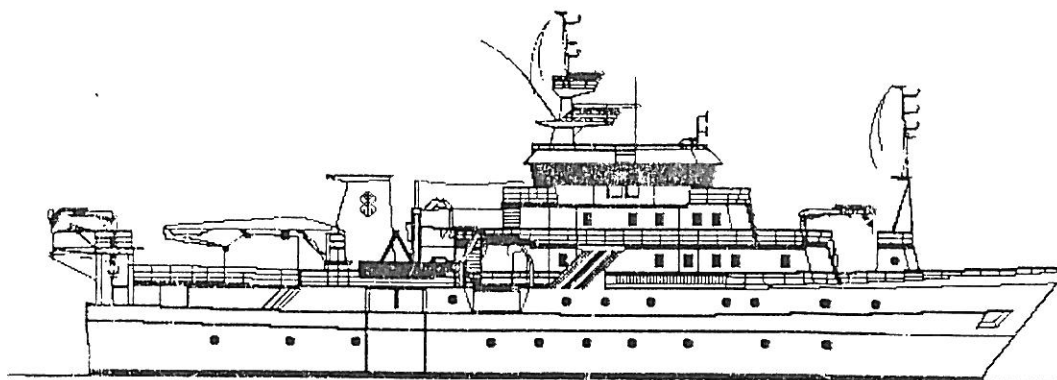


NORAD - FAO/UNDP GLO 92/013

CRUISE REPORTS "DR. FRIDTJOF NANSEN"



SURVEY OF THE FISH RESOURCES OF ANGOLA

Preliminary Cruise Report No. 2/97

Survey of the demersal resources
15 May - 3 June 1997

Institute of Marine Research
IMR, Bergen

Institute of Fisheries Research
IIP, Luanda

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF ANGOLA

Preliminary Cruise Report No. 2/97

**Survey of the demersal resources
15 May - 3 June 1997**

by

Sigbjørn Mehl

Institute of Marine Research
P.O. Box 1870 Nordnes
N-5025 Bergen, Norway

Maria de Lourdes Sardinha

Instituto de Investigação Pesqueira
Luanda, Angola

**Institute of Marine Research
Bergen, 1997**

TABLE OF CONTENTS

CHAPTER 1	INTRODUCTION	1
1.1	Objectives	1
1.2	Participation	1
1.3	Narrative	2
1.4	Survey effort	2
CHAPTER 2	METHODS	5
2.1	Hydrographic sampling	5
2.2	Fish sampling	6
CHAPTER 3	OCEANOGRAPHIC CONDITIONS	7
CHAPTER 4	CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEMERSAL FISH (SHELF)	13
4.1	Luanda - Benguela	13
4.2	Cabinda-Luanda	19
4.3	Review of results	24
CHAPTER 5	CATCH RATES, DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF DEEP-WATER SHRIMP AND HAKE (SLOPE)	25
5.1	Deep water shrimp	27
5.2	Benguela hake	32
Annex I	Records of fishing stations	
Annex II	Size compositions of main species	
Annex III	Swept-area estimates	
Annex IV	Instruments and fishing gear used	

CHAPTER 1 INTRODUCTION

1.1 Objectives

The objectives of the survey had been previously agreed upon with the Director of Instituto de Investigação Pesqueira (IIP) and were also briefly discussed with the Angolan participants prior to the survey.

The objectives of the survey were to:

- Describe the distribution, composition and abundance of the major demersal species, with special emphasis on deep-water shrimps (*Parapenaeus longirostris* and *Aristeus varidens*), seabreams (Sparidae), Benguela hake (*Merluccius polli*) and other shrimp by-catch species, from Cabinda to Benguela by a swept-area trawl programme.
- Map the general hydrographic regime by using a CTD-sonde at trawl stations all over the survey area and monitor the temperature, salt and oxygen along IIP standard profiles, for hydrographical studies.
- Collection of bottom sediment samples to study the benthos community

1.2 Participation

The scientific staff consisted of:

From IIP, Angola:

Francisco de Almeida, Domingos Azevedo, Kiluange Coelho, Kumbi Kilongo, Pedro Panzo, Esperança Santos and Maria de Lourdes Sardinha.

From IMR, Norway:

Ole Gullaksen, Sigbjørn Mehl, Tore Mørk, Ronald Pedersen and Cathrine Strømø (University of Bergen).

1.3 Narrative

The vessel left Luanda in the morning of 15 May and steamed southwards to Pta. das Palmeirinhas where the sampling programme commenced with course tracks approximately 20-25 nm apart, covering the inner, middle and outer shelf and the slope to 600-800 m depth. Semi-random swept-area hauls were carried out on the shelf during daytime and on the slope deeper than 400 m also during dark hours. CTD-stations were taken at most of the trawl stations and a few additional were taken for the standard hydrographic transects. Acoustic registration and integration of main groups were done throughout the survey. Bottom sediment samples were collected with a grab at selected trawl stations to 400 m depth to study the benthos community.

The southern part of the survey area, Luanda to Benguela, was covered from 15 to 23 May. Three hydrographic transects were sampled in the region; Pta. das Palmeirinhas, Pta. do Morro and Lobito. The northern part of the survey area, Luanda to Cabinda, was covered from 24 May to 2 June, including the hydrographic transects Ambriz and Pta. Da Moita Seca. The Cabinda region was not covered due to oil-drilling activities. The survey was completed south of the Congo River in the evening of 2 June and the vessel steamed southwards to Luanda.

1.4 Survey effort

Table 1 presents the number of CTD, fishing and grab stations and the distance surveyed. Figure 1 (a, b) shows the cruise track with fishing, CTD and grab stations.

Area	CTD	BT	G	Swept-area hauls			Distance surveyed
				0-200m	200-400m	400-800m	
Luanda-Benguela	56	53	16	24	14	14	1805
Cabinda-Luanda	66	68	16	29	18	19	1870
Total	122	121	32	53	32	33	3675

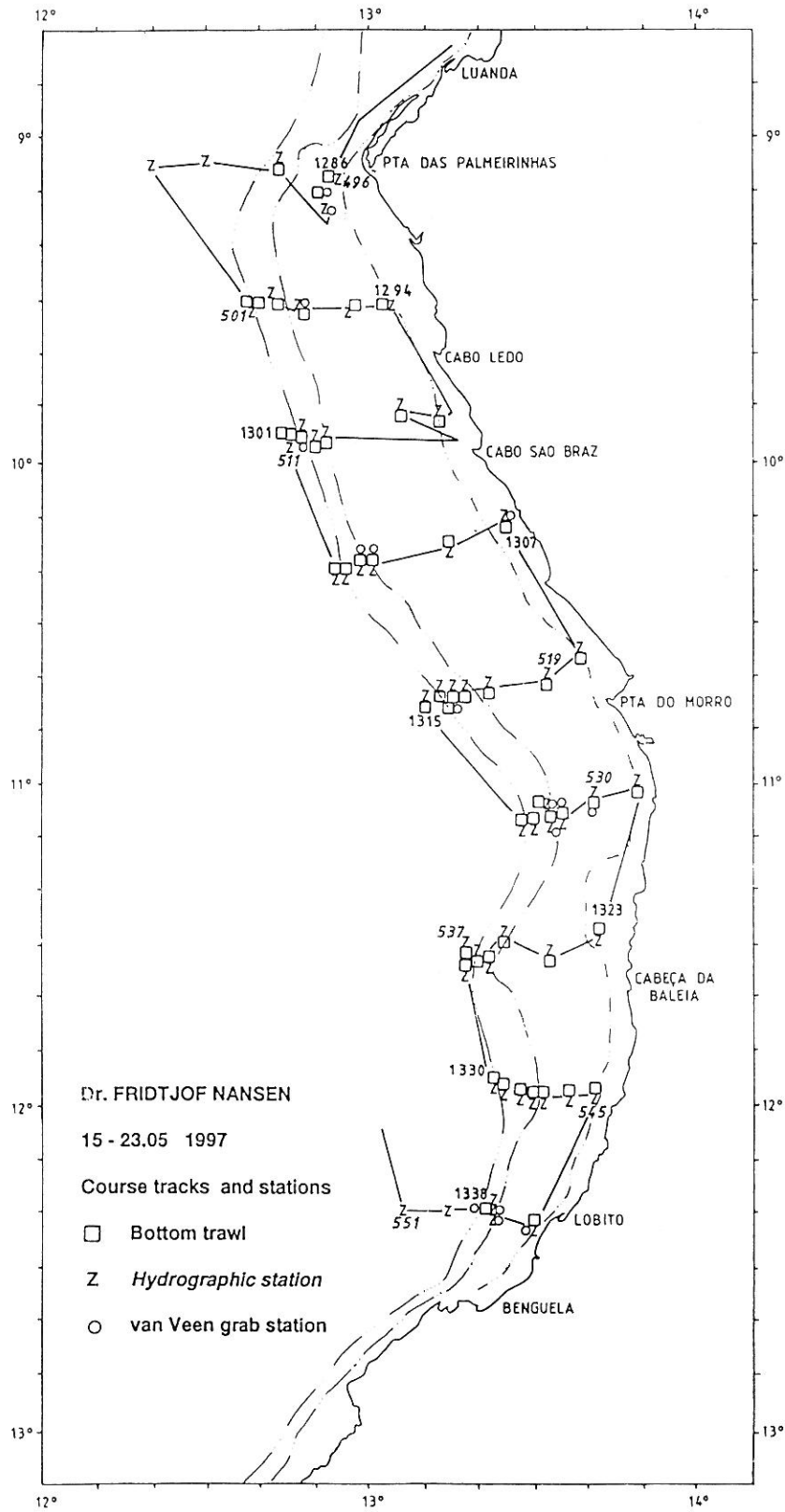


Figure 1a. Course track with fishing, CTD and grab stations. Luanda-Benguela

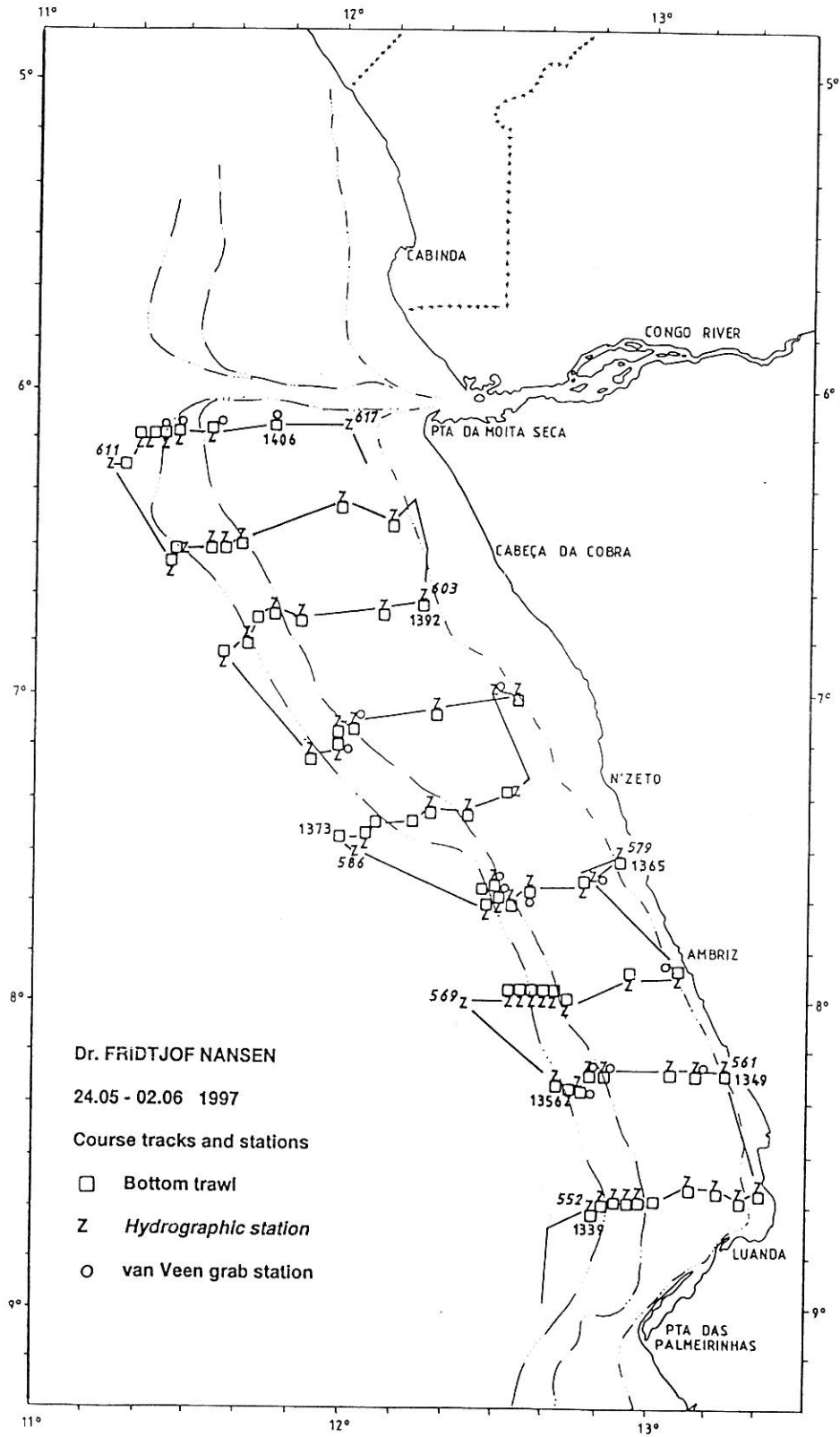


Figure 1b. Course track with fishing, CTD and grab stations. Luanda-Cabinda.

CHAPTER 2 METHODS

2.1 Hydrographic sampling

A Seabird 911 CTD plus was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the Seabird Seasave software installed on a PC. The profiles were taken down to a few metres above the bottom or to 700 m depth. Two Niskin bottles were triggered for water samples on each station, one near the bottom and one near the surface (5 m depth). The samples were analysed for salinity using a Guildline Portasal salinometer, and the oxygen content was determined using the Winkler method. These laboratory values were used for calibration of the CTD after removing obvious outliers.

Using 161 points for the salinity calibration the average difference between the Seabird values and the laboratory analysis was $-0.144 (\pm 0.0078)$. Thus the CTD values were somewhat low compared to the Portasal, and could be corrected according to the formula:

$$S = S_{\text{CTD}} + 0.144$$

For oxygen 142 samples were accepted for the calibration. A linear regression gave the following formula for correcting the oxygen values:

$$O_2 = O_{2\text{ctd}} \cdot 0.988 + 0.732$$

Applying this formula a standard deviation of 0.102 was obtained.

ADCP current measurements

A ship born Acoustic Doppler Current Profiler (ADCP) from RD Instruments was activated on every CTD station with bottom depths greater than about 25 m. The ADCP was set to ping every 8 seconds, the depth cell was chosen to 8 m and the number of cells to 50. As a routine the data were averaged over 300 seconds for analyses onboard. Both the raw and averaged data were stored on files. The data were analysed by the PC software UMS (Underway Mapping System).

Meteorological observations

Wind (direction and speed), air temperature, global radiation and sea surface temperature (5 m depth) were logged automatically every nautical mile using an Anderaa meteorological station.

2.2 Fish sampling

The catches were sampled for species composition by weight and numbers (and by sex for *P. longirostris* and *A. varidens*). Length measurements were taken as follows: total length (cm) for fish and carapace length (mm) for shrimp (punched in mm). Biological samples, i.e. length, weight, sex and maturity stages, were taken for *P. longirostris* and *A. varidens*. The records of fishing stations are presented in Annex I. Pooled length frequency distributions (weighted by the catch) of selected species by area are shown in Annex II.

Table 2 shows the areas used in the swept-area biomass estimates. A stratified semi-random design was used, with depth and main geographic regions (northern and southern areas) as stratifying variables. The allocation of trawl stations has previously been proportional to the stratum size, but due to a tighter schedule only one station was taken per depth stratum on each transect down to 600 m in the southern region. In the northern region a few additional stations were taken in the largest strata and the slope was covered to 800 m. Biomass estimates by species were obtained by summing the estimates calculated for each depth stratum.

Depth stratum (m)	Cabinda-Luanda	Luanda-Benguela
0-50	3 023	1 850
50-100	2 693	1 730
100-200	2 085	1 252
200-300	755	500
300-400	660	350
400-500	540	445
500-600	880	450
600-800	1500	(900)

The bottom trawl has a estimated headline height 5 m and distance between wings during towing about 18 m. The footrope was equipped with a tickler chain to improve the catchability of deep-water shrimp. During trawling a 9.5 m long rope was fastened between the wires 130 m in front of the doors giving a constant distance between the doors of 49-50 m. All trawl hauls were monitored by SCANMAR trawl sensors and the actual time the trawl was fishing on the bottom was determined with improved accuracy. A more detailed description of the fishing gear is given in Annex IV. For conversion of catch rates to fish densities the area between the wings is assumed to be the effective fishing area. The catchability coefficient q was assumed equal to 1. The length of a haul, recorded as distance over the bottom, was measured by the GPS.

CHAPTER 3 OCEANOGRAPHIC CONDITIONS

Surface distribution

The horizontal distributions of temperature and salinity are shown in Figs. 2 and 3, respectively. The minimum temperatures at about 21 °C were found near the coast, the temperature increased monotonically with distance from the coast along the whole coast, with maximum temperatures up to 25 °C, which is about 2 °C warmer than observed during the surveys in July-August. In the Cabinda-Luanda region the temperatures were on average 1-2 °C lower than in the southern region. Also the salinity distribution was typical for the time of the year, ranging from 35.5 ‰ near the coast (lower values at Pta das Palmeirinhas) to 35.7 ‰ and 35.8 ‰ further out in the ocean in the northern and southern region respectively.

Vertical sections

In Figs. 4 and 5 the vertical distribution of temperature, salinity and oxygen are shown for the 5 sections worked during the survey. A thermocline was found between 10 and 30 m depth. A relative flat structure was observed in most sections, but there were also some signs of vertical water displacement and upwelling. There were no signs of low bottom oxygen content at the shelf.

ADCP current measurements

A subset of current vectors obtained at 34 m depth is shown in Fig. 6. No averaging has been done except the 5 minutes averaging done in real time. Therefore at deep stations lasting more than 10 minutes, several vectors are plotted at the same position, and there is some variability both within stations as well as between stations due to variability in time and space. Although interpretations should be handled with care, we get an impression of a prevailing current direction parallel to the coastline, with opposite directions in the two regions.

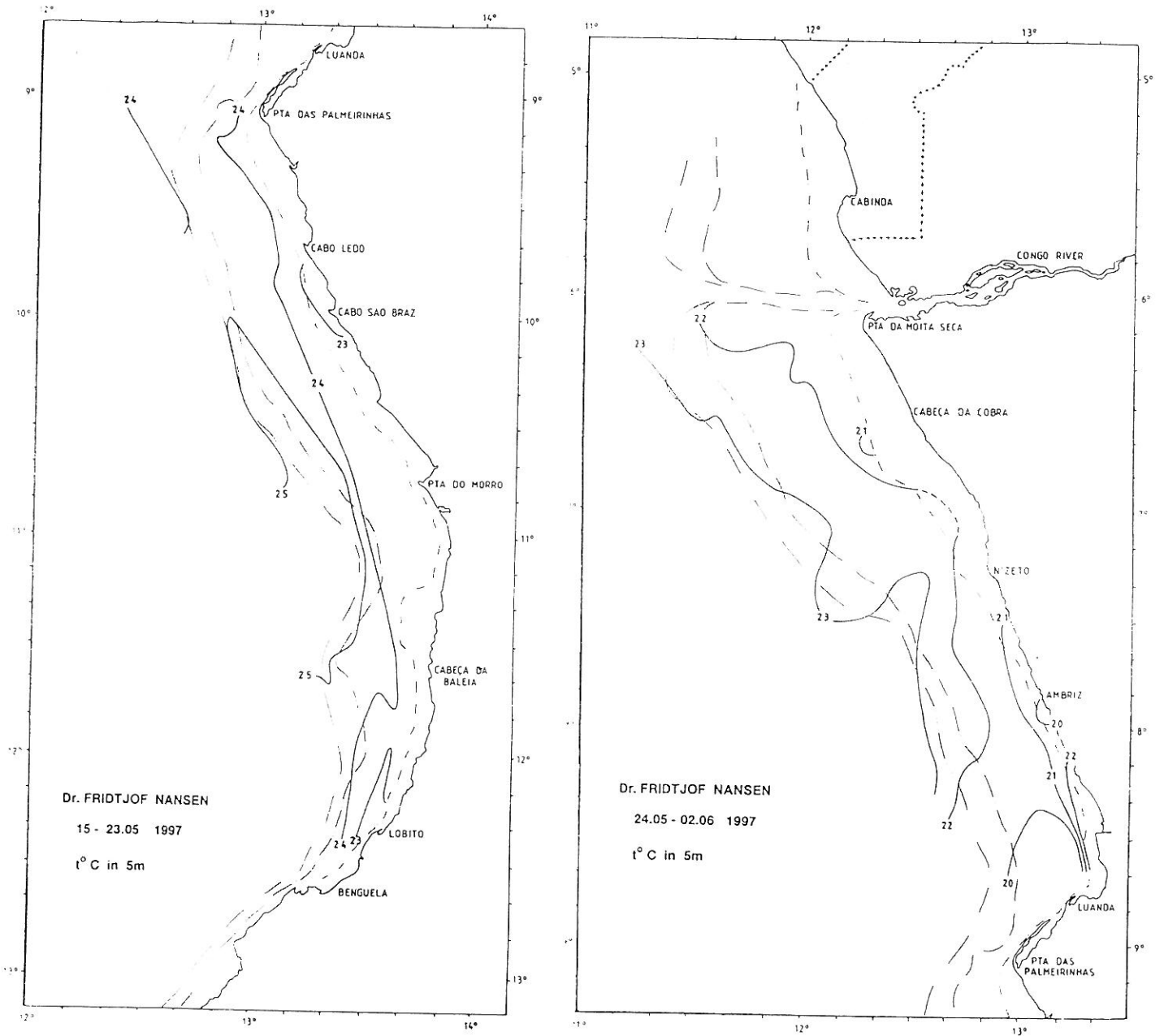


Figure 2. Horizontal distribution of surface temperature (5m depth). Luanda-Benguela and Cabinda-Luanda.

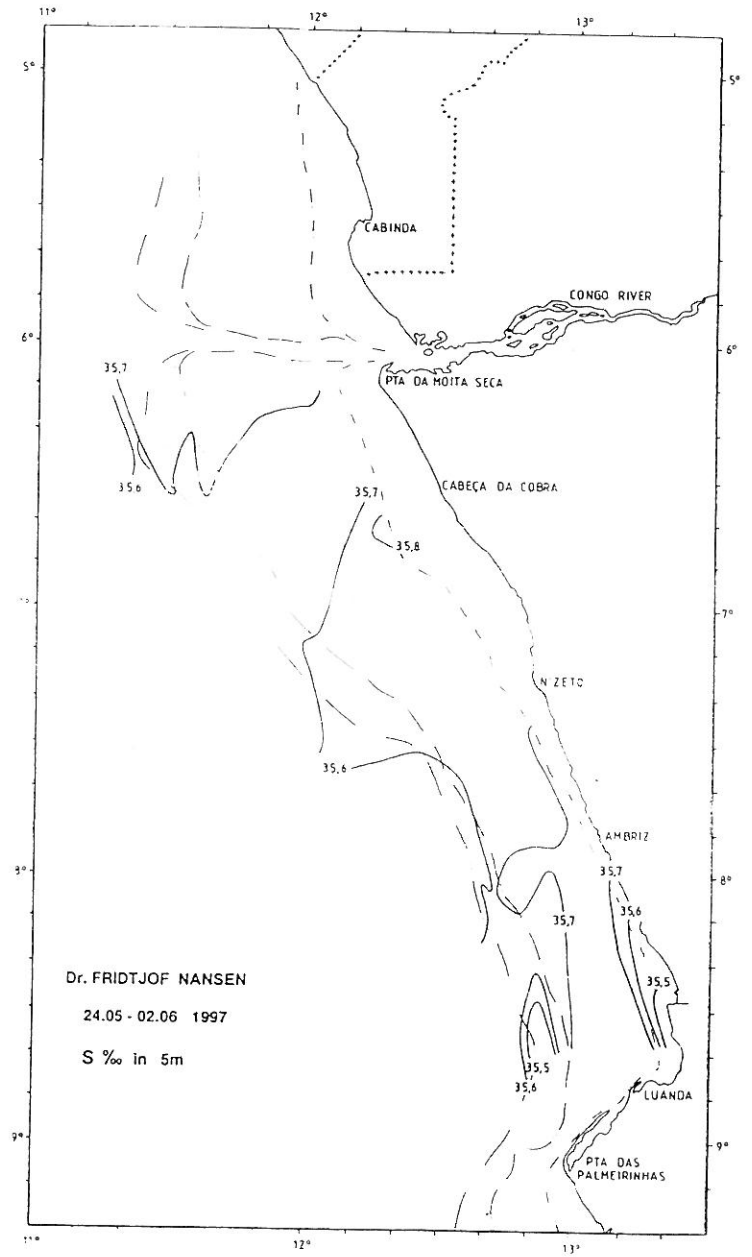
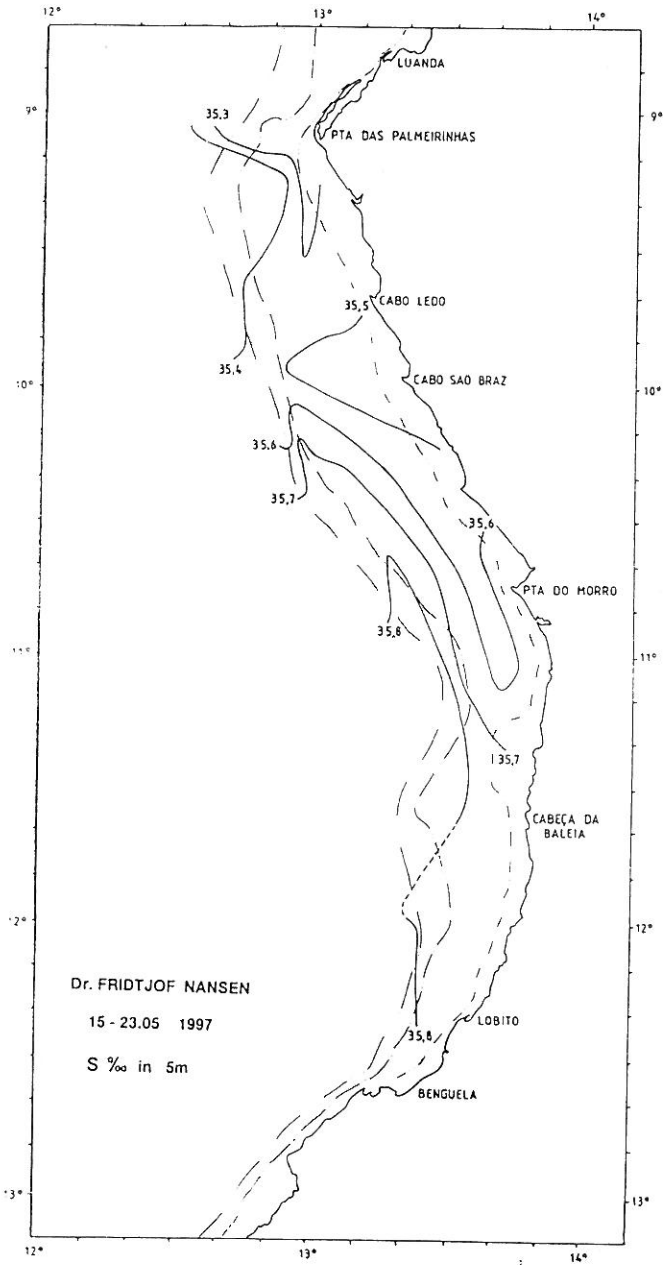


Figure 3. Horizontal distribution of surface salinity (5 m depth). Luanda-Benguela and Cabinda-Luanda.

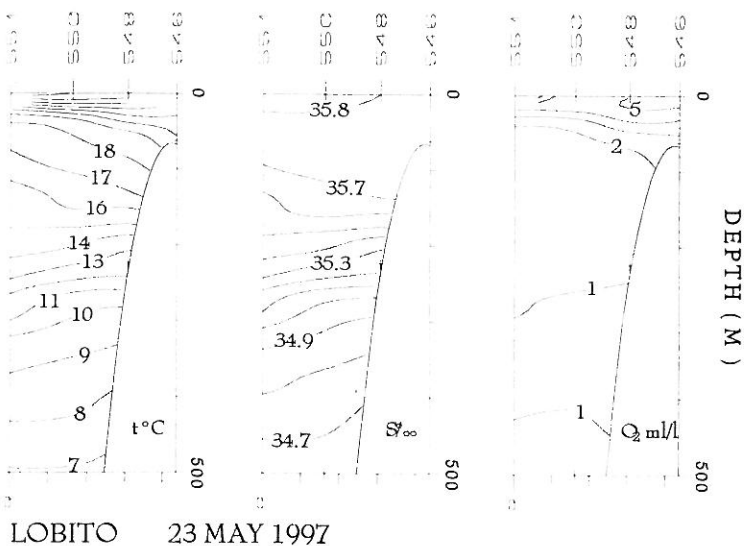
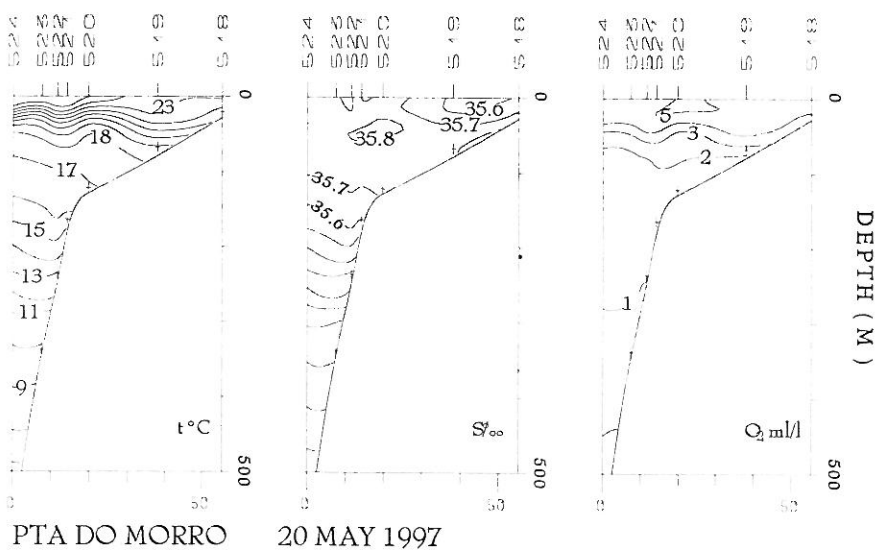
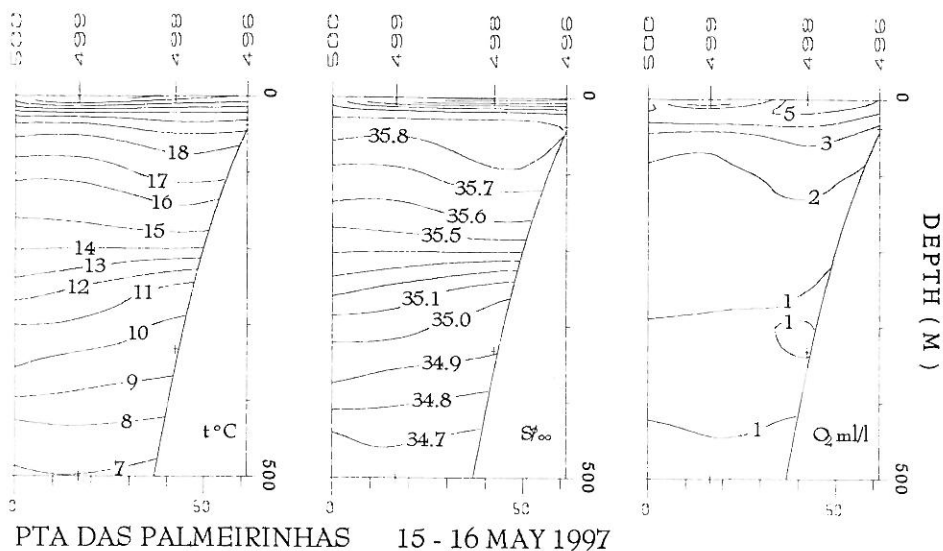
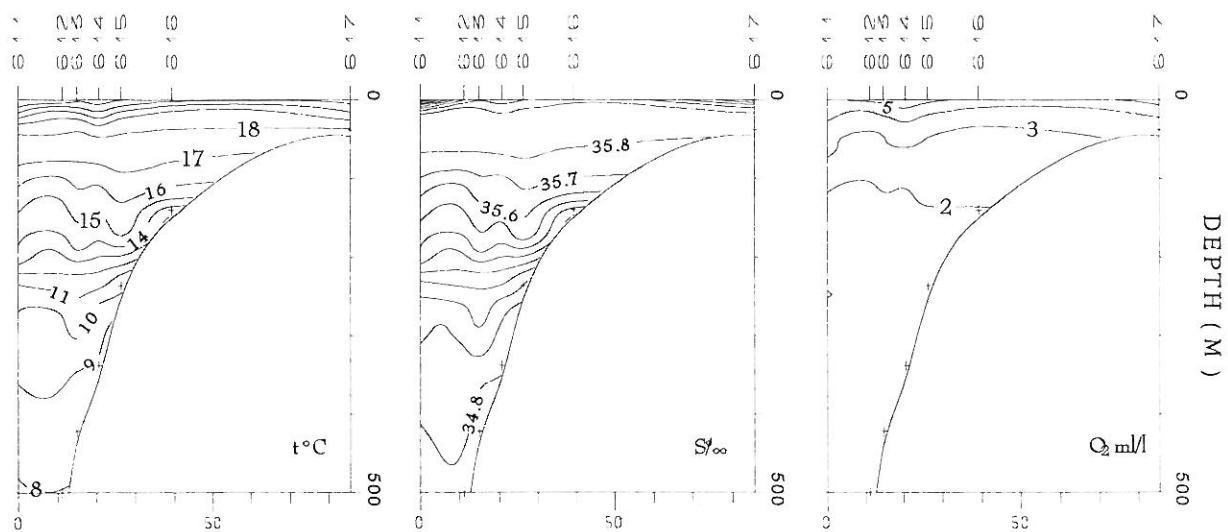
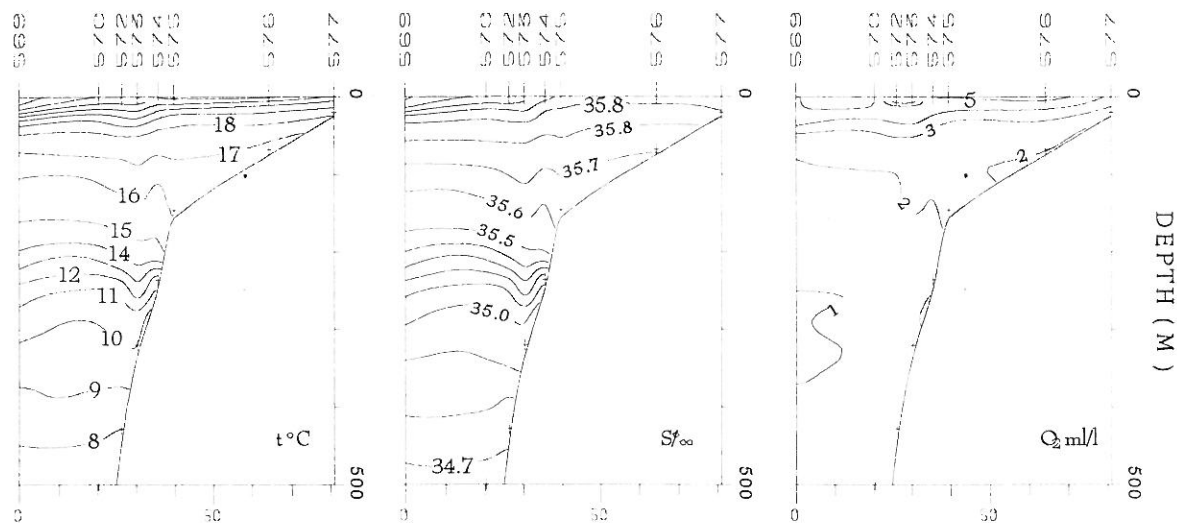


Figure 4. Vertical sections of a) temperature, b) salinity and c) oxygen. Pta. das Palmeirinhas, Pta. do Morro and Lobito



PTA DA MOITA SECA 1 - 2 JUNE 1997



AMBRIZ 26 - 27 MAY 1997

Figure 5. Vertical sections of a) temperature, b) salinity and c) oxygen. Ambriz and Pta. da Moita Seca.

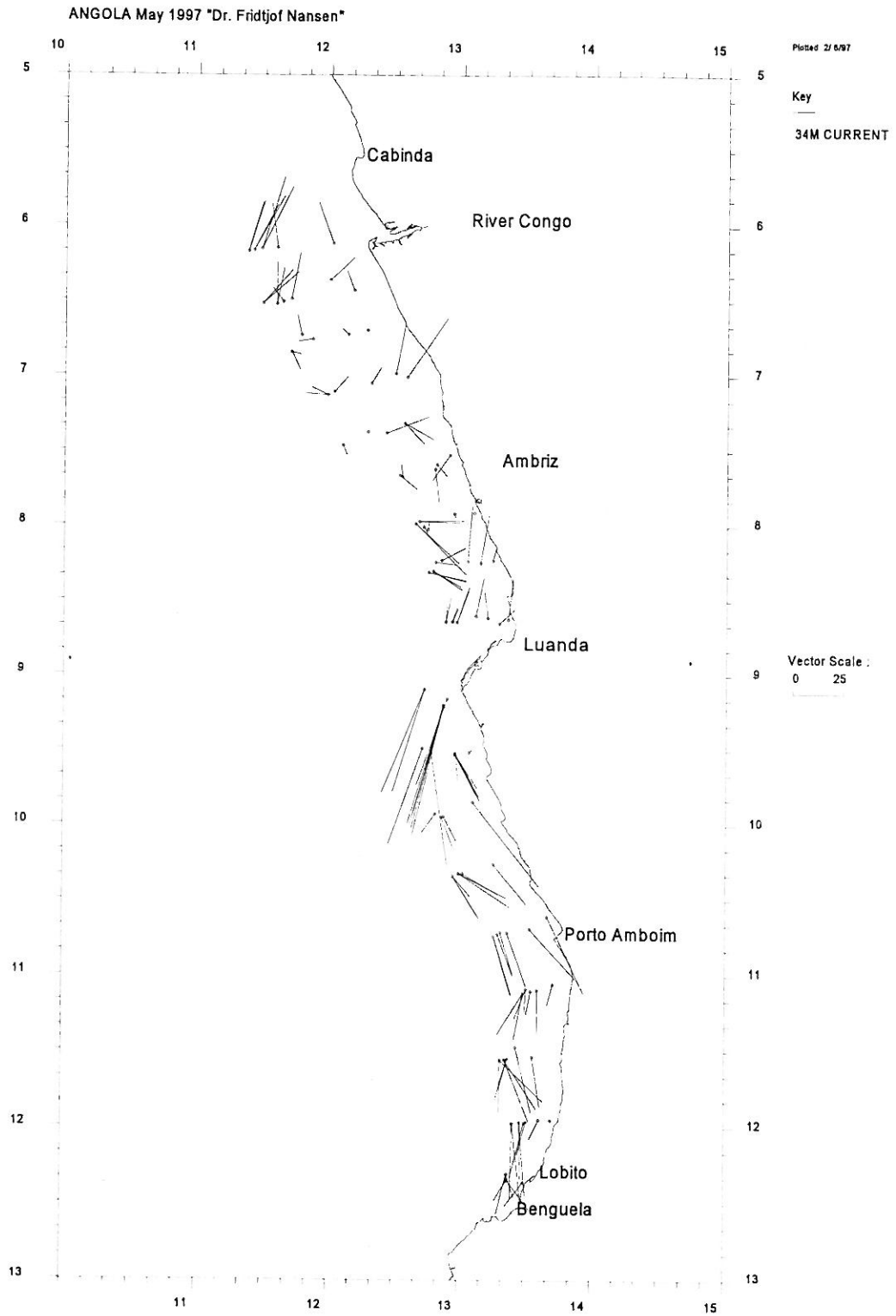


Figure 6. ADCP current vectors at 34 m depth. Cabinda-Benguela.

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

The composition of the fish fauna in the catches on the shelf was carried out using two depth strata: 20-70 m depth (inner shelf) and 71-200 m depth (outer shelf). The results for the slope area are presented in Chapter 5. The locations of the trawl stations are shown in Fig. 1. Records of fishing stations and catches are presented in Annex I, and pooled length distributions (weighted by the catch) of main species are shown in Annex II.

In the swept-area biomass estimates for the shelf down to 200 m, the depth strata 0-50m, 50-100m and 100-200 m were used. Mean densities by depth strata of the main species, the incidence and the catch distributions are shown in Annex III.

4.1 Luanda-Benguela

In this region, 24 swept-area trawl stations were successfully performed on the shelf. Table 3 shows the catch rates by main species groups for the inner shelf (20-70 m) and the outer shelf (71-200 m). "Demersal" comprises the commercially important families Sciaenidae, Haemulidae (=Pomadasyidae), Serranidae, Sparidae and Lutjanidae, while "Pelagic" includes Engraulidae, Clupeidae, Carangidae, Scombridae, Sphyraenidae and Trichiuridae (the latter family is actually mainly benthopelagic). Like in the previous surveys the demersal group dominated on the inner shelf contributing with about 44 % of the catches. However this value is only 3% higher than those of the pelagic group which made up 41 % of the catches. Compared with the results from July-August 1996 the catch rates of both demersal and pelagic species were much higher in 1997. Sharks and shrimps represented only minor components of the catches on the inner shelf, as well as on the outer shelf. In this survey, the mean catch rate of shrimps was increased on the outer shelf whereas on the inner shelf it was more than 100% lower compared with the results from July- August 1996. The group comprising the non commercial species was the most important on the outer shelf with almost 58 % of the catches. This is different of what has been found in previous years where either the pelagic or the demersal group dominated the catches on the outer shelf. In the present survey, the pelagic group made up 20 % of the catches and the demersal species 19 %. In the latter group, the mean catch rates were rather higher than those obtained in 1996, while the catch rate of the pelagic group was slightly lower than in 1996 and nearly two times lower than in 1994. The mean catch rate of the shrimp group was about eighth times higher than the one obtained last year.

Table 3. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the shelf.
LUANDA-BENGUELA.

INNER SHELF 0-70 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
1287	65	59.04	1296.20			2.60	16.06
1294	43	62.04	19.68			32.00	131.48
1295	22	7.04	13.12			22.28	14.86
1296	68	356.52	316.36	21.75		25.36	198.17
1307	19	4332.00	2612.87				1063.32
1308	30	539.43	295.13			7.84	22.52
1322	25	526.62	479.30			2.50	355.29
1323	30	457.62	1116.09				127.71
1336	42	324.20	147.82		0.14	113.81	48.77
1337	70	344.59	161.15			25.71	102.85
MEAN		700.91	645.77	2.18	0.01	23.21	208.10

OUTER SHELF, 71-200 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Lobster	Other
1292	162	30.38	15.29	5.42	7.17		473.40
1293	73	357.40	733.91				381.58
1297	165	55.69	12.19	9.56	1.31		2175.58
1305	157	49.20	4.40				6839.80
1306	76	265.50	1829.63				41.44
1309	79	358.38	1152.88		0.22		82.78
1310	130	27.68	960.77				227.88
1311	182	30.38			81.38		2737.91
1320	155	94.87	57.00		10.50		344.55
1321	75	361.60	123.60				79.40
1324	79	860.52	708.78				2160.84
1325	141	35.20	0.40				518.40
1334	174	1201.99	10.47		84.46		1055.24
1335	80	750.62	76.86				90.57
MEAN		319.96	406.16	1.07	13.22		1229.24

Catch rates of the most important pelagic families are presented in Table 4. Like in the previous surveys carangids dominated both on the inner and outer shelf and *Trachurus trecae* was the most important species, followed by *Selene dorsalis* and *Decapterus rhonchus*. Hairtails were the second most important pelagic family followed by clupeids. The catch rates of *Trichiurus lepturus* on the inner and on the outer shelf was higher than in July-August 1996. *Ilisha africana* and *Sardinella maderensis* were the most abundant species of the clupeids found in the shallow coastal waters. Barracudas, mainly *Sphyrna guachancho*, were caught only on the inner shelf with a mean catch rate about three times higher than the one obtained last year. This increase was mainly due to one large catch. Scombrids were only found in one station, also on the inner shelf.

Table 4. Catch rates (kg/hour) of main pelagic families in swept area bottom trawl hauls on the shelf.
LUANDA-BENGUELA

INNER SHELF, 0-70 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
1287	65	0.20	761.60			534.40	77.70
1294	43	0.56	13.08			6.04	225.52
1295	22		11.84	1.28			44.18
1296	68	1.05	186.19	6.56	9.68	112.88	601.80
1307	19	189.90	1905.19	475.39		42.39	5395.32
1308	30	2.32	267.84			24.97	569.79
1322	25	7.51	37.10			434.69	884.41
1323	30	608.61	165.90	82.95		258.63	585.33
1336	42	5.56	131.42			10.84	486.92
1337	70		30.86			130.29	473.15
MEAN		81.57	351.10	56.62	0.97	155.51	934.41

OUTER SHELF, 71-200m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
1292	162					15.29	516.37
1293	73		356.32			377.59	738.98
1297	165		12.19				2242.14
1305	157		4.40				6889.00
1306	76		1759.50			70.13	306.94
1309	79		851.88			301.00	441.38
1310	130		960.00			0.77	255.56
1311	182						2849.67
1320	155					57.00	449.92
1321	75		57.60			66.00	441.00
1324	79		117.69			591.09	3021.36
1325	141		0.40				553.60
1334	174					10.47	2341.69
1335	80		59.09			17.77	841.19
MEAN			298.51			107.65	1563.49

Table 5 presents the catch rates of the most important demersal species grouped into families. Croakers of genus *Pomadasys* dominated on the inner shelf and the second most important group was seabreams followed by grunts. This is slightly different of what was found in July-August 1996, when croakers also dominated the inner shelf, but the second most important family was grunts. The mean catch rate of groupers on the inner shelf (*Epinephelus* spp.) was lower in this survey compared with last year.

Seabreams were the dominating family on the outer shelf. The most abundant species were *Dentex macrophthalmus* and *Pagellus bellottii*, followed by *D. angolensis* and *Sparus auriga*. Like on the inner shelf, the groupers were rare occurring only in one station. The snappers (*Lutjanus* spp.) were absent on the inner and on the outer shelves.

Table 5. Catch rates (kg/hour) of valuable species grouped by families in swept area bottom trawl hauls on the shelf. LUANDA-BENGUELA

INNER SHELF, 0-70 m

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Snappers	Other
1287	65	37.80		21.20			1314.90
1294	43	56.24			5.80		183.16
1295	22	6.72					50.58
1296	68	327.00	9.38	17.93	2.21		561.64
1307	19						8008.19
1308	30	29.47					835.45
1322	25		251.02	111.06			1001.63
1323	30	12.39	4.95	223.98			1460.10
1336	42	6.20	35.04	57.67	1.16		534.67
1337	70	73.72	4.29	220.29			336.00
MEAN		54.95	30.47	65.21	0.92		1428.63

OUTER SHELF, 71-200 m

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Snappers	Other
1292	162	17.42		0.77			513.47
1293	73	98.45		118.78	19.63		1236.03
1297	165	33.75					2220.58
1305	157	49.20					6844.20
1306	76	168.94					1967.63
1309	79	279.70		23.42			1291.14
1310	130	27.68					1188.65
1311	182	30.38					2819.29
1320	155	87.56		5.06			414.30
1321	75	15.40		0.80			548.40
1324	79	671.25		189.27			2869.62
1325	141	35.20					518.80
1334	174	1183.09					1169.07
1335	80	456.91		290.28			170.86
MEAN		225.35		44.88	1.40		1698.00

Figure 7 shows the distribution of the seabreams in the region between Luanda and Benguela. They were distributed from the inner shelf to about 300 m depth on the slope, with the highest abundance on the outer shelf and upper slope. Three main areas of concentration can be observed for this group. The best catches were taken between Cabeça da Baleia and Lobito and consisted mainly of *D. macrophthalmus*, followed by *P. bellottii* and *D. angolensis*.

In Annex IA, swept-area estimates of mean densities based on 24 random bottom trawl hauls are presented for demersal species on the shelf, to 200 m depth. Like in the last survey, *B. auritus* had the highest density in the 0-50 m zone, followed by *Galeoides decadactylus*. The mean density of *Stromateus fiatola* was much higher than in July-August 1996. *Synagrops microlepis* had the highest density between 50 and 100 m, followed by *P. bellottii* and *D. macrophthalmus*. Also in the deepest shelf zone *S. microlepis* had the highest density, followed by *D. macrophthalmus* and *Merluccius polli*.

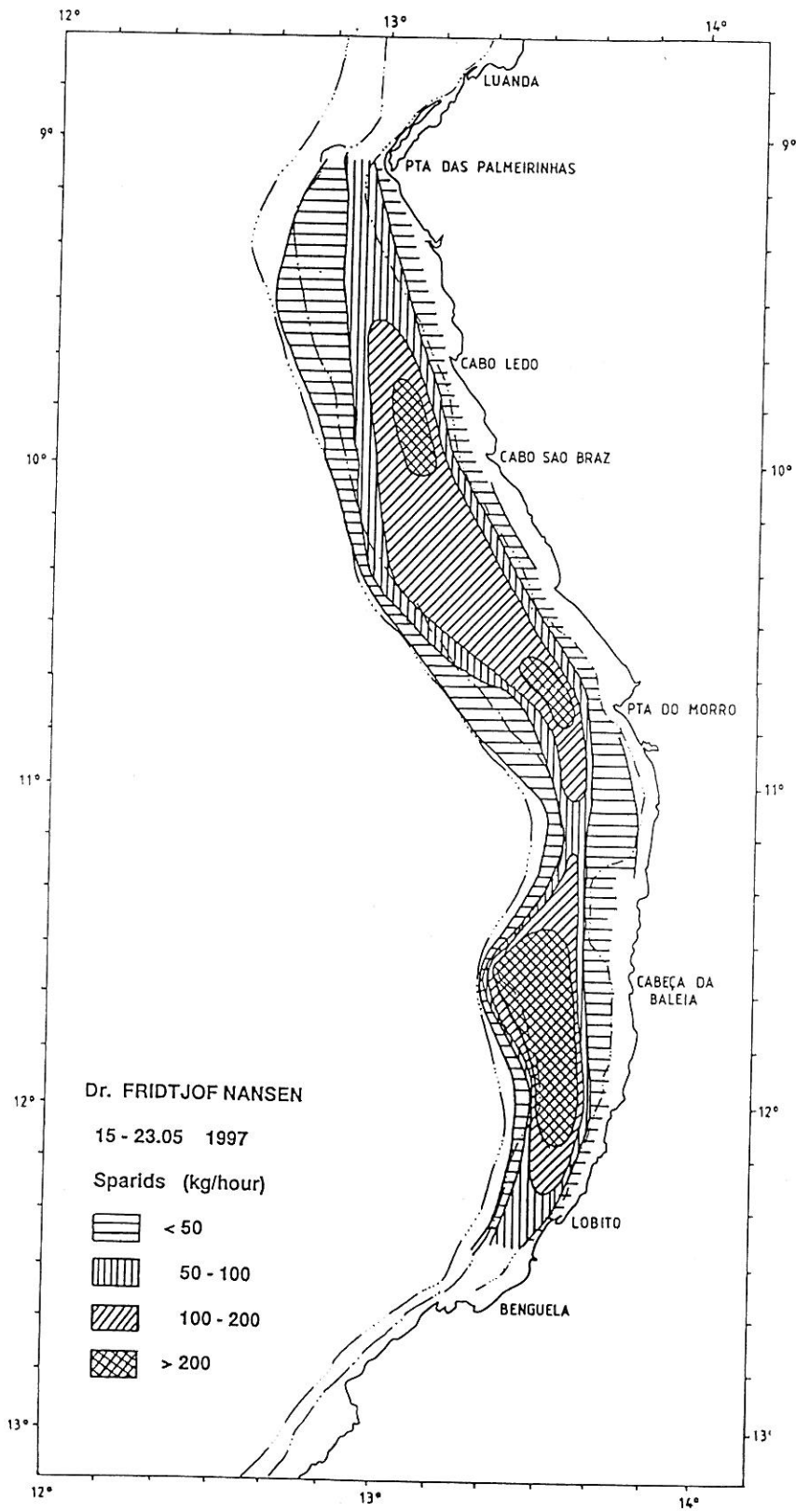


Figure 7. Distribution of seabreams (family Sparidae). Luanda-Benguela.

The total biomass of valuable demersal groups (Table 6) is slightly higher in 1997 compared to 1996 mainly due to an increase in the biomass of seabreams and croakers.

Group/ species	Biomass (tonnes)							
	1986/I*	1989/I*	1991/II*	1992*	1994*	1995*	1996*	1997*
Seabreams	9 300	11 100	24 580	28 000	29 200	21 800	19000	21650
Grunts	2 700	5 600	5 500	2 000	120	3 400	5230	2320
Croakers	5 500	1 450	19 000	2 000	4 010	13 290	6140	8490
Groupers	470	550	1 000	1 000	350	470	830	300
Sum dem. val.	17 970	18 700	50 080	33 000	33 680	38 960	31200	32760
Bigeye grunt	44 600	18 500	18 500	52 000	2 990	29 500	31120	44110
Horse mackerel	21 000	7 200	48 500	75 000	65 100	4 200	37090	42480
Other carangids	3 100	8 500	290	1 640	2 790	8 400	5360	16120
Barracudas	1 900	3 000			740	2 700	1540	4810
Hairtail	17 300	12 500	4100	1 300	26 200	5 300	5080	23120

* summer season (February-March)

* winter season (May-September)

Most pelagic and semi-pelagic species are not included in the swept-area estimates shown in Appendix III, but separate runs including important semi-pelagic groups were done in order to make comparisons with previous biomass estimates of these groups. The estimated biomass of *B. auritus* (big-eye grunt) was higher than in the two previous surveys and much higher than in 1994. The biomass of horse mackerel was also higher in 1997 than in the period 1995 - 1996, although the value is still lower than the maximum obtained in 1992. It should however be remembered that the summer survey of 1995 produced extremely low results as regards the pelagic species, both with the acoustic and the swept-area method, probably due to the anomalous climatic conditions. The biomass of hairtail had an increase of about four times from 1995, but this value is 12% lower than the one observed in 1994. Other carangids and barracudas came out with considerable higher biomass-estimates than last year.

4.2 Cabinda-Luanda

The shelf area, from 20 to 200 m depth, was covered with 29 bottom trawl stations. Catch rates by stations for the main groups are presented in Table 7. Tables 8 and 9 show the pelagic and valuable demersal groups respectively, further separated into the main taxa. The families and species included under each group are as specified under section 4.1. Like in the southern region, the demersal group dominated on the inner shelf in the north. The mean catch rate was higher than in the south but slightly lower than the one obtained in 1996. The pelagic group was the second most important, with catch rates 28% higher than those found in 1996.

Table 7. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the shelf.
CABINDA-LUANDA.

INNER SHELF 0-70 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
1347	43	877.00	3215.40		40.60	219.20	109.60
1348	21	1668.60	1480.50		5.40	105.00	316.20
1349	28	2012.80	263.68		4.66	16.34	175.00
1350	61	599.32	66.44		1.96	31.72	125.04
1364	24	615.96	69.24		9.72	0.52	79.20
1365	32	283.40	46.16		1.48	1.64	72.32
1380	33	2100.42	325.08		3.15		261.66
1392	44	150.00	75.60	16.00		6.00	6.40
1393	40	7.66	21.20				3.89
MEAN		923.91	618.14	1.78	7.44	42.27	127.70

OUTER SHELF 71-200 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
1344	155	14.96	733.26		17.68	27.32	382.40
1345	102	41.26	160.52			24.42	57.38
1346	71	600.43	10750.28			195.43	37.71
1351	93	45.90	61.99		0.04	42.27	140.06
1352	132	106.04	385.32			56.16	104.02
1362	147	81.20	45.60			40.00	102.00
1363	78	177.00	121.00			42.60	25.26
1366	75	424.44	266.40			7.08	44.64
1367	112	84.00	346.15			60.93	120.93
1368	178	38.85	21.14			84.57	3804.56
1378	122	23.40	12.60	39.00			46.02
1379	84	402.58	2223.06	15.60	0.60	12.66	78.74
1381	84	16.30	1520.24			0.82	42.26
1382	153	64.06	24.60	17.00		18.00	73.20
1390	143	63.76	1.94			7.16	37.04
1391	75	31.40	170.80	12.00		1.40	18.20
1394	82	588.57	897.47	19.55	0.12	35.22	88.26
1395	153	58.29	2.74			4.29	211.29
1405	151	28.60	189.20		0.08	4.60	43.20
1406	96	662.70	152.80	6.20	1.00	8.20	99.30
MEAN		177.69	904.36	5.47	0.98	33.66	277.82

The pelagic group had a rather higher mean catch rate compared to the demersal one on the outer shelf. In 1994 and 1995 the demersal families were the most important on the outer shelf, but in July-August 1996 the pelagic group had a slightly higher mean catch rate compared with the

demersal group. The value obtained in the present survey for the pelagic species is about four times higher than the one obtained in 1996. The abundance of shrimps and cephalopods was also higher this year both on the inner and on outer shelves. However, the increase observed in this survey in the occurrence of shrimps was lower in the northern region than in Luanda-Benguela.

Table 8. Catch rates (kg/hour) of main pelagic families in swept area bottom trawl hauls on the shelf. CABINDA -LUANDA.

INNER SHELF, 0-70 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
1347	43		3174.80			40.60	1246.40
1348	21	703.50	745.50		21.00	10.50	2095.20
1349	28	91.00	32.68			140.00	2208.80
1350	61		8.32			58.12	758.04
1364	24	11.64	39.60			18.00	705.40
1365	32	8.36	0.20			37.60	358.84
1380	33	248.01	68.67	8.40			2365.23
1392	44	28.80	32.00	1.20		13.60	178.40
1393	40	0.03	11.71			9.46	11.55
MEAN		121.26	457.05	1.07	2.33	36.43	1103.10

OUTER SHELF 71-200 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
1344	155		616.54			116.72	442.36
1345	102		125.86			34.66	123.06
1346	71	61.71	10601.14			87.43	833.57
1351	93		2.61			59.38	228.27
1352	132		375.72			9.60	266.22
1362	147		45.60				223.20
1363	78		96.40			24.60	244.86
1366	75	1.32	213.12		2.40	49.56	476.16
1367	112		346.15				265.86
1368	178					21.14	3927.98
1378	122		0.60			12.00	109.02
1379	84		2223.06				509.58
1381	84		1520.24				59.38
1382	153		20.40			4.20	172.26
1390	143		1.94				107.96
1391	75	0.40	164.40			6.00	63.00
1394	82		865.74		24.38	7.35	731.72
1395	153		0.17			2.57	273.87
1405	151					189.20	76.48
1406	96		25.30			127.50	777.40
MEAN		3.17	862.25		1.34	37.60	495.61

In the pelagic group carangids dominated both on the inner and outer shelf, and the catch rates were higher than those obtained in 1994, 1995 and 1996. *S. dorsalis* was the dominating species both on the inner and outer shelf, mainly due to a few large catches. *T. trecae* was the second most abundant species with the catches more homogeneously distributed in almost all stations, followed by *D. rhonchus*. Both juvenile and adult horse mackerel were caught. Clupeids was the second most important pelagic family on the inner shelf and the abundance was much higher than last year. Like in 1996, hairtail was most abundant on the outer shelf. Scombrids were caught in a few hauls, while barracudas only occurred in the inner shelf with about the same value as in 1996.

Grunts (*Pomadasys* spp.) was the dominating family on the inner shelf followed by croakers (*U. canariensis* and *P. typus*) and seabreams (Table 9). This is different from what was found in 1996 in the same region, when sparids dominated, both on the inner and outer shelves. The mean catch rate obtained for seabreams in the present survey was found to be about six times lower than in 1996. On the outer shelf seabreams were more abundant followed by croakers and groupers, which is in accordance with the results of last year. Figure 8 shows the distribution of seabreams in the Cabinda-Benguela region.

Table 9. Catch rates (kg/hour) of valuable species grouped by families in swept area bottom trawl hauls on the shelf. CABINDA-LUANDA.

INNER SHELF, 0-70

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Snappers	Other
1347	43	16.20		85.20			4360.40
1348	21		514.80	73.80			2987.10
1349	28		107.34	24.80			2340.34
1350	61	108.56		5.62	21.80		688.50
1364	24		46.80	34.56			693.28
1365	32	12.28	36.68	174.92			181.12
1380	33	52.50	131.25	125.79	16.80		2363.97
1392	44	4.00	17.60	14.40	8.00	12.20	197.80
1393	40	5.63					27.12
MEAN		22.13	94.94	59.90	5.18	1.36	1537.74

OUTER SHELF, 71-200

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Snappers	Other
1344	155	12.02					1163.60
1345	102	16.92		23.80			242.86
1346	71	42.86		139.28			11401.71
1351	93	22.22		16.94	5.86		245.24
1352	132	101.86					549.68
1362	147	37.80					231.00
1363	78	39.00	26.60	30.60			269.66
1366	75	94.56		13.32			634.68
1367	112	71.08					540.93
1368	178	35.42					3913.70
1378	122	5.40		6.00			110.22
1379	84	126.60		174.70			2431.34
1381	84	16.30					1563.32
1382	153	64.00					132.86
1390	143	63.68					46.22
1391	75	31.20					202.60
1394	82	180.38			10.84		1437.97
1395	153	48.00					228.61
1405	151	28.60					237.08
1406	96	186.50		5.40	12.50		725.80
MEAN		61.22	1.33	20.50	1.46		1315.45

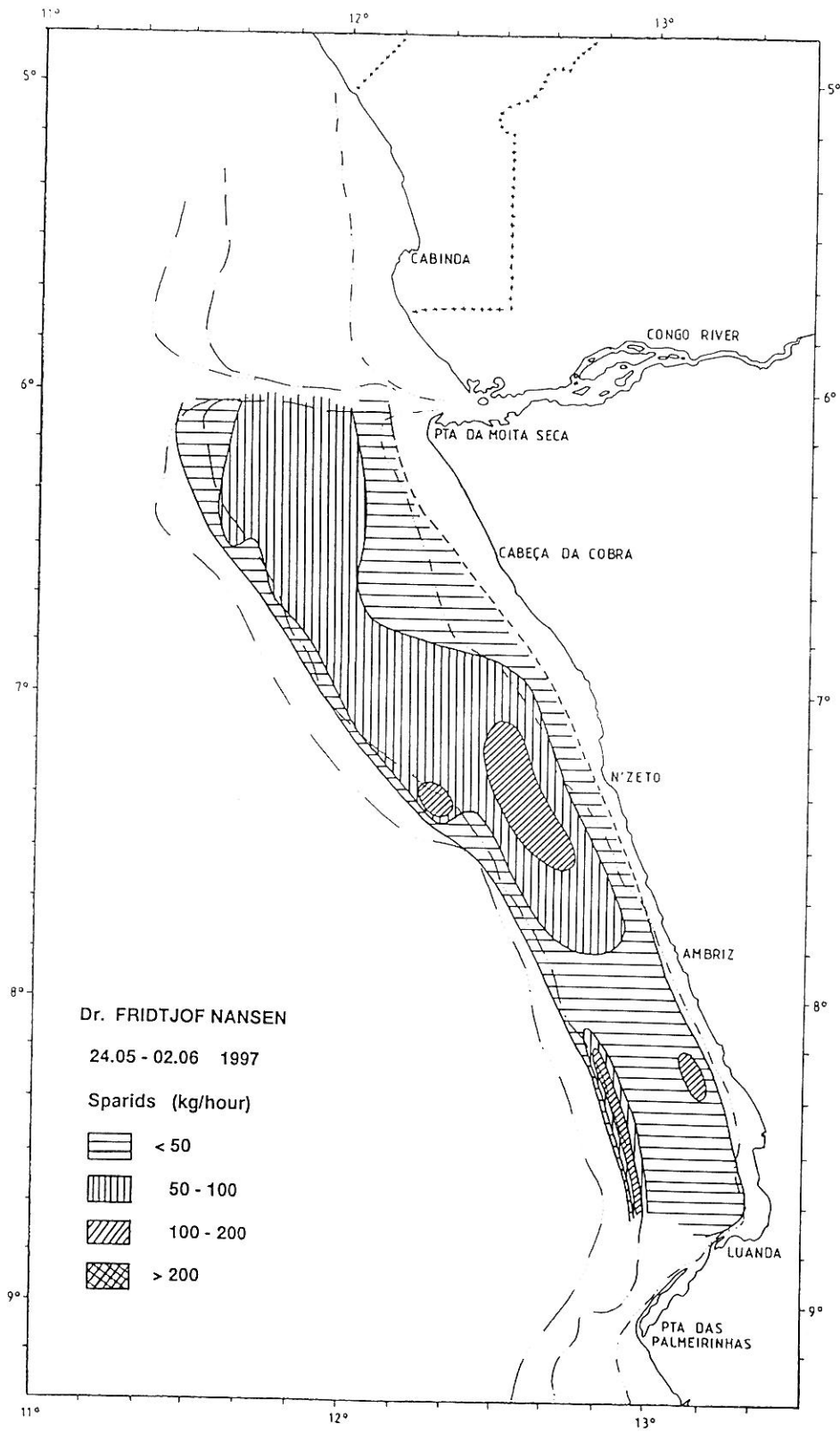


Figure 8. Distribution of seabreams (family Sparidae). Cabinda-Luanda.

In Annex I-B swept-area estimates based on 29 bottom trawl hauls are presented for demersal species on the shelf. In the 0-50 m zone *B. auritus* had the highest density, followed by *Galeiodes decadactylus* and *Pteroscion peli*. *B. auritus* also had the highest density between 50 and 200 m depth followed by *Pentheroscion mbizi* and *P. bellottii*. In the deepest shelf zone, *S. microlepis* was more abundant and then came *D. angolensis* and *D. congoensis*. In the last survey the later species was more abundant but it was due to one large catch.

Table 10 presents the biomass estimates for the main commercial groups and for other groups that occur in sizeable quantities.

The estimated total biomass of valuable demersal groups was 40 % lower than the record high estimate of last year and is now at about the average of the time series. The reduction was mainly due to a reduction in the estimated biomass of seabreams. Both grunts (excluding *B. auritus*) and croakers (excluding *P. peli* and *P. mbizi*) came out with the same biomasses as found in 1996. The biomass of groupers is the lowest in the time series.

Group/ species	Biomass (tonnes)							
	1986/I☼	1989/I☼	1991/II◆	1992◆	1994◆	1995 ☼	1996◆	1997◆
Seabreams	14 700	9 500	16 500	16 000	31 200	10 100	30200	12130
Grunts	1 400	840	2 900	1 000	900	4 200	11200	10460
Croakers	5 200	4 600	15 600	14 000	6 100	4 100	11600	10050
Groupers	740	950	940	3 000	3 200	900	3700	670
Sum dem. val.	22 040	15 900	35 940	34 000	41 400	19 300	56700	33310
Bigeye grunt	42 800	6 900	19 700	21 000	17 100	21 200	57800	76610
Horse mackerel	11 900	9 300	12 000	20 000	18 500	600	44700	50950
Other carangids	8 900	1 650	860	4 000	13 300	11 800	3200	143790
Barracudas	1 800	900	-	1 000	820	4 100	200	120
Hairtail	9 600	2 200	8300	7 000	8 900	11 200	6700	9190

☼ summer season (February-March)

◆ winter season (May-September)

Of the other species both *B. auritus*, *T. trecae* and other carangids (mainly *S. dorsalis*) came out with the highest biomass estimates in the time series. Also hairtail had a higher biomass than in 1996, while barracudas were very scarce.

4.3 Review of results

In the category high-value demersal fish we include species of seabreams, croakers, grunts (excluding the bigeye grunt), groupers etc. that constitute the most valuable food fish. Table 11 shows the results of present and previous surveys. Last years estimate was the highest in the time series, while the estimate from the present survey is about 25 % lower an at an average level in the time series. Since 1992 the biomass estimates have been more stable in the Benguela-Luanda region than in the Luanda-Cabinda region.

Table 11. Valuable demersal fish. Mean biomass estimates (1000 tonnes) by survey and region.

Survey	Cunene-Benguela	Benguela-Luanda	Luanda-Cabinda	Benguela-Cabinda	Total
1/85-4/85	N.S.	N.S.	48.8	-	-
1/86-2/86	15.6	21.2	38.3	59.5	78.4
1/89-2/89	28.2	17.9	25.5	43.4	75.1
3/89	N.S.	N.S.	31.7	-	-
Nov/89					68.0*
1/91	26.4	15.0	15.9	30.9	57.3
2/91	36.4	50.1	35.9	86.0	122.4
1/92	47.7	33.0	34.0	67.0	114.7
1/94	N.S.	33.7	41.4	75.1	-
1/95	N.S.	39.0	19.3	58.3	-
2/96	N.S.	31.2	56.7	87.9	-
2/97	N.S.	32.7	33.3	65.0	-

* From GOA survey, seabreams only.

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

The slope off Luanda-Benguela was covered with 28 swept-area hauls with the following distribution: 200-400 m: 14 hauls and 400-600 m: 14 hauls. The slope from Luanda to Cabinda was covered with 37 hauls distributed as follows: 200-400 m: 17 hauls and 400-800 m: 20 hauls. The results from the swept-area analysis by depth intervals are presented in Annex III C and D.

Table 12. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the slope. LUANDA-BENGUELA.

SLOPE 200-800 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
1288	342	225.00			15.03	6.24	486.06
1289	551			1.26	13.30	0.82	47.40
1290	417	331.20		142.56	69.06	65.76	143.67
1291	224	42.00	5.80		64.80	7.80	1168.00
1298	229	141.86	31.35		6.77	49.94	1252.09
1299	336	365.54	8.68	7.02	382.34	8.49	134.82
1300	448	29.00	1.26	2.76	18.18	10.72	75.08
1301	557	1.80	0.40	0.40	50.66		126.40
1302	549		15.09	5.09	280.90	2.00	214.90
1303	448	6.34	24.38	2.33	121.78	24.99	133.77
1304	243	203.40			97.18	24.96	2454.92
1312	240	511.80			64.00	14.60	1305.40
1313	346	486.87	1.26	70.46	139.67	11.32	113.24
1314	438		1.10	1.10	338.82	11.22	137.92
1315	576		12.00	20.40	133.32	2.40	127.68
1316	548		11.59	8.28	24.83		367.37
1317	448	138.50	1.10	2.40	255.10	4.60	96.40
1318	352	262.80	22.50	23.86	525.74	1.44	100.70
1319	264	893.85	207.00		29.70		770.70
1326	258	882.86			32.40	8.05	2358.32
1327	357	1488.40	2.40	238.60	302.80		399.08
1328	455	123.76		25.30	133.22	11.46	454.30
1329	556			10.90	99.12	19.40	396.20
1330	560	12.60	21.00	2.80	112.00	1.40	718.68
1331	450	24.00	4.80	0.40	137.60		258.56
1332	348	269.20	16.00	129.20	246.96	1.60	428.96
1333	250	475.86	107.26		244.16	1.96	276.58
1338	357	14.79	0.54	30.93	153.45	23.13	584.61
MEAN		247.55	17.70	25.93	146.17	11.23	540.42

Tables 12 and 13 show the composition of the catches by major groups in the southern and northern regions respectively. These tables provide information on bycatch composition in the commercial shrimp fisheries. The groups included under 'Demersal' are families of commercial interest (including hake). The category 'Shrimps' includes all species caught. In the Luanda-Benguela region shrimps made up about 15 % of the catches on the slope and the mean catch rate

was a little higher than last year. The catch rates of the demersal group as well as of "other" were considerable higher than those obtained in 1996. In the northern region shrimps made up 23 % of the catches and the mean rate was somewhat higher than in the south and more than 3 times higher than the results from last year. The catch rates of the demersal group was considerable lower than those obtained in the southern region, but higher than what was found in 1996.

Table 13. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls on the slope.
CABINDA-LUANDA.

SLOPE 200-800 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
1339	710			1.00	138.20		238.80
1340	549	18.00		5.40	387.00		121.00
1341	450	23.40		6.20	654.00	2.60	48.34
1343	250	220.62	22.96		15.88	11.74	234.08
1353	266	6.75	121.75		142.00		1105.25
1354	352	470.40	21.00	119.00	180.80	7.00	216.80
1355	459	12.88	14.04	3.92	338.22	7.60	138.32
1356	543		2.80	8.90	365.20	7.60	64.20
1357	703	12.00	24.00	3.00	181.50		249.00
1358	548		5.40		353.80	4.50	81.70
1359	450			17.00	574.50	16.90	99.06
1360	355	298.30	1.90	14.50	437.38	1.14	202.16
1361	245	3.60	52.20		12.00	5.40	301.86
1369	256	8.07	18.83		5.52	12.41	991.45
1370	356	298.20	0.70		385.42	9.52	124.46
1371	434	20.21			515.19	5.78	115.45
1372	548		8.00	10.20	321.00	6.40	61.00
1373	702				14.40		229.68
1374	557		6.20		327.64		175.84
1375	459		280.60	16.40	196.66	5.30	129.56
1376	374	474.20	739.20		296.00	6.60	450.80
1377	253	266.60	35.20		9.20	26.00	696.08
1383	273	68.40	0.40		16.80	35.80	3553.00
1384	376	253.22	11.95		156.63	2.86	229.42
1385	571		0.60		5.20	1.80	143.00
1386	706		2.71		6.46	2.71	412.43
1387	493	2.86	3.99	2.64	20.62	2.44	86.91
1388	359	242.16	24.47	36.98	23.91	8.10	209.08
1389	246	100.30			2.86	23.32	816.20
1396	250	235.40	26.40		22.20	29.20	2216.20
1397	350	201.60	1.54	1.68	136.08	25.48	491.34
1399	557		39.96	0.96	38.00		95.02
1400	701		1.45		6.62		468.40
1401	547	3.00	11.00	8.50	32.98	1.50	105.00
1402	433	60.00	4.64	128.68	33.04	11.20	121.40
1403	359	180.70	28.60	0.52	154.58	13.52	435.22
1404	259	45.60	0.06		10.20	13.80	113.52
MEAN		95.31	40.88	10.42	176.15	8.33	420.84

4.1 Deep water shrimp

Table 14 shows the catch rates of important shrimps and fish on the slope off Luanda-Benguela. Deep-water shrimps were caught at all stations, and like in previous investigations spider shrimp (*Nematocarcinus africanus*) had the highest catch rate, about the same as found in 1996. The overall mean catch of *P. longirostris* was 13.2 kg/h, which is 6 times higher than what was obtained in 1996, while the catch rate of *A. varidens* (6.8 kg/h) was somewhat lower than last year. Figs. 9 and 10 show the distribution of *P. longirostris* and *A. varidens* respectively. The highest catch rates of *P. longirostris* were obtained off Pta. do Moro and between Cabeça da Baleia and Lobito, and the area with catch rates above 20 kg/h was much larger than what has been found in the previous surveys. *A. varidens* had a much more scattered distribution, with only small areas with catch rates above 20 kg/h.

Table 14. Catch rates (kg/hour) of main shrimp and bycatch species in swept area bottom trawl hauls on the slope. LUANDA-BENGUELA.

SLOPE 200-800 m

ST. NO.	DEP.	Sparids	Hakès	Rose shr.	Str. shr.	Spid. shr.	Other
1288	342		225.00	0.45	2.34		504.54
1289	551				0.74		62.04
1290	417		331.20	0.09	15.99		404.97
1291	224	9.60	32.40	62.80			1183.60
1298	229	47.80	94.06	6.00			1334.15
1299	336		365.54	4.80			536.55
1300	448		29.00		2.52		105.48
1301	557		1.80		0.16	50.40	127.30
1302	549				4.36	275.09	238.53
1303	448		6.34		37.07		270.18
1304	243	65.80	137.60	96.32			2480.74
1312	240	7.20	504.60	61.00			1323.00
1313	346		486.87	0.64	0.64	132.10	202.57
1314	438				12.66	325.60	151.90
1315	576				1.20	132.00	162.60
1316	548				13.24	11.59	387.24
1317	448		138.50		14.00	238.00	107.60
1318	352		262.80		0.36	523.40	150.48
1319	264	43.35	850.50	29.70			977.70
1326	258	541.03	341.83	32.40			2366.37
1327	357		1488.40		12.40	288.00	642.48
1328	455		123.76		23.54		600.74
1329	556				3.52		522.10
1330	560		12.60		4.20	107.80	743.88
1331	450		24.00		9.60	128.00	263.76
1332	348	4.80	264.40	0.16	2.00	244.80	575.76
1333	250	327.66	148.20	72.16			557.80
1338	357		14.79	2.42	28.65		761.59
MEAN		37.40	210.15	13.18	6.76	87.74	633.77

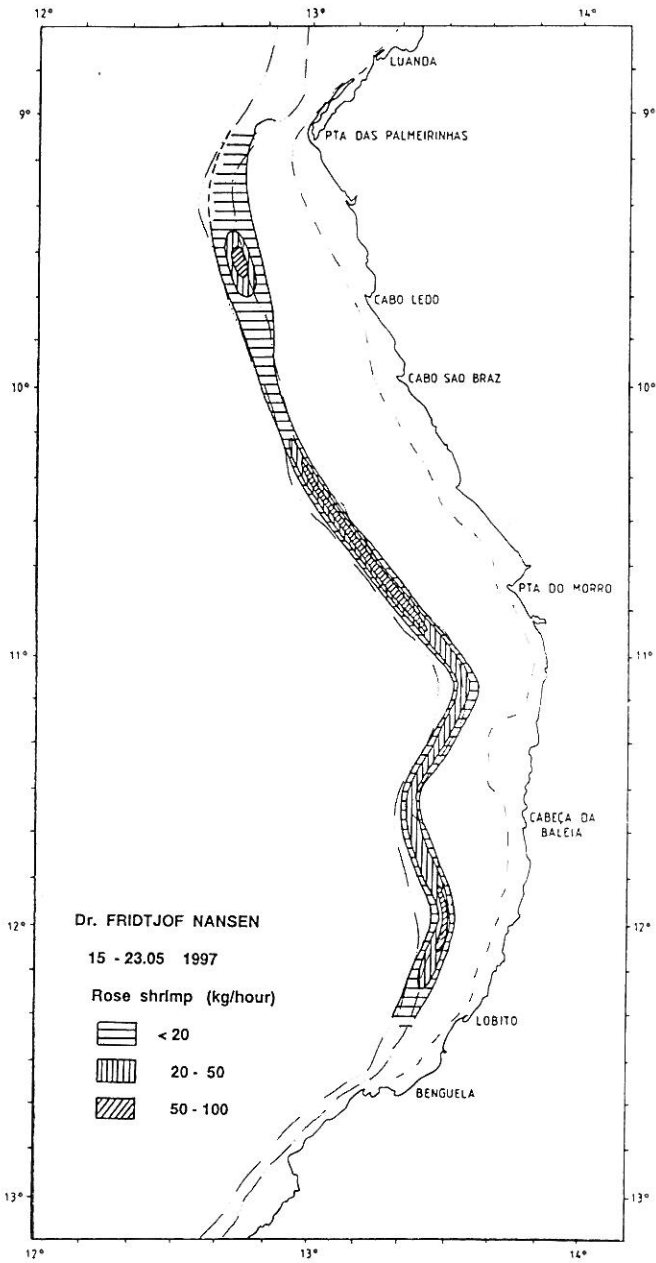


Figure 9. Distribution of rose shrimp (*Parapenaeus longirostris*). Luanda-Benguela.

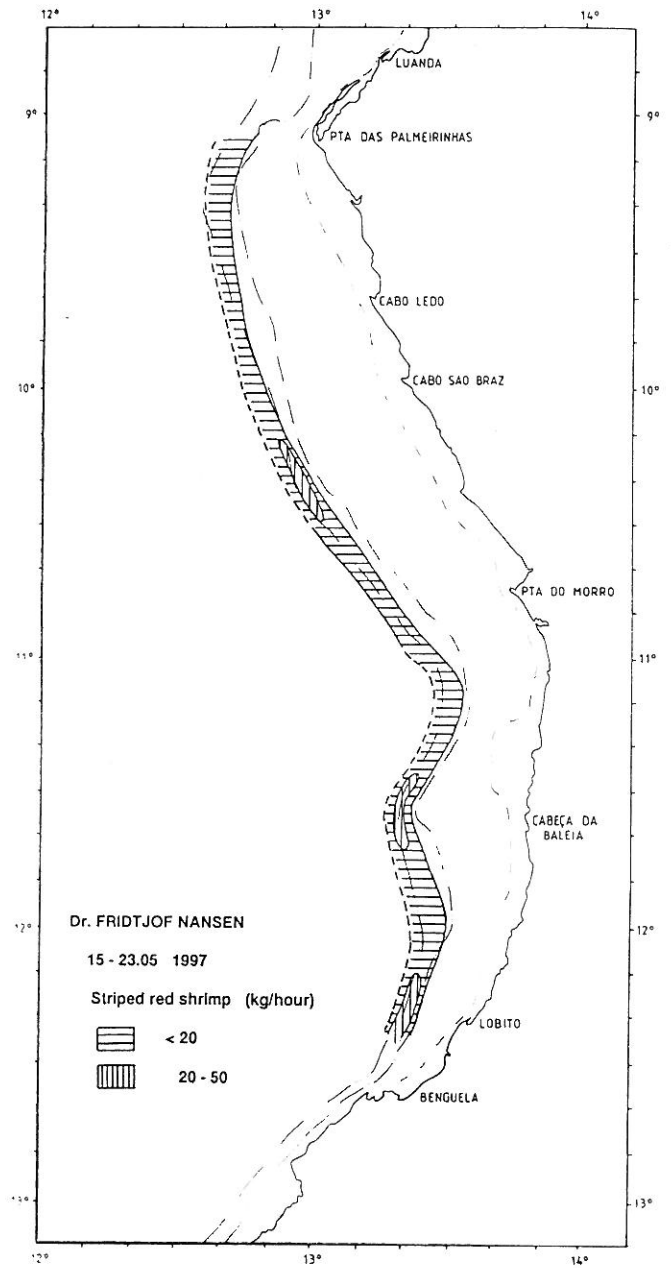


Figure 10. Distribution of striped red shrimp (*Aristeus varidens*). Luanda-Benguela.

In the Cabinda-Luanda region (Table 15) 37 stations were performed and deep-water shrimps were caught on all of them. Like in previous investigations *N. africanus* had the highest mean catch rate, about the double of what was found in the Luanda-Benguela region. The overall mean catch rate of *P. longirostris* was 7.2 kg/h, which is about the half of what was found in the south but more than three times higher than what was obtained last year. The mean catch rate of *A. varidens* (4.1 kg/h) was quite similar to the results from the previous surveys, and about 40 % lower than that obtained in the southern region.

Table 15. Catch rates (kg/hour) of main shrimp and bycatch species in swept area bottom trawl hauls on the slope. CABINDA - LUANDA .

SLOPE 200-800 m

ST.NO.	DEP.	Sparids	Hakes	Rose shr.	Str. shr.	Spid. shr.	Other
1339	710				2.20	136.00	239.80
1340	549		18.00		16.20	370.80	126.40
1341	450		23.40		15.80	635.60	59.74
1343	250	174.54	46.08	13.66			271.00
1353	266		6.75	138.50			1230.50
1354	352		470.40	0.20		179.20	365.20
1355	459		12.88		5.64	331.20	165.26
1356	543				7.00	356.00	85.70
1357	703		12.00		4.50	177.00	276.00
1358	548				3.60	350.20	91.60
1359	450				3.80	569.40	134.26
1360	355		298.30	16.72		419.90	220.46
1361	245	3.00	0.60	12.00			359.46
1369	256		8.07	5.38			1022.83
1370	356		298.20	2.24	0.28	381.50	136.08
1371	434		20.21	0.08	5.78	508.61	121.95
1372	548				2.20	318.40	86.00
1373	702				2.40	12.00	229.68
1374	557				8.54	319.00	182.14
1375	459				6.28	189.76	432.48
1376	374		474.20		1.20	293.80	1197.00
1377	253	105.40	161.20	9.20			757.28
1383	273		68.40	16.40			3589.60
1384	376		253.22	1.32	3.05	151.82	244.67
1385	571				4.60	0.60	145.40
1386	706				2.21	4.06	418.04
1387	493		2.86		15.68	4.84	96.08
1388	359		242.16	7.37		7.93	287.24
1389	246	20.00	80.30	2.86			839.52
1396	250	63.80	171.60	22.00			2272.00
1397	350		201.60	1.32		134.20	520.60
1399	557				7.20	30.80	135.94
1400	701				6.62		469.85
1401	547		3.00		6.98	26.00	126.00
1402	433		60.00		19.04	14.00	265.92
1403	359		180.70	5.06		146.14	481.24
1404	259	21.60	24.00	10.20			127.38
MEAN		10.50	84.81	7.15	4.08	164.02	481.36

Figs. 11 and 12 show the distribution of rose shrimp and striped red shrimp respectively. The catch rates of both *P. longirostris* and *A. varidens* were below 20 kg/h in most of the region, but a couple of higher catches were made of the former species.

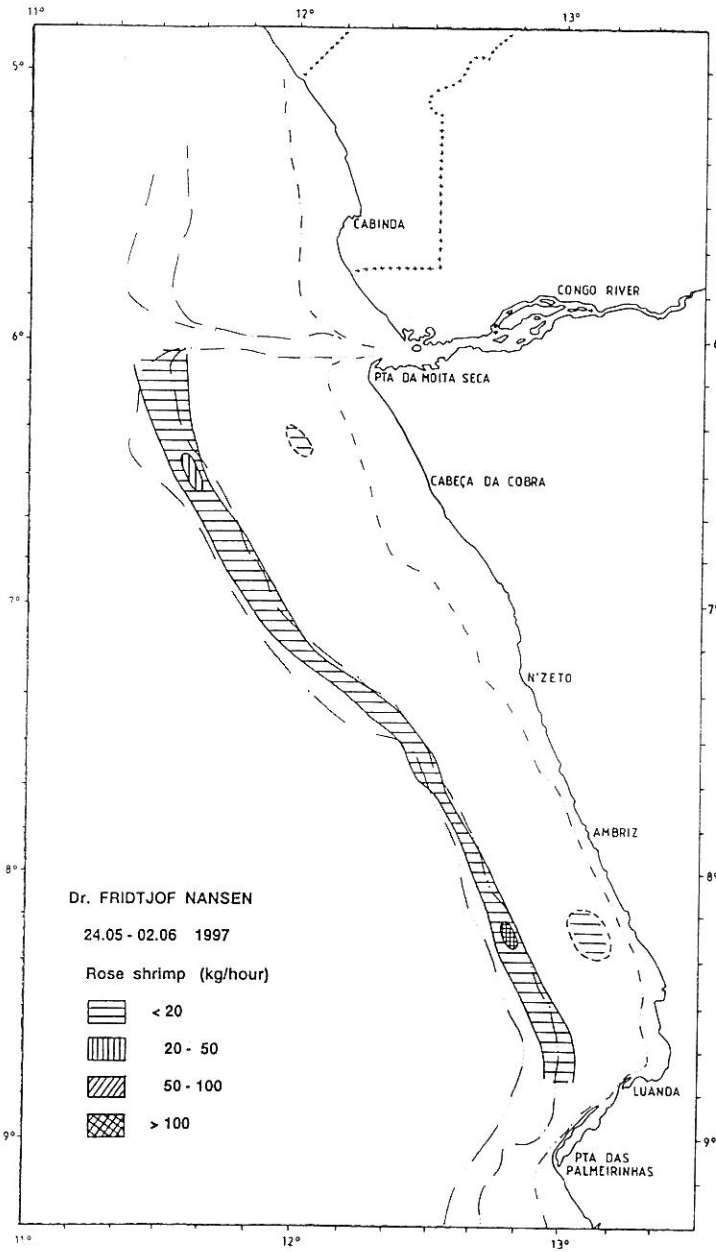


Figure 11. Distribution of rose shrimp (*Parapenaeus longirostris*). Cabinda-Luanda.

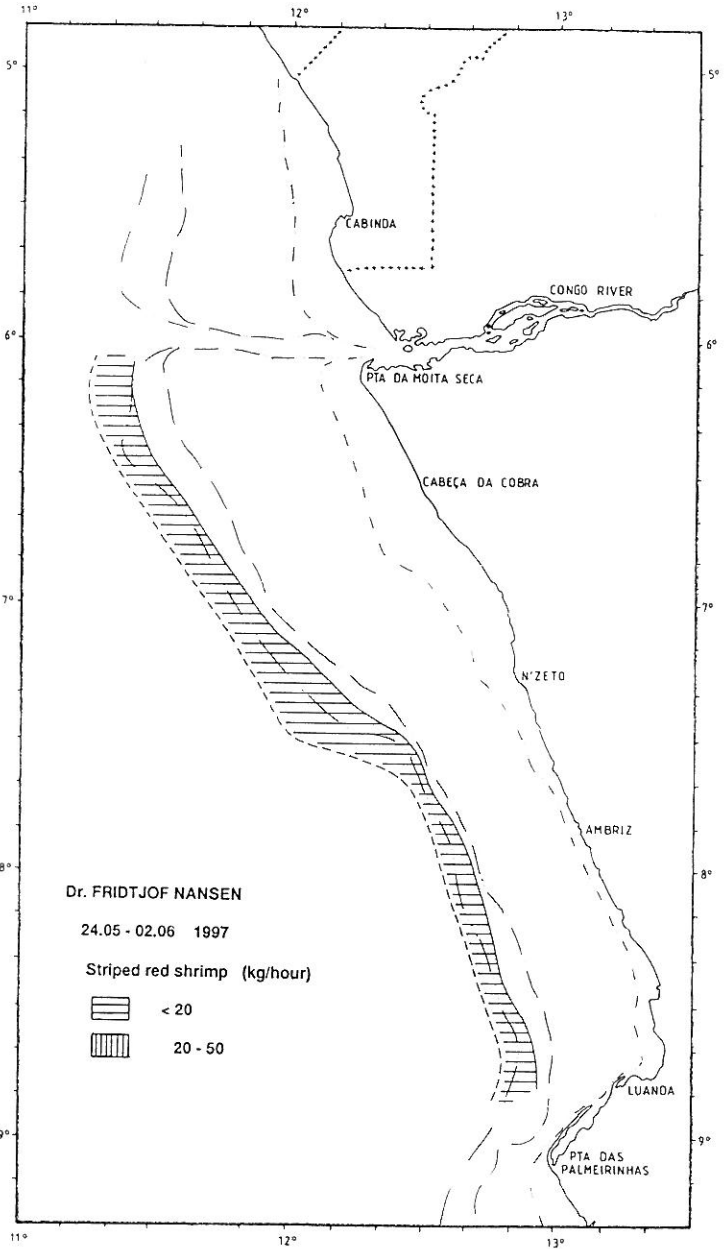


Figure 12. Distribution of striped red shrimp (*Aristeus varidens*). Cabinda-Luanda.

Table 16 shows the catch rates of *P. longirostris* (rose shrimp) by region and depth range, and catch rates from previous investigations are given for comparisons. The mean catch rate found last year was the lowest in the time series, while the catch rates obtained during the present survey are among the highest in the time series, especially in the southern region. Like in previous surveys the highest catch rate was found between 200 and 300 m depth.

Table 16. Rose shrimp. Mean catch rates (kg/hour) by region, depth range and year of investigation.

Area/ depth	Year of investigation								
	1986/I	1989	1991/I	1992	1994	1995/1	1995/2	1996	1997
Cabinda-Luanda									
100-200 m	4	+	+	2	3	8	No survey	+	2
200-300 m	60	10	8	18	15	34		6	26
300-400 m	4	5	1	+	12	10		1	4
Mean	19	5	2	8	10	16		3	10
Luanda-Benguela									
100-200 m	32	5	-	2	3	6	6	1	23
200-300 m	38	14	14	26	30	16	21	6	51
300-400 m	11	26	2	1	14	18	13	3	1
Mean	25	11	4	8	13	12	15	3	25

Table 17 Striped shrimp. Mean catch rates (kg/hour) by region, depth range and year of investigation.

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

Mean catch rates of *A. varidens* (striped red shrimp) are presented in Table 17. In the Luanda-Benguela region the catch rates were among the lowest in the time series, especially between 500 and 600 m. In the Cabinda-Luanda region the mean catch rate was similar to those found in 1994 - 1996. The more efficient gear and tickler chain used in the latest surveys probably mask a small decline in the catch rates of *A. varidens* also in the northern region.

Biomass estimates of commercially important shrimps are presented in Table 18. In the southern region the biomass estimate of *P. longirostris* increased considerable and is the second highest in the time series. The biomass of *A. varidens* was more than halved compared to last year and is among the lowest in the time series. The deepest stratum (600-800 m) was not covered during the present survey and the actual reduction is therefore somewhat smaller. Also in the northern region the biomass of *P. longirostris* increased much compared to the results from last year, but this is partly due to one large catch. The biomass of *A. varidens* also increased somewhat in the Cabinda-Luanda region, and the estimated total biomass of commercial deep water shrimp in the Cabinda-Benguela area is the second highest in the time series.

Table 18. Biomass of commercial deep water shrimps by region and year of investigation (tonnes).

Region/ species	Year of investigation								
	1985/I	1986/I	1989	1992	1994	1995/I	1995/2	1996	1997
Cabinda-Luanda									
-Rose shrimp	380	150	550	615	1 110	1 580	No survey	210	830
-Striped red shr.	-	1 200	400	515	610	500		440	590
-Scarlet shrimp	-	+	+	130	+	+		50	10
Luanda-Benguela									
-Rose shrimp	-	3 400	700	680	710	460	750	130	1780
-Striped red shr.	-	1 000	370	570	890	940	730	850	370
-Scarlet shrimp	-	100	+	+	+	+	+	90	10
Total		5 850	2 020	2 570	3 410	3 480		1770	3580

4.2 Benguela hake

The catch rates of Benguela hake (*Merluccius polli*) in each haul on the slope in the two regions are shown in Tables 14 and 15 and Table 19 presents catch rates by depth zone. Catch rates from some previous investigations are also given. Hake was caught on most stations on the slope in the southern region and the mean catch rate was about the double of what was obtained in 1996 and the second highest in the time series. Like in previous surveys the best catch rates were obtained between 300 and 400 m depth. The mean length (Annex II) decreased by almost 6 cm from 1996 to 1997 because of more small hake in the catches during the present survey. Also in the northern region hake was caught on most stations. The mean catch rate was less than half of what was found in the south, but a little higher than the results from the three previous surveys.

Table 19. HAKE. Mean catch rates (kg/hour) by regions, depth range and year of investigation.

Area/ depth	Year of investigation								
	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997
Cabinda-Luanda									
100-200 m	+	3	1	13	+	2		-	+
200-300 m	59	44	11	104	28	9	No survey	43	63
300-400 m	289	145	382	264	134	194		136	302
400-500 m	258	223	564	224	43	86		96	17
500-600 m	83	25	28	21	12	6		7	3
600-800 m	-	56	-	12	1	10		8	2
Mean	114	72	203	90	40	47		48	65
Luanda-Benguela									
100-200 m	6	8	+	31	49	3	39	15	98
200-300 m	161	167	30	112	122	23	51	31	301
300-400 m	822	82	384	220	55	196	197	330	444
400-500 m	433	291	394	174	64	80	121	116	93
500-600 m	45	44	180	39	52	27	8	44	2
600-800 m	-	-	-	10	5	30	3	10	-
Mean	378	93	138	91	63	61	74	95	185

Biomass estimates of hake are presented in Table 20. In the southern region the biomass increased by 100 % compared to the result from July-August 1996 and is the second highest in the time series. In the northern region the biomass increased by almost 40 % compared to last year, while the biomass for the whole area was about 70 % higher than what was found in 1996 and the third highest in the time series.

Table 20. Biomass estimates of hake by area and year of investigation (tonnes).

Region	Year of investigation								
	1986/I	1989	1991/I	1992	1994	1995/I	1995/2	1996	1997
Cabinda-Luanda	17 000	15 300	18 000	14 000	4 700	7 100	*	6170	8500
Luanda-Benguela	31 400	5 300	11 000	8 100	6 670	4 950	6830	7510	15230
Total	48 400	20 600	29 000	22 100	11 370	12 050		13680	23730

* no survey

Figs. 13 and 14 show the distribution of hake in the Luanda-Benguela and Benguela-Cabinda region respectively. In the southern region the distribution pattern was similar to those from the previous surveys, but with larger areas with catch rates > 200 kg/h. Also in the north the distribution pattern was similar to what was observed in the period 1994 - 1996.

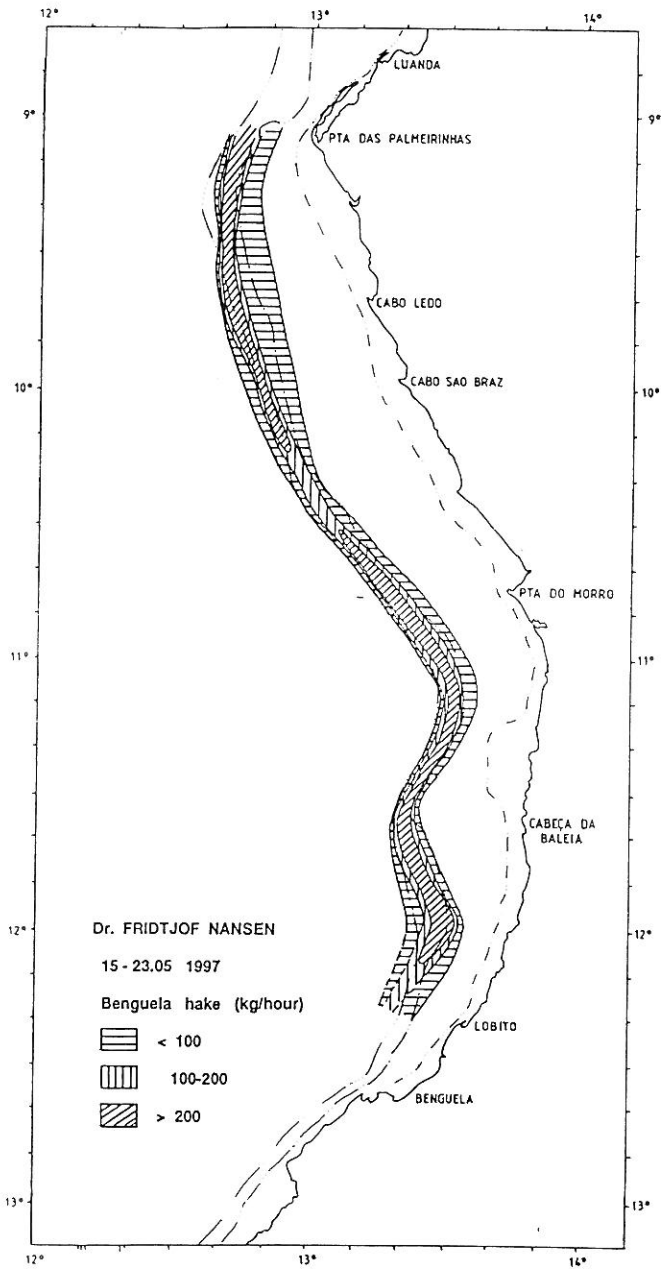


Figure 13. Distribution of Benguela hake (*Merluccius polli*). Luanda-Benguela.

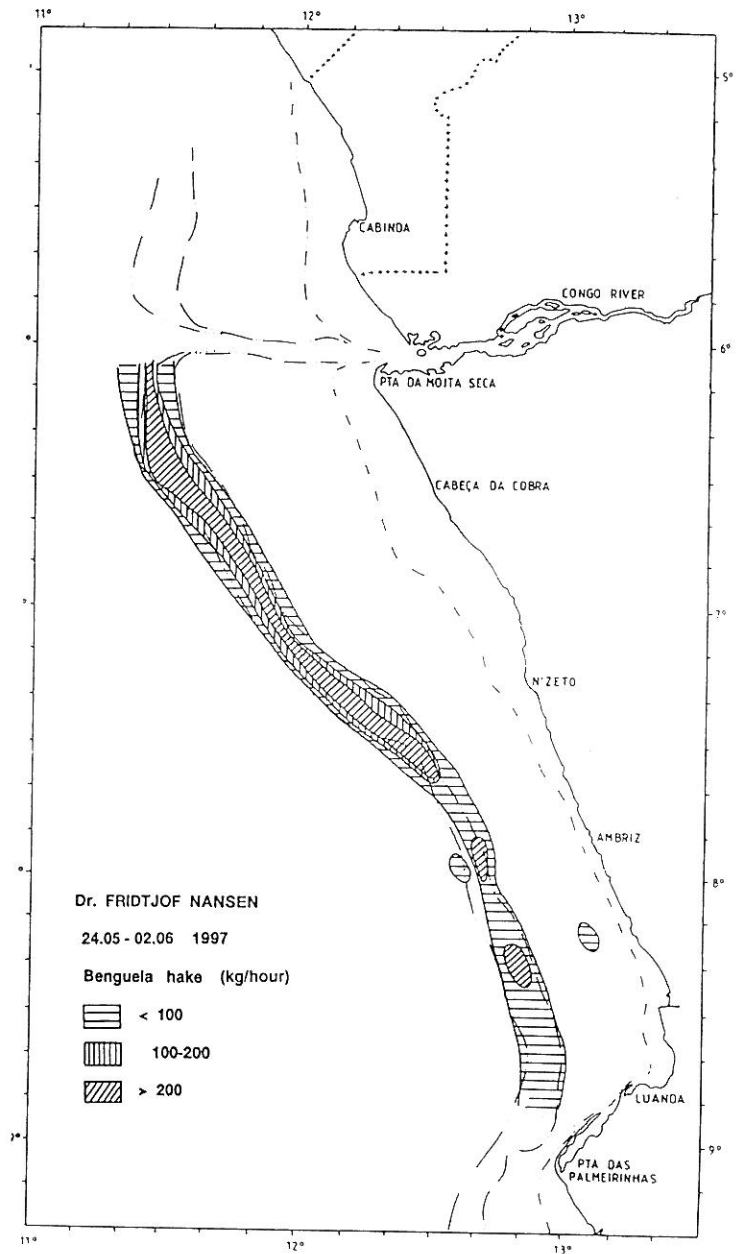


Figure 14. Distribution of Benguela hake (*Merluccius polli*). Cabinda-Luanda

Annex I Records of fishing stations

PROJECT STATION:1286
 DATE:15/ 5/97 GEAR TYPE: BT No:2 POSITION:Lat S 908 Long E 1254
 start stop duration
 TIME :12:03:43 12:17:14 14 (min) Purpose code: 3
 LOG :5510 64 5511 59 0 48 Area code : 1
 FDEPTH: 40 46 GearCond code: 9
 BDEPTH: 40 46 Validity code: 4
 Towing dir: 25° Wire out: 200 m Speed: 32 kn*10

Sorted: 49 Kg Total catch: 49 40 CATCH/HOUR: 211.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex barnardi	47 57	733	22 47	
Trigla lyra	47 57	570	22 47	
Sepia officinalis hierredda	27 00	184	12 75	
Lithognathus mormyrus	18 43	47	8 71	
Pagrus caeruleostictus	16 71	514	7 89	
Pagellus bellottii	14 57	137	6 88	2829
Octopus vulgaris	10 71	4	5 06	
Citharus linguatula	9 00	111	4 25	
Trachurus trecae	4 29	9	2 03	
Fistularia petimba	4 29	30	2 03	
Lagocephalus laevigatus	2 57	4	1 21	
Chilomycterus spinosus mauret.	1 29	9	0 61	
Scorpaena stephanica	1 29	17	0 61	
Grammolites gruvelli	1 29	17	0 61	
Citharichthys stampflii	1 29	21	0 61	
Raja miraletus	1 29	4	0 61	
Brachydeuterus auritus	0 86	4	0 41	
Trachinus araneus	0 43	4	0 20	
Epinephelus aeneus	0 43	4	0 20	
Syacium micrurum	0 43	9	0 20	
Uranoscopus cadenati	0 43	4	0 20	
Total	211 74	100 01		

PROJECT STATION:1289
 DATE:16/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 930 Long E 1238
 start stop duration
 TIME :05:12:26 05:42:34 30 (min) Purpose code: 3
 LOG :5599 47 5601 26 1 41 Area code : 1
 FDEPTH: 556 546 GearCond code:
 BDEPTH: 556 546 Validity code:
 Towing dir: 355° Wire out:1500 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 31 39 CATCH/HOUR: 62 78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lamprogrammus exultus	15 60	56	24 85	
Shrimps, small, non comm.	12 18	1046	19 40	
MYCTOPHIDAE	4 06	532	6 47	
J E L L Y F I S H	4 06	2080	6 47	
Yarella blackfordi	4 00	104	6 37	
Talismania sp	3 56	138	5 67	
Hoplostethus cadenati	3 36	104	5 35	
Munida sp *	3 10	310	4 94	
Chlorophthalmus atlanticus	2 80	66	4 46	
Gonostoma elongatum	2 38	54	3 79	
Ebinania costaecanarie	1 76	12	2 80	
Etmopterus spinax	1 26	14	2 01	
Nezumia aequalis	1 02	22	1 62	
CONGRIDAE	0 62	20	0 99	
Todaropsis eblanae	0 46	2	0 73	
Aristeus varidens, male	0 42	56	0 67	2840
Malacocephalus occidentalis	0 40	28	0 64	
Illex coindetii	0 36	2	0 57	
Laemonema laureysi	0 34	48	0 54	
Aristeus varidens, female	0 32	20	0 51	2839
Plesiopeneaeus edwardsianus	0 30	20	0 48	2838
Citharus linguatula	0 12	6	0 19	
Lophius vaillanti	0 10	2	0 16	
PALAEONIDAE	0 08	10	0 13	
Trachyrincus scabrus	0 06	2	0 10	
Melanocetus johnsoni	0 06	2	0 10	
Total	62 78	100 01		

PROJECT STATION:1287
 DATE:15/ 5/97 GEAR TYPE: BT No:2 POSITION:Lat S 910 Long E 1252
 start stop duration
 TIME :14:19:00 14:49:00 30 (min) Purpose code: 3
 LOG :515 60 516 20 0 60 Area code : 1
 FDEPTH: 68 61 GearCond code: 1
 BDEPTH: 68 61 Validity code:
 Towing dir: 190° Wire out: 210 m Speed: 30 kn*10

Sorted: Kg Total catch: 686 95 CATCH/HOUR: 1373 90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	760 00	16426	55 32	2830
Trichiurus lepturus	534 40	1482	38 90	
Pagellus bellottii	15 00	76	1 38	2831
Dentex angolensis	12 20	124	0 89	2832
Umbrina canariensis	10 80	96	0 79	
Atractoscion aequidens	10 40	12	0 76	
Trigla lyra	6 80	32	0 49	
Dentex barnardi	6 60	38	0 48	
Raja miraletus	5 40	10	0 39	
Sepia officinalis hierredda	2 60	8	0 19	
Citharus linguatula	2 20	34	0 16	
Decapterus rhonchus	1 60	2	0 12	
Zeus faber	0 80	4	0 06	
Priacanthus arenatus	0 60	2	0 04	
Grammolites gruvelli	0 20	2	0 01	
Sardinella aurita	0 20	2	0 01	
Boops boops	0 04	2		
Saurida brasiliensis	0 04	2		
Trachinus araneus	0 02	6		
Total	1373 90	99 99		

PROJECT STATION:1290
 DATE:16/ 5/97 GEAR TYPE: BT No:2 POSITION:Lat S 914 Long E 1240
 start stop duration
 TIME :07:19:26 07:39 43 20 (min) Purpose code: 3
 LOG :5609 23 5609 85 1 01 Area code : 1
 FDEPTH: 416 417 GearCond code:
 BDEPTH: 416 417 Validity code:
 Towing dir: 170° Wire out:1200 m Speed: 30 kn*10

Sorted: 36 Kg Total catch: 250 75 CATCH/HOUR: 752 25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	331 20	1416	44 03	2843
Neoharriotta pinnata	68 40	24	9 09	
Centroprorus uyato	60 00	24	7 98	
Shrimps, small, non comm.	52 89	18189	7 03	
Synagrops microlepis	46 80	3216	6 22	
Illex coindetii	39 36	456	5 23	
Chlorophthalmus atlanticus	32 88	816	4 37	
Todaropsis eblanae	14 64	96	1 95	
Etmopterus spinax	14 16	312	1 88	
Yarella blackfordi	12 48	336	1 66	
MYCTOPHIDAE	12 39	8682	1 65	
Gadella imberbis	9 60	552	1 28	
Octopus sp	8 88	48	1 18	
Aristeus varidens, female	8 07	549	1 07	2842
Aristeus varidens, male	7 92	1161	1 05	2841
Coelorrhinus coelorrhinus	7 44	192	0 99	
Munida sp. *	5 28	624	0 70	
Gonostoma elongatum	5 04	96	0 67	
Malacocephalus laevis	3 60	96	0 48	
Hoplostethus cadenati	3 36	120	0 45	
Gmmastrophes pteropus	2 88	48	0 38	
Hymenocephalus italicus	2 88	264	0 38	
Paralepis sp.	1 44	72	0 19	
Dibranchius atlanticus	0 48	24	0 06	
Plesiopeneaeus edwardsianus	0 09	12	0 01	2844
Parapeneaeus longirostris, fem	0 09	9	0 01	
Total	752 25	99 99		

PROJECT STATION:1288
 DATE:15/ 5/97 GEAR TYPE: BT No:2 POSITION:Lat S 907 Long E 1243
 start stop duration
 TIME :19:50:55 20:10:34 20 (min) Purpose code: 3
 LOG :5540 76 5541 17 1 06 Area code : 1
 FDEPTH: 319 364 GearCond code: 8
 BDEPTH: 319 364 Validity code:
 Towing dir: 200° Wire out:1050 m Speed: 30 kn*10

Sorted: 86 Kg Total catch: 244 11 CATCH/HOUR: 732 33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	356 40	6159	48 67	
Merluccius polli	225 00	1029	30 72	2834
Hoplostethus atlanticus	43 20	54	5 90	2833
MYCTOPHIDAE	21 72	16083	2 97	
Hymenocephalus italicus	14 64	1464	2 00	
Malacocephalus laevis	13 92	84	1 90	
Shrimps, small, non comm.	12 24	6288	1 67	
Synagrops microlepis	7 44	264	1 02	
Illex coindetii	6 24	72	0 85	
Pterothrissus bellocci	5 40	36	0 74	
Malacocephalus occidentalis	5 04	36	0 69	
Gadella imberbis	4 56	108	0 62	
Hoplostethus cadenati	4 56	252	0 62	
Nezumia aequalis	2 40	60	0 33	
Aristeus varidens, male	1 68	231	0 23	2837
Epigonus telescopus	1 68	12	0 23	
Trigla lyra	1 44	12	0 20	
Pontinus kuhlii	1 08	24	0 15	
Lophius vaillanti	1 08	24	0 15	
Citharus linguatula	0 84	12	0 11	
Aristeus varidens, female	0 66	72	0 09	2836
Parapeneaeus longirostris, fem	0 45	45	0 06	2835
Peristedion cataphractum	0 36	48	0 05	
Eumunida squamifera *	0 24	12	0 03	
Saurida brasiliensis	0 06	12	0 01	
Total	732 33	100 01		

PROJECT STATION:1291
 DATE:16/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 911 Long E 1243
 start stop duration
 TIME :10:25:55 10:55:48 30 (min) Purpose code: 3
 LOG :5618 11 5619 00 1 56 Area code : 1
 FDEPTH: 221 226 GearCond code:
 BDEPTH: 221 226 Validity code:
 Towing dir: 155° Wire out: 700 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 644 20 CATCH/HOUR: 1288 40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	984 20	68000	76 39	
Zenopsis conchifer	118 00	1614	9 16	
Parapeneaeus longirostris, fem	43 80	678	3 40	2846
Merluccius polli	32 40	398	2 51	
Nezumia aequalis	24 80	1102	1 92	
Parapeneaeus longirostris, male	19 00	3800	1 47	2845
Bembrops heterurus	11 40	132	0 88	
MYCTOPHIDAE	11 40	4046	0 88	
Pterothrissus bellocci	9 60	56	0 75	
Dentex macrocephalus	9 60	76	0 75	
Illex coindetii	7 60	228	0 59	
Trichiurus lepturus	5 80	18	0 45	
Raja clavata	2 00	18	0 16	
Gonostoma elongatum	2 00	18	0 16	
Citharus linguatula	2 00	94	0 16	
Chlorophthalmus atlanticus	2 00	114	0 16	
Solenocera africana	2 00	180	0 16	
Saurida brasiliensis	0 60	56	0 05	
Sepia officinalis hierredda	0 20	18	0 02	
Total	1288 40	100 02		

PROJECT STATION: 1292
 DATE: 16/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 931 Long E 1247
 start stop duration Purpose code: 3
 TIME :13:09:27 13:40:20 31 (min) Area code : 1
 LOG : 5625.74 5627.57 1.24 GearCond code:
 FDEPTH: 157 166 Validity code:
 BDEPTH: 157 166
 Towing dir: 310° Wire out: m Speed: kn*10
 Sorted: 27 Kg Total catch: 274.70 CATCH/HOUR: 531.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	278.71	26011	52.42	
Bembrops heterurus	50.52	523	9.50	
Brotula barbata	27.48	39	5.17	
Zenopsis conchifer	20.90	52	3.93	
Illex coindetii	20.90	836	3.93	
Citharus linguatula	15.68	645	2.95	
Trichiurus lepturus	15.29	23	2.88	
Boops boops	12.19	331	2.29	
Saurida brasiliensis	12.19	296	2.29	
Pterothrissus belloci	12.19	87	2.29	
Dentex angolensis	10.45	77	1.97	2849
Chelidonichthys gabonensis	8.71	279	1.64	
Dentex macrophthalmus	6.97	39	1.31	
Squatina oculata	5.42	2	1.02	2850
Uranoscopus cadenati	5.23	52	0.98	
Todaropsis eblanae	5.23	139	0.98	
Parapenaeus longirostris, fem.	5.23	192	0.98	2847
Peristedion cataphractum	3.48	52	0.65	
Sepia officinalis hierredda	3.48	52	0.65	
Parapenaeus longirostris, male	1.94	195	0.36	2848
Scorpaena normani	1.74	35	0.33	
Conger conger	1.74	17	0.33	
Chlorophthalmus atlanticus	1.74	157	0.33	
Raja clavata	1.16	35	0.22	
Anthias anthias	0.97	17	0.18	
Umbrina canariensis	0.77	2	0.14	
Malacocephalus laevis	0.77	17	0.14	
Merluccius polli	0.58	21	0.11	
Total	531.66		99.97	

PROJECT STATION: 1295
 DATE: 17/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 952 Long E 1313
 start stop duration Purpose code: 3
 TIME :05:21:12 05:51:00 30 (min) Area code : 1
 LOG : 5679.48 5681.30 1.37 GearCond code:
 FDEPTH: 23 21 Validity code:
 BDEPTH: 23 21
 Towing dir: 345° Wire out: 120 m Speed: 30 kn*10
 Sorted: 29 Kg Total catch: 28.65 CATCH/HOUR: 57.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sepia officinalis hierredda	20.00	40	34.90	
Alectis alexandrinus	9.96	8	17.38	
Chelidonichthys capensis	6.92	56	12.08	
Pagellus bellottii	6.72	28	11.73	2857
Eucinostomus melanopterus	5.58	80	9.74	
Alloteuthis africana	2.28	792	3.98	
Trachurus trecae	1.32	322	2.30	2856
Sphyræna guachancho	1.28	2	2.23	
Symphurus sp.	1.10	4	1.92	
Citharus linguatula	0.78	8	1.36	
Chloroscombrus chrysurus	0.56	4	0.98	
Raja miraletus	0.48	2	0.84	
Brachydeuterus auritus	0.32	2	0.56	
Total	57.30		100.00	

PROJECT STATION: 1296
 DATE: 17/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 932 Long E 1306
 start stop duration Purpose code: 3
 TIME :07:32:19 07:48:37 16 (min) Area code : 1
 LOG : 5690.99 5691.67 0.98 GearCond code:
 FDEPTH: 68 67 Validity code:
 BDEPTH: 68 67
 Towing dir: 165° Wire out: 270 m Speed: 30 kn*10
 Sorted: 112 Kg Total catch: 244.83 CATCH/HOUR: 918.11

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	273.45	4181	29.78	2860
Selene dorsalis	126.86	244	13.82	2861
Trichiurus lepturus	112.88	368	12.29	
Pseudupeneus prayensis	81.38	701	8.86	
Lagocephalus laevis	53.81	124	5.86	
Trachurus trecae	49.43	1673	5.38	2859
Dentex barnardi	46.80	754	5.10	2862
Raja miraletus	26.70	53	2.91	
Alloteuthis africana	21.79	8786	3.37	
Squatina oculata	21.75	4	2.37	
Atractoscion aequidens	17.93	19	1.93	
Chelidonichthys capensis	13.13	139	1.43	
Zeus faber	10.05	19	1.09	
Alectis alexandrinus	6.90	8	1.08	
Sarda sarda	9.68	4	1.05	
Pomadasys incisus	9.38	34	1.02	
Sphyræna guachancho	6.56	8	0.71	
Spondyliosoma cantharus	5.36	4	0.58	
Pomatomus saltatrix	5.29	4	0.58	
Citharus linguatula	4.46	113	0.49	
Sepia orbignyana	3.23	26	0.35	
Epinephelus aeneus	2.21	44	0.24	
Scorpaena stephanica	1.58	26	0.17	
Dentex angolensis	1.39	98	0.15	2858
Chaetodon hoefleri	1.13	8	0.12	
Sardinella aurita	1.05	8	0.11	
Chaetodon marcellae	0.45	8	0.05	
Illex coindetii	0.34	8	0.04	
Dicologlossa hexophthalma	0.19	8	0.02	
Total	918.16		99.97	

PROJECT STATION: 1293
 DATE: 16/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 931 Long E 1258
 start stop duration Purpose code: 3
 TIME :15:33:00 15:55:00 22 (min) Area code : 1
 LOG : 639.80 641.10 1.30 GearCond code:
 FDEPTH: 79 67 Validity code:
 BDEPTH: 79 67
 Towing dir: 350° Wire out: 260 m Speed: 35 kn*10
 Sorted: 65 Kg Total catch: 540.06 CATCH/HOUR: 1472.89

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	377.59	1170	25.64	
Selene dorsalis	274.77	551	18.66	2854
Umbrina canariensis	108.14	445	7.34	
Brachydeuterus auritus	92.18	674	6.26	
Chelidonichthys gabonensis	83.32	586	5.56	
Trachurus trecae	81.55	5.54	5.54	
Pagellus bellottii	76.91	338	5.22	2851
Sepia officinalis hierredda	49.64	213	3.37	
Citharus linguatula	47.86	1312	3.25	
Raja miraletus	46.09	71	3.13	
Conger conger	37.23	19	2.53	
Stromateus fiatola	28.36	19	1.93	
Illex coindetii	21.27	728	1.44	
Priacanthus arenatus	19.50	19	1.42	
Epinephelus guaza ?	14.45	5	0.98	
Sparus caeruleostictus *	14.18	19	0.96	
Dentex angolensis	13.36	164	0.91	2853
Scorpaena normani	13.12	106	0.89	
Atractoscion aequidens	10.64	19	0.72	
Zeus faber	10.64	19	0.72	
Branchiostegus semifasciatus	10.64	14	0.72	
Centrarchops chapini	8.86	8	0.60	
Dentex barnardi	8.18	46	0.56	2852
Parapristipoma humile	5.32	19	0.36	
Epinephelus aeneus	5.18	5	0.35	
Loligo vulgaris	3.55	55	0.24	
Uranoscopus polli	3.55	19	0.24	
Octopus sp	3.27	5	0.22	
Bembrops heterurus	1.77	35	0.12	
Brotula barbata	1.77	19	0.12	
Total	1472.89		100.00	

PROJECT STATION: 1297
 DATE: 18/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 956 Long E 1252
 start stop duration Purpose code: 3
 TIME :12:27:13 12:58:43 32 (min) Area code : 1
 LOG : 5742.72 5744.42 1.45 GearCond code:
 FDEPTH: 167 163 Validity code:
 BDEPTH: 167 163
 Towing dir: 345° Wire out: 510 m Speed: 31 kn*10
 Sorted: 105 Kg Total catch: 1202.90 CATCH/HOUR: 2255.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trigla lyra	101.00	592	41.19	
Pagellus bellottii	54.00	272	22.02	2855
Raja miraletus	24.36	52	9.93	
Octopus sp	16.44	24	6.70	
Alloteuthis africana	13.00	3944	5.30	
Seriola dumerili	6.76	8	2.76	
Trichiurus lepturus	6.04	20	2.46	
Epinephelus aeneus	5.80	4	2.37	
Citharus linguatula	5.76	36	2.35	
Caranx crysos	4.40	4	1.79	
Sepia orbignyana	2.56	16	1.04	
Dentex barnardi	2.24	12	0.91	
Decapterus rhonchus	1.48	24	0.60	
Sardinella aurita	0.56	4	0.23	
Trachinotus ovatus	0.44	4	0.18	
Fistularia petimba	0.36	4	0.15	
Total	245.20		99.98	

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1920.75	112984	85.16	
Brotula barbata	104.81	98	4.65	
Zeus faber	68.25	1268	3.03	
Uranoscopus polli	31.69	195	1.41	
Boops boops	21.94	609	0.97	
Dentex angolensis	19.31	71	0.86	2863
Dentex macrophthalmus	14.44	90	0.54	2864
Trachurus trecae	12.19	244	0.54	
Bembrops heterurus	12.19	146	0.54	
Malacocephalus laevis	9.75	561	0.43	
Oxymotus centrina	9.56	2	0.42	
Pterothrissus belloci	7.31	49	0.32	
Scorpaena normani	4.88	24	0.22	
Merluccius polli	4.88	122	0.22	
Todaropsis eblanae	2.44	146	0.11	
Chelidonichthys gabonensis	2.44	24	0.11	
Peristedion cataphractum	2.44	73	0.11	
Chlorophthalmus atlanticus	2.44	171	0.11	
Parapenaeus longirostris	1.31	24	0.06	
Sepia officinalis hierredda	1.31	24	0.06	
Total	2254.33		99.97	

PROJECT STATION: 1298
 DATE: 18/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 956
 start stop duration Long E 1251
 TIME :14:07:25 14:38:20 31 (min) Purpose code: 3
 LOG :5749.75 5751.39 1.42 Area code : 1
 FDEPTH: 230 227 GearCond code: 1
 BDEPTH: 230 227 Validity code:
 Towing dir: 345° Wire out: 700 m Speed: 32 kn*10

Sorted: 103 Kg Total catch: 765.70 CATCH/HOUR: 1482.00

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Cynorhops microlepis	851.81	56963	57.48		
Chlorophthalmus atlanticus	296.13	6056	19.98		
Merluccius polli	94.06	1812	6.35	2867	
Illex coindetii	33.10	1272	2.23		
Trichiurus lepturus	31.35	52	2.12		
MYCTOPHIDAE	26.13	9145	1.76		
Dentex macrocephalus	24.77	87	1.67	2866	
Zenopsis conchifer	24.39	331	1.65		
Brotula barbata	24.39	35	1.65		
Dentex angolensis	23.03	66	1.55	2865	
Bembrops heterurus	12.19	122	0.82		
Todaropsis eblanae	10.45	226	0.71		
Todaropsis sagittatus	5.23	52	0.35		
Epigonus telescopus	5.23	35	0.35		
Pterothrissus belloci	5.23	35	0.35		
Scorpaena stephanica	5.23	17	0.35		
Parapenaeus longirostris, fem	4.06	726	0.27	2868	
Parapenaeus longirostris, male	1.94	447	0.13	2869	
Sepia officinalis hierredda	1.16	52	0.08		
Malacocephalus laevis	0.97	52	0.07		
Solenocera africana	0.77	122	0.05		
Citharus linguatula	0.39	70	0.03		
Total	1482.01		100.00		

PROJECT STATION: 1301
 DATE: 18/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 955
 start stop duration Long E 1246
 TIME :21:45:08 22:15:08 30 (min) Purpose code: 3
 LOG :5777.01 5778.70 1.47 Area code : 1
 FDEPTH: 549 565 GearCond code: 1
 BDEPTH: 549 565 Validity code:
 Towing dir: 335° Wire out: 1450 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 89.80 CATCH/HOUR: 179.60

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
MYCTOPHIDAE	50.60	29036	28.17		
Nematocarcinus africanus	50.40	18028	28.06		
Gonostoma elongatum	31.00	1216	17.26		
GONOSTOMATIDAE	14.40	206	8.02		
Lamprogrammus sp	9.40	90	5.23		
Hoplostethus cadenati	7.00	234	3.90		
Malacocephalus laevis	2.20	20	1.22		
Merluccius polli	1.80	4	1.00		
Triplophos sp.	1.60	50	0.89		
Geryon sp.	1.40	4	0.78		
Lophius vaillanti	1.20	12	0.67		
Hymenocephalus italicus	1.20	126	0.67		
Coelorhynchus coelorhynchus	1.00	14	0.56		
Yarrella blackfordi	1.00	18	0.56		
Xenodermichthys copei	1.00	38	0.56		
Dibranchius atlanticus	0.60	6	0.33		
Chaunax pictus	0.60	6	0.33		
Chlorophthalmus atlanticus	0.60	12	0.33		
Munida sp. *	0.60	12	0.33		
Talismania sp.	0.60	24	0.33		
Nemichthys scolopaceus	0.40	14	0.22		
Etmopterus spinax	0.40	4	0.22		
Trichiurus lepturus	0.40	6	0.22		
Aristeus varidens, male	0.12	16	0.07	2877	
Glyphus marsupialis	0.10	8	0.06		
Aristeus varidens, female	0.04	2	0.02	2876	
Total	179.66		100.01		

PROJECT STATION: 1299
 DATE: 18/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 954
 start stop duration Long E 1248
 TIME :16:15:44 16:41:14 26 (min) Purpose code: 3
 LOG :5757.60 5758.86 1.23 Area code : 1
 FDEPTH: 354 318 GearCond code:
 BDEPTH: 354 318 Validity code:
 Towing dir: 340° Wire out: 1000 m Speed: 32 kn*10

Sorted: 49 Kg Total catch: 392.98 CATCH/HOUR: 906.88

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Shrimps, small, non comm.	377.54	105282	41.63		
Merluccius polli	365.54	3138	40.31	2870	
Coelorhynchus coelorhynchus	28.06	148	3.09		
Synagrops microlepis	24.00	1403	2.65		
Chlorophthalmus atlanticus	22.34	388	2.46		
Hymenocephalus italicus	18.65	1883	2.06		
Malacocephalus occidentalis	15.51	277	1.71		
Gadella imberbis	9.05	240	0.96		
Trichiurus lepturus	8.68	185	0.94		
Illex coindetii	8.49	185	0.94		
Etmopterus spinax	7.02	111	0.77		
Zenopsis conchifer	6.28	55	0.69		
Pterothrissus belloci	6.09	37	0.67		
Parapenaeus longirostris, fem	4.43	369	0.49	2871	
Bembrops heterurus	1.85	18	0.20		
Lophius vaillanti	1.66	37	0.18		
Xenolepidichthys dagleishi	0.74	55	0.08		
Parapenaeus longirostris, male	0.37	55	0.04	2872	
Scorpaena normani	0.37	18	0.04		
Chaunax pictus	0.18	55	0.02		
Zenion hololepis	0.02	18			
Peristedion cataphractum	0.02	18			
Total	906.89		99.99		

PROJECT STATION: 1302
 DATE: 19/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1019
 start stop duration Long E 1254
 TIME :02:36:55 03:10:15 33 (min) Purpose code: 3
 LOG :5811.31 5812.98 1.75 Area code : 1
 FDEPTH: 554 543 GearCond code:
 BDEPTH: 554 543 Validity code:
 Towing dir: 350° Wire out: 1450 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 284.90 CATCH/HOUR: 518.00

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Nematocarcinus africanus	275.09	64471	53.11		
Hoplostethus cadenati	65.09	2022	12.57		
Lamprogrammus sp	49.09	300	9.48		
GOBIIDAE	49.09	1049	9.48		
Gonostoma elongatum	38.18	1091	7.37		
Trichiurus lepturus	15.09	338	2.91		
Etmopterus spinax	5.09	49	0.98		
Xenodermichthys copei	4.00	369	0.77		
Aristeus varidens, male	3.09	449	0.60		
Illex coindetii	2.91	360	0.56	2878	
Yarrella blackfordi	2.00	9	0.39		
Aristeus varidens, female	2.00	80	0.39		
Nemichthys scolopaceus	1.45	80	0.28	2879	
Talismania sp	1.09	60	0.21		
Chlorophthalmus atlanticus	1.09	69	0.21		
Munida sp. *	1.09	20	0.21		
Plesiopeanaeus edwardsianus	1.09	200	0.21		
Glyphus marsupialis	1.09	249	0.21		
Glyphus marsupialis	0.36	49	0.07		
Total	517.98		100.01		

PROJECT STATION: 1300
 DATE: 18/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 955
 start stop duration Long E 1247
 TIME :19:34:14 20:04:39 30 (min) Purpose code: 3
 LOG :5767.76 5769.17 1.22 Area code : 1
 FDEPTH: 445 450 GearCond code:
 BDEPTH: 445 450 Validity code:
 Towing dir: 340° Wire out: 1050 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 68.50 CATCH/HOUR: 137.00

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Malacocephalus occidentalis	34.40	336	25.11		
Merluccius polli	29.00	30	21.17		
Shrimps, small, non comm.	15.18	2084	11.08		
Lamprogrammus exutus	10.66	520	7.78		
Yarrella blackfordi	6.20	166	4.53		
Illex coindetii	5.66	40	4.13		
Todaropsis eblanae	5.06	40	3.69		
Gonostoma elongatum	4.60	66	3.36		
Hoplostethus cadenati	4.40	196	3.21		
Coelorhynchus coelorhynchus	3.16	70	2.31		
Chlorophthalmus atlanticus	2.86	60	2.09		
Etmopterus spinax	2.76	56	2.01		
Nezumia aequalis	1.96	6	1.43		
Dibranchius atlanticus	1.56	60	1.14		
Aristeus varidens, female	1.46	76	1.07	2874	
Trichiurus lepturus	1.26	30	0.92		
Aristeus varidens, male	1.06	136	0.77	2873	
Hymenocephalus italicus	0.96	110	0.70		
Pterothrissus belloci	0.90	6	0.66		
Raja clavata	0.86	6	0.63		
Lophius vaillanti	0.66	10	0.48		
CONGRIDAE	0.50	16	0.36		
Plesiopeanaeus edwardsianus, m	0.48	16	0.35	2875	
Chaunax pictus	0.46	6	0.34		
Gadella imberbis	0.36	10	0.26		
Ebinania costaecanarie	0.36	10	0.26		
Triplophos sp	0.10	20	0.07		
NEMICHTHYIDAE	0.06	10	0.04		
Zenion hololepis	0.06	6	0.04		
Total	137.00		99.99		

PROJECT STATION: 1303
 DATE: 19/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1019
 start stop duration Long E 1256
 TIME :04:51:01 05:22:40 32 (min) Purpose code: 3
 LOG :5819.68 5821.29 1.73 Area code : 1
 FDEPTH: 443 452 GearCond code:
 BDEPTH: 443 452 Validity code:
 Towing dir: 345° Wire out: 1250 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 167.24 CATCH/HOUR: 313.58

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Shrimps, small, non comm	84.71	24705	27.01		
Hoplostethus cadenati	46.07	2353	14.69		
GONOSTOMATIDAE	27.79	696	8.86		
Trichiurus lepturus	24.38	536	7.77		
Aristeus varidens, male	19.63	2769	6.26	2880	
Aristeus varidens, female	17.44	1757	5.56	2881	
Malacocephalus occidentalis	14.51	195	4.63		
Illex coindetii	13.65	122	4.35		
Yarrella blackfordi	12.81	512	4.09		
OMMASTREPHIDAE	11.34	13	3.62		
Merluccius polli	6.34	13	2.02		
Nezumia aequalis	5.25	49	1.67		
Gadella imberbis	4.39	159	1.40		
Dibranchius atlanticus	4.39	244	1.40		
Halosaurus ovenii	3.90	219	1.24		
Coelorhynchus coelorhynchus	3.54	111	1.13		
Xenodermichthys copei	3.17	463	1.01		
Ebinania costaecanarie	3.06	208	0.98		
Etmopterus spinax	2.33	38	0.74		
Hymenocephalus italicus	1.71	195	0.55		
Chaceon maritae	1.35	13	0.43		
NEMICHTHYIDAE	1.22	86	0.39		
Munida sp	0.24	49	0.08		
Peristedion cataphractum	0.24	38	0.08		
Chaunax pictus	0.13	13	0.04		
Total	313.59		100.00		

DATE: 19/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1304
start stop duration POSITION: Lat S 1019
TIME : 07:55:55 08:26:13 30 (min) Purpose code: 3
LOG : 5837 20 5838 50 1.56 Area code : 1
FDEPTH: 243 243 GearCond code:
BDEPTH: 243 243 Validity code:
Towing dir: 325° Wire out: 780 m Speed: 30 kn*10
Sorted: 96 Kg Total catch: 1390 23 CATCH/HOUR: 2780 46

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Synagrops microlepis	2003 80	132	72 07	
Chlorophthalmus atlanticus	417 10	8342	15 00	
Merluccius polli	137 60	1764	4 95	2882
Dentex angolensis	58 70	136	2 11	2883
Parapenaeus longirostris, fem	56 76	8902	2 04	2886
Parapenaeus longirostris, male	39 56	9332	1 42	2885
Illex coindetii	22 80	258	0 82	
Bembrops heterurus	10 32	86	0 37	
Pterothrissus belloci	9 90	86	0 36	
Dentex macrophthalmas	7 10	32	0 26	2884
Zenopsis conchifer	4 74	86	0 17	
Lophius vaillanti	4 30	44	0 15	
Coelorrhinus coelorhincus	3 88	86	0 14	
Sepia orbignyana	2 16	130	0 08	
Solenocera africana	0 86	44	0 03	
CYNOGLOSSIDAE	0 44	44	0 02	
MEMICHTHYIDAE	0 44	86	0 02	
Total	2780 46		100 01	

DATE: 20/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1308
start stop duration POSITION: Lat S 1036
TIME : 05:30:34 06:01:20 31 (min) Purpose code: 3
LOG : 5915 42 5916 92 1 70 Area code : 1
FDEPTH: 29 31 GearCond code:
BDEPTH: 29 31 Validity code:
Towing dir: 315° Wire out: 145 m Speed: 30 kn*10
Sorted: 60 Kg Total catch: 446 87 CATCH/HOUR: 864 91

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Brachydeuterus auritus	500 81	7198	57 90	2894
Trachurus trecae	230 81	6054	26 69	2895
Chloroscombrus chrysurus	34 84	377	4 03	
Dentex barnardi	24 97	58	2 89	
Galeoides decadactylus	17 86	261	2 06	2897
Pagellus bellottii	14 52	29	1 68	
Arius parkii	11 61	58	1 06	2896
Sepia officinalis hierredda	9 15	15	0 91	
Lagocephalus laevigatus	7 84	15	0 77	
Selene dorsalis	6 68	15	0 91	
Sardinella aurita	2 19	74	0 25	2898
Dicologlossa cuneata	1 45	58	0 17	2899
Engraulis encrasicolus	1 32	29	0 15	
	0 87	132	0 10	
Total	864 92		100 00	

DATE: 19/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1305
start stop duration POSITION: Lat S 1019
TIME : 10:46:00 11:16:00 30 (min) Purpose code: 3
LOG : 845 20 846 50 1 30 Area code : 1
FDEPTH: 160 153 GearCond code:
BDEPTH: 160 153 Validity code:
Towing dir: 325° Wire out: 480 m Speed: 26 kn*10
Sorted: 111 Kg Total catch: 3446 70 CATCH/HOUR: 6893 40

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Synagrops microlepis	6757 40	604606	98 03	
Spicara alta	26 00	216	0 38	
Zenopsis conchifer	26 00	216	0 38	
Dentex angolensis	18 20	126	0 26	2888
Dentex barnardi	17 40	126	0 26	
Dentex macrophthalmas	13 60	92	0 20	2887
Illex coindetii	13 00	346	0 19	
Todaropsis eblanae	8 60	216	0 12	
Bembrops heterurus	4 40	42	0 06	
Trachurus trecae	4 40	86	0 06	
Ariomma bondi	4 40	42	0 06	
Total	6893 40		99 99	

DATE: 20/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1309
start stop duration POSITION: Lat S 1042
TIME : 07:35:23 08:05:35 30 (min) Purpose code: 3
LOG : 5928 35 5930 13 1 58 Area code : 1
FDEPTH: 79 78 GearCond code:
BDEPTH: 79 78 Validity code:
Towing dir: 325° Wire out: 280 m Speed: 30 kn*10
Sorted: 74 Kg Total catch: 797 13 CATCH/HOUR: 1594 26

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Selene dorsalis	477 78	1182	29 97	2905
Trachurus trecae	374 10	9546	23 47	2906
Trichiurus sp.	301 00	236	18 88	
Pagellus bellottii	201 00	1332	12 61	2900
Dentex angolensis	58 48	474	3 67	2903
Brachydeuterus auritus	53 54	322	3 36	2904
Chelidonichthys capensis	19 14	130	1 20	
Pterothrissus belloci	18 28	216	1 15	
Citharus linguatula	16 56	258	1 04	
Umbrina canariensis	16 12	86	1 01	
Dentex macrophthalmas	12 48	64	0 78	2901
Branchiostegus semifasciatus	10 10	46	0 63	
Chelidonichthys gabonensis	9 68	64	0 61	
Lagocephalus laevigatus	9 02	22	0 57	
Dentex barnardi	7 74	150	0 49	2902
Pseudotolithus sp.	7 30	44	0 46	
Boops boops	1 72	108	0 11	
Parapenaeus longirostris	0 22	22	0 01	
Total	1594 26		100 02	

DATE: 19/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1306
start stop duration POSITION: Lat S 1015
TIME : 14:21:32 14:51:25 32 (min) Purpose code: 3
LOG : 864 50 866 20 1 76 Area code : 1
FDEPTH: 78 74 GearCond code:
BDEPTH: 78 74 Validity code:
Towing dir: 350° Wire out: 260 m Speed: 31 kn*10
Sorted: 100 Kg Total catch: 1139 50 CATCH/HOUR: 2136 56

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Trachurus trecae	1017 94	12213	47 64	2889
Selene dorsalis	741 56	2053	34 71	2890
Pagellus bellottii	133 88	1644	6 27	2891
Brachydeuterus auritus	96 56	701	4 52	
Trichiurus lepturus	70 13	285	3 28	
Dentex barnardi	35 06	613	1 64	2892
Chelidonichthys gabonensis	17 63	328	0 83	
Sepia officinalis hierredda	8 81	174	0 41	
Pseudopenaeus prayensis	4 31	43	0 20	
Citharus linguatula	4 31	131	0 20	
Saurida brasiliensis	2 25	21	0 11	
Brotula barbata	2 25	21	0 11	
Scorpaena sp.	1 13	21	0 05	
Illex coindetii	0 75	21	0 04	
Total	2136 57		100 01	

DATE: 20/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1310
start stop duration POSITION: Lat S 1042
TIME : 09:57:39 10:28:44 31 (min) Purpose code: 3
LOG : 5943 70 5945 28 1 63 Area code : 1
FDEPTH: 130 130 GearCond code:
BDEPTH: 130 130 Validity code:
Towing dir: 325° Wire out: 480 m Speed: 30 kn*10
Sorted: 105 Kg Total catch: 628 44 CATCH/HOUR: 1216 34

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Trachurus trecae	960 00	22875	78 93	2909
Zenopsis conchifer	107 42	1932	8 83	
Illex coindetii	36 39	1659	2 99	
Chelidonichthys gabonensis	29 61	33	2 42	
Dentex macrophthalmas	15 29	128	1 26	2908
Brotula barbata	15 29	17	1 26	
Dentex angolensis	12 39	48	1 02	2907
Bembrops heterurus	9 87	141	0 81	
Raja miraletus	8 52	14	0 70	
Scorpaena normani	7 16	56	0 59	
Citharus linguatula	5 61	99	0 46	
Saurida brasiliensis	2 90	226	0 24	
Merluccius polli	1 35	27	0 11	
Peristedion cataphractum	1 35	70	0 11	
Uranoscopus polli	1 35	14	0 11	
Trichiurus lepturus	0 77	14	0 06	
Sepia officinalis hierredda	0 39	99	0 03	
Synagrops microlepis	0 39	126	0 03	
Spicara alta	0 14	14	0 01	
Chlorophthalmus atlanticus	0 14	14	0 01	
Total	1216 33		99 99	

DATE: 19/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1307
start stop duration POSITION: Lat S 1012
TIME : 16:23:23 16:54:32 31 (min) Purpose code: 3
LOG : 5878 09 5879 50 1 59 Area code : 1
FDEPTH: 19 18 GearCond code:
BDEPTH: 19 18 Validity code:
Towing dir: 350° Wire out: 90 m Speed: 31 kn*10
Sorted: 67 Kg Total catch: 4137 57 CATCH/HOUR: 8008 20

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Brachydeuterus auritus	4076 71	209880	50 91	
Trachurus trecae	1481 81	80044	18 50	2893
Stromateus fiatola	556 45	848	6 95	
Galeoides decadactylus	505 65	205	6 31	
Sphyraena guachancho	475 39	726	5 94	
Selene dorsalis	287 90	1092	3 60	
Pentheroscion mbizi	255 29	11493	3 19	
Illex coindetii	169 35	2903	2 11	
Chloroscombrus chrysurus	135 48	5686	1 69	
Trichiurus lepturus	42 39	484	0 53	
Engraulis encrasicolus	20 55	3025	0 26	
Cynoglossus senegalensis	1 22	122	0 02	
Total	8008 19		100 01	

DATE: 20/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1311
start stop duration POSITION: Lat S 1042
TIME : 11:38:09 12:10:25 32 (min) Purpose code: 3
LOG : 5951 66 5953 46 1 66 Area code : 1
FDEPTH: 182 181 GearCond code:
BDEPTH: 182 181 Validity code:
Towing dir: 320° Wire out: 580 m Speed: 31 kn*10
Sorted: 106 Kg Total catch: 1519 80 CATCH/HOUR: 2849 63

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
Synagrops microlepis	1677 38	125243	58 86	
Merluccius polli	546 00	10815	19 16	2913
Chlorophthalmus atlanticus	212 63	13348	7 46	
Brotula barbata	128 63	210	4 51	
Parapenaeus longirostris, fem	86 63	683	3 04	
Bembrops heterurus	70 88	11261	2 49	2910
Todaropsis eblanae	34 13	368	1 20	
Dentex angolensis	26 25	446	0 82	
Hymenocephalus italicus	18 94	53	0 66	2912
Dentex macrophthalmas	15 75	1549	0 55	
Parapenaeus longirostris, male	11 44	11	0 40	
Pterothrissus belloci	10 50	241	0 37	2911
Sepia officinalis hierredda	7 88	79	0 28	
	2 63	210	0 79	
Total	2849 67		99 99	

PROJECT STATION: 1312
 DATE: 20/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 1043
 start stop duration
 TIME : 11:17:23 13:47:19 30 (min) Purpose code: 3
 LOG : 5958.88 5960.48 1.50 Area code : 1
 FDEPTH: 238 241 GearCond code:
 BDEPTH: 238 241 Validity code:
 Towing dir: 320° Wire out: 750 m Speed: 31 kn*10

Sorted: 69 Kg Total catch: 947.90 CATCH/HOUR: 1895.80

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Chlorophthalmus atlanticus	736.60	18414	38.85		
Merluccius polli	504.60	6372	26.62	2914	
Synagrops microlepis	495.00	26860	26.15		
MYCTOPHIDAE	52.20	35496	2.75		
Parapeneus longirostris, fem.	37.80	4680	1.99	2916	
Parapeneus longirostris, male	23.20	3132	1.22	2917	
Sepia officinalis hierredra	8.80	580	0.46		
Pterothrissus belloci	8.80	58	0.46		
Dentex macropthalmus	7.20	50	0.38	2915	
Zenopsis conchifer	5.80	86	0.31		
Illex coindetii	5.80	58	0.31		
Hymenocephalus italicus	3.00	174	0.16		
Ariomma bondi	3.00	232	0.16		
Solenocera africana	3.00	348	0.16		
Total	1895.80		99.99		

PROJECT STATION: 1313
 DATE: 20/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 1043
 start stop duration
 TIME : 15:12:06 15:42:36 31 (min) Purpose code: 3
 LOG : 5966.29 5968.02 1.55 Area code : 1
 FDEPTH: 343 348 GearCond code:
 BDEPTH: 343 348 Validity code:
 Towing dir: 320° Wire out: 1000 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 425.11 CATCH/HOUR: 822.79

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Merluccius polli	486.87	3296	59.17	2918	
Nematocarcinus africanus	132.10	38309	16.06		
Hymenocephalus italicus	61.65	8166	7.49		
Centrophorus uyato	47.81	14	5.81		
Etmopterus spinax	22.65	1875	2.75		
Hoplostethus cadenati	15.10	592	1.84		
Yarella sp.	12.58	240	1.53		
Illex coindetii	11.32	114	1.28		
Yarella blackfordi	6.29	240	0.76		
Coelorinchus coelorhincus	5.03	64	0.61		
Chlorophthalmus atlanticus	5.03	114	0.61		
Shrimps, small, non comm.	3.77	1574	0.46		
Solenocera africana	2.52	277	0.31		
Zenopsis conchifer	1.26	25	0.15		
CONGOSTOMATIDAE	1.26	14	0.15		
Trichiurus lepturus	1.26	50	0.15		
Scorpaena sp.	1.26	226	0.15		
Synagrops microlepis	1.26	39	0.15		
Chaunax pictus	1.26	14	0.15		
Lophius vaillanti	1.26	14	0.15		
Parapeneus longirostris	0.64	101	0.08		
Aristeus varidens	0.64	75	0.08		
Total	822.82		99.99		

PROJECT STATION: 1314
 DATE: 20/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 1044
 start stop duration
 TIME : 19:03:11 19:33:07 30 (min) Purpose code: 3
 LOG : 5976.60 5978.20 1.52 Area code : 1
 FDEPTH: 436 440 GearCond code:
 BDEPTH: 436 440 Validity code:
 Towing dir: 325° Wire out: 1250 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 245.08 CATCH/HOUR: 490.16

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Nematocarcinus africanus	325.60	105080	66.43		
Hoplostethus cadenati	53.02	2102	10.82		
Malacocephalus laevis	37.62	1232	7.68		
Yarella blackfordi	12.88	462	2.63		
Illex coindetii	10.12	88	2.06		
CONGOSTOMATIDAE	7.38	122	1.51		
Aristeus varidens, female	7.04	440	1.44	2920	
Aristeus varidens, male	5.62	760	1.15	2919	
CONGRIDAE	5.50	186	1.12		
Lophius vaillanti	3.20	22	0.65		
Chlorophthalmus atlanticus	2.76	66	0.56		
Chaceon maritae	2.64	12	0.54		
Coelorinchus sp.	2.42	66	0.49		
Gadella imberbis	2.20	56	0.45		
Triplophos sp.	1.98	254	0.40		
Dibranchius atlanticus	1.44	66	0.29		
Lamprogrammus exutus	1.32	34	0.27		
Bathypsectes piperitus	1.22	12	0.25		
Hymenocephalus italicus	1.22	154	0.25		
Todaropsis eblanae	1.10	22	0.22		
Trichiurus lepturus	1.10	44	0.22		
Etmopterus spinax	1.10	110	0.22		
Solenocera africana	0.56	56	0.11		
Halosaurus ovenii	0.56	34	0.11		
Peristedion cataphractum	0.44	110	0.09		
Xenodermichthys copei	0.12	12	0.02		
Total	490.16		99.98		

PROJECT STATION: 1315
 DATE: 20/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 1044
 start stop duration
 TIME : 22:01:33 22:31:25 30 (min) Purpose code: 3
 LOG : 5987.15 5988.76 1.50 Area code : 1
 FDEPTH: 570 581 GearCond code:
 BDEPTH: 570 581 Validity code:
 Towing dir: 317° Wire out: 1500 m Speed: 30 kn*10

Sorted: 24 Kg Total catch: 149.20 CATCH/HOUR: 298.40

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Nematocarcinus africanus	132.00	50688	44.24		
Hoplostethus cadenati	37.20	1284	12.47		
Yarella blackfordi	32.40	984	10.86		
Etmopterus spinax	20.40	120	6.84		
Gonostoma sp.	19.20	348	6.43		
Lamprogrammus exutus	13.20	24	4.42		
Laemonema laureysi	13.20	120	4.42		
Trichiurus lepturus	12.00	288	4.02		
Triplophos sp.	3.60	504	1.21		
Talismania sp.	3.60	144	1.21		
Todaropsis eblanae	2.40	24	0.80		
Xenodermichthys copei	1.20	60	0.40		
Nezumia aequalis	1.20	12	0.40		
Munida sp. *	1.20	12	0.40		
Gadella maraldi	1.20	24	0.40		
Aristeus varidens	1.20	108	0.40		
Nemichthys scolopaceus	0.24	24	0.08		
CONGRIDAE	0.24	12	0.08		
Glyphis marsupialis	0.12	24	0.04		
Total	295.80		99.12		

PROJECT STATION: 1316
 DATE: 21/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 1106
 start stop duration
 TIME : 02:41:17 03:10:28 29 (min) Purpose code: 3
 LOG : 6019.88 6021.41 1.50 Area code : 1
 FDEPTH: 548 548 GearCond code:
 BDEPTH: 548 548 Validity code:
 Towing dir: 358° Wire out: 1500 m Speed: 31 kn*10

Sorted: 36 Kg Total catch: 199.20 CATCH/HOUR: 412.14

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Hoplostethus cadenati	198.62	7138	48.19		
Yarella blackfordi	48.00	1523	11.65		
Gonostoma sp.	43.03	745	10.44		
Chlorophthalmus atlanticus	26.48	695	6.43		
Lamprogrammus exutus	23.17	1241	5.62		
Trichiurus lepturus	11.59	397	2.81		
Nematocarcinus africanus	11.59	2510	2.81		
Triplophos sp.	9.93	1357	2.41		
Etmopterus spinax	8.28	66	2.01		
Aristeus varidens, male	6.62	977	1.61	2922	
Aristeus varidens, female	6.62	414	1.61	2921	
Gadella imberbis	6.62	281	1.61		
Xenodermichthys copei	6.62	430	1.61		
Lophius vaillanti	1.66	33	0.40		
Laemonema laureysi	1.66	17	0.15		
Ariomma bondi	0.62	17	0.15		
Nemichthys scolopaceus	0.62	50	0.15		
Munida sp. *	0.17	33	0.04		
Nezumia aequalis	0.17	33	0.04		
Total	412.07		99.99		

PROJECT STATION: 1317
 DATE: 21/ 5/97 GEAR TYPE: BT No. POSITION: Lat S 1105
 start stop duration
 TIME : 04:35:05 05:05:32 30 (min) Purpose code: 3
 LOG : 6026.56 6028.06 1.56 Area code : 1
 FDEPTH: 448 447 GearCond code:
 BDEPTH: 448 447 Validity code:
 Towing dir: 358° Wire out: 1250 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 249.05 CATCH/HOUR: 498.10

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Nematocarcinus africanus	238.00	88060	47.78		
Merluccius polli	138.50	210	27.81	2923	
Yarella blackfordi	29.50	970	5.92		
CONGOSTOMATIDAE	17.70	430	3.55		
Malacocephalus laevis	15.00	680	3.01		
Aristeus varidens, female	7.60	890	1.53	2924	
Hoplostethus cadenati	7.50	352	1.51		
Chlorophthalmus atlanticus	7.20	170	1.45		
Aristeus varidens, male	6.40	1010	1.28	2925	
Triplophos sp.	5.00	580	1.00		
Illex coindetii	4.60	30	0.92		
Solenocera africana	3.10	250	0.62		
Nezumia aequalis	2.90	30	0.58		
Gadella imberbis	2.50	150	0.50		
Etmopterus spinax	2.40	20	0.48		
Xenodermichthys copei	2.20	480	0.44		
Halosaurus ovenii	2.00	120	0.40		
Epigonus telescopus	1.50	20	0.30		
Trichiurus lepturus	1.10	20	0.22		
MYCTOPHIDAE	1.00	180	0.20		
Coelorinchus coelorhincus	0.90	70	0.18		
NEMICHTHIDAE	0.40	40	0.08		
Ariomma bondi	0.40	10	0.08		
Synagrops microlepis	0.20	20	0.04		
Epigonus sp.	0.20	20	0.04		
Munida sp. *	0.10	10	0.02		
CONGRIDAE	0.10	10	0.02		
Peristedion cataphractum	0.10	10	0.02		
Total	498.10		99.98		

PROJECT STATION: 1318
 DATE: 21/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1104 Long E 1330
 start stop duration
 TIME :06:03:05 06:33:11 30 (min) Purpose code: 3
 LOG :6032 17 6033 62 1.48 Area code : 1
 FDEPTH: 351 353 GearCond code:
 BDEPTH: 351 353 Validity code:
 Towing dir: 169° Wire out: 1050 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 468.52 CATCH/HOUR: 937.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	523.40	186914	55.86	
Merluccius polli	262.90	612	28.05	2926
Malacocephalus laevis	23.22	540	2.48	
Trichiurus lepturus	22.50	792	2.40	
MYCTOPHIDAE	18.98	37964	2.03	
Centrophorus uyato	17.20	4	1.84	
Synagrops microlepis	17.10	1404	1.82	
GONOSTOMATIDAE	11.88	216	1.27	
Etmopterus spinax	6.66	234	0.71	
Paralepis sp.	6.30	288	0.67	
CONGRIDAE	5.22	90	0.56	
Gadella imberbis	4.50	234	0.48	
Yarella blackfordi	3.96	144	0.42	
Bathynectes piperiti	3.42	36	0.36	
Hymenoccephalus italicus	2.52	270	0.27	
Solenocera africana	1.98	216	0.21	
Todarodes sp.	1.44	18	0.15	
Chlorophthalmus atlanticus	1.08	36	0.12	
Chaunax pictus	0.72	18	0.08	
Hoplostethus cadonati	0.72	54	0.08	
Zenopsis conchifer	0.54	18	0.06	
Aristeus varidens, female	0.18	36	0.02	
Aristeus varidens, male	0.18	54	0.02	
Zenion hololepis	0.18	18	0.02	
Peristedion cataphractum	0.18	36	0.02	
NEMICHTHYIDAE	0.18	36	0.02	
Total		937.04	100.02	

PROJECT STATION: 1319
 DATE: 21/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1106 Long E 1332
 start stop duration
 TIME :09:09:06 09:29:08 20 (min) Purpose code: 3
 LOG :6040 04 6041 07 1.02 Area code : 1
 FDEPTH: 265 262 GearCond code:
 BDEPTH: 265 262 Validity code:
 Towing dir: 360° Wire out: 780 m Speed: 30 kn*10

Sorted: 76 Kg Total catch: 633.75 CATCH/HOUR: 1901.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	850.50	9948	44.73	2927
MYCTOPHIDAE	604.50	171420	31.79	
Trichiurus lepturus	207.00	120	10.89	
Synagrops microlepis	93.00	8190	4.89	
Pterothrissus belloci	59.70	360	3.14	
Dentex macrophthalmus	43.35	210	2.28	2928
Parapanaeus longirostris, fem.	19.50	4134	1.03	2930
Chlorophthalmus atlanticus	12.00	330	0.63	
Parapanaeus longirostris, male	10.20	2400	0.54	2929
Zenopsis conchifer	1.50	30	0.08	
Total		1901.25	100.00	

PROJECT STATION: 1320
 DATE: 21/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1105 Long E 1335
 start stop duration
 TIME :10:55:39 11:27:58 32 (min) Purpose code: 3
 LOG :6046 84 6048 74 1.71 Area code : 1
 FDEPTH: 158 152 GearCond code:
 BDEPTH: 158 152 Validity code:
 Towing dir: 350° Wire out: 500 m Speed: 31 kn*10

Sorted: 41 Kg Total catch: 270.30 CATCH/HOUR: 506.81

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	255.00	2104	50.31	
Dentex macrophthalmus	65.25	450	12.87	2932
Trichiurus lepturus	57.00	285	11.25	
Pterothrissus belloci	39.00	240	7.70	
Dentex angolensis	22.31	107	4.40	2931
Chelidonichthys capensis	12.00	90	2.37	
Brotula barbata	9.00	17	1.78	
Parapanaeus longirostris, fem.	7.50	1545	1.48	2933
Zenopsis conchifer	7.50	90	1.48	
Todaropsis eblanae	6.00	165	1.18	
Atractoscion aequidens	5.06	2	1.00	
Merluccius polli	4.50	180	0.89	
Bembrops heterurus	4.50	45	0.89	
Parapanaeus longirostris, male	3.00	870	0.59	2934
Illex coindetii	3.00	165	0.59	
Scorpaena stephanica	1.50	15	0.30	
Boops boops	1.50	15	0.30	
Pteroscion pelli	0.75	2	0.15	
Nezumia aequalis	0.60	105	0.12	
MYCTOPHIDAE	0.60	285	0.12	
Hymenoccephalus italicus	0.45	60	0.09	
Chlorophthalmus atlanticus	0.30	30	0.06	
Sepia officinalis hierredda	0.30	30	0.06	
Citharus linguatula	0.30	15	0.06	
Total		506.92	100.04	

PROJECT STATION: 1321
 DATE: 21/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1103 Long E 1343
 start stop duration
 TIME :14:12:36 14:42:52 30 (min) Purpose code: 3
 LOG :6057 86 6059 39 1.63 Area code : 1
 FDEPTH: 75 75 GearCond code:
 BDEPTH: 75 75 Validity code:
 Towing dir: 355° Wire out: 25 m Speed: 30 kn*10

Sorted: 73 Kg Total catch: 282.30 CATCH/HOUR: 564.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	345.00	2234	61.11	2935
Trichiurus lepturus	166.00	1106	11.59	
Synagrops microlepis	53.00	7536	9.39	
Trachurus trecae	36.00	130	6.38	2936
Selene dorsalis	21.60	36	3.83	2937
Pagellus bellottii	9.60	54	1.70	2938
Zeus faber	8.00	40	1.42	
Dentex macrophthalmus	5.00	32	0.89	2939
Sepia elegans	4.00	190	0.71	
Pterothrissus belloci	4.00	40	0.71	
Citharus linguatula	4.00	50	0.71	
Brotula barbata	2.40	10	0.43	
Torpedo torpedo	2.00	10	0.35	
Bembrops heterurus	1.00	10	0.18	
Zenopsis conchifer	1.00	10	0.18	
Atractoscion aequidens	0.80	4	0.14	
Dentex barnardi	0.60	10	0.11	
Boops boops	0.40	10	0.07	
Dentex angolensis	0.20	4	0.04	
Total		564.60	100.04	

PROJECT STATION: 1322
 DATE: 21/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1101 Long E 1350
 start stop duration
 TIME :16:25:29 16:54:48 29 (min) Purpose code: 3
 LOG :6068 35 6069 79 1.69 Area code : 1
 FDEPTH: 26 24 GearCond code:
 BDEPTH: 26 24 Validity code:
 Towing dir: 350° Wire out: 100 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 659.19 CATCH/HOUR: 1363.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	434.69	1343	31.87	
Galeoides decadactylus	226.45	523	16.60	
Pomadasys incisus	142.92	523	10.48	
Pteroscion pelli	135.41	2208	9.93	
Pseudotolithus typus	111.06	250	8.14	
Pomadasys rogeri	108.10	91	7.93	
Pentaneus quinquearius	37.55	956	2.75	
Dasyatis marmorata	35.50	23	2.60	
Brachydeuterus auritus	29.13	341	2.14	2940
Trachurus trecae	27.31	91	2.00	2941
Torpedo marmorata	20.94	23	1.54	
Dasyatis margarita	20.71	46	1.52	
SOLEIDAE	13.66	410	1.00	
Chloroscombus chrysurus	9.79	1024	0.72	
Ilisha africana	7.51	91	0.55	
Sepia elegans	2.50	46	0.18	
Panulirus regius	0.48	2	0.04	
Total		1363.71	99.99	

PROJECT STATION: 1323
 DATE: 22/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1129 Long E 1342
 start stop duration
 TIME :05:38:30 05:58:41 20 (min) Purpose code: 3
 LOG :6107 09 6108 11 1.08 Area code : 1
 FDEPTH: 30 30 GearCond code:
 BDEPTH: 30 30 Validity code:
 Towing dir: 355° Wire out: 150 m Speed: 30 kn*10

Sorted: 93 Kg Total catch: 567.20 CATCH/HOUR: 1701.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ilisha africana	598.95	11757	35.20	
Trichiurus lepturus	258.63	471	15.20	
Pseudotolithus typus	219.03	744	12.87	2944
Pteroscion pelli	201.69	8292	11.85	2945
Galeoides decadactylus	113.85	348	6.69	
Chloroscombus chrysurus	108.96	594	6.40	
Sphyraxea guachancho	82.95	99	4.87	2943
Selene dorsalis	56.43	198	3.32	2946
Brachydeuterus auritus	14.61	174	0.86	2942
Pagellus bellottii	12.36	24	0.73	
Sardinella maderensis	8.91	24	0.52	
Dicologlossa cuneata	5.19	75	0.31	
Umbrina canariensis	4.95	51	0.29	
Pomadasys incisus	4.95	24	0.29	
Bembrops greyi	4.47	51	0.26	
Cynoglossus senegalensis	4.20	24	0.25	
Engraulis encrasicolus	0.75	99	0.04	
Trachurus trecae, juvenile	0.51	24	0.03	
Total		1701.42	99.98	

PROJECT STATION: 1324
 DATE: 22/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1132 Long E 1333
 start stop duration
 TIME :07:35:40 07:55:10 20 (min) Purpose code: 3
 LOG :6119 80 6120 85 0.98 Area code : 1
 FDEPTH: 80 78 GearCond code:
 BDEPTH: 80 78 Validity code:
 Towing dir: 350° Wire out: 280 m Speed: 30 kn*10

Sorted: 131 Kg Total catch: 1243.38 CATCH/HOUR: 3730.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	1973.85	408537	52.92	
Trichiurus lepturus	591.09	1722	15.85	
Dentex macrophthalmus	586.89	3165	15.73	2953
Umbrina canariensis	189.27	501	5.07	2947
Selene dorsalis	99.36	195	2.66	2948
Citharus linguatula	57.45	1083	1.54	
Dasyatis margarita	44.10	27	1.18	
Dentex barnardi	33.57	57	0.90	2949
Pterothrissus belloci	30.24	168	0.81	
Pagellus bellottii	27.75	138	0.74	2951
Chelidonichthys capensis	23.58	279	0.63	
Dentex angolensis	20.25	249	0.54	2950
Trachurus trecae	18.33	1167	0.49	2952
Chelidonichthys gabonensis	16.92	111	0.45	
Octopus vulgaris	8.61	27	0.23	
Chaetodon hoefleri	4.44	27	0.12	
Dentex gibbosus	2.79	57	0.07	
Sepia elegans	1.65	57	0.04	
Total		3730.14	99.97	

PROJECT STATION: 1325
 DATE: 22/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 1129 Long E 1325
 start stop duration
 TIME :10:08:04 10:38:05 30 (min) Purpose code: 3
 LOG :6137 30 6138 66 1.61 Area code : 1
 FDEPTH: 139 142 GearCond code:
 BDEPTH: 139 142 Validity code:
 Towing dir: 220° Wire out: 480 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 277.00 CATCH/HOUR: 554.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	425.60	43810	76.82	
Illex coindetii	72.80	4610	13.14	
Dentex angolensis	15.20	72	2.74	2955
Dentex macrophthalmus	15.20	184	2.74	2954
Zeus faber	6.40	8	1.16	
Torpedo torpedo	4.80	8	0.87	
Dentex gibbosus	3.20	8	0.58	
Peristedion cataphractum	3.20	64	0.58	
Saurida brasiliensis	2.40	24	0.43	
Pagellus bellottii	1.60	8	0.29	
Scorpaena stephanica	1.60	32	0.29	
Sepia officinalis hierredda	0.80	16	0.14	
Citharus linguatula	0.80	24	0.14	
Trachurus trecae	0.40	8	0.07	
Total		554.00	99.99	

PROJECT STATION:1326
 DATE:22/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 1132 Long E 1323
 start stop duration
 TIME :11:42:20 12:17:47 35 (min) Purpose code: 3
 LOG :6143.22 6144.88 1.99 Area code : 1
 FDEPTH: 255 260 GearCond.code:
 BDEPTH: 255 260 Validity code:
 Towing dir: 30° Wire out: 780 m Speed: 31 kn*10
 Sorted: 118 Kg Total catch: 1914.30 CATCH/HOUR: 3281.66

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MYCTOPHIDAE	1628.40	810086	49.62	
Synagrops microlepis	632.57	50146	19.28	
Dentex macrophthalmus	541.03	3051	16.49	2956
Merluccius polli	341.83	861	10.42	2957
Epigonus telescopus	34.97	350	1.07	
Parapenaeus longirostris, fem.	21.60	3946	0.66	2958
Brotula barbata	18.86	26	0.57	
Parapenaeus longirostris, male	10.80	2745	0.33	2959
Nezumia aequalis	10.80	994	0.33	
Chlorophthalmus atlanticus	10.80	295	0.33	
Illex coindetii	5.31	187	0.16	
Zenopsis conchifer	5.31	81	0.16	
Pterothrissus belloci	5.31	53	0.16	
Sepia sp.	2.74	106	0.08	
Scorpaena normani	2.74	26	0.08	
CONGRIDAE	2.74	161	0.08	
Bombrops heterurus	2.74	26	0.08	
Peristedion cataphractum	2.74	53	0.08	
Citharus linguatula	0.34	53	0.01	
Total	3281.63		99.99	

PROJECT STATION: 1329
 DATE:22/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 1132 Long E 1319
 start stop duration
 TIME :17:32:29 18:02:10 30 (min) Purpose code: 3
 LOG :6165.55 6166.87 1.52 Area code : 1
 FDEPTH: 549 562 GearCond.code:
 BDEPTH: 549 562 Validity code:
 Towing dir: 15° Wire out:1500 m Speed: 30 kn*10
 Sorted: 54 Kg Total catch: 262.81 CATCH/HOUR: 525.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	306.00	11322	58.22	
Shrimps, small, non comm	94.00	34282	17.88	
Lamprogrammus exutus	30.90	912	5.88	
Yarella blackfordi	19.00	610	3.61	
CONOSTOMATIDAE	13.80	240	2.63	
Gadella imberbis	8.80	350	1.67	
Illex coindetii	7.40	40	1.41	
Malacocephalus laevis	6.40	40	1.22	
C E P H A L O P O D A	6.30	20	1.20	
Todaropsis eblanae	5.70	30	1.08	
Etmopterus spinax	5.60	120	1.07	
Centrophorus uyato	5.30	2	1.01	
Aristeus varidens, female	2.56	150	0.49	2966
Xenodermichthys copei	2.10	240	0.40	
Talismania sp.	2.10	80	0.40	
Chlorophthalmus atlanticus	2.10	50	0.40	
Hirundichthys affinis	1.80	10	0.34	
Triplophos sp.	1.60	230	0.30	
Plesiopeanaeus edwardsianus	1.50	60	0.29	
Aristeus varidens, male	0.96	142	0.18	2967
Ebinania costaeacanarie	0.70	40	0.13	
CONGRIDAE	0.40	40	0.08	
Coelorinchus coelorhincus	0.20	10	0.04	
PASIPHAEDIDAE	0.10	10	0.02	
Melanocetus johnsoni	0.10	10	0.02	
Coelorinchus sp.	0.10	10	0.02	
Dibranchius atlanticus	0.10	10	0.02	
Total	525.62		100.01	

PROJECT STATION:1327
 DATE:22/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 1132 Long E 1321
 start stop duration
 TIME :13:39:09 14:08:56 30 (min) Purpose code: 3
 LOG :6151.15 6152.59 1.60 Area code : 1
 FDEPTH: 352 362 GearCond.code:
 BDEPTH: 352 362 Validity code:
 Towing dir: 22° Wire out:1000 m Speed: 31 kn*10
 Sorted: 103 Kg Total catch: 1215.60 CATCH/HOUR: 2431.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	1488.40	9128	61.22	2960
Nematocarcinus africanus	288.00	133996	11.85	
Etmopterus spinax	231.20	10790	9.51	
Laemonema laureysi	162.40	2752	6.68	
Hymenocephalus italicus	61.40	7174	2.53	
Pterothrissus belloci	59.00	344	2.43	
Hoplostethus cadenati	49.20	1770	2.02	
Synagrops microlepis	29.60	2386	1.22	
Chlorophthalmus atlanticus	12.40	344	0.51	
CONGRIDAE	7.40	24	0.30	
Centrophorus uyato	7.40	24	0.30	
Aristeus varidens, male	7.40	1066	0.30	2962
Gadella imberbis	7.40	344	0.30	
Scorpaena sp.	7.40	712	0.30	
Aristeus varidens, female	5.00	910	0.21	2961
Malacocephalus laevis	2.40	24	0.10	
Trichiurus lepturus	2.40	72	0.10	
Solenocera africana	2.40	294	0.10	
Chaunax pictus	0.24	24	0.01	
Nezumia aequalis	0.24	24	0.01	
Total	2431.28		100.00	

PROJECT STATION:1330
 DATE:22/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 1156 Long E 1322
 start stop duration
 TIME :22:10:45 22:40:41 30 (min) Purpose code: 3
 LOG :6196.82 6198.23 1.46 Area code : 1
 FDEPTH: 561 558 GearCond.code:
 BDEPTH: 561 558 Validity code:
 Towing dir: 350° Wire out:1500 m Speed: 30 kn*10
 Sorted: 63 Kg Total catch: 434.20 CATCH/HOUR: 868.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	466.20	19006	53.68	
Yarella blackfordi	120.20	3652	13.84	
Nematocarcinus africanus	107.80	41502	12.41	
Lamprogrammus exutus	74.20	1130	8.54	
CONOSTOMATIDAE	28.00	476	3.22	
Trichiurus lepturus	21.00	532	2.42	
Triplophos sp.	15.40	1950	1.77	
Merluccius polli	12.60	14	1.45	
Gadella imberbis	7.00	224	0.81	
Aristeus varidens, male	2.80	434	0.32	2969
CONGRIDAE	2.80	168	0.32	
Etmopterus spinax	2.80	112	0.32	
Todaropsis eblanae	1.40	14	0.16	
MACROURIDAE	1.40	42	0.16	
Talismania sp.	1.40	28	0.16	
Aristeus varidens, female	1.40	98	0.16	2968
Munida sp.	1.40	98	0.16	
Nezumia aequalis	0.40	98	0.05	
Xenodermichthys copei	0.28	42	0.03	
Total	868.48		99.98	

PROJECT STATION:1328
 DATE:22/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 1132 Long E 1320
 start stop duration
 TIME :15:30:42 16:01:03 30 (min) Purpose code: 3
 LOG :6158.15 6159.67 1.61 Area code : 1
 FDEPTH: 459 451 GearCond.code:
 BDEPTH: 459 451 Validity code:
 Towing dir: 28° Wire out:1250 m Speed: 31 kn*10
 Sorted: 68 Kg Total catch: 374.02 CATCH/HOUR: 748.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	256.00	12258	38.23	
Merluccius polli	123.76	254	16.54	2963
Shrimps, small, non comm	109.46	49256	14.63	
Gadella imberbis	67.22	2586	8.99	
Lamprogrammus exutus	27.18	594	3.63	
Yarella blackfordi	26.30	1024	3.52	
Etmopterus spinax	25.08	660	3.35	
Chlorophthalmus atlanticus	12.98	330	1.74	
Aristeus varidens, female	12.76	834	1.71	2965
Aristeus varidens, male	10.78	1450	1.44	2964
CONOSTOMATIDAE	10.02	176	1.34	
Illex coindetii	6.28	56	0.84	
Xenodermichthys copei	5.72	672	0.76	
Nezumia aequalis	4.18	34	0.56	
Todaropsis eblanae	4.08	22	0.55	
Synagrops microlepis	2.98	198	0.40	
Malacocephalus laevis	2.10	166	0.28	
CONGRIDAE	1.98	210	0.26	
Epigonus telescopus	1.66	12	0.22	
Triplophos sp.	1.44	188	0.19	
Halosaurus ovenii	1.44	132	0.19	
Hymenocephalus italicus	1.44	210	0.19	
OMASTREPHIDAE	1.10	22	0.15	
Coelorinchus coelorhincus	1.10	22	0.15	
Solenocera africana	0.22	12	0.03	
CHIMAERIDAE	0.22	12	0.03	
Ebinania costaeacanarie	0.22	12	0.03	
Paralepis sp.	0.22	12	0.03	
Peristedion cataphractum	0.12	12	0.02	
Total	748.04		100.00	

PROJECT STATION:1331
 DATE:23/ 5/97 GEAR TYPE: BT No: POSITION:Lat S 1157 Long E 1324
 start stop duration
 TIME :00:18:07 00:48:11 30 (min) Purpose code: 3
 LOG :6205.38 6206.80 1.58 Area code : 1
 FDEPTH: 448 451 GearCond.code:
 BDEPTH: 448 451 Validity code:
 Towing dir: 345° Wire out:1250 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 212.70 CATCH/HOUR: 425.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	128.00	6292	30.09	
Yarella blackfordi	92.80	2690	21.81	
CONOSTOMATIDAE	64.00	1242	15.04	
Hoplostethus cadenati	41.60	1712	9.78	
Merluccius polli	24.00	32	5.64	
Triplophos sp.	16.00	2026	3.76	
Gadella imberbis	11.20	768	2.63	
Halosaurus ovenii	8.00	544	1.88	
Lamprogrammus exutus	8.00	192	1.13	
Trichiurus lepturus	4.80	144	1.13	
Aristeus varidens, male	4.80	832	1.13	2971
Aristeus varidens, female	4.80	496	1.13	2970
Pterothrissus belloci	3.20	16	0.75	
Gadella maraldi	3.20	208	0.75	
CONGRIDAE	1.60	80	0.38	
Nezumia aequalis	1.60	160	0.38	
Epigonus telescopus	1.60	16	0.38	
Chlorophthalmus atlanticus	1.60	48	0.38	
Callinectes amnicola	1.60	16	0.38	
Laemonema laureysi	1.60	48	0.38	
Xenodermichthys copei	0.48	80	0.11	
MYCTOPHIDAE	0.48	160	0.11	
Etmopterus spinax	0.40	144	0.09	
Total	425.36		99.99	

DATE: 23/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1332
 start stop duration POSITION: Lat S 1157
 TIME : 02:14:19 02:44:23 30 (min) Purpose code: 3 Long E 1327
 LOG : 6213 24 6214 60 1.59 Area code : 1
 FDEPTH: 347 349 GearCond code:
 BDEPTH: 347 349 Validity code:
 Towing dir: 335° Wire out: 1000 m Speed: 31 kn*10

Sorted: 71 Kg Total catch: 545.96 CATCH/HOUR: 1091.92

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
weight	numbers			
Chlorophthalmus atlanticus	278.40	25056	25.50	
Merluccius polli	264.40	618	24.21	2974
Nematocarcinus africanus	244.80	64464	22.42	
Etmopterus spinax	120.00	2484	10.99	
Hymenocephalus italicus	49.60	3264	4.54	
Laemonema laureysi	35.20	522	3.22	
GONOSTOMATIDAE	22.40	384	2.05	
Pterothrissus belloci	16.00	112	1.47	
Yarrella blackfordi	16.00	400	1.47	
Trichiurus lepturus	16.00	240	1.47	
Centrophorus uyato	7.60	2	0.70	
Dentex macrophthalmus	4.80	16	0.44	
Coelorinchus acanthiger	4.80	96	0.44	
Todaropsis eblanae	1.60	16	0.15	
Synagrops microlepis	1.60	64	0.15	
Squalus sp	1.60	32	0.15	
Hoplostethus cadenati	1.60	160	0.15	
Lophius vaillanti	1.60	32	0.15	
Aristeus varidens, female	1.60	256	0.15	2972
Gadella maraldi	0.60	32	0.05	
Halosaurus ovenii	0.60	64	0.05	
Nemichthys scolopaceus	0.40	96	0.04	
Aristeus varidens, male	0.40	94	0.04	2973
CONGRIDAE	0.16	16	0.01	
Parapenaeus longirostris, fem.	0.16	32	0.01	
Total	1091.92		100.02	

DATE: 23/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1333
 start stop duration POSITION: Lat S 1157
 TIME : 05:42:37 06:12:34 30 (min) Purpose code: 3 Long E 1330
 LOG : 6224 73 6226 30 1.62 Area code : 1
 FDEPTH: 257 243 GearCond code:
 BDEPTH: 257 243 Validity code:
 Towing dir: 20° Wire out: 750 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 552.91 CATCH/HOUR: 1105.82

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
weight	numbers			
Dentex macrophthalmus	327.66	2028	29.63	2975
Chlorophthalmus atlanticus	218.80	6116	19.79	
Shrimps, small, non comm.	171.60	122180	15.52	
Merluccius polli	148.20	936	13.40	2976
Trichiurus lepturus	107.26	2302	9.70	
Parapenaeus longirostris, fem	42.12	5578	3.81	2977
Hoplostethus cadenati	32.76	1054	2.96	
Parapenaeus longirostris, male	30.04	4330	2.72	2978
Zenopsis conchifer	8.98	118	0.81	
Synagrops microlepis	7.02	936	0.63	
Pterothrissus belloci	4.30	40	0.39	
MYCTOPHIDAE	2.34	468	0.21	
Sepia officinalis hierreda	1.96	40	0.18	
Scorpaena normani	0.78	40	0.07	
Solenocera africana	0.40	118	0.04	
Coelorinchus sp	0.40	40	0.04	
CYNOGLOSSIDAE	0.40	40	0.04	
Bembrops heterurus	0.40	40	0.04	
Citharus linguatula	0.40	40	0.04	
Total	1105.82		100.02	

DATE: 23/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1334
 start stop duration POSITION: Lat S 1157
 TIME : 07:28:25 07:50:46 22 (min) Purpose code: 3 Long E 1331
 LOG : 6231 20 6232 28 1.13 Area code : 1
 FDEPTH: 175 172 GearCond code:
 BDEPTH: 175 172 Validity code:
 Towing dir: 25° Wire out: 500 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 862.46 CATCH/HOUR: 2352.16

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
weight	numbers			
Dentex macrophthalmus	1170.63	9998	49.77	2979
Chlorophthalmus atlanticus	440.48	11305	18.73	
Merluccius polli	227.29	2735	9.66	2980
Synagrops microlepis	187.06	14389	7.95	
Parapenaeus longirostris, fem	65.56	10972	2.79	2982
Bembrops heterurus	42.25	442	1.80	
Zenopsis conchifer	41.05	565	1.75	
Coelorinchus coelorhincus	37.01	2978	1.57	
Pterothrissus belloci	33.79	243	1.44	
Parapenaeus longirostris, male	18.90	4015	0.80	2981
Boops boops	18.90	161	0.80	
Nezumia aequalis	16.91	565	0.72	
Uranoscopus polli	15.68	82	0.67	
Dentex angolensis	12.46	41	0.53	
Trichiurus lepturus	10.47	41	0.45	
Todaropsis eblanae	5.81	82	0.25	
Chelidonicichthys capensis	3.63	41	0.15	
Erythrocles monodi	2.67	3	0.11	
Hoplostethus atlanticus	1.20	41	0.05	
Peristedion cataphractum	0.41	41	0.02	
Total	2352.16		100.01	

DATE: 23/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1335
 start stop duration POSITION: Lat S 1157
 TIME : 09:18:23 09:39:46 21 (min) Purpose code: 3 Long E 1337
 LOG : 6240 06 6241 15 1.17 Area code : 1
 FDEPTH: 78 81 GearCond code:
 BDEPTH: 78 81 Validity code:
 Towing dir: 7° Wire out: 270 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 321.30 CATCH/HOUR: 918.00

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
weight	numbers			
Umbrina canariensis	245.14	691	26.70	2987
Pagellus bellottii	240.43	1500	26.19	2984
Dentex macrophthalmus	121.80	551	13.27	2986
Dentex barnardi	82.97	251	9.04	2985
Trachurus trecae	59.09	1969	6.44	2983
Atractoscion aequidens	45.14	31	4.92	
Chelidonicichthys capensis	40.57	346	4.42	
Chelidonicichthys gabonensis	31.43	314	3.42	
Trichiurus lepturus	17.77	17	1.94	
Dentex gibbosus	11.71	14	1.28	
Zeus faber	9.43	31	1.03	
Chaetodon hoefleri	5.43	31	0.59	
Raja miraletus	3.71	14	0.40	
Sparus pagrus africanus *	3.43	314	0.37	
Total	918.05		100.01	

DATE: 23/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1336
 start stop duration POSITION: Lat S 1157
 TIME : 10:49:57 11:20:43 31 (min) Purpose code: 3 Long E 1342
 LOG : 6248 97 6250 55 1.70 Area code : 1
 FDEPTH: 41 42 GearCond code:
 BDEPTH: 41 42 Validity code:
 Towing dir: 10° Wire out: 160 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 327.94 CATCH/HOUR: 634.72

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
weight	numbers			
Brachydeuterus auritus	162.58	1736	25.61	2992
Sepia officinalis hierreda	113.81	230	17.93	
Trachurus trecae	111.10	1823	17.50	2988
Lithognathus mormyrus	51.48	81	8.11	
Pomadasy incisius	32.52	149	5.12	
Umbrina canariensis	23.03	176	1.63	
Pseudolithus typus	22.45	25	3.54	2991
Galeoides decadactylus	18.97	58	2.99	
Selene dorsalis	17.61	474	2.77	2990
Raja miraletus	13.55	14	2.13	
Argyrosomus hololepidotus	12.19	95	1.92	
Trichiurus lepturus	10.84	203	1.71	
Pteroscion pelli	8.13	122	1.28	
Citharus linguatula	5.42	95	0.85	
Pagellus bellottii	4.26	25	0.67	2989
Chaetodon hoefleri	4.06	14	0.64	
Bembrops heterurus	4.06	68	0.64	
Chloroscombrus chrysurus	2.71	14	0.43	
Sardinella aurita	2.71	14	0.43	
Ilisha africana	2.71	27	0.43	
Dicologlossa cuneata	2.71	41	0.43	
Pomadasy jubelini	2.52	4	0.40	
Sparus pagrus pagrus *	1.94	2	0.31	
Dentex barnardi	1.94	8	0.31	
Epinephelus aeneus	1.16	2	0.18	
Engraulis encrasicolus	0.14	41	0.02	
Penaues notialis	0.14	14	0.02	
Total	634.74		100.00	

DATE: 23/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1337
 start stop duration POSITION: Lat S 1221
 TIME : 14:34:01 14:41:19 7 (min) Purpose code: 3 Long E 1330
 LOG : 6278 11 6278 50 0.37 Area code : 1
 FDEPTH: 69 70 GearCond code: 9
 BDEPTH: 69 70 Validity code: 1
 Towing dir: 20° Wire out: 220 m Speed: 32 kn*10

Sorted: 74 Kg Total catch: 74.00 CATCH/HOUR: 634.29

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
weight	numbers			
Umbrina canariensis	220.29	531	34.73	2995
Trichiurus lepturus	130.29	754	20.54	2993
Dentex macrophthalmus	48.86	429	7.70	2994
Arius parkii	39.43	9	6.22	
Trachurus trecae	30.86	917	4.87	2994
Sepia sp.	25.71	69	4.05	
Pterothrissus belloci	25.71	223	4.05	
Pagellus bellottii	15.43	103	2.43	2996
Branchiostegus semifasciatus	14.57	34	2.30	
Citharus linguatula	12.86	214	2.03	
Rhinobatos albomaculatus	10.29	9	1.62	
Dentex barnardi	9.43	26	1.49	
Raja miraletus	8.57	9	1.35	
Trigla lyra	8.57	60	1.35	
Brotula barbata	8.57	26	1.35	
Bembrops heterurus	6.00	86	0.95	
Chaetodipterus gorenensis	6.00	43	0.95	
Pomadasy incisius	4.29	17	0.68	
Pteroscion pelli	4.29	17	0.68	
Serranus accraensis	1.71	17	0.27	
Zeus faber	1.71	17	0.27	
Boops boops	0.86	17	0.14	
Total	634.30		100.02	

DATE: 23/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1338
 start stop duration POSITION: Lat S 1219
 TIME : 19:29:46 19:59:06 29 (min) Purpose code: 3 Long E 1322
 LOG : 6298 44 6299 73 1.44 Area code : 1
 FDEPTH: 329 385 GearCond code:
 BDEPTH: 329 385 Validity code:
 Towing dir: 215° Wire out: 1050 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 390.27 CATCH/HOUR: 807.46

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
weight	numbers			
Chlorophthalmus atlanticus	163.53	3710	20.25	
Malacocephalus laevis	135.83	2768	16.82	
S H R I M P S	122.38	72314	15.16	
Yarrella blackfordi	102.74	3207	12.72	
Pterothrissus belloci	60.52	377	7.50	
Lophius vaillanti	55.14	753	6.83	
Galeus polli	23.40	484	2.90	
Todaropsis eblanae	23.13	269	2.86	
Aristeus varidens, female	21.12	2098	2.62	2999
Coelorinchus coelorhincus	17.75	646	2.20	
Hoplostethus cadenati	16.68	538	2.07	
Merluccius polli	14.79	54	1.83	
Nezumia aequalis	10.49	108	1.30	
Aristeus varidens, male	7.53	1291	0.93	2998
Etmopterus spinax	7.53	215	0.93	
Triplophos sp	6.46	646	0.80	
Epigonus telescopus	3.77	81	0.47	
Halosaurus ovenii	2.42	296	0.30	
GONOSTOMATIDAE	2.15	27	0.27	
Parapenaeus longirostris, fem	1.88	188	0.23	2997
Chaunax pictus	1.88	54	0.23	
Bathynectes piperitus	1.61	27	0.20	
Eumunida squamifera *	1.34	403	0.17	
MYCTOPHIDAE	1.22	1034	0.15	
Pontinus accraensis	1.08	27	0.13	
Parapenaeus longirostris, male	0.54	54	0.07	
Trachurus trecae, juvenile	0.54	81	0.07	
Total	807.46		100.01	

PROJECT STATION: 1339
DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 841
start stop duration Long E 1249
TIME : 21:15:39 21:45:43 30 (min) Purpose code: 3
LOG : 6515.13 6516.69 1.36 Area code : 2
FDEPTH: 710 709 GearCond code:
BDEPTH: 710 709 Validity code:
Towing dir: 210° Wire out: 1800 m Speed: 30 kn*10
Sorted: 35 Kg Total catch: 189.00 CATCH/HOUR: 378.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Nematocarcinus africanus	136.00	25386	35.98
Trachyrhynchus scabratus	41.60	256	11.01
Yarella blackfordi	36.80	1656	9.74
Nezumia aequalis	32.00	608	8.47
OPHIDIIDAE	22.40	970	5.93
Lamprogrammus exutus	17.60	32	4.66
CONGRIDAE	17.60	464	4.66
Munida sp. *	16.00	528	4.23
Triplophos sp.	12.80	1634	3.39
Gonostoma sp.	12.80	240	3.39
Hoplostethus cadenati	9.60	256	2.54
Talismania sp.	6.40	80	1.69
Dibranchius atlanticus	4.80	176	1.27
Xenodermichthys copei	3.20	112	0.85
Halosaurus ovenii	2.20	32	0.58
Nezumia leonis	1.60	16	0.42
MACROURIDAE	1.40	32	0.37
Aristeus varidens, male	1.20	152	0.32
Aristeus varidens, female	1.00	56	0.26
Etmopterus spinax	1.00	16	0.26
Total	378.00	100.02	

PROJECT STATION: 1343
DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 840
start stop duration Long E 1258
TIME : 04:47:57 05:17:32 30 (min) Purpose code: 3
LOG : 6544.80 6546.45 1.45 Area code : 2
FDEPTH: 248 252 GearCond code:
BDEPTH: 248 252 Validity code:
Towing dir: 190° Wire out: 700 m Speed: 30 kn*10
Sorted: 62 Kg Total catch: 252.64 CATCH/HOUR: 505.28

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dentex angolensis	174.54	362	34.54
Bembrops heterurus	69.36	732	13.73
Brotula barbata	60.50	52	11.97
Merluccius polli	46.08	290	9.12
Pterothrissus belloci	39.62	324	7.84
Chlorophthalmus atlanticus	35.20	868	6.97
Trichiurus lepturus	22.96	102	4.54
Parapenaeus longirostris, fem.	7.78	1232	1.54
Synagrops microlepis	5.88	39354	1.16
Parapenaeus longirostris, male	5.88	1164	1.16
Scorpaena normani	5.44	68	1.08
Illex coindetii	5.10	120	1.01
Todaropsis eblanae	4.08	52	0.81
MYCTOPHIDAE	4.08	2924	0.81
Monolene microstoma	3.74	170	0.74
Peristedion cataphractum	2.38	154	0.47
Solenocera africana	2.22	290	0.44
Hoplostethus atlanticus	2.04	18	0.40
OMMASTREPHIDAE	1.54	52	0.30
Zenopsis conchifer	1.54	34	0.30
Uranoscopus albesca	1.36	18	0.27
Sepia elegans	1.02	68	0.20
Coelorhynchus coelorrhynchus	1.02	86	0.20
Conger conger	0.52	18	0.10
C R A B S	0.52	52	0.10
OPHIDIIDAE	0.52	18	0.10
Eumunida squamifera *	0.18	52	0.04
Bathynectes piperitus	0.18	18	0.04
Total	505.28	99.98	

PROJECT STATION: 1340
DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 840
start stop duration Long E 1251
TIME : 23:38:54 00:08:33 30 (min) Purpose code: 3
LOG : 6524.55 6526.16 1.37 Area code : 2
FDEPTH: 547 550 GearCond code:
BDEPTH: 547 550 Validity code:
Towing dir: 186° Wire out: 1500 m Speed: 28 kn*10
Sorted: 36 Kg Total catch: 265.70 CATCH/HOUR: 531.40

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Nematocarcinus africanus	370.80	82810	69.78
Hoplostethus cadenati	41.40	1780	7.79
Triplophos sp.	28.80	5256	5.42
Yarella blackfordi	18.00	522	3.39
Merluccius polli	18.00	18	3.39
Aristeus varidens, female	9.00	414	1.69
Gonostoma sp.	7.20	234	1.35
Aristeus varidens, male	7.20	792	1.35
Etmopterus spinax	5.40	36	1.02
Xenodermichthys copei	5.40	684	1.02
Munida sp. *	5.40	666	1.02
CONGRIDAE	3.60	324	0.68
Lamprogrammus exutus	3.60	108	0.68
Laemonema laureysi	1.80	162	0.34
Hymenoccephalus italicus	1.80	216	0.34
Dibranchius atlanticus	1.80	54	0.34
Gadella imberbis	1.80	72	0.34
Gadella maraldi	0.40	36	0.08
Total	531.40	100.02	

PROJECT STATION: 1344
DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 839
start stop duration Long E 1302
TIME : 06:20:15 06:50:11 30 (min) Purpose code: 3
LOG : 6552.56 6554.13 1.52 Area code : 2
FDEPTH: 152 158 GearCond code:
BDEPTH: 152 158 Validity code:
Towing dir: 190° Wire out: 470 m Speed: 30 kn*10
Sorted: 104 Kg Total catch: 587.81 CATCH/HOUR: 1175.62

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trachurus trecae	616.54	1142	52.44
Synagrops microlepis	265.20	29942	22.56
Trichiurus lepturus	116.72	250	9.93
Pterothrissus belloci	42.62	328	3.63
Bembrops heterurus	27.20	340	2.31
Todaropsis eblanae	18.70	430	1.59
Chelidonicichthys gabonensis	17.22	182	1.46
Parapenaeus longirostris, fem.	12.58	2070	1.07
Dentex angolensis	10.32	46	0.88
Brotula barbata	9.40	22	0.80
Illex coindetii	7.26	226	0.62
Parapenaeus longirostris, male	5.10	1150	0.43
Zeus faber	4.76	22	0.40
Uranoscopus albesca	3.62	34	0.31
Zenopsis conchifer	3.40	12	0.29
Scorpaena normani	3.06	56	0.26
Pentheroscion mbizi	2.94	22	0.25
Peristedion cataphractum	1.82	102	0.15
Monolene microstoma	1.82	68	0.15
Dentex macrophthalmus	1.70	12	0.14
Citharus linguatula	1.70	34	0.14
Sepia elegans	1.36	124	0.12
Thorogobius angolensis	0.22	12	0.02
Saurida brasiliensis	0.12	12	0.01
C R A B S	0.12	12	0.01
Antigonia capros	0.12	12	0.01
Total	1175.62	99.98	

PROJECT STATION: 1341
DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 840
start stop duration Long E 1253
TIME : 01:37:46 02:07:37 30 (min) Purpose code: 3
LOG : 6532.00 6533.68 1.45 Area code : 2
FDEPTH: 451 448 GearCond code:
BDEPTH: 451 448 Validity code:
Towing dir: 190° Wire out: 1250 m Speed: 31 kn*10
Sorted: 58 Kg Total catch: 367.27 CATCH/HOUR: 734.54

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Nematocarcinus africanus	635.60	177630	86.53
CONGRIDAE	30.00	464	4.08
Merluccius polli	23.40	38	3.19
Aristeus varidens, female	11.80	780	1.61
Etmopterus spinax	6.20	272	0.84
Laemonema laureysi	4.00	64	0.54
Aristeus varidens, male	4.00	624	0.54
Gadella maraldi	2.60	208	0.35
Triplophos sp.	2.60	350	0.35
Illex coindetii	2.60	12	0.35
Solenocera africana	2.60	260	0.35
Nezumia aequalis	1.80	104	0.25
Lophius vaillanti	1.40	12	0.19
Gadella imberbis	1.40	38	0.19
Yarella blackfordi	1.40	38	0.19
Halosaurus ovenii	1.40	142	0.19
Gonostoma sp.	1.40	52	0.19
Dibranchius atlanticus	0.20	12	0.03
Munida sp. *	0.14	38	0.02
Total	734.54	99.98	

PROJECT STATION: 1345
DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 837
start stop duration Long E 1306
TIME : 08:14:10 08:44:11 30 (min) Purpose code: 3
LOG : 6562.68 6564.06 1.57 Area code : 2
FDEPTH: 102 102 GearCond code:
BDEPTH: 102 102 Validity code:
Towing dir: 180° Wire out: 330 m Speed: 30 kn*10
Sorted: 73 Kg Total catch: 141.79 CATCH/HOUR: 283.58

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trachurus trecae	125.86	284	44.38
Trichiurus lepturus	34.66	64	12.22
Pterothrissus belloci	24.80	144	8.75
Sepia officinalis hierredda	21.90	26	7.72
Atractoscion aequidens	12.96	8	4.57
Umbrina canariensis	10.84	22	3.82
Scorpaena normani	10.72	112	3.78
Citharus linguatula	9.72	148	3.43
Chelidonicichthys gabonensis	8.28	54	2.92
Dentex angolensis	7.06	40	2.49
Dentex barnardi	5.14	10	1.81
Pagellus bellottii	4.72	18	1.66
Uranoscopus albesca	3.46	18	1.22
Illex coindetii	1.62	86	0.57
Boops boops	0.54	22	0.19
Sepia elegans	0.50	18	0.18
Todaropsis eblanae	0.40	22	0.14
Saurida brasiliensis	0.36	32	0.13
GOBIIDAE	0.04	4	0.01
Total	283.58	99.94	

PROJECT STATION: 1342
DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 839
start stop duration Long E 1256
TIME : 03:29:37 03:43:54 14 (min) Purpose code: 3
LOG : 6539.78 6540.53 0.67 Area code : 2
FDEPTH: 348 352 GearCond code: 9
BDEPTH: 348 352 Validity code: 9
Towing dir: 188° Wire out: 1000 m Speed: 32 kn*10
Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION:1346
 DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 838 Long E 1312
 start stop duration
 TIME : 09:56:30 10:11:41 14 (min) Purpose code: 3
 LOG : 6571 81 6572 49 0.72 Area code : 2
 FDEPTH: 71 71 GearCond code:
 BDEPTH: 71 71 Validity code:
 Towing dir: 180° Wire out: 260 m Speed: 30 kn*10
 Sorted: 80 Kg Total catch: 2702.90 CATCH/HOUR: 11583.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	9737.14	44657	84.06	3020
Trachurus trecae	864.00	6686	7.46	3019
Brachydeuterus auritus	418.29	2914	1.61	3018
Sepia officinalis hierredda	195.43	514	1.69	
Trichurus lepturus	87.43	343	0.75	
Umbrina canariensis	85.71	171	0.74	
Sardinella maderensis	61.71	171	0.53	
Atractoscion aequidens	53.57	26	0.46	
Pagellus bellottii	42.86	171	0.37	
Ranchiostegus semifasciatus	29.14	171	0.25	
Citharus linguatula	8.57	171	0.07	
Total	11583.85		99.99	

PROJECT STATION:1347
 DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 839 Long E 1317
 start stop duration
 TIME : 11:23:49 11:53:45 30 (min) Purpose code: 3
 LOG : 6580 20 6581 71 1.68 Area code : 2
 FDEPTH: 43 43 GearCond code:
 BDEPTH: 43 43 Validity code:
 Towing dir: 355° Wire out: 150 m Speed: 34 kn*10
 Sorted: 107 Kg Total catch: 2231.00 CATCH/HOUR: 4462.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	2586.00	22388	57.96	3021
Brachydeuterus auritus	767.40	6698	17.20	3022
Trachurus trecae	588.80	9604	13.20	3023
Sepia officinalis hierredda	219.20	406	4.91	
Galeoides decadactylus	81.20	120	1.82	
Pseudotolithus typus	81.20	40	1.82	
Penaeus notialis	40.60	1502	0.91	3024
Trichurus lepturus	40.60	242	0.91	
Raja miraletus	20.40	40	0.46	
Pagellus bellottii	16.20	40	0.36	
Pteroscion peli	8.20	242	0.18	
Grammolites gruvelli	4.00	40	0.09	
Pseudotolithus senegalensis	4.00	40	0.09	
Dicologlossa cuneata	4.00	80	0.09	
Total	4461.80		100.00	

PROJECT STATION:1348
 DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 837 Long E 1321
 start stop duration
 TIME : 12:47:21 13:07:45 20 (min) Purpose code: 3
 LOG : 6587 21 6588 22 1.08 Area code : 2
 FDEPTH: 21 20 GearCond code:
 BDEPTH: 21 20 Validity code:
 Towing dir: 340° Wire out: 100 m Speed: 32 kn*10
 Sorted: 75 Kg Total catch: 1191.90 CATCH/HOUR: 3575.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	976.50	56148	27.31	3025
Chloroscombrus chrysurus	682.50	28299	19.09	
Pomadasys jubelini	498.90	1260	13.95	3029
Ilisha africana	430.50	20055	12.04	
Sardinella maderensis	262.50	6300	7.34	3027
Galeoides decadactylus	157.50	474	4.40	
Stromateus fiatola	120.90	264	3.38	
Sepia officinalis hierredda	105.00	159	2.94	
Pteroscion peli	103.50	7350	2.89	
Pseudotolithus typus	68.40	369	1.91	
Trachurus trecae	63.00	2100	1.76	3026
Dicologlossa cuneata	26.40	579	0.74	
Scomberomorus tritor	21.00	54	0.59	
Pomadasys incisus	15.90	54	0.44	
Trichurus lepturus	10.50	105	0.29	
Sardinella aurita	10.50	684	0.29	3028
Conger conger	5.40	3	0.15	
Umbrina canariensis	5.40	54	0.15	
Penaeus notialis	5.40	315	0.15	
Ephippion guttifer	4.80	3	0.13	
Torpedo nobiliana	1.20	54	0.03	
Total	3575.70		99.97	

PROJECT STATION:1349
 DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 813 Long E 1314
 start stop duration
 TIME : 15:41:12 16:11:29 30 (min) Purpose code: 3
 LOG : 6608.90 6610.24 1.69 Area code : 2
 FDEPTH: 29 27 GearCond code:
 BDEPTH: 29 27 Validity code:
 Towing dir: 350° Wire out: 350 m Speed: 34 kn*10
 Sorted: 117 Kg Total catch: 1236.24 CATCH/HOUR: 2472.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1208.66	24366	48.88	3030
Pteroscion peli	490.00	9488	19.92	
Arius parkii	182.00	140	7.36	
Galeoides decadactylus	149.34	304	6.04	
Trichurus lepturus	140.00	956	5.66	
Pomadasys jubelini	93.34	116	3.78	
Ilisha africana	91.00	2926	3.68	
Pseudotolithus typus	24.80	78	1.00	3031
Chloroscombrus chrysurus	23.34	490	0.94	
Sepia officinalis hierredda	16.34	24	0.66	
Dicologlossa cuneata	14.00	46	0.57	
Pomadasys incisus	14.00	24	0.57	
Trachurus trecae	9.34	116	0.38	
Stromateus fiatola	7.00	24	0.28	
Torpedo nobiliana	4.66	24	0.19	
Penaeus notialis	4.66	560	0.19	
Total	2472.48		100.00	

PROJECT STATION:1350
 DATE: 25/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 813 Long E 1308
 start stop duration
 TIME : 17:02:23 17:32:18 30 (min) Purpose code: 3
 LOG : 6616.38 6617.87 1.37 Area code : 2
 FDEPTH: 60 61 GearCond code:
 BDEPTH: 60 61 Validity code:
 Towing dir: 170° Wire out: 200 m Speed: 30 kn*10
 Sorted: 75 Kg Total catch: 412.24 CATCH/HOUR: 824.48

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	446.56	32950	54.16	3035
Pagellus bellottii	98.42	742	11.94	3033
Trichurus lepturus	58.12	130	7.05	
Raja miraletus	38.10	40	4.62	
Sepia officinalis hierredda	31.72	78	3.85	
Chelidonichthys gabonensis	29.38	118	3.56	
Epinephelus aeneus	21.80	4	2.64	
Brotula barbata	20.80	92	2.52	
Pentheroscion mbizi	15.74	104	1.91	
Citharus linguatula	12.48	300	1.51	
Dentex barnardi	9.88	104	1.20	3034
Sufflogobius bibarbatus	9.24	1092	1.12	
Trachurus trecae	8.32	274	1.01	
Pseudotolithus typus	4.98	4	0.60	3032
Grammolites gruvelli	4.82	104	0.58	
Chaetodon hoefleri	3.78	26	0.46	
Thorogobius angolensis	3.52	390	0.43	
Vanstraelenia chiropthalmus	2.22	14	0.27	
Parapanaeus longirostris, fem	1.44	720	0.17	3036
Boops boops	1.04	66	0.13	
Umbrina canariensis	0.64	14	0.08	
Parapanaeus longirostris, male	0.52	248	0.06	3037
Dentex angolensis	0.26	14	0.03	
CONGRIDAE	0.14	14	0.02	
Scorpaena normani	0.14	14	0.02	
Saurida brasiliensis	0.14	14	0.02	
Ephippion guttifer	0.14	14	0.02	
SOLEIDAE	0.14	14	0.02	
Total	824.48		100.00	

PROJECT STATION:1351
 DATE: 26/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 815 Long E 1303
 start stop duration
 TIME : 05:38:20 06:09:14 31 (min) Purpose code: 3
 LOG : 6638.68 6640.26 1.52 Area code : 2
 FDEPTH: 92 94 GearCond code:
 BDEPTH: 92 94 Validity code:
 Towing dir: 170° Wire out: 300 m Speed: 30 kn*10
 Sorted: 67 Kg Total catch: 149.97 CATCH/HOUR: 290.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	59.38	99	20.46	
Pterothrissus bellocci	26.65	356	9.18	
Citharus linguatula	26.28	606	9.05	
Uranoscopus albesca	21.85	85	7.53	
Chelidonichthys gabonensis	21.85	281	7.53	
Sepia orbignyana	20.15	135	6.94	
Sepia officinalis hierredda	16.43	41	5.66	
Dentex angolensis	15.68	226	5.40	3038
Scorpaena normani	14.54	207	5.01	
Raja miraletus	11.34	17	3.91	
Atractoscion aequidens	10.61	6	3.66	
Zeus faber	7.95	41	2.74	
Pagellus bellottii	6.54	58	2.25	3039
Umbrina canariensis	6.33	50	2.18	3040
Epinephelus aeneus	5.86	4	2.02	
Sepia elegans	4.57	172	1.57	
Trachurus trecae	2.61	54	0.90	3041
Chaetodon hoefleri	2.57	10	0.89	
Chelidonichthys capensis	2.21	10	0.76	
Vanstraelenia chiropthalmus	2.07	10	0.71	
Saurida brasiliensis	1.86	108	0.64	
Illex coindetii	1.12	31	0.39	
Torpedo torpedo	0.72	4	0.25	
Merluccius polli	0.37	17	0.13	
Pentheroscion mbizi	0.37	4	0.13	
Thorogobius angolensis	0.17	17	0.06	
Boops boops	0.14	10	0.05	
Parapanaeus longirostris	0.04	4	0.01	
Total	290.26		100.01	

PROJECT STATION:1352
 DATE: 26/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 814 Long E 1251
 start stop duration
 TIME : 08:20:02 08:50:15 30 (min) Purpose code: 3
 LOG : 6655.13 6656.68 1.47 Area code : 2
 FDEPTH: 131 133 GearCond code:
 BDEPTH: 131 133 Validity code:
 Towing dir: 150° Wire out: 430 m Speed: 10 kn*10
 Sorted: 92 Kg Total catch: 325.77 CATCH/HOUR: 651.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	375.72	10916	57.67	3042
Mola mola	60.00	2	9.21	
Dentex angolensis	55.20	324	8.47	3043
Sepia orbignyana	49.40	1140	7.58	
Dentex congolensis	37.82	618	5.80	3045
Spicara alta	20.14	408	3.09	3046
Trichurus lepturus	9.60	10	1.47	
Dentex macrophthalmus	8.84	38	1.36	
Raja miraletus	7.60	10	1.17	3044
Illex coindetii	6.76	134	1.04	
Chelidonichthys gabonensis	6.08	10	0.93	
Lagocephalus laevigatus	4.28	10	0.66	
Boops boops	4.18	104	0.64	
Pterothrissus bellocci	2.76	20	0.42	
Citharus linguatula	2.28	86	0.35	
Chelidonichthys capensis	0.58	28	0.09	
Peristedion cataphractum	0.20	-	0.03	
SOLEIDAE	0.10	10	0.02	
Total	651.54		100.00	

DATE:26/ 5/97 GEAR TYPE: BT No: PROJECT STATION:1353
POSITION:Lat S 815
Long E 1249
start stop duration
TIME :11:01:34 11:25:04 24 (min) Purpose code: 3
LOG :6662.50 6663.64 1.14 Area code : 2
FDEPTH: 264 267 GearCond code:
BDEPTH: 264 267 Validity code:
Towing dir: 144* Wire out: 780 m Speed: 30 kn*10
Sorted: 41 Kg Total catch: 550.30 CATCH/HOUR: 1375.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MYCTOPHIDAE	567.00	19135	41.21	
Synagrops microlepis	425.25	3273	30.91	
Trichiurus lepturus	118.25	843	8.60	
Parapanaeus longirostris, fem.	94.50	15328	6.87	3047
Zenopsis conchifer	67.50	33	4.91	
Parapanaeus longirostris, male	44.00	8628	3.20	3048
Pterothrissus bellocci	33.75	100	2.45	
Merluccius polli	6.75	68	0.49	
Chlorophthalmus atlanticus	3.50	135	0.25	
Trachurus trecae	3.50	68	0.25	
Solenocera africana	3.50	438	0.25	
Coelorinchus coelorhincus	3.50	135	0.25	
Eumunida squamifera *	3.50	1248	0.25	
Pterothrissus bellocci	0.75	33	0.05	
Peristedion cataphractum	0.25	33	0.02	
Citharus linguatula	0.25	33	0.02	
Total	1375.75		99.98	

DATE:26/ 5/97 GEAR TYPE: BT No: PROJECT STATION:1354
POSITION:Lat S 817
Long E 1247
start stop duration
TIME :14:12:10 14:42:08 30 (min) Purpose code: 3
LOG :6669.14 6670.59 1.58 Area code : 2
FDEPTH: 354 349 GearCond code:
BDEPTH: 354 349 Validity code:
Towing dir: 360* Wire out:1000 m Speed: 32 kn*10
Sorted: 73 Kg Total catch: 507.50 CATCH/HOUR: 1015.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	470.40	1558	46.34	3049
Nematocarcinus africanus	179.20	55552	17.66	
Centrophorus uyato	105.00	14	10.34	
Hymenocephalus italicus	84.00	5208	8.28	
Zenopsis conchifer	33.60	84	3.31	
Laemonema laureysi	32.20	350	3.17	
Trichiurus lepturus	21.00	812	2.07	
Pterothrissus bellocci	14.00	42	1.38	
Chauxax pictus	14.00	336	1.38	
Etmopterus spinax	14.00	308	1.38	
Chlorophthalmus atlanticus	11.20	70	1.10	
Gadella imberbis	7.00	238	0.69	
Todaropsis eblanae	7.00	112	0.69	
Nezumia aequalis	5.60	140	0.55	
Coelorinchus coelorhincus	5.60	42	0.55	
Scorpaena sp	4.20	532	0.41	
Epigonus telescopus	2.80	70	0.28	
Solenocera africana	1.40	70	0.14	
GONOSTOMATIDAE	1.40	56	0.14	
Synagrops microlepis	0.40	14	0.04	
CONGRIDAE	0.40	14	0.04	
Parapanaeus longirostris	0.20	28	0.02	
Halosaurus ovenii	0.20	14	0.02	
Dibranchius atlanticus	0.20	28	0.02	
Total	1015.00		100.00	

DATE:26/ 5/97 GEAR TYPE: BT No: PROJECT STATION:1355
POSITION:Lat S 817
Long E 1244
start stop duration
TIME :17:37:02 18:07:02 30 (min) Purpose code: 3
LOG :6677.08 6678.53 1.52 Area code : 2
FDEPTH: 462 455 GearCond code:
BDEPTH: 462 455 Validity code:
Towing dir: 341* Wire out:1250 m Speed: 30 kn*10
Sorted: 23 Kg Total catch: 257.49 CATCH/HOUR: 514.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	331.20	106560	64.31	
Hoplostethus cadenati	59.12	2714	11.48	
Lamprogrammus exutus	20.48	1036	3.98	
Malacocephalus laevis	16.34	1634	3.17	
Gadella imberbis	14.26	874	2.77	
Trichiurus lepturus	14.04	530	2.73	
GONOSTOMATIDAE	14.04	322	2.50	
Merluccius polli	12.88	24	2.50	
Illex coindetii	7.60	70	1.48	
Triplophos sp.	4.60	598	0.89	
Aristeus varidens, male	4.02	506	0.78	3050
Xenodermichthys copei	3.92	230	0.76	
Etmopterus spinax	3.92	24	0.76	
Yarella blackfordi	1.84	70	0.36	
Aristeus varidens, female	1.62	104	0.31	3051
Solenocera africana	1.38	116	0.27	
Conger conger	0.92	24	0.18	
Dibranchius atlanticus	0.70	46	0.14	
Bathynectes piperitus	0.46	24	0.09	
NEMICTHYIDAE	0.46	46	0.09	
Coelorinchus sp.	0.46	162	0.09	
Melanocetus johnsoni	0.24	46	0.05	
Munida sp.	0.24	24	0.05	
Halosaurus ovenii	0.24	24	0.05	
Total	514.98		100.02	

DATE:26/ 5/97 GEAR TYPE: BT No: PROJECT STATION:1356
POSITION:Lat S 815
Long E 1242
start stop duration
TIME :19:25:40 19:55:56 30 (min) Purpose code: 3
LOG :6682.79 6684.22 1.51 Area code : 2
FDEPTH: 545 541 GearCond code:
BDEPTH: 545 541 Validity code:
Towing dir: 340* Wire out:1500 m Speed: 30 kn*10
Sorted: 26 Kg Total catch: 224.35 CATCH/HOUR: 448.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	356.00	77134	79.34	
Hoplostethus cadenati	20.40	780	4.55	
GONOSTOMATIDAE	19.80	460	4.41	
Centrophorus uyato	8.30	2	1.78	
Xenodermichthys copei	8.00	420	1.85	
OMMASTREPHIDAE	4.40	20	0.98	
Aristeus varidens, male	4.20	520	0.94	3052
Lamprogrammus exutus	4.00	160	0.89	
Triplophos sp.	3.60	480	0.80	
Aristeus varidens, female	2.80	140	0.62	3053
Trichiurus lepturus	2.80	80	0.62	
Yarella blackfordi	2.60	80	0.58	
Gadella imberbis	2.00	60	0.45	
Illex coindetii	1.80	20	0.40	
Munida sp. *	1.80	240	0.40	
Plesiopanaeus edwardsianus	1.60	20	0.36	
Todaropsis eblanae	1.40	20	0.31	
Chlorophthalmus atlanticus	1.40	40	0.31	
Etmopterus spinax	0.60	20	0.13	
S H R I H P S	0.40	60	0.09	
Coelorinchus sp.	0.40	40	0.09	
Solenocera africana	0.20	20	0.04	
Conger conger	0.20	20	0.04	
Total	448.70		99.98	

DATE:27/ 5/97 GEAR TYPE: BT No: PROJECT STATION:1357
POSITION:Lat S 758
Long E 1236
start stop duration
TIME :01:02:50 01:34:41 32 (min) Purpose code: 3
LOG :6716.90 6718.34 1.62 Area code : 2
FDEPTH: 701 705 GearCond code:
BDEPTH: 701 705 Validity code:
Towing dir: 5* Wire out:1800 m Speed: 30 kn*10
Sorted: 35 Kg Total catch: 250.40 CATCH/HOUR: 469.50

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	177.00	32449	37.70	
Yarella blackfordi	52.50	1024	11.18	
Coelorinchus coelorhincus	36.00	750	7.67	
Talismania sp	34.50	626	7.35	
Munida sp. *	24.00	1371	5.11	
Trichiurus lepturus	24.00	1678	5.11	
GONOSTOMATIDAE	22.50	360	4.79	
Gadella imberbis	19.50	1281	4.15	
Merluccius polli	12.00	15	2.56	
Trachyrhynchus scabrus	10.50	60	2.24	
Xenodermichthys copei	10.50	458	2.24	
Hoplostethus cadenati	9.00	255	1.92	
Triplophos sp	6.00	765	1.28	
CONGRIDAE	6.00	105	1.28	
Hoplostethus atlanticus	4.50	15	0.96	
Laemonema sp.	4.50	120	0.96	
Etmopterus spinax	3.00	15	0.64	
Gadella maraldi	3.00	30	0.64	
Aristeus varidens, female	3.00	150	0.64	3054
Dibranchius atlanticus	3.00	120	0.64	
Lamprogrammus exutus	1.50	15	0.32	
Nemichthys scolopaceus	1.50	10	0.32	
Aristeus varidens, male	1.50	135	0.32	3055
Total	469.50		100.02	

DATE:27/ 5/97 GEAR TYPE: BT No: PROJECT STATION:1358
POSITION:Lat S 758
Long E 1237
start stop duration
TIME :03:16:01 03:45:55 30 (min) Purpose code: 3
LOG :6724.45 6725.77 1.51 Area code : 2
FDEPTH: 548 547 GearCond code:
BDEPTH: 548 547 Validity code:
Towing dir: 358* Wire out:1500 m Speed: 30 kn*10
Sorted: 49 Kg Total catch: 222.70 CATCH/HOUR: 445.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	350.20	95692	78.63	
GONOSTOMATIDAE	27.00	808	6.06	
Triplophos sp.	15.40	1192	3.46	
Hoplostethus cadenati	10.00	360	2.25	
Gadella imberbis	10.00	314	2.25	
Yarella blackfordi	9.00	252	2.02	
Trichiurus lepturus	5.40	342	1.21	
Todaropsis eblanae	4.50	46	1.01	
Xenodermichthys copei	2.70	132	0.61	
Malacocephalus laevis	1.80	10	0.40	
Laemonema laureysi	1.80	18	0.40	
Aristeus varidens, male	1.80	198	0.40	3056
Aristeus varidens, female	1.80	72	0.40	3057
Munida sp. *	1.80	216	0.40	
Talismania sp	1.00	62	0.22	
Dibranchius atlanticus	1.00	18	0.22	
Nemichthys scolopaceus	0.10	10	0.02	
Lamprogrammus exutus	0.10	450	0.02	
Total	445.40		99.98	

DATE: 27/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1359
 start stop duration POSITION: Lat S 758
 TIME :05:15:27 05:45:11 30 (min) Purpose code: 3 Long E 1239
 LOG :6731.17 6732 52 1.53 Area code : 2
 FDEPTH: 447 452 GearCond.code:
 BDEPTH: 447 452 Validity code:
 Towing dir: 345° Wire out: 1250 m Speed: 30 kn*10
 Sorted: 35 Kg Total catch: 353.73 CATCH/HOUR: 707.46

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Nematocarcinus africanus	569.40	168890	80.49		
Malacocephalus laevis	20.80	416	2.94		
Centrophorus uyato	17.00	4	2.40		
Illex coindetii	16.90	208	2.39		
Gadella imberbis	16.64	676	2.35		
Hoplostethus cadenati	16.64	598	2.35		
Dibranchius atlanticus	15.08	988	2.13		
Chaunax pictus	13.00	26	1.84		
GONOSTOMATIDAE	6.76	208	0.96		
Triplophos sp.	3.90	494	0.55		
Aristeus varians, male	2.42	320	0.34	3058	
Lamprogrammus exultans	2.08	52	0.29		
Yarellia blackfordi	2.08	52	0.29		
Aristeus varians, female	1.38	112	0.20	3059	
Solenocera africana	1.30	104	0.18		
Xenodermichthys copei	0.78	130	0.11		
MYCTOPHIDAE	0.26	26	0.04		
Coelorinchus sp.	0.26	26	0.04		
NEMICHTHYIDAE	0.26	26	0.04		
Munida sp *	0.26	26	0.04		
Conger conger	0.26	26	0.04		
Total	707.46		100.01		

DATE: 27/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1360
 start stop duration POSITION: Lat S 757
 TIME :07:26:38 07:56:43 30 (min) Purpose code: 3 Long E 1240
 LOG :6738.75 6740.09 1.55 Area code : 2
 FDEPTH: 355 354 GearCond.code:
 BDEPTH: 355 354 Validity code:
 Towing dir: 340° Wire out: 1050 m Speed: 30 kn*10
 Sorted: 32 Kg Total catch: 477.69 CATCH/HOUR: 955.38

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Nematocarcinus africanus	419.90	107416	43.95		
Merluccius polli	298.30	836	31.22	3060	
Pontinus accraensis	66.12	3306	6.92		
Zenopsis conchifer	48.26	228	5.05		
Malacocephalus laevis	25.84	266	2.70		
Nezumia aequalis	17.10	190	1.79		
Centrophorus uyato	14.44	2	1.52		
Gadella imberbis	14.44	684	1.51		
Parapanaeus longirostris, fem.	13.42	1570	1.40	3061	
Chaunax pictus	10.64	342	1.11		
Hymenocephalus italicus	9.12	988	0.95		
Synagrops microlepis	4.18	152	0.44		
Coelorinchus acanthiger	3.42	76	0.36		
Parapanaeus longirostris, male	3.30	430	0.35	3062	
Trichiurus lepturus	1.90	76	0.20		
Chlorophthalmus atlanticus	1.90	38	0.20		
Illex coindetii	1.14	38	0.12		
MYCTOPHIDAE	0.76	152	0.08		
Solenocera africana	0.76	76	0.08		
Dibranchius atlanticus	0.38	38	0.04		
Total	955.38		99.99		

DATE: 27/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1361
 start stop duration POSITION: Lat S 759
 TIME :10:05:39 10:35:18 30 (min) Purpose code: 3 Long E 1242
 LOG :6746.07 6747.31 1.49 Area code : 2
 FDEPTH: 243 247 GearCond.code:
 BDEPTH: 243 247 Validity code:
 Towing dir: 160° Wire out: 780 m Speed: 30 kn*10
 Sorted: 63 Kg Total catch: 187.50 CATCH/HOUR: 375.00

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
MYCTOPHIDAE	178.20	126740	47.52		
Synagrops microlepis	118.80	8710	31.68		
Trichiurus lepturus	52.20	72	13.92		
Parapanaeus longirostris, fem.	9.00	1280	2.40	3063	
Illex coindetii	4.80	84	1.28		
Parapanaeus longirostris, male	3.00	558	0.80	3064	
Dentex macrophthalmus	3.00	6	0.80		
Zenopsis conchifer	3.00	42	0.80		
Pterothrissus belloci	1.20	6	0.32		
Sepia sp	0.60	18	0.16		
Merluccius polli	0.60	12	0.16		
Chlorophthalmus atlanticus	0.60	588	0.16		
Chaunax pictus	0.06	6	0.02		
Total	375.06		100.02		

DATE: 27/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1362
 start stop duration POSITION: Lat S 800
 TIME :11:45:00 12:15:00 30 (min) Purpose code: 1 Long E 1244
 LOG :6750.60 6753 50 1.60 Area code : 2
 FDEPTH: 149 144 GearCond.code:
 BDEPTH: 149 144 Validity code:
 Towing dir: 348° Wire out: 480 m Speed: 32 kn*10
 Sorted: 38 Kg Total catch: 134.40 CATCH/HOUR: 268.80

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Spicara alta	84.00	1166	31.25		
Trachurus trecae	45.60	960	16.96	3066	
Boops boops	43.40	714	16.15		
Sepia officinalis hierredda	31.60	224	11.76		
Dentex macrophthalmus	21.00	56	7.81		
Dentex angolensis	16.80	76	6.25	3065	
Brotula barbata	7.00	6	2.60		
Todaropsis eblanae	4.20	182	1.56		
Illex coindetii	4.20	70	1.56		
Saurida brasiliensis	3.60	294	1.34		
Bembrus heterurus	3.00	14	1.12		
Zenopsis conchifer	1.40	6	0.52		
Erythrocles monodi	1.40	6	0.52		
Citharus linguatula	0.80	6	0.30		
Tripla lyra	0.80	132	0.30		
Total	268.80		100.00		

DATE: 27/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1363
 start stop duration POSITION: Lat S 756
 TIME :14:10:43 14:40:14 30 (min) Purpose code: 3 Long E 1257
 LOG :6764.54 6765 92 1.54 Area code : 2
 FDEPTH: 77 78 GearCond.code:
 BDEPTH: 77 78 Validity code:
 Towing dir: 170° Wire out: 250 m Speed: 30 kn*10
 Sorted: 74 Kg Total catch: 182.93 CATCH/HOUR: 365.86

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Trachurus trecae	92.40	8742	25.26	3068	
Brachydeuterus auritus	74.40	4406	20.34	3067	
Sepia officinalis hierredda	40.20	60	10.99		
Pagellus bellottii	27.60	252	7.54	3069	
Trichiurus lepturus	24.60	48	6.72		
Chelidonichthys gabonensis	18.00	120	4.92		
Pomadasy's jubelini	18.00	24	4.92	3071	
Atractoscion aequidens	18.00	10	4.92		
Umbrina canariensis	12.60	30	3.44		
Plectorhynchus mediterraneus	8.60	2	2.35		
Dentex barnardi	6.00	60	1.64	3072	
Decapterus rhonchus	4.00	4	1.09		
Sparus caeruleostictus *	3.40	16	0.93		
Boops boops	3.00	102	0.82		
Dentex angolensis	3.00	192	0.82	3070	
Dentex gibbosus	2.40	6	0.66		
Octopus vulgaris	2.40	6	0.66		
Raja miraletus	1.80	6	0.49		
Fistularia petimba	1.80	6	0.49		
Chaetodon hoefleri	1.20	6	0.33		
Zeus faber	1.20	12	0.33		
Peristedion cataphractum	0.60	12	0.16		
Saurida brasiliensis	0.60	54	0.16		
Citharus linguatula	0.60	6	0.02		
Total	365.86		100.00		

DATE: 27/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1364
 start stop duration POSITION: Lat S 754
 TIME :15:54:13 16:23:57 30 (min) Purpose code: 3 Long E 1306
 LOG :6774.24 6775.60 1.44 Area code : 2
 FDEPTH: 24 24 GearCond.code:
 BDEPTH: 24 24 Validity code:
 Towing dir: 340° Wire out: m Speed: kn*10
 Sorted: 65 Kg Total catch: 387.42 CATCH/HOUR: 774.84

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Brachydeuterus auritus	496.20	13810	64.04	3073	
Pteroscion pelli	38.40	1332	4.96		
Pseudolithus typus	34.56	96	4.46		
Chloroscombrus chrysurus	33.84	348	4.37		
Galeoides decadactylus	33.12	108	4.27		
Pomadasy's peroteti	31.56	108	4.07	3074	
Pentaneus quinquarius	19.68	552	2.54		
Raja miraletus	18.60	12	2.45		
Trichiurus lepturus	18.00	216	2.32		
Pomadasy's incisivus	15.24	48	1.97		
Ilisha africana	11.64	228	1.50		
Parapanaeopsis atlantica, fem.	8.16	1752	1.05	3077	
Trachurus trecae	4.80	96	0.62	3075	
Cynoglossus senegalensis	3.96	36	0.51		
Vanstraelenia chirophthalmus	1.92	24	0.25		
Cynoglossus canariensis	1.56	12	0.20		
Parapanaeopsis atlantica, male	1.08	696	0.14	3076	
Selene dorsalis	0.96	48	0.12		
Sepiella ornata	0.52	24	0.07		
Penaeus notialis	0.48	24	0.06		
Total	774.64		99.97		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1365
 start stop duration POSITION: Lat S 732
 TIME :05:31:34 06:01:20 30 (min) Purpose code: 1 Long E 1255
 LOG :6808.91 6810.18 1.55 Area code : 2
 FDEPTH: 31 32 GearCond.code:
 BDEPTH: 31 32 Validity code:
 Towing dir: 155° Wire out: 130 m Speed: 30 kn*10
 Sorted: 148 Kg Total catch: 202.50 CATCH/HOUR: 405.00

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Pseudolithus typus	172.40	92	42.57	3078	
Pteroscion pelli	44.80	2986	11.06		
Trichiurus lepturus	37.60	288	9.28		
Galeoides decadactylus	32.80	128	8.10		
Pomadasy's incisivus	17.56	96	4.34	3079	
Panulirus regius	15.80	30	3.90	3082	
Arius parkii	13.64	24	3.37		
Dentex barnardi	12.28	48	3.03	3080	
Pomadasy's peroteti	10.00	16	2.47		
Plectorhynchus mediterraneus	9.12	12	2.25		
Ilisha africana	8.32	284	2.05		
Dasyatis margarita	4.52	4	1.12		
Cynoglossus canariensis	4.00	16	0.99		
MURAEINIDAE	4.00	6	0.99		
Zanobatus schoenleinii	3.56	4	0.88		
Pentaneus quinquarius	2.68	32	0.66		
Umbrina canariensis	2.52	12	0.62		
Stromateus fiatola	1.84	4	0.45		
Sepia officinalis hierredda	1.64	4	0.40		
Sparus pagrus africanus *	1.08	8	0.27	3081	
Parapanaeopsis atlantica, fem.	0.92	232	0.23	3084	
Ryphticus saponaceus	0.76	12	0.19		
Chaetodon hoefleri	0.64	4	0.16		
Scorpaena angolensis	0.56	20	0.14		
Pseudupeneus prayensis	0.48	8	0.12		
Trachinus armatus	0.28	8	0.07		
Penaeus notialis, male	0.24	10	0.06	3085	
Penaeus notialis, female	0.16	4	0.04	3086	
Monolene microstoma	0.12	4	0.03		
Vanstraelenia chirophthalmus	0.12	8	0.03		
Parapanaeopsis atlantica, male	0.08	60	0.02	3083	
Penaeus kerathurus	0.08	2	0.02		
Selene dorsalis, juveniles	0.08	24	0.02		
Trachurus trecae	0.08	4	0.02		
Lagocephalus sp.	0.08	8	0.02		
Chloroscombrus chrysurus	0.04	28	0.01		
Chaetodon marcellae	0.04	4	0.01		
Engraulis encrasicolus	0.04	4	0.01		
SOLEIDAE	0.04	4	0.01		
Total	405.00		100.01		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1366
start stop duration POSITION: Lat S 737
TIME : 07:31:25 08:01:23 30 (min) Purpose code: 3 Long E 1247
LOG : 6820 49 6821 71 1.48 Area code : 2
FDEPTH: 74 75 GearCond code:
BDEPTH: 74 75 Validity code:
Towing dir: 130° Wire out: 260 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 371 28 CATCH/HOUR: 742 56

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Brachydeuterus auritus	308.52	2814	41 55	3092
Trachurus trecae	142.80	4258	19 23	3093
Selene dorsalis	70.20	288	9 45	3091
Trichiurus lepturus	49.56	96	6.67	
Pagellus bellottii	49.32	840	6.64	3090
Dentex angolensis	20.04	468	2.70	3089
Atractoscion aequidens	13.32	12	1.79	
Dentex barnardi	12.08	144	1.76	3088
Dasyatis margarita	12.48	12	1.68	
Pseudupeneus prayensis	11.40	288	1.54	
Chelidonichthys capensis	9.24	72	1.24	
Arius parkii	7.68	12	1.03	
Dentex congoensis	7.32	144	0.99	3087
Chelidonichthys gabonensis	6.84	120	0.92	
Alloteuthis africana	4.80	1752	0.65	
Dentex gibbosus	4.80	12	0.32	
Sarda sarda	2.40	2	0.31	
Illex coindetii	2.28	48	0.31	
Fistularia petimba	2.16	12	0.29	
Sardinella maderensis	1.20	12	0.16	
Saurida brasiliensis	0.84	60	0.11	
Citharus linguatula	0.72	24	0.10	
Branchiostegus semifasciatus	0.72	12	0.10	
Boops boops	0.36	24	0.05	
Monolele microstoma	0.24	24	0.03	
Chloroscombrus chrysurus	0.12	108	0.02	
Sardinella aurita	0.12	12	0.02	
Total	742.56	100 00		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1367
start stop duration POSITION: Lat S 738
TIME : 09:30:51 09:56:49 26 (min) Purpose code: 3 Long E 1237
LOG : 6832 37 6833 33 1.34 Area code : 2
FDEPTH: 112 111 GearCond code:
BDEPTH: 112 111 Validity code:
Towing dir: 340° Wire out: 380 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 265.20 CATCH/HOUR: 612 00

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Trachurus trecae	346.15	16705	56 56	3095
Saurida brasiliensis	36.00	3702	5.88	
Chelidonichthys gabonensis	35.08	748	5.73	
Sepia orbignyana	32.31	129	5.28	
Illex coindetii	28.62	1858	4.68	
Dentex gibbosus	24.92	55	4.07	3096
Spicara alta	23.08	1468	3.77	
Dentex congoensis	17.54	378	2.87	3098
Pagellus bellottii	16.62	351	2.72	3094
Boops boops	12.92	914	2.11	
Dentex angolensis	10.15	83	1.66	3097
Fistularia petimba	8.31	9	1.36	
Branchiostegus semifasciatus	7.58	9	1.21	
Lagocephalus laevigatus	5.54	9	0.91	
Citharus linguatula	2.77	102	0.45	
Chelidonichthys capensis	1.85	18	0.30	
Dentex barnardi	1.85	9	0.30	
Zeus faber	0.92	9	0.15	
Total	612.01	100 01		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1368
start stop duration POSITION: Lat S 739
TIME : 12:32:48 12:54:15 21 (min) Purpose code: 3 Long E 1233
LOG : 6841 97 6842 73 0.93 Area code : 2
FDEPTH: 174 181 GearCond code:
BDEPTH: 174 181 Validity code:
Towing dir: 335° Wire out: 580 m Speed: 27 kn*10

Sorted: 116 Kg Total catch: 1382.20 CATCH/HOUR: 3949 14

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Synagrops microlepis	3647.71	280580	92.37	
Zenopsis conchifer	76.00	896	1.92	
Illex coindetii	56.29	1089	1.43	
Saurida brasiliensis	35.14	2109	0.89	
Spicara alta	21.14	174	0.54	
Trichiurus lepturus	21.14	34	0.54	
Sepia officinalis hierredda	17.71	174	0.45	
Dentex macrocephalus	17.71	69	0.45	
Dentex angolensis	17.71	69	0.45	
Pterothrissus belloci	14.00	140	0.35	
Todaropsis eblanae	10.57	246	0.27	
Bemdrops heterurus	7.14	69	0.18	
Merluccius polli	3.43	69	0.09	
Uranoscopus polli	1.43	34	0.04	
Peristedion cataphractum	1.43	69	0.04	
Citharus linguatula	0.57	34	0.01	
Total	3949.12	100 02		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1369
start stop duration POSITION: Lat S 739
TIME : 13:49:54 14:19:22 29 (min) Purpose code: 3 Long E 1231
LOG : 6846 11 6847 27 1.67 Area code : 2
FDEPTH: 249 262 GearCond code:
BDEPTH: 249 262 Validity code:
Towing dir: 340° Wire out: 760 m Speed: 33 kn*10

Sorted: 83 Kg Total catch: 500.90 CATCH/HOUR: 1036 35

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Synagrops microlepis	652.34	52680	62 95	
MYCTOPHIDAE	324.21	172585	31 28	
Trichiurus lepturus	18.83	27	1.82	
Illex coindetii	12.41	188	1.20	
Merluccius polli	8.07	93	0.78	
Chlorophthalmus atlanticus	6.83	296	0.66	
Parapenaeus longirostris, fem	4.14	592	0.40	3099
Zenopsis conchifer	4.14	27	0.40	
Bemdrops heterurus	2.69	281	0.26	
Parapenaeus longirostris, male	1.24	273	0.12	3100
Saurida brasiliensis	0.62	54	0.06	
CONGRIDAE	0.41	66	0.04	
Scorpaena normani	0.21	12	0.02	
Solenocera africana	0.14	12	0.01	
Total	1036.28	100 00		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1370
start stop duration POSITION: Lat S 738
TIME : 16:44:30 17:14:08 30 (min) Purpose code: 3 Long E 1230
LOG : 6852 61 6853 81 1.65 Area code : 2
FDEPTH: 348 363 GearCond code:
BDEPTH: 348 363 Validity code:
Towing dir: 335° Wire out: 1000 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 409.15 CATCH/HOUR: 818 30

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Nematocarcinus africanus	381.50	124260	46 62	
Merluccius polli	298.20	1722	36 44	3101
Chlorophthalmus atlanticus	43.40	84	5 30	
Malacocephalus laevis	15.82	294	1 93	
Synagrops microlepis	13.72	770	1 68	
Gadella imberbis	13.58	392	1 66	
Chaunax pictus	9.66	420	1 18	
Illex coindetii	9.52	168	1 16	
Pterothrissus belloci	8.40	42	1 03	
Coelorhynchus coelorhynchus	5.60	140	0 68	
Hymenocephalus italicus	5.04	560	0 62	
Pontinus kuhlii	4.20	126	0 51	
Parapenaeus longirostris, fem	2.06	216	0 25	3103
Scorpaena normani	1.54	14	0 19	
Solenocera africana	1.40	210	0 17	
MYCTOPHIDAE	1.26	854	0 15	
Bemdrops sp.	1.12	28	0 14	
Trichiurus lepturus	0.70	28	0 09	
Epigonus telescopus	0.56	28	0 07	
Parapenaeus longirostris, male	0.18	28	0 02	3102
Aristeus varidens, female	0.14	28	0 02	
Aristeus varidens, male	0.14	14	0 02	
Dibranchius atlanticus	0.14	14	0 02	
Eumunida squamifera *	0.14	28	0 02	
Saurida brasiliensis	0.14	14	0 02	
Triplophos sp.	0.14	14	0 02	
Total	818.30	100 01		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1371
start stop duration POSITION: Lat S 738
TIME : 20:10:17 20:26:07 16 (min) Purpose code: 3 Long E 1229
LOG : 6861 97 6862 57 0.84 Area code : 2
FDEPTH: 439 429 GearCond code:
BDEPTH: 439 429 Validity code:
Towing dir: 350° Wire out: 1250 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 175.09 CATCH/HOUR: 656 59

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Nematocarcinus africanus	508.61	125993	77 46	
Hoplostethus cadonati	60.53	2363	9 22	
Merluccius polli	20.21	53	3 08	
Malacocephalus laevis	17.06	551	2 60	
Lamprogrammus exutus	9.19	131	1 40	
Illex coindetii	5.78	41	0 88	
Coelorhynchus sp.	4.73	41	0 72	
Triplophos sp.	4.09	604	0 62	
Gadella imberbis	3.94	120	0 60	
Chlorophthalmus atlanticus	3.94	94	0 60	
Aristeus varidens, female	3.23	334	0 49	3105
Aristeus varidens, male	2.55	315	0 39	3104
Nezumia aequalis	2.25	41	0 34	
Dibranchius atlanticus	2.25	184	0 34	
Munida sp. *	1.99	225	0 30	
GONOSTOMATIDAE	1.58	41	0 24	
Bathynectes piperitus	1.20	15	0 18	
Yarella blackfordi	1.05	41	0 16	
Chaunax pictus	0.94	15	0 14	
Solenocera africana	0.53	53	0 08	
Hymenocephalus italicus	0.26	26	0 04	
Plesiopeanaeus edwardsianus	0.19	8	0 03	
CYNOGLOSSIDAE	0.15	15	0 02	
Eumunida squamifera *	0.15	15	0 02	
Peristedion cataphractum	0.15	26	0 02	
Parapenaeus longirostris, fem	0.08	8	0 01	
Total	656.63	99 98		

DATE: 28/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1372
start stop duration POSITION: Lat S 741
TIME : 21:51:11 22:21:00 30 (min) Purpose code: 3 Long E 1230
LOG : 6870 32 6871 46 1.62 Area code : 2
FDEPTH: 520 575 GearCond code:
BDEPTH: 520 575 Validity code:
Towing dir: 325° Wire out: 1500 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 203.30 CATCH/HOUR: 406 60

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Nematocarcinus africanus	318.40	91274	78 31	
GONOSTOMATIDAE	16.00	368	3 94	
Triplophos sp.	14.40	2160	3 54	
REGALCIDAE	11.20	16	2 75	
Centrophorus uyato	10.20	4	2 51	
Trichiurus lepturus	8.00	352	1 97	
Illex coindetii	6.40	48	1 57	
Hoplostethus cadonati	6.40	240	1 57	
Gadella imberbis	4.80	112	1 18	
Munida sp. *	4.80	336	1 18	
Lamprogrammus exutus	3.20	48	0 79	
Aristeus varidens, female	1.60	48	0 39	3106
Aristeus varidens, male	0.60	30	0 15	3107
Heterocarpus ensifer	0.20	16	0 05	
Yarella blackfordi	0.20	6	0 05	
Solenocera africana	0.20	0	0 05	
Total	406 60	100 00		

PROJECT STATION: 1373
 DATE: 29/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 728
 start stop duration Long E 1200
 TIME :03:20:58 03:50:28 30 (min) Purpose code: 3
 LOG :6899.24 6900.52 1.46 Area code : 2
 FDEPTH: 702 701 GearCond.code: 2
 BDEPTH: 702 701 Validity code:
 Towing dir: 330° Wire out: 1800 m Speed: 29 kn*10
 Sorted: 34 Kg Total catch: 122.04 CATCH/HOUR: 244.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Hoplostethus cadenati	121.20	658	49.66	
Yarella blackfordi	44.40	682	18.19	
Munida sp. *	18.00	1320	7.37	
Triplophos sp.	15.60	1638	6.39	
Nezumia aequalis	15.60	312	6.39	
Nematocarcinus africanus	12.00	8640	4.92	
Gadella imberbis	4.80	168	1.97	
GONOSTOMATIDAE	3.60	144	1.47	
Xenodermichthys copei	3.60	168	1.47	
Malacocephalus occidentalis	1.20	12	0.49	
Aristeus varidens, male	1.20	252	0.49	3109
Aristeus varidens, female	1.20	180	0.49	3108
Halosaurus ovenii	1.20	12	0.49	
Dibranchius atlanticus	0.48	12	0.20	
Total	244.08		99.99	

PROJECT STATION: 1376
 DATE: 29/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 724
 start stop duration Long E 1212
 TIME :09:23:57 09:53:56 30 (min) Purpose code: 3
 LOG :6923.64 6925.05 1.51 Area code : 2
 FDEPTH: 372 376 GearCond.code: 2
 BDEPTH: 372 376 Validity code:
 Towing dir: 125° Wire out: 1050 m Speed: 30 kn*10
 Sorted: 67 Kg Total catch: 983.40 CATCH/HOUR: 1966.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	739.20	5452	37.58	
Merluccius polli	474.20	1804	24.11	3114
Chlorophthalmus atlanticus	310.20	2588	15.77	
Nematocarcinus africanus	293.80	64614	14.94	
Zenopsis conchifer	39.60	32	2.01	
Malacocephalus laevis	23.20	264	1.18	
GONOSTOMATIDAE	16.60	792	0.84	
Nezumia aequalis	13.20	66	0.67	
Gadella imberbis	13.20	428	0.67	
Hymenocephalus italicus	7.20	726	0.37	
Illex coindetii	6.60	98	0.34	
MYCTOPHIDAE	6.60	5148	0.34	
Chaunax pictus	3.40	264	0.17	
Triplophos sp.	3.00	98	0.15	
Munida sp. *	3.00	132	0.15	
Epigonus telescopus	3.00	132	0.15	
Dibranchius atlanticus	2.40	32	0.12	
NEMICHTHYIDAE	2.40	198	0.12	
Synagrops microlepis	1.60	66	0.08	
Conger conger	1.40	32	0.07	
Aristeus varidens, female	0.80	94	0.04	3116
Aristeus varidens, male	0.40	40	0.02	3115
Solenocera africana	0.40	32	0.02	
Bathynectes piperitus	0.40	32	0.02	
Xenolepidichthys dagleishi	0.40	32	0.02	
Total	1966.20		99.95	

PROJECT STATION: 1374
 DATE: 29/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 727
 start stop duration Long E 1205
 TIME :05:46:03 06:16:02 30 (min) Purpose code: 3
 LOG :6908.70 6909.87 1.44 Area code : 2
 FDEPTH: 556 558 GearCond.code: 2
 BDEPTH: 556 558 Validity code:
 Towing dir: 320° Wire out: 1500 m Speed: 30 kn*10
 Sorted: 26 Kg Total catch: 254.84 CATCH/HOUR: 509.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	319.00	62164	62.59	
Lamprogrammus exultans	55.20	120	10.83	
Hoplostethus cadenati	53.60	1944	10.52	
Munida sp. *	21.00	1700	4.12	
Gadella imberbis	18.20	660	3.57	
GONOSTOMATIDAE	12.00	120	2.35	
Aristeus varidens, female	8.14	340	1.60	3111
Triplophos sp.	7.80	980	1.53	
Trichiurus lepturus	6.20	40	1.22	
Nezumia aequalis	2.60	80	0.51	
Yarella blackfordi	1.60	60	0.31	
Melanocetus johnsoni	1.20	40	0.24	
MYCTOPHIDAE	0.80	800	0.16	
Dibranchius atlanticus	0.60	20	0.12	
Halosaurus ovenii	0.60	20	0.12	
Aristeus varidens, male	0.40	54	0.08	3110
MACROURIDAE	0.20	20	0.04	
Chlorophthalmus sp.	0.20	20	0.04	
Conger conger	0.20	20	0.04	
Shrimps, small, non comm	0.10	20	0.02	
Eumunida squamifera *	0.04	20	0.01	
Total	509.68		100.02	

PROJECT STATION: 1377
 DATE: 29/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 723
 start stop duration Long E 1218
 TIME :11:24:44 11:54:47 30 (min) Purpose code: 3
 LOG :6932.38 6933.89 1.53 Area code : 2
 FDEPTH: 249 257 GearCond.code: 2
 BDEPTH: 249 257 Validity code:
 Towing dir: 115° Wire out: 780 m Speed: 30 kn*10
 Sorted: 76 Kg Total catch: 516.50 CATCH/HOUR: 1033.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	317.20	22996	30.71	
MYCTOPHIDAE	283.40	266396	27.43	
Merluccius polli	161.20	1130	15.61	3117
Dentex angolensis	96.20	272	9.31	3120
Zenopsis conchifer	36.40	90	3.52	
Trichiurus lepturus	35.20	234	3.41	
Nezumia aequalis	31.20	754	3.02	
Illex coindetii	26.00	338	2.52	
Dentex macrophthalmus	9.20	38	0.89	
Chlorophthalmus atlanticus	9.20	312	0.89	
Bembrops heterurus	7.80	78	0.76	
Parapenaeus longirostris, fem.	6.60	726	0.64	3118
Malacocephalus occidentalis	5.20	182	0.50	
Parapenaeus longirostris, male	2.60	468	0.25	3119
Peristedion cataphractum	2.60	78	0.25	
Pterothrissus belloci	1.40	12	0.14	
Scorpaena sp.	1.40	78	0.14	
Dibranchius atlanticus	0.14	26	0.01	
Citharus linguatula	0.14	26	0.01	
Total	1033.08		100.01	

PROJECT STATION: 1375
 DATE: 29/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 725
 start stop duration Long E 1206
 TIME :07:37:24 08:07:12 30 (min) Purpose code: 3
 LOG :6916.13 6917.29 1.49 Area code : 2
 FDEPTH: 457 460 GearCond.code: 2
 BDEPTH: 457 460 Validity code:
 Towing dir: 315° Wire out: 1250 m Speed: 30 kn*10
 Sorted: 35 Kg Total catch: 314.26 CATCH/HOUR: 628.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	280.60	1772	44.64	
Nematocarcinus africanus	189.76	48540	30.19	
GONOSTOMATIDAE	69.00	3296	10.98	
Centrophorus uyato	16.40	4	2.56	
Triplophos sp.	16.10	2070	2.61	
Chaunax pictus	14.04	162	2.23	
Gadella imberbis	8.28	506	1.32	
Munida sp. *	6.68	644	1.06	
Illex coindetii	5.30	70	0.84	
Lophius vaillanti	5.06	24	0.81	
Aristeus varidens, female	4.82	322	0.77	3112
Bathynectes piperitus	2.76	70	0.44	
Yarella blackfordi	2.10	70	0.37	
Aristeus varidens, male	1.46	170	0.23	3113
NEMICHTHYIDAE	1.16	162	0.18	
Hymenocephalus italicus	1.16	92	0.18	
Xenodermichthys copei	0.92	208	0.15	
Plesiopeanaeus edwardsianus	0.62	16	0.10	
Paralepis sp.	0.46	24	0.07	
Chascanopsetta lugubris	0.46	24	0.07	
MYCTOPHIDAE	0.46	506	0.07	
Saurida brasiliensis	0.24	24	0.04	
Malacocephalus laevis	0.24	24	0.04	
CONGRIDAE	0.24	24	0.04	
Total	628.52		99.99	

PROJECT STATION: 1378
 DATE: 29/ 5/97 GEAR TYPE: BT No: POSITION: Lat S 722
 start stop duration Long E 1225
 TIME :13:52:36 14:02:52 10 (min) Purpose code: 3
 LOG :6946.32 6946.69 0.49 Area code : 2
 FDEPTH: 121 123 GearCond.code: 9
 BDEPTH: 121 123 Validity code:
 Towing dir: 330° Wire out: 380 m Speed: 29 kn*10
 Sorted: 20 Kg Total catch: 20.27 CATCH/HOUR: 121.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Squatina aculeata	39.00	6	32.07	
Saurida brasiliensis	36.00	5268	29.60	
Trichiurus lepturus	12.00	18	9.87	
Boops boops	12.00	450	9.87	
Umbrina canariensis	6.00	18	4.93	
Dentex angolensis	4.80	18	3.95	
Scorpaena angolensis	3.60	6	2.96	
Zenopsis conchifer	1.80	6	1.48	
Zeus faber	1.80	6	1.48	
Uranoscopus polli	1.20	6	0.99	
Trigla lyra	1.20	6	0.99	
Trachurus trecae	0.60	6	0.49	
Parapandalus narval	0.60	198	0.49	
Dentex congolensis	0.60	12	0.49	
Bembrops heterurus	0.24	6	0.20	
Spicara alta	0.12	6	0.10	
Dibranchius atlanticus	0.06	6	0.05	
Total	121.62		100.01	

DATE: 29/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1379
 start stop duration POSITION: Lat S 719
 TIME :15:47:51 16:17:26 30 (min) Purpose code: 3 Long E 1233
 LOG :6956.45 6957.74 1.57 Area code : 2
 FDEPTH: 79 88 GearCond code:
 BDEPTH: 79 88 Validity code:
 Towing dir: 240° Wire out: 280 m Speed: 30 kn*10

Sorted: 115 Kg Total catch: 1366.32 CATCH/HOUR: 2732.64

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Selene dorsalis	1987.60	5642	72.74	3123
Trachurus trecae	235.46	11146	8.62	3124
Atractoscion aeguidens	136.72	76	5.00	
Boops boops	101.28	7712	3.71	
Pagellus bellottii	101.28	3402	3.71	3121
Chelidonichthys capensis	50.64	330	1.85	
Umbrina canariensis	37.98	76	1.39	
Leptocharias smithii	15.60	10	0.57	
Dentex congoensis	15.18	582	0.56	3122
Sepia officinalis hierredda	10.12	26	0.37	
Priacanthus arenatus	7.60	50	0.28	
Chaetodon hoefleri	7.58	50	0.28	
Saurida brasiliensis	5.06	6234	0.19	
Dentex angolensis	5.06	178	0.19	
Zeus faber	5.06	26	0.19	
Dentex gibbosus	2.54	50	0.09	
Illex coindetii	2.54	26	0.09	
Spicara alta	2.54	50	0.09	
Dentex barnardi	2.54	26	0.09	
Citharus linguatula	0.26	26	0.01	
Total	2732.64	100.02		

DATE: 30/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1382
 start stop duration POSITION: Lat S 706
 TIME :10:53:39 11:23:34 30 (min) Purpose code: 3 Long E 1201
 LOG :7021.78 7023.44 1.63 Area code : 2
 FDEPTH: 151 154 GearCond code:
 BDEPTH: 151 154 Validity code:
 Towing dir: 300° Wire out: 480 m Speed: 32 kn*10

Sorted: 98 Kg Total catch: 98.40 CATCH/HOUR: 196.80

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Dentex angolensis	43.00	208	21.85	3138
Chelidonichthys capensis	23.00	152	11.69	
Trachurus trecae	20.40	388	10.37	3137
Dentex congoensis	18.00	338	9.15	3136
Leptocharias smithii	17.00	2	8.64	
Zenopsis conchifer	15.40	60	7.83	
Sepia officinalis hierredda	14.00	108	7.11	
Spicara alta	8.00	94	4.07	
Ariomma bondi	6.60	106	3.35	
Saurida brasiliensis	4.60	524	2.34	
Trichiurus lepturus	4.20	4	2.13	
Illex coindetii	4.00	70	2.03	
Brotula barbata	3.80	4	1.93	
Bembrops heterurus	3.60	48	1.83	
Dentex macrophthalmus	3.00	14	1.52	
Raja miraletus	2.20	4	1.12	
Citharus linguatula	2.00	44	1.02	
Peristedion cataphractum	2.00	36	1.02	
Priacanthus arenatus	0.60	2	0.30	
Scorpaena normani	0.40	4	0.20	
Zeus faber	0.40	2	0.20	
Scorpaena stephanica	0.40	4	0.20	
Uranoscopus polli	0.20	2	0.10	
Boops boops	0.06	2	0.03	
Total	196.86	100.03		

DATE: 30/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1380
 start stop duration POSITION: Lat S 701
 TIME :05:35:51 05:55:27 20 (min) Purpose code: 3 Long E 1235
 LOG :6989.00 6989.81 0.96 Area code : 2
 FDEPTH: 33 33 GearCond code:
 BDEPTH: 33 33 Validity code:
 Towing dir: 155° Wire out: 150 m Speed: 30 kn*10

Sorted: 208 Kg Total catch: 896.77 CATCH/HOUR: 2690.11

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Brachydeuterus auritus	1566.60	48108	58.23	3131
Galeoides decadactylus	239.40	2310	8.90	
Engraulis encrasicolus	150.78	34632	5.60	
Pseudotolithus typus	117.60	105	4.37	3129
Arius parkii	102.06	84	3.79	
Ilisha africana	96.39	1575	3.58	
Plectorhinchus mediterraneus	67.41	84	3.58	
Pentheroscion mbizi	62.58	882	2.13	
Pomadasy peroteti	55.65	42	2.07	
Dentex barnardi	36.75	105	1.37	3127
Sparus caeruleostictus *	30.87	126	1.15	3126
Selene dorsalis	29.19	399	1.09	
Chloroscombrus chrysurus	28.35	315	1.05	
Pagellus bellottii	9.87	126	0.37	3125
Cephalopholis taeniops	9.66	21	0.36	
Dasyatis marmorata	8.40	21	0.31	
Sphyræna guachancho	8.40	21	0.31	
Epinephelus costae	8.40	6	0.31	
Epinephelus aeneus	8.40	3	0.31	
Pomadasy incisus	8.19	42	0.30	
Umbrina canariensis	8.19	21	0.30	
Trachinus radiatus	6.51	21	0.24	
Trachurus trecae, juvenile	6.30	378	0.23	3128
Dentex gibbosus	5.88	21	0.22	
Decapterus rhonchus	4.83	168	0.18	3130
Citharus linguatula	4.20	21	0.16	
Pteroscion peli	2.31	84	0.09	
Penaeus kerathurus	2.31	42	0.09	
Trachinocephalus myops	1.68	21	0.06	
Monolepis microstoma	1.26	42	0.05	
Penaeus notialis	0.84	42	0.03	
Sardinella maderensis	0.42	21	0.02	
Sardinella aurita - Juveniles	0.42	63	0.02	
Chaetodon marcellae	0.21	21	0.01	
Total	2690.31	100.01		

DATE: 30/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1383
 start stop duration POSITION: Lat S 708
 TIME :14:58:48 15:28:25 30 (min) Purpose code: 3 Long E 1160
 LOG :7036.42 7037.89 1.45 Area code : 2
 FDEPTH: 270 276 GearCond code:
 BDEPTH: 270 276 Validity code:
 Towing dir: 125° Wire out: 840 m Speed: 29 kn*10

Sorted: 117 Kg Total catch: 1837.20 CATCH/HOUR: 3674.40

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Synagrops microlepis	3090.00	194834	84.10	
Chlorophthalmus atlanticus	401.00	9356	10.91	
Merluccius polli	68.40	846	1.86	3139
Illex coindetii	35.80	586	0.97	
Zenopsis conchifer	32.60	162	0.89	
Coelorhynchus coelorhynchus	9.80	32	0.27	
Parapenaeus longirostris, fem	9.80	882	0.27	3140
Parapenaeus longirostris, male	6.60	684	0.18	3141
Eumunida squamifera *	6.60	554	0.18	
Nezumia aequalis	3.20	32	0.09	
Trigla lyra	3.20	32	0.09	
Scorpaena stephanica	3.20	32	0.09	
Calappa sp.	2.00	32	0.05	
Raja clavata	1.40	32	0.04	
Trichiurus lepturus	0.40	32	0.01	
Solenocera africana	0.40	32	0.01	
Total	3674.40	100.01		

DATE: 30/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1384
 start stop duration POSITION: Lat S 711
 TIME :18:14:20 18:40:35 26 (min) Purpose code: 3 Long E 1159
 LOG :7046.78 7048.19 1.39 Area code : 2
 FDEPTH: 368 384 GearCond code:
 BDEPTH: 368 384 Validity code:
 Towing dir: 320° Wire out: 1050 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 283.44 CATCH/HOUR: 654.09

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Merluccius polli	251.22	1177	38.71	3142
Nematocarcinus africanus	151.82	58798	23.21	
Chlorophthalmus atlanticus	139.22	2072	21.28	
Malacocephalus laevis	20.28	318	3.10	
MYCTOPHIDAE	19.73	21951	3.02	
Hymenoccephalus italicus	18.74	1285	2.87	
Trichiurus lepturus	11.95	286	1.83	
Chaunax pictus	7.78	187	1.19	
Gadella imberbis	6.90	175	1.05	
Nezumia aequalis	6.14	44	0.94	
Epigonus telescopus	3.30	111	0.50	
Aristeus varidens, male	2.91	321	0.44	3143
Coelorhynchus coelorhynchus	2.19	55	0.33	
Illex coindetii	1.87	23	0.29	
Parapenaeus longirostris, fem	1.32	99	0.20	3145
Chascanopsetta lugubris	1.32	12	0.20	
Bathynectes piperitus	1.11	12	0.17	
Ommastrephes pteropus	0.99	12	0.15	
Eumunida squamifera *	0.76	67	0.12	
Munida sp. *	0.76	32	0.12	
Bembrops sp.	0.55	12	0.08	
Parapandalus narval	0.32	55	0.05	
Halosaurus ovenii	0.32	12	0.05	
Dibranchius atlanticus	0.32	23	0.05	
Aristeus varidens, female	0.14	7	0.02	3144
Solenocera africana	0.12	12	0.02	
Total	654.08	99.99		

DATE: 30/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1381
 start stop duration POSITION: Lat S 702
 TIME :08:21:03 08:51:02 30 (min) Purpose code: 3 Long E 1218
 LOG :7006.37 7007.52 1.63 Area code : 2
 FDEPTH: 83 85 GearCond code:
 BDEPTH: 83 85 Validity code:
 Towing dir: 290° Wire out: 260 m Speed: 30 kn*10

Sorted: 95 Kg Total catch: 789.81 CATCH/HOUR: 1579.62

SPECIES	CATCH/HOUR	% OF TOT	C	SAMP
	weight numbers			
Trachurus trecae	1520.24	47766	96.24	3135
Chelidonichthys capensis	29.48	150	1.87	
Dentex congoensis	7.12	150	0.46	3132
Fistularia petimba	5.66	34	0.36	
Pagellus bellottii	5.66	134	0.36	3133
Dentex angolensis	3.32	66	0.21	3134
Lepidotrigla carolae	2.66	84	0.17	
Chaetodon hoefleri	1.98	16	0.13	
Zeus faber	1.32	16	0.08	
Priacanthus arenatus	1.16	16	0.07	
Illex coindetii	0.82	16	0.05	
Total	1579.62	100.00		

DATE: 30/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1385
 start stop duration POSITION: Lat S 711
 TIME :21:38:45 22:08:42 30 (min) Purpose code: 3 Long E 1153
 LOG :7059 41 7060 91 1.48 Area code : 2
 FDEPTH: 566 575 GearCond code:
 BDEPTH: 566 575 Validity code:
 Towing dir: 320° Wire out: 1500 m Speed: 30 kn*10
 Sorted: 27 Kg Total catch: 75.30 CATCH/HOUR: 150.60

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Munida sp. *	42.00	2190	27.89		
Hoplostethus cadenati	28.80	748	19.12		
Triplophos sp.	13.80	1656	9.16		
Lamprogrammus exutus	13.80	30	9.16		
GONOSTOMATIDAE	12.00	216	7.97		
Laemonema laureysi	9.60	78	6.37		
Gadella imberbis	6.60	384	4.38		
Raja clavata	6.00	6	3.98		
Aristeus varidens, female	4.00	138	2.66		3146
MACROURIDAE	2.40	6	1.59		
Coelorinchus coelorhincus	2.40	36	1.59		
Malacocephalus laevis	1.80	54	1.20		
Illex coindetii	1.20	6	0.80		
Xenodermichthys copei	1.20	54	0.80		
Nematocarcinus africanus	0.60	132	0.40		
Chaunax pictus	0.60	6	0.40		
Dibranchius atlanticus	0.60	18	0.40		
Trichiurus lepturus	0.60	12	0.40		
Todaropsis eblanae	0.60	6	0.40		
CONGRIDAE	0.60	18	0.40		
Yarella blackfordi	0.60	18	0.40		
Aristeus varidens, male	0.60	70	0.40		3147
Scorpaena stephanica	0.20	6	0.13		
Total		150.60		100.00	

DATE: 31/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1386
 start stop duration POSITION: Lat S 651
 TIME :01:32:16 02:03:13 31 (min) Purpose code: 3 Long E 1138
 LOG :7086 21 7087 85 1.60 Area code : 2
 FDEPTH: 711 701 GearCond code:
 BDEPTH: 711 701 Validity code:
 Towing dir: 350° Wire out: 1800 m Speed: 31 kn*10
 Sorted: 33 Kg Total catch: 219.20 CATCH/HOUR: 424.26

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Hoplostethus cadenati	311.61	1334	73.45		
Munida sp. *	21.68	1277	5.11		
Chaceon maritae	20.32	27	4.79		
GONOSTOMATIDAE	13.55	352	3.19		
Yarella blackfordi	13.55	149	3.19		
Coelorinchus coelorhincus	8.13	135	1.92		
Xenodermichthys copei	8.13	285	1.92		
Lamprogrammus exutus	5.42	14	1.28		
Nematocarcinus africanus	4.06	55	0.96		
Ommastrephes pteropus	2.71	14	0.64		
Triplophos sp.	2.71	352	0.64		
Aphanopus sp.	2.71	27	0.64		
Aristeus varidens, female	2.13	135	0.50		3148
Talismaania sp.	1.35	41	0.32		
Lophius vailanti	1.35	27	0.32		
Dibranchius atlanticus	1.35	27	0.32		
Halosaurus ovenii	1.35	27	0.32		
Gadella imberbis	1.35	54	0.32		
MYCTOPHIDAE	0.39	420	0.09		
Heterocarpus ensifer	0.19	14	0.04		
MACROURIDAE	0.19	14	0.04		
Aristeus varidens, male	0.08	31	0.02		3149
Total		424.31		100.02	

DATE: 31/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1387
 start stop duration POSITION: Lat S 649
 TIME :04:12:08 04:43:30 31 (min) Purpose code: 3 Long E 1142
 LOG :7099 84 7101.45 1.60 Area code : 2
 FDEPTH: 492 494 GearCond code:
 BDEPTH: 492 494 Validity code:
 Towing dir: 356° Wire out: 1300 m Speed: 30 kn*10
 Sorted: 25 Kg Total catch: 61.72 CATCH/HOUR: 119.46

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Lamprogrammus exutus	27.10	58	22.69		
Munida sp. *	14.86	1287	12.44		
GONOSTOMATIDAE	11.61	366	9.72		
Aristeus varidens, female	8.23	490	6.89		3151
Halacocephalus laevis	7.74	93	6.48		
Aristeus varidens, male	7.45	300	6.24		3150
Nematocarcinus africanus	4.84	988	4.05		
Triplophos sp.	4.51	631	3.78		
Gadella imberbis	3.93	209	3.29		
Hoplostethus cadenati	3.83	174	3.21		
Chaceon maritae	3.64	6	3.05		
Chaunax pictus	3.15	45	2.64		
Trichiurus lepturus	3.06	6	2.56		
Merluccius polli	2.86	10	2.39		
Elmopterus pusillus	1.90	6	1.59		
Yarella blackfordi	1.55	35	1.30		
Nezumia aequalis	1.26	35	1.05		
C E P H A L O P O D A	0.93	6	0.78		
Benthodesmus tenuis	0.93	25	0.78		
Illex coindetii	0.77	6	0.64		
Xenodermichthys copei	0.77	39	0.64		
OMMASTREPHIDAE	0.74	6	0.62		
Elmopterus spinax	0.58	6	0.49		
Coelorinchus sp.	0.58	6	0.49		
MACROURIDAE	0.48	6	0.40		
MYCTOPHIDAE	0.39	194	0.33		
Halosaurus ovenii	0.35	15	0.29		
OPHIDIIDAE	0.29	15	0.24		
Chlorophthalmus atlanticus	0.25	6	0.21		
Dibranchius atlanticus	0.25	10	0.21		
UNIDENTIFIED FISH	0.15	6	0.13		
CONGRIDAE	0.10	6	0.08		
SOLENERGIDAE	0.10	10	0.08		
Eumunida squamifera *	0.06	10	0.05		
Dasyatis margarita	0.06	6	0.05		
Total		119.46		100.01	

DATE: 31/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1388
 start stop duration POSITION: Lat S 646
 TIME :06:14:10 06:45:56 32 (min) Purpose code: 3 Long E 1144
 LOG :7111 42 7113.09 1.65 Area code : 2
 FDEPTH: 358 359 GearCond code:
 BDEPTH: 358 359 Validity code:
 Towing dir: 335° Wire out: 1050 m Speed: 30 kn*10
 Sorted: 50 Kg Total catch: 290.50 CATCH/HOUR: 544.69

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Merluccius polli	242.16	1215	44.46		3152
Chlorophthalmus atlanticus	63.79	945	11.71		
Squatina aculeata	36.47	2	6.70		
Malacocephalus laevis	29.19	473	5.36		
Hymenocephalus italicus	26.66	2623	4.89		
Gadella imberbis	25.14	1333	4.62		
Trichiurus lepturus	14.68	17	2.70		
Pontinus accraensis	13.50	388	2.48		
Epigonus telescopus	11.14	219	2.05		
Benthodesmus tenuis	9.79	287	1.80		
Nezumia aequalis	8.44	51	1.55		
Illex coindetii	8.10	118	1.49		
Synagrops microlepis	7.93	219	1.46		
Nematocarcinus africanus	7.93	1823	1.46		
Parapandalus narval	7.93	1084	1.46		
Parapenaeus longirostris, fem	7.31	720	1.34		3154
Coelorinchus sp.	6.41	169	1.18		
Pterothrissus belloci	5.23	34	0.96		
Munida sp. *	2.19	152	0.40		
Chaunax pictus	2.19	84	0.40		
MYCTOPHIDAE	2.03	1725	0.37		
Lophius vailanti	1.69	17	0.31		
Dibranchius atlanticus	1.18	34	0.22		
GONOSTOMATIDAE	1.18	51	0.22		
Solenocera africana	0.68	84	0.12		
Cyttopsis roseus	0.68	17	0.12		
STERNOPTYCHIDAE	0.51	17	0.09		
Elmopterus spinax	0.51	17	0.09		
Parapenaeus longirostris, male	0.06	6	0.01		3153
Total		544.70		100.02	

DATE: 31/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1389
 start stop duration POSITION: Lat S 645
 TIME :08:00:49 08:31:02 30 (min) Purpose code: 3 Long E 1147
 LOG :7119 00 7120 58 1.41 Area code : 2
 FDEPTH: 243 248 GearCond code:
 BDEPTH: 243 248 Validity code:
 Towing dir: 155° Wire out: 760 m Speed: 30 kn*10
 Sorted: 43 Kg Total catch: 470.04 CATCH/HOUR: 940.08

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Synagrops microlepis	708.40	45284	75.36		
Merluccius polli	80.30	968	8.54		3155
Zenopsis conchifer	66.22	242	7.04		
Dentex angolensis	20.00	58	2.13		3156
Illex coindetii	18.70	286	1.99		
Chlorophthalmus sp	12.32	286	1.31		
Ariomma bondi	9.24	176	0.98		
Chlorophthalmus atlanticus	5.28	116	0.56		
Sepia elegans	4.62	154	0.49		
Uranoscopus polli	3.96	44	0.42		
Saurida brasiliensis	3.52	330	0.37		
Coelorinchus coelorhincus	2.64	44	0.28		
Bembrops heterurus	1.98	22	0.21		
Parapenaeus longirostris, fem	1.54	198	0.16		3158
Hoplostethus atlanticus	1.54	22	0.16		
Parapenaeus longirostris, male	1.32	242	0.16		3157
Scorpaena normani	1.10	22	0.12		
Total		942.68		100.26	

DATE: 31/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1390
 start stop duration POSITION: Lat S 644
 TIME :09:57:22 10:28:19 31 (min) Purpose code: 3 Long E 1151
 LOG :7127 47 7128 84 1.61 Area code : 2
 FDEPTH: 144 142 GearCond code:
 BDEPTH: 144 142 Validity code:
 Towing dir: 5° Wire out: 460 m Speed: 30 kn*10
 Sorted: 57 Kg Total catch: 56.80 CATCH/HOUR: 109.94

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Dentex congoensis	31.16	534	28.34		3160
Dentex angolensis	28.26	139	25.70		3159
Spicara alta	15.48	205	14.08		
Ariomma bondi	12.00	174	10.92		
Trigla lyra	4.45	106	4.05		
Sepia officinalis hierredda	4.45	43	4.05		
Zenopsis conchifer	3.87	6	3.52		
Dentex gibbosus	3.87	4	3.52		
Illex coindetii	2.71	70	2.46		
Trachurus trectae	1.94	19	1.76		
Bembrops heterurus	0.77	8	0.70		
Citharus linguatula	0.39	12	0.35		
Dentex macrophthalmus	0.39	2	0.35		
Boops boops	0.08	2	0.07		
Peristedion cataphractum	0.08	2	0.07		
Total		109.90		99.94	

DATE: 31/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1391
 start stop duration POSITION: Lat S 642
 TIME :13:09:45 13:39:37 30 (min) Purpose code: 3 Long E 1207
 LOG :7149 42 7150 83 1.63 Area code : 2
 FDEPTH: 75 75 GearCond code:
 BDEPTH: 75 75 Validity code:
 Towing dir: 360° Wire out: 240 m Speed: 32 kn*10

Sorted: 117 Kg Total catch: 116.90 CATCH/HOUR: 233.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	164.40	5754	70.32	3161
Dentex congcoensis	18.00	336	7.70	3163
Squatina oculata	12.00	2	5.13	
Raja miraletus	6.20	12	2.65	
Pagellus bellottii	6.00	76	2.57	3164
Trichiurus lepturus	6.00	6	2.57	
Dentex angolensis	4.80	20	2.05	3162
Trigla lyra	3.20	126	1.37	
Chelidonichthys gabonensis	3.20	26	1.37	
Priacanthus arenatus	2.20	20	0.94	
Dentex barnardi	2.00	10	0.86	
Sepia officinalis hierredda	1.20	2	0.51	
Torpedo torpedo	0.80	2	0.34	
Chaetodon hoefleri	0.80	4	0.34	
Sardinella aurita	0.40	24	0.17	
Zeus faber	0.40	2	0.17	
Lagocephalus laevigatus	0.40	2	0.17	
Fistularia petimba	0.40	4	0.17	
Dentex gibbosus	0.40	6	0.17	
Bembrops heterurus	0.20	2	0.09	
Boops boops	0.20	6	0.09	
Saurida brasiliensis	0.20	12	0.09	
Illex coindetii	0.20	2	0.09	
Peristedion cataphractum	0.20	8	0.09	
Total	233.80		100.02	

DATE: 1/ 6/97 GEAR TYPE: BT No:2 PROJECT STATION: 1394
 start stop duration POSITION: Lat S 623
 TIME :09:53:00 10:23:39 31 (min) Purpose code: 3 Long E 1200
 LOG :7215 31 7216 84 1.55 Area code : 2
 FDEPTH: 80 84 GearCond code:
 BDEPTH: 80 84 Validity code:
 Towing dir: 160° Wire out: 260 m Speed: 30 kn*10

Sorted: 39 Kg Total catch: 841.80 CATCH/HOUR: 1629.29

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	864.58	21960	53.06	3170
Brachydeuterus auritus	385.16	2663	23.84	3174
Dentex angolensis	73.16	610	4.49	3171
Pagellus bellottii	52.45	619	3.22	3173
Saurida brasiliensis	42.77	6486	2.63	
Dentex barnardi	37.74	97	2.32	
Sepia officinalis hierredda	34.06	85	2.09	
Trigla lyra	24.39	645	1.50	
Leptocharias smithii	19.55	12	1.20	
Dentex congcoensis	17.03	292	1.05	3172
Sarda sarda	12.19	12	0.75	
Scomber japonicus	12.19	12	0.75	
Boops boops	12.19	621	0.75	
Epinephelus aeneus	10.84	2	0.67	
Trichiurus lepturus	7.35	12	0.45	
Fistularia petimba	7.35	25	0.45	
Citharus linguatula	6.19	230	0.38	
Pseudupeneus prayensis	2.52	23	0.15	
Chaetodon hoefleri	2.52	12	0.15	
Zeus faber	2.52	12	0.15	
Illex coindetii	1.16	23	0.07	
Selene dorsalis	1.16	12	0.07	
Parapanaeus longirostris	0.12	12	0.01	
Total	1629.19		100.00	

DATE: 31/ 5/97 GEAR TYPE: BT No: PROJECT STATION: 1392
 start stop duration POSITION: Lat S 641
 TIME :15:13:30 15:43:27 30 (min) Purpose code: 3 Long E 1216
 LOG :7162 90 7163 96 1.45 Area code : 2
 FDEPTH: 43 44 GearCond code:
 BDEPTH: 43 44 Validity code:
 Towing dir: 315° Wire out: 150 m Speed: 30 kn*10

Sorted: 77 Kg Total catch: 127.00 CATCH/HOUR: 254.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	82.00	700	32.28	3165
Ilisha africana	28.00	398	11.02	
Trachurus trecae	17.60	464	6.93	3167
Leptocharias smithii	16.00	4	6.30	
Trichiurus lepturus	13.60	20	5.35	
Lutjanus fulgens	12.20	14	4.80	
Pseudotolithus typus	10.00	6	3.94	
Plectorhynchus mediterraneus	9.20	12	3.62	
Trachinotus teraia	9.20	4	3.62	
Pomadasys incisus	8.40	44	3.31	3166
Epinephelus aeneus	8.00	8	3.15	
Sparus caeruleostictus *	6.60	12	2.60	
Sepia officinalis hierredda	6.00	12	2.36	
Boops boops	5.20	358	2.05	
Selene dorsalis	5.20	84	2.05	
Galeoides decadactylus	5.20	12	2.05	
Umbrina canariensis	4.40	6	1.73	
Dentex barnardi	2.00	4	0.79	
Pagellus bellottii	2.00	6	0.79	
Sphyræna guachancho	1.20	4	0.47	
Sardinella aurita	0.80	4	0.31	
Chaetodon hoefleri	0.80	4	0.31	
Fistularia petimba	0.40	4	0.16	
Total	254.00		99.99	

DATE: 1/ 6/97 GEAR TYPE: BT No:2 PROJECT STATION: 1395
 start stop duration POSITION: Lat S 629
 TIME :12:57:35 13:25:28 28 (min) Purpose code: 3 Long E 1142
 LOG :7237 24 7238 53 1.65 Area code : 2
 FDEPTH: 155 150 GearCond code:
 BDEPTH: 155 150 Validity code:
 Towing dir: 340° Wire out: 480 m Speed: 32 kn*10

Sorted: 66 Kg Total catch: 129.10 CATCH/HOUR: 276.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Spicara alta	180.00	1320	65.07	
Dentex angolensis	45.00	219	16.27	3175
Boops boops	9.86	154	3.56	
Trigla lyra	9.00	111	3.25	
Torpedo torpedo	5.14	4	1.86	
Zenopsis conchifer	5.14	21	1.86	
Illex coindetii	4.29	69	1.55	
Trichiurus lepturus	2.57	4	0.93	
Saurida brasiliensis	2.14	287	0.77	
Bembrops heterurus	2.14	43	0.77	
Arionna bondi	2.14	30	0.77	
Dentex macropthalmus	1.71	9	0.62	
Scorpaena normani	1.29	21	0.47	
Pterothrissus belloci	1.29	9	0.47	
Dentex congcoensis	1.29	17	0.47	
Trachinocephalus myops	0.86	4	0.31	
Peristedion cataphractum	0.86	26	0.31	
Citharus linguatula	0.86	39	0.31	
Pentheroscion mbizi	0.43	4	0.16	
Erythrocles monodi	0.43	4	0.16	
Trachurus trecae	0.17	4	0.06	
Total	276.61		100.00	

DATE: 1/ 6/97 GEAR TYPE: BT No: PROJECT STATION: 1393
 start stop duration POSITION: Lat S 625
 TIME :07:36:58 07:57:33 21 (min) Purpose code: 3 Long E 1210
 LOG :7201 99 7202 86 1.19 Area code : 2
 FDEPTH: 39 40 GearCond code:
 BDEPTH: 39 40 Validity code:
 Towing dir: 333° Wire out: 150 m Speed: 30 kn*10

Sorted: 11 Kg Total catch: 11.46 CATCH/HOUR: 32.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	9.46	17	28.89	
Caranx crysos	6.46	6	19.73	
Pagellus bellottii	5.63	43	17.20	3169
Decapterus rhombus	4.94	129	15.09	3168
Sparus caeruleostictus *	1.89	3	5.77	
Uranoscopus polli	1.29	6	3.94	
Chelidonichthys capensis	1.17	6	3.57	
Lagocephalus lunaris	0.71	3	2.17	
Pseudupeneus prayensis	0.63	3	1.92	
Trachurus trecae	0.31	9	0.95	
Brachydeuterus auritus	0.14	3	0.43	
Bothus podas africanus	0.06	3	0.18	
Trachinus armatus	0.03	3	0.09	
Sardinella aurita - Juveniles	0.03	3	0.09	
Total	32.75		100.02	

DATE: 1/ 6/97 GEAR TYPE: BT No:2 PROJECT STATION: 1396
 start stop duration POSITION: Lat S 629
 TIME :14:38:22 15:08:10 30 (min) Purpose code: 3 Long E 1138
 LOG :7244 64 7245 92 1.58 Area code : 2
 FDEPTH: 250 250 GearCond code:
 BDEPTH: 250 250 Validity code:
 Towing dir: 340° Wire out: 780 m Speed: 32 kn*10

Sorted: 115 Kg Total catch: 1264.70 CATCH/HOUR: 2529.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	2094.00	117286	82.79	
Merluccius polli	171.60	1782	6.78	3177
Zenopsis conchifer	55.00	88	2.17	
Dentex angolensis	55.00	220	2.17	3176
Illex coindetii	28.60	374	1.13	
Trichiurus lepturus	26.40	22	1.04	
Broctula barbata	22.00	22	0.87	
Arionna bondi	22.00	374	0.87	
Parapanaeus longirostris, fem.	15.40	2244	0.61	3178
Pterothrissus belloci	11.00	110	0.43	
Dentex macropthalmus	8.80	44	0.35	
Parapanaeus longirostris, male	6.60	1430	0.26	3179
Calappa sp.	4.40	66	0.17	
Chlorophthalmus atlanticus	2.20	66	0.09	
Peristedion cataphractum	2.20	22	0.09	
Erythrocles monodi	2.20	44	0.09	
Sepia sp.	0.60	22	0.02	
Nezumia aequalis	0.60	22	0.02	
Solenocera africana	0.20	22	0.01	
Saurida brasiliensis	0.20	22	0.01	
Scorpaena normani	0.20	22	0.01	
MYCTOPHIDAE	0.20	220	0.01	
Total	2529.40		99.99	

PROJECT STATION: 1397
 DATE: 1/6/97 GEAR TYPE: BT No:2 POSITION: Lat S 630 Long E 1135
 start stop duration
 TIME :16:29:14 16:59:41 30 (min) Purpose code: 3
 LOG :7252 20 7253 46 1 60 Area code : 2
 FDEPTH: 354 345 GearCond code:
 BDEPTH: 354 345 Validity code:
 Towing dir: 350° Wire out:1000 m Speed: 30 kn*10
 Sorted: 61 Kg Total catch: 428.86 CATCH/HOUR: 857.72

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Chlorophthalmus atlanticus	246.40	3790	28.73		
Merluccius polli	201.60	1274	23.50	3180	
Nematocarcinus africanus	134.20	34508	15.65		
Pontinus accraensis	61.60	1992	7.18		
Pterothrissus bellocci	50.82	280	5.93		
Gadella imberbis	25.90	798	3.02		
Illex coindetii	25.06	280	2.92		
Synagrops microlepis	19.74	574	2.30		
Hymenocephalus italicus	15.40	1512	1.74		
MYCTOPHIDAE	14.92	11050	1.80		
Malacocephalus laevis	11.62	308	1.35		
Coelorinchus sp.	10.92	210	1.27		
Nezumia aequalis	7.42	84	0.87		
Zenopsis conchifer	6.86	28	0.80		
Chlorophthalmus sp.	6.44	112	0.75		
Chascanopsetta lugubris	3.92	42	0.46		
GRAMMICOLEPIDAE	2.10	112	0.24		
Dibranchius atlanticus	1.82	224	0.21		
Etmopterus spinax	1.68	28	0.20		
Chaunax pictus	1.54	84	0.18		
Dasyatis margarita	1.40	14	0.16		
Parapanaeus longirostris, fem	1.22	112	0.14	3181	
Benthodesmus tenuis	0.98	28	0.11		
Epigonus sp.	0.84	14	0.10		
Peristedion cataphractum	0.70	28	0.08		
Solenocera africana	0.56	56	0.07		
Trichurus lepturus	0.56	28	0.07		
Sepia elegans	0.42	14	0.05		
Epigonus telescopus	0.42	28	0.05		
Paralepis sp.	0.28	14	0.03		
Ariomma bondi	0.28	14	0.03		
Parapanaeus longirostris, male	0.10	10	0.01	3182	
Total	857.72		100.00		

PROJECT STATION: 1398
 DATE: 1/6/97 GEAR TYPE: BT No:2 POSITION: Lat S 630 Long E 1128
 start stop duration
 TIME :18:34:28 18:37:11 3 (min) Purpose code: 3
 LOG :7261 55 7261 65 0 09 Area code : 2
 FDEPTH: 445 427 GearCond code: 9
 BDEPTH: 445 427 Validity code: 9
 Towing dir: 320° Wire out:1250 m Speed: 30 kn*10
 Sorted: 33 Kg Total catch: 32.64 CATCH/HOUR: 652.80

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Merluccius polli	448.00	820	68.63		
Malacocephalus laevis	68.80	980	10.54		
Hymenocephalus italicus	41.80	3100	6.40		
Chaunax pictus	17.40	180	2.67		
Benthodesmus tenuis	11.60	280	1.59		
Coeloconger cadenati	10.40	140	1.59		
Munida sp *	10.00	980	1.53		
Halosaurus ovenii	10.00	420	1.53		
Zenopsis conchifer	7.40	40	1.13		
Etmopterus spinax	5.00	100	0.77		
Dibranchius atlanticus	3.80	380	0.58		
Coelorinchus coelorhincus	3.60	80	0.55		
Hoplostethus cadenati	2.80	40	0.43		
Aristeus varidens, male	2.20	160	0.34		
GRAMMICOLEPIDAE	2.00	120	0.31		
MYCTOPHIDAE	1.60	1540	0.25		
Yarella blackfordi	1.40	100	0.21		
Pontinus accraensis	1.40	40	0.21		
Gadella imberbis	1.20	40	0.18		
Aristeus varidens, female	1.00	100	0.15		
GONOSTOMATIDAE	0.80	80	0.12		
Bathynectes piperitus	0.60	20	0.09		
Total	652.80		99.99		

PROJECT STATION: 1399
 DATE: 1/6/97 GEAR TYPE: BT No:2 POSITION: Lat S 633 Long E 1125
 start stop duration
 TIME :20:20:34 20:50:24 30 (min) Purpose code: 3
 LOG :7270 73 7272 02 1 48 Area code : 2
 FDEPTH: 553 560 GearCond code:
 BDEPTH: 553 560 Validity code:
 Towing dir: 320° Wire out:1500 m Speed: 30 kn*10
 Sorted: 29 Kg Total catch: 86.97 CATCH/HOUR: 173.94

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Benthodesmus tenuis	39.96	902	22.97		
Hoplostethus cadenati	31.26	1172	17.97		
Nematocarcinus africanus	30.80	10328	17.71		
Triplophos sp	18.84	2164	10.83		
Munida sp *	9.12	830	5.24		
Lamprogrammus exutus	8.52	198	4.90		
Aristeus varidens, female	5.52	324	3.17	3184	
Chaceon maritae	4.80	12	2.76		
Xenodermichthys copei	4.80	162	2.76		
MYCTOPHIDAE	4.60	4694	2.41		
GONOSTOMATIDAE	4.20	108	2.64		
Nezumia aequalis	3.48	66	2.00		
MACRURIDAE	1.74	30	1.00		
Aristeus varidens, male	1.68	216	0.97	3183	
Yarella blackfordi	1.44	36	0.83		
CONGRIDAE	1.02	54	0.59		
Etmopterus spinax	0.96	6	0.55		
Gadella imberbis	0.60	54	0.34		
Halosaurus ovenii	0.42	18	0.24		
STERNOPTERYCHIDAE	0.12	18	0.07		
Dibranchius atlanticus	0.06	6	0.03		
Total	173.94		99.98		

PROJECT STATION: 1400
 DATE: 2/6/97 GEAR TYPE: BT No:2 POSITION: Lat S 609 Long E 1117
 start stop duration
 TIME :00:55:44 01:25:05 29 (min) Purpose code: 3
 LOG :7302 38 7303 68 1 54 Area code : 2
 FDEPTH: 702 700 GearCond code:
 BDEPTH: 702 700 Validity code:
 Towing dir: 360° Wire out:1800 m Speed: 31 kn*10
 Sorted: 33 Kg Total catch: 230.30 CATCH/HOUR: 476.48

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Hoplostethus cadenati	249.10	3786	52.28		
Lamprogrammus exutus	75.31	159	15.81		
Chaceon maritae	30.41	43	6.38		
Coelorinchus coelorhincus	20.28	420	4.26		
Gadella imberbis	20.28	1012	4.26		
LOPHIIDAE	14.48	14	3.04		
Xenodermichthys copei	14.48	319	3.04		
Malacocephalus laevis	13.03	29	2.73		
Munida sp *	8.69	695	1.82		
Triplophos sp.	5.79	652	1.22		
Aristeus varidens, female	5.17	472	1.09	3185	
CONGRIDAE	4.34	58	0.91		
Halosaurus ovenii	4.34	130	0.91		
GONOSTOMATIDAE	2.90	58	0.61		
Yarella blackfordi	2.90	43	0.61		
RAJIDAE	1.45	29	0.30		
Benthodesmus tenuis	1.45	29	0.30		
Aristeus varidens, male	1.45	269	0.30	3186	
Dibranchius atlanticus	0.62	14	0.13		
Total	476.47		100.00		

PROJECT STATION: 1401
 DATE: 2/6/97 GEAR TYPE: BT No:2 POSITION: Lat S 609 Long E 1120
 start stop duration
 TIME :03:13:00 03:43:05 30 (min) Purpose code: 3
 LOG :7311 31 7312 62 1 56 Area code : 2
 FDEPTH: 549 545 GearCond code:
 BDEPTH: 549 545 Validity code:
 Towing dir: 360° Wire out:1500 m Speed: 31 kn*10
 Sorted: 35 Kg Total catch: 80.99 CATCH/HOUR: 161.98

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Hoplostethus cadenati	60.00	3150	37.04		
Nematocarcinus africanus	26.00	7194	16.05		
Trichurus lepturus	11.00	210	6.79		
Triplophos sp	8.00	1080	4.94		
Lamprogrammus exutus	8.00	16	4.94		
Centrophorus uyato	8.00	2	4.94		
GONOSTOMATIDAE	6.00	126	3.70		
Xenodermichthys copei	6.00	26	3.70		
Aristeus varidens, female	5.48	370	3.38	3187	
Lophius vaillanti	5.00	6	3.09		
Merluccius polli	3.00	4	1.85		
Coelorinchus coelorhincus	2.00	6	1.23		
Munida sp *	2.00	10	0.93		
Illex coindetii	1.50	10	0.93		
Gadella maraldi	1.50	10	0.93		
CONGRIDAE	1.50	40	0.93		
Aristeus varidens, male	1.50	210	0.93	3188	
Yarella blackfordi	1.00	26	0.62		
Chaunax pictus	1.00	6	0.62		
Laemonema laureysi	1.00	10	0.62		
Chaceon maritae	0.50	16	0.31		
Gadella imberbis	0.50	6	0.31		
Nezumia aequalis	0.50	6	0.31		
Halosaurus ovenii	0.50	16	0.31		
Etmopterus spinax	0.50	16	0.31		
Total	161.98		100.01		

PROJECT STATION: 1402
 DATE: 2/6/97 GEAR TYPE: BT No:2 POSITION: Lat S 609 Long E 1122
 start stop duration
 TIME :05:19:28 05:49:35 30 (min) Purpose code: 3
 LOG :7319 08 7320 29 1 47 Area code : 2
 FDEPTH: 433 432 GearCond code:
 BDEPTH: 433 432 Validity code:
 Towing dir: 7° Wire out:1250 m Speed: 30 kn*10
 Sorted: 36 Kg Total catch: 179.48 CATCH/HOUR: 358.96

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Galeus polli	115.84	2282	32.27		
Merluccius polli	60.00	112	16.71	3189	
Pontinus accraensis	34.08	672	9.49		
Malacocephalus laevis	19.20	320	5.35		
Munida sp *	16.64	1452	4.64		
Aristeus varidens, female	16.24	1048	4.52		
Nematocarcinus africanus	14.00	2800	3.90	3191	
Gadella imberbis	11.68	368	3.25		
Chaceon maritae	11.36	32	3.16		
Illex coindetii	11.20	96	3.12		
Centrophorus uyato	8.70	2	2.42		
Chaunax pictus	7.36	80	2.05		
Benthodesmus tenuis	4.64	112	1.29		
Coelorinchus sp	4.48	128	1.25		
Halosaurus ovenii	4.16	176	1.15		
Pterothrissus bellocci	3.20	16	0.89		
Aristeus varidens, male	2.80	336	0.78	3190	
Deania profundorum	2.24	16	0.62		
GONOSTOMATIDAE	2.24	32	0.62		
Etmopterus spinax	1.90	336	0.53		
MYCTOPHIDAE	1.76	112	0.49		
Hoplostethus cadenati	1.40	1120	0.39		
Gadella maraldi	1.28	16	0.36		
Triplophos sp	0.80	96	0.22		
Dibranchius atlanticus	0.64	48	0.18		
Yarella blackfordi	0.48	16	0.13		
Argyropelecus affinis	0.16	16	0.04		
Chlorophthalmus sp	0.16	16	0.04		
Ariomma bondi	0.16	16	0.04		
Hymenocephalus italicus	0.16	16	0.04		
Total	358.96		9.94		

PROJECT STATION: 1403
 DATE: 2/ 6/97 GEAR TYPE: BT No:2 POSITION: Lat S 608 Long E 1125
 start stop duration
 TIME :07:32:36 08:02:19 30 (min) Purpose code: 3
 LOG :7327 51 7328 71 1 39 Area code : 2
 FDEPTH: 359 358 GearCond.code:
 BDEPTH: 359 358 Validity code:
 Towing dir: 355° Wire out:1050 m Speed: 30 kn*10
 Sorted: 44 Kg Total catch: 406 56 CATCH/HOUR: 813 12

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Merluccius polli	180.70	950	22.22		3192
Chlorophthalmus atlanticus	147.68	2462	18.16		
Nematocarcinus africanus	146.14	39946	17.97		
Pterothrissus belloci	67.86	364	8.35		
MYCTOPHIDAE	43.66	18916	5.37		
Synagrops microlepis	37.44	1092	4.60		
Pontinus accraensis	34.06	2184	4.19		
Ariomma bondi	33.28	650	4.09		
Trichiurus lepturus	23.40	26	2.88		
Chlorophthalmus sp.	16.38	286	2.01		
Coelorinchus sp.	13.26	286	1.63		
Illex coindetii	12.74	130	1.57		
Gadella imberbis	12.22	442	1.50		
Malacocephalus laevis	7.54	104	0.93		
Chaunax pictus	6.76	130	0.83		
Benthodesmus tenuis	5.20	156	0.64		
Parapenaeus longirostris, fem.	4.86	416	0.60		3194
Zeus faber	3.90	26	0.48		
Solenocera africana	2.86	286	0.35		
Hymenoccephalus italicus	2.34	156	0.29		
Chascanopsetta lugubris	2.08	52	0.26		
Munida sp.	1.82	234	0.22		
Laemonema laureysi	1.56	182	0.19		
Bembrops sp.	1.04	26	0.13		
Sepia elegans	0.78	26	0.10		
Nezumia aequalis	0.78	26	0.10		
Dibranchius atlanticus	0.78	104	0.10		
Nematopalaemon hastatus	0.52	26	0.06		
CONGRIDAE	0.52	26	0.06		
Galeus polli	0.52	26	0.06		
Peristedion cataphractum	0.26	78	0.03		
Parapenaeus longirostris, male	0.20	10	0.02		3193
Total	813.14		99.99		

PROJECT STATION: 1404
 DATE: 2/ 6/97 GEAR TYPE: BT No:2 POSITION: Lat S 608 Long E 1128
 start stop duration
 TIME :10:14:44 10:44:19 30 (min) Purpose code: 3
 LOG :7336 65 7337 86 1 46 Area code : 2
 FDEPTH: 257 261 GearCond.code:
 BDEPTH: 257 261 Validity code:
 Towing dir: 360° Wire out: 760 m Speed: 29 kn*10
 Sorted: 38 Kg Total catch: 91 60 CATCH/HOUR: 183 20

SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Synagrops microlepis	82.20	4192	44.87		
Merluccius polli	24.00	240	13.10		3196
Dentex angolensis	21.60	68	11.79		3195
Illex coindetii	6.60	96	3.60		
Pterothrissus belloci	6.60	54	3.60		
Zenopsis conchifer	6.60	24	3.60		
MYCTOPHIDAE	6.00	5100	3.28		
Parapenaeus longirostris, fem	6.00	612	3.28		3197
Todaropsis eblanae	6.00	60	3.28		
Parapenaeus longirostris, male	4.20	582	2.29		3198
Bembrops heterurus	3.00	276	1.64		
Ariomma bondi	3.00	66	1.64		
Nezumia aequalis	3.00	72	1.64		
Sepia sp.	1.20	54	0.66		
Scorpaena normani	1.20	24	0.66		
Epigonus telescopus	0.60	24	0.33		
Dibranchius atlanticus	0.60	36	0.33		
Gadella maraldi	0.60	24	0.33		
Coelorinchus coelorrhynchus	0.06	6	0.03		
Trichiurus lepturus	0.06	6	0.03		
Chlorophthalmus atlanticus	0.06	6	0.03		
Total	183.18		100.01		

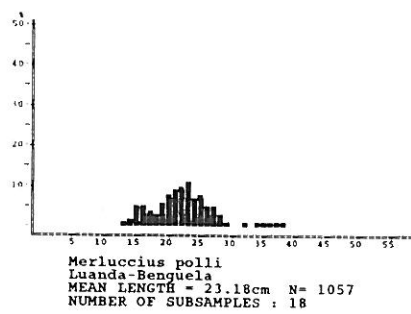
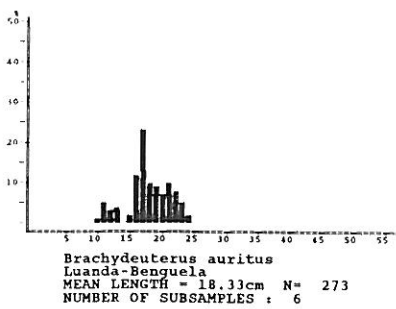
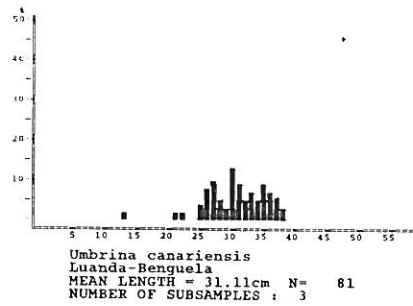
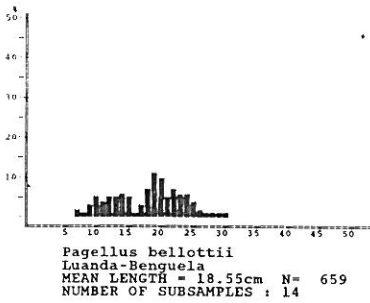
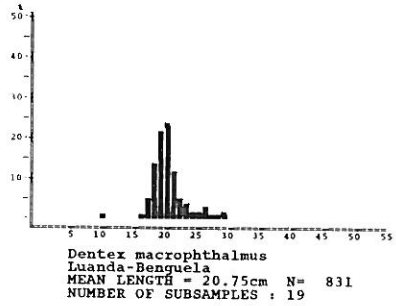
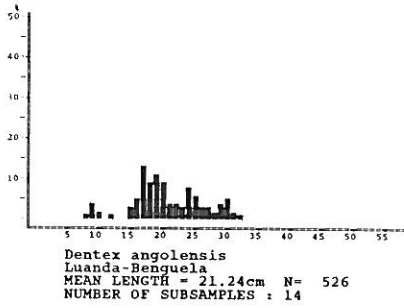
PROJECT STATION: 1405
 DATE: 2/ 6/97 GEAR TYPE: BT No:2 POSITION: Lat S 608 Long E 1135
 start stop duration
 TIME :13:30:53 14:00:26 30 (min) Purpose code: 3
 LOG :7348 79 7350 16 1 66 Area code : 2
 FDEPTH: 151 151 GearCond.code:
 BDEPTH: 151 151 Validity code:
 Towing dir: 355° Wire out: 480 m Speed: 33 kn*10
 Sorted: 133 Kg Total catch: 132.80 CATCH/HOUR: 265 60

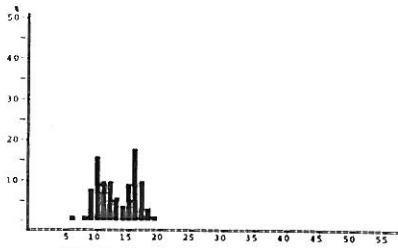
SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Trichiurus lepturus	189.20	1166	71.23		
Dentex angolensis	28.00	142	10.54		3199
Pterothrissus belloci	17.00	154	6.40		
Trigla lyra	8.20	144	3.09		
Zenopsis conchifer	7.00	18	2.84		
Illex coindetii	4.20	74	1.58		
Brotula barbata	2.60	6	0.98		
Scorpaena stephanica	2.00	32	0.75		
Bembrops heterurus	2.00	42	0.75		
Branchiostegus semifasciatus	1.20	2	0.45		
Uranoscopus polli	1.00	8	0.38		
Bembrops sp.	0.80	8	0.30		
Peristedion cataphractum	0.80	32	0.30		
Dentex congongensis	0.60	10	0.23		
Octopus vulgaris	0.40	2	0.15		
Saurida brasiliensis	0.40	50	0.15		
Citharus linguatula	0.20	20	0.08		
Parapenaeus longirostris, male	0.06	4	0.02		
Parapenaeus longirostris, fem.	0.02	2	0.01		
Total	265.68		100.03		

PROJECT STATION: 1406
 DATE: 2/ 6/97 GEAR TYPE: BT No:2 POSITION: Lat S 607 Long E 1147
 start stop duration
 TIME :16:33:25 17:03:32 30 (min) Purpose code: 3
 LOG :7363 38 7364 67 1 64 Area code : 2
 FDEPTH: 94 98 GearCond.code:
 BDEPTH: 94 98 Validity code:
 Towing dir: 360° Wire out: 220 m Speed: 30 kn*10
 Sorted: 101 Kg Total catch: 465.75 CATCH/HOUR: 931 50

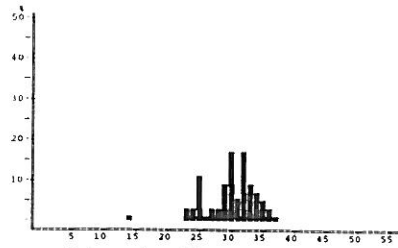
SPECIES	CATCH/HOUR		% OF TOT	C	SAMP
	weight	numbers			
Pentheroscion mbizi	456.00	4208	48.95		3203
Trichiurus lepturus	127.50	410	13.69		
Dentex congongensis	99.20	1450	10.65		3200
Dentex angolensis	86.70	520	9.31		3201
Synagrops sp.	42.50	2864	4.56		
Chelidonichthys gabonensis	22.20	430	2.38		
Trachurus trecae	21.80	510	2.34		3202
Epinephelus aeneus	12.50	2	1.34		
Citharus linguatula	9.40	370	1.01		
Brotula barbata	9.20	20	0.99		
Leptocharias smithii	6.20	2	0.67		
Umbrina canariensis	5.40	10	0.58		
Raja miraletus	5.00	10	0.54		
Illex coindetii	4.50	110	0.48		
Saurida brasiliensis	3.90	760	0.42		
Sepia orbignyana	3.70	90	0.40		
Selene dorsalis	3.50	10	0.38		
Zeus faber	3.20	10	0.34		
Boops boops	2.30	50	0.25		
Dicologlossa cuneata	1.50	140	0.16		
Monolene microstoma	1.00	160	0.11		
Uranoscopus albesca	0.90	10	0.10		
Pagellus bellottii	0.60	10	0.06		
Parapenaeus longirostris, fem	0.50	160	0.05		3205
Parapenaeus longirostris, male	0.50	210	0.05		3204
Squilla mantis	0.40	10	0.04		
NEMICHTHYIDAE	0.10	10	0.01		
Total	930.20		99.86		

Annex II. Length distributions of main species

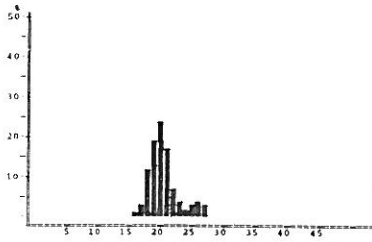




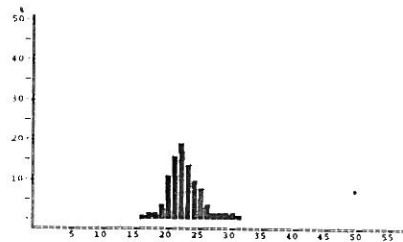
Trachurus trecae
Luanda-Benguela
MEAN LENGTH = 13.98cm N= 1370
NUMBER OF SUBSAMPLES : 14



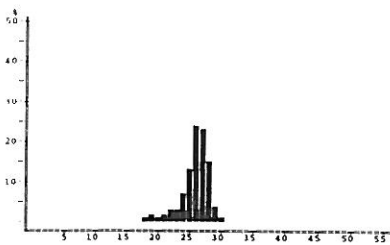
Selene dorsalis
Luanda-Benguela
MEAN LENGTH = 30.24cm N= 223
NUMBER OF SUBSAMPLES : 9



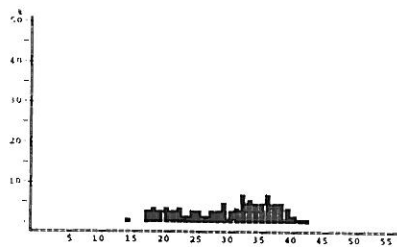
Parapenaeus longirostris, male
Luanda-Benguela
MEAN LENGTH = 21.0 mm N= 1181
NUMBER OF SUBSAMPLES : 12



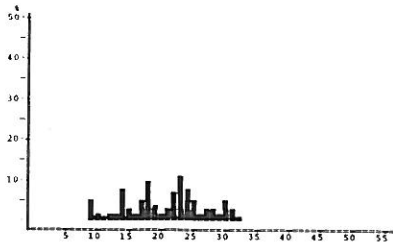
Parapenaeus longirostris, fem.
Luanda-Benguela
MEAN LENGTH = 22.9 mm N= 1444
NUMBER OF SUBSAMPLES : 14



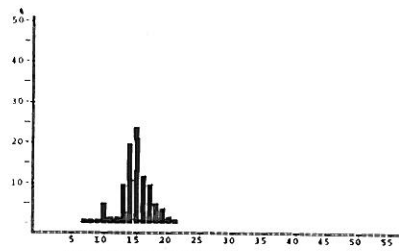
Aristeus varidens, male
Luanda-Benguela
MEAN LENGTH = 26.3 mm N= 1123
NUMBER OF SUBSAMPLES : 17



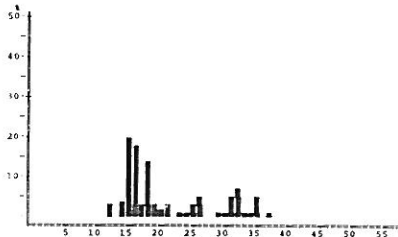
Aristeus varidens, female
Luanda-Benguela
MEAN LENGTH = 30.48 mm N= 839
NUMBER OF SUBSAMPLES : 17



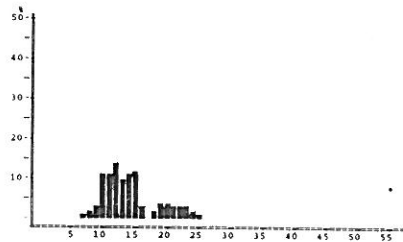
Dentex angolensis
Cabinda-Luanda
MEAN LENGTH = 21.09cm N= 779
NUMBER OF SUBSAMPLES : 21



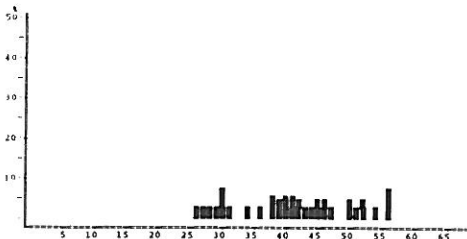
Dentex congosensis
Cabinda-Luanda
MEAN LENGTH = 15.30cm N= 580
NUMBER OF SUBSAMPLES : 10



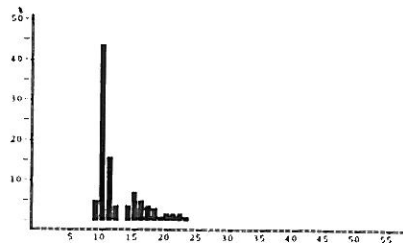
Dentex barnardi
Cabinda-Luanda
MEAN LENGTH = 21.05cm N= 47
NUMBER OF SUBSAMPLES : 5



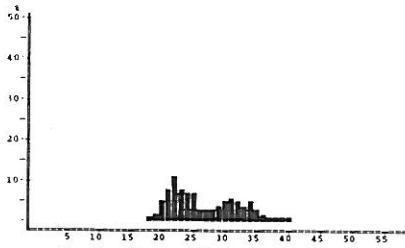
Pagellus bellottii
Cabinda-Luanda
MEAN LENGTH = 14.94cm N= 420
NUMBER OF SUBSAMPLES : 11



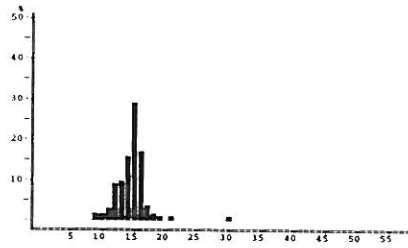
Pseudotolithus typus
Cabinda-Luanda
MEAN LENGTH = 42.19cm N= 90
NUMBER OF SUBSAMPLES : 4



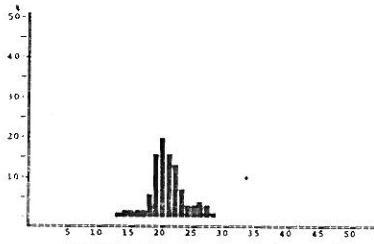
Brachydeuterus auritus
Cabinda-Luanda
MEAN LENGTH = 12.88cm N= 722
NUMBER OF SUBSAMPLES : 11



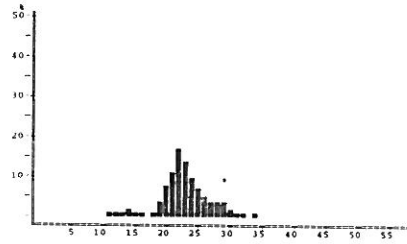
Merluccius polli
Cabinda-Luanda
MEAN LENGTH = 27.49cm N= 917
NUMBER OF SUBSAMPLES : 15



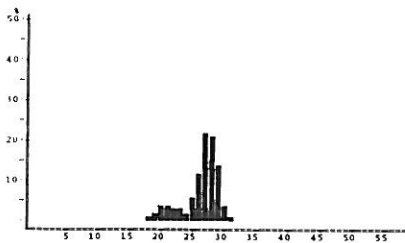
Trachurus trecae
Cabinda-Luanda
MEAN LENGTH = 15.34cm N= 1531
NUMBER OF SUBSAMPLES : 19



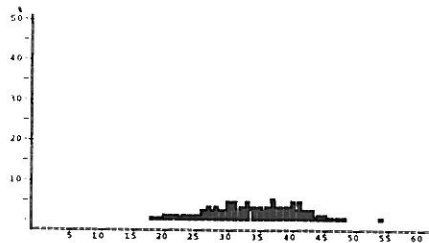
Parapenaeus longirostris, male
Cabinda-Luanda
MEAN LENGTH = 21.3 mm N= 738
NUMBER OF SUBSAMPLES : 17



Parapenaeus longirostris, fem.
Cabinda-Luanda
MEAN LENGTH = 23.3 mm N= 1231
NUMBER OF SUBSAMPLES : 18



Aristeus varidens, male
Cabinda-Luanda
MEAN LENGTH = 26.8 mm N= 734
NUMBER OF SUBSAMPLES : 22



Aristeus varidens, female
Cabinda-Luanda
MEAN LENGTH = 34.3 mm N= 809
NUMBER OF SUBSAMPLES : 22

Annex III Swept-area estimates

SWEPT AREA ANALYSIS FROM STATION 1286 TO STATION 1338

A. LUANDA-BENGUELA. Demersal species shelf.

1850 1730

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	Lower limits, Kg/nm								- 50m	50-100m	100-200m	200-200m
	>0	10	30	100	300	1000						
<i>Synagrops microlepis</i>	1	1	2	2	3	1	42	20.50				
<i>Brachydeuterus auritus</i>	3	3	1	2			42	7.16	21.99	7.64	52.91	
<i>Dentex macrophthalmus</i>	8	2	1	1	1		54	2.85		1.98		
<i>Pagellus bellottii</i>	8	2	5				63	1.46		2.86	5.34	
<i>Galeoides decadactylus</i>	2		2	1			21	1.14	0.64	3.39	0.01	
<i>Umbrina canariensis</i>	5		4				38	1.09	0.12	2.80		
<i>Merluccius polli</i>	4		1	1			25	1.05			3.16	
<i>Chlorophthalmus atlanticus</i>	4		1	1			25	0.89			2.66	
<i>Stromateus fiatola</i>	1			1			8	0.79	2.58	0.09		
<i>Pteroscion peli</i>	3		2				21	0.44	1.48	0.02		
<i>Pseudolithus typus</i>	1		2				13	0.44	1.52			
<i>Brotula barbata</i>	6	1	2				38	0.43		0.05	1.24	
<i>Zenopsis conchifer</i>	4	2	1				29	0.40			1.20	
<i>Dentex barnardi</i>	9	4					54	0.36	0.11	0.81	0.08	
<i>Dentex angolensis</i>	12	2					58	0.35		0.44	0.55	
<i>Pentheroscion mbizi</i>			1				4	0.35	1.19			
<i>Trigla lyra</i>	2		1				13	0.30	0.90	0.09		
<i>Sepia officinalis hierredda</i>	10	1	1				50	0.28	0.63	0.21	0.04	
<i>Citharus linguatula</i>	13	2					63	0.26	0.08	0.53	0.11	
<i>Chelidonichthys gabonensis</i>	7	1					33	0.25		0.52	0.17	
<i>Bembrops heterurus</i>	8	3					46	0.25	0.02	0.03	0.71	
<i>Pterothrissus belloci</i>	6	3					38	0.25		0.28	0.42	
<i>Illex coindetii</i>	6	2					33	0.23		0.07	0.61	
<i>Pomadasys incisus</i>	4		1				21	0.23	0.75	0.04	0.61	
<i>Raja miraletus</i>	7	2					38	0.21	0.28	0.32	0.03	
<i>Parapenaeus longirostris, fem.</i>	2	2					17	0.20			0.61	
<i>Zeus faber</i>	7	1					33	0.16		0.14	0.34	
<i>Chelidonichthys capensis</i>	6	1					29	0.16	0.04	0.33	0.06	
<i>Atractoscion aequidens</i>	5	1					25	0.13		0.34	0.02	
<i>Pomadasys rogeri</i>			1				4	0.13	0.44			
<i>Pseudupeneus prayensis</i>	1	1					8	0.10		0.26		
<i>Boops boops</i>	8						33	0.09		0.01	0.25	
<i>Dasyatis margarita</i>	1	1					8	0.09	0.09	0.17		
<i>Uranoscopus polli</i>	3	1					17	0.08		0.01	0.22	
<i>Lagocephalus laevigatus</i>	2	1					13	0.08	0.03	0.19		
<i>Todaropsis eblanae</i>	6						25	0.08			0.23	
<i>Lithognathus mormyrus</i>		1					4	0.07	0.22			
<i>Alloteuthis africana</i>	3						13	0.06	0.13	0.07		
<i>Arius parkii</i>	1	1					8	0.06	0.04	0.14		
<i>Octopus sp.</i>	1	1					4	0.05	0.15	0.01		
<i>Parapenaeus longirostris, male</i>	4						17	0.05			0.14	
<i>Pentanemus quinquarius</i>		1					4	0.05	0.15			
<i>Coelorrhinus coelorrhinus</i>		1					4	0.05			0.15	
<i>Conger conger</i>	1	1					8	0.05		0.12	0.01	
<i>Branchiostegus semifasciatus</i>	3						13	0.05		0.12		
<i>Penaeus notialis</i>	1						4				0.01	
<i>Parapenaeus longirostris</i>	2						8				0.71	
Other fish								0.71	0.60	0.80	0.71	
Sum all species								44.46	38.10	24.88	71.99	
Sum Snappers								0.06	0.06	0.11		
Sum Groupers								7.53	23.19	2.04		
Sum Grunts								2.48	4.36	3.19	0.02	
Sum Croakers								5.23	0.98	7.63	6.24	
Sum Seabraams								0.05		0.07	0.07	
Sum Sharks								0.39	0.61	0.54	0.06	
Sum Rays								0.76	0.94	0.52	0.88	
Sum Squids								0.25			0.76	
Sum commercial shrimps												

Number of stations included in analysis, total and by depth strata

24

7

9

8

B. CABINDA-LUANDA. Demersal species shelf.

3023 2693

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	>0	10	30	100	300			1000	- 50m	50-100m	100-200m
Brachydeuterus auritus	1	2		6	3	41	7.54	20.40	5.55		
Synagrops microlepis			1		1	7	5.04			13.27	
Sepia officinalis hierredda	11	3	3			59	0.84	1.31	1.09	0.27	
Galeoides decadactylus	1	3	3			24	0.77	2.80			
Pteroscion peli	2	2	1	1		21	0.72	2.60			
Pomadasys jubelini	1	1		1		10	0.65	2.27	0.06		
Pentheroscion mbizi	4	1		1		21	0.58	0.27	1.45	0.01	
Pseudolithus typus	3	3	2			24	0.57	2.06	0.02		
Dentex angolensis	15	5				69	0.53		0.68	0.77	
Pagellus bellottii	11	3	2			55	0.51	0.13	1.31	0.06	
Spicara alta	7	1	1			31	0.37				
Arius parkii	2		2			14	0.33	1.17	0.01	0.97	
Dentex congoensis	11	1	1			45	0.30		0.51	0.32	
Atractoscion aequidens	4	1	1			21	0.27		0.75	0.04	
Boops boops	15	1	1			59	0.23	0.02	0.39	0.24	
Umbrina canariensis	10	2				41	0.21	0.09	0.48	0.05	
Saurida brasiliensis	13	4				59	0.20		0.18	0.37	
Chelidonichthys gabonensis	8	2				34	0.19		0.34	0.20	
Illex coindetii	16	1				59	0.16		0.04	0.38	
Dentex barnardi	9	2				38	0.15	0.22	0.24	0.02	
Pterothrissus belloci	6	1				24	0.15		0.09	0.31	
Zenopsis conchifer	7	1				28	0.14			0.37	
Stromateus fiatola	2		1			10	0.14	0.50			
Chelidonichthys capensis	7	1				28	0.13		0.29	0.07	
Raja miraletus	8	1				31	0.13	0.16	0.22	0.03	
Sepia orbignyana	2	2				14	0.12		0.08	0.25	
Pomadasys peroteti	1	2				10	0.12	0.42			
Plectorhinchus mediterraneus	3	1				14	0.11	0.37	0.03		
Citharus linguatula	19					66	0.10	0.02	0.22	0.06	
Pomadasys incisus	6					21	0.09	0.32			
Leptocharias smithii	5					17	0.08	0.07	0.13	0.05	
Epinephelus aeneus	6					21	0.08	0.07	0.17		
Mola mola		1				3	0.07			0.19	
Trigla lyra	7					24	0.06		0.09	0.07	
Dentex macrophthalmus	7					24	0.06			0.17	
Brotula barbata	6					21	0.06		0.10	0.07	
Sparus caeruleostictus *	3	1				14	0.05	0.17	0.01		
Dentex gibbosus	7					24	0.05	0.03	0.03	0.09	
Dicologlossa cuneata	4					14	0.05	0.17	0.01		
Penaeus notialis	4	1				17	0.05	0.20			
Squatina aculeata		1				3	0.05			0.12	
Bembrops heterurus	9					31	0.05			0.14	
Synagrops sp.		1				3	0.05		0.13		
Parapenaeus longirostris, fem.	4					14	0.02		0.01	0.04	
Parapenaeopsis atlantica, fem.	2					7	0.01	0.04			
Parapenaeus longirostris, male	4					14	0.01			0.02	
Parapenaeopsis atlantica, male	2					7		0.01			
Penaeus notialis, female	1					1					
Penaeus notialis, male	1					3					
Penaeus kerathurus	2					7		0.01			
Parapenaeus longirostris	2					7					
Parapandalus narval	1										
Other fish							0.63	0.68	0.80	0.44	
Sum all species							22.82	36.58	15.54	19.46	
Sum Snappers							0.02	0.05			
Sum Groupers							0.10	0.15	0.17		
Sum Grunts							8.51	23.78	5.64		
Sum Croakers							2.35	5.04	2.70	0.10	
Sum Seabreams							1.88	0.57	3.17	1.67	
Sum Sharks							0.14	0.07	0.17	0.17	
Sum Rays							0.18	0.25	0.27	0.04	
Sum Squids							1.18	1.31	1.26	1.02	
Sum							0.09	0.26	0.01	0.06	
Sum commercial shrimps											

C. LUANDA-BENGUELA. Demersal species slope.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm					% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²				
	>0	10	30	100	300			1000	200-300m	300-400m	400-500m	500-600m
<i>Merluccius polli</i>	5	2	8	6	1	79	6.80	9.73	14.34	3.05	0.07	
<i>Synagrops microlepis</i>	9	1	1	2	3	57	6.05	23.59	0.38	0.24		
<i>Chlorophthalmus atlanticus</i>	17	1	3	4		89	3.08	8.03	3.83	0.28	0.15	
<i>Nematocarcinus africanus</i>	1	1	8	2		43	2.86		5.54	3.20	2.69	
<i>Hoplostethus cadenati</i>	10	7	2	2		71	1.92	0.14	0.40	1.99	5.15	
Shrimps, small, non comm.	4	2	3	1		36	1.11	0.76	1.97	1.20	0.50	
<i>Dentex macrophthalmus</i>	5	1		2		29	1.04	4.15	0.02			
<i>Yarella blackfordi</i>	13	3	2			64	0.65		0.61	0.88	1.09	
<i>Etmopterus spinax</i>	18		2			71	0.55		1.78	0.22	0.21	
<i>Pterothrissus bellocci</i>	11	3				50	0.30	0.48	0.68	0.02		
<i>Malacocephalus laevis</i>	9	1	1			39	0.29	0.01	0.84	0.27	0.04	
<i>Parapenaeus longirostris</i> , fem.	8	4				43	0.27	1.03	0.03			
<i>Hymenocephalus italicus</i>	10	3				46	0.26	0.01	0.96	0.04	0.01	
<i>Lamprogrammus exutus</i>	7	2				32	0.25			0.23	0.76	
GONOSTOMATIDAE	11	1				43	0.25		0.17	0.57	0.27	
<i>Laemonema laureysi</i>	4	1	1			21	0.24		0.88	0.01	0.07	
<i>Illex coindetii</i>	15	2				61	0.23		0.13	0.38	0.05	
<i>Zenopsis conchifer</i>	9		1			36	0.21	0.36	0.04			
<i>Centrophorus uyato</i>	4	2				21	0.17	0.79	0.38	0.28	0.03	
<i>Gadella imberbis</i>	13	1				50	0.17		0.12	0.44	0.11	
<i>Parapenaeus longirostris</i> , male	8	1				32	0.16	0.61				
S H R I M P S			1			4	0.15		0.59			
<i>Aristeus varidens</i> , female	18					64	0.12		0.14	0.27	0.06	
<i>Dentex angolensis</i>	1	1				7	0.10	0.39				
<i>Aristeus varidens</i> , male	18					64	0.10		0.08	0.26	0.06	
<i>Gonostoma elongatum</i>	4	2				21	0.10	0.01		0.05	0.33	
<i>Todaropsis eblanae</i>	11					39	0.09	0.05	0.12	0.12	0.05	
<i>Malacocephalus occidentalis</i>	4	1				18	0.09		0.10	0.27		
<i>Coelorinchus coelorhincus</i>	11					39	0.09	0.02	0.25	0.08	0.01	
<i>Lophius vaillanti</i>	10	1				39	0.09	0.02	0.29	0.02	0.01	
<i>Neoharriotta pinnata</i>			1			4	0.08			0.32		
<i>Nezumia aequalis</i>	14					50	0.08	0.16	0.06	0.07	0.01	
<i>Triplophos</i> sp.	12					43	0.08		0.03	0.11	0.17	
<i>Lamprogrammus</i> sp.	1	1				7	0.07				0.27	
<i>Gonostoma</i> sp.	1	1				7	0.07				0.29	
<i>Epigonus telescopus</i>	6	1				25	0.06	0.17	0.03	0.02		
<i>Hoplostethus atlanticus</i>			1			4	0.05		0.19			
<i>Bembrops heterurus</i>	6					21	0.05	0.18	0.01			
<i>Brotula barbata</i>	2					7	0.05	0.21				
<i>Solenocera africana</i>	11					39	0.02	0.03	0.03	0.02		
<i>Glyphus marsupialis</i>	3					11						
PASIPHAEDAE	1					4						
PALAEMONIDAE	1					4						
<i>Parapenaeus longirostris</i>	1					4						
<i>Plesiopenaeus edwardsianus</i> , m.	1					4						
<i>Plesiopenaeus edwardsianus</i>	4					14					0.01	
<i>Aristeus varidens</i>	2					7					0.01	
Other fish								0.36	0.21	0.43	0.46	0.30
Sum all species							28.76	51.14	35.45	15.37	12.78	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks							1.14	4.54	0.02			
Sum Rays							0.83		2.28	0.82	0.24	
Sum Squids								0.01		0.01		
Sum							0.37	0.52	0.26	0.61	0.13	
Sum commercial shrimps							3.68	1.67	6.41	3.75	2.83	

Number of stations included in analysis, total and by depth strata

28

7

7

7

7

SWEPT AREA ANALYSIS FROM STATION 1339 TO STATION 1406

D. CABINDA-LUANDA. Demersal species slope.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES						% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	Lower limits, Kg/nm >0 10 30 100 300 1000								200-300m	300-400m	400-500m	500-500m
<i>Synagrops microlepis</i>	7	2	1	4	1	1	67	10.50				
<i>Nematocarcinus africanus</i>	3		6	6			63	5.40	27.68	0.36		
<i>Merluccius polli</i>	8	4	8	2			92	4.19		6.87	10.65	
<i>Chlorophthalmus atlanticus</i>	11	3	3	2			79	1.98	2.09	9.72	0.57	
<i>Zenopsis conchifer</i>	5	8					54	0.56	1.77	3.93	0.02	
<i>Dentex angolensis</i>	2	1	2				21	0.52	1.37			
<i>Illex coindetii</i>	21	1					92	0.35	0.51	0.26	0.24	
<i>Pterothrissus belloci</i>	9	4					50	0.34	0.36	0.61	0.02	
<i>Pontinus accraensis</i>	1	4					21	0.29		0.72	0.17	
<i>Malacocephalus laevis</i>	13						54	0.29		0.54	0.38	
<i>Parapenaeus longirostris, fem.</i>	15		1				67	0.26	0.59	0.12		
<i>Gadella imberbis</i>	15						63	0.24		0.48	0.28	
<i>Hymenocephalus italicus</i>	10	1					46	0.23		0.67	0.01	
<i>Centrophorus uyato</i>	4		1				21	0.22		0.47	0.20	
<i>Hoplostethus cadenati</i>	3	2					21	0.19			0.65	
<i>Galeus polli</i>	1		1				8	0.17				
GONOSTOMATIDAE	8	1					38	0.17		0.08	0.56	
<i>Nezumia aequalis</i>	13	1					58	0.14	0.14	0.24	0.50	
<i>Chaunax pictus</i>	14						58	0.13		0.23	0.03	
<i>Bembrops heterurus</i>	4	1					21	0.12	0.32		0.18	
<i>Brotula barbata</i>	1	1					8	0.12	0.31			
<i>Parapenaeus longirostris, male</i>	13	1					58	0.11	0.29	0.02		
<i>Ariomma bondi</i>	5	1					25	0.10	0.13	0.15		
<i>Lamprogrammus exutus</i>	4						17	0.08			0.27	
<i>Aristeus varidens, female</i>	10						42	0.07		0.01	0.23	
<i>Munida sp. *</i>	11						46	0.07				
<i>Coelorinchus sp.</i>	8						33	0.06		0.03	0.19	
<i>Triplophos sp.</i>	9						33	0.06		0.13	0.05	
<i>Squatina aculeata</i>		1					4	0.05		0.01	0.17	
<i>Laemonema laureysi</i>	2	1					13	0.05		0.15	0.02	
CONGRIDAE	5	1					25	0.05				
<i>Chlorophthalmus sp.</i>	4						17	0.05	0.05	0.10	0.15	
<i>Aristeus varidens, male</i>	10						42	0.04		0.01	0.12	
<i>Solenocera africana</i>	17						71	0.03	0.03	0.03	0.03	
<i>Parapandalus narval</i>	2						8	0.01		0.03		
SOLENCERIDAE	1						4					
<i>Nematopalaemon hastatus</i>	1						4					
<i>Parapenaeus longirostris</i>	1						4					
<i>Plesiopeneus edwardsianus</i>	2						8					
Other fish								0.48	0.49	0.45	0.45	
Sum all species								27.72	37.16	27.07	16.14	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams								0.55	1.45			
Sum Sharks								0.48				
Sum Rays										0.68	0.84	
Sum Squids										0.01		
Sum								0.38	0.59	0.30	0.24	
Sum commercial shrimps								5.92	0.91	7.09	11.03	

Number of stations included in analysis, total and by depth strata

24 9 8 7

D. CABINDA-LUANDA. Demersal species slope cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm				% inci- dence	Mean dens. t/nm ²	Mean densities by bottom depth strata t/nm ²			
	>0	10	30	100 300 1000			500-600m	600-800m	800-800m	800-800m
Nematocarcinus africanus	4	1	3	4	92	5.47				
Hoplostethus cadenati	6	4	2	1	100	2.40	7.46	2.27		
Lamprogrammus exutus	10	2			85	0.50	1.07	4.54		
Yarella blackfordi	10	3			100	0.49	0.41	0.65		
Munida sp. *	12	1			100	0.46	0.15	1.03		
							0.37	0.59		
Triplophos sp.	12	1			100	0.40	0.47	0.30		
GONOSTOMATIDAE	11				85	0.35	0.40	0.28		
Gadella imberbis	12				92	0.23	0.19	0.30		
Coelorinchus coelorhincus	4	1			38	0.17	0.02	0.42		
Xenodermichthys copei	11				85	0.17	0.12	0.26		
Nezumia aequalis	4	1			38	0.15	0.03	0.34		
Trachyrincus scabrus	1	1			8	0.14	0.14	0.38		
Chaceon maritae	4				31	0.14	0.02	0.32		
Aristeus varidens, female	13				100	0.13	0.16	0.08		
Talismania sp.	3	1			31	0.11	0.28			
Merluccius polli	3				23	0.09	0.09	0.08		
CONGRIDAE	7				54	0.09	0.03	0.20		
Centrophorus uyato	3				23	0.07	0.11			
Aristeus varidens, male	13				100	0.06	0.08	0.04		
OPHIDIIDAE	1				8	0.06	0.17			
Gonostoma sp.	2				15	0.06	0.03	0.09		
Solenocera africana	2				15					
Heterocarpus ensifer	2				15					
Plesiopenaeus edwardsianus	1				8		0.01			
Shrimps, small, non comm.	1				8					
S H R I M P S	1				8					
Other fish						0.43	0.39	0.49		
Sum all species						12.17	11.61	13.11		
Sum Snappers										
Sum Groupers										
Sum Grunts										
Sum Croakers										
Sum Seabreams										
Sum Sharks										
Sum Rays						0.10	0.14	0.03		
Sum Squids						0.02	0.03	0.01		
Sum						0.07	0.09	0.02		
Sum commercial shrimps						5.66	7.71	2.39		

Number of stations included in analysis, total and by depth strata

13

8

5

Annex IV Instruments and fishing gear used

The Simrad EK-500/38kHz scientific sounder was used during the survey for fish abundance estimation. The Bergen Echo Integrator system (BEI) was used to scrutinize the acoustic records from the 38kHz echo sounder, and to allocate integrator values to fish species.

The details of the settings of the 38kHz echo sounder were as follows:

Tranceiver-1 menu (38 kHz lowering keel)

Transducer depth	5.00 m
Absorbtion coeff.	10 dB/km
Pulse length	medium (1ms)
Bandwidth	wide
Max power	2000 Watt
2-way beam angle	-21.0 dB
SV transducer gain	27.7 dB
TS transducer gain	27.8 dB
Angle sensitivity	21.9
3 dB beamwidth	6.8 dg
Alongship offset	0.00 "
Athwardship offset	0.04 "

Display menu

Echogram	1 (38 kHz)
Bottom range	12 m
Bottom range start	10 m
Sv colour min	-67 dB

Printer- menu

Echogram	1 (38 kHz)
Range	50, 100, 250, 500 and 1000 m
Range start	0
Bottom range	12 m
Bottom range start	10 m
Sv colour min	-67 dB
TVG	20 log R

Bottom detection menu Minimum level -45 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 innernett of 10 mm meshsize. The estimated opening is 6 m (observed 5.7) and distance between wings during towing about 18 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. The doors are of 'Thyborøn' combi type, 7.81 m², 1670 kg, their distance while trawling about 46 m in average. This distance is kept constant at all depths by the use of a 9.5 m strap between the wires at 130 m distance from the doors (applied at depths greater than 60 m). A tickler chain (44 m in total) was attached at the footrope to improve the catchability of deep-water shrimp.

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.

The pelagic trawl is equipped with a trawleye that provides information on the trawl opening and the distance of the footrope to the bottom.