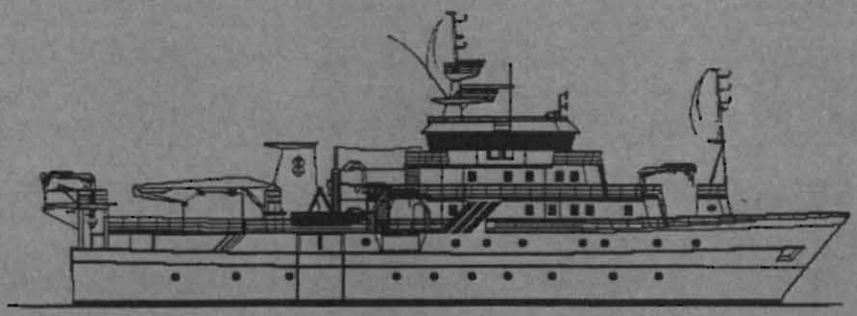
NORAD - FAO/UNDP PROJECT GLO 92/013

CRUISE REPORTS "DR. FRIDTJOF NANSEN"



SURVEYS OF THE FISH RESOURCES OF ANGOLA

Cruise Report No 2/96

PART I

Survey of the demersal resources

16 July - 8 August 1996

PART II

Survey of the pelagic resources

19 August - 7 September 1996

Instituto de Investigação Pesqueira, IIP
Luanda

Institute of Marine Research, IMR
Bergen

The survey programme by the RV 'Dr. Fridtjof Nansen' is sponsored by the Norwegian Agency for Development Co-operation (NORAD). The programme is implemented by the Institute of Marine Research (IMR) in co-operation with the Food and Agriculture Organisation of the United Nations (FAO) and research institutions in partner countries. The programme in Angola is organised and planned by the Instituto de Investigação Pesqueira (IIP) and IMR.

Surveys in Angolan waters by RV 'Dr. Fridtjof Nansen':

Survey	Objectives	Survey period
1985/1	Pelagic and demersal	28.01-26.02
1985/2	Pelagic and demersal	23.04-28.05
1985/3	Pelagic and demersal	08.08-10.09
1985/4	Pelagic and demersal	05.11-05.12
1986/1	Pelagic and demersal	21.01-11.03
1986/2	Pelagic and demersal	22.04-05.06
1989/1	Pelagic and demersal	13.02-16.03
1989/2	Pelagic and demersal	23.04-29.05
1989/3	Pelagic and demersal	17.11-13.12
1991/1	Pelagic and demersal	04.05-19.06
1991/2	Pelagic and demersal	06.08-18.09
1992	Pelagic and demersal	05.08-22.09
1994/1	Pelagic	21.02-16.03
1994/2	Pelagic	02.08-17.08
1994/2	Demersal	01.09-19.09
1995/1	Pelagic and demersal	27.02-02.04
1995/2	Demersal	27.07-13.08
1995/2	Pelagic	22.08-22.09
1996/1	Pelagic	28.02-01.04
1996/2	Demersal	16.07-08.08
1996/2	Pelagic	19.08-07.09

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF ANGOLA

Cruise Report No. 2/96

PART 1

Survey of the demersal resources

16 July - 8 August 1996

by

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

Kumbi Kilongo
Instituto de Investigação Pesqueira
Luanda, Angola

Bergen, 1996

TABLE OF CONTENTS

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 seabreams (Sparidae), Benguela hake (*Merluccius polli*), deep-water shrimps (*Parapenaeus longirostris* and *Aristeus varidens*) and cephalopods, from Cabinda to Benguela by a swept-area trawl programme.

- Conduct fishing trials for squid by jigging and try to do acoustic observations.

- Continue the stomach sampling programme for Benguela hake.

- Map the general hydrographic regime by using a CTD-sonde on trawl stations all over the survey area and monitor the temperature, salt and oxygen on IIP standard profiles for hydrographical studies.

- On-the-job training for the Angolan participants on the main survey routines.

1.2 Participation

The scientific staff consisted of:

From IIP, Angola:

Domingas ADELINO, Paulo BRINCA, Guilherme CAMARADA, Fernando GOMBO, Kumbi KILONGO and Enoque VASCO

From South Africa:

Christian ROHLEDER

From IMR, Bergen:

Guillermo BURGOS, Martin DAHL, Ole GULLAKSEN, and Sigbjørn MEHL.

1.3 Narrative

The vessel left Luanda in the afternoon of 16 July and steamed southwards to Pta. das Palmeirinhas where the sampling programme commenced with course tracks approximately 20 NM apart, covering the inner, middle and outer shelf and the slope to 700 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.

The southern part of the survey area, Pta. das Palmeirinhas to Benguela, was covered from 16 to 26 July. Three hydrographic transects were sampled in the region; Pta. das Palmeirinhas, Pta. do Morro and Lobito. On 27 and 28 July fishing trials for squid were conducted outside the slope between Benguela and Pta. das Palmeirinhas. The northern part of the survey area, Pta. das Palmeirinhas to Cabinda, was covered from 29 July to 8 August, including the hydrographic transects Ambriz and Pta. da Moita Seca. The Cabinda region was only partially covered due to oil-drilling activities. The survey was completed off Cabinda the night of the 8th of August and the vessel steamed northwards to Port Gentil.

1.4 Survey effort

Figure 1a-b shows the cruise tracks with fishing and CTD-stations and Table 1 presents the number of CTD and fishing stations and the distance surveyed.

Table 1 Number of hydrographic (CTD), jigging (JIG), pelagic (PT), bottom (BT) trawl stations, successful swept-area hauls and distance surveyed (NM) by area.

Area	CTD	JIG	PT	BT	Swept-area hauls			Distance surveyed
					0-200m	200-400m	400-800m	
Cabinda	6	-	-	10	1	4	5	110
Congo R.-Pta. Palm.	49	3	-	70	33	17	20	1095
Pta. Palm. - Benguela	60	9	2	77	34	19	24	1460
Total	115	12	2	157	68	40	49	2665

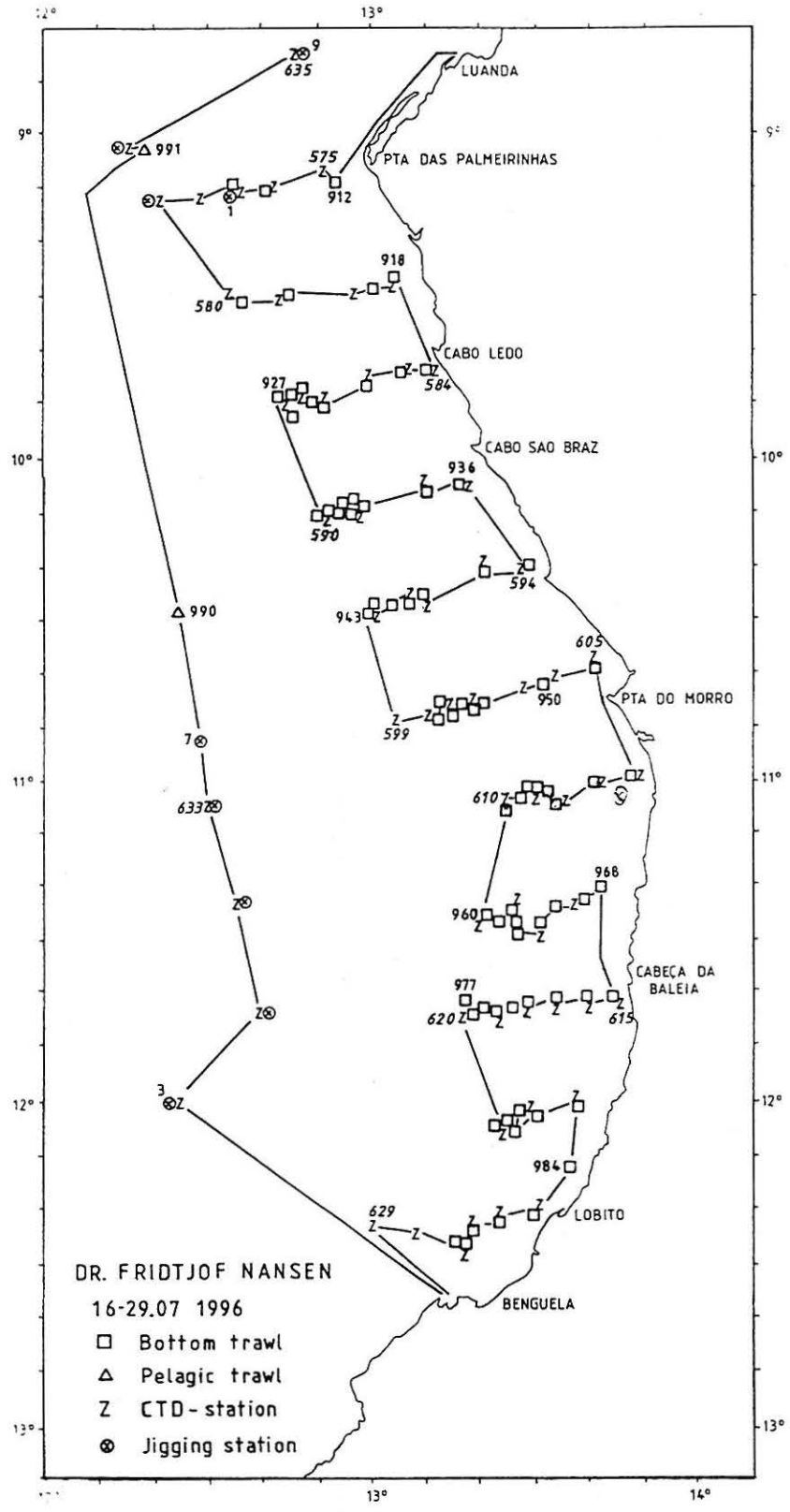


Figure 1a. Course tracks with fishing stations and CTD-stations. Benguela-Pta. das Palmeirinhas.

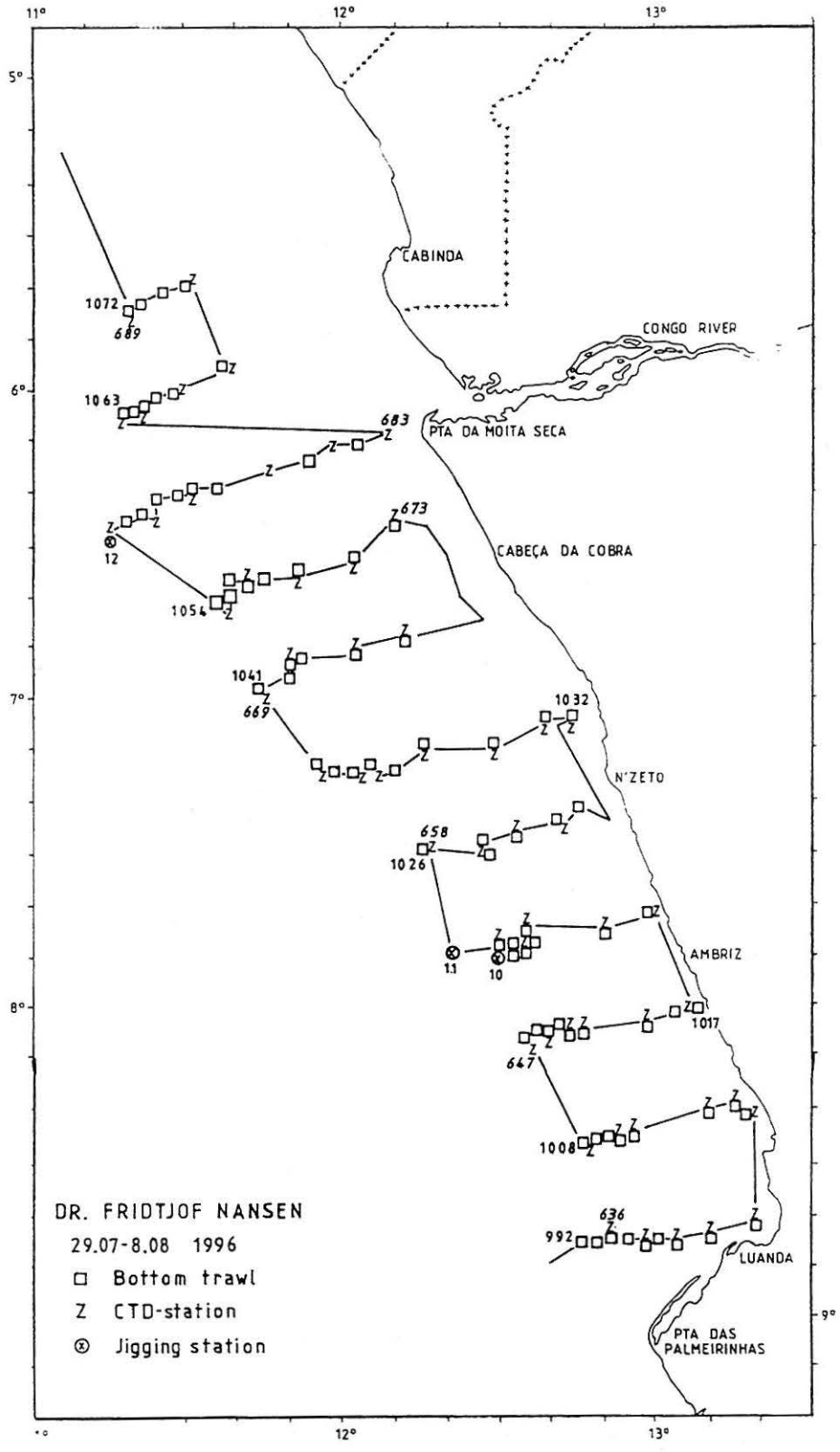


Figure 1b. Course tracks with fishing stations and CTD-stations. Pta. das Palmeirinhas-Cabinda.

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 meters above the bottom. 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.

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 for fish (total length in cm), for shrimp (carapace length in mm for shrimp, punched in cm with one decimal) and for cephalopods (mantle length in cm) were taken for the main species. Biological samples, i.e.

length, weight, sex and maturity stages, were taken for *M. polli* in connection with stomach sampling. 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 was approximately proportional to the stratum size. The Cabinda region could not be covered entirely because of the ongoing oil-drilling activities. For this reason, there is an insufficient number of stations for biomass estimation in this region. Biomass estimates cover therefore only the area south of the Congo River. Furthermore, for the shallowest depth stratum (to 50 m depth), only the area from 20 m to 50 m depth was used for calculating the biomass instead of multiplying by the whole area (0 to 50 m depth) as done in previous reports. Care should therefore be taken when comparing present biomass estimates with previous years estimates. Biomass estimates by species were obtained by summing the estimates calculated for each depth stratum.

Table 2. Areas used in the swept-area biomass estimates (depths in m, areas in NM^2)

Depth stratum/area	20-50	50-100	100-200	200-300	300-400	400-500	500-600	600-800
Cabinda								
5 - 6°S		723	146	155	110	102	472	390
Congo River - Pta das Palmeirinhas								
6 - 7°S	595	827	744	262	235	184	161	181
7 - 8°S	520	685	706	145	154	142	148	151
8 - 9°S	264	457	490	194	161	111	100	76
Total	1379	1970	1939	600	550	438	408	1110
Pta das Palmeirinhas - Benguela								
9 - 10°S	320	393	425	160	105	102	102	73
10 - 11°S	353	607	587	116	116	101	104	66
11 - 12°S	310	344	319	103	123	86	92	72
12 - 13°S	85	242	108	28	28	54	48	57
Total	1068	1587	1439	408	372	343	346	625

The bottom trawl has a headline of 31 m (float line), footrope 47 m, estimated headline height 5 m and distance between wings during towing about 18 m. On trawl hauls deeper than 300 m the footrope was equipped with a tickler chain to improve the catchability of *A. varidens* (Mehl and Constança 1995). 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 (bottom contact, headline height

and distance between the doors) and the actual time the trawl was fishing on the bottom was determined with improved accuracy. For conversion of catch rates to fish densities the area between the wings is assumed to be the effective fishing. Furthermore, the catchability coefficient q was assumed equal to 1 for all species. The length of a haul, recorded as distance over bottom, was measured by the GPS.

A more detailed description of the fishing gear, the acoustic instruments and their standard settings is given in Annex IV.

CHAPTER 3 OCEANOGRAPHIC CONDITIONS

Surface distribution

The horizontal distributions of temperature and salinity are shown in Figs. 2 and 3, respectively. In the Pta. das Palmeirinhas-Benguela region temperatures range from 19-20 near the shore to 21-23°C offshore. In the Cabinda-Pta. das Palmeirinhas 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 35.6 ‰ near the coast (lower values at Congo River) to 35.7 ‰ and 35.8 ‰ further out in the ocean in the northern and southern region respectively. Increasing temperature and salinity with increasing distance from the coast indicates that upwelling has occurred.

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. The maximum temperature was found near the surface and decreases with depth from 20-22°C near the surface to 5-6°C at about 700 m depth. A thermocline was found between 10 and 30 m depth and a secondary weaker at 200-400 depth, indicating the influence of different water masses. Also the salinity decreases monotonically from 35.7-35.8 ‰ near the surface to 34.5-34.6 ‰ at about 700 m depth. No surface salinity maximum was observed during this survey. The oxygen distribution was in general as usually observed, with 5 ml/l O_2 near the surface and 3 ml/l O_2 at about 800 m depth. Also this year an offshore minimum with values below 1 ml/l O_2 was observed at 200-400 m depth. This is the same depth range as the deep thermocline and indicates that the water masses penetrating below the upper layer is rich in oxygen. There were no clear signs of low bottom oxygen content at the shelf.

The overall oceanographic situation seems to be consistent with former observations in this season.

ADCP current measurements

A subset of current vectors obtained at 35 m dept 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. However, a certain impression of the direction and magnitude of the current may be obtained, but interpretations should be handled with care.

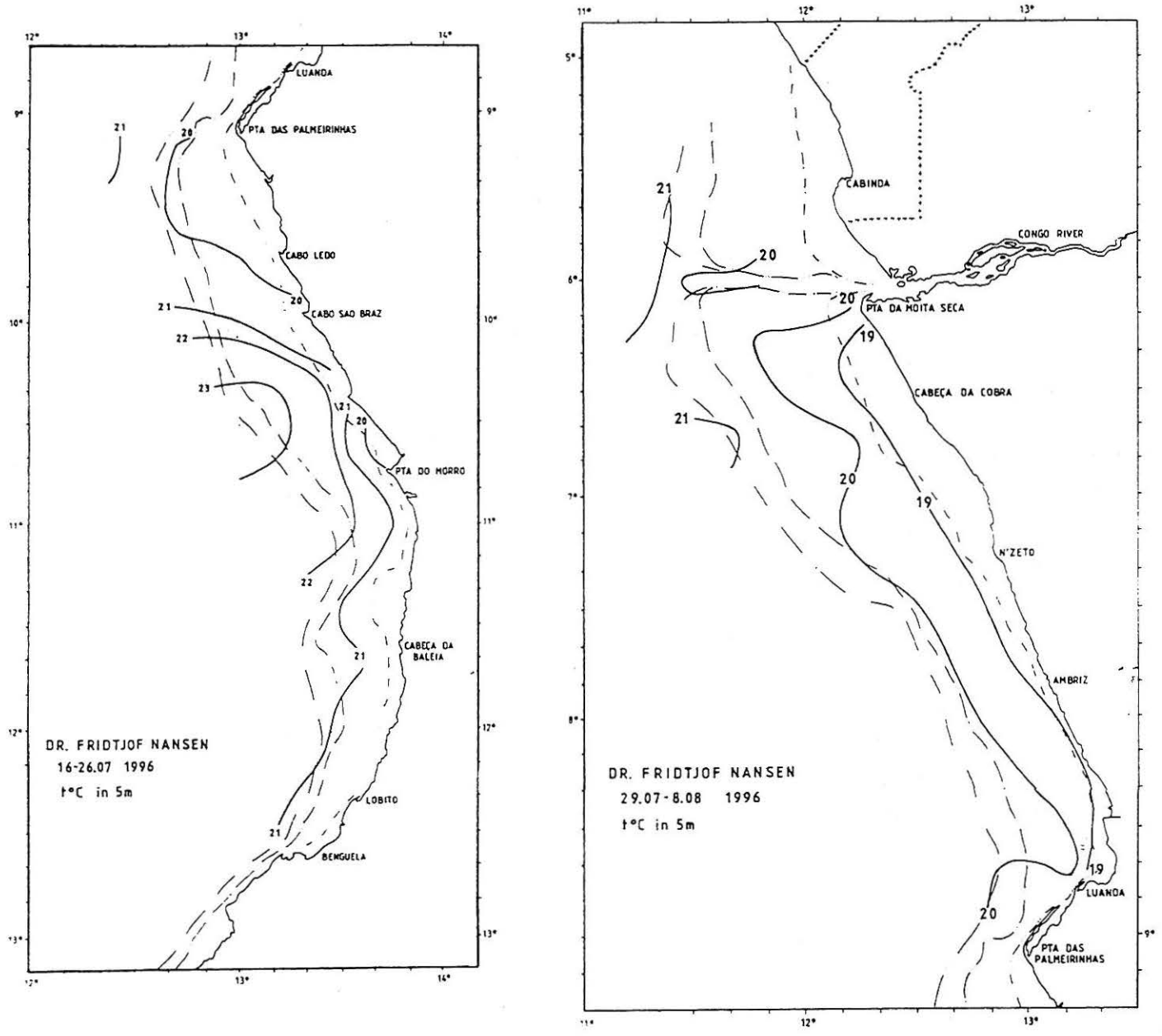


Figure 2. Horizontal distribution of surface (5 m depth) temperature. Pta. das Palmeirinhas-Benguela and Cabinda-Pta. das Palmeirinhas.

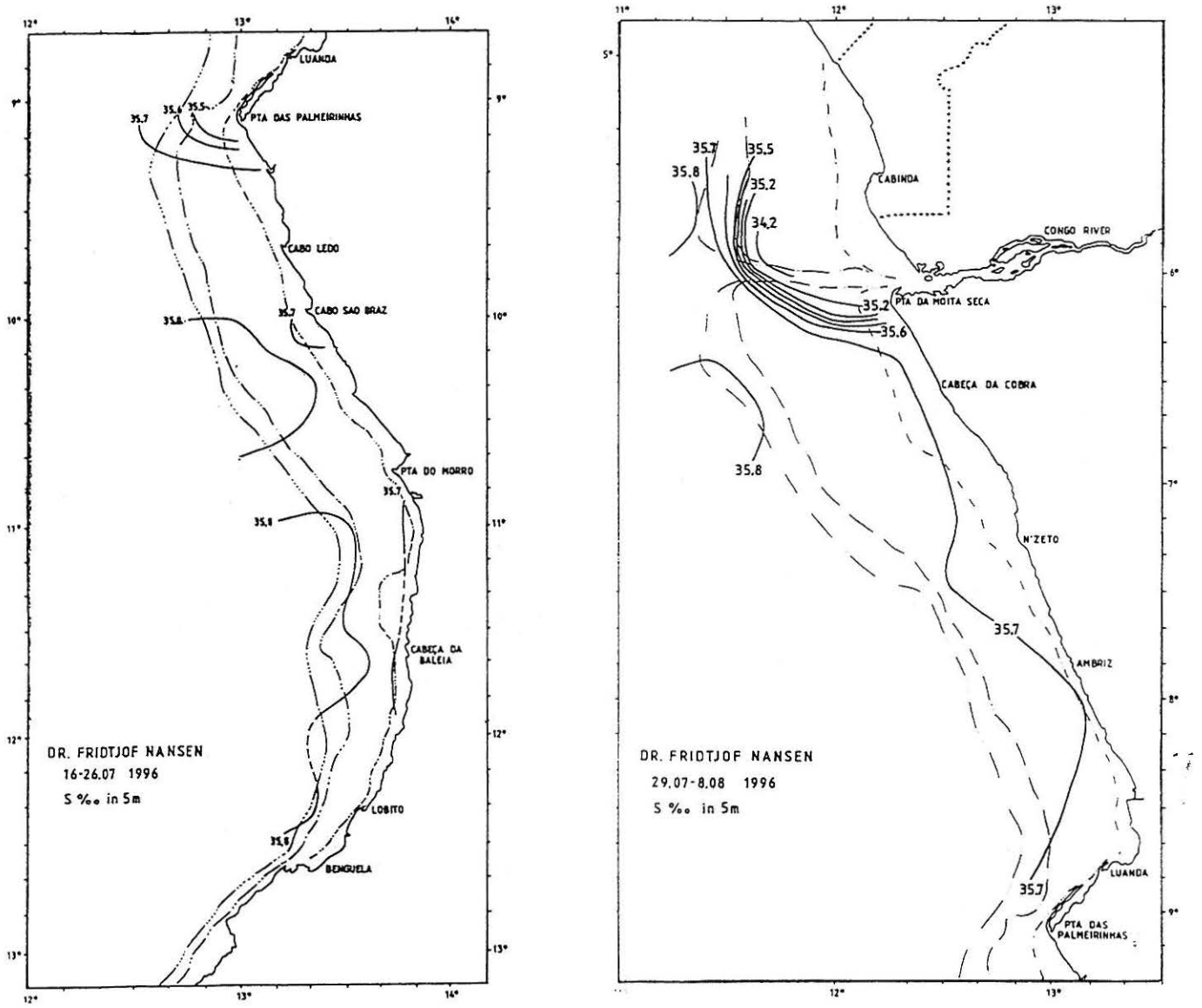


Figure 3. Horizontal distribution of surface (5 m depth) salinity. Pta. das Palmeirinhas-Benguela and Cabinda-Pta. das Palmeirinhas.

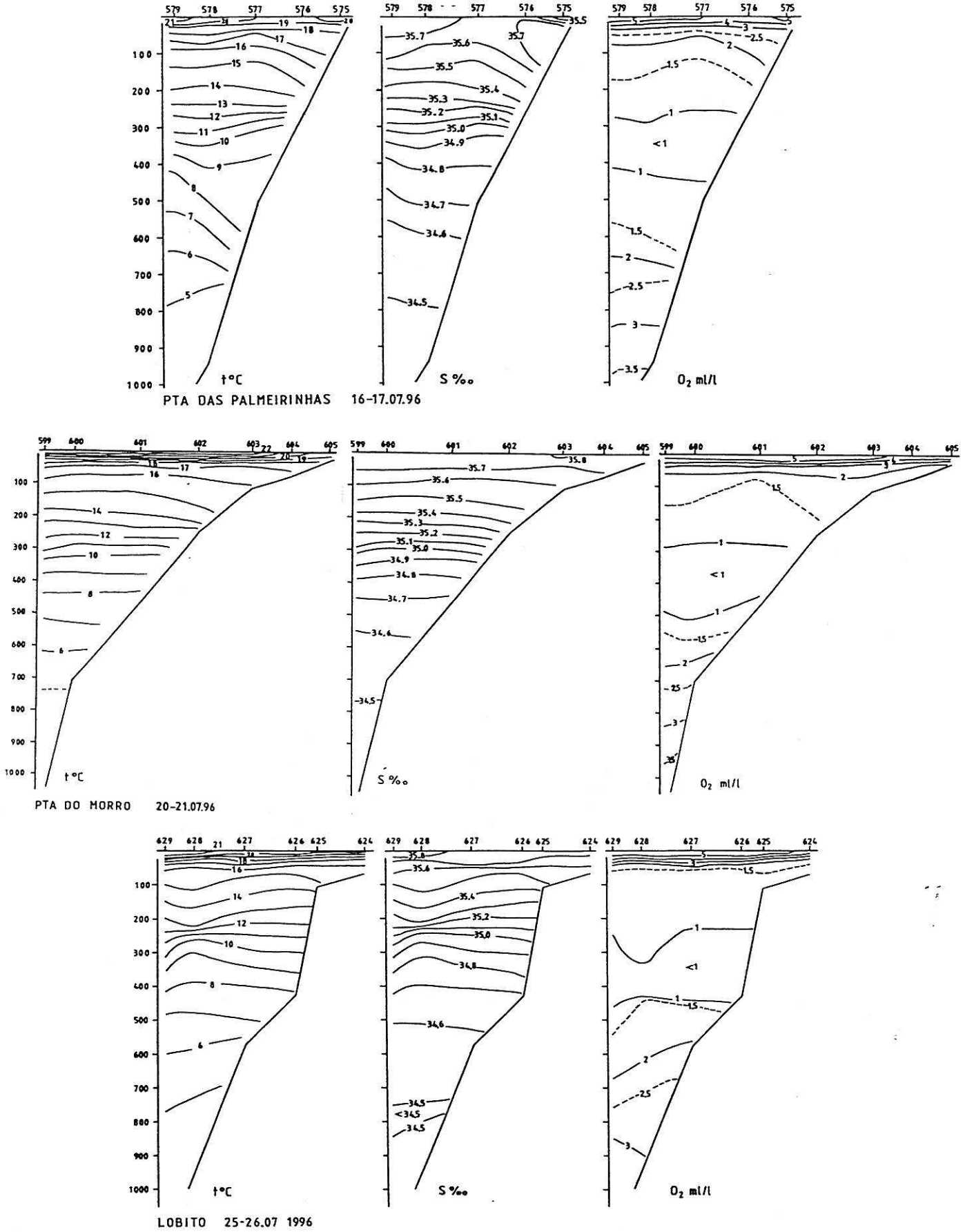


Figure 4. Vertical sections of a) temperature, b) salinity and c) oxygen. Pta. das Palmeirinhas, Pta. do Morro and Lobito.

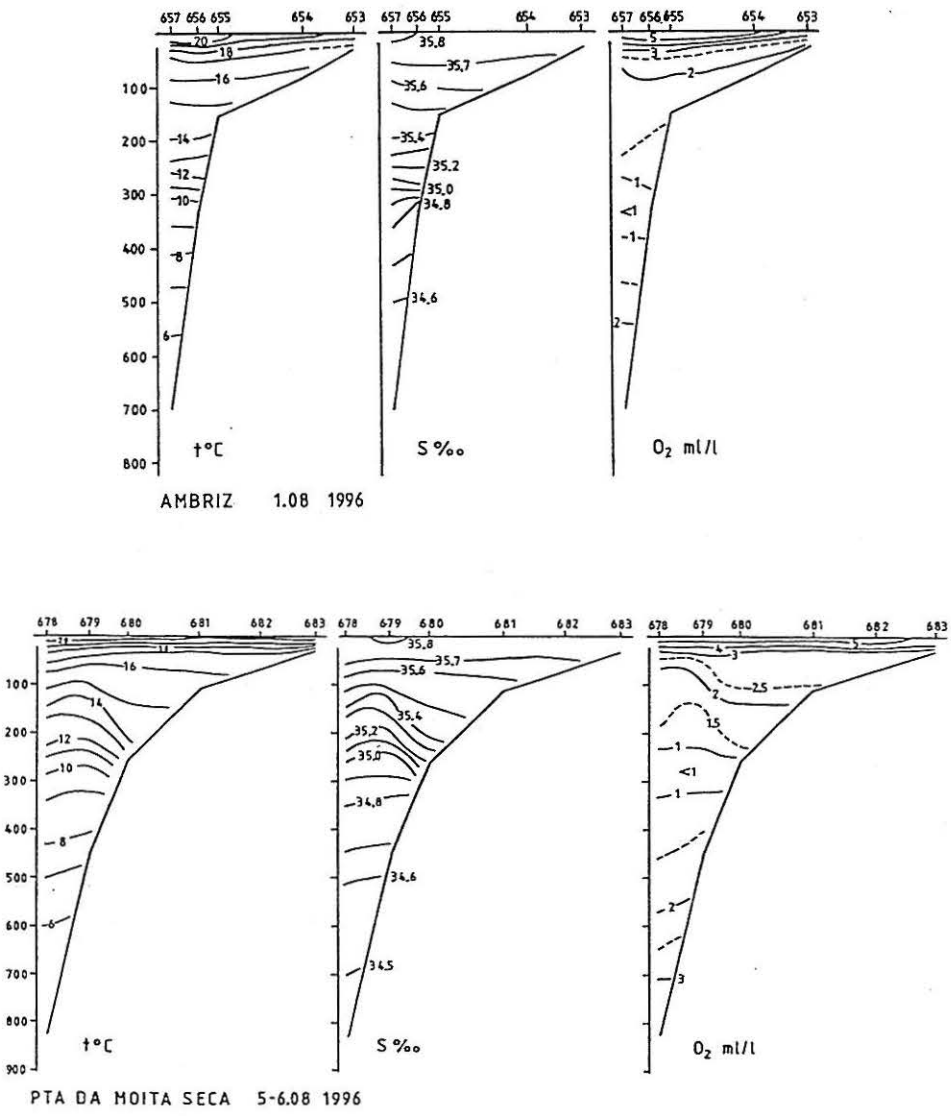


Figure 5. Vertical sections of a) temperature, b) salinity and c) oxygen. Ambriz and Pta. da Moita Seca.

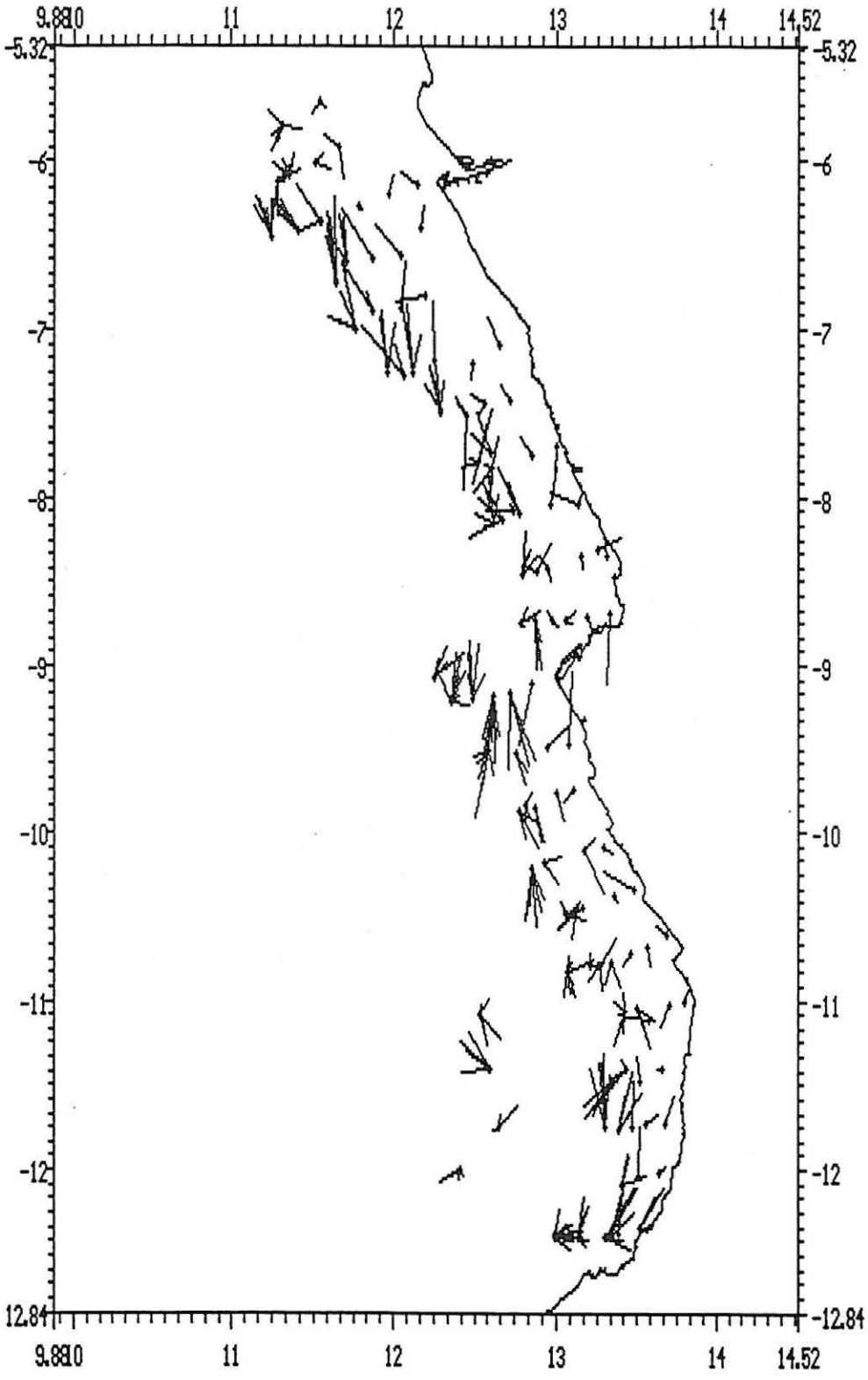


Figure 6. ADCP current vectors at 34 m depth. Cabinda-Benguela.

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 studied by dividing the shelf into two parts: an inner shelf, down to 70 m depth and an outer shelf, from 71 to 200 m. 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 20-50 m, 50-100 m 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 Pta. das Palmeirinhas-Benguela

In this region, 34 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 August - September 1995, the demersal group dominated on the inner shelf and made up more than 50 % of the catches, while the pelagic group contributed with about 25 %. The mean catch rates of both groups were however the double of last year. Compared with the results from September 1994 the catch rates of demersal species were much higher in 1996 and those of pelagic species slightly lower. The mean catch rate of cephalopods was only half of what was found in 1994, but 5 times higher than in 1995. More detailed results for cephalopods are presented in Chapter 6. Sharks and shrimps represented only minor components of the catches on the inner shelf, as well as on the outer shelf. The pelagic group was the most important on the outer shelf with almost 50 % of the catches, and the demersal group made up about 20 %. This is the opposite of what was found last year when the demersal group also dominated on the outer shelf, but the same as in 1994 when the pelagic group also was most important. The mean catch rates were somewhat lower than those obtained in 1994, while the catch rate of the pelagic group was 3 times higher than in 1995 and the catch rate of the demersal group was only half of what was found last

year. Like on the inner shelf cephalopods were more abundant than the previous year, while the mean catch rate was slightly lower than in 1994.

Table 3. Catch rates (kg/hour) by main groups in swept-area bottom trawl hauls on the shelf. Pta. das Palmeirinhas - Benguela.

INNER SHELF 20-70 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
912	63	234.9	204.9			29.7	47.0
917	48	143.8	68.9			9.8	5.5
918	27	259.3	70.3			3.4	71.1
919	25	415.2	359.7			12.2	702.0
920	59	115.0	39.6			15.2	11.2
936	26	1473.9	623.3	71.3		50.5	312.8
937	31	2354.7	597.1			32.8	349.4
951	25	1190.5	471.7			24.0	257.2
952	45	433.6	122.3		14.1	24.5	75.6
966	53	11.1	73.3			10.9	3.3
967	36	1271.3	162.4				52.6
969	31	242.5	47.1		1.6	21.2	172.3
970	61	99.1	758.7			42.0	18.4
983	62	156.5	28.7			15.2	27.5
984	44	486.9	53.6		11.3	27.7	158.0
985	68	257.8	219.3			18.9	127.4
MEAN		571.6	243.8	4.4	1.7	21.1	149.5

OUTER SHELF 71-200 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
916	164	111.0	131.7		0.6	13.3	115.5
921	94	109.6	244.9	8.6		1.9	11.0
922	181	106.8	103.5	12.0		3.8	63.4
934	127	268.8	4354.7			142.4	4131.7
935	75	8.7	211.6			7.3	15.8
938	71	496.4	672.9	15.5		6.3	31.7
939	123	43.2	26.1			7.2	4.9
940	183	201.6	1.3	4.1	0.7	6.5	124.1
949	150	295.8	161.7			7.7	65.1
950	75	134.2	145.4			7.4	24.0
953	80	88.4	273.0			61.6	16.2
954	194	402.6	145.9		5.3	0.4	604.9
964	115	439.3	197.9			8.6	26.4
965	86	640.9	943.6			9.4	27.7
971	106	371.8	648.0			8.9	11.8
972	160	287.7	176.7	1.6		9.7	79.5
982	100	62.4	20.1			0.1	3.8
986	105	304.7	4.4		0.4	2.8	93.5
MEAN		243.0	470.2	2.3	0.4	17.0	302.8

Catch rates of pelagic groups broken down to families (Table 4) are presented just to give some indication of the forms present. Like in the two previous surveys carangids dominated both on the inner and outer shelf. The catch rates were a little lower than those obtained in 1994, but 2-4 times higher than in 1995. *Trachurus trecae* was the most important species, followed by *Selene dorsalis* and *Decapterus rhonchus*. Both juvenile and adult horse mackerel were caught. The mean length was 25.6 cm, which is almost the same as in 1994. Hairtail were the second most important pelagic family. The catch rates of *Trichiurus lepturus* on the inner shelf was about 4 times higher than in the two previous surveys, while the catches on the outer shelf were 1/3 of the 1995-level and only 5 % of what was caught in 1994. Like in the previous surveys

clupeids were mainly found on the inner shelf, and the mean catch rate was somewhat higher than in 1994 and 1995. *Ilisha africana* and *Sardinella maderensis* were the most abundant species. Barracudas, mainly *Sphyraena guachancho*, were caught in every second haul on the inner shelf with catch rates a little below those obtained last year, while scombrids only were found on a couple of stations on the inner shelf.

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

INNER SHELF, 20-70 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
912	63	2.2	198.4			4.2	311.6
917	48		39.2	1.9		27.8	159.1
918	27		64.2	4.2		1.9	333.8
919	25	63.4	128.9	117.0		50.4	1129.5
920	59		28.4		1.3	9.9	141.4
936	26	61.8	313.7	64.5		183.4	1908.4
937	31	25.2	444.6			127.3	2736.8
951	25	27.9	218.8	58.5		166.5	1471.8
952	45		76.7			45.7	547.6
966	53		72.8	0.5			25.2
967	36		120.1	30.5		11.8	1323.9
969	31	0.5	16.9			29.8	437.6
970	61		715.1	2.6		41.0	159.5
983	62	0.0	25.3			3.4	199.2
984	44		9.0		12.6	32.0	683.9
985	68	0.0	205.9			13.3	404.1
MEAN		11.3	167.4	17.5	0.9	46.8	748.3

OUTER SHELF 71-200 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
916	164		118.8			12.9	240.4
921	94		241.1			3.9	131.1
922	181		103.5				186.0
934	127		4354.7				4543.0
935	75		109.8			101.8	31.8
938	71		633.4			39.5	549.9
939	123	0.02	26.1				55.3
940	183		1.3				336.9
949	150		153.7			8.0	368.6
950	75		104.8			40.6	165.6
953	80		263.0			10.0	166.2
954	194		127.8			18.1	1013.2
964	115		197.9				474.3
965	86		933.1			10.5	678.0
971	106		648.0				392.5
972	160		176.7				378.4
982	100		20.1				66.3
986	105		4.4				401.4
MEAN			456.6			13.6	565.5

Table 5 shows the catch rates of the most important demersal species grouped into families. Grunts dominated on the inner shelf, and *Brachydeuterus auritus* was the most abundant

species. The mean catch rate was several times higher than those obtained during the two previous surveys. The second most important family was croakers, closely followed by seabreams, and the catch rates of both families were much higher than in 1994 and 1995. Groupers (*Epinephelus* spp.) occurred in almost every second haul on the inner shelf, and the catch rate was at the same level as last year. Like in the previous surveys snappers (*Lutjanus* spp.) were more rare and were only caught at one station on the inner shelf. Seabreams was the dominating family on the outer shelf, and the mean catch rate was almost the same as in 1995 but only half of that from 1994. Croakers were much less abundant on the outer shelf than in the two previous surveys. The most common croakers were *Umbrina canariensis* and *Pseudolithus typus*. Among the seabreams *Dentex macrophthalmus* and *Pagellus bellottii* were most abundant, followed by *D. angolensis* and *Sparus auriga*.

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

INNER SHELF, 20-70 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Snappers	Other
912	63	222.5		3.5	8.9		281.6
917	48	27.6	75.0	35.4	5.8		84.2
918	27	155.4	36.9		34.4	32.6	144.8
919	25	6.8	327.4	81.1			1074.0
920	59	100.8		4.3	8.0		67.9
936	26	13.1	1158.8	283.3	18.6		1057.9
937	31	11.6	2111.6	173.3			1037.4
951	25	104.5	705.5	361.6	2.4		769.5
952	45		111.26	313.0			245.7
966	53	11.1					87.4
967	36	137.8	1124.4	9.2			215.0
969	31	24.9	121.9	95.7			242.2
970	61	78.1	10.3	10.6			819.1
983	62	116.7	35.3	4.5			71.5
984	44	104.3	345.3	37.3			250.6
985	68	92.5	0.8	163.1	1.4		365.6
MEAN		75.5	385.3	98.5	5.0	2.0	425.9

OUTER SHELF 71-200 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Snappers	Other
916	164	108.8					263.3
921	94	109.6					266.5
922	181	103.5					186.0
934	127	114.2		80.6	74.0		8628.9
935	75	5.1	3.4	0.2			234.7
938	71	23.1	462.0	11.3			726.4
939	123	43.2					38.3
940	183	100.6		2.2	35.3		200.2
949	150	295.8					234.5
950	75	105.9	6.7	21.6			176.9
953	80	16.9	67.0	4.5			350.8
954	194	289.8					869.3
964	115	425.8	3.5	10.0			232.9
965	86	614.5	2.4	24.1			980.7
971	106	371.8					668.6
972	160	287.0					268.1
982	100	62.4					24.1
986	105	304.5					101.3
MEAN		187.9	30.3	8.6	6.1		802.9

Figure 7 shows the distribution of seabreams in the region Pta. das Palmeirinhas - 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. The best catches were taken of Cabeça da Baleia and consisted mainly of *D. macrophthalmus*.

In Annex I-A swept-area estimates of mean densities based on 34 random bottom trawl hauls are presented for demersal species on the shelf, to 200 m. In the 20-50 m zone *B. auritus* had the highest density, followed by *Galeoides decadactylus* and *P. typus*. *D. macrophthalmus* had the highest density between 50 and 100 m, and then came *P. bellottii* and *B. auritus*. Also in the deepest shelf zone *D. macrophthalmus* had the highest density , followed by *Anthias* sp., *D. angolensis* and *Synagrops microlepis*. The latter was much less abundant than in the two previous surveys. The mean density of demersal species on the shelf was about 18 tonnes/NM^2, which is almost the same as in 1994 and 1995. If major pelagic groups are included the mean density increased to 31 tonnes/NM^2.

At the bottom of Annex I-A, summed densities of the most important species by main groups are presented. Grunts had the highest mean density, followed by seabreams and croakers. The densities in each depth stratum were multiplied by the area of the stratum, and Table 6 presents the biomass estimates for the main commercial groups and for other groups that occur in sizeable quantities. It should be noted that the area size of each stratum has been updated in this survey as compared to earlier ones, based on more detailed information on bottom soundings. Furthermore, it has been decided to calculate the biomass of the shallowest stratum (to 50 m depth) for the depth zone 20 to 50 m, while in previous surveys the area corresponding to 0-50 m depth was used. The area used in this survey for the shallowest stratum is therefore about 40% less than what previously used. This leads to a corresponding lower biomass estimate in this survey for this depth stratum. This should be kept in mind when comparing the figures presented in Table 6.

The total biomass of valuable demersal groups was at the same level as in the three previous investigations. The biomass of seabreams has decreased by about 30 % since 1994, while the biomass of grunts (excluding big-eye grunt) has increased.

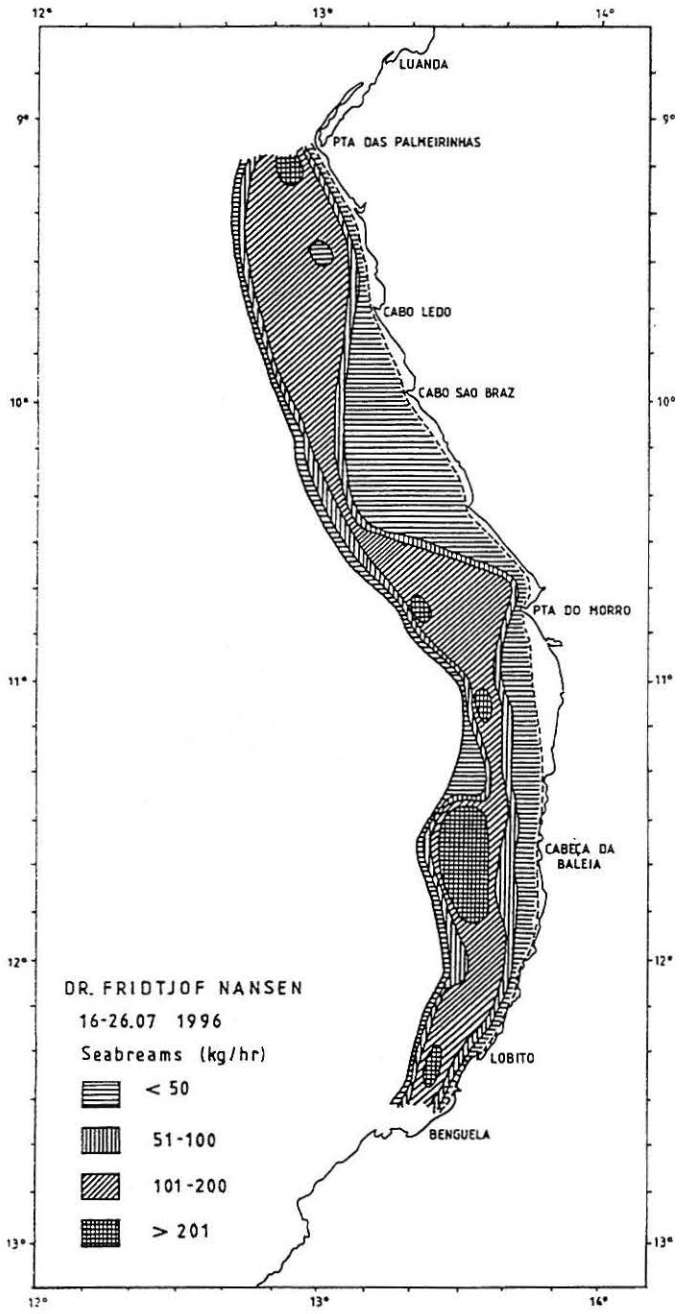


Figure 7. Distribution of seabreams (family Sparidae). Pta. das Palmeirinhas-Benguela.

Table 6 Biomass estimates by main groups over the shelf, by year of investigation (tons). Central region, Pta. das Palmeirinhas - Benguela

Group/species	Biomass						
	1986 s	1989 s	1991 w	1992 w	1994 w	1995 s	**1996 w**
Seabreams*	9 300	11 100	24 580	28 000	28 730	21 800	**19 354**
Grunts*	2 700	5 600	5 500	2 000	120	3 400	**3 094**
Croakers*	5 500	1 450	19 000	2 000	9 250	13 290	**4 091**
Groupers	470	550	1 000	1 000	400	470	**723**
Sum dem. val.	17 970	18 700	50 080	33 000	38 500	38 960	**27 262**
Bigeye grunt	44 600	18 500	18 500	52 000	2 990	29 500	**18 662**
Barracudas	1 900	3 000			740	2 700	**934**
Hairtail	17 300	12 500	4 100	1 300	26 200	5 300	**3 618**

* Seabreams: not including *Boops boops*; grunts: not including *Brachydeuterus auritus* (big-eye grunt); croakers: not including *Pteroscion peli* and *Pentheroscion mbizi*.

s : summer season (February-March)

w : winter season (July-September)

The estimated biomass of *B. auritus* (big-eye grunt) was almost the same as in 1995 and much higher than in 1994. Also the biomass of hairtail was almost the same as in 1995, but only 1/5 of the 1994-level. Barracudas came out with somewhat lower biomass-estimates than last year.

4.2 Cabinda - Pta. das Palmeirinhas

The shelf area, from 20 to 200 m depth, was covered with 34 bottom trawl stations. Only one station was sampled in the Cabinda shelf and the description of distribution and the biomass estimates apply therefore only to the shelf between the Congo River to Pta. das Palmeirinhas. Catch rates by stations for the main groups are presented in Table 7. In Tables 8 and 9, the pelagic and demersal groups respectively are further separated into the main taxa. The families and species included under each group are as specified under section 4.1. Like in 1994 and 1995, the demersal group dominated on the inner shelf of the southern region. The mean catch rate was higher than in the south and 3-4 times higher than those obtained in the two previous surveys. The pelagic group was the second most important, also with catch rates above those found in 1994 and 1995. The mean catch rate of shrimps was similar to that obtained in 1995, while cephalopods had a much higher abundance than last year, but somewhat lower than in 1994.

Table 7. Catch rates (kg/hour) by main groups in swept-area bottom trawl hauls on the shelf. Cabinda - Pta. das Palmeirinhas

INNER SHELF 20-70 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
1000	31	2267.8	191.5			4.6	161.3
1001	27	4664.0	464.6		20.3	47.0	61.2
1002	39	1214.7	364.3		11.8	0.8	87.8
1016	60	265.7	35.4		0.8	2.9	10.6
1017	37	611.2	87.9		12.0		182.4
1018	25	618.2	68.5	3.9	19.9	8.0	119.6
1030	58	13.6	143.8			50.6	17.2
1031	41	361.1	103.8	3.5		14.0	66.7
1033	31	5.2	41.9			2.9	21.6
1047	39	27.9	1358.5			30.2	5.8
1062	48	507.1		9.7	0.1	3.7	54.8
MEAN		959.7	260.0	1.6	5.9	15.0	71.7

OUTER SHELF 71-200 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
997	168	157.4	211.2		3.3	14.5	140.4
998	121	266.1	698.4			3.7	42.5
999	76	169.8	106.1		0.6	27.9	208.2
1003	71	113.1	234.8				21.9
1004	164	90.6	1357.1			11.1	227.8
1014	152	58.6	228.3			15.7	39.1
1015	90	50.5	39.1			15.4	13.3
1019	80	114.2	99.1	2.3		3.3	12.0
1020	150	57.4	150.8			10.0	20.3
1028	144	315.4	112.9	14.4	0.9	2.2	11.9
1029	98	54.7	75.0	1.6		23.7	15.7
1034	75	109.2	579.4			20.2	14.4
1035	127	107.0	89.7			5.9	4.6
1036	197	69.2	223.6	1.3	0.1	5.3	132.0
1044	166	128.5	45.0			9.3	67.4
1045	89	186.0	3.4	10.1		7.5	8.6
1046	71	128.3	74.3	5.6		59.3	17.0
1048	87	243.1	126.9			8.8	21.3
1049	121	131.0	259.5			5.6	9.0
1050	167	51.7	28.3			4.2	26.2
1060	158	25.2	54.9			6.4	25.6
1061	81	40.0	32.1			7.6	0.8
1068	155	1838.4	21.5		1.7	4.5	119.0
MEAN		195.9	210.9	1.5	0.3	11.8	52.1

The pelagic group had a slightly higher mean catch rate than the demersal one on the outer shelf. In 1994 and 1995 the demersal families were the most important on the outer shelf, but the mean catch rates of both groups were highest in 1996. The occurrence of shrimps was lower than during the two previous surveys, while the abundance of cephalopods was higher this year.

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

INNER SHELF 20-70 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
1000	31		89.7			101.8	2433.7
1001	27	138.9	180.7	13.4		131.6	4792.5
1002	39		326.0			38.4	1315.2
1016	60		9.4			26.0	280.0
1017	37	4.5	12.2			71.2	805.6
1018	25	2.9	6.2	3.8		55.6	769.7
1030	58		66.5	0.2		77.1	81.4
1031	41		101.7	2.1			445.2
1033	31		41.9				29.8
1047	39		1358.5				63.9
1062	48						575.4
MEAN		13.3	199.3	1.8		45.6	1053.9

OUTER SHELF 71-200 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
997	168		198.0			13.2	315.7
998	121		690.7			7.8	312.3
999	76	17.6	46.3			42.2	406.4
1003	71		196.7			38.1	135.0
1004	164		1351.3		5.8		329.5
1014	152		226.9			1.4	113.4
1015	90		27.6		3.0	8.5	79.2
1019	80		95.6			3.5	131.8
1020	150		144.2			6.6	87.6
1028	144		111.1			1.8	344.8
1029	98		68.0			7.0	95.6
1034	75		579.4				143.8
1035	127		83.9			5.8	117.5
1036	197		154.8			68.7	207.8
1044	166	0.1	36.8			8.1	205.2
1045	89	0.8	2.6				212.2
1046	71		73.4			0.9	210.2
1048	87		121.0			5.9	273.1
1049	121		235.8		16.9	6.9	145.6
1050	167		16.8			11.5	82.2
1060	158		29.0			25.9	57.2
1061	81	+	17.4			14.7	48.5
1068	155					21.5	1963.7
MEAN		0.8	196.0		1.1	13.0	261.7

In the pelagic group carangids dominated both on the inner and outer shelf, and the catch rates were higher than those obtained in 1994 and 1995. Like in the southern region, *T. trecae* was the dominating species, followed by *S. dorsalis* and *D. rhonchus*. Both juvenile and adult horse mackerel were caught. Hairtails with species *T. lepturus* was the second most important pelagic family, and the abundance was the same as last year. Clupeids were most abundant on the outer shelf, and the main species was *I. africana*, followed by *S. aurita* and *S. maderensis*. Scombrids (*Sarda sarda*) was caught in a few hauls on the inner shelf, while barracudas only occurred on the outer shelf.

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

INNER SHELF 20 - 70 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Snappers	Other
1000	31	1344.9	766.8	149.3	6.8		357.4
1001	27		4237.5	268.1			751.4
1002	39		700.8	476.5			502.2
1016	60	45.8	165.2	53.4	1.3		49.7
1017	37		388.8	195.9			308.8
1018	25		362.9	255.1	0.3		220.0
1030	58	13.6					211.6
1031	41	299.4	27.0		34.7		188.0
1033	31	5.2					66.4
1047	39	19.1			8.8		1394.5
1062	48	9.7	46.8	247.0	203.6		68.3
MEAN		158.0	608.7	149.6	23.2		374.4

OUTER SHELF 71-200 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Snappers	Other
997	168	121.4		36.0			369.5
998	121	244.1		22.0			744.6
999	76	82.1	32.0	35.0	20.8		342.7
1003	71	41.4	4.6	67.1			256.6
1004	164	81.6		9.0			1596.0
1014	152	58.6					283.0
1015	90	35.6		14.9			67.8
1019	80	96.1			18.1		116.7
1020	150	46.4			11.0		181.1
1028	144	258.1		57.3			142.2
1029	98	52.6		2.0			116.0
1034	75	84.8		22.1	2.4		614.0
1035	127	107.0					100.2
1036	197	67.3		1.9			362.2
1044	166	126.0		2.5			121.7
1045	89	137.1			48.9		29.6
1046	71	108.9			19.4		156.2
1048	87	211.6		3.1	28.4		156.9
1049	121	124.3		6.7			274.1
1050	167	51.2		0.5			58.8
1060	158	21.9		3.3			86.9
1061	81	40.0					40.5
1068	155	52.6		1773.6	12.3		146.7
MEAN		97.9	1.6	89.4	7.0		276.7

Like in the southern region grunts was the dominating among the valuable demersal families, and *B. auritus* the most important species, followed by *Pomadasys* spp. The catch rates were 5-10 times higher than those obtained in 1994 and 1995. The second most important family was seabreams, closely followed by croakers. These two families were the most abundant on the outer shelf. The catch rates, especially of croakers, were higher than during the two previous surveys. The most common seabreams were *D. angolensis*, *D. barnardi, D. macrophthalmus*, *P. bellottii* and *Sparus* spp. Among the croakers *U. canariensis* was the most abundant one, followed by *Pentheroscion mbizi* and *P. typus*. Groupers, mainly *E. aeneus*, occurred both on the inner and outer shelf. They were most abundant on the outer shelf, where the mean catch rate due to one large catch was higher than in 1994 and 1995. Snappers were not caught at any station. Figure 8 shows the distribution of seabreams in the region Cabinda-Pta. das Palmeirinhas. They had the same wide distribution as in the south, with the highest abundance on the outer shelf off Cabeça da Cobra.

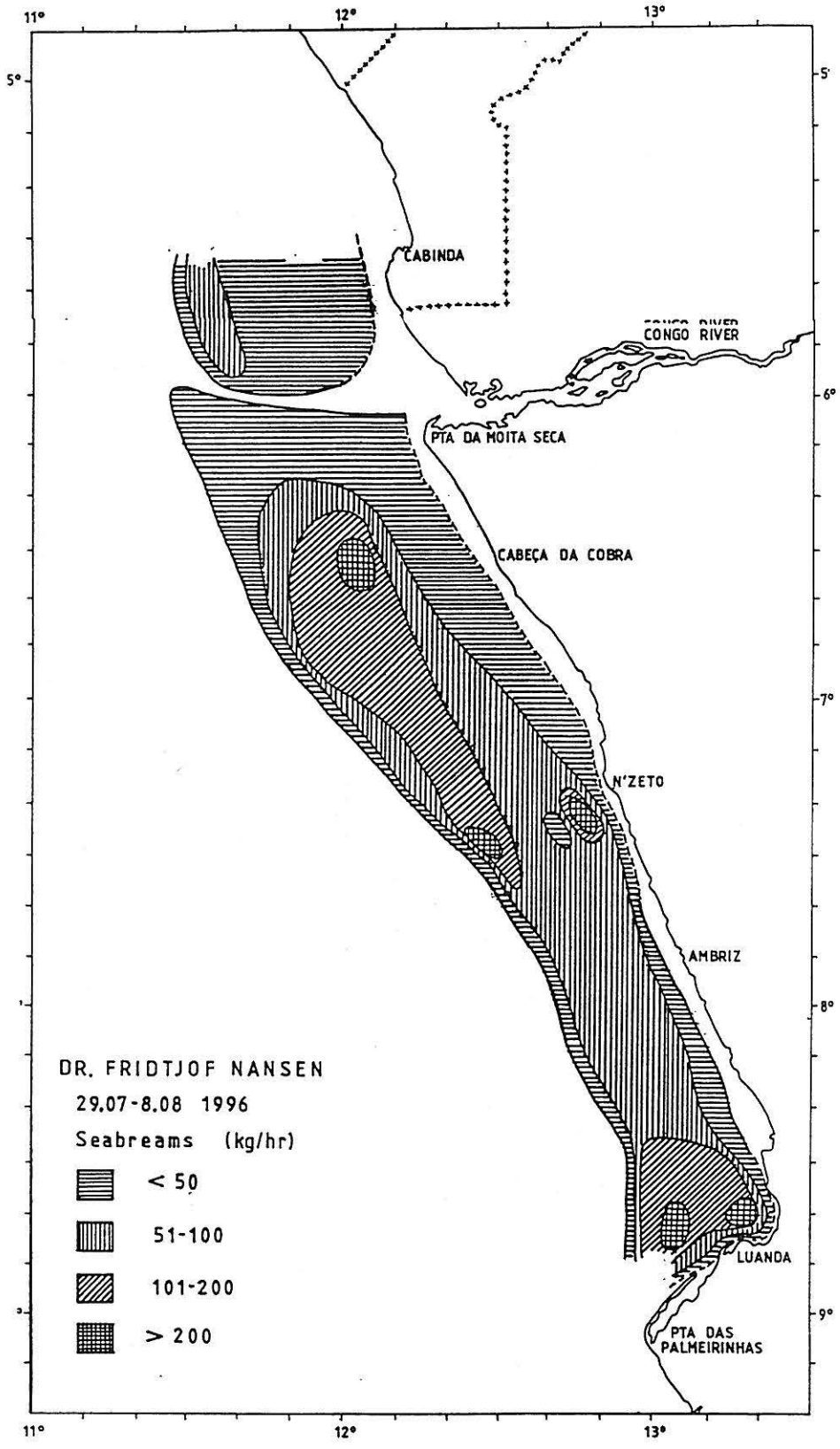


Figure 8. Distribution of seabreams (family Sparidae). Cabinda-Pta. das Palmeirinhas.

In Annex I-B swept-area estimates based on 34 bottom trawl hauls are presented for demersal species on the shelf, from the Congo River to Pta. das Palmeirinhas, from 20 to 200 m depth. In the 20-50 m zone *B. auritus* had the highest density, followed by *D. barnardi* (one large catch), *Pteroscion peli* and *Pomadasys peroteti*. *D. angolensis* (one large catch) had the highest density between 50 and 200 m depth. The mean density of demersal species on the shelf was about 16 t/NM^2, which is about 30 % higher than what was found in 1994 and 1995. If pelagic groups are included, the mean density increases to almost 23 t/NM^2. Summed densities of the most important species by main groups are presented at the bottom of Annex I-B. Like in the southern region grunts had the highest mean density, followed by seabreams and croakers. 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 is the highest in the time series, almost 30 % above the second highest result from 1994. Seabreams had the same biomass as in 1994, but 3 times higher than what was found in 1995. Both grunts (excluding *B. auritus*) and croakers (excluding *P. peli* and *P. mbizi*) increased by a factor of 2.5. The biomass of groupers was the same as obtained in 1994, but 4 times higher than in 1995. The estimate for *B. auritus* is the highest in the time series, as well as that for horse mackerel. Other carangids, barracudas and hairtail came out with somewhat lower biomass estimates than in 1994 and 1995.

Table 10. Biomass estimates by main groups on the shelf by year/period of investigation. Cabinda - Pta. das Palmeirinhas.

Group/species	Biomass (tonnes)							
	1985 s	1986 s	1989 s	1991 w	1992 w	1994 w	1995 s	**1996w***
Seabreams**	9 600	14 700	9 500	16 500	16 000	32 700	10 100	**20 660**
Grunts**	950	1 400	840	2 900	1 000	900	4 200	**5 160**
Croakers**	6 200	5 200	4 600	15 600	14 000	8 500	4 100	**5 540**
Groupers	350	740	950	940	3 000	3 500	900	**1 990**
Sum dem. val.	17 100	22 040	15 900	35 940	34 000	45 600	19 300	**33 350**
Bigeye grunt	34 400	42 800	6 900	19 700	21 000	17 100	21 200	**26 780**
Barracudas	620	1 800	900	-	1 000	820	4 100	**100**
Hairtail	16 300	9 600	2 200	8300	7 000	8 900	11 200	**5 600**

* Cabinda not included

** Seabreams: not including *Boops boops*; grunts: not including *Brachydeuterus auritus* (big-eye grunt); croakers: not including *Pteroscion peli* and *Pentheroscion mbizi*

s : summer season (February-March)

w : winter season (July-September)

4.3 Review of results

In the category high-value demersal fish we include species of seabreams, croakers, grunts (excluding the big-eye grunt), groupers etc. that constitute the most valuable food fish caught on the shelf. Table 11 shows the results of present and previous surveys. It seems that surveys made in the winter season give higher estimates than those from summer surveys. All the highest estimates in the Cabinda - Pta. das Palmeirinhas region come from winter surveys (Table 10). The results from the present survey show that the resources maintain abundance levels similar to the ones observed in previous surveys.

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

Survey	Cunene-Benguela	Pta. das Palmeirinhas - Benguela	Cabinda - Pta. das Palmeirinhas	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.	38.5	45.6	84.1	-
1/95	N.S.	39.0	19.3	58.3	-
1/96	**N.S.**	**27.3**	**33.5****	**60.8**	-

* From GOA survey, seabreams only
** From Congo River to Pta. das Palmeirinhas (Cabinda not included)

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

The slope off Pta. das Palmeirinhas - Benguela was covered with 43 swept-area hauls with the following distribution: 200-400 m: 28 hauls and 400-800 m: 15 hauls. The slope from Cabinda to Pta. das Palmeirinhas was covered with 46 hauls distributed as follows: 200-400 m: 21 hauls and 400-800 m: 25 hauls. Of these, 9 hauls were taken in the Cabinda area, just north of the Congo River. Because of the incomplete coverage of the Cabinda area, biomass estimates for this region are not included. The results from the swept-area analysis by depth intervals are presented in Annex III B and D.

Table 12. Catch rates (kg/hour) by main groups in swept-area bottom trawl hauls on the slope. Pta. das Palmeirinhas - Benguela.

SLOPE 200-800 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopods	Other
913	315	48.2		56.0	6.4		937.3
914	530	27.0	12.4	1.8	34.1		207.5
915	693	8.2			16.3		255.4
923	219	195.6	70.1	30.0	8.4	6.0	215.6
924	308	645.6	1.7	208.0	36.0	2.6	869.3
925	381	147.6		29.5	13.3	3.8	206.9
926	438	83.5		33.2	17.6	1.5	152.7
927	554	26.3	7.9	30.7	13.0	1.3	122.2
928	713	14.6	1.2	2.2	10.0	7.5	172.9
929	550	16.2	38.9	17.6	137.8		238.3
930	448	105.0	2.4	11.6	238.9		154.8
931	359	299.6	6.2	14.6	1111.3	2.1	167.7
932	279	40.3	3.7		2.8	0.8	293.0
933	225	73.5			5.8	3.1	427.7
941	278	68.8			15.3		399.4
942	375	115.5		8.5	222.3	1.7	366.9
943	453	209.3	4.7	10.2	208.8		210.6
944	703		2.6		12.0		604.7
945	549	9.2	3.8	2.2	78.0	2.9	100.2
946	449	43.8	3.4	134.4	131.3	1.2	183.5
947	354	84.4	3.9		85.5	0.5	268.5
948	238	90.5	15.1		2.4	2.1	345.1
955	272	149.1	1.8		13.4	0.7	344.2
956	349	1577.4	2.6	20.1	362.3		123.8
957	449	199.8	5.0	3.4	482.0	6.8	84.6
958	552	41.5		10.3	84.8		174.3
959	701	11.4		6.3	48.6		161.0
960	608	4.4	3.1	3.1	70.6	0.2	133.7
961	419	21.8	2.6	13.4	200.3		105.6
962	351	180.4	1.1	18.0	71.1	1.4	147.7
963	219	91.6	12.2		7.8	1.5	972.0
973	245	185.1			1.5	1.3	452.3
974	350	153.8	3.8	486.0	965.6		725.7
975	451	107.4		15.8	50.0		173.5
976	553	54.6	1.7	8.2	50.2		239.9
977	716	6.0	5.1	5.6	9.5		243.0
978	550	25.6	33.1	15.0	69.0		261.6
979	452	80.1	12.2	19.2	87.1		372.0
980	361	43.4	3.5	12.0	10.4		197.1
981	253	141.6			2.8	0.1	46.9
987	457	196.5		56.4	64.8		311.9
988	564	151.2	4.5		65.5		772.0
989	698	34.9	4.9	2.8	12.2	7.7	291.0
MEAN		135.1	11.1	29.9	119.5	1.3	307.8

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 by-catch 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 Pta. das Palmeirinhas - Benguela region shrimps made up about 20 % of the catches on the slope and the mean catch rate was the double of what was found in the three previous surveys. The catch rates of the other groups were comparable to those obtained in 1994 and 1995. In the northern region shrimps made up 15 % of the caches. The mean rate was only about half of what was obtained in the south but quite similar to the results from the two previous surveys.

Table 13. Catch rates (kg/hour) by main groups in swept-area bottom trawl hauls on the slope. Cabinda - Pta. das Palmeirinhas.

SLOPE 200-800 m							
ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopods	Other
992	704	26.5		6.0	11.6	1.3	269.6
993	551	3.2		12.6	130.6		98.6
994	448	23.4		3.8	62.8		96.3
995	346	52.5	38.5		58.9	0.4	149.8
996	251	255.9	84.9		8.3	2.2	202.4
1005	296	60.7	68.6		4.5		1001.4
1006	349	323.0			248.1	0.7	89.2
1007	447	117.4		13.6	133.7		105.2
1008	543	3.5			135.0		88.0
1009	701		10.8		34.8	0.8	253.3
1010	555	3.2	2.4		173.8		140.2
1011	464	77.4			131.0	2.9	208.6
1012	338	122.5	6.9		131.7	1.1	229.7
1013	247	100.4	24.4		2.5	5.0	105.3
1021	241	87.2	180.2		4.1	26.8	253.4
1022	349	249.9	56.8		243.6	0.6	115.4
1023	426	113.1	1.2	38.8	269.9	2.3	92.1
1024	552	4.5	1.3	0.1	170.4	0.1	110.3
1025	717				4.6	58.9	326.1
1026	511	10.7	0.4		14.8	0.2	120.8
1027	259	45.9	50.2		21.8	2.2	229.6
1037	268	27.9	4.7		2.2	5.5	183.5
1038	369	82.4	5.5		108.4		241.4
1039	461	45.7		0.2	7.9	0.3	65.0
1040	550		3.8	5.2	11.5		142.5
1041	549	2.8	0.3	4.7	8.9		106.6
1042	312	58.1	7.9		17.5	0.2	250.7
1043	221	48.1	18.6	1.3	1.5	9.9	171.4
1051	249	79.1	14.9		14.7	10.4	649.4
1052	351	119.4	60.0	7.1	3.7	2.0	370.3
1053	458	90.1	5.2	1.8	5.8		77.3
1054	548	1.5	1.9	0.4	5.3		184.6
1055	702	10.7	1.5	3.2	11.4	5.9	184.3
1056	558	16.2	3.0		29.3	0.2	157.8
1057	467	239.1	1.6	24.1	40.4		90.4
1058	366	103.0	207.5	0.2	33.5	15.8	523.1
1059	254	23.1	2.3		4.6	2.4	176.0
1063	713	3.7	1.1	1.7	10.3		285.6
1064	561	7.0	1.1	9.3	60.5	1.0	61.0
1065	457	73.6	23.6	34.7	26.4	6.7	280.1
1066	353	191.2	21.1		76.3	11.7	721.4
1067	247	59.2	48.1		6.4	23.9	141.1
1069	264	176.3	5.6		0.5	0.7	47.0
1070	350	57.0	22.9		72.1		110.7
1071	455	86.6	1.2	3.1	29.8		54.4
1072	550	20.8	5.0	4.4	82.6		79.6
MEAN		71.8	21.6	3.8	58.0	4.4	209.6

4.1 Deep water shrimp

Table 14 shows the catch rates of important shrimps and fish on the slope off Pta. das Palmeirinhas - Benguela. Deep-water shrimps were caught on all stations and like in previous investigations spider shrimp (*Nematocarcinus africanus*) had the highest catch rate, 2-3 times higher than in 1994 and 1995. The overall mean catch of *P. longirostris* was 2.1 kg/h, which is much lower than what was obtained in 1994 and 1995, while the catch rate of *A. varidens* (10.6 kg/h) was quite similar to the three previous results. Figs. 9 and 10 show the distribution of *P. longirostris* and *A. varidens* respectively. Except in a couple of hauls off Pta. do Morro the catch rates of *P. longirostris* were below 10 kg/h in the whole region, while *A. varidens* had a more dense distribution (10-20 kg/h) in parts of the region, with the highest catch rates on the slope off Lobito and Benguela.

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

SLOPE 200-800 m

ST.NO.	DEP.	Sparids	Hake	Rose shr.	Str. shr.	Spid. shr.	Other
913	315		48.2	4.9			994.8
914	530		27.0		21.1	3.6	231.0
915	693				7.7	8.5	263.7
923	219	112.9	82.7	8.4			321.7
924	308		645.6	7.7		27.6	1082.3
925	381		147.6		13.3		240.2
926	438		83.5		17.6		187.4
927	554		26.3		10.0		165.1
928	713		14.6		8.2		185.7
929	550		16.2		16.9	116.2	299.4
930	448		105.0		17.0	220.8	169.9
931	359		299.6	2.5	1.1	1097.2	201.0
932	279	28.8	11.5		2.8		297.4
933	225	26.8	46.7	5.8			430.8
941	278	68.8		15.2			399.4
942	375		115.5		6.7	215.6	377.1
943	453		209.3		21.3	187.5	225.5
944	703				12.0		607.3
945	549		9.2		2.3	75.2	109.7
946	449		43.8		9.6	108.0	336.2
947	354		84.4	0.5	0.4	84.6	272.9
948	238	81.7	8.8	2.4			362.3
955	272	55.7	93.3	13.3			346.9
956	349		1577.4	11.2		348.5	149.2
957	449		199.8		25.7	91.3	464.9
958	552		41.5		5.0	73.0	191.4
959	701		11.4		2.4	45.6	167.8
960	608		4.4		7.0	54.8	148.8
961	419		21.8		20.6	173.4	128.0
962	351		180.4	3.2	1.0	66.4	168.6
963	219	56.0	35.6	7.8			985.7
973	245	180.4	4.4	1.5			453.9
974	350		153.8	0.9		827.4	1352.8
975	451		107.4		9.2	37.5	192.7
976	553		54.6		10.1	37.1	252.8
977	716		6.0		4.5	1.2	257.6
978	550		25.6		44.4	24.6	309.7
979	452		80.1		23.9	60.2	406.3
980	361		43.4		7.2	2.2	213.6
981	253	141.6		2.8			46.9
987	457		196.5		63.8		369.3
988	564		151.2		55.7	5.9	780.4
989	698		34.9		7.6		311.1
MEAN		17.5	117.4	2.1	10.6	92.9	364.2

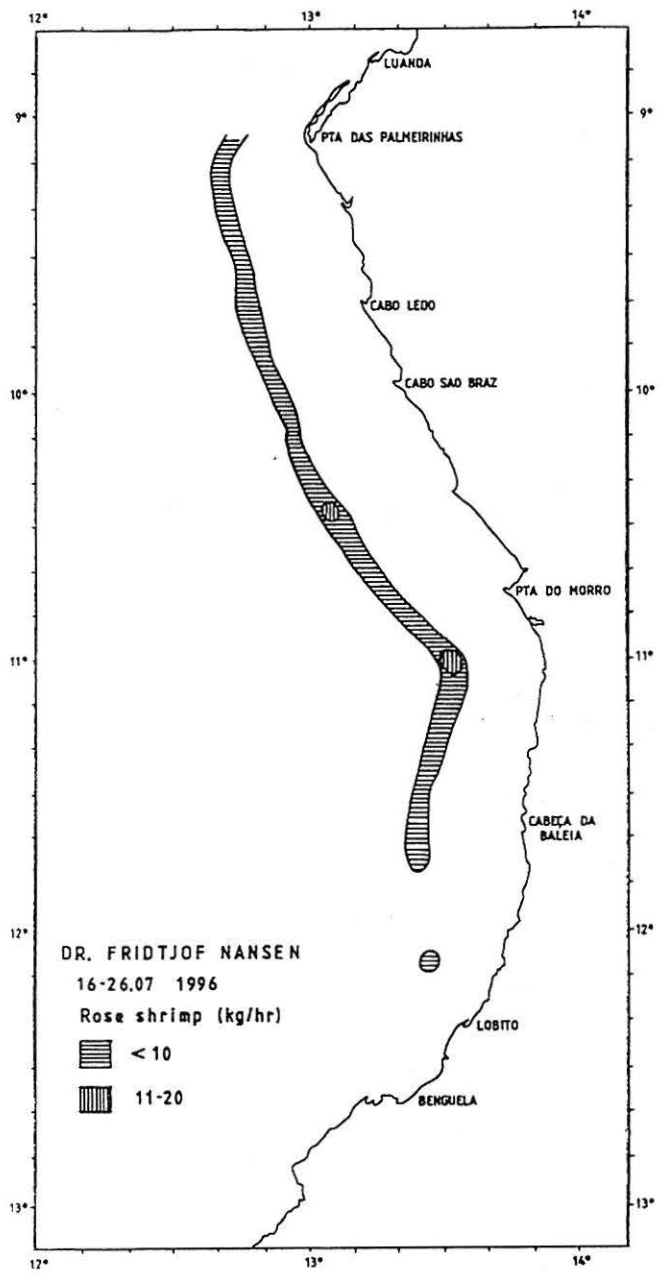


Figure 9. Distribution of rose shrimp (*Parapenaeus longirostris*). Pta. das Palmeirinhas-Benguela.

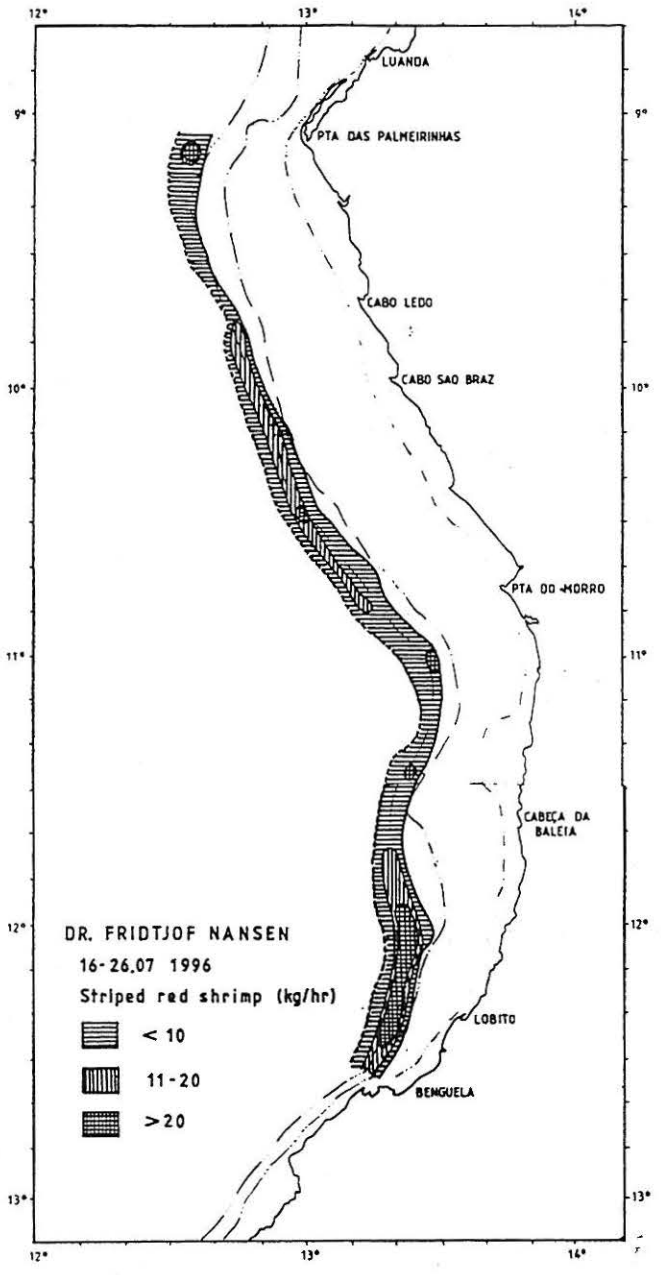


Figure 10. Distribution of striped red shrimp (*Aristeus varidens*). Pta. das Palmeirinhas-Benguela.

In the Cabinda-Pta. das Palmeirinhas region (Table 15) 46 stations were performed and deep-water shrimps were caught on 43 stations. Like in previous investigations *N. africanus* had the highest mean catch rate, only about half of what was found in the Pta. das Palmeirinhas-Benguela region and a little lower than what was obtained in 1994 and 1995. The overall mean catch rate of *P. longirostris* was 1.8 kg/h, which is even lower than the one found in the south and much lower than those obtained in the two previous surveys. The mean catch rate of *A. varidens* (3.7 kg/h) was also lower than in the south, while it was quite similar to the results from 1994 and 1995.

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

SLOPE 200-800 m

ST.NO.	DEP.	Sparids	Hake	Rose shr.	Str. shr.	Spid. shr.	Other
992	704		26.5		1.80	6.9	279.8
993	551		3.2		6.66	123.5	111.6
994	448		23.4		14.41	48.4	100.2
995	346		52.5	3.9		54.2	189.5
996	251	208.8	47.1	8.3			289.4
1005	296		60.7	3.9		0.4	1070.1
1006	349		323.0			245.6	92.3
1007	447		117.4		5.10	128.0	119.4
1008	543		3.5		0.86	130.8	91.4
1009	701				3.42	28.8	267.5
1010	555		3.2		0.42	172.8	143.2
1011	464		77.4		1.44	127.2	213.9
1012	338		122.5	1.8		129.9	237.7
1013	247	24.2	76.2	2.5			134.7
1021	241	11.9	73.8	3.0			463.1
1022	349		249.9	0.6		242.2	173.6
1023	426		113.1		11.37	257.3	135.6
1024	552		4.5		1.62	168.6	112.1
1025	717				2.72		386.9
1026	511		10.7		13.72	1.1	121.4
1027	259	9.9	36.0	21.8			281.9
1037	268		27.9	2.2			193.7
1038	369		82.4			108.4	246.9
1039	461		45.7		2.73	5.2	65.5
1040	550				8.58	2.8	151.7
1041	549		2.8		6.92	0.8	112.8
1042	312		58.1	2.2		15.4	258.8
1043	221	28.8	11.3	1.4		0.1	209.4
1051	249	23.0	56.1	14.7			674.6
1052	351		119.4	3.5		0.9	439.5
1053	458		90.1		5.22	0.5	84.3
1054	548		1.5		3.72	0.4	188.0
1055	702		10.7		1.24		205.2
1056	558		16.2		2.78	26.5	161.1
1057	467		239.1		8.90	30.9	116.6
1058	366		103.0		14.70	17.1	748.2
1059	254		23.1	4.4			180.9
1063	713		3.7		0.90		297.8
1064	561		7.0		14.34	45.9	72.7
1065	457		73.6		17.60	8.8	345.1
1066	353		191.2	0.6		75.2	754.7
1067	247	5.1	45.4	6.4			221.8
1069	264	57.4	20.3	0.5			151.9
1070	350		57.0			72.0	133.7
1071	455		86.6		9.76	19.2	59.6
1072	550		20.8		8.48	73.6	89.5
MEAN		8.0	61.3	1.8	3.68	51.5	243.0

Figs. 11 and 12 show the distribution of rose shrimp and striped red shrimp respectively. Like in the south the catch rates of *P. longirostris* were below 10 kg/h in most of the northern region, while *A. varidens* had some larger areas with higher catch rates (10-20 kg/h).

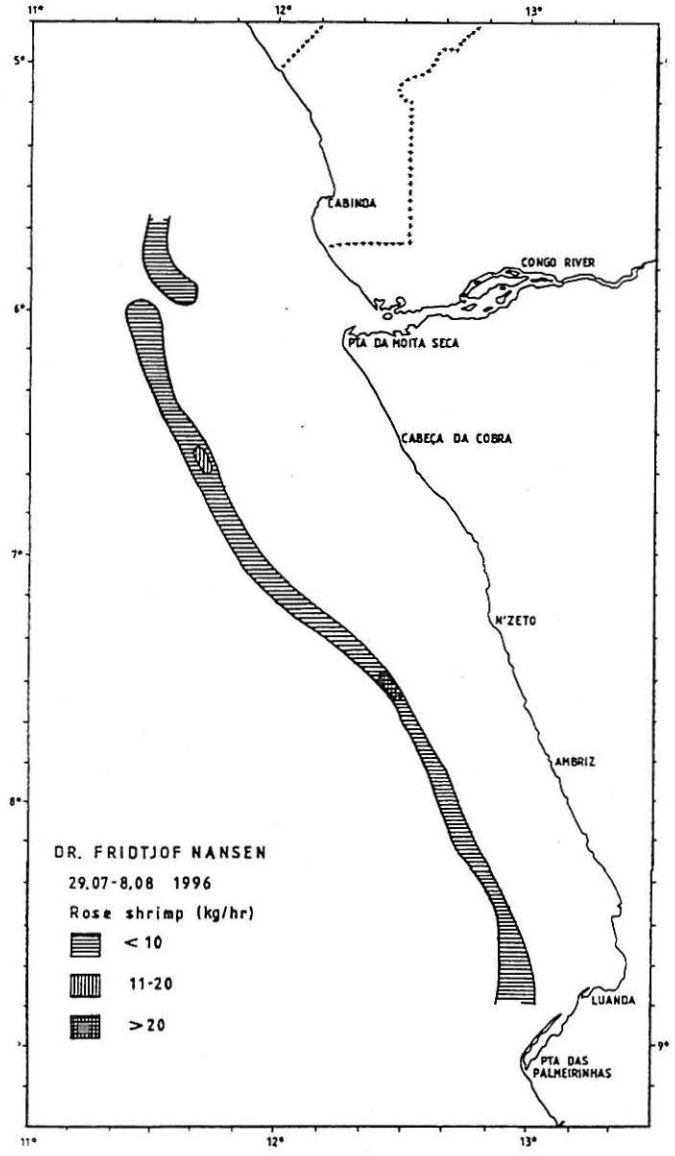


Figure 11. Distribution of rose shrimp (*Parapenaeus longirostris*). Cabinda-Pta. das Palmeirinhas.

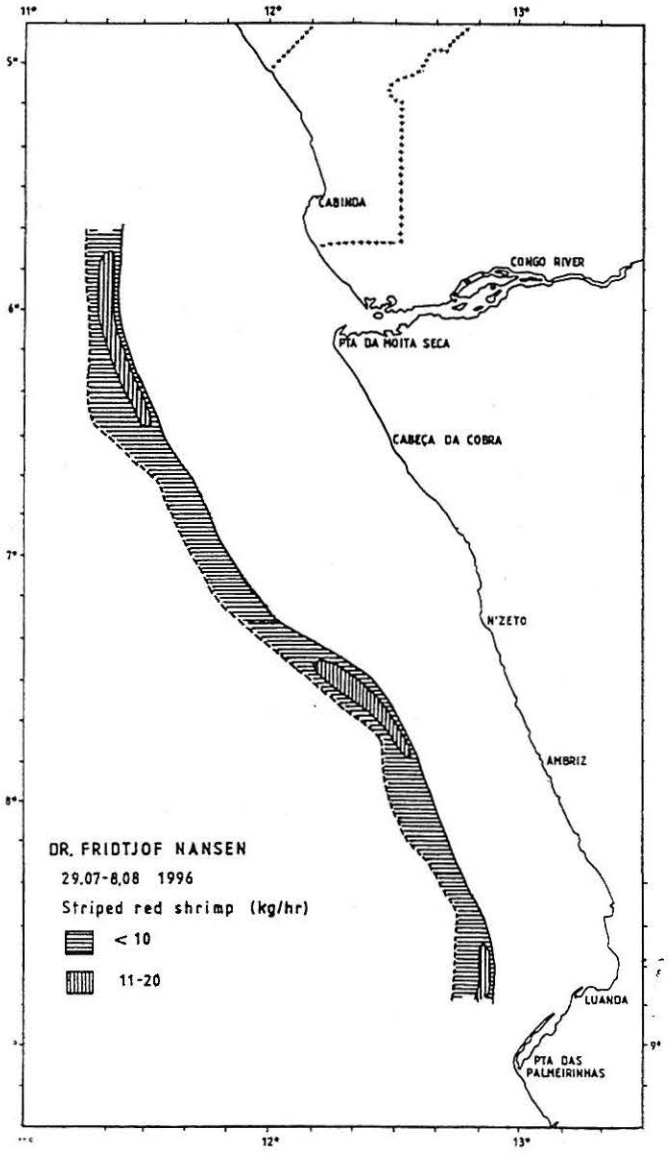


Figure 12. Distribution of striped red shrimp (*Aristeus varidens*). Cabinda-Pta. das Palmeirinhas.

Table 16 shows the catch rates of *Parapenaeus longirostris* (rose shrimp) by region and depth range, and catch rates from previous investigations are given for comparisons. The mean catch rate is the lowest in the time series, with catch rates decreasing in both regions and in all

depth zones. Like in previous surveys the highest catch rate was found between 200 and 300 m depth.

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

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

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

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

Mean catch rates of *Aristeus varidens* (striped red shrimp) are presented in Table 17. In the Pta. das Palmeirinhas-Benguela region the catch rate between 300-400 m depth was lower

than in the two previous surveys, while it was higher from 500 to 600 m. The mean catch rate (13 kg/h) was almost the same as what was obtained in the 3 last surveys as well as in earlier ones. Also in the Cabinda-Pta. das Palmeirinhas region the mean catch rate was similar to those found in 1994 and 1995. But the more efficient gear and tickler chain used in the latest surveys probably mask a small decline in the catch rates of *A. varidens*.

Biomass estimates of commercially important shrimps are presented in Table 18. In the central region, the biomass estimate of *P. longirostris* showed a fivefold decrease compared with the results from August 1995 and is the lowest in the time series. The biomass of *A. varidens* was about at the same level as in survey 2/1995, but the biomass is below the 1994 level in spite of the introduction of tickler chain, which should increase the catch rates with about 25 % (Mehl and Constança 1995). In the northern region the biomass of *P. longirostris* also shows a strong decrease and the estimate is almost 90 % lower than the previous one from 1995. The biomass of *A. varidens* also follows a decreasing trend. In both cases some of the decrease can be explained by the exclusion of the Cabinda area in the estimate, but the even accounting for this there has been a dramatic fall in the estimates. The use of tickler chain in the two last surveys, that enhances catches of *A. varidens*. makes the observed decline even more serious.

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

Region/species	Year / period of investigation							
	1985/I	1986/I	1989	1992	1994	1995/1	1995/2	**1996***
Congo R. - Pta. das Palmeirinhas								
-Rose shrimp	380	150	550	615	1 110	1 580	No	**185**
-Striped red shr.	_	1 200	400	515	610	500	survey	**280**
- Scarlet shrimp	_	+	+	130	+	+		**+**
Pta. das Palmeirinhas-Benguela								
- Rose shrimp	_	3 400	700	680	710	460	750	**130**
- Striped red shr.	_	1 000	370	570	890	940	730	**660**
- Scarlet shrimp	_	100	+	+	+	+	+	**90**
Total		5 850	2 020	2 570	3 410	3 480		**1 345**

* Cabinda not included

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 almost every station on the slope in the southern region and the mean catch rate was 30-50 % higher than in 1994 and 1995 and is now at the 1992-level. Like in previous surveys the best catch rates were obtained between 300 and 400 m depth. Also in the northern region hake was caught on almost every station. The mean catch rate was only about half of what was found in the south, but similar to the results from 1994 and 1995.

Figs. 13 and 14 show the distribution of hake in the Pta. das Palmeirinhas-Benguela and Benguela-Cabinda region respectively. In the southern region the distribution pattern was similar to those from the three previous surveys, but with larger areas with catch rates > 50 kg/h. Also in the north the distribution pattern was similar to what was observed in 1994 and 1995.

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

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

Biomass estimates of hake are presented in Table 20. In the northern region the biomass decreased by 13 % compared to March 1995. However considering that the present value does not include the Cabinda shelf, it seems that the value is about at the same level as in 1995. The results in later years show, however, that the resource is at a much lower level than in the 1980s. In the central region, the results show stronger fluctuations, and the present value is within the range of previous surveys.

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

Region	Year/period of investigation						
	1986/I	1989	1991/I	1992	1994	1995/1	**1996***
Congo R.. - Pta. das Palmeirinhas	17 000	15 300	18 000	14 000	4 700	7 100	**5 125**
Pta. das Palmeirinhas-Benguela	31 400	5 300	11 000	8 100	6 670	4 950	**7 190**
Total	48 400	20 600	29 000	22 100	11 370	12 050	**12 315**

* Cabinda area not included

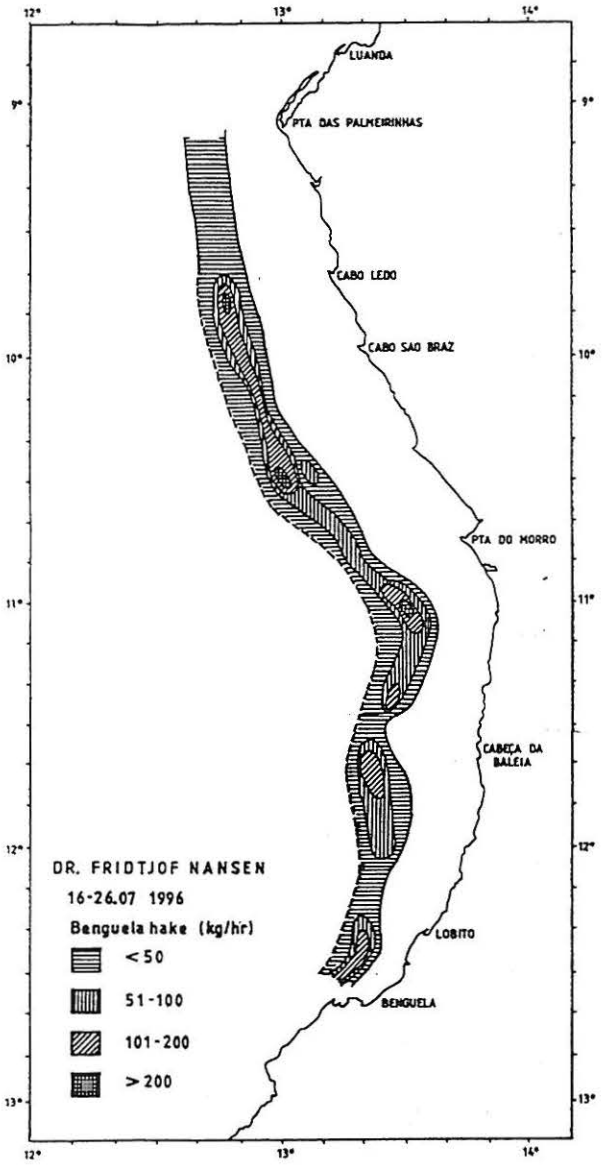


Figure 11. Distribution of Benguela hake (*Merluccius polli*). Pta. das Palmeirinhas-Benguela.

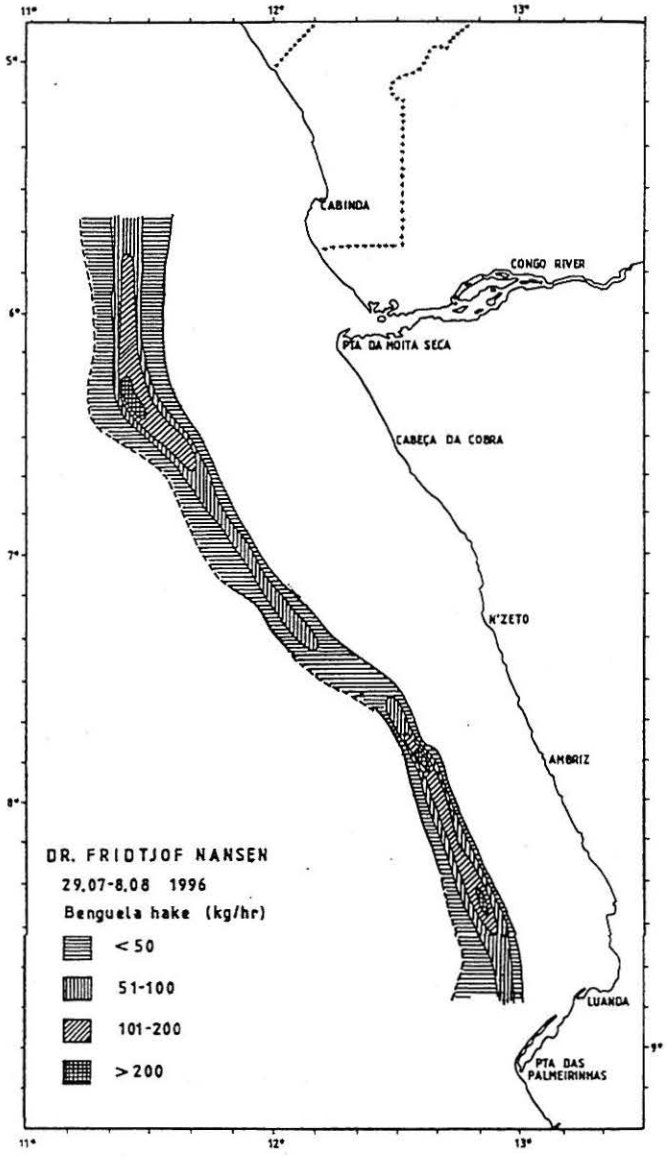


Figure 12. Distribution of. Benguela hake (*Merluccius polli*). Cabinda-Pta. das Palmeirinhas.

CHAPTER 6 CEPHALOPODS

Cephalopods are marine resources with high commercial value and several species are known to occur off Angola, both of coastal and oceanic type. They are caught as by-catch, but little is known about their abundance and distribution. As a first step in a project aiming at evaluating the potential for the development of a specialized cephalopod fishery in Angola it was decided to put more effort in describing the distribution and abundance of cephalopods.

6.1 Catch rates, distribution and biomass estimates of main groups

Table 21 and 22 presents the catch rates of the main families of cephalopods in Pta. das Palmeirinhas - Benguela and Cabinda - Pta. das Palmeirinhas respectively. In the southern region Sepiidae was the dominating family on the inner shelf, with a mean catch rate of 20 kg/hour.

Table 21. Catch rates (kg/hour) of cephalopods grouped by families in swept-area bottom trawl hauls on the shelf. Pta. das Palmeirinhas - Benguela.

INNER SHELF 20 - 70 m						
ST.NO.	DEP.	Sepiidae	Ommastrephidae	Loliginidae	Octopodidae	Other
912	63	29.7				486.8
917	48	4.6	1.9	0.1	3.2	218.2
918	27	3.4				400.7
919	25	12.2				1477.0
920	59	9.4		4.1	1.7	165.8
936	26	50.5				2481.2
937	31	32.85				3301.1
951	25	24.0				1919.5
952	45	24.5				645.5
966	53	10.9				87.7
967	36					1486.3
969	31	21.2				463.6
970	61	41.7		0.4		876.2
983	62	7.7	0.2	0.6	6.7	212.7
984	44	27.7				709.8
985	68	18.9				604.5
MEAN		19.9	0.1	0.3	0.7	971.0

OUTER SHELF 71-200 m						
ST.NO.	DEP.	Sepiidae	Ommastrephidae	Loliginidae	Octopodidae	Other
916	164		12.5		0.8	358.8
921	94	1.6	0.2			374.2
922	181		3.8			285.6
934	127				142.4	8755.3
935	75			7.3		236.1
938	71			6.3		1216.5
939	123		7.2			74.2
940	183	0.7	5.8			331.8
949	150	4.0	3.7			522.6
950	75				7.4	303.6
953	80	60.6	0.3	0.7		377.6
954	194		0.4			1158.7
964	115		0.9		7.7	663.7
965	86				9.4	1612.2
971	106		0.8		8.1	1031.6
972	160		9.7			545.5
982	100		0.1			86.3
986	105	2.6	0.3			403.0
MEAN		3.9	2.5	0.8	9.8	1018.7

Table 21. Cont.

SLOPE 200-500 m

ST.NO.	DEP.	Sepiidae	Ommastreph.	Loliginidae	Octopod.	Var.cephal.	Other
913	315						1047.9
923	219		6.0				519.7
924	308		2.6				1760.6
925	381		3.8				397.3
926	438					1.5	287.1
930	448						512.8
931	359		2.1				1599.4
932	279		0.8				339.7
933	225	1.0	2.1				507.0
941	278						483.5
942	375		1.7				713.2
943	453						643.5
946	449		1.2				496.4
947	354					0.5	442.3
948	238		2.1				453.0
955	272	0.5	0.3				508.5
956	349						2086.3
957	449		6.8				774.9
961	419						343.8
962	351		1.4				418.3
963	219	0.6	1.0				1083.6
973	245		1.3				638.9
974	350						2334.8
975	451						346.8
979	452						570.5
980	361						266.4
981	253	0.1					191.2
987	457						629.6
MEAN		0.1	1.2			0.1	728.5

Species from the other families were only caught in low numbers in a few hauls. On the outer shelf the other families were a little more abundant. Ommastrephidae had the highest frequency of occurrence, while Octopodidae had the highest mean catch rate (10 kg/h), mainly because of one relatively large catch. On the slope (down to 500 m depth) Ommastrephidae was the most abundant family, but the mean catch rate was only half of that on the outer shelf. The most common species were *Sepia orbignyana* and *S. officinalis* in family Sepiidae, *Illex coindetii* and *Todaropsis eblanae* in family Ommastrephidae and *Alloteuthis africana* in family Loliginidae.

Figs. 15 and 16 show the distribution of Sepiidae and Ommastrephidae in the southern region. The maps show clearly that Sepiidae has a shallow and dense distribution, with the highest catch rates (> 20 kg/h) in the central part of the region. Ommastrephidae has a much more scattered distribution, from the outer shelf to about 500 m depth on the slope, with only one catch > 10 kg/h.

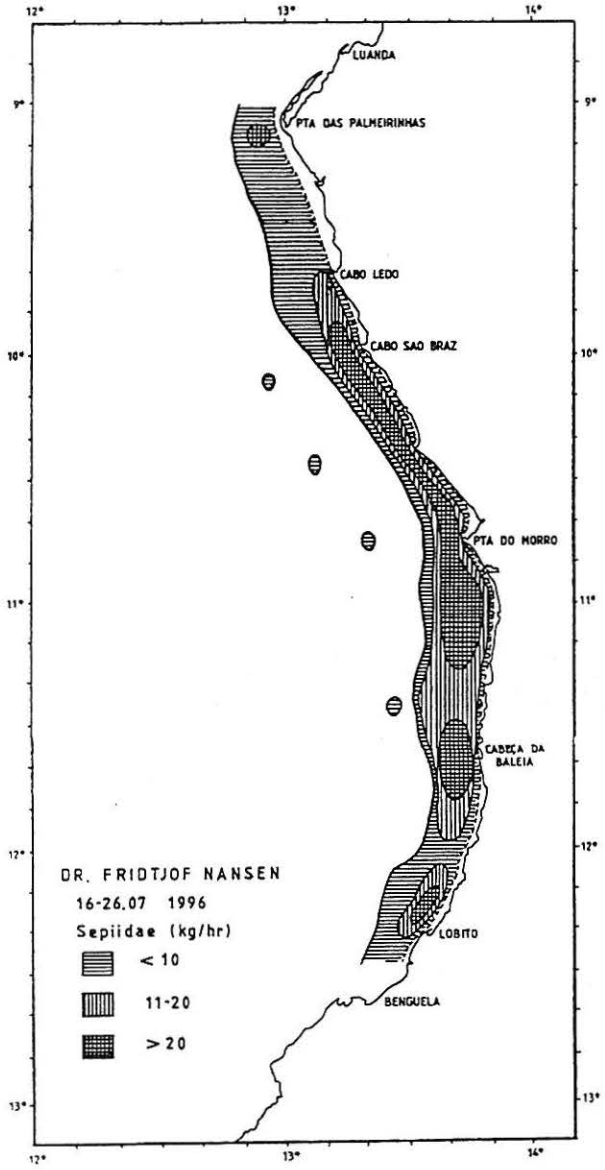


Figure 15. Distribution of Sepiidae.
Pta. das Palmeirinhas-Benguela.

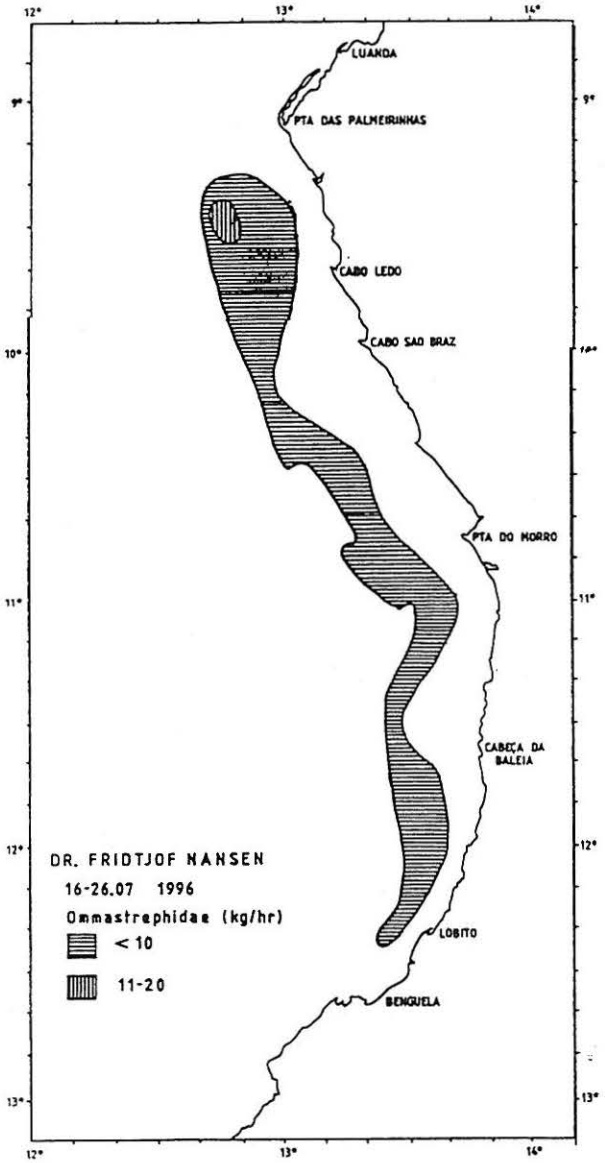


Figure 16. Distribution of Ommastrephidae.
Pta. das Palmeirinhas-Benguela.

Table 22. Catch rates (kg/hour) of cephalopods grouped by families in swept-area bottom trawl hauls on the shelf. Cabinda - Pta. das Palmeirinhas.

INNER SHELF 0-70 m

ST.NO.	DEP.	Sepiidae	Ommastrephidae	Loliginidae	Octopodidae	Other
1000	31	4.6				2620.6
1001	27	47.0				5210.1
1002	39	0.8				1678.8
1016	60	2.4	0.4	0.1		312.5
1017	37					893.5
1018	25	8.0				830.2
1030	58	38.4		9.9	2.3	174.6
1031	41	14.0				535.1
1033	31	2.9				68.7
1047	39	2.6		27.6		1392.3
1062	48	3.7				571.7
MEAN		11.3	0.04	3.4	0.2	1298.9

OUTER SHELF 71-200 m

ST.NO.	DEP.	Sepiidae	Ommastrephidae	Loliginidae	Octopodidae	Other
997	168	0.1	14.4			512.4
998	121	0.3	3.4			1007.0
999	76	12.2	1.0		14.7	484.6
1003	71					369.7
1004	164		11.1			1675.5
1014	152		14.5		1.2	325.9
1015	90	6.6	8.2	0.6		102.9
1019	80	2.6	0.2	0.5		227.6
1020	150	0.3	8.4	0.1	1.2	228.5
1028	144		1.6		0.6	455.4
1029	98	13.4	8.9	1.4		147.0
1034	75	1.6		18.6		703.0
1035	127	2.2	2.7	1.0		201.3
1036	197	0.2	5.2			426.1
1044	166		9.3			240.9
1045	89	4.6	2.2	0.8		208.0
1046	71	11.0	0.2	48.1		225.3
1048	87	2.2	4.4	2.2		391.2
1049	121		5.6			399.5
1050	167		4.2			106.3
1060	158		5.0		1.4	105.7
1061	81	2.0	3.0	2.6		72.9
1068	155		4.5			1980.7
MEAN		2.6	5.1	3.3	0.8	460.8

SLOPE, 200-500 m

ST.NO.	DEP.	Sepiidae	Ommastreph.	Loliginidae	Octopod.	Var.cephal.	Other
994	448						186.4
995	346		0.4				299.7
996	251	1.5	0.7				551.5
1005	296						1135.2
1006	349		0.7				660.3
1007	447						369.9
1011	464						420.0
1012	338		0.7				491.2
1013	247	0.6	4.4				232.7
1021	241	0.6	26.1				525.0
1022	349		0.6				665.7
1023	426		2.3				515.1
1027	259		2.2				347.5
1037	268	1.8	3.7				218.3
1038	369						437.7
1039	461					0.3	118.8
1042	312		0.2				334.2
1043	221	1.7	8.2				241.0
1051	249		10.4				758.0
1052	351		2.0				560.5
1053	458						180.2
1057	467						395.5
1058	366		15.8				867.2
1059	254	0.6	1.8				206.1
1065	457		5.8				439.3
1066	353		11.7				1010.1
1067	247	3.5	20.4				254.8
1069	264	0.0	0.7				229.4
1070	350						262.7
1071	455						175.2
MEAN		0.4	4.0			0.01	436.3

Like in the southern region, Sepiidae was the main family on the inner shelf but the mean catch rate was only about a half (11.3 kg/h). On both the outer shelf and the slope Ommastrephidae was the most abundant family, and the mean cath rate was higher than in the south. The main species were the same as in the Pta. das Palmeirinhas - Benguela region. Figs. 17 and 18 show the distribution of the two families. Sepiidae had a "wider" but more scatter distribution than in the south, while Ommastrephidae had larger areas with higher catch rates.

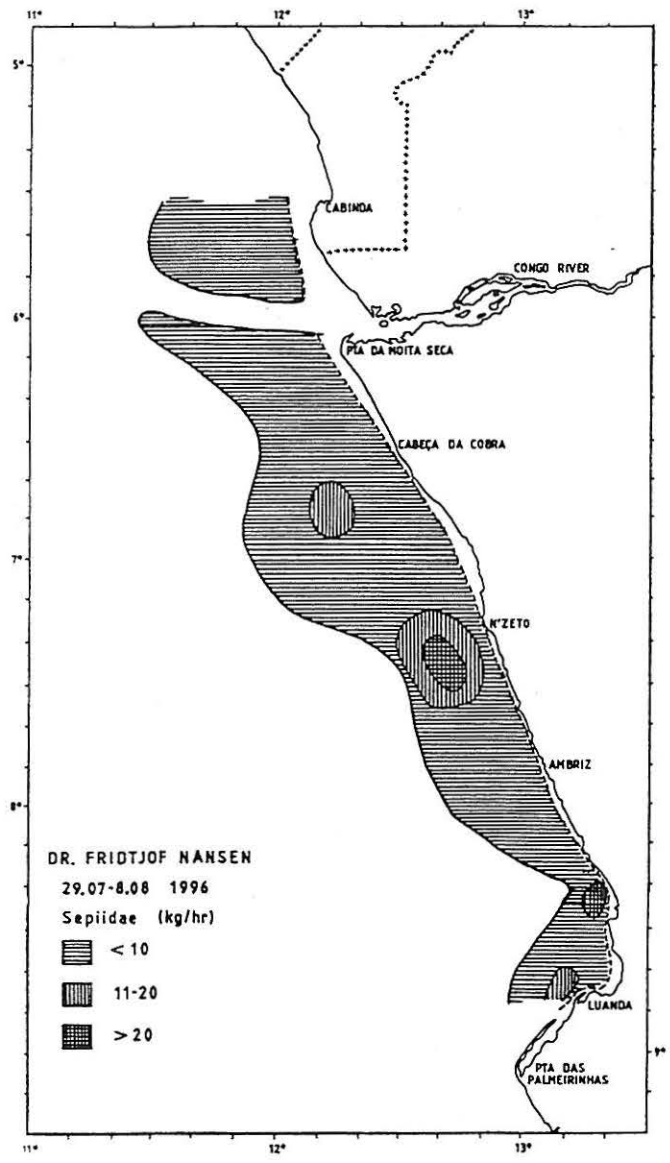


Figure 17. Distribution of Sepiidae.
Cabinda-Pta. das Palmeirinhas.

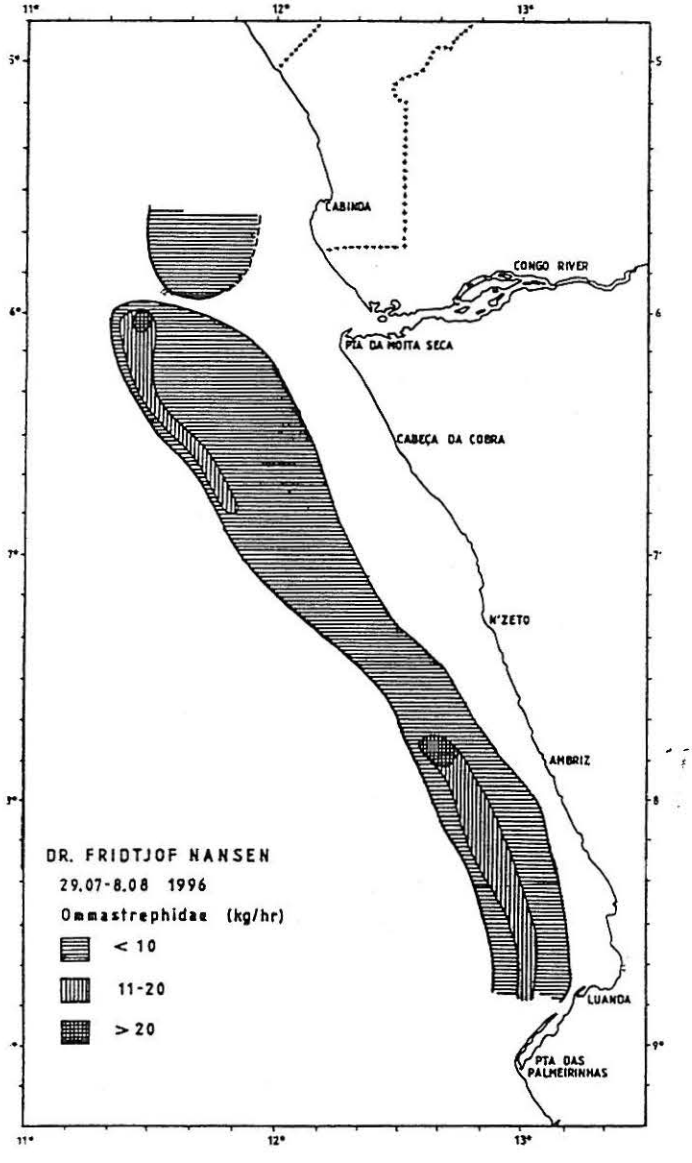


Figure 18. Distribution of Ommastrephidae.
Cabinda-Pta. das Palmeirinhas.

Tables 23 and 24 presents catch rates by region and main depth ranges for Sepiidae and Ommastrephidae respectively, for the whole time series. The values for 1985-1991 are the averages for all swept-area hauls in the two regions in these years. Sepiidae is most abundant on the shelf (Tables 20-21) and swept-area hauls down to 200 m depth are analysed for this family. In most years the highest catch rates were obtained on the inner shelf, and in 6 out of 8 years the catch rates have been higher in the southern region. Only in two years (1994 and 1996), the mean catch rate has been more than 10 kg/h.

Table 23. Sepiidae. Mean catch rates (kg/hour) by region, depth range and year/period of investigation.

Area/depth	Year/period of investigation							
	1985	1986	1989	1991	1992	1994	1995	1996
Cabinda-Pta. das Palmeirinhas								
20-70 m	2.1	3.6	1.9	3.5	5.0	15.0	0.4	11.3
70-200 m	1.4	4.8	1.4	1.3	3.4	5.6	3.3	2.6
Mean	1.8	4.2	1.7	2.5	4.2	9.3	2.1	5.4
Pta. das Palmeirinhas-Benguela								
20-70 m	1.1	3.3	3.3	3.8	2.3	39.1	3.2	19.9
70-200 m	-	6.9	4.9	1.6	0.3	3.3	4.9	3.9
Mean	0.6	4.6	4.1	2.7	1.4	18.8	3.9	11.4

Table 24. Ommastrephidae. Mean catch rates (kg/hour) by region, depth range and year/per of investigation.

Area/depth	Year/period of investigation							
	1985	1986	1989	1991	1992	1994	1995	1996
Cabinda-Pta. das Palmeirinhas								
70-200 m	18.2	1.4	3.6	15.5	6.4	3.1	0.6	5.1
200-500 m	4.7	6.0	7.2	11.3	2.3	4.9	0.6	4.0
Mean	14.2	3.0	4.9	13.6	4.4	4.2	0.6	4.5
Pta. das Palmeirinhas-Benguela								
70-200 m	-	1.6	8.9	5.6	28.3	14.0	0.1	2.5
200-500 m	-	19.9	5.6	4.5	4.4	3.6	0.6	1.2
Mean	-	9.4	7.8	5.2	15.3	8.4	0.4	1.7

Ommastrephidae is more rare on the inner shelf but more frequent on the slope than Sepiidae (Tables 21-22), and therefore swept-area hauls from 70-500 m depth are analysed for

Ommastrephids. They seems to be slightly more abundant on the outer shelf than on the slope, but since trawl hauls deeper than 400 m are mainly made during dark hours when Ommastrephids migrate towards the surface, the catch rates on the slope are underestimates, both absolute and relative to those on the shelf. The highest mean catch rate from year to year has alternated between the two regions. Only in one year has the mean catch rate been above 10 kg/h, in 1994 in the southern region. Whitaker (1980) found corresponding low catch rates for squid off the south-eastern USA, and concluded that a development of a large-scale fishery appeared highly improbable.

Table 24 presents biomass estimates for all cephalopods in the two regions for the whole time series. The values for 1986-1991 are the average of the biomass estimates for each survey in these years. The biomass estimates of all cephalopods were in all years higher for the shelf than for the slope (not shown in the table), and slightly higher in the northern than in the southern region. The variation between the different estimates in years with more than one survey was just as large as the variation between years, and the same was found for *Loligo vulgaris* in stratified random trawl surveys on the south and west coast of South Africa (Augustyn *et al.* 1992). This seasonal variation in abundance is probably mainly the effect of the short life cycle, usually 1 - 1 ½ year, and horizontal migration. Only in one year (1994) has the total biomass index been over 10000 tonnes.

Table 24. Biomass of estimates of cephalopods by region and year/period of investigation (tonnes).

Region/family	Year / period of investigation							
	1985/4	1986	1989	1991	1992	1994	1995	**1996***
Cabinda-Pta. das Palmeirinhas								
- Sepiidae			500	580	1046	1189	382	
- Ommastrephidae			1420	2451	1027	815	136	
- All	3190	4070	2230	3280	3400	5350	1060	**2390****
Pta. das Palmeirinhas-Benguela								
- Sepiidae			513	451	208	4187	665	
- Ommastrephidae			1273	776	2058	1109	37	
- All	5580	1800	2200	1760	2790	5500	1160	**2540****
Total	8770	5870	4430	5040	6190	10850	2160	**4930**

* Cabinda not included

** Opisthotheutidae not included

6.3 Fishing trials (jigging) for squid of the slope

Fishing trials for squid were done in the ocean off the slope by simple jigging, using two manually operated spools with fishing line and 4 jigs of different colours (white, green and red). The 10 cm long jigs consisted of a non-luminescent coloured plastic body with two sets of 15 mm barbless hooks. 4 strong lights (500 W) were mounted over the fishing spools. The line was lowered so that the last jig coming off the spool was about 1 m below the surface before the line was retrieved. The same procedure was used off the Northeast United States (Long and Rathjen 1980), while in Japanese jigging surveys the jigs were lowered to depths between 50 and 70 m (Murata 1983). Fig. 1a-b shows the location of the stations and Table 25 presents station- and catch-data.

Table 25. Jigging stations and catch of cephalopods. Pta. das Palmeirinhas-Benguela and Cabinda-Pta. das Palmeirinhas.

St. no.	Date	Time	Depth	Position	Duration	Catch
1	16.7	2210	507	0911S 1237E	30 min.	No catch and no observations
2	17.7	0320	1287	0913S 1221E	30 min.	No catch and no observations
3	27.7	1730	>1500	1200S 1225E	60 min.	2 *Todarodes sagittatus*; 14, 16.5 cm ML
4	"	2030	>1500	1144S 1239E	30 min.	1 *T. sagittatus*; 17 cm ML
5	"	2330	>1500	1124S 1235E	30 min.	1 *T. sagittatus*; 17 cm ML
6	28.7	0215	>1500	1105S 1230E	30 min.	No catch, few individuals at surface
7	"	0400	>1500	1053S 1239S	45 min.	1 *T. sagittatus*; 23 cm ML
8	"	1830	>1500	0904S 1215E	25 min.	1 *T. sagittatus*; 18 cm ML
9	"	2230	681	0845S 1247E	25 min.	No catch and no observations
10	1.8	2050	700	0745S 1231E	30 min.	No catch and no observations
11	"	2300	1216	0750S 1222E	30 min.	No catch and no observations
12	5.8	2330	826	0627S 1115E	40 min.	No catch, 1 squid observed

All observations and catches were done at some distance off the slope (bottom depths greater than 1500 m). At all stations with catch the squids showed up at the surface 1-15 minutes after the lights were turned on. Lupins and Wrzesinksi (1981) observed squid concentrations 20 minutes after the lights were switched on. The highest concentrations were in the boundary zone between the light and the dark areas. It was very difficult to catch *Todarodes sagittatus* with the jigs. One reason was that the spools and lines were to close to the vessel and the jigs did not reach the area with the highest concentration. Ogura (1981), cited by Flores (1982), reported best catches in the boundary zone. In station 3 and 8 squids were caught by throwing a line with a jig off the side of the vessel. On several stations it was observed that the squid was preying on zooplankton, and Lupins and Wrzesinksi (1981) found that squid concentrating in areas with concentrations of Euphausids did not react to artificial bait. They also observed that some species (e.g. *Ommastrephes bartrami*) did not form such well-

defined concentrations at night as others (e.g. *Illex argentinus*). Other explanations to the difficulties catching *T. sagittatus* may be the type and amount of light (Flores 1982, Amaral and Carr 1980) and the size, shape and colour of the jigs. At station 7 it was observed that the red jigs were more attractive than the others. On the other hand, this was perhaps not the right season for successfully jigging of *T. sagittatus*. In some areas, e.g. Nantucet Sound, Cape Cod USA (Amaral and Carr 1980) it has been concluded that the potential use of jig as a means to commercially harvest of certain squid species is questionable.

6.3 Acoustic observations

In the open ocean acoustic registration and integration were done only for pelagic occurrences. All registrations were allocated to the plankton group, though some of it was Myctophidae. No registrations could be allocated to cephalopods. The only observations that perhaps could be cephalopods were some scattered needle-like registrations at night between 20 and 40 m depth. The average S_A-value was 10-20 (m^2 reflecting surface per NM^2). Applying a target strength (TS) = 19 log ML (cm) - 65.9 measured for *Ommastrephes bartrami* by Kajiwara *et al.* (1990), an average S_A-value of 15, a mean mantle length (ML) of 17 cm and a mean body weight of 100 g, results in an average density of about 4.1 t/nm^2. MacLennan and Simmons presents a TS = 20 log L - 75.4 for *Todarodes pacificus* (cited from Arnaya *et al.* 1989) and applying this for *T. sagittatus* with a total length of 25 cm gives a density of about 4.9 t/nm^2. A pelagic trawl with a horizontal opening of 36 m, covering the whole depth range in this example (20-40 m), would in one hour catch 250-300 kg, which is not a particularly high catch. A few pelagic trawl hauls were performed to identify acoustic registrations, one at night in 20 m depth and one during daytime at 300 m depth. The shallowest haul mainly contained Myctophidae, Trachipteridae and about 50 small Ommastrephidae (5 cm ML), while the deepest catch consisted of jellyfish, Sternoptychidae and 2 small Ommastrephidae.

ON-THE-JOB TRAINING

All the Angolan participants performed the daily sampling of catches and species identification. Domingas Adelino, Paulo Brinca and Fernando Gomo entered data with NAN-SIS, and Kumbi Kilongo collected and recorded stomachs of Benguela hake.

Enoque Vasco and Fernando Gombo took care of the water samples, and they used the Portasal salinometer to analyse the salinity and they did the titration of the oxygen samples. Fernando Gombo and Enoque Vasco also drew all the vertical sections, and they participated in in the use of the software for CTD calibration.

Guillerme Camarada and Paulo Brinca plotted catch rates on maps and drew isolines for the species distribution maps. Domingas Adelino learned some more about how to use NAN-SIS for checking and correcting data, analysing data and printing reports.

Kumbi Kilongo worked with his paper on the diet and consumption of Benguela hake, and he took part in the final preparation of the cruise report.

REFERENCES

Amaral, E.H., and Carr, A. 1980. Experimental fishing for squid with lights in Nantcket Sound. *Mar. Fish. Rev.*, 42 (7-8): 51-56.

Anon. 1994. Surveys of the fish resources of Angola. Cruise Report No. 2/94. Part II. Survey of the demersal resources. 1 to 19 September 1994. 51 pp.

Augustyn, C.J., Lipi_ski, M.R., and Sauer, W.H.H. 1992. Can the *Loligo* squid fishery be managed effectively? A synthesis of research on *Loligo vulgaris Reynaudii*. In: A.I.L. Payne, K.H. Brink, K.H. Mann and R. Hilborn (Eds.), Benguela Trophic Functioning. *S. Afr. J. Mar. Sci.*, 12:903-918.

Flores, E.Ed.C. 1982. Light attraction techniques in squid fishing. *Proc. Int. Squid Symp.*, Boston 9-13 Aug 1981. pp 55-67.

Kajiwara, Y., Iida, K., and Kamei, Y. 1990. Measurements of target strength for the flying squid (*Ommastrephes bartrami*). *Bull. Fac. Fish. Hokkaido Univ.* 41(4):205-212.

Kilongo, K. 1996. Predation by Benguela hake (Merluccius polli) on commercially exploited shrimps (Parapanaeus longirostris and Aristeus varidens) in Angolan waters. (in prep.).

Lipinski, M., and Wrzesinski, O. 1982. Some observations on the behavior of squid (Cephalopoda: Ommastrephidae) during jigging operations. *Proc. Int. Squid Symp.*, August 9-12 1981, Boston, Massachusetts. UNIPUB, New York, pp 137-144.

Long, D., and Rathjen, W.F. 1980. Experimental jigging for squid. *Mar. Fish. Rev.* 42 (7-8): 60-66.

MacLennan, D.N., and Simmonds, E.J. 1992. Fisheries Acoustics. Chapman & Hall, London. 325 pp.

Mehl, S. 1989. The Norteast Arctic cod stock's consumption of commercially exploited prey species in 1984-1986. *Rap. Proc. -Ver. Reun. Mer*, 188:185-205.

Mehl, S., and Constança, L. 1995. Surveys of the fish resources of Angola. Cruise Report No. 2/95. Part I. Survey of deep-water shrimp and hake. Gear experiments. 27 July - 13 August 1995. Institute of Marine Research, Bergen.24 pp.

Murata, M. 1983. Quantitative assessment of oceanic squid by means of jigging surveys. SCOR Symposium on Methods of Sampling Mikronekton, Idyllwild CA (USA), 27 Apr 1980. *Biol. Oceanogr.* 2 (2-4):433-456.

Punt, A.E., Leslie, R.W., and Du Plessis, S.E. 1992. Estimation of the annual consumption of food by Cape hake *Merluccius capensis* and *M. paradoxus* off the South African west coast. In: A.I.L. Payne, K.H. Brink, K.H. Mann and R. Hilborn (Eds.), Benguela Trophic Functioning. *S. Afr. J. Mar. Sci.*, 12:611-634.

Whitaker, J.D. 1980. Squid catches resulting from trawl surveys off the southeastern United States. *Mar. Fish. Rev.*, 42(7-8): 39-43.

Annex I Records of fishing stations

PROJECT STATION: 912

DATE:17/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 909
start stop duration Long E 1253
TIME :17:05:00 17:35:00 30 (min) Purpose code: 3
LOG :3286.90 3288.60 1.70 Area code : 1
FDEPTH: 57 68 GearCond.code:
BDEPTH: 57 68 Validity code: 1
Towing dir: 270° Wire out: 220 m Speed: 32 kn*10

Sorted: 65 Kg Total catch: 258.24 CATCH/HOUR: 516.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	211.60	3480	40.97	
Decapterus punctatus	112.80	224	21.84	
Decapterus rhonchus	85.60	160	16.57	
Sepia elegans	29.68	48	5.75	1869
Trigla lyra	14.96	112	2.90	
Pseudupeneus prayensis	9.92	120	1.92	
Dentex barnardi	8.96	40	1.73	
Epinephelus aeneus	8.88	16	1.72	
Scorpaena stephanica	8.00	112	1.55	
Unidentified fish	6.08	96	1.18	
Trichiurus lepturus	4.24	8	0.82	
Atractoscion aequidens	3.52	8	0.68	
Fistularia petimba	3.36	16	0.65	
Sardinella maderensis	2.24	8	0.43	
Bothus podas africanus	2.00	56	0.39	
Citharichthys stampflii	2.00	40	0.39	
Dentex angolensis	1.92	24	0.37	
Bembrops heterurus	0.72	8	0.14	
Total	516.48		100.00	

PROJECT STATION: 913

DATE:16/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 912
start stop duration Long E 1241
TIME :20:25:00 20:55:00 30 (min) Purpose code: 3
LOG :3304.00 3305.60 1.60 Area code : 1
FDEPTH: 319 310 GearCond.code:
BDEPTH: 319 310 Validity code: 1
Towing dir: 260° Wire out: 930 m Speed: 32 kn*10

Sorted: 68 Kg Total catch: 524.63 CATCH/HOUR: 1049.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	747.06	13570	71.20	
Hoplostethus mediterraneus	94.34	154	8.99	1870
Squalus megalops	56.00	14	5.34	
Helicolenus dactylopterus	48.62	122	4.63	
Merluccius polli	48.16	138	4.59	
Malacocephalus laevis	10.58	168	1.01	
Malacocephalus occidentalis	10.44	46	0.99	
Epigonus telescopus	7.52	46	0.72	
Parapenaeus longirostris	4.90	674	0.47	
Coelorinchus coelorhincus	4.60	92	0.44	
Nezumia aequalis	4.44	106	0.42	
MACROURIDAE	3.98	76	0.38	
SQUILLIDAE	2.30	122	0.22	
Lophius vaillanti	2.14	30	0.20	
Solenocera africana	1.54	520	0.15	
Synagrops microlepis	0.92	14	0.09	
Callinectes marginatus	0.20	154	0.02	
NEMICHTHYIDAE	0.14	14	0.01	
Total	1047.88		99.87	

PROJECT STATION: 914

DATE:17/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 909
start stop duration Long E 1237
TIME :23:58:00 00:08:00 10 (min) Purpose code: 3
LOG :3316.80 3317.30 0.50 Area code : 1
FDEPTH: 535 525 GearCond.code: 9
BDEPTH: 535 525 Validity code: 1
Towing dir: 250° Wire out:1550 m Speed: 32 kn*10

Sorted: 23 Kg Total catch: 47.12 CATCH/HOUR: 282.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	73.80	2028	26.10	
Merluccius polli, female	27.00	36	9.55	1871
Lamprogrammus exutus	24.36	276	8.62	
MELANOSTOMIATIDAE	23.16	420	8.19	
Aristeus varidens, female	13.80	660	4.88	1872
Hoplostethus cadenati	12.96	396	4.58	
Talismania sp.	11.04	336	3.90	
Trachinotus ovatus	10.20	24	3.61	
Raja alba	7.68	12	2.72	
Hoplostethus mediterraneus	7.44	12	2.63	
Aristeus varidens, male	7.32	876	2.59	1873
Trachipterus sp.	6.24	12	2.21	
Shrimps, small, non comm.	5.88		2.08	
MYCTOPHIDAE	5.40		1.91	
Scyllarides herklotsii	5.40	552	1.91	
Malacocephalus laevis	4.80	36	1.70	
Nezumia sp.	4.56	156	1.61	
Bathyuroconger vicinus	4.08	192	1.44	
Nematocarcinus africanus	3.60	1296	1.27	
Plesiopenaeus edwardsianus	3.48	132	1.23	
Triplophos sp.	2.76	456	0.98	
MYCTASTOMATIDAE	2.64	60	0.93	
Lophius vaillanti	2.16	36	0.76	
Trichiurus lepturus	2.16	60	0.76	
Laemonema laureysi	2.04	240	0.72	
Etmopterus spinax	1.80	24	0.64	
Gadella imberbis	1.68	60	0.59	
Halosaurus ovenii	1.56	24	0.55	
Chaceon maritae	1.44	12	0.51	
Himantolophus sp.	1.44	12	0.51	
Bathynectes piperitus	0.60	12	0.21	
PSYCHROLUTIDAE	0.12	12	0.04	
Dibranchus atlanticus	0.12	12	0.04	
Total	282.72		99.97	

PROJECT STATION: 915

DATE:17/ 7/96 GEAR TYPE: BT No:2 POSITION:Lat S 931
start stop duration Long E 1236
TIME :07:51:00 08:21:00 30 (min) Purpose code: 3
LOG :3366.80 3368.40 1.60 Area code : 1
FDEPTH: 700 685 GearCond.code:
BDEPTH: 700 685 Validity code: 1
Towing dir: 165° Wire out:1800 m Speed: 35 kn*10

Sorted: 55 Kg Total catch: 139.85 CATCH/HOUR: 279.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
CONGRIDAE	49.16	1170	17.58	
Talismania sp.	48.00	290	17.16	
Coelorinchus sp.	41.50	256	14.84	
Lamprogrammus exutus	35.06	80	12.53	
Bathyuroconger vicinus	32.76	396	11.71	
Nematocarcinus africanus	8.50		3.04	
Atractoscion aequidens	8.16	6	2.92	
Scyllarides herklotsii	8.00	450	2.86	
Gonostoma sp.	8.00	196	2.86	
Dibranchus atlanticus	7.40	20	2.65	
Melanostomias sp.	6.06	126	2.17	
Aristeus varidens, female	3.90	186	1.39	1875
Ebinania costaecanarie	3.76	10	1.34	
Aristeus varidens, male	3.76	116	1.34	1874
Alepocephalus sp.	3.56	26	1.27	
Raja sp.	2.90	60	1.04	
Gadella imberbis	2.50	110	0.89	
Geryon sp.	2.20	6	0.79	
Ariomma bondi	1.50	10	0.54	
Malacocephalus laevis	1.46	30	0.52	
Halosaurus ovenii	0.56	6	0.20	
Triplophos sp.	0.56	50	0.20	
Hymenocephalus italicus	0.46	26	0.16	
Plesiopenaeus edwardsianus	0.10	36	0.04	
Total	279.82		100.04	

PROJECT STATION: 916

DATE:17/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 930
start stop duration Long E 1245
TIME :11:43:00 12:13:00 30 (min) Purpose code: 3
LOG :3387.80 3389.40 1.60 Area code : 1
FDEPTH: 168 159 GearCond.code:
BDEPTH: 168 159 Validity code: 1
Towing dir: 350° Wire out: 600 m Speed: 30 kn*10

Sorted: 122 Kg Total catch: 183.60 CATCH/HOUR: 367.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	118.80	204	32.35	1879
Dentex angolensis	67.50	198	18.38	1881
Synagrops microlepis	58.50	3774	15.93	
Dentex macrophthalmus	41.26	238	11.24	1880
Xenopsis conchifer	31.80	292	8.66	
Trichiurus lepturus	12.90	34	3.51	
Todaropsis eblanae	12.48	204	3.40	1876
Pterothrissus belloci	7.32	54	1.99	
Pterothrissus belloci	7.32	54	1.99	
Bembrops heterurus	2.62	28	0.71	
Pontinus kuhlii	2.58	22	0.70	
Merluccius polli	2.26	34	0.62	
Chelidonichthys gabonensis	1.90	12	0.52	
Torpedo torpedo	1.32	4	0.36	
Uranoscopus polli	0.94	6	0.26	
OCTOPODIDAE	0.82	4	0.22	
TRIGLIDAE	0.58	4	0.16	
Parapenaeus longirostris, fem.	0.42	84	0.11	1877
Saurida brasiliensis	0.34	28	0.09	
Chlorophthalmus atlanticus	0.28	30	0.08	
Parapenaeus longirostris, male	0.16	40	0.04	1878
Total	372.10		101.32	

PROJECT STATION: 917

DATE:17/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 928
start stop duration Long E 1300
TIME :15:04:00 15:34:00 30 (min) Purpose code: 3
LOG :3410.10 3411.60 1.50 Area code : 1
FDEPTH: 49 46 GearCond.code:
BDEPTH: 49 46 Validity code: 1
Towing dir: 360° Wire out: 200 m Speed: 30 kn*10

Sorted: 114 Kg Total catch: 114.00 CATCH/HOUR: 228.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys incisus	73.40	286	32.19	
Selene dorsalis	34.40	108	15.09	
Trichiurus lepturus	27.80	56	12.19	
Sparus auriga	23.80	70	10.44	1882
Argyrosomus hololepidotus	20.10	22	8.82	1885
Pseudotolithus senegalensis	8.10	6	3.55	1883
Umbrina canariensis	7.20	18	3.16	
Epinephelus aeneus	5.80	4	2.54	
Sepia officinalis hierredda	4.60	2	2.02	
Trachurus trecae	4.38	8	1.92	
Octopus sp.	3.20	2	1.40	
Chelidonichthys sp.	2.82	16	1.24	
Raja sp.	2.32	2	1.02	
Sphyraena guachancho	1.94	8	0.85	
Todaropsis eblanae	1.88	40	0.82	1884
Lithognathus mormyrus	1.58	2	0.69	
Plectorhinchus mediterraneus	1.24	4	0.54	
SPARIDAE	0.92	4	0.40	
Pagellus bellottii	0.82	4	0.36	
Dentex barnardi	0.48	4	0.21	
Decapterus rhonchus	0.42	6	0.18	
Chaetodon hoefleri	0.40	2	0.18	
Brachydeuterus auritus	0.32	110	0.14	
Alloteuthis africana	0.08	38	0.04	
Total	228.00		99.99	

PROJECT STATION: 918

DATE:17/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 927
start stop duration Long E 1304
TIME :16:31:00 17:01:00 30 (min) Purpose code: 3
LOG :3417.60 3419.20 1.60 Area code : 1
FDEPTH: 27 26 GearCond.code:
BDEPTH: 27 26 Validity code: 1
Towing dir: 360° Wire out: 180 m Speed: 30 kn*10

Sorted: 199 Kg Total catch: 199.16 CATCH/HOUR: 398.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sparus caeruleostictus *	111.90	108	28.09	1888
Selene dorsalis	64.20	114	16.12	
Myliobatis aquila	34.90	4	8.76	
Sparus auriga *	30.40	16	7.63	1886
Mycteroperca rubra	27.70	4	6.95	
Lutjanus fulgens	24.30	8	6.10	1887
Plectorhinchus mediterraneus	19.40	24	4.87	
Pomadasys incisus	17.50	72	4.39	
Galeoides decadactylus	10.20	22	2.56	
Galeoides decadactylus	10.20	22	2.56	
Dentex barnardi	8.58	24	2.15	1890
Lutjanus goreensis	8.30	8	2.08	1889
Acanthurus monroviae	8.30	8	2.08	
Epinephelus goreensis	6.74	4	1.69	
Sphyraena guachancho	4.20	6	1.05	
Raja miraletus	3.60	4	0.90	
Sepia orbignyana	3.40	2	0.85	
Pagellus bellottii	3.34	6	0.84	
Chaetodon boefleri	2.26	14	0.57	
Trichiurus lepturus	1.88	4	0.47	
Dentex canariensis	1.16	2	0.29	
Raja clavata	0.88	2	0.22	
Pseudupeneus prayensis	0.74	6	0.19	
Total	404.08		101.41	

PROJECT STATION: 919

DATE:18/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 944
start stop duration Long E 1311
TIME :05:31:00 06:01:00 30 (min) Purpose code: 3
LOG :3448.10 3449.80 1.70 Area code : 1
FDEPTH: 23 26 GearCond.code:
BDEPTH: 23 26 Validity code: 1
Towing dir: 346° Wire out: 145 m Speed: 34 kn*10

Sorted 148 Kg Total catch: 744.63 CATCH/HOUR: 1489.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Galeoides decadactylus	567.84	3016	38.13	
Brachydeuterus auritus	290.16	2414	19.48	1892
Sphyraena guachancho	117.00	136	7.86	1894
Stromateus fiatola	105.04	146	7.05	
Selene dorsalis	96.20	354	6.46	1891
Trichiurus lepturus	50.44	114	3.39	
Pteroscion peli	41.60	644	2.79	
Sardinella sp.	40.88	2850	2.74	
Pseudotolithus typus	39.52	52	2.65	
Pomadasys rogeri	29.96	104	2.01	
Ilisha africana	22.46	354	1.51	
Chloroscombrus chrysurus	22.26	124	1.49	
Raja miraletus	16.32	20	1.10	
Sepia orbignyana	12.24	18	0.82	1893
Decapterus punctatus	10.40	20	0.70	
Lagocephalus laevigatus	8.64	10	0.58	
Pomadasys incisus	7.28	42	0.49	
Dentex barnardi	6.76	10	0.45	
Cynoglossus sp.	4.16	10	0.28	
Sardinella maderensis	0.10	10	0.01	
Total	1489.26		99.99	

PROJECT STATION: 920

DATE:18/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 945
start stop duration Long E 1306
TIME :07:07:00 07:39:00 32 (min) Purpose code: 3
LOG :3456.50 5458.20 1.70 Area code : 1
FDEPTH: 59 58 GearCond.code:
BDEPTH: 59 58 Validity code: 1
Towing dir: 158° Wire out: 230 m Speed: 32 kn*10

Sorted: 96 Kg Total catch: 96.53 CATCH/HOUR: 180.99

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	84.00	471	46.41	1895
Trachurus trecae	28.41	83	15.70	1897
Dentex canariensis	16.78	60	9.27	1898
Trichiurus lepturus	9.94	13	5.49	
Sepia orbignyana	9.38	13	5.18	1896
Epinephelus aeneus	7.97	9	4.40	
Chaetodon boefleri	6.71	54	3.71	
Atractoscion aequidens	4.31	2	2.38	
Alloteuthis africana	4.11	1174	2.27	
Zeus faber	2.89	11	1.60	
Arius parkii	1.89	2	1.04	
Octopus sp.	1.74	2	0.96	
Scomberomorus tritor	1.29	2	0.71	
Fistularia petimba	1.03	4	0.57	
Chilomycterus spinosus mauret.	0.54	2	0.30	
Total	180.99		99.99	

PROJECT STATION: 921

DATE:18/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 946
start stop duration Long E 1300
TIME :09:00:00 09:30:00 30 (min) Purpose code: 3
LOG :3468.40 3470.00 1.60 Area code : 1
FDEPTH: 94 94 GearCond.code:
BDEPTH: 94 94 Validity code: 1
Towing dir: 160° Wire out: 340 m Speed: 32 kn*10

Sorted: 126 Kg Total catch: 189.87 CATCH/HOUR: 379.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	232.80	1636	61.31	1901
Sparus caeruleostictus *	39.60	30	10.43	1902
Dentex macrophthalmus	34.66	138	9.13	1899
Pagellus bellottii	23.44		6.17	
Squatina oculata	8.64	6	2.28	
Selene dorsalis	8.26	24	2.18	
Raja miraletus	7.20	12	1.90	
Dentex angolensis	5.40	58	1.42	1900
Trichiurus lepturus	3.88	18	1.02	
Dentex gibbosus	3.78	10	1.00	
Zeus faber	2.92	12	0.77	
Dentex barnardi	2.70	12	0.71	
Sepia orbignyana	1.62	8	0.43	1903
Chelidonichthys gabonensis	0.90	6	0.24	
Todaropsis eblanae	0.12	6	0.03	
Illex coindetii	0.12	4	0.03	
Total	376.04		99.05	

PROJECT STATION: 922

DATE:18/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 950
start stop duration Long E 1251
TIME :11:24:00 11:54:00 30 (min) Purpose code: 3
LOG :3486.10 3486.60 0.50 Area code : 1
FDEPTH: 181 181 GearCond.code:
BDEPTH: 181 181 Validity code: 1
Towing dir: 350° Wire out: 650 m Speed: 30 kn*10

Sorted: 98 Kg Total catch: 144.47 CATCH/HOUR: 288.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	103.50	192	35.82	1906
Dentex macrophthalmus	84.30	474	29.18	1908
Spicara alta	49.66	238	17.19	
Dentex angolensis	19.20	66	6.64	1907
Squatina aculeata	12.00	2	4.15	
Lenopsis conchifer	5.52	64	1.91	
Todaropsis eblanae	3.82	60	1.32	1904
Merluccius polli	3.28	36	1.14	1905
Pterothrissus belloci	2.56	16	0.89	
Raja miraletus	2.46	4	0.85	
Uranoscopus cadenati	2.26	12	0.78	
Synagrops microlepis	0.90	54	0.31	
Total	289.46		100.18	

PROJECT STATION: 923

DATE:18/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 949
start stop duration Long E 1250
TIME :12:19:00 12:49:00 30 (min) Purpose code: 3
LOG :3490.20 3491.40 1.70 Area code : 1
FDEPTH: 219 219 GearCond.code:
BDEPTH: 219 219 Validity code: 1
Towing dir: 345° Wire out:7403 m Speed: 31 kn*10

Sorted: 166 Kg Total catch: 262.81 CATCH/HOUR: 525.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	182.40	11760	34.70	
Merluccius polli	82.70	410	15.73	1912
Dentex macrophthalmus	81.50	318	15.51	1910
Trachurus trecae	69.50	118	13.22	1911
Dentex angolensis	31.40	78	5.97	1909
Squatina aculeata	30.00	6	5.71	
Spicara alta	13.56	60	2.58	
Lenopsis conchifer	7.92	108	1.51	
Todaropsis eblanae	6.00	108	1.14	1915
Coelorinchus coelorhincus	4.32	72	0.82	
Parapenaeus longirostris, fem.	4.20	624	0.80	1914
Parapenaeus longirostris, male	4.20	780	0.80	1913
Uranoscopus cadenati	3.12	12	0.59	
MYCTOPHIDAE	2.16	624	0.41	
Pterothrissus belloci	1.44	12	0.27	
Chlorophthalmus atlanticus	0.72	12	0.14	
Trichiurus lepturus	0.60	12	0.11	
Total	525.74		100.01	

PROJECT STATION: 924

DATE:18/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 949
start stop duration Long E 1248
TIME :14:06:00 14:36:00 30 (min) Purpose code: 3
LOG :3497.80 3499.40 1.60 Area code : 1
FDEPTH: 309 306 GearCond.code:
BDEPTH: 309 306 Validity code: 1
Towing dir: 360° Wire out: 960 m Speed: 31 kn*10

Sorted: 81 Kg Total catch: 881.60 CATCH/HOUR: 1763.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	645.60	3144	36.62	1916
Chlorophthalmus atlanticus	632.40	10896	35.87	
Squalus megalops	192.00	48	10.89	
Pterothrissus belloci	110.40	576	6.26	
Hymenocephalus italicus	51.60	6960	2.93	
Nematocarcinus africanus	27.60	7368	1.57	
Laemonema laureysi	25.20	600	1.43	
Etmopterus spinax	16.00	4	0.91	
Coelorinchus coelorhincus	9.60	360	0.54	
MYCTOPHIDAE	8.88	4368	0.50	
Malacocephalus occidentalis	8.64	72	0.49	
Gadella imberbis	7.20	216	0.41	
Parapenaeus longirostris, fem.	5.76	216	0.33	1918
Pontinus kuhlii	5.28	96	0.30	
Raja sp.	3.36	24	0.19	
Illex coindetii	2.64	48	0.15	
Nezumia sp.	1.92	96	0.11	
Parapenaeus longirostris, male	1.92	528	0.11	1917
Trichiurus lepturus	1.68	48	0.10	
Lophius vaillanti	1.20	24	0.07	
Bassanago albescens	0.96	24	0.05	
Dibranchus atlanticus	0.96	48	0.05	
Solenocera africana	0.72	144	0.04	
Peristedion cataphractum	0.72	144	0.04	
Callinectes pallidus	0.48	24	0.03	
Macroparalepis macrogeneion	0.48	24	0.03	
Total	1763.20		100.02	

PROJECT STATION: 925

DATE:18/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 949
start stop duration Long E 1247
TIME :15:30:00 16:00:00 30 (min) Purpose code: 3
LOG :3503.40 3504.90 1.50 Area code : 1
FDEPTH: 383 379 GearCond.code:
BDEPTH: 383 379 Validity code: 1
Towing dir: 170° Wire out:1150 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 200.58 CATCH/HOUR: 401.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	147.60	540	36.79	1919
Malacocephalus laevis	48.00	378	11.97	
Malacocephalus occidentalis	30.00	438	7.48	
Etmopterus spinax	29.46	276	7.34	
Pterothrissus belloci	26.04	54	6.49	
Dibranchus atlanticus	21.00	928	5.23	
Lophius vaillanti	15.06	42	3.75	
Chaunax pictus	15.00	150	3.74	
Aristeus varidens	13.32	1300	3.32	1920
Hoplostethus mediterraneus	9.36	6	2.33	
Bathyuroconger vicinus	8.16	180	2.03	
Talismania sp.	7.32	138	1.82	
Nezumia aequalis	5.88	36	1.47	
Geryon sp.	5.64	18	1.41	
Todaropsis eblanae	3.84	12	0.96	
Hymenocephalus italicus	3.30	156	0.82	
Raja sp.	2.94	24	0.73	
Hoplostethus cadenati	2.34	30	0.58	
Gonostoma sp.	2.22	12	0.55	
Chlorophthalmus atlanticus	2.16	12	0.54	
Peristedion cataphractum	1.80	36	0.45	
Bathynectes piperitus	0.30	12	0.07	
Macroparalepis macrogeneion	0.30	12	0.07	
Halosaurus ovenii	0.12	18	0.03	
Total	401.16		99.97	

PROJECT STATION: 926

DATE:18/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 952
start stop duration Long E 1246
TIME :19:10:00 19:40:00 30 (min) Purpose code: 3
LOG :3518.30 3519.90 1.60 Area code : 1
FDEPTH: 420 456 GearCond.code:
BDEPTH: 420 456 Validity code: 1
Towing dir: 16° Wire out:1290 m Speed 32 kn*10

Sorted: 61 Kg Total catch 144.34 CATCH/HOUR: 288.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	83.50	130	28.92	1921
Malacocephalus laevis	49.50	276	17.15	
Gonostoma elongatum	25.96	630	8.99	
Nezumia aequalis	25.26	166	8.75	
Etmopterus spinax	18.06	406	6.26	
Aristeus varidens	17.60	2514	6.10	1922
Centrophorus uyato	12.60	2	4.36	
Dibranchus atlanticus	10.96	640	3.80	
Geryon sp.	8.20	30	2.84	
Pterothrissus belloci	7.26	40	2.51	
Scyllarides herklotsii	4.86	460	1.68	
Coloconger cadenati	4.80	10	1.66	
Bathyuroconger vicinus	4.56	246	1.58	
Chaunax pictus	3.60	50	1.25	
Gonostoma sp.	2.56	56	0.89	
Holohalaelurus regani	2.56	6	0.89	
Hoplostethus cadenati	1.80	60	0.62	
Histioteuthis reversa	1.46	16	0.51	
Gadella imberbis	1.36	60	0.47	
Coelorinchus sp.	0.80	10	0.28	
Chlorophthalmus atlanticus	0.70	16	0.24	
Bathynectes piperitus	0.30	10	0.10	
Ebinania costaecanarie	0.10	10	0.03	
Cynoglossus sp.	0.10	6	0.03	
Raja sp.	0.06	6	0.02	
Total	288.52		99.93	

PROJECT STATION: 927

DATE:18/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 949
start stop duration Long E 1243
TIME :21:55:00 22:20:00 25 (min) Purpose code: 3
LOG :3538.60 3540.00 1.40 Area code : 1
FDEPTH: 540 567 GearCond.code:
BDEPTH: 540 567 Validity code: 1
Towing dir: 141° Wire out:1550 m Speed: 32 kn*10

Sorted: 39 Kg Total catch: 84.04 CATCH/HOUR: 201.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	28.30	799	14.03	
Merluccius polli	26.28	36	13.03	1925
Centrophorus uyato	15.00	5	7.44	
Scymnodon obscurus	12.46	259	6.18	
Laemonema laureysi	10.80	86	5.35	
Hoplostethus cadenati	10.37	324	5.14	
Dibranchus atlanticus	9.22	454	4.57	
Nezumia sp.	8.71	266	4.32	
POLYCHAELIDAE	8.28	994	4.11	
Lamprogrammus exutus	7.99	86	3.96	
Trichiurus lepturus	7.92	230	3.93	
MELANOSTOMIATIDAE	7.06	115	3.50	
NETTASTOMATIDAE	6.26	180	3.10	
Geryon sp.	6.12	22	3.03	
Aristeus varidens, female	5.69	238	2.82	1923
Aristeus varidens, male	4.32	425	2.14	1924
Galeus polli	3.24	58	1.61	
Dicrolene intronigra	2.59	295	1.28	
Glyphus marsupialis	2.52	583	1.25	
Gonostoma elongatum	2.09	281	1.04	
Coelorinchus coelorhincus	2.02	12	1.00	
Xenodermichthys copei	1.94	223	0.96	
Malacocephalus laevis	1.66	22	0.82	
Coloconger cadenati	1.44	7	0.71	
Lolliguncula mercatoris	1.30	7	0.64	
OPHICHTHIDAE	1.30	50	0.64	
Alepocephalus sp.	1.30	72	0.64	
Bathyuroconger vicinus	1.15	43	0.57	
Bathynectes piperitus	0.94	65	0.47	
OPHIDIIDAE	0.79	158	0.39	
Bassanago albescens	0.50	14	0.25	
Plesiopenaeus edwardsianus	0.43	14	0.21	
Lophius vaillanti	0.36	7	0.18	
Bathygadus melanobranchus	0.29	7	0.14	
Halosaurus ovenii	0.22	7	0.11	
MYCTOPHIDAE	0.14	7	0.07	
Gadella imberbis	0.14	7	0.07	
NEMICHTHYIDAE	0.14	7	0.07	
Ebinania costaecanarie	0.07	7	0.03	
Total	201.35		99.80	

PROJECT STATION: 928

DATE:19/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1010
start stop duration Long E 1250
TIME :01:59:00 02:29:00 30 (min) Purpose code: 3
LOG :3567.00 3568.70 1.70 Area code : 1
FDEPTH: 712 714 GearCond.code:
BDEPTH: 712 714 Validity code: 1
Towing dir: 340° Wire out:1850 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 104.22 CATCH/HOUR: 208.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nezumia sp.	47.04	840	22.57	
MELANOSTOMIATIDAE	17.44	352	8.37	
Yarrella blackfordi	17.36	376	8.33	
Malacocephalus occidentalis	16.88	184	8.10	
Alepocephalus sp.	15.28	280	7.33	
Merluccius polli	14.60	14	7.00	1928
POLYCHAELIDAE	13.52	896	6.49	
Dibranchus sp.	13.44	528	6.45	
Hoplostethus cadenati	10.56	208	5.07	
Bathyuroconger vicinus	8.48	96	4.07	
OCTOPOTEUTHIDAE	7.52	104	3.61	
Aristeus varidens, female	7.04	320	3.38	1927
Ebinania costaecanarie	4.40	8	2.11	
Bathygadus melanobranchus	4.40	112	2.11	
Scymnodon obscurus	2.24	8	1.07	
Raja sp.	2.24	8	1.07	
Glyphus marsupialis	1.84	152	0.88	
OPHICHTHIDAE	1.44	56	0.69	
Trichiurus lepturus	1.20	32	0.58	
Aristeus varidens, male	1.12	64	0.54	1926
Chlorophthalmus atlanticus	0.40	8	0.19	
Total	208.44		100.01	

PROJECT STATION: 929

DATE:19/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1010
start stop duration Long E 1251
TIME :03:57:00 04:27:00 30 (min) Purpose code: 3
LOG :3576.00 3577.80 1.70 Area code : 1
FDEPTH: 554 545 GearCond.code:
BDEPTH: 554 545 Validity code: 1
Towing dir: 340° Wire out:1550 m Speed: 30 kn*10

Sorted: 25 Kg Total catch: 172.12 CATCH/HOUR: 344.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	68.60	2002	19.93	
Trichiurus lepturus	38.92	756	11.31	
Lamprogrammus exutus	34.02	280	9.88	
Gonostoma sp.	29.96	490	8.70	
Gonostoma elongatum	21.14	532	6.14	
Etmopterus spinax	17.64	84	5.12	
Dibranchus atlanticus	16.80	560	4.88	
Merluccius polli	16.24	14	4.72	
Laemonema laureysi	12.04	70	3.50	
Solenocera africana	11.62	24794	3.38	
Aristeus varidens, female	11.34	700	3.29	1930
Malacocephalus occidentalis	10.36	126	3.01	
Scyllarides herklotsii	7.84	560	2.28	
Malacocephalus laevis	6.16	42	1.79	
Aristeus varidens, male	5.60	294	1.63	1929
Talismania oregonia	5.46	126	1.59	
Chlorophthalmus atlanticus	5.04	28	1.46	
NEMICHTHYIDAE	4.76	42	1.38	
Bathyuroconger vicinus	4.62	42	1.34	
GONOSTOMATIDAE	4.48	84	1.30	
Talismania sp.	4.48	56	1.30	
Plesiopenaeus edwardsianus	4.34	98	1.26	
Ijimaia loppei	1.66	2	0.48	
SQUILLIDAE	0.28	140	0.08	
MYCTOPHIDAE	0.28	14	0.08	
Gadella imberbis	0.28	28	0.08	
Nematocarcinus africanus	0.28	14	0.08	
Total	344.24		99.99	

PROJECT STATION: 930

DATE:19/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1009
start stop duration Long E 1252
TIME :05:44:00 06:14:00 30 (min) Purpose code: 3
LOG :3584.80 3586.40 1.60 Area code : 1
FDEPTH: 454 442 GearCond.code:
BDEPTH: 454 442 Validity code: 1
Towing dir: 337° Wire out:1290 m Speed: 32 kn*10

Sorted: 42 Kg Total catch: 256.38 CATCH/HOUR: 512.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Solenocera africana	220.20		42.94	
Merluccius polli	105.00	180	20.48	1933
Laemonema laureysi	42.00	1452	8.19	
Hoplostethus cadenati	19.56	672	3.81	
Gonostoma elongatum	16.80	432	3.28	
Lophius vaillanti	16.68	36	3.25	
Malacocephalus occidentalis	16.56	996	3.23	
Etmopterus spinax	11.64	144	2.27	
GONOSTOMATIDAE	9.00	72	1.76	
Aristeus varidens, female	8.76	384	1.71	1932
Aristeus varidens, male	8.28	1104	1.61	1931
Malacocephalus laevis	6.60	60	1.29	
Bathyuroconger vicinus	5.76	132	1.12	
Gadella imberbis	4.56	132	0.89	
Lamprogrammus exutus	3.96	48	0.77	
Coloconger cadenati	3.36	12	0.66	
Halosaurus ovenii	2.88	504	0.56	
Chlorophthalmus atlanticus	2.88	36	0.56	
Dibranchus atlanticus	2.52	96	0.49	
Trichiurus lepturus	2.40	48	0.47	
Plesiopenaeus edwardsianus	1.08	84	0.21	
Hymenocephalus italicus	0.84	60	0.16	
Nematocarcinus africanus	0.60	12	0.12	
MYCTOPHIDAE	0.60	12	0.12	
NEMICHTHYIDAE	0.24	36	0.05	
Total	512.76		100.00	

PROJECT STATION: 931

DATE:19/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1010
start stop duration Long E 1254
TIME :07:30:00 08:00:00 30 (min) Purpose code: 3
LOG :3592.70 3594.30 1.60 Area code : 1
FDEPTH: 360 357 GearCond.code:
BDEPTH: 360 357 Validity code: 1
Towing dir: 340° Wire out:1150 m Speed: 32 kn*10

Sorted: 57 Kg Total catch: 800.74 CATCH/HOUR: 1601.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Solenocera africana	1097.20	231192	68.51	
Merluccius polli	299.60	1344	18.71	1934
Hymenocephalus italicus	72.80	5726	4.55	
Laemonema laureysi	21.28	504	1.33	
Pterothrissus belloci	17.78	98	1.11	
Etmopterus spinax	14.56	462	0.91	
Nezumia aequalis	12.46	154	0.78	
Chaunax pictus	12.18	532	0.76	
Chlorophthalmus atlanticus	11.34	238	0.71	
Plesiopenaeus edwardsianus	10.50	3360	0.66	
Trichiurus lepturus	6.16	70	0.38	
Gonostoma elongatum	5.60	168	0.35	
GONOSTOMATIDAE	5.32	140	0.33	
Dibranchus atlanticus	3.08	714	0.19	
Parapenaeus longirostris	2.52	420	0.16	
Todaropsis eblanae	2.10	14	0.13	
Bathyuroconger vicinus	1.54	42	0.10	
Lophius vaillanti	1.40	28	0.09	
Bathynectes piperitus	1.26	28	0.08	
Aristeus varidens	1.12	140	0.07	
Cynoglossus sp.	0.70	28	0.04	
Peristedion cataphractum	0.56	56	0.03	
MYCTOPHIDAE	0.42	1036	0.03	
Total	1601.48		100.01	

PROJECT STATION: 932

DATE:19/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1009
start stop duration Long E 1254
TIME :09:12:00 09:42:00 30 (min) Purpose code: 3
LOG :3601.20 3602.90 1.70 Area code : 1
FDEPTH: 280 277 GearCond.code:
BDEPTH: 280 277 Validity code: 1
Towing dir: 343° Wire out: 900 m Speed: 34 kn*10

Sorted: 68 Kg Total catch: 170.18 CATCH/HOUR: 340.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	102.00	2420	29.97	
Pterothrissus belloci	67.50	356	19.83	
Synagrops microlepis	54.06	4310	15.88	
MYCTOPHIDAE	53.46	16696	15.71	
Dentex macrophthalmus	28.76	150	8.45	1938
Merluccius polli	11.50	90	3.38	1937
Cynoponticus ferox	4.50	6	1.32	
Xenopsis conchifer	4.16	46	1.22	
Trichiurus lepturus	3.66	6	1.08	
Raja clavata	3.26	6	0.96	
Brotula barbata	2.30	6	0.68	
Aristeus varidens, male	1.46	186	0.43	1936
Aristeus varidens, female	1.30	140	0.38	1935
Muraenesox bagio	0.86	6	0.25	
Todaropsis eblanae	0.80	16	0.24	
Epigonus telescopus	0.46	6	0.14	
Scorpaena sp.	0.36	6	0.11	
Citharus linguatula	0.06	6	0.02	
Total	340.46		100.05	

PROJECT STATION: 933

DATE:19/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1009
start stop duration Long E 1255
TIME :10:52:00 11:22:00 30 (min) Purpose code: 3
LOG :3608.40 3610.10 1.70 Area code : 1
FDEPTH: 225 225 GearCond.code:
BDEPTH: 225 225 Validity code: 1
Towing dir: 345° Wire out: 720 m Speed: 30 kn*10

Sorted: 57 Kg Total catch: 255.77 CATCH/HOUR: 511.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	283.92	90500	55.50	
Synagrops microlepis	109.00	7010	21.31	
Merluccius polli	46.70	276	9.13	1942
Chlorophthalmus atlanticus	28.50	4700	5.57	
Dentex macrophthalmus	26.80	146	5.24	1941
Parapenaeus longirostris, fem.	3.74	562	0.73	1940
Pterothrissus belloci	3.54	20	0.69	
Parapenaeus longirostris, male	2.08	396	0.41	1939
Illex coindetii	2.08	20	0.41	
Xenopsis conchifer	1.66	20	0.32	
Chlorophthalmus punctatus	1.04	104	0.20	
Sepia orbignyana	1.04	42	0.20	
Solenocera africana	0.00	2		
Total	510.10		99.71	

PROJECT STATION: 934

DATE:19/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1009
start stop duration Long E 1257
TIME :12:27:00 12:57:00 30 (min) Purpose code: 3
LOG :3617.00 3618.60 1.60 Area code : 1
FDEPTH: 128 126 GearCond.code:
BDEPTH: 128 126 Validity code: 1
Towing dir: 355° Wire out: 480 m Speed: 29 kn*10

Sorted: 180 Kg Total catch: 4420.00 CATCH/HOUR: 8840.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	4308.36	14352	48.74	1944
Erythrocles monodi	2437.08	4692	27.57	1943
Anthias sp.	1694.64	26882	19.17	
Octopus sp.	142.42	56	1.61	
Umbrina canariensis	80.60	220	0.91	
Epinephelus goreensis	74.00	6	0.84	
Dentex angolensis	46.92	110	0.53	
Selene dorsalis	46.36	110	0.52	
Dentex gibbosus	25.90	10	0.29	
Dentex macrophthalmus	23.18	56	0.26	
Boops boops	18.22	110	0.21	
Total	8897.68		100.65	

PROJECT STATION: 935

DATE:19/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1005
start stop duration Long E 1310
TIME :15:00:00 15:30:00 30 (min) Purpose code: 3
LOG :3635.00 3636.70 1.70 Area code : 1
FDEPTH: 76 74 GearCond.code:
BDEPTH: 76 74 Validity code: 1
Towing dir: 350° Wire out: 320 m Speed: 31 kn*10

Sorted: 121 Kg Total catch: 121 69 CATCH/HOUR: 243.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	101.80	552	41.83	
Trachurus trecae	83.90	342	34.47	1945
Selene dorsalis	19.26	56	7.91	
Zeus faber	10.32	24	4.24	
Alloteuthis africana	7.28	1566	2.99	
Decapterus rhonchus	6.62	8	2.72	
Pagellus bellottii	4.52	44	1.86	1946
Xenopsis conchifer	3.42	4	1.41	
Brachydeuterus auritus	3.40	24	1.40	
Raja miraletus	1.04	2	0.43	
Chaetodon hoefleri	0.62	4	0.25	
Dentex barnardi	0.54	2	0.22	
Fistularia petimba	0.44	2	0.18	
Umbrina canariensis	0.22	2	0.09	
Total	243.38		100.00	

PROJECT STATION: 936

DATE:19/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1004
start stop duration Long E 1316
TIME :16:22:00 16:52:00 30 (min) Purpose code: 3
LOG :3643.60 3645.20 1.60 Area code : 1
FDEPTH: 26 26 GearCond.code:
BDEPTH: 26 26 Validity code: 1
Towing dir: 150° Wire out: 120 m Speed: 30 kn*10

Sorted: 133 Kg Total catch: 1268.87 CATCH/HOUR: 2537.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	1064.00	27798	41.93	1947
Galeoides decadactylus	272.66	1710	10.74	
Chloroscombrus chrysurus	218.50	1540	8.61	1949
Trichiurus lepturus	183.36	13130	7.23	
Pseudotolithus typus	158.46	152	6.24	
Pteroscion peli	101.66	2984	4.01	
Rhizoprionodon acutus	71.26	38	2.81	
Sphyraena guachancho	64.50	96	2.54	
Trachurus trecae	55.68	228	2.19	1950
Pomadasys incisus	54.16	190	2.13	
Sepia orbignyana	50.54	38	1.99	1948
Illisha africana	49.22	552	1.94	
Pomadasys rogeri	40.66	38	1.60	
Selene dorsalis	39.52	514	1.56	
Stromateus fiatola	27.74	20	1.09	
Argyrosomus hololepidotus	23.18	20	0.91	
Epinephelus aeneus	18.62	20	0.73	
Pagellus bellottii	13.12	20	0.52	
Sardinella maderensis	12.54	114	0.49	
Cynoglossus sp.	12.36	38	0.49	
Total	2531.74		99.75	

PROJECT STATION: 937

DATE:20/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1020
start stop duration Long E 1327
TIME :05:30:00 05:56:00 26 (min) Purpose code: 3
LOG :3669.90 3671.50 1.60 Area code : 1
FDEPTH: 30 32 GearCond.code:
BDEPTH: 30 32 Validity code: 1
Towing dir: 320° Wire out: 135 m Speed: 34 kn*10

Sorted: 105 Kg Total catch: 1444.67 CATCH/HOUR: 3333.85

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	2087.15	46855	62.60	1951
Trachurus trecae	233.19	992	6.99	1952
Galeoides decadactylus	228.23	695	6.85	
Selene dorsalis	165.72	628	4.97	
Trichiurus lepturus	127.34	1389	3.82	
Pseudotolithus typus	124.71	99	3.74	
Stromateus fiatola	83.35	132	2.50	
Arius parkii	58.22	67	1.75	
Chloroscombrus chrysurus	45.65	298	1.37	
Sepia orbignyana	32.75	32	0.98	
Pteroscion peli	32.75	2712	0.98	
Sardinella maderensis	25.15	231	0.75	
Pomadasys rogeri	24.48	32	0.73	
Erythrocles monodi	17.19	32	0.52	
Cynoglossus sp.	13.89	67	0.42	
Dentex barnardi	11.58	32	0.35	
Atractoscion aequidens	10.92	32	0.33	
Panulirus regius	6.69	12	0.20	
Argyrosomus hololepidotus	4.89	2	0.15	
Total	3333.85		100.00	

PROJECT STATION: 938

DATE:20/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1022
start stop duration Long E 1321
TIME :07:25:00 07:55:00 30 (min) Purpose code: 3
LOG :3682.30 3684.10 1.80 Area code : 1
FDEPTH: 72 69 GearCond.code:
BDEPTH: 72 69 Validity code: 1
Towing dir: 345° Wire out: 270 m Speed: 36 kn*10

Sorted: 133 Kg Total catch: 611.40 CATCH/HOUR: 1222.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	577.50	4134	47.23	1954
Brachydeuterus auritus	462.00	3220	37.78	1953
Selene dorsalis	42.10	110	3.44	1955
Trichiurus lepturus	39.50	80	3.23	
Stromateus fiatola	26.00	30	2.13	
Pagellus bellottii	16.70	170	1.37	1956
Squatina oculata	15.50	6	1.27	
Decapterus rhonchus	13.80	20	1.13	
Atractoscion aequidens	11.30	4	0.92	
Dentex canariensis	6.40	20	0.52	
Alloteuthis africana	6.30	1780	0.52	
Zeus faber	2.50	10	0.20	
Fistularia petimba	1.70	10	0.14	
Chaetodon hoefleri	1.50	10	0.12	
Total	1222.80		100.00	

PROJECT STATION: 939

DATE:20/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1025
start stop duration Long E 1309
TIME :09:47:00 10:17:00 30 (min) Purpose code: 3
LOG :3699.80 3701.40 1.60 Area code : 1
FDEPTH: 124 121 GearCond.code:
BDEPTH: 124 121 Validity code: 1
Towing dir: 345° Wire out: 450 m Speed: 32 kn*10

Sorted: 40 Kg Total catch: 40.73 CATCH/HOUR: 81.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	26.10	288	32.04	1959
Dentex angolensis	20.60	96	25.29	1957
Boops boops	19.60	162	24.06	
Todaropsis eblanae	5.54	252	6.80	
Raja miraletus	2.30	4	2.82	
Zenopsis conchifer	2.14	2	2.63	
Dentex barnardi	1.78	6	2.19	
Illex coindetii	1.68	66	2.06	1958
Pagellus bellottii	0.72	6	0.88	
Chelidonichthys gabonensis	0.50	4	0.61	
Dentex macrophthalmus	0.48		0.59	
Engraulis encrasicolus	0.02	2	0.02	
Total	81.46		99.99	

PROJECT STATION: 940

DATE:20/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1026
start stop duration Long E 1306
TIME :11:27:00 11:57:00 30 (min) Purpose code: 3
LOG :3708.00 3709.60 1.60 Area code : 1
FDEPTH: 185 181 GearCond.code:
BDEPTH: 185 181 Validity code: 1
Towing dir: 334° Wire out: 640 m Speed: 30 kn*10

Sorted: 138 Kg Total catch: 169.12 CATCH/HOUR: 338.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	80.00	206	23.65	1960
Merluccius polli	63.50	606	18.77	1961
Pterothrissus belloci	37.62	796	11.12	
Zenopsis conchifer	36.62	1220	10.83	
Epinephelus caninus	35.28	2	10.43	
Dentex macrophthalmus	20.50	80	6.06	1962
Uranoscopus polli	10.08	82	2.98	
Spicara alta	9.10	38	2.69	
Hyperoglyphe moselii	7.28	2	2.15	
Synagrops microlepis	6.50	512	1.92	
Illex coindetii	5.82	102	1.72	1965
Squatina oculata	4.08	10	1.21	
Hoplostethus mediterraneus	3.58	2	1.06	
Zeus faber	3.42	8	1.01	
Bembrops greyi	2.50	30	0.74	
Chlorophthalmus atlanticus	2.46	180	0.73	
Umbrina canariensis	2.22	6	0.66	
Trachurus trecae	1.32	2	0.39	
Brotula barbata	1.06	2	0.31	
Peristedion cataphractum	0.92	30	0.27	
Calappa pelii	0.76	26	0.22	
Hymenocephalus italicus	0.72	42	0.21	
Trigla lyra	0.60	2	0.18	
Raja straeleni	0.60	2	0.18	
Parapenaeus longirostris, fem.	0.56	130	0.17	1964
Sepia orbignyana	0.46	8	0.14	
Sepia elegans	0.22	18	0.07	
Pegusa lascaris	0.16	6	0.05	
Parapenaeus longirostris, male	0.16	62	0.05	1963
Chlorophthalmus punctatus	0.10	8	0.03	
Boops boops	0.06	6	0.02	
Total	338.26		100.02	

PROJECT STATION: 941

DATE:20/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1027
start stop duration Long E 1304
TIME :13:12:00 13:26:00 14 (min) Purpose code: 3
LOG :3718.60 3719.40 0.80 Area code : 1
FDEPTH: 277 278 GearCond.code: 8
BDEPTH: 277 278 Validity code: 1
Towing dir: 150° Wire out: 920 m Speed: 30 kn*10

Sorted: 40 Kg Total catch: 112.81 CATCH/HOUR: 483.47

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	258.86	5640	53.54	
Dentex macrophthalmus	68.79	180	14.23	1966
MYCTOPHIDAE	26.91	8897	5.57	
Synagrops microlepis	25.37	1663	5.25	
Zenopsis conchifer	24.00	257	4.96	
Hoplostethus mediterraneus	17.14	34	3.55	
Brotula barbata	11.49	17	2.38	
Malacocephalus laevis	9.09	69	1.88	
Parapenaeus longirostris, male	8.23	1560	1.70	1967
Parapenaeus longirostris, fem.	7.03	1080	1.45	1968
Lacmonema laureysi	6.00	86	1.24	
Coelorinchus coelorhincus	5.66	189	1.17	
Dibranchus atlanticus	3.09	274	0.64	
Callinectes pallidus	2.91	34	0.60	
Pontinus kuhlii	2.74	34	0.57	
Pterothrissus belloci	2.57	17	0.53	
Macroparalepis macrogeneion	1.89	86	0.39	
Eumunida squamifera	0.86	120	0.18	
Arnoglossus imperialis	0.86	34	0.18	
Total	483.49		100.01	

PROJECT STATION: 942

DATE:20/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1027
start stop duration Long E 1303
TIME :19:37:00 20:07:00 30 (min) Purpose code: 3
LOG :3738.70 3740.20 1.50 Area code : 1
FDEPTH: 372 377 GearCond.code:
BDEPTH: 372 377 Validity code: 1
Towing dir: 143° Wire out:1200 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 357.46 CATCH/HOUR: 714.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	215.60	51030	30.16	
Chlorophthalmus atlanticus	198.80	2954	27.81	
Merluccius polli	115.50	392	16.16	1969
Hymenocephalus italicus	58.80	9744	8.22	
Malacocephalus sp.	43.68	308	6.11	
Lacmonema laureysi	25.76	420	3.60	
Pterothrissus belloci	9.80	70	1.37	
Etmopterus spinax	8.54	210	1.19	
Chaceon maritae	8.54	28	1.19	
Coelorinchus coelorhincus	4.34	140	0.61	
Aristeus varidens, female	4.06	434	0.57	1971
MURAENIDAE	4.00	10	0.56	
Chaunax pictus	3.36	112	0.47	
Aristeus varidens, male	2.66	378	0.37	1970
Epigonus telescopus	2.10	28	0.29	
Lophius vaillanti	1.82	28	0.25	
Todaropsis eblanae	1.68	14	0.23	
Bathynectes piperitus	1.68	42	0.23	
Dibranchus atlanticus	1.54	140	0.22	
Bathyuroconger vicinus	0.84	28	0.12	
Cynoglossus sp.	0.70	14	0.10	
Gadella imberbis	0.56	14	0.08	
Macroparalepis macrogeneion	0.42	28	0.06	
SQUILLIDAE	0.14	14	0.02	
Total	714.92		99.99	

PROJECT STATION: 943

DATE:20/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1028
start stop duration Long E 1301
TIME :21:20:00 21:32:00 12 (min) Purpose code: 3
LOG :3747.30 3747.90 0.60 Area code : 1
FDEPTH: 449 456 GearCond.code:
BDEPTH: 449 456 Validity code: 1
Towing dir: 145° Wire out:1350 m Speed: 32 kn*10

Sorted: 42 Kg Total catch: 128.70 CATCH/HOUR: 643.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	209.25	300	32.52	1974
Nematocarcinus africanus	187.50	83430	29.14	
Laemonema laureysi	80.85	1365	12.56	
Gonostoma elongatum	39.45	1155	6.13	
Dibranchus atlanticus	17.55	1020	2.73	
Hoplostethus cadenati	16.80	450	2.61	
Aristeus varidens, female	16.50	945	2.56	1973
Geryon sp.	14.70	45	2.28	
Malacocephalus sp.	12.60	75	1.96	
Coelorinchus coelorhincus	11.10	180	1.72	
Etmopterus spinax	10.20	225	1.59	
Aristeus varidens, male	4.80	720	0.75	1972
Trichiurus lepturus	4.65	120	0.72	
Hymenocephalus italicus	2.85	255	0.44	
GONOSTOMATIDAE	2.55	180	0.40	
Chaunax pictus	2.25	30	0.35	
Lophius vaillanti	1.80	15	0.28	
Halosaurus ovenii	1.80	75	0.28	
Gadella imberbis	1.65	30	0.26	
Bathyuroconger vicinus	1.05	60	0.16	
Scyllarides herklotsii	0.90	75	0.14	
Lamprogrammus exutus	0.75	75	0.12	
Talismania sp.	0.60	30	0.09	
MYCTOPHIDAE	0.45	750	0.07	
Chlorophthalmus atlanticus	0.45	30	0.07	
Bathynectes piperitus	0.45	15	0.07	
Total	643.50		100.00	

PROJECT STATION: 944

DATE:20/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1049
start stop duration Long E 1312
TIME :03:00:00 03:23:00 23 (min) Purpose code: 3
LOG :3783.80 3785.00 1.20 Area code : 1
FDEPTH: 701 704 GearCond.code:
BDEPTH: 701 704 Validity code: 1
Towing dir: 325° Wire out:1850 m Speed: 30 kn*10

Sorted: 11 Kg Total catch: 237.40 CATCH/HOUR: 619.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nezumia sp.	123.13	1930	19.88	
Talismania sp.	117.91	574	19.04	
Bathyuroconger vicinus	99.65	887	16.09	
Cruriraja parcomaculata	99.13	261	16.01	
Geryon sp.	58.43	417	9.43	
Hoplostethus cadenati	41.22	522	6.66	
Dibranchus atlanticus	28.70	939	4.63	
Dicrolene intronigra	25.57	470	4.13	
Aristeus varidens, female	11.48	730	1.85	1976
Lophius vaillanti	6.78	52	1.09	
Scyllarides herklotsii	4.17	678	0.67	
Lepidopus caudatus	2.61	52	0.42	
Aristeus varidens, male	0.52	52	0.08	1975
Total	619.30		99.98	

PROJECT STATION: 945

DATE:20/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1046
start stop duration Long E 1313
TIME :04:42:00 05:12:00 30 (min) Purpose code: 3
LOG :3791.40 3792.90 1.50 Area code : 1
FDEPTH: 551 546 GearCond.code:
BDEPTH: 551 546 Validity code: 1
Towing dir: 325° Wire out: 945 m Speed: 30 kn*10

Sorted: 49 Kg Total catch: 98.18 CATCH/HOUR: 196.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	75.20	16472	38.30	
Hoplostethus cadenati	21.40	1224	10.90	
GONOSTOMATIDAE	19.36	1024	9.86	
Chlorophthalmus atlanticus	17.68	428	9.00	
Laemonema laureysi	13.80	96	7.03	
Lamprogrammus exutus	11.40	48	5.81	
Merluccius polli	9.20	12	4.69	
Coloconger cadenati	5.20	12	2.65	
Trichiurus lepturus	3.84	80	1.96	
Gadella imberbis	2.92	128	1.49	
C E P H A L O P O D A	2.88	8	1.47	
Etmopterus spinax	2.24	20	1.14	
Gonostoma elongatum	1.80	60	0.92	
Coelorinchus coelorhincus	1.48	12	0.75	
Aristeus varidens, male	1.16	148	0.59	1977
Aristeus varidens, female	1.12	248	0.57	1978
Talismania sp.	0.96	60	0.49	
Dibranchus atlanticus	0.88	56	0.45	
CONGRIDAE	0.76	4	0.39	
Scyllarides herklotsii	0.64	112	0.33	
Bathyuroconger vicinus	0.60	24	0.31	
Plesiopenaeus edwardsianus	0.56	84	0.29	
SQUILLIDAE	0.44	160	0.22	
Malacocephalus sp.	0.40	8	0.20	
Halosaurus ovenii	0.16	16	0.08	
NEMICHTHYIDAE	0.12	12	0.06	
Bathynectes piperitus	0.08	4	0.04	
Ebinania costaecanarie	0.04	4	0.02	
Lophius vaillanti	0.04	4	0.02	
Total	196.36		100.03	

PROJECT STATION: 946

DATE:21/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1046
start stop duration Long E 1314
TIME :07:05:00 07:35:00 30 (min) Purpose code: 3
LOG :3800.00 3801.50 1.50 Area code : 1
FDEPTH: 451 446 GearCond.code:
BDEPTH: 451 446 Validity code: 1
Towing dir: 324° Wire out:1290 m Speed: 30 kn*10

Sorted: 88 Kg Total catch: 248.72 CATCH/HOUR: 497.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
GONOSTOMATIDAE	110.28	2244	22.17	
Nematocarcinus africanus	108.00	23652	21.71	
Squalus megalops	95.20	24	19.14	
Merluccius polli	43.80	84	8.81	
Etmopterus spinax	21.00	192	4.22	
Neoharriotta pinnata	18.24	4	3.67	
Gonostoma elongatum	16.44	432	3.30	
Plesiopenaeus edwardsianus	13.68	5412	2.75	
Chlorophthalmus atlanticus	11.04	300	2.22	
Hoplostethus cadenati	9.36	396	1.88	
Gadella imberbis	8.40	492	1.69	
Laemonema laureysi	8.40	444	1.69	
Talismania sp.	7.68	852	1.54	
Aristeus varidens, female	6.00	516	1.21	1980
Coloconger cadenati	3.84	12	0.77	
Aristeus varidens, male	3.60	372	0.72	1979
Trichiurus lepturus	3.36	72	0.68	
Bathyuroconger vicinus	2.40	96	0.48	
Lophius vaillanti	1.80	24	0.36	
TRACHIPTERIDAE	1.20	12	0.24	
Coelorinchus coelorhincus	1.20	48	0.24	
Illex coindetii	1.20	12	0.24	
Halosaurus ovenii	0.72	36	0.14	
Macroparalepis macrogeneion	0.24	12	0.05	
NEMICHTHYIDAE	0.24	24	0.05	
Cynoglossus sp.	0.12	12	0.02	
Bembrops heterurus	0.12	24	0.02	
Total	497.56		100.01	

PROJECT STATION: 947

DATE:21/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1046
start stop duration Long E 1316
TIME :08:42:00 09:12:00 30 (min) Purpose code: 3
LOG :3807.90 3809.40 1.50 Area code : 1
FDEPTH: 356 351 GearCond.code:
BDEPTH: 356 351 Validity code: 1
Towing dir: 320° Wire out:1150 m Speed: 30 kn*10

Sorted: 55 Kg Total catch: 221.04 CATCH/HOUR: 442.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	95.44	42056	21.59	
Nematocarcinus africanus	84.64	26600	19.15	
Merluccius polli	84.40	296	19.09	1981
Laemonema laureysi	52.80	1584	11.94	
Chlorophthalmus atlanticus	38.88	272	8.79	
Hymenocephalus italicus	28.32	3296	6.41	
Zenopsis conchifer	27.36	40	6.19	
Malacocephalus sp.	11.68	128	2.64	
Coelorinchus coelorhincus	5.60	168	1.27	
Trichiurus lepturus	3.92	240	0.89	
GONOSTOMATIDAE	2.72	88	0.62	
Macroparalepis macrogeneion	1.76	104	0.40	
MURAENIDAE	1.60	8	0.36	
Gonostoma elongatum	0.64	24	0.14	
Parapenaeus longirostris	0.48	96	0.11	
Histioteuthis reversa	0.48	8	0.11	
Chaunax pictus	0.48	48	0.11	
Gadella imberbis	0.48	8	0.11	
Aristeus varidens	0.40	56	0.09	
Bathyuroconger vicinus	0.24	16	0.05	
Lophius vaillanti	0.24	8	0.05	
Eumunida squamifera	0.08	32	0.02	
Scorpaena sp.	0.08	16	0.02	
Peristedion cataphractum	0.08	32	0.02	
Total	442.80		100.17	

PROJECT STATION: 948

DATE:21/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1045
start stop duration Long E 1319
TIME :10:40:00 11:10:00 30 (min) Purpose code: 3
LOG :3817.20 3818.80 1.60 Area code : 1
FDEPTH: 238 237 GearCond.code:
BDEPTH: 238 237 Validity code: 1
Towing dir: 320° Wire out: 780 m Speed: 30 kn*10

Sorted: 103 Kg Total catch: 228.14 CATCH/HOUR: 456.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	246.60	6372	54.05	
Dentex macrophthalmus	81.70	318	17.91	1984
Synagrops microlepis	47.76	2976	10.47	
Zenopsis conchifer	39.90	492	8.74	
Trachurus trecae	15.06	30	3.30	
Merluccius polli	8.76	60	1.92	
Raja miraletus	3.60	6	0.79	
Bembrops greyi	2.70	30	0.59	
Coelorinchus coelorhincus	2.28	60	0.50	
Parapenaeus longirostris, fem.	1.68	228	0.37	1983
Todaropsis eblanae	1.32	12	0.29	
Illex coindetii	0.78	18	0.17	
Parapenaeus longirostris, male	0.68	116	0.15	1982
Pontinus kuhlii	0.66	12	0.14	
Uranoscopus polli	0.60	6	0.13	
Pterothrissus belloci	0.48	6	0.11	
Peristedion cataphractum	0.42	12	0.09	
Monolene microstoma	0.12	6	0.03	
Total	455.10		99.75	

PROJECT STATION: 949

DATE:21/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1044
start stop duration Long E 1321
TIME :12:02:00 12:28:00 26 (min) Purpose code: 3
LOG :3824.60 3826.20 1.60 Area code : 1
FDEPTH: 150 150 GearCond.code:
BDEPTH: 150 150 Validity code: 1
Towing dir: 325° Wire out: 550 m Speed: 35 kn*10

Sorted: 114 Kg Total catch: 229.78 CATCH/HOUR: 530.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	270.46	2520	51.01	1986
Trachurus trecae	153.69	900	28.98	1985
Zenopsis conchifer	25.57	129	4.82	
Dentex angolensis	25.34	97	4.78	1987
Pterothrissus belloci	16.48	120	3.11	
Trichiurus lepturus	7.98	5	1.50	
Bembrops heterurus	6.05	97	1.14	
Sepia bertheloti	3.97	28	0.75	1990
Citharus linguatula	3.32	42	0.63	
Spicara alta	3.32	28	0.63	
Monolene microstoma	3.00	148	0.57	
Chelidonichthys gabonensis	2.31	18	0.44	
Illex coindetii	2.17	42	0.41	1989
Uranoscopus polli	1.71	14	0.32	
Todaropsis eblanae	1.52	37	0.29	1988
Brotula barbata	1.52	5	0.29	
Pontinus kuhlii	1.38	5	0.26	
Peristedion cataphractum	0.46	14	0.09	
Total	530.35		100.02	

PROJECT STATION: 950

DATE:21/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1041
start stop duration Long E 1332
TIME :14:11:00 14:41:00 30 (min) Purpose code: 3
LOG :3840.20 3841.90 1.70 Area code : 1
FDEPTH: 75 74 GearCond.code:
BDEPTH: 75 74 Validity code: 1
Towing dir: 330° Wire out: 320 m Speed: 30 kn*10

Sorted: 111 Kg Total catch: 155.51 CATCH/HOUR: 311.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	104.20	624	33.50	1991
Sparus auriga *	61.08	288	19.64	1995
Trichiurus lepturus	40.60	148	13.05	
Pagellus bellottii	28.28	270	9.09	1994
Umbrina canariensis	21.60	126	6.94	
Stromateus fiatola	18.16	24	5.84	
Dentex macrophthalmus	10.54	52	3.39	1992
Octopus sp.	7.42	10	2.39	
Dentex angolensis	5.46	126	1.76	1993
Pomadasys jubelini	3.92	4	1.26	
Zeus faber	3.78	14	1.22	
Brachydeuterus auritus	2.74	18	0.88	
Chaetodon hoefleri	1.58	10	0.51	
Selene dorsalis	0.64	8	0.21	
Dentex barnardi	0.56	8	0.18	
Pseudupeneus prayensis	0.36	4	0.12	
Peristedion cataphractum	0.10	4	0.03	
Dicologoglossa hexophthalma	0.04	4	0.01	
Total	311.06		100.02	

PROJECT STATION: 951

DATE:21/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1039
start stop duration Long E 1342
TIME :16:16:00 16:46:00 30 (min) Purpose code: 3
LOG :3854.70 3856.20 1.50 Area code : 1
FDEPTH: 25 24 GearCond.code:
BDEPTH: 25 24 Validity code: 1
Towing dir: 325° Wire out: 120 m Speed: 31 kn*10

Sorted: 129 Kg Total catch: 972.03 CATCH/HOUR: 1944.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	488.24	10646	25.11	
Pseudotolithus typus	239.24	284	12.31	
Trachurus trecae	211.50	584	10.88	1996
Galeoides decadactylus	198.74	1590	10.22	
Trichiurus lepturus	166.50	1064	8.56	
Pteroscion peli	99.90	2954	5.14	
Pomadasys jubelini	99.74	164	5.13	
Pomadasys rogeri	89.24	240	4.59	
Sphyraena guachancho	58.50	90	3.01	1997
Dentex barnardi	53.54	134	2.75	1999
Stromateus fiatola	49.50	60	2.55	
Lithognathus mormyrus	43.64	74	2.24	
Pomadasys incisus	28.26	134	1.45	
Ilisha africana	27.90	494	1.44	
Sepia orbignyana	24.00	30	1.23	2000
Atractoscion aequidens	22.50	14	1.16	
Arius parkii	16.50	60	0.85	
Cynoglossus sp.	9.00	14	0.46	
Pagellus bellottii	7.34	14	0.38	
Selene dorsalis	7.04	164	0.36	1998
Epinephelus aeneus	2.40	14	0.12	
Chloroscombrus chrysurus	0.30	14	0.02	
Total	1943.52		99.96	

PROJECT STATION: 952

DATE:22/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1059
start stop duration Long E 1346
TIME :05:26:00 05:56:00 30 (min) Purpose code: 3
LOG :3889.90 3891.70 1.80 Area code : 1
FDEPTH: 44 45 GearCond.code:
BDEPTH: 44 45 Validity code: 1
Towing dir: 340° Wire out: 165 m Speed: 36 kn*10

Sorted: 48 Kg Total catch: 334.98 CATCH/HOUR: 669.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pteroscion peli	228.34	6320	34.08	
Brachydeuterus auritus	78.00	1668	11.64	2001
Trachurus trecae	76.66	180	11.44	2002
Trichiurus lepturus	45.66	666	6.82	
Pseudotolithus typus	36.54	126	5.45	
Pomadasys jubelini	31.80	46	4.75	
Sepia orbignyana	24.46	26	3.65	2003
Argyrosomus hololepidotus	24.34	54	3.63	
Cynoglossus sp.	21.40	474	3.19	
Cynoponticus ferox	16.66	14	2.49	
Atractoscion aequidens	15.14	6	2.26	
Parapenaeopsis atlantica	14.06	2526	2.10	
Arius parkii	9.34	6	1.39	
Umbrina canariensis	8.60	80	1.28	
Dasyatis margarita	7.04	14	1.05	
Torpedo nobiliana	6.54	6	0.98	
Raja miraletus	6.34	6	0.95	
Rhinobatos albomaculatus	6.20	2	0.93	
Ephippion guttifer	6.00	6	0.90	
Brotula barbata	3.00	66	0.45	
Bembrops heterurus	1.86	66	0.28	
Pomadasys rogeri	1.46	6	0.22	
Citharus linguatula	0.34	34	0.05	
ANTENNARIIDAE	0.06	6	0.01	
GOBIIDAE	0.06	6	0.01	
Fistularia petimba	0.06	6	0.01	
Total	669.96		100.01	

PROJECT STATION: 953

DATE:22/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1106
start stop duration Long E 1341
TIME :07:15:00 07:45:00 30 (min) Purpose code: 3
LOG :3901.30 3903.00 1.70 Area code : 1
FDEPTH: 79 81 GearCond.code:
BDEPTH: 79 81 Validity code: 1
Towing dir: 335° Wire out: 280 m Speed: 34 kn*10

Sorted: 109 Kg Total catch: 219.62 CATCH/HOUR: 439.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	248.20	1660	56.51	2006
Brachydeuterus auritus	67.00	1364	15.25	2005
Sepia orbignyana	60.60	48	13.80	2004
Selene dorsalis	14.84	32	3.38	
Trichiurus lepturus	10.00	44	2.28	
Dentex macrophthalmus	9.72	72	2.21	
Zeus faber	8.84	28	2.01	
Pagellus bellottii	6.00	56	1.37	
Dasyatis margarita	3.72	4	0.85	
Atractoscion aequidens	2.92	4	0.66	
Umbrina canariensis	1.36	16	0.31	
Dentex barnardi	1.16	24	0.26	
Cynoglossus sp.	0.88	4	0.20	
Torpedo torpedo	0.84	4	0.19	
Dicologoglossa hexophthalma	0.76	12	0.17	
Alloteuthis africana	0.72	164	0.16	
Bembrops heterurus	0.44	8	0.10	
Brotula barbata	0.32	4	0.07	
Todaropsis eblanae	0.28	12	0.06	
Miracorvina angolensis	0.24	16	0.05	
GOBIIDAE	0.20	28	0.05	
Pterothrissus belloci	0.16	4	0.04	
Citharus linguatula	0.04	12	0.01	
Total	439.24		99.99	

PROJECT STATION: 954

DATE:22/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1105
start stop duration Long E 1334
TIME :09:41:00 10:11:00 30 (min) Purpose code: 3
LOG :3918.30 3919.90 1.60 Area code : 1
FDEPTH: 194 194 GearCond.code:
BDEPTH: 194 194 Validity code: 1
Towing dir: 355° Wire out: 660 m Speed: 32 kn*10

Sorted: 96 Kg Total catch: 579.54 CATCH/HOUR: 1159.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	379.32	146856	32.73	
Dentex macrophthalmus	289.80	768	25.00	2007
Synagrops microlepis	170.16	16524	14.68	
Trachurus trecae	127.80	240	11.03	2008
Merluccius polli	112.80	1068	9.73	2011
Zenopsis conchifer	33.96	504	2.93	
Trichiurus lepturus	18.12	324	1.56	
Pterothrissus belloci	12.84	96	1.11	
Brotula barbata	8.04	12	0.69	
Parapenaeus longirostris, fem.	4.08	768	0.35	2010
Parapenaeus longirostris, male	1.20	360	0.10	2009
Squilla mantis	0.36	12	0.03	
Todaropsis eblanae	0.36	12	0.03	
Chlorophthalmus atlanticus	0.24	48	0.02	
Total	1159.08		99.99	

PROJECT STATION: 955

DATE:22/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1102
start stop duration Long E 1331
TIME :11:05:00 11:35:00 30 (min) Purpose code: 3
LOG :3925.70 3927.40 1.70 Area code : 1
FDEPTH: 269 274 GearCond.code:
BDEPTH: 269 274 Validity code: 1
Towing dir: 175° Wire out: 900 m Speed: 31 kn*10

Sorted: 95 Kg Total catch: 254.64 CATCH/HOUR: 509.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	136.00	44918	26.70	
Chlorophthalmus atlanticus	94.66	2656	18.59	
Merluccius polli	93.34	762	18.33	2014
Synagrops microlepis	69.86	5674	13.72	
Dentex macrophthalmus	55.74	278	10.94	2015
Pterothrissus belloci	42.24	378	8.29	
Parapenaeus longirostris, fem.	9.66	1254	1.90	2013
Parapenaeus longirostris, male	3.62	618	0.71	2012
Trichiurus lepturus	1.82	48	0.36	
Sepia officinalis hierredda	0.48	26	0.09	
Lophius vaillanti	0.32	6	0.06	
Illex coindetii	0.26	6	0.05	
Bassanago albescens	0.26	6	0.05	
Pontinus kuhlii	0.26	22	0.05	
MORIDAE	0.22	6	0.04	
Zenopsis conchifer	0.22	6	0.04	
Coelorinchus coelorhincus	0.16	6	0.03	
Solenocera africana	0.16	38	0.03	
Total	509.28		99.98	

PROJECT STATION: 956

DATE:22/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1103
start stop duration Long E 1330
TIME :13:00:00 13:30:00 30 (min) Purpose code: 3
LOG :3933.40 3935.00 1.40 Area code : 1
FDEPTH: 349 349 GearCond.code:
BDEPTH: 349 349 Validity code: 1
Towing dir: 170° Wire out:1080 m Speed: 38 kn*10

Sorted: 63 Kg Total catch: 1043.13 CATCH/HOUR: 2086.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	1577.40	9636	75.61	2018
Nematocarcinus africanus	348.48		16.70	
Chlorophthalmus atlanticus	40.92	760	1.96	
Hymenocephalus italicus	22.44	4324	1.08	
Bassanago albescens	22.12	528	1.06	
Etmopterus spinax	20.14	2410	0.97	
Parapenaeus longirostris, fem.	7.26	692	0.35	2017
Malacocephalus laevis	6.60	66	0.32	
Laemonema laureysi	6.60	66	0.32	
Callinectes sp.	5.94	66	0.28	
MYCTOPHIDAE	5.94	6138	0.28	
Coelorinchus coelorhincus	4.96	100	0.24	
Gadella imberbis	4.30	132	0.21	
Parapenaeus longirostris, male	3.96	496	0.19	2016
Solenocera africana	2.64	396	0.13	
Trichiurus lepturus	2.64	66	0.13	
Hoplostethus cadenati	1.66	34	0.08	
Macroparalepis macrogeneion	1.66	100	0.08	
Chaunax pictus	0.66	100	0.03	
Total	2086.32		100.02	

PROJECT STATION: 957

DATE:22/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1103
start stop duration Long E 1328
TIME :14:34:00 15:04:00 30 (min) Purpose code: 3
LOG :3941.40 3943.20 1.80 Area code : 1
FDEPTH: 455 442 GearCond.code:
BDEPTH: 455 442 Validity code: 1
Towing dir: 165° Wire out:1250 m Speed: 35 kn*10

Sorted: 132 Kg Total catch: 390.87 CATCH/HOUR: 781.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
OPLOPHORIDAE	365.04	255528	46.70	
Merluccius polli	199.80	332	25.56	2019
Nematocarcinus africanus	91.26	36504	11.67	
Yarrella blackfordi	16.38	540	2.10	
Aristeus varidens, male	16.02	2250	2.05	2020
Coelorinchus coelorhincus	13.14	594	1.68	
Chlorophthalmus atlanticus	10.08	252	1.29	
Aristeus varidens, female	9.72	810	1.24	2021
MELANOSTOMIATIDAE	9.18	234	1.17	
Laemonema laureysi	7.56	72	0.97	
GONOSTOMATIDAE	7.02	1080	0.90	
Todaropsis eblanae	6.84	36	0.87	
Halosaurus ovenii	5.76	504	0.74	
Hoplostethus cadenati	5.76	234	0.74	
Lepidopus caudatus	5.04	180	0.64	
Gadella imberbis	3.42	162	0.44	
Malacocephalus laevis	3.06	36	0.39	
Bassanago albescens	2.34	18	0.30	
Oxynotus centrina	2.16	18	0.28	
Hymenocephalus italicus	0.72	54	0.09	
Galeus polli	0.72	18	0.09	
Scyliorhinus sp.	0.54	18	0.07	
Nezumia sp.	0.18	90	0.02	
Total	781.74		100.00	

PROJECT STATION: 958

DATE:22/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1104
start stop duration Long E 1327
TIME :16:24:00 16:54:00 30 (min) Purpose code: 3
LOG :3950.70 3952.70 2.00 Area code : 1
FDEPTH: 554 550 GearCond.code:
BDEPTH: 554 550 Validity code: 1
Towing dir: 165° Wire out:1550 m Speed: 33 kn*10

Sorted: 31 Kg Total catch: 155.50 CATCH/HOUR: 311.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	73.00	24670	23.47	
GONOSTOMATIDAE	72.40	3070	23.28	
Hoplostethus cadenati	43.70	1590	14.05	
Merluccius polli	41.50	50	13.34	
Gonostoma elongatum	24.00	690	7.72	
Laemonema laureysi	15.30	390	4.92	
Etmopterus spinax	10.30	90	3.31	
Plesiopenaeus edwardsianus	6.80	2080	2.19	
Malacocephalus occidentalis	5.70	80	1.83	
Aristeus varidens, male	4.60	610	1.48	2022
Coelorinchus coelorhincus	4.00	20	1.29	
Gadella imberbis	3.50	100	1.13	
Bathyuroconger vicinus	1.70	80	0.55	
Talismania sp.	1.30	90	0.42	
Chlorophthalmus atlanticus	1.20	30	0.39	
Halosaurus ovenii	0.60	20	0.19	
Aristeus varidens, female	0.40	250	0.13	2023
CONGRIDAE	0.40	10	0.13	
Scyllarides berklotsii	0.20	20	0.06	
Ebinania costaecanarie	0.10	10	0.03	
NEMICHTHYIDAE	0.10	20	0.03	
Lamprogrammus exutus	0.10	20	0.03	
Total	310.90		99.97	

PROJECT STATION: 959

DATE:22/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1107
start stop duration Long E 1325
TIME :19:04:00 19:34:00 30 (min) Purpose code: 3
LOG :3960.00 3962.00 2.00 Area code : 1
FDEPTH: 701 701 GearCond.code:
BDEPTH: 701 701 Validity code: 1
Towing dir: 177° Wire out:1850 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 113.64 CATCH/HOUR: 227.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	45.60	848	20.06	
Lamprogrammus exutus	39.60	144	17.42	
Bathyuroconger vicinus	27.28	592	12.00	
Malacocephalus occidentalis	22.24	168	9.79	
GONOSTOMATIDAE	20.24	1064	8.91	
Merluccius polli	11.44	16	5.03	
Gonostoma elongatum	11.12	288	4.89	
Talismania sp.	8.64	200	3.80	
Hoplostethus cadenati	6.96	168	3.06	
Etmopterus spinax	6.32	48	2.78	
Scyllarides berklotsii	5.28	312	2.32	
CONGRIDAE	5.28	64	2.32	
Alepocephalus sp.	5.12	16	2.25	
Dicrolene intronigra	3.68	400	1.62	
Aristeus varidens	2.40	104	1.06	
Chlorophthalmus atlanticus	1.84	40	0.81	
Melanonus zugmayeri	1.60	16	0.70	
Dibranchus atlanticus	0.80	40	0.35	
Chaceon maritae	0.48	8	0.21	
Plesiopenaeus edwardsianus	0.48	40	0.21	
Halosaurus ovenii	0.40	64	0.18	
NEMICHTHYIDAE	0.40	16	0.18	
Plesionika martia	0.08	40	0.04	
Total	227.28		99.99	

PROJECT STATION: 960

DATE:23/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1126
start stop duration Long E 1321
TIME :23:42:00 00:12:00 30 (min) Purpose code: 3
LOG :3992.80 3994.40 1.60 Area code : 1
FDEPTH: 612 604 GearCond.code:
BDEPTH: 612 604 Validity code: 1
Towing dir: 30° Wire out:1700 m Speed: 30 kn*10

Sorted: 54 Kg Total catch: 107.62 CATCH/HOUR: 215.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	54.84	11272	25.48	
MELANOSTOMIATIDAE	48.80	976	22.67	
Lamprogrammus exutus	26.40	116	12.27	
Hoplostethus cadenati	13.36	1008	6.21	
Yarrella blackfordi	10.20	316	4.74	
Ebinania costaecanarie	9.44	16	4.39	
OPLOPHORIDAE	8.76	3504	4.07	
Aristeus varidens, female	5.76	272	2.68	2025
Laemonema laureysi	5.60	80	2.60	
Alepocephalus sp.	4.44	160	2.06	
Merluccius polli	4.40	6	2.04	
Lepidopus caudatus	3.12	80	1.45	
GONOSTOMATIDAE	3.08	448	1.43	
Etmopterus spinax	2.40	36	1.12	
Melanonus zugmayeri	2.28	44	1.06	
Bathyuroconger vicinus	2.12	76	0.98	
SCYLLARIDAE	1.84	208	0.85	
Xenodermichthys copei	1.64	72	0.76	
Nezumia sp.	1.48	36	0.69	
Aristeus varidens, male	1.24	152	0.58	2024
Scymnodon obscurus	0.68	4	0.32	
Dibranchus atlanticus	0.64	32	0.30	
OPHICHTHIDAE	0.52	8	0.24	
Chlorophthalmus atlanticus	0.44	12	0.20	
NEMICHTHYIDAE	0.36	8	0.17	
NOTOSUDIDAE	0.28	4	0.13	
Halosaurus ovenii	0.28	4	0.13	
Onychoteithis sp.	0.20	4	0.09	
Gadella imberbis	0.16	4	0.07	
Dicrolene intronigra	0.16	12	0.07	
Lophius vaillanti	0.16	12	0.07	
Total	215.08		99.92	

PROJECT STATION: 961

DATE:23/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1127
start stop duration Long E 1323
TIME :01:59:00 02:29:00 30 (min) Purpose code: 3
LOG :4004.80 4006.30 1.50 Area code : 1
FDEPTH: 416 421 GearCond.code:
BDEPTH: 416 421 Validity code: 1
Towing dir: 30° Wire out:1250 m Speed: 31 kn*10

Sorted: 51 Kg Total catch: 171.90 CATCH/HOUR: 343.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	173.44	56080	50.45	
MELANOSTOMIATIDAE	27.68	568	8.05	
Laemonema laureysi	23.28	528	6.77	
Merluccius polli	21.80	34	6.34	2028
Hoplostethus cadenati	18.88	760	5.49	
Yarrella blackfordi	16.48	488	4.79	
Aristeus varidens, female	13.92	904	4.05	2026
Etmopterus spinax	11.28	360	3.28	
Aristeus varidens, male	6.64	784	1.93	2027
Coelorinchus coelorhincus	6.56	272	1.91	
Malacocephalus laevis	5.52	64	1.61	
OPLOPHORIDAE	4.96	2232	1.44	
Lepidopus caudatus	2.64	64	0.77	
Lophius vaillanti	2.16	24	0.63	
Scymnodon obscurus	2.16	16	0.63	
Pterothrissus belloci	1.52	8	0.44	
Solenocera africana	1.36	128	0.40	
Gadella imberbis	1.20	40	0.35	
GONOSTOMATIDAE	0.88	128	0.26	
Callinectes pallidus	0.80	8	0.23	
Bathyuroconger vicinus	0.40	16	0.12	
Halosaurus ovenii	0.24	24	0.07	
Total	343.80		100.01	

PROJECT STATION: 962

DATE:23/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1125
start stop duration Long E 1325
TIME :03:51:00 04:21:00 30 (min) Purpose code: 3
LOG :4011.70 4013.30 1.60 Area code : 1
FDEPTH: 350 351 GearCond.code:
BDEPTH: 350 351 Validity code: 1
Towing dir: 215° Wire out:1100 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 210.44 CATCH/HOUR: 420.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	180.40	344	42.86	2029
Laemonema laureysi	82.80	1104	19.67	
Nematocarcinus africanus	66.40	21584	15.78	
Etmopterus spinax	18.00	120	4.28	
Pterothrissus belloci	11.68	48	2.78	
GONOSTOMATIDAE	10.24	200	2.43	
Gonostoma elongatum	10.08	336	2.39	
Hoplostethus cadenati	9.36	360	2.22	
Coelorinchus coelorhincus	6.24	216	1.48	
Nezumia sp.	5.20	56	1.24	
Chlorophthalmus atlanticus	3.20	80	0.76	
Gadella imberbis	2.24	80	0.53	
Parapenaeus longirostris, male	2.00	400	0.48	2030
Halosaurus ovenii	1.92	160	0.46	
Hymenocephalus italicus	1.68	224	0.40	
Todaropsis eblanae	1.36	8	0.32	
Parapenaeus longirostris, fem.	1.20	232	0.29	2031
Trichiurus lepturus	1.12	24	0.27	
Aristeus varidens	1.04	56	0.25	
MYCTOPHIDAE	0.80	312	0.19	
Scorpaena angolensis	0.80	24	0.19	
Bathynectes piperitus	0.64	8	0.15	
Plesiopenaeus edwardsianus	0.48	64	0.11	
NEMICHTHYIDAE	0.48	16	0.11	
Chaunax pictus	0.08	16	0.02	
Talismania sp.	0.08	32	0.02	
Eumunida squamifera	0.08	56	0.02	
Scyllarides herklotsii	0.08	16	0.02	
Total	419.68		99.72	

PROJECT STATION: 963

DATE:23/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1127
start stop duration Long E 1325
TIME :06:36:00 07:06:00 30 (min) Purpose code: 3
LOG :3031.40 3033.20 1.80 Area code : 1
FDEPTH: 220 218 GearCond.code:
BDEPTH: 220 218 Validity code: 1
Towing dir: 34° Wire out: 680 m Speed: 36 kn*10

Sorted: 135 Kg Total catch: 542.56 CATCH/HOUR: 1085.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	464.00	14328	42.76	
MYCTOPHIDAE	434.40	221152	40.03	
Dentex macrophthalmus	56.00	448	5.16	2033
Synagrops microlepis	43.20	2352	3.98	
Merluccius polli	35.60	296	3.28	2032
Zenopsis conchifer	17.52	184	1.61	
Trachurus trecae	10.48	24	0.97	
Pterothrissus belloci	7.20	48	0.66	
Parapenaeus longirostris, fem.	4.96	824	0.46	2035
Brotula barbata	3.28	8	0.30	
Parapenaeus longirostris, male	2.88	592	0.27	2034
Ophidion sp.	1.68	120	0.15	
Trichiurus lepturus	1.68	64	0.15	
Todaropsis eblanae	0.56	16	0.05	
Sepia sp.	0.56	56	0.05	
Macroparalepis macrogeneion	0.40	16	0.04	
Illex coindetii	0.40	8	0.04	
C R A B S	0.32	8	0.03	
Total	1085.12		99.99	

PROJECT STATION: 964

DATE:23/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1128
start stop duration Long E 1326
TIME :08:06:00 08:22:00 16 (min) Purpose code: 3
LOG :4040.00 4040.90 0.90 Area code : 1
FDEPTH: 111 118 GearCond.code:
BDEPTH: 111 118 Validity code: 1
Towing dir: 30° Wire out: 360 m Speed: 35 kn*10

Sorted: 120 Kg Total catch: 179.25 CATCH/HOUR: 672.19

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	415.43	2408	61.80	2037
Trachurus trecae	195.49	409	29.08	2036
Umbrina canariensis	10.01	34	1.49	
Anthias anthias	8.10	98	1.21	
Sparus caeruleostictus *	7.84	11	1.17	
Octopus sp.	7.65	8	1.14	
Hoplostethus mediterraneus	4.50	4	0.67	
Parapristipoma octolineatum	3.49	8	0.52	
Pontinus accraensis	3.38	19	0.50	
Zeus faber	3.26	30	0.48	
Chaetodon hoefleri	3.00	19	0.45	
Erythrocles monodi	2.44	8	0.36	
Selene dorsalis	2.44	8	0.36	
Dentex angolensis	2.10	56	0.31	2038
Spicara alta	1.46	19	0.22	
Todaropsis eblanae	0.90	19	0.13	
Boops boops	0.45	8	0.07	
Peristedion cataphractum	0.19	8	0.03	
Citharus sp.	0.08	8	0.01	
Total	672.21		100.00	

PROJECT STATION: 965

DATE:23/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1127
start stop duration Long E 1330
TIME :09:46:00 10:16:00 30 (min) Purpose code: 3
LOG :4050.30 4052.00 1.70 Area code : 1
FDEPTH: 87 85 GearCond.code:
BDEPTH: 87 85 Validity code: 1
Towing dir: 340° Wire out: 300 m Speed: 34 kn*10

Sorted: 115 Kg Total catch: 810.81 CATCH/HOUR: 1621.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	802.20	7084	49.47	2040
Dentex macrophthalmus	541.10	2618	33.37	2041
Selene dorsalis	108.08	952	6.66	2039
Dentex angolensis	45.22	140	2.79	2042
Raja sp.	26.46	14	1.63	
Atractoscion aequidens	24.08	28	1.48	
Decapterus rhonchus	22.82	28	1.41	
Pagellus bellottii	12.88	84	0.79	
Trichiurus lepturus	10.50	28	0.65	
Octopus sp.	9.38	14	0.58	
Dentex barnardi	8.12	42	0.50	
Boops boops	7.14	42	0.44	
Brachydeuterus auritus	2.38	14	0.15	
Chelidonichthys sp.	1.26	14	0.08	
Total	1621.62		100.00	

PROJECT STATION: 966

DATE:23/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1123
start stop duration Long E 1333
TIME :12:15:00 12:45:00 30 (min) Purpose code: 3
LOG :4066.40 4068.00 1.60 Area code : 1
FDEPTH: 53 52 GearCond.code:
BDEPTH: 53 52 Validity code: 1
Towing dir: 160° Wire out: 220 m Speed: 32 kn*10

Sorted: 49 Kg Total catch: 49.27 CATCH/HOUR: 98.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus rhonchus	64.80	106	65.76	2043
Sepia orbignyana	8.04	6	8.16	
Trachurus trecae	8.04	34	8.16	2044
Sparus auriga *	7.06	22	7.16	2045
Pagellus bellottii	4.04	30	4.10	2046
Sepia officinalis hierredda	2.82	2	2.86	
Fistularia petimba	1.54	8	1.56	
Zeus faber	0.68	2	0.69	
Chaetodon robustus	0.50	4	0.51	
Trachinus draco	0.48	6	0.49	
Sphyraena guachancho	0.48	2	0.49	
Citharus linguatula	0.06	2	0.06	
Total	98.54		100.00	

PROJECT STATION: 967

DATE:23/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1123
start stop duration Long E 1339
TIME :14:26:00 14:56:00 30 (min) Purpose code: 3
LOG :4081.90 4083.50 1.60 Area code : 1
FDEPTH: 36 36 GearCond.code:
BDEPTH: 36 36 Validity code: 1
Towing dir: 350° Wire out: 180 m Speed: 37 kn*10

Sorted: 129 Kg Total catch: 743.13 CATCH/HOUR: 1486.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	1118.38	59778	75.25	2047
Lithognathus mormyrus	106.96	184	7.20	2048
Trachurus trecae	100.06	426	6.73	2049
Stromateus fiatola	29.56	34	1.99	
Sphyraena guachancho	20.82	70	1.40	
Selene dorsalis	20.02	196	1.35	2050
Dentex canariensis	16.56	80	1.11	
Galeoides decadactylus	14.96	184	1.01	
Trichiurus lepturus	11.84	34	0.80	
Pagellus bellottii	10.46	58	0.70	
Sphyraena sphyraena	9.66	34	0.65	
Pseudotolithus senegalensis	9.20	12	0.62	
Raja miraletus	8.06	12	0.54	
Pomadasys incisus	5.98	46	0.40	
Sparus auriga *	3.80	12	0.26	
Total	1486.32		100.01	

PROJECT STATION: 968

DATE:23/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1120

	start	stop	duration			Long E 1341
TIME	:16:27:00	16:31:00	4	(min)	Purpose code:	3
LOG	:4097.90	4098.10	0.20		Area code :	1
FDEPTH:	27	26			GearCond.code:	
BDEPTH:	27	26			Validity code:	4

Towing dir: 178° Wire out: 150 m Speed: 30 kn*10

Sorted: 70 Kg Total catch: 70.13 CATCH/HOUR: 1051.95

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyrna lewini	328.50	60	31.23	
Arius parkii	140.25	405	13.33	
Trachurus trecae	99.00	225	9.41	2051
Trichiurus lepturus	80.25	720	7.63	
Selene dorsalis	74.55	225	7.09	2052
Brachydeuterus auritus	55.95	420	5.32	
Pomadasys jubelini	54.75	60	5.20	
Lithognathus mormyrus	43.65	75	4.15	
Pteroscion peli	38.40	480	3.65	
Ilisha africana	29.10	420	2.77	
Pseudotolithus typus	28.95	45	2.75	
Raja miraletus	17.55	30	1.67	
Sepia sp.	17.25	15	1.64	
Pomadasys rogeri	15.15	15	1.44	
Umbrina canariensis	12.45	30	1.18	
Dentex gibbosus	9.60	15	0.91	
Pomadasys incisus	3.60	45	0.34	
Trachinus sp.	3.00	15	0.29	
Total	1051.95		100.00	

PROJECT STATION: 969

DATE:23/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1146

	start	stop	duration			Long E 1344
TIME	:05:34:00	06:04:00	30	(min)	Purpose code:	3
LOG	:4127.20	4128.90	1.70		Area code :	1
FDEPTH:	31	31			GearCond.code:	
BDEPTH:	31	31			Validity code:	1

Towing dir: 350° Wire out: 130 m Speed: 34 kn*10

Sorted: 138 Kg Total catch: 242.38 CATCH/HOUR: 484.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Stromateus fiatola	93.46	64	19.28	
Brachydeuterus auritus	74.02	2888	15.27	2053
Galeoides decadactylus	70.70	570	14.58	
Pomadasys incisus	47.26	414	9.75	
Pteroscion peli	42.88	1410	8.85	
Pseudotolithus typus	41.48	50	8.56	
Trichiurus lepturus	29.76	512	6.14	
Sepia orbignyana	21.18	22	4.37	2057
Pagellus bellottii	14.88	38	3.07	2054
Trachurus trecae	14.22	32	2.93	2056
Lithognathus mormyrus	10.04	18	2.07	
Atractoscion aequidens	4.28	4	0.88	
Argyrosomus hololepidotus	4.16	4	0.86	
Cynoglossus senegalensis	3.72	14	0.77	
Torpedo nobiliana	3.40	4	0.70	
Umbrina canariensis	2.88	18	0.59	2055
Selene dorsalis	2.60	8	0.54	
Penaeus notialis	1.64	38	0.34	
Dicologoglossa cuneata	0.92	10	0.19	
Pomadasys rogeri	0.64	4	0.13	
Sardinella maderensis	0.52	28	0.11	
Citharus linguatula	0.08	8	0.02	
Alectis alexandrinus	0.04	14	0.01	
Total	484.76		100.01	

PROJECT STATION: 970

DATE:24/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1142

	start	stop	duration			Long E 1346
TIME	:07:25:00	07:55:00	30	(min)	Purpose code:	3
LOG	:4137.00	4138.80	1.80		Area code :	1
FDEPTH:	62	60			GearCond.code:	
BDEPTH:	62	60			Validity code:	1

Towing dir: 350° Wire out: 220 m Speed: 36 kn*10

Sorted: 131 Kg Total catch: 459.01 CATCH/HOUR: 918.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	701.40	4246	76.40	2085
Pagellus bellottii	58.64	462	6.39	2083
Sepia orbignyana	41.66	22	4.54	2086
Trichiurus lepturus	40.96	106	4.46	
Dentex canariensis	16.32	140	1.78	2084
Decapterus rhonchus	13.72	22	1.49	
Atractoscion aequidens	10.64	14	1.16	
Brachydeuterus auritus	10.30	64	1.12	
Fistularia petimba	5.82	14	0.63	
Zeus faber	5.32	8	0.58	
Chaetodon hoefleri	3.36	14	0.37	
Spondyliosoma cantharus	3.16	8	0.34	
Raja miraletus	2.74	8	0.30	
Sphyraena sphyraena	2.60	8	0.28	
Citharus linguatula	0.64	8	0.07	
Pseudupeneus prayensis	0.56	22	0.06	
Alloteuthis africana	0.36		0.04	
Total	918.20		100.01	

PROJECT STATION: 971

DATE:24/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1142

	start	stop	duration			Long E 1333
TIME	:09:22:00	09:52:00	30	(min)	Purpose code:	3
LOG	:4149.80	4151.50	1.70		Area code :	1
FDEPTH:	103	109			GearCond.code:	
BDEPTH:	103	109			Validity code:	1

Towing dir: 335° Wire out: 360 m Speed: 34 kn*10

Sorted: 130 Kg Total catch: 520.24 CATCH/HOUR: 1040.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	648.00	13042	62.28	2059
Dentex macrophthalmus	340.80	2052	32.75	2058
Dentex angolensis	20.64	200	1.98	2060
Raja miraletus	11.76	16	1.13	
Octopus sp.	8.08	8	0.78	
Pagellus bellottii	7.52	64	0.72	
Dentex canariensis	1.76	8	0.17	
Boops boops	1.12	8	0.11	
Todaropsis eblanae	0.80	40	0.08	
Total	1040.48		100.00	

PROJECT STATION: 972

DATE:24/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1143

	start	stop	duration			Long E 1328
TIME	:11:18:00	11:48:00	30	(min)	Purpose code:	3
LOG	:4161.20	4162.70	1.50		Area code :	1
FDEPTH:	160	160			GearCond.code:	
BDEPTH:	160	160			Validity code:	1

Towing dir: 335° Wire out: 600 m Speed: 29 kn*10

Sorted: 93 Kg Total catch: 277.56 CATCH/HOUR: 555.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	274.20	2670	49.39	2061
Trachurus trecae	176.70	558	31.83	2062
Pterothrissus belloci	45.72	402	8.24	
Zenopsis conchifer	30.90	390	5.57	
Dentex angolensis	12.78	66	2.30	2063
Todaropsis eblanae	6.84	144	1.23	2064
Illex coindetii	2.82	60	0.51	2065
Squatina oculata	1.56	6	0.28	
Citharus linguatula	0.78	18	0.14	
Merluccius polli	0.72	12	0.13	
Monolene microstoma	0.66	30	0.12	
Chelidonichthys gabonensis	0.54	6	0.10	
Bembrops greyi	0.48	6	0.09	
Pontinus kuhlii	0.42	6	0.08	
Total	555.12		100.01	

PROJECT STATION: 973

DATE:24/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1144

	start	stop	duration			Long E 1325
TIME	:12:46:00	13:16:00	30	(min)	Purpose code:	3
LOG	:4169.40	4171.20	1.80		Area code :	1
FDEPTH:	243	246			GearCond.code:	
BDEPTH:	243	246			Validity code:	1

Towing dir: 350° Wire out: 800 m Speed: 30 kn*10

Sorted: 140 Kg Total catch: 320.25 CATCH/HOUR: 640.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	347.00	18746	54.18	
Dentex macrophthalmus	180.40	594	28.17	2068
Synagrops microlepis	61.88	4810	9.66	
Zenopsis conchifer	30.20	330	4.72	
Pterothrissus belloci	8.08	64	1.26	
Merluccius polli	4.40	46	0.69	
Macroparalepis macrogeneion	2.38	92	0.37	
Coelorinchus coelorhincus	1.84	100	0.29	
Todaropsis eblanae	1.28	36	0.20	
Parapenaeus longirostris, fem.	1.20	156	0.19	2067
Parapenaeus longirostris, male	0.28	46	0.04	2066
MYCTOPHIDAE	0.28	46	0.04	
Eumunida squamifera	0.28	18	0.04	
Pteroscion peli	0.28	10	0.04	
Chlorophthalmus punctatus	0.18	18	0.03	
Hymenocephalus italicus	0.18	18	0.03	
Total	640.14		99.95	

PROJECT STATION: 974

DATE:24/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1144

	start	stop	duration			Long E 1323
TIME	:14:57:00	15:27:00	30	(min)	Purpose code:	3
LOG	:4179.60	4181.20	1.60		Area code :	1
FDEPTH:	349	351			GearCond.code:	
BDEPTH:	349	351			Validity code:	1

Towing dir: 350° Wire out:1100 m Speed: 30 kn*10

Sorted: 162 Kg Total catch: 1167.38 CATCH/HOUR: 2334.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	827.40	472800	35.44	
MYCTOPHIDAE	519.46	190456	22.25	
Etmopterus spinax	471.90	10576	20.21	
Merluccius polli	153.76	886	6.59	2069
Plesionika martia	137.26	40110	5.88	
Pterothrissus belloci	89.86	436	3.85	
Laemonema laureysi	31.06	376	1.33	
Chlorophthalmus atlanticus	23.70	406	1.02	
Malacocephalus occidentalis	20.40	226	0.87	
Coelorinchus coelorhincus	19.50	840	0.84	
Centrophorus uyato	14.10	2	0.60	
Macroparalepis macrogeneion	6.30	286	0.27	
Hymenocephalus italicus	4.80	346	0.21	
Hoplostethus cadenati	4.20	150	0.18	
Lepidopus caudatus	3.76	150	0.16	
Bassanago albescens	3.30	150	0.14	
Bathyuroconger vicinus	2.26	30	0.10	
Pontinus kuhlii	0.90	16	0.04	
Parapenaeus longirostris, fem.	0.90	76	0.04	
Total	2334.82		100.02	

PROJECT STATION: 975

DATE:24/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1144
start stop duration Long E 1321
TIME :16:43:00 17:13:00 30 (min) Purpose code: 3
LOG :4188.60 4190.30 1.70 Area code : 1
FDEPTH: 449 452 GearCond.code:
BDEPTH: 449 452 Validity code: 1
Towing dir: 350° Wire out:1300 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 173.40 CATCH/HOUR: 346.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	107.40	156	30.97	2070
GONOSTOMATIDAE	93.00	2172	26.82	
Nematocarcinus africanus	37.50	8748	10.81	
Gonostoma elongatum	26.70	1380	7.70	
Etmopterus spinax	14.94	366	4.31	
Hoplostethus cadenati	11.04	414	3.18	
Laemonema laureysi	8.88	378	2.56	
Gadella imberbis	8.04	198	2.32	
Talismania sp.	6.60	882	1.90	
Aristeus varidens, female	6.54	468	1.89	2072
Pterothrissus belloci	6.00	24	1.73	
Chlorophthalmus atlanticus	3.96	30	1.14	
Plesiopenaeus edwardsianus	3.36	768	0.97	
Malacocephalus occidentalis	3.18	24	0.92	
Aristeus varidens, male	2.64	366	0.76	2071
Coelorinchus coelorhincus	1.62	66	0.47	
Bathyuroconger vicinus	1.20	96	0.35	
Galeus polli	0.90	12	0.26	
Nemichthys scolopaceus	0.78	48	0.22	
Halosaurus ovenii	0.72	36	0.21	
MYCTOPHIDAE	0.60	222	0.17	
Macroparalepis macrogeneion	0.48	12	0.14	
Lophius vaillanti	0.36	6	0.10	
Lamprogrammus exutus	0.30	18	0.09	
SOLEIDAE	0.06	6	0.02	
Total	346.80		100.01	

PROJECT STATION: 976

DATE:24/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1143
start stop duration Long E 1319
TIME :18:39:00 19:09:00 30 (min) Purpose code: 3
LOG :4199.00 4200.60 1.60 Area code : 1
FDEPTH: 552 554 GearCond.code:
BDEPTH: 552 554 Validity code: 1
Towing dir: 355° Wire out:1600 m Speed: 32 kn*10

Sorted: 59 Kg Total catch: 177.29 CATCH/HOUR: 354.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	68.10	2796	19.21	
GONOSTOMATIDAE	66.90	1500	18.87	
Gonostoma elongatum	60.30	2574	17.01	
Merluccius polli	54.60	90	15.40	2073
Nematocarcinus africanus	37.08	8652	10.46	
Bathyuroconger vicinus	8.64	540	2.44	
Etmopterus spinax	7.86	144	2.22	
Laemonema laureysi	7.80	114	2.20	
Aristeus varidens, female	7.50	522	2.12	2075
Lamprogrammus exutus	5.10	180	1.44	
Epigonus telescopus	4.80	6	1.35	
MACROURIDAE	4.68	126	1.32	
Plesiopenaeus edwardsianus	2.64	594	0.74	
Aristeus varidens, male	2.62	356	0.74	2074
Malacocephalus occidentalis	2.40	18	0.68	
Gadella imberbis	2.10	60	0.59	
Halosaurus ovenii	1.80	36	0.51	
Trichiurus lepturus	1.68	48	0.47	
Talismania sp	1.44	342	0.41	
Macroparalepis macrogeneion	1.20	18	0.34	
Pterothrissus belloci	1.20	6	0.34	
Trachyrincus scabrus	0.90	6	0.25	
Coelorinchus coelorhincus	0.84	66	0.24	
MYCTOPHIDAE	0.72	288	0.20	
Nemichthys scolopaceus	0.66	54	0.19	
OPLOPHORIDAE	0.36	60	0.10	
Scyllarides herklotsii	0.36	42	0.10	
Galeus polli	0.30	6	0.08	
Total	354.58		100.02	

PROJECT STATION: 977

DATE:24/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1142
start stop duration Long E 1317
TIME :21:14:00 21:29:00 15 (min) Purpose code: 3
LOG :4210.00 4210.70 0.70 Area code : 1
FDEPTH: 714 718 GearCond.code:
BDEPTH: 714 718 Validity code: 1
Towing dir: 355° Wire out:1850 m Speed: 28 kn*10

Sorted: 34 Kg Total catch: 67.32 CATCH/HOUR: 269.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lamprogrammus exutus	62.80	160	23.32	
GONOSTOMATIDAE	52.96	920	19.67	
Hoplostethus cadenati	40.00	856	14.85	
Bathyuroconger vicinus	29.12	512	10.81	
Gonostoma elongatum	21.44	520	7.96	
Coelorinchus coelorhincus	11.44	232	4.25	
CONGRIDAE	7.04	64	2.61	
MACROURIDAE	6.64	152	2.47	
Scyllarides herklotsii	6.32	256	2.35	
Merluccius polli	6.00	8	2.23	
Trichiurus lepturus	5.12	168	1.90	
Etmopterus spinax	4.80	40	1.78	
Aristeus varidens, female	4.48	192	1.66	2076
Ebinania costaecanarie	3.68	8	1.37	
Plesionika martia	3.04	200	1.13	
Nematocarcinus africanus	1.20	280	0.45	
Chaceon maritae	1.20	16	0.45	
Plesiopenaeus edwardsianus	0.80	184	0.30	
Galeus polli	0.80	8	0.30	
Nemichthys scolopaceus	0.40	16	0.15	
Total	269.28		100.01	

PROJECT STATION: 978

DATE:25/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1204
start stop duration Long E 1323
TIME :01:53:00 02:23:00 30 (min) Purpose code: 3
LOG :4241.90 4243.60 1.70 Area code : 1
FDEPTH: 548 551 GearCond.code:
BDEPTH: 548 551 Validity code: 1
Towing dir: 345° Wire out:1550 m Speed: 38 kn*10

Sorted: 44 Kg Total catch: 202.16 CATCH/HOUR: 404.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MELANOSTOMIATIDAE	126.00	5556	31.16	
Hoplostethus cadenati	44.88	1392	11.10	
Aristeus varidens, female	36.24	1836	8.96	2077
Lepidopus caudatus	33.12	900	8.19	
Yarrella blackfordi	28.80	720	7.12	
Merluccius polli	25.60	34	6.33	2079
Nematocarcinus africanus	24.60	14052	6.08	
Melanonus zugmayeri	15.36	300	3.80	
Gonostoma elongatum	11.04	1344	2.73	
Aristeus varidens, male	8.16	996	2.02	2078
Centroscymnus crepidater	7.08	24	1.75	
MYCTOPHIDAE	6.00	2220	1.48	
Halosaurus ovenii	6.00	168	1.48	
Laemonema laureysi	4.80	36	1.19	
Chlorophthalmus atlanticus	4.56	96	1.13	
Lamprogrammus exutus	4.32	156	1.07	
GONOSTOMATIDAE	4.20	288	1.04	
Etmopterus lucifer	4.08	12	1.01	
Etmopterus spinax	3.84	36	0.95	
Xenodermichthys copei	2.52	96	0.62	
Gadella imberbis	1.80	36	0.45	
Talismania sp.	0.60	36	0.15	
Nezumia sp.	0.48	36	0.12	
Scyllarides herklotsii	0.24	12	0.06	
Total	404.32		99.99	

PROJECT STATION: 979

DATE:25/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1203
start stop duration Long E 1325
TIME :03:45:00 04:15:00 30 (min) Purpose code: 3
LOG :4251.80 4253.40 1.60 Area code : 1
FDEPTH: 454 450 GearCond.code:
BDEPTH: 454 450 Validity code: 1
Towing dir: 360° Wire out:1300 m Speed: 35 kn*10

Sorted: 75 Kg Total catch: 285.26 CATCH/HOUR: 570.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
GONOSTOMATIDAE	193.90	3374	33.99	
Gonostoma elongatum	89.60	2422	15.70	
Merluccius polli	80.10	114	14.04	2080
Nematocarcinus africanus	60.20	14042	10.55	
Hoplostethus cadenati	45.50	2044	7.98	
Aristeus varidens, female	18.34	1190	3.21	2082
Etmopterus spinax	15.12	98	2.65	
Trichiurus lepturus	12.18	322	2.13	
Pterothrissus belloci	9.52	42	1.67	
Talismania sp.	8.26	700	1.45	
Laemonema laureysi	6.02	70	1.06	
Aristeus varidens, male	5.60	756	0.98	2081
Chaceon maritae	4.20	14	0.74	
Lamprogrammus exutus	4.20	42	0.74	
Galeus polli	2.94	56	0.52	
Halosaurus ovenii	2.80	154	0.49	
Chlorophthalmus atlanticus	2.38	42	0.42	
Bathyuroconger vicinus	1.82	42	0.32	
Plesiopenaeus edwardsianus	1.68	378	0.29	
Gadella imberbis	1.68	56	0.29	
OPLOPHORIDAE	1.26	140	0.22	
Nemichthys scolopaceus	1.26	42	0.22	
RHINOCHIMAERIDAE	1.12	14	0.20	
Bathynectes piperitus	0.84	14	0.15	
Total	570.52		100.01	

PROJECT STATION: 980

DATE:25/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1202
start stop duration Long E 1327
TIME :05:47:00 06:17:00 30 (min) Purpose code: 3
LOG :4263.50 4265.00 1.50 Area code : 1
FDEPTH: 354 367 GearCond.code:
BDEPTH: 354 367 Validity code: 1
Towing dir: 205° Wire out:1150 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 133.18 CATCH/HOUR: 266.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pterothrissus belloci	88.00	530	33.04	
Merluccius polli	43.40	110	16.29	2087
Hymenocephalus italicus	21.00	1780	7.88	
Laemonema laureysi	19.00	250	7.13	
Chlorophthalmus atlanticus	16.40	400	6.16	
GONOSTOMATIDAE	15.20	350	5.71	
Gonostoma elongatum	12.70	510	4.77	
Malacocephalus occidentalis	8.20	110	3.08	
Etmopterus spinax	7.00	170	2.63	
Aristeus varidens, female	5.36	470	2.01	2089
Galeus polli	3.90	130	1.46	
Hoplostethus cadenati	3.60	120	1.35	
Trichiurus lepturus	3.50	100	1.31	
Coelorinchus coelorhincus	3.00	90	1.13	
Bathynectes piperitus	2.50	40	0.94	
Halosaurus ovenii	2.40	150	0.90	
Nematocarcinus africanus	2.20	530	0.83	
Aristeus varidens, male	1.80	306	0.68	2088
Synagrops microlepis	1.60	90	0.60	
Heptranchias perlo	1.10	10	0.41	
Plesiopenaeus edwardsianus	1.00	240	0.38	
Gadella imberbis	1.00	50	0.38	
Talismania sp.	0.70	90	0.26	
Peristedion cataphractum	0.50	20	0.19	
Chaunax pictus	0.50	10	0.19	
Nemichthys scolopaceus	0.50	20	0.19	
SOLEIDAE	0.20	10	0.08	
Bathyuroconger vicinus	0.10	10	0.04	
Total	266.36		100.02	

PROJECT STATION: 981

DATE:25/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1206

	start	stop	duration			Long E 1326
TIME	:08:25:00	08:35:00	10 (min)	Purpose code:	3	
LOG	:4280.00	4280.50	0.50	Area code :	1	
FDEPTH:	251	254		GearCond.code:	8	
BDEPTH:	251	254		Validity code:	1	

Towing dir: 20° Wire out: 770 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 31.88 CATCH/HOUR: 191.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	141.60	462	74.03	2090
Epigonus telescopus	13.86	144	7.25	
Synagrops microlepis	13.14	978	6.87	
Pterothrissus belloci	9.30	72	4.86	
Brotula barbata	3.30	6	1.73	
MYCTOPHIDAE	2.64	930	1.38	
Parapenaeus longirostris, fem.	2.04	228	1.07	2092
Coelorinchus coelorhincus	1.86	36	0.97	
Hoplostethus mediterraneus	1.80	6	0.94	
Parapenaeus longirostris, male	0.72	102	0.38	2091
Bembrops heterurus	0.72	6	0.38	
Scorpaena sp.	0.24	6	0.13	
Sepia sp.	0.06	6	0.03	
Total	191.28		100.02	

PROJECT STATION: 982

DATE:25/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1203

	start	stop	duration			Long E 1331
TIME	:10:07:00	10:37:00	30 (min)	Purpose code:	3	
LOG	:4288.30	4289.80	1.50	Area code :	1	
FDEPTH:	100	100		GearCond.code:		
BDEPTH:	100	100		Validity code:	1	

Towing dir: 190° Wire out: 330 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 43.21 CATCH/HOUR: 86.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	38.70	216	44.78	2096
Trachurus trecae	20.10	54	23.26	2097
Dentex angolensis	16.30	108	18.86	2093
Pagellus bellottii	4.18	50	4.84	2094
Sparus auriga *	2.04	8	2.36	2095
Chaetodon hoefleri	2.02	14	2.34	
Perulibatrachus rossignoli	0.86	6	1.00	
Dentex gibbosus	0.78	2	0.90	
Chelidonichthys gabonensis	0.54	6	0.62	
Fistularia petimba	0.34	2	0.39	
Dentex barnardi	0.28	2	0.32	
Illex coindetii	0.12	4	0.14	
Neomerinthe folgori	0.08	2	0.09	
Boops boops	0.08	2	0.09	
Total	86.42		99.99	

PROJECT STATION: 983

DATE:25/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1201

	start	stop	duration			Long E 1338
TIME	:12:06:00	12:36:00	30 (min)	Purpose code:	3	
LOG	:4301.10	4302.50	1.40	Area code :	1	
FDEPTH:	62	61		GearCond.code:		
BDEPTH:	62	61		Validity code:	1	

Towing dir: 186° Wire out: 240 m Speed: 30 kn*10

Sorted: 114 Kg Total catch: 113.96 CATCH/HOUR: 227.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	82.50	836	36.20	2098
Pomadasys incisus	35.00	318	15.36	
Sparus auriga *	27.90	226	12.24	2100
Trachurus trecae	24.80	500	10.88	2101
Raja miraletus	10.30	14	4.52	
Sepia orbignyana	7.72	14	3.39	
Pseudupeneus prayensis	7.10	66	3.12	
Octopus sp.	6.70	4	2.94	
Umbrina canariensis	4.06	34	1.78	
Chaetodon hoefleri	3.56	18	1.56	
Lithognathus mormyrus	3.48	6	1.53	
Trichiurus lepturus	3.40	10	1.49	
Fistularia petimba	3.02	10	1.33	
Rhinobatos albomaculatus	2.96	2	1.30	
Dentex macrophthalmus	2.08	10	0.91	2099
Dentex gibbosus	0.66	2	0.29	
Alloteuthis africana	0.64	192	0.28	
Chelidonichthys gabonensis	0.54	4	0.24	
Decapterus rhonchus	0.48	4	0.21	
Miracorvina angolensis	0.42	2	0.18	
Brachydeuterus auritus	0.26	2	0.11	
Todaropsis eblanae	0.16	116	0.07	
Dentex angolensis	0.10	2	0.04	
Citharus linguatula	0.04	2	0.02	
Sardinella aurita	0.04	2	0.02	
Total	227.92		100.01	

PROJECT STATION: 984

DATE:25/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1213

	start	stop	duration			Long E 1336
TIME	:14:21:00	14:51:00	30 (min)	Purpose code:	3	
LOG	:4316.40	4317.80	1.40	Area code :	1	
FDEPTH:	43	44		GearCond.code:		
BDEPTH:	43	44		Validity code:	1	

Towing dir: 20° Wire out: 200 m Speed: 30 kn*10

Sorted: 122 Kg Total catch: 368.76 CATCH/HOUR: 737.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys peroteti	179.40	228	24.32	
Brachydeuterus auritus	93.60	3120	12.69	2106
Pomadasys incisus	72.30	630	9.80	
Sparus auriga *	49.50	294	6.71	2102
Pagellus bellottii	45.30	384	6.14	2103
Stromateus fiatola	41.10	42	5.57	
Trichiurus lepturus	32.04	210	4.34	
Atractoscion aequidens	31.56	18	4.28	
Sepia orbignyana	27.72	30	3.76	
Rhinobatos albomaculatus	23.70	6	3.21	
Solea vulgaris	21.54	1014	2.92	
Dasyatis marmorata	18.24	6	2.47	
Raja miraletus	15.18	18	2.06	
Sarda sarda	12.60	6	1.71	
Galeoides decadactylus	11.82	60	1.60	
Citharus linguatula	11.16	366	1.51	
Lithognathus mormyrus	9.48	18	1.29	
Trachurus trecae	9.00	24	1.22	
Penaeus notialis, female	8.70	144	1.18	2105
Torpedo torpedo	6.84	24	0.93	
Miracorvina angolensis	5.76	24	0.78	
Zeus faber	5.34	12	0.72	
Bembrops greyi	3.06	60	0.41	
Penaeus notialis, male	2.58	102	0.35	2104
Total	737.52		99.97	

PROJECT STATION: 985

DATE:25/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1221

	start	stop	duration			Long E 1329
TIME	:16:33:00	17:03:00	30 (min)	Purpose code:	3	
LOG	:4332.30	4334.00	1.70	Area code :	1	
FDEPTH:	68	68		GearCond.code:		
BDEPTH:	68	68		Validity code:	1	

Towing dir: 50° Wire out: 300 m Speed: 31 kn*10

Sorted: 144 Kg Total catch: 312.68 CATCH/HOUR: 625.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	199.36	784	31.88	2109
Umbrina canariensis	144.22	346	23.06	2108
Pagellus bellottii	62.80	644	10.04	2107
Citharus linguatula	56.48	1462	9.03	
Dentex macrophthalmus	26.32	216	4.21	2110
Lepidotrigla carolae	22.42	184	3.59	
Sepia orbignyana	18.90	28	3.02	2111
Raja miraletus	18.86	28	3.02	
Pterothrissus belloci	17.86	184	2.86	
Atractoscion aequidens	17.32	4	2.77	
Trichiurus lepturus	13.32	30	2.13	
Decapterus rhonchus	6.58	10	1.05	
Zeus faber	4.14	14	0.66	
Bembrops heterurus	4.06	68	0.65	
Dentex canariensis	2.70	36	0.43	
Miracorvina angolensis	1.54	10	0.25	
Serranus cabrilla	1.40	22	0.22	
Torpedo torpedo	1.30	4	0.21	
Pomadasys incisus	0.82	4	0.13	
Dentex angolensis	0.64	10	0.10	
Chaetodon hoefleri	0.58	4	0.09	
Brotula barbata	0.54	4	0.09	
Dicologoglossa cuneata	0.40	4	0.06	
Fistularia petimba	0.40	4	0.06	
GOBIIDAE	0.36	28	0.06	
Engraulis encrasicolus	0.04	4	0.01	
Total	623.36		99.68	

PROJECT STATION: 986

DATE:25/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 1222

	start	stop	duration			Long E 1324
TIME	:19:15:00	19:45:00	30 (min)	Purpose code:	3	
LOG	:4349.90	4351.40	1.50	Area code :	1	
FDEPTH:	105	105		GearCond.code:		
BDEPTH:	105	105		Validity code:	1	

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

Sorted: 67 Kg Total catch: 202.92 CATCH/HOUR: 405.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	268.20	2534	66.09	2112
Pagellus bellottii	24.42	474	6.02	2113
Chelidonichthys gabonensis	16.68	342	4.11	
MYCTOPHIDAE	13.80	6816	3.40	
Citharus linguatula	12.00	606	2.96	
Boops boops	11.88	144	2.93	
Raja clavata	10.92	6	2.69	
Uranoscopus cadenati	8.40	30	2.07	
Raja miraletus	7.80	18	1.92	
Lepidotrigla carolae	6.18	18	1.52	
Pterothrissus belloci	5.40	6	1.33	
Trachurus trecae	4.44	84	1.09	
Spicara alta	4.26	186	1.05	
Arnoglossus imperialis	3.00	18	0.74	
Sepia orbignyana	2.64	54	0.65	2114
Dicologoglossa hexophthalma	2.40	48	0.59	
Bathyuroconger vicinus	1.02	18	0.25	
OPHIDIIDAE	0.60	30	0.15	
Pontinus accraensis	0.48	12	0.12	
Shrimps, small, non comm.	0.42	204	0.10	
Scorpaena normani	0.24	30	0.06	
Todaropsis eblanae	0.18	6	0.04	
Branchiostegus semifasciatus	0.18	6	0.04	
Merluccius polli	0.18	6	0.04	
CONGRIDAE	0.12	6	0.03	
Total	405.84		99.99	

PROJECT STATION: 987

DATE:25/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1222
start stop duration Long E 1320
TIME :20:58:00 21:13:00 15 (min) Purpose code: 3
LOG :4366.50 4367.20 0.70 Area code : 1
FDEPTH: 448 465 GearCond.code:
BDEPTH: 448 465 Validity code: 1
Towing dir: 210° Wire out:1290 m Speed: 28 kn*10

Sorted: 47 Kg Total catch: 158.13 CATCH/HOUR: 632.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	196.52	300	31.07	2115
Yarrella blackfordi	80.32	2260	12.70	
Lamprogrammus exutus	52.60	260	8.32	
Aristeus varidens, female	47.40	3240	7.49	2117
Hoplostethus cadenati	47.00	1660	7.43	
Squalus megalops	29.00	8	4.58	
Ebinania costaecanarie	23.40	40	3.70	
Chaceon maritae	22.00	40	3.48	
Laemonema laureysi	20.40	300	3.23	
Galeus polli	16.80	240	2.66	
Aristeus varidens, male	16.40	2400	2.59	2116
Halosaurus ovenii	15.80	760	2.50	
Pterothrissus belloci	13.00	60	2.06	
Scyllarides herklotsii	12.40	1820	1.96	
Etmopterus spinax	10.60	180	1.68	
Coelorinchus coelorhincus	8.80	200	1.39	
MELANOSTOMIATIDAE	5.00	240	0.79	
Gadella imberbis	3.40	100	0.54	
Chlorophthalmus atlanticus	1.80	40	0.28	
Malacocephalus occidentalis	1.60	40	0.25	
Nezumia sp.	1.60	100	0.25	
Plesiopenaeus edwardsianus	1.00	40	0.16	
Dibranchus atlanticus	0.80	40	0.13	
NETTASTOMATIDAE	0.80	20	0.13	
Bathynectes piperitus	0.60	20	0.09	
Bathyuroconger vicinus	0.60	60	0.09	
Total	629.64		99.55	

PROJECT STATION: 988

DATE:26/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1225
start stop duration Long E 1317
TIME :00:04:00 00:34:00 30 (min) Purpose code: 3
LOG :4378.20 4379.80 1.60 Area code : 1
FDEPTH: 551 576 GearCond.code:
BDEPTH: 551 576 Validity code: 1
Towing dir: 20° Wire out:1550 m Speed: 31 kn*10

Sorted: 105 Kg Total catch: 489.58 CATCH/HOUR: 979.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Yarrella blackfordi	516.60	14028	52.76	
Merluccius polli	151.20	202	15.44	2118
Hoplostethus cadenati	100.80	3920	10.29	
Laemonema laureysi	59.92	392	6.12	
Aristeus varidens, female	39.48	2576	4.03	2119
MELANOSTOMIATIDAE	25.76	532	2.63	
Scyllarides herklotsii	17.36	1568	1.77	
Aristeus varidens, male	16.24	2212	1.66	2120
Lamprogrammus exutus	14.56	252	1.49	
MYCTOPHIDAE	8.40	6216	0.86	
Halosaurus ovenii	8.40	196	0.86	
Nezumia sp.	7.00	196	0.71	
Nematocarcinus africanus	5.88	1176	0.60	
Xenodermichthys copei	5.04	532	0.51	
Lepidopus caudatus	4.48	112	0.46	
Plesionika martia	2.52	924	0.26	
Gadella imberbis	2.52	84	0.26	
Dibranchus atlanticus	2.52	112	0.26	
Glyphus marsupialis	1.40	252	0.14	
Bathyuroconger vicinus	1.40	28	0.14	
Chlorophthalmus atlanticus	1.40	28	0.14	
Talismania sp.	0.28	56	0.03	
Total	993.16		101.42	

PROJECT STATION: 989

DATE:26/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 1225
start stop duration Long E 1315
TIME :02:51:00 03:10:00 19 (min) Purpose code: 3
LOG :4391.30 4392.20 0.90 Area code : 1
FDEPTH: 699 696 GearCond.code: 9
BDEPTH: 699 696 Validity code: 1
Towing dir: 30° Wire out:1800 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 111.94 CATCH/HOUR: 353.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MELANOSTOMIATIDAE	87.63	1781	24.79	
Yarrella blackfordi	68.21	1516	19.30	
Hoplostethus cadenati	53.05	2008	15.01	
Deepwater fish mixture	44.05		12.46	
Merluccius polli	34.89	47	9.87	2123
Nezumia sp.	9.19	152	2.60	
Talismania sp.	7.86	227	2.22	
OCTOPOTEUTHIDAE	7.67	28	2.17	
Aristeus varidens, female	6.63	379	1.88	2121
Melanonus zugmayeri	5.49	104	1.55	
Lepidopus caudatus	4.93	114	1.39	
Glyphus marsupialis	4.64	227	1.31	
Halosaurus ovenii	3.03	38	0.86	
Etmopterus spinax	2.84	19	0.80	
Scyllarides herklotsii	2.65	246	0.75	
Scopelosaurus sp.	2.46	9	0.70	
MYCTOPHIDAE	1.99	824	0.56	
STYLOPHOBRANCHIDAE	1.52	9	0.43	
Gonostoma sp.	1.04	76	0.29	
Bathyuroconger vicinus	1.04	9	0.29	
TRACHIPTERIDAE	1.04	9	0.29	
Aristeus varidens, male	0.95	95	0.27	2122
Nemichthys scolopaceus	0.66	9	0.19	
Gonostoma elongatum	0.09	19	0.03	
Total	353.55		100.01	

PROJECT STATION: 990

DATE:28/ 7/96 GEAR TYPE: PT No:5 POSITION:Lat S 1028
start stop duration Long E 1224
TIME :07:40:00 08:40:00 60 (min) Purpose code: 2
LOG :4603.80 4607.60 3.80 Area code : 1
FDEPTH: 300 300 GearCond.code:
BDEPTH: 2000 2000 Validity code: 4
Towing dir: 350° Wire out: 900 m Speed: 38 kn*10

Sorted: 4 Kg Total catch: 7.58 CATCH/HOUR: 7.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	5.74		75.73	
STERNOPTYCHIDAE	0.92	480	12.14	
MYCTOPHIDAE	0.46	440	6.07	
Lepidopus caudatus	0.19	6	2.51	
Histioteuthis reversa	0.08	1	1.06	
Sea cucumbers	0.04	4	0.53	
UNIDENTIFIED FISH	0.04	16	0.53	
SPARIDAE	0.02	2	0.26	
Todaropsis eblanae	0.02	2	0.26	
STOMIIDAE	0.02	16	0.26	
Peristedion cataphractum	0.02	4	0.26	
Total	7.55		99.61	

PROJECT STATION: 991

DATE:28/ 7/96 GEAR TYPE: PT No:5 POSITION:Lat S 902
start stop duration Long E 1219
TIME :17:12:00 18:12:00 60 (min) Purpose code: 2
LOG :4697.90 4701.60 3.70 Area code : 1
FDEPTH: 20 20 GearCond.code:
BDEPTH: Validity code: 4
Towing dir: 240° Wire out: 100 m Speed: 37 kn*10

Sorted: 3 Kg Total catch: 6.22 CATCH/HOUR: 6.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	3.30	2398	53.05	
TRACHIPTERIDAE	1.14	6	18.33	
Ornithoteuthis antillarum	0.52	50	8.36	
SALPS	0.48		7.72	
Ariomma bondi	0.30	12	4.82	
J E L L Y F I S H	0.24		3.86	
Macroparalepis macrogenecion	0.12	8	1.93	
Small squids	0.08	10	1.29	
SOLEIDAE	0.02	2	0.32	
Selene dorsalis	0.02	14	0.32	
Total	6.22		100.00	

PROJECT STATION: 992

DATE:29/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 845
start stop duration Long E 1247
TIME :00:06:00 00:36:00 30 (min) Purpose code: 3
LOG :4745.10 4746.90 1.80 Area code : 2
FDEPTH: 698 709 GearCond.code:
BDEPTH: 698 709 Validity code: 1
Towing dir: 200° Wire out:1850 m Speed: 31 kn*10

Sorted: 61 Kg Total catch: 157.52 CATCH/HOUR: 315.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lamprogrammus exutus	42.60	84	13.52	
Nezumia sp.	38.10	702	12.09	
Talismania sp.	31.80	294	10.09	
Trachyrincus scabrus	28.80	168	9.14	
Yarrella blackfordi	27.30	390	8.67	
Merluccius polli	26.50	44	8.41	2124
MELANOSTOMIATIDAE	22.50	468	7.14	
POLYCHAELIDAE	13.32	1086	4.23	
Dibranchus atlanticus	12.60	306	4.00	
Lophius vaillanti	11.58	24	3.68	
Chaceon maritae	8.52	18	2.70	
Cruriraja parcomaculata	8.22	24	2.61	
Nematocarcinus africanus	6.90	1362	2.19	
Centroscymnus crepidater	6.00	24	1.90	
Ebinania costaecanarie	5.28	18	1.68	
Hoplostethus cadenati	4.38	60	1.39	
Bathysadus melanobranchus	2.76	126	0.88	
Eumunida squamifera	2.46	1440	0.78	
Glyphus marsupialis	2.16	150	0.69	
STYLOPHOBRANCHIDAE	2.04	30	0.65	
Aristeus varidens, female	1.80	66	0.57	2125
STOMIIDAE	1.62	66	0.51	
Bathyuroconger vicinus	1.56	18	0.50	
OCTOPOTEUTHIDAE	1.32	6	0.42	
Melanonus zugmayeri	1.14	24	0.36	
Gadella imberbis	1.14	30	0.36	
Triplophos sp.	0.90	102	0.29	
Plesiopenaeus edwardsianus	0.72	6	0.23	
Scopelosaurus sp.	0.42	6	0.13	
Nemichthys scolopaceus	0.36	30	0.11	
Halosaurus ovenii	0.24	6	0.08	
Total	315.04		100.00	

PROJECT STATION: 993

DATE:29/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 844
start stop duration Long E 1249
TIME :02:08:00 02:38:00 30 (min) Purpose code: 3
LOG :4755.90 4757.40 1.50 Area code : 2
FDEPTH: 549 553 GearCond.code:
BDEPTH: 549 553 Validity code: 1
Towing dir: 200° Wire out:1550 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 122.43 CATCH/HOUR: 244.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	123.50	31560	50.44	
MELANOSTOMIATIDAE	33.00	626	13.48	
Triplophos sp.	24.50	2636	10.01	
Hoplostethus cadenati	20.10	606	8.21	
Centrophorus uyato	12.56	6	5.13	
Yarrella blackfordi	7.86	186	3.21	
Lamprogrammus exutus	6.60	146	2.70	
Aristeus varidens, female	5.96	260	2.43	2127
Merluccius polli	3.20	6	1.31	
POLYCHAELIDAE	1.30	166	0.53	
Melanonus zugmayeri	1.26	36	0.51	
Talismania sp.	0.86	46	0.35	
Gadella imberbis	0.86	30	0.35	
Bathyuroconger vicinus	0.76	20	0.31	
Aristeus varidens, male	0.70	80	0.29	2126
Dibranchus atlanticus	0.56	20	0.23	
Glyphus marsupialis	0.46	40	0.19	
Nezumia sp.	0.30	20	0.12	
Chlorophthalmus atlanticus	0.26	6	0.11	
Bathygadus melanobranchus	0.20	26	0.08	
Haloasaurus ovenii	0.16	6	0.07	
Total	244.96		100.06	

PROJECT STATION: 994

DATE:29/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 844
start stop duration Long E 1252
TIME :04:27:00 04:43:00 16 (min) Purpose code: 3
LOG :4765.80 4766.60 0.80 Area code : 2
FDEPTH: 448 447 GearCond.code: 9
BDEPTH: 448 447 Validity code: 1
Towing dir: 195° Wire out:1300 m Speed: 30 kn*10

Sorted: 9 Kg Total catch: 49.68 CATCH/HOUR: 186.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	48.38	12364	25.97	
Bathyuroconger vicinus	28.13	563	15.10	
Merluccius polli	23.40	45	12.56	
Lacmonema laureysi	20.25	473	10.87	
Gonostoma elongatum	14.85	630	7.97	
Aristeus varidens, female	9.68	833	5.20	2129
Talismania sp.	6.30	608	3.38	
MELANOSTOMIATIDAE	6.08	113	3.26	
Hoplostethus cadenati	5.85	225	3.14	
Aristeus varidens, male	4.73	630	2.54	2128
RHINOCHIMAERIDAE	3.83	45	2.06	
Chaunax pictus	3.38	23	1.81	
SOLEIDAE	3.15	113	1.69	
Coelorinchus coelorhincus	2.70	90	1.45	
Gadella imberbis	1.58	68	0.85	
Haloasaurus ovenii	1.58	68	0.85	
Lophius vaillanti	1.13	23	0.61	
STOMIIDAE	0.90	45	0.48	
POLYCHAELIDAE	0.23	23	0.12	
Bathynectes piperitus	0.23	23	0.12	
Total	186.36		100.03	

PROJECT STATION: 995

DATE:29/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 845
start stop duration Long E 1255
TIME :06:03:00 06:33:00 30 (min) Purpose code: 3
LOG :4774.70 4776.10 1.40 Area code : 2
FDEPTH: 346 346 GearCond.code:
BDEPTH: 348 348 Validity code: 1
Towing dir: 180° Wire out:1150 m Speed: 28 kn*10

Sorted: 50 Kg Total catch: 150.06 CATCH/HOUR: 300.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	54.24	21696	18.07	
Merluccius polli	52.50	162	17.49	2130
Lophius vaillanti	40.20	24	13.39	
Trichiurus lepturus	36.00	96	12.00	
Chlorophthalmus atlanticus	35.34	642	11.78	
MYCTOPHIDAE	18.06	6060	6.02	
Lacmonema laureysi	8.76	102	2.92	
Pterothrissus belloci	8.70	48	2.90	
Chaunax pictus	6.90	318	2.30	
Malacocephalus occidentalis	6.24	36	2.08	
Ruvettus pretiosus	5.82	6	1.94	
Zeopsis conchifer	4.38	6	1.46	
Bathyuroconger vicinus	3.72	90	1.24	
Coelorinchus coelorhincus	3.24	108	1.08	
Parapenaeus longirostris, fem.	3.18	318	1.06	2132
Hymenocephalus italicus	3.18	618	1.06	
Benthodesmus tenuis	2.52	84	0.84	
Epigonus telescopus	1.50	84	0.50	
Pontinus accraensis	0.84	60	0.28	
Dibranchus atlanticus	0.78	66	0.26	
Parapenaeus longirostris, male	0.72	66	0.24	2131
Solenocera africana	0.72	54	0.24	
Bathynectes piperitus	0.72	24	0.24	
Gadella imberbis	0.72	30	0.24	
Todaropsis eblanae	0.42	6	0.14	
Eumunida squamifera	0.42	102	0.14	
SOLEIDAE	0.30	18	0.10	
Total	300.12		100.01	

PROJECT STATION: 996

DATE:29/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 845
start stop duration Long E 1258
TIME :08:09:00 08:39:00 30 (min) Purpose code: 3
LOG :4783.60 4785.20 1.60 Area code : 2
FDEPTH: 249 252 GearCond.code:
BDEPTH: 252 252 Validity code: 1
Towing dir: 190° Wire out: 780 m Speed: 32 kn*10

Sorted: 119 Kg Total catch: 276.84 CATCH/HOUR: 553.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	123.30	252	22.27	2133
Dentex macrophthalmus	85.50	318	15.44	2137
Brotula barbata	83.10	74	15.01	2136
Synagrops microlepis	57.90	3510	10.46	
Merluccius polli	47.10	234	8.51	2134
Trachurus trecae	46.50	78	8.40	2135
Trichiurus lepturus	38.40	102	6.94	
Bembrops heterurus	13.02	114	2.35	
Coelorinchus coelorhincus	11.28	282	2.04	
Zenopsis conchifer	11.16	24	2.02	
Pterothrissus belloci	9.72	60	1.76	
Epigonus telescopus	6.72	72	1.21	
Parapenaeus longirostris, fem.	5.76	750	1.04	2139
MYCTOPHIDAE	4.86	1572	0.88	
Parapenaeus longirostris, male	2.58	486	0.47	2138
Chlorophthalmus atlanticus	1.86	36	0.34	
Uranoscopus cadenati	1.56	12	0.28	
Sepia bertheloti	1.50	60	0.27	
Todaropsis eblanae	0.66	12	0.12	
Hoplostethus mediterraneus	0.66	6	0.12	
Monolene microstoma	0.48	18	0.09	
Antigonia capros	0.06	6	0.01	
Total	553.68		100.03	

PROJECT STATION: 997

DATE:29/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 845
start stop duration Long E 1301
TIME :09:40:00 10:10:00 30 (min) Purpose code: 3
LOG :4792.00 4793.60 1.60 Area code : 2
FDEPTH: 168 167 GearCond.code:
BDEPTH: 168 167 Validity code: 1
Towing dir: 180° Wire out: 520 m Speed: 32 kn*10

Sorted: 131 Kg Total catch: 262.66 CATCH/HOUR: 525.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	198.00	368	37.69	2147
Dentex macrophthalmus	103.40	608	19.68	2146
Zenopsis conchifer	65.80	92	12.53	
Synagrops microlepis	37.40	2768	7.12	
Pentheroscion mbizi	36.00	188	6.85	2140
Dentex angolensis	18.00	76	3.43	2141
Pterothrissus belloci	16.28	92	3.10	
Trichiurus lepturus	13.20	60	2.51	
Todaropsis eblanae	12.00	192	2.28	2142
Zeus faber	9.16	20	1.74	
Chelidonichthys gabonensis	7.00	48	1.33	
Chlorophthalmus atlanticus	2.76	216	0.53	
Illex coindetii	2.40	52	0.46	2143
Parapenaeus longirostris, male	1.40	344	0.27	2144
Parapenaeus longirostris, male	1.40	344	0.27	
Parapenaeus longirostris, fem.	0.52	220	0.10	2145
Uranoscopus polli	0.48	4	0.09	
Spicara alta	0.44	4	0.08	
Pontinus kuhlii	0.40	4	0.08	
Citharus linguatula	0.36	12	0.07	
Citharus linguatula	0.36	12	0.07	
Sepia officinalis hierredda	0.12	8	0.02	
Total	526.88		100.30	

PROJECT STATION: 998

DATE:29/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 844
start stop duration Long E 1304
TIME :11:34:00 12:04:00 30 (min) Purpose code: 3
LOG :4800.00 4801.00 1.50 Area code : 2
FDEPTH: 120 121 GearCond.code:
BDEPTH: 120 121 Validity code: 1
Towing dir: 195° Wire out: 450 m Speed: 28 kn*10

Sorted: 148 Kg Total catch: 505.34 CATCH/HOUR: 1010.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	665.04	2060	65.80	2149
Dentex macrophthalmus	183.94	1060	18.20	2150
Dentex angolensis	47.26	224	4.68	2151
Selene dorsalis	25.64	62	2.54	2152
Pterothrissus belloci	16.46	108	1.63	
Spicara alta	13.26	224	1.31	
Umbrina canariensis	11.22	62	1.11	
Pentheroscion mbizi	10.82	40	1.07	
Sparus auriga *	10.68	28	1.06	
Branchiostegus semifasciatus	9.38	20	0.93	
Trichiurus lepturus	7.76	20	0.77	
Chelidonichthys gabonensis	3.40	20	0.34	
Todaropsis eblanae	3.06	108	0.30	2148
Pagellus bellottii	1.70	14	0.17	
Boops boops	0.48	14	0.05	
Illex coindetii	0.34	20	0.03	
Sepia sp.	0.28	14	0.03	
Total	1010.72		100.02	

PROJECT STATION: 999

DATE:29/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 844
start stop duration Long E 1311
TIME :13:26:00 13:56:00 30 (min) Purpose code: 3
LOG :4812.00 4813.50 1.50 Area code : 2
FDEPTH: 76 75 GearCond.code:
BDEPTH: 76 75 Validity code: 1
Towing dir: 190° Wire out: 320 m Speed: 33 kn*10

Sorted: 128 Kg Total catch: 256.26 CATCH/HOUR: 512.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pterothrissus belloci	107.60	1780	20.99	
Lithognathus mormyrus	46.20	88	9.01	
Trachurus trecae	43.00	228	8.39	2158
Trichiurus lepturus	42.20	388	8.23	
Umbrina canariensis	29.40	184	5.74	2154
Brachydeuterus auritus	25.80	992	5.03	2159
Citharus linguatula	24.80	460	4.84	
Pagellus bellottii	23.80	276	4.64	2157
Chelidonichthys gabonensis	20.20	108	3.94	
Epinephelus marginatus	20.00	16	3.90	
Sardinella maderensis	17.60	60	3.43	2156
Octopus sp.	14.68	12	2.86	
Dasyatis marmorata	14.52	4	2.83	
Brotula barbata	13.80	40	2.69	
Sepia orbignyana	12.24	24	2.39	
Sparus auriga *	9.60	24	1.87	
Chaetodon hoefleri	6.52	56	1.27	
Pomadasys incisus	6.16	20	1.20	
Raja miraletus	5.76	8	1.12	
Pseudotolithus senegalensis	5.56	8	1.08	
Xenopsis conchifer	4.52	4	0.88	
Branchiostegus semifasciatus	4.36	8	0.85	
Zeus faber	3.64	12	0.71	
Decapterus rhonchus	3.28	4	0.64	
Dentex angolensis	2.52	52	0.49	2153
Scorpaena sp.	1.16	16	0.23	
Torpedo torpedo	1.04	24	0.20	
Todaropsis eblanae	0.84	32	0.16	2155
Serranus cabrilla	0.80	12	0.16	
Penaeus notialis	0.56	16	0.11	
Dicologoglossa cuneata	0.24	4	0.05	
Illex coindetii	0.12	4	0.02	
Total	512.52		99.95	

PROJECT STATION: 1000

DATE:29/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 842
start stop duration Long E 1319
TIME :15:23:00 15:53:00 30 (min) Purpose code: 3
LOG :4824.20 4825.70 1.50 Area code : 2
FDEPTH: 34 28 GearCond.code:
BDEPTH: 34 28 Validity code: 1
Towing dir: 205° Wire out: 150 m Speed: 30 kn*10

Sorted: 173 Kg Total catch: 1315.72 CATCH/HOUR: 2631.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	1104.28	3132	41.96	2162
Brachydeuterus auritus	556.32	3376	21.14	2160
Pomadasys incisus	204.44	866	7.77	2166
Lithognathus mormyrus	172.52	546	6.56	2165
Galeoides decadactylus	142.58	258	5.42	
Trichiurus lepturus	101.84	744	3.87	
Trachurus trecae	89.68	182	3.41	2164
Pagellus bellottii	68.10	258	2.59	2161
Argyrosomus hololepidotus	57.46	120	2.18	2163
Pseudotolithus typus	49.40	92	1.88	
Pteroscion peli	35.72	668	1.36	
Ephippion guttifer	8.06	16	0.31	
Balistes capriscus	6.84	30	0.26	
Epinephelus aeneus	6.84	16	0.26	
Umbrina canariensis	6.68	46	0.25	
Pomadasys peroteti	6.08	16	0.23	
Sepia orbignyana	4.56	16	0.17	
Pseudupeneus prayensis	3.80	46	0.14	
Total	2625.20		99.76	

PROJECT STATION: 1001

DATE:30/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 821
start stop duration Long E 1318
TIME :05:20:00 05:40:00 20 (min) Purpose code: 3
LOG :4854.10 4855.30 1.10 Area code : 2
FDEPTH: 26 27 GearCond.code:
BDEPTH: 26 27 Validity code: 1
Towing dir: 180° Wire out: 120 m Speed: 33 kn*10

Sorted: 129 Kg Total catch: 1752.36 CATCH/HOUR: 5257.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	3717.90	69984	70.72	2167
Pomadasys peroteti	510.30	1701	9.71	2170
Pteroscion peli	212.64	4740	4.04	
Arius parkii	158.37	123	3.01	
Ilisha africana	135.27	2025	2.57	
Selene dorsalis	134.07	2187	2.55	2168
Trichiurus lepturus	131.64	810	2.50	
Sepia orbignyana	46.98	42	0.89	
Trachurus trecae	46.59	810	0.89	2169
Pseudotolithus typus	29.16	162	0.55	
Argyrosomus hololepidotus	26.34	81	0.50	
Galeoides decadactylus	23.10	42	0.44	
Penaeus notialis	20.25	2796	0.39	
Torpedo nobiliana	17.01	42	0.32	
Sphyraena guachancho	13.38	42	0.25	
Dicologoglossa cuneata	9.72	162	0.18	
Cynoglossus senegalensis	9.33	42	0.18	
Pomadasys incisus	9.33	42	0.18	
Sardinella aurita	3.66	42	0.07	
Pentanemus quinquarius	2.04	42	0.04	
Total	5257.08		99.98	

PROJECT STATION: 1002

DATE:30/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 819
start stop duration Long E 1314
TIME :07:06:00 07:36:00 30 (min) Purpose code: 3
LOG :4863.90 4865.50 1.60 Area code : 2
FDEPTH: 38 40 GearCond.code:
BDEPTH: 38 40 Validity code: 1
Towing dir: 175° Wire out: 160 m Speed: 32 kn*10

Sorted: 129 Kg Total catch: 840.55 CATCH/HOUR: 1681.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	531.70	4596	31.63	2171
Trachurus trecae	321.30	1080	19.11	2172
Pteroscion peli	297.06	5738	17.67	
Pseudotolithus typus	179.40	312	10.67	2173
Pomadasys peroteti	162.50	338	9.67	2174
Trichiurus lepturus	38.36	976	2.28	
Arius parkii	37.44	40	2.23	
Cynoponticus ferox	33.80	14	2.01	
Pentanemus quinquarius	21.98	300	1.31	
Penaeus notialis	11.84	2050	0.70	
Dasyatis margarita	9.50	14	0.57	
Torpedo marmorata	8.98	14	0.53	
Cynoglossus senegalensis	8.84	26	0.53	
Pomadasys incisus	6.64	26	0.39	
Selene dorsalis	4.68	26	0.28	
Dicologoglossa cuneata	2.60	66	0.15	
Galeoides decadactylus	1.82	14	0.11	
Sepia sp.	0.78	40	0.05	
Schedophilus pemarco	0.32	2	0.02	
Total	1679.54		99.91	

PROJECT STATION: 1003

DATE:30/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 821
start stop duration Long E 1309
TIME :08:51:00 09:21:00 30 (min) Purpose code: 3
LOG :4874.60 4876.10 1.50 Area code : 2
FDEPTH: 70 71 GearCond.code:
BDEPTH: 70 71 Validity code: 1
Towing dir: 170° Wire out: 260 m Speed: 30 kn*10

Sorted: 125 Kg Total catch: 184.86 CATCH/HOUR: 369.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	193.96	458	52.46	2175
Atractoscion aequidens	43.36	22	11.73	
Trichiurus lepturus	38.10	392	10.31	
Dentex barnardi	25.96	60	7.02	2177
Dentex angolensis	13.20	66	3.57	2176
Umbrina canariensis	13.06	76	3.53	2178
Argyrosomus hololepidotus	10.70	2	2.89	
Stromateus fiatola	10.26	2	2.78	
Zeus faber	6.64	18	1.80	
Brachydeuterus auritus	4.60	96	1.24	
Decapterus rhonchus	2.70	4	0.73	
Raja miraletus	2.68	4	0.72	
Pagellus bellottii	2.22	10	0.60	
Chelidonichthys capensis	1.02	4	0.28	
Torpedo torpedo	0.66	4	0.18	
Chaetodon hoefleri	0.60	4	0.16	
Total	369.72		100.00	

PROJECT STATION: 1004

DATE:30/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 824
start stop duration Long E 1256
TIME :11:34:00 12:04:00 30 (min) Purpose code: 3
LOG :4895.10 4896.70 1.60 Area code : 2
FDEPTH: 166 161 GearCond.code:
BDEPTH: 166 161 Validity code: 1
Towing dir: 340° Wire out: 580 m Speed: 31 kn*10

Sorted: 137 Kg Total catch: 843.28 CATCH/HOUR: 1686.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1351.26	4912	80.12	2182
Spicara alta	147.50	1126	8.75	2181
Xenopsis conchifer	63.38	38	3.76	
Dentex angolensis	41.88	212	2.48	2179
Dentex macrophthalmus	39.76	188	2.36	2180
Pterothrissus belloci	11.76	100	0.70	
Todaropsis eblanae	10.38	226	0.62	2183
Umbrina canariensis	9.00	12	0.53	
Sarda sarda	5.80	2	0.34	
Zeus faber	5.12	12	0.30	
Illex coindetii	0.76	12	0.05	
Total	1686.60		100.01	

PROJECT STATION: 1005

DATE:30/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 825
start stop duration Long E 1252
TIME :13:33:00 14:03:00 30 (min) Purpose code: 3
LOG :4905.30 4906.90 1.60 Area code : 2
FDEPTH: 296 295 GearCond.code:
BDEPTH: 296 295 Validity code: 1
Towing dir: 345° Wire out: 950 m Speed: 33 kn*10

Sorted: 129 Kg Total catch: 567.59 CATCH/HOUR: 1135.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	538.30	8302	47.42	
MYCTOPHIDAE	402.50	250040	35.46	
Merluccius polli	60.70	284	5.35	2184
Trachurus trecae	52.20	100	4.60	2185
Xenopsis conchifer	19.88	28	1.75	
Synagrops microlepis	17.08	588	1.50	
Trichiurus lepturus	15.82	42	1.39	
Pterothrissus belloci	8.82	42	0.78	
Pontinus kuhlii	8.26	56	0.73	
Laemonema laureysi	3.22	42	0.28	
Parapenaeus longirostris, fem.	2.94	336	0.26	2186
Bembrops heterurus	1.68	14	0.15	
Parapenaeus longirostris, male	0.98	112	0.09	2187
Coelorinchus coelorhincus	0.98	28	0.09	
Hymenocephalus italicus	0.70	168	0 06	
Lepidopus caudatus	0.56	84	0.05	
Nematocarcinus africanus	0.42	112	0.04	
Solenocera africana	0.14	14	0.01	
Total	1135.18		100.01	

PROJECT STATION:1006

DATE:30/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 825
start stop duration Long E 1251
TIME :15:40:00 16:10:00 30 (min) Purpose code: 3
LOG :4914.60 4916.20 1.60 Area code : 2
FDEPTH: 350 348 GearCond.code:
BDEPTH: 350 348 Validity code: 1
Towing dir: 340° Wire out:1050 m Speed: 33 kn*10

Sorted: 217 Kg Total catch: 330.46 CATCH/HOUR: 660.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	323.00	858	48.87	2188
Nematocarcinus africanus	245.58	92094	37.16	
MYCTOPHIDAE	33.24	12186	5.03	
Hymenocephalus italicus	17.34	3684	2.62	
Chaunax pictus	16.86	678	2.55	
Hoplostethus mediterraneus	4.86	6	0.74	
Lophius vaillanti	2.94	6	0.44	
Solenocera africana	2.52	270	0.38	
Malacocephalus occidentalis	2.40	24	0.36	
Gadella imberbis	2.16	60	0.33	
Laemonema laureysi	1.74	18	0.26	
Coelorinchus coelorhincus	1.26	30	0.19	
Bembrops sp.	1.20	12	0.18	
Pterothrissus belloci	0.96	6	0.15	
Dibranchus atlanticus	0.90	66	0.14	
Bathyuroconger vicinus	0.90	30	0.14	
Bathynectes piperitus	0.54	6	0.08	
Halosaurus ovenii	0.54	30	0.08	
CONGRIDAE	0.48	6	0.07	
Chlorophthalmus atlanticus	0.48	12	0.07	
Todaropsis eblanae	0.36	6	0.05	
Pontinus accraensis	0.36	18	0.05	
Illex coindetii	0.30	6	0.05	
Total	660.92		99.99	

PROJECT STATION:1007

DATE:30/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 826
start stop duration Long E 1249
TIME :18:21:00 18:51:00 30 (min) Purpose code: 3
LOG :4926.10 4927.60 1.50 Area code : 2
FDEPTH: 446 447 GearCond.code:
BDEPTH: 446 447 Validity code: 1
Towing dir: 340° Wire out:1290 m Speed: 30 kn*10

Sorted: 105 Kg Total catch: 184.95 CATCH/HOUR: 369.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	128.04	44532	34.61	
Merluccius polli	117.40	172	31.74	2189
Laemonema laureysi	25.08	306	6.78	
Bathyuroconger vicinus	18.60	402	5.03	
Gonostoma elongatum	14.94	660	4.04	
Hymenocephalus italicus	8.34	1944	2.25	
Hoplostethus cadenati	7.86	258	2.12	
Centrophorus uyato	7.60	2	2.05	
Halosaurus ovenii	6.30	324	1.70	
STOMIIDAE	4.32	420	1.17	
Dibranchus atlanticus	4.02	216	1.09	
Neoharriotta pinnata	4.00	2	1.08	
Malacocephalus occidentalis	3.54	42	0.96	
Aristeus varidens, female	3.48	204	0.94	2191
Coelorinchus coelorhincus	3.06	84	0.83	
MYCTOPHIDAE	2.76	1104	0.75	
MELANOSTOMIATIDAE	2.58	42	0.70	
Lamprogrammus exutus	2.52	18	0.68	
Aristeus varidens, male	1.62	210	0.44	2190
Etmopterus spinax	1.62	36	0.44	
Plesiopenaeus edwardsianus	0.54	6	0.15	
Chaunax pictus	0.54	12	0.15	
Gadella imberbis	0.42	12	0.11	
Talismania sp.	0.36	12	0.10	
Galeus polli	0.36	6	0.10	
Total	369.90		100.01	

PROJECT STATION:1008

DATE:30/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 825
start stop duration Long E 1247
TIME :20:42:00 21:12:00 30 (min) Purpose code: 3
LOG :4936.30 4937.80 1.50 Area code : 2
FDEPTH: 538 548 GearCond.code:
BDEPTH: 538 548 Validity code: 1
Towing dir: 335° Wire out:1500 m Speed: 30 kn*10

Sorted: 45 Kg Total catch: 113.24 CATCH/HOUR: 226.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	130.76	26150	57.74	
Lamprogrammus exutus	16.50	116	7.29	
Gonostoma elongatum	14.30	490	6.31	
Hoplostethus cadenati	14.26	450	6.30	
STOMIIDAE	10.90	1186	4.81	
MELANOSTOMIATIDAE	9.00	176	3.97	
Talismania sp.	8.80	380	3.89	
Lophius vaillanti	3.66	6	1.62	
Merluccius polli	3.46	6	1.53	
Plesiopenaeus edwardsianus	3.00	96	1.32	
Bathyuroconger vicinus	2.36	50	1.04	
POLYCHAELIDAE	2.20	220	0.97	
Coelorinchus coelorhincus	1.26	40	0.56	
MACROURIDAE	1.10	20	0.49	
Chaceon maritae	1.06	16	0.47	
Chlorophthalmus atlanticus	0.96	20	0.42	
Aristeus varidens	0.86	36	0.38	
Laemonema laureysi	0.76	6	0.34	
Gadella imberbis	0.36	10	0.16	
Dibranchus atlanticus	0.30	10	0.13	
OPLOPHORIDAE	0.26	16	0.11	
Melanocetus johnsoni	0.26	16	0.11	
Neterocarpus ensifer	0.10	6	0.04	
Total	226.48		100.00	

PROJECT STATION:1009

DATE:31/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 806
start stop duration Long E 1236
TIME :00:30:00 01:00:00 30 (min) Purpose code: 3
LOG :4959.00 4960.70 1.70 Area code : 2
FDEPTH: 700 702 GearCond.code:
BDEPTH: 700 702 Validity code: 1
Towing dir: 355° Wire out:1850 m Speed: 33 kn*10

Sorted: 50 Kg Total catch: 149.85 CATCH/HOUR: 299.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MELANOSTOMIATIDAE	49.50	948	16.52	
Metumia sp.	32.40	606	10.81	
Hoplostethus cadenati	31.50	870	10.51	
POLYCHAELIDAE	30.30	2664	10.11	
Nematocarcinus africanus	28.80	5040	9.61	
Yarrella blackfordi	25.20	534	8.41	
Lamprogrammus exutus	19.38	42	6.47	
Bathyuroconger vicinus	13.50	114	4.50	
Triplophos sp.	13.14	1704	4.38	
Talismania sp.	9.72	72	3.24	
Trichiurus lepturus	9.24	192	3.08	
GALATHEIDAE	4.74	2898	1.58	
Dibranchus atlanticus	4.62	180	1.54	
Bathygadus melanobranchus	4.20	174	1.40	
STOMIIDAE	3.60	282	1.20	
Aristeus varidens, female	3.24	126	1.08	2192
Melanonus zugmayeri	3.12	60	1.04	
Lophius vaillanti	2.46	18	0.82	
Glyphus marsupialis	2.16	126	0.72	
Chaceon maritae	1.68	6	0.56	
Benthodesmus tenuis	1.56	30	0.52	
Cruriraja parcomaculata	1.32	12	0.44	
SYNAPHOBRANCHIDAE	1.20	42	0.40	
OCTOPOTEUTHIDAE	0.84	6	0.28	
Xenodermichthys copei	0.66	30	0.22	
OPLOPHORIDAE	0.42	66	0.14	
Porogadus sp.	0.30	36	0.10	
Malacocephalus laevis	0.30	6	0.10	
Bathylagus sp.	0.24	12	0.08	
Macroparalepis macrogeneion	0.18	6	0.06	
Aristeus varidens, male	0.18	18	0.06	2193
Total	299.70		99.98	

PROJECT STATION:1010

DATE:31/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 804
start stop duration Long E 1237
TIME :03:11:00 03:41:00 30 (min) Purpose code: 3
LOG :4970.30 4972.00 1.70 Area code : 2
FDEPTH: 556 554 GearCond.code:
BDEPTH: 556 554 Validity code: 1
Towing dir: 350° Wire out: m Speed:155 kn*10

Sorted: 28 Kg Total catch: 159.79 CATCH/HOUR: 319 58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	172.80	36564	54.07	
Hoplostethus cadenati	51.60	2496	16.15	
MELANOSTOMIATIDAE	32.40	552	10.14	
Triplophos sp.	19.32	1488	6.05	
Xenodermichthys copei	10.32	708	3.23	
Lamprogrammus exutus	9.24	84	2.89	
Yarrella blackfordi	8.16	252	2.55	
POLYCHAELIDAE	4.20	552	1.31	
Talismania sp.	3.36	132	1.05	
Merluccius polli	3.20	4	1.00	
Trichiurus lepturus	2.40	48	0.75	
Laemonema laureysi	1.56	12	0.49	
OPLOPHORIDAE	0.60	84	0.19	
Aristeus varidens	0.42	48	0.13	
Total	319.58		100.00	

PROJECT STATION:1011

DATE:31/ 7/96 GEAR TYPE: BT No:1 POSITION:Lat S 806
start stop duration Long E 1239
TIME :05:42:00 06:12:00 30 (min) Purpose code: 3
LOG :4981.80 4983.30 1.50 Area code : 2
FDEPTH: 462 465 GearCond.code:
BDEPTH: 462 465 Validity code: 1
Towing dir: 345° Wire out:1290 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 209.98 CATCH/HOUR: 419.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	127.20	37696	30.29	
Hoplostethus cadenati	82.08	3296	19.54	
Merluccius polli	77.40	138	18.43	2194
MELANOSTOMIATIDAE	36.96	736	8.80	
Triplophos sp.	19.52	3184	4.65	
Gadella imberbis	18.08	928	4.31	
Pontinus accraensis	12.16	192	2.90	
Yarrella blackfordi	9.76	288	2.32	
Xenodermichthys copei	7.36	832	1.75	
Laemonema laureysi	5.92	400	1.41	
Malacocephalus occidentalis	4.96	32	1.18	
VITRELEDONELLIDAE	2.88	96	0.69	
Lamprogrammus exutus	2.88	208	0.69	
Bathyuroconger vicinus	2.56	208	0.61	
Halosaurus ovenii	2.24	112	0.53	
Plesiopenaeus edwardsianus	2.08	560	0.50	
MYCTOPHIDAE	1.92	672	0.46	
Aristeus varidens	1.44	96	0.34	
STOMIIDAE	0.80	48	0.19	
Lophius vaillanti	0.48	16	0.11	
Coelorinchus coelorhincus	0.48	32	0.11	
Dibranchus atlanticus	0.48	48	0.11	
Solenocera africana	0.32	16	0.08	
Total	419.96		100.00	

PROJECT STATION:1012

DATE:31/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 805
start stop duration Long E 1242
TIME :07:18:00 07:48:00 30 (min) Purpose code: 3
LOG :4988.30 4989.80 1.50 Area code : 2
FDEPTH: 341 335 GearCond.code:
BDEPTH: 341 335 Validity code: 1
Towing dir: 160° Wire out:1150 m Speed: 30 kn*10

Sorted: 98 Kg Total catch: 245.95 CATCH/HOUR: 491.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	129.90	28870	26.41	
Merluccius polli	122.50	528	24.90	2195
Symenocephalus italicus	44.70	5612	9.09	
Synagrops microlepis	44.40	1608	9.03	
Chlorophthalmus atlanticus	43.70	658	8.88	
Pontinus accraensis	28.60	1338	5.81	
MYCTOPHIDAE	26.60	7090	5.41	
Gadella imberbis	12.60	470	2.56	
Coelorinchus coelorhincus	9.60	290	1.95	
Malacocephalus occidentalis	8.60	60	1.75	
Laemonema laureysi	5.50	70	1.12	
Trichiurus lepturus	3.80	550	0.77	
Benthodesmus tenuis	3.10	150	0.63	
Chaunax pictus	2.80	110	0.57	
Parapenaeus longirostris	1.80	160	0.37	
Chaceon maritae	0.80	10	0.16	
Dibranchus atlanticus	0.50	70	0.10	
Illex coindetii	0.50	20	0.10	
AMPHITRETIDAE	0.40	10	0.08	
Epigonus telescopus	0.30	40	0.06	
Chascanopsetta lugubris	0.30	20	0.06	
Macroparalepis macrogeneion	0.20	30	0.04	
Bathyuroconger vicinus	0.20	10	0.04	
Todaropsis eblanae	0.20	40	0.04	
Eumunida squamifera	0.20	60	0.04	
Dicologoglossa cuneata	0.10	10	0.02	
Total	491.90		99.99	

PROJECT STATION:1013

DATE:31/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 805
start stop duration Long E 1244
TIME :09:04:00 09:34:00 30 (min) Purpose code: 3
LOG :4995.30 4996.80 1.50 Area code : 2
FDEPTH: 248 245 GearCond.code:
BDEPTH: 248 245 Validity code: 1
Towing dir: 155° Wire out: 800 m Speed: 30 kn*10

Sorted: 80 Kg Total catch: 118.82 CATCH/HOUR: 237.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	76.40	3916	32.15	
Merluccius polli	76.20	268	32.07	2196
Dentex macrophthalmus	24.24	100	10.20	2197
Trachurus trecae	21.20	36	8.92	2198
Chlorophthalmus atlanticus	11.40	1412	4.80	
Erythrocles monodi	9.40	12	3.96	
Zenopsis conchifer	3.32	44	1.40	
Trichiurus lepturus	3.24	52	1.36	
Todaropsis eblanae	3.16	44	1.33	
Brotula barbata	2.64	4	1.11	
Parapenaeus longirostris, fem.	1.88	296	0.79	2201
Illex coindetii	1.20	24	0.50	
Pterothrissus belloci	1.00	4	0.42	
Citharus linguatula	0.68	16	0.29	
Parapenaeus longirostris, male	0.60	132	0.25	2200
Sepia sp.	0.60	68	0.25	2199
MYCTOPHIDAE	0.48	164	0.20	
Total	237.64		100.00	

PROJECT STATION:1014

DATE:31/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 806
start stop duration Long E 1246
TIME :10:35:00 11:05:00 30 (min) Purpose code: 3
LOG :5001.60 5003.20 1.60 Area code : 2
FDEPTH: 152 151 GearCond.code:
BDEPTH: 152 151 Validity code: 1
Towing dir: 155° Wire out: 480 m Speed: 33 kn*10

Sorted: 170 Kg Total catch: 170.81 CATCH/HOUR: 341.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	226.90	426	66.42	2205
Dentex macrophthalmus	42.80	190	12.53	2206
Spicara alta	17.20	542	5.03	
Zenopsis conchifer	14.20	22	4.16	
Dentex angolensis	13.70	70	4.01	2202
Illex coindetii	7.96	160	2.33	2203
Todaropsis eblanae	6.56	198	1.92	2204
Erythrocles monodi	5.80	10	1.70	
Trichiurus lepturus	1.36	2	0.40	
Dentex gibbosus	1.34	2	0.39	
Zeus faber	1.18	4	0.35	
Octopus sp.	1.16	2	0.34	
Arioemma bondi	0.54	6	0.16	
Dentex congoensis	0.40	6	0.12	
Pagellus bellottii	0.38	4	0.11	
Citharus linguatula	0.14	2	0.04	
Total	341.62		100.01	

PROJECT STATION:1015

DATE:31/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 803
start stop duration Long E 1258
TIME :13:05:00 13:35:00 30 (min) Purpose code: 3
LOG :5018.80 5020.30 1.50 Area code : 2
FDEPTH: 89 90 GearCond.code:
BDEPTH: 89 90 Validity code: 1
Towing dir: 160° Wire out: 340 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 59.14 CATCH/HOUR: 118.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	27.10	72	22.91	2211
Dentex gibbosus	18.52	12	15.66	2209
Dentex angolensis	13.80	138	11.67	2212
Atractoscion aequidens	10.42	6	8.81	
Trichiurus lepturus	8.46	80	7.15	
Sepia orbignyana	6.62	8	5.60	2213
Illex coindetii	5.70	236	4.82	2208
Umbrina canariensis	4.48	12	3.79	
Zeus faber	4.32	18	3.65	
Zenopsis conchifer	4.04	4	3.42	
Sarda sarda	2.98	2	2.52	
Todaropsis eblanae	2.48	54	2.10	2207
Pagellus bellottii	1.56	30	1.32	2210
Raja miraletus	1.40	2	1.18	
Sparus auriga *	1.30	6	1.10	
Fistularia petimba	1.12	2	0.95	
Torpedo torpedo	1.04	2	0.88	
Chelidonichthys gabonensis	0.64	10	0.54	
Alloteuthis africana	0.58	150	0.49	
Selene dorsalis	0.54	2	0.46	
Dentex congoensis	0.44	8	0.37	
Pseudupeneus prayensis	0.32	6	0.27	
Schedophilus pemarco	0.18	2	0.15	
Scorpaena normani	0.16	4	0.14	
Citharus linguatula	0.08	2	0.07	
Total	118.28		100.02	

PROJECT STATION:1016

DATE:31/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 802
start stop duration Long E 1304
TIME :14:37:00 15:07:00 30 (min) Purpose code: 3
LOG :5028.50 5030.00 1.50 Area code : 2
FDEPTH: 60 60 GearCond.code:
BDEPTH: 60 60 Validity code: 1
Towing dir: 160° Wire out: 250 m Speed: 30 kn*10

Sorted: 81 Kg Total catch: 157.70 CATCH/HOUR: 315.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	154.00	22168	48.83	2216
Pseudotolithus senegalensis	34.30	32	10.88	2220
Trichiurus lepturus	26.00	184	8.24	
Sparus auriga *	19.90	64	6.31	2217
Pagellus bellottii	19.40	118	6.15	2218
Umbrina canariensis	14.56	98	4.62	2221
Pomadasys peroteti	9.68	8	3.07	
Trachurus trecae	7.30	40	2.31	2219
Chelidonichthys gabonensis	7.12	24	2.26	
Atractoscion aequidens	4.54	18	1.44	
Dentex canariensis	4.34	6	1.38	
Sepia orbignyana	2.40	4	0.76	
Dentex gibbosus	2.20	4	0.70	
Selene dorsalis	2.08	8	0.66	
Pomadasys incisus	1.50	6	0.48	
Pegusa lascaris	1.36	8	0.43	
Torpedo torpedo	1.36	16	0.43	
Epinephelus aeneus	1.28	2	0.41	
Pseudupeneus prayensis	0.80	8	0.25	
Penaeus notialis, female	0.54	18	0.17	2214
Penaeus notialis, male	0.26	14	0.08	2215
Illex coindetii	0.24	8	0.08	
Todaropsis eblanae	0.16	8	0.05	
Alloteuthis africana	0.08	8	0.03	
Total	315.40		100.02	

PROJECT STATION:1017

DATE:31/ 7/96 GEAR TYPE: BT No:9 POSITION:Lat S 801
start stop duration Long E 1307
TIME :16:13:00 16:43:00 30 (min) Purpose code: 3
LOG :5038.60 5040.00 1.40 Area code : 2
FDEPTH: 36 37 GearCond.code:
BDEPTH: 36 37 Validity code: 1
Towing dir: 160° Wire out: 180 m Speed: 30 kn*10

Sorted: 113 Kg Total catch: 446.76 CATCH/HOUR: 893.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	373.20	6030	41.77	2223
Pteroscion peli	133.20	1968	14.91	
Cynoponticus ferox	79.60	16	8.91	
Trichiurus lepturus	71.20	976	7.97	
Pseudotolithus typus	62.72	240	7.02	2222
Pentanemus quinquarius	53.68	752	6.01	
Caleoides decadactylus	32.16	48	3.60	
Arius parkii	26.48	16	2.96	
Pomadasys peroteti	15.60	24	1.75	
Parapenaeopsis atlantica	12.00	1064	1.34	
Raja miraletus	11.28	16	1.26	
Trachurus trecae	9.44	16	1.06	
Ilisha africana	4.48	24	0.50	
Dicologoglossa cuneata	2.88	16	0.32	
Panulirus regius	2.80	2	0.31	
Selene dorsalis	2.80	8	0.31	
Total	893.52		100.00	

PROJECT STATION:1018

DATE: 1/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 741

start stop duration Long E 1300

TIME :05:30:00 05:42:00 12 (min) Purpose code: 3

LOG :5068.40 5069.20 0.80 Area code : 2

FDEPTH: 25 25 GearCond.code: 8

BDEPTH: 25 25 Validity code: 1

Towing dir: 340° Wire out: 120 m Speed: 30 kn*10

Sorted: 167 Kg Total catch: 167.63 CATCH/HOUR: 838.15

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	280.50	2620	33.47	2224
Pseudotolithus typus	208.25	250	24.85	2227
Pomadasys jubelini	57.75	165	6.89	2225
Trichiurus lepturus	55.60	380	6.63	
Pentanemus quinquarius	52.75	1055	6.29	
Pteroscion peli	46.35	230	5.53	
Parapenaeopsis atlantica	19.95	4900	2.38	
Raja miraletus	17.00	20	2.03	
Pomadasys peroteti	15.40	25	1.84	2226
Dasyatis centroura	14.00	10	1.67	
Galeoides decadactylus	14.00	30	1.67	
Cynoponticus ferox	14.00	20	1.67	
Plectorhinchus mediterraneus	9.25	5	1.10	
Sepia orbignyana	8.00	5	0.95	
Panulirus regius	7.75	5	0.92	
Trachurus trecae	6.20	25	0.74	
Centrophorus uyato	3.95	5	0.47	
Sphyraena guachancho	3.80	5	0.45	
Ilisha africana	2.90	50	0.35	
Umbrina canariensis	0.45	5	0.05	
Centrarchops chapini	0.25	5	0.03	
Scyllarides herklotsii	0.05	10	0.01	
Total	838.15		99.99	

PROJECT STATION:1019

DATE: 1/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 744

start stop duration Long E 1250

TIME :07:40:00 08:05:00 25 (min) Purpose code: 3

LOG :5083.40 5084.90 1.30 Area code : 2

FDEPTH: 79 80 GearCond.code:

BDEPTH: 79 80 Validity code: 1

Towing dir: 330° Wire out: 280 m Speed: 30 kn*10

Sorted: 96 Kg Total catch: 96.20 CATCH/HOUR: 230.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	95.64	228	41.42	2228
Dentex gibbosus	27.48	41	11.90	2231
Sparus caeruleostictus *	21.72	14	9.41	
Epinephelus aeneus	18.12	2	7.85	
Pagellus bellottii	16.73	158	7.25	2232
Dentex canariensis	10.68	10	4.63	
Dentex angolensis	10.56	36	4.57	2233
Dentex barnardi	8.88	26	3.85	2230
Rhinobatos albomaculatus	6.72	2	2.91	
Chaetodon hoefleri	3.58	19	1.55	
Trichiurus lepturus	3.50	5	1.52	
Sepia orbignyana	2.62	7	1.13	2229
Leptocharias smithii	2.26	2	0.98	
Chelidonichthys gabonensis	0.86	5	0.37	
Fistularia petimba	0.84	2	0.36	
Alloteuthis africana	0.48		0.21	
Todaropsis eblanae	0.22	5	0.10	
Total	230.89		100.01	

PROJECT STATION:1020

DATE: 1/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 745

start stop duration Long E 1236

TIME :10:26:00 10:56:00 30 (min) Purpose code: 3

LOG :5104.40 5106.00 1.60 Area code : 2

FDEPTH: 149 151 GearCond.code:

BDEPTH: 149 151 Validity code: 1

Towing dir: 155° Wire out: 500 m Speed: 32 kn*10

Sorted: 119 Kg Total catch: 119.23 CATCH/HOUR: 238.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	144.20	296	60.47	2234
Dentex angolensis	36.50	194	15.31	2235
Epinephelus goreensis	11.00	2	4.61	
Spicara alta	10.48	152	4.39	
Dentex congoensis	9.56	148	4.01	2237
Trichiurus lepturus	6.62	8	2.78	
Todaropsis eblanae	5.76	178	2.42	2236
Chelidonichthys gabonensis	3.68	44	1.54	
Illex coindetii	2.58	48	1.08	2238
Xenopsis conchifer	2.22	6	0.93	
Octopus sp.	1.24	2	0.52	
Uranoscopus polli	1.22	6	0.51	
Pontinus accraensis	0.70	6	0.29	
Zeus faber	0.62	2	0.26	
Chaetodon hoefleri	0.60	4	0.25	
Citharus linguatula	0.48	16	0.20	
Sepia orbignyana	0.30	4	0.13	
Dentex barnardi	0.30	2	0.13	
Peristedion cataphractum	0.14	6	0.06	
Alloteuthis africana	0.10	26	0.04	
Dibranchus atlanticus	0.08	4	0.03	
Monolene microstoma	0.06	2	0.03	
Total	238.46		99.99	

PROJECT STATION:1021

DATE: 1/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 718

start stop duration Long E 1237

TIME :12:00:00 12:30:00 30 (min) Purpose code: 3

LOG :5111.60 5113.10 1.50 Area code : 2

FDEPTH: 252 229 GearCond.code:

BDEPTH: 252 229 Validity code: 1

Towing dir: 335° Wire out: 800 m Speed: 31 kn*10

Sorted: 122 Kg Total catch: 276.14 CATCH/HOUR: 552.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	164.02	10130	29.70	
Trichiurus lepturus	159.98	676	28.97	
Merluccius polli	73.80	756	13.36	2239
Xenopsis conchifer	69.30	136	12.55	
Trachurus trecae	20.26	36	3.67	2240
Illex coindetii	18.36	356	3.32	2242
Chlorophthalmus atlanticus	12.68	2656	2.30	
Dentex macrophthalmus	11.88	82	2.15	2241
Todaropsis eblanae	7.78	130	1.41	2243
Pterothrissus belloci	4.64	36	0.84	
Chlorophthalmus punctatus	2.26	288	0.41	
Parapenaeus longirostris, fem.	1.80	280	0.33	2244
Miracorvina angolensis	1.54	10	0.28	
Parapenaeus longirostris, male	1.18	252	0.21	2245
Plesionika sp.	1.12	838	0.20	
Sepia orbignyana	0.64	54	0.12	
Uranoscopus polli	0.50	4	0.09	
Total	551.74		99.91	

PROJECT STATION:1022

DATE: 1/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 748

start stop duration Long E 1235

TIME :13:59:00 14:29:00 30 (min) Purpose code: 3

LOG :5120.00 5121.60 1.60 Area code : 2

FDEPTH: 349 348 GearCond.code:

BDEPTH: 349 348 Validity code: 1

Towing dir: 328° Wire out:1050 m Speed: 30 kn*10

Sorted: 140 Kg Total catch: 333.13 CATCH/HOUR: 666.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	249.90	1104	37.51	2246
Nematocarcinus africanus	242.20	58072	36.35	
Trichiurus lepturus	56.84	84	8.53	
MYCTOPHIDAE	41.16	24696	6.18	
Hymenocephalus italicus	15.96	2072	2.40	
Laemonema laureysi	12.32	392	1.85	
Xenopsis conchifer	9.80	28	1.47	
Malacocephalus laevis	8.96	140	1.34	
Pterothrissus belloci	8.96	56	1.34	
Pontinus accraensis	6.16	448	0.92	
Gadella imberbis	3.64	56	0.55	
Chlorophthalmus atlanticus	2.24	84	0.34	
Coelorinchus coelorhincus	1.96	56	0.29	
Chaunax pictus	1.40	112	0.21	
Physiculus sp.	1.12	28	0.17	
Solenocera africana	0.84	84	0.13	
Bassanago albescens	0.84	28	0.13	
Parapenaeus longirostris	0.56	42	0.08	
Illex coindetii	0.56	28	0.08	
Dibranchus atlanticus	0.56	56	0.08	
Nezumia sp.	0.28	28	0.04	
Total	666.26		99.99	

PROJECT STATION:1023

DATE: 1/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 748

start stop duration Long E 1234

TIME :16:26:00 16:48:00 22 (min) Purpose code: 3

LOG :5129.90 5131.20 1.30 Area code : 2

FDEPTH: 450 401 GearCond.code: 9

BDEPTH: 450 401 Validity code: 1

Towing dir: 350° Wire out:1250 m Speed: 31 kn*10

Sorted: 100 Kg Total catch: 189.70 CATCH/HOUR: 517.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	257.32	74959	49.74	
Merluccius polli	113.05	210	21.85	2247
Centrophorus uyato	36.95	11	7.14	
Hoplostethus cadenati	32.15	1205	6.21	
Triplophos sp.	21.52	2940	4.16	
Lamprogrammus exutus	11.70	57	2.26	
MELANOSTOMIATIDAE	11.37	180	2.20	
Aristeus varidens, female	6.05	164	1.17	2249
Xenodermichthys copei	6.05	485	1.17	
Aristeus varidens, male	5.32	262	1.03	2248
Gadella imberbis	4.58	196	0.89	
Todaropsis eblanae	2.29	33	0.44	
Bathyuroconger vicinus	2.05	65	0.40	
Etmopterus spinax	1.88	25	0.36	
Benthodesmus tenuis	1.23	33	0.24	
MYCTOPHIDAE	0.90	360	0.17	
Plesiopenaeus edwardsianus	0.82	393	0.16	
STOMIIDAE	0.49	41	0.09	
Halosaurus ovenii	0.41	41	0.08	
SERGESTIDAE	0.33	41	0.06	
Dibranchus atlanticus	0.33	49	0.06	
Chaunax pictus	0.16	8	0.03	
Yarrella blackfordi	0.16	8	0.03	
Bembrops sp.	0.08	8	0.02	
Laemonema laureysi	0.08	8	0.02	
POLYCHAELIDAE	0.08	49	0.02	
Total	517.35		100.00	

PROJECT STATION:1024

DATE: 1/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 749
start stop duration Long E 1239
TIME :18:38:00 18:58:00 20 (min) Purpose code: 3
LOG :5141.40 5142.20 0.80 Area code : 2
FDEPTH: 542 561 GearCond.code:
BDEPTH: 542 561 Validity code: 1
Towing dir: 340° Wire out:1500 m Speed: 25 kn*10

Sorted: 50 Kg Total catch: 95.60 CATCH/HOUR: 286.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	168.60	37230	58.79	
Triplophos sp.	30.18	3624	10.52	
MELANOSTOMIATIDAE	16.38	174	5.71	
Raja alba	15.00	3	5.23	
Hoplostethus cadenati	14.40	252	5.02	
Gadella imberbis	7.68	264	2.68	
Lamprogrammus exutus	6.12	48	2.13	
Yarrella blackfordi	5.16	150	1.80	
Merluccius polli	4.50	12	1.57	
Xenodermichthys copei	4.32	264	1.51	
STOMIIDAE	3.24	120	1.13	
POLYCHAELIDAE	1.68	210	0.59	
Talismania sp.	1.62	48	0.56	
Aristeus varidens, female	1.50	60	0.52	2250
TRACHIPTERIDAE	1.50	6	0.52	
Benthodesmus tenuis	1.32	54	0.46	
Malacocephalus occidentalis	0.78	12	0.27	
Melanocetus johnsoni	0.66	6	0.23	
Dibranchus atlanticus	0.54	18	0.19	
Ariomma bondi	0.54	12	0.19	
Coelorinchus coelorhincus	0.24	6	0.08	
SERGESTIDAE	0.18	24	0.06	
Nemichthys scolopaceus	0.18	6	0.06	
Aristeus varidens, male	0.12	24	0.04	2251
Galeus polli	0.12	6	0.04	
Bathyuroconger vicinus	0.12	6	0.04	
VITRELEDONELLIDAE	0.12	6	0.04	
Total	286.80		99.98	

PROJECT STATION:1025

DATE: 1/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 748
start stop duration Long E 1232
TIME :20:51:00 21:21:00 30 (min) Purpose code: 3
LOG :5149.00 5150.50 1.50 Area code : 2
FDEPTH: 726 708 GearCond.code:
BDEPTH: 726 708 Validity code: 1
Towing dir: 143° Wire out:1850 m Speed: 30 kn*10

Sorted: 24 Kg Total catch: 194.80 CATCH/HOUR: 389.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	160.80	2608	41.27	
OPISTHOTEUTHIDAE	58.88	32	15.11	
POLYCHAELIDAE	52.64	3632	13.51	
Nezumia sp.	23.68	448	6.08	
Bathyuroconger vicinus	22.88	384	5.87	
Talismania sp.	19.52	304	5.01	
Yarrella blackfordi	14.08	336	3.61	
Chaceon maritae	11.68	32	3.00	
MACROORIDAE	9.28	768	2.38	
Lamprogrammus exutus	4.48	16	1.15	
CALATHEIDAE	2.72	1712	0.70	
Aristeus varidens	2.72	112	0.70	
MELANOSTOMIATIDAE	2.40	64	0.62	
Plesiopenaeus edwardsianus	1.92	112	0.49	
Halosaurus ovenii	1.28	16	0.33	
Dibranchus atlanticus	0.48	32	0.12	
CYNOGLOSSIDAE	0.16	16	0.04	
Total	389.60		99.99	

PROJECT STATION:1026

DATE: 2/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 729
start stop duration Long E 1218
TIME :03:25:00 03:55:00 30 (min) Purpose code: 3
LOG :5194.50 5196.00 1.50 Area code : 2
FDEPTH: 510 511 GearCond.code:
BDEPTH: 510 511 Validity code: 1
Towing dir: 88° Wire out:1500 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 73.44 CATCH/HOUR: 146.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	29.50	1120	20.08	
Triplophos sp.	18.70	2306	12.73	
MELANOSTOMIATIDAE	15.76	326	10.73	
Lamprogrammus exutus	14.76	46	10.05	
Merluccius polli	10.70	22	7.28	2254
Lophius vaillanti	9.80	2	6.67	
Aristeus varidens, female	9.56	470	6.51	2253
POLYCHAELIDAE	9.36	1140	6.37	
Aristeus varidens, male	4.10	476	2.83	2252
Nezumia sp.	3.90	90	2.66	
Gadella imberbis	3.76	210	2.56	
SYNAPHOBRANCHIDAE	3.56	186	2.42	
Xenodermichthys copei	2.40	30	1.63	
Gonostoma elongatum	1.96	66	1.33	
Chaceon maritae	1.60	6	1.09	
GALATHEIDAE	1.56	1110	1.06	
Nematocarcinus africanus	1.10	350	0.75	
Yarrella blackfordi	1.00	36	0.68	
STOMIIDAE	0.86	40	0.59	
Chaunax pictus	0.80	10	0.54	
Dibranchus atlanticus	0.56	36	0.38	
Lacmonema laureysi	0.40	6	0.27	
Trichiurus lepturus	0.36	16	0.25	
Talismania sp.	0.30	10	0.20	
Halosaurus ovenii	0.20	10	0.14	
VITRELEDONELLIDAE	0.16	30	0.11	
Hymenocephalus italicus	0.10	6	0.07	
Total	146.88		99.98	

PROJECT STATION:1027

DATE: 2/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 729
start stop duration Long E 1226
TIME :07:04:00 07:24:00 20 (min) Purpose code: 3
LOG :5216.00 5217.00 1.00 Area code : 2
FDEPTH: 264 254 GearCond.code:
BDEPTH: 264 254 Validity code: 1
Towing dir: 330° Wire out: 760 m Speed: 30 kn*10

Sorted: 41 Kg Total catch: 116.54 CATCH/HOUR: 349.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	92.40	5340	26.43	
MYCTOPHIDAE	54.00	24600	15.45	
Trichiurus lepturus	48.60	168	13.90	
Zenopsis conchifer	42.36	60	12.12	
Merluccius polli	36.00	336	10.30	2255
Chlorophthalmus atlanticus	23.16	564	6.62	
Parapenaeus longirostris, fem.	13.44	1080	3.84	2257
Parapenaeus longirostris, male	8.40	732	2.40	2256
Hoplostethus mediterraneus	6.36	36	1.82	
Dentex angolensis	5.88	15	1.68	
Coelorinchus coelorhincus	5.64	168	1.61	
Dentex macrophthalmus	3.99	24	1.14	
Pterothrissus belloci	2.76	24	0.79	
Todaropsis eblanae	2.16	24	0.62	
Trachurus trecae	1.59	3	0.45	
Bembrops sp.	1.20	132	0.34	
CALAPPIDAE	0.96	24	0.27	
Pontinus kuhlii	0.72	12	0.21	
Total	349.62		99.99	

PROJECT STATION:1028

DATE: 2/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 727
start stop duration Long E 1226
TIME :08:22:00 08:52:00 30 (min) Purpose code: 3
LOG :5222.30 5224.00 1.70 Area code : 2
FDEPTH: 142 146 GearCond.code:
BDEPTH: 142 146 Validity code: 1
Towing dir: 335° Wire out: 470 m Speed: 34 kn*10

Sorted: 228 Kg Total catch: 228.81 CATCH/HOUR: 457.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	250.40	694	54.72	2261
Trachurus trecae	111.10	180	24.28	2259
Umbrina canariensis	57.30	126	12.52	2260
Squatina oculata	14.40	18	3.15	
Dentex congoensis	5.52	48	1.21	2258
Raja miraletus	3.08	6	0.67	
Branchiostegus semifasciatus	2.58	2	0.56	
Brotula sp.	2.40	2	0.52	
Dentex macrophthalmus	2.12	10	0.46	
Raja clavata	2.08	2	0.45	
Trichiurus lepturus	1.76	2	0.38	
Todaropsis eblanae	1.44	58	0.31	
Plesionika sp.	0.90	322	0.20	
Zeus faber	0.68	2	0.15	
Octopus sp.	0.58	2	0.13	
Spicara alta	0.52	6	0.11	
Aulopus cadenati	0.22	2	0.05	
Scorpaena stephanica	0.20	2	0.04	
Illex coindetii	0.16	4	0.03	
Bembrops heterurus	0.08	2	0.02	
Boops boops	0.06	2	0.01	
Anthias anthias	0.04	2	0.01	
Total	457.62		99.98	

PROJECT STATION:1029

DATE: 2/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 726
start stop duration Long E 727
TIME :10:28:00 10:58:00 30 (min) Purpose code: 3
LOG :5234.50 5236.00 1.50 Area code : 2
FDEPTH: 98 98 GearCond.code:
BDEPTH: 98 98 Validity code: 1
Towing dir: 143° Wire out: 350 m Speed: 30 kn*10

Sorted: 85 Kg Total catch: 85.25 CATCH/HOUR: 170.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	68.00	242	39.88	2264
Dentex congoensis	29.80	670	17.48	2262
Dentex angolensis	14.40	156	8.45	2265
Sepia orbignyana	13.40	26	7.86	
Chelidonichthys gabonensis	10.60	84	6.22	
Illex coindetii	8.20	294	4.81	2266
Trichiurus lepturus	7.00	8	4.11	
Sparus auriga *	4.90	14	2.87	2263
Dentex barnardi	2.36	4	1.38	
Raja miraletus	2.16	4	1.27	
Umbrina canariensis	2.02	2	1.18	
Squatina oculata	1.64	2	0.96	
Branchiostegus semifasciatus	1.44	4	0.84	
Alloteuthis africana	1.36	222	0.80	
Pagellus bellottii	1.18	18	0.69	
Zeus faber	0.90	2	0.53	
Todaropsis eblanae	0.70	34	0.41	2267
Chaetodon hoefleri	0.40	2	0.23	
Saurida brasiliensis	0.18	20	0.11	
Total	170.64		100.08	

PROJECT STATION:1030

DATE: 2/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 723

	start	stop	duration			Long E 1242
TIME	:12:29:00	12:59:00	30 (min)	Purpose code:	3	
LOG	:5247.90	5249.40	1.50	Area code	: 2	
FDEPTH:	58	58		GearCond.code:		
BDEPTH:	58	58		Validity code:	1	

Towing dir: 148° Wire out: 240 m Speed: 30 kn*10

Sorted: 112 Kg Total catch: 112.62 CATCH/HOUR: 225.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	77.08	210	34.22	
Trachurus trecae	55.40	112	24.60	2270
Sepia orbignyana	27.10	58	12.03	
Sepia officinalis hierredda	11.30	26	5.02	
Trachurus trecae, juvenile	10.26	7576	4.56	2269
Alloteuthis africana	9.94	6278	4.41	
Pagellus bellottii	9.14	154	4.06	2271
Rhinobatos albomaculatus	4.38	2	1.94	
Raja miraletus	4.26	8	1.89	
Fistularia petimba	4.20	12	1.86	
Sparus auriga *	2.56	10	1.14	2268
Chaetodon hoefleri	2.28	12	1.01	
Octopus sp.	2.26	2	1.00	
Zeus faber	1.32	4	0.59	
Sparus caeruleostictus *	1.10	2	0.49	
Trachinotus ovatus	0.84	2	0.37	
Dentex barnardi	0.82	2	0.36	
Torpedo torpedo	0.42	2	0.19	
Lagocephalus laevigatus	0.34	2	0.15	
Sphyraena sphyraena	0.24	2	0.11	
Total	225.24		100.00	

PROJECT STATION:1031

DATE: 2/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 722

	start	stop	duration			Long E 1246
TIME	:14:08:00	14:28:00	20 (min)	Purpose code:	3	
LOG	:5256.50	5257.50	1.00	Area code	: 2	
FDEPTH:	40	42		GearCond.code:	9	
BDEPTH:	40	42		Validity code:	1	

Towing dir: 160° Wire out: 180 m Speed: 28 kn*10

Sorted: 183 Kg Total catch: 183.02 CATCH/HOUR: 549.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	210.30	861	38.30	2272
Sparus auriga *	63.15	177	11.50	2273
Decapterus rhonchus	47.55	99	8.66	2276
Selene dorsalis	36.60	84	6.67	2277
Epinephelus aeneus	34.65	15	6.31	
Plectorhinchus mediterraneus	27.00	30	4.92	
Raja miraletus	26.40	48	4.81	
Sparus caeruleostictus *	25.95	57	4.73	2275
Chelidonichthys gabonensis	18.60	78	3.39	
Trachurus trecae	17.55	36	3.20	2274
Rhinobatos albomaculatus	16.20	6	2.95	
Sepia officinalis hierredda	7.50	6	1.37	
Sepia orbignyana	6.45	9	1.17	
Leptocharias smithii	3.51	3	0.64	
Sphyraena sphyraena	2.13	6	0.39	
Echeneis naucrates	1.77	3	0.32	
Zeus faber	1.71	6	0.31	
Ephippion guttifer	1.41	3	0.26	
Syacium micrurum	0.63	3	0.11	
Total	549.06		100.01	

PROJECT STATION:1032

DATE: 3/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 704

	start	stop	duration			Long E 1243
TIME	:05:27:00	05:42:00	15 (min)	Purpose code:	3	
LOG	:5301.10	5302.00	0.90	Area code	: 2	
FDEPTH:	16	17		GearCond.code:		
BDEPTH:	16	17		Validity code:	4	

Towing dir: 320° Wire out: 80 m Speed: 36 kn*10

Sorted: 37 Kg Total catch: 37.55 CATCH/HOUR: 150.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus rhonchus	68.64	372	45.70	2278
Seriola carpenteri	42.60	44	28.36	2279
Sepia orbignyana	12.60	12	8.39	
Sphyraena sphyraena	6.00	24	3.99	
Pomadasys rogeri	4.20	8	2.80	
Pagellus bellottii	3.84	20	2.56	
Stromateus fiatola	3.32	4	2.21	
Sardinella aurita	3.24	20	2.16	
Raja miraletus	2.36	4	1.57	
Pomadasys peroteti	1.92	4	1.28	
Pomadasys jubelini	1.44	4	0.96	
Centrarchops chapini	0.04	8	0.03	
Total	150.20		100.01	

PROJECT STATION:1033

DATE: 3/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 705

	start	stop	duration			Long E 1239
TIME	:07:15:00	07:30:00	15 (min)	Purpose code:	3	
LOG	:5310.40	5311.30	0.90	Area code	: 2	
FDEPTH:	30	32		GearCond.code:		
BDEPTH:	30	32		Validity code:	1	

Towing dir: 324° Wire out: 130 m Speed: 36 kn*10

Sorted: 17 Kg Total catch: 17.91 CATCH/HOUR: 71.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Stromateus fiatola	21.64	28	30.21	
Alectis alexandrinus	14.00	8	19.54	
Decapterus rhonchus	12.60	116	17.59	2282
Seriola carpenteri	6.40	4	8.93	
Trachurus trecae	5.20	24	7.26	2280
Pagellus bellottii	5.16	40	7.20	2281
Selene dorsalis	3.40	8	4.75	
Sepia orbignyana	2.92	4	4.08	
Decapterus punctatus	0.28	4	0.39	
Boops boops	0.04	4	0.06	
Total	71.64		100.01	

PROJECT STATION:1034

DATE: 3/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 711

	start	stop	duration			Long E 1228
TIME	:09:21:00	09:51:00	30 (min)	Purpose code:	3	
LOG	:5326.40	5328.10	1.70	Area code	: 2	
FDEPTH:	74	76		GearCond.code:		
BDEPTH:	74	76		Validity code:	1	

Towing dir: 320° Wire out: 260 m Speed: 34 kn*10

Sorted: 181 Kg Total catch: 361.60 CATCH/HOUR: 723.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	579.00	1216	80.06	2286
Boops boops	41.80	2904	5.78	
Umbrina canariensis	22.08	36	3.05	2285
Dentex gibbosus	19.56	32	2.70	2284
Alloteuthis africana	18.60		2.57	
Pagellus bellottii	13.84	92	1.91	2283
Sparus caeruleostictus *	9.32	16	1.29	
Fistularia petimba	3.76	12	0.52	
Zeus faber	2.96	4	0.41	
Epinephelus aeneus	2.40	4	0.33	
Raja miraletus	2.12	4	0.29	
Pseudupeneus prayensis	2.08	24	0.29	
Torpedo marmorata	1.84	4	0.25	
Sepia orbignyana	1.56	4	0.22	
Chaetodon hoefleri	0.76	4	0.11	
Chelidonichthys gabonensis	0.56	4	0.08	
Anthias anthias	0.36	32	0.05	
Decapterus rhonchus	0.36	4	0.05	
Dentex angolensis	0.12	4	0.02	
Dentex canariensis	0.12	4	0.02	
Total	723.20		100.00	

PROJECT STATION:1035

DATE: 3/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 711

	start	stop	duration			Long E 1215
TIME	:11:45:00	12:09:00	24 (min)	Purpose code:	3	
LOG	:5344.40	5345.60	1.20	Area code	: 2	
FDEPTH:	126	128		GearCond.code:	9	
BDEPTH:	126	128		Validity code:	1	

Towing dir: 150° Wire out: 470 m Speed: 30 kn*10

Sorted: 83 Kg Total catch: 82.85 CATCH/HOUR: 207.13

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	83.88	1420	40.50	2289
Dentex congoensis	56.25	730	27.16	2287
Dentex angolensis	46.63	283	22.51	2288
Trichiurus lepturus	5.78	8	2.79	
Spicara alta	2.18	93	1.05	
Sepia orbignyana	2.15	3	1.04	
Sparus pagrus africanus *	2.03	5	0.98	
Dentex barnardi	1.75	3	0.84	
Illex coindetii	1.45	43	0.70	2290
Todaropsis eblanae	1.28	48	0.62	2291
Alloteuthis africana	1.03	543	0.50	
Chelidonichthys gabonensis	0.75	100	0.36	
Zeus faber	0.73	3	0.35	
Branchiostegus semifasciatus	0.70	3	0.34	
Pagellus bellottii	0.30	5	0.14	
Peristedion cataphractum	0.15	3	0.07	
Citharus linguatula	0.13	3	0.06	
Total	207.17		100.01	

PROJECT STATION:1036

DATE: 3/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 713

	start	stop	duration			Long E 1209
TIME	:13:59:00	14:29:00	30 (min)	Purpose code:	3	
LOG	:5360.70	5362.30	1.60	Area code	: 2	
FDEPTH:	196	198		GearCond.code:		
BDEPTH:	196	198		Validity code:	1	

Towing dir: 305° Wire out: 650 m Speed: 34 kn*10

Sorted: 154 Kg Total catch: 215.68 CATCH/HOUR: 431.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	154.84	400	35.90	2292
Spicara alta	86.24	426	19.99	
Trichiurus lepturus	68.74	294	15.94	
Dentex angolensis	65.80	208	15.25	2293
Zenopsis conchifer	25.90	92	6.00	
Brotula barbata	8.66	6	2.01	
Pterothrissus belloci	7.12	58	1.65	
Todaropsis eblanae	3.14	68	0.73	2294
Illex coindetii	2.02	40	0.47	2295
Miracorvina angolensis	1.90	8	0.44	
Dentex macrophthalmus	1.46	8	0.34	
Squatina oculata	1.26	2	0.29	
Chelidonichthys gabonensis	0.96	6	0.22	
Uranoscopus polli	0.92	6	0.21	
Pontinus kuhlii	0.76	8	0.18	
Bembrops heterurus	0.62	8	0.14	
Bassanago albescens	0.34	2	0.08	
Monolene microstoma	0.30	16	0.07	
Peristedion cataphractum	0.20	2	0.05	
Sepia orbignyana	0.16	2	0.04	
Parapenaeus longirostris	0.06	12	0.01	
Total	431.40		100.01	

PROJECT STATION:1037

DATE: 3/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 714

	start	stop	duration			Long E 1206
TIME	:15:56:00	16:26:00	30 (min)	Purpose code:	3	
LOG	:5370.50	5372.20	1.70	Area code	: 2	
FDEPTH:	269	267		GearCond.code:		
BDEPTH:	269	267		Validity code:	1	

Towing dir: 330° Wire out: 860 m Speed: 31 kn*10

Sorted: 47 Kg Total catch: 111.87 CATCH/HOUR: 223.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	159.90	142968	71.47	
Merluccius polli	27.90	306	12.47	2296
Bembrops sp.	9.96	1482	4.45	
Synagrops microlepis	9.84	810	4.40	
Todaropsis eblanae	3.54	72	1.58	
Trichiurus lepturus	3.18	12	1.42	
Zenopsis conchifer	3.06	24	1.37	
Sepia sp.	1.80	156	0.80	
Benthodesmus tenuis	1.56	198	0.70	
Parapenaeus longirostris, fem.	1.40	172	0.63	2298
Parapenaeus longirostris, male	0.76	120	0.34	2297
Chlorophthalmus atlanticus	0.54	48	0.24	
Illex coindetii	0.12	6	0.05	
Nezumia sp.	0.12	6	0.05	
Zenion hololepis	0.06	6	0.03	
Total	223.74		100.00	

PROJECT STATION:1038

DATE: 3/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 715
start stop duration Long E 1202
TIME :18:14:00 18:44:00 30 (min) Purpose code: 3
LOG :5381.60 5383.20 1.60 Area code : 2
FDEPTH: 368 369 GearCond.code:
BDEPTH: 368 369 Validity code: 1
Towing dir: 330° Wire out:1150 m Speed: 32 kn*10

Sorted: 55 Kg Total catch: 218.97 CATCH/HOUR: 437.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	108.40	24000	24.75	
Merluccius polli	82.40	472	18.82	2299
Chlorophthalmus atlanticus	67.52	960	15.42	
Hymenocephalus italicus	55.20	4784	12.60	
Malacocephalus occidentalis	36.88	208	8.42	
Coelorinchus coelorhincus	17.44	616	3.98	
Laemonema laureysi	15.44	272	3.53	
Dibranchus atlanticus	11.68	1392	2.67	
Ariomma bondi	8.64	88	1.97	
Ophisurus serpens	7.16	80	1.63	
Chaunax pictus	6.32	152	1.44	
Benthodesmus tenuis	5.52	136	1.26	
Chaceon maritae	2.64	8	0.60	
Lophius vaillanti	2.32	16	0.53	
Paromola cuvieri	2.24	2	0.51	
Coloconger cadenati	2.00	8	0.46	
Bembrops heterurus	1.84	24	0.42	
Gadella imberbis	1.60	40	0.37	
Bathyuroconger vicinus	1.44	24	0.33	
Halosaurus ovenii	0.72	24	0.16	
Eumunida squamifera	0.16	24	0.04	
POLYCHAELIDAE	0.08	8	0.02	
Bathynectes piperitus	0.08	8	0.02	
Total	437.72		99.95	

PROJECT STATION:1039

DATE: 3/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 714
start stop duration Long E 1159
TIME :19:57:00 20:26:00 29 (min) Purpose code: 3
LOG :5390.70 5392.40 1.70 Area code : 2
FDEPTH: 460 462 GearCond.code:
BDEPTH: 460 462 Validity code: 1
Towing dir: 325° Wire out:1290 m Speed: 34 kn*10

Sorted: 37 Kg Total catch: 57.57 CATCH/HOUR: 119.11

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	45.72	83	38.38	2300
Lamprogrammus exutus	24.31	68	20.41	
Laemonema laureysi	7.34	99	6.16	
POLYCHAELIDAE	7.14	751	5.99	
Gadella imberbis	5.48	248	4.60	
Nematocarcinus africanus	5.17	1303	4.34	
Dibranchus atlanticus	3.83	403	3.22	
Lophius vaillanti	3.83	6	3.22	
MELANOSTOMIATIDAE	2.90	72	2.43	
Chaunax pictus	2.34	27	1.96	
Nezumia sp.	1.55	21	1.30	
Hoplostethus cadenati	1.55	21	1.30	
Aristeus varidens, male	1.41	163	1.18	2301
Aristeus varidens, female	1.32	77	1.11	2302
Bathyuroconger vicinus	1.14	10	0.96	
Triplophos sp.	0.83	114	0.70	
Coloconger cadenati	0.72	6	0.60	
STOMIIDAE	0.52	27	0.44	
Chlorophthalmus atlanticus	0.52	10	0.44	
MACROURIDAE	0.41	21	0.34	
Histioteuthis reversa	0.31	6	0.26	
Halosaurus ovenii	0.27	17	0.23	
Etmopterus spinax	0.17	10	0.14	
CONGRIDAE	0.17	10	0.14	
Bathynectes piperitus	0.10	6	0.08	
Dicologoglossa cuneata	0.06	6	0.05	
Total	119.11		99.98	

PROJECT STATION:1040

DATE: 3/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 714
start stop duration Long E 1156
TIME :22:10:00 22:40:00 30 (min) Purpose code: 3
LOG :5400.10 5401.70 1.60 Area code : 2
FDEPTH: 546 554 GearCond.code:
BDEPTH: 546 554 Validity code: 1
Towing dir: 320° Wire out:1500 m Speed: 32 kn*10

Sorted: 27 Kg Total catch: 81.51 CATCH/HOUR: 163.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lamprogrammus exutus	27.78	102	17.04	
MELANOSTOMIATIDAE	26.70	516	16.38	
Triplophos sp.	17.46	2094	10.71	
Chaceon maritae	14.88	30	9.13	
Nezumia sp.	13.68	294	8.39	
POLYCHAELIDAE	10.92	1254	6.70	
Ebinania costaecanarie	7.74	6	4.75	
Aristeus varidens, female	7.14	258	4.38	2304
Hoplostethus cadenati	5.82	216	3.57	
Benthodesmus tenuis	3.78	108	2.32	
Lophius vaillanti	3.30	6	2.02	
Hydrolagus africanus	3.18	6	1.95	
Dibranchus atlanticus	3.06	330	1.88	
Nematocarcinus africanus	2.76	576	1.69	
Etmopterus spinax	2.04	30	1.25	
Bathyuroconger vicinus	1.74	42	1.07	
Coloconger cadenati	1.50	6	0.92	
STOMIIDAE	1.50	78	0.92	
Aristeus varidens, male	1.44	162	0.88	2303
Yarrella blackfordi	1.14	30	0.70	
Dicrolene intronigra	0.78	156	0.48	
Bathygadus melanobranchus	0.78	12	0.48	
OPHIDIIDAE	0.66	12	0.40	
Talismania sp.	0.54	18	0.33	
NETTASTOMATIDAE	0.48	18	0.29	
Xenodermichthys copei	0.42	42	0.26	
Gadella imberbis	0.42	18	0.26	
SYNAPHOBRANCHIDAE	0.42	12	0.26	
Bassanago albescens	0.36	6	0.22	
Halosaurus ovenii	0.24	6	0.15	
Glyphus marsupialis	0.18	54	0.11	
Gonostoma sp.	0.12	6	0.07	
MYCTOPHIDAE	0.06	60	0.04	
Total	163.02		100.00	

PROJECT STATION:1041

DATE: 4/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 657
start stop duration Long E 1144
TIME :01:39:00 02:09:00 30 (min) Purpose code: 3
LOG :5420.20 5421.80 1.60 Area code : 2
FDEPTH: 549 549 GearCond.code:
BDEPTH: 549 549 Validity code: 1
Towing dir: 320° Wire out:1520 m Speed: 31 kn*10
Sorted: 26 Kg Total catch: 61.68 CATCH/HOUR: 123.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lamprogrammus exutus	21.00	50	17.02	
MELANOSTOMIATIDAE	19.70	430	15.97	
Triplophos sp.	14.50	1740	11.75	
Lophius vaillanti	13.20	6	10.70	
Hoplostethus cadenati	7.66	240	6.21	
Talismania sp.	7.26	270	5.89	
POLYCHAELIDAE	6.80	770	5.51	
Aristeus varidens, female	4.66	216	3.78	2305
Nezumia sp.	3.96	90	3.21	
Centroscymnus crepidater	3.30	16	2.68	
Merluccius polli	2.76	6	2.24	
Aristeus varidens, male	2.26	246	1.83	2306
STOMIIDAE	2.24	140	1.82	
Chaceon maritae	1.96	10	1.59	
Yarrella blackfordi	1.80	30	1.46	
Xenodermichthys copei	1.60	106	1.30	
Etmopterus spinax	1.36	20	1.10	
Glyphus marsupialis	1.20	150	0.97	
Melanonus zugmayeri	1.06	46	0.86	
Nematocarcinus africanus	0.80	200	0.65	
Chaunax pictus	0.66	10	0.54	
Gonostoma sp.	0.66	26	0.54	
Laemonema laureysi	0.40	6	0.32	
Bathygadus melanobranchus	0.40	20	0.32	
Scopelosaurus sp.	0.36	6	0.29	
Bathyuroconger vicinus	0.36	16	0.29	
Pontinus accraensis	0.30	6	0.24	
Benthodesmus tenuis	0.30	10	0.24	
NETTASTOMATIDAE	0.30	10	0.24	
Dibranchus atlanticus	0.26	20	0.21	
Gadella imberbis	0.10	6	0.08	
Dicrolene sp.	0.10	16	0.08	
Total	123.28		99.93	

PROJECT STATION:1042

DATE: 4/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 655
start stop duration Long E 1150
TIME :04:33:00 04:55:00 22 (min) Purpose code: 3
LOG :5440.40 5441.60 1.20 Area code : 2
FDEPTH: 313 310 GearCond.code: 9
BDEPTH: 313 310 Validity code: 1
Towing dir: 340° Wire out: 93 m Speed: 33 kn*10
Sorted: 47 Kg Total catch: 122.61 CATCH/HOUR: 334.39

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	177.93	2062	53.21	
Merluccius polli	58.09	286	17.37	2309
Nematocarcinus africanus	15.38	4233	4.60	
Hymenocephalus italicus	14.73	458	4.41	
Coelorinchus coelorhincus	12.22	207	3.65	
Laemonema laureysi	12.00	207	3.59	
MYCTOPHIDAE	11.24	4156	3.36	
Gadella imberbis	8.95	251	2.68	
Trichiurus lepturus	5.45	11	1.63	
Malacocephalus occidentalis	3.27	11	0.98	
Benthodesmus tenuis	2.40	120	0.72	
Pterothrissus belloci	1.96	11	0.59	
Parapenaeus longirostris, fem.	1.88	145	0.56	2308
Eumunida squamifera	1.64	109	0.49	
Pontinus kuhlii	1.31	33	0.39	
STOMIIDAE	1.20	55	0.36	
CALAPPIDAE	0.98	11	0.29	
Nezumia sp.	0.65	65	0.19	
Lophius vaillanti	0.55	11	0.16	
Synagrops microlepis	0.55	22	0.16	
Nemichthys scolopaceus	0.44	22	0.13	
MACROURIDAE	0.33	22	0.10	
POLYCHAELIDAE	0.33	55	0.10	
Parapenaeus longirostris, male	0.27	27	0.08	2307
Todaropsis eblanae	0.22	11	0.07	
Dicologoglossa cuneata	0.22	11	0.07	
Peristedion cataphractum	0.11	11	0.03	
Bembrops sp.	0.11	11	0.03	
Total	334.41		100.00	

PROJECT STATION:1043

DATE: 4/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 654
start stop duration Long E 1152
TIME :05:59:00 06:29:00 30 (min) Purpose code: 3
LOG :5448.20 5449.80 1.60 Area code : 2
FDEPTH: 220 221 GearCond.code:
BDEPTH: 220 221 Validity code: 1
Towing dir: 350° Wire out: 710 m Speed: 32 kn*10
Sorted: 70 Kg Total catch: 125.44 CATCH/HOUR: 250.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	128.20	6000	51.10	
Dentex angolensis	25.70	78	10.24	2314
Trichiurus lepturus	18.40	44	7.33	
Merluccius polli	11.28	104	4.50	2312
Todaropsis eblanae	8.12	152	3.24	
Miracorvina angolensis	7.60	4	3.03	
Raja clavata	7.28	16	2.90	
Zenopsis conchifer	7.24	60	2.89	
Hoplostethus mediterraneus	5.40	4	2.15	
Bembrops sp.	3.60	120	1.43	
Brotula barbata	3.40	4	1.36	
Pterothrissus belloci	3.12	24	1.24	
Uranoscopus cadenati	3.08	24	1.23	
Dentex macrophthalmus	3.06	10	1.22	2313
Coelorinchus coelorhincus	2.64	76	1.05	
Aulopus cadenati	1.96	12	0.78	
Sepia sp.	1.68	64	0.67	
Torpedo marmorata	1.60	4	0.64	
Pontinus kuhlii	1.48	36	0.59	
Galeus polli	1.32	8	0.53	
Lophiodes kempi	1.04	4	0.41	
Parapenaeus longirostris, male	0.88	176	0.35	2310
Peristedion cataphractum	0.84	36	0.33	
Parapenaeus longirostris, fem.	0.52	96	0.21	2311
Pentheroscion mbizi	0.48	4	0.19	
Benthodesmus tenuis	0.20	40	0.08	
CALAPPIDAE	0.20	4	0.08	
Bathyuroconger vicinus	0.16	4	0.06	
Illex coindetii	0.12	4	0.05	
Nematocarcinus africanus	0.08	36	0.03	
MYCTOPHIDAE	0.08	32	0.03	
Monolene microstoma	0.08	12	0.03	
Epigonus telescopus	0.04	4	0.02	
Total	250.88		99.99	

PROJECT STATION:1044

DATE: 4/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 653
start stop duration Long E 1153
TIME :08:02:00 08:32:00 30 (min) Purpose code: 3
LOG :5456.40 5457.90 1.50 Area code : 2
FDEPTH: 160 163 GearCond.code:
BDEPTH: 160 163 Validity code: 1
Towing dir: 350° Wire out: 550 m Speed: 30 kn*10

Sorted: 125 Kg Total catch: 125.07 CATCH/HOUR: 250.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	85.60	334	34.22	2316
Dentex macrophthalmus	40.40	214	16.15	2315
Trachurus trecae	36.80	74	14.71	2317
Spicara alta	21.40	150	8.56	
Ariomma bondi	20.00	288	8.00	
Zenopsis conchifer	12.50	34	5.00	
Todaropsis eblanae	8.52	168	3.41	
Trichiurus lepturus	8.10	14	3.24	
Brotula barbata	2.68	2	1.07	
Raja clavata	2.56	2	1.02	
Citharus linguatula	2.06	36	0.82	
Anthias anthias	2.04	34	0.82	
Miracorvina angolensis	1.72	2	0.69	
Pterothrissus belloci	1.24	8	0.50	
Zeus faber	1.20	4	0.48	
Umbrina canariensis	0.82	2	0.33	
Illex coindetii	0.74	14	0.30	
Lepidotrigla cadmani	0.70	6	0.28	
Cynoponticus ferox	0.40	2	0.16	
Aulopus cadenati	0.36	2	0.14	
Pontinus kuhlii	0.16	2	0.06	
Peristedion cataphractum	0.14	2	0.06	
Engraulis encrasicolus	0.06	4	0.02	
Total	250.20		100.04	

PROJECT STATION:1045

DATE: 4/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 621
start stop duration Long E 1203
TIME :10:23:00 10:53:00 30 (min) Purpose code: 3
LOG :5471.90 5473.50 1.60 Area code : 2
FDEPTH: 91 87 GearCond.code:
BDEPTH: 91 87 Validity code: 1
Towing dir: 85° Wire out: 320 m Speed: 32 kn*10

Sorted: 108 Kg Total catch: 107.79 CATCH/HOUR: 215.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	119.50	114	55.43	2321
Epinephelus aeneus	46.40	6	21.52	
Pagellus bellottii	16.00	92	7.42	2320
Leptocharias smithii	10.10	4	4.69	
Sepia orbignyana	4.60	6	2.13	
Zenopsis conchifer	3.04	2	1.41	
Trachurus trecae	2.58	10	1.20	
Epinephelus marginatus	2.48	2	1.15	
Zeus faber	2.10	6	0.97	
Chelidonichthys gabonensis	1.76	12	0.82	
Sparus caeruleostictus *	1.30	2	0.60	
Todaropsis eblanae	1.26	42	0.58	2318
Illex coindetii	0.92	26	0.43	2319
Sardinella aurita	0.78	2	0.36	
Alloteuthis africana	0.76	190	0.35	
Fistularia petimba	0.74	2	0.34	
Peristedion cataphractum	0.42	8	0.19	
Chaetodon hoefleri	0.38	2	0.18	
Dentex angolensis	0.30	2	0.14	
OPHICHTHIDAE	0.16	2	0.07	
Total	215.58		99.98	

PROJECT STATION:1046

DATE: 4/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 649
start stop duration Long E 1212
TIME :13:08:00 13:38:00 30 (min) Purpose code: 3
LOG :5492.60 5494.20 1.60 Area code : 2
FDEPTH: 70 71 GearCond.code:
BDEPTH: 70 71 Validity code: 1
Towing dir: 320° Wire out: 280 m Speed: 30 kn*10

Sorted: 142 Kg Total catch: 142.27 CATCH/HOUR: 284.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	69.70	202	24.50	2323
Alloteuthis africana	48.10	22024	16.90	
Dentex barnardi	40.40	82	14.20	2325
Pagellus bellottii	34.70	322	12.20	2324
Dentex canariensis	19.40	28	6.82	2326
Epinephelus aeneus	19.40	12	6.82	
Sepia orbignyana	11.00	22	3.87	
Dentex angolensis	6.90	30	2.42	2327
Sparus auriga *	5.68	20	2.00	2328
Leptocharias smithii	5.60	2	1.97	
Rhinobatos albomaculatus	3.94	2	1.38	
Zeus faber	3.12	10	1.10	
Fistularia petimba	3.02	12	1.06	
Chaetodon hoefleri	2.88	18	1.01	
Branchiostegus semifasciatus	2.48	2	0.87	
Seriola lalandi	2.46	2	0.86	
Sparus caeruleostictus *	1.86	4	0.65	
Trachurus trecae, juvenile	1.24	950	0.44	2322
Trichiurus lepturus	0.94	2	0.33	
Raja miraletus	0.92	2	0.32	
Chelidonichthys gabonensis	0.64	4	0.22	
Illex coindetii	0.16	6	0.06	
Total	284.54		100.00	

PROJECT STATION:1047

DATE: 5/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 624
start stop duration Long E 1210
TIME :05:25:00 05:55:00 30 (min) Purpose code: 3
LOG :5545.30 5546.90 1.60 Area code : 2
FDEPTH: 39 39 GearCond.code:
BDEPTH: 39 39 Validity code: 1
Towing dir: 155° Wire out: 160 m Speed: 32 kn*10

Sorted: 113 Kg Total catch: 711.23 CATCH/HOUR: 1422.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1344.62	3406	94.53	2332
Alloteuthis africana	27.60	8584	1.94	
Decapterus rhonchus	13.90	14	0.98	2329
Epinephelus costae	8.80	2	0.62	
Pagellus bellottii	7.94	56	0.56	2331
Sparus caeruleostictus *	5.32	10	0.37	
Dentex barnardi	4.38	10	0.31	
Fistularia petimba	2.74	10	0.19	
Sepia orbignyana	2.60	8	0.18	2330
Dentex gibbosus	1.50	2	0.11	
Raja miraletus	1.32	2	0.09	
Lagocephalus laevigatus	0.80	2	0.06	
Zeus faber	0.74	2	0.05	
OPHIDIIDAE	0.20	4	0.01	
Total	1422.46		100.00	

PROJECT STATION:1048

DATE: 5/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 632
start stop duration Long E 1202
TIME :07:50:00 08:20:00 30 (min) Purpose code: 3
LOG :5561.90 5563.60 1.70 Area code : 2
FDEPTH: 87 87 GearCond.code:
BDEPTH: 87 87 Validity code: 1
Towing dir: 358° Wire out: 320 m Speed: 34 kn*10

Sorted: 107 Kg Total catch: 200.00 CATCH/HOUR: 400.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	185.00	1944	46.25	2334
Trachurus trecae	121.00	488	30.25	2333
Epinephelus aeneus	28.40	6	7.10	
Dentex angolensis	17.00	156	4.25	2335
Dentex gibbosus	9.56	12	2.39	
Brotula barbata	7.44	4	1.86	
Zeus faber	7.16	12	1.79	
Trichiurus lepturus	5.88	8	1.47	
Todaropsis eblanae	4.24	152	1.06	
Umbrina canariensis	3.12	4	0.78	
Fistularia petimba	3.08	8	0.77	
Raja miraletus	3.04	4	0.76	
Sepia orbignyana	2.24	4	0.56	
Alloteuthis africana	2.16	740	0.54	
Chelidonichthys gabonensis	0.48	12	0.12	
Illex coindetii	0.12	8	0.03	
Citharus linguatula	0.08	4	0.02	
Total	400.00		100.00	

PROJECT STATION:1049

DATE: 5/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 635
start stop duration Long E 1152
TIME :10:07:00 10:37:00 30 (min) Purpose code: 3
LOG :5576.50 5578.00 1.50 Area code : 2
FDEPTH: 122 120 GearCond.code:
BDEPTH: 122 120 Validity code: 1
Towing dir: 155° Wire out: 450 m Speed: 30 kn*10

Sorted: 124 Kg Total catch: 202.57 CATCH/HOUR: 405.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	235.78	1066	58.20	2338
Dentex congoensis	59.32	858	14.64	2336
Dentex angolensis	56.22	394	13.88	2339
Sarda sarda	16.86	6	4.16	
Dentex barnardi	7.68	10	1.90	
Trichiurus lepturus	6.86	16	1.69	
Atractoscion aequidens	6.66	4	1.64	
Illex coindetii	5.62	114	1.39	2337
Chelidonichthys gabonensis	2.56	56	0.63	
Raja miraletus	2.04	4	0.50	
Torpedo torpedo	1.96	4	0.48	
Branchiostegus semifasciatus	1.72	4	0.42	
Pagellus bellottii	1.10	4	0.27	
Chaetodon hoefleri	0.48	4	0.12	
Citharus linguatula	0.26	6	0.06	
Total	405.12		99.98	

PROJECT STATION:1050

DATE: 5/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 636
start stop duration Long E 1146
TIME :11:57:00 12:27:00 30 (min) Purpose code: 3
LOG :5588.60 5590.10 1.50 Area code : 2
FDEPTH: 167 167 GearCond.code:
BDEPTH: 167 167 Validity code: 1
Towing dir: 160° Wire out: 570 m Speed: 32 kn*10

Sorted: 55 Kg Total catch: 55.25 CATCH/HOUR: 110.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	51.20	230	46.33	2343
Trachurus trecae	16.80	42	15.20	2340
Trichiurus lepturus	11.50	22	10.41	
Zenopsis conchifer	10.10	42	9.14	
Spicara alta	5.76	54	5.21	
Chelidonichthys gabonensis	3.56	36	3.22	
Pterothrissus belloci	3.10	28	2.81	
Todaropsis eblanae	2.98	80	2.70	2342
Pontinus kuhlii	2.10	40	1.90	
Illex coindetii	1.24	22	1.12	2341
Pentheroscion mbizi	0.54	4	0.49	
Aulopus cadenati	0.54	6	0.49	
Bembrops heterurus	0.36	8	0.33	
Ariomma bondi	0.18	4	0.16	
Trigla lyra	0.16	2	0.14	
Peristedion cataphractum	0.10	4	0.09	
Citharus linguatula	0.10	4	0.09	
Uranoscopus polli	0.10	4	0.09	
Saurida brasiliensis	0.06	14	0.05	
Monolene microstoma	0.02	2	0.02	
Total	110.50		99.99	

PROJECT STATION:1051

DATE: 5/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 836

	start	stop	duration			Long E 1142
TIME	:13:48:00	14:18:00	30 (min)	Purpose code:	3	
LOG	:5597.70	5599.10	1.40	Area code :	2	
FDEPTH:	246	251		GearCond.code:		
BDEPTH:	246	251		Validity code:	1	

Towing dir: 160° Wire out: 770 m Speed: 33 kn*10

Sorted: 82 Kg Total catch: 384.14 CATCH/HOUR: 768.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	284.90	6094	37.08	
Synagrops microlepis	249.70	12760	32.50	
MYCTOPHIDAE	74.26	26620	9.67	
Merluccius polli	56.10	652	7.30	2345
Dentex angolensis	23.00	76	2.99	2344
Xenopsis conchifer	21.02	78	2.74	
Trichiurus lepturus	14.86	34	1.93	
Parapenaeus longirostris, male	8.94	1238	1.16	2347
Todaropsis eblanae	6.06	100	0.79	2349
Parapenaeus longirostris, fem.	5.72	614	0.74	2346
Coelorinchus coelorhincus	5.72	210	0.74	
Illex coindetii	4.30	110	0.56	2348
Uranoscopus polli	4.08	22	0.53	
Chlorophthalmus punctatus	3.30	144	0.43	
Lophius vaillanti	1.88	12	0.24	
Pterothrissus belloci	1.54	12	0.20	
Ariomma bondi	1.22	22	0.16	
Epigonus pandionis	0.78	34	0.10	
Pegusa lascaris	0.44	12	0.06	
Apogon sp.	0.44	34	0.06	
Citharus linguatula	0.12	12	0.02	
Total	768.38		100.00	

PROJECT STATION:1052

DATE: 5/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 635

	start	stop	duration			Long E 1138
TIME	:15:45:00	16:15:00	30 (min)	Purpose code:	3	
LOG	:5609.50	5610.90	1.40	Area code :	2	
FDEPTH:	352	349		GearCond.code:		
BDEPTH:	352	349		Validity code:	1	

Towing dir: 150° Wire out:1050 m Speed: 30 kn*10

Sorted: 112 Kg Total catch: 281.28 CATCH/HOUR: 562.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	181.28	3036	32.22	
Merluccius polli	119.40	454	21.22	2350
Pontinus accraensis	76.56	1338	13.61	
Hymenocephalus italicus	53.86	5386	9.57	
Benthodesmus tenuis	46.64	1092	8.29	
Laemonema laureysi	16.02	352	2.85	
Trichiurus lepturus	13.38	18	2.38	
Gadella imberbis	11.62	344	2.07	
Pterothrissus belloci	11.44	52	2.03	
Malacocephalus occidentalis	7.12	36	1.27	
Centrophorus uyato	7.10	2	1.26	
Bembrops sp.	3.70	52	0.66	
Parapenaeus longirostris	3.52	264	0.63	
Chaunax pictus	3.00	124	0.53	
Coelorinchus coelorhincus	2.64	52	0.47	
Todaropsis eblanae	2.02	36	0.36	
Bathynectes piperitus	1.58	18	0.28	
Nezumia sp.	0.62	26	0.11	
Eumunida squamifera	0.44	36	0.08	
Dicologoglossa cuneata	0.26	8	0.05	
MYCTOPHIDAE	0.18	70	0.03	
Nematocarcinus africanus	0.18	88	0.03	
Total	562.56		100.00	

PROJECT STATION:1053

DATE: 5/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 639

	start	stop	duration			Long E 1138
TIME	:17:40:00	18:10:00	30 (min)	Purpose code:	3	
LOG	:5619.80	5621.40	1.60	Area code :	2	
FDEPTH:	458	458		GearCond.code:		
BDEPTH:	458	458		Validity code:	1	

Towing dir: 315° Wire out:1290 m Speed: 32 kn*10

Sorted: 61 Kg Total catch: 90.10 CATCH/HOUR: 180.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	90.10	156	50.00	2353
Laemonema laureysi	17.40	258	9.66	
Coloconger cadenati	10.44	48	5.79	
Chaunax pictus	7.92	84	4.40	
POLYCHAELIDAE	7.08	564	3.93	
Triplophos sp.	6.60	726	3.66	
Benthodesmus tenuis	5.22	114	2.90	
Gadella imberbis	4.50	150	2.50	
Aristeus varidens, female	3.36	212	1.86	2352
Nezumia sp.	3.12	102	1.73	
Paromola cuvieri	2.74	2	1.52	
MELANOSTOMIATIDAE	2.70	48	1.50	
Bathygadus melanobranchus	2.40	12	1.33	
Halosaurus ovenii	1.98	60	1.10	
Aristeus varidens, male	1.86	130	1.03	2351
Lamprogrammus exutus	1.80	6	1.00	
Etmopterus spinax	1.80	24	1.00	
CONGRIDAE	1.50	30	0.83	
Pterothrissus belloci	1.44	6	0.80	
Malacocephalus occidentalis	1.26	6	0.70	
Hoplostethus cadenati	1.14	6	0.63	
Bathyuroconger vicinus	1.14	24	0.63	
Yarrella blackfordi	0.66	12	0.37	
Bathynectes piperitus	0.66	12	0.37	
Nematocarcinus africanus	0.54	222	0.30	
Dibranchus atlanticus	0.36	12	0.20	
STOMIIDAE	0.24	6	0.13	
MACROURIDAE	0.18	18	0.10	
Ariomma bondi	0.06	6	0.03	
Total	180.20		100.00	

PROJECT STATION:1054

DATE: 5/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 641

	start	stop	duration			Long E 1137
TIME	:20:20:00	20:50:00	30 (min)	Purpose code:	3	
LOG	:5632.90	5634.60	1.70	Area code :	2	
FDEPTH:	548	548		GearCond.code:		
BDEPTH:	548	548		Validity code:	1	

Towing dir: 310° Wire out:1500 m Speed: 34 kn*10

Sorted: 34 Kg Total catch: 96.82 CATCH/HOUR: 193.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Triplophos sp.	75.30	9636	38.89	
Lamprogrammus exutus	43.50	132	22.46	
Hoplostethus cadenati	16.50	696	8.52	
Nezumia sp.	13.02	282	6.72	
Lophius vaillanti	9.42	6	4.86	
POLYCHAELIDAE	8.22	804	4.24	
MELANOSTOMIATIDAE	7.68	156	3.97	
CONGRIDAE	3.36	96	1.74	
Aristeus varidens, female	2.56	104	1.32	2355
Benthodesmus tenuis	1.86	42	0.96	
STOMIIDAE	1.80	72	0.93	
Xenodermichthys copei	1.68	96	0.87	
Merluccius polli	1.52	4	0.78	
Cryptopsaras couesii	1.32	6	0.68	
Plesiopenaeus edwardsianus	1.20	30	0.62	
Aristeus varidens, male	1.16	136	0.60	2354
Chaunax pictus	1.02	18	0.53	
Laemonema laureysi	0.60	6	0.31	
Yarrella blackfordi	0.54	12	0.28	
Nematocarcinus africanus	0.36	144	0.19	
Etmopterus spinax	0.36	6	0.19	
MACROURIDAE	0.30	6	0.15	
MYCTOPHIDAE	0.12	42	0.06	
Bathynectes piperitus	0.12	6	0.06	
Dibranchus atlanticus	0.06	12	0.03	
OPHIDIIDAE	0.06	24	0.03	
Total	193.64		99.99	

PROJECT STATION:1055

DATE: 6/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 625

	start	stop	duration			Long E 1118
TIME	:01:40:00	02:10:00	30 (min)	Purpose code:	3	
LOG	:5669.10	5670.80	1.70	Area code :	2	
FDEPTH:	701	702		GearCond.code:		
BDEPTH:	701	702		Validity code:	1	

Towing dir: 353° Wire out:1850 m Speed: 34 kn*10

Sorted: 54 Kg Total catch: 108.56 CATCH/HOUR: 217.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	52.00	1804	23.95	
Nezumia sp.	26.00	636	11.97	
Lamprogrammus exutus	25.04	48	11.53	
MELANOSTOMIATIDAE	18.40	340	8.47	
POLYCHAELIDAE	15.80	928	7.28	
Triplophos sp.	13.00	1540	5.99	
Merluccius polli	10.72	16	4.94	
SOLENOCERIDAE	9.88	1620	4.55	
Halosaurus ovenii	6.16	160	2.84	
OCTOPOTEUTHIDAE	5.92	24	2.73	
Yarrella blackfordi	4.68	88	2.16	
Leptoderma sp.	3.32	252	1.53	
Etmopterus spinax	3.24	12	1.49	
Dicrolene intronigra	3.24	204	1.49	
Talismania sp.	3.20	92	1.47	
STOMIIDAE	2.76	128	1.27	
Melanonus zugmayeri	2.16	28	0.99	
Malacocephalus occidentalis	1.80	16	0.83	
Benthodesmus tenuis	1.48	24	0.68	
Cruriraja parcomaculata	1.36	8	0.63	
SYNAPHOBRANCHIDAE	1.28	16	0.59	
Aristeus varidens, female	1.24	44	0.57	2356
CARISTIIDAE	1.08	8	0.50	
Xenodermichthys copei	1.00	64	0.46	
Bathygadus melanobranchus	0.72	4	0.33	
GONOSTOMATIDAE	0.52	8	0.24	
Scopelosaurus sp.	0.36	12	0.17	
Glyphus marsupialis	0.32	28	0.15	
Gonostoma sp.	0.24	12	0.11	
NEPHROPIDAE	0.20	12	0.09	
Total	217.12		100.00	

PROJECT STATION:1056

DATE: 6/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 624

	start	stop	duration			Long E 1121
TIME	:04:06:00	04:36:00	30 (min)	Purpose code:	3	
LOG	:5681.80	5683.40	1.60	Area code :	2	
FDEPTH:	559	557		GearCond.code:		
BDEPTH:	559	557		Validity code:	1	

Towing dir: 350° Wire out:1550 m Speed: 31 kn*10

Sorted: 33 Kg Total catch: 103.29 CATCH/HOUR: 206.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Triplophos sp.	72.32	2048	35.01	
MELANOSTOMIATIDAE	46.64	776	22.58	
Nematocarcinus africanus	26.48	6256	12.82	
Lamprogrammus exutus	22.48	72	10.88	
Merluccius polli	16.20	30	7.84	2359
STOMIIDAE	4.72	152	2.28	
Hoplostethus cadenati	3.20	88	1.55	
Benthodesmus tenuis	3.04	88	1.47	
POLYCHAELIDAE	2.48	216	1.20	
Nezumia sp.	2.40	64	1.16	
Aristeus varidens, female	2.38	86	1.15	2358
MYCTOPHIDAE	1.20	88	0.58	
Yarrella blackfordi	0.64	16	0.31	
OPHIDIIDAE	0.48	40	0.23	
Aristeus varidens, male	0.40	40	0.19	2357
Laemonema laureysi	0.40	8	0.19	
CONGRIDAE	0.40	8	0.19	
MACROURIDAE	0.24	32	0.12	
Todarodes sagittatus	0.24	8	0.12	
Xenodermichthys copei	0.16	16	0.08	
Glyphus marsupialis	0.08	24	0.04	
Total	206.58		99.99	

PROJECT STATION:1057

DATE: 6/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 622
start stop duration Long E 1123
TIME :07:06:00 07:36:00 30 (min) Purpose code: 3
LOG :5693.90 5695.40 1.50 Area code : 2
FDEPTH: 457 476 GearCond.code:
BDEPTH: 457 476 Validity code: 1
Towing dir: 345° Wire out:1290 m Speed: 30 kn*10

Sorted: 62 Kg Total catch: 197.77 CATCH/HOUR: 395.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	239.06	518	60.44	2362
Nematocarcinus africanus	30.94	7316	7.82	
Pontinus accraensis	27.66	392	6.99	
Centrophorus uyato	15.78	6	3.99	
Chaunax pictus	12.82	134	3.24	
Gadella imberbis	11.56	358	2.92	
Laemonema laureysi	10.64	126	2.69	
Aristeus varidens, female	7.84	420	1.98	2361
MYCTOPHIDAE	5.46	3822	1.38	
Bathygadus melanobranchus	5.26	14	1.33	
Etmopterus spinax	4.98	92	1.26	
MELANOSTOMIATIDAE	3.58	56	0.91	
Galeus polli	3.30	42	0.83	
POLYCHAELIDAE	3.22	210	0.81	
Colocongor cadenati	2.88	8	0.73	
Halosaurus ovenii	2.88	70	0.73	
Nezumia sp.	1.96	84	0.50	
Benthodesmus tenuis	1.62	36	0.41	
Aristeus varidens, male	1.06	98	0.27	2360
MACROURIDAE	0.92	42	0.23	
STOMIIDAE	0.78	42	0.20	
Bassanago albescens	0.70	22	0.18	
Plesiopenaeus edwardsianus	0.56	14	0.14	
OPHIDIIDAE	0.08	8	0.02	
Total	395.54		100.00	

PROJECT STATION:1058

DATE: 6/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 622
start stop duration Long E 1128
TIME :09:14:00 09:44:00 30 (min) Purpose code: 3
LOG :5706.40 5708.00 1.60 Area code : 2
FDEPTH: 365 366 GearCond.code:
BDEPTH: 365 366 Validity code: 1
Towing dir: 347° Wire out:1150 m Speed: 32 kn*10

Sorted: 62 Kg Total catch: 441.49 CATCH/HOUR: 882.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	372.76	4396	42.22	
Trichiurus lepturus	206.26	300	23.36	
Merluccius polli	103.00	580	11.67	2363
Hymenocephalus italicus	43.50	3930	4.93	
Pontinus accraensis	34.20	1440	3.87	
Epigonus telescopus	32.56	586	3.69	
Nematocarcinus africanus	17.10	4036	1.94	
Todaropsis eblanae	14.86	346	1.68	
Aristeus varidens, female	14.70	1110	1.66	2364
Synagrops microlepis	9.46	300	1.07	
Gadella imberbis	8.86	256	1.00	
Laemonema laureysi	6.46	150	0.73	
Nezumia sp.	3.60	150	0.41	
Bembrops sp.	3.00	60	0.34	
Bathygadus melanobranchus	2.40	16	0.27	
Chlorophthalmus sp.	1.66	60	0.19	
Solenocera africana	1.66	150	0.19	
Dibranchus atlanticus	1.50	210	0.17	
Benthodesmus tenuis	1.20	76	0.14	
POLYCHAELIDAE	1.06	106	0.12	
Illex coindetii	0.90	30	0.10	
Chaunax pictus	0.90	60	0.10	
Halosaurus ovenii	0.90	90	0.10	
CAPROIDAE	0.16	16	0.02	
Macroparalepis macrogenion	0.16	46	0.02	
Etmopterus spinax	0.16	30	0.02	
Total	882.98		100.01	

PROJECT STATION:1059

DATE: 6/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 620
start stop duration Long E 1132
TIME :11:34:00 12:04:00 30 (min) Purpose code: 3
LOG :5718.40 5720.00 1.60 Area code : 2
FDEPTH: 255 252 GearCond.code:
BDEPTH: 255 252 Validity code: 1
Towing dir: 340° Wire out: 800 m Speed: 29 kn*10

Sorted: 69 Kg Total catch 104.15 CATCH/HOUR: 208.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	138.76	8770	66.62	
Merluccius polli	23.10	228	11.09	2365
Xenopsis conchifer	15.94	36	7.65	
CHLOROPHTHALMIDAE	8.62	534	4.14	
Chlorophthalmus atlanticus	5.64	192	2.71	
Ariomma bondi	2.94	58	1.41	
Parapenaeus longirostris, fem.	2.70	234	1.30	2367
Trichiurus lepturus	2.32	6	1.11	
Pterothrissus belloci	2.20	18	1.06	
Parapenaeus longirostris, male	1.72	204	0.83	2368
Illex coindetii	1.42	30	0.68	2366
Zenion hololepis	0.60	70	0.29	
Sepia orbignyana	0.58	36	0.28	
Todaropsis eblanae	0.36	10	0.17	
Epigonus pandionis	0.36	12	0.17	
Coelorinchus coelorhincus	0.24	10	0.12	
Solenocera africana	0.22	18	0.11	
Beryx splendens	0.16	4	0.08	
Bembrops sp.	0.16	4	0.08	
Malacocephalus occidentalis	0.16	4	0.08	
Saurida brasiliensis	0.12	16	0.06	
Chascanopsetta lugubris	0.10	4	0.05	
Total	208.42		100.09	

PROJECT STATION:1060

DATE: 6/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 620
start stop duration Long E 1137
TIME :13:22:00 13:52:00 30 (min) Purpose code: 3
LOG :5729.30 5730.90 1.60 Area code : 2
FDEPTH: 156 159 GearCond.code:
BDEPTH: 156 159 Validity code: 1
Towing dir: 330° Wire out: 520 m Speed: 32 kn*10

Sorted: 56 Kg Total catch: 56.03 CATCH/HOUR: 112.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	29.00	52	25.88	2369
Trichiurus lepturus	25.90	62	23.11	
Dentex angolensis	21.50	126	19.19	2370
Synagrops microlepis	15.84	720	14.14	
Xenopsis conchifer	3.68	8	3.28	
Todaropsis eblanae	2.62	56	2.34	2371
Chelidonichthys gabonensis	2.52	26	2.25	
Illex coindetii	2.36	52	2.11	2372
Pentheroscion mbizi	1.84	14	1.64	
Miracorvina angolensis	1.42	2	1.27	
Octopus sp.	1.38	2	1.23	
Spicara alta	1.36	12	1.21	
Pterothrissus belloci	0.78	6	0.70	
Aulopus cadenati	0.52	6	0.46	
Bembrops heterurus	0.36	4	0.32	
Pontinus kuhlii	0.30	6	0.27	
Dentex macrophthalmus	0.24	2	0.21	
Monolene microstoma	0.16	8	0.14	
Dentex congoensis	0.16	2	0.14	
Citharus linguatula	0.12	2	0.11	
Total	112.06		100.00	

PROJECT STATION:1061

DATE: 6/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 614
start stop duration Long E 1154
TIME :16:22:00 16:41:00 19 (min) Purpose code: 3
LOG :5751.90 5753.00 1.10 Area code : 2
FDEPTH: 79 82 GearCond.code: 9
BDEPTH: 79 82 Validity code: 1
Towing dir: 250° Wire out: 300 m Speed: 33 kn*10

Sorted: 26 Kg Total catch: 25.51 CATCH/HOUR: 80.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	31.58	180	39.20	2375
Trichiurus lepturus	14.68	32	18.22	
Trachurus trecae	11.68	28	14.50	2374
Decapterus rhonchus	5.68	6	7.05	
Pagellus bellottii	3.28	19	4.07	2373
Alloteuthis africana	2.62	587	3.25	
Sepia orbignyana	2.02	3	2.51	
Todaropsis eblanae	1.99	167	2.47	
Dentex barnardi	1.89	6	2.35	
Dentex congoensis	1.67	25	2.07	
Dentex gibbosus	1.61	9	2.00	
Illex coindetii	1.01	126	1.25	
Xenopsis conchifer	0.79	3	0.98	
Engraulis encrasicolus	0.03	3	0.04	
Total	80.53		99.96	

PROJECT STATION:1062

DATE: 6/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 611
start stop duration Long E 1202
TIME :19:06:00 19:36:00 30 (min) Purpose code: 3
LOG :5767.00 5768.60 1.60 Area code : 2
FDEPTH: 48 47 GearCond.code:
BDEPTH: 48 47 Validity code: 1
Towing dir: 345° Wire out: 180 m Speed: 32 kn*10

Sorted: 288 Kg Total catch: 287.71 CATCH/HOUR: 575.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Umbrina canariensis	247.00	444	42.93	2379
Epinephelus aeneus	172.00	48	29.89	2378
Pomadasys incisus	46.80	178	8.13	2376
Chelidonichthys gabonensis	33.20	130	5.77	
Epinephelus goreensis	18.00	2	3.13	
Leptocharias smithii	9.70	4	1.69	
Raja miraletus	9.60	14	1.67	
Epinephelus costae	7.80	6	1.36	
Epinephelus guaza ?	5.80	2	1.01	
Pagellus bellottii	5.02	48	0.87	2377
Sepia orbignyana	3.74	22	0.65	2380
Priacanthus arenatus	3.32	6	0.58	
Dasyatis marmorata	2.34	2	0.41	
Boops boops	1.94	78	0.34	
Dentex gibbosus	1.78	2	0.31	
Pseudupeneus prayensis	1.58	28	0.27	
Zeus faber	1.24	4	0.22	
Trachinus sp.	0.96	24	0.17	
Sparus caeruleostictus *	0.94	2	0.16	
Uranoscopus polli	0.86	6	0.15	
Cynoglossus senegalensis	0.54	2	0.09	
Chaetodon hoefleri	0.42	2	0.07	
Syacium micrurum	0.34	12	0.06	
Citharus linguatula	0.12	6	0.02	
Bembrops sp.	0.10	2	0.02	
Parapenaeopsis atlantica	0.10	4	0.02	
OPHIDIIDAE	0.10	16	0.02	
Bothus podas africanus	0.06	2	0.01	
Arnoglossus imperialis	0.02	2		
Total	575.42		100.02	

PROJECT STATION:1063

DATE: 7/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 605
start stop duration Long E 1117
TIME :02:40:00 03:10:00 30 (min) Purpose code: 3
LOG :5834.10 5835.70 1.60 Area code : 2
FDEPTH: 705 721 GearCond.code:
BDEPTH: 705 721 Validity code: 1
Towing dir: 345° Wire out:1850 m Speed: 33 kn*10

Sorted: 50 Kg Total catch: 151.20 CATCH/HOUR: 302.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	85.20	3114	28.17	
Nezumia sp.	48.30	936	15.97	
Lamprogrammus exutus	34.86	78	11.53	
POLYCHAELIDAE	15.90	960	5.26	
Halosaurus ovenii	12.66	216	4.19	
Dicrolene intronigra	12.54	702	4.15	
Trachyrincus scabrus	11.76	54	3.89	
Yarrella blackfordi	8.70	132	2.88	
Xenodermichthys copei	8.46	312	2.80	
Bathygadus melanobranchus	6.72	18	2.22	
SOLENOCERIDAE	6.66	1308	2.20	
MELANOSTOMIATIDAE	6.48	126	2.14	
Bathyuroconger vicinus	5.58	36	1.85	
Leptoderma sp.	5.22	402	1.73	
Triplophos sp.	4.86	426	1.61	
MACROURIDAE	3.72	18	1.23	
Merluccius polli	3.66	6	1.21	
SYNAPHOBRANCHIDAE	3.00	36	0.99	
STOMIIDAE	2.76	102	0.91	
Paralomis africana	2.52	6	0.83	
Glyphus marsupialis	2.22	84	0.73	
Talismania sp.	2.10	48	0.69	
Etmopterus spinax	1.74	12	0.58	
CARISTIIDAE	1.56	6	0.52	
GONOSTOMATIDAE	1.14	18	0.38	
Benthodesmus tenuis	1.14	24	0.38	
Aristeus varidens, female	0.84	36	0.28	2381
Scopelosaurus sp	0.72	6	0.24	
Dibranchus atlanticus	0.60	24	0.20	
Heterocarpus ensifer	0.48	30	0.16	
Chlorophthalmus atlanticus	0.24	6	0.08	
Aristeus varidens, male	0.06	6	0.02	2382
Total	302.40		100.02	

PROJECT STATION:1065

DATE: 7/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 603
start stop duration Long E 1121
TIME :07:43:00 08:13:00 30 (min) Purpose code: 3
LOG :5855.90 5857.40 1.50 Area code : 2
FDEPTH: 454 459 GearCond.code:
BDEPTH: 454 459 Validity code: 1
Towing dir: 4° Wire out:1290 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 222.56 CATCH/HOUR: 445.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	166.40	1280	37.38	
Merluccius polli	73.60	192	16.53	2387
Bathygadus melanobranchus	28.72	136	6.45	
Trichiurus lepturus	22.40	40	5.03	
Galeus polli	21.76	320	4.89	
Aristeus varidens, female	16.58	720	3.72	2386
Laemonema laureysi	12.56	224	2.82	
Gadella imberbis	11.28	688	2.53	
Etmopterus spinax	10.96	208	2.46	
Pontinus accraensis	10.00	120	2.25	
MACROURIDAE	9.68	592	2.17	
POLYCHAELIDAE	8.96	768	2.01	
Nematocarcinus africanus	8.80	2736	1.98	
Coelorinchus coelorhincus	8.32	56	1.87	
Halosaurus sp.	5.68	152	1.28	
Coloconger cadenati	5.20	56	1.17	
MYCTOPHIDAE	4.80	1584	1.08	
Todaropsis eblanae	4.48	104	1.01	
Chaunax pictus	3.52	56	0.79	
Centrophorus uyato	2.00	8	0.45	
Nezumia sp.	1.52	88	0.34	
STOMIIDAE	1.44	96	0.32	
Illex coindetii	1.36	24	0.31	
Benthodesmus tenuis	1.20	32	0.27	
Aristeus varidens, male	1.02	106	0.23	2385
OPISTHOTEUTHIDAE	0.88	8	0.20	
Chaceon maritae	0.80	8	0.18	
Dibranchus atlanticus	0.32	32	0.07	
Raja sp.	0.16	8	0.04	
Macroparalepis macrogeneion	0.16	8	0.04	
Ariomma bondi	0.16	16	0.04	
MELANOSTOMIATIDAE	0.16	16	0.04	
Bathynectes piperitus	0.08	8	0.02	
CONGRIDAE	0.08	8	0.02	
Bembrops sp.	0.08	8	0.02	
Total	445.12		100.01	

PROJECT STATION:1064

DATE 7/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 604
start stop duration Long E 1119
TIME 04 51:00 05 21:00 30 (min) Purpose code: 3
LOG 5845.00 5846.60 1.60 Area code : 2
FDEPTH 554 568 GearCond.code:
BDEPTH 554 568 Validity code: 1
Towing dir 350° Wire out:1550 m Speed: 32 kn*10

Sorted 30 Kg Total catch: 69.99 CATCH/HOUR: 139.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	45.90	7944	32.79	
Triplophos sp	17.70	3540	12.64	
Hoplostethus cadenati	11.22	150	8.02	
Aristeus varidens, female	10.98	444	7.84	2384
Merluccius polli	7.00	14	5.00	
Centrophorus uyato	6.90	2	4.93	
Lophiodes kempi	6.50	2	4.64	
Lamprogrammus exutus	5.46	30	3.90	
Nezumia sp	4.80	102	3.43	
MELANOSTOMIATIDAE	3.90	78	2.79	
Aristeus varidens, male	3.36	504	2.40	2383
Etmopterus spinax	2.40	6	1.71	
Xenodermichthys copei	2.16	108	1.54	
POLYCHAELIDAE	1.98	222	1.41	
STOMIIDAE	1.62	84	1.16	
Chaceon maritae	1.50	6	1.07	
Macroparalepis macrogeneion	1.20	60	0.86	
Benthodesmus tenuis	1.14	24	0.81	
OPISTHOTEUTHIDAE	1.02	6	0.73	
Halosaurus ovenii	0.66	24	0.47	
MYCTOPHIDAE	0.54	228	0.39	
GALATHEIDAE	0.54	384	0.39	
Chaunax pictus	0.36	6	0.26	
Gadella imberbis	0.36	12	0.26	
CONGRIDAE	0.30	24	0.21	
SERGESTIDAE	0.12	12	0.09	
Dibranchus atlanticus	0.12	12	0.09	
Plesiopenaeus edwardsianus	0.12	36	0.09	
OPHIDIIDAE	0.06	24	0.04	
MACROURIDAE	0.06	6	0.04	
Total	139.98		100.00	

PROJECT STATION:1066

DATE: 7/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 602
start stop duration Long E 1124
TIME :09:32:00 10:02:00 30 (min) Purpose code: 3
LOG :5865.90 5867.40 1.50 Area code : 2
FDEPTH: 354 352 GearCond.code:
BDEPTH: 354 352 Validity code: 1
Towing dir: 7° Wire out:1150 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 510.88 CATCH/HOUR: 1021.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	432.80	7472	42.36	
Merluccius polli	191.20	1168	18.71	2388
Pterothrissus belloci	130.40	880	12.76	
Nematocarcinus africanus	75.20	16176	7.36	
Zenopsis conchifer	40.48	32	3.96	
Synagrops microlepis	29.44	1008	2.88	
Trichiurus lepturus	21.12	128	2.07	
MYCTOPHIDAE	20.96	10336	2.05	
Pontinus accraensis	12.00	144	1.17	
Illex coindetii	11.68	256	1.14	2389
Coelorinchus coelorhincus	11.36	288	1.11	
Gadella imberbis	9.44	304	0.92	
Paromola cuvieri	8.80	4	0.86	
Laemonema laureysi	5.60	64	0.55	
Chascanopsetta lugubris	3.84	32	0.38	
Malacocephalus occidentalis	3.20	48	0.31	
Hymenocephalus italicus	2.88	240	0.28	
Nezumia sp.	2.24	128	0.22	
Bembrops sp.	1.76	96	0.17	
Chaunax pictus	1.60	32	0.16	
POLYCHAELIDAE	1.12	48	0.11	
Epigonus telescopus	1.12	32	0.11	
OPHIDIIDAE	0.96	80	0.09	
Parapenaeus longirostris	0.64	32	0.06	
Ariomma bondi	0.64	16	0.06	
CAPROIDAE	0.48	32	0.05	
Solenocera africana	0.48	48	0.05	
Dibranchus atlanticus	0.32	48	0.03	
Total	1021.76		99.98	

PROJECT STATION:1067

DATE: 7/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 601
start stop duration Long E 1127
TIME :11:46:00 12:16:00 30 (min) Purpose code: 3
LOG :5877.10 5878.80 1.70 Area code : 2
FDEPTH: 242 251 GearCond.code:
BDEPTH: 242 251 Validity code: 1
Towing dir: 240° Wire out: 800 m Speed: 32 kn*10

Sorted: 77 Kg Total catch: 139.36 CATCH/HOUR: 278.72

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Synagrops microlepis	100.12	5580	35.92	
Trichiurus lepturus	48.14	94	17.27	
Merluccius polli	45.40	406	16.29	2390
Chlorophthalmus atlanticus	13.20	2062	4.74	
Zenopsis conchifer	12.36	22	4.43	
Pterothrissus belloci	11.80	102	4.23	
Illex coindetii	10.56	218	3.79	2391
Todaropsis eblanae	9.84	162	3.53	2392
Pentheroscion mbizi	8.70	56	3.12	
CHLOROPHTHALMIDAE	3.58	316	1.28	
Sepia orbignyana	3.54	306	1.27	
Parapenaeus longirostris, fem.	3.36	388	1.21	2393
Dentex macrophthalmus	3.10	8	1.11	
Parapenaeus longirostris, male	3.06	438	1.10	2394
Dentex angolensis	1.96	12	0.70	
Total	278.72		99.99	

PROJECT STATION:1068

DATE: 7/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 555
start stop duration Long E 1139
TIME :14:24:00 14:54:00 30 (min) Purpose code: 3
LOG :5894.10 5896.20 2.10 Area code : 2
FDEPTH: 156 154 GearCond.code:
BDEPTH: 156 154 Validity code: 1
Towing dir: 310° Wire out: 520 m Speed: 32 kn*10

Sorted: 160 Kg Total catch: 992.56 CATCH/HOUR: 1985.12

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	1449.56	12288	73.02	2395
Miracorvina angolensis	308.14	422	15.52	2396
Pterothrissus belloci	54.56	360	2.75	
Dentex angolensis	52.58	174	2.65	2397
Brotula barbata	22.82	24	1.15	
Trichiurus lepturus	21.46	38	1.08	
Uranoscopus polli	16.62	136	0.84	
Synagrops microlepis	16.36	1004	0.82	
Umbrina canariensis	15.88	24	0.80	
Epinephelus goreensis	12.28	12	0.62	
Zenopsis conchifer	5.58	12	0.28	
Todaropsis eblanae	2.86	74	0.14	
Zeus faber	1.74	12	0.09	
Illex coindetii	1.62	24	0.08	
Bembrops heterurus	1.36	12	0.07	
Parapenaeus longirostris, fem.	1.24	112	0.06	2398
Parapenaeus longirostris, male	0.50	74	0.03	2399
Total	1985.16		100.00	

PROJECT STATION:1069

DATE: 7/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 540
start stop duration Long E 1132
TIME :17:25:00 17:55:00 30 (min) Purpose code: 3
LOG :5917.30 5918.90 1.60 Area code : 2
FDEPTH: 263 265 GearCond.code:
BDEPTH: 263 265 Validity code: 1
Towing dir: 199° Wire out: 760 m Speed: 32 kn*10

Sorted: 115 Kg Total catch: 115.06 CATCH/HOUR: 230.12

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	96.10	766	41.76	2404
Dentex angolensis	57.40	158	24.94	2402
Pterothrissus belloci	36.00	256	15.64	
Merluccius polli	20.30	144	8.82	2403
Trichiurus lepturus	5.60	40	2.43	
Umbrina canariensis	2.54	6	1.10	
Synagrops microlepis	2.46	86	1.07	
Ophisurus serpens	1.94	2	0.84	
Dicologoglossa cuneata	1.72	44	0.75	
Peristedion cataphractum	1.60	40	0.70	
Epigonus telescopus	1.24	234	0.54	
Todaropsis eblanae	0.64	8	0.28	
Uranoscopus cadenati	0.54	8	0.23	
Bembrops sp.	0.52	26	0.23	
Brotula barbata	0.50	2	0.22	
Chlorophthalmus atlanticus	0.36	8	0.16	
Parapenaeus longirostris, fem.	0.30	34	0.13	2401
Parapenaeus longirostris, male	0.18	22	0.08	2400
Syacium micrurum	0.06	4	0.03	
Nezumia sp.	0.04	6	0.02	
Engraulis encrasicolus	0.02	2	0.01	
Solenocera africana	0.02	4	0.01	
Illex coindetii	0.02	2	0.01	
Sepia sp.	0.02	2	0.01	
Total	230.12		100.01	

PROJECT STATION:1070

DATE: 7/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 541
start stop duration Long E 1126
TIME :18:57:00 19:30:00 33 (min) Purpose code: 3
LOG :5925.30 5927.00 1.70 Area code : 2
FDEPTH: 350 350 GearCond.code:
BDEPTH: 350 350 Validity code: 1
Towing dir: 199° Wire out:1080 m Speed: 34 kn*10

Sorted: 48 Kg Total catch: 144.48 CATCH/HOUR: 262.69

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	72.00	26182	27.41	
Chlorophthalmus atlanticus	58.91	845	22.43	
Merluccius polli	57.00	229	21.70	2405
Benthodesmus tenuis	22.91	638	8.72	
Laemonema laureysi	16.04	164	6.11	
Malacocephalus occidentalis	8.56	49	3.26	
Pterothrissus belloci	7.91	44	3.01	
Epigonus telescopus	5.51	87	2.10	
Bembrops sp.	3.27	60	1.24	
Nezumia sp.	2.02	82	0.77	
Bathygadus melanobranchus	1.58	115	0.60	
Peristedion cataphractum	1.53	38	0.58	
Coelorinchus coelorhincus	1.36	22	0.52	
Chascanopsetta lugubris	1.15	5	0.44	
Ophisurus serpens	1.09	5	0.41	
Hymenocephalus italicus	0.82	76	0.31	
OPHIDIIDAE	0.27	27	0.10	
Chaunax pictus	0.22	5	0.08	
Halosaurus ovenii	0.22	11	0.08	
Pontinus accraensis	0.16	5	0.06	
Solenocera africana	0.11	5	0.04	
Gadella imberbis	0.05	5	0.02	
Total	262.69		99.99	

PROJECT STATION:1071

DATE: 7/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 543
start stop duration Long E 1122
TIME :20:50:00 21:20:00 30 (min) Purpose code: 3
LOG :5935.00 5936.50 1.50 Area code : 2
FDEPTH: 453 456 GearCond.code:
BDEPTH: 453 456 Validity code: 1
Towing dir: 200° Wire out:1290 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 87.58 CATCH/HOUR: 175.16

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius polli	86.60	136	49.44	2408
Nematocarcinus africanus	19.20	7296	10.96	
Laemonema laureysi	13.04	120	7.44	
Bathygadus melanobranchus	10.80	48	6.17	
Aristeus varidens, female	6.88	520	3.93	2407
Hoplostethus cadenati	4.64	48	2.65	
Chaceon maritae	4.24	16	2.42	
Halosaurus ovenii	3.52	24	2.01	
POLYCHAELIDAE	3.36	488	1.92	
Chaunax pictus	3.04	32	1.74	
Aristeus varidens, male	2.88	384	1.64	2406
Triplophos sp.	2.48	288	1.42	
Dibranchus atlanticus	2.40	80	1.37	
Nezumia sp.	2.24	72	1.28	
Galeus polli	1.60	24	0.91	
Etmopterus spinax	1.52	24	0.87	
MELANOSTOMIATIDAE	1.28	24	0.73	
Benthodesmus tenuis	1.20	88	0.69	
Bathynectes piperitus	0.88	16	0.50	
Plesiopenaeus edwardsianus	0.88	8	0.50	
Bathyuroconger vicinus	0.80	8	0.46	
Chlorophthalmus atlanticus	0.56	8	0.32	
STOMIIDAE	0.32	8	0.18	
MACROURIDAE	0.32	8	0.18	
Dicologoglossa cuneata	0.24	8	0.14	
CONGRIDAE	0.24	8	0.14	
Total	175.16		100.01	

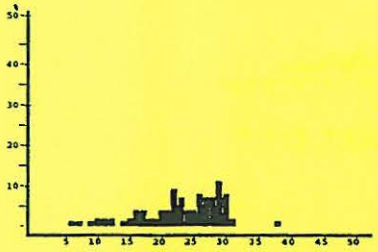
PROJECT STATION:1072

DATE: 7/ 8/96 GEAR TYPE: BT No:1 POSITION:Lat S 545
start stop duration Long E 1119
TIME :23:12:00 23:42:00 30 (min) Purpose code: 3
LOG :5944.20 5945.70 1.50 Area code : 2
FDEPTH: 547 552 GearCond.code:
BDEPTH: 547 552 Validity code: 1
Towing dir: 360° Wire out:1550 m Speed: 30 kn*10

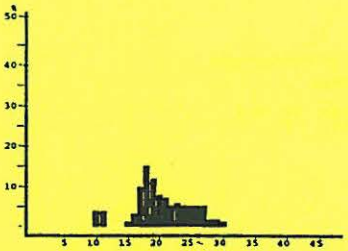
Sorted: 33 Kg Total catch: 96.20 CATCH/HOUR: 192.40

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	73.60	11040	38.25	
Lamprogrammus exutus	25.20	96	13.10	
Merluccius polli	20.80	30	10.81	2409
Triplophos sp.	8.80	1336	4.57	
Bathygadus melanobranchus	7.20	144	3.74	
Aristeus varidens, female	7.12	340	3.70	2410
POLYCHAELIDAE	6.48	768	3.37	
Halosaurus ovenii	5.84	112	3.04	
Hoplostethus cadenati	5.12	104	2.66	
Trichiurus lepturus	5.04	8	2.62	
Xenodermichthys copei	4.88	200	2.54	
Chaceon maritae	4.64	24	2.41	
SYNAPHOBRANCHIDAE	4.64	48	2.41	
Etmopterus spinax	4.40	24	2.29	
MELANOSTOMIATIDAE	3.52	56	1.83	
Bathyuroconger vicinus	1.52	32	0.79	
Aristeus varidens, male	1.36	160	0.71	2411
Malacocephalus occidentalis	0.88	8	0.46	
Glyphus marsupialis	0.48	16	0.25	
STOMIIDAE	0.48	16	0.25	
Nezumia sp.	0.24	8	0.12	
Dicrolene intronigra	0.16	16	0.08	
Total	192.40		100.00	

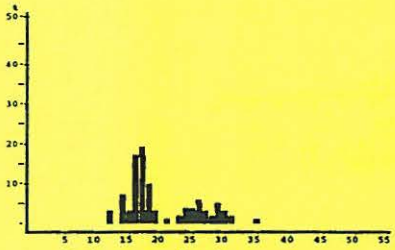
Annex II. Length distributions of main species



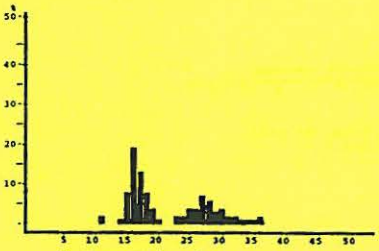
Dentex angolensis
Luanda-Benguela
MEAN LENGTH = 23.57cm N= 443
NUMBER OF SUBSAMPLES : 13



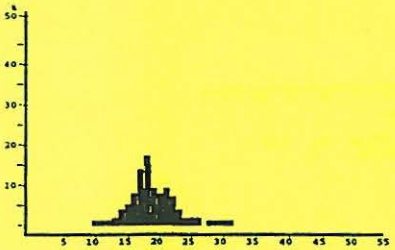
Dentex macrophthalmus
Luanda-Benguela
MEAN LENGTH = 20.80cm N= 2085
NUMBER OF SUBSAMPLES : 24



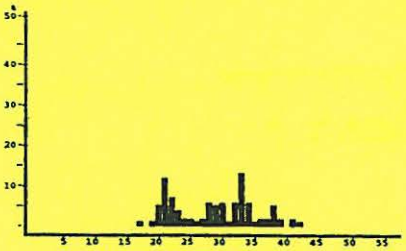
Dentex canariensis
Luanda-Benguela
MEAN LENGTH = 20.54cm N= 52
NUMBER OF SUBSAMPLES : 2



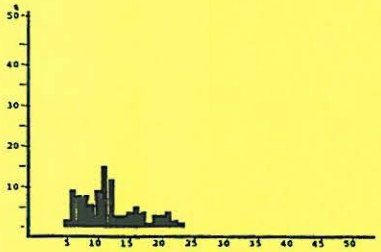
Sparus auriga *
Luanda-Benguela
MEAN LENGTH = 22.58cm N= 302
NUMBER OF SUBSAMPLES : 7



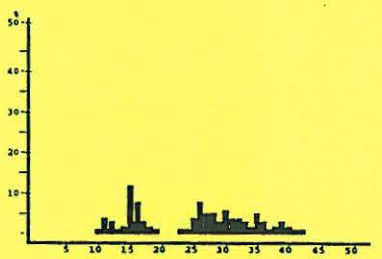
Pagellus bellottii
Luanda-Benguela
MEAN LENGTH = 19.57cm N= 824
NUMBER OF SUBSAMPLES : 12



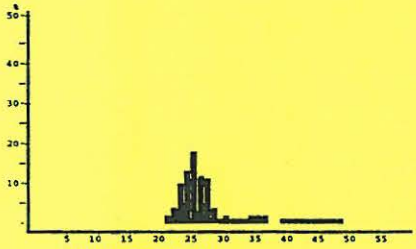
Umbrina canariensis
Luanda-Benguela
MEAN LENGTH = 29.41cm N= 82
NUMBER OF SUBSAMPLES : 2



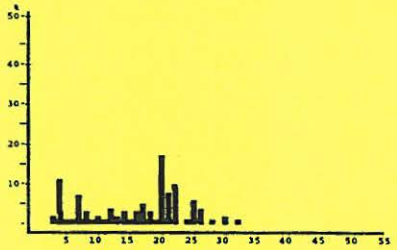
Brachydeuterus auritus
Luanda-Benguela
MEAN LENGTH = 12.36cm N= 969
NUMBER OF SUBSAMPLES : 9



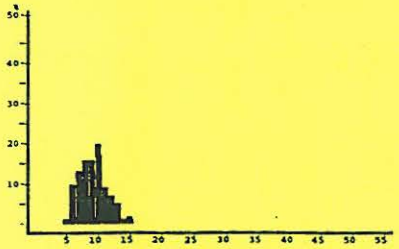
Trachurus trecae
Luanda-Benguela
MEAN LENGTH = 25.56cm N= 2299
NUMBER OF SUBSAMPLES : 29



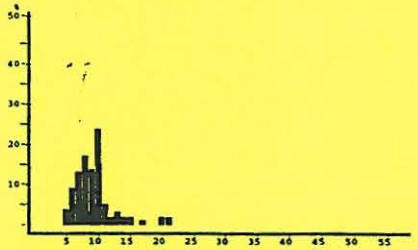
Merluccius polli
Luanda-Benguela
MEAN LENGTH = 28.50cm N= 1865
NUMBER OF SUBSAMPLES : 32



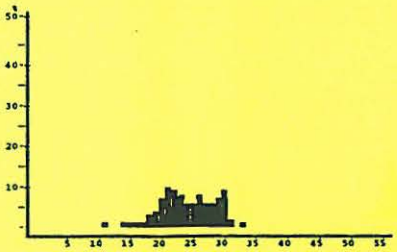
Sepia orbignyana
Luanda-Benguela
MEAN LENGTH = 16.89cm N= 72
NUMBER OF SUBSAMPLES : 11



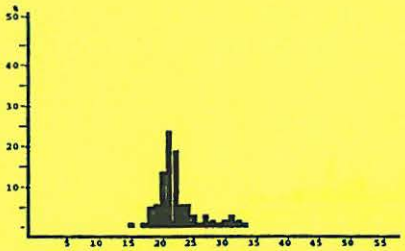
Illex coindetii
Luanda-Benguela
MEAN LENGTH = 9.68cm N= 92
NUMBER OF SUBSAMPLES : 4



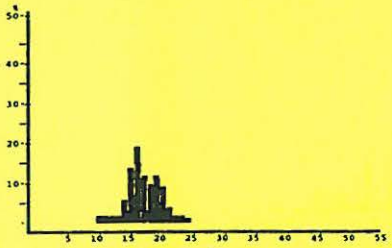
Todaropsis eblanae
Luanda-Benguela
MEAN LENGTH = 9.96cm N= 149
NUMBER OF SUBSAMPLES : 6



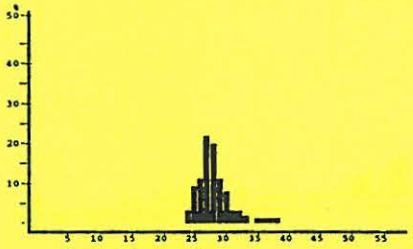
Dentex angolensis
Cabinda-Luanda
MEAN LENGTH = 24.65cm N= 1379
NUMBER OF SUBSAMPLES : 26



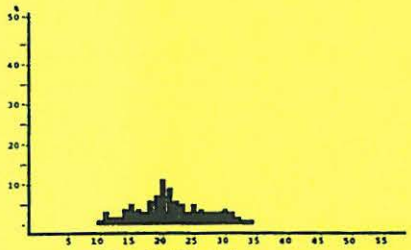
Dentex macrophthalmus
Cabinda-Luanda
MEAN LENGTH = 22.75cm N= 626
NUMBER OF SUBSAMPLES : 9



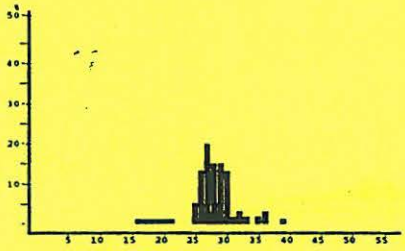
Dentex congoensis
Cabinda-Luanda
MEAN LENGTH = 17.62cm N= 965
NUMBER OF SUBSAMPLES : 6



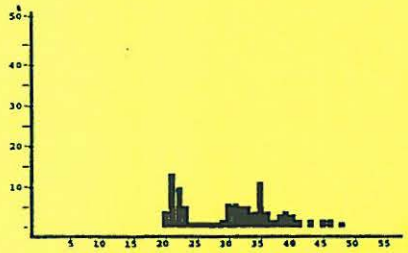
Dentex barnardi
Cabinda-Luanda
MEAN LENGTH = 28.90cm N= 188
NUMBER OF SUBSAMPLES : 5



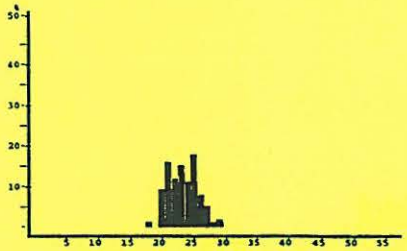
Pagellus bellottii
Cabinda-Luanda
MEAN LENGTH = 21.72cm N= 888
NUMBER OF SUBSAMPLES : 14



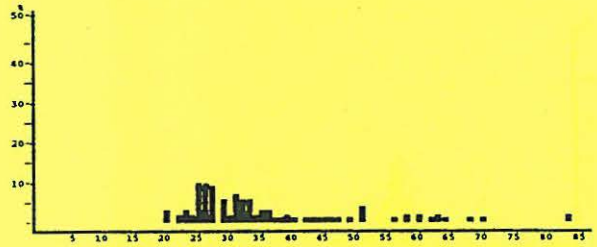
Sparus auriga *
Cabinda-Luanda
MEAN LENGTH = 28.52cm N= 113
NUMBER OF SUBSAMPLES : 5



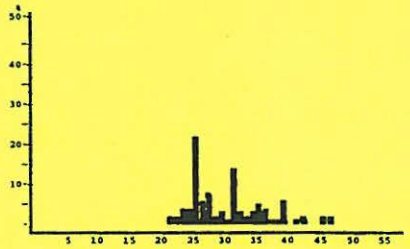
Umbrina canariensis
Cabinda-Luanda
MEAN LENGTH = 30.90cm N= 248
NUMBER OF SUBSAMPLES : 6



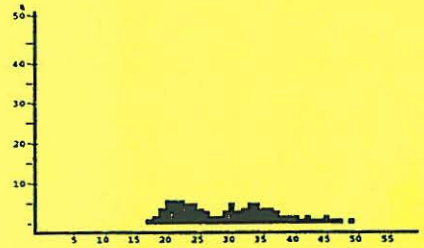
Pentheroscion mbizi
Cabinda-Luanda
MEAN LENGTH = 23.78cm N= 320
NUMBER OF SUBSAMPLES : 3



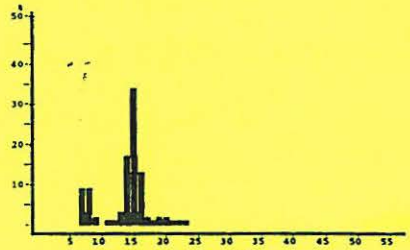
Pseudotolithus typus
Cabinda-Luanda
MEAN LENGTH = 35.73cm N= 104
NUMBER OF SUBSAMPLES : 4



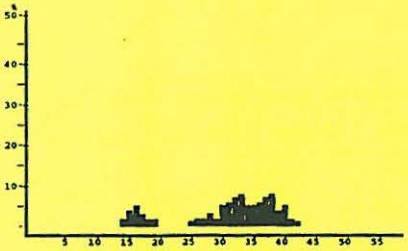
Pomadasys peroteti
Cabinda-Luanda
MEAN LENGTH = 30.50cm N= 73
NUMBER OF SUBSAMPLES : 3



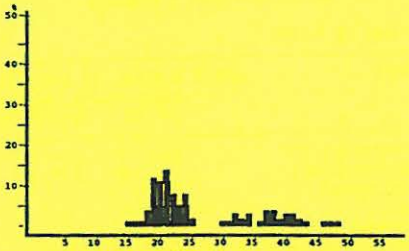
Merluccius polli
Cabinda-Luanda
MEAN LENGTH = 29.94cm N= 2696
NUMBER OF SUBSAMPLES : 33



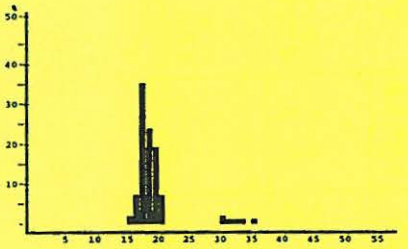
Brachydeuterus auritus
Cabinda-Luanda
MEAN LENGTH = 14.33cm N= 634
NUMBER OF SUBSAMPLES : 7



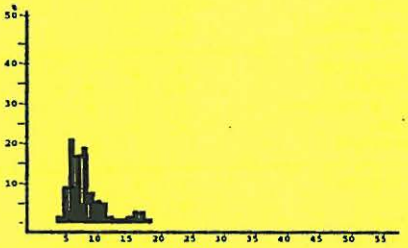
Trachurus trecae
Cabinda-Luanda
MEAN LENGTH = 31.29cm N= 2662
NUMBER OF SUBSAMPLES : 33



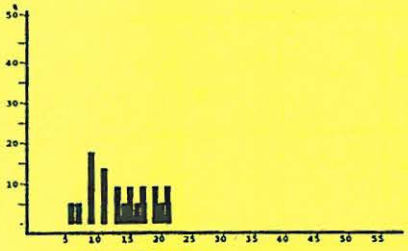
Decapterus rhonchus
Cabinda-Luanda
MEAN LENGTH = 26.91cm N= 191
NUMBER OF SUBSAMPLES : 5



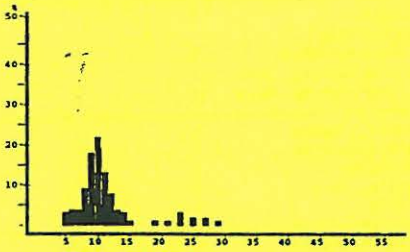
Selene dorsalis
Cabinda-Luanda
MEAN LENGTH = 19.16cm N= 91
NUMBER OF SUBSAMPLES : 3



Todaropsis eblanae
Cabinda-Luanda
MEAN LENGTH = 8.93cm N= 530
NUMBER OF SUBSAMPLES : 16



Sepia orbignyana
Cabinda-Luanda
MEAN LENGTH = 14.23cm N= 22
NUMBER OF SUBSAMPLES : 4



Illex coindetii
Cabinda-Luanda
MEAN LENGTH = 11.83cm N= 664
NUMBER OF SUBSAMPLES : 16

Annex III Swept-area estimates

SWEPT AREA ANALYSIS FROM STATION 912 TO STATION 1072

SECTOR 2, Pta. das Palmeirinhas - Benguela

ONLY STATIONS IN SECTOR

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 50m	50-100m	100-200m	200-300m
Brachydeuterus auritus	6	3	2	2	3		37	4.01	15.72	1.18		
Dentex macrophthalmus	9	8	7	3			63	2.54		1.52	6.17	2.39
Erythrocles monodi	2					1	7	1.78	0.05		6.93	
Anthias sp.						1	2	1.23			4.81	
Chlorophthalmus atlanticus	5	2	3	1			26	1.04			0.01	4.94
Galeoides decadactylus	3	1	3	1			19	0.96	4.13			
MYCTOPHIDAE	5	1	2	2			23	0.91			1.12	2.99
Trichiurus lepturus	18	7	3				65	0.71	2.09	0.62	0.11	0.03
Synagrops microlepis	4	6	3				30	0.59			0.68	1.98
Pagellus bellottii	17	5	1				53	0.52	0.32	1.41	0.10	
Pseudotolithus typus		3	3				14	0.46	1.97			
Selene dorsalis	8	6	2				37	0.46	1.26	0.43	0.14	
Pteroscion peli	1	2	3				14	0.38	1.62			
Stromateus fiatola	4	4	1				21	0.33	1.30	0.10		
Merluccius polli	8	4	1				30	0.33			0.54	0.92
Dentex angolensis	12	5					40	0.32		0.18	0.95	0.10
Pomadasys incisus	5	5					23	0.26	1.00	0.10		
Sepia orbignyana	15	3					42	0.25	0.60	0.34	0.01	
Zenopsis conchifer	12	4					37	0.22		0.01	0.50	0.41
Pterothrissus belloci	14	4					42	0.21		0.04	0.38	0.47
Sphyraena guachancho	4	2	1				16	0.20	0.84			
Umbrina canariensis	9	1	1				26	0.20	0.06	0.39	0.26	
Chloroscombrus chrysurus	2	1	1				9	0.20	0.87			
Pagrus auriga	6	2					19	0.16	0.36	0.24		
Pomadasys peroteti			1				2	0.15	0.64			
Decapterus rhonchus	7	2					21	0.15		0.49		
Octopus sp.	8		1				21	0.14	0.01	0.07	0.45	
Pomadasys rogeri	4	2					14	0.14	0.59			
Spicara alta	5		1				14	0.14			0.50	0.04
Lithognathus mormyrus	4	1	1				14	0.13	0.55	0.01		
Pagrus caeruleostictus	1	1	1				7	0.12	0.35	0.10	0.02	
Atractoscion aequidens	12	1					30	0.12	0.27	0.17	0.03	
Pomadasys jubelini	2		1				7	0.10	0.42	0.01		
Raja miraletus	15						35	0.09	0.16	0.10	0.08	0.01
Dentex barnardi	12	1					30	0.08	0.26	0.05	0.01	
Decapterus punctatus	1		1				5	0.08	0.03	0.26		
Ilisha africana	2	1					7	0.07	0.31			
Epinephelus goreensis	1	1					5	0.06	0.02		0.21	
Citharus linguatula	11	1					28	0.06	0.04	0.13	0.05	
Arius parkii	4	1					12	0.06	0.25	0.01		
Squatina aculeata	1	1					5	0.05			0.11	0.10
Rhizoprionodon acutus		1					2	0.05	0.22			
Argyrosomus hololepidotus	5						12	0.05	0.23			
Parapenaeus longirostris, fem.	11						26	0.03			0.01	0.11
Parapenaeus longirostris, male	11						26	0.02				0.07
Penaeus notialis, female	1							0.01	0.03			
Parapenaeopsis atlantica	1						2	0.01	0.04			
Solenocera africana	2						5					
Penaeus notialis, male	1						2		0.01			
Penaeus notialis	1						2		0.01			
Aristeus varidens, female	1											
Aristeus varidens, male	1						2					0.01
Shrimps, small, non comm.	1						2					
Other fish								0.95	1.69	0.85	0.95	0.43
Sum all species								21.13	38.32	8.81	25.13	15.00
Sum Snappers								0.03	0.11			
Sum Groupers								0.14	0.20	0.04	0.31	
Sum Grunts								4.68	18.44	1.29	0.01	
Sum Croakers								1.23	4.23	0.57	0.29	
Sum Seabreams								3.97	1.90	3.65	7.48	2.49
Sum Sharks								0.12	0.22	0.05	0.13	0.10
Sum Rays								0.23	0.52	0.19	0.11	0.02
Sum Squids								0.48	0.64	0.54	0.63	0.04
Sum												
Number of stations included in analysis, total and by depth strata								43	10	13	11	9

SWEPT AREA ANALYSIS FROM STATION 912 TO STATION 1072

SECTOR 2, Pta. das Palmeirinhas - Benguela

ONLY STATIONS IN SECTOR

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% incidence	Mean dens.	Mean densities by bottom depth strata t/nm²			
	>0	10	30	100	300	1000		t/nm²	300-400m	400-500m	500-600m	600-800m
Merluccius polli	9	9	11	1	1		91	4.60	11.09	3.70	1.22	0.33
Nematocarcinus africanus	8	10	6	2	1		76	3.73	8.56	3.12	1.24	0.45
Chlorophthalmus atlanticus	22	2	1	2			79	1.66	5.43	0.11	0.12	0.01
MELANOSTOMIATIDAE	16	5	4				74	0.97	0.11	1.55	1.27	1.10
Yarrella blackfordi	6	3		1			29	0.81		0.43	2.54	0.46
Etmopterus spinax	25			1			76	0.70	1.85	0.40	0.16	0.07
Hoplostethus cadenati	18	9	1				79	0.68	0.07	0.64	1.40	0.79
MYCTOPHIDAE	14		1	1			47	0.61	1.99	0.01	0.08	0.01
Laemonema laureysi	20	5					74	0.56	0.85	0.72	0.48	0.03
Pterothrissus belloci	10	2	1				38	0.37	1.13	0.14	0.01	
Gonostoma elongatum	16	3					56	0.36	0.09	0.75	0.44	0.15
Squalus megalops		2	2				12	0.35	0.78	0.47		
OPLOPHORIDAE	4			1			15	0.31		1.15		0.04
Lamprogrammus exutus	13	4					50	0.31		0.24	0.40	0.74
Aristeus varidens, female	21	3					71	0.28	0.03	0.47	0.44	0.18
Hymenocephalus italicus	10	3					38	0.26	0.86	0.02		
Nezumia sp.	14	1	1				47	0.24	0.10	0.10	0.08	0.81
Bathyuroconger vicinus	25	2	1				82	0.23	0.04	0.06	0.09	0.90
Talismania sp.	15	1	1				50	0.21	0.03	0.08	0.06	0.82
Malacocephalus occidentalis	13						38	0.14	0.25	0.07	0.07	0.15
Malacocephalus laevis	9	2					32	0.14	0.22	0.23	0.05	0.01
Plesionika martia	3		1				12	0.13	0.43		0.01	0.02
Dibranchus atlanticus	18						53	0.13	0.09	0.12	0.11	0.23
Chaceon maritae	11	1					35	0.13	0.05	0.19	0.03	0.28
Aristeus varidens, male	23						68	0.12	0.02	0.23	0.19	0.03
Coelorinchus coelorhincus	19						56	0.11	0.19	0.15	0.03	0.06
Hoplostethus mediterraneus	2	1					9	0.10	0.33		0.03	
Trichiurus lepturus	16	1					50	0.09	0.06	0.08	0.20	0.03
Cruriraja parcomaculata			1				3	0.09				0.45
Malacocephalus sp.	3	1					12	0.07	0.19	0.05		
Scyllarides herklotsii	16						47	0.07		0.07	0.13	0.12
Gadella imberbis	25						74	0.06	0.05	0.12	0.06	0.01
Halosaurus ovenii	23						68	0.06	0.01	0.11	0.07	0.02
CONGRIDAE	4	1					15	0.06				0.27
Lepidopus caudatus	8						24	0.05	0.01	0.03	0.14	0.05
Plesiopenaeus edwardsianus	17						50	0.05	0.04	0.08	0.07	0.01
Helicolenus dactylopterus		1					3	0.05	0.15			
Ebinania costaecanarie	9						26	0.05		0.09		0.10
Deepwater fish mixture		1					3	0.05				0.22
Lophius vaillanti	16						47	0.05	0.07	0.08	0.01	0.03
Aristeus varidens	6						18	0.03	0.05	0.06		0.01
Parapenaeus longirostris, fem.	4						12	0.02	0.05			
Solenocera africana	5						15	0.01	0.02	0.01		
Glyphus marsupialis	4						12	0.01			0.02	0.03
Parapenaeus longirostris, male	3						9	0.01	0.03			
Parapenaeus longirostris	3						9	0.01	0.03			
Shrimps, small, non comm.	1						3	0.01			0.03	
Other fish								0.66	0.62	0.41	0.89	0.86
Sum all species								19.80	35.97	16.34	12.17	9.88
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers								0.01				0.04
Sum Seabreams												
Sum Sharks								1.17	2.68	1.09	0.33	0.08
Sum Rays								0.11	0.02		0.03	0.47
Sum Squids								0.02	0.04	0.03	0.02	0.07
Sum												
Number of stations included in analysis, total and by depth strata								34	10	9	8	7

SWEPT AREA ANALYSIS FROM STATION 912 TO STATION 1072

SECTOR 3, Congo River - Pta. das Palmeirinhas

ONLY STATIONS IN SECTOR

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 50m	50-100m	100-200m	200-300m
Brachydeuterus auritus	2		2	3		1	19	4.15	18.69	0.51		
Dentex barnardi	9	1	1		1		29	1.04	4.11	0.53	0.03	
Trichiurus lepturus	23	9	3				83	0.83	1.39	0.61	0.42	1.11
Synagrops microlepis	3	3	5				26	0.78			0.14	3.44
Dentex angolensis	16	8	2				62	0.77		0.29	1.93	0.63
Chlorophthalmus atlanticus	7			2			21	0.69			0.01	3.21
Pteroscion peli		2	3				12	0.54	2.54			
Pomadasys peroteti	4		1	1			14	0.52	2.41	0.03		
MYCTOPHIDAE	3	2	1	1			17	0.52				2.43
Dentex macrophthalmus	7	4	2				31	0.42			1.12	0.46
Pseudotolithus typus	1	2	2				12	0.37	1.73			
Pagellus bellottii	17	2	1				48	0.35	1.09	0.38	0.01	
Merluccius polli	3	6					21	0.32				1.50
Zenopsis conchifer	17	4					50	0.31		0.03	0.52	0.71
Umbrina canariensis	12	1	1				33	0.31	0.88	0.24	0.20	
Dentex congoensis	7	2	1				24	0.26		0.54	0.36	
Epinephelus aeneus	6	2	1				21	0.25	0.75	0.30		
Spicara alta	9	1	1				26	0.23			0.81	
Pomadasys incisus	4	1	1				14	0.22	0.97	0.02		
Lithognathus mormyrus		1	1				5	0.17	0.64	0.13		
Galeoides decadactylus	3	1	1				12	0.17	0.78			
Arius parkii	1	1	1				7	0.17	0.77			
Selene dorsalis	6	1	1				19	0.16	0.63	0.01	0.07	
Pterothrissus belloci	15		1				38	0.15		0.30	0.15	0.12
Sepia orbignyana	23	1					57	0.12	0.25	0.23	0.01	
Pentanemus quinquarius	2	2					10	0.10	0.44			
Cynoponticus ferox	2	2					10	0.10	0.47			
Ilisha africana	2		1				7	0.10	0.48			
Chelidonichthys gabonensis	18	1					45	0.09	0.18	0.12	0.07	
Pagrus auriga	7	1					19	0.09	0.23	0.12	0.03	
Brotula barbata	6	1					17	0.09		0.06	0.03	0.31
Todaropsis eblanae	27						64	0.08		0.03	0.15	0.12
Alloteuthis africana	12	1					31	0.08	0.10	0.22		
Argyrosomus hololepidotus	2	1					7	0.07	0.30	0.03		
Raja miraletus	15						36	0.07	0.23	0.06	0.01	
Decapterus rhonchus	6	1					17	0.07	0.26	0.03		
Dentex gibbosus	9						21	0.06	0.01	0.21		
Illex coindetii	26						62	0.05		0.05	0.07	0.10
Pagrus caeruleostictus	8						19	0.05	0.12	0.09		
Atractoscion aequidens	3	1					7	0.05		0.16	0.02	
Parapenaeus longirostris, fem.	10						24	0.03				0.13
Penaeus notialis	4						10	0.03	0.13			
Parapenaeus longirostris, male	10						24	0.02				0.10
Parapenaeopsis atlantica	3						7	0.02	0.10			
Solenocera africana	2						5					
Penaeus notialis, female	1											
Penaeus notialis, male	1						2					
Parapenaeus longirostris	1						2					
Plesionika sp.	2						5					
Nematocarcinus africanus	2						5					
Other fish								0.80	1.25	1.01	0.53	0.60
Sum all species								15.87	41.93	6.34	6.69	14.97
Sum Snappers												
Sum Groupers								0.30	0.89	0.36	0.03	
Sum Grunts								4.95	22.36	0.56		
Sum Croakers								1.42	5.45	0.54	0.36	0.03
Sum Seabreams								3.27	6.21	2.48	3.49	1.09
Sum Sharks								0.03	0.06	0.06	0.04	0.01
Sum Rays								0.16	0.46	0.16	0.03	0.04
Sum Squids								0.37	0.38	0.61	0.24	0.24
Sum												
Number of stations included in analysis, total and by depth strata								42	9	12	12	9

SWEPT AREA ANALYSIS FROM STATION 912 TO STATION 1072

SECTOR 3, Congo River - Pta. das Palmeirinhas

ONLY STATIONS IN SECTOR

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 300-400m	400-500m	500-600m	600-800m
Nematocarcinus africanus	12	3	11				93	2.40	3.24	2.65	2.40	0.26
Merluccius polli	11	6	7	1			89	2.17	4.46	3.22	0.17	0.26
Chlorophthalmus atlanticus	5	3	2	1			39	1.02	3.56		0.01	
Hoplostethus cadenati	15	3	1				68	0.62		0.60	0.58	1.98
MELANOSTOMIATIDAE	16	4					71	0.41		0.30	0.74	0.68
Triplophos sp.	12	3					54	0.39		0.21	0.97	0.20
Trichiurus lepturus	6	2	1				32	0.38	1.29		0.01	0.07
Lamprogrammus exutus	16	2					64	0.33		0.18	0.59	0.66
Hymenocephalus italicus	6	4					36	0.30	1.01	0.04		
Pontinus accraensis	7	2					32	0.23	0.62	0.19		
Laemonema laureysi	21						75	0.20	0.32	0.40	0.01	
POLYCHAELIDAE	20	1					75	0.20	0.01	0.08	0.17	0.87
Nezumia sp.	16	1					61	0.18	0.02	0.03	0.13	0.89
MYCTOPHIDAE	11	2					46	0.17	0.53	0.05	0.01	
Gadella imberbis	22						79	0.13	0.21	0.21	0.06	0.01
Yarrella blackfordi	15						54	0.12		0.05	0.10	0.53
Lophius vaillanti	13	1					50	0.12	0.20	0.02	0.14	0.10
Bathyuroconger vicinus	18						64	0.12	0.03	0.25	0.02	0.30
Benthodesmus tenuis	15	1					57	0.10	0.27	0.04	0.04	0.02
Aristeus varidens, female	17						61	0.10	0.06	0.15	0.12	0.05
Talismania sp.	13						46	0.10		0.03	0.08	0.48
Centrophorus uyato	4	1					18	0.09	0.03	0.26	0.05	
Malacocephalus occidentalis	10	1					39	0.09	0.26	0.05		0.01
Chaunax pictus	16						57	0.08	0.16	0.13	0.01	
OPISTHOTEUTHIDAE		1					4	0.07				0.49
Coelorinchus coelorhincus	12						43	0.07	0.19	0.03	0.01	
Gonostoma elongatum	4						14	0.06		0.14	0.06	
Synagrops microlepis	2	1					11	0.06	0.22			
STOMIIDAE	18						64	0.05	0.01	0.04	0.10	0.06
Dibranchus atlanticus	21						75	0.05	0.06	0.04	0.02	0.13
Chaceon maritae	9						32	0.05	0.01		0.07	0.17
Aristeus varidens, male	14						50	0.03		0.07	0.04	
Solenocera africana	5						18	0.01	0.02			
SOLENOCERIDAE	1						4	0.01				0.07
Glyphus marsupialis	7						25	0.01			0.01	0.03
Parapenaeus longirostris, fem.	2						7	0.01	0.02			
Parapenaeus longirostris	3						11	0.01	0.03			
Plesiopenaeus edwardsianus	8						29	0.01		0.02	0.02	0.02
Aristeus varidens	4						14	0.01		0.01	0.01	0.02
SERGESTIDAE	2						7					
Parapenaeus longirostris, male	2						7					
Heterocarpus ensifer	1						4					
OPLOPHORIDAE	3						11					
Other fish								0.52	0.69	0.43	0.30	0.88
Sum all species								11.08	17.53	9.92	7.05	9.24
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks								0.15	0.03	0.37	0.08	0.06
Sum Rays								0.03			0.07	0.08
Sum Squids								0.10	0.08	0.02		0.55
Sum 2.90												
Number of stations included in analysis, total and by depth strata								28	8	7	9	4

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 where 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	28.1 dB
TS transducer gain	28.0 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	100, 250 and 500 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". 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 equiped with a 12" rubber bobbins gear. The doors are of 'Thyborøn' combi type, 7.81 m^2, 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 at depths greater than 300 m.

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.

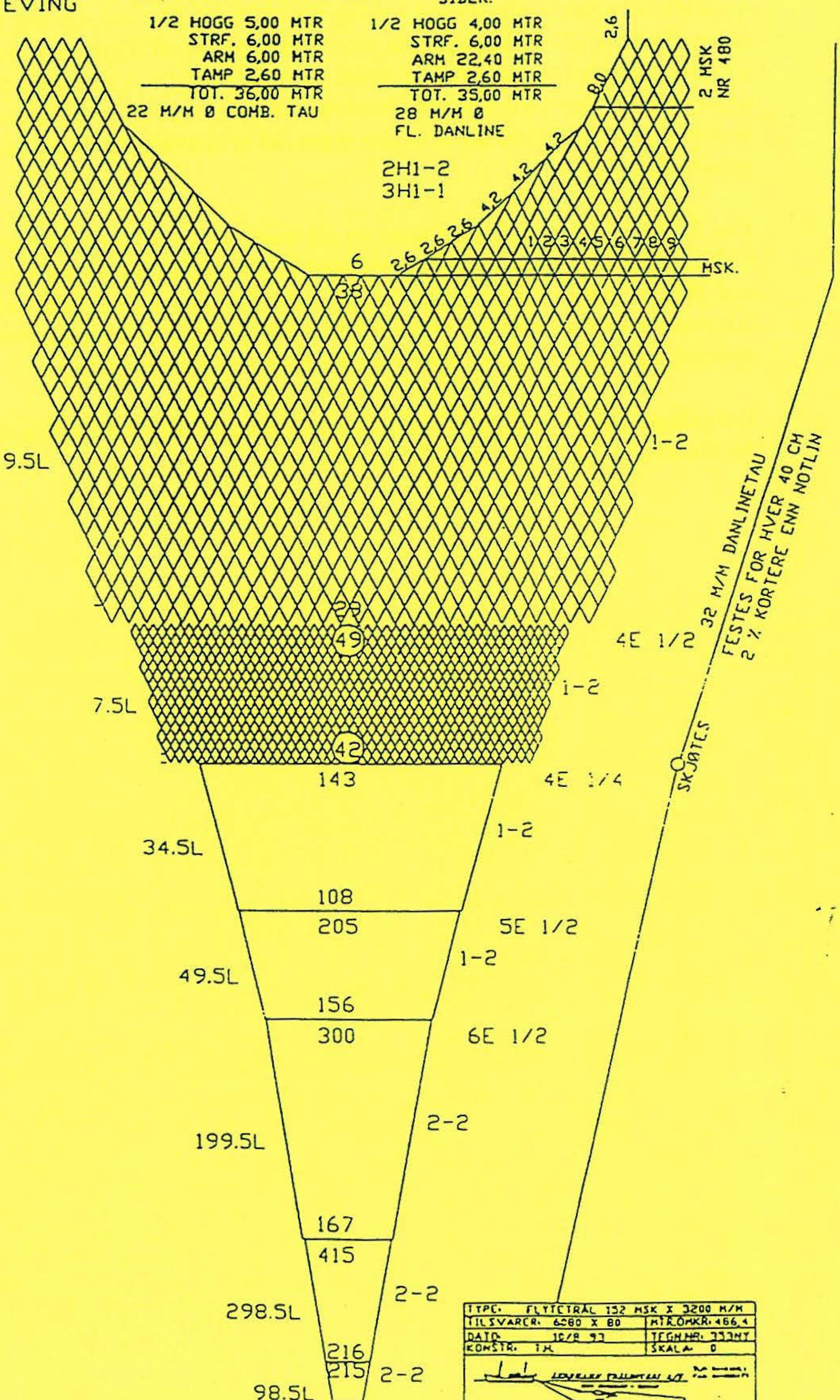
F/F Dr. Fridtjof Nansen

OVER/UNDER/SIDER

OVERDEL:
50 STK 11" PLASTKULER
UNDERDEL
14 M/M WIRE OMSP. MED
14 M/M BLYTAU
+ KJETTING.
TOTAL VEKT UNDER 400 KG.

1/2 HOGG 5,00 MTR	SIDER. 1/2 HOGG 4,00 MTR
STRF. 6,00 MTR	STRF. 6,00 MTR
ARM 6,00 MTR	ARM 22,40 MTR
TAMP 2,60 MTR	TAMP 2,60 MTR
TOT. 36,00 MTR	TOT. 35,00 MTR
22 M/M Ø COMB. TAU	28 M/M Ø FL. DANLINE

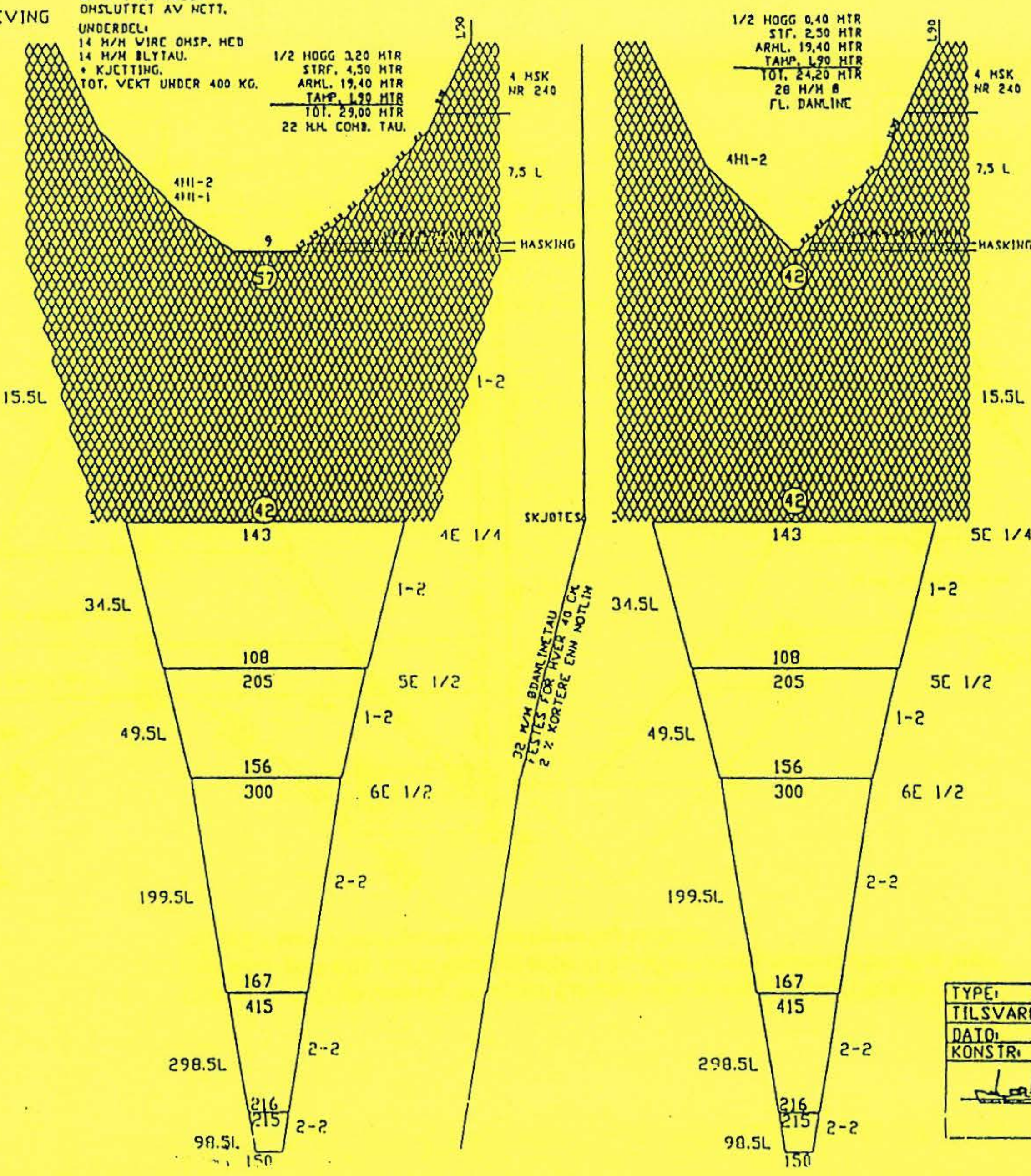
MASKER M/M	TRAAD NR.	LENGDE I MTR.	MASKER I EVING
3200.0	240	22.4	4
3200.0	240	32.0	4
1620.0	160	13.0	4
400.0	48	14.0	4
200.0	32	10.00	4
100.0	24	20.0	4
38.0	12	11.4	4
38.0	18	3.76	4



TYPE: FLYTETRÅL 152 MSK X 3200 M/M	
TILSVARER: 6080 X 80	MTR.OMKR: 466,4
DATO: 18/8 93	TEGN.NR: 3??MT
KONSTR: TH	SKALA: 0

F/F Dr. Fridtjof Nansen

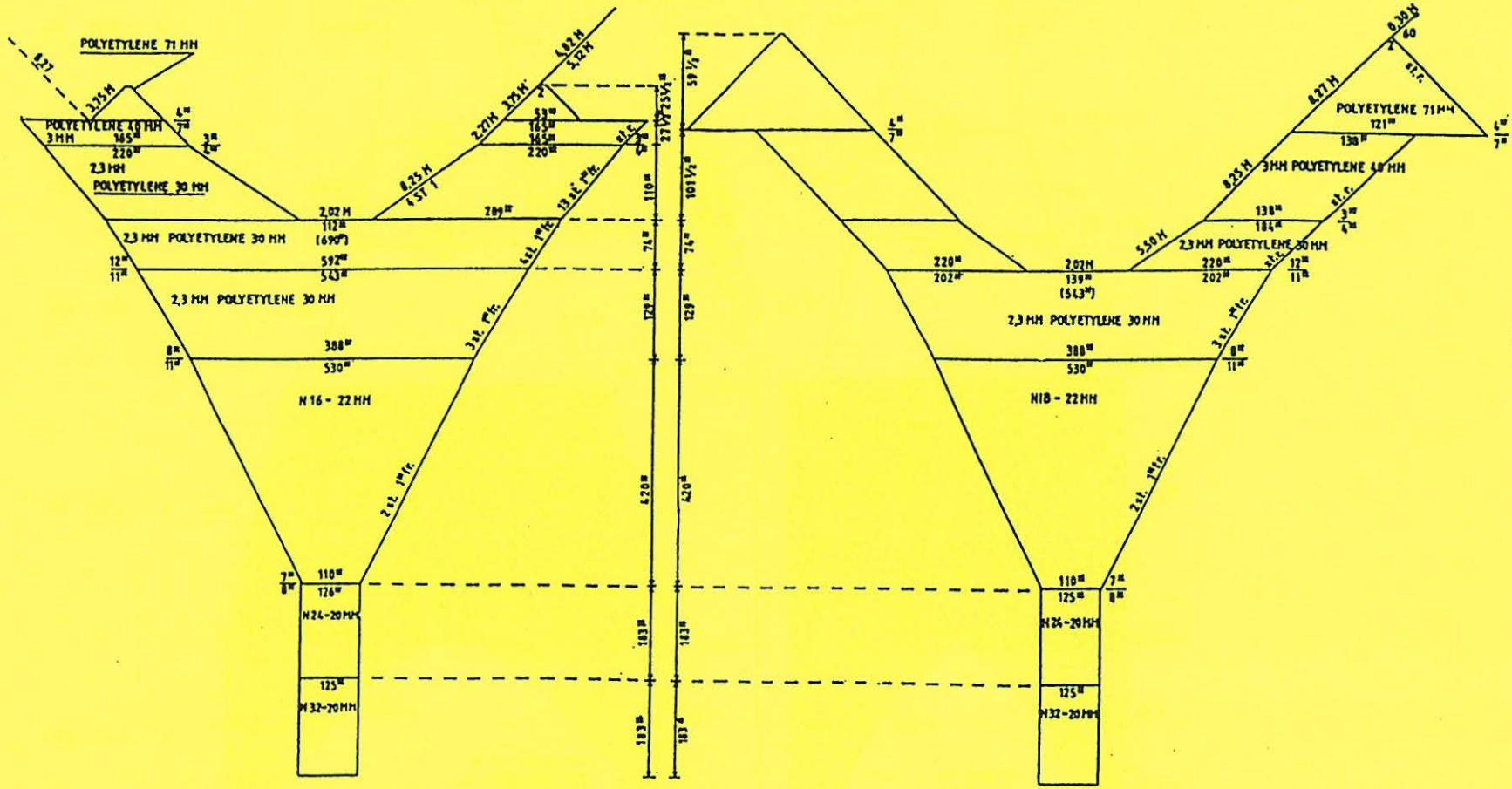
MASKER M/M	TRAAD NR.	LENGDE I MTR.	MASKER I EVING
1620.0	160	19.4	4
1620.0	160	25.9	4
400.0	48	14.0	4
200.0	32	10.00	4
100.0	24	20.0	4
38.0	12	11.4	4
36.0	18	3.76	4



TYPE: FLYTETRÅL 198 MSK X 1620 M/M	
TILSVARER: 4010 X 80	MTR.OMKR: 320
DATO: 23/6 93	TEGN.NR: 510
KONSTR: T-H	SKALA: 0

AKERMANN TRÅLBØTERI A/S

Bottom trawl: High opening shrimp and fish trawl with net headline 31m (floatline), foot-rope 47m, gear with 12 cm diameter roller disks, 40 m sweeps, estimated headline hight 6m and distance between wings during towing 18-20m.



CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF ANGOLA

Cruise Report No. 2/96

PART 2

Survey of the demersal resources

19 August - 7 September 1996

by

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

Filomena Vas Valho and **N'Kosi Luyeye**
Instituto de Investigação Pesqueira
Luanda, Angola

Bergen, 1996

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

1.1 Objectives

The objectives of the survey, previously agreed upon with the Director of the Instituto de Investigação Pesqueira (IIP), are the same as earlier pelagic surveys off Angola, i.e.:

- To map the distribution and estimate the abundance of the commercially important pelagic and semi-pelagic fish species in Angolan waters, including the two sardinella species *Sardinella aurita* and *S. maderensis*, the Cunene horse mackerel *Trachurus trecae*, the Cape horse mackerel *Trachurus capensis*, the pilchard *Sardinops ocellata* and other pelagic species, mainly carangids.

- To estimate the biological condition of sardinella and Cunene horse mackerel, length weight-relationships and reproductive stages.

- Map the general hydrographic regime by using a CTD-sonde all over the survey area and monitor the temperature, salt and oxygen on IIP standard profiles for hydrographical studies.

- Conduct current measurements with ADCP system.

- On-the-job training for the Angolan participants on the main survey routines would be imparted, including collection and processing of raw data, species identification, utilisation of the programme package NAN-SIS. In addition, the vessel would host a training course in acoustics for 4 Angolan and 4 Namibian participants, in the period 26 August-8 September.

The aim of these surveys is to build a time series to allow a better understanding of the fluctuations in the main pelagic stocks and of the main species biology.

The training course in acoustics was organised in cooperation with the FAO/DANIDA project 'Training in tropical fish stock assessment'

1.2 Participation

The scientific staff consisted of:

From IIP, Angola: Filomena Vas Valho (to 14 September), N'Kosi Luyeye, Vianda Filipe, António Lopes Manuel de Barros (19-24 August);

From IMR, Bergen: Martin Dahl, Ole Gullaksen, Christian Rohleder, Gabriella Bianchi;

Acoustic course:

Instructors: Poul Degnbol (North Sea Centre, Hirtshals, Denmark);
John Dalen and Ingvald Svellingen (Institute of Marine Research,Bergen, Norway);

Participants: Filomena Vaz Velho, Nkosi Luyeye, Agostinho Duarte, Afonso Miguel (Instituto de Investigação Pesqueira, Luanda, Angola);
Rudi Cloete, Anke Lemensiek, Heidrun Plarre, Helen Boyer (Ministry of Fisheries and Marine Resources, Swakopmund, Namibia).

1.3 Narrative

The survey started at Point Noire in the afternoon 19 August 1996. The area off Cabinda was not covered because of restrictions due to oil drilling activities. From the Congo River and southward, the entire shelf was covered from close to shore (20 m depth) to beyond the 200 m isobath or to where no pelagic fish were recorded. The course track consisted of systematic triangular transects, their endpoints about 15 nautical miles (NM) apart. This distance was however smaller (to about 5 NM) in correspondence with narrower parts of the shelf. In areas where significant concentrations of pelagic fish were detected, surveying was conducted both during daytime and night-time. CTD (Conductivity-Temperature-Depth) and ADCP (Acoustic Doppler Current Profiler) measurements were taken on standard hydrographical sections. A call was made in Luanda on 24 August to embark the Angolan and Namibian participants in the acoustic course, to be held onboard from 26 August to 8 September, parallel to the acoustic survey. An additional call in Luanda on 28 September was necessary due to the delayed arrival of the Namibian participants. The survey terminated just north of the Cunene River estuary. Thereafter, the vessel steamed towards Walvis Bay to disembark all the participants in the cruise.

1.4 Survey effort

Figures 1a-c show the cruise tracks with fishing stations and the hydrographic profiles and Table 1 the number of hydrographic, pelagic and bottom trawl stations and distance surveyed in the three regions.

Table 1 Number of bottom (BT) and pelagic (PT) trawl stations, hydrographic stations (CTD) and distance surveyed (NM) by area.

Area	BT	PT	CTD	Distance surveyed
Cabinda	0	2	0	75
Congo River-Pta. das Palmeirinhas	2	25	15	1 030
Pta. das Palmeirinhas -Benguela	1	32	15	1 310
Benguela-Cunene	4	16	6	780
Total	7	73	36	3 195

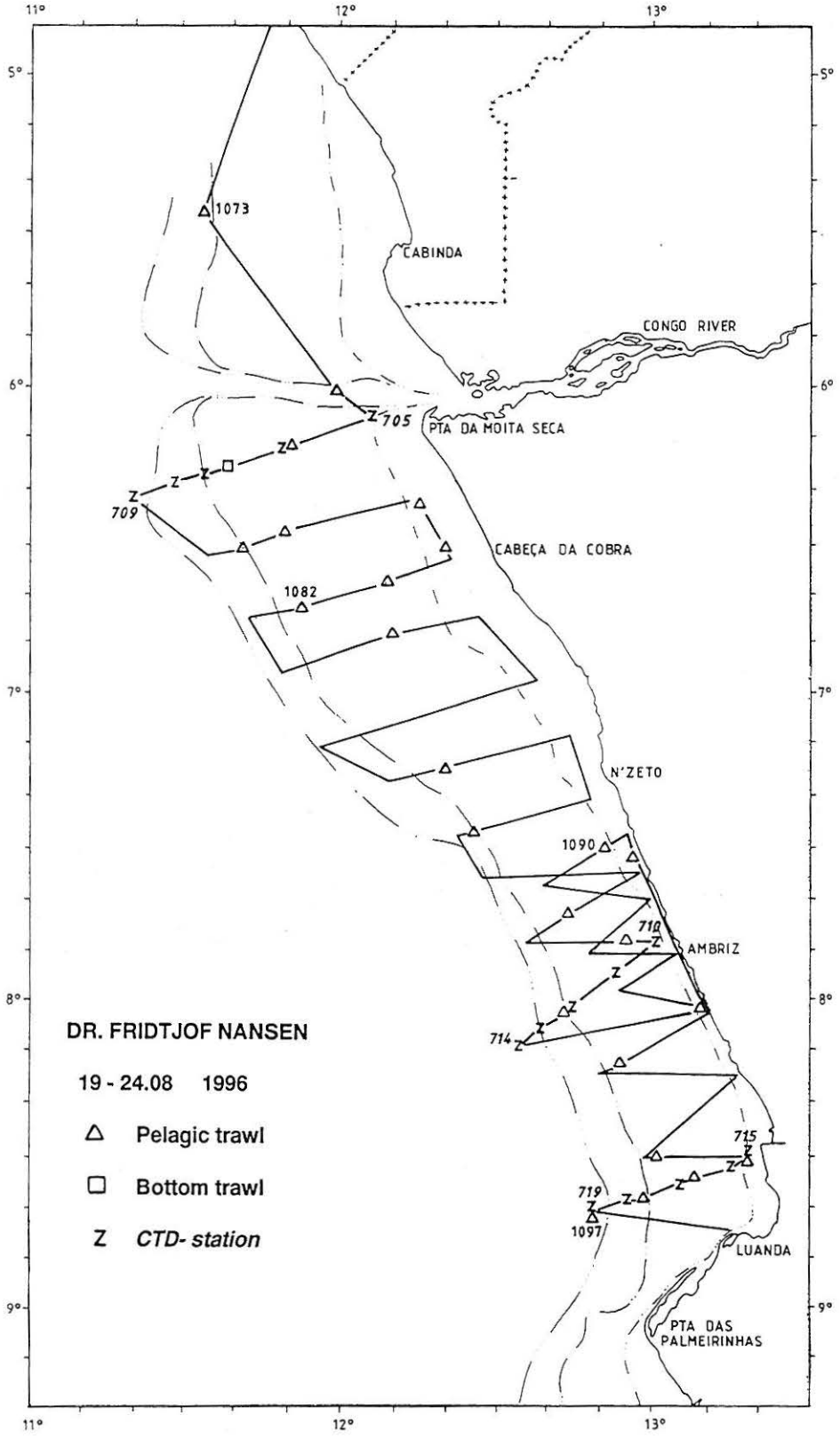


Figure 1a. Course track with fishing and hydrographic stations, Congo River-Pta. das Palmeirinhas.

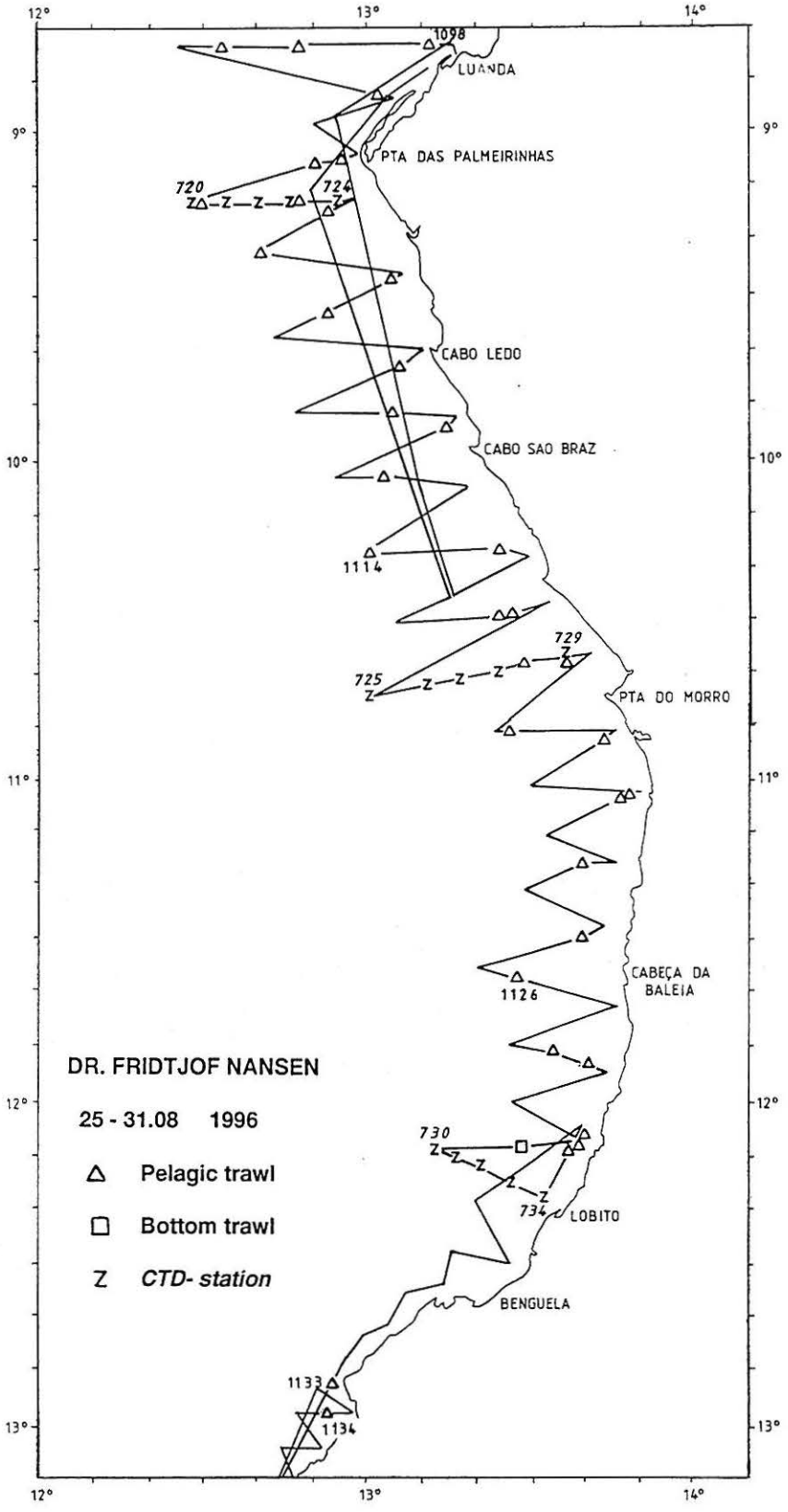


Figure 1b. Course track with fishing and hydrographic stations, Pta. das Palmeirinhas-Benguela.

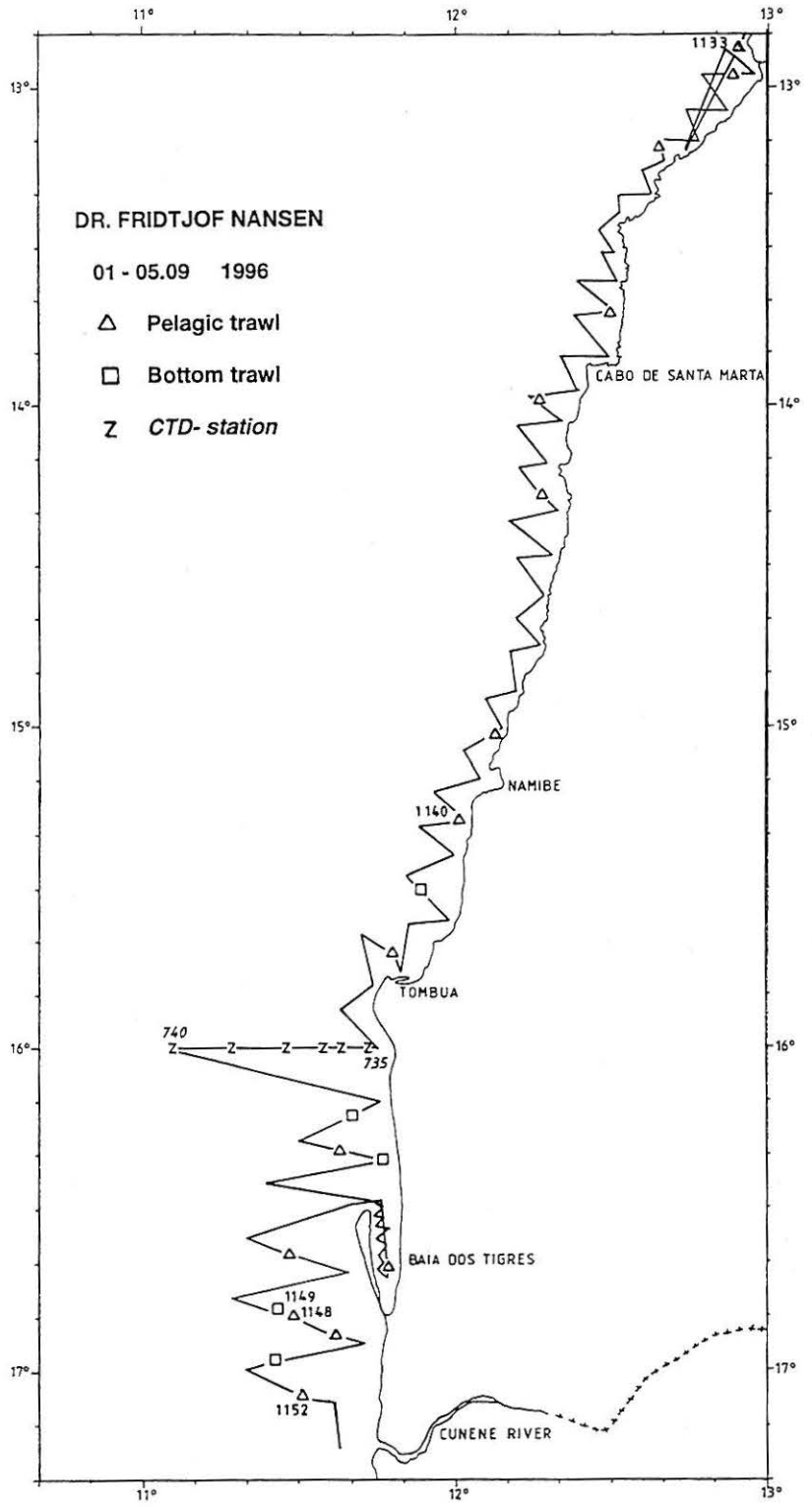


Figure 1c. Course track with fishing and hydrographic stations, Benguela-Cunene.

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. Two Niskin bottles were triggered for water samples on each station, one near the bottom and one near the surface (5 m depth). This was done only in the CDT stations between Cabinda and Luanda. 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 29 points for the salinity calibration the average difference between the Seabird values and the laboratory analysis was -0.026 (±0.034). Thus the CTD values were a little bit low compared to the Portasal. However, as the difference was within the standard deviation of the calibration, the salinity values presented here are taken from the CTD without any correction.

For oxygen 22 samples were accepted for the calibration. A linear regression gave the following formula for correcting the oxygen values:

$$O_2 = O_{2ctd} * 1.045 + 0.02$$

The standard deviation of the calibration was 0.230.

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 Aanderaa meteorological station.

2.2 Fish sampling

Abundance estimation

The catches were sampled for species composition, by weight and numbers. Biological samples, i.e. length and weight compositions were taken for the target species. Records of fishing stations are presented in Annex I.

A description of the acoustic instruments and their standard settings is given in Annex III. This also includes a description of the fishing gear used.

The following target strength (TS) function was applied to convert s_A-values (mean integrator value for a given area) to number of fish (pilchard, sardinella and Cunene horse mackerel):

$$TS = 20 \log L - 72 \text{ dB} \qquad (1)$$

or in the form

$$C_F = 1.26 \cdot 10^6 \cdot L^{-2} \qquad (2)$$

where L is total length and C_F is the fish conversion factor. The following formula was used to calculate the number of fish in length groups (cm) for each fish concentration:

$$N_i = A \_ s_A \_ \frac{p_i}{\sum_{i=1}^{n} \frac{p_i}{C_{Fi}}} \qquad (3)$$

where:

N_i = number of fish in length group i
A = area (NM^2) of fish concentration
s_A = mean integrator value in area (A)
p_i = proportion of fish in length group i in samples from the area
C_{Fi} = fish conversion factor for length group i

The number per length group (N_i) was then summed and the total number of fish obtained:

$$N = \sum_{i=1}^{n} N_i \qquad (4)$$

The length distribution of a given species within an area was computed by weighing the length frequencies obtained in each trawl sample within the area by the average s_A value attributed to that species in the 5 NM where the sample was taken.

In the case of co-occurrence of *Sardinella aurita* and *S. maderensis* (these species cannot be separated in the echo traces), the respective contribution to the s_A value attributed to the 'sardinella' category was split in accordance with their presence in weight in the trawl catches. The biomass of fish per length group (B_i) was calculated by applying their condition factor observed mean weights per length group (W_i) multiplied by number of fish in the same length groups (N_i). The total biomass in each area was obtained by summing the biomass of each length group:

$$B = \sum_{i=1}^{n} N_i \overline{W}_i \qquad (5)$$

The number and biomass per length group in each concentration were at last summed to obtain the totals for each region. The mean integrator values in each sampling unit (s_A-values) were divided between the following categories of fish on the basis of trawl catches and characteristics of the echo traces:

- sardinella (*S. aurita* and *S. maderensis*)
- horse mackerel (*T. trecae and T. capensis*)
- pilchard
- round herring
- anchovy
- P2 (carangids, scombrids, barracudas, big-eye grunt and hairtails)
- other demersal fish
- plankton

Biological sampling

Total length and body weight were recorded for sardinella and horse mackerel to the nearest 1 cm or 1 g below, respectively. Sex and reproductive stages were described by macroscopic examination, scoring each individually sampled fish according to the following categories:

1	Juvenile
2	Inactive
3	Active
4	Ripe
5	Running/ Spent

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.

CHAPTER 3 OCEANOGRAPHIC CONDITIONS

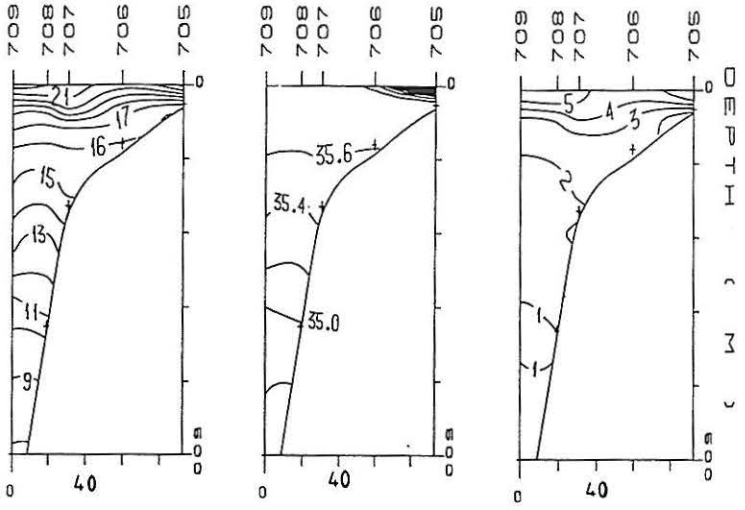
Vertical sections

The vertical distributions of temperature, salinity and oxygen along the standard sections are shown in Figures 4 a-g.

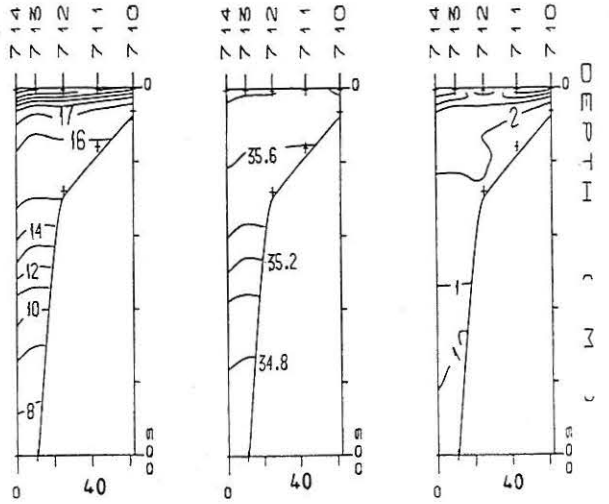
In the northernmost section (Ponta da Moita Seca) brackish water, probably from the Congo River, was found close to the shore. In the section at Ambriz there is no sign of the Congo River water and maximum salinity (35.8) is found at the surface. In both section the isolines are mainly horizontal, which indicates that no upwelling is occurring. Surface temperatures were about 21°C on the shelf and 22°C offshore. The section off Luanda showed lower temperatures (19°C close to coastline and 20°C offshore) as compared to the northernmost sections. The oxygen distribution is more or less as usually observed, with surface values of 4-5 ml/l, and a minimum (< 1ml/l) is found at about 300 m depth.

Clear signs of upwelling were found off Pta. das Palmeirinhas (Fig. 2 d), with the characteristic uptilting of the isotherms toward the coast. The sections taken in central Angola on the contrary, (Pta. do Morro and Lobito, Fig. 2 e and f) seem to indicate a less dynamic situation with no uplifting of the isolines. Surface temperature was however slightly lower close to the coast that further offshore (18 to 19°C and 20 to 21°C, respectively).

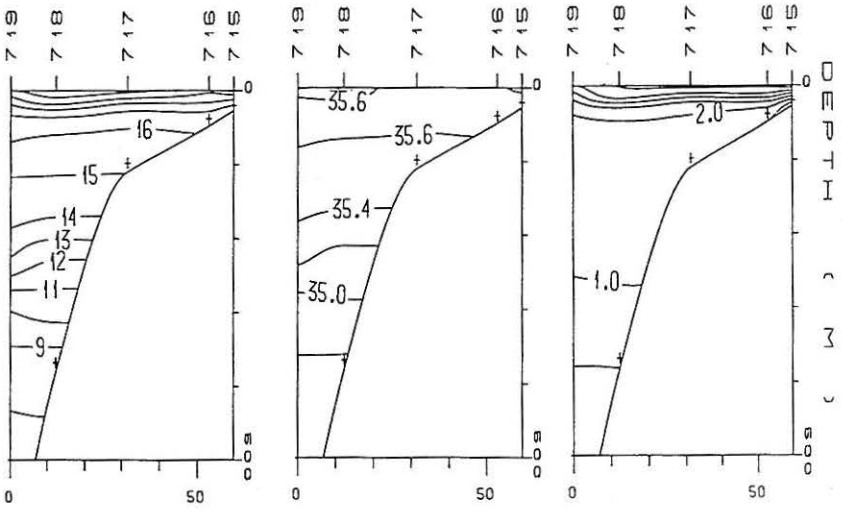
The section off Tombua (Fig. 2 g) shows a rather different structure of the water masses, with clear signs of upwelling and a very weak thermocline. Surface temperatures were 16 to 18°C. This structure is similar to the areas under the influence of the Benguela Current. The above indicates that the frontal area is probably located between Lobito and Tombua.



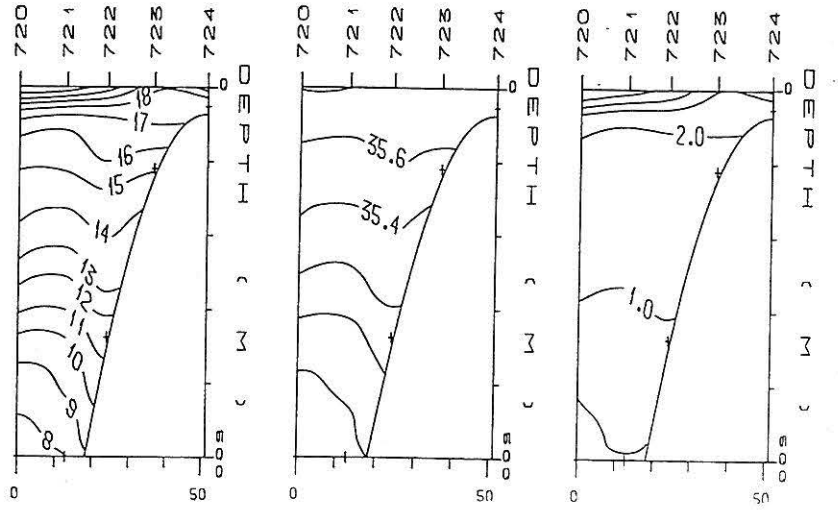
2 a. Vertical profiles of temperature, salinity and oxygen, Pta. da Moita Seca.



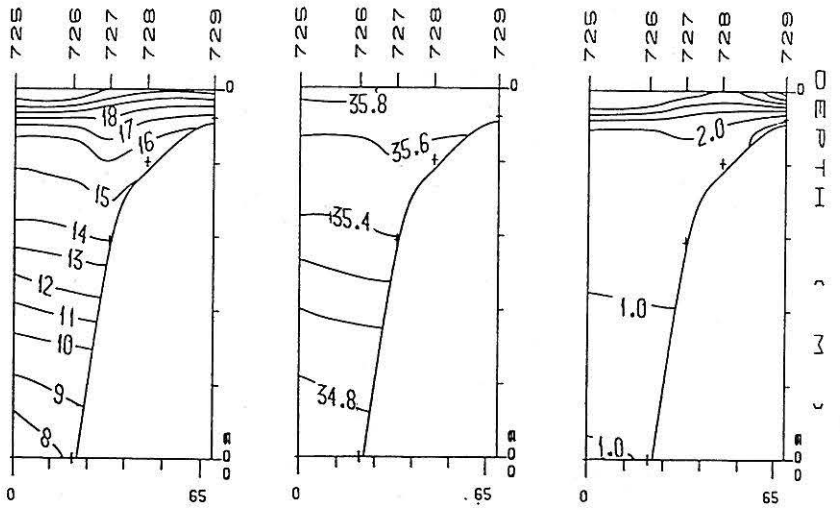
2 b. Vertical profiles of temperature, salinity and oxygen, Ambriz.



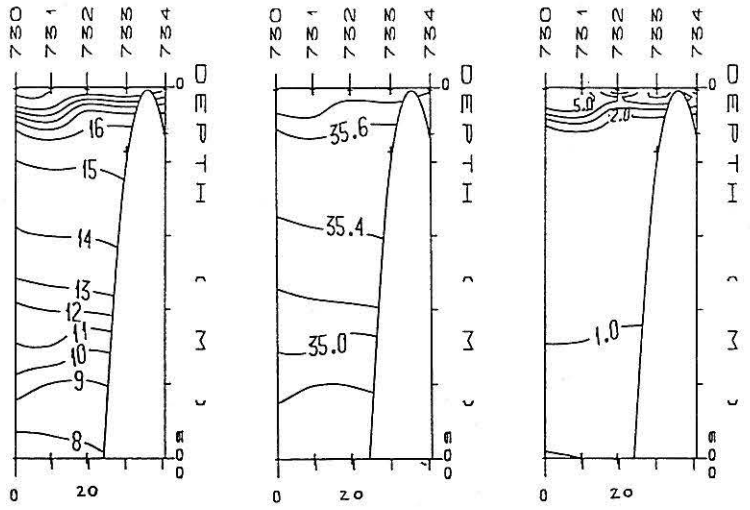
2 c. Vertical profiles of temperature, salinity and oxygen, Luanda.



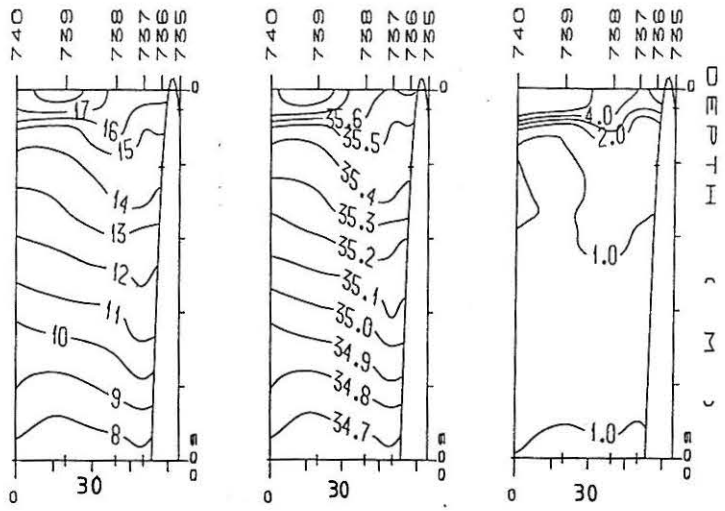
2 d. Vertical profiles of temperature, salinity and oxygen, Pta. das Palmeirinhas.



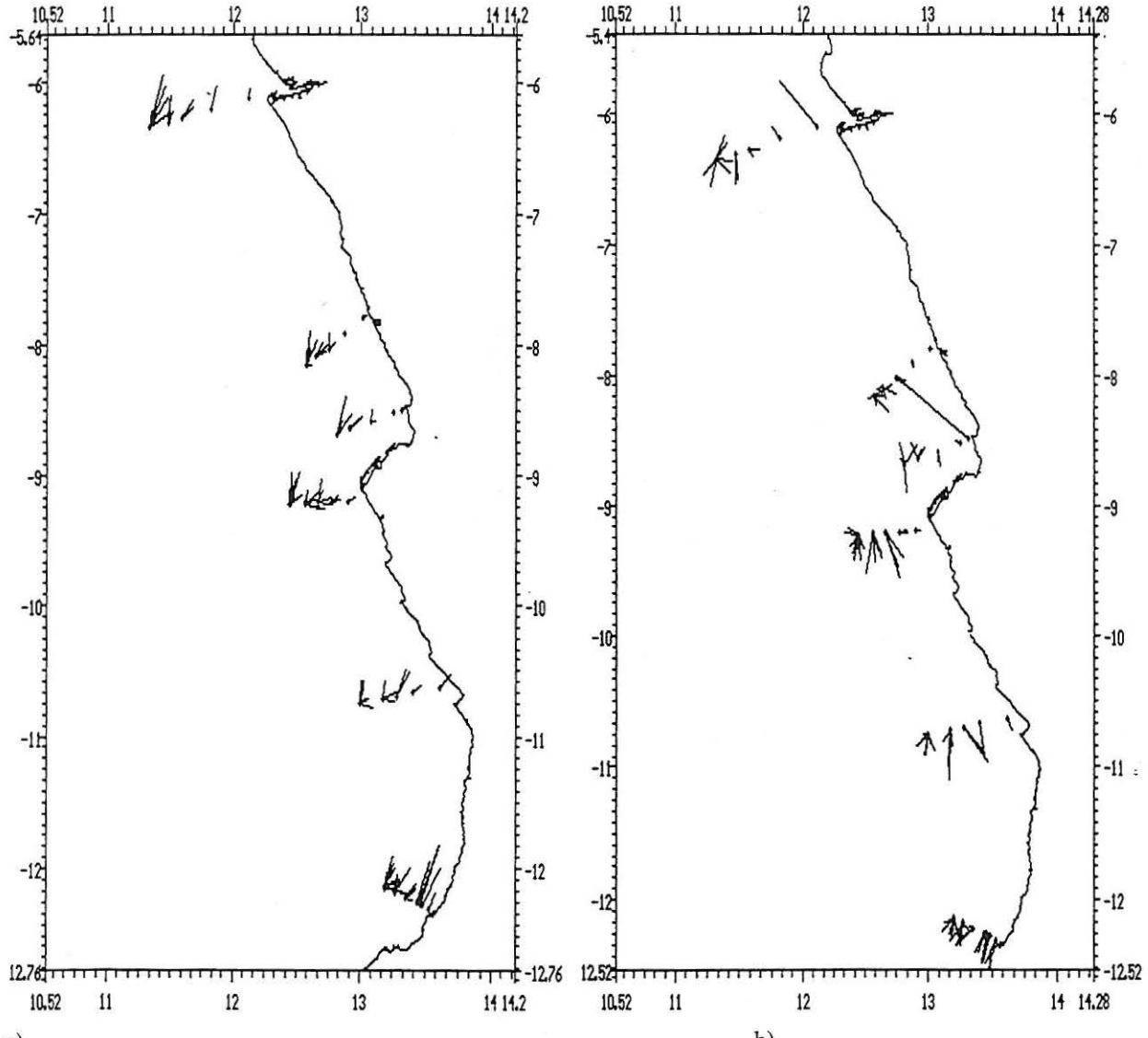
2 e. Vertical profiles of temperature, salinity and oxygen, Pta. do Morro.



2 f. Vertical profiles of temperature, salinity and oxygen, Lobito.



2 g. Vertical profiles of temperature, salinity and oxygen, Tombua.



a) b)

Figure 3. ADCP measurements. a) at 18m depth and b) at 34 m depth.

ADCP measurements

Figures 3 (a and b) show the main current directions and strengths at 18 and 34 m depth respectively. The currents closer to the surface are characterised by a major northward component that is typical for the season. At 34 m depth the directions are less consistent. Two vectors just north of the Congo River estuary and north of Luanda show a particularly strong northward component.

CHAPTER 4 DISTRIBUTION, COMPOSITION AND BIOMASS ESTIMATES OF PELAGIC FISH

4.1 Congo River-Pta. das Palmeirinhas

The northern shelf region, Cabinda, was not covered by the survey because of oil extraction activities. The entire exclusion of this area from the survey coverage started with the August-September survey in 1995. Comparison with earlier surveys should take into account this difference in coverage.

4.1.1 Sardinella

Figure 4 shows the distribution of both sardinellas (*Sardinella aurita*, the round sardinella, and *Sardinella maderensis*, the flat sardinella) for the northern region, including the varying degree of their concentrations as average acoustic integrator values for each area. Both species were found in shelf waters from the Congo River to Pta. das Palmeirinhas, with highest concentrations in the shallow area between Pta da Moita Seca and Cabeça da Cobra and off Ambriz. The former area consisted of juveniles of both species, with the round sardinella dominating the catches. In the rest of the area the flat sardinella was dominating.

The biomass of the flat sardinella was estimated to 146 000 tonnes, while the round sardinella was estimated to 87 000 tonnes (see Chapter 6 for comparisons with earlier surveys).

The length frequency distributions for both species are presented in figure 5 (a and b). They show the dominance in numbers of juveniles and modes of 11cm and 36 cm for the round sardinella and 8, 24 and 32 cm for the flat sardinella. Surveys in later years have failed in detecting juvenile fish in this region. This might be due to the limits of 10 NM miles kept from the coast for security reasons in earlier surveys, while it was not considered any longer necessary in the present survey.

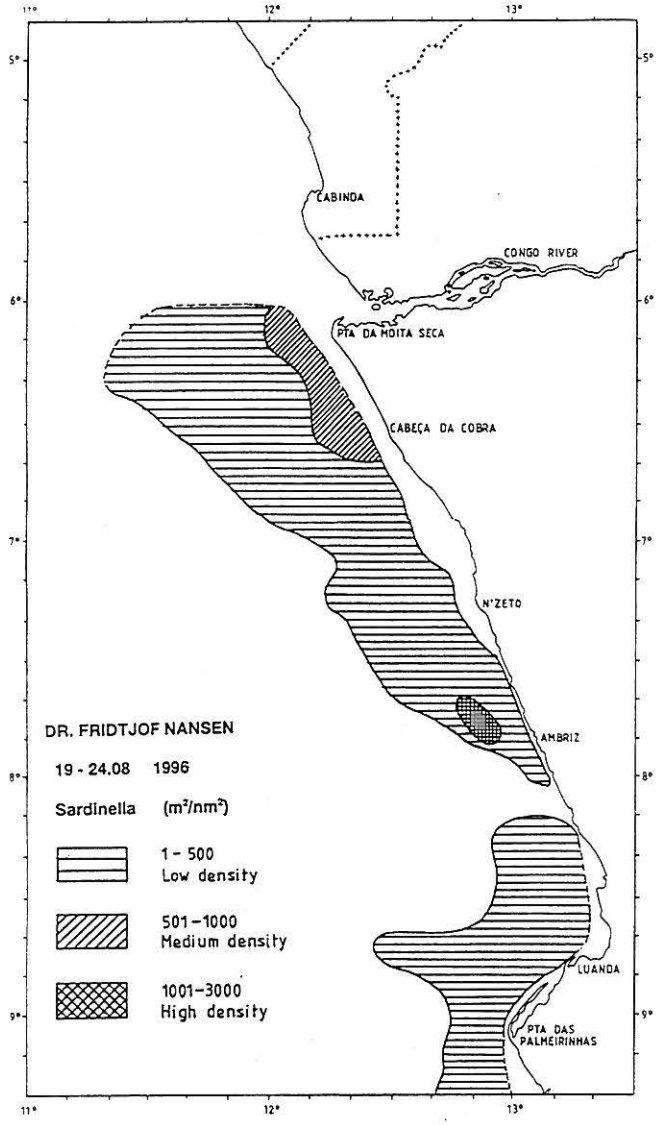


Figure 4. Distribution of *Sardinella* spp. Congo River-Pta. das Palmeirinhas.

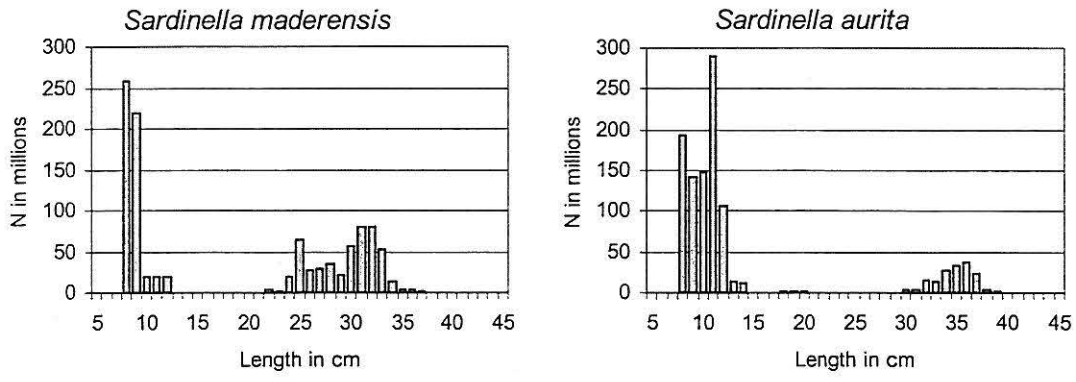


Figure 5. Total length distribution of flat sardinella (*Sardinella maderensis)* and round sardinella (*S. aurita*). Congo River-Pta. das Palmeirinhas.

4.1.2 Cunene horse mackerel

Figure 6 shows the distribution of horse mackerel for the region Congo River-Pta. das Palmeirinhas. The species appeared to be distributed, in low concentrations, throughout the intermediate and deeper parts of the shelf region. The main concentration was found just north of Cabeça da Cobra and consisted mainly of juvenile fish with a mode of 5 cm. Figure 7 shows the length distribution of horse mackerel for the whole region. Also for horse mackerel, juveniles dominate, followed by a cohort with mode 17 cm and adults up to 40 cm. The total biomass of horse mackerel in this region was estimated to 63 000 tonnes.

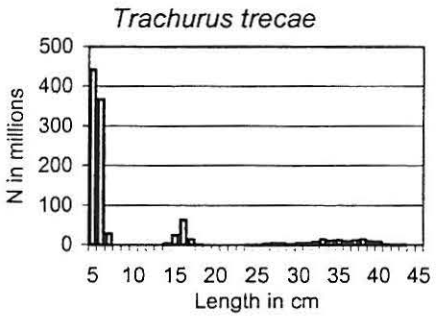


Figure 7. Estimated abundance of Cunene horse mackerel (*Trachurus trecae*) divided in length groups, Congo River - Pta. das Palmeirinhas.

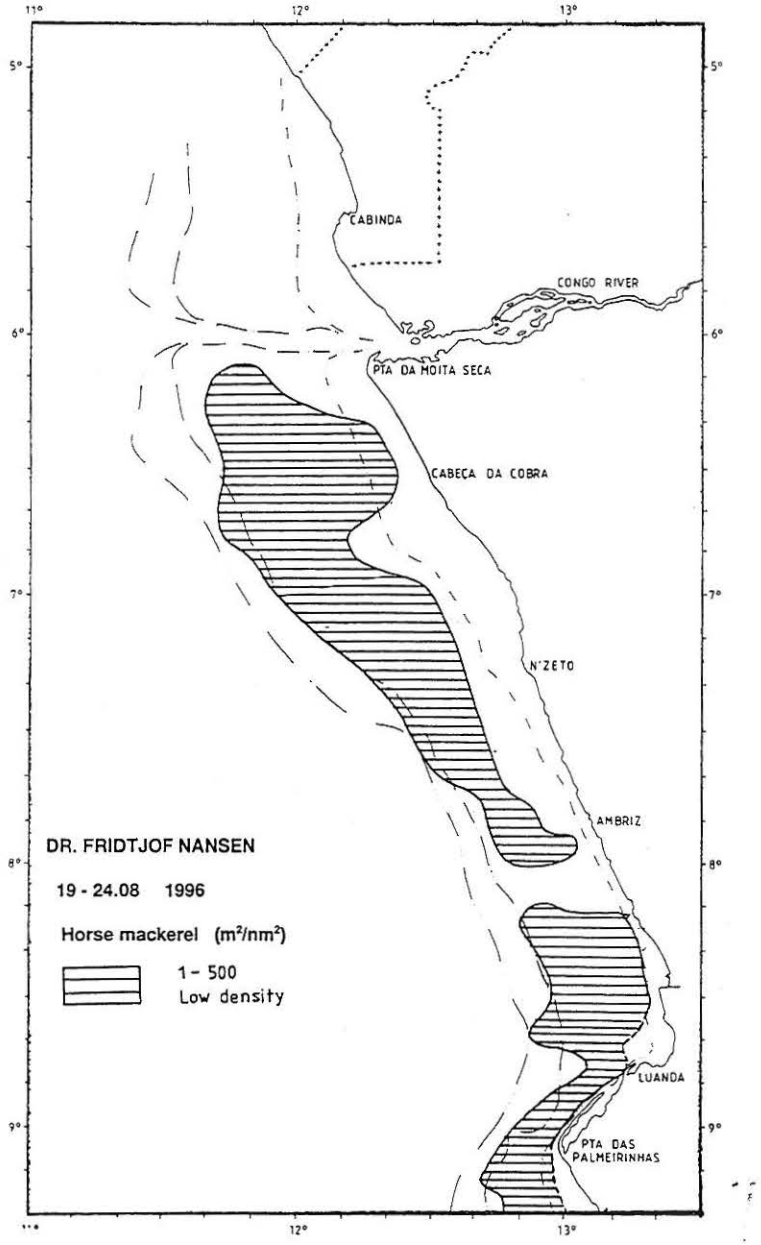


Figure 6. Distribution of Cunene horse mackerel (Trachurus trecae). Congo River-Pta. das Palmeirinhas

4.1.3 Other pelagic species

Figure 8 shows the distribution of pelagic fish type 2 for the region Congo River-Pta. das Palmeirinhas. This category includes various pelagic groups: carangids (other than horse mackerel), barracudas, scombrids and the hairtail. Table 2 shows the catch rates of the main categories included in this group. Sardinella and horse mackerel are not included.

Table 2. Catch rates (kg/h) of main groups of pelagic fish. Congo River-Pta. das Palmeirinhas.

ST.NO.	DEP.	Oth. Caran	Scombrids	Barracudas	Hairtail	Other
1073			5.1		68.4	180.6
1074		248.5		30.4	129.9	160.2
1075	5	0.1			2.1	96.9
1076	121	0.1				
1077		0.1	4.4			38.0
1078	120				46.2	365.1
1079	5			49.0		252.2
1080	5					4004.6
1081		64.6	4.1		45.1	33.9
1082					29.7	273.6
1083	5	2.0				566.7
1084		4.8	39.6		46.6	836.8
1085		8.2	34.8		155.8	455.0
1086	10	0.1				4.0
1087	5	2.9				2.2
1088	230				3.1	285.7
1089	5			3.9	77.8	401.8
1090		446.4	7.4	85.1		9.2
1091		1.7	9.0	1.2		14.5
1092						80.0
1093	5				12.6	962.9
1094				7.7	4.6	1531.4
1095	5	4.1	4.6		2.8	38.0
1096	5	1.1	36.9		34.7	222.0
1097	5				0.7	92.1
MEAN		31.4	5.8	7.0	26.4	436.3

Highest concentrations were detected in the shallow waters between Pta. da Moita Seca and Cabeça da Cobra and between N'Zeto and Ambriz. The biomass estimate was obtained by using an overall average length (about 35 cm) for this area and resulted in a value of about 56 000 tonnes. The composition in the catches shows a dominance of Carangidae (*Selene dorsalis* and *Trachinotus ovatus*) followed by hairtail (*Trichiurus lepturus*), both in the shallow inshore waters as well as over the edge of the shelf. The above estimate and relative abundance of the various groups are obviously very rough but still useful to give an idea of the order of magnitude of the resources and to indicate whether important changes have occurred. This group includes several species of commercial importance, particularly for small scale fisheries.

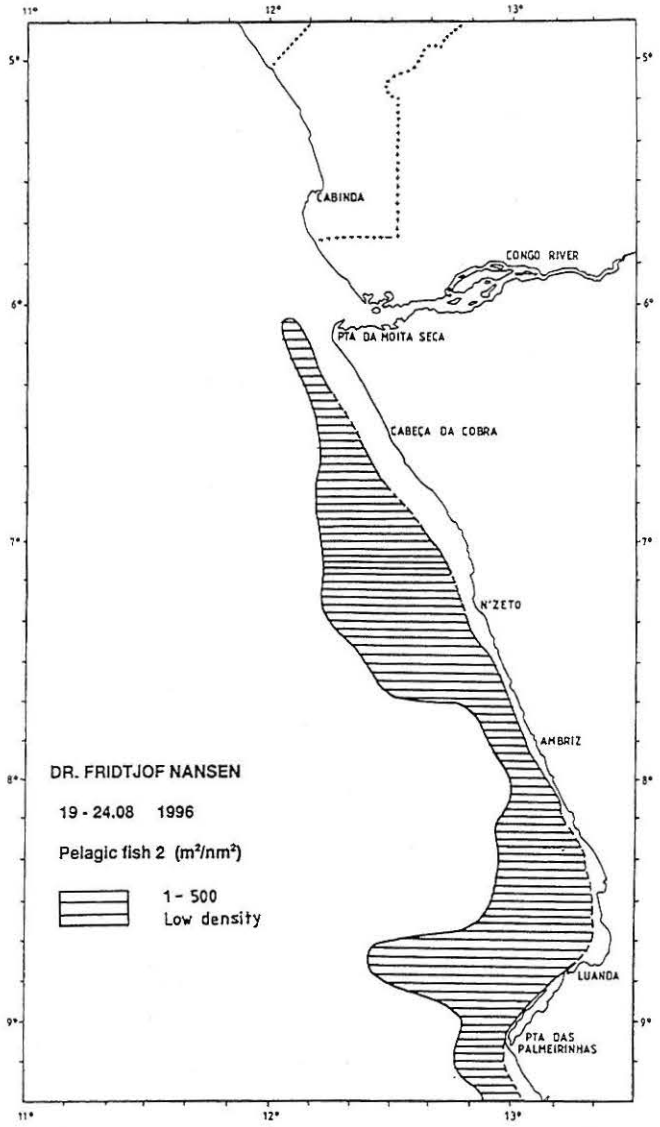


Figure 8. Distribution of pelagic fish type 2. Congo River-Pta. das Palmeirinhas.

4.2 Pta. das Palmeirinhas-Benguela

4.2.1 Sardinella

The distribution of the two sardinella species in this region is shown in Figure 9. They are found throughout the region, mainly over shelf waters. Off Pta. das Palmeirinhas sardinellas vere found far offshore, about 40 NM from the coastline and over 1300 m depth. These were mainly large adults of both species. During nighttime, pelagic trawling close to the surface usually yielded sardinella together with hairtails and small tunas or carangids (i.e. *Trachinotus*) almost anywhere along this part of the coast. During daytime, the sardinellas would form schools very close to the surface. These schools were detectable only with the sonar or by direct observation at the sea surface.

Most of the samples included large fish: modal length 33 cm for the flat sardinella and 35 cm for the round sardinella (Fig. 10).The element of young fish was almost negligible. Some young round sardinella, with an average total length of about 17 cm, were found off Pta do Morro.

The biomass on the shelf was estimated to about 130 000 tonnes of which about 5% were *S. aurita* and 95% *S. maderensis.*

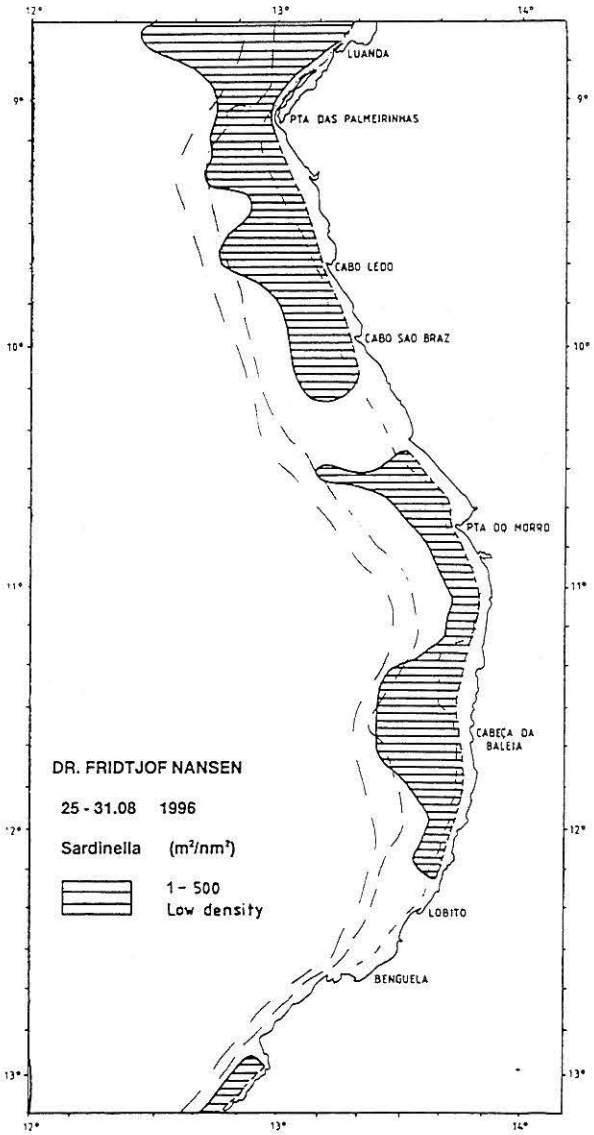


Figure 9. Distribution of *Sardinella* spp. Pta. das Palmeirinhas-Benguela

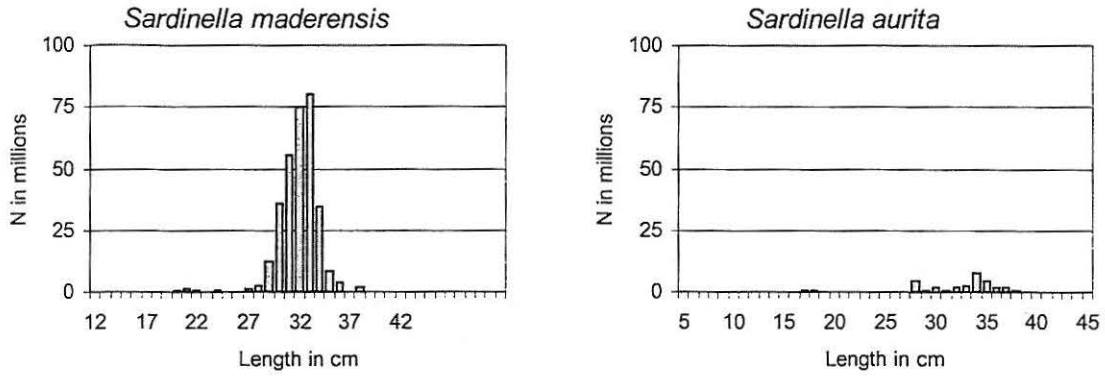


Figure 10. Total length distribution of flat sardinella (*Sardinella maderensis*) and round sardinella (*Sardinella aurita*), Pta. das Palmeirinhas-Benguela.

4.2.2 Cunene horse mackerel

Horse mackerel were evenly distributed over most of the inner shelf in this region (Figure 11). Larger concentrations were found closer to the coast and particularly between Pta do Morro and Cabeça da Baleia. The largest was found off Pta das Palmeirinhas. The vertical distribution was very much the same as was observed north of Luanda,- dense schools close to bottom at daytime and dispersal and concentration of single fish near the surface during night. The length distribution (Fig. 12) shows that large fish dominate (mode 35 cm), but a cohort of 15 cm mode is also present. The biomass estimate for the species was about 157 000 tonnes.

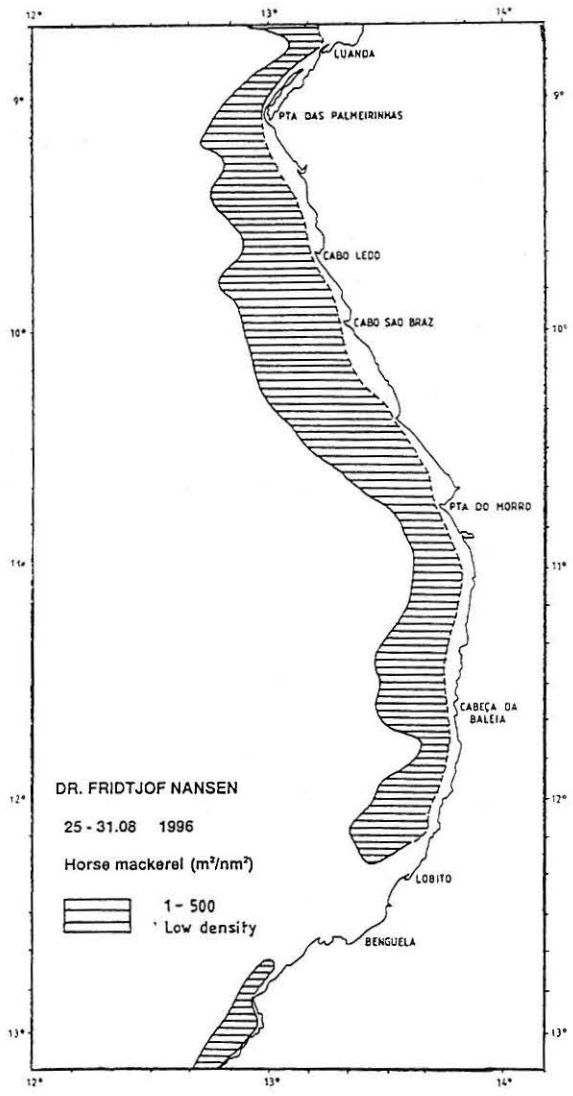


Figure 11. Distribution of horse mackerel (*Trachurus trecae*), Pta. das Palmeirinhas-Benguela.

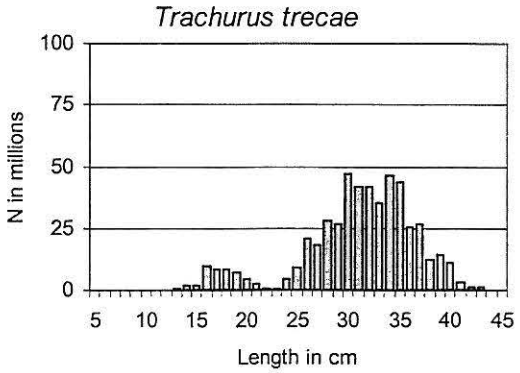


Figure 12. Total length distribution of horse mackerel (*Trachurus trecae*), Pta. das Palmeirinhas-Benguela.

4.2.3 Other pelagic species

Figure 15 shows that pelagic species type 2 were widely distributed in this region from shallow coastal waters to beyond the edge of the continental shelf. Also here the carangids were dominating with the lookdown (*Selene dorsalis*) as the most common species. The carangids constituted 65% of this group, the scombrids about 9%, barracudas 11% and hairtails (15%) were also quite common The fish was rather evenly distributed with no places of dense concentrations. The estimated biomass totalled about 72 000 tonnes.

Table 3. Catch rates (kg/h) of main groups of pelagic fish. Pta. das Palmeirinhas-Benguela

ST.NO.	DEP.	Oth.Carang	Scombrids	Barracudas	Hairtail	Other
1098		29.2				23.1
1099		35.4	4.8		55.2	355.9
1100		22.8	5.6		1.9	163.6
1101		12.1	2.8		15.0	137.8
1102		115.7	9.4	10.8	7.5	75.8
1103	25	2.1	7.7			0.7
1104						0.6
1105		112.7	0.6			7.5
1106		63.2		6.6	6.6	328.6
1107	5	0.6				28.3
1108		260.0	7.3	98.7	8.7	796.7
1109	5	20.6	7.8	5.6	24.5	43.2
1110	10	205.8	2.7	2.4		570.8
1111		4.9				192.7
1112	24	20.2			3.8	444.7
1113	10		23.3		23.6	73.8
1114	10		1.2			295.0
1115	10	21.2			19.0	1428.7
1116		165.8	4.1			4.0
1117	33	4.5				700.0
1118		49.4	7.4		27.3	523.6
1119	5				17.6	1231.6
1120						8.0
1121	5	37.7		12.5	35.8	6182.3
1122	5	13.3	21.4			6320.4
1123	20	30.2			7.5	1603.8
1124	10	57.8		8.6	8.5	169.3
1125		27.6	24.7	22.5	10.0	1532.2
1126			0.0		6.5	46.8
1127			4.8			21.8
1128	5		38.2	5.2	6.6	2190.2
1129						
1130	10		7.9	2.6	0.1	36.5
1131	103			16.2		1326.4
1132	5	2.3		33.4	22.4	529.0
MEAN		37.5	5.2	6.4	8.8	782.7

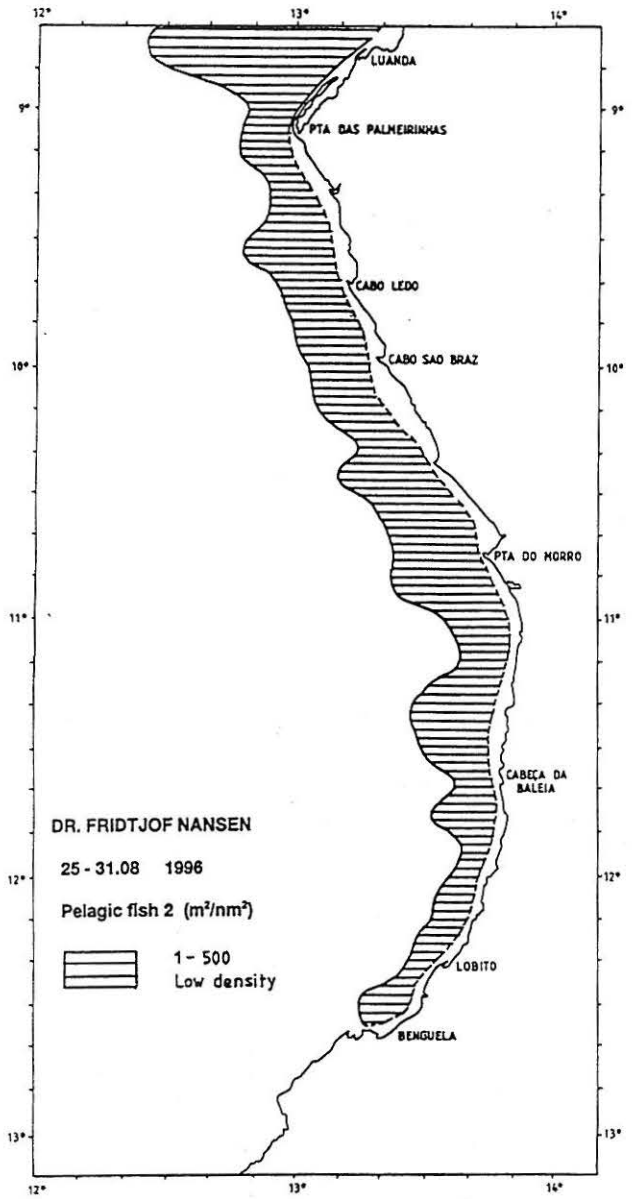


Figure 13. Distribution of pelagic fish type 2. Pta. das Palmeirinhas-Benguela.

4.3 Benguela - Cunene

4.3.1 Horse mackerel

The horse mackerel in this region consists of two species, the Cunene horse mackerel (*Trachurus trecae*) and the Cape horse mackerel (*Trachurus capensis*). The latter species reaches its northernmost distribution in southern Angola but is mainly found further south, off Namibia and south Africa. Its northernmost distribution is related to the displacement of the Angola-Benguela front. This species started appearing in the catches off Cabo de Santa Marta (about 14°S), mixed with the Cunene horse mackerel. The two species co-occur throughout the southern Angolan shelf. Close to the border with Namibia, the catches consisted of Cape

horse mackerel only. Horse mackerel was schooling near the bottom during daytime, and could be caught with bottom trawls mixed with species of the genus *Dentex* (mainly *D. macrophthalmus*) or in mid-waters during night-time. Horse mackerel seem to be the dominating species both in the pelagic and the near bottom environment.

The distribution of the species combined, between Benguela and Cunene, is shown in Figure 14. The horse mackerel were found to be distributed more or less all along the coast, except for a smaller area some 15 NM north of Cabo de Santa Marta. The biomass estimate for both species combined totalled 140 000 tonnes, 70 % of which was Cunene horse mackerel and about 30 % Cape horse mackerel.

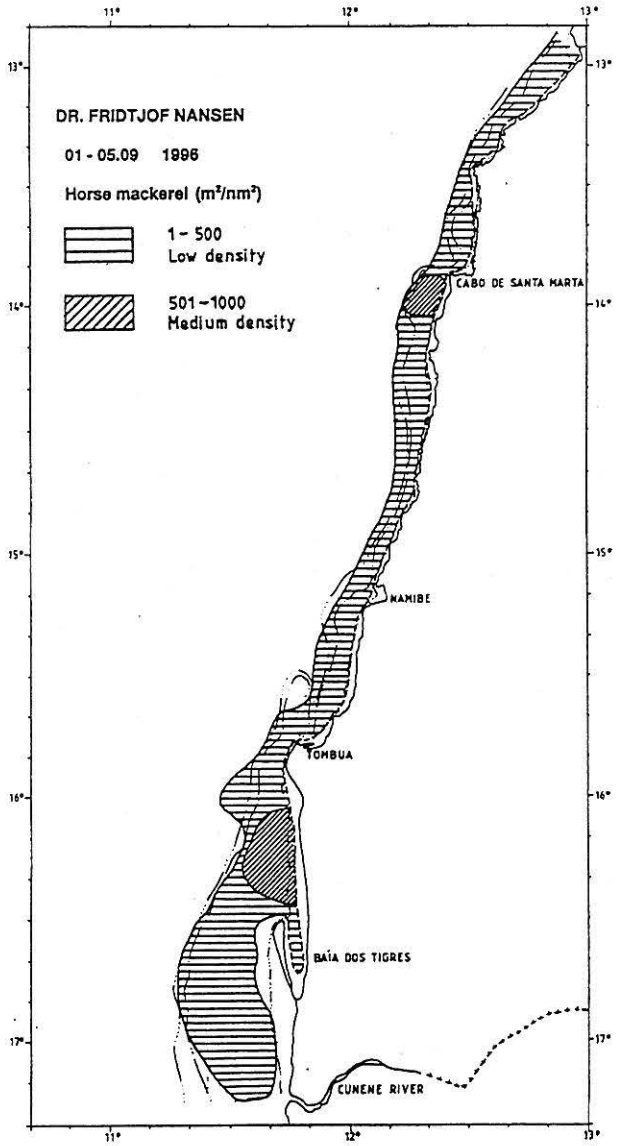


Figure 14. Distribution of *Trachurus trecae* and *Trachurus capensis*, Benguela-Cunene

The length frequency distributions for both species are presented in figure 15). It is difficult to clearly distinguish cohorts in the frequency distributions. There are two modes of 15 and 21 cm for the Cunene horse mackerel and of 11, 17 and 21 for the Cape horse mackerel.

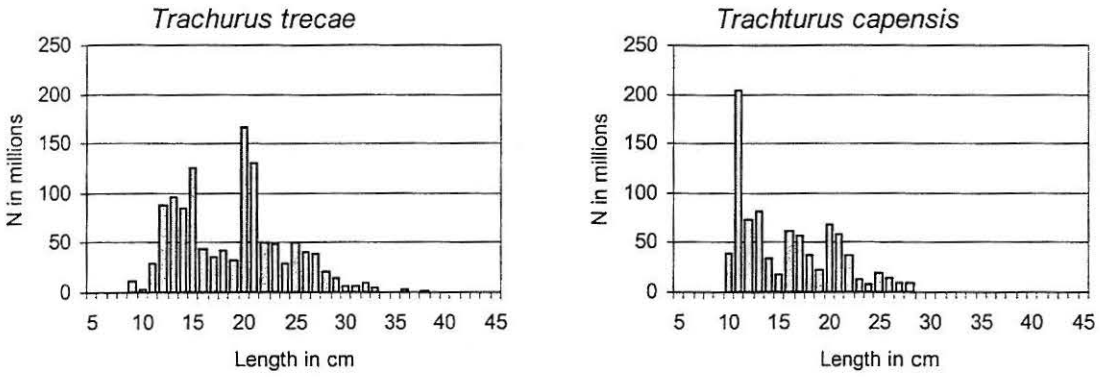


Figure 15. Total length distribution of *Trachurus trecae* (a) and *T. capensis* (b) Benguela-Tombua.

Differently to what observed off central and northern Angola, the Cunene horse mackerel appear to consist of young individuals only. This pattern is consistent with what was observed in earlier surveys. Very little is known about the migration pattern of this species but, from the length frequency distributions it would appear that the southern Angolan region is a major feeding area. On the other hand, the lack of large adults in the population may also be indicative of high fishing pressure on this part of the stock. Also in the case of *Trachurus capensis*, only young fish were caught.

4.3.2 Pilchard

This species was caught at two stations only, in the middle of the shelf and at about 16°20 S and close to the border with Namibia, respectively. Because of the extremely low abundance, it was not possible to estimate the biomass for this species.

4.3.3 Round herring

This species (*Etrumeus whiteheadi*) was the most abundant of the clupeoids. Its distribution is shown in Figure 15. It was caught in the pelagic trawl throughout the shelf from south of Tombua to the border with Namibia. Its biomass was estimated to about 24 000 tonnes, using a condition factor of 0.66. The length frequency distribution of figure 16 shows one mode at 15 cm which is consistent with earlier surveys.

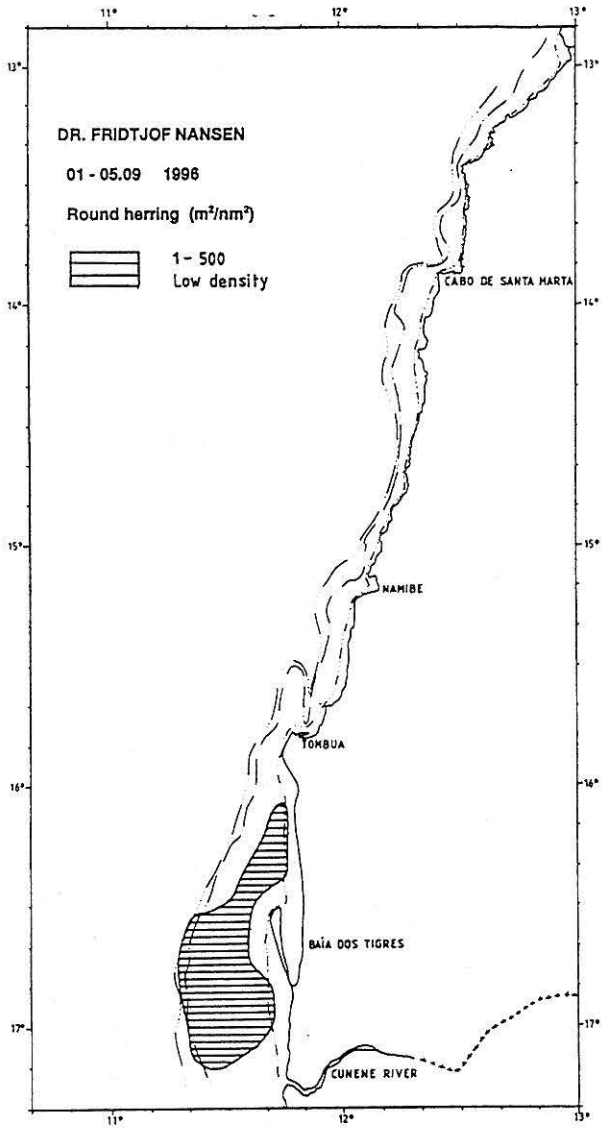


Figure 15. Distribution of round herring (*Etrumeus whiteheadi*), Tombua-Cunene.

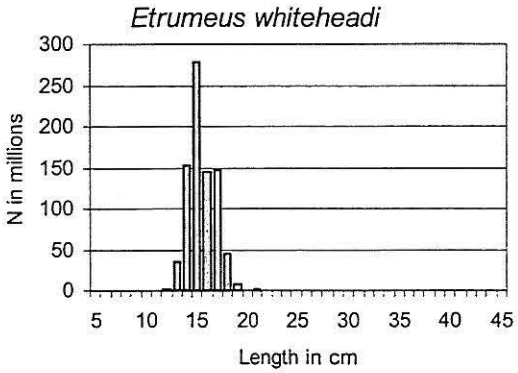


Figure 16. Total length distribution of round herring (*Etrumeus whiteheadi*), Benguela-Cunene.

CHAPTER 5 BIOLOGICAL SAMPLING

5.1 Sardinellas (*Sardinella maderensis* and *Sardinella aurita*)

Figure 17 (a and b) shows the results of the sampling for determining the maturity stages of *Sardinella maderensis*, for the region Congo River-Pta. das Palmeirinhas (N=1231) and Pta. das Palmeirinhas-Benguela (N=702), respectively. The length range is different in the two cases but the figures show that practically 100% of flat sardinella > 28 cm was spawning or almost ripe to spawn, in both regions.

This situation is typical of the cold season, when the greater dynamics of the water masses enhances productivity. This in term makes the growth conditions for larvae and juveniles more favourable.

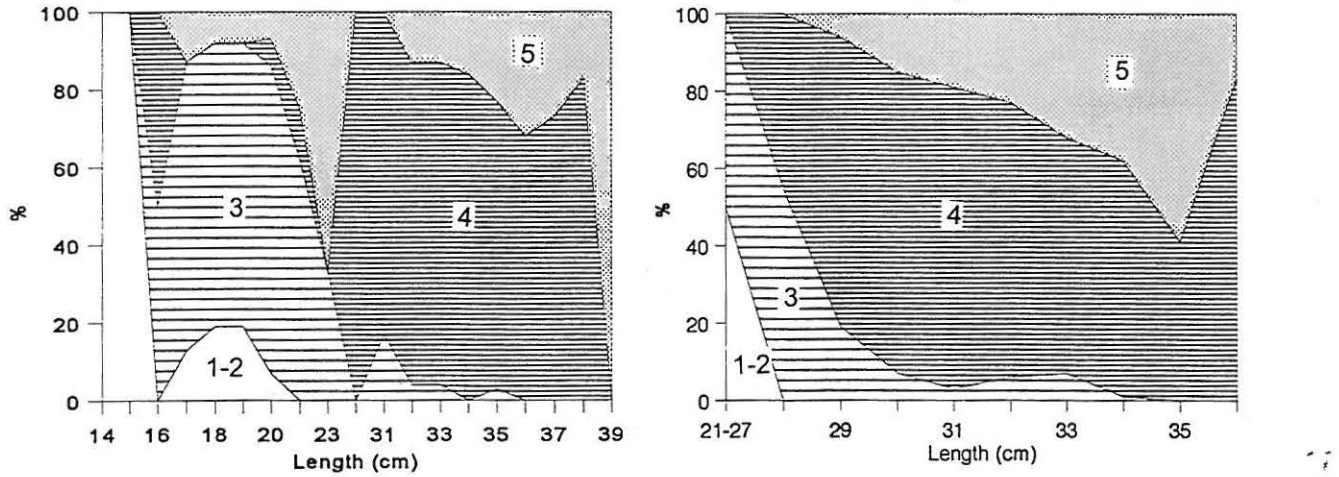


Figure 17. Relative frequency of maturity stages at different length groups. *Sardinella maderensis*. a) Congo River-Pta. das Palmeirinhas; b) Pta. das Palmeirinhas-Benguela.

The round sardinella (N=405) was found to be in stages 4 and 5 (ripe and running, respectively) in almost 100% of individuals larger than 30 cm. All individuals under 16 cm were inactive but some young specimens of 17 cm were found to be ripe (Fig. 18). Only a few specimens of round sardinella were measured in the region Pta. das Palmeirinhas-Benguela and these are not represented. They were mostly above 34 cm and they all had active gonads.

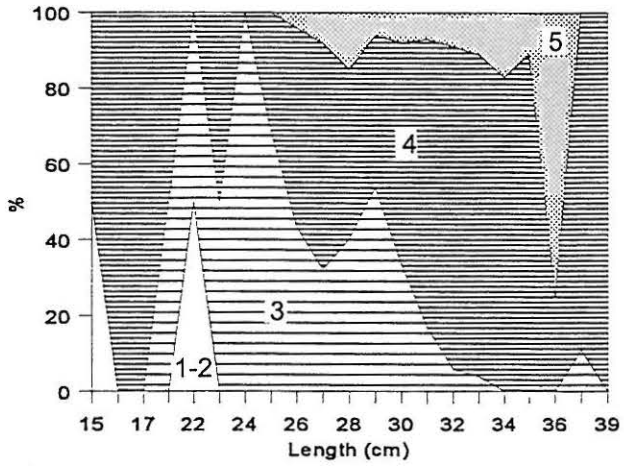


Figure 18. Relative frequency of maturity stages at different length groups. *Sardinella aurita.* Pta. das Palmeirinhas-Congo River.

5.2 Horse mackerel (*Trachurus trecae*)

Figure 19 shows the relative frequency of occurrence of maturity stages 2 to 5 for the region Congo River-Pta. das Palmeirinhas (a) and Pta. das Palmeirinhas-Benguela (b). The total number of fish sampled were 683 in the

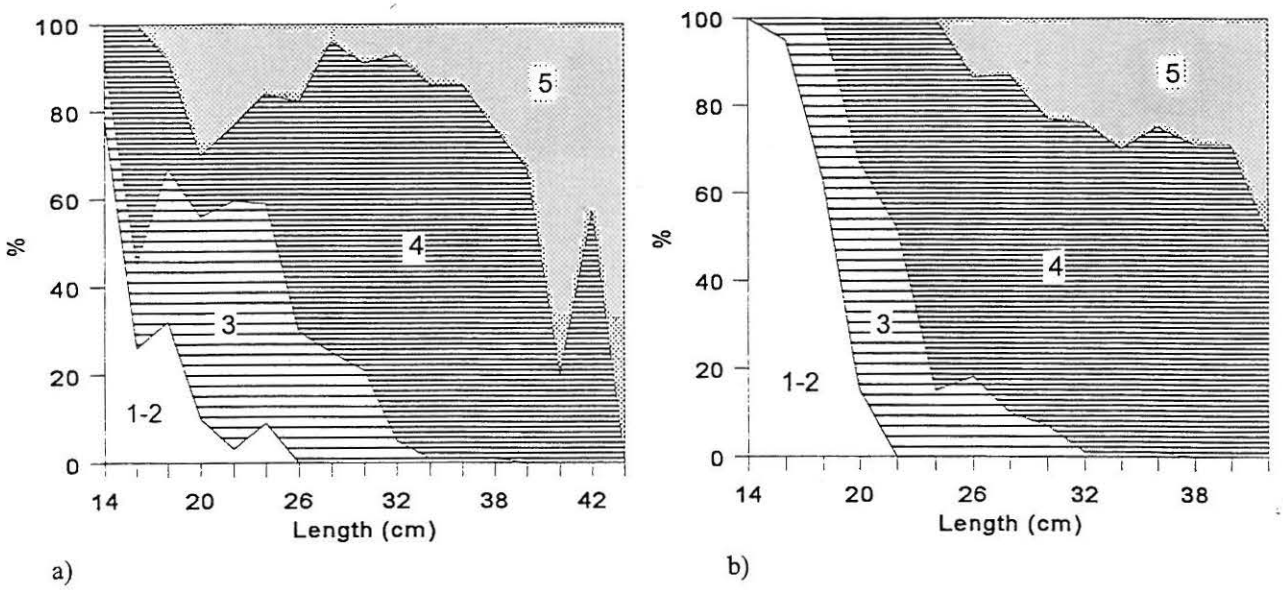


Figure 19. Relative frequency of maturity stages at different length groups of *Trachurus trecae.* a) Congo River-Pta. das Palmeirinhas; b) Pta. das Palmeirinhas-Benguela.

former and 725 for the latter. In both cases, more than 80% of the fish analysed was close to being ripe or was ripe and spawning. A high percentage of young specimens had ripe gonads

or were spawning in the Congo River-Pta. das Palmeirinhas region, with some specimens of 16-17 cm having running gonads. In the Pta. das Palmeirinhas-Benguela region a very low percentage of the young fish below 20 cm had active gonads.

Also for horse mackerel this appears to be the peak spawning season.

CHAPTER 6 REVIEW OF SURVEY RESULTS

6.1 Sardinella and horse mackerel

The survey on pelagic stocks in Angola, in March 1996, resulted in a low estimates of both sardinella and horse mackerel (Tables 4 and 5), consistent with the results obtained in the course of the February-March 1995 survey. In both cases, abnormal conditions of temperature and salinity had been observed which seemed to influence the behaviour of these species and make them less available to echo detection. The 1995 winter survey, however, gave rather consistent results with previous surveys at the same time of the year.

Sardinellas were estimated to 363 000 tonnes, which is the lowest estimate for this season. A general impression from the survey was the limited occurrence of large schools. Small schools were often detected visually and observed in the sonar diagrams. This estimate should therefore be considered as an underestimate. The introduction of a method for biomass estimation based on the sonar readings will soon be available and a final estimate will be calculated.

Table 4 Estimates of biomass of sardinellas by regions and surveys (1 000 tonnes)

Survey	Cunene-Benguela	Benguela-Pta. das Palmeirinhas	Pta. das Palmeirinhas-Congo River	Benguela-Congo River	TOTAL
1/85	25	220	80	300	325
2/85	110	190	180	370	480
3/85	0	70	190	260	260
4/85	0	200	110	310	310
1/86	10	140	110	250	260
2/86	10	130	130	260	270
1/89	40	200	60	260	300
2/89	20	40	130	170	190
3/89	40	100	60	160	200
1/91	+	180	120	300	300
2/91	+	68	154	222	222
1/92	+	119	161	280	280
1/94	*	410	100	510	510
2/94	*	245	290	535	535
1/95	*	140	24	164	
2/95	+	277	297	574	574
1/96	49	175	70	245	294
2/96	+	130	233	363	363

* not surveyed

Table 5 Estimates of Cunene horse mackerel by regions and surveys (1 000 tonnes).

Survey	Cunene-Benguela	Benguela-Pta. das Palmeirinhas	Pta. das Palmeirinhas-Congo River	Benguela-Congo River	TOTAL
1/85	30	195	40	235	265
3/85	50	90	40	130	180
4/85&1/86	100	125	20	145	245
1/89	35	55	40	95	130
3/89	170	40	35	75	245
1/91	100	80	20	100	200
2/91	100	70	30	100	200
1/92	98	86	80	166	264
1/94	*	238	1	239	
2/94	*	130	120	250	
1/95	*	*	84	84	
2/95	70	160	110	270	340
1/96	286	214	6	220	506
2/96	140	157	63	220	360

* not surveyed

The total obtained for the region Benguela-Congo River is rather consistent with previous estimates. They show a trend of a northward displacement of the stock in the winter season. The main differences in the estimates are found in the Cunene-Benguela region. These estimates should be seen in combination with the estimates of the Namibian part of the stock, at least for *Trachurus capensis*.

Annex I Records of fishing stations

PROJECT STATION:1073
DATE:19/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 526
start stop duration Long E 1134
TIME :20:48:00 21:18:00 30 (min) Purpose code: 1
LOG :7685.30 7687.00 1.70 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 303 301 Validity code: 4
Towing dir: 5° Wire out: 150 m Speed: 34 kn*10

Sorted: 91 Kg Total catch: 127.11 CATCH/HOUR: 254.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	112.00	454	44.06	2412
Trichiurus lepturus	68.40	732	26.91	
MYCTOPHIDAE	61.20	19524	24.07	
Euthynnus alletteratus	5.16	4	2.03	
Trachurus trecae	2.84	8	1.12	
Centrolophus niger	2.56	4	1.01	
Ornithoteuthis antillarum	0.84	52	0.33	
Sardinella aurita	0.74	2	0.29	
Paralepis sp.	0.20	28	0.08	
Sepiella ornata	0.16	8	0.06	
Ariomma bondi	0.08	4	0.03	
Naucrates ductor	0.04	4	0.02	
Total	254.22		100.01	

PROJECT STATION:1074
DATE:20/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 600
start stop duration Long E 1159
TIME :02:35:00 03:05:00 30 (min) Purpose code: 1
LOG :7745.00 7747.20 2.20 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 480 952 Validity code: 4
Towing dir: 128° Wire out: 170 m Speed: 35 kn*10

Sorted: 196 Kg Total catch: 284.51 CATCH/HOUR: 569.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	222.60	802	39.12	2415
Sardinella maderensis	132.00	496	23.20	2413
Trichiurus lepturus	129.90	1492	22.83	
Sphyraena afra	30.40	2	5.34	
Chloroscombrus chrysurus	14.62	88	2.57	
Caranx senegallus	11.28	12	1.98	
MYCTOPHIDAE	10.56	5280	1.86	
Hexanchus griseus	9.30	2	1.63	
Pentheroscion mbizi	6.60	400	1.16	
Saurida brasiliensis	1.54	132	0.27	
Trachurus trecae	0.22	142	0.04	2414
Total	569.02		100.00	

PROJECT STATION:1075
DATE:20/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 611
start stop duration Long E 1149
TIME :06:16:00 06:46:00 30 (min) Purpose code: 1
LOG :7775.30 7777.00 1.80 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 92 83 Validity code: 4
Towing dir: 76° Wire out: 150 m Speed: 36 kn*10

Sorted: 49 Kg Total catch: 49.50 CATCH/HOUR: 99.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	43.30	108	43.74	2416
T U R T L E S	40.00	2	40.40	
Sardinella maderensis	11.72	42	11.84	2417
Trichiurus lepturus	2.10	6	2.12	
Echeneis naucrates	1.50	4	1.52	
Lagocephalus laevigatus	0.18	14	0.18	
Octopus sp.	0.16	2	0.16	
Sepia sp.	0.10	6	0.10	
Selene dorsalis	0.04	20	0.04	
Total	99.10		100.10	

PROJECT STATION:1076
DATE:20/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 615
start stop duration Long E 1138
TIME :08:45:00 08:53:00 8 (min) Purpose code: 1
LOG :7794.40 7794.80 0.40 Area code : 3
FDEPTH: 121 120 GearCond.code:
BDEPTH: 121 120 Validity code: 9
Towing dir: 68° Wire out: 410 m Speed: 30 kn*10

Sorted: Kg Total catch: 0.01 CATCH/HOUR: 0.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis, juveniles	0.08	15	100.00	
Total	0.08		100.00	

PROJECT STATION:1077
DATE:20/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 630
start stop duration Long E 1142
TIME :14:51:00 15:21:00 30 (min) Purpose code: 1
LOG :7845.70 7847.60 1.90 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 172 143 Validity code: 4
Towing dir: 74° Wire out: 170 m Speed: 38 kn*10

Sorted: 21 Kg Total catch: 21.25 CATCH/HOUR: 42.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	30.40	80	71.53	2418
Sardinella maderensis	5.50	18	12.94	2419
Auxis thazard	4.40	10	10.35	
Naucrates ductor	1.60	2	3.76	
ARGONAUTIDAE	0.30	6	0.71	
C E P H A L O P O D A	0.26	4	0.61	
Selene dorsalis, juveniles	0.04	16	0.09	
Total	42.50		99.99	

PROJECT STATION:1078
DATE:20/ 8/96 GEAR TYPE: BT No:9 POSITION:Lat S 628
start stop duration Long E 1149
TIME :16:35:00 17:05:00 30 (min) Purpose code: 1
LOG :7856.50 7858.20 1.70 Area code : 3
FDEPTH: 118 121 GearCond.code:
BDEPTH: 118 121 Validity code: 4
Towing dir: 254° Wire out: 450 m Speed: 33 kn*10

Sorted: 88 Kg Total catch: 205.67 CATCH/HOUR: 411.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	282.10	690	68.58	2421
Trichiurus lepturus	46.20	42	11.23	
Dentex congoensis	22.16	304	5.39	
Trachurus trecae, juvenile	19.00	470	4.62	2420
Umbrina canariensis	16.06	32	3.90	
Dentex angolensis	10.88	70	2.65	
Torpedo torpedo	3.12	4	0.76	
Illex coindetii	2.84	84	0.69	
Todaropsis eblanae	2.42	46	0.59	
Pagellus bellottii	2.28	14	0.55	
Uranoscopus polli	1.68	14	0.41	
Lepidotrigla carolae	0.94	24	0.23	
Boops boops	0.74	4	0.18	
Bembrops sp.	0.46	4	0.11	
Chelidonichthys gabonensis	0.46	4	0.11	
Total	411.34		100.00	

PROJECT STATION:1079
DATE:20/ 8/96 GEAR TYPE: PT No:7 POSITION:Lat S 623
start stop duration Long E 1214
TIME :19:51:00 20:21:00 30 (min) Purpose code: 1
LOG :7886.80 7888.40 1.60 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 25 26 Validity code: 4
Towing dir: 148° Wire out: 150 m Speed: 32 kn*10

Sorted: 68 Kg Total catch: 150.60 CATCH/HOUR: 301.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	123.74	127902	41.08	2423
Brachydeuterus auritus	60.30	1044	20.02	
Sardinella maderensis	42.30	244	14.04	2424
Sphyraena guachancho	36.60	82	12.15	
Sardinella aurita	21.60	1296	7.17	2422
Sphyraena sphyraena	12.40	44	4.12	
Todaropsis eblanae	2.06	44	0.68	
Raja miraletus	1.16	8	0.39	
Pagellus bellottii	0.72	170	0.24	
Illex coindetii	0.36	8	0.12	
Total	301.24		100.01	

PROJECT STATION:1080
DATE:20/ 8/96 GEAR TYPE: PT No:7 POSITION:Lat S 630
start stop duration Long E 1219
TIME :21:26:00 21:56:00 30 (min) Purpose code: 1
LOG :7897.00 7898.70 1.70 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 24 26 Validity code: 9
Towing dir: 330° Wire out: 150 m Speed: 3 kn*10

Sorted: 1 Kg Total catch: 2002.30 CATCH/HOUR: 4004.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	4000.00		99.89	
Sardinella aurita	3.68	324	0.09	2425
Sardinella maderensis	0.92	108	0.02	2426
Total	4004.60		100.00	

PROJECT STATION:1081
DATE:21/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 637
start stop duration Long E 1208
TIME :23:54:00 00:24:00 30 (min) Purpose code: 1
LOG :7917.50 7919.40 1.90 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 64 71 Validity code: 4
Towing dir: 252° Wire out: 180 m Speed: 35 kn*10

Sorted: 73 Kg Total catch: 73.87 CATCH/HOUR: 147.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachinotus ovatus	64.60	138	43.73	2428
Trichiurus lepturus	45.10	98	30.53	2427
Trachurus trecae	19.80	48	13.40	2430
Sepia orbignyana	6.92	8	4.68	
Scomber japonicus	4.12	6	2.79	
Sepia officinalis hierredda	3.32	10	2.25	
Lagocephalus laevigatus	1.80	2	1.22	
Saurida brasiliensis	1.18	550	0.80	
Naucrates ductor	0.54	2	0.37	
Trachurus trecae, juvenile	0.36	270	0.24	2429
Total	147.74		100.01	

PROJECT STATION:1082

DATE:21/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 642
start stop duration Long E 1152
TIME :02:10:00 02:40:00 30 (min) Purpose code: 1
LOG :7935.50 7937.10 1.60 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 127 121 Validity code: 4
Towing dir: 72° Wire out: 170 m Speed: 33 kn*10

Sorted: 152 Kg Total catch: 152.06 CATCH/HOUR: 304.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	113.40	362	37.29	2432
Prionace glauca	75.20	2	24.73	
Trachurus trecae	47.00	208	15.45	2433
Sardinella aurita	32.20	78	10.59	2431
Trichiurus lepturus	29.70	42	9.77	2434
Saurida brasiliensis	4.12	732	1.35	
Sepiella ornata	1.10	74	0.36	
Naucrates ductor	0.44	2	0.14	
Todaropsis eblanae	0.16	4	0.05	
Total	303.32		99.73	

PROJECT STATION:1083

DATE:21/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 649
start stop duration Long E 1212
TIME :07:45:00 08:15:00 30 (min) Purpose code: 1
LOG :7991.00 7992.90 1.90 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 57 69 Validity code: 4
Towing dir: 250° Wire out: 150 m Speed: 38 kn*10

Sorted: 284 Kg Total catch: 284.42 CATCH/HOUR: 568.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	558.00	1730	98.09	2436
Sardinella aurita	4.76	12	0.84	2435
J E L L Y F I S H	4.00		0.70	
Trachinotus ovatus	2.08	4	0.37	
Total	568.84		100.00	

PROJECT STATION:1084

DATE:21/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 715
start stop duration Long E 1220
TIME :18:33:00 19:03:00 30 (min) Purpose code: 1
LOG :8099.40 8100.90 1.50 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 125 116 Validity code: 4
Towing dir: 75° Wire out: 150 m Speed: 30 kn*10

Sorted: 222 Kg Total catch: 463.90 CATCH/HOUR: 927.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	502.00	1758	54.11	2438
Trachurus trecae	203.20	1098	21.90	2439
Sardinella aurita	131.00	308	14.12	2437
Trichiurus lepturus	46.60	132	5.02	
Sarda sarda	15.20	6	1.64	
Scomber japonicus	9.80	16	1.06	
Auxis thazard	7.60	16	0.82	
Euthynnus alletteratus	7.00	6	0.75	
Trachinotus ovatus	4.80	12	0.52	
Sepiella ornata	0.60	12	0.06	
Saurida brasiliensis	0.04	4		
Total	927.84		100.00	

PROJECT STATION:1085

DATE:22/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 727
start stop duration Long E 1225
TIME :00:28:00 00:58:00 30 (min) Purpose code: 1
LOG :8160.00 8161.90 1.90 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 257 398 Validity code: 4
Towing dir: 254° Wire out: 160 m Speed: 27 kn*10

Sorted: 200 Kg Total catch: 326.90 CATCH/HOUR: 653.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	155.80	3694	23.83	
Trachurus trecae	147.20	598	22.51	2440
Sardinella aurita	109.80	278	16.79	2442
Sardinella maderensis	80.80	288	12.36	2441
Sphyrna lewini	68.80	2	10.52	
MYCTOPHIDAE	34.00	21348	5.20	
Euthynnus alletteratus	31.80	28	4.86	
Dasyatis violacea	14.40	2	2.20	
Trachinotus ovatus	8.20	22	1.25	
Scomber japonicus	3.00	4	0.46	
Total	653.80		99.98	

PROJECT STATION:1086

DATE:22/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 743
start stop duration Long E 1243
TIME :06:48:00 07:18:00 30 (min) Purpose code: 1
LOG :8221.00 8222.70 1.70 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 103 96 Validity code: 4
Towing dir: 60° Wire out: 160 m Speed: 34 kn*10

Sorted: 2 Kg Total catch: 2.01 CATCH/HOUR: 4.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	4.00		99.50	
Selene dorsalis, juveniles	0.02	4	0.50	
Total	4.02		100.00	

PROJECT STATION:1087

DATE:22/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 748
start stop duration Long E 1254
TIME :10:30:00 11:00:00 30 (min) Purpose code: 1
LOG :8255.00 8256.50 1.50 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 66 58 Validity code: 1
Towing dir: 90° Wire out: 160 m Speed: 3 kn*10

Sorted: Kg Total catch: 2.59 CATCH/HOUR: 5.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachinotus ovatus	2.90	8	55.98	
Sardinella maderensis	1.64	6	31.66	2443
Sepiella ornata	0.64	18	12.36	
Total	5.18		100.00	

PROJECT STATION:1088

DATE:22/ 8/96 GEAR TYPE: PT No:5 POSITION:Lat S 803
start stop duration Long E 1243
TIME :15:20:00 15:50:00 30 (min) Purpose code: 1
LOG :8291.30 8292.90 1.60 Area code : 3
FDEPTH: 230 230 GearCond.code:
BDEPTH: 250 254 Validity code: 4
Towing dir: 264° Wire out: 540 m Speed: 28 kn*10

Sorted: 144 Kg Total catch: 144.46 CATCH/HOUR: 288.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	155.80	141512	53.92	
J E L L Y F I S H	129.96		44.98	
Trichiurus lepturus	3.16	6	1.09	
Total	288.92		99.99	

PROJECT STATION:1089

DATE:22/ 8/96 GEAR TYPE: PT No:7 POSITION:Lat S 802
start stop duration Long E 1309
TIME :21:57:00 22:17:00 20 (min) Purpose code: 1
LOG :8345.40 8346.60 1.20 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 25 25 Validity code: 4
Towing dir: 160° Wire out: 150 m Speed: 35 kn*10

Sorted: 86 Kg Total catch: 161.21 CATCH/HOUR: 483.63

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	225.90	8631	46.71	
Pteroscion peli	103.05	2385	21.31	
Trichiurus lepturus	77.85	1980	16.10	
Ilisha africana	23.67	522	4.89	
Trachurus trecae	20.70	45	4.28	2444
Stromateus fiatola	11.52	21	2.38	
Arius latiscutatus	7.35	3	1.52	
Sepia orbignyana	4.86	9	1.00	
Sphyraena guachancho	3.96	27	0.82	
Pseudotolithus typus	3.51	3	0.73	
Sardinella maderensis	1.26	18	0.26	
Total	483.63		100.00	

PROJECT STATION:1090

DATE:23/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 731
start stop duration Long E 1249
TIME :08:15:00 08:45:00 30 (min) Purpose code: 1
LOG :8444.10 8445.80 1.70 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 35 35 Validity code: 4
Towing dir: 220° Wire out:1603 m Speed: 4 kn*10

Sorted: 274 Kg Total catch: 274.10 CATCH/HOUR: 548.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	363.30	994	66.27	2446
Sphyraena guachancho	85.10	72	15.52	2447
Trachinotus ovatus	45.50	94	8.30	
Decapterus rhonchus	34.60	56	6.31	2445
Hemicaranx bicolor	7.60	26	1.39	
Scomberomorus tritor	7.48	6	1.36	
Caranx senegallus	2.30	2	0.42	
Stromateus fiatola	1.62	2	0.30	
Chloroscombrus chrysurus	0.70	2	0.13	
Total	548.20		100.00	

PROJECT STATION:1091

DATE:23/ 8/96 GEAR TYPE: PT No:7 POSITION:Lat S 732
start stop duration Long E 1256
TIME :10:14:00 10:44:00 30 (min) Purpose code: 1
LOG :8458.90 8460.70 1.80 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 24 25 Validity code: 4
Towing dir: 160° Wire out: 160 m Speed: 36 kn*10

Sorted: Kg Total catch: 13.28 CATCH/HOUR: 26.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomberomorus tritor	9.02	6	33.96	
Stromateus fiatola	6.28	8	23.64	
Hemicaranx bicolor	5.80	18	21.84	
Trachinotus ovatus	1.78	2	6.70	
Trachinus araneus	1.56	2	5.87	
Sphyraena guachancho	1.20	2	4.52	
Trachurus trecae, juvenile	0.92	58	3.46	2448
Total	26.56		99.99	

PROJECT STATION:1092

DATE:23/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 812
start stop duration Long E 1253
TIME :15:48:00 16:18:00 30 (min) Purpose code: 1
LOG :8512.30 8513.90 1.60 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 117 119 Validity code: 4
Towing dir: 238° Wire out: 160 m Speed: 32 kn*10

Sorted: 40 Kg Total catch: 40.00 CATCH/HOUR: 80.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Isurus oxyrinchus	80.00	2	100.00	
Total	80.00		100.00	

PROJECT STATION:1093

DATE:23/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 830
start stop duration Long E 1302
TIME :22:02:00 22:32:00 30 (min) Purpose code: 1
LOG :8571.20 8272.90 1.70 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 121 111 Validity code: 4
Towing dir: 96° Wire out: 160 m Speed: 34 kn*10

Sorted: Kg Total catch: 487.70 CATCH/HOUR: 975.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	708.80	2128	72.67	2449
Trachurus trecae	250.60	980	25.69	2450
Trichiurus lepturus	12.60	70	1.29	
MYCTOPHIDAE	3.58	1184	0.37	
Total	975.58		100.02	

PROJECT STATION:1094

DATE:24/ 8/96 GEAR TYPE: PT No:7 POSITION:Lat S 830
start stop duration Long E 1319
TIME :00:20:00 00:50:00 30 (min) Purpose code: 1
LOG :8588.90 8590.60 1.70 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 25 32 Validity code: 4
Towing dir: 220° Wire out: 160 m Speed: 39 kn*10

Sorted: Kg Total catch: 771.80 CATCH/HOUR: 1543.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	881.20	9824	57.09	
Sardinella maderensis	467.50	2036	30.29	2451
Trachurus trecae	82.00	936	5.31	2453
Sardinella aurita	72.00	1034	4.66	2452
Pomadasys jubelini	14.20	34	0.92	
Sepia orbignyana	8.14	12	0.53	
Sphyraena guachancho	7.70	44	0.50	
Hemicaranx bicolor	4.96	22	0.32	
Trichiurus lepturus	4.60	34	0.30	
Trachurus trecae, juvenile	1.40	78	0.09	
Total	1543.70		100.01	

PROJECT STATION:1095

DATE:24/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 834
start stop duration Long E 1308
TIME :02:14:00 02:44:00 30 (min) Purpose code: 1
LOG :8601.40 8603.20 1.80 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 88 98 Validity code: 4
Towing dir: 260° Wire out: 160 m Speed: 37 kn*10

Sorted: Kg Total catch: 25.10 CATCH/HOUR: 50.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	20.70	52	41.24	2454
Synagrops microlepis	17.26	11168	34.38	
Sarda sarda	4.64	2	9.24	
Trachinotus ovatus	4.10	12	8.17	
Trichiurus lepturus	2.80	24	5.58	
Saurida brasiliensis	0.62	54	1.24	
Total	50.12		99.85	

PROJECT STATION:1096

DATE:24/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 839
start stop duration Long E 1258
TIME :04:14:00 04:44:00 30 (min) Purpose code: 1
LOG :8613.10 8614.70 1.60 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 253 290 Validity code: 4
Towing dir: 230° Wire out: 160 m Speed: 34 kn*10

Sorted: Kg Total catch: 147.70 CATCH/HOUR: 295.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	109.40	356	37.03	2456
Mola mola	60.00	2	20.31	
Trichiurus lepturus	34.70	368	11.75	
Trachurus trecae	32.40	74	10.97	2757
Euthynnus alletteratus	27.30	44	9.24	
MYCTOPHIDAE	15.60	5814	5.28	
Scomber japonicus	8.30	4	2.81	
Sardinella aurita	3.94	10	1.33	2455
Trachinotus ovatus	1.88	6	0.64	
Scomber japonicus	1.30	2	0.44	
Paralepis sp.	0.38	20	0.13	
Echeneis naucrates	0.30	4	0.10	
Total	295.50		100.03	

PROJECT STATION:1097

DATE:24/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 841
start stop duration Long E 1249
TIME :06:37:00 07:07:00 30 (min) Purpose code: 1
LOG :8624.60 8626.50 1.90 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 641 525 Validity code: 4
Towing dir: 96° Wire out: 160 m Speed: 38 kn*10

Sorted: Kg Total catch: 46.42 CATCH/HOUR: 92.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	67.00	206	72.17	2459
Sardinella aurita	25.00	58	26.93	2458
Trichiurus lepturus	0.72	2	0.78	
Sepia sp.	0.12	6	0.13	
Total	92.84		100.01	

PROJECT STATION:1098

DATE:25/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 844
start stop duration Long E 1310
TIME :15:57:00 16:27:00 30 (min) Purpose code: 1
LOG :8677.10 8679.00 1.90 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 77 77 Validity code: 4
Towing dir: ° Wire out: 180 m Speed: 39 kn*10

Sorted: 26 Kg Total catch: 26.23 CATCH/HOUR: 52.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	23.00	76	43.84	2461
Sardinella maderensis	22.50	64	42.89	2460
Decapterus rhonchus	4.58	8	8.73	
Trachinotus ovatus	1.78	6	3.39	
Sepiella ornata	0.60	16	1.14	
Total	52.46		99.99	

PROJECT STATION:1099

DATE:25/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 844
start stop duration Long E 1247
TIME :19:10:00 19:40:00 30 (min) Purpose code: 1
LOG :8709.80 8706.60 3.20 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 680 656 Validity code: 4
Towing dir: 190° Wire out: 160 m Speed: 36 kn*10

Sorted: Kg Total catch: 225.70 CATCH/HOUR: 451.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alopias superciliosus	140.00	2	31.01	
Sardinella aurita	135.20	322	29.95	2465
Sardinella maderensis	63.80	190	14.13	2464
Trichiurus lepturus	55.20	856	12.23	
Trachinotus ovatus	35.40	100	7.84	2462
Trachurus trecae	8.20	18	1.82	2463
MYCTOPHIDAE	7.80	2710	1.73	
Euthynnus alletteratus	4.80	6	1.06	
Mugil sp.	0.40	2	0.09	
Taractichthys longipinnis	0.20	2	0.04	
Sepiella ornata	0.20	26	0.04	
Taractes asper	0.12	2	0.03	
Total	451.32		99.97	

PROJECT STATION:1100

DATE:25/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 843
start stop duration Long E 1231
TIME :21:31:00 22:01:00 30 (min) Purpose code: 1
LOG : 872.80 8723.60 0.80 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 1205 1266 Validity code: 4
Towing dir: 280° Wire out: 160 m Speed: 36 kn*10

Sorted: 97 Kg Total catch: 96.99 CATCH/HOUR: 193.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	123.40	316	63.61	2468
Sardinella maderensis	37.50	184	19.33	2467
Trachinotus ovatus	22.80	60	11.75	2466
Auxis thazard	3.50	8	1.80	
Euthynnus alletteratus	2.18	2	1.12	
Trichiurus lepturus	1.90	26	0.98	
MYCTOPHIDAE	1.20	162	0.62	
Ariomma bondi	0.72	38	0.37	
Cubiceps sp.	0.30	6	0.15	
Nealotus tripes	0.30	18	0.15	
Ornithoteuthis antillarum	0.16	14	0.08	
Fistularia petimba	0.02	2	0.01	
Total	193.98		99.97	

PROJECT STATION:1101

DATE:26/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 853
start stop duration Long E 1302
TIME :02:55:00 03:25:00 30 (min) Purpose code: 1
LOG :8769.80 8771.60 1.80 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 128 181 Validity code: 4
Towing dir: 295° Wire out: 160 m Speed: 33 kn*10

Sorted: 83 Kg Total catch: 83.91 CATCH/HOUR: 167.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	77.50	600	46.18	2469
Sardinella maderensis	54.50	162	32.48	2470
Trichiurus lepturus	15.00	142	8.94	
Trachinotus ovatus	11.46	32	6.83	2471
Sardinella aurita	3.58	8	2.13	2472
Sarda sarda	2.84	2	1.69	
Mugil sp.	1.78	2	1.06	
Selene dorsalis	0.68	2	0.41	
OMMASTREPHIDAE	0.24	6	0.14	
Synagrops microlepis	0.12	24	0.07	
Saurida brasiliensis	0.12	44	0.07	
Total	167.82		100.00	

PROJECT STATION:1102

DATE:26/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 906
start stop duration Long E 1254
TIME :06:56:00 07:26:00 30 (min) Purpose code: 1
LOG :8805.70 8807.60 1.90 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 51 57 Validity code: 4
Towing dir: 256° Wire out: 150 m Speed: 38 kn*10

Sorted: 109 Kg Total catch: 109.72 CATCH/HOUR: 219.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	102.00	338	46.48	2474
Sardinella maderensis	50.50	172	23.01	2475
Trachurus trecae	14.78	30	6.74	2473
Trachinotus ovatus	10.02	28	4.57	
Sphyraena sphyraena	9.50	26	4.33	
Trichiurus lepturus	7.50	22	3.42	
Caranx crysos	6.06	6	2.76	
Sarda sarda	5.98	2	2.73	
Stromateus fiatola	3.72	4	1.70	
Euthynnus alletteratus	3.48	6	1.59	
Decapterus rhonchus	3.20	6	1.46	
Sphyraena guachancho	1.38	2	0.63	
Mugil sp.	0.82	4	0.37	
Chloroscombrus chrysurus	0.50	2	0.23	
J E L L Y F I S H	0.00	2952		
Total	219.44		100.02	

PROJECT STATION:1103

DATE:26/ 8/96 GEAR TYPE: PT No:1 POSITION:Lat S 907
start stop duration Long E 1249
TIME :08:30:00 09:00:00 30 (min) Purpose code: 1
LOG :8815.00 8816.40 1.40 Area code : 2
FDEPTH: 25 25 GearCond.code:
BDEPTH: 87 110 Validity code: 4
Towing dir: 9° Wire out: 180 m Speed: 28 kn*10

Sorted: 5 Kg Total catch: 5.31 CATCH/HOUR: 10.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomber japonicus	5.96	4	56.12	
Trachinotus ovatus	2.10	4	19.77	
Euthynnus alletteratus	1.80	2	16.95	
Sardinella maderensis	0.76	2	7.16	
Total	10.62		100.00	

PROJECT STATION:1104

DATE:26/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 913
start stop duration Long E 1229
TIME :12:47:00 13:17:00 30 (min) Purpose code: 1
LOG :8844.70 8846.50 1.80 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 898 774 Validity code: 4
Towing dir: 88° Wire out: 170 m Speed: 36 kn*10

Sorted: Kg Total catch: 0.30 CATCH/HOUR: 0.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis, juveniles	0.40	24	66.67	
Peristedion cataphractum	0.10	4	16.67	
Schedophilus sp.	0.06	2	10.00	
Trachurus trecae	0.02	8	3.33	
CHAETODONTIDAE	0.02	2	3.33	
Total	0.60		100.00	

PROJECT STATION:1105

DATE:26/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 912
start stop duration Long E 1247
TIME :16:07:00 16:37:00 30 (min) Purpose code: 1
LOG :8862.70 8864.60 1.90 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 108 95 Validity code: 4
Towing dir: 88° Wire out: 170 m Speed: 34 kn*10

Sorted: 60 Kg Total catch: 60.41 CATCH/HOUR: 120.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachinotus ovatus	112.70	296	93.28	2476
Sardinella maderensis	5.20	16	4.30	2477
Sardinella aurita	1.88	4	1.56	
Euthynnus alletteratus	0.62	2	0.51	
Sepiella ornata	0.20	4	0.17	
Lagocephalus laevigatus	0.18	4	0.15	
Sphoeroides sp.	0.04	2	0.03	
Total	120.82		100.00	

PROJECT STATION:1106

DATE:26/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 914
start stop duration Long E 1252
TIME :18:29:00 18:59:00 30 (min) Purpose code: 1
LOG :8877.20 8878.70 1.50 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 64 82 Validity code: 4
Towing dir: 234° Wire out: 150 m Speed: 30 kn*10

Sorted: 202 Kg Total catch: 202.50 CATCH/HOUR: 405.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	270.80	518	66.86	2482
Trachurus trecae	45.40	116	11.21	2479
Trachinotus ovatus	37.00	96	9.14	2478
Selene dorsalis	26.20	78	6.47	2481
Sardinella aurita	6.80	22	1.68	2480
Trichiurus lepturus	6.60	44	1.63	
Sphyraena sphyraena	3.40	14	0.84	
Alloteuthis africana	3.40	1152	0.84	
Sphyraena guachancho	3.20	4	0.79	
Sepia officinalis hierredda	2.20	2	0.54	
Sepiella ornata	0.08	2	0.02	
Total	405.08		100.02	

PROJECT STATION:1107

DATE:26/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 923
start stop duration Long E 1240
TIME :20:50:00 21:20:00 30 (min) Purpose code: 1
LOG :8893.90 8895.50 1.60 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 305 315 Validity code: 4
Towing dir: 185° Wire out: 150 m Speed: 32 kn*10

Sorted: 145 Kg Total catch: 14.50 CATCH/HOUR: 29.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	26.70	15504	92.07	
Trachurus trecae	1.10	2	3.79	
Selene dorsalis	0.64	2	2.21	
Illex coindetii	0.26	34	0.90	
Todaropsis eblanae	0.08	16	0.28	
Selene dorsalis, juveniles	0.08	26	0.28	
Alloteuthis africana	0.06	6	0.21	
TREMOCTOPODIDAE	0.04	4	0.14	
Paralepis sp.	0.04	2	0.14	
J E L L Y F I S H	0.00	40		
Total	29.00		100.02	

PROJECT STATION:1108

DATE:27/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 928
start stop duration Long E 1303
TIME :00:19:00 00:49:00 30 (min) Purpose code: 1
LOG :8924.30 8926.00 1.70 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 30 41 Validity code: 4
Towing dir: 245° Wire out: 170 m Speed: 30 kn*10

Sorted: 321 Kg Total catch: 585.80 CATCH/HOUR: 1171.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lutjanus agennes	386.40	42	32.98	
Selene dorsalis	258.70	846	22.08	2483
Stromateus fiatola	203.12	222	17.34	2486
Brachydeuterus auritus	131.30	1098	11.21	
Sphyraena guachancho	78.66	66	6.71	2485
Trachurus trecae	21.98	52	1.88	2484
Sphyraena afra	20.10	2	1.72	
Lutjanus fulgens	12.80	20	1.09	
Galeoides decadactylus	11.06	20	0.94	
Sardinella maderensis	9.04	26	0.77	
Trichiurus lepturus	8.78	26	0.75	
Scomberomorus tritor	7.34	6	0.63	
Caranx senegallus	7.02	6	0.60	
Pagellus bellottii	6.38	14	0.54	
Caranx crysos	4.04	6	0.34	
Lithognathus mormyrus	3.06	6	0.26	
Chloroscombrus chrysurus	1.30	6	0.11	
Pteroscion peli	0.52	6	0.04	
Total	1171.60		99.99	

PROJECT STATION:1109

DATE:27/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 934
start stop duration Long E 1251
TIME :02:21:00 02:51:00 30 (min) Purpose code: 1
LOG :8937.70 8939.50 1.80 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 115 126 Validity code: 4
Towing dir: 248° Wire out: 170 m Speed: 33 kn*10

Sorted: 50 Kg Total catch: 50.94 CATCH/HOUR: 101.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	28.00	82	27.48	2488
Trichiurus lepturus	24.50	116	24.05	
Trachinotus ovatus	19.00	56	18.65	
Sardinella maderensis	8.70	30	8.54	2487
Sarda sarda	7.88	4	7.73	
Sepia sp.	4.60	6	4.52	
Sphyraena sphyraena	3.08	8	3.02	
Sphyraena guachancho	2.58	2	2.53	
Brachydeuterus auritus	1.90	16	1.86	
Selene dorsalis	1.64	4	1.61	
Total	101.88		99.99	

PROJECT STATION:1110

DATE:27/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 943
start stop duration Long E 1306
TIME :07:15:00 07:45:00 30 (min) Purpose code: 1
LOG :8981.90 8984.20 2.10 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 45 51 Validity code: 4
Towing dir: 165° Wire out: 160 m Speed: 42 kn*10

Sorted: 151 Kg Total catch: 390.94 CATCH/HOUR: 781.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	489.60	1826	62.62	2492
Decapterus rhonchus	123.90	210	15.85	2490
Selene dorsalis	80.10	228	10.24	2489
Sardinella maderensis	61.30	204	7.84	2491
Stromateus fiatola	8.76	12	1.12	
Spondyliosoma cantharus	7.44	6	0.95	
Euthynnus alletteratus	2.70	6	0.35	
Sphyraena sphyraena	2.46	6	0.31	
Sarpa salpa	2.16	6	0.28	
Trachinotus ovatus	1.86	6	0.24	
Sardinella aurita	1.60	4	0.20	
Total	781.88		100.00	

PROJECT STATION:1111

DATE:27/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 952
start stop duration Long E 1303
TIME :11:59:00 12:29:00 30 (min) Purpose code: 1
LOG :9023.50 9025.10 1.60 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 81 73 Validity code: 4
Towing dir: 93° Wire out: 170 m Speed: 28 kn*10

Sorted: 98 Kg Total catch: 98.84 CATCH/HOUR: 197.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	181.30	690	91.71	2494
Sardinella aurita	9.08	22	4.59	2493
Trachinotus ovatus	4.94	14	2.50	
Lagocephalus laevigatus	2.00	4	1.01	
Sepiella ornata	0.26	10	0.13	
Echeneis naucrates	0.10	2	0.05	
Total	197.68		99.99	

PROJECT STATION:1112

DATE:27/ 8/96 GEAR TYPE: PT No:7 POSITION:Lat S 955
start stop duration Long E 1313
TIME :14:25:00 14:55:00 30 (min) Purpose code: 1
LOG :9041.10 9042.50 1.40 Area code : 2
FDEPTH: 24 24 GearCond.code:
BDEPTH: 24 24 Validity code: 4
Towing dir: 360° Wire out: 150 m Speed: 25 kn*10

Sorted: 67 Kg Total catch: 234.40 CATCH/HOUR: 468.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pseudotolithus senegalensis	207.00	224	44.16	
Brachydeuterus auritus	77.00	1430	16.42	
Pteroscion peli	73.40	1962	15.66	
Trachurus trecae	23.10	74	4.93	2495
Galeoides decadactylus	18.40	108	3.92	
Sardinella maderensis	15.00	56	3.20	2496
Decapterus rhonchus	12.80	18	2.73	
Ilisha africana	10.60	152	2.26	
Plectorhinchus mediterraneus	8.00	8	1.71	
Parapenaeopsis atlantica	4.58	972	0.98	
Trichiurus lepturus	3.80	116	0.81	
Cynoglossus browni	3.80	8	0.81	
Selene dorsalis	3.80	8	0.81	
Chloroscombrus chrysurus	3.60	28	0.77	
Pentanemus quinquarius	2.80	72	0.60	
Drepane africana	0.44	8	0.09	
Sepia elegans	0.36	8	0.08	
Stromateus fiatola	0.26	8	0.06	
Total	468.74		100.00	

PROJECT STATION:1113

DATE:27/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1004
start stop duration Long E 1302
TIME :18:09:00 18:39:00 30 (min) Purpose code: 1
LOG :9075.60 9077.10 1.50 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 96 92 Validity code: 4
Towing dir: 92° Wire out: 160 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 60.39 CATCH/HOUR: 120.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	72.20	528	59.78	2498
Trichiurus lepturus	23.60	70	19.54	
Auxis thazard	23.30	82	19.29	2497
Illex coindetii	1.48	224	1.23	
Sepiella ornata	0.16	4	0.13	
Saurida brasiliensis	0.04	4	0.03	
J E L L Y F I S H	0.00	240		
Total	120.78		100.00	

PROJECT STATION:1114

DATE:27/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1018
start stop duration Long E 1259
TIME :22:43:00 22:56:00 13 (min) Purpose code: 1
LOG :9116.70 9117.50 0.80 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 240 260 Validity code: 4
Towing dir: 160° Wire out: 160 m Speed: 30 kn*10

Sorted: 64 Kg Total catch: 64.19 CATCH/HOUR: 296.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyrna lewini	161.54	5	54.53	
MYCTOPHIDAE	127.62	140377	43.08	
Trachurus trecae	5.82	42	1.96	2499
Auxis thazard	1.20	5	0.41	
Paralepis sp.	0.09	5	0.03	
Total	296.27		100.01	

PROJECT STATION:1115

DATE:28/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1017
start stop duration Long E 1322
TIME :01:35:00 02:05:00 30 (min) Purpose code: 1
LOG :9142.50 9144.10 1.60 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 49 58 Validity code: 4
Towing dir: 270° Wire out: 160 m Speed: 31 kn*10

Sorted: 122 Kg Total catch: 734.52 CATCH/HOUR: 1469.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	721.80	3014	49.13	2501
Brachydeuterus auritus	705.60	5630	48.03	2500
Selene dorsalis	21.24	48	1.45	
Trichiurus lepturus	19.08	228	1.30	
Sepiella ornata	0.72	12	0.05	
Pteroscion peli	0.48	12	0.03	
Selene dorsalis, juveniles	0.12	24	0.01	
Total	1469.04		100.00	

PROJECT STATION:1116

DATE:29/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1028
start stop duration Long E 1324
TIME :07:22:00 07:53:00 31 (min) Purpose code: 1
LOG :9447.50 9449.30 1.80 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 69 52 Validity code: 4
Towing dir: 83° Wire out: 160 m Speed: 36 kn*10

Sorted: 89 Kg Total catch: 89.94 CATCH/HOUR: 174.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachinotus ovatus	165.87	681	95.28	2502
Euthynnus alletteratus	4.12	4	2.37	
Sardinella maderensis	2.38	8	1.37	
Lagocephalus laevigatus	1.59	14	0.91	
Sepiella ornata	0.12	4	0.07	
Total	174.08		100.00	

PROJECT STATION:1117

DATE:29/ 8/96 GEAR TYPE: PT No:1 POSITION:Lat S 1027
start stop duration Long E 1325
TIME :08:25:00 08:55:00 30 (min) Purpose code: 1
LOG :9450.80 9452.60 1.80 Area code : 2
FDEPTH: 30 35 GearCond.code:
BDEPTH: 57 72 Validity code: 4
Towing dir: 260° Wire out: 180 m Speed: 36 kn*10

Sorted: 72 Kg Total catch: 352.28 CATCH/HOUR: 704.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	684.20	2874	97.11	2503
Brachydeuterus auritus	14.00	96	1.99	
Selene dorsalis	4.50	10	0.64	
Sepia orbignyana	1.86	2	0.26	
Total	704.56		100.00	

PROJECT STATION:1118

DATE:29/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1039
start stop duration Long E 1329
TIME :17:54:00 18:24:00 30 (min) Purpose code: 1
LOG :9528.30 9530.00 1.70 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 90 81 Validity code: 4
Towing dir: 81° Wire out: 160 m Speed: 34 kn*10

Sorted: 133 Kg Total catch: 303.94 CATCH/HOUR: 607.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	288.60	1788	47.48	2504
Trachurus trecae	134.70	1354	22.16	2506
Isurus oxyrinchus	90.00	6	14.81	
Trachinotus ovatus	49.44	222	8.13	2505
Trichiurus lepturus	27.30	210	4.49	
Sepia sp.	7.98	96	1.31	
Euthynnus alletteratus	7.46	6	1.23	
Uraspis secunda	2.40	6	0.39	
Total	607.88		100.00	

PROJECT STATION:1119

DATE:29/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1038
start stop duration Long E 1336
TIME :19:34:00 20:04:00 30 (min) Purpose code: 1
LOG :9538.00 9539.80 1.80 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 46 53 Validity code: 4
Towing dir: 260° Wire out: 160 m Speed: 36 kn*10

Sorted: 127 Kg Total catch: 624.60 CATCH/HOUR: 1249.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	561.60	3906	44.96	2509
Sardinella maderensis	427.00	1502	34.18	2508
Trachurus trecae	206.60	602	16.54	2507
Sardinella aurita	29.60	350	2.37	2510
Trichiurus lepturus	17.60	296	1.41	
Stromateus fiatola	6.80	10	0.54	
Total	1249.20		100.00	

PROJECT STATION:1120

DATE:29/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1051
start stop duration Long E 1325
TIME :23:27:00 23:57:00 30 (min) Purpose code: 1
LOG :9570.90 9572.80 1.90 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 265 180 Validity code: 4
Towing dir: 90° Wire out: 160 m Speed: 32 kn*10

Sorted: 4 Kg Total catch: 4.04 CATCH/HOUR: 8.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	6.90	5750	85.40	
Octopus sp.	0.96	8	11.88	
Sphoeroides sp.	0.12	4	1.49	
Sepia sp.	0.04	2	0.50	
Paralepis sp.	0.04	2	0.50	
Selene dorsalis, juveniles	0.02	4	0.25	
Total	8.08		100.02	

PROJECT STATION:1121

DATE:30/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1053
start stop duration Long E 1342
TIME :03:01:00 03:31:00 30 (min) Purpose code: 1
LOG :9599.20 9600.10 0.90 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 52 63 Validity code: 4
Towing dir: 239° Wire out: 170 m Speed: 34 kn*10

Sorted: 134 Kg Total catch: 3134.69 CATCH/HOUR: 6269.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	4849.46	40490	77.35	2511
Trachurus trecae	809.80	3584	12.92	2512
Sardinella maderensis	402.58	1350	6.42	2513
Pomadasys jubelini	107.04	94	1.71	
Selene dorsalis	37.70	94	0.60	
Trichiurus lepturus	35.84	1024	0.57	
Sardinella aurita	13.50	46	0.22	
Sphyraena sphyraena	12.56	46	0.20	
Total	6268.48		99.99	

PROJECT STATION:1122

DATE:30/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1104
start stop duration Long E 1347
TIME :07:25:00 07:55:00 30 (min) Purpose code: 1
LOG :5638.80 5640.80 2.00 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 48 57 Validity code: 4
Towing dir: 243° Wire out: 160 m Speed: 40 kn*10

Sorted: 148 Kg Total catch: 3177.57 CATCH/HOUR: 6355.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	6072.00	18422	95.54	2515
Sardinella aurita	215.74	506	3.39	2514
Trachurus trecae	32.66	92	0.51	
Sarda sarda	21.40	12	0.34	
Trachinotus ovatus	13.34	46	0.21	
Total	6355.14		99.99	

PROJECT STATION:1123

DATE:30/ 8/96 GEAR TYPE: PT No:1 POSITION:Lat S 1104
start stop duration Long E 1347
TIME :09:10:00 09:35:00 25 (min) Purpose code: 1
LOG :9648.20 9650.10 1.90 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 49 52 Validity code: 4
Towing dir: 180° Wire out: 150 m Speed: 40 kn*10

Sorted: 137 Kg Total catch: 684.00 CATCH/HOUR: 1641.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	973.20	3029	59.28	2516
Trachurus trecae	390.60	1116	23.79	2517
Brachydeuterus auritus	239.40	2244	14.58	
Selene dorsalis	26.40	60	1.61	
Trichiurus lepturus	7.56	132	0.46	
Trachinotus ovatus	3.84	12	0.23	
Sepiella ornata	0.60	12	0.04	
Total	1641.60		99.99	

PROJECT STATION:1124

DATE:30/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1117
start stop duration Long E 1339
TIME :13:45:00 14:15:00 30 (min) Purpose code: 1
LOG :9690.30 9692.20 1.90 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 34 34 Validity code: 4
Towing dir: 190° Wire out: 180 m Speed: 36 kn*10

Sorted: 122 Kg Total catch: 122.18 CATCH/HOUR: 244.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	82.40	280	33.72	2521
Sardinella maderensis	44.00	134	18.01	2522
Brachydeuterus auritus	38.10	982	15.59	2519
Decapterus rhonchus	37.80	132	15.47	2520
Selene dorsalis	15.32	36	6.27	2518
Sphyraena sphyraena	8.62	44	3.53	
Trichiurus lepturus	8.56	20	3.50	
Trachinotus ovatus	4.70	24	1.92	
Sepia sp.	2.54	2	1.04	
Lagocephalus laevigatus	1.68	4	0.69	
Pagellus bellottii	0.58	4	0.24	
Fistularia petimba	0.06	4	0.02	
Total	244.36		100.00	

PROJECT STATION:1125

DATE:30/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1130
start stop duration Long E 1339
TIME :17:48:00 18:03:00 15 (min) Purpose code: 1
LOG :9727.10 9727.90 0.80 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 39 37 Validity code: 4
Towing dir: 60° Wire out: 160 m Speed: 32 kn*10

Sorted: 134 Kg Total catch: 404.31 CATCH/HOUR: 1617.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	1129.20	3440	69.82	2524
Trachurus trecae	283.80	860	17.55	2523
Brachydeuterus auritus	49.80	552	3.08	
Stromateus fiatola	29.40	36	1.82	
Pomatomus saltatrix	25.56	24	1.58	
Sarda sarda	24.72	12	1.53	
Selene dorsalis	22.80	60	1.41	
Sphyraena guachancho	22.56	24	1.39	
Trichiurus lepturus	10.08	108	0.62	
Rhizoprionodon acutus	9.48	12	0.59	
Sardinella aurita	5.04	12	0.31	
Trachinotus ovatus	4.80	12	0.30	
Total	1617.24		100.00	

PROJECT STATION:1126

DATE:30/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1138
start stop duration Long E 1327
TIME :21:00:00 21:30:00 30 (min) Purpose code: 1
LOG :9757.10 9758.60 1.50 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 126 119 Validity code: 4
Towing dir: 104° Wire out: 160 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 26.71 CATCH/HOUR: 53.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	42.20	878	79.00	2525
Trichiurus lepturus	6.54	22	12.24	
MYCTOPHIDAE	3.10	950	5.80	
Saurida brasiliensis	0.70	124	1.31	
Illex coindetii	0.54	26	1.01	
Todaropsis eblanae	0.32	32	0.60	
Scomber japonicus	0.02	2	0.04	
Total	53.42		100.00	

PROJECT STATION:1127

DATE:31/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1151
start stop duration Long E 1334
TIME :02:15:00 02:45:00 30 (min) Purpose code: 1
LOG :9804.40 9806.00 1.60 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 108 101 Validity code: 4
Towing dir: 106° Wire out: 170 m Speed: 34 kn*10

Sorted: 13 Kg Total catch: 13.32 CATCH/HOUR: 26.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Isurus oxyrinchus	19.10	2	71.70	
Sarda sarda	3.36	4	12.61	
Trachurus trecae	2.42	70	9.08	2526
Euthynnus alletteratus	1.46	4	5.48	
Illex coindetii	0.28	16	1.05	
Todaropsis eblanae	0.02	2	0.08	
J E L L Y F I S H	0.00	600		
Total	26.64		100.00	

PROJECT STATION:1128

DATE:31/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1154
start stop duration Long E 1341
TIME :03:44:00 04:04:00 20 (min) Purpose code: 1
LOG :9812.90 9814.10 1.20 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 58 68 Validity code: 4
Towing dir: 288° Wire out: 170 m Speed: 37 kn*10

Sorted: 135 Kg Total catch: 746.81 CATCH/HOUR: 2240.43

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	1474.29	5859	65.80	2528
Trachurus trecae	670.74	2694	29.94	2529
Euthynnus alletteratus	38.28	66	1.71	
Sardinella aurita	34.50	117	1.54	2527
Brachydeuterus auritus	10.56	66	0.47	
Trichiurus lepturus	6.60	249	0.29	
Sphyraena sphyraena	5.28	18	0.24	
Todaropsis eblanae	0.18	18	0.01	
Total	2240.43		100.00	

PROJECT STATION:1129

DATE:31/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1207
start stop duration Long E 1338
TIME :08:27:00 08:58:00 31 (min) Purpose code: 1
LOG :9855.70 9857.40 1.70 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 39 37 Validity code: 4
Towing dir: 25° Wire out: 160 m Speed: 34 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	0.00	48		
Total				

PROJECT STATION:1130

DATE:31/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1206
start stop duration Long E 1338
TIME :09:27:00 09:57:00 30 (min) Purpose code: 1
LOG :9858.60 9860.60 2.00 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 37 39 Validity code: 4
Towing dir: 206° Wire out: 160 m Speed: 40 kn*10

Sorted: 23 Kg Total catch: 23.62 CATCH/HOUR: 47.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	19.80	72	41.91	2531
Sardinella aurita	7.34	32	15.54	2530
Scomberomorus tritor	4.86	2	10.29	
Pomatomus saltatrix	4.30	6	9.10	
Sarda sarda	3.12	2	6.60	
Sphyraena sphyraena	2.60	10	5.50	
Mugil cephalus	1.98	2	4.19	
Trachurus trecae	1.50	6	3.18	
Pomadasys jubelini	0.98	2	2.07	
Brachydeuterus auritus	0.62	4	1.31	
Trichiurus lepturus	0.12	2	0.25	
Engraulis encrasicolus	0.02	2	0.04	
Total	47.24		99.98	

PROJECT STATION:1131

DATE:31/ 8/96 GEAR TYPE: PT No:7 POSITION:Lat S 1209
start stop duration Long E 1327
TIME :11:41:00 12:11:00 30 (min) Purpose code: 1
LOG :9875.10 9876.60 1.50 Area code : 2
FDEPTH: 105 101 GearCond.code:
BDEPTH: 105 101 Validity code: 4
Towing dir: 90° Wire out: 420 m Speed: 28 kn*10

Sorted: 100 Kg Total catch: 671.30 CATCH/HOUR: 1342.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1009.60	6232	75.20	2532
Dentex macrophthalmus	215.80	1412	16.07	
Dentex angolensis	28.40	174	2.12	
Raja miraletus	18.00	28	1.34	
Branchiostegus semifasciatus	17.00	14	1.27	
Zeus faber	16.80	28	1.25	
Sphyraena sphyraena	16.20	28	1.21	
Chaetodon hoefleri	9.40	66	0.70	
Dentex barnardi	9.00	28	0.67	
Pagellus bellottii	2.00	28	0.15	
Lepidotrigla carolae	0.40	14	0.03	
Total	1342.60		100.01	

PROJECT STATION:1132

DATE:31/ 8/96 GEAR TYPE: PT No:2 POSITION:Lat S 1207
start stop duration Long E 1338
TIME :19:22:00 19:53:00 31 (min) Purpose code: 1
LOG :9930.20 9931.90 1.70 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 38 38 Validity code: 4
Towing dir: 22° Wire out: 160 m Speed: 34 kn*10

Sorted: 124 Kg Total catch: 303.46 CATCH/HOUR: 587.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	168.62	1136	28.71	2533
Sardinella maderensis	140.07	484	23.85	2535
Trachurus trecae	106.20	420	18.08	2534
Pomadasys jubelini	73.78	116	12.56	
Sphyraena guachancho	31.49	77	5.36	
Trichiurus lepturus	22.49	184	3.83	
Stromateus fiatola	10.55	10	1.80	
Pomatomus saltatrix	7.74	2	1.32	
Sepia officinalis hierredda	7.55	10	1.29	
Pomadasys incisus	7.45	48	1.27	
Spondyliosoma cantharus	4.10	4	0.70	
Trachinotus ovatus	2.36	4	0.40	
Sphyraena sphyraena	1.97	4	0.34	
Lithognathus mormyrus	1.94	4	0.33	
Pteroscion peli	0.68	4	0.12	
Penaeus notialis	0.19	4	0.03	
Sepiella ornata	0.15	4	0.03	
Total	587.33		100.02	

PROJECT STATION:1133

DATE 1/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1252
start stop duration Long E 1253
TIME :03:45:00 04:15:00 30 (min) Purpose code: 1
LOG : 19.20 20.70 1.50 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 76 258 Validity code: 4
Towing dir: 26° Wire out: 170 m Speed: 36 kn*10

Sorted: 71 Kg Total catch: 70.98 CATCH/HOUR: 141.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alopias superciliosus	60.00	2	42.27	
Sphyrna lewini	42.00	6	29.59	
Trachurus trecae	31.90	528	22.47	2536
Sphyraena sphyraena	4.48	16	3.16	
Trichiurus lepturus	3.18	28	2.24	
MYCTOPHIDAE	0.16	96	0.11	
Lagocephalus laevigatus	0.16	2	0.11	
Sepiella ornata	0.08	2	0.06	
J E L L Y F I S H	0.00	40		
Total	141.96		100.01	

PROJECT STATION:1134

DATE: 2/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1258
start stop duration Long E 1251
TIME :00:00:00 00:30:00 30 (min) Purpose code: 1
LOG : 85.90 87.70 1.80 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 83 60 Validity code: 4
Towing dir: 90° Wire out: 170 m Speed: 36 kn*10

Sorted: 138 Kg Total catch: 413.55 CATCH/HOUR: 827.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	804.30	4934	97.24	2537
Pomatomus saltatrix	8.40	12	1.02	
Sardinella maderensis	6.72	18	0.81	
Sphyraena guachancho	5.46	6	0.66	
Sphyraena sphyraena	1.74	6	0.21	
Trichiurus lepturus	0.48	12	0.06	
Total	827.10		100.00	

PROJECT STATION:1135

DATE: 2/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1311
start stop duration Long E 1240
TIME :04:26:00 04:41:00 15 (min) Purpose code: 1
LOG : 125.70 126.70 1.00 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 195 111 Validity code: 4
Towing dir: 174° Wire out: 170 m Speed: 37 kn*10

Sorted: 214 Kg Total catch: 405.70 CATCH/HOUR: 1622.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1123.20	8944	69.21	2538
Alopias superciliosus	240.00	4	14.79	
Isurus oxyrinchus	130.00	8	8.01	
Sphyrna lewini	106.80	4	6.58	
Trichiurus lepturus	16.32	132	1.01	
MYCTOPHIDAE	6.48	2652	0.40	
Total	1622.80		100.00	

PROJECT STATION:1136

DATE: 2/ 9/96 GEAR TYPE: BT No:9 POSITION:Lat S 1342
start stop duration Long E 1230
TIME :10:38:00 10:45:00 7 (min) Purpose code: 1
LOG : 184.30 184.70 0.40 Area code : 1
FDEPTH: 109 109 GearCond.code:
BDEPTH: 109 109 Validity code: 4
Towing dir: 300° Wire out: 400 m Speed: 32 kn*10

Sorted: 93 Kg Total catch: 121.73 CATCH/HOUR: 1043.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	930.43	8983	89.17	2539
Dentex barnardi	31.71	51	3.04	
Dentex angolensis	24.69	77	2.37	
Anthias anthias	13.20	60	1.27	
Plectorhinchus mediterraneus	12.51	26	1.20	
Sparus pagrus africanus *	10.20	9	0.98	
Raja miraletus	6.43	9	0.62	
Pagellus bellottii	4.89	26	0.47	
Parapristipoma octolineatum	4.20	9	0.40	
Lepidotrigla cadmani	1.89	9	0.18	
Umbrina canariensis	1.71	9	0.16	
Chelidonichthys capensis	1.54	9	0.15	
Total	1043.40		100.01	

PROJECT STATION:1137

DATE: 2/ 9/96 GEAR TYPE: PT No:7 POSITION:Lat S 1359
start stop duration Long E 1216
TIME :15:05:00 15:35:00 30 (min) Purpose code: 1
LOG : 226.40 227.80 1.40 Area code : 1
FDEPTH: 134 121 GearCond.code:
BDEPTH: 134 121 Validity code: 4
Towing dir: 78° Wire out: 500 m Speed: 29 kn*10

Sorted: 97 Kg Total catch: 2720.50 CATCH/HOUR: 5441.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	3544.00	42504	65.14	2541
Trachurus capensis	1668.00	19208	30.66	2540
Dentex macrophthalmus	166.80	2464	3.07	
Atractoscion aequidens	62.20	56	1.14	
Total	5441.00		100.01	

PROJECT STATION:1138

DATE: 2/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1416
start stop duration Long E 1216
TIME :20:00:00 20:30:00 30 (min) Purpose code: 1
LOG : 271.80 273.50 1.70 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 86 102 Validity code: 4
Towing dir: 316° Wire out: 160 m Speed: 34 kn*10

Sorted: 100 Kg Total catch: 832.40 CATCH/HOUR: 1664.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1020.00	5394	61.27	2542
Sardinella maderensis	592.60	1908	35.60	2543
Pomatomus saltatrix	31.60	32	1.90	
Trachurus capensis	6.98	32	0.42	
Sardinella aurita	6.30	32	0.38	
Sphyraena guachancho	4.32	16	0.26	
Alloteuthis africana	1.50	580	0.09	
MYCTOPHIDAE	1.50	698	0.09	
Total	1664.80		100.01	

PROJECT STATION:1139

DATE: 3/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1502
start stop duration Long E 1207
TIME :04:40:00 05:10:00 30 (min) Purpose code: 1
LOG : 356.50 358.20 1.70 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 89 65 Validity code: 4
Towing dir: 60° Wire out: 160 m Speed: 34 kn*10

Sorted: Kg Total catch: 0.06 CATCH/HOUR: 0.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	0.12	2	100.00	
Total	0.12		100.00	

PROJECT STATION:1140

DATE: 3/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1517
start stop duration Long E 1201
TIME :08:46:00 09:16:00 30 (min) Purpose code: 1
LOG : 391.60 393.20 1.60 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 40 44 Validity code: 4
Towing dir: 200° Wire out: 160 m Speed: 32 kn*10

Sorted: 30 Kg Total catch: 30.09 CATCH/HOUR: 60.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyrna lewini	60.00	2	99.70	
Sepiella ornata	0.18	4	0.30	
Total	60.18		100.00	

PROJECT STATION:1141

DATE: 3/ 9/96 GEAR TYPE: BT No:9 POSITION:Lat S 1530
start stop duration Long E 1153
TIME :12:36:00 12:55:00 19 (min) Purpose code: 1
LOG : 424.80 425.50 0.70 Area code : 1
FDEPTH: 113 111 GearCond.code: 8
BDEPTH: 113 111 Validity code: 4
Towing dir: 316° Wire out: 480 m Speed: 32 kn*10

Sorted: 68 Kg Total catch: 68.02 CATCH/HOUR: 214.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Squalus mitsukurii	92.21	540	42.93	
Pagellus bellottii	44.05	341	20.51	
Myliobatis aquila	39.79	3	18.52	
Dentex angolensis	21.47	69	10.00	
Squatina squatina	5.68	6	2.64	
Zeus faber	3.82	9	1.78	
Dentex barnardi	3.13	9	1.46	
Raja miraletus	2.78	3	1.29	
Sparus pagrus africanus *	1.86	3	0.87	
Total	214.79		100.00	

PROJECT STATION:1142

DATE: 3/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1541
start stop duration Long E 1148
TIME :16:16:00 16:46:00 30 (min) Purpose code: 1
LOG : 458.00 459.60 1.60 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 92 202 Validity code: 4
Towing dir: 115° Wire out: 170 m Speed: 28 kn*10

Sorted: 1 Kg Total catch: 0.49 CATCH/HOUR: 0.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Seriola lalandi	0.98	2	100.00	
Total	0.98		100.00	

PROJECT STATION:1143

DATE: 4/ 9/96 GEAR TYPE: BT No:9 POSITION:Lat S 1612
start stop duration Long E 1139
TIME :07:55:00 08:15:00 20 (min) Purpose code: 1
LOG : 585.30 586.30 1.00 Area code : 1
FDEPTH: 61 58 GearCond.code:
BDEPTH: 61 58 Validity code: 4
Towing dir: 60° Wire out: 210 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 730.00 CATCH/HOUR: 2190.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	948.75	84225	43.32	2544
Trachurus trecae	821.25	38043	37.50	2545
Trachurus capensis	405.00	17901	18.49	2546
Alloteuthis africana	7.50	1125	0.34	
Umbrina canariensis	7.50	150	0.34	
J E L L Y F I S H	0.00	90		
Total	2190.00		99.99	

PROJECT STATION:1144

DATE: 4/ 9/96 GEAR TYPE: PT No:1 POSITION:Lat S 1619
start stop duration Long E 1138
TIME :10:47:00 11:02:00 15 (min) Purpose code: 1
LOG : 609.80 610.70 0.90 Area code : 1
FDEPTH: 40 40 GearCond.code:
BDEPTH: 76 79 Validity code: 4
Towing dir: 280° Wire out: 180 m Speed: 3 kn*10

Sorted: 792 Kg Total catch: 554.40 CATCH/HOUR: 2217.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Etrumeus whiteheadi	2122.40	56596	95.71	2547
Sardinops ocellatus	93.52	1220	4.22	2548
Sardinella aurita	1.68	28	0.08	
Total	2217.60		100.01	

PROJECT STATION:1145

DATE: 4/ 9/96 GEAR TYPE: PT No:7 POSITION:Lat S 1620
start stop duration Long E 1145
TIME :12:18:00 12:38:00 20 (min) Purpose code: 1
LOG : 620.80 621.90 1.10 Area code : 1
FDEPTH: 20 38 GearCond.code:
BDEPTH: 20 38 Validity code: 4
Towing dir: 285° Wire out: 150 m Speed: 31 kn*10

Sorted: 266 Kg Total catch: 3009.19 CATCH/HOUR: 9027.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	5542.65	230373	61.40	2549
Trachurus capensis	2983.20	240582	33.05	2550
Pagellus bellottii	491.55	35256	5.44	
Boops boops	10.17	339	0.11	
Total	9027.57		100.00	

PROJECT STATION:1146

DATE: 4/ 9/96 GEAR TYPE: PT No:7 POSITION:Lat S 1640
start stop duration Long E 1146
TIME :19:54:00 20:14:00 20 (min) Purpose code: 1
LOG : 690.40 691.70 1.30 Area code : 1
FDEPTH: 5 5 GearCond.code:
BDEPTH: 14 16 Validity code: 4
Towing dir: 345° Wire out: 120 m Speed: 35 kn*10

Sorted: 30 Kg Total catch: 60.04 CATCH/HOUR: 180.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	176.10	5700	97.77	2551
Sepia orbignyana	1.50	30	0.83	
Lithognathus mormyrus	1.02	48	0.57	
Trichiurus lepturus	0.48	12	0.27	
Atractoscion aequidens	0.42	12	0.23	
Pagellus bellottii	0.36	24	0.20	
Sepiella ornata	0.18	6	0.10	
Engraulis encrasicolus	0.06	6	0.03	
Total	180.12		100.00	

PROJECT STATION:1147

DATE: 5/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1638
start stop duration Long E 1128
TIME :01:09:00 01:39:00 30 (min) Purpose code: 1
LOG : 738.50 740.40 1.90 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 116 120 Validity code: 4
Towing dir: 287° Wire out: 170 m Speed: 35 kn*10

Sorted: 75 Kg Total catch: 226.20 CATCH/HOUR: 452.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Etrumeus whiteheadi	406.68	18486	89.89	2552
Engraulis encrasicolus	45.72	2732	10.11	2553
Total	452.40		100.00	

PROJECT STATION:1148

DATE: 5/ 9/96 GEAR TYPE: PT No:1 POSITION:Lat S 1650
start stop duration Long E 1127
TIME :07:28:00 07:58:00 30 (min) Purpose code: 1
LOG : 797.60 799.70 2.10 Area code : 1
FDEPTH: 40 60 GearCond.code:
BDEPTH: 119 123 Validity code: 4
Towing dir: 288° Wire out: 190 m Speed: 42 kn*10

Sorted: 48 Kg Total catch: 48.38 CATCH/HOUR: 96.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Etrumeus whiteheadi	91.80	3802	94.87	2555
Engraulis encrasicolus	4.96	252	5.13	2554
J E L L Y F I S H	0.00	40		
Total	96.76		100.00	

PROJECT STATION:1149

DATE: 5/ 9/96 GEAR TYPE: BT No:9 POSITION:Lat S 1649
start stop duration Long E 1125
TIME :08:39:00 08:49:00 10 (min) Purpose code: 1
LOG : 801.50 801.90 0.40 Area code : 1
FDEPTH: 124 126 GearCond.code:
BDEPTH: 124 126 Validity code: 4
Towing dir: 106° Wire out: 400 m Speed: 30 kn*10

Sorted: 284 Kg Total catch: 170.46 CATCH/HOUR: 1022.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	586.80	6270	57.37	2557
Trachurus capensis	223.80	8028	21.88	2556
Merluccius capensis	28.08	72	2.75	
Galeichthys feliceps	25.20	72	2.46	
Trigla lyra	11.52	108	1.13	
Todaropsis eblanae	10.80	108	1.06	
Anthias anthias	6.12	36	0.60	
Umbrina canariensis	5.04	72	0.49	
Pagellus bellottii	5.04	36	0.49	
Citharus linguatula	0.36	36	0.04	
Total	902.76		88.27	

PROJECT STATION:1150

DATE: 5/ 9/96 GEAR TYPE: PT No:1 POSITION:Lat S 1654
start stop duration Long E 1137
TIME :10:39:00 11:09:00 30 (min) Purpose code: 1
LOG : 816.80 818.70 1.90 Area code : 1
FDEPTH: 45 45 GearCond.code:
BDEPTH: 77 74 Validity code: 4
Towing dir: 180° Wire out: 190 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 26.68 CATCH/HOUR: 53.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Etrumeus whiteheadi	51.80	2446	97.08	2559
Trachurus capensis	0.92	98	1.72	2558
Engraulis encrasicolus	0.64	36	1.20	
Total	53.36		100.00	

PROJECT STATION:1151

DATE: 5/ 9/96 GEAR TYPE: PT No:7 POSITION:Lat S 1658
start stop duration Long E 1125
TIME :14:03:00 14:33:00 30 (min) Purpose code: 1
LOG : 845.40 846.80 1.40 Area code : 1
FDEPTH: 118 116 GearCond.code:
BDEPTH: 118 116 Validity code: 4
Towing dir: 77° Wire out: 450 m Speed: 31 kn*10

Sorted: 314 Kg Total catch: 1069.64 CATCH/HOUR: 2139.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	1832.60	44220	85.66	2560
Dentex macrophthalmus	170.00	2244	7.95	
Sepia orbignyana	68.68	68	3.21	
Zeus faber	24.48	68	1.14	
Arius heudeloti	17.68	68	0.83	
Anthias anthias	10.88	136	0.51	
Serranus cabrilla	8.16	68	0.38	
Umbrina canariensis	6.80	68	0.32	
Total	2139.28		100.00	

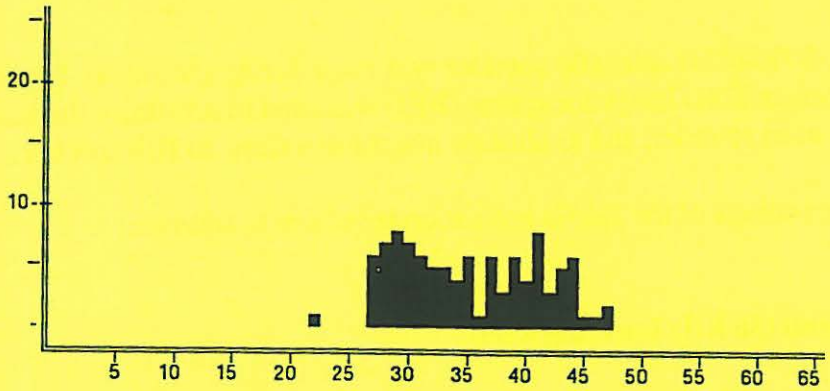
PROJECT STATION:1152

DATE: 5/ 9/96 GEAR TYPE: PT No:2 POSITION:Lat S 1705
start stop duration Long E 1131
TIME :17:02:00 17:32:00 30 (min) Purpose code: 1
LOG : 868.80 870.60 1.80 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 108 105 Validity code: 4
Towing dir: 2° Wire out: 170 m Speed: 36 kn*10

Sorted: 68 Kg Total catch: 610.92 CATCH/HOUR: 1221.84

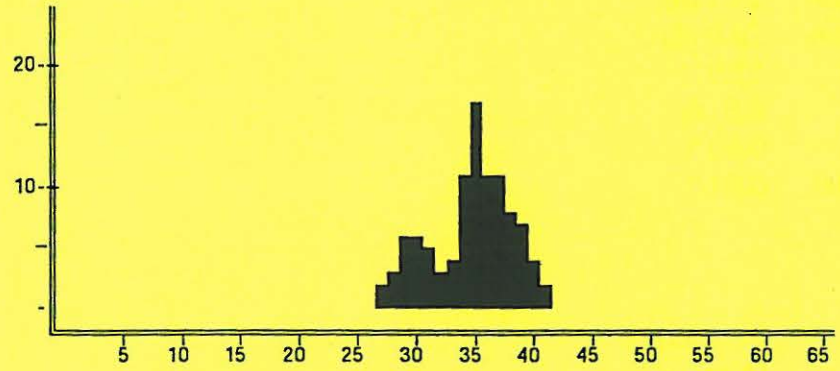
SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Etrumeus whiteheadi	1109.70	31312	90.82	2562
Sardinops ocellatus	111.60	1530	9.13	2561
Engraulis encrasicolus	0.54	36	0.04	
Total	1221.84		99.99	

Annex II. Length distributions of main species



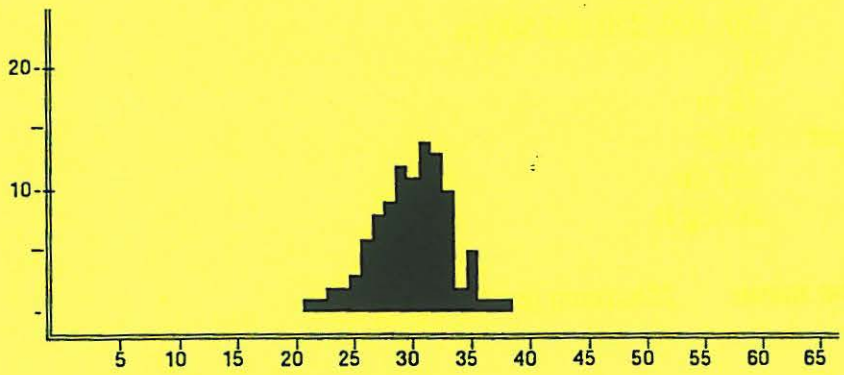
Decapterus rhonchus
Cabinda-Benguela
Pooled sample (simple adding).

MEAN LENGTH = 35.69cm N= 129
NUMBER OF SUBSAMPLES : 3



Trachinotus ovatus
Cabinda-Benguela
Pooled sample (simple adding).

MEAN LENGTH = 35.29cm N= 402
NUMBER OF SUBSAMPLES : 9



Selene dorsalis
Cabinda-Benguela
Pooled sample (simple adding).

MEAN LENGTH = 30.37cm N= 368
NUMBER OF SUBSAMPLES : 8

Annex III 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 where as follows:

Tranceiver-1 menu (38 kHz lowering keel)

Transducer depth	5.0 - 7.5m
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	28.1 dB
TS transducer gain	28.0 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	15 m
Bottom range start	10 m
Sv colour min	-67 dB

Printer- menu

Echogram	1 (38 kHz)
Range	50, 100, 250 and 500 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 -50 - -35 dB

Fishing gear

The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super bottom trawl". The pelagic trawl is equipped with a trawleye that provides information on the trawl opening and distance of the footrope to the bottom.

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 equiped with a 12" rubber bobbins gear. The doors are of 'Thyborøn' combi type, 7.81 m^2, 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 at every second haul.

The SCANMAR system was used on some of the 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..

F/F Dr. Fridtjof Nansen

OVER/UNDER/SIDER

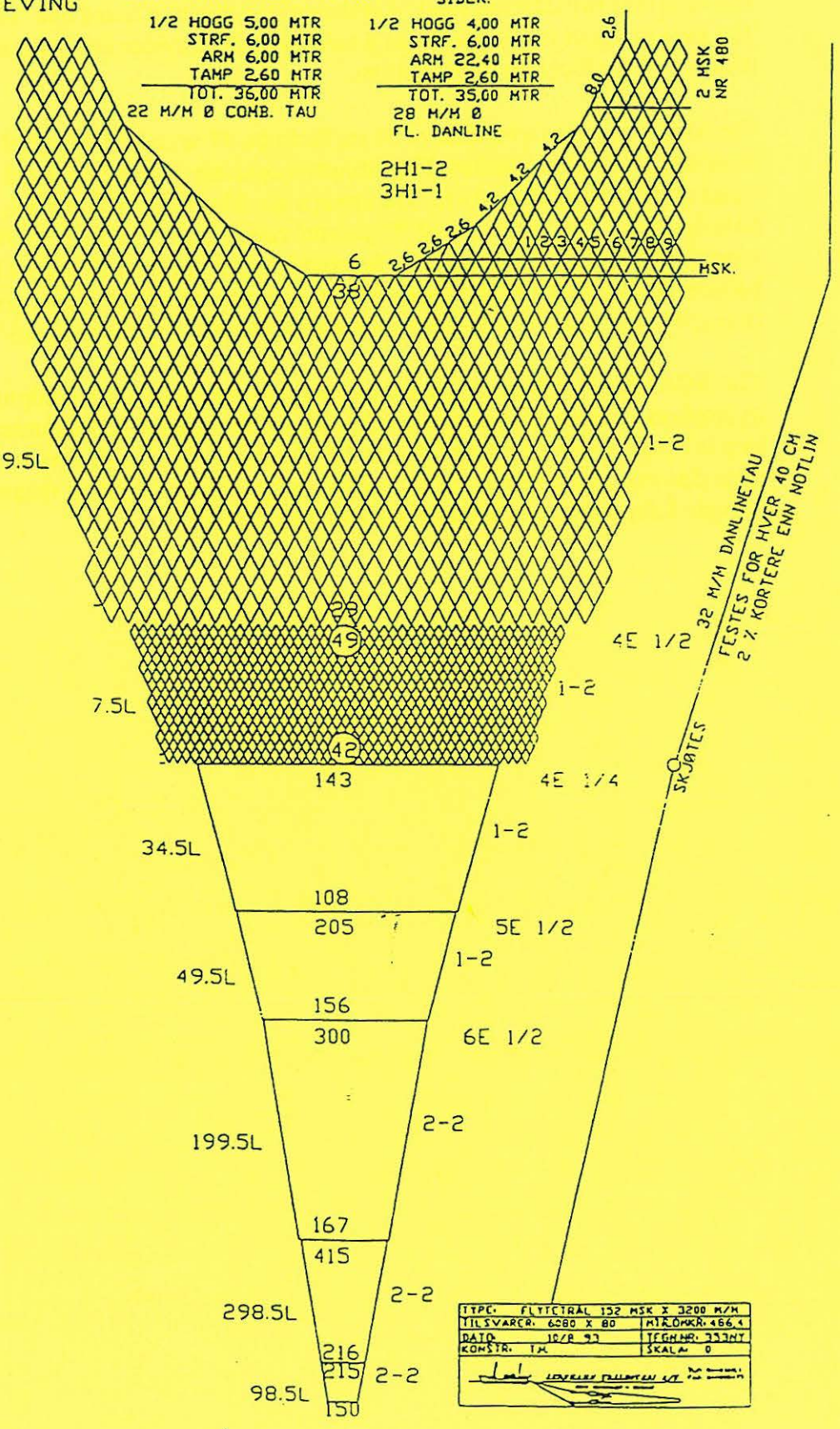
OVERDEL:
50 STK 11" PLASTKULER

UNDERDEL
14 M/M WIRE OMSP. MED
14 M/M BLYTAU
+ KJETTING.
TOTAL VEKT UNDER 400 KG.

MASKER M/M	TRAAD NR.	LENGDE MASKER I MTR.	I EVING	
3200.0	240	22.4	4	
3200.0	240	32.0	4	9.5L
1620.0	160	13.0	4	7.5L
400.0	48	14.0	4	34.5L
200.0	32	10.00	4	49.5L
100.0	24	20.0	4	199.5L
38.0	12	11.4	4	298.5L
38.0	18	3.76	4	98.5L

1/2 HOGG 5,00 MTR
STRF. 6,00 MTR
ARM 6,00 MTR
TAMP 2,60 MTR
TOT. 36,00 MTR
22 M/M Ø COMB. TAU

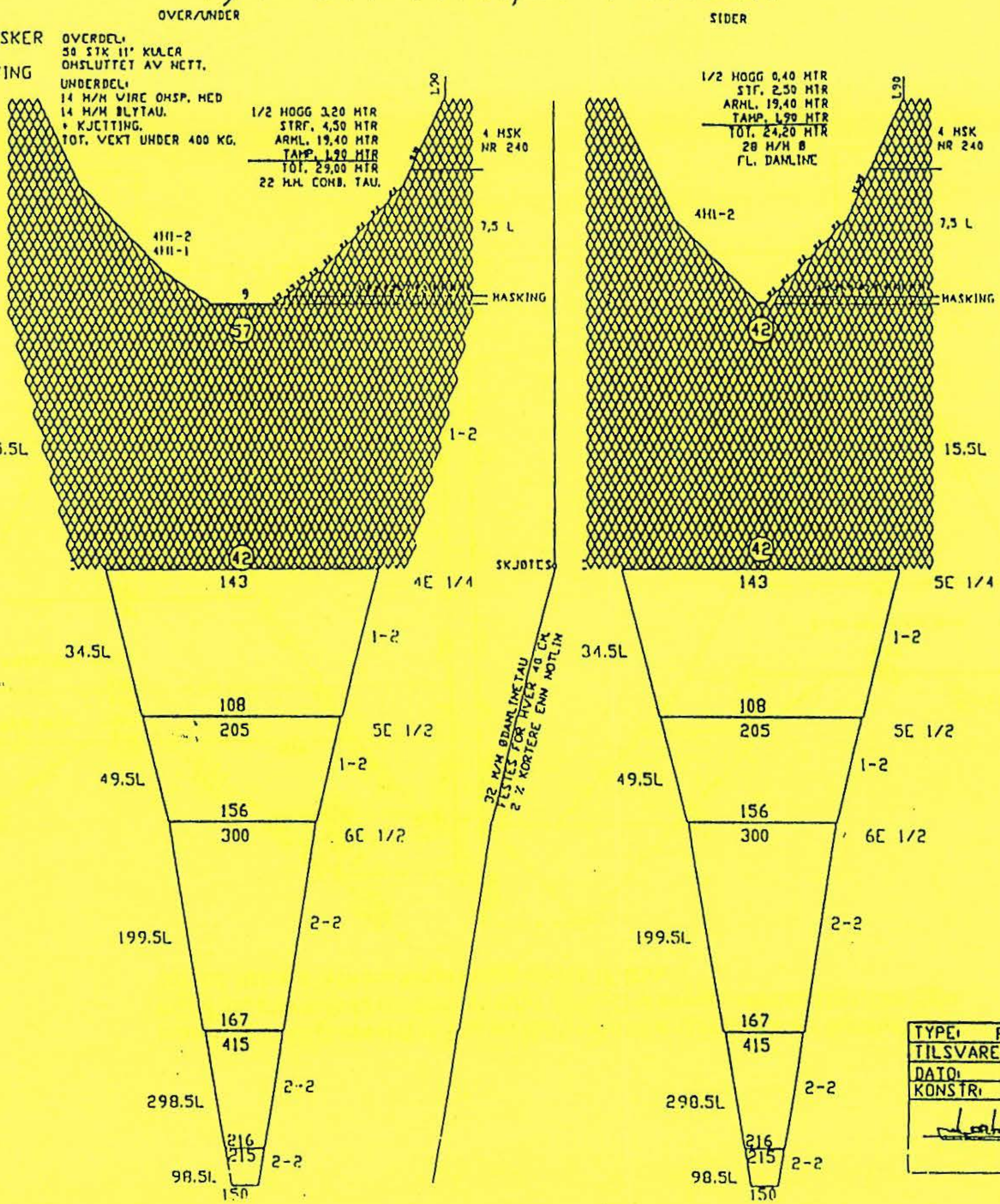
SIDER.
1/2 HOGG 4,00 MTR
STRF. 6,00 MTR
ARM 22,40 MTR
TAMP 2,60 MTR
TOT. 35,00 MTR
28 M/M Ø
FL. DANLINE



TYPE: FLYTETRÅL 152 MSK X 3200 M/M	
TILSVARER: 6080 X 80	MÅLOMKR. 486,4
DATO: 10/8 93	TEGN.NR: 333NT
KONSTR: TM	SKALA: 0

F/F Dr. Fridtjof Nansen

MASKER M/M	TRAAD NR.	LENGDE I MTR.	MASKER I EVING
1620.0	160	19.4	4
1620.0	160	25.9	4
400.0	48	14.0	4
200.0	32	10.00	4
100.0	24	20.0	4
38.0	12	11.4	4
36.0	18	3.76	4



TYPE: FLYTETRAL 198 MSK X 1620 M/M	
TILSVARER: 4010 X 80	MTR.OMKR: 320
DATO: 23/6 93	TEGN.NR: 510
KONSTR: T-H	SKALA: 0

AKERSTRANN TRÅLBØTERI A/S

Bottom trawl: High opening shrimp and fish trawl with net headline 31m (floatline), foot-rope 47m, gear with 12 cm diameter roller disks, 40 m sweeps, estimated headline hight 6m and distance between wings during towing 18-20m.