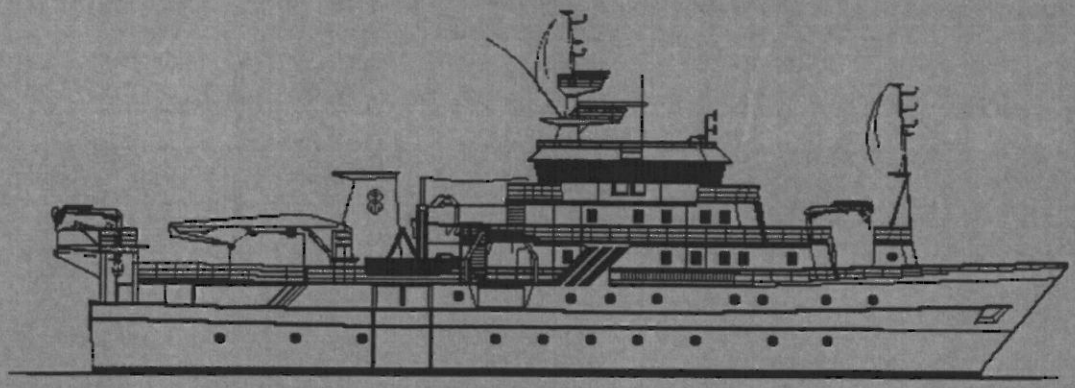

SURVEY OF THE FISH RESOURCES OF ANGOLA

Survey of the demersal resources
1 March - 29 March 2001

Institute of Marine Research
IMR, Bergen
Norway

Instituto de Investigação Marinha
IIM, 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
1 - 26 March 2001

by

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Bergen, 2001

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CHAPTER 1 INTRODUCTION

1.1 Objectives

The objectives of the cruise had been previously discussed and agreed upon by the responsible of the Demersal Programme of the Instituto de Investigação Marinha (IIM), 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 seabreams (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 Benguela (12° 35' S) to Congo River (06° 00' S), using bottom trawl and the swept-area method.

- Collect biological data (length, weight, sex and maturity) of *Dentex macrophtalmus*, *D. angolensis*, *Pagellus bellottii, Pseudotolithus typus, Merluccius polli*, *A. varidens* and *P. longirostris*.

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

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

- To verify the taxonomic identity of the trawl species and develop a collection of the fish species to be made available for future reference. A brief report on the taxonomy is included in this report as Annex VIII.

1.2 Participation

The scientific staff consisted of:

From IIM, Angola: From 01/3 to 17/3: Maria de Lourdes SARDINHA (Local Cruise Leader), Francisco de ALMEIDA, Geraldina de ASSUNÇÃO, Bomba BAZICA, Paulo BRINCA, Guillerme CAMARADA, Lia NETO, Pedro PANZO, Marcelo TCHICULUPITI. From 18/3 to 26/3: Maria de Lourdes SARDINHA (Local Cruise Leader), Nilsa ALVES, Paulo BRINCA, Guillerme CAMARADA, Enoque CANGAJO, Vanequissa JONICO, Lia NETO, Pedro PANZO

From IMR, Norway: Åge HØINES (Cruise Leader 1/3-17/3), Sigbjørn MEHL (Cruise Leader 17/3-26/3), Magne OLSEN, Haraldur EINARSSON, Tore NILSEN and Jan Frode WILHELMSEN.

From South Africa: Dennis TWEDDLE (GALB Smith Institute of Ichthyology, Graham Town).

1.3 Narrative

The vessel left Walvis Bay, Namibia, in the afternoon 1st of March and steamed northwards. The survey started with the hydrographic transects at Namibe and Baia dos Tigres. Benguela (12° 35' S) was reached in the late evening of 4 March and during the next 11 days the central region of the Angolan coast from Benguela to Luanda (9° 00' S) was covered. Also a few course tracks north of Luanda were done. In the central region the hydrographic transects at Lobito, Pta. do Morro and Pta. das Palmerinhas were performed. The vessel called into port at Luanda at noon 16 March to exchange crew and cruise leader and departed after noon 18 March to resume the survey of the northern region.

Late after noon 18 March the coverage of the northern region from Luanda to Congo River (9° 00' to 6° 00' S) continued. The coverage of the northern part of the northern region 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 were not satisfactorily covered. Due to special circumstances the survey ended on 25 March just south of 6° 30' S, and the two northernmost course tracks were not taken. In this region only the hydrographic transect at Ambriz was done. The cruise finished 26 March when 'Dr. Fridtjof Nansen' called at Luanda.

Course tracks were set approximately 15 nautical miles (NM) apart, covering the shelf and the slope to 800 m depth. Semi-random swept-area hauls, allocated according to the area of each 100 m depth stratum, were carried out on the shelf during daytime, and on the slope deeper than 400 m during dark hours. Acoustic registrations of the resources were 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, sector, and by the total area. The overall average coverage was 1 trawl station per 96 NM^2. 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 the distance surveyed, divided into the central region (Benguela to Luanda), and the northern region: (Luanda to Congo River).

	Depth strata (m)												
Region	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	total	failures	CTD	Distance
Benguela-Luanda												93	1464
area (NM^2)	1068	1586	1439	407	372	343	346	268	357	6186			
# hauls (BT)	12	18	16	4	4	6	3	3	4	70	1		
% area	17.3	25.6	23.3	6.6	6.0	5.5	5.6	4.3	5.8	42.4			
% hauls	17.1	25.7	22.9	5.7	5.7	8.6	4.3	4.3	5.7	46.4			
Luanda-Congo River												71	1160
area (NM^2)	1379	1969	1940	601	550	437	409	408	702	8395			
# hauls (BT)	11	14	18	7	10	5	8	5	3	81	1		
% area	16.4	23.5	23.1	7.2	6.6	5.2	4.9	4.9	8.4	57.6			
% hauls	13.6	17.3	22.2	8.6	12.3	6.2	9.9	6.2	3.7	53.6			
Grand total												164	2624
area (NM^2)	2447	3555	3379	1008	922	780	755	676	1059	14581			
# hauls (BT)	23	32	34	11	14	11	11	8	7	151	2		
% area	16.8	24.4	23.2	6.9	6.3	5.3	5.2	4.6	7.3				
% hauls	15.2	21.2	22.5	7.3	9.3	7.3	7.3	5.3	4.6		153	total hauls	

A stratified semi- random survey design was used in the cruise (Table 2.1, Figures 2.2 - 2.3), with depth and area as stratifying variables. Trawl hauls were taken along transects perpendicular to the coast and with a distance of 15-16 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 unsuitable bottom conditions, or in non-accessible areas due to oil exploitation in the northern sector.

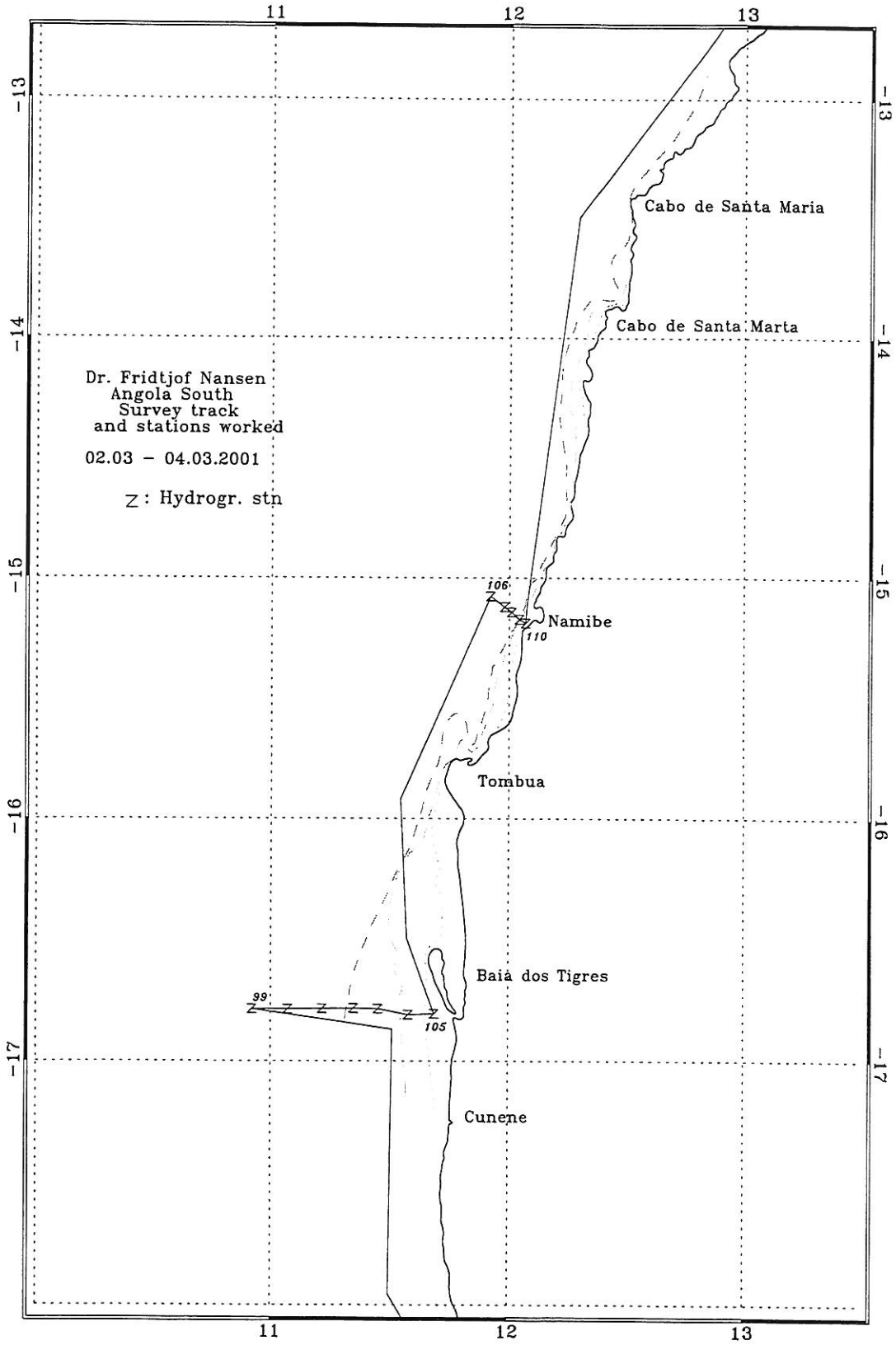

Figure 2.1 Southern Angola: Cunene to Tombua. Course track with hydrographic transects. Depth contours at 20, 50 and 100 m are shown.

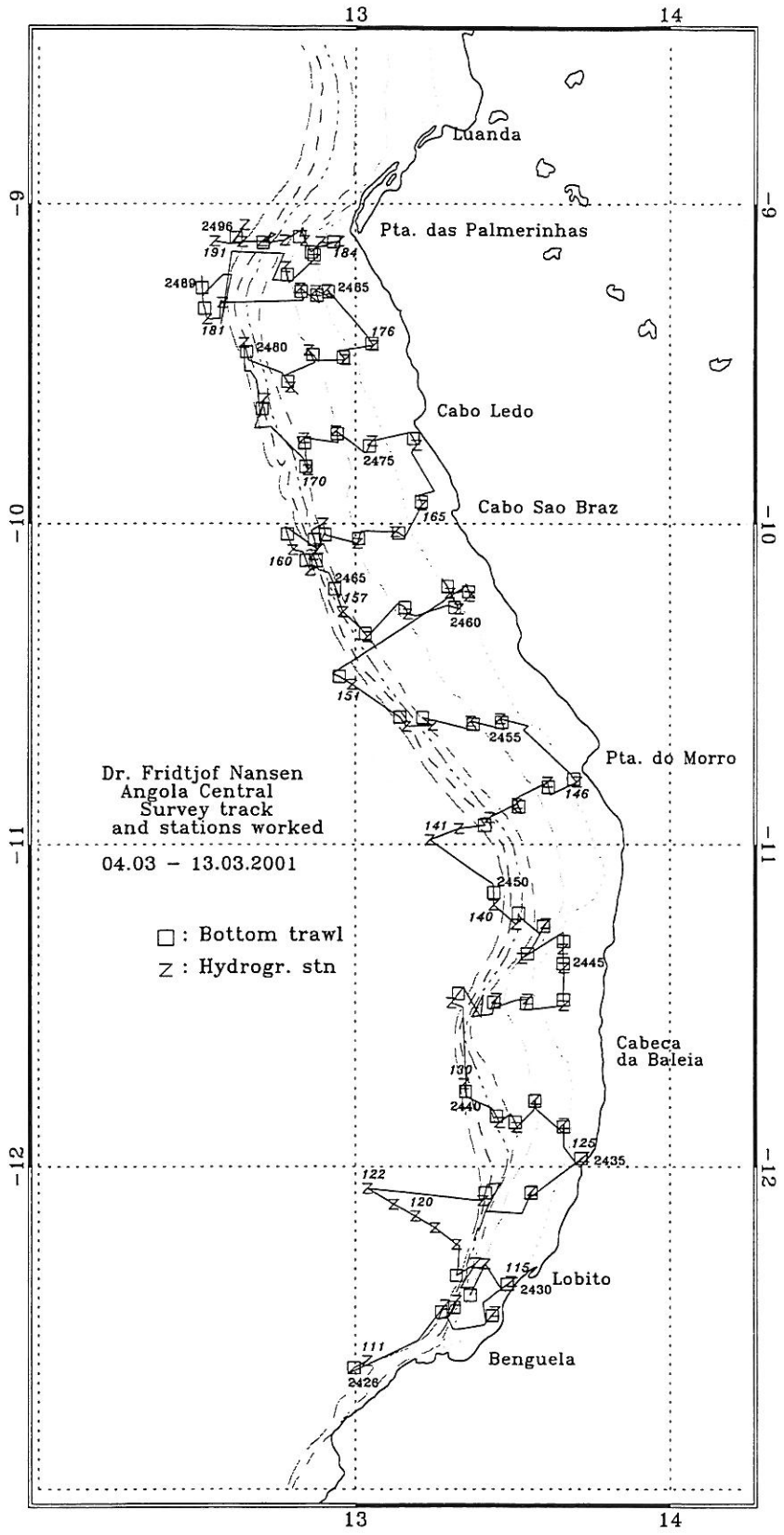

Figure 2.2 Central Angola: Benguela to Luanda. Course track with fishing stations and hydrographic transects. Depth contours at 20, 50, 100, 200, 300, 400, 500 and 600 m are included.

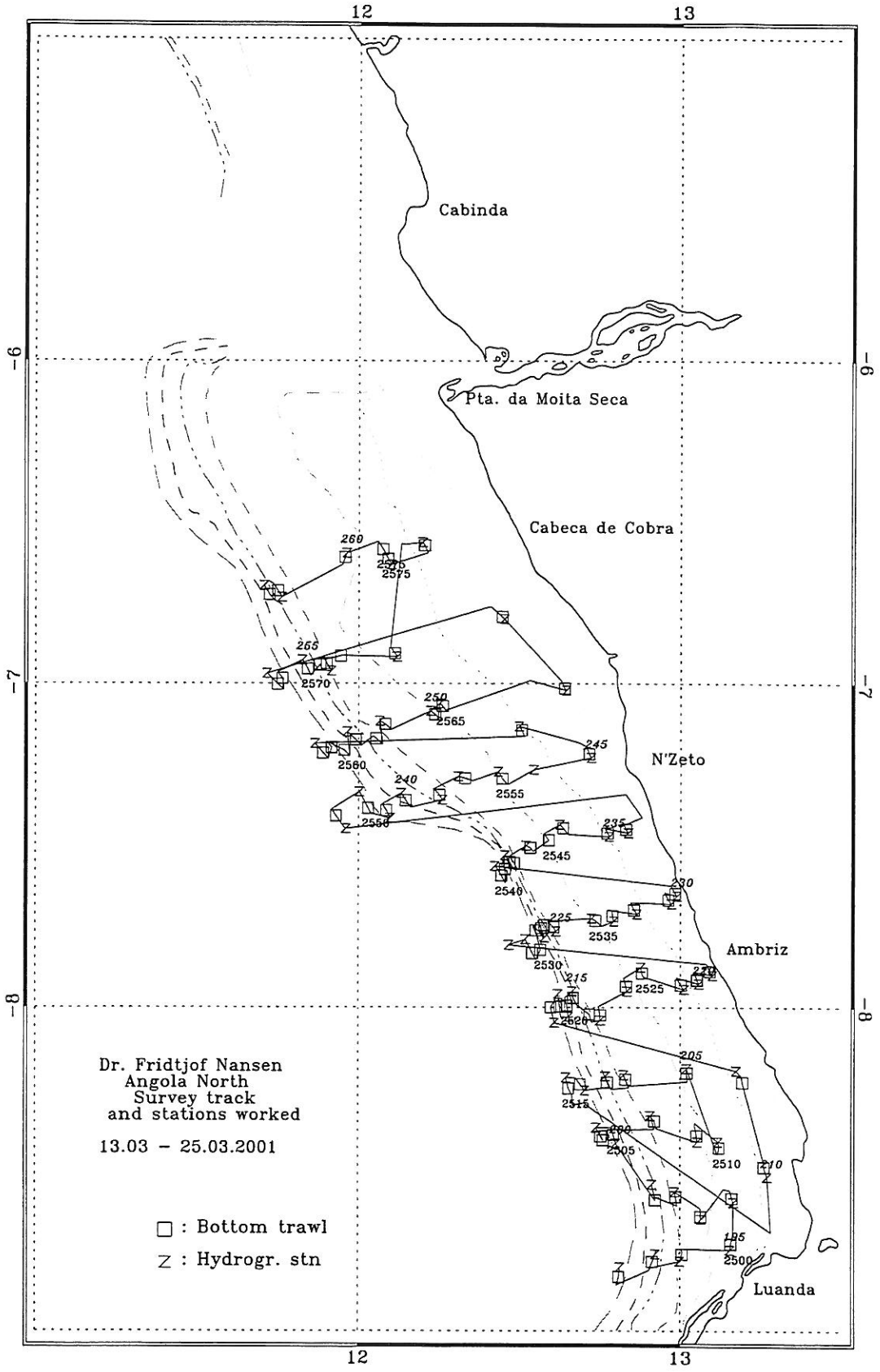

Figure 2.3. Northern Angola: Luanda to Congo River. Course track with fishing stations and hydrographic transects. Depth contours as in Fig. 2.2.

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 most of the trawl stations, and at standard hydrographic transects.

ADCP current measurement
A ship-born 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 two Niskin bottles were triggered for water samples, one near the surface and one near the bottom, in order to calibrate the oxygen sensor. The water samples were analysed for dissolved oxygen using the Winkler method (Carrit and Carpenter, 1966). A total of 160 samples were taken for oxygen calibration. A linear regression of the Winkler determinations on the CTD values, separated into the southern and central region, gave the results shown in Figures 2.4 and 2.5. Based on the good correlation between the analysed water samples and the CTD values, it was decided to keep the CTD values unadjusted. On some stations in the southern and central region also one Niskin bottle was triggered at the thermocline to get water samples for nutrient- and phytoplankton analysis.

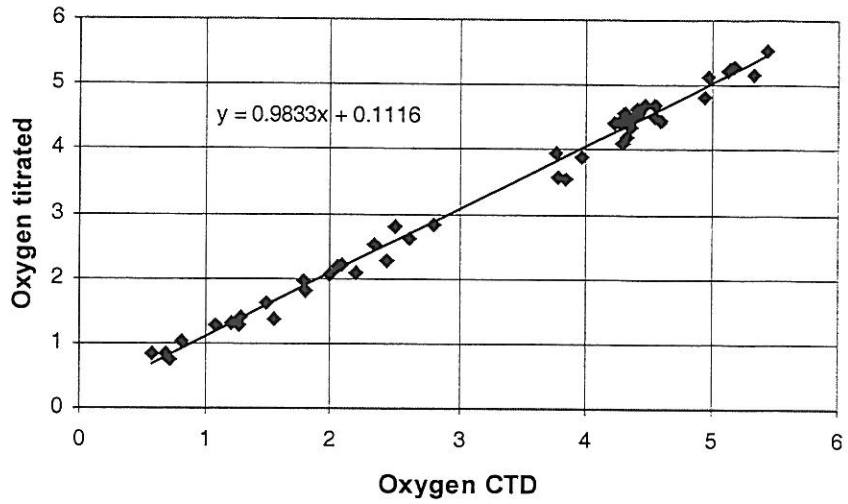

Figure 2.4. A regression of the Winkler-determinated oxygen concentrations from the Niskin bottles against linear the CTD values obtained from hydrographic stations 99 – 151, southern Angola.

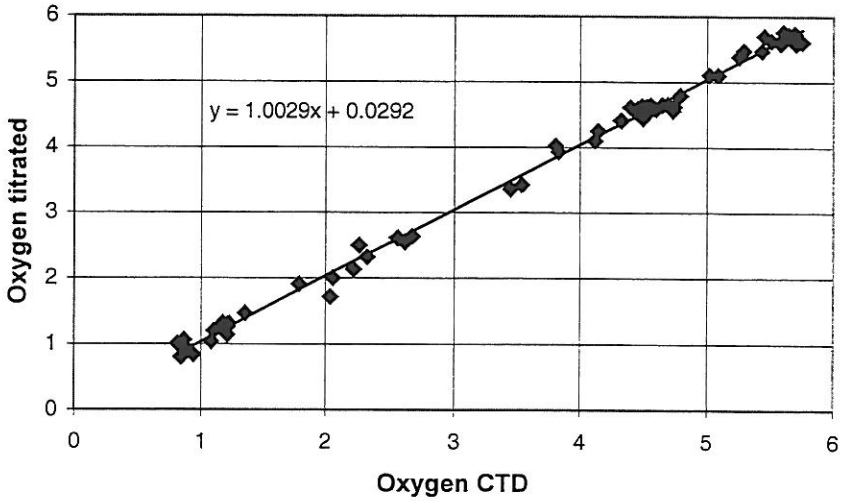

Figure 2.5. A linear regression of the Winkler-determinated oxygen concentrations from the Niskin bottles against the CTD values obtained from hydrographic stations 166 – 199, central Angola.

2.3 Biological sampling

Sampling gear
A Gisund super bottom trawl 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. 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 to 1 mm below was recorded. The records of fishing stations are presented in Annex I. A total of 378 length samples were measured during the cruise. 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 colleted consisted of body weight (1g); sex and reproductive stages by macroscopic examination, scoring each individually sampled fish and shrimp.

2.4 Areas and depth strata

Table 2.1 shows the areas (NM^2) in the northern region (Luanda-Congo River) and the central region (Benguela-Luanda). 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 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/NM^2), 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, was measured by the SCANMAR and GPS. The area swept (a_k) for each $haul_k$ was thus 18.5 times the distance trawled, raised to NM^2/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 (Strømme, 1992). 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 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 tables with grouped catch-rates presented in this report.

CHAPTER 3 OCEANOGRAPHIC CONDITIONS

3.1 Surface distribution

The horizontal distributions of surface temperature and surface salinity (5 m depth) are shown in Figures 3.1(a and b) and 3.2(a and b) for the central and northern regions, respectively.

The temperatures in the central region, Benguela – Luanda, ranged from 28 °C near the shore to 30°C in the slope area. On average the surface temperature was 1 °C higher than during the 2000 survey. In the northern region, the temperature ranged from 27°C near the shore to 29°C in the slope. These values are slightly lower than those found in the same area in the previous survey, where the temperature ranged from 27 to 30°C.

The surface salinity distribution in the central region was characterised by very low salinity water due to strong rainwater run off. The salinity ranged from 32.5 psu in the slope area to 34.0 psu on the inner shelf between Lobito and Cabeça da Baleia. In March 2000 the salinity ranged from 33.0 psu to 35.8 psu. In the Northern region the salinity distribution showed slightly higher values: 34.6 psu near the shore to 33.0 psu offshore. In the last survey the values of salinity were ranged from 34.5–35.0 psu near the shore to 34.0 psu off shore.

The low temperature values (27°C) and the high salinity value detected off Ambriz and northern Luanda may suggest a mixing of local upwelled waters. The common feature for this region is the formation of pockets with relative coldwater masses.

3.2 Vertical sections

Fig. 3.3(a-b) shows the two sections worked in the southern region, off Baia dos Tigres and Namibe. Both transects had a relative flat structure. In the Baía dos Tigres area the surface temperature, 24–27 °C, was considerably higher than the surface temperature found last year with a difference of 3°C. A thermocline was found at about 45 m depth with a temperature of about 23°C and like last year the temperature decreased gradually to about 8°C at 400 m depth. Surface (5 m depth) salinity (35.6–35.8 psu) was lower than in March 2000 (36.0 psu), with the highest values on the shelf. The Namibe profile shows weak signs of an upwelling process but not convincing (Fig.3.3b) and anomalous hydrographical conditions are also present in this area due the high temperature and low salinity content. The flat isolines below 250 m depth suggest that a weak mixing process takes place between deep-water masses. There were no signs of low bottom oxygen content at the shelf, but low oxygen content was found deeper than 200 m.

In Fig. 3.3(c-e), the vertical distributions of temperature, salinity and oxygen are shown for the three sections worked in the central region during the survey, i.e. off Lobito, Ponta do Morro and Ponta das Palmerinhas. In this region all sections confirm the presence of a stable surface layer of warm brackish water and pronounced stratification of the whole water column due to the strong rainwater run off along the Angolan coast. In this region transects also had a relative flat structure. The surface temperature (29°C) was higher than in the south, and the temperature in the thermocline at about 30 m was 23–26°C. Salinity ranged from 34.3

psu at the surface to 35.7 psu at 100 m depth and then decreasing to below 35.0 psu at 400 m depth. Also in this region low oxygen content was found deeper than 200 m.

Figure 3.f shows the section worked in the northern region, off Ambriz. The surface temperature was 28°C, and the thermocline was at about 20 m. Salinity ranged from 34.4 psu at the surface to 35.8 psu at 60 m depth and then decreasing to below 35.0 psu at 400 m depth. This section confirms the presence of a mixing process and the isolines toward the surface suggest that a week process of coastal upwelling was taking place. On this profile the conditions are more dynamic and the surface layer is broken towards the coast probably due to upwelling processes.

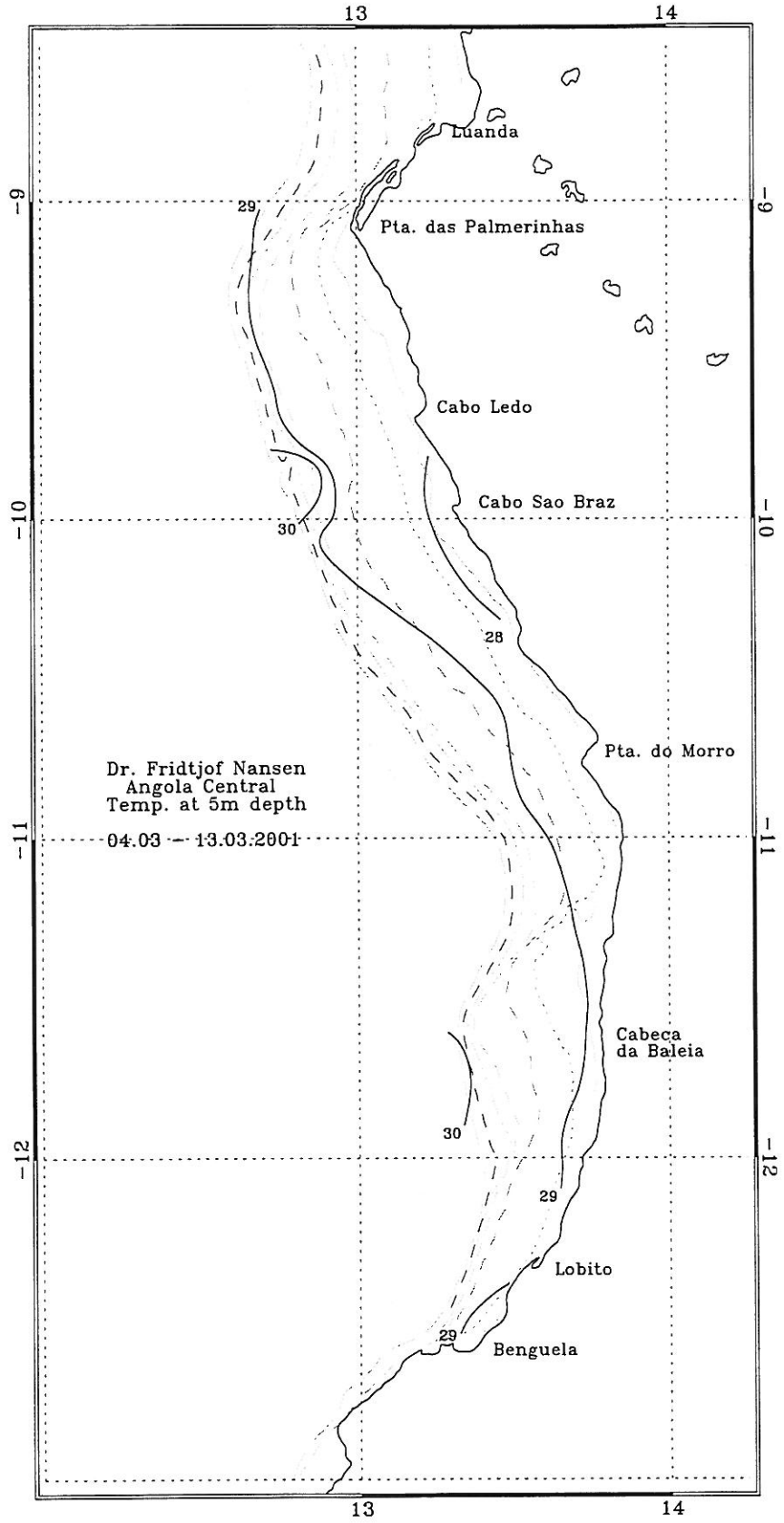

Figure 3.1a Central Angola. Horizontal distribution of surface temperature (5m depth). Depth contours ad shown in Fig. 2.2.

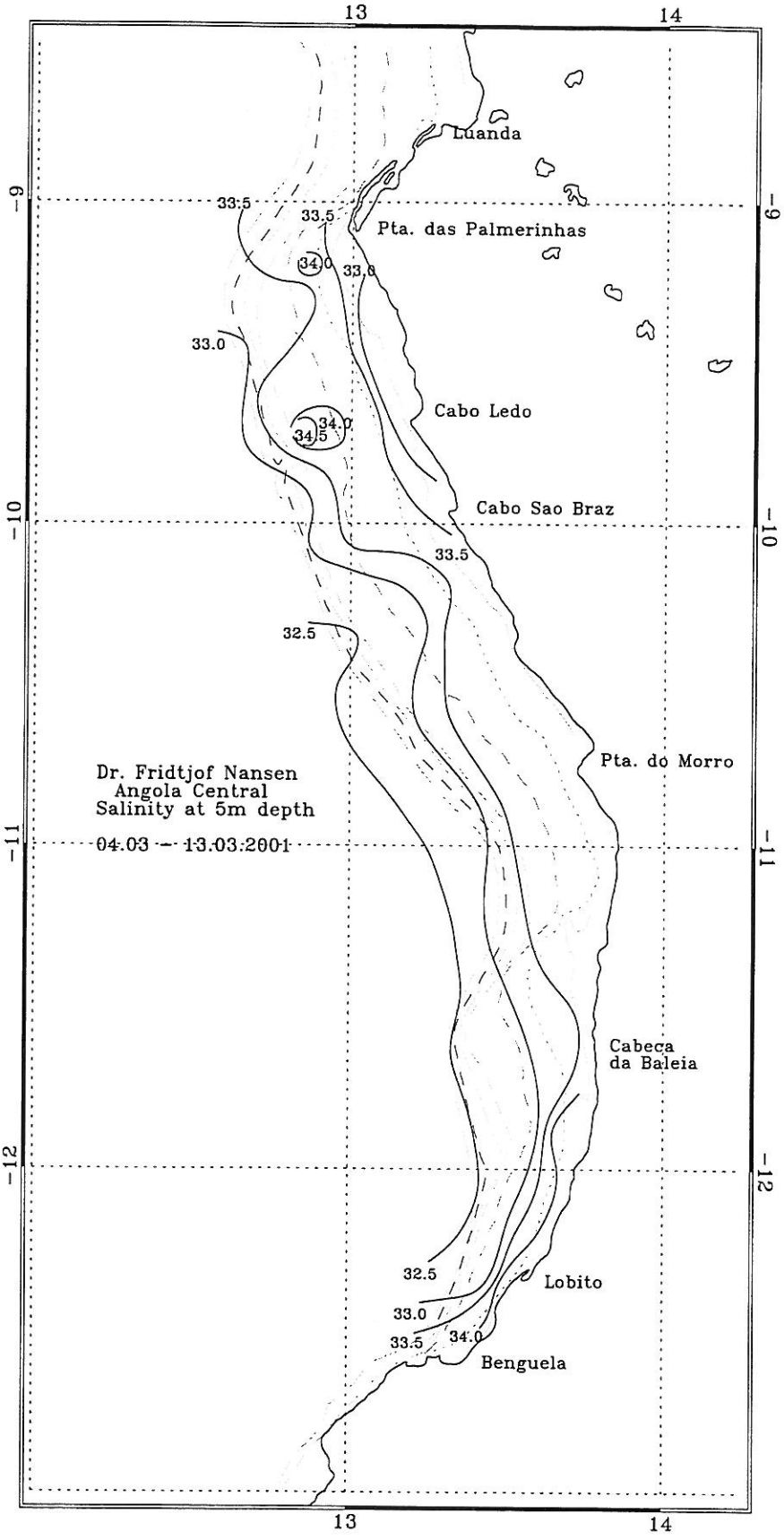

Figure 3.1b. Central Angola. Horizontal distribution of surface salinity (5m depth). Depth contours as shown in Fig. 2.2.

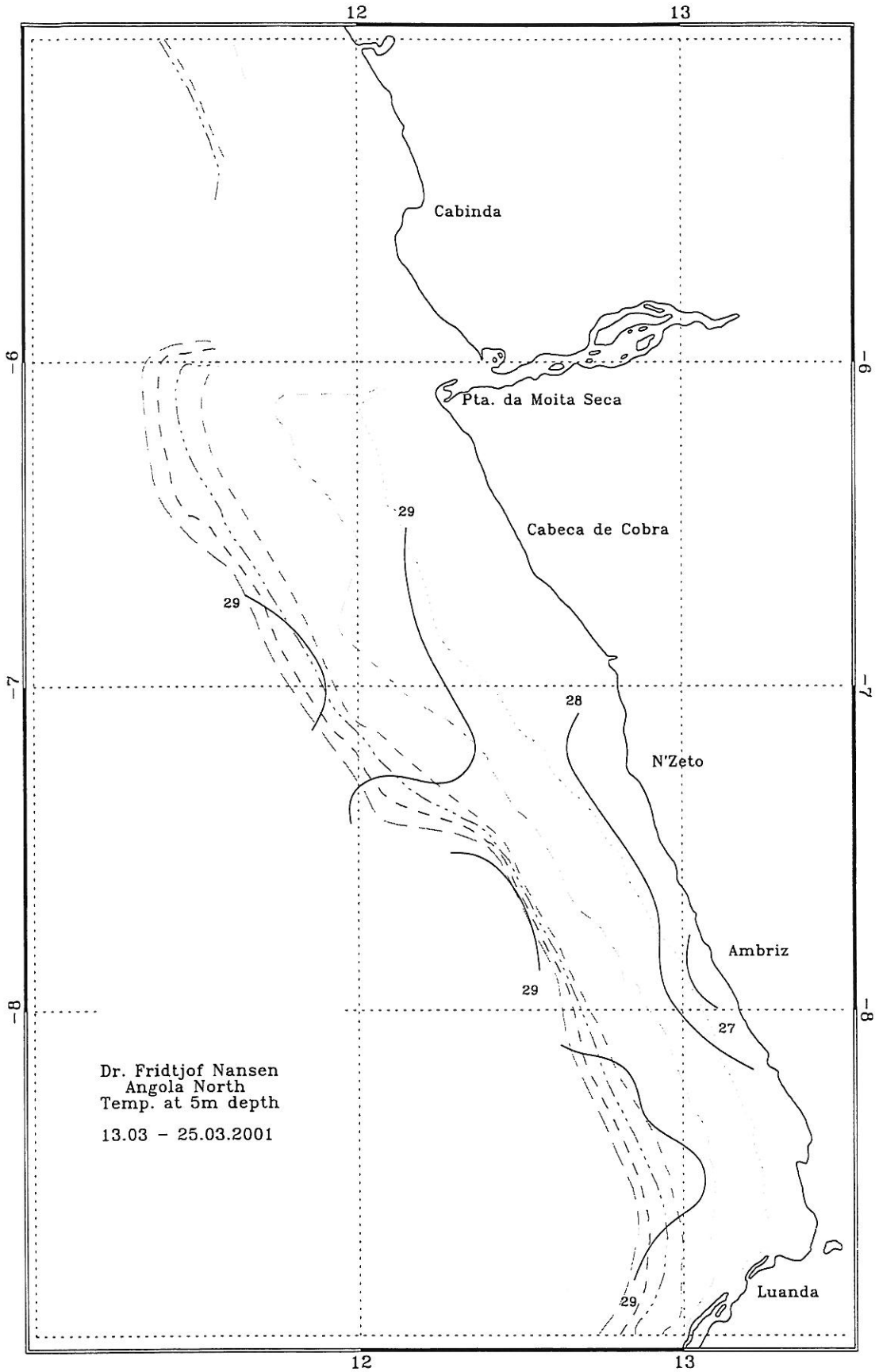

Figure 3.2a. Northern Angola. Horizontal distribution of surface temperature (5 m depth). Depth contours as shown in Fig. 2.2.

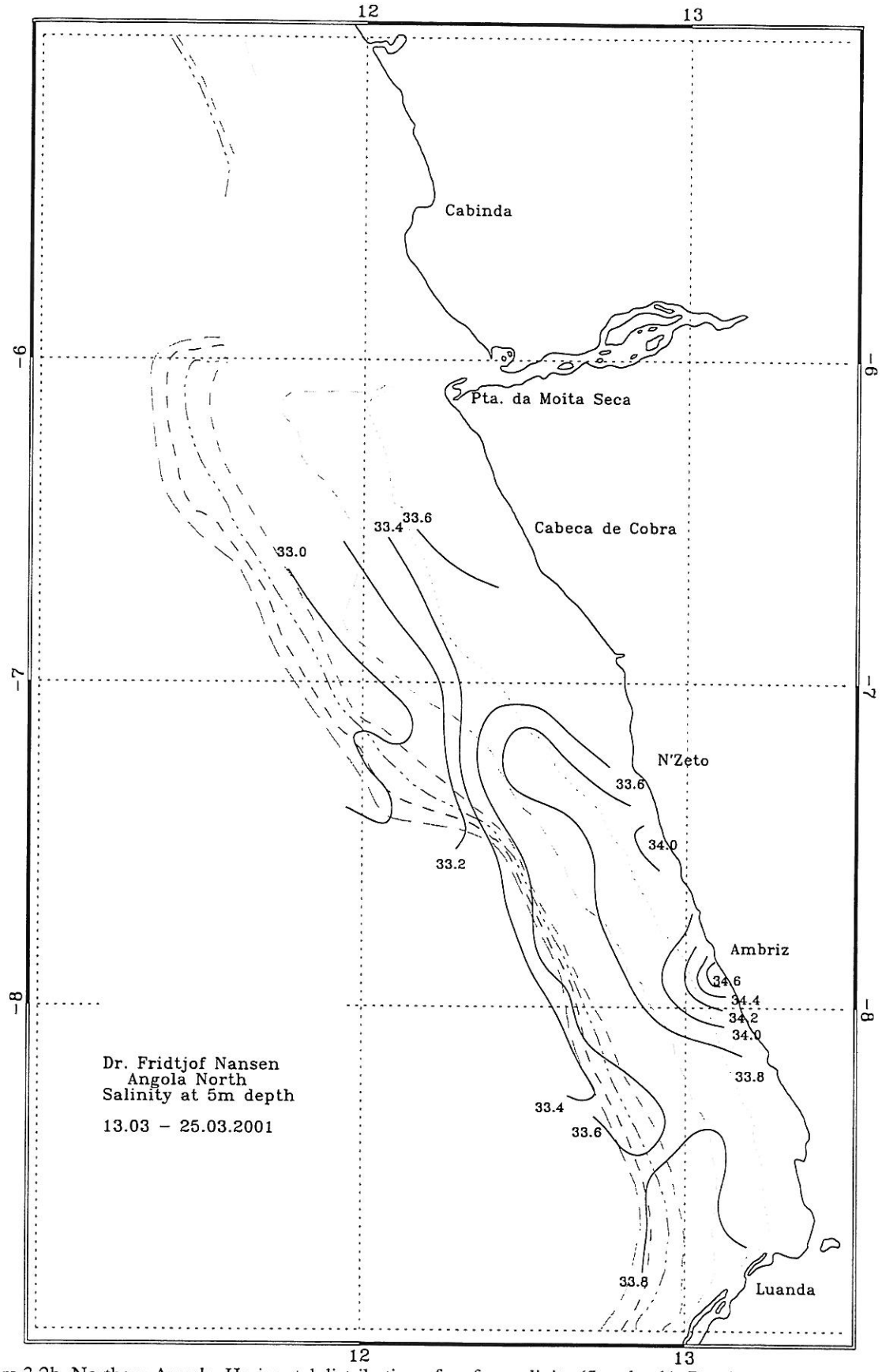

Figure 3.2b. Northern Angola. Horizontal distribution of surface salinity (5 m depth). Depth contours as shown in Fig. 2.2.

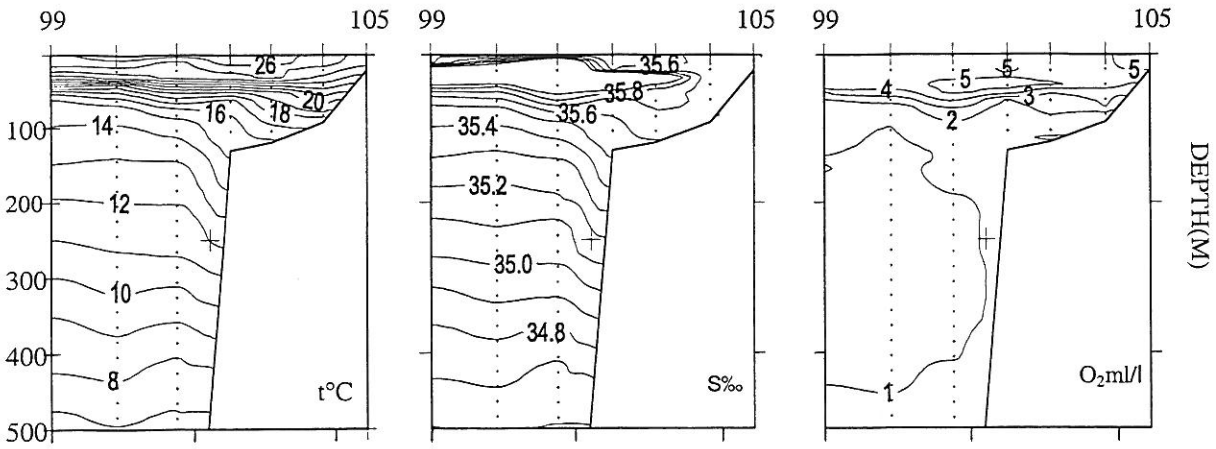

Figure 3.3a. Baía dos Tigres 03.03.2001.

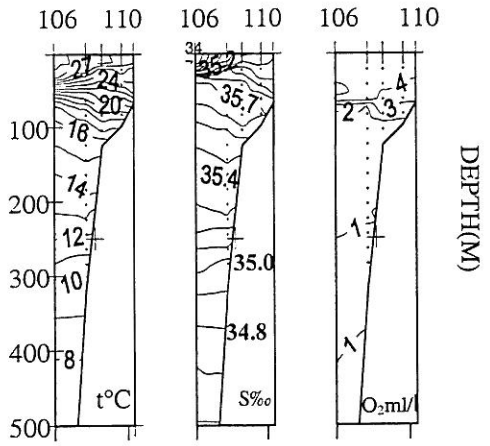

Figure 3.3b. Namibe 04.03.2001.

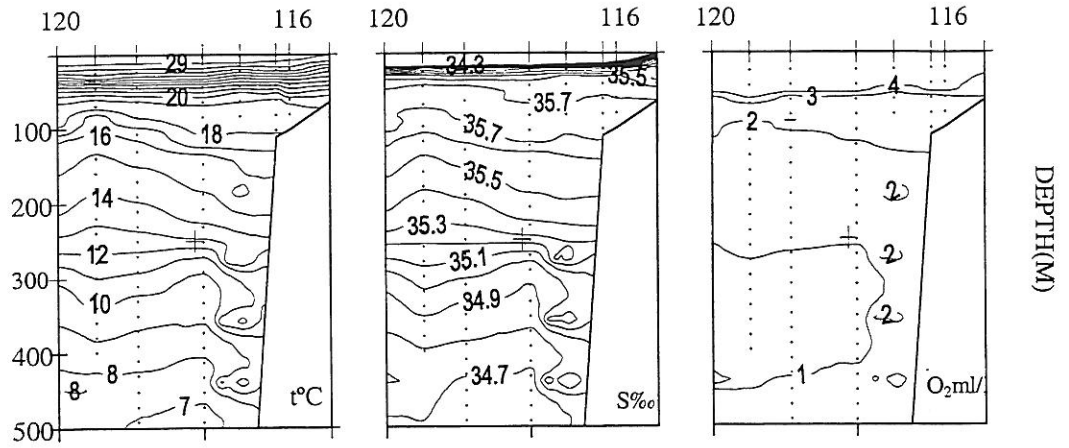

Figure 3.3c. Lobito 05.03.2001.

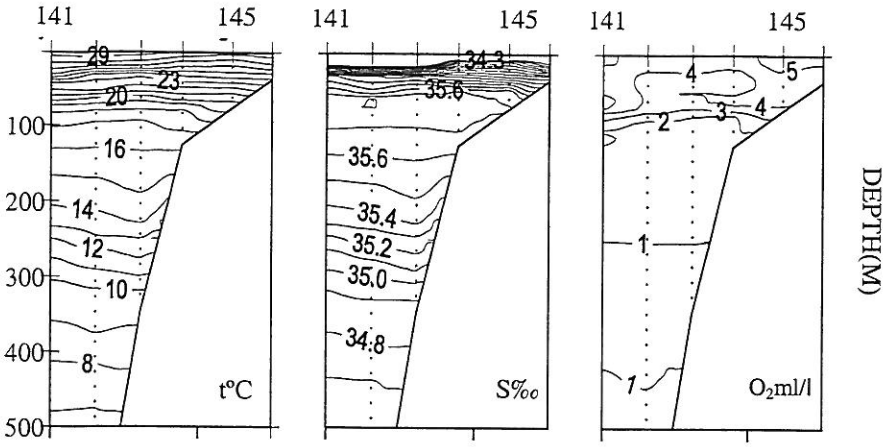

Figure 3.3d. Pta. do Morro.

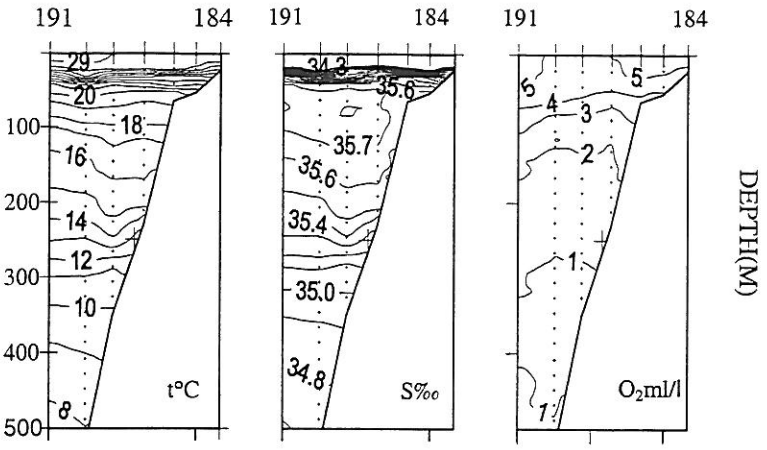

Figure 3.3e. Pta. das Palmerinhas.

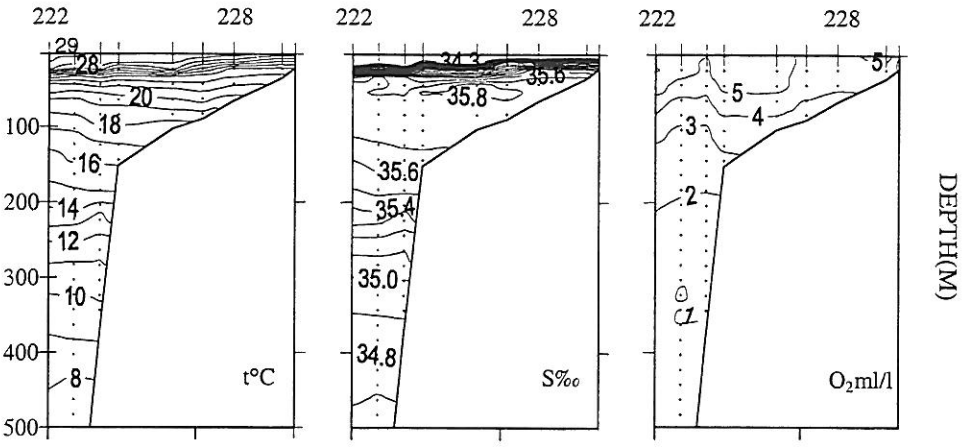

Figure 3.3f. Ambriz.

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. 2.2 - 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/NM^2) 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 Luanda - Benguela shelf

A total of 46 successful swept-area trawl stations were accomplished on the shelf area (Table 2.1). Table 4.1(a and b) presents the catch rates by main species groups on the inner and outer shelf.

Table 4.1. Central region, March 2001. 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
2429	42	261.6	37.3	2.4	0.8		51.8	354.0
2435	27	327.7	77.1	1.2	5.8		79.1	490.9
2436	66	368.2	182.8				29.2	580.2
2444	35	107.1	122.3		0.6		30.9	260.8
2445	33	25.4	100.9		0.7		8.4	135.4
2446	34		28.9		4.3		11.8	45.0
2447	54	0.2	1.4		4.6		6.1	12.2
2454	46	464.7	62.8		1.9		52.3	581.8
2460	33	7.0	119.1			2.9	17.6	146.6
2461	52	62.0	55.1		0.5		43.5	161.1
2462	63	4 349.6	248.6				73.4	4 671.6
2473	30	748.5	360.6				7	1 179.1
2474	24	22.7	33.7			4.3	3.3	64.0
2483	62	164.4	30.9		5.8		9.9	210.9
2484	26	25.8	35.0				58.0	118.8
2485	44	195.5	25.3	1.1	1.5	16.7	102.5	342.5
2486	65	55.1	43.5		0.4		0.6	99.6
2491	66	232.9	76.3		3.2		0.7	313.1
2492	39	168.2	7.1		0.2		18.1	193.6
2493	70	7.0	3.8		2.0		5.4	18.1
MEAN	45.55	379.7	82.6	0.2	1.6	1.2	33.6	499.0
SE		213.3	20.2	0.1	0.5	0.9	6.9	227.9
% CATCH		76.1	16.6	0.1	0.3	0.2	6.7	

As usual the 'Demersal' group dominated on the inner shelf with a relative contribution of 76%. The average catch rate was only about 40% of what was obtained in 1999 and 2000. The 'Pelagic' group contributed 17% and also had an average catch rate less than half of those found in the two previous surveys. Shrimps, cephalopods and sharks contributed less than 1% each and were much less frequent.

On the outer shelf the group of non-commercial species had the highest average catch rate, closely followed by the 'Demersal' group, and then came the 'Pelagic' group. The catch rates were higher than on the inner shelf, while in 1999 and 2000 the opposite was found. Like in the 2000 survey the most abundant species were *Brachydeuterus auritus* and *Synagrops microlepis*. Juveniles of *Trachurus trecae* also occurred quite frequently. Cephalopods, shrimps and sharks were more abundant than on the inner shelf, and their average catch rates were higher than in the 1999 survey and more similar to what was obtained in 2000.

Table 4.1. continued...
b) Outer shelf 71-200 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2430	73	931.9	427.2		27.0		184.7	1 570.8
2431	106	1 458.6	1 327.9		3.3		188.6	2 978.3
2434	87	36.2	363.0		3.3		25.6	428.1
2437	105	436.0	2.9		3.6		5.5	447.9
2438	191	37.6	17.9		8.9		144.8	209.2
2442	109	358.9	335.0		1.6		17.0	712.5
2443	77	460.5	154.4		0.7		21.8	637.4
2448	160	92.6	449.4	57.2	310.4		217.9	1 127.5
2452	125	98.4	281.1	2.6	2.6	11.5	251.0	647.2
2453	80	4 021.3	937.0	3.3			50.9	5 012.4
2455	84	669.4	121.5				13.6	804.6
2456	107	132.6	936.0		6.8		517.7	1 593.1
2457	168	45.5	0.4	1.9	38.6		197.4	283.8
2463	99	15.7	206.0		3.2	8.4	42.8	276.1
2464	178	229.5	28.9			53.2	9 688.7	10 000.4
2470	156	163.1	2.8		0.3		86.5	252.8
2471	96	10.1	352.0		0.4	7.3	7.3	377.1
2472	72	221.0	548.3				461.8	1 231.0
2475	83	381.2	456.0				24.2	861.4
2476	107	318.5	191.0		1.2	14.7	7.0	532.3
2477	179	93.9	3.8	0.3	3.0	2.3	164.5	267.9
2481	170	26.0	45.7	3.9	1.7		115.5	192.7
2482	101	389.0	61.7		6.4		39.3	496.4
2487	95	6.0	83.5		2.9		2.1	94.4
2490	108	51.7	98.7		8.7		15.3	174.5
2494	119	121.8	32.8		13.6		71.8	24
MEAN	116.7	415.7	287.1	2.7	17.2	3.8	483.2	1 209.6
SE		158.1	66.3	2.2	11.9	2.1	369.2	407.6
% CATCH		34.4	23.7	0.2	1.4	0.3	40.0	

4.2 Pelagic group

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 dominated on both the inner and outer shelf with much lower average catch rates on the inner shelf and somewhat higher on the outer shelf compared to 1999 and 2000. Like in previous years the most abundant species were Cunene horse mackerel (*T. trecae*), Atlantic bumper (*Chloroscombrus chrysurus*) and African lookdown (*Selene dorsalis*). "Clupeids" were caught only on a few stations, mainly on the inner shelf, and consisted of *Sardinella aurita, S. maderensis* and *Ilisha africana*. In 1999 anchovies (*Engraulis encrasicolus*) were the most abundant clupeid, while this species was not encountered in the 2000 and 2001 surveys. Also barracudas were mainly caught on the inner shelf, while hairtail was found both on the inner and outer shelf, with highest average catch rate on the latter. Both groups had lower catch rates than last year's estimate. Like in the previous survey scombrids were scarce.

Table 4.2. Central region, March 2001. 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
2429	42		2.9	2.6	5.0	26.8	316.7	354.0
2435	27	13.0	33.4		30.7		413.8	490.9
2436	66	0.3	111.3		71.2		397.4	580.2
2444	35	7.6	79.2		11.1	24.4	138.6	260.8
2445	33	0.5	97.6		1.0	1.8	34.5	135.4
2446	34		28.9				16.0	45.0
2447	54		1.4				10.9	12.2
2454	46		1		45.1	7.7	518.9	581.8
2460	33		109.1		1.0	9.0	27.5	146.6
2461	52	0.3	19.3			35.4	106.0	161.1
2462	63		187.4		16.5	44.7	4 423.0	4 671.6
2473	30		340.4		18.6	1.5	818.5	1 179.1
2474	24		33.7				30.3	64.0
2483	62		17.3			13.6	180.1	210.9
2484	26		32.7	0.9		1.4	83.8	118.8
2485	44		1.0			24.3	317.2	342.5
2486	65	0.6	24.5		4.1	14.3	56.0	99.6
2491	66	0.6	48.5		4.3	22.9	236.8	313.1
2492	39		7.1				186.6	193.6
2493	70		0.3			3.4	14.4	18.1
MEAN	45.6	1.2	59.3	0.2	10.4	11.6	416.3	499.0
SE		0.7	18.4	0.1	4.2	3.1	216.0	227.9
% CATCH		0.2	11.9	0.0	2.1	2.3	83.4	

Table 4.2 continued...

b) Outer shelf 71-200 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other	Total
2430	73		28.8		398.4		1 143.6	1 570.8
2431	106		1 327.9				1 650.4	2 978.3
2434	87		247.5		111.9	3.6	65.1	428.1
2437	105		2.9				445.0	447.9
2438	191			1.9	16.0		191.3	209.2
2442	109		334.2	0.4	0.4		377.5	712.5
2443	77	5.4	124.3		16.0	8.6	483.0	637.4
2448	160			7.3	442.1		678.1	1 127.5
2452	125		278.1	0.9	2.1		366.1	647.2
2453	80		725.2		211.7		4 075.5	5 012.4
2455	84		119.1			2.4	683.1	804.6
2456	107		928.0		8.0		657.1	1 593.1
2457	168			0.4			283.4	283.8
2463	99		206.0				70.1	276.1
2464	178				28.9		9 971.4	10 000.4
2470	156			0.1	2.7		25	252.8
2471	96		307.4	11.8	32.8		25.1	377.1
2472	72		441.1		88.6	18.6	682.8	1 231.0
2475	83		392.3		15.3	48.4	405.4	861.4
2476	107		159.4		31.6		341.3	532.3
2477	179		0.8	0.3	2.6		264.1	267.9
2481	170		0.3		45.4		147.1	192.7
2482	101		19.5		42.2		434.7	496.4
2487	95		1.0		82.4		10.9	94.4
2490	108		61.0	7.3	30.4		75.8	174.5
2494	119		32.8				207.2	24
MEAN	116.7	0.2	220.7	1.2	61.9	3.1	922.5	1 209.6
SE		0.2	64.2	0.6	22.7	2.0	394.7	407.6
% CATCH		0.0	18.2	0.1	5.1	0.3	76.3	

4.3 Demersal groups

Table 4.3 (a and b) presents the catch rates of the most valuable demersal species on the shelf down to 200 m grouped into 'families': seabreams (Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *B. auritus*), and croakers (Sciaenidae).

Like in previous surveys seabreams was the main demersal group on both the inner and outer shelf, but the average catch rates were considerably lower than those obtained in 1999 and 2000, especially on the inner shelf. *Dentex macrophthalmus* was the dominating species followed by *Pagellus bellottii, D. angolensis* and *D. barnardi* (Annex III). The second most important demersal family on the inner shelf was Haemulidae, grunts, and consisted mainly of *Pomadasys incisus*, *P. rogeri*, and *P. jubelini.* Croakers, mainly *Umbrina canariensis*, *Atractoscion aequidens* and *Pseudotolithus typus* were also common, and the second most important group on the outer shelf. Grunts, croakers and groupers were less common than in the 1999 and 2000 surveys. Snappers were as usual very scarce, found only on one station on the inner shelf.

Table 4.3. Central region, March 2001. 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
2429	42	18.8		0.4			334.8	354.0
2435	27			1.1	125.2	59.2	305.4	490.9
2436	66	69.4			8.6	6.0	496.2	580.2
2444	35	16.6			25.4	2.0	216.8	260.8
2445	33	4.8			20.2		110.3	135.4
2446	34						45.0	45.0
2447	54	0.2					12.0	12.2
2454	46	33.1			22.3	19.7	506.7	581.8
2460	33	2.3			3.8		140.6	146.6
2461	52	12.3			45.1	3.2	100.6	161.1
2462	63	14.9			41.5		4 615.2	4 671.6
2473	30	163.0			8.7	9.0	998.3	1 179.1
2474	24	5.7			1.1		57.1	64.0
2483	62	127.3		3.1	12.6	16.2	51.7	210.9
2484	26	0.1	1.1		8.2	1.4	108.0	118.8
2485	44	21.5		3.3		57.4	260.3	342.5
2486	65	4.2					95.4	99.6
2491	66	7.3					305.8	313.1
2492	39	168.2					25.4	193.6
2493	70	7.0					11.2	18.1
MEAN	45.6	33.8	0.1	0.4	16.1	8.7	439.8	499.0
SE		12.1	0.1	0.2	6.5	4.0	226.0	227.9
% CATCH		6.8	0.0	0.1	3.2	1.7	88.2	

Table 4.3. continued...

b) Outer shelf 71-200 m

STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2430	73	34.9		12.6	68.4	24.4	1 430.6	1 570.8
2431	106	1 440.3					1 538.1	2 978.3
2434	87	11.5					416.6	428.1
2437	105	419.1				5.8	23.0	447.9
2438	191	29.2					18	209.2
2442	109	282.0				62.1	368.4	712.5
2443	77	127.3				3.6	506.5	637.4
2448	160	44.4				0.8	1 082.3	1 127.5
2452	125	78.9				9.2	559.1	647.2
2453	80	14.1					4 998.3	5 012.4
2455	84	125.2				8.2	671.2	804.6
2456	107	108.0					1 485.1	1 593.1
2457	168	44.6					239.2	283.8
2463	99	3.0					273.1	276.1
2464	178	229.5					9 770.9	10 000.4
2470	156	161.4					91.3	252.8
2471	96	4.3					372.8	377.1
2472	72	50.5			36.8	17.0	1 126.8	1 231.0
2475	83	60.3					801.2	861.4
2476	107	27.2				239.6	265.5	532.3
2477	179	93.9					174.0	267.9
2481	170	20.1				2.2	170.4	192.7
2482	101	4.2					492.2	496.4
2487	95						94.4	94.4
2490	108	19.4				29.5	125.6	174.5
2494	119	118.6					121.4	24
MEAN	116.7	136.6	0.0	0.5	4.1	15.5	1 053.0	1 209.6
SE		55.6	0.0	0.5	2.9	9.4	398.8	407.6
% CATCH		11.3	0.0	0.0	0.3	1.3	87.1	

Table 4.4a presents swept-area biomass estimates with 95% confidence limits for 1999 – 2001 and Table 4.4b gives the time series of swept-area biomass estimates back to 1986. This year's seabream estimate of 13 600 tonnes is one of the lowest in the time series, and only about 60% of the two previous estimates (1999 and 2000). Also the biomass estimate of croakers (1 700 tonnes) is one of the lowest in the time series and much lower than in 1999 and 2000. The estimated 3900 tonnes of grunts is slightly higher than the 1999 estimate, but only about half of what was estimated last year. The small biomass estimate of groupers (78 tonnes) is the lowest in the time series and outside last year's confidence limits. The sum of biomass estimates of valuable demersal species is 19 300 tonnes. This is the lowest since 1989 and the third lowest in the time series; in most years since 1991 this sum has been between 31 000 and 39 000 tonnes. The estimate is not within the confidence limits of last year's estimate.

Concerning the biomass estimates of the other groups and species presented in Table 4.4a, most of the results from the present survey are within the confidence limits of the 1999 and 2000 estimates and comparable to what has been obtained in most previous years.

Figure 4.1 shows the distribution of the seabreams in the region between Benguela and Luanda. The general distribution is similar to what was found in the two previous surveys, but with fewer and smaller areas of high concentration.

Table 4.4a. Biomass estimates (tonnes) with 95% confindence limits of valuable demersal and pelagic fish by main groups on the shelf in 1999-2001, Benguela-Luanda.

	Biomass in tonnes with 95% confidence limits ①								
	1999	1999 95% confidence limits		2000	2000 95% confidence limits		2001	2001 95% confidence limits	
Seabreams	19 960	8 224	31 694	22 452	14 731	30 173	13 594	5 029	22 160
Grunts	3 246	0	7 288	6 815	2 587	11 043	3 894	1 209	6 579
Croakers	9 907	0	23 857	5 435	2 787	8 084	1 745	255	3 236
Groupers	624	18	1 231	1 039	226	1 851	78	0	182
Sum demersal	33 737	9 449	60 047	35 741	24 839	46 644	19 311	10 437	28 186
Bigeye grunt	93 415	13 100	173 730	55 819	0	111 911	38 526	5 252	71 800
Horse mackerel	12 880	2 941	22 819	19 094	8 061	30 128	16 487	6 676	26 300
Other carangids	7 484	1 556	13 412	5 912	3 058	8 765	3 996	1 332	6 661
Barracudas	1 573	647	2 499	3 304	1 652	4 956	944	472	1 416
Hairtail	7 882	0	18 081	11 810	6 113	17 507	5 727	2 026	9 429

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.

Table 4.4b. 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 ☼	2000 ☼	2001 ☼
Seabreams	9 300	11 100	24 580	28 000	29 200	21 800	19 000	21 650	*56 110	19 960	22 452	13 594
Grunts	2 700	5 600	5 500	2 000	120	3 400	5 230	2 320	*12 700	3 246	6 815	3 894
Croakers	5 500	1 450	19 000	2 000	4 010	13 290	6 140	8 490		9 907	5 435	1 745
Groupers	470	550	1 000	1 000	350	470	830	300	330	624	1 039	78
Sum demersal	17 970	18 700	50 080	33 000	33 680	38 960	31 200	32 760	*78 830	33 737	35 741	19 311
Bigeye grunt	44 600	18 500	18 500	52 000	2 990	29 500	31 120	44 110	34 765	93 415	55 819	38 526
Horse mackerel	21 000	7 200	48 500	75 000	65 100	4 200	37 090	42 480	5 500	12 880	19 094	16 487
Other carangids	3 100	8 500	290	1 640	2 790	8 400	5 360	16 120	2 360	7 484	5 912	3 996
Barracudas	1 900	3 000			740	2 700	1 540	4 810	755	1 573	3 304	944
Hairtail	17 300	12 500	4 100	1 300	26 200	5 300	5 080	23 120	47 351	7 882	11 810	5 727

✣ 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

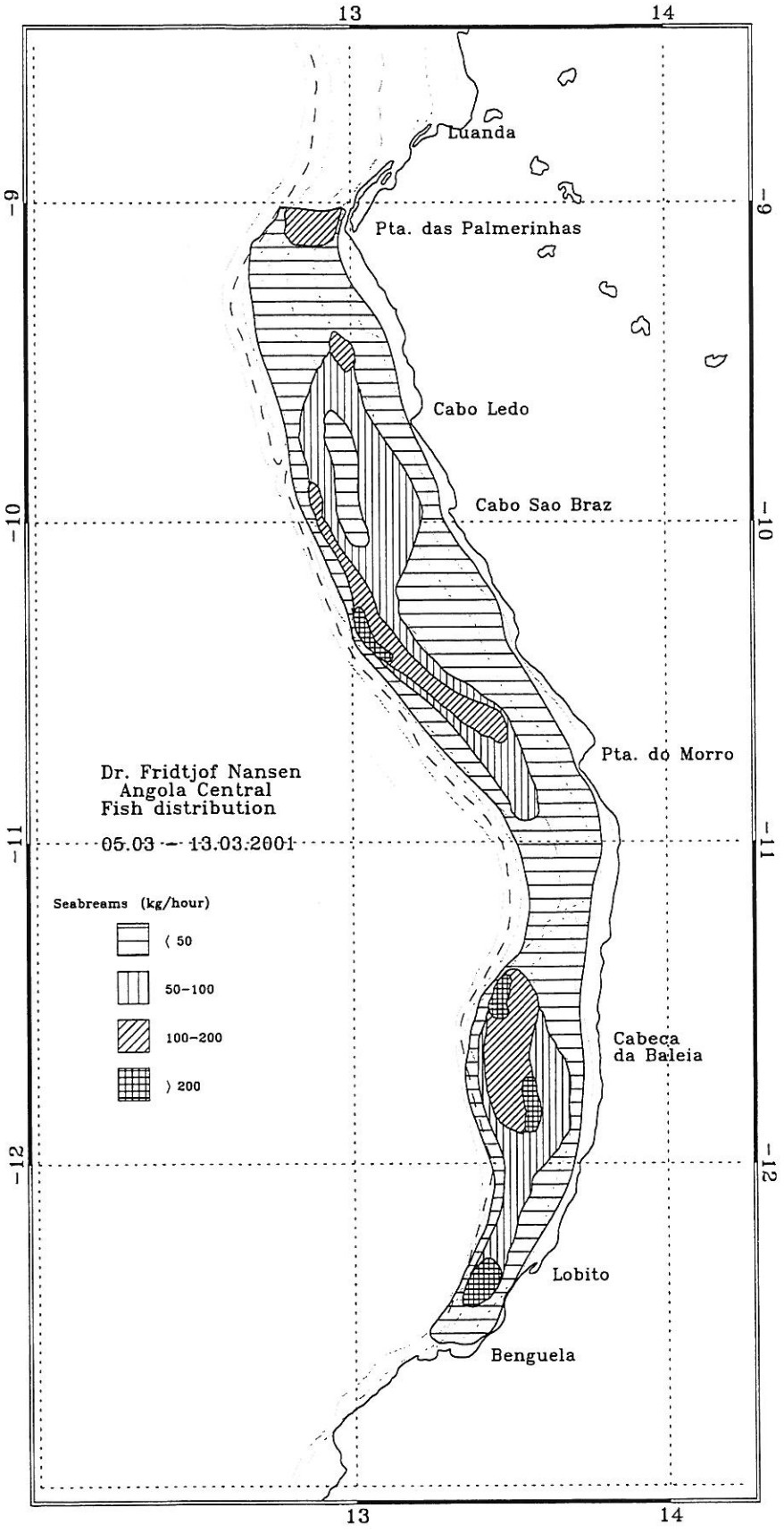

Figure 4.1. Estimated distribution of seabreams (family Sparidae). Benguela-Luanda. Depth contours as in Fig. 2.2.

4.4 Luanda-Congo River shelf

The present survey covered the northern region of Angola from Luanda to around Cabeça da Cobra (6º44' S) (Fig. 2.3). The Cabinda region is now practically inaccessible to fisheries surveys due to the increased restrictions from the oil exploitation. However, most of the previous surveys have also covered the Cabinda region north to the Congo River. This difference in the survey designs should be remembered when comparing the biomass tables presented.

A total of 43 successful swept-area trawl stations were accomplished on the shelf area (20-200 m) in the northern region (Table 2.1). Table 4.5 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 4.5. Northern region, March 2001. 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
2516	45	823.9	101.6	0.6			159.8	1 085.8
2517	44	309.8	84.3	8.7		25.9	42.9	471.5
2526	62	88.2	71.2		3.2		52.0	214.7
2527	42	85.4	47.4	0.1			4.8	137.7
2528	20	104.3	760.6			24.4	16.4	905.6
2537	67	17.9	19.8		1.5		2.0	41.2
2538	36	227.8	127.4	17.3		4.0	156.6	533.1
2539	25	285.5	23.6	1.1		9.2	54.3	373.8
2547	51	75.5	3.0		7.8	5.2	4.4	96.0
2548	36	21.3	2.2		0.9		6.1	30.5
2556	32	39.8					3.6	43.4
2557	53	18.6					0.9	19.5
2566	24	60.3	5.3				69.4	134.9
2567	24	33.0	15.6				1.6	50.3
2574	48	60.8			3.2		1.3	65.2
MEAN	40.6	150.1	84.1	1.9	1.1	4.6	38.4	280.2
SE		54.0	49.5	1.2	0.6	2.3	13.9	86.5
% CATCH		53.6	30.0	0.7	0.4	1.6	13.7	

On the inner shelf, the "Demersal" group dominated with a contribution of 54% from the total catches. However the mean catch rate was less than half the values obtained in the central region, and somewhat lower than the one found in March 2000 when the demersal group did not dominate the overall catches. The mean catch rate of the "Pelagic" group was less than half of what was obtained in the previous survey. Shrimps, cephalopods and sharks were like in previous years much less frequent and contributed little.

On the outer shelf the "Pelagic" group was the most important with a relative contribution of 45%, while the "Demersal" group contributed about 35%. Also here the mean catch rate of the "Demersal" group was less than half of that in the central region, and also considerable lower than in March 2000. The "Pelagic" group had catch rates similar to what was found in

the central region and somewhat higher than those obtained during last year's survey. Cephalopods were more abundant than on the inner shelf, while sharks and shrimps was less frequent.

Table 4.5 continued...
b) Outer shelf 71-200 m

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2499	184	10.7	0.2	6.8			34.4	52.0
2500	83	506.6	202.4				144.0	853.0
2501	82	228.1	1 744.8		97.2		321.6	2 391.7
2502	113	53.6	57.6		3.6		3.4	118.3
2503	187	36.2	31.2	10.8	1.4		307.7	387.4
2508	167	8.5	2.5	5.3	0.2		23.8	40.3
2509	109		16.9				0.0	16.9
2510	89	466.5	117.2		8.2	9.7	25.6	627.1
2511	97	821.0	93.9		2.1		11.7	928.8
2512	174	5.0	1 846.7	2.3	8.1		110.1	1 972.3
2523	131	23.7	2.8		0.3	12.5	5.5	44.8
2524	106	21.4	9.7		0.8		6.1	37.9
2525	87	142.0	6.3		1.7		4.8	154.7
2534	159	34.3	180.1		3.5		38.9	256.8
2535	101	7.1	17.7		5.8		14.1	44.7
2536	88	39.9	6.4		5.6		3.9	55.8
2544	114	245.7	45.1		0.4		96.3	387.5
2545	101	693.3	40.8		1.3		4.4	739.8
2546	82	36.2	0.6		0.3		10.2	47.3
2554	146	27.6	193.2		0.3		13.0	234.0
2555	102	71.9	3.1		8.6		13.8	97.3
2563	135	59	844.7		2.0		649.5	2 086.2
2564	108	77.0	32.6		20.3		4.1	134.0
2565	94	74.3	34.7		1.1		6.3	116.3
2572	174	34.7	7.1		1.9		514.9	558.7
2573	90	112.6	2.2		0.6		4.8	120.2
2575	79	75.4	223.6				6.0	305.0
2576	110	67.0	90.9				3.4	161.3
MEAN	117.6	161.1	209.1	0.9	6.3	0.8	85.1	463.2
SE		43.6	90.2	0.5	3.5	0.6	31.1	123.1
% CATCH		34.8	45.1	0.2	1.4	0.2	18.4	

4.5 Pelagic groups

Catch rates of the most important pelagic fish families, caught with bottom trawls during this survey, are presented in Table 4.6, a and b. Like in previous surveys and like in the central region Carangids dominated in the inner shelf with a similar mean catch rate as in the central region but much lower than in March 2000. Cunene horse mackerel (*T. trecae*) was the most frequent species. On the outer shelf hairtails, mainly *Trichiurus lepturus*, had the highest mean catch rate, about three times higher than the carangids. In the previous survey and in the central region carangids dominated also in the outer shelf. Barracudas were mainly caught on the inner shelf, while scombrids were a little more frequent on the outer shelf. Clupeids, with *I. africana, S. aurita* and *S. maderensis*, occurred on a few stations mainly on the inner shelf.

Table 4.6. Northern region, March 2001. 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
2516	45	10.4	88.1	3.0			984.2	1 085.8
2517	44	27.8	9.0		2.5	45.1	387.2	471.5
2526	62	0.6	2		45.6	5.2	143.5	214.7
2527	42	0.1	34.3		2.2	10.7	90.3	137.7
2528	20	22.9	646.2	1.3	7.7	82.4	145.1	905.6
2537	67				19.8		21.4	41.2
2538	36	39.6	3		6.5	51.4	405.7	533.1
2539	25	7.3	0.4		16.0		350.2	373.8
2547	51			3.0			92.9	96.0
2548	36		2.2				28.3	30.5
2556	32						43.4	43.4
2557	53						19.5	19.5
2566	24		5.3				129.6	134.9
2567	24		15.6				34.6	50.3
2574	48						65.2	65.2
MEAN	40.6	7.2	56.7	0.5	6.7	13.0	196.1	280.2
SE		3.3	42.5	0.3	3.2	6.6	66.0	86.5
% CATCH		2.6	20.3	0.2	2.4	4.6	70.0	

b) Outer shelf 71-200 m

STAT	Depth	Clupeids	Carangids	Scombrids	Hairtail	Barracudas	Other	Total
2499	184				0.2		51.8	52.0
2500	83	3.3	119.2	1.4	74.2	4.3	650.6	853.0
2501	82		120.8		1 624.0		646.9	2 391.7
2502	113		51.0		6.6		60.6	118.3
2503	187				31.2		356.2	387.4
2508	167				2.5		37.8	40.3
2509	109		4.5		12.4			16.9
2510	89		108.0		1.6	7.5	51	627.1
2511	97		80.9		10.3	2.8	834.8	928.8
2512	174	11.6			1 835.1		125.6	1 972.3
2523	131				2.8		42.0	44.8
2524	106	3.0	2.6		4.1		28.2	37.9
2525	87	0.6	3.9		1.9		148.4	154.7
2534	159				180.1		76.7	256.8
2535	101		17.7				27.0	44.7
2536	88		1.8		3.9	0.7	49.4	55.8
2544	114		41.6		3.5		342.4	387.5
2545	101	1.4	38.0			1.4	699.0	739.8
2546	82		0.6				46.7	47.3
2554	146		8.0		185.2		40.9	234.0
2555	102				3.1		94.3	97.3
2563	135		837.2		7.5		1 241.5	2 086.2
2564	108	1.6	29.0		2.0		101.4	134.0
2565	94	3.2	31.5				81.6	116.3
2572	174		0.3		6.9		551.5	558.7
2573	90		2.2				118.0	120.2
2575	79		14.0		209.6		81.4	305.0
2576	110		87.7		3.2		70.4	161.3
MEAN	117.6	0.9	57.2	0.1	150.4	0.6	254.1	463.2
SE		0.4	29.8	0.1	85.2	0.3	59.6	123.1
% CATCH		0.2	12.3	0.0	32.5	0.1	54.9	

4.6 Demersal groups

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

Among the seabreams, as during previous surveys, *P. bellottii* was the dominating species in the north (Annex III), followed by *D. angolensis*, *D. barnardi* and *D. congoensis*. The mean density of *D. macrophthalmus* was lower in the northern region compared with the central area and *Pagrus caeruleostictus* was present only in small quantities. The non-commercial bigeye grunt (*B. auritus*) was the overall most important species among the grunts, with a mean density about half of what was obtained in 1999 and 2000 cruises. However this value is only about 25% of what was found in the central region. Among the commercially important grunts, *P. jubelini* was most abundant in the northern area followed by *P. incisus*. Snappers were very scarce in the northern region and were represented by only one species

(*Lutjanus agennes*). In this survey groupers (*Epinephelus sp.*) were more abundant in the northern region. During the 2000 survey groupers were less common in the northern region compared with the central region, but with higher catch rates than in the present survey. Mean catch rates of croakers, mainly *P. typus,* were slightly higher compared with the central region. In the previous surveys croakers were common in the north but with lower catches in the central region.

In general, grunts were the main demersal group on the inner shelf whereas the seabreams dominated in the outer shelf like in the previous surveys. However, the average catch rates of the seabreams were lower than those obtained in 1999 and 2000. The distribution of this group seams to be consistent with the previous surveys (Figure 4.2). The high-density area off Ponta da Moita is not evident in this survey since the area was not surveyed.

Biomass estimates of the commercially important groups are presented in Table 4.8 (a-b). It should be noted that the time series of the biomass estimates (previous values taken from earlier reports) and those of catch rates some times do not correspond. For example the seabreams had a biomass estimate in 1994 and 1996 around 3 times higher than those of 1995, 1997 and 2000, while the catch rates were only 16% and 30% higher in 1994 and 1996, respectively. Similarly, the mean catch rates of seabreams in 1995 and 1997 were identical (48 kg/hr), while the biomass estimates differ in 2 000 tonnes. Also for grunts there seems to be inconsistencies between the biomass figures and the catch rates. This calls for reassessment of the biomass figures. The biomass estimates for the seabreams in this survey is one of lowest in the time series. In general this year's biomass estimates of demersal species were low compared with the previous years but within the confidence limits.

Table 4.7. Northern region, March 2001. 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
2516	45	169.4	194.5		327.9	103.5	290.5	1 085.8
2517	44	39.5			65.5	16.8	349.7	471.5
2526	62	9.4			78.4		126.9	214.7
2527	42	0.9					136.8	137.7
2528	20				1.1	0.8	903.7	905.6
2537	67	17.7					23.5	41.2
2538	36	22.9		5.0	49.3	28.8	427.1	533.1
2539	25	3.4	3.9	28.9	52.0	122.7	162.8	373.8
2547	51	69.4		6.1			20.5	96.0
2548	36	21.3					9.2	30.5
2556	32	37.8		2.0			3.6	43.4
2557	53	18.6					0.9	19.5
2566	24	43.0		17.3			74.6	134.9
2567	24	33.0					17.2	50.3
2574	48	50.8		1			4.5	65.2
MEAN	40.6	35.8	13.2	4.6	38.3	18.2	170.1	280.2
SE		10.8	13.0	2.2	21.9	10.2	63.3	86.5
% CATCH		12.8	4.7	1.7	13.7	6.5	60.7	

Table 4.7 continued...

b) Outer shelf 71-200 m

STAT	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
2499	184	0.8					51.2	52.0
2500	83	12.3				5.0	835.7	853.0
2501	82	24.6				1.5	2 365.6	2 391.7
2502	113	53.1					65.2	118.3
2503	187	7.0				9.6	370.8	387.4
2508	167	1.3					39.0	40.3
2509	109						16.9	16.9
2510	89	107.0			1.6	6.9	511.7	627.1
2511	97	3.4				13.6	911.7	928.8
2512	174	5.0					1 967.3	1 972.3
2523	131	23.7					21.1	44.8
2524	106	18.1				3.0	16.8	37.9
2525	87	79.5			11.5	51.0	12.8	154.7
2534	159	34.1					222.7	256.8
2535	101	5.6					39.1	44.7
2536	88	39.7					16.1	55.8
2544	114	29.5					358.0	387.5
2545	101	106.6					633.2	739.8
2546	82	34.5					12.8	47.3
2554	146	24.5					209.6	234.0
2555	102	70.6					26.7	97.3
2563	135	571.2					1 514.9	2 086.2
2564	108	75.0					59.0	134.0
2565	94	66.5		7.8			42.0	116.3
2572	174	33.1				1.6	524.0	558.7
2573	90	112.6					7.7	120.2
2575	79	66.8		8.6			229.6	305.0
2576	110	64.9					96.4	161.3
MEAN	117.6	59.7		0.6	0.5	3.3	399.2	463.2
SE		2		0.4	0.4	1.9	116.2	123.1
% CATCH		12.9		0.1	0.1	0.7	86.2	

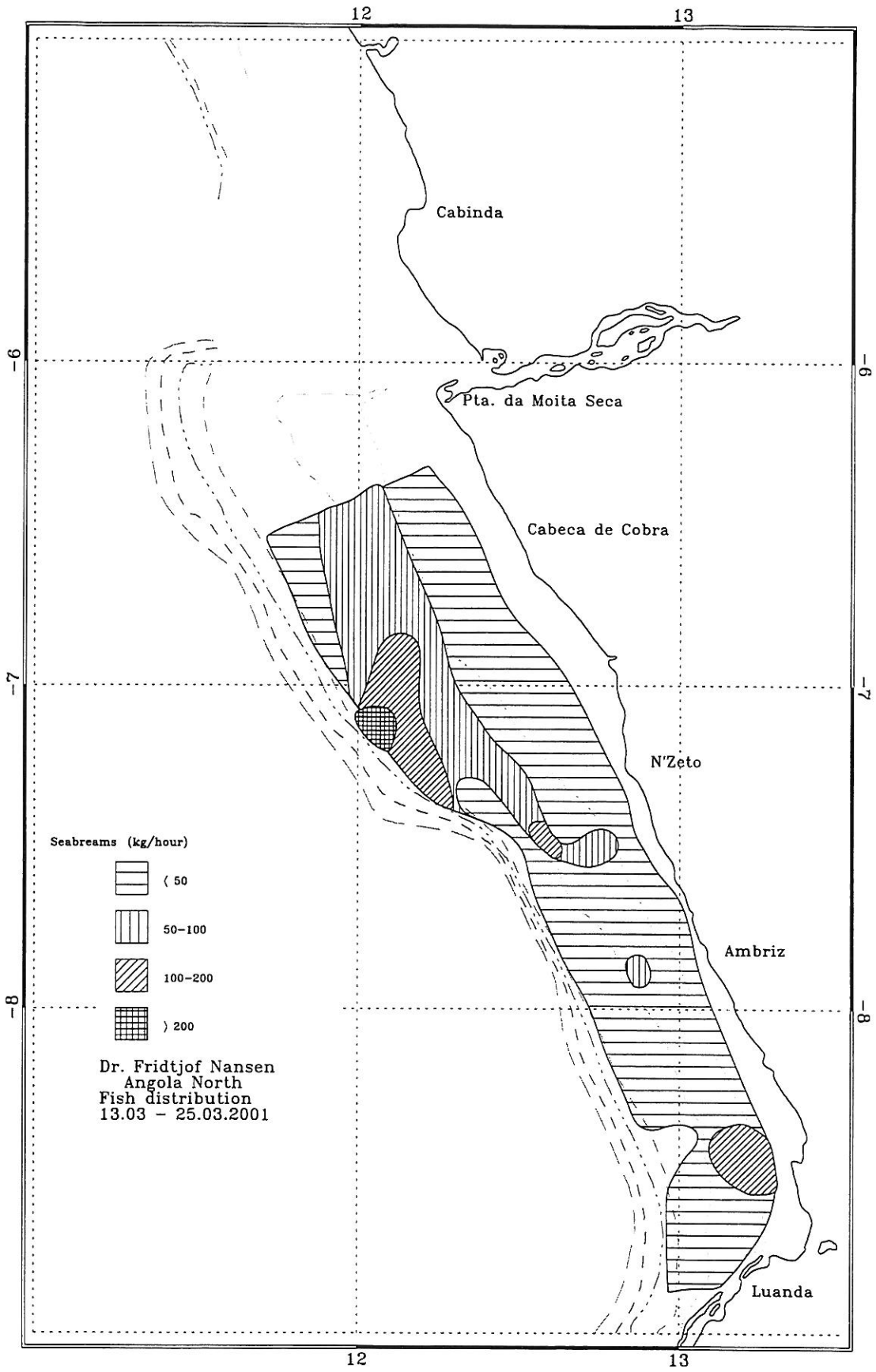

Figure 4.2. Estimated distribution of seabreams (family Sparidae). Luanda-Congo River. Depth contours as in Fig. 2.2

Table 4.8a. Biomass estimates (tonnes) with 95% confindence limits of valuable demersal and pelagic fish by main groups on the shelf in 1999-2001, Luanda-Congo River (2001 to north of Cabeça de Cobra).

	Biomass in tonnes with 95% confidence limits ①								
	1999	1999 95% confidence limits		2000	2000 95% confidence limits		2001	2001 95% confidence limits	
Seabreams	13 670	9 557	17 783	15 211	8 983	21 439	9 550	0	149 005
Grunts	5 630	1 187	10 074	380	0	838	3 475	0	7 616
Croakers	8 641	0	17 779	2 476	557	4 396	1 500	243	2 757
Groupers	1 020	274	1 765	639	288	991	793	0	1 724
Sum demersal	28 961	17 133	40 790	18 707	12 427	24 987	15 318	8 228	22 408
Bigeye grunt	37 669	19 172	56 167	22 774	3 705	41 844	12 631	2 505	22 757
Horse mackerel	4 170	1 659	6 556	5 373	1 634	9 113	5 490	0	11 314
Other carangids	12 409	3 051	21 766	17 850	0	37 491	3 823	0	9 327
Barracudas	2 371	736	4 405	1 164	0	2 761	863	105	1 620
Hairtail	16 931	9 460	24 401	5 690	1 384	9 995	17 789	0	37 131

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.

Table 4.8b. 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, and in 2001 Luanda to north of Cabeça de Cobra.

	Biomass tonnes✣											
	1986/I ☼	1989/I ☼	1991/II ◆	1992 ◆	1994 ◆	1995 ☼	1996 ◆	1997 ◆	1998 ◆	1999 ☼	2000 ☼	2001 ☼
Seabreams	14 700	9 500	16 500	16 000	*31 200	10 100	*30 200	12 130		13 670	15 211	9 550
Grunts	1 400	840	2 900	1 000	900	4 200	11 200	10 460	No	5 630	380	3 475
Croakers	5 200	4 600	15 600	14 000	6 100	4 100	11 600	10 050	Survey	8 641	2 476	1 500
Groupers	740	950	940	3 000	3 200	900	3 700	670		1 020	639	793
Sum demersal	22 040	15 900	35 940	34 000	41 400	19 300	56 700	33 310		28 961	18 707	15 318
Bigeye grunt	42 800	6 900	19 700	21 000	17 100	21 200	57 800	76 610		37 669	22 774	12 631
Horse mackerel	11 900	9 300	12 000	20 000	18 500	600	44 700	50 950		4 170	5 373	5 490
Other carangids	8 900	1 650	860	4 000	13 300	11 800	3 200	*143 790		12 409	17 850	3 823
Barracudas	1 800	900	-	1 000	820	4 100	200	120		2 371	1 164	863
Hairtail	9 600	2 200	8 300	7 000	8 900	11 200	6 700	9 190		16 931	5 690	17 789

✣ 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

4.7 Review of results

Tables 4.4 and 4.8 show the time series of biomass estimates of the most important 'inshore' species for the central and northern region, respectively. For the 'demersal' species, seabreams, grunts, croakers, and groupers, the estimates of this survey are lower than the estimates in 1999 and/or 2000 and this is reflected also in the overall demersal estimates which is the lowest in the time series. The 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.

For the 'pelagic' species there are less evident trends but somewhat more variation, particularly for horse mackerel, barracudas, and hairtail, although few of the changes are statistically significant different compared to the two previous years. Still, the pelagic species appear to be more influenced by the oceanographic conditions, with carangids fluctuating negatively with the warm, low salinity events in 1995 and this year.

As emphasized in previous reports, 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. The work that was initiated as a separate activity within the co-operation between IIM and IMR should be carried on, including analysis of the statistical properties of the survey indices. The possible association between catches and the seasonal and/or annual oceanographic conditions should be further examined.

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 24 swept-area hauls, and the slope of the northern region (Luanda-Congo River) was covered with 38 hauls. The distribution of the hauls by sector, position and depth intervals are shown in Table 2.1 and Figures 2.2 - 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 sector and main groups, using the same group definitions as in Table 4.1 (see Annex VI).

Table 5.1. Central region, March 2001. 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
2426	750	49.1	2.7	48.6	8.3	6.5	373.7	488.9
2427	523	295.7	30.1	31.7	17.0	6.4	166.7	547.6
2428	321	85.4	3.5	11.3	7.1		305.1	412.4
2432	594	52.2	2.5	15.1	12.9	2.0	242.3	327.0
2433	445	1.4	0.2	24.8		1.1	31.6	59.1
2439	272	207.7		4.9	59.5		137.4	409.6
2440	435	31.3	0.5	57.6	1.2	2.4	12.1	105.1
2441	639	56.6	1.1	22.2	6.5	2.3	435.3	524.0
2449	327	365.7	20.3	43.4		5.6	95.7	530.8
2450	620	37.0	8.1	13.6	7.1	3.4	90.0	159.2
2451	446	16.5	3.3	273.3	9.6	5.1	123.6	431.4
2458	415	117.4	2.3	153.4	1.6	1.2	89.8	365.6
2459	718	155.0		4.3	16.6		1 015.9	1 191.8
2465	234	273.6		3.5	15.1		437.3	729.5
2466	376	68.9	1.1	171.2	1.1		39.0	281.4
2467	532	5.9		48.6	0.9	0.3	57.5	113.2
2468	754			4.6	24.0	0.8	87.8	117.2
2469	297	61.2	12.8	2.1	4.7	206.3	281.2	568.3
2478	216	71.6	4.2	2.2	5.6		116.6	200.2
2479	459	117.9	0.3	4.9		6.9	49.6	179.6
2480	445	97.4	0.3	11.8	0.2	7.6	24.2	141.6
2489	774	2.5		2.9			159.0	164.3
2495	323	7.0	4.6	10.6	2.4		1 411.4	1 436.1
2496	674	20.7	0.7	36.1	4.9	20.6	134.5	217.5
MEAN	482.9	91.6	4.1	41.8	8.6	11.6	246.6	404.2
SE		20.5	1.5	13.5	2.6	8.5	67.0	68.5
% CATCH		22.7	1.0	10.3	2.1	2.9	61.0	

Table 5.2. Northern region, March 2001. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the slope (201-800m).

STAT	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
2497	540	51.9	13.9	42.4	3.8	18.2	136.5	266.7
2498	357	233.6	11.5	10.6	2.7		166.7	425.1
2504	369	249.0	3.3	24.6	5.4		384.6	667.0
2505	448	386.8	2.6	37.4	0.5	16.4	4.8	448.5
2507	629	17.7	1.2	137.7	6.1	53.0	93.8	309.5
2513	323	18.5	28.6	7.9	2.0		182.0	239.0
2514	569	0.2					17.8	18.1
2515	782	3.8	0.1	19.9	3.6		141.0	168.4
2518	688	36.2		114.2	15.0	0.4	733.4	899.2
2519	549	8.0		216.9	414.9	4.8	464.0	1 108.7
2520	453	54.2	4.8	568.8	7.8	0.9	235.5	872.0
2521	356	138.8	30.5	198.9	6.1		232.7	607.0
2522	241	62.6	80.8	4.3	4.0		395.8	547.6
2529	738	26.6		4.6		38.1	246.3	315.6
2530	550	8.7	6.0	196.3	0.8	13.9	150.2	375.9
2531	445	19.2	3.2	627.7		12.3	178.2	840.6
2532	338	7	73.1	23.4	5.0		389.5	561.1
2533	251	163.1	2.1	13.6	2.6		82.4	263.8
2540	647	31.7		268.7	24.4	9.8	475.2	809.7
2541	516	61.1	9.1	530.1	9.0	9.3	240.8	859.3
2542	343	131.0	35.2	68.8	1.7	1.4	250.1	488.3
2543	246	151.4	3.4	12.5	3.2	2.1	243.8	416.4
2549	745	2.4	14.5	9.4	8.2	5.7	342.6	382.8
2550	554	19.4	13.7	108.6	4.3	10.3	171.3	327.4
2551	441	47.7	119.4	40.6		8.1	229.6	445.3
2552	360	47.5	19.6	43.7	6.5	30.8	432.1	580.2
2553	228	185.5	12.3	3.1	2.1		327.0	530.1
2558	632	52.1	3.5	10.9	27.2	10.1	299.9	403.9
2559	522	40.7	13.6	18.0	1.0	5.0	157.7	236.1
2560	448	19.4	37.5	17.9	3.8	48.4	176.6	303.6
2561	344	40.1	51.2	16.1	8.9	3.2	284.6	404.1
2562	256	26.7	11.2	28.5	11.6	0.1	88.2	166.3
2568	629	122.2	12.6	20.2	14.2	5.0	368.1	542.3
2569	549	26.7	20.4	16.3	2.8	5.0	138.0	209.2
2570	341	24.8	13.5	21.6	3.0	0.4	238.4	301.7
2571	241	17.7		10.7	13.8		105.0	147.3
2577	284	20.9	11.4	3.5	6.6		841.4	883.8
2578	336	63.6	11.9	29.6	30.3	538.1	903.7	1 577.1
MEAN	455.0	70.6	17.8	92.8	17.4	22.4	277.6	498.7
SE		13.4	4.1	25.7	10.8	14.1	32.7	50.1
% CATCH		14.2	3.6	18.6	3.5	4.5	55.7	

As seen from Tables 5.1 and 5.2, the group of non-commercial species ("Other") was the dominating one. The "Demersal" group was the second most important and "Shrimp" contributed more here than on the shelf, while the "Pelagic" group contributed little. The overall catch rates of the "Demersal" group in the northern region were slightly lower than 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 10% of the total catches on the slope, while in the northern region this proportion is increased to about 19%.

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 also a major component on the slope down to 350 m. In the central region the overall average catch rate of *P. longirostris* was less than half of last year's estimate, while the average catch rate of *A. varidens* was slightly higher than what was found in March 2000. *N. africanus* was less abundant than in the two previous surveys.

Table 5.3. Central region, March 2001. Catch rates (kg/hour) by main commercial groups in swept-area bottom trawl hauls on the slope (201-800m).

STAT	Depth	Seabreams	Hake	*P.longirostris*	*A.varidens*	*N.africanus*	Other	Total
2426	750		31.8		34.0		423.1	488.9
2427	523		283.9		31.4		232.3	547.6
2428	321	36.9	48.5	11.2			315.8	412.4
2432	594		39.6		13.7		273.6	327.0
2433	445		1.4		4.3	11.9	41.5	59.1
2439	272	166.7	41.0	4.9			196.9	409.6
2440	435	0.5	30.8	1.5	9.5		62.9	105.1
2441	639		14.6	1.4	3.8		504.3	524.0
2449	327		365.7	18.9	0.3		145.8	530.8
2450	620		2.6		9.0		147.6	159.2
2451	446				4.8	263.4	163.2	431.4
2458	415		117.4	2.4	5.7		240.1	365.6
2459	718		1.6				1 190.2	1 191.8
2465	234		273.6	3.4			452.5	729.5
2466	376		68.9	4.9	5.9		201.7	281.4
2467	532		3.5		6.4		103.4	113.2
2468	754				2.0		115.2	117.2
2469	297	0.9	60.3	2.0			505.1	568.3
2478	216	46.4	13.6	2.2			137.9	200.2
2479	459		117.9		4.6		57.0	179.6
2480	445		97.4	0.1	3.6		40.5	141.6
2489	774				0.8		163.5	164.3
2495	323	0.8	5.5	1			1 419.8	1 436.1
2496	674		3.0		23.2		191.3	217.5
MEAN	482.9	10.5	67.6	2.6	6.8	11.5	305.2	404.2
SE		7.2	20.6	1.0	2.0	11.0	69.2	68.5
% CATCH		2.6	16.7	0.7	1.7	2.8	75.5	

Table 5.4. Northern region, March 2001. Catch rates (kg/hour) by main commercial groups in swept-area bottom trawl hauls on the slope (201-800 m).

STAT	Depth	Seabreams	Hake	*P.longirostris*	*A.varidens*	*N.africanus*	Other	Total
2497	540		31.8		8.1	31.9	194.9	266.7
2498	357		233.6	9.2			182.3	425.1
2504	369		249.0	3.8	0.3		413.8	667.0
2505	448		386.8	0.1	0.5		61.1	448.5
2507	629		5.4		1.2	134.8	168.1	309.5
2513	323		18.5	7.2			213.3	239.0
2514	569						18.1	18.1
2515	782				1.5		166.9	168.4
2518	688		5.8		1.5	112.6	779.2	899.2
2519	549		1.9		4.0	213.0	889.9	1 108.7
2520	453		49.4		6.0	562.8	253.8	872.0
2521	356		138.8	17.6			450.6	607.0
2522	241		62.6	4.3			480.6	547.6
2529	738		8.7		1.3		305.6	315.6
2530	550				1.1	195.2	179.6	375.9
2531	445		19.2	0.4	0.4	623.9	196.8	840.6
2532	338		7	23.0			468.0	561.1
2533	251		163.1	13.5			87.2	263.8
2540	647				1.6	264.4	543.8	809.7
2541	516		16.1		13.5	514.8	314.9	859.3
2542	343		131.0	68.6			288.6	488.3
2543	246		151.4	12.5			252.5	416.4
2549	745				5.9		376.9	382.8
2550	554		9.3		10.7	97.8	209.7	327.4
2551	441		47.7		8.6	32.0	357.0	445.3
2552	360		47.5	6.7			526.0	580.2
2553	228	175.9	0.6	3.1			350.5	530.1
2558	632		17.7		2.2	7.5	376.4	403.9
2559	522		16.5		8.7	8.9	202.0	236.1
2560	448		15.6	6.1	5.8	5.2	270.9	303.6
2561	344		40.1	14.6			349.4	404.1
2562	256		26.7	28.5			111.1	166.3
2568	629				1.3	17.9	523.1	542.3
2569	549		1.4		6.2	8.2	193.5	209.2
2570	341		24.8	17.2			259.7	301.7
2571	241		17.7	10.7			118.9	147.3
2577	284		20.9	3.5			859.4	883.8
2578	336		37.9	15.1			1 524.0	1 577.1
MEAN	455.0	4.6	54.4	7.0	2.4	74.5	355.7	498.7
SE		4.6	13.7	2.1	0.6	26.1	45.6	50.1
% CATCH		0.9	10.9	1.4	0.5	14.9	71.3	

In the northern sector the average catch rate of *P. longirostris* was slightly higher than last year's estimate, while the average catch rate of *A. varidens* was almost the same as found in 2000. The average catch rate of *N. africanus* was almost two times higher what was obtained in the previous survey.

Table 5.5. Rose shrimp (*Parapenaeus longirostris*). Mean catch rates (kg/hour) by region, depth range and year of investigation.

	Year of investigation												
Region/Depth	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000	2001
Luanda-Cabinda *													
100-200 m	4	+	+	2	3	8	No	+	2	No	2	+	1
200-300 m	60	10	8	18	15	34	Survey	6	26	Survey	21	14	11
300-400 m	4	5	1	+	12	10		1	4		6	9	18
Mean	19	5	2	8	10	16		3	10		7	4	8
Benguela-Luanda													
100-200 m	32	5	-	2	3	6	6	1	23	3	+	6	4
200-300 m	38	14	14	26	30	16	21	6	51	39	7	14	3
300-400 m	11	26	2	1	14	18	13	3	1	4	8	7	11
Mean	25	11	4	8	13	12	15	3	25	15	4	8	5

* 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 the deepest depth distribution since 1995. The overall mean catch rate was about half of last year's estimates and similar to those of 1999. In the northern region, the depth distribution was deeper than previous year, and the average catch rate was higher than last year but, about the same as the 1999 estimate.

Table 5.6. Striped red shrimp (*Aristeus varidens*). Mean catch rates (kg/hour) by region, depth range and year of investigation.

	Year of investigation												
Area/Depth	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000	2001
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	4
500-600 m	37	5	1	7	10	3		6	7		5	3	7
600-800 m	-	3	-	4	5	3		2	4		-	2	2
Mean	13	3	2	4	5	5		5	5		3	3	3
Benguela- Luanda													
300-400 m	1	1	3	1	1	17	11	3	7	7	5	4	2
400-500 m	22	10	19	2	23	13	22	23	16	24	4	12	5
500-600 m	16	6	32	5	15	17	4	21	4	10	16	9	17
600-800 m	-	-	-	15	10	9	7	7	-	26	-	3	10
Mean	13	6	12	6	12	14	12	13	9	22	8	6	8

* 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. In the central region the highest catch rate was observed in within the stratum 500-600 m. This is deeper than in 2000 and more similar to1999. The average catch rate was a little higher than found in 2000 and the same as in 1999, but among the lower in the time series. In the northern region the mean catch-rate was less than half of what was found in the central region, but the same as found in 1999 and 1998.

Biomass estimates of the main commercial shrimp species are presented in Table 5.7(a-b). In the central region the estimated biomass of *P. longirostris* is one of the lowest in the time series and only about the half of the 2000 estimate but within the 95% confidence limits. The present estimate is, however, almost two times higher than the 1999 estimate and outside the confidence limits of that estimate. The biomass estimate of *A. varidens* is also one of the lowest in the time series, though it is quite similar to the two previous estimates and within their confidence limits.

Table 5.7a. Biomass (t) and 95% confidence limits of commercial deep-water shrimps by region in 1999-2001.

	Year of investigation					
Region/Species	1999	95% CL	2000	95% CL	2001	95% CL
Luanda-Congo River						
Rose shrimp	540	305-775	503	326-680	655	384-926
Striped red shrimp	148	75-222	180	103-256	246	147-347
Scarlet shrimp	42	5-78	8	0-17		+
Benguela-Luanda						
Rose shrimp	227	82-372	758	232-1283	399	44-754
Striped red shrimp	503	102-903	382	270-494	424	207-641
Scarlet shrimp	14	0-30	3	0-10	+	+
Total	1474		1834		1745	

In the northern region, the estimated biomass of *P. longirostris* is similar to the previous estimates and within the 95% confidence limit. The biomass estimate of *A. varidens is* slightly higher than in previous surveys.

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

	Year of investigation												
Region/Species	1985/I	1986/I	1989	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000	2001
Luanda-Cabinda *													
Rose shrimp	380	150	550	615	1110	1580	No	210	830	No	540	503	655
Striped red shrimp	-	1200	400	515	610	500	Survey	440	590	Survey	148	180	246
Scarlet shrimp	-	+	+	130	+	+		50	10		42	8	+
Benguela-Luanda													
Rose shrimp	-	3400	700	680	710	460	750	130	1780	847	227	758	399
Striped red shrimp	-	1000	370	570	890	940	730	850	370	1493	503	382	424
Scarlet shrimp	-	100	+	+	+	+	+	90	10	187	14	3	+
Total		5850	2020	2570	3410	3480		1770	3580		1474	1834	1724

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

Conclusions

Table 5.7b gives the time series of biomass estimates for the main shrimp species. Although most of the values are within the estimated 95% confidence limits, the rose shrimp (*Parapenaeus longirostris*) shows cyclical fluctuations along the years of investigation without any general trend. As a short-lived species its abundance have a very strong dependence on the recruitment. Thus, fluctuations can be associated with the success of recruitment that may be largely influenced by environmental conditions. *A. varidens* seems to be more stable compared to the rose shrimp, but showed a decreasing trend in later years, particularly in the central region.

Judging from the observed general trend, it appears that most of the stocks showing fluctuations have peaked around 1997, which may indicate that common external factors are causing these variations. Anomalous oceanographic conditions, with warm low salinity water masses on the surface were found along the whole coast in 2000, resembling the conditions found in 1995. In this year's cruise the temperature was 1 degree higher in the central area and therefore could be one explanatory factor of the shrimp resources tendency to move to deeper waters. Thus, possible association between catches and the seasonal and/or annual oceanographic conditions should be analysed.

5.2 Benguela hake

Table 5.8 presents 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. 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. In the central region the mean catch rate obtained in the present survey was about the same as found last year and somewhat higher than in 1999. In the northern region the mean catch-rate was slightly higher than in 1999 and 2000.

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

	Year of investigation												
Region/depth	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000	2001
Luanda-Cabinda*													
100-200 m	+	3	1	13	+	2	No	-	+	No	+	+	1
200-300 m	59	44	11	104	28	9	Survey	43	63	Survey	4	78	63
300-400 m	289	145	382	264	134	194		136	302		121	89	99
400-500 m	258	223	564	224	43	86		96	17		74	76	104
500-600 m	83	25	28	21	12	6		7	3		6	5	10
600-800 m	-	56	-	12	1	10		8	2		-	4	5
Mean	114	72	203	90	40	47		48	65		30	27	37
Benguela- Luanda													
100-200 m	6	8	+	31	49	3	39	15	98	8	+	5	3
200-300 m	161	167	30	112	122	23	51	31	301	149	25	192	97
300-400 m	822	82	384	220	55	196	197	330	44	423	87	153	122
400-500 m	433	291	394	174	64	80	121	116	93	247	88	50	61
500-600 m	45	44	180	39	52	27	8	44	2	9	1	13	109
600-800 m	-	-	-	10	5	30	3	10	-	5	-	2	8
Mean	378	93	138	91	63	61	74	95	185	140	32	47	42

* 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(a-b). In the central region the estimated biomass was slightly lower than last year's result but within its confidence limits. The estimate is, however, only about one third of the biomass estimate from 1997 and one of the lowest in the time series.

In the northern region, the biomass estimates are similar to those of most previous surveys and within the confident limits of the two previous ones.

Table 5.9a. Biomass estimates (tonnes) with 95% confidence limits of hake by region, 1999 - 2001.

	Year of investigation					
Region	1999	95% CL	2000	95% CL	2001	95% CL
Luanda-Congo River	3 431	1 947-4 915	4 430	1 579-7 227	4 999	2 387-7 611
Benguela-Luanda	2 987	1 158-4 816	5 600	2 752-8 449	4 709	1 457-7 960
Benguela-Congo River	6 418		10 030		9 708	
Cunene-Tombua[1]	No survey		6 057	2 374-9 740		No survey

[1)] Includes *M. polli* and *M. capensis*

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

	Year of investigation												
Region	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997	1998	1999	2000	2001
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	4 430	4 999
Benguela-Luanda	31 400	5 300	11 000	8 100	6 670	4 950	6 830	7 510	15 230	11 370	2 987	5 600	4 709
Benguela-Cabinda	48 400	20 600	29 000	22 100	11 370	12 050		13 680	23 730		6 418	10 030	9 708
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	No survey

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

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

Figures 5.1 and 5.2 show the distribution of hake in the central and northern regions, respectively. The geographical distribution and areas of concentrations are similar to previous surveys. In the central region the areas with high concentrations are smaller than what was found in March 2000 and somewhat larger than in March 1999. In the northern region the highest concentration was found between Luanda and Ambriz.

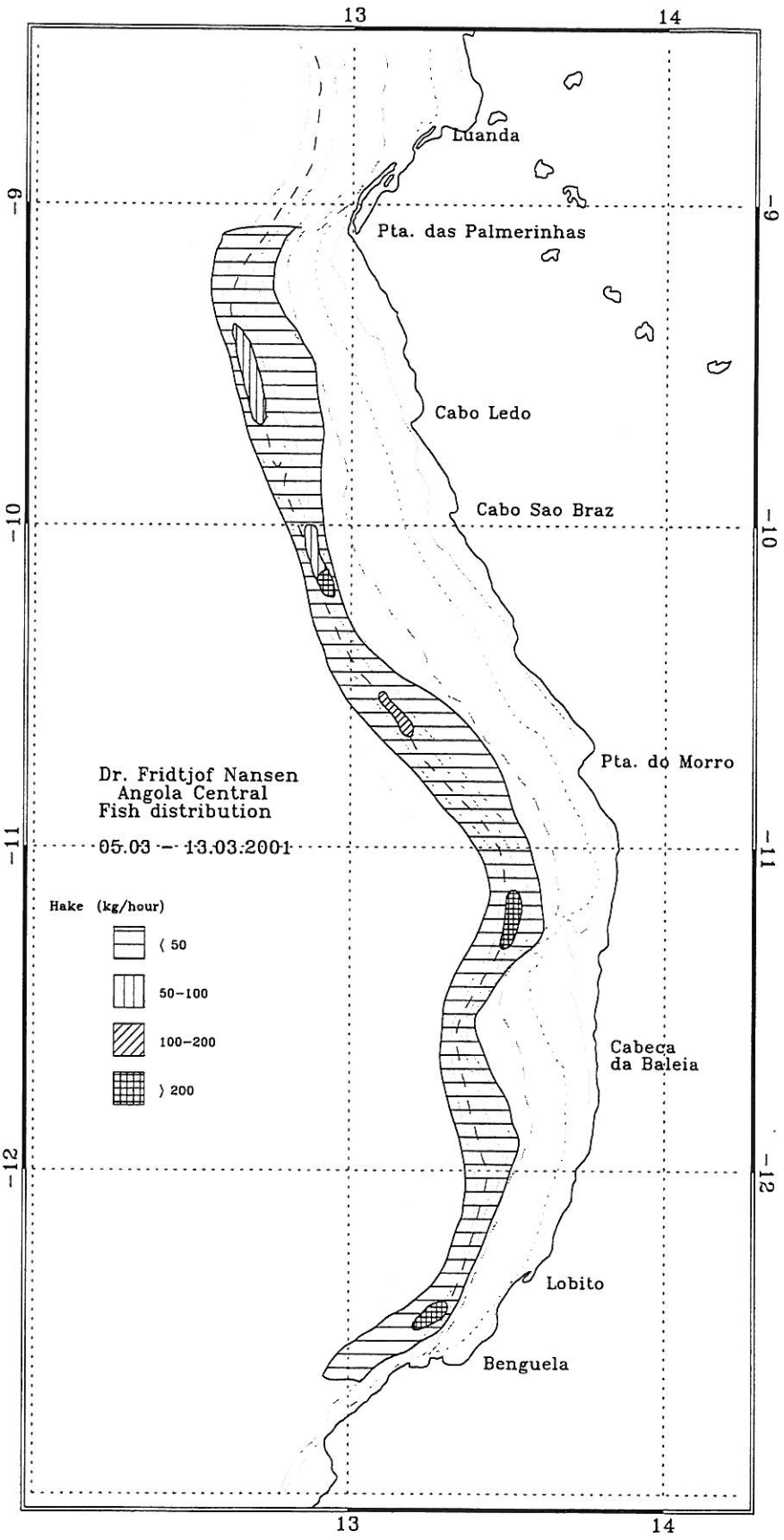

Figure 5.1. Estimated distribution of Benguela hake (*Merluccius polli*). Benguela-Luanda. Depth contours as in Fig. 2.2.

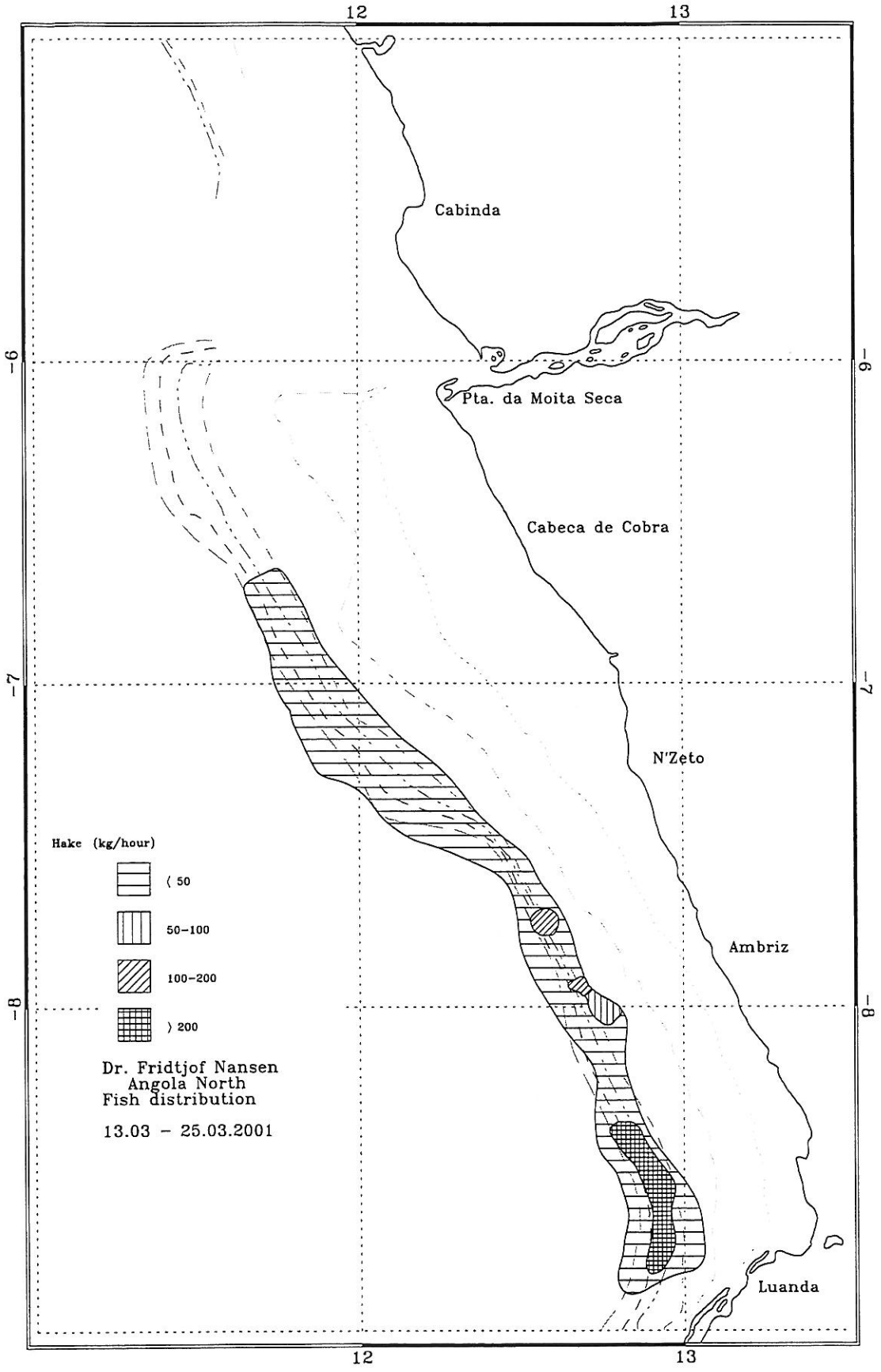

Figure 5.2. Estimated distribution of *Merluccius polli*. Luanda-Congo River. Depth contours as in Fig. 2.2.

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Annex I Records of fishing stations

PROJECT STATION:2426
DATE: 4/ 3/01 GEAR TYPE: BT No: POSITION:Lat S 1237
start stop duration Long E 1258
TIME :22:40:00 23:00:00 20 (min) Purpose code: 3
LOG :7742.00 7743.70 1.70 Area code : 2
FDEPTH: 750 750 GearCond.code:
BDEPTH: 750 750 Validity code: 1
Towing dir: 90º Wire out:1750 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 162.96 CATCH/HOUR: 488.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	126.63	4578	25.90	
Yarrella blackfordi	108.54	2754	22.20	
STROMATEIDAE	61.02	1122	12.48	
Nezumia leonis	53.46	1311	10.94	
Merluccius polli	28.50	33	5.83	
Aristeus varidens, male	18.90	4320	3.87	5352
Lamprogrammus exutus	17.28	54	3.53	
Aristeus varidens, female	15.12	1215	3.09	5353
Glyphus marsupialis	14.58	594	2.98	
OCTOPODIDAE	8.34	6	1.71	
Talismania bifurcata	7.56	135	1.55	
SYNAPHOBRANCHIDAE	6.21	123	1.27	
Etmopterus lucifer	4.86	42	0.99	
Bathyuroconger vicinus	3.51	27	0.72	
Merluccius paradoxus	3.30	3	0.68	
Benthodesmus tenuis	2.70	54	0.55	
POLYCHAELIDAE	2.43	81	0.50	
Halosaurus ovenii	2.16	54	0.44	
Deania calcea	1.62	15	0.33	
Chaceon maritae	1.20	6	0.25	
Ebinania costaecanarie	0.81	3	0.17	
Phrynichthys wedli	0.15	15	0.03	
Total	488.88		100.01	

PROJECT STATION:2427
DATE: 5/ 3/01 GEAR TYPE: BT No: POSITION:Lat S 1227
start stop duration Long E 1317
TIME :03:29:37 03:59:24 30 (min) Purpose code: 3
LOG :7778.03 7779.59 1.56 Area code : 2
FDEPTH: 530 515 GearCond.code:
BDEPTH: 530 515 Validity code: 1
Towing dir: 210º Wire out:1380 m Speed: 30 kn*10

Sorted: 162 Kg Total catch: 273.78 CATCH/HOUR: 547.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	283.88	448	51.84	5354
Laemonema laureysi	62.08	432	11.34	
Hoplostethus cadenati	49.92	2032	9.12	
Benthodesmus tenuis	30.08	1104	5.49	
Aristeus varidens, female	16.96	1312	3.10	5356
Aristeus varidens, male	14.40	1952	2.63	5355
Triplophus hemingi	14.40	1632	2.63	
SEPIOLIDAE	14.08	32	2.57	
Lamprogrammus exutus	11.84	48	2.16	
Xenodermichthys copei	10.08	1248	1.84	
Halosaurus ovenii	7.36	160	1.34	
Trachipterus jacksonensis	4.16	16	0.76	
Photonectes braueri	4.16	112	0.76	
Centroscymnus crepidater	4.16	32	0.76	
Malacocephalus laevis	3.52	144	0.64	
Chaceon maritae	3.20	16	0.58	
HISTIOTEUTHIDAE	2.88	16	0.53	
POLYCHAELIDAE	2.88	384	0.53	
Etmopterus sp.	2.24	22	0.41	
Chlorophthalmus atlanticus	1.92	48	0.35	
Ebinania costaecanarie	1.60	16	0.29	
Dibranchus atlanticus	1.28	48	0.23	
Glyphus marsupialis	0.32	96	0.06	
Raja sp.	0.16	16	0.03	
Total	547.56		99.99	

PROJECT STATION:2428
DATE: 5/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 1226
start stop duration Long E 1319
TIME :05:55:39 06:26:37 31 (min) Purpose code: 3
LOG :7789.81 7791.53 1.72 Area code : 2
FDEPTH: 315 326 GearCond.code:
BDEPTH: 315 326 Validity code: 1
Towing dir: 210º Wire out: 900 m Speed: 30 kn*10

Sorted: 57 Kg Total catch: 212.92 CATCH/HOUR: 412.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	93.75	6110	22.75	
Pterothrissus belloci	63.14	393	15.32	
Laemonema laureysi	55.28	1301	13.41	
Merluccius polli, juveniles	48.50	799	11.77	5357
Dentex macrophthalmus	36.93	112	8.96	5358
Coelorinchus coelorhincus	36.58	1924	8.88	
Chlorophthalmus atlanticus	14.90	1626	3.62	
Zeus faber	13.20	17	3.20	
Epigonus telescopus	10.57	95	2.56	
Parapenaeus longirostris, fem.	8.05	559	1.95	5359
Todaropsis eblanae	7.05	145	1.71	
Mystriophis rostellatus	6.23	41	1.51	
Helicolenus dactylopterus	5.69	27	1.38	
Chaceon maritae	4.45	15	1.08	
Trichiurus lepturus	3.45	4	0.84	
Parapenaeus longirostris, male	3.10	372	0.75	5360
MYCTOPHIDAE	0.54	339	0.13	
Gadella maraldi	0.54	27	0.13	
CONGRIDAE	0.27	14	0.07	
Solenocera africana	0.14	41	0.03	
Total	412.36		100.05	

PROJECT STATION:2429
DATE: 5/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1228
start stop duration Long E 1326
TIME :08:26:01 08:56:07 30 (min) Purpose code: 3
LOG :7805.67 7807.36 1.69 Area code : 2
FDEPTH: 39 45 GearCond.code:
BDEPTH: 39 45 Validity code: 1
Towing dir: 220º Wire out: 140 m Speed: 30 kn*10

Sorted: 61 Kg Total catch: 176.99 CATCH/HOUR: 353.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	241.08	39522	68.11	
Galeoides decadactylus	24.90	750	7.03	
Sphyraena guachancho	17.82	270	5.03	
Sphyraena sphyraena	9.00	30	2.54	
Pagellus bellottii	8.76	54	2.47	5361
Grammoplites gruveli	6.24	138	1.76	
Lithognathus mormyrus	5.40	12	1.53	
Citharus linguatula	5.16	120	1.46	
Trichiurus sp.	5.04	354	1.42	
Dentex barnardi	4.68	144	1.32	5363
Cynoglossus canariensis	3.12	12	0.88	
Rhinobatos albomaculatus	2.64	2	0.75	
Scomberomorus tritor	2.56	2	0.72	
Chaetodon hoefleri	2.52	12	0.71	
Penaeus notialis	2.40	246	0.68	
Raja miraletus	2.00	2	0.57	
Torpedo torpedo	1.96	2	0.55	
Trachurus trecae, juvenile	1.80	162	0.51	5362
Psettodes belcheri	1.32	66	0.37	
Brotula barbata	1.32	2	0.37	
Selene dorsalis	1.08	30	0.31	
Thorogobius angolensis	0.84	264	0.24	
Sepiella ornata	0.48	60	0.14	
ARGENTINIDAE	0.48	6	0.14	
Dicologoglossa cuneata	0.36	6	0.10	
Sepia orbignyana	0.36	6	0.10	
Epinephelus guaza ?	0.36	6	0.10	
Monolene microstoma	0.24	12	0.07	
Raja sp.	0.06	12	0.02	
Total	353.98		100.00	

PROJECT STATION:2430
DATE: 5/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1222
start stop duration Long E 1329
TIME :10:30:23 11:01:20 31 (min) Purpose code: 3
LOG :7819.74 7821.17 1.42 Area code : 2
FDEPTH: 70 75 GearCond.code:
BDEPTH: 70 75 Validity code: 1
Towing dir: 240º Wire out: 220 m Speed: 30 kn*10

Sorted: 71 Kg Total catch: 811.48 CATCH/HOUR: 1570.61

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	784.80	81482	49.97	
Trichiurus lepturus	398.40	25161	25.37	
C R A B S	45.60	358	2.90	
Citharus linguatula	38.40	1260	2.44	
Pomadasys jubelini	34.49	633	2.20	
Pomadasys incisus	33.89	240	2.16	
Trachurus trecae, juvenile	28.80	186	1.83	
Grammoplites gruveli	27.60	300	1.76	
Chaetodon hoefleri	27.00	60	1.72	
Sepia officinalis hierredda	27.00	180	1.72	
Pentheroscion mbizi	24.00	300	1.53	
Pagellus bellottii	20.40	600	1.30	
Torpedo torpedo	20.40	180	1.30	
Epinephelus marginatus	12.60	60	0.80	
Dicologoglossa cuneata	12.60	15	0.80	
Stromateus fiatola	8.40	10	0.53	
Brotula barbata	6.91	180	0.44	
Lithognathus mormyrus	5.79	1051	0.37	
Dentex canariensis	3.89	120	0.25	
Galeoides decadactylus	3.29	300	0.21	
Dentex macrophthalmus	2.69	60	0.17	
Dentex angolensis	2.09	60	0.13	
Zeus faber	1.12	2	0.07	
Atractoscion aequidens	0.39	2	0.02	
Fistularia petimba	0.27	2	0.02	
Total	1570.82		100.01	

PROJECT STATION:2431
DATE: 5/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1224
start stop duration Long E 1322
TIME :13:17:53 12:48:24 31 (min) Purpose code: 3
LOG :7839.34 7841.04 1.69 Area code : 2
FDEPTH: 107 105 GearCond.code:
BDEPTH: 107 105 Validity code: 1
Towing dir: 23º Wire out: 345 m Speed: 30 kn*10

Sorted: 123 Kg Total catch: 1538.70 CATCH/HOUR: 2978.13

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	1273.35	53249	42.76	5366
Dentex macrophthalmus	837.00	7508	28.10	5365
Pagellus bellottii	596.19	6881	20.02	5367
Citharus linguatula	146.32	348	4.91	
Selene dorsalis	54.58	99	1.83	5364
Trigla lyra	21.77	523	0.73	
Boops boops	15.68	523	0.53	
Chaetodon hoefleri	8.71	45	0.29	
Dentex angolensis	6.54	87	0.22	
Lagocephalus laevigatus	4.88	8	0.16	
Sepia officinalis hierredda	3.25	4	0.11	
Fistularia petimba	2.94	6	0.10	
Brotula barbata	2.67	2	0.09	
Raja miraletus	1.63	2	0.05	
Uranoscopus polli	0.77	4	0.03	
Zeus faber	0.74	2	0.02	
Torpedo torpedo	0.70	2	0.02	
Spondyliosoma cantharus	0.52	2	0.02	
Microchirus frechkopi	0.10	2		
Total	2978.34		99.99	

PROJECT STATION:2432

DATE: 5/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1220
start stop duration Long E 1320
TIME :16:23:44 16:53:51 30 (min) Purpose code: 3
LOG :7862.88 7864.44 1.55 Area code : 2
FDEPTH: 574 614 GearCond.code:
BDEPTH: 574 614 Validity code: 1
Towing dir: 20º Wire out:1480 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 165.10 CATCH/HOUR: 330.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	104.16	4480	31.54	
Laemonema laureysi	56.84	420	17.21	
Triplophus hemingi	47.88	6090	14.50	
Merluccius polli	39.60	56	11.99	
Yarrella blackfordi	12.60	378	3.82	
Lamprogrammus exutus	12.60	126	3.82	
Aristeus varidens, female	9.66	554	2.93	5369
Todaropsis eblanae	8.96	56	2.71	
Chaceon maritae	7.68	24	2.33	
Xenodermichthys copei	5.60	560	1.70	
Aristeus varidens, male	4.06	680	1.23	5368
Octopus sp.	3.92	14	1.19	
Nezumia leonis	3.36	98	1.02	
TRICHIURIDAE	2.52	112	0.76	
Etmopterus lucifer	1.96	14	0.59	
STOMIIDAE	1.40	42	0.42	
Glyphus marsupialis	1.40	154	0.42	
POLYCHAELIDAE	0.96	154	0.29	
Raja sp.	0.56	14	0.17	
Halosaurus ovenii	0.40	28	0.12	
Nezumia micronychodon	0.28	14	0.08	
Dibranchus atlanticus	0.28	14	0.08	
Coelorinchus coelorhincus	0.28	14	0.08	
Total	326.96		99.00	

PROJECT STATION:2433

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1205
start stop duration Long E 1325
TIME :01:16:49 01:46:33 30 (min) Purpose code: 3
LOG :7919.63 7921.24 1.61 Area code : 2
FDEPTH: 444 445 GearCond.code:
BDEPTH: 444 445 Validity code: 1
Towing dir: 15º Wire out:1220 m Speed: 30 kn*10

Sorted: 86 Kg Total catch: 29.55 CATCH/HOUR: 59.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	18.12	714	30.66	
Nematocarcinus africanus	11.92	6268	20.17	
PANDALIDAE	8.58	3862	14.52	
Yarrella blackfordi	6.04	192	10.22	
Laemonema laureysi	5.24	240	8.87	
Aristeus varidens, female	2.92	128	4.94	5371
Aristeus varidens, male	1.40	192	2.37	5370
Merluccius polli	1.36	2	2.30	
STOMIIDAE	1.12	22	1.90	
Ariomma bondi	0.68	22	1.15	
Etmopterus lucifer	0.68	22	1.15	
Galeus polli	0.40	12	0.68	
Benthodesmus tenuis	0.20	16	0.34	
Chaunax pictus	0.20	2	0.34	
Xenodermichthys copei	0.12	56	0.20	
Halosaurus ovenii	0.08	4	0.14	
Coelorinchus coelorhinc. polli	0.04	2	0.07	
Total	59.10		100.02	

PROJECT STATION:2434

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1205
start stop duration Long E 1334
TIME :05:27:06 05:57:36 31 (min) Purpose code: 3
LOG :7944.46 7945.84 1.38 Area code : 2
FDEPTH: 86 87 GearCond.code:
BDEPTH: 86 87 Validity code: 1
Towing dir: 200º Wire out: 270 m Speed: 30 kn*10

Sorted: 131 Kg Total catch: 221.17 CATCH/HOUR: 428.07

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	247.52	7868	57.82	5373
Trichiurus lepturus	111.87	172	26.13	
Brachydeuterus auritus	24.48	155	5.72	5372
Stromateus fiatola	11.46	10	2.68	
Lagocephalus laevigatus	10.30	15	2.41	
Pagellus bellottii	6.77	93	1.58	5374
Dentex angolensis	3.87	68	0.90	5375
Sphyraena sphyraena	3.58	35	0.84	
Octopus vulgaris	1.74	2	0.41	
Torpedo torpedo	1.74	4	0.41	
Sepia bertheloti	1.06	6	0.25	
Fistularia petimba	0.97	4	0.23	
Dentex barnardi	0.87	6	0.20	
Lepidotrigla cadmani	0.58	6	0.14	
Citharus linguatula	0.58	15	0.14	
Sepia orbignyana	0.48	6	0.11	
Boops boops	0.19	6	0.04	
Total	428.06		100.01	

PROJECT STATION:2435

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1159
start stop duration Long E 1343
TIME :07:43:45 08:14:17 31 (min) Purpose code: 3
LOG :7960.89 7962.21 1.67 Area code : 2
FDEPTH: 25 29 GearCond.code:
BDEPTH: 25 29 Validity code: 1
Towing dir: 230º Wire out: 90 m Speed: 30 kn*10

Sorted: 72 Kg Total catch: 253.60 CATCH/HOUR: 490.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	123.10	22378	25.08	
Pomadasys jubelini	111.02	290	22.62	5377
Pseudotolithus typus	30.85	43	6.29	5376
Trichiurus lepturus	30.66	348	6.25	
Galeoides decadactylus	27.41	128	5.58	
Chloroscombrus chrysurus	26.94	3554	5.49	
Pteroscion peli	24.62	1312	5.02	
Arius parkii	19.16	35	3.90	
Dicologoglossa cuneata	13.94	232	2.84	
Ilisha africana	13.01	499	2.65	
Pomadasys incisus	9.52	35	1.94	
Stromateus fiatola	8.59	12	1.75	
Selene dorsalis	6.50	325	1.32	
Sepiella ornata	5.57	418	1.13	
Cynoponticus ferox	5.15	8	1.05	
Pomadasys rogeri	4.65	12	0.95	
Pentanemus quinquarius	4.18	81	0.85	
Cynoglossus canariensis	3.75	2	0.76	
Atractoscion aequidens	3.72	46	0.76	
Grammoplites gruveli	3.72	35	0.76	
Torpedo marmorata	3.14	4	0.64	
Lagocephalus laevigatus	2.79	12	0.57	
Dasyatis margarita	1.78	4	0.36	
OPHICHTHIDAE	1.63	4	0.33	
Raja miraletus	1.55	2	0.32	
Parapenaeopsis atlantica	1.16	209	0.24	
Epinephelus aeneus	1.05	2	0.21	
Portunus validus	0.89	2	0.18	
Scorpaena sp.	0.58	12	0.12	
Octopus vulgaris	0.23	12	0.05	
Total	490.86		100.01	

PROJECT STATION:2436

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1153
start stop duration Long E 1340
TIME :09:29:22 09:59:50 30 (min) Purpose code: 3
LOG :7972.51 7973.71 1.20 Area code : 2
FDEPTH: 66 65 GearCond.code:
BDEPTH: 66 65 Validity code: 1
Towing dir: 180º Wire out: 220 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 286.72 CATCH/HOUR: 573.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	284.18	13108	49.56	5381
Trachurus trecae, juvenile	108.42	12736	18.91	5380
Trichiurus lepturus	71.24	196	12.42	
Pagellus bellottii	62.14	794	10.84	5379
Torpedo torpedo	10.40	14	1.81	
Raja miraletus	10.38	14	1.81	
Pomadasys incisus	8.58	68	1.50	5382
Torpedo marmorata	7.28	14	1.27	
Dentex barnardi	7.28	182	1.27	5383
Umbrina canariensis	5.98	78	1.04	5378
Chloroscombrus chrysurus	2.86	14	0.50	
Pseudupeneus prayensis	0.78	40	0.14	
Saurida brasiliensis	0.40	66	0.07	
Engraulis sp.	0.26	66	0.05	
Total	580.18		101.19	

PROJECT STATION:2437

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1148
start stop duration Long E 1334
TIME :11:19:20 11:49:13 30 (min) Purpose code: 3
LOG :7984.06 7985.65 1.59 Area code : 2
FDEPTH: 103 107 GearCond.code:
BDEPTH: 103 107 Validity code: 1
Towing dir: 180º Wire out: 320 m Speed: 30 kn*10

Sorted: 104 Kg Total catch: 224.03 CATCH/HOUR: 448.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	366.64	4284	81.83	5386
Dentex angolensis	26.74	204	5.97	5385
Pagellus bellottii	14.84	126	3.31	5384
Sparus pagrus africanus *	9.72	8	2.17	
Umbrina canariensis	5.80	14	1.29	
Dentex canariensis	5.64	22	1.26	
Dentex gibbosus	5.20	4	1.16	
Loligo vulgaris	3.56	964	0.79	
Trigla lyra	3.04	26	0.68	
Trachurus trecae, juvenile	2.86	4	0.64	
Zeus faber	1.82	14	0.41	
Brachydeuterus auritus	1.38	8	0.31	
Fistularia petimba	0.64	2	0.14	
Total	447.88		99.96	

PROJECT STATION:2438

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1152
start stop duration Long E 1331
TIME :13:13:26 13:43:12 30 (min) Purpose code: 3
LOG :7995.27 7997.06 1.79 Area code : 2
FDEPTH: 189 193 GearCond.code:
BDEPTH: 189 193 Validity code: 1
Towing dir: 340º Wire out: 610 m Speed: 30 kn*10

Sorted: 40 Kg Total catch: 104.63 CATCH/HOUR: 209.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	116.50	936	55.67	
Zenopsis conchifer	24.40	30	11.66	
Trichiurus lepturus	16.00	18	7.65	
Dentex macrophthalmus	16.00	88	7.65	5387
Dentex angolensis	13.20	42	6.31	5388
Illex coindetii	8.90	200	4.25	
Merluccius polli	8.40	100	4.01	5389
Pterothrissus belloci	1.90	10	0.91	
Scomber japonicus	1.90	20	0.91	
Zeus faber	1.60	6	0.76	
Parapercis sp.	0.40	30	0.19	
Total	209.20		99.97	

PROJECT STATION:2439

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1151

	start	stop	duration			Long E 1327
TIME	:15:22:30	15:52:13	30 (min)	Purpose code:	3	
LOG	:8005.14	8006.85	1.69	Area code	: 2	
FDEPTH:	268	276		GearCond.code:		
BDEPTH:	268	276		Validity code:	1	

Towing dir: 335o Wire out: 810 m Speed: 30 kn*10

Sorted: 68 Kg Total catch: 206.70 CATCH/HOUR: 413.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	166.68	1008	40.32	5393
Synagrops microlepis	73.80	4602	17.85	
Illex coindetii	58.80	576	14.22	
Zenopsis conchifer	53.28	246	12.89	
Merluccius polli	41.04	588	9.93	5392
Pterothrissus belloci	4.56	30	1.10	
Coelorinchus coelorhincus	3.84	156	0.93	
Parapenaeus longirostris, male	3.00	450	0.73	5391
Parapenaeus longirostris, fem.	1.92	258	0.46	5390
Chlorophthalmus atlanticus	1.92	150	0.46	
Sepia officinalis hierredda	0.72	18	0.17	
Total	409.56		99.06	

PROJECT STATION:2440

DATE: 6/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1146

	start	stop	duration			Long E 1321
TIME	:17:28:44	17:59:32	31 (min)	Purpose code:	3	
LOG	:8016.68	8017.96	1.28	Area code	: 2	
FDEPTH:	432	437		GearCond.code:		
BDEPTH:	432	437		Validity code:	1	

Towing dir: 170o Wire out:1080 m Speed: 30 kn*10

Sorted: 54 Kg Total catch: 54.32 CATCH/HOUR: 105.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
NEMATOCARCINIDAE	46.65	23905	44.37	
Merluccius polli	30.77	70	29.27	5394
Aristeus varidens, female	8.05	633	7.66	5395
Laemonema laureysi	5.96	275	5.67	
Zeus faber	2.81	10	2.67	
Etmopterus lucifer	2.32	66	2.21	
Aristeus varidens, male	1.47	95	1.40	5396
Parapenaeus longirostris	1.45	145	1.38	
Todaropsis eblanae	1.24	12	1.18	
Triplophos hemingi	1.08	149	1.03	
Yarrella blackfordi	0.70	19	0.67	
Dentex macrophthalmus	0.54	2	0.51	
Trichiurus lepturus	0.46	17	0.44	
Halosaurus ovenii	0.43	17	0.41	
Coelorinchus coelorhincus	0.31	8	0.29	
Stomias sp.	0.23	6	0.22	
Nezumia micronychodon	0.23	15	0.22	
Malacocephalus occidentalis	0.19	2	0.18	
Xenodermichthys copei	0.12	27	0.11	
Neoharriotta pinnata	0.06	2	0.06	
Bassanago albescens	0.04	2	0.04	
Monolene microstoma	0.02	4	0.02	
Total	105.13		100.01	

PROJECT STATION:2441

DATE: 6/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1128

	start	stop	duration			Long E 1320
TIME	:20:00:52	21:40:28	31 (min)	Purpose code:	3	
LOG	:8042.33	8043.83	1.49	Area code	: 2	
FDEPTH:	654	624		GearCond.code:		
BDEPTH:	654	624		Validity code:	1	

Towing dir: 40o Wire out:1400 m Speed: 30 kn*10

Sorted: 38 Kg Total catch: 269.66 CATCH/HOUR: 521.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	201.60	596	38.63	
Triplophus hemingi	89.42	962	17.13	
Hoplostethus cadenati	78.97	2414	15.13	
Lamprogrammus exutus	40.65	298	7.79	
STOMIIDAE	39.83	4281	7.63	
Merluccius polli	14.59	17	2.80	5397
PENAEIDAE	13.55	474	2.60	
THYSANOTEUTHIDAE	6.50	27	1.25	
Xenodermichthys copei	5.96	420	1.14	
POLYCHAELIDAE	5.42	149	1.04	
Bathygadus melanobranchus	4.88	41	0.94	
Aristeus varidens, female	3.79	176	0.73	
Etmopterus lucifer	2.32	27	0.44	
Glyphus marsupialis	2.17	163	0.42	
Bathyuroconger vicinus	2.17	54	0.42	
Talismania bifurcata	2.17	108	0.42	
Nezumia leonis	1.90	95	0.36	
Chaceon maritae	1.39	4	0.27	
OPLOPHORIDAE	1.35	244	0.26	
Parapenaeus longirostris	1.35	461	0.26	
Arius heudeloti	1.35	14	0.26	
TRACHIPTERIDAE	1.32	2	0.25	
Scomber japonicus	1.08	14	0.21	
SYNAPHOBRANCHIDAE	0.27	14	0.05	
Total	524.00		100.43	

PROJECT STATION:2442

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1129

	start	stop	duration			Long E 1327
TIME	:05:40:59	06:02:21	21 (min)	Purpose code:	3	
LOG	:8071.95	8072.84	0.87	Area code	: 2	
FDEPTH:	109	109		GearCond.code:		
BDEPTH:	109	109		Validity code:	1	

Towing dir: 190o Wire out: 300 m Speed: 30 kn*10

Sorted: 739 Kg Total catch: 249.39 CATCH/HOUR: 712.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	334.20	22514	46.90	5398
Dentex macrophthalmus	241.60	1580	33.91	5401
Umbrina canariensis	53.40	180	7.49	5400
Pagellus bellottii	27.00	211	3.79	5399
Zeus faber	10.80	51	1.52	
Atractoscion aequidens	8.74	6	1.23	
Dentex angolensis	5.00	31	0.70	
Boops boops	4.60	51	0.65	
Parapristipoma octolineatum	4.60	11	0.65	
Dentex barnardi	4.40	11	0.62	
Dentex congoensis	4.00	31	0.56	
Sparus pagrus africanus *	3.60	11	0.51	
Lepidotrigla cadmani	3.20	40	0.45	
Brotula barbata	2.00	3	0.28	
Sepia orbignyana	1.60	11	0.22	
Anthias anthias	1.40	11	0.20	
Ariomma bondi	1.20	20	0.17	
Scomber japonicus	0.40	11	0.06	
Trichiurus lepturus	0.40	11	0.06	
Citharus linguatula	0.40	11	0.06	
Total	712.54		100.03	

PROJECT STATION:2443

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1130

	start	stop	duration			Long E 1333
TIME	:07:28:04	07:58:10	30 (min)	Purpose code:	3	
LOG	:8081.74	8083.09	1.35	Area code	: 2	
FDEPTH:	73	81		GearCond.code:		
BDEPTH:	73	81		Validity code:	1	

Towing dir: 190o Wire out: 220 m Speed: 30 kn*10

Sorted: 68 Kg Total catch: 318.68 CATCH/HOUR: 637.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	329.40	4348	51.68	5406
Pagellus bellottii	105.48	514	16.55	5402
Trachurus trecae, juvenile	85.60	5620	13.43	5403
Selene dorsalis	28.62	172	4.49	5407
Trichiurus lepturus	16.02	46	2.51	
Stromateus fiatola	15.08	18	2.37	
Dentex angolensis	11.34	172	1.78	5404
Dentex barnardi	10.44	64	1.64	5405
Sphyraena sphyraena	8.64	46	1.36	
Decapterus rhonchus	5.94	36	0.93	
Fistularia petimba	5.64	10	0.88	
Sardinella maderensis	5.40	18	0.85	
Trachurus trecae	4.14	28	0.65	
Atractoscion aequidens	3.64	4	0.57	
Branchiostegus semifasciatus	1.08	2	0.17	
Alloteuthis africana	0.54	280	0.08	
Ommastrephes bartrami	0.18	10	0.03	
Boops boops	0.18	10	0.03	
Total	637.36		100.00	

PROJECT STATION:2444

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1129

	start	stop	duration			Long E 1340
TIME	:09:14:43	09:47:29	33 (min)	Purpose code:	3	
LOG	:8092.48	8094.38	1.90	Area code	: 2	
FDEPTH:	35	35		GearCond.code:		
BDEPTH:	35	35		Validity code:	1	

Towing dir: 360o Wire out: 140 m Speed: 30 kn*10

Sorted: 113 Kg Total catch: 143.45 CATCH/HOUR: 260.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	57.82	449	22.17	5413
Selene dorsalis	32.36	184	12.41	5415
Chloroscombrus chrysurus	31.64	195	12.13	5409
Pomadasys rogeri	22.44	49	8.60	5412
Sphyraena guachancho	18.98	55	7.28	
Galeoides decadactylus	17.45	73	6.69	
Trichiurus lepturus	11.09	53	4.25	
Lithognathus mormyrus	10.18	35	3.90	5411
Alectis alexandrinus	7.53	9	2.89	
Pagellus bellottii	6.44	25	2.47	5410
Stromateus fiatola	5.89	7	2.26	
Ephippion guttifer	5.64	2	2.16	
Sphyraena sphyraena	5.45	22	2.09	
Ilisha africana	3.75	60	1.44	
Arius parkii	3.56	4	1.36	
Caranx crysos	3.24	5	1.24	
Pomadasys incisus	2.98	51	1.14	5408
Decapterus rhonchus	2.80	55	1.07	
Sardinella maderensis	2.76	13	1.06	
Pseudotolithus typus	1.96	2	0.75	
Brachydeuterus auritus Juv.	1.71	387	0.66	5416
Selene dorsalis, juveniles	1.45	84	0.56	5414
Lagocephalus laevigatus	0.76	2	0.29	
Sardinella maderensis - Juv.	0.58	31	0.22	
Bucinostomus melanopterus	0.55	4	0.21	
Octopus vulgaris	0.55	2	0.21	
Pseudupeneus prayensis	0.47	2	0.18	
Sardinella aurita	0.47	15	0.18	
Syacium micrurum	0.15	2	0.06	
Trachurus trecae, juvenile	0.15	9	0.06	
Pteroscion peli	0.04	4	0.02	
Total	260.84		100.01	

PROJECT STATION:2445

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1122
start stop duration Long E 1340
TIME :10:34:55 11:04:53 30 (min) Purpose code: 3
LOG :8099.34 8101.02 1.68 Area code : 2
FDEPTH: 33 33 GearCond.code:
BDEPTH: 33 33 Validity code: 1
Towing dir: 360º Wire out: 140 m Speed: 30 kn*10

Sorted: 68 Kg Total catch: 67.70 CATCH/HOUR: 135.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	51.92	214	38.35	5418
Selene dorsalis	33.20	80	24.52	5417
Pomadasys rogeri	20.24	12	14.95	
Alectis alexandrinus	12.36	12	9.13	
Balistes capriscus	6.08	12	4.49	
Lithognathus mormyrus	3.72	12	2.75	
Sphyraena sphyraena	1.76	4	1.30	
Galeoides decadactylus	1.24	2	0.92	
Pagellus bellottii	1.12	2	0.83	
Aluterus sp.	1.08	2	0.80	
Trichiurus lepturus	1.04	2	0.77	
Alloteuthis africana	0.72	232	0.53	
Sardinella aurita	0.52	2	0.38	
Brachydeuterus auritus	0.28	2	0.21	
Trachurus trecae	0.12	4	0.09	
Total	135.40		100.02	

PROJECT STATION:2446

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1118
start stop duration Long E 1340
TIME :11:41:04 12:11:09 30 (min) Purpose code: 3
LOG :8103.49 8105.25 1.76 Area code : 2
FDEPTH: 31 36 GearCond.code:
BDEPTH: 31 36 Validity code: 1
Towing dir: 360º Wire out: 140 m Speed: 30 kn*10

Sorted: 22 Kg Total catch: 22.48 CATCH/HOUR: 44.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	18.40	16	40.93	
Balistes capriscus	10.20	24	22.69	
Selene dorsalis	5.80	10	12.90	
Octopus vulgaris	3.56	2	7.92	
Trachinotus goreensis	2.76	6	6.14	
Alectis ciliaris	1.96	2	4.36	
Aluterus sp.	0.88	2	1.96	
Alloteuthis africana	0.72	328	1.60	
Lagocephalus laevigatus	0.40	2	0.89	
Chilomycterus spinosus mauret.	0.28	2	0.62	
Total	44.96		100.01	

PROJECT STATION:2447

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1120
start stop duration Long E 1333
TIME :13:53:46 14:14:10 20 (min) Purpose code: 3
LOG :8117.30 8118.40 1.09 Area code : 2
FDEPTH: 53 55 GearCond.code:
BDEPTH: 53 55 Validity code: 1
Towing dir: 50º Wire out: 200 m Speed: 30 kn*10

Sorted: 46 Kg Total catch: 4.08 CATCH/HOUR: 12.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Balistes capriscus	6.06	12	49.51	
Sepia officinalis hierredda	4.38	3	35.78	
Trachinotus goreensis	1.38	3	11.27	
Pagellus bellottii	0.24	3	1.96	
Alloteuthis africana	0.18	60	1.47	
Total	12.24		99.99	

PROJECT STATION:2448

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1115
start stop duration Long E 1336
TIME :15:31:30 16:01:14 30 (min) Purpose code: 3
LOG :8126.67 8128.27 1.60 Area code : 2
FDEPTH: 152 168 GearCond.code:
BDEPTH: 152 168 Validity code: 1
Towing dir: 200º Wire out: 480 m Speed: 30 kn*10

Sorted: 126 Kg Total catch: 564.14 CATCH/HOUR: 1128.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	442.08	1846	39.18	
Alloteuthis africana	310.44	152880	27.51	
Synagrops microlepis	205.92	19110	18.25	
Dentex macrophthalmus	42.88	214	3.80	5420
Parapenaeus longirostris, fem.	31.20	7202	2.77	5421
Merluccius polli	29.64	832	2.63	5419
Parapenaeus longirostris, male	26.00	8502	2.30	5422
Brotula barbata	17.80	24	1.58	
Pterothrissus belloci	7.80	78	0.69	
Scomber japonicus	7.28	104	0.65	
Pontinus accraensis	2.60	26	0.23	
Dentex angolensis	1.48	8	0.13	
Dicologoglossa cuneata	1.04	26	0.09	
Umbrina canariensis	0.80	2	0.07	
Chlorophthalmus atlanticus	0.26	104	0.02	
Zenopsis conchifer	0.26	26	0.02	
Total	1127.48		99.92	

PROJECT STATION:2449

DATE: 7/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1113
start stop duration Long E 1331
TIME :17:05:18 17:38:36 33 (min) Purpose code: 3
LOG :8136.77 8138.49 1.71 Area code : 2
FDEPTH: 321 332 GearCond.code:
BDEPTH: 321 332 Validity code: 1
Towing dir: 180º Wire out: 950 m Speed: 30 kn*10

Sorted: 54 Kg Total catch: 291.90 CATCH/HOUR: 530.73

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	365.73	1536	68.91	5423
MYCTOPHIDAE	52.36	4664	9.87	
NEMATOCARCINIDAE	22.91	17411	4.32	
Laemonema laureysi	21.27	229	4.01	
Trichiurus lepturus	20.29	965	3.82	
Parapenaeus longirostris, fem.	16.04	2333	3.02	5424
Peristedion cataphractum	6.55	131	1.23	
Pontinus kuhlii	5.89	115	1.11	
Etmopterus sp.	5.56	376	1.05	
Parapenaeus longirostris, male	2.85	451	0.54	5425
Dibranchus atlanticus	2.29	65	0.43	
Chlorophthalmus atlanticus	2.13	33	0.40	
CONGRIDAE	1.96	65	0.37	
Coelorinchus fasciatus	1.80	33	0.34	
Solenocera africana	1.31	278	0.25	
Chlorophthalmus sp.	0.82	16	0.15	
Zenopsis conchifer	0.33	16	0.06	
Aristeus varidens	0.33	115	0.06	
Nezumia aequalis	0.33	16	0.06	
Total	530.75		100.00	

PROJECT STATION:2450

DATE: 7/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1109
start stop duration Long E 1327
TIME :19:58:28 20:29:29 31 (min) Purpose code: 3
LOG :8147.08 8148.66 1.59 Area code : 2
FDEPTH: 618 622 GearCond.code:
BDEPTH: 618 622 Validity code: 1
Towing dir: 360º Wire out:1500 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 82.22 CATCH/HOUR: 159.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	21.68	836	13.62	
Lamprogrammus exutus	21.37	77	13.43	
Stomias sp.	17.65	248	11.09	
Yarrella blackfordi	17.34	403	10.90	
Triplophus hemingi	13.94	1486	8.76	
OPHIDIIDAE	13.01	93	8.18	
Aristeus varidens	8.98	81	5.64	
Trichiurus lepturus	8.05	46	5.06	
Chaceon maritae	6.97	29	4.38	
POLYCHAELIDAE	6.81	898	4.28	
NEMATOCARCINIDAE	4.34	790	2.73	
C E P H A L O P O D A	4.34	15	2.73	
Etmopterus sp.	3.41	62	2.14	
Bathyuroconger vicinus	3.10	93	1.95	
Small squids unident.	2.79	15	1.75	
Merluccius polli	2.59	4	1.63	
Ebinania costaecanarie	1.24	15	0.78	
Nezumia aequalis	1.24	217	0.78	
Glyphus marsupialis	0.31	31	0.19	
Total	159.16		100.02	

PROJECT STATION:2451

DATE: 8/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1057
start stop duration Long E 1325
TIME :00:01:02 00:01:27 30 (min) Purpose code: 3
LOG :8178.69 8180.21 1.52 Area code : 2
FDEPTH: 451 441 GearCond.code:
BDEPTH: 451 441 Validity code: 1
Towing dir: 325º Wire out:1210 m Speed: 30 kn*10

Sorted: 287 Kg Total catch: 216.00 CATCH/HOUR: 432.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	263.40	49386	60.97	
Triplophus hemingi	58.50	5850	13.54	
Hoplostethus cadenati	49.20	1938	11.39	
Lamprogrammus exutus	16.50	404	3.82	
Illex coindetii	8.06	46	1.87	
Etmopterus pusillus	5.10	16	1.18	
STOMIIDAE	4.80	106	1.11	
Yarrella blackfordi	4.80	136	1.11	
OPLOPHORIDAE	3.90	1124	0.90	
Aristeus varidens, female	3.00	180	0.69	5426
Gadella imberbis	2.70	90	0.63	
Trichiurus lepturus	2.40	106	0.56	
Aristeus varidens, male	1.80	226	0.42	5427
Xenodermichthys copei	1.80	270	0.42	
Onychoteuthis sp.	1.50	30	0.35	
PASIPHAEIDAE	1.20	166	0.28	
Bassanago albescens	0.90	16	0.21	
Scomber japonicus	0.90	16	0.21	
Peristedion cataphractum	0.60	106	0.14	
Laemonema laureysi	0.30	16	0.07	
Total	431.36		99.87	

PROJECT STATION:2452

DATE: 8/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1053
start stop duration Long E 1331
TIME :05:36:35 06:07:28 31 (min) Purpose code: 3
LOG :8196.90 8198.54 1.62 Area code : 2
FDEPTH: 126 124 GearCond.code:
BDEPTH: 126 124 Validity code: 1
Towing dir: 340º Wire out:8205 m Speed:100 kn*10

Sorted: 95 Kg Total catch: 334.38 CATCH/HOUR: 647.19

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	278.13	11090	42.98	5428
Synagrops microlepis	241.26	33635	37.28	
Dentex macrophthalmus	47.38	223	7.32	5434
Dentex angolensis	24.08	89	3.72	5433
Squatina oculata	11.54	4	1.78	
Brotula barbata	9.45	10	1.46	
Umbrina canariensis	8.52	23	1.32	5432
Dentex barnardi	7.06	12	1.09	5429
Torpedo torpedo	2.90	15	0.45	
Ommastrephes bartrami	2.61	58	0.40	
Trichiurus lepturus	2.05	2	0.32	
Saurida brasiliensis	2.03	277	0.31	
Parapenaeus longirostris, fem.	1.74	348	0.27	5430
Lepidotrigla cadmani	1.74	15	0.27	
Pterothrissus belloci	1.45	15	0.22	
Parapenaeus longirostris, male	0.87	58	0.13	5431
Boops boops	0.87	29	0.13	
Scomber japonicus	0.87	15	0.13	
Fistularia petimba	0.85	2	0.13	
Miracorvina angolensis	0.70	2	0.11	
Pagellus bellottii	0.35	2	0.05	
Thorogobius angolensis	0.29	87	0.04	
Citharus linguatula	0.29	15	0.04	
Chlorophthalmus atlanticus	0.15	29	0.02	
Total	647.18		99.97	

PROJECT STATION:2453

DATE: 8/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1049
start stop duration Long E 1337
TIME :07:28:27 07:59:16 31 (min) Purpose code: 3
LOG :8206.79 8208.27 1.46 Area code : 2
FDEPTH: 79 81 GearCond.code:
BDEPTH: 79 81 Validity code: 1
Towing dir: 170º Wire out: 250 m Speed: 30 kn*10

Sorted: 107 Kg Total catch: 2589.76 CATCH/HOUR: 5012.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	3426.77	28078	68.37	5440
Brachydeuterus auritus Juv.	532.45	80566	10.62	5441
Selene dorsalis	288.77	706	5.76	5437
Trachurus trecae	227.61	1647	4.54	5439
Trichiurus lepturus	211.74	1411	4.22	
Trachurus trecae, juvenile	208.84	7713	4.17	5438
Synagrops microlepis	48.97	13215	0.98	
Brotula barbata	48.00	46	0.96	
Pagellus bellottii	14.11	95	0.28	
Parapenaeus longirostris, fem.	2.83	612	0.06	5436
Pterothrissus belloci	1.88	46	0.04	
Parapenaeus longirostris, male	0.46	46	0.01	5435
Total	5012.43		100.01	

PROJECT STATION:2454

DATE: 8/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1048
start stop duration Long E 1342
TIME :08:20:16 10:00:49 31 (min) Purpose code: 3
LOG :8216.48 8217.62 1.10 Area code : 2
FDEPTH: 44 47 GearCond.code:
BDEPTH: 44 47 Validity code: 1
Towing dir: 325º Wire out: 150 m Speed: 30 kn*10

Sorted: 79 Kg Total catch: 300.56 CATCH/HOUR: 581.73

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	203.23	3089	34.94	5445
Brachydeuterus auritus Juv.	186.39	38876	32.04	5443
Trichiurus lepturus	45.10	3292	7.75	
Galeoides decadactylus	39.29	225	6.75	
Pomadasys incisus	22.26	532	3.83	5444
Pseudotolithus typus	17.42	12	2.99	
Pagellus bellottii	16.65	124	2.86	5447
Dentex barnardi	16.45	439	2.83	5442
Rhinobatos albomaculatus	10.45	4	1.80	
Sphyraena guachancho	7.74	15	1.33	
Selene dorsalis	4.18	108	0.72	5446
Chloroscombrus chrysurus	3.10	31	0.53	
Pteroscion peli	2.32	54	0.40	
Sepiella ornata	1.94	31	0.33	
Trachurus, Juveniles	1.94	108	0.33	
Dicologoglossa cuneata	1.55	23	0.27	
Citharus linguatula	0.97	23	0.17	
Decapterus rhonchus	0.77	46	0.13	
Total	581.75		100.00	

PROJECT STATION:2455

DATE: 8/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1037
start stop duration Long E 1328
TIME :13:02:49 13:32:37 30 (min) Purpose code: 3
LOG :8244.63 8246.10 1.45 Area code : 2
FDEPTH: 82 85 GearCond.code:
BDEPTH: 82 85 Validity code: 1
Towing dir: 170º Wire out: 270 m Speed: 30 kn*10

Sorted: 110 Kg Total catch: 403.24 CATCH/HOUR: 806.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	536.00	3472	66.46	5448
Trachurus trecae, juvenile	100.48	4928	12.46	5451
Pagellus bellottii	98.80	816	12.25	5449
Dentex angolensis	13.60	86	1.69	5452
Dentex barnardi	12.80	32	1.59	
Chloroscombrus chrysurus	12.22	16	1.52	
Pentheroscion mbizi	8.24	46	1.02	5450
Raja miraletus	7.80	12	0.97	
Trachurus trecae	6.40	48	0.79	
Trigla lyra	4.48	32	0.56	
Sphyraena guachancho	2.44	6	0.30	
Stromateus fiatola	1.36	2	0.17	
Total	804.62		99.78	

PROJECT STATION:2456

DATE: 8/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1038
start stop duration Long E 1323
TIME :14:50:54 15:20:54 30 (min) Purpose code: 3
LOG :8254.90 8256.39 1.48 Area code : 2
FDEPTH: 106 108 GearCond.code:
BDEPTH: 106 108 Validity code: 1
Towing dir: 150º Wire out: 330 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 796.60 CATCH/HOUR: 1593.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	928.00	58788	58.25	5454
Synagrops sp.	486.80	48672	30.55	
Dentex macrophthalmus	54.00	324	3.39	
Dentex angolensis	47.60	468	2.99	5453
Stromateus fiatola	22.60	30	1.42	
Brachydeuterus auritus	10.80	72	0.68	
Boops boops	9.40	360	0.59	
Trichiurus lepturus	8.00	36	0.50	
Pagellus bellottii	6.40	108	0.40	
Illex coindetii	5.80	72	0.36	
Merluccius polli	4.40	108	0.28	
Fistularia petimba	2.56	8	0.16	
Pterothrissus belloci	2.20	36	0.14	
Zeus faber	1.80	6	0.11	
Lagocephalus laevigatus	1.72	4	0.11	
Octopus vulgaris	1.00	2	0.06	
Total	1593.08		99.99	

PROJECT STATION:2457

DATE: 8/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1036
start stop duration Long E 1313
TIME :16:52:49 17:23:25 31 (min) Purpose code: 3
LOG :8270.49 8272.21 1.70 Area code : 2
FDEPTH: 173 163 GearCond.code:
BDEPTH: 173 163 Validity code: 1
Towing dir: 136º Wire out: 560 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 146.64 CATCH/HOUR: 283.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	125.42	10560	44.19	
Zenopsis conchifer	65.81	403	23.19	
Illex coindetii	38.63	372	13.61	
Dentex angolensis	26.21	95	9.23	5455
Dentex macrophthalmus	18.39	106	6.48	5456
Parapenaeus longirostris, fem.	1.70	345	0.60	5457
Saurida sp.	1.55	124	0.55	
Lepidotrigla cadmani	1.39	15	0.49	
Merluccius polli	0.93	15	0.33	
Bembrops heterurus	0.93	8	0.33	
Citharus linguatula	0.93	15	0.33	
Pterothrissus belloci	0.70	8	0.25	
Monolene microstoma	0.39	15	0.14	
Scomber japonicus	0.39	8	0.14	
Parapenaeus longirostris, male	0.23	62	0.08	5458
Uranoscopus cadenati	0.23	8	0.08	
Total	283.83		100.02	

PROJECT STATION:2458

DATE: 8/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1036
start stop duration Long E 1309
TIME :18:20:02 18:21:17 31 (min) Purpose code: 3
LOG :8281.21 8282.69 1.46 Area code : 2
FDEPTH: 400 429 GearCond.code:
BDEPTH: 400 429 Validity code: 1
Towing dir: 300º Wire out:1050 m Speed: 30 kn*10

Sorted: 23 Kg Total catch: 188.85 CATCH/HOUR: 365.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
NEMATOCARCINIDAE	145.16	45223	39.71	
Merluccius polli	117.41	352	32.12	5459
Laemonema laureysi	37.45	358	10.25	
Torpedo nobiliana	27.68	2	7.57	
Dibranchus atlanticus	6.77	513	1.85	
Aristeus varidens, female	4.94	319	1.35	5462
Hymenocephalus italicus	4.84	397	1.32	
Pterothrissus belloci	3.87	19	1.06	
Zeus faber	3.68	6	1.01	
Parapenaeus longirostris, fem.	2.42	252	0.66	5460
TRICHIURIDAE	2.32	68	0.63	
Illex coindetii	1.55	10	0.42	
Gadella imberbis	1.55	29	0.42	
Cynoponticus ferox	1.16	10	0.32	
Etmopterus lucifer	1.16	48	0.32	
Bathynectes piperitus	0.97	10	0.27	
Aristeus varidens, male	0.77	122	0.21	5461
Chlorophthalmus atlanticus	0.58	10	0.16	
Lophius vaillanti	0.39	10	0.11	
Peristedion cataphractum	0.39	39	0.11	
Nezumia micronychodon	0.19	10	0.05	
Malacocephalus occidentalis	0.19	10	0.05	
Solenocera africana	0.10	10	0.03	
MYCTOPHIDAE	0.10	10	0.03	
Total	365.64		100.03	

PROJECT STATION:2459

DATE: 8/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1029
start stop duration Long E 1257
TIME :21:41:06 21:41:15 30 (min) Purpose code: 3
LOG :8295.42 8296.87 1.42 Area code : 2
FDEPTH: 703 733 GearCond.code:
BDEPTH: 703 733 Validity code: 1
Towing dir: 300º Wire out:1600 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 595.90 CATCH/HOUR: 1191.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	466.56	16276	39.15	
Triplophus hemingi	340.56	33346	28.58	
Lamprogrammus exutus	153.36	756	12.87	
Nezumia leonis	102.24	1800	8.58	
Yarrella blackfordi	34.56	756	2.90	
Bathyuroconger vicinus	17.28	180	1.45	
OCTOPODIDAE	16.56	108	1.39	
POLYCHAELIDAE	11.52	864	0.97	
SYNAPHOBRANCHIDAE	8.64	144	0.72	
Xenodermichthys copei	8.64	432	0.72	
Ebinania costaecanarie	7.20	36	0.60	
STOMIIDAE	7.20	180	0.60	
Bathygadus melanobranchus	5.04	288	0.42	
Talismania bifurcata	2.88	72	0.24	
OPLOPHORIDAE	2.16	720	0.18	
Glyphus marsupialis	2.16	144	0.18	
Dibranchus atlanticus	2.16	72	0.18	
Merluccius polli	1.64	2	0.14	
NETTASTOMATIDAE	0.72	36	0.06	
DICERATIIDAE	0.72	56	0.06	
Total	1191.80		99.99	

PROJECT STATION:2460

DATE: 9/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1013
start stop duration Long E 1322
TIME :05:32:25 06:02:11 30 (min) Purpose code: 3
LOG :8335.14 8336.65 1.50 Area code : 2
FDEPTH: 34 31 GearCond.code:
BDEPTH: 34 31 Validity code: 1
Towing dir: 340º Wire out: 140 m Speed: 30 kn*10

Sorted: 73 Kg Total catch: 73.30 CATCH/HOUR: 146.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	81.92	98	55.88	
Caranx crysos	21.76	112	14.84	
Galeoides decadactylus	15.60	36	10.64	
Sphyraena guachancho	9.04	16	6.17	
Sphyrna lewini	2.88	2	1.96	
Chloroscombrus chrysurus	2.72	48	1.86	5464
Pomadasys jubelini	2.56	8	1.75	
Pagellus bellottii	2.28	10	1.56	5463
Selene dorsalis	2.16	6	1.47	
Stromateus fiatola	1.92	2	1.31	
Brachydeuterus auritus	1.00	10	0.68	
Trichiurus lepturus	0.96	2	0.65	
Pomadasys rogeri	0.76	2	0.52	
Trachurus trecae, juvenile	0.48	24	0.33	
Pomadasys incisus	0.44	2	0.30	
Selene dorsalis, juveniles	0.08	2	0.05	
Torpedo torpedo	0.04	2	0.03	
Total	146.60		100.00	

PROJECT STATION:2461

DATE: 9/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1011
start stop duration Long E 1318
TIME :07:16:25 07:46:11 30 (min) Purpose code: 3
LOG :8343.10 8344.50 1.40 Area code : 2
FDEPTH: 51 52 GearCond.code:
BDEPTH: 51 52 Validity code: 1
Towing dir: 320º Wire out: 140 m Speed: 30 kn*10

Sorted: 81 Kg Total catch: 80.94 CATCH/HOUR: 161.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys peroteti	41.08	68	25.38	5466
Sphyraena sphyraena	35.44	52	21.89	
Galeoides decadactylus	33.36	100	20.61	
Pagellus bellottii	12.28	64	7.59	5469
Decapterus rhonchus	8.80	432	5.44	5467
Stromateus fiatola	6.92	8	4.27	
Pomadasys rogeri	4.00	8	2.47	
Lagocephalus laevigatus	3.20	6	1.98	
Pseudotolithus typus	3.16	6	1.95	
Alectis alexandrinus	3.04	4	1.88	
Chloroscombrus chrysurus	2.76	32	1.70	5468
Caranx crysos	2.68	14	1.66	
Trachurus trecae, juvenile	1.96	238	1.21	5465
Brachydeuterus auritus	1.48	16	0.91	5470
Sepia officinalis hierredda	0.24	2	0.15	
Alloteuthis africana	0.24	74	0.15	
Sardinella maderensis	0.20	2	0.12	
Sardinella aurita	0.12	2	0.07	
Selene dorsalis	0.08	2	0.05	
Peristedion cataphractum	0.02	2	0.01	
Pterothrissus belloci	0.02	2	0.01	
Total	161.08		99.50	

PROJECT STATION:2462

DATE: 9/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1016
start stop duration Long E 1319
TIME :08:59:47 09:29:39 30 (min) Purpose code: 3
LOG :8352.60 8354.01 1.38 Area code : 2
FDEPTH: 60 65 GearCond.code:
BDEPTH: 60 65 Validity code: 1
Towing dir: 290º Wire out: 200 m Speed: 30 kn*10

Sorted: 87 Kg Total catch: 2335.75 CATCH/HOUR: 4671.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	4293.20	44794	91.90	5471
Trachurus trecae, juvenile	75.40	6862	1.61	5472
Galeoides decadactylus	73.40	320	1.57	
Trachurus trecae	50.42	426	1.08	5473
Pomadasys incisus	41.48	212	0.89	
Sphyraena guachancho	41.48	54	0.89	
Selene dorsalis	31.18	160	0.67	
Chloroscombrus chrysurus	19.14	2128	0.41	
Trichiurus lepturus	16.50	54	0.35	
Pagellus bellottii	14.90	106	0.32	
Alectis alexandrinus	8.12	4	0.17	
Sphyraena sphyraena	3.18	54	0.07	
Decapterus punctatus	3.18	106	0.07	
Total	4671.58		100.00	

PROJECT STATION:2463

DATE: 9/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1016
start stop duration Long E 1310
TIME :11:04:00 11:34:00 30 (min) Purpose code: 3
LOG :8364.31 8365.87 1.53 Area code : 2
FDEPTH: 98 100 GearCond.code:
BDEPTH: 98 100 Validity code: 1
Towing dir: 305º Wire out: 330 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 138.04 CATCH/HOUR: 276.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	206.00	14126	74.62	5474
Fistularia petimba	21.60	6	7.82	
Stromateus fiatola	19.36	22	7.01	
Squatina oculata	8.40	6	3.04	
Brachydeuterus auritus	8.12	56	2.94	
Boops boops	4.62	182	1.67	
Illex coindetii	3.22	70	1.17	
Lagocephalus laevigatus	1.48	4	0.54	
Pagellus bellottii	1.48	18	0.54	
Dentex barnardi	1.32	8	0.48	
Trigla lyra	0.32	2	0.12	
Dentex angolensis	0.16	2	0.06	
Total	276.08		100.01	

PROJECT STATION:2464

DATE: 9/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1021
start stop duration Long E 1302
TIME :13:28:44 13:58:28 30 (min) Purpose code: 3
LOG :8379.73 8381.47 1.71 Area code : 2
FDEPTH: 177 179 GearCond.code:
BDEPTH: 177 179 Validity code: 1
Towing dir: 320º Wire out: 570 m Speed: 30 kn*10

Sorted: 123 Kg Total catch: 5000.00 CATCH/HOUR: 10000.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	9343.48	1280672	93.43	
Spicara alta	186.08	1034	1.86	
Dentex macrophthalmus	121.98	620	1.22	
Dentex angolensis	107.52	414	1.08	
Stromateus fiatola	78.56	104	0.79	
Squatina oculata	53.20	4	0.53	
Zeus faber	45.48	104	0.45	
Zenopsis conchifer	35.14	104	0.35	
Trichiurus lepturus	28.94	104	0.29	
Total	10000.38		100.00	

PROJECT STATION:2465

DATE: 9/ 3/01 GEAR TYPE: BT No: POSITION:Lat S 1012
start stop duration Long E 1256
TIME :16:13:41 16:43:26 30 (min) Purpose code: 3
LOG :8395.73 8397.28 1.54 Area code : 2
FDEPTH: 236 232 GearCond.code:
BDEPTH: 236 232 Validity code: 1
Towing dir: 160º Wire out: 740 m Speed: 30 kn*10

Sorted: 61 Kg Total catch: 364.74 CATCH/HOUR: 729.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli, juveniles	273.60	5700	37.51	5475
Synagrops microlepis	236.88	18600	32.47	
Zenopsis conchifer	177.36	1956	24.31	
Chlorophthalmus atlanticus	23.04	1848	3.16	
Todaropsis eblanae	9.60	108	1.32	
Illex coindetii	4.80	36	0.66	
Parapenaeus longirostris, male	2.16	528	0.30	5477
Parapenaeus longirostris, fem.	1.20	228	0.16	5476
Sepia elegans	0.72	36	0.10	
Parapandalus narval	0.12	24	0.02	
Total	729.48		100.01	

PROJECT STATION:2466

DATE: 9/ 3/01 GEAR TYPE: BT No: POSITION:Lat S 1007
start stop duration Long E 1253
TIME :18:37:32 19:07:56 30 (min) Purpose code: 3
LOG :8409.94 8411.24 1.29 Area code : 2
FDEPTH: 374 378 GearCond.code:
BDEPTH: 374 378 Validity code: 1
Towing dir: 160º Wire out:1000 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 140.69 CATCH/HOUR: 281.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
NEMATOCARCINIDAE	160.20	83660	56.93	
Merluccius polli	68.88	280	24.48	5478
Laemonema laureysi	18.60	230	6.61	
Pterothrissus belloci	7.00	36	2.49	
Aristeus varidens, female	5.20	460	1.85	5480
Malacocephalus occidentalis	4.90	36	1.74	
Parapenaeus longirostris, fem.	4.70	550	1.67	5482
Hymenocephalus italicus	3.20	330	1.14	
Chaunax pictus	2.20	106	0.78	
Trichiurus lepturus	1.10	60	0.39	
Yarrella blackfordi	0.90	30	0.32	
Aristeus varidens, male	0.70	96	0.25	5479
OCTOPOTEUTHIDAE	0.70	6	0.25	
Gadella imberbis	0.60	26	0.21	
Todaropsis eblanae	0.40	6	0.14	
Dibranchus atlanticus	0.40	40	0.14	
Peristedion cataphractum	0.30	36	0.11	
Halosaurus ovenii	0.30	10	0.11	
Parapenaeus longirostris, male	0.20	20	0.07	5481
Hoplostethus cadenati	0.20	6	0.07	
Solenocera africana	0.20	30	0.07	
Lophius vaillanti	0.20	6	0.07	
Coelorinchus coelorhincus	0.20	10	0.07	
Etmopterus spinax	0.04	6	0.01	
MYCTOPHIDAE	0.04	20	0.01	
Total	281.36		99.98	

PROJECT STATION:2467

DATE: 9/ 3/01 GEAR TYPE: BT No: POSITION:Lat S 1007
start stop duration Long E 1251
TIME :20:23:48 20:54:41 31 (min) Purpose code: 3
LOG :8415.41 8417.01 1.61 Area code : 2
FDEPTH: 535 529 GearCond.code:
BDEPTH: 535 529 Validity code: 1
Towing dir: 340º Wire out:1400 m Speed: 30 kn*10

Sorted: 301 Kg Total catch: 58.50 CATCH/HOUR: 113.23

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
NEMATOCARCINIDAE	41.96	12035	37.06	
Stomias sp.	31.12	600	27.48	
Yarrella blackfordi	8.52	236	7.52	
Triplophus hemingi	7.35	1215	6.49	
Hoplostethus cadenati	5.50	298	4.86	
Aristeus varidens, male	4.10	294	3.62	5483
Merluccius polli	3.48	8	3.07	
Xenodermichthys copei	2.55	306	2.25	
Lamprogrammus exutus	2.32	39	2.05	
Aristeus varidens, female	2.25	201	1.99	5484
Gadella imberbis	1.55	58	1.37	
OCTOPOTEUTHIDAE	0.85	4	0.75	
Dibranchus atlanticus	0.46	46	0.41	
Lophius vaillanti	0.39	8	0.34	
Glyphus marsupialis	0.31	27	0.27	
Etmopterus lucifer	0.31	8	0.27	
Pentheroscion mbizi	0.08	12	0.07	
POLYCHAELIDAE	0.08	23	0.07	
Total	113.18		99.94	

PROJECT STATION:2468

DATE: 9/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 1002
start stop duration Long E 1247
TIME :21:40:12 21:40:15 30 (min) Purpose code: 3
LOG :8422.34 8423.83 1.50 Area code : 2
FDEPTH: 727 780 GearCond.code:
BDEPTH: 727 780 Validity code: 1
Towing dir: 340º Wire out:1600 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 58.50 CATCH/HOUR: 117.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
OCTOPODIDAE	24.00	44	20.51	
STOMIIDAE	22.80	238	19.49	
Hoplostethus cadenati	16.80	84	14.36	
Yarrella blackfordi	16.00	168	13.68	
POLYCHAELIDAE	6.80	296	5.81	
Talismania bifurcata	6.00	84	5.13	
Triplophus hemingi	5.80	576	4.96	
Nezumia leonis	4.80	84	4.10	
SYNAPHOBRANCHIDAE	4.00	120	3.42	
Dibranchus atlanticus	2.60	104	2.22	
PASIPHAEIDAE	1.60	4	1.37	
Aristeus varidens, male	1.20	16	1.03	5486
PARALEPIDIDAE	0.80	8	0.68	
Aristeus varidens, female	0.80	38	0.68	5485
Nealotus tripes	0.80	4	0.68	
Glyphus marsupialis	0.80	40	0.68	
Etmopterus lucifer	0.80	8	0.68	
MYCTOPHIDAE	0.40	12	0.34	
OPLOPHORIDAE	0.20	4	0.17	
Bathygadus melanobranchus	0.20	4	0.17	
Total	117.20		100.16	

PROJECT STATION:2469

DATE:10/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1003
start stop duration Long E 1252
TIME :05:23:37 05:55:12 32 (min) Purpose code: 3
LOG :8442.63 8444.40 1.77 Area code : 2
FDEPTH: 298 296 GearCond.code:
BDEPTH: 298 296 Validity code: 1
Towing dir: 340º Wire out: 800 m Speed: 30 kn*10

Sorted: 175 Kg Total catch: 303.08 CATCH/HOUR: 568.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alopias superciliosus	206.25	2	36.29	
Chlorophthalmus atlanticus	165.71	3144	29.16	
Synagrops microlepis	96.30	6722	16.95	
Merluccius polli, juveniles	60.30	906	10.61	5487
Trichiurus lepturus	12.83	11	2.26	
Zenopsis conchifer	12.83	39	2.26	
MYCTOPHIDAE	3.38	1828	0.59	
Illex coindetii	2.36	28	0.42	
Parapenaeus longirostris, fem.	1.46	203	0.26	5488
Pterothrissus belloci	1.46	11	0.26	
Sepia elegans	1.35	68	0.24	
Illex coindetii	1.01	349	0.18	
Laemonema laureysi	0.90	11	0.16	
Dentex macrophthalmus	0.90	4	0.16	
Parapenaeus longirostris, male	0.56	113	0.10	5489
Pontinus accraensis	0.56	6	0.10	
Solenocera africana	0.06	6	0.01	
Coelorinchus coelorhincus	0.06	6	0.01	
Total	568.28		100.02	

PROJECT STATION:2470

DATE:10/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1002
start stop duration Long E 1254
TIME :07:08:39 07:38:16 30 (min) Purpose code: 3
LOG :8450.00 8451.20 1.20 Area code : 2
FDEPTH: 156 156 GearCond.code:
BDEPTH: 156 156 Validity code: 1
Towing dir: 94º Wire out: 450 m Speed: 30 kn*10

Sorted: 126 Kg Total catch: 126.38 CATCH/HOUR: 252.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	107.04	994	42.35	5491
Spicara alta	59.60	580	23.58	
Dentex angolensis	54.40	266	21.52	5490
Zenopsis conchifer	15.84	30	6.27	
Zeus faber	4.48	12	1.77	
Erythrocles monodi	2.96	52	1.17	
Trichiurus lepturus	2.72	2	1.08	
Lagocephalus laevigatus	1.92	4	0.76	
Boops boops	1.68	12	0.66	
Raja miraletus	1.08	2	0.43	
Lepidotrigla cadmani	0.48	4	0.19	
Sepia officinalis hierredda	0.32	2	0.13	
Citharus linguatula	0.16	2	0.06	
Scomber japonicus	0.08	2	0.03	
Total	252.76		100.00	

PROJECT STATION:2471

DATE:10/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1003
start stop duration Long E 1301
TIME :08:49:59 09:19:58 30 (min) Purpose code: 3
LOG :8458.91 8460.40 1.49 Area code : 2
FDEPTH: 97 94 GearCond.code:
BDEPTH: 97 94 Validity code: 1
Towing dir: 30º Wire out: 300 m Speed: 30 kn*10

Sorted: 36 Kg Total catch: 188.56 CATCH/HOUR: 377.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	307.40	19300	81.51	5493
Trichiurus lepturus	32.80	40	8.70	
Sarda sarda	11.80	10	3.13	
Squatina oculata	7.28	2	1.93	
Boops boops	5.80	230	1.54	
Fistularia petimba	3.20	8	0.85	
Dentex congoensis	1.80	40	0.48	
Dentex angolensis	1.40	20	0.37	
Raja miraletus	1.28	2	0.34	
Echeneis naucrates	1.20	4	0.32	
Pagellus bellottii	1.12	16	0.30	5492
Priacanthus arenatus	1.00	2	0.27	
Lagocephalus laevigatus	0.64	2	0.17	
Illex coindetii	0.40	10	0.11	
Total	377.12		100.02	

PROJECT STATION:2472

DATE:10/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 1002
start stop duration Long E 1308
TIME :10:29:42 10:59:09 29 (min) Purpose code: 3
LOG :8468.74 8470.15 1.38 Area code : 2
FDEPTH: 74 69 GearCond.code:
BDEPTH: 74 69 Validity code: 1
Towing dir: 100º Wire out: 220 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 594.80 CATCH/HOUR: 1230.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Stromateus fiatola	429.93	579	34.94	
Trachurus trecae, juvenile	312.41	22130	25.39	5496
Trachurus trecae	121.24	933	9.85	5494
Brachydeuterus auritus	116.69	1303	9.48	5495
Trichiurus lepturus	88.55	207	7.20	
Pagellus bellottii	36.83	290	2.99	5497
Pomadasys rogeri	25.24	21	2.05	
Sphyraena guachancho	18.62	41	1.51	
Argyrosomus hololepidotus	12.83	21	1.04	
Dentex angolensis	12.41	21	1.01	
Pomadasys incisus	11.59	207	0.94	
Raja miraletus	11.17	21	0.91	
Lagocephalus laevigatus	7.86	21	0.64	
Selene dorsalis	7.45	21	0.61	
Fistularia petimba	6.21	21	0.50	
Dicologoglossa cuneata	4.14	21	0.34	
Umbrina canariensis	4.14	62	0.34	
Pseudupeneus prayensis	2.48	21	0.20	
Dentex barnardi	1.24	41	0.10	
Total	1231.03		100.04	

PROJECT STATION:2473

DATE:10/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 956
start stop duration Long E 1313
TIME :12:18:38 12:48:20 30 (min) Purpose code: 3
LOG :8479.21 8480.56 1.34 Area code : 2
FDEPTH: 29 30 GearCond.code:
BDEPTH: 29 30 Validity code: 1
Towing dir: 340º Wire out: 130 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 589.54 CATCH/HOUR: 1179.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	554.80	1520	47.05	5498
Chloroscombrus chrysurus	301.72	5058	25.59	5499
Spondyliosoma cantharus	159.60	304	13.54	
Galeoides decadactylus	64.04	932	5.43	
Decapterus punctatus	23.56	1350	2.00	
Trichiurus lepturus	18.62	38	1.58	
Brachydeuterus auritus Juv.	12.92	7322	1.10	5500
Pseudotolithus typus	9.00	12	0.76	5501
Pomadasys rogeri	8.74	20	0.74	
Selene dorsalis	8.74	172	0.74	
Stromateus fiatola	4.56	20	0.39	
Pagellus bellottii	3.42	20	0.29	
Alectis alexandrinus	3.36	6	0.28	
Trachurus trecae	3.04	38	0.26	
Sphyraena-juveniles	1.52	134	0.13	
Raja miraletus	1.44	2	0.12	
Total	1179.08		100.00	

PROJECT STATION:2474

DATE:11/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 944
start stop duration Long E 1311
TIME :08:25:09 08:56:00 31 (min) Purpose code: 3
LOG :8498.80 8500.11 1.30 Area code : 2
FDEPTH: 23 24 GearCond.code:
BDEPTH: 23 24 Validity code: 1
Towing dir: 330º Wire out: 100 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 33.05 CATCH/HOUR: 63.97

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	31.70	33	49.55	
Brachydeuterus auritus	15.91	135	24.87	5502
Galeorhinus galeus	4.30	2	6.72	
Spondyliosoma cantharus	3.72	8	5.82	
Pagrus caeruleostictus	2.01	10	3.14	
Caranx hippos	1.16	2	1.81	
Lagocephalus laevigatus	1.12	6	1.75	
Pomadasys rogeri	1.08	2	1.69	
Balistes capriscus	0.83	2	1.30	
Chloroscombrus chrysurus	0.81	12	1.27	
Drepane africana	0.75	2	1.17	
Pseudupeneus prayensis	0.31	2	0.48	
Syacium micrurum	0.25	2	0.39	
Total	63.95		99.96	

PROJECT STATION:2475

DATE:11/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 945
start stop duration Long E 1303
TIME :10:06:45 10:38:03 31 (min) Purpose code: 3
LOG :8508.97 8510.57 1.59 Area code : 2
FDEPTH: 81 85 GearCond.code:
BDEPTH: 81 85 Validity code: 1
Towing dir: 220c Wire out: 240 m Speed: 30 kn*10

Sorted: 92 Kg Total catch: 445.06 CATCH/HOUR: 861.41

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	319.35	29063	37.07	
Trachurus trecae, juvenile	230.32	15470	26.74	5503
Trachurus trecae	139.35	925	16.18	5504
Pagellus bellottii	51.48	403	5.98	
Sphyraena guachancho	48.39	81	5.62	
Raja miraletus	24.19	41	2.81	
Selene dorsalis	22.65	321	2.63	
Trichiurus lepturus	15.29	41	1.77	
Dentex angolensis	7.16	81	0.83	
Dentex congoensis	1.61	41	0.19	
Boops boops	1.61	41	0.19	
Total	861.40		100.01	

PROJECT STATION:2476

DATE:11/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 943
start stop duration Long E 1257
TIME :12:03:16 12:33:11 30 (min) Purpose code: 3
LOG :8520.80 8522.47 1.66 Area code : 2
FDEPTH: 106 107 GearCond.code:
BDEPTH: 106 107 Validity code: 1
Towing dir: 170c Wire out: 330 m Speed: 30 kn*10

Sorted: 85 Kg Total catch: 266.20 CATCH/HOUR: 532.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Umbrina canariensis	239.60	560	45.00	5505
Selene dorsalis	119.20	1006	22.39	5506
Brachydeuterus auritus	47.60	328	8.94	
Trichiurus lepturus	31.60	40	5.94	
Trachurus trecae, juvenile	31.00	1504	5.82	5507
Squatina oculata	14.66	6	2.75	
Trachurus trecae	9.20	48	1.73	
Dentex barnardi	8.28	36	1.56	5508
Dentex angolensis	7.56	54	1.42	5510
Dentex macrophthalmus	6.36	22	1.19	5511
Pagellus bellottii	4.96	28	0.93	5509
Boops boops	3.40	152	0.64	
Zeus faber	2.76	8	0.52	
Fistularia petimba	2.68	4	0.50	
Raja miraletus	1.52	2	0.29	
Illex coindetii	1.20	8	0.23	
Sparus pagrus africanus *	0.72	2	0.14	
Total	532.30		99.99	

PROJECT STATION:2477

DATE:11/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 945
start stop duration Long E 1250
TIME :13:20:52 13:21:09 30 (min) Purpose code: 3
LOG :8533.89 8535.39 1.50 Area code : 2
FDEPTH: 179 178 GearCond.code:
BDEPTH: 179 178 Validity code: 1
Towing dir: 175c Wire out: 550 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 133.97 CATCH/HOUR: 267.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops sp.	66.00	6510	24.63	
Dentex macrophthalmus	65.94	584	24.61	5513
Zenopsis conchifer	55.80	122	20.83	
Spicara alta	34.00	156	12.69	
Dentex angolensis	27.98	134	10.44	5512
Zeus faber	5.30	16	1.98	
Illex coindetii	3.02	58	1.13	
Trichiurus lepturus	2.64	4	0.99	
Squatina aculeata	2.32	4	0.87	
Pterothrissus belloci	1.76	12	0.66	
Uranoscopus polli	0.84	8	0.31	
Selene dorsalis, juveniles	0.68	4	0.25	
Aulopus filamentosus	0.50	2	0.19	
Scomber japonicus	0.34	4	0.13	
Parapenaeus longirostris	0.34	12	0.13	
Monolene microstoma	0.32	12	0.12	
Trachurus trecae	0.16	12	0.06	
Total	267.94		100.02	

PROJECT STATION:2478

DATE:11/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 949
start stop duration Long E 1251
TIME :16:22:25 16:52:12 30 (min) Purpose code: 3
LOG :8544.84 8546.38 1.52 Area code : 2
FDEPTH: 214 218 GearCond.code:
BDEPTH: 214 218 Validity code: 1
Towing dir: 340c Wire out: 650 m Speed: 30 kn*10

Sorted: 100 Kg Total catch: 100.16 CATCH/HOUR: 200.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenopsis conchifer	66.68	316	33.29	
Synagrops microlepis	36.64	4012	18.29	
Dentex angolensis	30.40	114	15.18	5516
Dentex macrophthalmus	15.96	80	7.97	5515
Merluccius polli	13.64	56	6.81	5514
Brotula barbata	11.56	8	5.77	
Pterothrissus belloci	7.92	60	3.95	
Trichiurus lepturus	4.20	6	2.10	
Todaropsis eblanae	2.80	38	1.40	
Uranoscopus polli	2.36	12	1.18	
Illex coindetii	2.32	32	1.16	
Parapenaeus longirostris, fem.	1.36	258	0.68	5517
Bembrops greyi	1.28	12	0.64	
Parapenaeus longirostris, male	0.88	214	0.44	5518
Raja sp.	0.44	2	0.22	
Bembrops heterurus	0.44	4	0.22	
Sepia elegans	0.44	24	0.22	
Monolene microstoma	0.36	20	0.18	
Pontinus kuhlii	0.24	2	0.12	
Zeus faber	0.20	2	0.10	
Chlorophthalmus atlanticus	0.02	14	0.01	
NETTASTOMATIDAE	0.02	2	0.01	
Total	200.16		99.94	

PROJECT STATION:2479

DATE:11/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 938
start stop duration Long E 1242
TIME :19:47:10 20:17:13 30 (min) Purpose code: 3
LOG :8566.69 8568.41 1.71 Area code : 2
FDEPTH: 432 486 GearCond.code:
BDEPTH: 432 486 Validity code: 1
Towing dir: 200c Wire out:1100 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 90.58 CATCH/HOUR: 181.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	117.88	332	65.07	5521
Zenopsis conchifer	12.24	20	6.76	
Pterothrissus belloci	8.56	48	4.73	
Laemonema laureysi	6.96	196	3.84	
Lophius vaillanti	6.48	4	3.58	
Centrophorus granulosus	5.68	2	3.14	
MISCELLANEOUS	3.68	1272	2.03	
Aristeus varidens, female	3.36	472	1.85	5520
CONGRIDAE	2.56	44	1.41	
Chaunax pictus	1.84	28	1.02	
Dibranchus atlanticus	1.60	100	0.88	
POLYCHAELIDAE	1.44	148	0.79	
Hymenocephalus italicus	1.36	148	0.75	
Aristeus varidens, male	1.28	160	0.71	5519
Etmopterus spinax	1.20	36	0.66	
MYCTOPHIDAE	0.76	698	0.42	
Yarrella blackfordi	0.56	16	0.31	
Stomias sp.	0.48	16	0.26	
Trichiurus lepturus	0.32	16	0.18	
Coelorinchus coelorhincus	0.32	8	0.18	
Solenocera africana	0.24	32	0.13	
Hoplostethus cadenati	0.24	4	0.13	
Gadella imberbis	0.24	4	0.13	
NETTASTOMATIDAE	0.08	8	0.04	
Halosaurus ovenii	0.08	16	0.04	
Parapenaeus longirostris	0.04	16	0.02	
Nezumia leonis	0.04	4	0.02	
Peristedion cataphractum	0.04	4	0.02	
Total	179.56		99.10	

PROJECT STATION:2480

DATE:11/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 928
start stop duration Long E 1239
TIME :23:05:45 23:35:27 30 (min) Purpose code: 3
LOG :8587.97 8589.58 1.61 Area code : 2
FDEPTH: 444 446 GearCond.code:
BDEPTH: 444 446 Validity code: 1
Towing dir: 180c Wire out:1250 m Speed: 30 kn*10

Sorted: 71 Kg Total catch: 70.82 CATCH/HOUR: 141.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	97.44	246	68.79	5525
Laemonema laureysi	14.92	182	10.53	
Centrophorus granulosus	7.20	2	5.08	
Shrimps, small, non comm.	6.76	3774	4.77	
Dibranchus atlanticus	3.72	230	2.63	
Yarrella blackfordi	2.56	82	1.81	
Aristeus varidens, female	1.76	96	1.24	5523
Aristeus varidens	1.52	634	1.07	5524
PANDALIDAE	1.04	488	0.73	
Hymenocephalus italicus	0.68	96	0.48	
POLYCHAELIDAE	0.60	72	0.42	
STOMIIDAE	0.48	12	0.34	
Malacocephalus laevis	0.44	4	0.31	
Etmopterus lucifer	0.44	12	0.31	
TRACHINIDAE	0.40	2	0.28	
Aristeus varidens, male	0.36	50	0.25	5522
Trichiurus lepturus	0.32	16	0.23	
Illex coindetii	0.24	2	0.17	
Plesiopenaeus edwardsianus	0.16	6	0.11	
Bathygadus melanobranchus	0.12	12	0.08	
Parapenaeus longirostris	0.08	8	0.06	
NEMICHTHYIDAE	0.08	18	0.06	
Solenocera africana	0.08	6	0.06	
MYCTOPHIDAE	0.04	46	0.03	
Gadella imberbis	0.04	4	0.03	
Chaunax pictus	0.04	6	0.03	
DICERATIIDAE	0.04	2	0.03	
Chlorophthalmus atlanticus	0.04	6	0.03	
Xenodermichthys copei	0.04	18	0.03	
Total	141.64		99.99	

PROJECT STATION:2481

DATE:12/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 933
start stop duration Long E 1247
TIME :05:18:39 05:49:01 30 (min) Purpose code: 3
LOG :8605.80 8607.11 1.31 Area code : 2
FDEPTH: 168 171 GearCond.code:
BDEPTH: 168 171 Validity code: 1
Towing dir: 320c Wire out: 500 m Speed: 30 kn*10

Sorted: 96 Kg Total catch: 96.37 CATCH/HOUR: 192.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	81.76	10246	42.42	
Trichiurus lepturus	45.40	90	23.56	
Pterothrissus belloci	20.64	130	10.71	
Dentex angolensis	18.72	86	9.71	5526
Brotula barbata	3.56	4	1.85	
Parapenaeus longirostris, fem.	2.92	592	1.51	5528
Zeus faber	2.48	4	1.29	
Umbrina canariensis	2.24	4	1.16	
Monolene microstoma	1.80	42	0.93	
Illex coindetii	1.68	16	0.87	
Dibranchus atlanticus	1.56	94	0.81	
Zenopsis conchifer	1.56	4	0.81	
Torpedo torpedo	1.48	2	0.77	
Dentex macrophthalmus	1.40	20	0.73	5527
Bembrops heterurus	1.12	2	0.58	
Bembrops greyi	1.08	2	0.56	
Parapenaeus longirostris, male	1.00	296	0.52	5529
Pontinus kuhlii	0.96	2	0.50	
Uranoscopus albesca	0.68	2	0.35	
Lepidotrigla cadmani	0.32	2	0.17	
Trachurus trecae, juvenile	0.28	14	0.15	
Sepia elegans	0.04	2	0.02	
Merluccius polli, juveniles	0.04	2	0.02	
Chlorophthalmus atlanticus	0.02	2	0.01	
Total	192.74		100.01	

PROJECT STATION:2482

DATE:12/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 928
start stop duration Long E 1252
TIME :07:24:30 07:54:41 30 (min) Purpose code: 3
LOG :8617.91 8619.35 1.44 Area code : 2
FDEPTH: 101 101 GearCond.code:
BDEPTH: 101 101 Validity code: 1
Towing dir: 150º Wire out: 320 m Speed: 30 kn*10

Sorted: 41 Kg Total catch: 248.15 CATCH/HOUR: 496.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	384.00	3000	77.37	5530
Trichiurus lepturus	42.24	158	8.51	
Trachurus trecae, juvenile	15.40	916	3.10	5531
Stromateus fiatola	15.00	16	3.02	
Rhinobatos albomaculatus	8.72	4	1.76	
Raja miraletus	4.00	6	0.81	
Pterothrissus belloci	3.80	30	0.77	
Illex coindetii	3.60	70	0.73	
Priacanthus arenatus	2.84	4	0.57	
Decapterus rhonchus	2.44	4	0.49	
Pagellus bellottii	1.96	10	0.39	
Fistularia petimba	1.80	6	0.36	
Sepia orbignyana	1.60	10	0.32	
Dentex angolensis	1.40	10	0.28	
Raja straeleni	1.32	2	0.27	
Zeus faber	1.28	2	0.26	
Alloteuthis africana	1.20	440	0.24	
Trachurus trecae	1.04	2	0.21	
Dentex barnardi	0.84	4	0.17	
Merluccius polli, juveniles	0.80	110	0.16	5532
Selene dorsalis	0.60	10	0.12	
Thorogobius angolensis	0.20	110	0.04	
Monolene microstoma	0.20	20	0.04	
Saurida brasiliensis	0.10	20	0.02	
Total	496.38		100.01	

PROJECT STATION:2483

DATE:12/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 929
start stop duration Long E 1258
TIME :08:58:33 09:27:53 29 (min) Purpose code: 3
LOG :8625.69 8627.18 1.49 Area code : 2
FDEPTH: 61 63 GearCond.code:
BDEPTH: 61 63 Validity code: 1
Towing dir: 330º Wire out: 200 m Speed: 30 kn*10

Sorted: 102 Kg Total catch: 101.90 CATCH/HOUR: 210.83

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	110.28	703	52.31	5536
Umbrina canariensis	16.18	39	7.67	5535
Decapterus rhonchus	15.43	116	7.32	
Pagellus bellottii	15.39	87	7.30	5533
Sphyraena guachancho	13.57	23	6.44	
Pomadasys incisus	9.35	50	4.43	5534
Sepia officinalis hierredda	4.84	2	2.30	
Parapristipoma sp.	3.85	8	1.83	
Plectorhinchus mediterraneus	3.27	8	1.55	
Raja miraletus	3.19	4	1.51	
Epinephelus aeneus	3.14	2	1.49	
Pseudupeneus prayensis	2.73	12	1.29	
Fistularia petimba	2.11	8	1.00	
CARANGIDAE	1.86	2	0.88	
Chaetodon hoefleri	1.70	12	0.81	
Pagrus pagrus	1.61	2	0.76	
Boops boops	1.37	12	0.65	
Alloteuthis africana	0.95	861	0.45	
Chaetodon marcellae	0.12	2	0.06	
Total	210.94		100.05	

PROJECT STATION:2484

DATE:12/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 926
start stop duration Long E 1303
TIME :10:41:08 11:11:09 30 (min) Purpose code: 3
LOG :8635.51 8637.01 1.50 Area code : 2
FDEPTH: 25 27 GearCond.code:
BDEPTH: 25 27 Validity code: 1
Towing dir: 335º Wire out: 120 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 59.42 CATCH/HOUR: 118.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	28.52	32	24.00	
Acanthurus monroviae	17.96	28	15.11	
Bodianus speciosus	16.36	14	13.77	
Boops boops	12.24	5464	10.30	
Aluterus scriptus	12.12	18	10.20	
Fistularia tabacaria	9.16	14	7.71	
Plectorhinchus mediterraneus	7.24	16	6.09	
Sparus auriga *	2.72	10	2.29	
Panulirus regius	1.76	2	1.48	
Selene dorsalis	1.72	4	1.45	
Umbrina canariensis	1.44	4	1.21	
Caranx senegallus	1.36	2	1.14	
Sphyraena guachancho	1.36	2	1.14	
Lutjanus fulgens	1.08	4	0.91	
Pomadasys incisus	0.96	6	0.81	
Caranx crysos	0.96	2	0.81	
Scomberomorus tritor	0.92	2	0.77	
Fistularia petimba	0.68	6	0.57	
Decapterus rhonchus	0.16	2	0.13	
Dentex congoensis	0.12	2	0.10	
Total	118.84		99.99	

PROJECT STATION:2485

DATE:12/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 916
start stop duration Long E 1255
TIME :12:39:06 13:12:19 33 (min) Purpose code: 3
LOG :8649.60 8651.12 1.51 Area code : 2
FDEPTH: 43 44 GearCond.code:
BDEPTH: 43 44 Validity code: 1
Towing dir: 150º Wire out: 170 m Speed: 30 kn*10

Sorted: 93 Kg Total catch: 188.90 CATCH/HOUR: 343.45

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	85.09	1445	24.78	
Ijimaia loppei	60.80	915	17.70	
Pseudotolithus typus	44.15	91	12.85	5537
Galeoides decadactylus	35.80	329	10.42	
Sphyraena guachancho	24.29	65	7.07	
Brachydeuterus auritus Juv.	20.40	291	5.94	
Rhizoprionodon acutus	16.65	4	4.85	
Pagellus bellottii	14.29	60	4.16	
Pentheroscion mbizi	11.60	175	3.38	
Arius parkii	7.78	4	2.27	
Lithognathus mormyrus	7.20	15	2.10	
Epinephelus aeneus	3.27	5	0.95	
Rhinobatos albomaculatus	1.75	2	0.51	
Argyrosomus hololepidotus	1.67	4	0.49	
Acanthurus monroviae	1.24	2	0.36	
Torpedo torpedo	1.20	5	0.35	
Penaeus notialis	1.13	45	0.33	
Aluterus scriptus	1.09	2	0.32	
Selene dorsalis	1.00	5	0.29	
Sepia officinalis hierredda	1.00	5	0.29	
Citharichthys stampflii	0.58	5	0.17	
Sepia orbignyana	0.51	5	0.15	
Total	342.49		99.73	

PROJECT STATION:2486

DATE:12/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 917
start stop duration Long E 1253
TIME :14:09:23 14:39:14 30 (min) Purpose code: 3
LOG :8657.94 8659.45 1.50 Area code : 2
FDEPTH: 65 65 GearCond.code:
BDEPTH: 65 65 Validity code: 1
Towing dir: 180º Wire out: 200 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 49.78 CATCH/HOUR: 99.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	50.88	460	51.10	
Trachurus trecae	20.24	324	20.33	5538
Sphyraena guachancho	14.28	36	14.34	
Trichiurus lepturus	4.12	50	4.14	
Decapterus rhonchus	2.72	14	2.73	
Dentex angolensis	2.28	14	2.29	
Pagellus bellottii	1.92	12	1.93	
Selene dorsalis	1.52	20	1.53	
Galeoides decadactylus	0.56	4	0.56	
Loligo vulgaris	0.40	98	0.40	
Engraulis encrasicolus	0.36	94	0.36	
Ilisha africana	0.28	6	0.28	
Total	99.56		99.99	

PROJECT STATION:2487

DATE:12/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 916
start stop duration Long E 1250
TIME :15:42:01 16:12:18 30 (min) Purpose code: 3
LOG :8666.39 8668.09 1.70 Area code : 2
FDEPTH: 94 95 GearCond.code:
BDEPTH: 94 95 Validity code: 1
Towing dir: 170º Wire out: 290 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 47.21 CATCH/HOUR: 94.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	82.44	344	87.31	
Brachydeuterus auritus	5.96	40	6.31	
Octopus vulgaris	2.56	2	2.71	
Fistularia petimba	1.00	2	1.06	
Trachurus trecae	0.64	10	0.68	
Synagrops microlepis	0.52	252	0.55	
Decapterus rhonchus	0.40	2	0.42	
Pterothrissus belloci	0.36	2	0.38	
Sepia orbignyana	0.32	2	0.34	
Citharus linguatula	0.16	2	0.17	
Monolene microstoma	0.06	2	0.06	
Total	94.42		99.99	

PROJECT STATION:2488

DATE:12/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 920
start stop duration Long E 1231
TIME :19:53:14 20:09:24 16 (min) Purpose code: 3
LOG :8693.76 8694.71 0.95 Area code : 2
FDEPTH: 751 769 GearCond.code: 7
BDEPTH: 751 769 Validity code: 4
Towing dir: 360º Wire out:1700 m Speed: 30 kn*10

Sorted: 5 Kg Total catch: 4.76 CATCH/HOUR: 17.85

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MELANOSTOMIATIDAE	5.10	98	28.57	
Yarrella blackfordi	3.98	83	22.30	
Phrynichthys wedli	1.69	34	9.47	
Gonostoma denudata	1.31	53	7.34	
Triplophus hemingi	1.28	143	7.17	
Talismania bifurcata	1.05	11	5.88	
POLYCHAELIDAE	0.86	75	4.82	
Laemonema laureysi	0.64	15	3.59	
STOMIIDAE	0.38	45	2.13	
Xenodermichthys copei	0.38	19	2.13	
Hoplostethus cadenati	0.30	11	1.68	
Nemichthys scolopaceus	0.23	11	1.29	
Sternoptyx sp.	0.19	15	1.06	
Glyphus marsupialis	0.15	8	0.84	
Nezumia aequalis	0.15	4	0.84	
Isistius brasiliensis	0.08	4	0.45	
MYCTOPHIDAE	0.08	34	0.45	
ALEPOCEPHALIDAE	0.04	4	0.22	
Total	17.89		100.23	

PROJECT STATION:2489

DATE:12/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 916
start stop duration Long E 1231
TIME :21:41:47 22:06:13 24 (min) Purpose code: 3
LOG :8702.39 8703.74 1.35 Area code : 2
FDEPTH: 776 771 GearCond.code:
BDEPTH: 776 771 Validity code: 1
Towing dir: 180º Wire out:1800 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 65.13 CATCH/HOUR: 162.83

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	41.90	1205	25.73	
Nezumia leonis	33.20	565	20.39	
Talismania bifurcata	26.60	253	16.34	
Stomias affinis	16.40	590	10.07	
POLYCHAELIDAE	11.90	818	7.31	
Unidentified fish	4.60	690	2.83	
Triplophus hemingi	3.30	330	2.03	
Hoplostethus cadenati	2.70	50	1.66	
Lamprogrammus exutus	2.30	5	1.41	
Ebinania costaecanarie	1.90	40	1.17	
Bathyuroconger vicinus	1.90	15	1.17	
Bathygadus melanobranchus	1.80	95	1.11	
Dibranchus atlanticus	1.30	45	0.80	
Glyphus marsupialis	0.95	48	0.58	
Heterocarpus grimaldii	0.80	58	0.49	
SYNODONTIDAE	0.80	20	0.49	
Xenodermichthys copei	0.80	20	0.49	
Aristeus varidens, female	0.60	23	0.37	5539
Heterocarpus ensifer	0.20	80	0.12	
Aristeus varidens, male	0.20	25	0.12	5540
OPHIDIIDAE	0.20	5	0.12	
MELANONIDAE	0.20	15	0.12	
Lithodes ferox	0.10	5	0.06	
Nephropsis atlantica	0.10	5	0.06	
CARISTIIDAE	0.10	5	0.06	
MYCTOPHIDAE	0.10	5	0.06	
NEMICHTHYIDAE	0.10	5	0.06	
Gadella imberbis	0.10	5	0.06	
BATHYPTEROIDAE	0.10	15	0.06	
Plesiopenaeus edwardsianus	0.08	8	0.05	
Solenocera africana	0.05	15	0.03	
Halosaurus ovenii	0.05	5	0.03	
Total	164.63		101.11	

PROJECT STATION:2490

DATE:13/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 913
start stop duration Long E 1247
TIME :05:21:06 05:51:10 30 (min) Purpose code: 3
LOG :8761.63 8763.21 1.58 Area code : 2
FDEPTH: 107 108 GearCond.code:
BDEPTH: 107 108 Validity code: 1
Towing dir: 170º Wire out: 340 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 87.60 CATCH/HOUR: 175.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	61.04	3332	34.84	5543
Trichiurus lepturus	30.40	60	17.35	
Umbrina canariensis	29.52	110	16.85	5542
Dentex angolensis	9.88	74	5.64	5541
Scomber japonicus	7.26	112	4.14	
Sepia officinalis hierredda	7.08	4	4.04	
Pagellus bellottii	6.16	44	3.52	5544
Dentex congoensis	3.36	26	1.92	5545
Zeus faber	2.80	8	1.60	
Zenopsis conchifer	2.44	2	1.39	
Uranoscopus cadenati	2.36	10	1.35	
Brotula barbata	2.20	2	1.26	
Pterothrissus belloci	1.76	10	1.00	
Priacanthus arenatus	1.64	4	0.94	
Octopus vulgaris	1.64	2	0.94	
Sphoeroides spengleri	1.20	2	0.68	
Fistularia petimba	1.12	2	0.64	
Boops boops	0.60	22	0.34	
Saurida brasiliensis	0.54	120	0.31	
Citharus linguatula	0.48	16	0.27	
Lepidotrigla cadmani	0.28	2	0.16	
Chaetodon hoefleri	0.24	2	0.14	
Chelidonichthys capensis	0.24	2	0.14	
Monolene microstoma	0.24	6	0.14	
Total	174.48		99.60	

PROJECT STATION:2491

DATE:13/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 910
start stop duration Long E 1252
TIME :07:07:18 07:37:27 30 (min) Purpose code: 3
LOG :8771.46 8772.69 1.23 Area code : 2
FDEPTH: 69 62 GearCond.code:
BDEPTH: 69 62 Validity code: 1
Towing dir: 10º Wire out: 240 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 156.56 CATCH/HOUR: 313.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	225.60	2128	72.05	5546
Trachurus trecae, juvenile	32.80	2528	10.48	5547
Sphyraena guachancho	13.88	32	4.43	
Sphyraena sphyraena	9.04	30	2.89	
Trachurus trecae	8.64	16	2.76	
Selene dorsalis	7.04	72	2.25	5549
Pagellus bellottii	5.48	52	1.75	5548
Trichiurus lepturus	4.32	8	1.38	
Sepia officinalis hierredda	1.56	6	0.50	
Alloteuthis africana	1.44	512	0.46	
Dentex angolensis	0.88	12	0.28	
Fistularia petimba	0.68	2	0.22	
Lithognathus mormyrus	0.60	4	0.19	
Sardinella maderensis	0.56	2	0.18	
Dentex barnardi	0.32	2	0.10	
Sepia elegans	0.24	2	0.08	
Sardinella aurita	0.04	2	0.01	
Total	313.12		100.01	

PROJECT STATION:2492

DATE:13/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 907
start stop duration Long E 1256
TIME :08:36:18 09:04:52 29 (min) Purpose code: 3
LOG :8778.85 8780.47 1.61 Area code : 2
FDEPTH: 30 48 GearCond.code:
BDEPTH: 30 48 Validity code: 1
Towing dir: 260º Wire out: 120 m Speed: 30 kn*10

Sorted: Kg Total catch: 93.60 CATCH/HOUR: 193.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Spondyliosoma cantharus	164.65	8	85.02	
Balistes capriscus	17.54	43	9.06	
Alectis alexandrinus	4.39	2	2.27	
Pagrus caeruleostictus	3.56	8	1.84	
Caranx crysos	1.82	2	0.94	
Lagocephalus laevigatus	0.50	2	0.26	
Decapterus rhonchus	0.46	2	0.24	
Trachurus trecae	0.41	2	0.21	
Alloteuthis africana	0.23	64	0.12	
Fistularia petimba	0.08	2	0.04	
Total	193.64		100.00	

PROJECT STATION:2493

DATE:13/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 909
start stop duration Long E 1252
TIME :09:42:53 10:13:52 29 (min) Purpose code: 3
LOG :8782.70 8784.51 1.81 Area code : 2
FDEPTH: 69 70 GearCond.code:
BDEPTH: 69 70 Validity code: 1
Towing dir: 200º Wire out: 200 m Speed: 30 kn*10

Sorted: Kg Total catch: 8.77 CATCH/HOUR: 18.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	6.95	91	38.31	5550
Sphyraena sphyraena	3.43	17	18.91	
Balistes capriscus	2.65	6	14.61	
Lagocephalus laevigatus	1.82	6	10.03	
Sepia officinalis hierredda	1.45	4	7.99	
Pseudupeneus prayensis	0.66	8	3.64	
Alloteuthis africana	0.54	211	2.98	
Trachurus trecae, juvenile	0.33	21	1.82	
Fistularia petimba	0.31	12	1.71	
Total	18.14		100.00	

PROJECT STATION:2494

DATE:13/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 906
start stop duration Long E 1249
TIME :11:52:03 12:18:49 27 (min) Purpose code: 3
LOG :8795.91 8797.22 1.26 Area code : 2
FDEPTH: 112 125 GearCond.code:
BDEPTH: 112 125 Validity code: 1
Towing dir: 20º Wire out: m Speed: kn*10

Sorted: 69 Kg Total catch: 107.99 CATCH/HOUR: 239.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	116.76	709	48.65	5551
Trigla lyra	52.58	360	21.91	
Seriola carpenteri	32.76	16	13.65	
Sphoeroides pachgaster	10.73	11	4.47	
Sepia officinalis hierredda	7.00	4	2.92	
Sepia orbignyana	6.62	9	2.76	
Zeus faber	4.13	16	1.72	
Brotula barbata	3.24	2	1.35	
Raja miraletus	2.09	2	0.87	
Scorpaena stephanica	1.64	4	0.68	
Dentex congoensis	1.09	20	0.45	
Dentex barnardi	0.71	4	0.30	
Citharus linguatula	0.62	11	0.26	
Total	239.97		99.99	

PROJECT STATION:2495

DATE:13/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 907
start stop duration Long E 1242
TIME :13:20:27 15:01:31 24 (min) Purpose code: 3
LOG :8814.88 8816.25 1.34 Area code : 2
FDEPTH: 341 305 GearCond.code:
BDEPTH: 341 305 Validity code: 1
Towing dir: 40º Wire out: 980 m Speed:300 kn*10

Sorted: Kg Total catch: 574.40 CATCH/HOUR: 1436.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	1187.50	538	82.69	
Chlorophthalmus atlanticus	130.25	2288	9.07	
Synagrops microlepis	68.88	2820	4.80	
Malacocephalus laevis	7.50	38	0.52	
Parapenaeus longirostris, fem.	7.13	913	0.50	5553
Laemonema laureysi	6.75	108	0.47	
Merluccius polli	5.50	38	0.38	
Parapenaeus longirostris, male	2.88	413	0.20	5552
Trichiurus lepturus	2.75	170	0.19	
Hymenocephalus italicus	2.75	405	0.19	
Gephyroberyx darwini	2.40	3	0.17	
Illex coindetii	2.38	20	0.17	
Sphyraena sphyraena	1.88	8	0.13	
Gadella imberbis	1.88	63	0.13	
Mystriophis rostellatus	1.20	5	0.08	
Raja straeleni	1.00	8	0.07	
Epinephelus costae	0.75	8	0.05	
Pagellus bellottii	0.75	8	0.05	
Bathynectes piperitus	0.63	13	0.04	
Xenolepidichthys dagleishi	0.53	25	0.04	
Solenocera africana	0.38	158	0.03	
Plesionika martia	0.25	95	0.02	
Coelorinchus coelorhincus	0.13	100	0.01	
Total	1436.05		100.00	

PROJECT STATION:2496

DATE:13/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 906
start stop duration Long E 1237
TIME :18:31:25 18:31:59 31 (min) Purpose code: 3
LOG :8831.40 8832.95 1.55 Area code : 2
FDEPTH: 650 697 GearCond.code:
BDEPTH: 650 697 Validity code: 1
Towing dir: 215o Wire out:1500 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 112.20 CATCH/HOUR: 217.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	42.04	1504	19.36	
MELANOSTOMIATIDAE	25.20	528	11.60	
Aristeus varidens, female	18.70	883	8.61	5554
Xenodermichthys copei	17.77	1063	8.18	
Lamprogrammus exutus	17.65	197	8.13	
Neoharriotta pinnata	16.18	2	7.45	
NEMATOCARCINIDAE	12.43	4703	5.72	
Gadella imberbis	11.03	852	5.08	
Hoplostethus cadenati	10.45	418	4.81	
Nezumia aequalis	7.90	139	3.64	
Aristeus varidens, male	4.53	569	2.09	5555
Etmopterus lucifer	4.41	17	2.03	
POLYCHAELIDAE	3.14	232	1.45	
Merluccius polli	3.02	6	1.39	
NETTASTOMATIDAE	2.90	6	1.34	
OCTOPOTEUTHIDAE	2.90	12	1.34	
Triplophus hemingi	2.67	395	1.23	
Chaceon maritae	2.52	6	1.16	
Todaropsis eblanae	2.03	12	0.93	
CONGRIDAE	1.39	35	0.64	
Bathygadus melanobranchus	1.28	6	0.59	
Laemonema laureysi	1.28	12	0.59	
Synaphobranchus kaupii	1.16	41	0.53	
Stromateus fiatola	1.05	35	0.48	
Phrynichthys wedli	1.05	17	0.48	
Gonostoma denudata	0.58	23	0.27	
Talismania bifurcata	0.58	29	0.27	
Dibranchus atlanticus	0.52	6	0.24	
Glyphus marsupialis	0.46	29	0.21	
Trichiurus lepturus	0.35	6	0.16	
Total	217.52		100.00	

PROJECT STATION:2497

DATE:14/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 850
start stop duration Long E 1249
TIME :23:01:37 00:01:33 30 (min) Purpose code: 3
LOG :8863.41 8864.92 1.52 Area code : 3
FDEPTH: 538 541 GearCond.code:
BDEPTH: 538 541 Validity code: 1
Towing dir: 200o Wire out:1370 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 132.26 CATCH/HOUR: 264.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	102.62	3956	38.79	
Nematocarcinus africanus	31.92	17982	12.07	
Merluccius polli	31.76	58	12.01	5558
Lamprogrammus exutus	20.16	372	7.62	
Centrophorus granulosus	15.28	4	5.78	
Benthodesmus tenuis	13.86	474	5.24	
POLYCHAELIDAE	7.56	1066	2.86	
Aristeus varidens, female	4.90	246	1.85	5556
Gadella imberbis	4.90	260	1.85	
Yarrella blackfordi	4.76	462	1.80	
Todarodes sagittatus	3.78	22	1.43	
Aristeus varidens, male	3.22	414	1.22	5557
Bathyuroconger vicinus	2.80	182	1.06	
Triplophus hemingi	2.80	452	1.06	
Stomias affinis	2.38	70	0.90	
Centroscymnus crepidater	1.68	14	0.64	
Lophius vaillanti	1.60	2	0.60	
Raja sp.	1.56	2	0.59	
Chlorophthalmus atlanticus	1.40	8	0.53	
Xenodermichthys copei	1.40	148	0.53	
OPLOPHORIDAE	1.26	630	0.48	
Etmopterus lucifer	1.26	36	0.48	
Bathygadus melanobranchus	0.70	112	0.26	
Coloconger cadenati	0.70	22	0.26	
PENAEIDAE	0.56	294	0.21	
PASIPHAEIDAE	0.56	98	0.21	
Chaceon maritae	0.48	2	0.18	
Halosaurus ovenii	0.28	8	0.11	
Dibranchus atlanticus	0.28	14	0.11	
NEMICHTHYIDAE	0.14	28	0.05	
Nezumia leonis	0.14	42	0.05	
Total	266.70		100.83	

PROJECT STATION:2498

DATE:14/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 847
start stop duration Long E 1255
TIME :05:11:59 05:42:10 30 (min) Purpose code: 3
LOG :8878.71 8880.03 1.32 Area code : 3
FDEPTH: 355 359 GearCond.code:
BDEPTH: 355 359 Validity code: 1
Towing dir: 210o Wire out: 950 m Speed: 30 kn*10

Sorted: 61 Kg Total catch: 212.53 CATCH/HOUR: 425.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	233.60	974	54.96	5559
Aequorea aequorea	95.00	1302	22.35	
Laemonema laureysi	32.62	302	7.67	
Trichiurus lepturus	11.48	224	2.70	
Synagrops microlepis	11.20	386	2.63	
Parapenaeus longirostris, fem.	8.54	1106	2.01	5561
Pterothrissus belloci	8.54	42	2.01	
Gadella imberbis	7.28	252	1.71	
Epigonus telescopus	4.06	126	0.96	
Hymenocephalus italicus	3.64	504	0.86	
Illex coindetii	2.66	28	0.63	
Chaunax pictus	2.24	70	0.53	
Solenocera africana	1.40	336	0.33	
Parapenaeus longirostris, male	0.70	42	0.16	5560
Halosaurus ovenii	0.70	22	0.16	
Coelorinchus coelorhincus	0.70	14	0.16	
MYCTOPHIDAE	0.42	266	0.10	
Dibranchus atlanticus	0.28	14	0.07	
Nezumia aequalis	0.02	8		
Peristedion cataphractum	0.02	8		
Total	425.10		100.00	

PROJECT STATION:2499

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 846
start stop duration Long E 1300
TIME :07:13:29 07:33:27 20 (min) Purpose code: 3
LOG :8888.23 8888.87 0.62 Area code : 3
FDEPTH: 185 183 GearCond.code:
BDEPTH: 185 183 Validity code: 1
Towing dir: 20o Wire out: 580 m Speed: 25 kn*10

Sorted: 17 Kg Total catch: 17.31 CATCH/HOUR: 51.93

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	12.54	1818	24.15	
MURAENIDAE	10.02	12	19.30	
Brotula barbata	8.88	15	17.10	
Bembrops heterurus	4.98	54	9.59	
Parapenaeus longirostris, male	4.29	1245	8.26	5563
Zenopsis conchifer	3.12	3	6.01	
Parapenaeus longirostris, fem.	2.37	543	4.56	5564
Pterothrissus belloci	1.68	12	3.24	
Merluccius polli	1.02	48	1.96	5562
Dentex angolensis	0.78	3	1.50	
GOBIIDAE	0.51	99	0.98	
CALAPPIDAE	0.45	9	0.87	
Monolene microstoma	0.42	3	0.81	
Laemonema laureysi	0.24	9	0.46	
Trichiurus lepturus	0.18	15	0.35	
Solenocera africana	0.12	15	0.23	
Squilla cadenati	0.12	3	0.23	
XANTHIDAE	0.12	3	0.23	
Calappa pelii	0.06	3	0.12	
Peristedion cataphractum	0.03	3	0.06	
Dibranchus sp.	0.03	9	0.06	
Chlorophthalmus atlanticus	0.03	21	0.06	
C R A B S	0.03	24	0.06	
Total	52.02		100.19	

PROJECT STATION:2500

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 844
start stop duration Long E 1309
TIME :08:20:12 08:21:27 33 (min) Purpose code: 3
LOG :8899.76 8901.59 1.83 Area code : 3
FDEPTH: 83 82 GearCond.code:
BDEPTH: 83 82 Validity code: 1
Towing dir: 20o Wire out: 240 m Speed: 30 kn*10

Sorted: 77 Kg Total catch: 469.14 CATCH/HOUR: 852.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	477.27	7178	55.95	5565
Stromateus fiatola	78.47	142	9.20	
Selene dorsalis	76.18	1453	8.93	5566
Trichiurus lepturus	74.22	415	8.70	
Galeoides decadactylus	27.16	95	3.18	
Trachurus trecae	25.29	236	2.96	5567
Raja miraletus	17.49	24	2.05	
Brotula barbata	12.05	13	1.41	
Fistularia petimba	10.00	18	1.17	
Trachurus trecae, juvenile	9.22	753	1.08	5568
Zeus faber	8.51	24	1.00	
Chloroscombrus chrysurus	8.51	71	1.00	
Pagellus bellottii	7.33	36	0.86	
Atractoscion sp.	4.96	24	0.58	
Dentex barnardi	4.49	24	0.53	
Sphyraena guachancho	4.25	13	0.50	
Sardinella aurita	3.31	36	0.39	
Pterothrissus belloci	2.36	36	0.28	
Scomber japonicus	1.42	13	0.17	
Dentex angolensis	0.47	13	0.06	
Total	852.96		100.00	

PROJECT STATION:2501

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 835
start stop duration Long E 1309
TIME :10:06:23 10:57:52 30 (min) Purpose code: 3
LOG :8908.48 8909.94 1.46 Area code : 3
FDEPTH: 81 83 GearCond.code:
BDEPTH: 81 83 Validity code: 1
Towing dir: 350o Wire out: 240 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 1195.84 CATCH/HOUR: 2391.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	1624.00	340	67.90	
Stromateus fiatola	224.00	204	9.37	
Brachydeuterus auritus	200.00	236	8.36	
Sepia orbignyana	97.20	54	4.06	
Galeoides decadactylus	94.40	216	3.95	
Trachurus trecae, juvenile	73.40	7610	3.07	5571
Selene dorsalis	47.40	594	1.98	
Pagellus bellottii	19.84	124	0.83	5569
Dentex angolensis	4.72	24	0.20	5570
Fistularia petimba	3.20	4	0.13	
Brotula barbata	2.04	2	0.09	
Atractoscion aequidens	1.48	2	0.06	
Total	2391.68		100.00	

PROJECT STATION:2502

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 839
start stop duration Long E 1304
TIME :12:47:05 13:17:06 30 (min) Purpose code: 3
LOG :8920.59 8922.09 1.49 Area code : 3
FDEPTH: 113 113 GearCond.code:
BDEPTH: 113 113 Validity code: 1
Towing dir: 360o Wire out: 340 m Speed: 30 kn*10

Sorted: 591 Kg Total catch: 59.14 CATCH/HOUR: 118.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	51.04	2552	43.15	5574
Dentex angolensis	30.20	164	25.53	5572
Dentex congoensis	21.04	234	17.79	5573
Trichiurus lepturus	6.60	22	5.58	
Sepia orbignyana	3.64	2	3.08	
Dentex congoensis	1.88	2	1.59	
Stromateus fiatola	1.60	2	1.35	
Zeus faber	1.60	10	1.35	
Brachydeuterus auritus	0.44	4	0.37	
Chaetodon marcellae	0.24	2	0.20	
Total	118.28		99.99	

PROJECT STATION:2503

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 835
start stop duration Long E 1259
TIME :14:42:38 15:12:27 30 (min) Purpose code: 3
LOG :8930.98 8932.60 1.61 Area code : 3
FDEPTH: 184 189 GearCond.code:
BDEPTH: 184 189 Validity code: 1
Towing dir: 175o Wire out: 570 m Speed: 31 kn*10

Sorted: 35 Kg Total catch: 193.70 CATCH/HOUR: 387.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops sp.	244.00	14352	62.98	
Zenopsis conchifer	37.44	48	9.66	
Trichiurus lepturus	31.20	24	8.05	
Merluccius capensis, juveniles	19.68	540	5.08	
Pterothrissus belloci	14.64	132	3.78	
Parapenaeus longirostris, fem.	6.24	1068	1.61	5575
Umbrina canariensis	5.28	12	1.36	
MYCTOPHIDAE	5.04	1116	1.30	
Dentex angolensis	5.04	20	1.30	
Parapenaeus longirostris, male	4.56	1236	1.18	5576
Miracorvina angolensis	4.32	12	1.12	
Zeus faber	2.64	12	0.68	
Dentex congoensis	1.92	24	0.50	
Torpedo torpedo	1.80	4	0.46	
BREGMACEROTIDAE	1.68	2520	0.43	
Illex coindetii	1.44	24	0.37	
Monolene microstoma	0.48	12	0.12	
Total	387.40		99.98	

PROJECT STATION:2504

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 836
start stop duration Long E 1255
TIME :16:59:40 17:29:31 30 (min) Purpose code: 3
LOG :8942.40 8943.80 1.40 Area code : 3
FDEPTH: 369 368 GearCond.code:
BDEPTH: 369 368 Validity code: 1
Towing dir: 326o Wire out: 950 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 333.50 CATCH/HOUR: 667.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Aequorea aequorea	320.00	4672	47.98	
Merluccius polli	249.00	1024	37.33	5577
Laemonema laureysi	23.04	192	3.45	
S H R I M P S	20.16	1456	3.02	
B I V A L V E S	11.84	384	1.78	
Illex coindetii	5.44	16	0.82	
Gadella imberbis	4.16	112	0.62	
Parapenaeus longirostris, fem.	3.84	448	0.58	5578
Synagrops microlepis	3.84	256	0.58	
Lophius vaillanti	3.52	2	0.53	
Trichiurus lepturus	3.28	18	0.49	
Bathynectes piperitus	3.20	48	0.48	
Chaunax pictus	2.88	48	0.43	
Helicolenus dactylopterus	2.84	6	0.43	
Bathygadus melanobranchus	2.56	2	0.38	
Zenopsis conchifer	2.28	4	0.34	
Hymenocephalus italicus	1.28	128	0.19	
CONGRIDAE	1.28	32	0.19	
Epigonus telescopus	0.64	32	0.10	
NETTASTOMATIDAE	0.64	16	0.10	
Aristeus varidens	0.32	48	0.05	
Solenocera africana	0.32	32	0.05	
Nezumia aequalis	0.32	2	0.05	
Coelorinchus coelorhincus	0.32	16	0.05	
Total	667.00		100.02	

PROJECT STATION:2505

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 824
start stop duration Long E 1248
TIME :20:02:25 20:32:27 30 (min) Purpose code: 3
LOG :8960.21 8961.61 1.39 Area code : 3
FDEPTH: 449 446 GearCond.code:
BDEPTH: 449 446 Validity code: 1
Towing dir: 340o Wire out:1100 m Speed: 30 kn*10

Sorted: 46 Kg Total catch: 224.24 CATCH/HOUR: 448.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	386.80	994	86.25	5579
NEMATOCARCINIDAE	36.80	8658	8.21	
Centrophorus granulosus	16.28	4	3.63	
Laemonema laureysi	3.20	36	0.71	
TRICHIURIDAE	2.64	98	0.59	
MELANOSTOMIATIDAE	0.68	12	0.15	
HISTIOTEUTHIDAE	0.52	6	0.12	
Gadella imberbis	0.52	18	0.12	
Aristeus varidens, female	0.36	30	0.08	
Dibranchus atlanticus	0.20	8	0.04	
Aristeus varidens, male	0.12	12	0.03	
Parapenaeus longirostris, fem.	0.12	12	0.03	
Hymenocephalus italicus	0.08	8	0.02	
Etmopterus spinax	0.08	2	0.02	
Halosaurus ovenii	0.04	2	0.01	
Hoplostethus cadenati	0.04	2	0.01	
Total	448.48		100.02	

PROJECT STATION:2506

DATE:14/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 824
start stop duration Long E 1245
TIME :22:07:14 22:21:00 14 (min) Purpose code: 3
LOG :8966.74 8967.40 0.66 Area code : 3
FDEPTH: 637 637 GearCond.code: 9
BDEPTH: 637 637 Validity code: 4
Towing dir: 150o Wire out:1650 m Speed: 30 kn*10

Sorted: 9 Kg Total catch: 8.92 CATCH/HOUR: 38.23

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	9.69	206	25.35	
Todaropsis eblanae	5.40	34	14.13	
OCTOPODIDAE	5.31	26	13.89	
Chaceon maritae	3.60	13	9.42	
Hoplostethus cadenati	3.34	116	8.74	
Lamprogrammus exutus	2.57	17	6.72	
OPHIDIIDAE	2.31	9	6.04	
Centroscymnus crepidater	1.71	4	4.47	
Bathyuroconger vicinus	1.03	26	2.69	
Stomias sp.	0.86	17	2.25	
Raja sp.	0.86	9	2.25	
Bathygadus melanobranchus	0.69	9	1.80	
POLYCHAELIDAE	0.51	39	1.33	
Etmopterus lucifer	0.34	4	0.89	
Total	38.22		99.97	

PROJECT STATION:2507

DATE:15/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 825
start stop duration Long E 1246
TIME :00:23:27 00:55:27 32 (min) Purpose code: 3
LOG :8974.43 8976.11 1.68 Area code : 3
FDEPTH: 624 633 GearCond.code:
BDEPTH: 624 633 Validity code: 1
Towing dir: 330o Wire out:1650 m Speed: 30 kn*10

Sorted: 393 Kg Total catch: 165.04 CATCH/HOUR: 309.45

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	134.83	29295	43.57	
Centrophorus granulosus	52.99	9	17.12	
STOMIIDAE	43.54	904	14.07	
Lamprogrammus exutus	12.32	94	3.98	
Yarrella blackfordi	10.97	321	3.54	
Raja sp.	9.62	9	3.11	
POLYCHAELIDAE	7.43	803	2.40	
Hoplostethus cadenati	6.58	270	2.13	
OCTOPODIDAE	6.08	34	1.96	
Merluccius polli	5.40	9	1.75	
Triplophus hemingi	5.06	878	1.64	
Gadella imberbis	3.38	118	1.09	
Setarches guentheri	1.69	17	0.55	
Xenodermichthys copei	1.52	118	0.49	
Benthodesmus tenuis	1.18	43	0.38	
PENAEIDAE	1.01	43	0.33	
DICERATIIDAE	1.01	84	0.33	
Chaceon maritae	0.98	6	0.32	
Aristeus varidens, female	0.84	43	0.27	5581
Bathygadus melanobranchus	0.68	17	0.22	
ASTRONESTHIDAE	0.51	17	0.16	
OPLOPHORIDAE	0.51	51	0.16	
PARALEPIDIDAE	0.51	17	0.16	
Aristeus varidens, male	0.34	51	0.11	5580
Bathyuroconger vicinus	0.17	9	0.05	
SERGESTIDAE	0.17	34	0.05	
Dibranchus atlanticus	0.17	9	0.05	
Total	309.49		99.99	

PROJECT STATION:2508

DATE:15/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 821
start stop duration Long E 1255
TIME :05:00:27 05:01:12 26 (min) Purpose code: 3
LOG :8992.95 8994.28 1.33 Area code : 3
FDEPTH: 164 169 GearCond.code:
BDEPTH: 164 169 Validity code: 1
Towing dir: 170o Wire out: 470 m Speed: 30 kn*10

Sorted: 17 Kg Total catch: 17.34 CATCH/HOUR: 40.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	17.12	325	42.78	
Brotula barbata	7.20	5	17.99	
Parapenaeus longirostris, fem.	4.34	877	10.84	5584
Trichiurus lepturus	2.49	2	6.22	
Saurida brasiliensis	1.38	30	3.45	
Bembrops heterurus	1.34	30	3.35	
Dentex angolensis	1.29	5	3.22	
Monolene microstoma	1.08	141	2.70	
Parapenaeus longirostris, male	0.92	277	2.30	5583
Thorogobius angolensis	0.78	526	1.95	
Microchirus frechkopi	0.60	39	1.50	
Pterothrissus belloci	0.46	2	1.15	
Lophius vaillanti	0.28	2	0.70	
Pontinus accraensis	0.28	30	0.70	
MURAENESOCIDAE	0.28	18	0.70	
CONGRIDAE	0.23	5	0.57	
Sepia elegans	0.18	12	0.45	
Gadella imberbis	0.00	2		
Solenocera africana	0.00	9		
C R A B S	0.00	134		
Peristedion cataphractum	0.00	7		
Squilla cadenati	0.00	2		
Total	40.25		100.57	

PROJECT STATION:2509

DATE:15/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 824
start stop duration Long E 1303
TIME :07:15:31 07:47:09 32 (min) Purpose code: 3
LOG :9003.76 9005.57 1.80 Area code : 3
FDEPTH: 110 108 GearCond.code:
BDEPTH: 110 108 Validity code: 1
Towing dir: 350o Wire out: 290 m Speed: 30 kn*10

Sorted: 9 Kg Total catch: 9.00 CATCH/HOUR: 16.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	12.41	66	73.52	
Selene dorsalis	4.46	24	26.42	5585
Total	16.87		99.94	

PROJECT STATION:2510

DATE:15/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 826
start stop duration Long E 1307
TIME :08:58:31 09:28:00 30 (min) Purpose code: 3
LOG :9013.20 9014.20 1.00 Area code : 3
FDEPTH: 89 89 GearCond.code:
BDEPTH: 89 89 Validity code: 1
Towing dir: 170o Wire out: 270 m Speed: 30 kn*10

Sorted: 87 Kg Total catch: 312.50 CATCH/HOUR: 625.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	351.04	10528	56.17	5586
Spondyliosoma cantharus	77.92	224	12.47	
Trachurus trecae	46.72	472	7.48	5589
Trachurus trecae, juvenile	46.72	4216	7.48	5588
Dentex angolensis	22.88	120	3.66	5590
Selene dorsalis	14.56	280	2.33	5587
Paragaleus pectoralis	9.72	2	1.56	
Galeoides decadactylus	8.00	32	1.28	
Sepia officinalis hierredda	7.68	16	1.23	
Sphyraena sphyraena	7.52	48	1.20	
Zeus faber	6.72	48	1.08	
Pagellus bellottii	4.40	36	0.70	5591
Atractoscion sp.	4.32	24	0.69	
Fistularia petimba	4.32	10	0.69	
Torpedo torpedo	3.84	8	0.61	
Pentheroscion mbizi	2.56	16	0.41	
Dentex barnardi	1.76	8	0.28	
Trichiurus lepturus	1.64	48	0.26	
Pomadasys jubelini	1.60	2	0.26	
Lagocephalus laevigatus	1.44	8	0.23	
Pterothrissus belloci	1.28	32	0.20	
Illex coindetii	0.48	8	0.08	
Total	627.12		100.35	

PROJECT STATION:2511

DATE:15/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 812

	start	stop	duration			
					Long E	1301
TIME	:11:47:58	12:17:52	30	(min)	Purpose code:	3
LOG	:9033.72	9035.32	1.59		Area code :	3
FDEPTH:	95	98			GearCond.code:	
BDEPTH:	95	98			Validity code:	1

Towing dir: 170º Wire out: 320 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 464.38 CATCH/HOUR: 928.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	804.00	11442	86.57	
Trachurus trecae, juvenile	44.24	3696	4.76	5593
Trachurus trecae	25.20	196	2.71	
Pteroscion peli	12.88	56	1.39	
Selene dorsalis	11.16	50	1.20	5592
Trichiurus lepturus	10.28	26	1.11	
Fistularia petimba	9.12	16	0.98	
Dentex angolensis	3.16	20	0.34	
Sphyraena guachancho	2.76	4	0.30	
Zeus faber	2.56	4	0.28	
Sepia officinalis hierredda	2.12	2	0.23	
Atractoscion aequidens	0.76	2	0.08	
Chloroscombrus chrysurus	0.28	2	0.03	
Pagellus bellottii	0.24	4	0.03	
Total	928.76		100.01	

PROJECT STATION:2512

DATE:15/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 813

	start	stop	duration			
					Long E	1250
TIME	:14:16:31	14:46:11	30	(min)	Purpose code:	3
LOG	:9050.51	9052.16	1.65		Area code :	3
FDEPTH:	168	179			GearCond.code:	
BDEPTH:	168	179			Validity code:	1

Towing dir: 160º Wire out: 520 m Speed: 30 kn*10

Sorted: 369 Kg Total catch: 985.62 CATCH/HOUR: 1971.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	1835.12	2204	93.09	
Synagrops microlepis	56.84	3712	2.88	
Raja miraletus	48.72	58	2.47	
Engraulis encrasicolus	11.60	1740	0.59	
Illex coindetii	8.12	116	0.41	
Dentex angolensis	5.04	18	0.26	5594
Zenopsis conchifer	3.48	58	0.18	
Zenopsis conchifer	3.48	58	0.18	
Parapenaeus longirostris	2.32	290	0.12	
Spicara alta	1.08	6	0.05	
Total	1975.80		100.23	

PROJECT STATION:2513

DATE:15/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 814

	start	stop	duration			
					Long E	1246
TIME	:16:14:31	16:41:11	27	(min)	Purpose code:	3
LOG	:9060.51	9061.70	1.19		Area code :	3
FDEPTH:	322	324			GearCond.code:	
BDEPTH:	322	324			Validity code:	1

Towing dir: 160º Wire out: 520 m Speed: 30 kn*10

Sorted: 49 Kg Total catch: 107.57 CATCH/HOUR: 239.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	65.44	1078	27.38	
Synagrops microlepis	42.67	1711	17.85	
Pterothrissus belloci	31.11	200	13.01	
Trichiurus lepturus	28.62	44	11.97	
Merluccius polli	18.53	249	7.75	5595
Laemonema laureysi	15.56	200	6.51	
Gadella imberbis	6.89	278	2.88	
Bathygadus melanobranchus	6.67	44	2.79	
Parapenaeus longirostris, fem.	6.44	1018	2.69	5596
Neomerinthe folgori	5.51	2	2.31	
Pontinus accraensis	3.60	31	1.51	
Epigonus telescopus	3.33	33	1.39	
Illex coindetii	2.00	33	0.84	
Parapenaeus longirostris, male	0.78	156	0.33	5597
Solenocera africana	0.67	78	0.28	
MYCTOPHIDAE	0.67	4878	0.28	
Hymenocephalus italicus	0.44	33	0.18	
Peristedion cataphractum	0.11	22	0.05	
MULLIDAE	0.00	11		
Total	239.04		100.00	

PROJECT STATION:2514

DATE:15/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 814

	start	stop	duration			
					Long E	1241
TIME	:18:56:56	19:26:41	30	(min)	Purpose code:	3
LOG	:9069.08	9070.52	1.44		Area code :	3
FDEPTH:	557	580			GearCond.code:	
BDEPTH:	557	580			Validity code:	1

Towing dir: 335º Wire out:1250 m Speed: 30 kn*10

Sorted: 5 Kg Total catch: 9.04 CATCH/HOUR: 18.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MISCELLANEOUS	12.56	3864	69.47	
MELANOSTOMIATIDAE	2.64	60	14.60	
Triplophus hemingi	1.04	132	5.75	
POLYCHAELIDAE	0.72	92	3.98	
Laemonema laureysi	0.24	32	1.33	
Lamprogrammus exutus	0.24	4	1.33	
MORIDAE	0.16	24	0.88	
Hoplostethus cadenati	0.16	4	0.88	
Bathyuroconger vicinus	0.16	8	0.88	
STOMIIDAE	0.08	8	0.44	
MYXINIDAE	0.08	8	0.44	
Gonostoma denudata	0.00	4		
Talismania bifurcata	0.00	4		
Total	18.08		99.98	

PROJECT STATION:2515

DATE:15/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 815

	start	stop	duration			
					Long E	1239
TIME	:21:00:08	21:30:48	31	(min)	Purpose code:	3
LOG	:9074.79	9076.25	1.45		Area code :	3
FDEPTH:	780	783			GearCond.code:	
BDEPTH:	780	783			Validity code:	1

Towing dir: 150º Wire out:1750 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 86.94 CATCH/HOUR: 168.27

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	58.41	1881	34.71	
Nezumia aequalis	23.46	403	13.94	
Glyphus marsupialis	18.35	58	10.91	
Yarrella blackfordi	18.00	422	10.70	
Talismania bifurcata	17.54	261	10.42	
POLYCHAELIDAE	9.29	821	5.52	
MORIDAE	5.69	273	3.38	
OCTOPOTEUTHIDAE	3.60	17	2.14	
Dicrolene intronigra	3.14	35	1.87	
MELANOSTOMIATIDAE	1.86	52	1.11	
Nezumia sp.	1.74	12	1.03	
Aristeus varidens, female	1.51	64	0.90	
Bathyuroconger vicinus	1.51	17	0.90	
STROMATEIDAE	1.22	46	0.73	
OPHIDIIDAE	0.70	6	0.42	
Dibranchus atlanticus	0.58	17	0.34	
SYNAPHOBRANCHIDAE	0.46	12	0.27	
Triplophus hemingi	0.46	52	0.27	
BATHYPTEROIDAE	0.35	58	0.21	
Halosaurus ovenii	0.35	17	0.21	
Trichiurus lepturus	0.12	6	0.07	
Laemonema laureysi	0.06	6	0.04	
Total	168.40		100.09	

PROJECT STATION:2516

DATE:18/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 830

	start	stop	duration			
					Long E	1315
TIME	:15:30:56	15:51:04	20	(min)	Purpose code:	3
LOG	:9152.26	9153.41	1.15		Area code :	3
FDEPTH:	45	44			GearCond.code:	
BDEPTH:	45	44			Validity code:	1

Towing dir: 350º Wire out: 200 m Speed: 30 kn*10

Sorted: 225 Kg Total catch: 361.47 CATCH/HOUR: 1084.41

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys jubelini	215.10	267	19.84	5600
Lutjanus agennes	194.52	24	17.94	
Galeoides decadactylus	158.79	726	14.64	
Spondyliosoma cantharus	123.00	492	11.34	
Pomadasys incisus	108.30	978	9.99	5599
Pseudotolithus typus	92.40	81	8.52	5601
Selene dorsalis, juveniles	44.04	1728	4.06	5598
Decapterus rhonchus	36.78	2754	3.39	
Dentex barnardi	30.36	84	2.80	
Brachydeuterus auritus Juv.	16.80	3201	1.55	
Arius parkii	11.76	6	1.08	
Argyrosomus inodorus	11.10	3	1.02	
Dentex gibbosus	10.02	45	0.92	
Ilisha africana	7.53	159	0.69	
Alectis alexandrinus	7.32	3	0.68	
Plectorhinchus mediterraneus	4.50	6	0.41	
Pagellus bellottii	3.54	24	0.33	
Scomberomorus tritor	3.00	3	0.28	
Lithognathus mormyrus	2.49	3	0.23	
Sardinella aurita - Juveniles	1.44	102	0.13	
Sardinella maderensis	1.44	15	0.13	
Penaeus notialis	0.57	15	0.05	
Chaetodon hoefleri	0.54	3	0.05	
Pseudupeneus prayensis	0.27	15	0.02	
Torpedo torpedo	0.18	3	0.02	
Total	1085.79		100.11	

PROJECT STATION:2517

DATE:18/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 814

	start	stop	duration			
					Long E	1311
TIME	:17:22:09	17:43:45	22	(min)	Purpose code:	3
LOG	:9168.54	9169.69	1.15		Area code :	3
FDEPTH:	44	43			GearCond.code:	
BDEPTH:	44	43			Validity code:	1

Towing dir: º Wire out: 200 m Speed: 32 kn*10

Sorted: 78 Kg Total catch: 172.90 CATCH/HOUR: 471.55

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus Juv.	187.96	30960	39.86	5602
Pomadasys incisus	65.54	300	13.90	5606
Sphyraena guachancho	45.05	185	9.55	
Galeoides decadactylus	39.57	262	8.39	
Pagellus bellottii	36.27	221	7.69	5605
Ilisha africana	26.10	483	5.53	
Rhizoprionodon acutus	25.85	8	5.48	
Pteroscion peli	14.51	415	3.08	
Penaeus notialis	8.65	401	1.83	
Selene dorsalis, juveniles	6.35	254	1.35	5604
Pagrus caeruleostictus	3.25	11	0.69	
Trichiurus lepturus	2.54	82	0.54	
Pseudotolithus typus	2.29	5	0.49	
Trachurus trecae, juvenile	2.10	172	0.45	5603
Saurida brasiliensis	1.77	567	0.38	
Sardinella maderensis	1.66	19	0.35	
Dicologoglossa cuneata	0.87	27	0.18	
Chloroscombrus chrysurus	0.52	14	0.11	
Citharus linguatula	0.52	25	0.11	
Syacium micrurum	0.16	3	0.03	
Total	471.53		99.99	

PROJECT STATION:2518

DATE:18/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 800
start stop duration Long E 1235
TIME :22:15:00 22:45:00 30 (min) Purpose code: 3
LOG :9209.93 9211.40 1.47 Area code : 3
FDEPTH: 694 681 GearCond.code:
BDEPTH: 694 681 Validity code: 1
Towing dir: 10º Wire out:1950 m Speed: 30 kn*10

Sorted: 37 Kg Total catch: 449.61 CATCH/HOUR: 899.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	337.80	14764	37.57	
POLYCHAELIDAE	233.20	1166	25.93	
Nematocarcinus africanus	112.64	27134	12.53	
Nezumia leonis	66.88	1144	7.44	
Yarrella blackfordi	51.04	1276	5.68	
Dicrolene intronigra	18.48	1012	2.06	
Dibranchus atlanticus	14.96	506	1.66	
Lamprogrammus exutus	11.88	22	1.32	
Todaropsis eblanae	10.56	44	1.17	
Chaceon maritae	6.24	14	0.69	
Merluccius polli	5.84	4	0.65	
STOMIIDAE	5.28	176	0.59	
OCTOPOTEUTHIDAE	4.40	22	0.49	
SYNODONTIDAE	3.96	132	0.44	
Triplophus hemingi	3.96	506	0.44	
Ebinania costaecanariе	3.52	22	0.39	
Xenodermichthys copei	3.08	66	0.34	
Talismania bifurcata	1.76	44	0.20	
Bathyuroconger vicinus	1.76	22	0.20	
Aristeus varidens, female	1.32	44	0.15	
Etmopterus lucifer	0.44	22	0.05	
Aristeus varidens, male	0.22	44	0.02	
Total	899.22		100.01	

PROJECT STATION:2519

DATE:19/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 800
start stop duration Long E 1238
TIME :00:30:03 00:59:43 30 (min) Purpose code: 3
LOG :9216.24 9217.67 1.28 Area code : 3
FDEPTH: 547 550 GearCond.code:
BDEPTH: 547 550 Validity code: 1
Towing dir: 176º Wire out:1550 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 554.36 CATCH/HOUR: 1108.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Todaropsis eblanae	396.00	22	35.72	
Nematocarcinus africanus	212.96	41316	19.21	
Yarrella blackfordi	157.08	3784	14.17	
Triplophus hemingi	102.52	12584	9.25	
STOMIIDAE	91.08	836	8.21	
Hoplostethus cadenati	47.08	2552	4.25	
Xenodermichthys copei	39.60	1980	3.57	
OCTOPOTEUTHIDAE	18.92	88	1.71	
POLYCHAELIDAE	13.64	1584	1.23	
Aristeus varidens	3.96	132	0.36	
Dicrolene intronigra	3.52	440	0.32	
Malacocephalus laevis	3.52	22	0.32	
Etmopterus lucifer	3.52	66	0.32	
Lamprogrammus exutus	2.64	22	0.24	
Dibranchus atlanticus	2.20	132	0.20	
Merluccius polli	1.88	4	0.17	
Setarches guentheri	1.76	22	0.16	
Nezumia leonis	1.32	22	0.12	
Bathynectes piperitus	1.32	88	0.12	
Deania profundorum	1.28	22	0.12	
Chaceon maritae	1.16	44	0.10	
SYNODONTIDAE	0.88	44	0.08	
Bathyuroconger vicinus	0.88	66	0.08	
Total	1108.72		100.03	

PROJECT STATION:2520

DATE:19/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 800
start stop duration Long E 1239
TIME :02:37:33 03:07:17 30 (min) Purpose code: 3
LOG :9222.56 9224.04 1.82 Area code : 3
FDEPTH: 450 455 GearCond.code:
BDEPTH: 450 455 Validity code: 1
Towing dir: 360º Wire out:1300 m Speed: 30 kn*10

Sorted: 51 Kg Total catch: 433.88 CATCH/HOUR: 867.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	562.80	140190	64.86	
Laemonema laureysi	69.60	2220	8.02	
Merluccius polli	49.36	100	5.69	5607
Triplophus hemingi	44.40	5460	5.12	
Dibranchus atlanticus	33.00	1590	3.80	
Chaunax pictus	25.20	150	2.90	
Yarrella blackfordi	19.80	660	2.28	
Bassanago albescens	8.40	90	0.97	
Hoplostethus cadenati	6.60	270	0.76	
Xenodermichthys copei	6.00	60	0.69	
Todaropsis eblanae	4.80	30	0.55	
SYNAPHOBRANCHIDAE	4.80	30	0.55	
Benthodesmus tenuis	4.80	150	0.55	
Lamprogrammus exutus	3.60	480	0.41	
Aristeus varidens, male	3.60	540	0.41	
Nezumia leonis	3.30	630	0.38	
OCTOPOTEUTHIDAE	3.00	30	0.35	
Malacocephalus laevis	2.40	30	0.28	
Gadella imberbis	2.40	90	0.28	
Coelorinchus coelorhincus	2.40	30	0.28	
Aristeus varidens, female	2.40	60	0.28	
STOMIIDAE	1.80	30	0.21	
Halosaurus ovenii	1.80	90	0.21	
Bathyuroconger vicinus	1.80	240	0.21	
Dicrolene intronigra	1.20	180	0.14	
POLYCHAELIDAE	1.20	270	0.14	
DICERATIIDAE	0.60	60	0.07	
Etmopterus lucifer	0.60	30	0.07	
Galeus polli	0.30	30	0.03	
Total	871.96		100.49	

PROJECT STATION:2521

DATE:19/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 758
start stop duration Long E 1240
TIME :05:00:06 05:00:16 32 (min) Purpose code: 3
LOG :9229.61 9231.08 1.86 Area code : 3
FDEPTH: 364 348 GearCond.code:
BDEPTH: 364 348 Validity code: 1
Towing dir: 155º Wire out:1000 m Speed: 28 kn*10

Sorted: 64 Kg Total catch: 323.50 CATCH/HOUR: 606.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
NEMATOCARCINIDAE	178.43	44606	29.42	
Merluccius polli	111.15	495	18.32	5609
Laemonema laureysi	67.50	585	11.13	
Chaunax pictus	64.58	2486	10.65	
Trichiurus lepturus	30.45	362	5.02	
Merluccius polli, juveniles	27.68	394	4.56	5608
Dibranchus atlanticus	19.80	2025	3.26	
Synagrops microlepis	16.88	810	2.78	
Parapenaeus longirostris, fem.	15.30	1868	2.52	5610
Setarches guentheri	14.40	529	2.37	
Malacocephalus occidentalis	13.73	113	2.26	
Hymenocephalus italicus	11.25	1530	1.85	
Gadella imberbis	8.55	293	1.41	
Coelorinchus coelorhincus	6.98	146	1.15	
Illex coindetii	3.60	45	0.59	
Solenocera africana	2.93	473	0.48	
Bassanago albescens	2.48	56	0.41	
Ommastrephes pteropus	2.48	23	0.41	
Parapenaeus longirostris, male	2.25	394	0.37	5611
Lophiodes kempi	1.35	23	0.22	
Munida sp. *	1.13	214	0.19	
Peristedion cataphractum	1.13	248	0.19	
Nezumia aequalis	1.13	90	0.19	
Portunus validus	0.90	11	0.15	
Chlorophthalmus atlanticus	0.45	11	0.07	
Halosaurus ovenii	0.45	23	0.07	
Total	606.96		100.04	

PROJECT STATION:2522

DATE:19/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 801
start stop duration Long E 1243
TIME :07:09:18 07:38:52 30 (min) Purpose code: 3
LOG :9234.93 9236.37 1.44 Area code : 3
FDEPTH: 233 248 GearCond.code:
BDEPTH: 233 248 Validity code: 1
Towing dir: 165º Wire out: 700 m Speed: 30 kn*10

Sorted: 117 Kg Total catch: 273.78 CATCH/HOUR: 547.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	294.00	20820	53.69	
Zenopsis conchifer	88.60	108	16.18	
Trichiurus lepturus	80.80	190	14.76	
Merluccius polli, juveniles	62.64	1356	11.44	5612
Chlorophthalmus atlanticus	10.80	1188	1.97	
Illex coindetii	4.00	46	0.73	
Parapenaeus longirostris, fem.	3.84	540	0.70	5614
Pterothrissus belloci	2.40	24	0.44	
Parapenaeus longirostris, male	0.48	108	0.09	5613
Total	547.56		100.00	

PROJECT STATION:2523

DATE:19/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 801
start stop duration Long E 1245
TIME :08:20:56 08:21:36 31 (min) Purpose code: 3
LOG :9239.91 9241.58 1.49 Area code : 3
FDEPTH: 135 126 GearCond.code:
BDEPTH: 135 126 Validity code: 1
Towing dir: º Wire out: 450 m Speed: 30 kn*10

Sorted: 23 Kg Total catch: 23.16 CATCH/HOUR: 44.83

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Squatina oculata	12.50	2	27.88	
Dentex angolensis	12.00	66	26.77	5616
Dentex congoensis	11.73	155	26.17	5615
Trichiurus lepturus	2.83	4	6.31	
Zeus faber	2.26	10	5.04	
Zenopsis conchifer	2.21	2	4.93	
Spicara alta	0.58	6	1.29	
Ommastrephes bartrami	0.31	4	0.69	
Lepidotrigla cadmani	0.27	2	0.60	
Ariomma bondi	0.15	2	0.33	
Total	44.84		100.01	

PROJECT STATION:2524

DATE:19/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 756
start stop duration Long E 1250
TIME :10:09:36 10:39:11 30 (min) Purpose code: 3
LOG :9249.08 9250.68 1.59 Area code : 3
FDEPTH: 107 105 GearCond.code:
BDEPTH: 107 105 Validity code: 1
Towing dir: 345º Wire out: 350 m Speed: 30 kn*10

Sorted: 19 Kg Total catch: 18.96 CATCH/HOUR: 37.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	9.24	26	24.37	
Fistularia petimba	4.80	12	12.66	
Trichiurus lepturus	4.12	6	10.86	
Umbrina canariensis	3.04	12	8.02	
Engraulis encrasicolus	3.00	782	7.91	
Dentex macrophthalmus	2.88	48	7.59	
Dentex angolensis	2.72	24	7.17	
Trachurus trecae, juvenile	2.56	214	6.75	5617
Dentex gibbosus	2.08	2	5.49	
Pagellus bellottii	1.20	12	3.16	
Zeus faber	0.76	4	2.00	
Sepia officinalis hierredda	0.56	2	1.48	
Chaetodon hoefleri	0.24	2	0.63	
Brachydeuterus auritus	0.20	2	0.53	
Todaropsis eblanae	0.20	4	0.53	
Citharus linguatula	0.20	4	0.53	
Trigla lyra	0.12	2	0.32	
Total	37.92		100.00	

PROJECT STATION:2525

DATE:19/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 754
start stop duration Long E 1253
TIME :11:37:16 11:50:21 13 (min) Purpose code: 3
LOG :9256.08 9256.77 0.68 Area code : 3
FDEPTH: 86 87 GearCond.code:
BDEPTH: 86 87 Validity code: 1
Towing dir: 160º Wire out: 300 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 33.52 CATCH/HOUR: 154.71

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	51.78	702	33.47	
Umbrina canariensis	34.62	60	22.38	5620
Pagellus bellottii	22.15	198	14.32	5618
Argyrosomus regius	16.34	5	10.56	
Plectorhinchus mediterraneus	11.54	5	7.46	
Trachurus trecae, juvenile	3.88	332	2.51	5619
Dentex angolensis	3.51	14	2.27	
Dentex barnardi	2.03	5	1.31	
Trichiurus lepturus	1.85	9	1.20	
Citharus linguatula	1.11	55	0.72	
Zeus faber	1.02	9	0.66	
Alloteuthis africana	0.74	332	0.48	
Chaetodon hoefleri	0.74	5	0.48	
Engraulis encrasicolus	0.55	189	0.36	
Chelidonichthys capensis	0.55	9	0.36	
Sepia officinalis hierredda	0.46	23	0.30	
Todaropsis eblanae	0.46	9	0.30	
Pseudupeneus prayensis	0.46	5	0.30	
Scorpaena stephanica	0.37	5	0.24	
Trigla lyra	0.37	5	0.24	
Chaetodon marcellae	0.14	5	0.09	
Priacanthus arenatus	0.05	5	0.03	
Total	154.72		100.04	

PROJECT STATION:2526

DATE:19/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 756
start stop duration Long E 1300
TIME :13:25:59 13:55:33 30 (min) Purpose code: 3
LOG :9267.97 9269.58 1.59 Area code : 3
FDEPTH: 62 62 GearCond.code:
BDEPTH: 62 62 Validity code: 1
Towing dir: 330º Wire out: 240 m Speed: 30 kn*10

Sorted: 107 Kg Total catch: 107.35 CATCH/HOUR: 214.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys jubelini	78.36	156	36.50	5622
Galeoides decadactylus	48.64	100	22.65	
Trichiurus lepturus	45.56	128	21.22	
Decapterus rhonchus	18.80	92	8.76	
Pagellus bellottii	6.04	58	2.81	5623
Sphyraena guachancho	5.16	26	2.40	
Sepia officinalis hierredda	2.60	2	1.21	
Dentex angolensis	2.28	6	1.06	
Fistularia petimba	2.12	2	0.99	
Raja miraletus	1.28	2	0.60	
Trachurus trecae, juvenile	1.16	168	0.54	5621
Dentex barnardi	1.12	6	0.52	
Alloteuthis africana	0.58	252	0.27	
Sardinella aurita	0.56	22	0.26	
Brachydeuterus auritus	0.44	28	0.20	
Total	214.70		99.99	

PROJECT STATION:2527

DATE:19/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 755
start stop duration Long E 1303
TIME :14:59:17 15:29:00 30 (min) Purpose code: 3
LOG :9277.07 9278.74 1.67 Area code : 3
FDEPTH: 42 41 GearCond.code:
BDEPTH: 42 41 Validity code:
Towing dir: 330º Wire out: 160 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 68.84 CATCH/HOUR: 137.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	84.48	9422	61.36	
Alectis alexandrinus	25.28	18	18.36	
Sphyraena sphyraena	10.72	176	7.79	
Galeoides decadactylus	4.84	32	3.52	
Selene dorsalis	4.64	64	3.37	
Chloroscombrus chrysurus	4.28	38	3.11	
Trichiurus lepturus	2.24	16	1.63	
Pagellus bellottii	0.88	8	0.64	
Trachurus trecae, juvenile	0.12	12	0.09	
Penaeus notialis	0.12	6	0.09	
Sardinella maderensis - Juv.	0.08	6	0.06	
Total	137.68		100.02	

PROJECT STATION:2528

DATE:19/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 753
start stop duration Long E 1305
TIME :16:26:34 16:53:36 27 (min) Purpose code: 3
LOG :9284.57 9286.05 1.48 Area code : 3
FDEPTH: 21 19 GearCond.code:
BDEPTH: 21 19 Validity code:
Towing dir: 330º Wire out: 110 m Speed: 30 kn*10

Sorted: 84 Kg Total catch: 407.54 CATCH/HOUR: 905.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	598.40	8480	66.07	
Brachydeuterus auritus Juv.	102.40	3640	11.31	5626
Sphyraena sphyraena	82.40	280	9.10	
Selene dorsalis, juveniles	35.73	2000	3.95	5625
Sardinella maderensis - Juv.	21.87	560	2.41	5624
Sphyrna lewini	12.44	7	1.37	
Rhizoprionodon acutus	11.96	4	1.32	
Trachinotus teraia	11.96	7	1.32	
Galeoides decadactylus	10.93	240	1.21	
Trichiurus lepturus	7.73	573	0.85	
Pteromylaeus bovinus	5.42	2	0.60	
Scomberomorus tritor	1.29	2	0.14	
Pomadasys peroteti	1.11	2	0.12	
Ilisha africana	1.07	27	0.12	
Pteroscion peli	0.80	107	0.09	
Decapterus punctatus	0.13	13	0.01	
Total	905.64		99.99	

PROJECT STATION:2529

DATE:19/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 750
start stop duration Long E 1232
TIME :22:05:25 22:34:35 29 (min) Purpose code: 3
LOG :9330.41 9331.81 1.41 Area code : 3
FDEPTH: 744 732 GearCond.code:
BDEPTH: 744 732 Validity code:
Towing dir: 155º Wire out:2000 m Speed: 30 kn*10

Sorted: 153 Kg Total catch: 152.56 CATCH/HOUR: 315.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	64.22	83	20.35	
POLYCHAELIDAE	51.64	745	16.36	
Chaceon maritae	45.02	182	14.26	
Yarrella blackfordi	37.41	794	11.85	
Carcharhinus limbatus	25.66	2	8.13	
Dibranchus atlanticus	15.23	778	4.83	
Lamprogrammus exutus	12.58	50	3.99	
Talismania bifurcata	10.26	166	3.25	
Etmopterus lucifer	9.60	50	3.04	
Merluccius polli	8.69	12	2.75	
Stomias sp.	8.61	265	2.73	
Dicrolene intronigra	5.30	248	1.68	
Deania quadrispinosum	2.86	6	0.91	
Malacocephalus laevis	2.65	17	0.84	
Glyphus marsupialis	2.32	149	0.74	
SYNAPHOBRANCHIDAE	2.32	50	0.74	
Bathyuroconger vicinus	2.32	33	0.74	
GALATHEIDAE *	1.32	794	0.42	
Aristeus varidens	1.32	83	0.42	
Plesiopenaeus edwardsianus	0.99	17	0.31	
SOLEIDAE	0.99	17	0.31	
Gadella imberbis	0.99	33	0.31	
Triplophus hemingi	0.99	83	0.31	
GONOSTOMATIDAE	0.66	17	0.21	
Bathypterois sp	0.66	17	0.21	
Xenodermichthys copei	0.66	17	0.21	
Coloconger cadenati *	0.17	17	0.05	
Halosaurus ovenii	0.17	17	0.05	
Total	315.61		100.00	

PROJECT STATION:2530

DATE:20/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 749
start stop duration Long E 1234
TIME :23:59:24 00:29:04 30 (min) Purpose code: 3
LOG :9336.45 9337.87 1.40 Area code : 3
FDEPTH: 547 553 GearCond.code:
BDEPTH: 547 553 Validity code: 1
Towing dir: 340º Wire out:1550 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 187.94 CATCH/HOUR: 375.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	195.16	58828	51.92	
Triplophus hemingi	52.64	7798	14.00	
Stomias sp.	33.60	784	8.94	
POLYCHAELIDAE	22.68	2870	6.03	
Yarrella blackfordi	18.48	1190	4.92	
Lamprogrammus exutus	8.68	154	2.31	
Gadella imberbis	7.56	392	2.01	
Neoharriotta pinnata	5.44	2	1.45	
Centrophorus granulosus	4.80	2	1.28	
Benthodesmus tenuis	3.92	154	1.04	
Centroscymnus crepidater	3.64	14	0.97	
Chaceon maritae	3.44	10	0.92	
GALATHEIDAE *	3.08	2310	0.82	
GONOSTOMATIDAE	2.24	28	0.60	
Trichiurus lepturus	2.12	2	0.56	
Xenodermichthys copei	1.96	196	0.52	
OGCOCEPHALIDAE	1.40	406	0.37	
Hoplostethus cadenati	1.12	56	0.30	
Aristeus varidens	1.12	84	0.30	
OCTOPODIDAE	0.84	14	0.22	
Dibranchus atlanticus	0.84	70	0.22	
NOTOSUDIDAE	0.56	14	0.15	
Bathyuroconger vicinus	0.28	28	0.07	
Bathynectes piperitus	0.14	14	0.04	
SYNAPHOBRANCHIDAE	0.14	14	0.04	
Total	375.88		100.00	

PROJECT STATION:2531

DATE:20/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 746
start stop duration Long E 1233
TIME :01:34:44 01:56:54 22 (min) Purpose code: 3
LOG :9341.12 9342.18 1.05 Area code : 3
FDEPTH: 433 456 GearCond.code:
BDEPTH: 433 456 Validity code: 1
Towing dir: 335º Wire out:1300 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 308.38 CATCH/HOUR: 841.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	623.89	105840	74.18	
Laemonema laureysi	99.27	3475	11.80	
Dibranchus atlanticus	25.96	1718	3.09	
Merluccius polli	19.20	52	2.28	5627
Triplophus hemingi	16.04	1795	1.91	
Yarrella blackfordi	12.22	535	1.45	
Centrophorus granulosus	10.04	3	1.19	
Chaunax pictus	6.11	76	0.73	
Hymenocephalus italicus	3.05	535	0.36	
Gadella imberbis	3.05	191	0.36	
POLYCHAELIDAE	2.29	458	0.27	
Neoharriotta pinnata	2.29	38	0.27	
Solenocera africana	2.29	305	0.27	
Hoplostethus cadenati	2.29	76	0.27	
Trichiurus lepturus	1.64	3	0.19	
Bathynectes piperitus	1.53	38	0.18	
Coelorinchus coelorhincus	1.53	38	0.18	
Benthodesmus tenuis	1.53	115	0.18	
Helicolenus dactylopterus	1.47	3	0.17	
SOLEIDAE	0.76	76	0.09	
Coloconger cadenati *	0.76	38	0.09	
SERGESTIDAE	0.76	153	0.09	
Halosaurus ovenii	0.76	76	0.09	
Stomias sp.	0.38	38	0.05	
Parapenaeus longirostris	0.38	38	0.05	
Nezumia leonis	0.38	153	0.05	
Xenodermichthys copei	0.38	38	0.05	
Aristeus varidens	0.38	115	0.05	
Total	840.63		99.94	

PROJECT STATION:2532

DATE:20/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 745
start stop duration Long E 1234
TIME :05:29:00 05:59:25 30 (min) Purpose code: 3
LOG :9353.06 9354.58 1.51 Area code : 3
FDEPTH: 340 336 GearCond.code:
BDEPTH: 340 336 Validity code: 1
Towing dir: 333o Wire out:1000 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 280.55 CATCH/HOUR: 561.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	136.08	5254	24.25	
Laemonema laureysi	102.96	1062	18.35	
Merluccius polli	70.02	532	12.48	5629
Trichiurus lepturus	65.92	106	11.75	
Pterothrissus belloci	48.24	288	8.60	
Setarches guentheri	21.60	1890	3.85	
Synagrops microlepis	19.08	1080	3.40	
Parapenaeus longirostris, fem.	16.92	2538	3.02	5628
Chaunax pictus	15.84	540	2.82	
Dibranchus atlanticus	11.88	1062	2.12	
Malacocephalus occidentalis	9.36	90	1.67	
TRICHIURIDAE	7.20	342	1.28	
Coelorinchus coelorhincus	7.20	144	1.28	
Parapenaeus longirostris, male	6.12	874	1.09	5637
Cmmastrephes pteropus	3.60	54	0.64	
MURAENESOCIDAE	3.60	126	0.64	
Hymenocephalus italicus	2.88	360	0.51	
Munida sp. *	2.88	882	0.51	
Illex coindetii	1.44	18	0.26	
Peristedion cataphractum	1.44	288	0.26	
Lophiodes kempi	1.44	36	0.26	
Pontinus accraensis	1.08	18	0.19	
Nezumia aequalis	1.08	36	0.19	
Hoplostethus cadenati	1.08	36	0.19	
Callinectes pallidus	1.08	54	0.19	
Chlorophthalmus atlanticus	0.36	18	0.06	
Solenocera africana	0.36	144	0.06	
Halosaurus ovenii	0.36	18	0.06	
Total	561.10		99.98	

PROJECT STATION:2533

DATE:20/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 745
start stop duration Long E 1235
TIME :07:13:02 07:42:19 29 (min) Purpose code: 3
LOG :9358.33 9359.82 1.49 Area code : 3
FDEPTH: 250 251 GearCond.code:
BDEPTH: 250 251 Validity code:
Towing dir: 155o Wire out: 750 m Speed: 30 kn*10

Sorted: 86 Kg Total catch: 127.57 CATCH/HOUR: 263.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli, juveniles	163.06	3544	61.78	5632
Synagrops microlepis	54.31	4293	20.58	
MYCTOPHIDAE	18.31	14506	6.94	
Parapenaeus longirostris, fem.	10.84	2036	4.11	5631
Zenopsis conchifer	6.46	21	2.45	
Parapenaeus longirostris, male	2.65	631	1.00	5630
Trichiurus lepturus	2.11	4	0.80	
Chlorophthalmus atlanticus	1.74	217	0.66	
Gadella imberbis	1.18	50	0.45	
Illex coindetii	1.12	12	0.42	
Alloteuthis africana	0.79	383	0.30	
Todaropsis eblanae	0.56	4	0.21	
Parasudis sp.	0.31	19	0.12	
Sepia elegans	0.12	4	0.05	
Solenocera africana	0.06	6	0.02	
Bassanago albescens	0.06	4	0.02	
Aristeus varidens	0.04	4	0.02	
Zenion hololepis	0.04	6	0.02	
Total	263.76		99.95	

PROJECT STATION:2534

DATE:20/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 745
start stop duration Long E 1236
TIME :08:31:44 09:01:21 30 (min) Purpose code: 3
LOG :9362.70 9364.32 1.60 Area code : 3
FDEPTH: 150 167 GearCond.code:
BDEPTH: 150 167 Validity code: 1
Towing dir: 340o Wire out: 500 m Speed: 32 kn*10

Sorted: 128 Kg Total catch: 128.40 CATCH/HOUR: 256.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	180.12	302	70.14	
Spicara alta	30.08	256	11.71	
Dentex angolensis	19.16	96	7.46	5633
Dentex macrophthalmus	14.60	74	5.69	5634
Zenopsis conchifer	6.00	8	2.34	
Illex coindetii	3.36	100	1.31	
Zeus faber	2.80	10	1.09	
Dentex angolensis	0.32	4	0.12	
Boops boops	0.20	4	0.08	
Sepia orbignyana	0.16	2	0.06	
Total	256.80		100.00	

PROJECT STATION:2535

DATE:20/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 744
start stop duration Long E 1244
TIME :10:22:06 10:53:01 31 (min) Purpose code: 3
LOG :9374.51 9376.03 1.52 Area code : 3
FDEPTH: 101 100 GearCond.code:
BDEPTH: 101 100 Validity code:
Towing dir: 145o Wire out: 330 m Speed: 31 kn*10

Sorted: 23 Kg Total catch: 23.10 CATCH/HOUR: 44.71

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae, juvenile	17.73	1291	39.66	5636
Trigla lyra	4.88	8	10.91	
Fistularia petimba	4.45	8	9.95	
Todaropsis eblanae	3.02	1167	6.75	
Dentex macrophthalmus	2.90	124	6.49	5635
Spicara alta	2.48	4	5.55	
Pagellus bellottii	2.44	10	5.46	
Todaropsis eblanae	2.32	19	5.19	
Zeus faber	2.13	6	4.76	
Brachydeuterus auritus	1.51	15	3.38	
Sepia officinalis hierredda	0.50	2	1.12	
Saurida brasiliensis	0.12	12	0.27	
Dentex angolensis	0.12	2	0.27	
Dentex barnardi	0.12	2	0.27	
Total	44.72		100.03	

PROJECT STATION:2536

DATE:20/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 743
start stop duration Long E 1247
TIME :11:39:05 11:57:50 19 (min) Purpose code: 3
LOG :9379.72 9380.68 0.92 Area code : 3
FDEPTH: 88 87 GearCond.code:
BDEPTH: 88 87 Validity code: 1
Towing dir: 333o Wire out: 300 m Speed: 30 kn*10

Sorted: 18 Kg Total catch: 17.61 CATCH/HOUR: 55.61

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	35.12	572	63.15	5640
Todaropsis eblanae - juvenile	5.43	2444	9.76	
Pagellus bellottii	4.55	69	8.18	5638
Trichiurus lepturus	3.92	3	7.05	
Trigla lyra	1.83	13	3.29	
Trachurus trecae, juvenile	1.77	136	3.18	5639
Fistularia petimba	1.71	6	3.07	
Sphyraena guachancho	0.69	6	1.24	
Zeus faber	0.32	3	0.58	
Brachydeuterus auritus	0.25	3	0.45	
Illex coindetii	0.19	9	0.34	
Total	55.78		100.29	

PROJECT STATION:2537

DATE:20/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 742
start stop duration Long E 1251
TIME :13:27:06 13:56:43 30 (min) Purpose code: 3
LOG :9390.16 9391.69 1.53 Area code : 3
FDEPTH: 67 67 GearCond.code:
BDEPTH: 67 67 Validity code:
Towing dir: 330o Wire out: 250 m Speed: 30 kn*10

Sorted: 21 Kg Total catch: 20.58 CATCH/HOUR: 41.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	19.76	44	48.01	
Pagellus bellottii	17.68	178	42.95	5641
Todaropsis eblanae - juvenile	1.52	816	3.69	
Raja miraletus	1.28	2	3.11	
Fistularia petimba	0.36	2	0.87	
Chelidonichthys capensis	0.32	2	0.78	
Brachydeuterus auritus	0.24	2	0.58	
Total	41.16		99.99	

PROJECT STATION:2538

DATE:20/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 740
start stop duration Long E 1258
TIME :15:16:07 15:46:05 30 (min) Purpose code: 3
LOG :9402.24 9403.80 1.56 Area code : 3
FDEPTH: 35 36 GearCond.code:
BDEPTH: 35 36 Validity code: 1
Towing dir: 320o Wire out: 200 m Speed: 30 kn*10

Sorted: 75 Kg Total catch: 266.33 CATCH/HOUR: 532.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Galeoides decadactylus	140.16	1224	26.31	
Brachydeuterus auritus	120.60	17880	22.64	
Sphyraena guachancho	51.36	708	9.64	
Pomadasys jubelini	48.00	216	9.01	
Ilisha africana	39.12	1140	7.34	
Pseudotolithus typus	27.36	28	5.14	5642
Selene dorsalis	23.76	1128	4.46	
Penaeus notialis	17.28	864	3.24	
Pagrus pagrus	11.08	28	2.08	
Pagellus bellottii	10.16	58	1.91	5643
Stromateus fiatola	7.40	8	1.39	
Trichiurus lepturus	6.48	276	1.22	
Chloroscombrus chrysurus	6.24	1116	1.17	
Chaetodipterus lippei	5.92	10	1.11	
Epinephelus aeneus	4.96	4	0.93	
Leptocharias smithii	4.00	4	0.75	
Pseudupeneus prayensis	2.16	12	0.41	
Dentex barnardi	1.68	4	0.32	
Pteroscion peli	1.44	180	0.27	
Plectorhinchus mediterraneus	1.32	2	0.25	
Arius parkii	1.20	2	0.23	
Eucinostomus melanopterus	0.72	12	0.14	
Sardinella maderensis	0.48	12	0.09	
Scorpaena stephanica	0.14	2	0.03	
UNIDENTIFIED FISH	0.04	2	0.01	
Sphoeroides "marmor"	0.04	2	0.01	
Total	533.14		100.11	

PROJECT STATION:2539

DATE:20/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 739
start stop duration Long E 1259
TIME :16:33:41 17:04:08 30 (min) Purpose code: 3
LOG :9408.41 9410.03 1.60 Area code : 3
FDEPTH: 24 26 GearCond.code:
BDEPTH: 24 26 Validity code: 1
Towing dir: 330o Wire out: 180 m Speed: 30 kn*10

Sorted: 188 Kg Total catch: 188.00 CATCH/HOUR: 376.00

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Arius parkii	72.24	70	19.21	
Pseudotolithus typus	45.80	26	12.18	
Pseudotolithus epipercus	37.20	98	9.89	
Pomadasys jubelini	32.60	70	8.67	5644
Epinephelus sp.	24.28	2	6.46	
Pseudotolithus senegalensis	23.32	26	6.20	
Dasyatis marmorata	17.32	8	4.61	
Trichiurus lepturus	16.00	746	4.26	
Pteroscion peli	15.60	706	4.15	
Plectorhinchus mediterraneus	11.36	18	3.02	
Leptocharias smithii	9.24	20	2.46	
Ilisha africana	7.20	256	1.91	
Dasyatis margarita	6.56	4	1.74	
Pomadasys rogeri	5.60	4	1.49	
Galeoides decadactylus	4.92	50	1.31	
Rhinobatos albomaculatus	4.32	2	1.15	
Lutjanus goreensis	3.92	2	1.04	
Dentex barnardi	3.44	12	0.91	
Centrarchops chapini	3.44	14	0.91	
Cynoglossus canariensis	3.20	4	0.85	
Stromateus fiatola	2.96	14	0.79	
Scyllarides herklotsii	2.60	18	0.69	
Pentanemus quinquarius	2.52	70	0.67	
Pomadasys incisus	2.40	52	0.64	
OPHIDIIDAE	2.04	2	0.54	
Parakuhlia macrophthalmus	2.00	28	0.53	
Balistes capriscus	1.72	2	0.46	
Panulirus regius	1.60	6	0.43	
Chaetodon hoefleri	1.56	12	0.41	
Epinephelus aeneus	1.20	2	0.32	
Pseudupeneus prayensis	0.96	14	0.26	
Parapenaeopsis atlantica	0.84	262	0.22	
SCIAENIDAE	0.80	16	0.21	
Torpedo sp.	0.52	2	0.14	
Lagocephalus laevigatus	0.36	4	0.10	
Selene dorsalis, juveniles	0.36	28	0.10	
Torpedo sp.	0.32	2	0.09	
Brachydeuterus auritus	0.30	4	0.08	
Penaeus notialis	0.24	10	0.06	
Sphoeroides "marmor"	0.24	4	0.06	
Torpedo marmorata	0.20	2	0.05	
Torpedo sp.	0.20	2	0.05	
APOGONIDAE	0.12	60	0.03	
Torpedo sp.	0.12	2	0.03	
Sardinella maderensis	0.06	6	0.02	
Total	373.80		99.40	

PROJECT STATION:2540

DATE:20/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 736
start stop duration Long E 1226
TIME :21:20:51 21:51:55 31 (min) Purpose code: 3
LOG :9446.83 9448.34 1.50 Area code : 3
FDEPTH: 642 651 GearCond.code:
BDEPTH: 642 651 Validity code: 1
Towing dir: 140o Wire out:1800 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 418.36 CATCH/HOUR: 809.73

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	264.39	11555	32.65	
Triplophus hemingi	168.00	4374	20.75	
Hoplostethus cadenati	89.81	1103	11.09	
POLYCHAELIDAE	87.48	1258	10.80	
Yarrella blackfordi	63.10	677	7.79	
Lamprogrammus exutus	25.55	77	3.16	
OCTOPOTEUTHIDAE	24.39	155	3.01	
Geryon maritae	19.16	46	2.37	
Stomias sp.	11.61	271	1.43	
Gadella imberbis	7.35	426	0.91	
Nezumia leonis	6.97	135	0.86	
Dicrolene intronigra	6.19	542	0.76	
Setarches guentheri	5.81	19	0.72	
Centrophorus granulosus	4.72	2	0.58	
Lophius sp.	4.30	2	0.53	
Etmopterus lucifer	3.48	39	0.43	
Halosaurus ovenii	3.48	58	0.43	
OPLOPHORIDAE	2.71	116	0.33	
Dibranchus atlanticus	2.32	135	0.29	
Raja confundens	1.94	19	0.24	
Deania calcea	1.55	19	0.19	
Aristeus varidens	1.55	39	0.19	
Coelorinchus coelorhincus	1.16	19	0.14	
SOLEIDAE	0.77	19	0.10	
NEMICHTHYIDAE	0.77	19	0.10	
MELANOSTOMIATIDAE	0.77	19	0.10	
Bathyuroconger vicinus	0.39	19	0.05	
Total	809.72		100.00	

PROJECT STATION:2541

DATE:20/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 734
start stop duration Long E 1227
TIME :23:13:03 23:31:52 18 (min) Purpose code: 3
LOG :9453.22 9454.14 0.92 Area code : 3
FDEPTH: 502 529 GearCond.code:
BDEPTH: 502 529 Validity code: 1
Towing dir: 320o Wire out:1500 m Speed: 30 kn*10

Sorted: 39 Kg Total catch: 257.75 CATCH/HOUR: 859.17

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	514.80	13080	59.92	
Hoplostethus cadenati	64.20	2820	7.47	
Triplophus hemingi	43.20	11670	5.03	
Lamprogrammus exutus	43.20	1230	5.03	
Yarrella blackfordi	32.40	870	3.77	
POLYCHAELIDAE	30.00	5430	3.49	
Gadella imberbis	17.40	1110	2.03	
Merluccius polli	16.07	30	1.87	
Laemonema laureysi	11.40	240	1.33	
Chaceon maritae	9.17	20	1.07	
Aristeus varidens, female	8.70	407	1.01	5645
Centrophorus granulosus	7.87	3	0.92	
Benthodesmus tenuis	7.20	240	0.84	
Bathyuroconger vicinus	6.60	900	0.77	
Todaropsis eblanae	6.00	30	0.70	
Stomias sp.	6.00	180	0.70	
Aristeus varidens, male	4.80	437	0.56	5646
Xenodermichthys copei	4.20	360	0.49	
Bathygadus melanobranchus	3.00	90	0.35	
Bathynectes piperitus	3.00	60	0.35	
OCTOPOTEUTHIDAE	3.00	30	0.35	
Chaunax pictus	2.40	60	0.28	
Trichiurus lepturus	1.87	3	0.22	
Trichiurus lepturus	1.87	3	0.22	
Raja confundens	1.80	30	0.21	
Nezumia leonis	1.80	60	0.21	
OPHIDIIDAE	1.80	300	0.21	
Dibranchus atlanticus	1.80	60	0.21	
CHIMAERIDAE	1.40	3	0.16	
Plesiopenaeus edwardsianus	1.20	30	0.14	
SYNAPHOBRANCHIDAE	1.20	30	0.14	
OPLOPHORIDAE	0.60	30	0.07	
NEMICHTHYIDAE	0.60	30	0.07	
SOLEIDAE	0.30	30	0.03	
Ebinania costaecanarie	0.30	30	0.03	
Total	861.15		100.25	

PROJECT STATION:2542

DATE:21/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 733
start stop duration Long E 1228
TIME :05:22:28 05:53:11 31 (min) Purpose code: 3
LOG :9469.80 9471.36 1.55 Area code : 3
FDEPTH: 320 366 GearCond.code:
BDEPTH: 320 366 Validity code:
Towing dir: 160o Wire out:1000 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 252.26 CATCH/HOUR: 488.25

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius polli	130.99	1028	26.83	5647
Pterothrissus belloci	76.30	505	15.63	
Parapenaeus longirostris, fem.	46.51	7177	9.53	5648
Trichiurus lepturus	35.23	52	7.22	
Synagrops microlepis	32.05	1008	6.56	
Munida sp. *	31.35	5487	6.42	
Laemonema laureysi	24.74	348	5.07	
Parapenaeus longirostris, male	22.12	4181	4.53	5649
Chlorophthalmus atlanticus	19.51	348	4.00	
Gadella imberbis	11.85	488	2.43	
Coelorinchus coelorhincus	11.50	331	2.36	
Bathynectes piperitus	11.15	192	2.28	
Chaunax pictus	5.57	192	1.14	
Zenopsis conchifer	3.91	4	0.80	
Malacocephalus laevis	3.83	35	0.78	
Echeneis naucrates	3.45	4	0.71	
Hymenocephalus italicus	2.09	261	0.43	
Pontinus accraensis	2.09	17	0.43	
Dibranchus atlanticus	2.09	174	0.43	
Ommastrephes pteropus	1.74	17	0.36	
Hoplostethus cadenati	1.74	52	0.36	
Bassanago albescens	1.39	35	0.28	
Etmopterus lucifer	1.39	52	0.28	
Setarches guentheri	1.39	70	0.28	
Bembrops greyi	1.05	17	0.22	
Raja sp.	1.05	35	0.22	
APOGONIDAE	0.70	17	0.14	
Lophius vaillanti	0.70	17	0.14	
Chaceon maritae	0.43	2	0.09	
Solenocera africana	0.17	35	0.03	
Peristedion cataphractum	0.17	17	0.03	
Total	488.25		100.01	

PROJECT STATION:2543

DATE:21/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 733
start stop duration Long E 1229
TIME :07:09:39 07:40:10 31 (min) Purpose code: 3
LOG :9475.37 9476.93 1.56 Area code : 3
FDEPTH: 244 248 GearCond.code:
BDEPTH: 244 248 Validity code:
Towing dir: 330o Wire out: 750 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 215.15 CATCH/HOUR: 416.42

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Synagrops microlepis	193.24	14899	46.41	
Merluccius polli, juveniles	151.43	4262	36.36	5650
Zenopsis conchifer	36.54	87	8.77	
Parapenaeus longirostris, fem.	9.06	1335	2.18	5652
MYCTOPHIDAE	4.41	3403	1.06	
Parapenaeus longirostris, male	3.48	778	0.84	5651
Trichiurus lepturus	3.37	4	0.81	
Dasyatis marmorata	3.06	2	0.73	
Chlorophthalmus atlanticus	2.79	499	0.67	
Dasyatis margarita	2.21	2	0.53	
C E P H A L O P O D A	2.09	1022	0.50	
Leptocharias smithii	2.05	2	0.49	
Illex coindetii	1.01	10	0.24	
Parasudis sp.	0.93	139	0.22	
Panulirus regius	0.39	2	0.09	
Beryx splendens	0.14	2	0.03	
Zenion hololepis	0.12	12	0.03	
Sepia orbignyana	0.12	12	0.03	
Total	416.44		99.99	

PROJECT STATION:2544

DATE:21/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 731
start stop duration Long E 1232
TIME :08:43:29 09:00:00 17 (min) Purpose code: 3
LOG :9482.45 9483.29 0.82 Area code : 3
FDEPTH: 114 114 GearCond.code:
BDEPTH: 114 114 Validity code: 1
Towing dir: 140o Wire out: 360 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 109.79 CATCH/HOUR: 387.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	210.25	1669	54.26	5654
Spicara alta	90.53	1447	23.36	
Trachurus trecae, juvenile	24.07	1122	6.21	5655
Trachurus trecae	17.54	162	4.53	5656
Dentex barnardi	14.19	35	3.66	5657
Dentex angolensis	8.75	49	2.26	5653
Boops boops	5.93	162	1.53	
Dentex gibbosus	4.66	7	1.20	
Zenopsis conchifer	3.88	11	1.00	
Trichiurus lepturus	3.53	4	0.91	
Zeus faber	1.48	7	0.38	
Dentex congoensis	1.20	14	0.31	
Pagellus bellottii	0.71	4	0.18	
Lepidotrigla cadmani	0.42	4	0.11	
Illex coindetii	0.35	7	0.09	
Total	388.97		100.37	

PROJECT STATION:2545

DATE:21/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 729
start stop duration Long E 1235
TIME :09:47:57 10:16:52 29 (min) Purpose code: 3
LOG :9488.50 9490.04 1.53 Area code : 3
FDEPTH: 100 101 GearCond.code:
BDEPTH: 100 101 Validity code:
Towing dir: 330o Wire out: 330 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 357.55 CATCH/HOUR: 739.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	586.72	991	79.31	5658
Pagellus bellottii	81.93	455	11.08	5659
Trachurus trecae, juvenile	38.01	2686	5.14	5660
Dentex canariensis	10.47	205	1.42	
Dentex barnardi	9.79	23	1.32	
Fistularia petimba	3.77	8	0.51	
Pagrus caeruleostictus	3.27	2	0.44	
Sphyraena guachancho	1.37	12	0.19	
Sardinella aurita	1.37	81	0.19	
Dentex angolensis	1.12	6	0.15	
Illex sp.	0.68	12	0.09	
Sepia officinalis hierredda	0.66	2	0.09	
Zeus faber	0.62	4	0.08	
Total	739.78		100.01	

PROJECT STATION:2546

DATE:21/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 727
start stop duration Long E 1238
TIME :11:08:27 11:38:02 30 (min) Purpose code: 3
LOG :9495.16 9496.66 1.49 Area code : 3
FDEPTH: 81 83 GearCond.code:
BDEPTH: 81 83 Validity code: 1
Towing dir: 144o Wire out: 280 m Speed: 30 kn*10

Sorted: 24 Kg Total catch: 23.66 CATCH/HOUR: 47.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	30.92	444	65.34	5661
Fistularia petimba	4.84	14	10.23	
Dentex macrophthalmus Juv.	3.56	54	7.52	5662
Zeus faber	3.00	4	6.34	
Lagocephalus laevigatus	1.92	6	4.06	
Brachydeuterus auritus	1.72	20	3.63	
Trachurus trecae, juvenile	0.48	50	1.01	5663
Trigla lyra	0.40	4	0.85	
Todaropsis eblanae - juvenile	0.28	150	0.59	
Decapterus rhonchus	0.16	4	0.34	
Illex coindetii	0.02	8	0.04	
Total	47.30		99.95	

PROJECT STATION:2547

DATE:21/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 728
start stop duration Long E 1246
TIME :12:56:24 13:17:03 21 (min) Purpose code: 3
LOG :9506.83 9507.81 0.96 Area code : 3
FDEPTH: 51 50 GearCond.code:
BDEPTH: 51 50 Validity code: 1
Towing dir: 335o Wire out: 200 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 33.58 CATCH/HOUR: 95.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	26.69	94	27.82	
Pagrus caeruleostictus	25.43	74	26.51	
Pagellus bellottii	17.31	94	18.04	5664
Sepia officinalis hierredda	6.46	3	6.73	
Mustelus mustelus	5.20	3	5.42	
Epinephelus aeneus	4.57	6	4.76	
Scomberomorus tritor	3.03	3	3.16	
Raja miraletus	2.06	3	2.15	
Fistularia petimba	1.66	9	1.73	
Epinephelus alexandrinus *	1.49	3	1.55	
Illex coindetii	1.20	1174	1.25	
Chaetodon hoefleri	0.34	3	0.35	
Trigla lyra	0.34	3	0.35	
Todaropsis eblanae - juvenile	0.17	86	0.18	
Total	95.95		100.00	

PROJECT STATION:2548

DATE:21/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 727
start stop duration Long E 1250
TIME :14:19:58 14:37:14 17 (min) Purpose code: 3
LOG :9515.07 9515.96 0.88 Area code : 3
FDEPTH: 35 36 GearCond.code:
BDEPTH: 35 36 Validity code:
Towing dir: 335o Wire out: 180 m Speed: 30 kn*10

Sorted: 9 Kg Total catch: 8.64 CATCH/HOUR: 30.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	14.40	42	47.23	
Pagrus auriga	5.01	4	16.43	
Bodianus speciosus	4.80	4	15.74	
Caranx crysos	2.19	4	7.18	
Fistularia petimba	1.27	7	4.17	
Pagrus caeruleostictus	0.99	7	3.25	
Pagellus bellottii	0.92	4	3.02	
Alloteuthis africana	0.92	328	3.02	
Total	30.50		100.04	

PROJECT STATION:2549

DATE:21/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 725
start stop duration Long E 1156
TIME :21:16:10 21:45:30 29 (min) Purpose code: 3
LOG :9581.41 9582.88 1.47 Area code : 3
FDEPTH: 744 746 GearCond.code:
BDEPTH: 744 746 Validity code: 1
Towing dir: 330o Wire out:2000 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 186.10 CATCH/HOUR: 385.03

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nezumia leonis	143.75	2880	37.33	
Xenodermichthys copei	66.79	1068	17.35	
Talismania bifurcata	22.84	248	5.93	
POLYCHAELIDAE	22.34	2570	5.80	
Hoplostethus cadenati	20.61	211	5.35	
Benthodesmus tenuis	13.12	41	3.41	
Bathyuroconger vicinus	13.12	41	3.41	
GALATHEIDAE *	12.41	708	3.22	
OCTOPOTEUTHIDAE	8.19	50	2.13	
Halosaurus ovenii	7.94	161	2.06	
Bathyraja smithii	6.66	8	1.73	
SYNAPHOBRANCHIDAE	5.71	87	1.48	
Etmopterus lucifer	5.71	25	1.48	
STOMIIDAE	5.46	199	1.42	
Triplophus hemingi	4.63	2185	1.20	
Aristeus varidens	4.22	844	1.10	
Glyphus marsupialis	2.98	149	0.77	
Chaceon maritae	2.86	10	0.74	
NEMICHTHYIDAE	1.99	50	0.52	
Raja sp.	1.99	4	0.52	
Dicrolene intronigra	1.74	124	0.45	
Aristeus varidens, female	1.66	64	0.43	5665
Trichiurus lepturus	1.37	12	0.36	
Dibranchus atlanticus	1.24	124	0.32	
Bathynectes piperitus	0.99	12	0.26	
NOTOSUDIDAE	0.74	25	0.19	
Luciobrotula bartschi	0.70	2	0.18	
PASIPHAEIDAE	0.50	37	0.13	
SOLEIDAE	0.25	25	0.06	
MYCTOPHIDAE	0.25	223	0.06	
Aristeus varidens, male	0.04	8	0.01	5666
Total	382.80		99.40	

PROJECT STATION:2550

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 723
start stop duration Long E 1202
TIME :23:55:45 00:18:07 22 (min) Purpose code: 3
LOG :9594.38 9595.46 1.08 Area code : 3
FDEPTH: 551 557 GearCond.code:
BDEPTH: 551 557 Validity code: 1
Towing dir: 160o Wire out:1550 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 120.06 CATCH/HOUR: 327.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	97.75	44967	29.85	
POLYCHAELIDAE	30.98	3327	9.46	
Triplophus hemingi	28.80	4145	8.80	
STOMIIDAE	26.40	502	8.06	
Laemonema laureysi	24.22	229	7.40	
Benthodesmus tenuis	13.31	447	4.06	
GALATHEIDAE *	10.91	1222	3.33	
Yarrella blackfordi	10.69	251	3.26	
Merluccius polli	9.33	25	2.85	
Aristeus varidens, female	8.07	349	2.46	5667
Chaceon maritae	7.58	19	2.31	
Xenodermichthys copei	6.55	327	2.00	
Dicrolene intronigra	5.67	349	1.73	
Centroscymnus crepidater	5.24	33	1.60	
Etmopterus lucifer	5.02	87	1.53	
Hoplostethus cadenati	5.02	120	1.53	
Nezumia leonis	4.80	109	1.47	
Todaropsis eblanae	4.15	22	1.27	
OPHIDIIDAE	3.05	556	0.93	
Aristeus varidens, male	2.62	295	0.80	5668
Bathyuroconger vicinus	2.40	213	0.73	
Lophius vaillanti	2.24	3	0.68	
Chaunax pictus	1.96	22	0.60	
Gadella imberbis	1.96	87	0.60	
Gempylus serpens	1.36	3	0.42	
Lamprogrammus exutus	1.31	98	0.40	
MYCTOPHIDAE	1.09	1560	0.33	
Bathynectes piperitus	0.98	33	0.30	
Malacocephalus laevis	0.87	11	0.27	
Caristius groenlandicus	0.87	11	0.27	
Dibranchus atlanticus	0.87	44	0.27	
Trichiurus lepturus	0.38	3	0.12	
Ebinania costaecanarie	0.22	11	0.07	
Glyphus marsupialis	0.11	55	0.03	
OCTOPOTEUTHIDAE	0.11	22	0.03	
NEMICHTHYIDAE	0.11	11	0.03	
NETTASTOMATIDAE	0.11	11	0.03	
SYNAPHOBRANCHIDAE	0.11	22	0.03	
SOLEIDAE	0.11	22	0.03	
Halosaurus ovenii	0.11	11	0.03	
Total	327.44		99.97	

PROJECT STATION:2551

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 724
start stop duration Long E 1205
TIME :01:49:02 02:19:05 30 (min) Purpose code: 3
LOG :9601.38 9602.76 1.37 Area code : 3
FDEPTH: 442 440 GearCond.code:
BDEPTH: 442 440 Validity code: 1
Towing dir: 330º Wire out:1300 m Speed: 30 kn*10

Sorted: 23 Kg Total catch: 222.67 CATCH/HOUR: 445.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Benthodesmus tenuis	119.36	3584	26.80	
Hymenocephalus italicus	111.36	9584	25.01	
Laemonema laureysi	52.48	992	11.78	
Merluccius polli	47.68	154	10.71	5669
Nematocarcinus africanus	32.00	9600	7.19	
POLYCHAELIDAE	21.44	2912	4.81	
Dibranchus atlanticus	13.76	1632	3.09	
Aristeus varidens	8.64	448	1.94	
Lophius sp.	7.68	6	1.72	
Centrophorus granulosus	7.28	2	1.63	
Chaunax pictus	5.76	144	1.29	
Raja straeleni	3.08	2	0.69	
Chaceon maritae	2.68	8	0.60	
Nezumia leonis	2.56	176	0.57	
MYCTOPHIDAE	2.24	2496	0.50	
Coloconger cadenati	2.24	48	0.50	
Halosaurus ovenii	1.60	96	0.36	
Bassanago albescens	1.28	16	0.29	
Talismania bifurcata	0.96	2	0.22	
Galeus polli	0.76	16	0.17	
Bathynectes piperitus	0.16	32	0.04	
NETTASTOMATIDAE	0.16	32	0.04	
Coelorinchus coelorhincus	0.16	16	0.04	
Etmopterus lucifer	0.02	2		
Total	445.34		99.99	

PROJECT STATION:2552

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 722
start stop duration Long E 1209
TIME :05:20:03 05:50:16 30 (min) Purpose code: 3
LOG :9610.26 9611.84 1.58 Area code : 3
FDEPTH: 355 364 GearCond.code:
BDEPTH: 355 364 Validity code:
Towing dir: 150º Wire out:1000 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 290.11 CATCH/HOUR: 580.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	163.80	2718	28.23	
Synagrops microlepis	93.96	3870	16.19	
Merluccius polli	47.52	396	8.19	5670
Lagocephalus laevigatus	45.72	720	7.88	
S H R I M P S	34.20	11052	5.89	
Carcharhinus signatus	30.80	2	5.31	
Parasudis sp.	24.12	594	4.16	
Chaunax pictus	21.96	1710	3.78	
TRICHIURIDAE	17.28	954	2.98	
Hymenocephalus italicus	15.84	1944	2.73	
Dibranchus atlanticus	14.04	2322	2.42	
Gadella imberbis	7.56	288	1.30	
Illex coindetii	6.48	72	1.12	
Bassanago albescens	6.12	108	1.05	
Parapenaeus longirostris, fem.	5.76	694	0.99	5671
Setarches guentheri	5.04	324	0.87	
Bembrops greyi	3.96	108	0.68	
Halosaurus ovenii	3.60	36	0.62	
PARALEPIDIDAE	3.60	36	0.62	
Lophius vaillanti	3.60	18	0.62	
Coelorinchus coelorhincus	3.60	90	0.62	
Epigonus telescopus	3.24	216	0.56	
Solenocera africana	2.88	306	0.50	
Trichiurus lepturus	2.32	2	0.40	
MYCTOPHIDAE	1.80	918	0.31	
Munida sp. *	1.80	198	0.31	
Beryx splendens	1.28	2	0.22	
Bathynectes piperitus	1.08	18	0.19	
Malacocephalus laevis	1.08	18	0.19	
Chascanopsetta lugubris	1.08	36	0.19	
Peristedion cataphractum	1.08	144	0.19	
Mystriophis rostellatus	0.96	2	0.17	
Parapenaeus longirostris, male	0.90	108	0.16	5672
Dicologoglossa cuneata	0.72	18	0.12	
Ariomma bondi	0.72	18	0.12	
Xenolepidichthys dagleishi	0.36	18	0.06	
Nezumia aequalis	0.36	18	0.06	
Total	580.22		100.00	

PROJECT STATION:2553

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 721
start stop duration Long E 1215
TIME :07:15:54 07:44:25 29 (min) Purpose code: 3
LOG :9619.63 9621.12 1.48 Area code : 3
FDEPTH: 232 224 GearCond.code:
BDEPTH: 232 224 Validity code:
Towing dir: 330º Wire out: 750 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 256.19 CATCH/HOUR: 530.05

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	252.62	13407	47.66	
Dentex angolensis	171.52	590	32.36	5675
Zenopsis conchifer	29.67	422	5.60	
Spicara alta	12.83	72	2.42	
Trichiurus lepturus	12.29	23	2.32	
Pterothrissus belloci	10.34	83	1.95	
Brotula barbata	9.06	10	1.71	
Dibranchus atlanticus	5.79	1159	1.09	
Dentex macrophthalmus	4.34	31	0.82	
Bembrops heterurus	4.24	62	0.80	
APOGONIDAE	2.90	341	0.55	
Chlorophthalmus atlanticus	2.28	372	0.43	
Ommastrephes pteropus	2.07	10	0.39	
Uranoscopus polli	1.86	10	0.35	
Parapenaeus longirostris, male	1.66	352	0.31	5674
Parapenaeus longirostris, fem.	1.45	228	0.27	5673
Trigla lyra	1.24	12	0.23	
Pontinus kuhlii	1.20	2	0.23	
Dicologoglossa cuneata	0.62	10	0.12	
Merluccius polli, juveniles	0.62	21	0.12	
Coelorinchus coelorhincus	0.62	21	0.12	
Zenion hololepis	0.41	93	0.08	
Peristedion cataphractum	0.21	72	0.04	
Parasudis sp.	0.21	31	0.04	
Total	530.05		100.01	

PROJECT STATION:2554

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 718
start stop duration Long E 1220
TIME :08:56:59 09:24:01 27 (min) Purpose code: 3
LOG :9628.29 9629.73 1.42 Area code : 3
FDEPTH: 149 143 GearCond.code:
BDEPTH: 149 143 Validity code: 1
Towing dir: 120º Wire out: 450 m Speed: 30 kn*10

Sorted: 105 Kg Total catch: 105.32 CATCH/HOUR: 234.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	185.20	298	79.13	
Dentex angolensis	23.64	129	10.10	5676
Trachurus trecae, juvenile	7.96	429	3.40	5677
Pterothrissus belloci	7.24	58	3.09	
Brotula barbata	3.07	4	1.31	
Spicara alta	1.73	33	0.74	
Trigla lyra	1.33	16	0.57	
Bembrops heterurus	1.16	24	0.50	
Dentex congoensis	0.84	13	0.36	
Monolene microstoma	0.71	33	0.30	
Pontinus kuhlii	0.58	4	0.25	
Sphoeroides pachgaster	0.22	2	0.09	
Illex coindetii	0.18	2	0.08	
Sepia officinalis hierredda	0.13	2	0.06	
Peristedion cataphractum	0.04	2	0.02	
Total	234.03		100.00	

PROJECT STATION:2555

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 718
start stop duration Long E 1227
TIME :10:26:11 10:54:57 29 (min) Purpose code: 3
LOG :9636.35 9637.85 1.46 Area code : 3
FDEPTH: 101 102 GearCond.code:
BDEPTH: 101 102 Validity code: 1
Towing dir: 150º Wire out: 330 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 47.04 CATCH/HOUR: 97.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	35.63	279	36.61	5679
Pagellus bellottii	16.47	157	16.92	5681
Dentex barnardi	10.14	31	10.42	5680
Sepia officinalis hierredda	8.07	31	8.29	
Dentex angolensis	6.79	41	6.98	5678
Fistularia petimba	3.39	10	3.48	
Trichiurus lepturus	3.06	6	3.14	
Rhinobatos albomaculatus	2.86	2	2.94	
Arnoglossus imperialis	2.05	37	2.11	
Dentex gibbosus	1.57	2	1.61	
Raja miraletus	1.49	2	1.53	
Zeus faber	1.41	6	1.45	
Scorpaena elongata	1.34	4	1.38	
Brotula barbata	1.28	2	1.32	
Chelidonichthys capensis	0.79	12	0.81	
Todaropsis eblanae	0.50	14	0.51	
Chaetodon hoefleri	0.25	2	0.26	
Dibranchus atlanticus	0.12	19	0.12	
Saurida brasiliensis	0.08	23	0.08	
Anthias anthias	0.02	2	0.02	
Trigla lyra	0.02	2	0.02	
Total	97.33		100.00	

PROJECT STATION:2556

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 713
start stop duration Long E 1243
TIME :13:36:27 14:06:15 30 (min) Purpose code: 3
LOG :9661.25 9662.76 1.50 Area code : 3
FDEPTH: 32 31 GearCond.code:
BDEPTH: 32 31 Validity code:
Towing dir: 340º Wire out: 170 m Speed: 30 kn*10

Sorted: 22 Kg Total catch: 21.68 CATCH/HOUR: 43.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagrus caeruleostictus	21.00	72	48.43	
Pagellus bellottii	13.12	74	30.26	5687
Dentex barnardi	3.64	10	8.39	
Xyrichtys novacula	2.04	2	4.70	
Epinephelus aeneus	2.04	2	4.70	
Zanobatus shoenleinii	1.04	2	2.40	
Fistularia petimba	0.48	4	1.11	
Total	43.36		99.99	

PROJECT STATION:2557

DATE:22/ 3/01 GEAR TYPE: BT No:4 POSITION:Lat S 709
start stop duration Long E 1230
TIME :16:02:44 16:29:49 27 (min) Purpose code: 3
LOG :9680.28 9681.56 1.27 Area code : 3
FDEPTH: 53 52 GearCond.code:
BDEPTH: 53 52 Validity code: 1
Towing dir: 160º Wire out: 210 m Speed: 30 kn*10

Sorted: 9 Kg Total catch: 8.78 CATCH/HOUR: 19.51

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	12.18	18	62.43	
Pagrus africanus	4.62	7	23.68	
Pagrus caeruleostictus	1.78	4	9.12	
Citharus linguatula	0.93	4	4.77	
Total	19.51		100.00	

PROJECT STATION:2558

DATE:22/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 713
start stop duration Long E 1153
TIME :21:13:46 21:42:52 29 (min) Purpose code: 3
LOG :9724.87 9726.26 1.39 Area code : 3
FDEPTH: 635 628 GearCond.code:
BDEPTH: 635 628 Validity code: 1
Towing dir: 130º Wire out:1700 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 195.19 CATCH/HOUR: 403.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	219.85	8270	54.44	
Lamprogrammus exutus	30.12	188	7.46	
POLYCHAELIDAE	26.65	2375	6.60	
OCTOPOTEUTHIDAE	22.59	145	5.59	
Merluccius polli	17.67	29	4.38	
Stomias sp.	12.41	290	3.07	
Nezumia leonis	11.59	246	2.87	
Etmopterus lucifer	10.14	101	2.51	
Triplophus hemingi	10.14	1043	2.51	
Xenodermichthys copei	8.98	377	2.22	
Nematocarcinus africanus	7.53	2983	1.86	
Chaceon maritae	5.83	19	1.44	
Todaropsis eblanae	4.63	14	1.15	
Dicrolene intronigra	4.34	203	1.07	
Benthodesmus tenuis	2.61	58	0.65	
Bathyuroconger vicinus	2.32	43	0.57	
Aristeus varidens, female	1.92	72	0.48	5682
Glyphus marsupialis	1.16	58	0.29	
Dibranchus atlanticus	1.16	29	0.29	
Trichiurus lepturus	0.91	2	0.23	
Raja sp.	0.87	58	0.22	
Aristeus varidens, male	0.29	25	0.07	5683
SYNAPHOBRANCHIDAE	0.14	14	0.03	
Total	403.85		100.00	

PROJECT STATION:2559

DATE:22/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 712
start stop duration Long E 1155
TIME :22:56:24 23:21:02 25 (min) Purpose code: 3
LOG :9730.07 9731.39 1.30 Area code : 3
FDEPTH: 521 523 GearCond.code:
BDEPTH: 521 523 Validity code:
Towing dir: 300º Wire out:1500 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 98.35 CATCH/HOUR: 236.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	33.94	790	14.38	
POLYCHAELIDAE	31.92	3058	13.52	
Hoplostethus cadenati	25.37	934	10.75	
Lophius vaillanti	20.16	17	8.54	
Lamprogrammus exutus	18.48	60	7.83	
Merluccius polli	16.46	31	6.97	5684
Benthodesmus tenuis	13.61	454	5.77	
Laemonema laureysi	10.42	161	4.41	
Nematocarcinus africanus	8.90	4234	3.77	
Dibranchus atlanticus	7.63	60	3.23	
Chaceon maritae	6.96	24	2.95	
Stomias sp.	6.89	151	2.92	
Aristeus varidens, female	6.72	290	2.85	5685
Dicrolene intronigra	5.71	403	2.42	
Etmopterus lucifer	5.04	84	2.14	
Triplophus hemingi	5.04	722	2.14	
Bathynectes piperitus	3.53	60	1.50	
Chaunax pictus	3.36	17	1.42	
Aristeus varidens, male	2.02	161	0.86	5686
Todaropsis eblanae	1.01	10	0.43	
Gadella imberbis	1.01	50	0.43	
Bathyuroconger vicinus	0.50	26	0.21	
Plesiopenaeus edwardsianus	0.38	2	0.16	
Xenodermichthys copei	0.34	50	0.14	
Halosaurus ovenii	0.34	10	0.14	
GONOSTOMATIDAE	0.17	17	0.07	
NETTASTOMATIDAE	0.07	26	0.03	
SYNAPHOBRANCHIDAE	0.07	26	0.03	
Total	236.05		100.01	

PROJECT STATION:2560

DATE:23/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 712
start stop duration Long E 1157
TIME :00:37:58 01:07:59 30 (min) Purpose code: 3
LOG :9737.56 9739.01 1.46 Area code : 3
FDEPTH: 449 446 GearCond.code:
BDEPTH: 449 446 Validity code: 1
Towing dir: 150º Wire out:1300 m Speed: 30 kn*10

Sorted: 25 Kg Total catch: 151.81 CATCH/HOUR: 303.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hymenocephalus italicus	46.20	4410	15.22	
Laemonema laureysi	42.20	690	13.90	
Benthodesmus tenuis	37.50	920	12.35	
POLYCHAELIDAE	31.80	2050	10.47	
Hexanchus griseus	23.92	2	7.88	
Dalatias licha	20.96	2	6.90	
Dibranchus atlanticus	17.40	1210	5.73	
Merluccius polli	15.64	46	5.15	5690
Yarrella blackfordi	14.80	360	4.87	
Chaunax pictus	10.80	220	3.56	
Parapenaeus longirostris, fem.	6.10	480	2.01	5691
Nematocarcinus africanus	5.20	1820	1.71	
Aristeus varidens, female	5.00	246	1.65	5688
Dicrolene intronigra	3.80	270	1.25	
Bathynectes piperitus	3.80	90	1.25	
Todaropsis eblanae	3.00	20	0.99	
Etmopterus lucifer	2.90	70	0.96	
Chaceon maritae	2.56	8	0.84	
Halosaurus ovenii	2.40	70	0.79	
Zenopsis conchifer	1.84	2	0.61	
Plesiopenaeus edwardsianus	0.80	10	0.26	
OCTOPOTEUTHIDAE	0.80	10	0.26	
Nezumia leonis	0.80	40	0.26	
Aristeus varidens, male	0.80	90	0.26	5689
Galeus polli	0.60	10	0.20	
Coloconger cadenati	0.60	10	0.20	
Coelorinchus coelorhincus	0.60	10	0.20	
NETTASTOMATIDAE	0.40	50	0.13	
Hoplostethus cadenati	0.40	20	0.13	
Total	303.62		99.99	

PROJECT STATION:2561

DATE:23/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 711
start stop duration Long E 1159
TIME :05:27:52 05:57:25 30 (min) Purpose code: 3
LOG :9750.92 9752.41 1.48 Area code : 3
FDEPTH: 346 342 GearCond.code:
BDEPTH: 346 342 Validity code:
Towing dir: 150º Wire out:1000 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 202.04 CATCH/HOUR: 404.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	106.56	1776	26.37	
Synagrops microlepis	77.76	2688	19.24	
Laemonema laureysi	33.60	516	8.32	
Trichiurus lepterus	31.08	70	7.69	
Merluccius polli	24.00	132	5.94	5693
TRICHIURIDAE	20.16	744	4.99	
Munida sp. *	18.24	1992	4.51	
Merluccius polli, juveniles	16.08	348	3.98	5692
Gadella imberbis	13.20	492	3.27	
Parapenaeus longirostris, fem.	9.84	1212	2.44	5694
Hymenocephalus italicus	8.64	1056	2.14	
Illex coindetii	6.72	48	1.66	
Coelorinchus coelorhincus	6.24	132	1.54	
Parapenaeus longirostris, male	4.80	696	1.19	5695
Malacocephalus laevis	4.80	36	1.19	
Dibranchus atlanticus	4.32	492	1.07	
Scyliorhinus cervigoni	3.24	2	0.80	
Bathynectes piperitus	3.12	36	0.77	
Sepia elegans	2.16	216	0.53	
Bembrops greyi	2.16	48	0.53	
Solenocera africana	1.44	156	0.36	
Chaceon maritae	0.88	2	0.22	
Chaunax pictus	0.72	24	0.18	
Nezumia aequalis	0.72	36	0.18	
MYCTOPHIDAE	0.72	336	0.18	
Chascanopsetta lugubris	0.72	24	0.18	
Lophius vaillanti	0.48	12	0.12	
POLYCHAELIDAE	0.48	36	0.12	
Peristedion cataphractum	0.24	48	0.06	
Epigonus telescopus	0.24	24	0.06	
APOGONIDAE	0.24	12	0.06	
Parasudis sp.	0.24	156	0.06	
NETTASTOMATIDAE	0.12	12	0.03	
PARALEPIDIDAE	0.12	12	0.03	
Total	404.08		100.01	

PROJECT STATION:2562

DATE:23/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 710
start stop duration Long E 1203
TIME :07:15:41 07:45:27 30 (min) Purpose code: 3
LOG :9759.01 9760.63 1.60 Area code : 3
FDEPTH: 256 256 GearCond.code:
BDEPTH: 256 256 Validity code: 1
Towing dir: 140º Wire out: 750 m Speed: 30 kn*10

Sorted: 37 Kg Total catch: 83.13 CATCH/HOUR: 166.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	73.50	4180	44.21	
Merluccius polli, juveniles	26.70	610	16.06	5696
Parapenaeus longirostris, fem.	15.54	1630	9.35	5697
Parapenaeus longirostris, male	12.94	3090	7.78	5698
Trichiurus lepturus	11.24	62	6.76	
Zenopsis conchifer	9.70	182	5.83	
Illex coindetii	7.10	80	4.27	
Chlorophthalmus atlanticus	3.20	420	1.92	
C E P H A L O P O D A	2.70	900	1.62	
Sepia elegans	1.80	150	1.08	
Parasudis sp.	0.70	90	0.42	
Zenion hololepis	0.50	130	0.30	
Mystriophis rostellatus	0.26	6	0.16	
PARALEPIDIDAE	0.10	6	0.06	
Scyliorhinus cervigoni	0.10	6	0.06	
APOGONIDAE	0.10	16	0.06	
Coelorinchus coelorhincus	0.10	10	0.06	
Total	166.28		100.00	

PROJECT STATION:2563

DATE:23/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 708
start stop duration Long E 1205
TIME :08:50:03 09:17:47 28 (min) Purpose code: 3
LOG :9767.15 9768.65 1.49 Area code : 3
FDEPTH: 131 139 GearCond.code:
BDEPTH: 131 139 Validity code: 1
Towing dir: 140º Wire out: 400 m Speed: 31 kn*10

Sorted: 121 Kg Total catch: 973.50 CATCH/HOUR: 2086.07

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Spicara alta	642.43	7513	30.80	
Trachurus trecae, juvenile	571.07	25157	27.38	5702
Dentex congoensis	546.04	5638	26.18	5700
Trachurus trecae	266.14	2492	12.76	5701
Dentex angolensis	24.60	94	1.18	5699
Boops boops	18.73	259	0.90	
Trichiurus lepturus	7.50	9	0.36	
Zeus faber	5.06	9	0.24	
Illex coindetii	1.99	41	0.10	
Fistularia petimba	1.67	2	0.08	
Dentex macrophthalmus	0.60	2	0.03	
Zenopsis conchifer	0.34	2	0.02	
Total	2086.17		100.03	

PROJECT STATION:2564

DATE:23/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 706

	start	stop	duration			Long E 1214
TIME	:10:39:11	10:54:47	16 (min)	Purpose code:	3	
LOG	:9778.04	9778.84	0.79	Area code :	3	
FDEPTH:	108	107		GearCond.code:		
BDEPTH:	108	107		Validity code:	1	

Towing dir: 150o Wire out: 330 m Speed: 30 kn*10

Sorted: 15 Kg Total catch: 35.72 CATCH/HOUR: 133.95

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	49.73	401	37.13	
Trachurus trecae, juvenile	28.95	1564	21.61	5704
Dentex angolensis	20.40	120	15.23	5703
Sepia officinalis hierredda	9.53	8	7.11	
Todaropsis eblanae - juvenile	7.13	851	5.32	
Dentex barnardi	2.78	4	2.08	
Pagellus bellottii	2.10	4	1.57	
Brachydeuterus auritus	2.03	4	1.52	
Zeus faber	2.03	4	1.52	
Trigla lyra	2.03	4	1.52	
Trichiurus lepturus	2.03	4	1.52	
Todaropsis eblanae	1.88	8	1.40	
Illex coindetii	1.80	11	1.34	
Sardinella aurita	1.58	4	1.18	
Total	134.00		100.05	

PROJECT STATION:2565

DATE:23/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 704

	start	stop	duration			Long E 1216
TIME	:11:48:13	12:07:39	19 (min)	Purpose code:	3	
LOG	:9784.37	9785.31	0.93	Area code :	3	
FDEPTH:	93	95		GearCond.code:		
BDEPTH:	93	95		Validity code:		

Towing dir: 150o Wire out: 300 m Speed: 30 kn*10

Sorted: 37 Kg Total catch: 36.83 CATCH/HOUR: 116.31

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	39.54	291	34.00	5705
Trachurus trecae, juvenile	31.45	2214	27.04	5706
Pagellus bellottii	17.37	104	14.93	5707
Epinephelus aeneus	7.83	3	6.73	
Dentex congoensis	4.80	76	4.13	
Dentex barnardi	4.74	13	4.08	
Sardinella aurita	3.22	139	2.77	
Fistularia petimba	2.46	9	2.12	
Chaetodon hoefleri	1.96	13	1.69	
Trigla lyra	1.26	9	1.08	
Todaropsis eblanae - juvenile	1.07	411	0.92	
Zeus faber	0.57	3	0.49	
Spicara alta	0.03	13	0.03	
Total	116.30		100.01	

PROJECT STATION:2566

DATE:23/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 701

	start	stop	duration			Long E 1238
TIME	:14:40:57	15:10:20	29 (min)	Purpose code:	3	
LOG	:9811.07	9812.63	1.55	Area code :	3	
FDEPTH:	24	24		GearCond.code:		
BDEPTH:	24	24		Validity code:		

Towing dir: 330o Wire out: 160 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 65.18 CATCH/HOUR: 134.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Balistes capriscus	42.00	85	31.14	
Dentex gibbosus	36.17	52	26.82	
Epinephelus aeneus	17.26	17	12.80	
Gymnammodytes capensis	9.52	4086	7.06	
Pagrus africanus	6.33	6	4.69	
Balistes punctatus	6.33	6	4.69	
Aluterus scriptus	5.09	6	3.77	
Seriola carpenteri	3.81	4	2.83	
Bodianus speciosus	2.65	2	1.97	
Acanthurus monroviae	1.99	4	1.48	
Decapterus rhonchus	1.45	2	1.08	
Zanobatus shoenleinii	1.08	2	0.80	
Fistularia petimba	0.70	6	0.52	
Pagellus bellottii	0.50	2	0.37	
Total	134.88		100.02	

PROJECT STATION:2567

DATE:23/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 648

	start	stop	duration			Long E 1227
TIME	:16:55:37	17:16:20	21 (min)	Purpose code:	3	
LOG	:9830.32	9831.33	0.99	Area code :	3	
FDEPTH:	24	23		GearCond.code:		
BDEPTH:	24	23		Validity code:	1	

Towing dir: 140o Wire out: 180 m Speed: 30 kn*10

Sorted: 18 Kg Total catch: 17.59 CATCH/HOUR: 50.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	32.17	171	64.01	5708
Caranx crysos	7.46	9	14.84	
Decapterus rhonchus	6.74	9	13.41	
Balistes capriscus	1.60	6	3.18	
Selar crumenophthalmus	1.43	9	2.85	
Pagrus caeruleostictus	0.86	6	1.71	
Total	50.26		100.00	

PROJECT STATION:2568

DATE:23/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 700

	start	stop	duration			Long E 1145
TIME	:22:55:42	23:25:06	29 (min)	Purpose code:	3	
LOG	:9883.02	9884.53	1.50	Area code :	3	
FDEPTH:	640	618		GearCond.code:		
BDEPTH:	640	618		Validity code:		

Towing dir: 140o Wire out:1775 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 261.86 CATCH/HOUR: 541.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	155.59	3046	28.72	
Lamprogrammus exutus	106.26	248	19.61	
Yarrella blackfordi	74.15	1903	13.69	
Xenodermichthys copei	27.81	1043	5.13	
Nezumia leonis	24.50	480	4.52	
POLYCHAELIDAE	21.19	1258	3.91	
Nematocarcinus africanus	17.88	5363	3.30	
Triplophus hemingi	16.88	1887	3.12	
Dicrolene intronigra	15.23	1233	2.81	
STOMIIDAE	14.90	364	2.75	
OCTOPOTEUTHIDAE	14.23	66	2.63	
Benthodesmus tenuis	12.58	298	2.32	
Coloconger cadenati	9.27	17	1.71	
Chaceon maritae	7.70	19	1.42	
Dibranchus atlanticus	3.31	248	0.61	
Raja sp.	2.32	17	0.43	
SYNAPHOBRANCHIDAE	2.32	50	0.43	
Bathygadus melanobranchus	2.32	33	0.43	
Deania quadrispinosum	1.99	17	0.37	
Bathyuroconger vicinus	1.99	17	0.37	
Etmopterus lucifer	1.66	17	0.31	
CHIMAERIDAE	1.37	2	0.25	
Lophius sp.	1.32	149	0.24	
Talismania bifurcata	1.32	50	0.24	
Glyphus marsupialis	0.99	83	0.18	
Halosaurus ovenii	0.99	17	0.18	
Aristeus varidens, female	0.99	50	0.18	
OPHIDIIDAE	0.74	17	0.14	
Aristeus varidens, male	0.33	83	0.06	
NETTASTOMATIDAE	0.17	17	0.03	
Total	542.30		100.09	

PROJECT STATION:2569

DATE:24/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 659

	start	stop	duration			Long E 1146
TIME	:00:35:04	01:05:03	30 (min)	Purpose code:	3	
LOG	:9888.04	9889.52	1.45	Area code :	3	
FDEPTH:	548	549		GearCond.code:		
BDEPTH:	548	549		Validity code:		

Towing dir: 315o Wire out:1550 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 105.32 CATCH/HOUR: 210.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	43.54	1110	20.67	
Lamprogrammus exutus	25.34	140	12.03	
Triplophus hemingi	24.50	3022	11.63	
Benthodesmus tenuis	20.44	704	9.70	
STOMIIDAE	15.54	318	7.38	
POLYCHAELIDAE	15.12	6280	7.18	
Xenodermichthys copei	9.72	584	4.61	
Hoplostethus cadenati	9.58	392	4.55	
Nematocarcinus africanus	8.18	5356	3.88	
Chaceon maritae	5.68	14	2.70	
Etmopterus lucifer	5.04	70	2.39	
Aristeus varidens, female	4.62	182	2.19	5709
Lophius sp.	3.08	8	1.46	
Laemonema laureysi	1.96	42	0.93	
Gadella imberbis	1.96	78	0.93	
OCTOPOTEUTHIDAE	1.54	14	0.73	
Aristeus varidens, male	1.54	190	0.73	5710
NOMEIDAE	1.40	8	0.66	
Raja sp.	1.40	14	0.66	
Merluccius polli	1.36	4	0.65	
Todaropsis eblanae	1.26	8	0.60	
Plesiopenaeus edwardsianus	0.98	14	0.47	
Nezumia leonis	0.98	22	0.47	
SERGESTIDAE	0.70	56	0.33	
NEMICHTHYIDAE	0.70	8	0.33	
Bathyuroconger vicinus	0.70	8	0.33	
NETTASTOMATIDAE	0.56	28	0.27	
Caristius groenlandicus	0.42	22	0.20	
Dibranchus atlanticus	0.42	36	0.20	
Halosaurus ovenii	0.42	14	0.20	
Glyphus marsupialis	0.28	28	0.13	
SYNAPHOBRANCHIDAE	0.28	14	0.13	
Total	209.24		99.32	

PROJECT STATION:2570

DATE:24/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 657
start stop duration Long E 1150
TIME :05:26:22 05:49:55 24 (min) Purpose code: 3
LOG :9908.01 9909.35 1.34 Area code : 3
FDEPTH: 355 327 GearCond.code:
BDEPTH: 355 327 Validity code: 1
Towing dir: 150º Wire out:1000 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 120.68 CATCH/HOUR: 301.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	62.20	198	20.62	
Chlorophthalmus atlanticus	48.80	830	16.18	
Laemonema laureysi	32.60	430	10.81	
Merluccius polli	23.40	120	7.76	
Paromola cuvieri	18.80	10	6.23	
Parapenaeus longirostris, fem.	14.40	1760	4.77	5711
Pterothrissus belloci	11.80	70	3.91	
TRICHIURIDAE	11.00	453	3.65	
Gadella imberbis	9.80	370	3.25	
Chaunax pictus	9.80	360	3.25	
Hymenocephalus italicus	8.40	923	2.78	
Setarches guentheri	7.20	260	2.39	
APOGONIDAE	7.00	150	2.32	
Munida sp. *	4.60	420	1.52	
Malacocephalus occidentalis	4.40	20	1.46	
Coelorinchus coelorhincus	3.00	40	0.99	
Parapenaeus longirostris, male	2.80	360	0.93	5712
S H R I M P S	2.80	570	0.93	
Trichiurus lepturus	2.50	3	0.83	
Chascanopsetta lugubris	2.00	60	0.66	
Ommastrephes pteropus	1.80	10	0.60	
Dibranchus atlanticus	1.80	250	0.60	
Solenocera africana	1.60	280	0.53	
Merluccius polli, juveniles	1.40	70	0.46	
POLYCHAELIDAE	1.00	70	0.33	
PARALEPIDIDAE	1.00	50	0.33	
Illex coindetii	1.00	10	0.33	
Trigla sp.	1.00	10	0.33	
MURAENESOCIDAE	0.80	10	0.27	
MYCTOPHIDAE	0.60	420	0.20	
Raja alba	0.40	10	0.13	
Nezumia aequalis	0.40	20	0.13	
Etmopterus spinax	0.40	10	0.13	
Epigonus sp.	0.40	20	0.13	
Aricomma bondi	0.20	10	0.07	
Sepia elegans	0.20	20	0.07	
Zenion hololepis	0.20	50	0.07	
C R A B S	0.10	10	0.03	
Peristedion cataphractum	0.10	10	0.03	
Total	301.70		100.01	

PROJECT STATION:2571

DATE:24/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 657
start stop duration Long E 1153
TIME :07:09:02 07:31:32 23 (min) Purpose code: 3
LOG :9917.54 9918.70 1.16 Area code : 3
FDEPTH: 246 236 GearCond.code:
BDEPTH: 246 236 Validity code: 1
Towing dir: 150º Wire out: 750 m Speed: 30 kn*10

Sorted: 38 Kg Total catch: 56.46 CATCH/HOUR: 147.29

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	41.74	5361	28.34	
Synagrops microlepis	33.65	16137	22.85	
Merluccius polli, juveniles	17.74	509	12.04	5713
Zenopsis conchifer	12.42	57	8.43	
Parapenaeus longirostris, fem.	6.78	730	4.60	5714
Ommastrephes pteropus	6.00	39	4.07	
Parasudis sp.	5.74	743	3.90	
Sepia elegans	5.74	143	3.90	
Aricomma bondi	5.22	78	3.54	
Parapenaeus longirostris, male	3.91	600	2.65	5715
Pterothrissus belloci	3.65	26	2.48	
Illex coindetii	2.09	26	1.42	
Munida sp. *	1.83	157	1.24	
Coelorinchus coelorhincus	0.52	13	0.35	
Zenion hololepis	0.26	91	0.18	
Total	147.29		99.99	

PROJECT STATION:2572

DATE:24/ 3/01 GEAR TYPE: BT No: POSITION:Lat S 656
start stop duration Long E 1154
TIME :08:35:16 08:52:35 17 (min) Purpose code: 3
LOG :9922.89 9923.66 0.76 Area code : 3
FDEPTH: 171 177 GearCond.code:
BDEPTH: 171 177 Validity code: 1
Towing dir: 330º Wire out: 550 m Speed: 30 kn*10

Sorted: 158 Kg Total catch: 158.27 CATCH/HOUR: 558.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Spicara alta	383.58	2619	68.67	
Epigonus sp.	109.41	4	19.59	
Dentex angolensis	25.41	95	4.55	5716
Erythrocles monodi	13.66	113	2.45	
Zenopsis conchifer	8.26	11	1.48	
Dentex macrophthalmus	7.69	39	1.38	5717
Trichiurus lepturus	6.85	7	1.23	
Illex coindetii	1.91	25	0.34	
Umbrina canariensis	1.20	4	0.21	
Pteroscion peli	0.42	4	0.08	
Trachurus trecae	0.28	4	0.05	
Total	558.67		100.03	

PROJECT STATION:2573

DATE:24/ 3/01 GEAR TYPE: BT No: POSITION:Lat S 654
start stop duration Long E 1207
TIME :11:55:40 12:25:07 30 (min) Purpose code: 3
LOG :9945.51 9946.92 1.41 Area code : 3
FDEPTH: 90 89 GearCond.code:
BDEPTH: 90 89 Validity code:
Towing dir: 310º Wire out: 300 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 60.11 CATCH/HOUR: 120.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	108.24	1334	90.03	5718
Dentex congoensis	4.12	84	3.43	
Trachurus trecae, juvenile	2.04	186	1.70	5719
Fistularia petimba	1.40	4	1.16	
Pseudupeneus prayensis	1.16	8	0.96	
Priacanthus arenatus	0.68	2	0.57	
Chelidonichthys capensis	0.66	4	0.55	
Sepia officinalis hierredda	0.60	2	0.50	
Trigla lyra	0.60	6	0.50	
Zeus faber	0.32	2	0.27	
Trachurus sp.	0.20	2	0.17	
Dentex angolensis	0.20	2	0.17	
Total	120.22		100.01	

PROJECT STATION:2574

DATE:25/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 634
start stop duration Long E 1212
TIME :07:43:45 08:13:01 29 (min) Purpose code: 3
LOG :9972.61 9974.13 1.51 Area code : 3
FDEPTH: 47 48 GearCond.code:
BDEPTH: 47 48 Validity code: 1
Towing dir: 160º Wire out: 200 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 31.52 CATCH/HOUR: 65.21

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagrus caeruleostictus	24.66	46	37.82	
Pagellus bellottii	10.72	56	16.44	5720
Pagrus africanus	10.10	14	15.49	
Epinephelus aeneus	9.97	4	15.29	
Dentex gibbosus	5.30	8	8.13	
Sepia officinalis hierredda	3.19	2	4.89	
Chaetodon hoefleri	0.74	4	1.13	
Fistularia tabacaria	0.54	4	0.83	
Total	65.22		100.02	

PROJECT STATION:2575

DATE:25/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 633
start stop duration Long E 1203
TIME :09:48:45 10:18:43 30 (min) Purpose code: 3
LOG :9984.60 9986.34 1.76 Area code : 3
FDEPTH: 76 81 GearCond.code:
BDEPTH: 76 81 Validity code:
Towing dir: 250º Wire out: 230 m Speed: 30 kn*10

Sorted: 153 Kg Total catch: 152.50 CATCH/HOUR: 305.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	209.56	532	68.71	
Dentex congoensis	39.00	582	12.79	5723
Pagellus bellottii	21.84	222	7.16	5722
Seriola carpenteri	14.04	16	4.60	
Epinephelus aeneus	8.60	4	2.82	
Dentex angolensis	6.00	28	1.97	5721
Zeus faber	2.16	6	0.71	
Fistularia petimba	1.40	4	0.46	
Pseudupeneus prayensis	1.20	10	0.39	
Lagocephalus laevigatus	1.20	2	0.39	
Total	305.00		100.00	

PROJECT STATION:2576

DATE:25/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 637
start stop duration Long E 1157
TIME :11:19:01 11:49:14 30 (min) Purpose code: 3
LOG :9993.92 9995.38 1.45 Area code : 3
FDEPTH: 110 110 GearCond.code:
BDEPTH: 110 110 Validity code: 1
Towing dir: 194º Wire out: 330 m Speed: 30 kn*10

Sorted: 81 Kg Total catch: 80.65 CATCH/HOUR: 161.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	44.84	510	27.80	5726
Trachurus trecae, juvenile	42.84	2838	26.56	5725
Dentex congoensis	31.36	388	19.44	5727
Dentex angolensis	31.28	212	19.39	5724
Trichiurus lepturus	3.24	6	2.01	
Pagellus bellottii	2.30	8	1.43	
Brachydeuterus auritus	2.04	14	1.26	
Aricomma bondi	1.68	26	1.04	
Fistularia petimba	0.96	2	0.60	
Trigla lyra	0.40	6	0.25	
Zeus faber	0.32	2	0.20	
Citharus linguatula	0.04	2	0.02	
Total	161.30		100.00	

PROJECT STATION:2577

DATE:25/ 3/01 GEAR TYPE: BT No:7 POSITION:Lat S 643

start stop duration Long E 1145

TIME :13:46:25 14:17:31 31 (min) Purpose code: 3

LOG : 13.04 14.68 1.62 Area code : 3

FDEPTH: 285 283 GearCond.code:

BDEPTH: 285 283 Validity code:

Towing dir: 340º Wire out: 850 m Speed: 30 kn*10

Sorted: 22 Kg Total catch: 455.64 CATCH/HOUR: 881.88

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Synagrops sp.	683.61	32644	77.52	
Parasudis sp.	58.06	1471	6.58	
Chlorophthalmus atlanticus	55.74	1341	6.32	
Ariomma bondi	24.77	581	2.81	
Merluccius polli, juveniles	20.90	581	2.37	
Zenopsis conchifer	14.21	31	1.61	
Trichiurus lepturus	11.42	29	1.29	
Pterothrissus belloci	3.87	39	0.44	
Parapenaeus longirostris, fem.	3.10	348	0.35	
Illex coindetii	3.10	39	0.35	
Todaropsis eblanae	2.71	194	0.31	
Sepia elegans	0.77	39	0.09	
Parapenaeus longirostris, male	0.39	116	0.04	
Zenion hololepis	0.39	39	0.04	
GALATHEIDAE *	0.39	116	0.04	
Coelorinchus coelorhincus	0.39	39	0.04	
Total	883.82		100.20	

PROJECT STATION:2578

DATE:25/ 3/01 GEAR TYPE: BT No:2 POSITION:Lat S 644

start stop duration Long E 1143

TIME :15:38:17 16:08:51 31 (min) Purpose code: 3

LOG : 19.59 21.05 1.44 Area code : 3

FDEPTH: 336 336 GearCond.code:

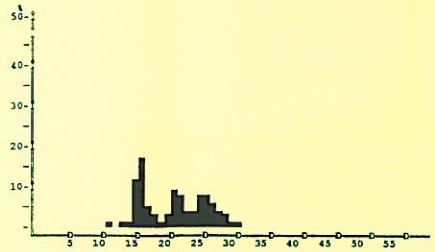
BDEPTH: 336 336 Validity code: 1

Towing dir: 147º Wire out:1000 m Speed: 30 kn*10

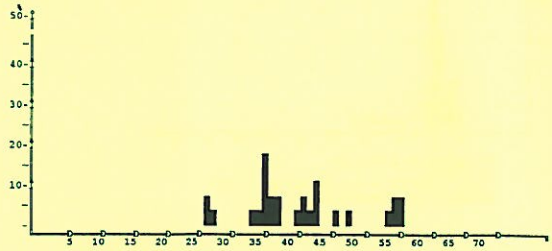
Sorted: 61 Kg Total catch: 814.96 CATCH/HOUR: 1577.34

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Squatina oculata	538.06	23	34.11	
Chlorophthalmus atlanticus	396.81	7963	25.16	
Synagrops microlepis	352.72	13556	22.36	
Merluccius polli	37.94	358	2.41	5728
Munida sp. *	26.98	2369	1.71	
Arius parkii	25.66	461	1.63	
Laemonema laureysi	24.35	329	1.54	
Ommastrephes pteropus	21.06	99	1.34	
Parasudis sp.	17.11	296	1.08	
Hymenocephalus italicus	14.48	1908	0.92	
Solenocera africana	13.16	1941	0.83	
APOGONIDAE	12.50	592	0.79	
Trichiurus lepturus	11.85	39	0.75	
Gadella imberbis	10.53	329	0.67	
Pterothrissus belloci	9.87	66	0.63	
Parapenaeus longirostris, fem.	9.52	1105	0.60	5729
Coelorinchus coelorhincus	6.58	197	0.42	
Parapenaeus longirostris, male	5.61	672	0.36	5730
Illex coindetii	5.26	33	0.33	
Zenopsis conchifer	5.23	10	0.33	
Bembrops greyi	4.61	66	0.29	
Sepia elegans	3.95	263	0.25	
Malacocephalus occidentalis	3.95	33	0.25	
Beryx splendens	3.29	33	0.21	
Callinectes marginatus	3.29	33	0.21	
Xenolepidichthys dagleishi	3.29	165	0.21	
Dibranchus atlanticus	2.63	296	0.17	
Chascanopsetta lugubris	1.97	33	0.12	
Mystriophis rostellatus	1.82	6	0.12	
S H R I M P S	1.32	132	0.08	
Chaceon maritae	1.05	4	0.07	
Peristedion cataphractum	0.66	99	0.04	
Total	1577.11		99.99	

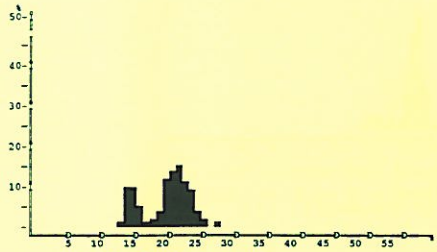
Annex II Length distributions of main species



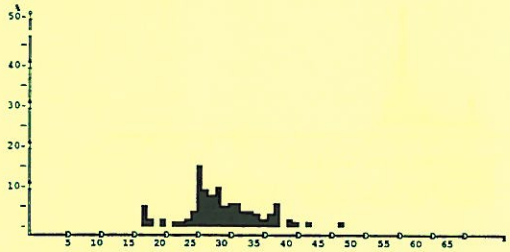
Dentex angolensis
CENTRAL
MEAN LENGTH = 21.38cm N= 718
NUMBER OF SUBSAMPLES : 15



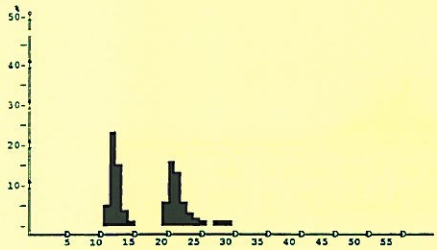
Pseudotolithus typus
CENTRAL
MEAN LENGTH = 41.86cm N= 28
NUMBER OF SUBSAMPLES : 2



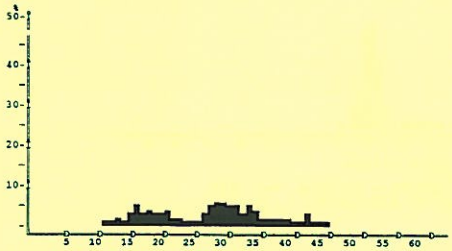
Dentex macrophthalmus
CENTRAL
MEAN LENGTH = 20.64cm N= 1182
NUMBER OF SUBSAMPLES : 15



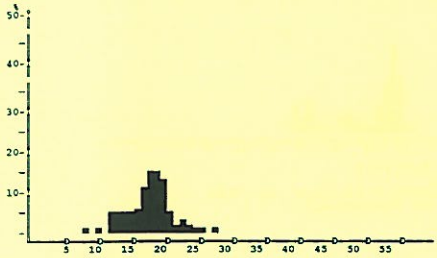
Umbrina canariensis
CENTRAL
MEAN LENGTH = 29.92cm N= 178
NUMBER OF SUBSAMPLES : 6



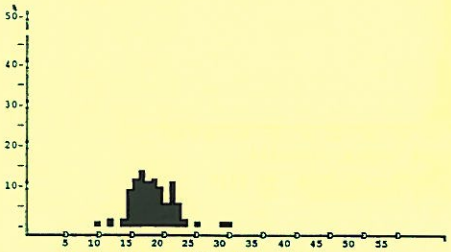
Dentex barnardi
CENTRAL
MEAN LENGTH = 18.11cm N= 221
NUMBER OF SUBSAMPLES : 6



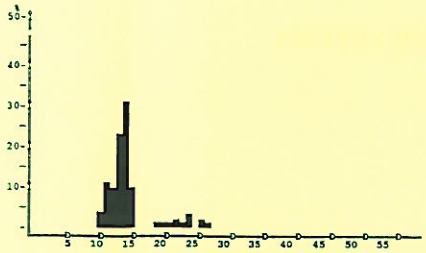
Merluccius polli
CENTRAL
MEAN LENGTH = 28.92cm N= 826
NUMBER OF SUBSAMPLES : 12



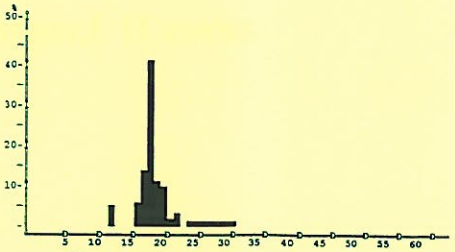
Pagellus bellottii
CENTRAL
MEAN LENGTH = 18.50cm N= 659
NUMBER OF SUBSAMPLES : 18



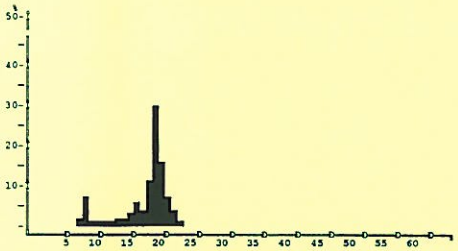
Merluccius polli, juveniles
CENTRAL
MEAN LENGTH = 19.21cm N= 288
NUMBER OF SUBSAMPLES : 4



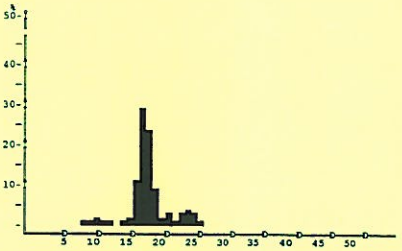
Pomadasys incisus
CENTRAL
MEAN LENGTH = 14.66cm N= 127
NUMBER OF SUBSAMPLES : 4



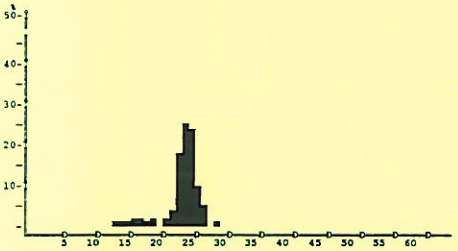
Chloroscombrus chrysurus
CENTRAL
MEAN LENGTH = 19.17cm N= 275
NUMBER OF SUBSAMPLES : 5



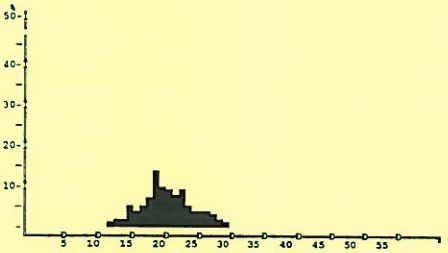
Brachydeuterus auritus
CENTRAL
MEAN LENGTH = 17.89cm N= 1260
NUMBER OF SUBSAMPLES : 14



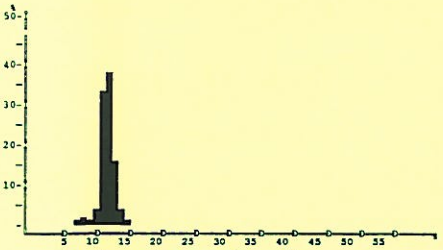
Parapenaeus longirostris, male
CENTRAL
MEAN LENGTH = 18.48cm N= 586
NUMBER OF SUBSAMPLES : 13



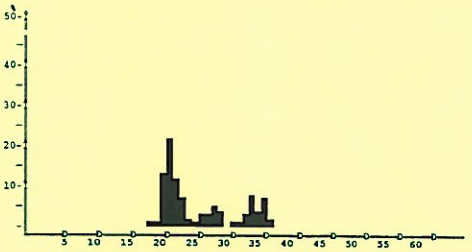
Trachurus trecae
CENTRAL
MEAN LENGTH = 24.00cm N= 285
NUMBER OF SUBSAMPLES : 5



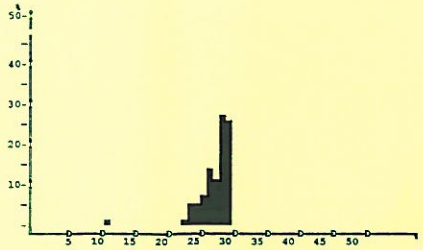
Parapenaeus longirostris, fem.
CENTRAL
MEAN LENGTH = 21.20cm N= 1068
NUMBER OF SUBSAMPLES : 14



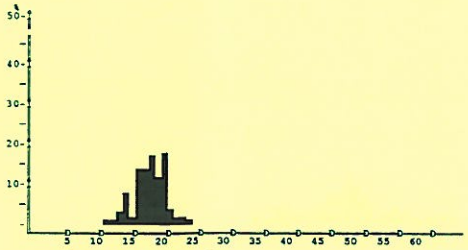
Trachurus trecae, juvenile
CENTRAL
MEAN LENGTH = 12.22cm N= 2416
NUMBER OF SUBSAMPLES : 20



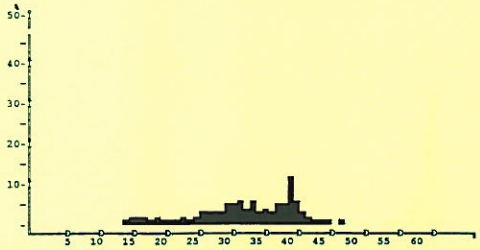
Selene dorsalis
CENTRAL
MEAN LENGTH = 26.18cm N= 283
NUMBER OF SUBSAMPLES : 7



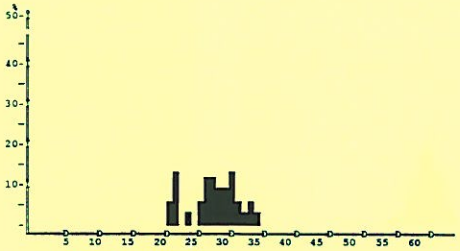
Aristeus varidens, male
CENTRAL
MEAN LENGTH = 28.19cm N= 618
NUMBER OF SUBSAMPLES : 14



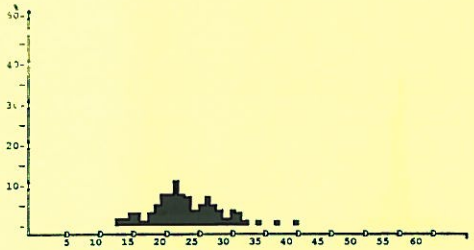
Dentex congoensis
NORTH
MEAN LENGTH = 18.30cm N= 282
NUMBER OF SUBSAMPLES : 3



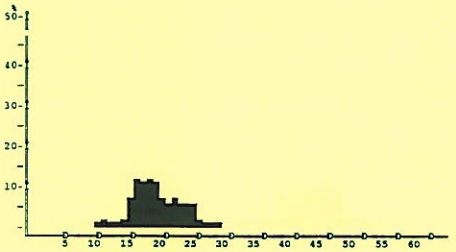
Aristeus varidens, female
CENTRAL
MEAN LENGTH = 33.29cm N= 983
NUMBER OF SUBSAMPLES : 14



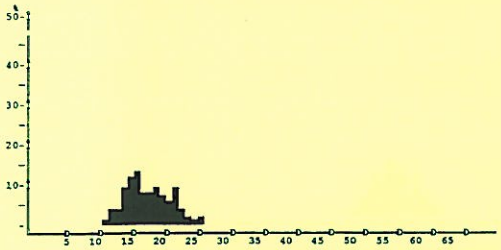
Dentex barnardi
NORTH
MEAN LENGTH = 28.54cm N= 25
NUMBER OF SUBSAMPLES : 2



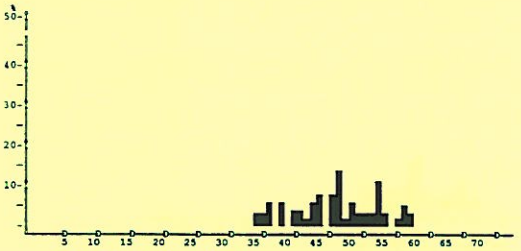
Dentex angolensis
NORTH
MEAN LENGTH = 24.35cm N= 608
NUMBER OF SUBSAMPLES : 15



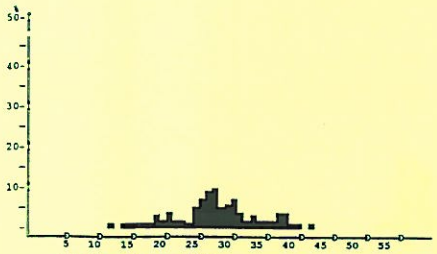
Pagellus bellottii
NORTH
MEAN LENGTH = 19.72cm N= 960
NUMBER OF SUBSAMPLES : 16



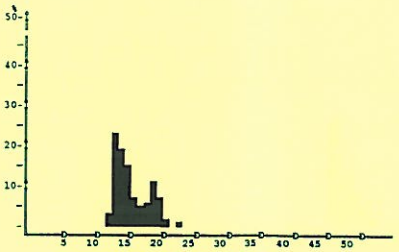
Dentex macrophthalmus
NORTH
MEAN LENGTH = 18.28cm N= 334
NUMBER OF SUBSAMPLES : 4



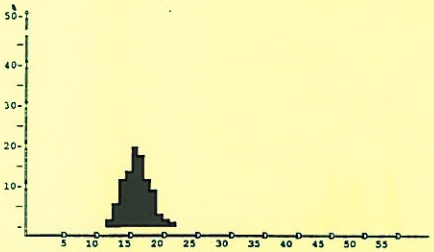
Pseudotolithus typus
NORTH
MEAN LENGTH = 47.83cm N= 41
NUMBER OF SUBSAMPLES : 2



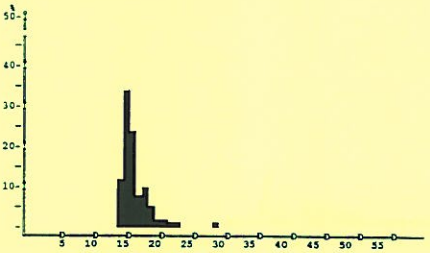
Merluccius polli
NORTH
MEAN LENGTH = 29.42cm N= 705
NUMBER OF SUBSAMPLES : 16



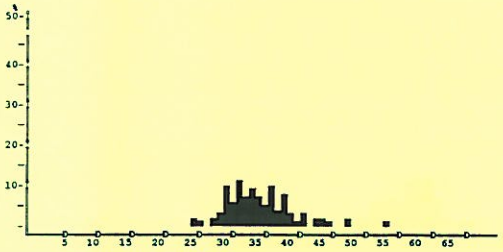
Brachydeuterus auritus
NORTH
MEAN LENGTH = 16.15cm N= 453
NUMBER OF SUBSAMPLES : 4



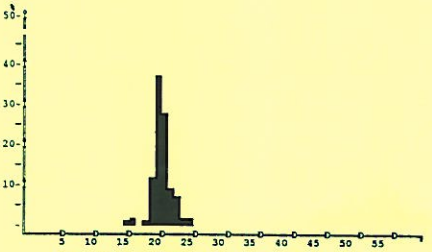
Merluccius polli, juveniles
NORTH
MEAN LENGTH = 16.86cm N= 639
NUMBER OF SUBSAMPLES : 7



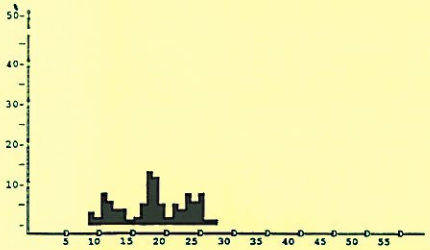
Selene dorsalis
NORTH
MEAN LENGTH = 16.88cm N= 196
NUMBER OF SUBSAMPLES : 4



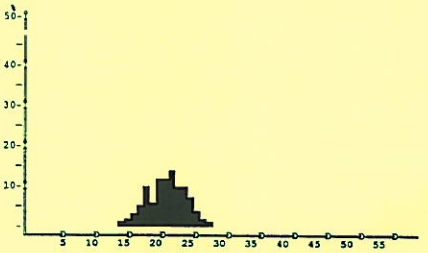
Pomadasys jubelini
NORTH
MEAN LENGTH = 35.73cm N= 157
NUMBER OF SUBSAMPLES : 3



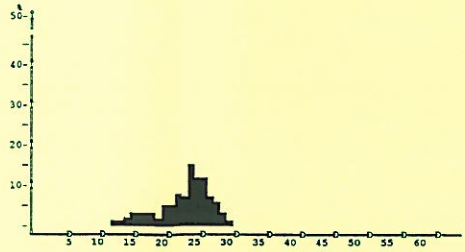
Trachurus trecae
NORTH
MEAN LENGTH = 21.08cm N= 230
NUMBER OF SUBSAMPLES : 4



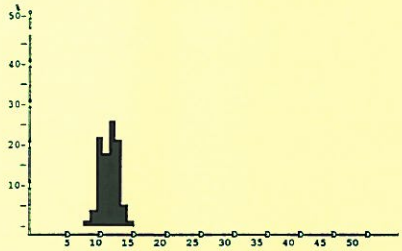
Pomadasys incisus
NORTH
MEAN LENGTH = 19.10cm N= 115
NUMBER OF SUBSAMPLES : 2



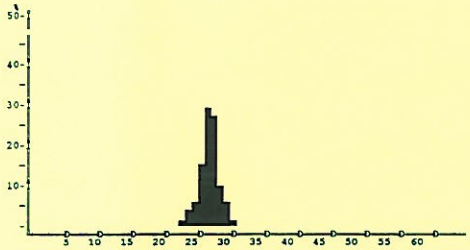
Parapenaeus longirostris, male
NORTH
MEAN LENGTH = 21.71cm N= 991
NUMBER OF SUBSAMPLES : 17



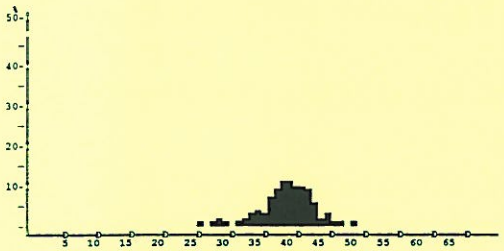
Parapenaeus longirostris, fem.
NORTH
MEAN LENGTH = 23.64cm N= 2009
NUMBER OF SUBSAMPLES : 18



Trachurus trecae, juvenile
NORTH
MEAN LENGTH = 12.09cm N= 1898
NUMBER OF SUBSAMPLES : 19



Aristeus varidens, male
NORTH
MEAN LENGTH = 27.72cm N= 239
NUMBER OF SUBSAMPLES : 9



Aristeus varidens, female
NORTH
MEAN LENGTH = 39.94cm N= 314
NUMBER OF SUBSAMPLES : 9

Annex III Swept area estimates

SWEPT AREA ANALYSIS FROM STATION 2426 TO STATION 2496

Central shelf

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 20- 50m	50-100m	100-200m	200-200m
Brachydeuterus auritus	9	3	6	7		2	59	9.49	3.89	20.81	0.95	
Synagrops microlepis	1	2	5	1		1	22	6.91		0.10	19.76	
Trachurus trecae, juvenile	10	4	8	3	2		59	3.58	0.01	3.80	6.00	
Trichiurus lepturus	21	6	3	2			70	1.37	0.36	2.10	1.31	
Dentex macrophthalmus	5	4	3	2			30	1.37		0.01	3.94	
Pagellus bellottii	25	4	2	1			70	0.84	0.17	0.91	1.28	
Brachydeuterus auritus Juv.	3		1	1			11	0.63	0.84	1.05		
Selene dorsalis	16	3	1	1			46	0.48	0.25	0.76	0.33	
Stromateus fiatola	12	1		1			30	0.47	0.06	0.96	0.22	
Trachurus trecae	11	1	3				33	0.45	0.01	1.12	0.02	
Dentex angolensis	22	2	2				57	0.40		0.11	1.04	
Chloroscombrus chrysurus	9	1		1			24	0.35	1.24	0.08		
Galeoides decadactylus	7	5					26	0.27	0.68	0.22		
Umbrina canariensis	9	1	1				24	0.26		0.05	0.69	
Spondyliosoma cantharus	2		2				9	0.24	0.92			
Alloteuthis africana	10		1				24	0.22		0.01	0.61	
Spicara alta		2	1				7	0.20			0.57	
Sphyraena guachancho	11	2					28	0.17	0.22	0.29		
Alectis alexandrinus	8	2					22	0.15	0.53	0.02		
Zenopsis conchifer	5	3					17	0.14			0.40	
Dentex barnardi	14		1				33	0.14	0.08	0.27	0.04	
Citharus linguatula	10	1	1				26	0.14	0.02	0.08	0.29	
Pomadasys incisus	7	3					22	0.12	0.12	0.21		
Pomadasys jubelini	1	1	1				7	0.10	0.29	0.07		
Pseudotolithus typus	5	1					13	0.09	0.31	0.01		
Brotula barbata	9	1					22	0.07		0.11	0.08	
Zeus faber	13	1					30	0.06			0.17	
Trigla lyra	4	1					11	0.06		0.01	0.17	
Sphyraena sphyraena	9	1					22	0.06	0.04	0.13		
Squatina oculata	4	1					11	0.06		0.03	0.15	
Raja miraletus	14						28	0.06	0.01	0.11	0.02	
Pomadasys rogeri	8						17	0.06	0.15	0.06		
Illex coindetii	8	1					20	0.05		0.01	0.12	
Boops boops	14						28	0.05	0.03	0.03	0.08	
Ijimaia loppei		1					2	0.05	0.19			
Parapenaeus longirostris, fem.	5						11	0.03		0.01	0.08	
Parapenaeus longirostris, male	5						11	0.02			0.06	
Penaeus notialis	2						4		0.01			
Parapenaeus longirostris	1						2					
Parapenaeopsis atlantica	1						2					
Other fish								0.85	1.20	0.95	0.69	
Sum all species								30.06	11.63	34.49	39.07	
Sum Snappers												
Sum Groupers								0.02	0.01	0.04		
Sum Grunts								10.44	5.31	22.30	0.96	
Sum Croakers								0.42	0.44	0.16	0.71	
Sum Seabreams								3.09	1.30	1.36	6.45	
Sum Sharks								0.07	0.07	0.03	0.16	
Sum Rays								0.12	0.09	0.20	0.05	
Sum Squids								0.34	0.03	0.11	0.82	
Sum 0.01												
Number of stations included in analysis, total and by depth strata								46	12	18	16	

SWEPT AREA ANALYSIS FROM STATION 2426 TO STATION 2496

Central slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 200-300m	300-400m	400-500m	500-500m
MYCTOPHIDAE	6	1				1	57	2.66	0.03	9.29	0.01	
Merluccius polli	3	3	3	1			71	2.01	0.42	3.65	1.99	
Synagrops microlepis		5	1				43	1.35	3.50	1.22		
NEMATOCARCINIDAE	1	1	2				29	1.00		1.74	1.17	
Merluccius polli, juveniles		2	1				21	0.87	2.68	0.36		
Zenopsis conchifer	3	2	1				43	0.74	2.48		0.06	
Chlorophthalmus atlanticus	8		2				64	0.73	1.45	1.11		
Nematocarcinus africanus	1		1				14	0.65			1.51	
Dentex macrophthalmus	3	1	1				36	0.47	1.37	0.28		
Alopias superciliosus			1				7	0.44	1.55			
Laemonema laureysi	9	2					79	0.41	0.01	0.82	0.40	
Pterothrissus belloci	6	1					50	0.21	0.11	0.54	0.07	
Illex coindetii	8	1					57	0.18	0.52	0.02	0.05	
Hoplostethus cadenati	3	1					29	0.16			0.37	
Triplophus hemingi		1					7	0.14			0.32	
Trichiurus lepturus	10						71	0.11	0.13	0.22	0.02	
Parapenaeus longirostris, fem.	9						64	0.10	0.05	0.29	0.01	
Coelorinchus coelorhincus	7	1					57	0.09	0.03	0.29		
Aristeus varidens, female	7						50	0.08		0.05	0.14	
Dentex angolensis	1						7	0.07	0.25			
Torpedo nobiliana	1						7	0.07			0.16	
Zeus faber	4						29	0.05		0.10	0.04	
Todaropsis eblanae	5						36	0.05	0.10	0.06	0.01	
Parapenaeus longirostris, male	8						57	0.04	0.05	0.07		
PANDALIDAE	2						14	0.02			0.05	
Aristeus varidens, male	7						50	0.02		0.01	0.04	
Shrimps, small, non comm.	1						7	0.02			0.04	
Solenocera africana	8						57	0.01		0.02		
OPLOPHORIDAE	1							0.01			0.02	
PASIPHAEIDAE	1						7				0.01	
Parapenaeus longirostris	3						21				0.01	
Plesionika martia	1						7					
Parapandalus narval	1						7					
Plesiopenaeus edwardsianus	1											
Aristeus varidens	2						14				0.01	
Other fish								0.51	0.16	0.70	0.68	
Sum all species								13.27	14.89	20.84	7.19	
Sum Snappers												
Sum Groupers										0.01		
Sum Grunts												
Sum Croakers												
Sum Seabreams								0.54	1.62	0.29		
Sum Sharks								0.50	1.55	0.05	0.14	
Sum Rays								0.07		0.01	0.16	
Sum Squids								0.24	0.65	0.09	0.07	
Sum 2.18												
Number of stations included in analysis, total and by depth strata								14	4	4	6	

SWEPT AREA ANALYSIS FROM STATION 2497 TO STATION 2578

North shelf

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 20- 50m	50-100m	100-200m	200-200m
Trichiurus lepturus	23	2	3		2		70	3.20	0.10	4.75	3.88	
Brachydeuterus auritus	10	1	3	4			42	2.25	0.58	4.58	1.45	
Spicara alta	6		1	2			21	0.90			2.15	
Trachurus trecae, juvenile	13	7		1			49	0.77	0.01	0.56	1.39	
Dentex congoensis	8	4		1			30	0.56		0.22	1.17	
Chloroscombrus chrysurus	5			1			14	0.44	1.69	0.02		
Galeoides decadactylus	5	2	3				23	0.40	1.00	0.43		
Pagellus bellottii	24	4	1				67	0.38	0.33	0.68	0.19	
Trachurus trecae	5	2	1				19	0.34		0.28	0.58	
Pomadasys jubelini	1	3	1				12	0.26	0.80	0.18		
Synagrops microlepis	2	1	1				9	0.25			0.59	
Stromateus fiatola	3	1	1				12	0.24	0.03	0.72		
Dentex angolensis	22	4					60	0.24		0.22	0.41	
Brachydeuterus auritus Juv.	1		2				7	0.22	0.87			
Spondyliosoma cantharus			2				5	0.17	0.32	0.28		
Selene dorsalis	5	2					16	0.14	0.08	0.36	0.01	
Lutjanus agennes			1				2	0.13	0.51			
Dentex barnardi	19						44	0.12	0.15	0.14	0.09	
Pseudotolithus typus	2	2					9	0.12	0.46			
Pomadasys incisus	1	1	1				7	0.12	0.48			
Epinephelus sp.	1		1				2	0.11	0.07		0.23	
Sepia orbignyana	2		1				7	0.08		0.24	0.01	
Sphyraena guachancho	5	2					16	0.08	0.28	0.03		
Dentex macrophthalmus	5	2					16	0.08		0.09	0.12	
Sphyraena sphyraena	2	1					7	0.07	0.26	0.03		
Pagrus caeruleostictus	8						19	0.06	0.15	0.07	0.01	
Ilisha africana	4	1					12	0.06	0.23			
Selene dorsalis, juveniles	2	2					9	0.06	0.23			
Arius parkii	2	1					7	0.06	0.24			
Zenopsis conchifer	7	1					19	0.05			0.12	
Raja miraletus	5	1					14	0.05		0.05	0.09	
Fistularia petimba	21						49	0.05	0.01	0.10	0.03	
Decapterus rhonchus	4	1					12	0.05	0.12	0.04		
Penaeus notialis	5						12	0.02	0.08			
Parapenaeus longirostris, fem.	3						7	0.01			0.03	
Parapenaeus longirostris, male	3						7	0.01			0.02	
Solenocera africana	2						5					
Parapenaeus longirostris	1						2					
Parapenaeopsis atlantica	1						2					
Other fish								0.81	1.64	0.67	0.57	
Sum all species								12.96	10.72	14.74	13.14	
Sum Snappers								0.13	0.52			
Sum Groupers								0.15	0.18	0.05	0.23	
Sum Grunts								2.87	2.80	4.79	1.45	
Sum Croakers								0.26	0.76	0.20	0.03	
Sum Seabreams								1.71	1.20	1.72	2.07	
Sum Sharks								0.07	0.18	0.05	0.02	
Sum Rays								0.09	0.11	0.06	0.10	
Sum Squids								0.16	0.01	0.33	0.12	
Sum												
Number of stations included in analysis, total and by depth strata								43	11	14	18	

SWEPT AREA ANALYSIS FROM STATION 2497 TO STATION 2578

North slope

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 200-300m	300-400m	400-500m	500-500m
Synagrops microlepis	4	8	2	3			77	3.47	7.40	2.45		
Merluccius polli	5	5	4	1			68	2.31		3.27	3.64	
Nematocarcinus africanus	1	1		2			18	1.75			7.72	
Chlorophthalmus atlanticus	8	4	2	1			68	1.43	0.55	2.76		
Laemonema laureysi	6	6	2				64	0.94		1.18	1.77	
Squatina oculata				1			5	0.88		1.93		
Merluccius polli, juveniles	7	1	2				45	0.73	2.08	0.14		
Aequorea aequorea			1	1			9	0.68		1.50		
Trichiurus lepturus	12	5					77	0.53	0.59	0.75	0.01	
Hymenocephalus italicus	12	1	1				64	0.36		0.23	1.15	
Zenopsis conchifer	9	1	1				50	0.32	0.95	0.04	0.01	
Pterothrissus belloci	7	3					45	0.32	0.10	0.64		
Parapenaeus longirostris, fem.	18	1					86	0.29	0.23	0.45	0.04	
NEMATOCARCINIDAE		1	1				9	0.29		0.51	0.27	
Benthodesmus tenuis	2	1	1				18	0.27			1.17	
Dentex angolensis			1					0.26	0.80			
MYCTOPHIDAE	8		1				41	0.25	0.11	0.47	0.02	
Chaunax pictus	11	1					55	0.24		0.38	0.30	
Dibranchus atlanticus	14						64	0.22	0.03	0.18	0.58	
Parasudis sp.	8	1					41	0.16	0.30	0.14		
Munida sp. *	7	1					36	0.14	0.01	0.30		
Gadella imberbis	13						59	0.13	0.01	0.27	0.04	
Parapenaeus longirostris, male	16						73	0.11	0.12	0.15		
TRICHIURIDAE	5						23	0.09		0.18	0.02	
S H R I M P S	3	1					18	0.09		0.19		
POLYCHAELIDAE	5	1					27	0.09		0.01	0.40	
Illex coindetii	15						68	0.08	0.09	0.12		
Coelorinchus coelorhincus	17						77	0.08	0.01	0.15	0.03	
Triplophus hemingi	1	1					9	0.08			0.36	
Lagocephalus laevigatus		1					5	0.07		0.15		
Setarches guentheri	5						23	0.07		0.16		
Yarrella blackfordi	3						14	0.07			0.30	
Ommastrephes pteropus	7						32	0.06	0.04	0.11		
Centrophorus granulosus	3						14	0.06			0.24	
Ariomma bondi	4						18	0.05	0.14			
Solenocera africana	12						55	0.04		0.09	0.02	
Aristeus varidens	4						18	0.02			0.07	
Aristeus varidens, female	3						14	0.01			0.05	
Aristeus varidens, male	3						14	0.01			0.03	
SERGESTIDAE	1						5				0.01	
Parapenaeus longirostris	1						5					
Plesiopenaeus edwardsianus	1						5				0.01	
Other fish								0.83	0.30	1.01	0.98	
Sum all species								17.88	13.86	19.91	19.24	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams								0.27	0.82			
Sum Sharks								1.07	0.01	2.05	0.59	
Sum Rays								0.02	0.02		0.02	
Sum Squids								0.20	0.21	0.25	0.07	
Sum 1.39												
Number of stations included in analysis, total and by depth strata								22	7	10	5	

Annex IV Calculations

Stratified mean density and confidence intervals

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

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

where

L is the number of strata,

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

$\bar{y}_i = \dfrac{\sum_{k=1}^{n_i} y_{i,k}}{n_i}$ 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 t/NMi^2 $= \dfrac{y_{ik}}{area\ swept_{ik}}$ for biomass estimates).

The estimated variance of the stratified mean, $\bar{y}_{st}$, is

$$\mathrm{var}(\bar{y}_{st}) = \sum_{i=1}^{L} W_i^2 \frac{s_i^2}{n_i} , \qquad (2)$$

where

$$s_i^2 = \frac{\sum_{k=1}^{n_i} (y_{i,k} - \bar{y}_i)^2}{n_i - 1} . \qquad (3)$$

When $\bar{y}_{st}$ is estimated in t/NMi^2 then an estimate of the total biomass in the area is calculated by

$$B = \bar{y}_{st} \cdot total\ area \qquad (4)$$

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 Annex 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

		95% Confidence limits:	
Total biomass=	19427	12946	25908

Annex VI

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

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.longirostris*	*A.varidens*	*N.africanus*
	SPADE00	MERME03	SHRPE31	SHRAR22	SHRNE21
	SPADI00	MERME12	SHRPEP1	SHRARA1	
	SPALI00	MERME13	SHRPEP2	SHRARA2	
	SPAPA00	MERME92			
	SPAPR00				
	SPASP00				

DEEP 2	Hake	Ommastrephidae	Sepiidae	*A.varidens*	*P.longirostris*
	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 where 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	27.39 dB
TS transducer gain	27.52 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, 750 and 1000 m
Range start	0
Bottom range	15 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 meshsize in the codend with an inner net of 10 mm meshsize. The estimated opening is 6 m (observed 5.7) and the 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' kombi type, 7.81 m^2, 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.