.65	
Illex coindetii	0.32	2	0.44	
Uranoscopus polli	0.28	2	0.38	
Dentex bairdii	0.24	2	0.33	
Seriola carpenteri	0.24	2	0.33	
ANTENNARIIDAE	0.20	6	0.27	
Decapterus rhonchus	0.20	6	0.27	
Decapterus rhonchus	0.12	12	0.16	
Dibranchius atlanticus	0.08	2	0.11	
Brachydeuterus auritus	0.04	8	0.05	
Saurida brasiliensis	0.04	10	0.05	
Arnoglossus imperialis	0.04	2	0.05	
Priacanthus arenatus	0.02	2	0.03	
Sepia orbignyana	0.02	2	0.03	
Total	73.70		100.26	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2268
 DATE: 3/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 738
 start stop duration Long E 1230
 TIME :17:14:03 17:46:49 33 (min) Purpose code: 3
 LOG :5086.37 5088.16 1.77 Area code : 3
 FDEPTH: 368 349 GearCond.code:
 BDEPTH: 368 349 Validity code:
 Towing dir: 340e Wire out:1000 m Speed: 30 kn*10

Sorted: 18 Kg Total catch: 148.21 CATCH/HOUR: 269.47

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	176.80	740	65.61	5082
Pterothrissus belloci	20.40	100	7.57	
Laemonema laureysi	12.00	140	4.45	
Merluccius polli, juveniles	8.40	140	3.12	5063
Centroscyllium fabricii	6.42	2	2.38	
ANTENNARIIDAE	6.40	1140	1.63	
Dibranchius atlanticus	4.40	720	1.63	
Illex coindetii	4.00	40	1.48	
SCORPAENIDAE	4.00	40	1.48	
Hymenocephalus italicus	3.60	360	1.34	
Coelorhynchus coelorhynchus	3.60	80	1.34	
Raja miraletus	2.95	4	1.09	
Bathynectes piperitus	2.80	40	1.04	
Sphyræna sphyraena	2.40	20	0.89	
Nematocarcinus africanus	1.20	160	0.45	
MYCTOPHIDAE	1.20	1440	0.45	
Lophius vaillanti	1.20	20	0.45	
Necunia sp.	1.20	20	0.45	
Trichiurus lepturus	1.20	60	0.45	
Synagrops microlepis	1.20	40	0.45	
Parapenaeus longirostris, fem.	1.00	80	0.37	5084
Etmopterus lucifer	0.80	40	0.30	
Aristeus varidens, female	0.60	111	0.22	5085
Aristeus varidens, male	0.40	51	0.15	5086
Peristedion cataphractum	0.40	80	0.15	
Lestidium atlanticum	0.40	20	0.15	
Arnoglossus imperialis	0.40	20	0.15	
Solenocera africana	0.11	11	0.04	
Total	269.48		100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2269
 DATE: 3/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 734
 start stop duration Long E 1228
 TIME :19:31:56 19:58:24 26 (min) Purpose code: 3
 LOG :5093.06 5094.38 1.26 Area code : 3
 FDEPTH: 425 401 GearCond.code:
 BDEPTH: 425 401 Validity code:
 Towing dir: 340e Wire out:1150 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 75.17 CATCH/HOUR: 173.47

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	77.61	32822	44.74	
Merluccius polli	18.28	69	10.54	5087
Laemonema laureysi	12.88	132	7.42	
Dibranchius atlanticus	11.77	1101	6.79	
Triplophus hemingi	10.52	1405	6.06	
Illex coindetii	6.09	42	3.51	
ANTENNARIIDAE	6.09	111	3.51	
Necunia leonis	4.29	28	2.47	
Aristeus varidens, female	4.15	381	2.39	5089
POLYCHAELIDAE	4.02	471	2.32	
MYCTOPHIDAE	3.25	1468	1.87	
Chaceon maritae	2.63	14	1.52	
Trichiurus lepturus	2.63	132	1.52	
Aristeus varidens, male	1.52	194	0.88	5088
Hoplostethus cadonati	1.52	42	0.88	
Coelorhynchus coelorhynchus	1.38	14	0.80	
Talismania bifurcata	0.97	14	0.56	
Zenopsis conchifer	0.92	2	0.53	
Plesiopeneus edwardsianus	0.88	25	0.51	
Necunia sp.	0.74	35	0.43	
Lepidion sp.	0.55	62	0.32	
Ophisurus serpens	0.42	14	0.24	
Halosaurus ovenii	0.28	14	0.16	
Peristedion cataphractum	0.07	35	0.04	
Total	173.46		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2270
 DATE: 3/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 731
 start stop duration Long E 1225
 TIME :21:24:00 21:56:40 33 (min) Purpose code: 3
 LOG :5099.48 5100.96 1.44 Area code : 3
 FDEPTH: 512 499 GearCond.code:
 BDEPTH: 512 499 Validity code:
 Towing dir: 340e Wire out:1400 m Speed: 30 kn*10

Sorted: 37 Kg Total catch: 115.20 CATCH/HOUR: 209.45

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Triplophus hemingi	38.91	4300	18.58	
Laemonema laureysi	28.09	409	13.85	
Parapenaeus longirostris	19.82	1727	9.46	
POLYCHAELIDAE	19.45	464	9.29	
Etmopterus polli	11.35	4	5.42	
Bathygadus melanobranchus	10.91	827	5.21	
MACROURIDAE	8.73	709	4.17	
Nematocarcinus africanus	8.18	2145	3.91	
Yarrella blackfordi	7.64	255	3.65	
Dibranchius atlanticus	6.91	709	3.30	
Trichiurus lepturus	6.69	9	3.19	
Illex coindetii	6.36	55	3.04	
Geryon maritae	6.36	11	3.04	
Bathyroconger vicinus	3.45	145	1.65	
Merluccius polli	3.20	7	1.53	
Chaunax pictus	2.91	45	1.39	
Hoplostethus cadonati	2.73	91	1.30	
Lamprogrammus exultus	2.65	2	1.27	
Halosaurus ovenii	2.55	100	1.22	
Etmopterus lucifer	2.00	136	0.95	
Plesionika martia	1.82	4091	0.87	
STOMIIDAE	1.64	55	0.78	
Coelorhynchus coelorhynchus	1.45	18	0.69	
Bathynectes piperitus	1.20	31	0.57	
C E P H A L O P O D A	0.91	18	0.43	
Coloconger cadonati	0.91	9	0.43	
Benthodesmus tenuis	0.91	73	0.43	
Xenodermichthys copei	0.73	64	0.35	
Total	209.46		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2271
 DATE: 4/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 733
 start stop duration Long E 1224
 TIME :23:51:06 00:21:11 30 (min) Purpose code: 3
 LOG :5111.01 5112.57 1.53 Area code : 3
 FDEPTH: 633 625 GearCond.code:
 BDEPTH: 633 625 Validity code:
 Towing dir: 310e Wire out:1650 m Speed: 30 kn*10

Sorted: 36 Kg Total catch: 131.33 CATCH/HOUR: 262.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadonati	99.80	3600	38.00	
Nematocarcinus africanus	37.20	9770	14.16	
Yarrella blackfordi	26.40	700	10.05	
Stomias sp.	19.40	340	7.39	
Lamprogrammus exultus	15.40	40	5.86	
Geryon maritae	15.28	34	5.82	
POLYCHAELIDAE	15.00	1700	5.71	
Coelorhynchus coelorhynchus	7.80	486	2.97	
Merluccius polli	7.24	14	2.76	
Illex coindetii	3.60	20	1.37	
Triplophus hemingi	3.00	446	1.14	
Aristeus varidens	3.00	120	1.14	
Xenodermichthys copei	2.80	93	1.07	
OPHIDIIDAE	1.40	120	0.53	
Glyphus marsupialis	1.20	70	0.46	
Hydrolagus sp.	1.00	2	0.38	
Dibranchius atlanticus	0.80	60	0.30	
Trichiurus lepturus	0.64	2	0.24	
SYNPHOBANCHIDAE	0.60	40	0.23	
OPLOPHORIDAE	0.60	50	0.23	
MORIDAE	0.20	40	0.08	
Nemichthys scolopaceus	0.10	10	0.04	
Total	262.46		99.93	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2272
 DATE: 4/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 733
 start stop duration Long E 1219
 TIME :02:10:34 02:40:16 30 (min) Purpose code: 3
 LOG :5119.67 5121.08 1.37 Area code : 3
 FDEPTH: 741 730 GearCond.code:
 BDEPTH: 741 730 Validity code:
 Towing dir: 290e Wire out:1850 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 417.47 CATCH/HOUR: 834.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadonati	516.24	11610	61.81	
Coelorhynchus coelorhynchus	75.06	1324	8.99	
Lamprogrammus exultus	63.72	136	7.63	
Yarrella blackfordi	37.26	730	4.46	
POLYCHAELIDAE	24.84	1810	2.98	
Merluccius polli	22.96	30	2.75	
Geryon maritae	15.80	24	1.89	
Stomias sp.	11.88	216	1.42	
SYNPHOBANCHIDAE	10.80	324	1.29	
Ceristius greenlandicus	9.18	28	1.10	
Bathyroconger vicinus	6.48	54	0.78	
Bathygadus melanobranchus	4.86	270	0.58	
Glyphus marsupialis	4.86	244	0.58	
C E P H A L O P O D A	4.32	28	0.52	
Halosaurus ovenii	4.32	54	0.52	
Xenodermichthys copei	3.78	108	0.45	
Talismania bifurcata	2.70	82	0.32	
Dicrolene intransigra	2.16	28	0.26	
Dibranchius atlanticus	1.62	54	0.19	
LOPHIIDAE	1.62	54	0.19	
SCOMBRIDAE	1.20	2	0.14	
Notacanthus sexspinis	1.08	28	0.13	
Trichiurus lepturus	0.64	2	0.08	
OPLOPHORIDAE	0.54	54	0.06	
Total	827.92		99.14	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2273
 DATE: 4/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 727
 start stop duration
 TIME :05:42:44 05:57:36 15 (min) Purpose code: 3
 LOG :5135.67 5137.29 0.60 Area code : 3
 FDEPTH: 224 215 GearCond.code:
 BDEPTH: 224 215 Validity code:
 Towing dir: 140e Wire out: 700 m Speed: 30 kn*10
 Sorted: 54 Kg Total catch: 182.34 CATCH/HOUR: 729.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	483.60	29860	66.30	
Zenopsis conchifer	46.40	64	6.36	
Illex coindetii	31.60	340	4.33	
MYCTOPHIDAE	30.00	20000	4.11	
Squatina oculata	28.72	4	3.94	
Dentex congoensis	24.00	104	3.29	5093
Uranoscopus polli	14.00	120	1.92	
Dentex angolensis	11.84	68	1.62	5092
Merluccius polli, juveniles	7.60	160	1.04	
Parapenaeus longirostris, fem.	6.80	1080	0.93	5091
Pterochirusus bellocci	6.40	60	0.88	
Nezumia leonis	5.20	160	0.71	
Saurida brasiliensis	4.80	520	0.66	
Torpedo marmorata	4.56	8	0.63	
Citharus linguatula	4.00	20	0.55	
Merluccius polli	3.60	20	0.49	
Broctula barbata	3.36	4	0.46	
Bembrops greyi	2.80	40	0.38	
Trichiurus lepturus	2.72	4	0.37	
Pontinus accraensis	2.00	20	0.27	
EPHIPPIDAE	1.76	8	0.24	
Parapenaeus longirostris, male	1.60	40	0.22	5090
Loligo sp.	1.60	600	0.22	
Sepia officinalis hierredda	0.40	20	0.05	
Total	729.36		99.97	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2274
 DATE: 4/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 727
 start stop duration
 TIME :07:10:16 07:40:17 30 (min) Purpose code: 3
 LOG :5143.42 5145.04 1.61 Area code : 3
 FDEPTH: 114 117 GearCond.code:
 BDEPTH: 114 117 Validity code:
 Towing dir: 170e Wire out: 34 m Speed: 30 kn*10
 Sorted: 39 Kg Total catch: 99.67 CATCH/HOUR: 199.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	69.96	2514	35.10	
Dentex congoensis	57.48	1176	28.24	5094
Dentex angolensis	21.60	168	10.84	5095
Spicara alta	20.76	654	10.41	
Squatina oculata	11.96	2	6.00	
Chelidonichthys gabonensis	8.52	90	4.27	
Zenopsis conchifer	3.52	8	1.77	
Illex coindetii	2.40	48	1.20	
Zeus faber	1.52	4	0.76	
Lagocephalus laevigatus	0.84	6	0.42	
Sepia orbignyana	0.80	6	0.30	
Saurida brasiliensis	0.12	12	0.06	
Arnoglossus imperialis	0.06	6	0.03	
Total	199.34		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2275
 DATE: 4/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 723
 start stop duration
 TIME :09:04:47 09:25:28 21 (min) Purpose code: 3
 LOG :5155.57 5156.70 1.10 Area code : 3
 FDEPTH: 74 71 GearCond.code:
 BDEPTH: 74 71 Validity code:
 Towing dir: 70e Wire out: 240 m Speed: 30 kn*10
 Sorted: 36 Kg Total catch: 35.65 CATCH/HOUR: 101.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex barnardi	23.43	123	23.00	5096
Umbrina canariensis	19.54	69	19.18	
Dentex gibbosus	13.94	23	13.69	5097
Pagellus bellottii	13.60	80	13.35	5099
Seriola lalandi	8.17	9	8.02	
Sepia orbignyana	7.83	6	7.69	
Pagrus caeruleostictus	7.31	17	7.18	5098
Fistularia petimba	3.14	9	3.08	
Chelidonichthys gabonensis	1.09	9	1.07	
Lagocephalus laevigatus	0.86	3	0.84	
Plectorhinchus mediterraneus	0.86	3	0.84	
Zeus faber	0.80	3	0.79	
Trachurus trecae	0.40	14	0.39	
Pseudupeneus prayensis	0.40	3	0.39	
Alloteuthis africana	0.23	80	0.23	
Dentex congoensis	0.23	3	0.23	
Saurida brasiliensis	0.03	3	0.03	
Total	101.86		100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2276
 DATE: 4/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 710
 start stop duration
 TIME :12:06:00 12:36:12 30 (min) Purpose code: 3
 LOG :5181.63 5183.13 1.48 Area code : 3
 FDEPTH: 25 22 GearCond.code:
 BDEPTH: 25 22 Validity code:
 Towing dir: 71e Wire out: 100 m Speed: 30 kn*10
 Sorted: 40 Kg Total catch: 39.90 CATCH/HOUR: 79.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagrus caeruleostictus	57.04	110	71.48	5100
Balistes capricus	11.72	24	14.69	
Torpedo sp.	2.44	4	3.06	
Rhinobatos albomaculatus	1.60	2	2.01	
Fistularia tabacaria	1.52	2	1.90	
Pagellus bellottii	1.44	6	1.80	
Epinephelus aeneus	1.44	2	1.80	
Lagocephalus laevigatus	0.76	2	0.95	
MONACANTHIDAE	0.52	2	0.65	
Fistularia petimba	0.52	6	0.65	
Pseudupeneus prayensis	0.40	18	0.50	
Rypiticus saponaceus	0.40	4	0.50	
Total	79.80		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2277
 DATE: 4/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 714
 start stop duration
 TIME :14:53:10 15:23:07 30 (min) Purpose code: 3
 LOG :5200.74 5202.37 1.60 Area code : 3
 FDEPTH: 72 61 GearCond.code:
 BDEPTH: 72 61 Validity code:
 Towing dir: 70e Wire out: 240 m Speed: 30 kn*10
 Sorted: 78 Kg Total catch: 77.82 CATCH/HOUR: 155.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	129.85	1334	83.40	5101
Balistes capricus	4.44	8	2.85	
Sphyræna sphyraena	3.68	26	2.36	
Caranx crysos	2.80	2	1.80	
Trichiurus lepturus	2.64	4	1.70	
Trachinus sp.	2.64	4	1.70	
Fistularia petimba	2.48	10	1.59	
Seriola carpenteri	1.60	2	1.03	
Pagrus caeruleostictus	1.60	6	1.03	
CONGRIDAE	1.20	2	0.77	
Lagocephalus laevigatus	0.72	4	0.46	
Sepia officinalis hierredda	0.68	2	0.44	
Zeus faber	0.64	2	0.41	
Trachinus armatus	0.40	2	0.26	
Chelidonichthys capensis	0.32	2	0.21	
Total	155.64		100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2278
 DATE: 4/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 717
 start stop duration
 TIME :16:40:56 17:10:31 30 (min) Purpose code: 3
 LOG :5212.33 5213.74 1.39 Area code : 3
 FDEPTH: 116 126 GearCond.code:
 BDEPTH: 116 126 Validity code:
 Towing dir: 240e Wire out: 5216 m Speed: 70 kn*10
 Sorted: 36 Kg Total catch: 95.54 CATCH/HOUR: 191.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	64.08	804	33.54	5103
Trachurus trecae	46.68	1788	24.43	
Spicara alta	33.72	1530	17.65	
Dentex angolensis	25.20	174	13.19	5102
Trichiurus lepturus	4.80	8	2.51	
Dentex gibbosus	4.68	6	2.45	
Sepia orbignyana	3.16	10	1.65	
Squatina oculata	2.16	4	1.13	
Umbrina canariensis	1.92	6	1.00	
Illex coindetii	1.08	30	0.57	
Chaetodon hoefleri	0.84	6	0.44	
Pterochirusus bellocci	0.72	6	0.38	
Brachydeuterus auritus	0.72	6	0.38	
Zeus faber	0.48	4	0.25	
Fistularia petimba	0.36	2	0.19	
Citharus linguatula	0.36	6	0.19	
Total	190.96		99.95	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2279
 DATE: 4/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 721
 start stop duration
 TIME :19:58:05 20:28:44 31 (min) Purpose code: 3
 LOG :5234.90 5236.58 1.66 Area code : 3
 FDEPTH: 440 441 GearCond.code:
 BDEPTH: 440 441 Validity code:
 Towing dir: 330e Wire out: 1200 m Speed: 30 kn*10
 Sorted: 276 Kg Total catch: 80.64 CATCH/HOUR: 156.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	108.70	295	69.64	5104
Trichiurus lepturus	13.24	447	8.48	
Laemonema laureysi	8.59	29	5.50	
POLYCHAELIDAE	6.85	1632	4.39	
Hymenocephalus italicus	5.34	488	3.42	
ANTENNARIIDAE	3.25	29	2.08	
Aristeus variidens, female	2.96	226	1.90	5106
Aristeus variidens, male	1.22	145	0.78	5105
MACROURIDAE	1.05	6	0.67	
Nezumia micronychodon	1.05	6	0.67	
Coelorrhinchus coelorrhinchus	0.93	12	0.60	
Dibranchius atlanticus	0.58	46	0.37	
Bathynectes piperitus	0.46	12	0.29	
MYCTOPHIDAE	0.46	2276	0.29	
Nezumia sp.	0.35	17	0.22	
Yarella blackfordi	0.23	17	0.15	
Halosaurus ovenii	0.23	12	0.15	
SCORPAENIDAE	0.12	6	0.08	
Plesionika martia	0.06	33	0.04	
Plesionopeneus edwardsianus	0.06	4	0.04	
Total	155.73		99.76	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2280
 DATE: 4/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 721
 start stop duration Long E 1201
 TIME :22:14:10 22:45:36 31 (min) Purpose code: 3
 LOG :5243.36 5245.09 1.67 Area code : 3
 FDEPTH: 522 526 GearCond.code:
 BDEPTH: 522 526 Validity code:
 Towing dir: 150e Wire out:1450 m Speed: 30 kn*10
 Sorted: 33 Kg Total catch: 112.68 CATCH/HOUR: 218.09

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Triplophus hemingi	81.75	10730	37.48
Benthodesmus tenuis	65.81	2090	30.18
Lamprogrammus exutus	13.32	31	6.11
POLYCHAELIDAE	8.36	859	3.83
Yarrrella blackfordi	7.59		3.48
Stomias sp.	6.81		3.12
Chaunax pictus	6.33	77	3.12
LOPHIDAE	5.34	31	2.90
Merluccius polli	5.23	6	2.45
Gadella imberbis	2.63	155	1.21
Nematocarcinus africanus	2.17	534	1.00
C E P H A L O P O D A	2.01	8	0.92
Aristeus varidens, female	1.94	155	0.89
Coelorinchus coelorhincus	1.70	39	0.78
Aristeus varidens, male	1.32	108	0.61
Laemonema laureysi	1.24	23	0.57
Hoplostethus cadenati	1.24	39	0.57
OPHLOPHORIDAE	0.62	302	0.28
Halosaurus ovenii	0.62	15	0.28
Geryon maritae	0.50	2	0.23
Coloconger cadenati	0.46	8	0.21
Trichiurus lepturus	0.46	2	0.21
SERGESTIDAE	0.31	39	0.14
Bathynectes piperitus	0.15	8	0.07
Dibranchius atlanticus	0.08	23	0.04
Neanchthys scolopaceus	0.08	8	0.04
Bathyrhoconger vicinus	0.08	8	0.04
Total	218.15		100.04

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2281
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 725
 start stop duration Long E 1156
 TIME :00:41:29 01:11:26 30 (min) Purpose code: 3
 LOG :5254.57 5255.98 1.38 Area code : 3
 FDEPTH: 748 747 GearCond.code:
 BDEPTH: 748 747 Validity code:
 Towing dir: 330e Wire out:1850 m Speed: 30 kn*10
 Sorted: 30 Kg Total catch: 180.80 CATCH/HOUR: 361.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Hoplostethus cadenati	89.04	3136	24.62
Coelorinchus coelorhincus	77.00	1526	21.29
Yarrrella blackfordi	33.32	462	9.21
Lamprogrammus exutus	33.32	70	9.21
POLYCHAELIDAE	25.20	1820	6.97
Bathyrhoconger vicinus	17.36	98	4.80
Halosaurus ovenii	12.88	140	3.56
Triplophus hemingi	11.20	1498	3.10
C E P H A L O P O D A	10.36	56	2.87
Etmopterus sp.	7.56	28	2.09
Xenodermichthys copei	6.16	266	1.70
RAJIDAE	5.36	4	1.48
Geryon maritae	4.84	8	1.34
Nezumia micronychodon	4.48	28	1.24
LOPHIDAE	4.20	14	1.16
Stomias sp.	3.92	112	1.08
Bathygadus melanobranchus	3.08	126	0.85
Benthodesmus tenuis	2.80	112	0.77
Glyphus marsupialis	2.52	126	0.70
Aristeus varidens	2.52	98	0.70
Deania calcea	2.24	14	0.62
CEMPYLIDAE	1.40	14	0.39
Heterocarpus grimaldii	0.28	14	0.08
SYNAPHOBANCHIDAE	0.28	14	0.08
APOGONIDAE	0.28	14	0.08
Total	361.60		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2282
 DATE: 5/ 4/00 GEAR TYPE: BT No: 8 POSITION:Lat S 709
 start stop duration Long E 1228
 TIME :06:07:34 06:37:50 30 (min) Purpose code: 3
 LOG :5297.03 5298.52 1.46 Area code : 3
 FDEPTH: 66 56 GearCond.code: 8
 BDEPTH: 66 56 Validity code: 1
 Towing dir: 48e Wire out: 240 m Speed: 30 kn*10
 Sorted: 78 Kg Total catch: 290.24 CATCH/HOUR: 580.48

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dentex barnardi	430.88	1360	74.23
Lutjanus fulgens	58.72	48	10.12
Pagrus auriga	29.60	24	5.10
Pomadasys incisus	14.08	64	2.43
Pagrus caeruleostictus	10.88	24	1.87
Apsillus fuscus	10.88	8	1.87
Mycteroperca rubra	8.12	2	1.40
Spondylisoma cantharus	5.60	8	0.96
Sparus pagrus africanus	3.36	8	0.58
Leptocharias smithii	3.36	2	0.58
Fistularia petimba	3.00	10	0.52
Dentex congoensis	1.76	8	0.30
Chaetodon hoeferli	0.24	2	0.04
Total	580.48		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2283
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 658
 start stop duration Long E 1238
 TIME :08:40:29 08:57:51 17 (min) Purpose code: 3
 LOG :5313.21 5314.22 0.99 Area code : 3
 FDEPTH: 20 20 GearCond.code:
 BDEPTH: 20 20 Validity code:
 Towing dir: 320e Wire out: 90 m Speed: 30 kn*10
 Sorted: 20 Kg Total catch: 19.60 CATCH/HOUR: 69.18

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Pagrus caeruleostictus	52.94	95	76.53
Dentex barnardi	10.16	18	14.69
Pagellus bellottii	3.39	11	4.90
Balistes punctatus	2.68	4	3.87
Total	69.17		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2284
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 706
 start stop duration Long E 1218
 TIME :11:32:24 12:02:29 30 (min) Purpose code: 3
 LOG :5337.87 5339.50 1.64 Area code : 3
 FDEPTH: 93 91 GearCond.code:
 BDEPTH: 93 91 Validity code:
 Towing dir: 330e Wire out: 360 m Speed: 30 kn*10
 Sorted: 79 Kg Total catch: 350.79 CATCH/HOUR: 701.58

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Pagellus bellottii	312.78	1894	44.58
Spicara alta	85.54	2834	12.19
Trachurus trecae, juvenile	71.24	1896	10.15
Dentex congoensis	69.94	754	9.97
Boops boops	52.26	2314	7.45
Trachurus trecae	22.10	66	3.15
Dentex barnardi	21.00	76	2.99
Dentex angolensis	15.52	104	2.21
Chaetodon hoeferli	10.92	78	1.56
Zeus faber	9.10	52	1.30
Dentex gibbosus	7.48	12	1.07
Sardinella aurita	4.42	104	0.63
Epinephelus aeneus	3.84	2	0.55
Scorpaena stephanica	3.36	6	0.48
Fistularia petimba	3.00	12	0.43
Trigla lyra	2.60	40	0.37
Sepia officinalis hierredda	2.24	2	0.32
Pagrus caeruleostictus	2.08	4	0.30
Raja miraletus	1.12	2	0.16
Citharus linguatula	1.04	40	0.15
Total	701.58		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2285
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 707
 start stop duration Long E 1214
 TIME :13:02:43 13:19:19 17 (min) Purpose code: 3
 LOG :5344.99 5345.87 0.87 Area code : 3
 FDEPTH: 115 116 GearCond.code:
 BDEPTH: 115 116 Validity code:
 Towing dir: 150e Wire out: 370 m Speed: 30 kn*10
 Sorted: 14 Kg Total catch: 13.92 CATCH/HOUR: 49.13

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dentex angolensis	12.85	106	26.16
Trigla lyra	9.74	159	19.82
Torpedo sp.	5.44	4	11.07
Trachurus trecae, juvenile	5.01	152	10.20
Raja miraletus	4.31	7	8.77
Citharus linguatula	2.26	45	4.60
Pagellus bellottii	1.69	11	3.44
Fistularia petimba	1.34	4	2.73
Zeus faber	1.34	4	2.73
Sardinella aurita	1.27	25	2.58
Brotula barbata	0.99	4	2.02
Illex coindetii	0.92	7	1.87
Trachurus trecae	0.85	4	1.73
Boops boops	0.64	28	1.30
Brachydotermus auritus	0.42	4	0.85
Dentex congoensis	0.07	4	0.14
Total	49.14		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2286
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 710
 start stop duration Long E 1210
 TIME :14:22:25 14:52:15 30 (min) Purpose code: 3
 LOG :5352.36 5353.91 1.54 Area code : 3
 FDEPTH: 150 152 GearCond.code:
 BDEPTH: 150 152 Validity code:
 Towing dir: 150e Wire out: 470 m Speed: 30 kn*10
 Sorted: 61 Kg Total catch: 60.98 CATCH/HOUR: 121.96

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trichiurus lepturus	83.56	806	68.51
Dentex angolensis	12.68	94	10.40
Squatina oculata	4.48	2	3.67
Pterothrissus belloci	3.72	50	3.05
Trigla lyra	3.28	46	2.69
Illex coindetii	2.72	46	2.23
Torpedo torpedo	2.48	2	2.03
Brotula barbata	1.88	2	1.54
Bembrops heterurus	1.72	24	1.41
Priacanthus arenatus	1.64	4	1.34
Scorpaena stephanica	1.44	6	1.18
Uranoscopus polli	1.04	6	0.85
Octopus vulgaris	0.28	2	0.23
Cynoglossus canariensis	0.28	6	0.23
Lagocephalus laevigatus	0.16	2	0.13
Peristedion cataphractum	0.12	2	0.10
Microchirus frechkopi	0.12	2	0.10
Dentex congoensis	0.08	2	0.07
Antigonia sp.	0.04	2	0.03
Total	121.96		99.99

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2287
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 713
 start stop duration Long E 1206
 TIME :16:23:53 16:53:45 30 (min) Purpose code: 3
 LOG :5362.83 5364.37 1.54 Area code : 3
 FDEPTH: 261 258 GearCond.code:
 BDEPTH: 261 258 Validity code:
 Towing dir: 330e Wire out: 810 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 233.80 CATCH/HOUR: 467.60

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	328.00	20992	70.15
Merluccius polli, juveniles	32.96	736	7.05
Chlorophthalmus atlanticus	21.76	3952	4.65
Aricomma bondi	20.48	480	4.38
POLYCHAELIDAE	12.16	1904	2.60
Parapanaeus longirostris, fem.	9.68	1080	2.07
Pterothrissus bellocci	8.96	16	1.92
Zenopsis conchifer	6.00	12	1.28
Zenion sp.	5.76	1376	1.23
Trichiurus lepturus	5.20	8	1.11
Parapanaeus longirostris, male	5.20	880	1.11
Illex coindetii	4.16	64	0.89
Merluccius polli	3.20	16	0.68
Sepia orbignyana	1.76	208	0.38
MYCTOPHIDAE	0.64	352	0.14
Dentex angolensis	0.48	2	0.10
Lophiodes kempi	0.32	16	0.07
Citharus linguatula	0.32	48	0.07
Dentex congongensis	0.16	2	0.05
CAPROIDAE	0.16	16	0.03
Peristedion cataphractum	0.16	16	0.03
Total	467.60	99.99	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2288
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 712
 start stop duration Long E 1200
 TIME :19:28:06 19:32:52 5 (min) Purpose code: 3
 LOG :5379.09 5379.28 0.17 Area code : 3
 FDEPTH: 363 342 GearCond.code: 9
 BDEPTH: 363 342 Validity code:
 Towing dir: 330e Wire out:1000 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 41.01 CATCH/HOUR: 492.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	124.92	2064	25.38
Laemonema laureysi	119.52	2196	24.29
Merluccius polli	68.40	396	13.90
Hymenocephalus italicus	60.84	8172	12.36
Pterothrissus bellocci	21.96	108	4.46
Parapanaeus longirostris, fem.	19.08	1728	3.88
ANTENNARIIDAE	11.16	312	2.27
Illex coindetii	9.36	72	1.90
Coelorinchus coelorhincus	8.64	144	1.76
MYCTOPHIDAE	5.76	780	1.17
Plesionika martia	4.68	1368	0.95
Synagrops microlepis	4.68	180	0.95
Dibranchius atlanticus	4.32	576	0.88
Trichiurus lepturus	4.32	216	0.88
POLYCHAELIDAE	3.60	24	0.73
Loligo sp.	2.88	1044	0.59
Muraenesox bagio	2.88	24	0.59
Gadella imberbis	2.52	72	0.51
Nezumia sp.	2.16	108	0.44
Parapanaeus longirostris, male	1.80	204	0.37
L O B S T E R S	1.80	204	0.37
Lophius vaillanti	1.80	24	0.37
Bemrops greyi	1.80	36	0.37
Solenocera africana	1.44	108	0.29
Aristeus varidens, male	0.72	72	0.15
CHAUNACIDAE	0.36	96	0.07
Peristedion cataphractum	0.36	24	0.07
NETTASTOMATIDAE	0.36	24	0.07
Total	492.12	100.02	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2289
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 715
 start stop duration Long E 1159
 TIME :21:21:02 21:51:07 30 (min) Purpose code: 3
 LOG :5388.87 5390.33 1.43 Area code : 3
 FDEPTH: 469 454 GearCond.code:
 BDEPTH: 469 454 Validity code:
 Towing dir: 330e Wire out:1250 m Speed: 30 kn*10

Sorted: 72 Kg Total catch: 91.32 CATCH/HOUR: 182.64

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Carcharhinus falciformis	79.44	2	43.50
Aristeus varidens, female	16.50	800	9.03
Laemonema laureysi	15.60	356	8.54
Merluccius polli	12.96	42	7.10
POLYCHAELIDAE	11.60	1390	6.35
Lophius vaillanti	9.68	4	5.30
Lamprogrammus exatus	6.00	16	3.29
ANTHIIDAE	5.60	60	3.07
Trichiurus lepturus	3.30	106	1.81
Aristeus varidens, male	3.10	366	1.70
Coelorinchus coelorhincus	2.90	16	1.59
Chaceon maritae	2.60	8	1.42
Hymenocephalus italicus	2.00	220	1.10
Illex coindetii	1.80	10	0.99
Etmopterus lucifer	1.50	26	0.82
Gadella imberbis	1.20	30	0.66
Dibranchius atlanticus	1.20	96	0.66
OPHIIDAE	1.10	110	0.60
Nezumia sp.	0.70	36	0.38
Muraenesox bagio	0.60	6	0.33
MELANONIDAE	0.50	6	0.27
Bathynectes piperitus	0.50	10	0.27
MYCTOPHIDAE	0.40	456	0.22
Halosaurus ovenii	0.40	16	0.22
Nematocarcinus africanus	0.20	30	0.11
Stomias sp.	0.20	20	0.11
Coloconger cadenati	0.20	6	0.11
Plesionema edwardsianus	0.20	6	0.11
SERGESTIDAE	0.10	36	0.05
Yarrella blackfordi	0.10	16	0.05
Total	182.18	99.76	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2290
 DATE: 5/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 716
 start stop duration Long E 1157
 TIME :22:51:08 23:21:23 30 (min) Purpose code: 3
 LOG :5395.10 5396.71 1.60 Area code : 3
 FDEPTH: 566 545 GearCond.code:
 BDEPTH: 566 545 Validity code:
 Towing dir: 135e Wire out:1450 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 95.95 CATCH/HOUR: 191.90

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Triplophus hemingi	85.80	10728	44.71
POLYCHAELIDAE	17.88	1602	9.32
Lamprogrammus exatus	17.04	42	8.88
Aristeus varidens, female	8.04	342	4.19
LOPHIIDAE	7.44	6	3.88
Stomias sp.	6.84	144	3.56
Yarrella blackfordi	6.48	162	3.38
Nematocarcinus africanus	5.76	2412	3.00
Coelorinchus coelorhincus	5.76	138	3.00
Benthodesmus tenuis	5.76	168	3.00
Merluccius polli	5.68	12	2.96
Hoplostethus cadenati	5.04	204	2.63
C E P H A L O P O D A	3.96	18	2.06
Geryon maritae	1.36	4	0.71
SYNAPHOBRANCHIDAE	1.32	54	0.69
Raja sp.	0.96	18	0.50
Glyphus marsupialis	0.96	54	0.50
Hymenocephalus italicus	0.72	96	0.38
Etmopterus lucifer	0.72	6	0.38
Xenodermichthys copei	0.72	78	0.38
Aristeus varidens, male	0.72	72	0.38
Dibranchius atlanticus	0.60	42	0.31
MYCTOPHIDAE	0.60	510	0.31
Laemonema laureysi	0.48	6	0.25
OPHIIDAE	0.36	48	0.19
Halosaurus ovenii	0.24	6	0.13
Chaunax pictus	0.24	6	0.13
Bathynectes piperitus	0.24	6	0.13
Plesionika martia	0.12	48	0.06
C R A B S	0.12	6	0.06
OPLOPHORIDAE	0.06	48	0.03
Total	192.02	100.09	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2291
 DATE: 6/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 658
 start stop duration Long E 1216
 TIME :08:56:31 09:16:12 20 (min) Purpose code: 3
 LOG :5486.31 5487.45 1.11 Area code : 3
 FDEPTH: 75 75 GearCond.code:
 BDEPTH: 75 75 Validity code:
 Towing dir: 320e Wire out: 240 m Speed: 30 kn*10

Sorted: 72 Kg Total catch: 168.27 CATCH/HOUR: 504.81

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex barnardi	267.15	705	52.92
Decapterus rhonchus	101.10	114	20.03
Pomadasys incisus	77.70	429	15.39
Umbra canariensis	19.20	45	2.80
Pagrus africanus	12.60	9	2.50
Plectorhynchus mediterraneus	6.42	18	1.27
Raja miraletus	4.80	9	0.95
Spondyliosoma cantharus	3.96	6	0.78
Pagellus bellottii	3.00	24	0.59
Epinephelus alexandrinus	2.70	3	0.53
Sepia orbignyana	2.40	9	0.48
Zeus faber	1.86	3	0.37
Fistularia petimba	1.62	9	0.32
Pseudupeneus prayensis	0.30	9	0.06
Total	504.81	99.99	

R/V 'DR. FRIDTJOF NANSEN' PROJECT:A4 PROJECT STATION:2292
 DATE: 6/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 658
 start stop duration Long E 1210
 TIME :10:28:17 10:48:22 20 (min) Purpose code: 3
 LOG :5494.64 5495.83 1.17 Area code : 3
 FDEPTH: 90 90 GearCond.code:
 BDEPTH: 90 90 Validity code:
 Towing dir: 320e Wire out: 290 m Speed: 30 kn*10

Sorted: 16 Kg Total catch: 16.22 CATCH/HOUR: 48.66

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae, juvenile	22.08	576	45.38
Priacanthus arenatus	7.86	453	16.15
Dentex congongensis	6.72	192	13.81
Sardinella aurita	4.68	108	9.62
Pagellus bellottii	2.82	24	5.80
Dentex angolensis	1.56	18	3.21
Fistularia petimba	1.02	3	2.10
Pomadasys incisus	0.60	3	1.23
Zeus faber	0.54	3	1.11
Brachydeuterus auritus	0.42	3	0.86
Illex coindetii	0.18	3	0.37
Trigla lyra	0.12	3	0.25
Citharus linguatula	0.06	3	0.12
Total	48.66	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2293
 DATE: 6/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 700 Long E 1206
 start stop duration
 TIME :11:59:25 12:29:41 30 (min) Purpose code: 3
 LOG :5501.88 5503.50 1.60 Area code : 3
 FDEPTH: 109 112 GearCond.code:
 BDEPTH: 109 112 Validity code:
 Towing dir: 145e Wire out: 350 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 47.42 CATCH/HOUR: 94.84

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	32.28 300	34.04	5135
Trachurus trecae	14.72 452	15.52	5139
Dentex congongensis	9.00 378	9.49	5137
Ariomma bondi	8.96 156	9.45	
Trigla lyra	5.48 246	5.78	
Pagellus bellottii	5.08 74	5.36	5138
Dentex macrophthalmus	5.08 104	5.36	5136
Sepia officinalis hierredda	2.96 4	3.12	
Citharus linguatula	2.64 110	2.78	
Raja miraletus	2.08 4	2.19	
Brachydeuterus auritus	2.04 16	2.15	
Torpedo torpedo	1.12 2	1.18	
Zeus faber	0.84 6	0.89	
Sardinella aurita	0.68 16	0.72	
Parapristipoma humile	0.56 48	0.59	
Illex coindetii	0.48 40	0.51	
Spicara alta	0.28 10	0.30	
Lophius vaillanti	0.24 2	0.25	
Arnoglossus imperialis	0.12 18	0.13	
Boops boops	0.12 2	0.13	
Saurida brasiliensis	0.04 8	0.04	
Microchirus frechkepi	0.04 2	0.04	
Total	94.84	100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2294
 DATE: 6/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 703 Long E 1202
 start stop duration
 TIME :13:33:00 14:03:00 30 (min) Purpose code: 3
 LOG :5510.22 5511.81 1.57 Area code : 3
 FDEPTH: 127 126 GearCond.code:
 BDEPTH: 127 126 Validity code:
 Towing dir: 340e Wire out: 410 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 145.56 CATCH/HOUR: 291.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	131.76 4086	45.26	5141
Spicara alta	61.38 1288	21.08	
Dentex congongensis	37.68 468	12.94	5142
Dentex angolensis	21.12 142	7.25	5140
Trigla lyra	19.80 370	6.80	
Brotula barbata	6.28 8	2.16	
Dentex macrophthalmus	4.14 52	1.42	
Dentex gibbosus	2.44 4	0.84	
Trichiurus lepturus	2.40 4	0.82	
Zeus faber	1.56 2	0.54	
Ariomma bondi	1.26 18	0.43	
Pagellus bellottii	0.66 6	0.23	
Atractoscion aequidens	0.64 2	0.22	
Total	291.12	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2295
 DATE: 6/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 704 Long E 1156
 start stop duration
 TIME :15:11:00 15:41:00 30 (min) Purpose code: 3
 LOG :5518.42 5519.90 1.46 Area code : 3
 FDEPTH: 256 265 GearCond.code:
 BDEPTH: 256 265 Validity code:
 Towing dir: 150e Wire out: 770 m Speed: 30 kn*10

Sorted: 70 Kg Total catch: 1171.54 CATCH/HOUR: 2343.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	802.56 2052	34.25	5146
Synagrops microlepis	703.76 34086	30.04	
Trichiurus lepturus	425.60 874	18.16	
Chlorophthalmus atlanticus	142.88 3078	6.10	
Chlorophthalmus sp.	52.44 950	2.24	
Merluccius polli	48.64 760	2.08	5143
Ariomma bondi	30.40 342	1.30	
Pterothrissus belloci	25.84 190	1.10	
Coelorinchus coelorhincus	21.28 570	0.91	
Epinephelus goreensis	17.46 2	0.75	
Todaropsis eblanae	16.72 72	0.71	
Parapenaeus longirostris, fem.	12.92 1558	0.55	5145
Illex coindetii	11.40 72	0.49	
Uranoscopus polli	8.36 18	0.36	
Parapenaeus longirostris, male	7.60 1026	0.32	5144
Sepia officinalis hierredda	3.80 54	0.16	
Trigla lyra	3.80 18	0.16	
Zenopsis conchifer	3.80 114	0.16	
Bembrops heterurus	1.52 18	0.06	
Raja miraletus	1.16 2	0.05	
Peristedion cataphractum	0.76 18	0.03	
Saurida brasiliensis	0.38 18	0.02	
Total	2343.08	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2296
 DATE: 6/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 705 Long E 1155
 start stop duration
 TIME :16:48:00 17:09:00 21 (min) Purpose code: 3
 LOG :5523.41 5524.57 1.13 Area code : 3
 FDEPTH: 348 344 GearCond.code:
 BDEPTH: 348 344 Validity code:
 Towing dir: 330e Wire out:1000 m Speed: 30 kn*10

Sorted: 40 Kg Total catch: 141.98 CATCH/HOUR: 405.66

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	110.00 1814	27.12	
Synagrops microlepis	66.00 2529	16.27	
Merluccius polli	55.71 286	13.73	5147
Trichiurus lepturus	35.71 1980	8.80	
Laemonema laureysi	33.14 614	8.17	
Pterothrissus belloci	27.43 157	6.76	
Hymenocephalus italicus	20.57 2971	5.07	
Parapenaeus longirostris, fem.	8.86 914	2.18	5150
L O B S T E R S	7.43 1114	1.83	
MYCTOPHIDAE	6.57 3114	1.62	
Merluccius polli, juveniles	5.71 129	1.41	5148
Illex coindetii	4.86 57	1.20	
Zenopsis conchifer	4.80 23	1.18	
Gadella imberbis	4.57 171	1.13	
Parapenaeus longirostris, male	4.00 571	0.95	5149
Nezumia aequalis	2.00 14	0.49	
Muraenox bagio	2.00 29	0.49	
Bembrops greyi	1.71 29	0.42	
Yarrella blackfordi	1.14 29	0.28	
Sepia officinalis hierredda	0.57 43	0.14	
Plesionika maritima	0.29 86	0.07	
Peristedion cataphractum	0.29 29	0.07	
Nezumia sp.	0.29 14	0.07	
POLYCHAELIDAE	0.29 57	0.07	
CAPROIDAE	0.29 14	0.07	
Lestidium atlanticum	0.29 14	0.07	
NETTASTOMATIDAE	0.29 14	0.07	
Solenocera africana	0.29 57	0.07	
Coelorinchus coelorhincus	0.29 14	0.07	
Zenion sp.	0.14 14	0.03	
Dibranchus atlanticus	0.14 14	0.03	
Total	405.67	99.97	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2297
 DATE: 6/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 707 Long E 1147
 start stop duration
 TIME :19:23:47 19:55:31 32 (min) Purpose code: 3
 LOG :5537.19 5538.80 1.60 Area code : 3
 FDEPTH: 755 759 GearCond.code:
 BDEPTH: 755 759 Validity code:
 Towing dir: 150e Wire out:1600 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 234.06 CATCH/HOUR: 438.86

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadonati	176.33 1950	40.18	
Triplophus hemingi	106.80 11340	24.34	
Coelorinchus coelorhincus	57.60 1140	13.12	
Chaceon maritae	31.50 45	7.18	
POLYCHAELIDAE	20.70 1950	4.72	
Yarrella blackfordi	9.30 135	2.12	
Bassanago albescens	6.90 30	1.57	
Octopus sp.	6.49 2	1.48	
Halosaurus ovenii	4.65 60	1.06	
Trichiurus lepturus	3.23 62	0.74	
Dicrolene intronigra	3.00 150	0.68	
Xenodermichthys copei	2.70 120	0.62	
Ebinania sp	2.40 15	0.55	
Talismania bifurcata	1.80 60	0.41	
Raja straeleni	1.50 15	0.34	
Aristeus varidens	1.35 180	0.31	
Nezumia sp.	1.20 15	0.27	
Nephropsis atlantica	0.30 15	0.07	
OPHIDIIDAE	0.30 15	0.07	
Laemonema laureysi	0.30 30	0.07	
Monacmitopus sp.	0.15 30	0.03	
Symphurus sp.	0.15 30	0.03	
S H R I M P S	0.08 8	0.02	
Glyphus marsupialis	0.08 8	0.02	
Total	438.81	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2298
 DATE: 6/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 710 Long E 1151
 start stop duration
 TIME :21:31:02 22:01:22 30 (min) Purpose code: 3
 LOG :5546.25 5547.71 1.44 Area code : 3
 FDEPTH: 663 659 GearCond.code:
 BDEPTH: 663 659 Validity code:
 Towing dir: 150e Wire out:1600 m Speed: 30 kn*10

Sorted: 39 Kg Total catch: 116.52 CATCH/HOUR: 233.04

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Triplophus hemingi	138.00 15720	59.22	
LOPHIIDAE	14.00 4	6.01	
Coelorinchus coelorhincus	9.00 170	3.86	
Hoplostethus cadonati	7.60 1220	3.26	
Geryon maritae	7.40 18	3.18	
POLYCHAELIDAE	6.16 1960	2.64	
C E P H A L O P O D A	4.80 30	2.06	
Aristeus varidens	4.20 190	1.80	
SYNAPHRANCHIDAE	3.68 260	1.58	
Stomias sp.	3.56 170	1.53	
Bathygadus melanobranchus	3.56 420	1.53	
Yarrella blackfordi	2.84 120	1.22	
Hydrolagus sp.	2.52 10	1.08	
Xenodermichthys copei	2.52 130	1.08	
Nematocarcinus africanus	2.32 750	1.00	
Etmopterus lucifer	2.28 30	0.99	
Illex coindetii	2.24 10	0.96	
SEKESIIDAE	1.96 50	0.84	
Halosaurus ovenii	1.96 10	0.84	
Dibranchus atlanticus	1.96 40	0.84	
NCMEIDAE	1.92 20	0.82	
Glyphus marsupialis	1.88 40	0.81	
Nephropsis atlantica	1.84 20	0.79	
Merluccius polli	1.72 2	0.74	
Raja sp.	1.28 2	0.55	
Benthodesmus tenuis	1.20 30	0.51	
Trichiurus lepturus	0.64 2	0.27	
Total	233.04	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2299
 DATE: 6/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 709 Long E 1152
 start stop duration
 TIME :23:22:26 23:52:16 30 (min) Purpose code: 3
 LOG :5553.71 5555.19 1.44 Area code : 3
 FDEPTH: 555 556 GearCond.code:
 BDEPTH: 555 556 Validity code:
 Towing dir: 330e Wire out:1400 m Speed: 30 kn*10
 Sorted: 30 Kg Total catch: 143.64 CATCH/HOUR: 287.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Laemonema laureysi	57.20	560	19.91
Triplophus hemingi	54.20	7850	18.87
Benthodesmus tenuis	46.60	1350	16.22
Xenodermichthys copei	22.20	870	7.73
POLYCHAELIDAE	22.00	1790	7.66
Etmopterus lucifer	18.00	20	6.27
Stomias sp.	12.80	220	4.46
Yarrella blackfordi	9.60	240	3.34
Geryon maritae	8.60	40	2.99
LOPHIIDAE	6.24	4	2.17
Chaunax pictus	4.20	10	1.46
Coelorinchus coelorrhynchus	4.20	80	1.46
Lamprogrammus exutus	4.00	10	1.39
Merluccius polli	3.48	8	1.21
Hoplostethus cadenati	3.20	70	1.11
B I V A L V E S	2.40	10	0.84
Dibranchius atlanticus	1.60	50	0.56
Aristeus varidens	1.60	80	0.56
C E P H A L O P O D A	1.40	10	0.49
MACROURIDAE	1.40	10	0.49
Nematocarcinus africanus	1.20	450	0.42
NOUEIDAE	0.96	2	0.33
Octopus sp.	0.80	10	0.28
Trachyrincus scabrurus	0.60	10	0.21
Glyphus marsupialis	0.40	10	0.14
MYCTOPHIDAE	0.40	10	0.14
Raja sp.	0.40	10	0.14
Total	289.68	100.85	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2300
 DATE: 7/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 646 Long E 1218
 start stop duration
 TIME :08:06:02 08:18:30 12 (min) Purpose code: 3
 LOG :5629.37 5630.10 0.71 Area code : 3
 FDEPTH: 39 41 GearCond.code:
 BDEPTH: 39 41 Validity code:
 Towing dir: 320e Wire out: 130 m Speed: 30 kn*10
 Sorted: 1 Kg Total catch: 1.48 CATCH/HOUR: 7.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Pagrus caeruleostictus	7.70	10	63.51
Dentex congoensis	2.70	5	36.49
Total	7.40	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2301
 DATE: 7/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 642 Long E 1213
 start stop duration
 TIME :09:38:47 10:09:04 30 (min) Purpose code: 3
 LOG :5640.25 5641.83 1.56 Area code : 3
 FDEPTH: 59 61 GearCond.code:
 BDEPTH: 59 61 Validity code:
 Towing dir: 160e Wire out: 190 m Speed: 30 kn*10
 Sorted: 72 Kg Total catch: 208.46 CATCH/HOUR: 416.92

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP	
weight	numbers			
Umbrina canariensis	312.20	860	74.88	5152
Epinephelus aeneus	33.84	20	8.12	
Sphyræna sphyraena	15.80	60	3.76	
Seriola lalandi	15.60	8	3.74	
Pagellus bellottii	10.04	88	2.41	5151
Pagrus caeruleostictus	7.36	18	1.77	
Fistularia petimba	4.08	22	0.98	
Chaetodon hoefleri	3.60	20	0.86	
Priacanthus arenatus	2.84	6	0.68	
Torpedo torpedo	2.32	4	0.56	
Trichiurus lepturus	2.04	4	0.49	
Raja miraletus	1.64	4	0.39	
Pagrus africanus	1.16	2	0.28	
Dentex angolensis	1.12	4	0.27	
Dentex congoensis	1.04	2	0.25	
Dentex barnardi	0.96	4	0.23	
Alloteuthis africana	0.80	420	0.19	
Pseudupeneus prayensis	0.10	10	0.02	
Serranus accraensis	0.10	10	0.02	
Arnoglossus imperialis	0.10	10	0.02	
Citharus linguatula	0.10	10	0.02	
Total	416.84	99.97		

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2302
 DATE: 7/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 651 Long E 1204
 start stop duration
 TIME :11:44:13 12:14:10 30 (min) Purpose code: 3
 LOG :5654.26 5655.85 1.56 Area code : 3
 FDEPTH: 88 90 GearCond.code:
 BDEPTH: 88 90 Validity code:
 Towing dir: 160e Wire out: 290 m Speed: 31 kn*10
 Sorted: 20 Kg Total catch: 20.29 CATCH/HOUR: 40.58

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP	
weight	numbers			
Pagellus bellottii	27.12	300	66.83	5153
Raja miraletus	2.88	6	7.10	
Fistularia petimba	2.84	12	7.00	
Trigla lyra	1.60	30	3.94	
Chelidonichthys capensis	1.44	10	3.55	
Lagocephalus laevigatus	1.24	6	3.06	
Sphyræna sphyraena	0.68	4	1.68	
Dentex congoensis	0.60	36	1.48	
Sepia orbignyana	0.36	24	0.89	
Trachurus trecae, juvenile	0.36	20	0.89	
CONGRIDAE	0.32	4	0.79	
Chaetodon hoefleri	0.28	2	0.69	
Illex coindetii	0.24	16	0.59	
Zeus faber	0.20	2	0.49	
Citharus linguatula	0.16	16	0.39	
Priacanthus arenatus	0.08	2	0.20	
Arnoglossus imperialis	0.08	12	0.20	
Saurida brasiliensis	0.02	4	0.05	
Total	40.50	99.82		

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2303
 DATE: 7/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 655 Long E 1201
 start stop duration
 TIME :14:41:05 15:11:15 30 (min) Purpose code: 3
 LOG :5669.74 5671.41 1.67 Area code : 3
 FDEPTH: 106 103 GearCond.code:
 BDEPTH: 106 103 Validity code:
 Towing dir: 340e Wire out: 320 m Speed: 30 kn*10
 Sorted: 62 Kg Total catch: 105.28 CATCH/HOUR: 210.56

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP	
weight	numbers			
Trachurus trecae, juvenile	107.88	4106	51.23	5155
Dentex congoensis	47.52	770	22.57	5156
Dentex angolensis	14.44	266	6.86	5154
Trigla lyra	10.80	306	5.13	
Zeus faber	4.68	24	2.22	
Dentex barnardi	4.28	14	2.03	
Sepia orbignyana	3.60	16	1.71	
Citharus linguatula	3.24	144	1.54	
Dentex gibbosus	2.56	4	1.22	
Priacanthus arenatus	2.48	6	1.18	
Squatina oculata	1.88	2	0.89	
Spicara alta	1.44	120	0.68	
Sardinella aurita	1.44	36	0.68	
Torpedo torpedo	1.32	2	0.63	
Lagocephalus laevigatus	0.76	4	0.36	
Fistularia petimba	0.60	2	0.28	
Dentex macrophthalmus	0.60	8	0.28	
Pagellus bellottii	0.56	12	0.27	
Arnoglossus imperialis	0.24	24	0.11	
Saurida brasiliensis	0.12	48	0.06	
Ariomma bondi	0.12	6	0.06	
Total	210.56	99.99		

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2304
 DATE: 7/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 657 Long E 1154
 start stop duration
 TIME :16:44:25 17:14:09 30 (min) Purpose code: 3
 LOG :5682.03 5683.64 1.60 Area code : 3
 FDEPTH: 187 207 GearCond.code:
 BDEPTH: 187 207 Validity code:
 Towing dir: 335e Wire out: 600 m Speed: 30 kn*10
 Sorted: 110 Kg Total catch: 368.35 CATCH/HOUR: 736.70

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP	
weight	numbers			
Synagrops microlepis	391.60	24600	53.16	
Dentex angolensis	102.32	400	13.89	5157
Zenopsis conchifer	55.16	92	7.49	
Illex coindetii	43.00	480	5.84	
Trichiurus lepturus	24.40	60	3.31	
Aulopus cadenati	18.40	190	2.50	
Squatina oculata	18.00	32	2.44	
Pentheroscion mbizi	17.80	180	2.42	
Pterothrissus belloci	16.20	160	2.20	
Bretula barbata	14.76	22	2.00	
Uranoscopus polli	7.20	80	0.98	
Zeus faber	4.60	20	0.62	
Saurida brasiliensis	3.60	1220	0.49	
Octopus sp.	3.00	10	0.41	
Torpedo torpedo	2.16	2	0.29	
Citharus linguatula	2.00	110	0.27	
Sepia orbignyana	1.80	140	0.24	
Lophius vaillanti	1.60	10	0.22	
Dentex congoensis	1.60	30	0.22	
Torpedo sp.	1.60	2	0.22	
Peristedion cataphractum	1.20	60	0.16	
Squilla mantis	1.20	40	0.16	
Parapenaeus longirostris	1.00	10	0.14	
Pontinus accraensis	0.80	10	0.11	
Trachurus trecae	0.60	30	0.06	
Coelorinchus coelorrhynchus	0.60	20	0.08	
CAPOIIDAE	0.20	10	0.03	
Todaropsis eblanæ	0.20	10	0.03	
Myxirophis rostellatus	0.10	10	0.01	
Total	736.70	100.01		

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2305
 DATE: 7/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 656 Long E 1152
 start stop duration
 TIME :18:12:17 18:42:47 31 (min) Purpose code: 3
 LOG :5688.35 5690.00 1.65 Area code : 3
 FDEPTH: 269 282 GearCond.code:
 BDEPTH: 269 282 Validity code:
 Towing dir: 150e Wire out: 700 m Speed: 30 kn*10
 Sorted: 28 Kg Total catch: 40.96 CATCH/HOUR: 79.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP	
weight	numbers			
Synagrops microlepis	25.49	1068	32.15	
Chlorophthalmus atlanticus	13.59	358	17.14	
Laemonema laureysi	4.94	97	6.23	
Pterothrissus belloci	4.82	35	6.08	
Peristedion cataphractum	3.72	416	4.69	
Pontinus accraensis	3.54	79	4.47	
Dicologlossa hexophthalma	3.08	116	3.88	
Illex coindetii	2.96	39	3.73	
Coelorinchus coelorrhynchus	2.38	50	3.00	
Chlorophthalmus sp.	2.26	87	2.85	
MYCTOPHIDAE	2.21	956	2.79	
L O B S T E R S	2.21	186	2.79	
Bretula barbata	1.86	2	2.35	
Merluccius polli	1.68	10	2.12	5158
Merluccius polli, juveniles	1.34	33	1.69	5159
Bombrops greyi	1.16	33	1.46	
Parapenaeus longirostris, fem.	0.56	81	0.71	5161
Gadella imberbis	0.41	15	0.52	
Psettodes belcheri	0.41	6	0.52	
Parapenaeus longirostris, male	0.25	48	0.32	5160
Myxirophis rostellatus	0.17	4	0.21	
Solenocera africana	0.12	41	0.15	
NETTASTOMATIDAE	0.12	6	0.15	
Plesionika martia	0.08	79	0.10	
Zenion sp.	0.06	6	0.08	
Zenopsis conchifer	0.05	4	0.08	
Total	79.48	100.26		

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2306
 DATE: 7/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 658
 start stop duration Long E 1151
 TIME :20:12:44 20:42:15 30 (min) Purpose code: 3
 LOG :5699.88 5701.35 1.45 Area code : 3
 FDEPTH: 342 362 GearCond.code:
 BDEPTH: 342 362 Validity code:
 Towing dir: 340e Wire out: 900 m Speed: 30 km*10

Sorted: 33 Kg Total catch: 101.92 CATCH/HOUR: 203.84

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	77.28 1224	37.91	
Laemonema laureys	42.72 768	20.96	
Coelorinchus coelorhincus	15.16 232	7.44	
Guentherus altivela	11.04 2	5.42	
Merluccius polli	10.24 56	5.02	5162
Hymenocephalus italicus	8.64 1296	4.24	
Pterothrissus bellocci	7.04 32	3.45	
Gephyroberyx darwini	6.32 4	3.10	
Muraenesox bagio	5.28 56	2.59	
Parapanaeus longirostris, fem.	3.92 360	1.92	5164
L O B S T E R S	3.36 392	1.65	
ANTENNARIDAE	3.04 104	1.49	
Parapanaeus longirostris, male	1.44 184	0.71	5163
Psetodes belcheri	1.12 16	0.55	
Plesionika martia	0.96 236	0.47	
Dibranchius atlanticus	0.80 72	0.39	
Cadella imberbis	0.80 24	0.39	
Synagrops microlepis	0.80 32	0.39	
Illex coindetii	0.80 8	0.39	
Peristedion cataphractum	0.72 32	0.35	
Lophius vaillanti	0.64 16	0.31	
MYCTOPHIDAE	0.48 408	0.24	
Dicologlossa cuneata	0.32 8	0.16	
Zenopsis conchifer	0.32 8	0.16	
Raja straeleni	0.32 2	0.16	
Nezumia aequalis	0.16 8	0.08	
CAPROIDAE	0.16 8	0.08	
Bembrops greyi	0.16 8	0.08	
Talismania bifurcata	0.16 8	0.08	
POLYCHAELIDAE	0.16 8	0.08	
Solenocera africana	0.08 12	0.04	
Zenion sp.	0.08 8	0.04	
Bathynectes piperitus	0.08 16	0.04	
Aristeus varidens	0.04 4	0.02	
Total	204.64	100.40	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2307
 DATE: 7/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 658
 start stop duration Long E 1162
 TIME :23:06:00 23:36:00 30 (min) Purpose code: 3
 LOG :5716.00 5717.60 1.60 Area code : 3
 FDEPTH: 658 637 GearCond.code:
 BDEPTH: 658 637 Validity code:
 Towing dir: 330e Wire out:1700 m Speed: 30 km*10

Sorted: 30 Kg Total catch: 94.24 CATCH/HOUR: 188.48

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	52.16 1520	27.67	
POLYCHAELIDAE	24.64 2896	13.07	
Nematocarcinus africanus	14.88 3776	7.89	
Lamprogrammus exutus	12.96 64	6.88	
Triplophus hemingi	12.48 1608	6.62	
LOPHIDAE	11.84 6	6.28	
Coelorinchus coelorhincus	10.72 224	5.69	
Xenodermichthys copei	8.96 576	4.54	
Yarella blackfordi	6.24 144	3.31	
Bathygadus melanobranchus	5.48 274	2.91	
Aristeus varidens	4.80 168	2.55	
Merluccius polli	4.04 6	2.14	
Stemias sp.	4.00 80	2.12	
SYNGONOTIDAE	1.60 40	0.85	
SERGESTIDAE	1.60 112	0.85	
Glyphus marsupialis	1.60 88	0.85	
Etmopterus lucifer	1.44 8	0.76	
Aphanopus sp.	1.28 8	0.68	
UNIDENTIFIED FISH	1.12 16	0.59	
Geryon maritae	1.12 4	0.59	
Dibranchius atlanticus	0.96 40	0.51	
SOLENOGASTERIDAE	0.96 152	0.51	
Bathyroconger vicinus	0.96 8	0.51	
Halosaurus ovenii	0.64 8	0.34	
Heterocarpus grimaldii	0.64 24	0.34	
Setarches guentheri	0.48 16	0.25	
Raja sp.	0.32 16	0.17	
Talismania bifurcata	0.32 8	0.17	
MORIDAE	0.16 16	0.08	
CYNOGLOSSIDAE	0.16 16	0.08	
Nephropsis atlantica	0.16 8	0.08	
MELANOCETIDAE	0.08 8	0.04	
BATRACHOIDIDAE	0.08 8	0.04	
Total	188.48	99.96	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2308
 DATE: 8/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 655
 start stop duration Long E 1137
 TIME :00:51:00 01:21:00 30 (min) Purpose code: 3
 LOG :5723.40 5725.00 1.60 Area code : 3
 FDEPTH: 732 751 GearCond.code:
 BDEPTH: 732 751 Validity code:
 Towing dir: 320e Wire out:1850 m Speed: 30 km*10

Sorted: 240 Kg Total catch: 90.66 CATCH/HOUR: 181.32

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	69.92 1176	38.56	
Coelorinchus coelorhincus	25.76 568	14.21	
Bathygadus melanobranchus	16.00 152	8.82	
POLYCHAELIDAE	15.04 1128	8.29	
Nematocarcinus africanus	12.00 1812	6.62	
Yarella blackfordi	7.52 88	4.15	
Bathyroconger vicinus	5.60 32	3.09	
Dibranchius atlanticus	5.44 8	3.00	
Xenodermichthys copei	4.32 104	2.38	
TRACHIPTERIDAE	3.56 2	1.96	
Halosaurus ovenii	3.04 88	1.68	
C E P H A L O P O D A	2.88 8	1.59	
Triplophus hemingi	2.72 336	1.50	
Stemias sp.	1.92 32	1.06	
Trichurus lepturus	1.48 4	0.82	
Glyphus marsupialis	0.96 40	0.53	
Talismania bifurcata	0.96 24	0.53	
Aristeus varidens	0.96 48	0.53	
Geryon maritae	0.76 2	0.42	
SYNGONOTIDAE	0.32 16	0.18	
SERGESTIDAE	0.16 8	0.09	
Total	181.32	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2309
 DATE: 8/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 646
 start stop duration Long E 1148
 TIME :05:44:00 06:14:11 30 (min) Purpose code: 3
 LOG :5745.40 5747.03 1.58 Area code : 3
 FDEPTH: 252 261 GearCond.code:
 BDEPTH: 252 261 Validity code:
 Towing dir: 160e Wire out: 700 m Speed: 30 km*10

Sorted: 54 Kg Total catch: 313.24 CATCH/HOUR: 626.48

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Synagrops microlepis	306.36 20322	48.90	
Chlorophthalmus atlanticus	187.20 6246	29.86	
Dentex angolensis	26.84 68	4.28	5165
Zenopsis conchifer	15.52 38	2.48	
Chlorophthalmus sp.	15.48 360	2.47	
Uranoscopus polli	10.44 108	1.67	
Pterothrissus bellocci	10.08 72	1.61	
Illex coindetii	9.36 144	1.49	
Bembrops greyi	8.64 112	1.38	
Coelorinchus coelorhincus	6.48 162	1.03	
Myxtriopsis rostellatus	4.32 18	0.69	
Parapanaeus longirostris, fem.	3.96 594	0.63	5167
Todaropsis eblanae	3.96 18	0.63	
Merluccius polli, juveniles	3.60 72	0.57	
Peristedion sp.	3.24 216	0.52	
Parapanaeus longirostris, male	2.52 450	0.40	5166
Trichurus lepturus	2.28 4	0.36	
Callappa sp.	1.80 36	0.29	
Sepia officinalis hierredda	1.80 72	0.29	
Loligo sp.	1.08 1260	0.17	
Plesionika martia	0.72 252	0.11	
Hymenocephalus italicus	0.72 18	0.11	
Citharus linguatula	0.36 18	0.06	
Ariomma bondi	0.36 72	0.06	
Chaceon maritae	0.18 18	0.03	
Zeion sp.	0.18 36	0.03	
Total	627.48	100.14	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2310
 DATE: 8/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 644
 start stop duration Long E 1153
 TIME :07:28:54 07:58:20 29 (min) Purpose code: 3
 LOG :5755.58 5757.25 1.64 Area code : 3
 FDEPTH: 130 151 GearCond.code:
 BDEPTH: 130 151 Validity code:
 Towing dir: 210e Wire out: 400 m Speed: 30 km*10

Sorted: 43 Kg Total catch: 42.48 CATCH/HOUR: 87.89

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex angolensis	22.68 151	25.80	5169
Dentex congolensis	18.91 298	21.52	5168
Spicara alta	12.33 190	14.03	
Chelidonichthys gabonensis	8.36 172	9.51	
Raja miraletus	8.11 14	9.23	
Trichurus lepturus	5.21 2	5.93	
Scorpaena stephanica	2.44 6	2.78	
Illex coindetii	2.07 43	2.36	
Citharus linguatula	1.74 106	1.98	
Brotula barbata	1.32 2	1.50	
Trachurus trerca	0.83 6	0.94	
Peristedion sp.	0.94 12	0.61	
Myxtriopsis rostellatus	0.46 2	0.52	
Dentex macropthalmus	0.37 2	0.42	
Sepia orbignyana	0.33 2	0.38	11
Pagellus bellottii	0.25 2	0.28	
Ariomma bondi	0.21 2	0.24	
Zeus faber	0.17 2	0.19	
Loligo sp.	0.12 56	0.14	
ELENNIDAE	0.08 2	0.09	
Scorpaena normani	0.08 2	0.09	
Sepia officinalis hierredda	0.04 2	0.05	
Arnoglossus imperialis	0.04 4	0.05	
Total	86.69	98.64	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2311
 DATE: 8/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 641
 start stop duration Long E 1200
 TIME :09:37:29 10:05:46 28 (min) Purpose code: 3
 LOG :5770.10 5771.71 1.56 Area code : 3
 FDEPTH: 87 89 GearCond.code:
 BDEPTH: 87 89 Validity code:
 Towing dir: 180e Wire out: 260 m Speed: 30 km*10

Sorted: 50 Kg Total catch: 50.60 CATCH/HOUR: 106.43

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex congolensis	63.64 911	58.69	5171
Trachurus trerca, juvenile	22.59 1954	20.83	5170
Trachurus trerca	11.70 69	10.79	5172
Pagellus bellottii	3.81 24	3.51	5173
Sardinella aurita	1.93 66	1.78	
Chelidonichthys gabonensis	1.59 24	1.47	
Lagocephalus laevigatus	0.69 2	0.64	
Thorogobius angolensis	0.43 2	0.40	
Brachydeuterus auritus	0.39 4	0.36	
Spicara alta	0.26 24	0.24	
Dentex angolensis	0.26 2	0.24	
Illex coindetii	0.21 2	0.19	
Boops boops	0.13 4	0.12	
Citharus linguatula	0.04 6	0.04	
Total	107.67	99.30	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2312
 DATE: 8/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 638
 start stop duration Long E 1206
 TIME :11:19:23 11:49:10 30 (min) Purpose code: 3
 LOG :5780.57 5781.89 1.30 Area code : 3
 FDEPTH: 74 71 GearCond.code:
 BDEPTH: 74 71 Validity code:
 Towing dir: 64° Wire out: 240 m Speed: 30 kn*10
 Sorted: 67 Kg Total catch: 148.21 CATCH/HOUR: 296.42

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Dentex congoensis	157.90	4486	66.76 5175
Pagellus bellottii	51.20	670	17.27 5174
Epinephelus aeneus	12.92	2	4.36
Brachydeuterus auritus	5.40	66	1.82
Trachurus trecae, juvenile	4.90	326	1.65
Lagocephalus laevigatus	4.32	16	1.46
Trachurus trecae	3.60	46	1.21
Trigla lyra	3.20	60	1.08
Boops boops	3.10	76	1.05
Sepia orbignyana	2.28	10	0.77
Zeus faber	1.60	2	0.54
Fistularia petimba	1.44	4	0.49
Chaetodon hoefleri	1.28	8	0.43
Pseudupeneus prayensis	1.00	10	0.34
Pagrus caeruleostictus	0.96	2	0.32
Decapterus punctatus	0.90	36	0.30
Cynoglossus canariensis	0.52	2	0.18
Spicara alta	0.40	136	0.13
Priacanthus arenatus	0.20	16	0.07
Sardinella aurita	0.20	136	0.07
Arnoglossus imperialis	0.10	16	0.03
Total	297.42	100.33	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2313
 DATE: 9/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 633
 start stop duration Long E 1222
 TIME :07:43:50 08:03:42 20 (min) Purpose code: 3
 LOG :5807.35 5808.26 0.88 Area code : 3
 FDEPTH: 19 20 GearCond.code:
 BDEPTH: 19 20 Validity code:
 Towing dir: 160° Wire out: 90 m Speed: 30 kn*10
 Sorted: 6 Kg Total catch: 6.31 CATCH/HOUR: 18.93

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pseudotolithus typus	13.20	12	69.73
Rhinobatos albomaculatus	2.34	3	12.36
Brachydeuterus auritus	1.20	186	6.34
Callinectes marginatus	0.78	3	4.12
Sepia orbignyana	0.54	3	2.85
Galeoides decadactylus	0.36	3	1.90
Eucinostomus melanopterus	0.24	3	1.27
Decapterus rhonchus	0.18	6	0.95
Penaeus notialis	0.06	3	0.32
Penaeus kerathurus	0.03	3	0.16
Total	18.93	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2314
 DATE: 9/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 624
 start stop duration Long E 1216
 TIME :09:37:13 09:53:04 16 (min) Purpose code: 3
 LOG :5820.64 5821.68 1.02 Area code : 3
 FDEPTH: 26 27 GearCond.code:
 BDEPTH: 26 27 Validity code:
 Towing dir: 310° Wire out: 100 m Speed: 30 kn*10
 Sorted: 23 Kg Total catch: 23.41 CATCH/HOUR: 87.79

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Seriola lalandi	31.58	45	35.97
Epinephelus aeneus	24.75	4	28.19
Alectis alexandrinus	15.83	15	18.03
Scomberomorus tritor	12.38	19	14.10
Decapterus punctatus	2.48	113	2.82
Decapterus rhonchus	0.53	19	0.60
Brachydeuterus auritus	0.23	23	0.26
Sardinella aurita	0.04	4	0.05
Total	87.82	100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2315
 DATE: 9/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 629
 start stop duration Long E 1206
 TIME :11:29:34 11:59:19 30 (min) Purpose code: 3
 LOG :5834.08 5835.51 1.41 Area code : 3
 FDEPTH: 59 56 GearCond.code:
 BDEPTH: 59 56 Validity code:
 Towing dir: 150° Wire out: 210 m Speed: 30 kn*10
 Sorted: 44 Kg Total catch: 43.70 CATCH/HOUR: 87.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pagellus bellottii	30.60	236	35.01 5176
Pagrus caeruleostictus	12.60	24	14.42
Epinephelus aeneus	9.96	2	11.40
Trichiurus lepturus	9.68	14	11.06
Dentex gibbosus	4.36	6	4.99
Priacanthus arenatus	3.40	8	3.89
Pagrus africanus	2.32	4	2.65
Torpedo torpedo	2.16	8	2.47
Seriola carpenteri	2.04	10	2.33
Fistularia petimba	1.92	6	2.20
Raja miraletus	1.56	2	1.78
Alloteuthis africana	1.44	1050	1.65
Branchiostegus semifasciatus	1.40	2	1.60
Chelidonichthys gabonensis	1.36	8	1.56
Lagocephalus laevigatus	0.60	2	0.69
Cynoglossus canariensis	0.56	2	0.64
Callinectes pallidus	0.40	2	0.46
Chaetodon hoefleri	0.28	2	0.32
Decapterus punctatus	0.24	10	0.27
Citharus linguatula	0.20	16	0.23
Calappa pelii	0.16	2	0.18
Total	87.24	99.82	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2316
 DATE: 9/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 633
 start stop duration Long E 1152
 TIME :14:11:41 14:41:27 30 (min) Purpose code: 3
 LOG :5853.00 5854.49 1.47 Area code : 3
 FDEPTH: 119 120 GearCond.code:
 BDEPTH: 119 120 Validity code:
 Towing dir: 160° Wire out: 370 m Speed: 30 kn*10
 Sorted: 42 Kg Total catch: 42.40 CATCH/HOUR: 84.80

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae, juvenile	25.64	818	30.24 5179
Dentex congoensis	14.00	206	16.51 5178
Trachurus trecae	12.96	92	15.28 5180
Dentex angolensis	7.08	58	8.35 5177
Brachydeuterus auritus	5.60	42	6.60
Boops boops	4.76	96	5.61
Trichiurus lepturus	4.08	6	4.81
Brotula barbata	2.40	2	2.83
Raja miraletus	1.84	4	2.17
Citharus linguatula	1.56	58	1.84
Torpedo torpedo	1.20	2	1.42
Trigla lyra	1.12	30	1.32
Pterothrissus belloci	0.68	6	0.80
Priacanthus arenatus	0.56	2	0.66
Spicara alta	0.48	14	0.57
Ariomma bondi	0.36	6	0.42
Zeus faber	0.28	2	0.33
Microchirus frechkopi	0.08	2	0.09
Pagellus bellottii	0.08	2	0.09
Arnoglossus imperialis	0.04	6	0.05
Total	84.80	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2317
 DATE: 9/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 635
 start stop duration Long E 1146
 TIME :16:06:19 16:36:11 30 (min) Purpose code: 3
 LOG :5864.10 5865.91 1.79 Area code : 3
 FDEPTH: 167 162 GearCond.code:
 BDEPTH: 167 162 Validity code:
 Towing dir: 340° Wire out: 520 m Speed: 30 kn*10
 Sorted: 19 Kg Total catch: 18.92 CATCH/HOUR: 37.84

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	13.48	20	35.62
Dentex angolensis	8.20	48	21.67 5181
Pterothrissus belloci	6.12	66	16.17
Illex coindetii	2.40	42	6.34
Brotula barbata	1.28	2	3.38
Trachurus trecae	1.08	10	2.85 5182
Chelidonichthys gabonensis	0.88	12	2.33
Bembrops greyi	0.80	14	2.11
Priacanthus arenatus	0.80	2	2.11
Trachurus trecae, juvenile	0.68	28	1.80 5183
Monolene microstoma	0.44	28	1.16
Citharus linguatula	0.44	12	1.16
Pentheroscion mbizi	0.16	2	0.42
Synagrops microlepis	0.16	10	0.42
Uranoscopus polli	0.16	4	0.42
Saurida brasiliensis	0.16	22	0.42
Boops boops	0.12	2	0.32
Dentex congoensis	0.08	2	0.21
Sardinella aurita	0.08	2	0.21
Sepia officinalis hierredda	0.08	8	0.21
Parapenaeus longirostris	0.04	16	0.11
CAPROIDAE	0.04	2	0.11
Total	37.68	99.55	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2318
 DATE: 9/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 639
 start stop duration Long E 1140
 TIME :18:38:18 18:47:26 9 (min) Purpose code: 3
 LOG :5876.78 5877.19 0.39 Area code : 3
 FDEPTH: 332 343 GearCond.code:
 BDEPTH: 332 343 Validity code:
 Towing dir: 170° Wire out: 920 m Speed: 30 kn*10
 Sorted: 26 Kg Total catch: 47.74 CATCH/HOUR: 318.27

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	169.87	3240	53.37
Laemonema laureysi	38.67	653	12.15
Nezumia aequalis	19.73	173	6.20
L O B S T E R S	15.73	1267	4.94
Parapenaeus longirostris, fem.	10.53	1253	3.31 5185
Paromola cuvieri	9.07	7	2.85
Synagrops microlepis	8.53	333	2.68
Hymenocephalus italicus	7.47	1013	2.35
Craceon maritae	7.33	20	2.30
Pterothrissus belloci	5.60	40	1.76
NETTASTOMATIDAE	5.07	53	1.59
Coelorrhinus coelorrhinus	3.47	160	1.09
Parapenaeus longirostris, male	2.80	400	0.88 5184
Raja straeleni	2.67	40	0.84
Bembrops greyi	2.40	67	0.75
Dibranchius atlanticus	2.13	293	0.67
Gadella imberbis	1.87	67	0.59
Peristedion cataphractum	1.87	120	0.59
Bathynectes piperitus	1.87	13	0.59
Psetodes belcheri	1.07	13	0.34
Plesionika martia	0.80	160	0.25
ASTYRIIDAE	0.53	27	0.17
Sepia officinalis hierredda	0.27	13	0.08
MYCTOPHIDAE	0.27	13	0.08
Trichiurus lepturus	0.27	13	0.08
Meluriscus polli, juveniles	0.27	13	0.08
Loligo sp.	0.13	40	0.04
Zenion sp.	0.13	13	0.04
Total	320.42	100.66	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2319
 DATE: 9/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 638
 start stop duration Long E 1136
 TIME :20:33:11 21:03:35 30 (min) Purpose code: 3
 LOG :5886.60 5887.81 1.17 Area code : 3
 FDEPTH: 481 494 GearCond.code:
 BDEPTH: 481 494 Validity code:
 Towing dir: 140e Wire out:1250 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 74.13 CATCH/HOUR: 148.26

SPECIES	CATCH/HOUR weight	% OF TOT. C	SAMP
Sphyrna couardi	56.50	2	38.11
Merluccius polli	24.64	66	16.62
Laemonema laureysi	17.52	724	11.82
POLYCHAELIDAE	8.00	808	5.40
ANTENNARIIDAE	6.88	36	4.64
Trichiurus lepturus	5.52	168	3.72
Bathyrcocongervicinus	4.72	68	3.18
Aristeus varidens, female	3.36	256	2.27
Etmopterus lucifer	2.08	44	1.40
Parapandalus narval	2.00	728	1.35
Yarella blackfordi	1.96	52	1.32
OPHIIDIIDAE	1.84	156	1.24
Haploblepharus pictus	1.68	16	1.13
Gadella imberbis	1.44	44	0.97
Triplophus hemingi	1.36	224	0.92
Coelorinchus coelorhincus	1.36	32	0.92
Aristeus varidens, male	1.04	132	0.70
Lamprogrammus exultus	1.04	2	0.70
Malacocephalus laevis	0.80	4	0.54
NETTASTOCHMIDAE	0.72	36	0.49
Lophodes kempi	0.72	4	0.49
Muraenesox bagio	0.72	20	0.49
Hoplostethus cadenati	0.64	4	0.43
Bathynectes piperitus	0.40	24	0.27
Dibranchius atlanticus	0.40	40	0.27
Plesiopeneaus edwardsianus	0.28	62	0.19
Nezumia aequalis	0.24	36	0.16
Loligo sp.	0.08	24	0.05
Mesistichys scolopaceus	0.08	8	0.05
Talismania bifurcata	0.08	4	0.05
Peristedion cataphractum	0.08	4	0.05
Hymenoccephalus italicus	0.04	4	0.03
Bathysolea sp.	0.04	8	0.03
Total	148.26		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2320
 DATE:10/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 641
 start stop duration Long E 1122
 TIME :23:46:21 00:16:08 30 (min) Purpose code: 3
 LOG :5906.65 5908.12 1.45 Area code : 3
 FDEPTH: 748 757 GearCond.code:
 BDEPTH: 748 757 Validity code:
 Towing dir: 150e Wire out:1850 m Speed: 30 kn*10

Sorted: 21 Kg Total catch: 78.81 CATCH/HOUR: 157.62

SPECIES	CATCH/HOUR weight	% OF TOT. C	SAMP
Coelorinchus coelorhincus	48.00	700	30.45
Hoplostethus cadenati	27.20	220	17.26
POLYCHAELIDAE	13.00	1060	8.25
Deania quadrispinosum	10.60	40	6.73
Bathygadus melanobranchus	9.40	240	5.96
Yarella blackfordi	8.80	100	5.58
LOPHIIDAE	7.40	2	4.69
Bathyrcocongervicinus	7.00	30	4.44
Raja sp.	5.52	4	3.50
PALAEONIDAE	5.00	790	3.17
Halosaurus evenii	4.40	70	2.79
Glyphus marsupialis	2.60	120	1.65
Xenodermichthys copei	2.20	70	1.40
UNIDENTIFIED FISH	2.00	70	1.27
Aristeus varidens	1.40	60	0.89
Stomias sp.	1.00	20	0.63
SYNPHOBANCHIDAE	0.80	10	0.51
Triplophus hemingi	0.80	80	0.51
Talismania bifurcata	0.40	10	0.25
Dibranchius atlanticus	0.10	10	0.06
Total	157.62		99.99

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2321
 DATE:10/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 616
 start stop duration Long E 1205
 TIME :05:59:38 06:29:14 30 (min) Purpose code: 3
 LOG :5961.03 5962.62 1.55 Area code : 3
 FDEPTH: 49 49 GearCond.code:
 BDEPTH: 49 49 Validity code:
 Towing dir: 340e Wire out: 260 m Speed: 30 kn*10

Sorted: 18 Kg Total catch: 18.04 CATCH/HOUR: 36.08

SPECIES	CATCH/HOUR weight	% OF TOT. C	SAMP
Epinephelus aeneus	12.64	2	35.03
Pagellus bellottii	6.76	52	18.74
Lagocephalus laevigatus	6.12	18	16.96
Pagrus caeruleostictus	3.00	8	8.31
Dentex angolensis	2.52	16	6.98
Sepia orbignyana	2.36	2	6.54
Sphyrna sphyraena	1.32	6	3.66
Cynoglossus browni	0.48	2	1.33
Citharus linguatula	0.40	2	1.11
Alloteuthis africana	0.24	96	0.67
Scorpaena normani	0.08	2	0.22
Bembrops greyi	0.08	2	0.22
Arnoglossus imperialis	0.02	4	0.06
Maja squinado	0.02	6	0.06
Priacanthus arenatus	0.02	2	0.06
Parapeneaus longirostris	0.02	2	0.06
Total	36.08		100.01

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2322
 DATE:10/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 617
 start stop duration Long E 1200
 TIME :08:06:15 08:36:46 31 (min) Purpose code: 3
 LOG :5975.09 5976.68 1.37 Area code : 3
 FDEPTH: 70 75 GearCond.code:
 BDEPTH: 70 75 Validity code:
 Towing dir: 180e Wire out: 260 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 26.10 CATCH/HOUR: 50.52

SPECIES	CATCH/HOUR weight	% OF TOT. C	SAMP
Seriola lalandi	9.72	8	19.24
Epinephelus aeneus	9.29	2	18.39
Raja miraletus	6.97	15	13.80
Dentex angolensis	4.61	27	9.13
Trichiurus lepturus	3.48	6	6.89
Arnoglossus imperialis	2.25	64	4.45
Zeus faber	2.21	10	4.37
Saurida brasiliensis	1.78	594	3.52
Pagrus caeruleostictus	1.74	4	3.44
Alloteuthis africana	1.43	238	2.83
Balistes capricus	1.05	2	2.08
Sphyrna sphyraena	0.77	6	1.52
Pagellus bellottii	0.74	6	1.46
Chaetodon hoefleri	0.66	4	1.31
Trigla lyra	0.66	6	1.31
Citharus linguatula	0.58	35	1.15
Lagocephalus laevigatus	0.46	2	0.91
Cynoglossus browni	0.46	2	0.91
Torpedo torpedo	0.43	2	0.85
Priacanthus arenatus	0.35	31	0.69
Trachurus trcae, juvenile	0.27	19	0.53
Dentex congoensis	0.19	4	0.38
Sepia orbignyana	0.19	4	0.38
Aulopus cadenati	0.19	2	0.38
Illex coindetii	0.19	2	0.38
Sardinella aurita	0.04	2	0.08
Total	50.71		100.38

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2323
 DATE:10/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 626
 start stop duration Long E 1156
 TIME :09:54:21 10:24:07 30 (min) Purpose code: 3
 LOG :5985.95 5987.68 1.41 Area code : 3
 FDEPTH: 88 93 GearCond.code:
 BDEPTH: 88 93 Validity code:
 Towing dir: 180e Wire out: 300 m Speed: 30 kn*10

Sorted: 70 Kg Total catch: 70.11 CATCH/HOUR: 140.22

SPECIES	CATCH/HOUR weight	% OF TOT. C	SAMP
Dentex angolensis	90.04	536	64.21
Dentex barnardi	11.64	36	8.30
Pagellus bellottii	9.76	96	6.96
Umbrina canariensis	7.72	20	5.51
Torpedo torpedo	3.08	4	2.20
Trigla lyra	2.56	26	1.83
Brachydeuterus auritus	2.40	18	1.71
Dentex congoensis	2.36	36	1.68
Sepia orbignyana	2.14	6	1.53
Lagocephalus laevigatus	2.12	6	1.51
Pagrus caeruleostictus	1.28	2	0.91
Zeus faber	1.24	4	0.88
Fistularia petimba	0.68	2	0.48
Chaetodon hoefleri	0.64	4	0.46
Illex coindetii	0.64	42	0.46
Raja miraletus	0.56	4	0.40
Pseudupeneus prayensis	0.44	4	0.31
Brotula barbata	0.24	2	0.17
Scorpaena stephanica	0.16	2	0.11
Citharus linguatula	0.16	12	0.11
Saurida brasiliensis	0.08	20	0.06
Sepia officinalis hierredda	0.08	4	0.06
Chaetodon marcellae	0.08	2	0.06
Decapterus punctatus	0.02	2	0.01
Total	140.12		99.92

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2324
 DATE:10/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 623
 start stop duration Long E 1146
 TIME :11:06:45 12:07:16 31 (min) Purpose code: 3
 LOG :5999.12 6000.91 1.79 Area code : 3
 FDEPTH: 118 117 GearCond.code:
 BDEPTH: 118 117 Validity code:
 Towing dir: 360e Wire out: 380 m Speed: 30 kn*10

Sorted: 89 Kg Total catch: 210.11 CATCH/HOUR: 406.66

SPECIES	CATCH/HOUR weight	% OF TOT. C	SAMP
Dentex congoensis	203.23	2762	49.98
Trachurus trcae, juvenile	89.75	2911	22.07
Dentex angolensis	49.18	329	12.09
Leptocharias smithii	15.25	2	3.75
Trigla lyra	11.94	255	2.94
Pagellus bellottii	8.05	62	1.96
Seriola lalandi	7.32	2	1.80
Ariomma bondi	5.36	97	1.32
Zeus faber	5.13	12	1.26
Trichiurus lepturus	4.14	8	1.02
Brotula barbata	2.28	4	0.56
Priacanthus arenatus	2.21	6	0.54
Illex coindetii	1.47	48	0.36
Torpedo torpedo	0.66	2	0.16
Selene dorsalis	0.58	2	0.14
Uranoscopus cadenati	0.12	12	0.03
Total	406.67		100.00

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2325
 DATE:10/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 625
 Longitude E 1138
 start stop duration
 TIME :13:00:05 14:01:35 30 (min) Purpose code: 3
 LOG :6010.03 6011.39 1.34 Area code : 3
 FDEPTH: 176 184 GearCond.code:
 BDEPTH: 176 184 Validity code:
 Towing dir: 170e Wire out: 530 m Speed: 30 kn*10
 Sorted: 47 Kg Total catch: 47.08 CATCH/HOUR: 94.16

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	34.04	116	36.15
Dentex angolensis	30.84	160	32.75
Zenopsis conchifer	8.88	8	9.43
Illex coindetii	3.88	82	4.12
Spicara alta	2.76	20	2.93
Brotula barbata	2.16	4	2.29
Dentex congoensis	1.88	24	2.00
Torpedo torpedo	1.72	2	1.83
Ariomma bondi	1.72	18	1.83
Pterothrissus bellocci	1.32	10	1.40
Bembrops heterurus	1.20	24	1.27
Trachurus trecae, juvenile	0.60	20	0.64
Trigla lyra	0.60	16	0.64
Monolele microstoma	0.52	22	0.55
Umbrina canariensis	0.48	4	0.51
Scorpaena normani	0.44	10	0.47
Uranoscopus cadenati	0.40	2	0.42
Uranoscopus polli	0.24	2	0.25
Saurida brasiliensis	0.20	24	0.21
Sardinella aurita	0.12	4	0.13
Sepia officinalis hierredda	0.08	4	0.08
Peristedion cataphractum	0.04	2	0.04
COBIIDAE	0.04	4	0.04
Parapeneus longirostris	0.04	14	0.04
Total	94.20	100.02	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2326
 DATE:10/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 627
 Longitude E 1137
 start stop duration
 TIME :15:11:29 15:41:12 30 (min) Purpose code: 3
 LOG :6016.52 6018.23 1.68 Area code : 3
 FDEPTH: 249 254 GearCond.code:
 BDEPTH: 249 254 Validity code:
 Towing dir: 340e Wire out: 760 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 32.49 CATCH/HOUR: 64.98

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	28.76	124	44.26
Zenopsis conchifer	18.84	54	28.99
Synagrops microlepis	7.48	478	11.51
Dentex angolensis	4.44	18	6.83
Brotula barbata	1.24	2	1.91
Pterothrissus bellocci	1.16	10	1.79
Parapeneus longirostris, fem.	0.88	88	1.35
Parapeneus longirostris, male	0.80	78	1.23
Todaropsis eblanae	0.36	4	0.55
Illex coindetii	0.32	4	0.49
Chlorophthalmus atlanticus	0.16	22	0.25
Merluccius polli	0.16	8	0.25
Scorpaena normani	0.12	2	0.18
Chlorophthalmus sp.	0.08	20	0.12
Saurida brasiliensis	0.04	10	0.06
C R A B S	0.04	2	0.06
Sepia officinalis hierredda	0.04	6	0.06
Bembrops heterurus	0.04	2	0.06
Epigonus telescopus	0.02	2	0.03
Total	64.98	99.98	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2327
 DATE:10/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 626
 Longitude E 1132
 start stop duration
 TIME :16:50:35 17:23:53 33 (min) Purpose code: 3
 LOG :6025.20 6026.19 0.91 Area code : 3
 FDEPTH: 348 348 GearCond.code:
 BDEPTH: 348 348 Validity code:
 Towing dir: 340e Wire out: 100 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 126.82 CATCH/HOUR: 230.58

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chlorophthalmus atlanticus	117.64	2045	51.02
Nematocarcinus africanus	28.45	4851	12.34
Synagrops microlepis	24.55	955	10.65
Laemonema laureysi	12.91	218	5.60
Trichiurus lepturus	6.76	275	2.93
Cubiceps sp.	6.00	145	2.60
Hymenocephalus italicus	4.55	864	1.97
Merluccius polli, juveniles	3.64	45	1.58
Ariomma bondi	3.45	45	1.50
Pterothrissus bellocci	2.91	24	1.26
Lestidium atlanticum	2.55	136	1.11
Gadella imberbis	2.55	100	1.11
MYCTOPHIDAE	2.36	664	1.02
Chlorophthalmus sp.	2.18	55	0.95
Parapeneus longirostris, fem.	1.36	151	0.59
ANTENNARIIDAE	1.27	82	0.55
Sepia officinalis hierredda	1.09	64	0.47
Illex coindetii	0.91	9	0.39
Bembrops greyi	0.91	27	0.39
Dibranchius atlanticus	0.73	109	0.32
Malacocephalus laevis	0.73	9	0.32
Coelorrhinchus coelorrhinchus	0.73	18	0.32
Engraulis encrasicolus	0.55	82	0.24
Parapeneus longirostris, male	0.45	87	0.20
Plesionika martia	0.45	87	0.20
Solenocera africana	0.36	55	0.16
Bathysolea sp.	0.27	9	0.12
POLYCHAELIDAE	0.18	18	0.08
Peristedion cataphractum	0.09	18	0.04
CAPRODIDAE	0.09	9	0.04
Total	230.67	100.07	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2328
 DATE:10/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 624
 Longitude E 1121
 start stop duration
 TIME :15:30:19 20:00:54 31 (min) Purpose code: 3
 LOG :6039.30 6040.94 1.59 Area code : 3
 FDEPTH: 586 589 GearCond.code:
 BDEPTH: 586 589 Validity code:
 Towing dir: 330e Wire out: 1450 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 168.02 CATCH/HOUR: 325.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	117.75	18557	36.21
Hoplostethus cadenati	60.85	929	18.71
Lamprogrammus exultus	56.67	523	17.43
Merluccius polli	18.70	41	5.75
POLYCHAELIDAE	10.22	1695	3.14
Yarrella blackfordi	7.43	186	2.28
Aristeus varidens, female	6.68	401	2.05
Gonostoma sp.	6.24	883	1.86
Triplophus hemingi	5.34	105	1.64
Halosaurus ovenii	4.18	81	1.29
Dicrolene intransigra	4.18	325	1.29
Xenodermichthys copei	4.18	186	1.29
Lophiodes kempfi	3.95	81	1.21
Illex coindetii	3.25	12	1.00
Malacocephalus occidentalis	3.25	81	1.00
Octopus sp.	3.25	12	1.00
Glyphus marsupialis	3.02	116	0.93
Etmopterus lucifer	1.63	12	0.50
Trichiurus lepturus	1.39	116	0.43
Bathymectes piperitus	1.35	14	0.42
Stomias boa boa	1.16	58	0.36
Plesionectes edwardsianus	1.16	12	0.36
Raja confundens	1.12	14	0.44
MACROURIDAE	0.70	12	0.22
MELANONIDAE	0.46	23	0.14
Nezumia aequalis	0.46	12	0.14
Dibranchius atlanticus	0.46	105	0.14
Aristeus varidens, male	0.29	35	0.09
L O B S T E R S	0.23	35	0.07
PANDALIDAE	0.12	93	0.04
Peristedion cataphractum	0.12	35	0.04
MYCTOPHIDAE	0.12	12	0.04
Nemichthys scolopaceus	0.12	23	0.04
Total	329.83	101.45	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2329
 DATE:10/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 624
 Longitude E 1117
 start stop duration
 TIME :22:04:38 22:35:16 31 (min) Purpose code: 3
 LOG :6049.67 6051.06 1.37 Area code : 3
 FDEPTH: 726 748 GearCond.code:
 BDEPTH: 726 748 Validity code:
 Towing dir: 170e Wire out: 1800 m Speed: 30 kn*10
 Sorted: 25 Kg Total catch: 147.92 CATCH/HOUR: 286.30

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Hoplostethus cadenati	185.34	3319	64.74
Xenodermichthys copei	34.41	935	12.02
Coelorrhinchus coelorrhinchus	20.05	379	7.00
POLYCHAELIDAE	8.13	528	2.84
Talismania bifurcata	6.77	68	2.36
Raja sp.	5.96	41	2.08
Geryon maritae	5.88	10	2.05
Yarrella blackfordi	3.52	68	1.23
LOPHIIDAE	3.48	2	1.22
Bathygadus melanobranchus	2.71	122	0.95
Caristius groenlandicus	2.17	14	0.76
Halosaurus ovenii	1.90	41	0.66
NETTASTOMATIDAE	1.63	14	0.57
OPHEIIDAE	1.35	14	0.47
Aristeus varidens	0.81	27	0.28
Stomias sp.	0.54	14	0.19
MACROURIDAE	0.54	27	0.19
Nephropsis atlantica	0.54	27	0.19
Glyphus marsupialis	0.54	14	0.19
Total	286.27	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2330
 DATE:11/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 606
 Longitude E 1209
 start stop duration
 TIME :05:30:29 06:00:35 30 (min) Purpose code: 3
 LOG :6112.67 6114.27 1.45 Area code : 3
 FDEPTH: 30 32 GearCond.code:
 BDEPTH: 30 32 Validity code:
 Towing dir: 180e Wire out: 6117 m Speed: 60 kn*10
 Sorted: 19 Kg Total catch: 19.12 CATCH/HOUR: 38.24

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Galeoides decadactylus	24.56	36	64.23
Rhinobatos albmaculatus	4.80	4	12.55
Fistularia petimba	3.48	12	9.10
Lagocephalus laevis	1.12	2	2.93
Sphyrna sphyraena	1.10	6	2.88
Chilomycterus spinosus mauret.	0.80	2	2.09
Selene dorsalis	0.72	2	1.88
Trachurus trecae, juvenile	0.48	16	1.26
Brachydeuterus auritus	0.40	51	1.05
Alloteuthis africana	0.28	66	0.73
Pagellus bellottii	0.28	2	0.73
Parapeneus atlantica	0.08	8	0.21
Sepia officinalis hierredda	0.04	8	0.10
Paromola cuvieri	0.02	8	0.05
Peneus notialis	0.02	2	0.05
Aulopus cadenati	0.02	2	0.05
Helicolenus dactylopterus	0.02	2	0.05
Saurida brasiliensis	0.02	4	0.05
Total	38.24	99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2331
 DATE:11/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 610
 start stop duration
 TIME :07:05:59 07:30:50 25 (min) Purpose code: 3
 LOG :6120.62 6122.05 1.42 Area code : 3
 FDEPTH: 43 47 GearCond.code:
 BDEPTH: 43 47 Validity code:
 Towing dir: 280e Wire out: 150 m Speed: 30 kn*10
 Sorted: 2 Kg Total catch: 1.80 CATCH/HOUR: 4.32

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Pagrus africanus	2.35 2	54.40	
Fistularia petimba	1.54 7	35.65	
Alloteuthis africana	0.38 254	8.80	
Callinectes sp.	0.02 5	0.46	
Brachydeuterus auritus	0.02 2	0.46	
Total	4.31	99.77	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2332
 DATE:11/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 613
 start stop duration
 TIME :08:55:26 09:27:14 32 (min) Purpose code: 3
 LOG :6132.26 6134.05 1.76 Area code : 3
 FDEPTH: 73 74 GearCond.code:
 BDEPTH: 73 74 Validity code:
 Towing dir: 350e Wire out: 250 m Speed: 30 kn*10
 Sorted: 53 Kg Total catch: 53.19 CATCH/HOUR: 99.73

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Epinephelus aeneus	21.90 4	21.96	
Umbina canariensis	17.06 45	17.11	
Dentex barnardi	15.90 45	15.94	5208
Dentex angolensis	14.89 71	14.93	5207
Pagellus bellottii	14.66 103	14.70	5206
Dentex gibbosus	6.75 8	6.77	
Brotula barbata	3.15 8	3.16	
Dentex congoensis	1.09 13	1.09	
Chaetodon hoefleri	0.83 6	0.83	
Pontinus accraensis	0.83 2	0.83	
Raja miraletus	0.71 2	0.71	
Lagocephalus laevis	0.56 2	0.56	
Pomadasys incisus	0.49 2	0.49	
Illex coindetii	0.38 60	0.38	
Trigla lyra	0.11 4	0.11	
Sepia orbignyana	0.08 4	0.08	
Sardinella aurita	0.08 2	0.08	
Arnoglossus imperialis	0.08 11	0.08	
Chaetodon marcellae	0.08 2	0.08	
Citharus linguatula	0.08 13	0.08	
Saurida brasiliensis	0.04 4	0.04	
Calappa pelii	0.02 2	0.02	
Total	99.77	100.03	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2333
 DATE:11/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 619
 start stop duration
 TIME :10:31:46 11:01:43 30 (min) Purpose code: 3
 LOG :6141.37 6143.06 1.68 Area code : 3
 FDEPTH: 94 98 GearCond.code:
 BDEPTH: 94 98 Validity code:
 Towing dir: 180e Wire out: 270 m Speed: 30 kn*10
 Sorted: 60 Kg Total catch: 59.75 CATCH/HOUR: 119.50

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Epinephelus aeneus	39.04 6	32.67	
Dentex congoensis	23.16 290	19.38	5210
Dentex angolensis	21.08 122	17.64	5209
Dentex barnardi	15.16 44	12.69	5211
Trachurus trecae, juvenile	10.60 294	8.87	5212
Pagellus bellottii	3.16 16	2.64	
Ariomma bondi	2.80 36	2.34	
Sardinella aurita	1.64 36	1.37	
Trachurus trecae	1.36 10	1.14	
Trigla lyra	1.04 10	0.87	
Alloteuthis africana	0.44 52	0.37	
Citharus linguatula	0.02 4	0.02	
Total	119.50	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2334
 DATE:11/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 615
 start stop duration
 TIME :12:03:26 12:59:33 29 (min) Purpose code: 3
 LOG :6154.87 6156.35 1.45 Area code : 3
 FDEPTH: 118 120 GearCond.code:
 BDEPTH: 118 120 Validity code:
 Towing dir: 180e Wire out: 370 m Speed: 30 kn*10
 Sorted: 70 Kg Total catch: 128.46 CATCH/HOUR: 265.78

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Dentex congoensis	143.01 1980	53.81	5214
Dentex angolensis	61.57 430	23.17	5213
Trachurus trecae	25.16 211	9.47	5215
Epinephelus aeneus	10.22 2	3.85	
Trigla lyra	6.29 116	2.37	
Dentex gibbosus	4.10 6	1.54	
Trachurus trecae, juvenile	3.56 91	1.34	
Brotula barbata	3.31 4	1.25	
Octopus vulgaris	3.02 4	1.14	
Branchiostegus semifasciatus	1.32 2	0.50	
Pagellus bellottii	1.08 8	0.41	
Fistularia petimba	0.99 2	0.37	
Raja miraletus	0.91 2	0.34	
Citharus linguatula	0.41 41	0.15	
Ariomma bondi	0.33 4	0.12	
Sepia orbignyana	0.25 2	0.09	
Saurida brasiliensis	0.17 50	0.06	
Illex coindetii	0.08 4	0.03	
Total	265.78	100.01	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2335
 DATE:11/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 616
 start stop duration
 TIME :14:16:39 14:46:32 30 (min) Purpose code: 3
 LOG :6164.27 6165.74 1.55 Area code : 3
 FDEPTH: 164 179 GearCond.code:
 BDEPTH: 164 179 Validity code:
 Towing dir: 170e Wire out: 510 m Speed: 30 kn*10
 Sorted: 38 Kg Total catch: 37.98 CATCH/HOUR: 75.96

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Dentex angolensis	27.28 162	35.91	5216
Trichurus lepturus	12.32 60	16.22	
Brotula barbata	7.36 12	9.69	
Trigla lyra	5.36 26	7.06	
Pterothrissus belloci	5.20 32	6.85	
Illex coindetii	2.88 66	3.79	
Zenopsis conchifer	2.88 4	3.79	
Miracorvina angolensis	2.36 20	3.11	
Dentex congoensis	1.80 28	2.37	
Bembrops heterurus	1.44 28	1.90	
Ariomma bondi	1.12 124	1.47	
Parapanaeus longirostris, fem.	1.00 140	1.32	5218
Uranoscopus polli	0.88 8	1.16	
Pagellus bellottii	0.84 2	1.11	
Trachurus trecae	0.76 8	1.00	
Octopus vulgaris	0.68 2	0.90	
Saurida brasiliensis	0.64 124	0.84	
Lagocephalus laevis	0.48 2	0.63	
Monolele microstoma	0.40 36	0.53	
Microchirus wittei	0.36 8	0.47	
Peristedion cataphractum	0.36 14	0.47	
Scorpaena normani	0.20 6	0.26	
Dentex macrophthalmus	0.20 2	0.26	
Parapanaeus longirostris, male	0.12 28	0.16	5217
Microchirus frechkopi	0.12 2	0.16	
Total	77.04	101.43	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2336
 DATE:11/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 619
 start stop duration
 TIME :16:05:33 16:35:18 30 (min) Purpose code: 3
 LOG :6173.18 6174.62 1.42 Area code : 3
 FDEPTH: 249 251 GearCond.code:
 BDEPTH: 249 251 Validity code:
 Towing dir: 170e Wire out: 770 m Speed: 30 kn*10
 Sorted: 37 Kg Total catch: 153.92 CATCH/HOUR: 307.84

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Synagrops microlepis	113.00 8560	36.71	
Chlorophthalmus atlanticus	72.40 6000	23.52	
Chlorophthalmus sp.	30.80 2270	10.01	
Merluccius polli	13.00 310	4.22	5221
Parapanaeus longirostris, male	12.20 2000	3.96	5220
Pterothrissus belloci	10.40 100	3.38	
Illex coindetii	9.80 100	3.18	
Zenopsis conchifer	9.20 36	2.99	
Parapanaeus longirostris, fem.	8.80 900	2.86	5219
Saurida brasiliensis	5.80 840	1.88	
Trichurus lepturus	5.80 6	1.88	
MYCTOPHIDAE	5.40 3300	1.75	
Dentex angolensis	1.64 10	0.53	
Parapandalus narval	1.60 890	0.52	
Bathysolea sp.	1.60 50	0.52	
Calappa sp.	1.40 20	0.45	
Sepia officinalis hierredda	1.20 90	0.39	
Trigla lyra	0.80 10	0.26	
Todaropsis eblanae	0.60 30	0.19	
Solenocera africana	0.40 70	0.13	
L O B S T E R S	0.40 100	0.13	
Zenion sp.	0.40 70	0.13	
Hymenocephalus italicus	0.20 40	0.06	
Peristedion cataphractum	0.20 20	0.06	
Ariomma melanum	0.20 50	0.06	
Citharus linguatula	0.20 10	0.06	
Monolele microstoma	0.20 50	0.06	
Total	307.64	99.89	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2337
 DATE:11/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 620
 start stop duration
 TIME :18:56:19 19:28:46 32 (min) Purpose code: 3
 LOG :6189.18 6190.78 1.57 Area code : 3
 FDEPTH: 475 499 GearCond.code:
 BDEPTH: 475 499 Validity code:
 Towing dir: 170e Wire out:1200 m Speed: 30 kn*10
 Sorted: 50 Kg Total catch: 183.12 CATCH/HOUR: 343.35

SPECIES	CATCH/HOUR weight numbers	% OF TOT. C	SAMP
Merluccius polli	209.25 259	60.94	5224
Nematocarcinus africanus	52.20 7245	15.20	
Lamprogrammus exilis	27.68 90	8.06	
Laemonema laureysi	14.63 281	4.26	
POLYCHAETIDAE	6.75 698	1.97	
Aristeus varidens, female	6.19 401	1.80	5223
Deania calcea	5.18 90	1.51	
Halosaurus evenii	3.83 79	1.12	
Chaceon maritae	2.48 45	0.72	
Aristeus varidens, male	2.14 274	0.62	5222
Bathymectes piperitus	2.03 11	0.59	
Todaropsis eblanae	1.58 11	0.46	
Melaccephalus laevis	1.58 11	0.46	
Hymenocephalus italicus	1.35 203	0.39	
ANTENNARIIDAE	1.13 23	0.33	
Nemichthys scolopaceus	0.90 68	0.26	
Nezumia aequalis	0.90 56	0.26	
Triplophus hemingi	0.90 135	0.26	
Trichurus lepturus	0.90 23	0.26	
Plesiocheilichthys edwardsianus	0.45 11	0.13	
Yarellia blackfordi	0.45 11	0.13	
PANDALIDAE	0.23 63	0.07	
Stemias boa boa	0.23 11	0.07	
Dicrionema intronigra	0.23 11	0.07	
Gadella imberbis	0.11 11	0.03	
Xenodermichthys copei	0.11 11	0.03	
Total	343.41	100.00	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2338
 DATE:11/ 4/00 GEAR TYPE: BT No: 7 POSITION:Lat S 623
 start stop duration Long E 1118
 TIME :21:27:31 21:58:15 31 (min) Purpose code: 3
 LOG :6200.78 6202.41 1.58 Area code : 3
 FDEPTH: 662 678 GearCond.code:
 BDEPTH: 662 678 Validity code:
 Towing dir: 340° Wire out:1600 m Speed: 30 kn*10

Sorted: 25 Kg Total catch: 121.80 CATCH/HOUR: 235.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	42.19	8352	17.90	
Hoplostethus cadenati	37.55	794	15.93	
Lamprogrammus exutus	31.55	68	13.38	
Yarella blackfordi	27.48	455	11.66	
LOPHIIDAE	16.84	10	7.14	
POLYCHAELIDAE	15.48	2177	6.57	
Hydrolagus sp.	9.29	10	3.94	
Triplophus hemingi	9.29	997	3.94	
Coelorhynchus coelorhynchus	7.74	145	3.28	
Bathygadus macrops	7.55	542	3.20	
Raja sp.	5.61	19	2.38	
C E P H A L O P O D A	4.65	19	1.97	
Xenodermichthys copei	3.87	145	1.64	
Aristeus varidens, female	3.58	151	1.52	5226
Aristeus varidens, male	2.61	393	1.11	5225
Glyphus marsupialis	2.32	116	0.98	
Stomias sp.	2.13	68	0.90	
Deania calcea	2.13	10	0.90	
Halosaurus ovensi	1.94	68	0.82	
SYNAPHOBANCHIDAE	0.58	10	0.25	
Dibranchius atlanticus	0.58	29	0.25	
GALATHEIDAE *	0.39	194	0.17	
Etmopterus lucifer	0.39	10	0.17	
Nephropsis atlantica	0.19	10	0.08	
Total	235.93		100.08	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2339
 DATE:12/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 605
 start stop duration Long E 1134
 TIME :05:25:25 05:55:19 30 (min) Purpose code: 3
 LOG :6240.75 6242.30 1.51 Area code : 3
 FDEPTH: 175 155 GearCond.code:
 BDEPTH: 175 155 Validity code:
 Towing dir: 100° Wire out: 540 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 48.42 CATCH/HOUR: 96.84

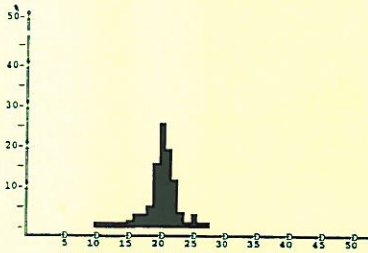
SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	31.08	156	32.09	5227
Trichiurus lepturus	17.32	56	17.89	
Zenopsis conchifer	13.20	16	13.63	
Brotula barbata	12.32	20	12.72	
Pterothrissus belloci	10.72	102	11.07	
Illex coindetii	2.76	48	2.85	
Bembrops greyi	2.14	42	2.21	
Uranoscopus polli	1.00	8	1.03	
Branchiostegus semifasciatus	0.96	2	0.99	
Zeus feber	0.96	2	0.99	
Saurida brasiliensis	0.84	216	0.87	
Dentex congoensis	0.56	10	0.58	
Trigla lyra	0.48	18	0.50	
Pontinus accraensis	0.40	8	0.41	
Citharus linguatula	0.36	52	0.37	
Dentex macrophthalmus	0.32	4	0.33	
Parapenaeus longirostris, fem.	0.28	126	0.29	5229
Sepia officinalis hierredda	0.28	42	0.29	
Peristedion cataphractum	0.28	8	0.29	
Miracorvina angolensis	0.20	2	0.21	
Cadella imberbis	0.12	4	0.12	
Microchirus wittei	0.12	4	0.12	
Cynoponticus ferox	0.12	2	0.12	
Parapenaeus longirostris, male	0.02	8	0.02	5228
Total	96.84		99.99	

R/V "DR. FRIDTJOF NANSEN" PROJECT:A4 PROJECT STATION:2340
 DATE:12/ 4/00 GEAR TYPE: BT No: 4 POSITION:Lat S 605
 start stop duration Long E 1154
 TIME :08:39:03 09:09:27 30 (min) Purpose code: 3
 LOG :6262.23 6263.77 1.52 Area code : 3
 FDEPTH: 82 74 GearCond.code:
 BDEPTH: 82 74 Validity code:
 Towing dir: 130° Wire out: 280 m Speed: 30 kn*10

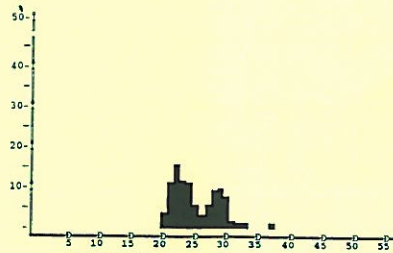
Sorted: 73 Kg Total catch: 358.24 CATCH/HOUR: 716.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	545.82	2794	76.18	
Dentex angolensis	91.52	572	12.77	5231
Chloroscombrus chrysurus	30.58	232	4.27	
Trichiurus lepturus	15.68	40	2.19	
Brachydeuterus auritus	11.88	210	1.66	
Trachurus trecae, juvenile	5.72	264	0.80	5230
Dentex congoensis	5.06	66	0.71	
Trachurus trecae	3.96	12	0.55	
Raja miraletus	2.68	6	0.37	
Pegellus bellottii	1.76	22	0.25	
Brotula barbata	1.48	2	0.21	
Citharus linguatula	0.22	12	0.03	
Parapenaeus longirostris	0.12	22	0.02	
Total	716.48		100.01	

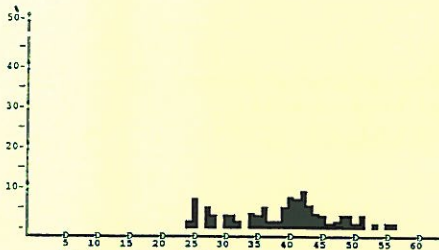
Annex II. Length distributions of main species



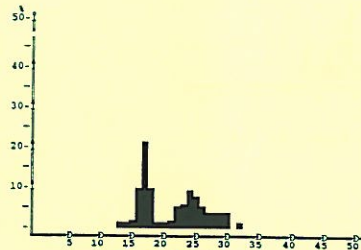
Dentex macrophthalmus
SOUTH
MEAN LENGTH = 20.47cm N= 1103
NUMBER OF SUBSAMPLES : 11



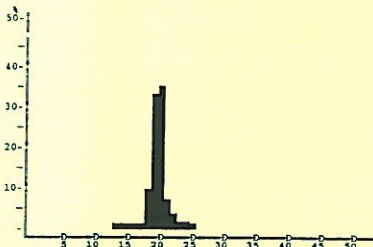
Trachurus capensis
SOUTH
MEAN LENGTH = 25.53cm N= 182
NUMBER OF SUBSAMPLES : 3



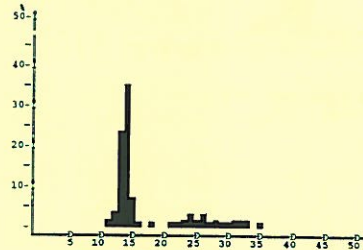
Merluccius polli
SOUTH
MEAN LENGTH = 38.66cm N= 250
NUMBER OF SUBSAMPLES : 7



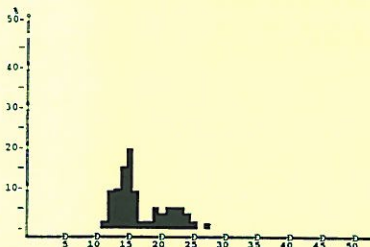
Dentex angolensis
CENTRAL
MEAN LENGTH = 22.06cm N= 842
NUMBER OF SUBSAMPLES : 15



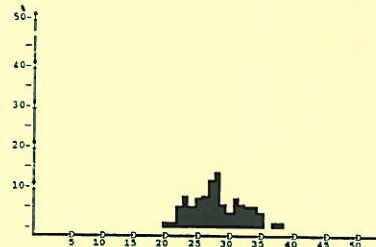
Trachurus trecae
SOUTH
MEAN LENGTH = 20.11cm N= 1044
NUMBER OF SUBSAMPLES : 9



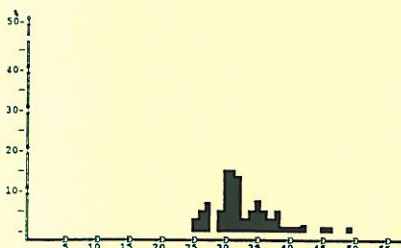
Dentex barnardi
CENTRAL
MEAN LENGTH = 17.75cm N= 208
NUMBER OF SUBSAMPLES : 4



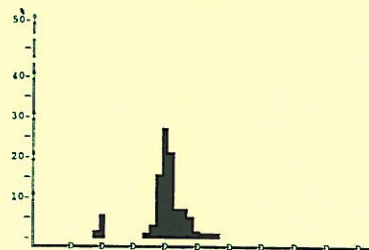
Pagellus bellottii
SOUTH
MEAN LENGTH = 17.06cm N= 473
NUMBER OF SUBSAMPLES : 8



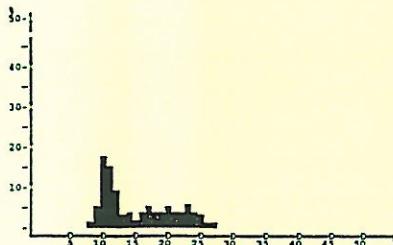
Lithognathus mormyrus
CENTRAL
MEAN LENGTH = 28.52cm N= 169
NUMBER OF SUBSAMPLES : 5



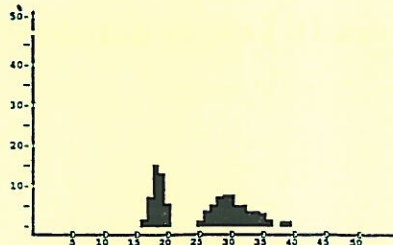
Atractoscion aequidens
SOUTH
MEAN LENGTH = 32.76cm N= 92
NUMBER OF SUBSAMPLES : 2



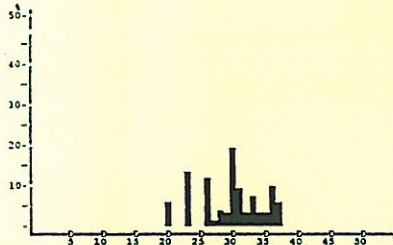
Dentex macrophthalmus
CENTRAL
MEAN LENGTH = 20.45cm N= 1406
NUMBER OF SUBSAMPLES : 22



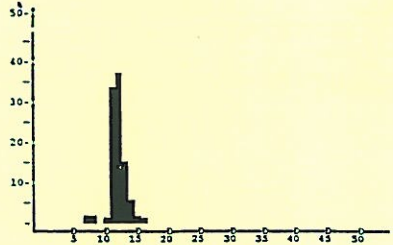
Pagellus bellottii
CENTRAL
MEAN LENGTH = 15.88cm N= 1889
NUMBER OF SUBSAMPLES : 24



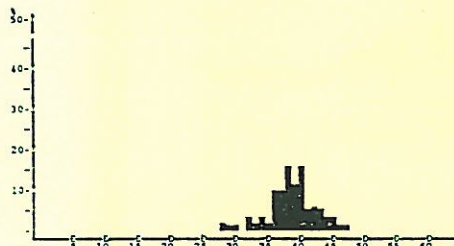
Umbrina canariensis
CENTRAL
MEAN LENGTH = 25.88cm N= 408
NUMBER OF SUBSAMPLES : 8



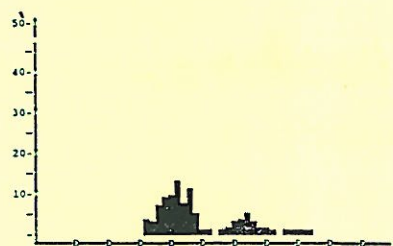
Pomadasys rogeri
CENTRAL
MEAN LENGTH = 30.00cm N= 66



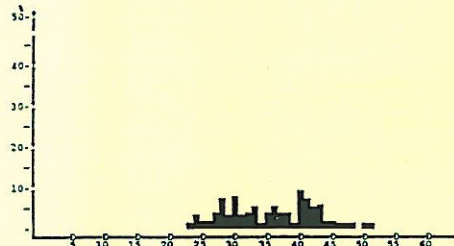
Trachurus trecae, juvenile
CENTRAL
MEAN LENGTH = 12.35cm N= 1354
NUMBER OF SUBSAMPLES : 10



Pomadasys jubelini
CENTRAL
MEAN LENGTH = 38.95cm N= 267
NUMBER OF SUBSAMPLES : 4



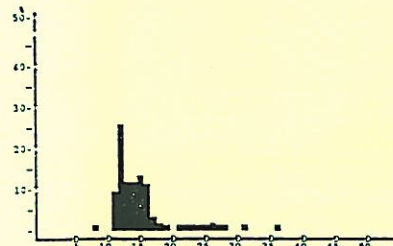
Merluccius polli
CENTRAL
MEAN LENGTH = 24.67cm N= 913
NUMBER OF SUBSAMPLES : 16



Pseudolithus typus
CENTRAL
MEAN LENGTH = 36.00cm N= 474
NUMBER OF SUBSAMPLES : 7



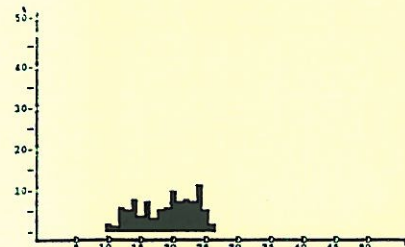
Parapenaeus longirostris, male
CENTRAL
MEAN LENGTH = 2.26cm N= 278
NUMBER OF SUBSAMPLES : 7



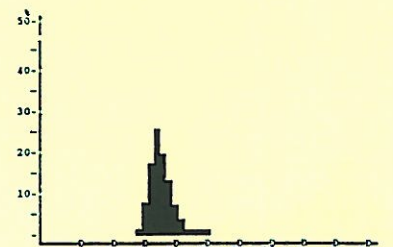
Trachurus trecae
CENTRAL
MEAN LENGTH = 15.34cm N= 161
NUMBER OF SUBSAMPLES : 2



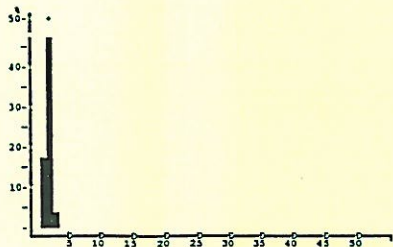
Aristeus varidens, male
CENTRAL
MEAN LENGTH = 2.50cm N= 546
NUMBER OF SUBSAMPLES : 9



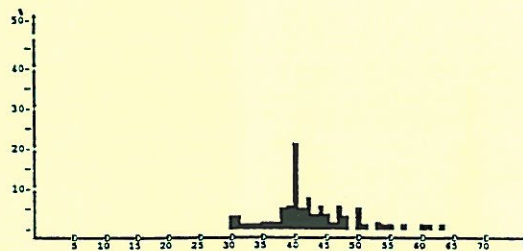
Pomadasys incisus
CENTRAL
MEAN LENGTH = 19.33cm N= 460
NUMBER OF SUBSAMPLES : 6



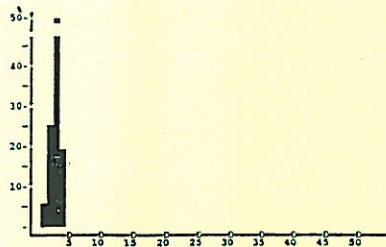
Merluccius polli, juveniles
CENTRAL
MEAN LENGTH = 18.23cm N= 825
NUMBER OF SUBSAMPLES : 9



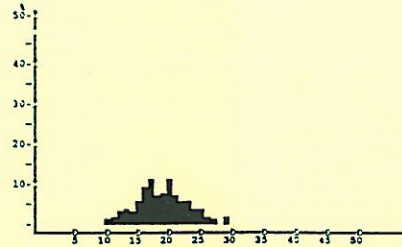
Parapenaeus longirostris, fem.
CENTRAL
MEAN LENGTH = 2.36cm N= 555
NUMBER OF SUBSAMPLES : 8



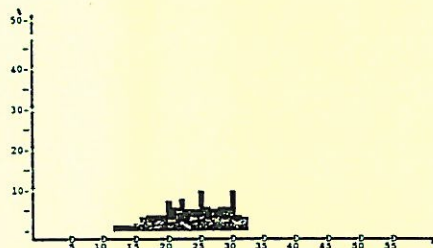
Dentex gibbosus
NORTH
MEAN LENGTH = 42.60cm N= 129
NUMBER OF SUBSAMPLES : 2



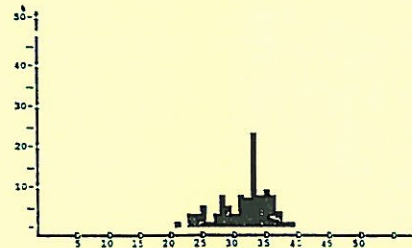
Aristeus varidens, female
CENTRAL
MEAN LENGTH = 3.93cm N= 570
NUMBER OF SUBSAMPLES : 10



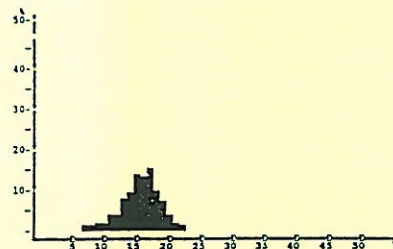
Pagellus bellottii
NORTH
MEAN LENGTH = 19.28cm N= 1354
NUMBER OF SUBSAMPLES : 19



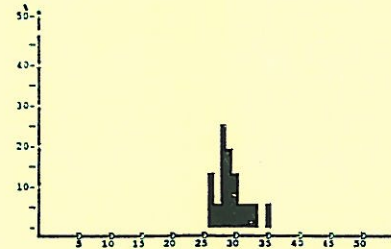
Dentex angolensis
NORTH
MEAN LENGTH = 24.43cm N= 1445
NUMBER OF SUBSAMPLES : 30



Pagrus caeruleostictus
NORTH
MEAN LENGTH = 32.03cm N= 88
NUMBER OF SUBSAMPLES : 3



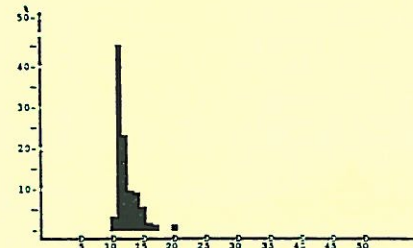
Dentex congoensis
NORTH
MEAN LENGTH = 16.28cm N= 1907
NUMBER OF SUBSAMPLES : 20



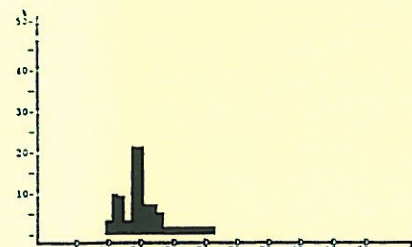
Atractoscion aequidens
NORTH
MEAN LENGTH = 29.81cm N= 16
NUMBER OF SUBSAMPLES : 1



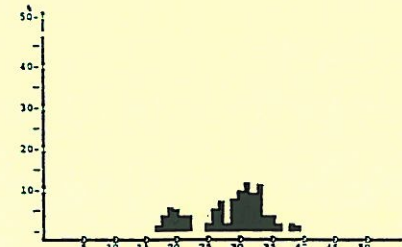
Dentex barnardi
NORTH
MEAN LENGTH = 28.90cm N= 414
NUMBER OF SUBSAMPLES : 8



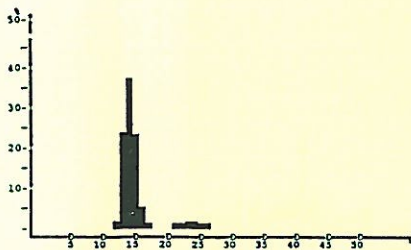
Trachurus trecae, juvenile
NORTH
MEAN LENGTH = 12.62cm N= 1081
NUMBER OF SUBSAMPLES : 11



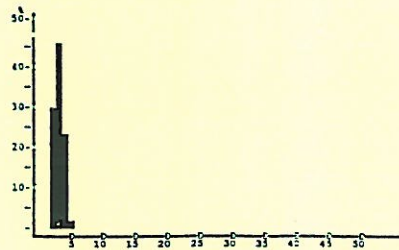
Dentex macrophthalmus
NORTH
MEAN LENGTH = 15.78cm N= 58
NUMBER OF SUBSAMPLES : 2



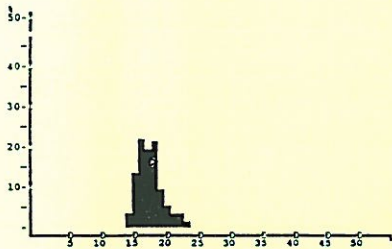
Umbrina canariensis
NORTH
MEAN LENGTH = 28.76cm N= 120
NUMBER OF SUBSAMPLES : 2



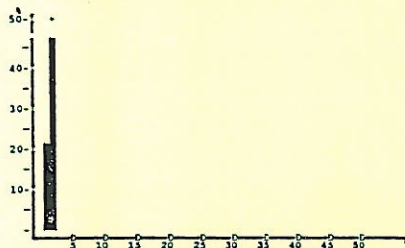
Trachurus trcae
NORTH
MEAN LENGTH = 15.35cm N= 411
NUMBER OF SUBSAMPLES : 6



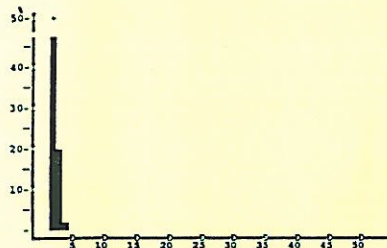
Aristeus varidens, female
NORTH
MEAN LENGTH = 3.46cm N= 446
NUMBER OF SUBSAMPLES : 7



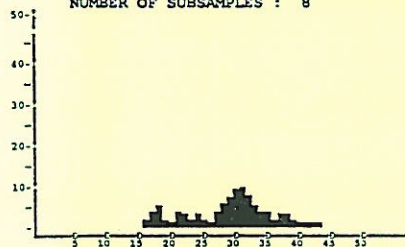
Merluccius polli, juveniles
NORTH
MEAN LENGTH = 17.83cm N= 524
NUMBER OF SUBSAMPLES : 9



Parapenaeus longirostris, male
NORTH
MEAN LENGTH = 2.29cm N= 835
NUMBER OF SUBSAMPLES : 18



Aristeus varidens, male
NORTH
MEAN LENGTH = 2.74cm N= 198
NUMBER OF SUBSAMPLES : 8



Merluccius polli
NORTH
MEAN LENGTH = 29.24cm N= 660
NUMBER OF SUBSAMPLES : 18



Parapenaeus longirostris, fem.
NORTH
MEAN LENGTH = 2.51cm N= 1581
NUMBER OF SUBSAMPLES : 21

Annex III. Swept area estimates

SWEPT AREA ANALYSIS FROM STATION 2074 TO STATION 2102

A. Cunene - Tombua shelf

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/			
	<10	10-30	30-100	100-300	300-1000	>1000			20- 50m	50-100m	100-200m	200-
Trachurus trecae	4	2	2	1	1	3	54	90.46	1.25	0.74	307.76	
Dentex macrophthalmus	3	2	2	3	2	2	58	28.95		2.96	95.44	
Trachurus capensis		1				2	13	16.22			55.61	
Anthias anthias	1	1			1		13	1.86				6.38
Chrysaora sp.		2	1		1		17	1.76	5.02	0.23		
Merluccius polli	2	1	2	1			25	1.59		0.14	5.26	
Atractoscion aequidens	12	2	2	1			67	1.48	0.24	0.45	4.23	
Pagellus bellottii	10	2	2	1			63	1.30	1.07	1.68	1.07	
Arius parkii	3	2	1	1			29	0.99		1.94	0.92	
Sea cucumbers			1	1			8	0.88	1.04	1.43		
Trachurus trecae, juvenile	3	2	2				29	0.81	0.29	1.90		
Squalus megalops	6	3	2				46	0.75		0.41	2.06	
Zeus faber	7			1			33	0.55		0.16	1.67	
Chelidonichthys capensis	6	2	1				38	0.50		0.54	1.02	
Illex sp.	4	4	1				38	0.44	0.33	0.76	0.15	
Lepidopus caudatus	1			1			8	0.43		0.76	1.46	
Loligo vulgaris	7	3					42	0.36	0.03	0.66	0.36	
Pterothrissus belloci	5	3					33	0.30		0.10	0.89	
Leptocharias smithii	7	3					38	0.29	0.38	0.42	0.05	
Synagrops microlepis			1				4	0.29			1.01	
Argyrosomus hololepidotus			1				4	0.27	0.81			
Sepia officinalis hierredda	7	2					38	0.26	0.13	0.56		
Spondyliosoma cantharus	9		1				42	0.25	0.01	0.04	0.79	
Zenopsis conchifer			1				4	0.20			0.70	
Merluccius capensis	3	2					21	0.20		0.28	0.31	
Lithognathus mormyrus	2		1				8	0.18	0.51	0.02		
Umbrina canariensis	8	1					33	0.18	0.04	0.26	0.22	
Dicologlossa cuneata	13	1					58	0.14	0.03	0.34		
Myliobatis aquila	5	1					25	0.10	0.04	0.23		
Trichiurus lepturus	3	1					17	0.09	0.20	0.04	0.02	
Dentex macrophthalmus Juv.		1					4	0.08		0.22		
Raja miraletus	7						29	0.08		0.22		
Dasyatis marmorata		1					4	0.08		0.22		
Mystriophis sp		1					4	0.08			0.29	
Sepia orbignyana	7						29	0.07	0.14	0.07		
Chelidonichthys gabonensis	5						21	0.05		0.06	0.09	
Pomatomus saltatrix	3						13	0.05	0.14			
Enchelycore nigricans	4						17	0.05		0.14		
Other fish								0.49	0.52	0.56	0.43	
Sum all species								153.11	12.22	17.78	488.19	
Sum Snappers												
Sum Groupers										0.01		
Sum Grunts												
Sum Croakers								1.93	1.10	0.71	4.45	
Sum Seabreams								30.83	1.60	5.07	97.35	
Sum Sharks								1.11	0.45	0.92	2.15	
Sum Rays								0.27	0.07	0.67		
Sum Squids								1.20	0.63	2.15	0.59	
Sum												

um shrimps (excl. SHRAA01)

umber of stations included in analysis, total and by depth strata

24 6 9 7

SWEPT AREA ANALYSIS FROM STATION 2074 TO STATION 2102

A. Cunene - Tombua slope

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/			
	<10	10-30	30-100	100-300	300-1000			>1000	200-300m	300-400m	400-500m
Merluccius polli		1		1		50	12.71	23.59		1.83	
Pontinus kuhlii				1		50	8.26	16.52			
Scorpaena normani				1		50	8.18			16.36	
Chlorophthalmus atlanticus			1				3.29			6.58	
Pterothrissus belloci		1					1.40			2.80	
Laemonema laureysi	1						0.26			0.53	
Scyliorhinus stellaris	1					50	0.20			0.41	
Coelorinchus coelorhincus	2					50	0.19	0.31		0.07	
Lophius vaillanti	1						0.19	0.37			
Parapenaeus longirostris	2					100	0.17	0.03		0.31	
Synagrops microlepis	1					50	0.16			0.31	
Malacocephalus laevis	1					50	0.12	0.24			
Chelidonichthys gabonensis	1						0.07			0.13	
Oxynotus shubnikovii	1					50	0.07	0.15			
Mystriophis rostellatus	1					50	0.06			0.12	
Other fish							0.12	0.08		0.15	
Sum all species							35.45	41.29		29.60	
Sum Snappers											
Sum Groupers											
Sum Grunts											
Sum Croakers											
Sum Seabreams											
Sum Sharks							0.27	0.15		0.41	
Sum Rays											
Sum Squids											
Sum											
Sum shrimps (excl. SHRAA01)							0.17	0.03		0.31	
Number of stations included in analysis, total and by depth strata							2	1		1	

EPT AREA ANALYSIS FROM STATION 2074 TO STATION 2102

Cunene - Tombua slope

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/			
	<10	10-30	30-100	100-300	300-1000	>1000			500-600m	600-700m	700-800m	800-
plostethus mediterraneus					1		33	16.29		24.44		
elorinchus coelorhincus			1	1			67	6.49		8.21		3.06
rluuccius capensis		2			1		100	5.91		1.76		14.22
lacocephalus laevis					1		33	4.50				13.50
rluuccius polli	2		1				100	3.45		4.94		0.48
achyrincus scabrurus			2				67	3.39		5.09		
inania costaecanarie			1				33	1.85		2.77		
lex sp.		2					67	1.11		0.77		1.78
lacocephalus occidentalis		1					33	0.99		1.48		
plostethus cadenati		2					67	0.93		0.67		1.45
JIDAE		2					67	0.87		0.55		1.50
EPOCEPHALIDAE		1					33	0.63		0.94		
nostoma sp.		1					33	0.55				1.65
loconger cadenati		1					33	0.54				1.63
ROMATEIDAE	1	1					67	0.48		0.69		0.05
lex coindetii		1					33	0.46		0.69		
YCHROLUTIDAE		1					33	0.42		0.63		
aceon maritae		1					33	0.39		0.59		
phius vaillanti	1						33	0.32		0.49		
mopterus spinax	1						33	0.30				0.89
ntroscymnus crepidater	2						33	0.28		0.32		0.20
HIDIIDAE	2						33	0.28		0.28		0.29
isteus varidens	2						67	0.27		0.02		0.78
mprogrammus exutus	1						33	0.27		0.41		
ssanago albescens	2						33	0.27		0.10		0.61
orpaena angolensis	1							0.20		0.30		
thodes ferox	1							0.18		0.26		
ania calcea	1						33	0.16		0.24		
ja springeri	1						33	0.16		0.23		
TOPODIDAE	2						67	0.13		0.06		0.25
epocephalus sp.	1						33	0.12		0.17		
tacanthus sexspinis	1						33	0.09				0.27
ryx splendens	1							0.08		0.12		
isteus varidens, female	1							0.07		0.10		
emonema laureysi	1							0.06		0.09		
yphus marsupialis	2						67	0.03		0.01		0.07
esiopenaeus edwardsianus	1						33	0.02				0.06
isteus varidens, male	1						33					
her fish								0.09				0.25
all species								52.63		57.42		42.99
m Snappers												
m Groupers												
m Grunts												
m Croakers												
m Seabreams												
m Sharks								0.74		0.56		1.09
m Rays								1.03		0.78		1.50
m Squids								1.70		1.52		2.03
m												
m shrimps (excl. SHRAA01)								0.39		0.13		0.91
umber of stations included in analysis, total and by depth strata								3		2		1

SWEPT AREA ANALYSIS FROM STATION 2103 TO STATION 2227

B. Luanda - Benguela shelf

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/ 200-			
	<10	10-30	30-100	100-300	300-1000	>1000			20-50m	50-100m	100-200m	200-
Brachydeuterus auritus	26	6	7	7	3	2	71	13.50	4.71	31.73	0.32	
Trachurus trecae, juvenile	18	6	10	5	2		57	3.29	0.18	3.49	6.30	
Synagrops microlepis	4		2	1	4		15	3.27		0.01	10.70	
Trichiurus lepturus	29	11	9	4	1		75	2.58	0.56	5.14	1.56	
Pagellus bellottii	34	11	9	1			75	1.57	0.36	3.48	0.50	
Dentex macrophthalmus	18	5	2	2	1		39	1.31	0.01	0.63	3.49	
Trachurus trecae	6	2	2		1		15	1.01	0.01	2.66	0.05	
Chloroscombrus chrysurus	9	6	4		2		29	0.86	2.24	0.38		
Sphyræna guachancho	19	6	5	1			43	0.84	1.44	1.02		
Pomadasys jubelini	6	1	1	3			15	0.79	0.28	1.87		
Galeoides decadactylus	15	5	5	1			36	0.77	1.94	0.41		
Pomadasys incisus	8	1	7				22	0.74	0.78	1.30		
Selene dorsalis	28	9	3				56	0.62	0.85	0.82	0.14	
Umbrina canariensis	21	4	6				43	0.58	0.19	0.96	0.54	
Stromateus fiatola	14	2	1	1			25	0.48	0.07	1.19	0.05	
Lithognathus mormyrus	5	6	3				19	0.41	0.26	0.88		
Dentex angolensis	24	4	3				43	0.40		0.15	1.11	
Dentex barnardi	29	5	2				50	0.37	0.17	0.77	0.09	
Pseudolithus typus	5	1	5				15	0.36	1.10	0.03		
Pseudupeneus prayensis	21	4		1			36	0.32	0.71	0.25		
Ilisha africana	3	2	1	1			10	0.31	0.96			
Citharus linguatula	45	4	1				69	0.31	0.05	0.62	0.19	
Pteroscion peli	4	2	3				13	0.29	0.90	0.02		
Saurida brasiliensis	21	1		1			32	0.24		0.06	0.72	
Trigla lyra	8	2	1				15	0.22		0.06	0.64	
Epinephelus aeneus	16	1	1				24	0.21	0.59	0.05	0.03	
Raja miraletus	42	4					64	0.21	0.06	0.31	0.23	
Boops boops	19	2	1				31	0.19	0.06	0.13	0.41	
Brotula barbata	21	6					36	0.18		0.09	0.49	
Dasyatis marmorata	3			1			6	0.16	0.51			
Pagrus caeruleostictus		1	1				1	0.15	0.43			
Lagocephalus laevigatus	29	1	1				43	0.13	0.26	0.07	0.07	
Diplodus cervinus cervinus			1				1	0.13	0.41			
Zenopsis conchifer	9	3					17	0.12	0.01	0.02	0.36	
Pagrus auriga			1				1	0.12	0.38			
Sepia officinalis hierredda	27		1				39	0.11	0.24	0.05	0.06	
Pomadasys rogeri	8	2					14	0.11	0.30	0.03		
Illex coindetii	17	2					26	0.10		0.01	0.32	
Atractoscion aequidens	14	1					21	0.10	0.13	0.08	0.08	
Rhinoptera marginata	2		1				4	0.10	0.29	0.03		
Zeus faber	30						42	0.09		0.06	0.20	
Sardinella maderensis	10	2					17	0.09	0.27	0.01		
Arius parkii	9	2					15	0.08	0.24			
Leptocharias smithii	2		1				4	0.07		0.18		
Grammolites gruveli	20	2					31	0.07	0.01	0.17		
Alloteuthis africana	15	1					22	0.06	0.04	0.12	0.01	
Argyrosomus hololepidotus	1	3					6	0.06	0.08	0.10		
Rhinobatos albomaculatus	7	2					13	0.06	0.16	0.03		
Fistularia petimba	25						35	0.06	0.01	0.09	0.07	
Alectis alexandrinus	7		1				11	0.06	0.19			
Chelidonichthys gabonensis	18						25	0.05	0.01	0.10	0.04	
Dentex congoensis	3		1				6	0.05		0.14	0.01	
Parapenaeus longirostris	5	1					8	0.05			0.15	
Scorpaena normani	15	1					22	0.05		0.01	0.13	
Gymnura micrura	7	1					11	0.05	0.15			
Merluccius polli, juveniles	3		1				6	0.05			0.17	
Sardinella aurita	18	1					26	0.05		0.12		
Decapterus rhonchus	12	1					18	0.05	0.11	0.03		
Parapenaeus longirostris, fem.	1							0.01			0.04	
Parapenaeus longirostris, male	1						1	0.01			0.02	
Penaeus notialis	8						11	0.01	0.02			
Other fish								1.21	1.34	0.96	1.39	
Sum all species								38.90	24.12	60.92	30.68	
Sum Snappers								0.03	0.09			
Sum Groupers								0.24	0.60	0.08	0.11	
Sum Grunts								15.22	6.25	34.99	0.32	
Sum Croakers								1.41	2.43	1.21	0.64	
Sum Seabreams								4.77	2.23	6.23	5.65	
Sum Sharks								0.14	0.04	0.24	0.09	
Sum Rays								0.67	1.34	0.43	0.27	
Sum Squids								0.40	0.32	0.30	0.63	
Sum												
Sum shrimps (excl. SHRAA01)								0.08	0.02		0.21	
Number of stations included in analysis, total and by depth strata								72	23	27	22	

SWEPT AREA ANALYSIS FROM STATION 2103 TO STATION 2227

B. Luanda - Benguela slope

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/			
	<10	10-30	30-100	100-300	300-1000	>1000			200-300m	300-400m	400-500m	500-
Synagrops microlepis	7	6	5	2	1	70	3.61	8.28	0.88	0.02		
Chlorophthalmus atlanticus	17	3		2	1	77	3.30	5.87	2.86	0.01		
Merluccius polli, juveniles	2	2	2	2	1	30	2.92	6.37	1.12			
Dentex macrophthalmus	5	2	2	2		37	1.92	4.80				
Merluccius polli	15	3	3	2		77	1.85	0.24	3.97	1.62		
Laemonema laureysi	9	5	3			57	0.87	0.09	1.85	0.80		
Zenopsis conchifer	14	1	1	1		57	0.70	1.72	0.02	0.03		
Trichiurus lepturus	12	1	2			50	0.59	0.63	0.64	0.11		
Pterothrissus belloci	14	7				67	0.58	0.69	0.77	0.19		
Nematocarcinus africanus	6	1	2			30	0.46		0.22	1.44		
Parrella blackfordi	5	2	1			27	0.35	0.01	0.16	1.09		
Hymenocephalus italicus	4	3	1			27	0.34	0.01	0.72	0.35		
Triplophus hemingi	5	1	1			23	0.30		0.08	1.02		
Parapenaeus longirostris, fem.	8	2				33	0.23	0.25	0.13	0.31		
Plesionika martia	7	1	1			30	0.22		0.02	0.82		
Millex coindetii	16	1				57	0.21	0.36	0.17	0.02		
Coelorinchus coelorhincus	26					87	0.15	0.24	0.12	0.06		
Brotula barbata	5		1			20	0.14	0.34				
Sadella imberbis	9		1			33	0.14		0.35	0.10		
Hoplostethus cadenati	8	2				33	0.13	0.01	0.04	0.44		
Rodaropsis eblanae	9	1				33	0.13	0.30	0.02	0.04		
Parapenaeus longirostris, male	8	1				30	0.13	0.19	0.01	0.21		
Malacocephalus occidentalis	11	1				40	0.13	0.02	0.31	0.06		
Malacocephalus laevis	9	1				33	0.13	0.02	0.34	0.03		
Dentex angolensis	2	2				13	0.10	0.26				
Stmopterus lucifer	9	1				33	0.10		0.18	0.15		
Spinephelus guaza ?			1			3	0.10	0.26				
MYCTOPHIDAE	13					43	0.10	0.13	0.13			
Malacocephalus laevigatus	1	1				7	0.09	0.02	0.24			
Squatina aculeata		1				3	0.09		0.28			
Lepturoberyx darwini	5	1				20	0.08	0.10	0.11			
Contusus kuhlii	4	1				17	0.08	0.08	0.12			
Meristeus varidens, female	8					27	0.07	0.04	0.02	0.20		
Squatina squatina		1				3	0.07		0.20			
Libranthus atlanticus	7	1				27	0.07	0.01	0.01	0.26		
Urophycis vaillanti	8					27	0.07	0.04		0.18		
Centrophorus granulosus	4					13	0.06	0.05	0.06	0.06		
ARALEPIDIDAE	1	1				7	0.06			0.22		
Millex sp.	2	1				10	0.05	0.12		0.01		
Meristeus varidens, male	8					27	0.05	0.03	0.03	0.10		
Meristeus varidens	10					33	0.05		0.06	0.10		
Leptocottopus heterurus	4					13	0.05	0.12				
Phisurus serpens	6					20	0.05	0.03	0.06			
Parapenaeus longirostris	10					33	0.04	0.04	0.08			
ANDALIDAE	2					7	0.02	0.04				
Polenocera africana	10					33	0.01	0.01	0.02			
Parapenaeopsis atlantica	1					3						
Plesiopenaeus edwardsianus	1					3						
Other fish							0.62	0.62	0.67	0.77		
Sum all species							21.61	32.74	17.07	10.83		
Sum Snappers												
Sum Groupers							0.10	0.26		0.01		
Sum Grunts								0.01				
Sum Croakers												
Sum Seabreams							2.02	5.06				
Sum Sharks							0.40	0.17	0.80	0.21		
Sum Rays							0.03	0.05	0.03			
Sum Squids							0.42	0.63	0.19	0.10		
Sum												
Sum shrimps (excl. SHRAA01)							1.28	0.60	0.59	3.19		
Number of stations included in analysis, total and by depth strata							30	12	10	8		

SWEPT AREA ANALYSIS FROM STATION 2103 TO STATION 2227

B. Luanda - Benguela slope

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% incidence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/			
	<10	10-30	30-100	100-300	300-1000	>1000			500-600m	600-700m	700-800m	800-
Yarrella blackfordi	12	7		1			91	1.47	2.00	1.37	0.89	
Hoplostethus cadenati	16	4	1				95	0.80	1.15	0.54	0.58	
Nematocarcinus africanus	6	3	1				45	0.50	0.53	1.02	0.03	
Lamprogrammus exutus	18	2	1				95	0.47	0.32	0.36	0.77	
Triplophus hemingi	14	2					73	0.41	0.37	0.27	0.58	
Photonektes braueri	8	2					45	0.30	0.21	0.34	0.38	
Plesionika martia	9	2					50	0.24	0.55	0.02	0.04	
Merluccius polli	13		1				64	0.24	0.45	0.04	0.14	
Coelorinchus coelorhincus	14	2					73	0.22	0.06	0.07	0.55	
Benthodesmus tenuis	9	1					45	0.20	0.35	0.17	0.04	
Illex sp.	6	1					32	0.17	0.33	0.03	0.10	
POLYCHAELIDAE	20						91	0.17	0.10	0.12	0.30	
Stomias boa boa	1	1					9	0.13		0.48		
Hexanchus griseus		1					5	0.13		0.46		
Laemonema laureysi	6	1					32	0.13	0.23		0.10	
Gonostoma sp.		1					5	0.12	0.30			
Chaceon maritae	14						64	0.10	0.09	0.06	0.14	
Talismania bifurcata	13						59	0.10		0.14	0.19	
STOMIIDAE	1	1					9	0.09		0.12	0.17	
Aristeus varidens	11						50	0.09	0.17	0.02	0.06	
PARALEPIDIDAE	5	1					27	0.09	0.20			
Stomias sp.	6						27	0.08	0.14	0.01	0.07	
Aristeus varidens, female	9						41	0.08	0.12	0.05	0.07	
Dibranchus atlanticus	12						55	0.06	0.04	0.04	0.10	
Synaphobranchus kaupii	5						23	0.05			0.16	
Illex coindetii	5						23	0.05	0.01	0.04	0.12	
C E P H A L O P O D A	4						18	0.05	0.01	0.07	0.08	
Bathyroconger vicinus	9						41	0.05	0.01	0.04	0.12	
Glyphus marsupialis	11						50	0.03		0.05	0.04	
PALAEONIDAE	1							0.01	0.01			
Aristeus varidens, male	7						32	0.01	0.02	0.01		
SERGESTIDAE	2						9					
PANDALIDAE	4						18			0.01		
OPLOPHORIDAE	1						5					
Plesiopenaeus edwardsianus	3						14					
Other fish								0.49	0.34	0.44	0.90	
Sum all species								7.13	8.11	6.39	6.72	
Sum Snappers												
Sum Groupers									0.01			
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks								0.20	0.04	0.54	0.12	
Sum Rays								0.03		0.02	0.09	
Sum Squids								0.28	0.37	0.15	0.30	
Sum												
Sum shrimps (excl. SHRAA01)								0.96	1.40	1.18	0.24	
Number of stations included in analysis, total and by depth strata								22	9	6	7	

WEPT AREA ANALYSIS FROM STATION 2228 TO STATION 2340

. Luanda - Congo River shelf

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/ 200-			
	<10	10-30	30-100	100-300	300-1000	>1000			20-. 50m	50-100m	100-200m	200-
<i>rachydeuterus auritus</i>	17	3	2	4	2	47	4.38	3.23	7.59	1.74		
<i>oloroscombrus chrysurus</i>	3	3			2	13	1.79	5.79	1.56			
<i>richiurus lepturus</i>	24	4	2	1		50	0.85	0.14	0.49	1.57		
<i>entex angolensis</i>	31	5	3	1		67	0.83	0.01	0.39	1.68		
<i>rachurus trecae, juvenile</i>	15	3	1	2		35	0.80		1.71	0.29		
<i>entex congoensis</i>	28	7	3			63	0.56	0.01	0.60	0.80		
<i>rachurus trecae</i>	18	3	2	1		40	0.54		0.24	1.11		
<i>ynagrops microlepis</i>	1		1	2		7	0.54			1.35		
<i>entex barnardi</i>	14		2	1		28	0.52	0.06	1.23	0.04		
<i>elene dorsalis</i>	7	2	1	1		18	0.51	0.88	0.79	0.05		
<i>agellus bellottii</i>	37	4	3			73	0.49	0.05	0.98	0.21		
<i>rizoprionodon acutus</i>	3			1		7	0.41	1.99	0.03			
<i>mbriana canariensis</i>	9	1		1		18	0.26		0.54	0.11		
<i>aleoides decadactylus</i>	4	2	1			12	0.18	0.64	0.12			
<i>phyraena guachancho</i>	6	1	1			13	0.17	0.63	0.10			
<i>entex gibbosus</i>	8		1			15	0.16		0.04	0.35		
<i>terothrissus bellocci</i>	14		1			25	0.13		0.01	0.32		
<i>picara alta</i>	10	3				22	0.12		0.11	0.18		
<i>pinophilus aeneus</i>	12	2				23	0.11	0.10	0.18	0.04		
<i>agrus caeruleostictus</i>	11	2				22	0.09	0.31	0.07			
<i>iracorrina angolensis</i>	3		1			7	0.09		0.01	0.20		
<i>eus faber</i>	30	1				52	0.08		0.14	0.06		
<i>pseudolithus typus</i>	4	2				10	0.08	0.39				
<i>enopsis conchifer</i>	8	1				15	0.07			0.18		
<i>ardinella maderensis</i>	4		1			8	0.07	0.34	0.01			
<i>lectis alexandrinus</i>	2		1			5	0.07	0.35				
<i>rigla lyra</i>	24					40	0.06		0.05	0.11		
<i>stromateus fiatola</i>	4	1				8	0.06	0.05	0.12			
<i>epia orbignyana</i>	19	1				33	0.06	0.01	0.02	0.13		
<i>rotula barbata</i>	19	1				33	0.06		0.01	0.15		
<i>scapterus rhonchus</i>	7		1			12	0.06	0.02	0.14			
<i>omadasys incisus</i>	4	1				8	0.05	0.01	0.12			
<i>enaeus notialis</i>	7					12	0.02	0.04		0.04		
<i>arapenaeus longirostris, fem.</i>	3					5						
<i>arapenaeus longirostris, male</i>	3					5						
<i>enaeus kerathurus</i>	1					2						
<i>arapenaeus longirostris</i>	8					13						
<i>arapenaeopsis atlantica</i>	1					2						
Other fish							0.86	0.76	0.96	0.81		
Sum all species							15.13	15.81	18.36	11.52		
Sum Snappers							0.04		0.10			
Sum Groupers							0.12	0.10	0.20	0.04		
Sum Grunts							4.45	3.32	7.72	1.74		
Sum Croakers							0.48	0.39	0.62	0.37		
Sum Seabreams							2.75	0.45	3.48	3.14		
Sum Sharks							0.46	2.02	0.05	0.09		
Sum Rays							0.09	0.12	0.09	0.08		
Sum Squids							0.12	0.01	0.06	0.25		
Sum												
Sum shrimps (excl. SHRAA01)							0.02	0.04		0.04		
Number of stations included in analysis, total and by depth strata							60	12	24	24		

SWEPT AREA ANALYSIS FROM STATION 2228 TO STATION 2340

C. Luanda - Congo River slope

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/ 500-			
	<10	10-30	30-100	100-300	300-1000	>1000			200-300m	300-400m	400-500m	500-
Synagrops microlepis	10	2	5	4			72	3.84	9.60	0.56		
Merluccius polli	9	8	6	1			83	1.82	0.46	2.74	2.55	
Chlorophthalmus atlanticus	10	3	7				69	1.71	2.12	2.63		
Dentex angolensis	6			1			24	1.00	2.64			
Trichiurus lepturus	19	1	1	1			76	0.93	1.47	1.00	0.12	
Nematocarcinus africanus	4	4	2				34	0.87		0.38	2.67	
Merluccius polli, juveniles	9	2	1	1			45	0.80	2.01	0.12		
Laemonema laureysi	14	3	1				62	0.57	0.04	1.18	0.55	
Pterothrissus belloci	18	2	1				72	0.42	0.70	0.43	0.05	
Zenopsis conchifer	15	3	1				66	0.38	0.96	0.05	0.01	
Illex coindetii	22	1					79	0.20	0.34	0.12	0.11	
MYCTOPHIDAE	15	3					62	0.20	0.39	0.13	0.02	
Hymenocephalus italicus	17	1					62	0.20		0.54	0.05	
Parapenaeus longirostris, fem.	21						72	0.19	0.25	0.29		
Chlorophthalmus sp.	4	2					21	0.12	0.31	0.01		
Coelorinchus coelorhincus	19						66	0.11	0.09	0.14	0.09	
Carcharhinus falciformis		1					3	0.10			0.35	
Parapenaeus longirostris, male	18						62	0.09	0.21	0.04		
Benthodesmus tenuis	4						14	0.08		0.05	0.21	
Sphyrna couardi		1						0.08			0.30	
POLYCHAELIDAE	15						52	0.07	0.04	0.03	0.18	
Arionma bondi	3	1					14	0.07	0.16	0.02		
ANTENNARIIDAE	11						38	0.06		0.12	0.08	
Yarrella blackfordi	5	1					21	0.05			0.16	
Dibranchius atlanticus	16						55	0.05		0.06	0.11	
Nezumia aequalis	7						24	0.05		0.15	0.01	
Aristeus varidens, female	6						21	0.04			0.15	
Aristeus varidens	6						21	0.02		0.01	0.07	
Solenocera africana	12						41	0.01	0.01	0.01		
Plesionika martia	9						31	0.01		0.03		
Parapandalus narval	2						7	0.01	0.01		0.01	
Aristeus varidens, male	7						24	0.01		0.01	0.04	
SERGESTIDAE	3						10				0.01	
SHRS011	1						3					
Glyphus marsupialis	2						7				0.01	
Penaeus notialis	1						3					
PANDALIDAE	1											
Plesiopenaeus edwardsianus	6						21				0.01	
Other fish								0.99	0.89	1.05	1.21	
Sum all species								15.15	22.70	11.90	9.13	
Sum Snappers												
Sum Groupers								0.02	0.05			
Sum Grunts												
Sum Croakers												
Sum Seabreams								1.04	2.74			
Sum Sharks								0.28	0.11	0.04	0.80	
Sum Rays								0.03	0.03	0.03		
Sum Squids								0.25	0.45	0.15	0.13	
Sum												
Sum shrimps (excl. SHRAA01)								1.25	0.45	0.77	2.97	
Number of stations included in analysis, total and by depth strata								29	11	10	8	

WEPT AREA ANALYSIS FROM STATION 2228 TO STATION 2340

. Luanda - Congo River slope

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/ nm ²			
	<10	10-30	30-100	100-300	300-1000			>1000	500-600m	600-700m	700-800m
<i>oplostethus cadenati</i>	11	6	4		1	100	2.28	0.35	1.03		5.05
<i>ematocarcinus africanus</i>	7	2	7			73	1.76	2.24	2.65		0.58
<i>riplophus hemingi</i>	13	4	2			86	0.95	1.36	1.02		0.54
<i>arrella blackfordi</i>	18	3	1			100	0.71	0.24	0.81		1.04
<i>amprogrammus exutus</i>	10	5	1			73	0.69	0.52	0.36		1.12
<i>coelorinchus coelorhincus</i>	12	4				73	0.56	0.05	0.18		1.33
OLYCHAEIIDAE	21	1				100	0.51	0.40	0.45		0.65
<i>tomias</i> sp.	16	1				77	0.28	0.35	0.40		0.11
<i>anthodesmus tenuis</i>	8	2				45	0.25	0.66	0.10		0.01
<i>anodermichthys copei</i>	18	1				86	0.17	0.14	0.10		0.25
<i>aemonema laureysi</i>	5	2				32	0.15	0.45	0.02		
<i>erluccius polli</i>	15					68	0.14	0.17	0.10		0.15
<i>eryon maritae</i>	13					59	0.14	0.09	0.18		0.14
OPHIIDAE	11					50	0.13	0.09	0.24		0.08
<i>llex coindetii</i>	8	1				41	0.11	0.07	0.29		
<i>azumia leonis</i>	1	1				9	0.10				0.28
OMIIDAE	2	1				14	0.09	0.11	0.17		
<i>athy gadus melanobranchus</i>	8					36	0.09	0.06	0.04		0.15
E P H A L O P O D A	14					64	0.08	0.04	0.07		0.13
<i>alosaurus ovenii</i>	16					73	0.08	0.04	0.05		0.14
<i>athyroconger vicinus</i>	10					45	0.08	0.02	0.01		0.19
<i>alifornia bifurcata</i>	13					59	0.08	0.02	0.05		0.17
<i>anceon maritae</i>	2	1				14	0.07		0.05		0.15
<i>lyphus marsupialis</i>	20					91	0.05	0.03	0.05		0.08
<i>tmopterus lucifer</i>	10					45	0.05	0.12	0.03		
<i>ibranthus atlanticus</i>	17					77	0.05	0.05	0.04		0.06
<i>risteus varidens</i>	15					68	0.04	0.01	0.07		0.03
<i>rapenaesus longirostris</i>	1					5	0.03	0.11			
<i>risteus varidens, female</i>	4					18	0.03	0.08	0.02		
ERGESTIDAE	5					23	0.01		0.02		
ALAEMONIDAE	1					5	0.01				0.02
LOPHORIDAE	7					32	0.01	0.01	0.01		
<i>risteus varidens, male</i>	4					18	0.01	0.01	0.01		
LENOCERIDAE	1					5					
<i>esionika martia</i>	2					9		0.01			
<i>terocarpus grimaldii</i>	2					9					
NDALIDAE	1					5					
<i>esiopenaesus edwardsianus</i>	1					5		0.01			
H R I M P S	1					5					
Other fish							0.46	0.47	0.41		0.55
Sum all species							10.25	8.39	9.03		13.00
Sum Snappers											
Sum Groupers											
Sum Grunts											
Sum Croakers											
Sum Seabreams											
Sum Sharks							0.14	0.16	0.12		0.10
Sum Rays							0.04	0.02	0.03		0.08
Sum Squids							0.21	0.13	0.36		0.16
Sum shrimps (excl. SHRAA01)							1.95	2.51	2.83		0.71
Number of stations included in analysis, total and by depth strata							22	7	7		8

Annex IV

1. Stratified mean density and confidence intervals

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

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

where

L is the number of strata,

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

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

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

$y_{i,k}$ is the catch by the k^{th} tow in stratum i (normalized to either kg/hour

or $\text{t/NMm}^2 = \frac{y_{ik}}{\text{area swept}_{ik}}$ for biomass estimates).

The estimated variance of the stratified mean, \bar{y}_{st} , is

$$\text{var}(\bar{y}_{st}) = \sum_{i=1}^L W_i^2 \frac{s_i^2}{n_i}, \quad (2)$$

where

$$s_i^2 = \frac{\sum_{k=1}^{n_i} (y_{i,k} - \bar{y}_i)^2}{n_i - 1}. \quad (3)$$

When \bar{y}_{st} is estimated in t/NMm^2 then an estimate of the total biomass in the area is calculated by

$$B = \bar{y}_{st} \cdot \text{total area} \quad (4)$$

2. Precision of the estimates of mean density

2.1. Estimates based on the sample mean

The estimate of the standard error for each stratum mean is given by

$$se(\bar{y}_i) = \sqrt{\frac{s_i^2}{n_i}}, \quad (5)$$

where s_i^2 is from equation (3).

The standard error of the stratified mean (\bar{y}_{st} , equation 1), i.e. the square root of the variance of \bar{y}_{st} , is calculated as

$$se(\bar{y}_{st}) = \sqrt{\text{var}(\bar{y}_{st})}, \quad (6)$$

where $\text{var}(\bar{y}_{st})$ is defined by equation (2).

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 lies in the interval (see Cochran, 1977)

$$\bar{y}_{st} \pm t_{(n-1)} se(\bar{y}_{st}), \quad (7)$$

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

2.2. Estimates of the mean based on lognormal theory - The Pennington estimator

Since abundance data from marine surveys usually have a large variance (much higher than the mean) and are highly skewed to the right, the sample sizes are typically not large enough so that equation (2) is a valid 95% confidence interval. In fact, the confidence associated with the interval given by equation (7) is usually much lower than 95% (McConnaughey and Conquest, 1992; Conquest *et al.*, 1996; Pennington, 1996). A major problem to the degree of skewness is due to the high proportion of zero tows often observed. Development of confidence intervals is complicated by the asymmetric distribution, and the occurrence of zero catches confounds an effective normalization transformation. Logarithmic transformation will

stabilize the variance but data will still not be normally distributed and interpretation of re-transformed means is difficult (Pennington and Grosslein 1978).

One way to generate more precise estimates of the mean and more accurate confidence statements for skewed marine data is to base the estimators on the lognormal Delta distribution (Pennington, 1983, 1996; Conquest *et al.*, 1996), in which catches are divided into zero and non-zero units, followed by transformation of the non-zero values to natural logarithms. When it is found that the transformed non-zero data are approximated by a lognormal distribution (*i.e.* the logged values are normally distributed), then a more efficient estimator of mean density, c_i , within each stratum is given by (Pennington, 1983, 1996)

$$c_i = \frac{m_i}{n_i} \exp(\bar{x}_i) G_{m_i}(s_{x,i}^2 / 2), \quad (8)$$

where

m_i is the number of sample values greater than 0 in stratum i ,

\bar{x}_i and $s_{x,i}^2$ are the mean and variance, respectively, of the log transformed values of catches greater than 0, and

$G_m(f)$ is an infinite series function of m and f [for example, $m = m_i$ and $f = s_{x,i}^2 / 2$ in equation (8)] which is used to correct for bias in re-transformation from log to arithmetic scale and is defined by

$$G_m(f) = 1 + \frac{m-1}{m} f + \sum_{j=2}^{\infty} \frac{(m-1)^{2j-1} f^j}{m^j (m+1)(m+3)\cdots(m+2j-3)j!} \quad (9)$$

The variance of c_i is given by

$$\text{var}(c_i) = \frac{m_i}{n_i} \exp(2\bar{x}_i) \left\{ \frac{m_i}{n_i} G_{m_i}^2(s_{x,i}^2 / 2) - \frac{(m_i-1)}{(n_i-1)} G_{m_i}\left(\frac{m_i-2}{m_i-1} s_{x,i}^2\right) \right\} \quad (10)$$

2.3. The modified Pennington estimator

In contrast to estimates based on the sample mean (equation 1 and 2), which are highly sensitive to a single or a few isolated high catch rates that may account for more than 50% of the total catch, Pennington's estimator (equations 8 and 10) is sensitive to low catch rates which contribute little to the total catch, but when log-transformed may give large negative values resulting in a distribution skewed to the left. In such a case a more precise estimator of mean density within each stratum, $\hat{\mu}_i$, is given by (modified from Pennington, 1983, 1996)

$$\hat{\mu}_i = \frac{(n_i - m_i)}{n_i} \bar{y}'_i + \frac{m_i}{n_i} \exp(\bar{x}_i) G_{m_i}(s_{x,i}^2 / 2), \quad (11)$$

where

m_i is the number of sample values greater than a defined 'cut-level' (rather than 0 as in equation 8) in stratum i ,

\bar{y}'_i denotes the arithmetic mean of the non-transformed values less than the cut-level,

and

\bar{x}_i and $s_{x,i}^2$ are the mean and variance, respectively, of the logged values of catches greater than the cut-level.

The variance of $\hat{\mu}_i$ is given by

$$\text{var}(\hat{\mu}_i) = \text{var}(c_i) + \left(\frac{n_i - m_i - 1}{n_i(n_i - 1)} \right) s_i'^2 + \left(\frac{m_i(n_i - m_i)}{n_i^2(n_i - 1)} \right) \bar{y}'_i{}^2 - 2 \left(\frac{n_i - m_i}{n_i(n_i - 1)} \right) \bar{y}'_i \times c_i, \quad (12)$$

where

$s_i'^2$ is the variance of the values less than the cut-level (equation 3), and

c_i and $\text{var}(c_i)$ are equations (8) and (10) with m_i bigger than the cut-level.

There is no single objective criterion upon which to define a cut-level bigger than zero. Basically the logged Delta distribution should be viewed (e.g. in GRAFER) in order to determine if it is skewed to the left and/or contains isolated small catches. As a 'rule of thumb' (Pennington pers. com.) the cut-level should be set = $(2\bar{x}_i - x_{\max})$, where \bar{x}_i and x_{\max} are the mean and the largest value, respectively, of the log transformed values of catches greater than 0.

2.4. Stratified mean and confidence interval based on lognormal theory

The stratified estimate of mean density (denoted by $\hat{\mu}_{st}$) in the entire area is calculated by replacing \bar{y}_i with $\hat{\mu}_i$ for each stratum in equation (1). The standard error of $\hat{\mu}_{st}$ is obtained by substituting $\text{var}(\hat{\mu}_i)$ for s_i^2 / n_i (which equals $\text{var}(\bar{y}_i)$) in equation (2) and then

$$\text{se}(\hat{\mu}_{st}) = \sqrt{\text{var}(\hat{\mu}_{st})} \quad (13)$$

Sometimes the $\hat{\mu}_{st}$ -estimator is higher than the one based on the sample mean. This is because, given the sample sizes typical for marine surveys, the sample mean tends to underestimate the true mean most of the time for these highly skewed distributions (Pennington, 1983, 1996; Conquest *et al.*, 1996).

An approximate 95% confidence interval for $\hat{\mu}_{st}$ is given by

$$\hat{\mu}_{st} \pm t_{(n-1)} \text{se}(\hat{\mu}_{st}) \quad (14)$$

Annex V. Excel sheet used for calculations of biomass and confidence intervals

This example is the biomass of seabreams in Sector 2 1998

This sheet is used to calculate stratified mean density, total biomass, and 95% confidence limits on the total biomass. Inputs are only required in the yellow fields and optionally the t-value can be set. NOTE that the Station field MUST be 1 even if there is no catch Density (t/NM^2) is from NAN-SIS and Coefficient of variation (CV) is from GRAFER using the same depth intervals The underlying assumption is that the CV from the catch (kg/hour) is equal for the density (t/NM^2), i.e. that the swept area is constant per hour Equation numbers (1) and (2) refers to Appendix in report

Input from NANSIS GRAFER

Depth (m)	Area	No Stations	Density (t/NM^2)	CV (kg/hour)	Equation (1)=	SD	Est. Variance	Equation (2)=
20-50	1068	9	2.38	0.9	0.46	2.142	4.588	0.019
50-100	1586	17	4.74	0.93	1.35	4.408	19.432	0.093
100-200	1439	12	5.37	1.14	1.39	6.122	37.476	0.209
200-300	407	8	4.03	1.31	0.29	5.279	27.871	0.019
300-400	372	1	0	0	0.00	0.000	0.000	0.000
400-500	343	1	0	0	0.00	0.000	0.000	0.000
500-600	346	1	0	0	0.00	0.000	0.000	0.000
Total	5561						Var (strat-mean)=	0.34

t-value = 2 Stratified mean = 3.49 SE(strat-mean)= 0.58

Total biomass= 19427 95% Confidence limits: 12946 25908

Annex VI

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

MAIN GROUP	Demersal	Pelagic	Shrimp	Cephalopod	Sharks
	SPA0000	ENG0000	SHR0000	SQU0000	SHA0000
	POD0000	CLU0000			
	SCI0000	CAR0000			
	ARD0000	SCM0000			
	SER0000	SPH0000			
	LUT0000	TRI0000			
	OPDAA00	STRAA00			
	MERME00				

PELAGIC	Clupeids	Carangids	Scombrids	Hairtails	Barracudas
	ENG0000	CAR0000	SCM0000	TRI0000	SPH0000
	CLU0000				

DEMERSAL	Seabream	Snappers	Groupers	Grunts	Croakers
	SPADE00	LUT0000	SER0000	PODPO00	SCI0000
	SPADI00				
	SPALI00				
	SPAPA00				
	SPAPR00				
	SPASP00				

DEEP 1	Seabream	Hake	P.longiros	A.varidens	N.africanus
	SPADE00	MERME03	SHRPE31	SHRAR22	SHRNE21
	SPADI00	MERME12	SHRPEP1	SHRARA1	
	SPALI00	MERME13	SHRPEP2	SHRARA2	
	SPAPA00	MERME92			
	SPAPR00				
	SPASP00				

DEEP 2	Hake	Ommastrep	Sepiidae	A.varidens	P.longiros
	MERME03	SQUOM21	SQUSE10	SHRAR22	SHRPE31
	MERME12	SQUOM31	SQUSE11	SHRARA1	SHRPEP1
	MERME13	SQUOM51	SQUSE12	SHRARA2	SHRPEP2
	MERME92		SQUSE13		
			SQUSE15		

NAN-SIS sectors in Angola

Latitude	Sector	Region
6° - 5° S	4	Cabinda
9° - 6° S	3	Pta. das Palmerinhas – Congo River
13° - 9° S	2	Benguela – Pta. das Palmerinhas
17°14' - 13° S	1	Cunene River – Benguela
17°14' >> S	5	South of Cunene River (Namibia)

Annex VII. Instruments and fishing gear used

The Simrad EK-500/38kHz scientific sounder was run during the survey only for observation of fish and bottom conditions.

The details of the settings of the 38kHz echo sounder were as follows:

Transceiver-1 menu (38 kHz lowering keel)

Transducer depth	5.50 m
Absorption coeff.	10 dB/km
Pulse length	medium (1ms)
Bandwidth	wide
Max power	2000 Watt
2-way beam angle	-21.0 dB
SV transducer gain	27.45 dB
TS transducer gain	27.65 dB
Angle sensitivity	21.9
3 dB beamwidth	6.8 dg along / athwardship: 6.7 dg
Alongship offset	-0.03 "
Athwardship offset	0.06 "

Display menu

Echogram	1 (38 kHz)
Sv colour min	-67 dB

Printer- menu

Echogram	1 (38 kHz)
Range	50, 100, 250, 500 and 1000 m
Range start	0
Bottom range	12 m
Bottom range start	10 m
Sv colour min	-67 dB
TVG	20 log R

Bottom detection menu Minimum level -40 dB

Fishing gear

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

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm mesh size in the codend with an innernet of 10 mm meshsize. The estimated opening is 6 m (observed 5.7) and distance between wings during towing about 18 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. The doors are of 'Thyborøn' combi type, 7.81 m², 1670 kg, their distance while trawling about 45 - 55 m in average, depending on the depth (least distance at low depths). During the present survey this distance was kept nearly constant (about 50 m) at all depths by the use of a 9.5 m strap between the wires at 130 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 is supposed to improve 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 a height sensor is fitted to the bottom trawl to measure the trawl opening and provide information on clearance and bottom contact.