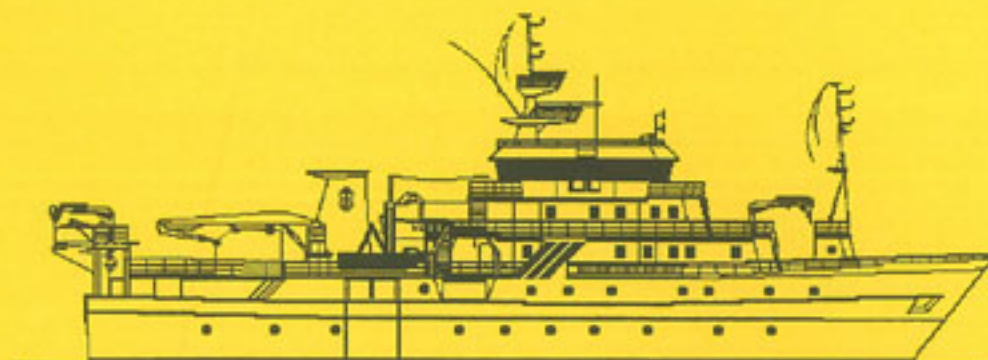


NORAD - FAO/UNDP GLO 92/013

CRUISE REPORTS 'DR. FRIDTJOF NANSEN'



## **SURVEY OF THE FISH RESOURCES OF CONGO and GABON**

**Cruise report No 1/95**

**14 - 24 August 1995**

Direction Générale de la Pêche, Brazzaville, Congo  
Direction Régionale de la Pêche au Kouilou, Pointe Noire, Congo  
Direction Générale de la Pêche et de l'Aquaculture, Libreville, Gabon

Institute of Marine Research  
Bergen,  
Norway



CRUISE REPORTS 'DR. FRIDTJOF NANSEN'

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**by**

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**Institute of Marine Research  
Bergen, 1995**

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## CHAPTER 1 INTRODUCTION

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### 1.1 OBJECTIVES

The main objectives of the survey were to:

- Conduct an acoustic survey to map the distribution and estimate the abundance of the main pelagic species, i.e. sardinella, Cunene horse mackerel and other pelagic/semipelagic species;
- Describe the distribution, composition and abundance of the demersal fish stocks by a swept-area trawl programme;
- Map the general hydrographic regime by using a CTD-sonde and monitor the temperature, salt and oxygen regimes on standard profiles.

### 1.2 PARTICIPATION

From the Direction Générale de la Pêche, Brazzaville:

Appolinaire Bissemou, Appolinaire Ngouembe, and Pierre Okana.

From the Direction Régionale de la Pêche au Kouilou, Pointe Noire:

Antoine Missamou

From the Direction Générale de la Pêche et de l'Aquaculture, Libreville:

Agnes Boulingui-Ilama, Jan de Dieu Doumambila-Bantsantsa and Jean-Paul Sassa-Mboungui.

From the Institute of Marine Research, Bergen:

Martin Dahl, Ole Gullaksen, Sigbjørn Mehl and Tore Mørk.

### 1.3 NARRATIVE

The survey started at Pointe Noire in the afternoon 14 August 1995 with the hydrographic profile off Pointe Noire. Systematic transects, 12-13 nm apart, were sailed from close to the shore (20 m depth) to beyond the 200 m isobath. Semi-random bottom trawl hauls for swept-area estimates were made during daytime, trying to cover the different depth ranges. This was sometimes hindered by rough bottom. Pelagic trawling with mid-water trawl was mainly carried out during dark hours and echo-integration to map distribution and estimate acoustic abundance of pelagic species was carried out during both day and night time.

The shelf and slope off Congo were covered from 14 to 17 August. In the southern part, trawling on the inner shelf was limited by the presence of oil rigs and pipelines. The Gabon shelf south of the protected area off Cap Lopez was surveyed during 17 to 23 August, and the hydrographic profiles off Pointe Panga and off Iguéla were made on 19 and 23 August respectively.

The survey terminated just south of the protected area on 23 August, after which the vessel steamed southwards to Pointe Noire.

### 1.4 SURVEY EFFORT

Figure 1 shows the course tracks with fishing stations and the hydrographic profiles and Table 1 presents the number of CTD and trawl stations and the distance surveyed.

Table 1. Number of hydrographic (CTD), pelagic (PT), bottom (BT) trawl stations, successful swept-area hauls and distance surveyed (nm) by area.							
Area	CTD	PT	BT	Swept-area hauls			Distance surveyed (nm)
				0-50m	50-200m	200-400m	
Congo	19	2	20	5	9	6	380
Gabon	33	7	35	7	19	7	875
Total	52	9	55	12	28	13	1255

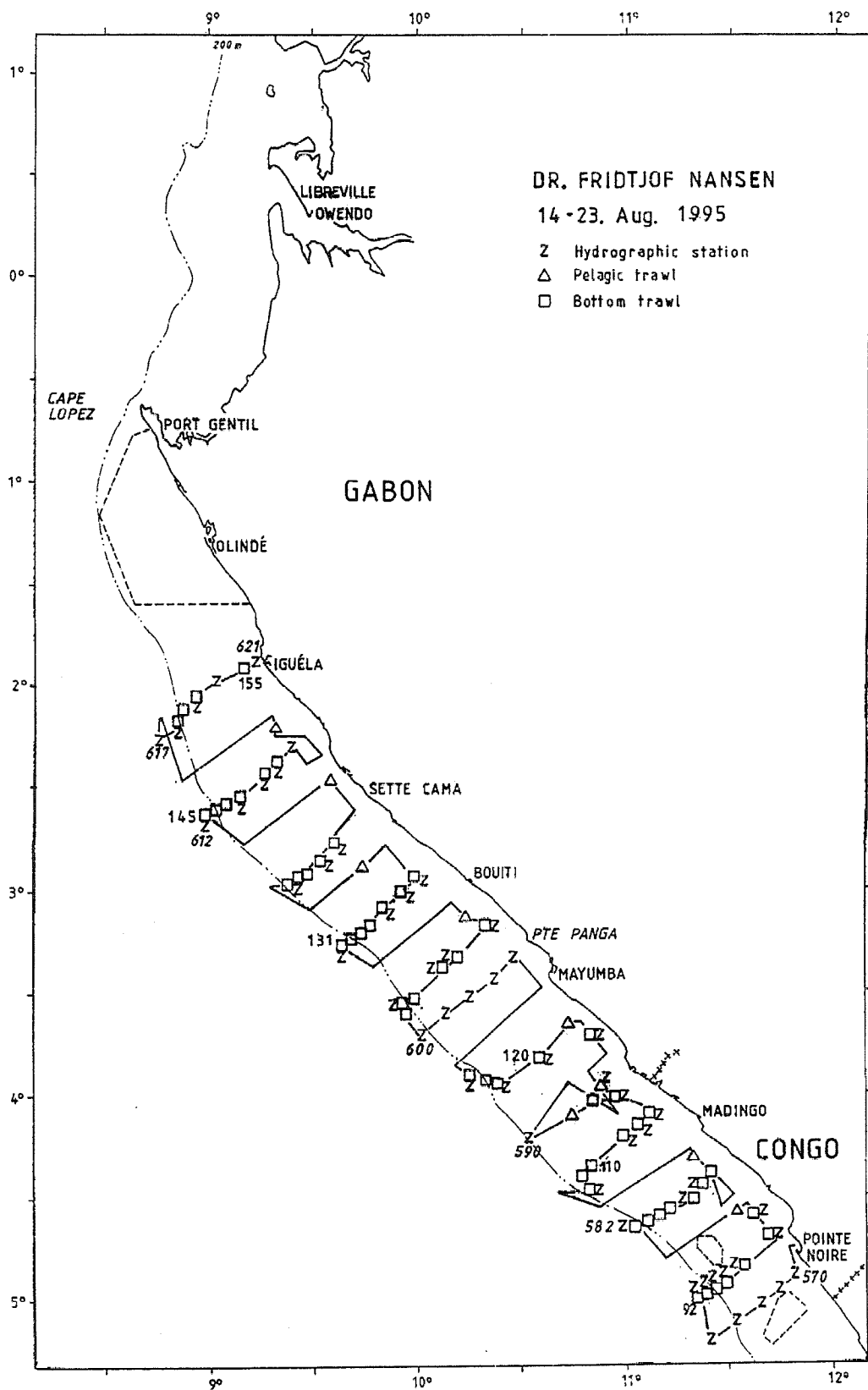


Fig. 1 Course tracks with fishing stations and CTD-stations

## CHAPTER 2 METHODS

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### 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.

#### *ADCP current measurements*

A ship born Acoustic Doppler Current Profiler (ADCP) from RD Instruments was activated on every trawl and CTD station where bottom tracking was obtained, i.e. bottom depths less than about 400 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. Both the raw and averaged data were stored on files.

#### *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. Length distributions (total length, also for shrimp) were taken for the main species. Biological samples, i.e. length and body weight were recorded for sardinella and horse mackerel to the nearest 1 cm or 1 g below, respectively. Records of fishing stations are presented in Annex I and pooled length frequency distributions of selected species are shown in Annex II. A detailed description of the fishing gear used, the acoustic instruments and their standard settings is given in Annex IV.



*Acoustic survey*

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

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

or on the form

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

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:

$$N_i = A \cdot S_A \cdot \frac{p_i}{\sum_{i=1}^n \frac{p_i}{C_{Fi}}} \quad (3)$$

where

$N_i$  = number of fish in length group  $i$

$A$  = area (naut.miles<sup>2</sup>) 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:

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

The length distribution of a given species within an area was computed by adding the length frequencies obtained in each trawl sample within the area. 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 using a factor obtained from their length frequency distributions and their CPUE in numbers. The biomass of fish per length group ( $B_i$ ) was calculated by applying observed mean weights per length group ( $\bar{W}_i$ ) 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:

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

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:

- plankton
- sardinella (*S. aurita* and *S. maderensis*)
- horse mackerel
- PEL1 (anchovies, clupeids)
- PEL2 (carangids, scombrids, barracudas and hairtail)
- big eye grunt (*Brachydeuterus auritus*)
- other demersal fish

#### *Bottom trawl survey*

Table 2 shows the areas used in the swept-area biomass estimates.

Table 2. Areas used in the swept-area biomass estimates (nm <sup>2</sup> )		
Depth stratum	Congo	Gabon
0- 50 m	750	4182
50-200 m	1770	2893

The bottom trawl has a headline of 31m (float line), footrope 47 m, estimated headline height 5 m and distance between wings during towing about 18 m. 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 by help of the sensors. For conversion of catch rates to fish densities the area between the wings is assumed to be the effective fishing area i.e. the catchability coefficient  $q$  is equal to 1. There was some occurrence of both hake and sparids more than 5 m above the bottom, and this may have reduced their swept-area estimates.

## CHAPTER 3 OCEANOGRAPHIC CONDITIONS

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### 3.1 Surface distribution

The horizontal distribution of temperature and salinity are shown in Fig. 2 and 3 respectively. Temperatures range from 20° C in south at the Cabinda border to above 24° C north of Sette Cama. The salinity was lowest in the south (34.7-35.1) and the distribution seems to be influenced by a near shore current deflecting water of lower salinity northwards, possibly from the Congo River. From the Congo/Gabon border to Pointe Panga the salinity values were about 35.8 - 35.9, after which they gradually declined to 34.7 off Sette Cama.

### 3.2 Vertical sections

In the section off Pointe Noire (Fig. 4) the surface temperature was 20-21 °C, which is about the same as in August last year. The main thermocline was observed near the surface. This year only weak signs of off shore low surface salinity were observed. The oxygen distribution gives an impression of a weak upwelling situation, but the oxygen content on the shelf is not likely to limit the distribution of fish, and neither the temperature nor the salinity distribution show characteristics typical for upwelling.

In the section off Pointe Panga (Fig. 5) the thermocline was a little stronger than off Pointe Noire and it was observed at about 25 m. The surface temperature was 23 °C. Like in August 1994 the surface layer was more saline than off Pointe Noire, indicating less influence by the Congo River. The oxygen content on the bottom of the shelf was slightly higher than off Pointe Noire.

In the section off Iguéla (Fig. 6) the surface temperature was 24 °C and the thermocline was observed at about 10 m. It was stronger than off Pointe Panga. The surface water was less saline than off Pointe Panga, almost as low as off Pointe Noire. The oxygen content in the surface layer was slightly lower than in the two other profiles. Both the oxygen and salinity distribution give an impression of a weak upwelling situation.

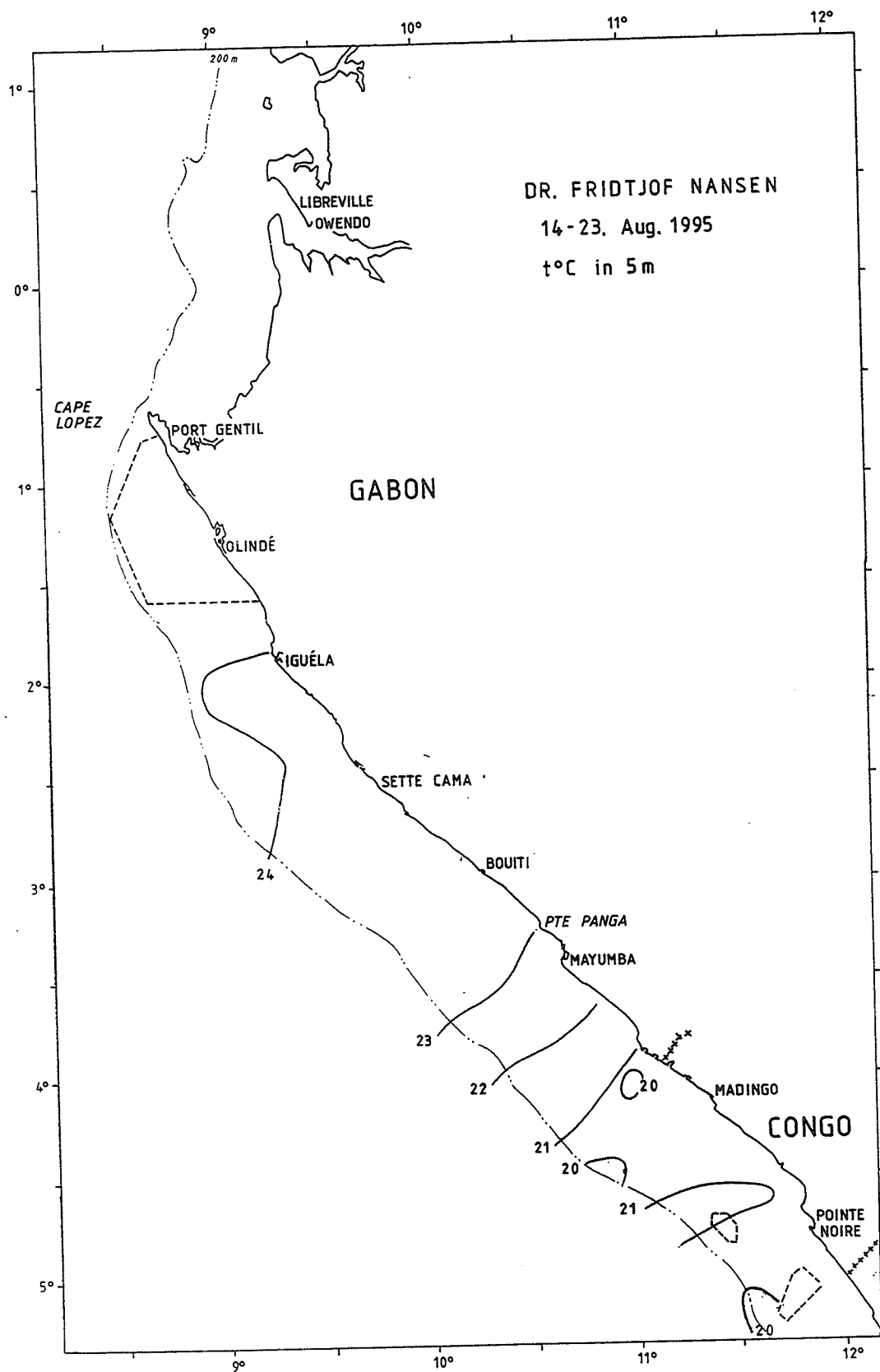


Fig. 2 Horizontal distribution of surface (5m depth) temperature, Congo - Gabon

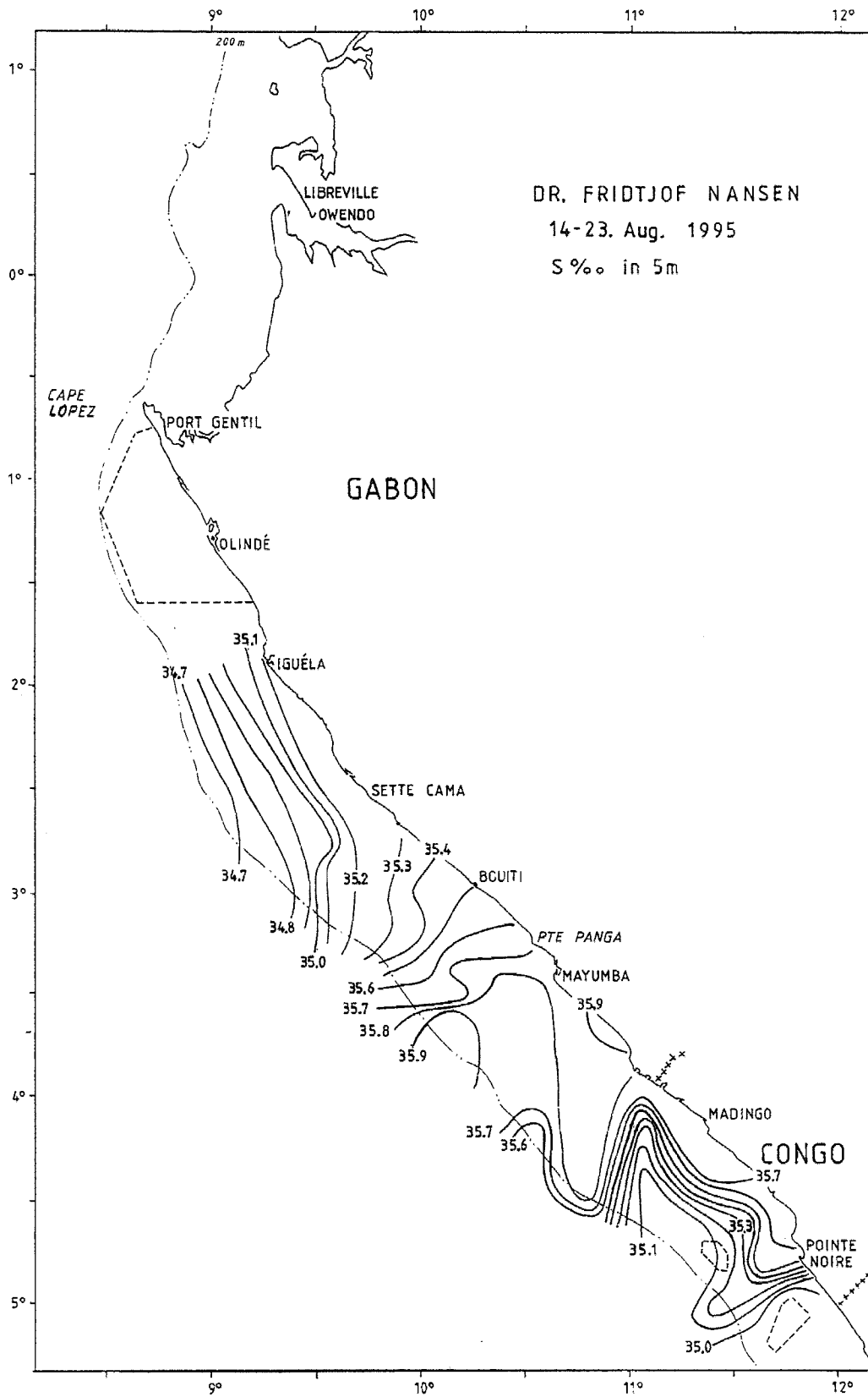


Fig. 3 Horizontal distribution of surface (5m depth) salinity, Congo - Gabon

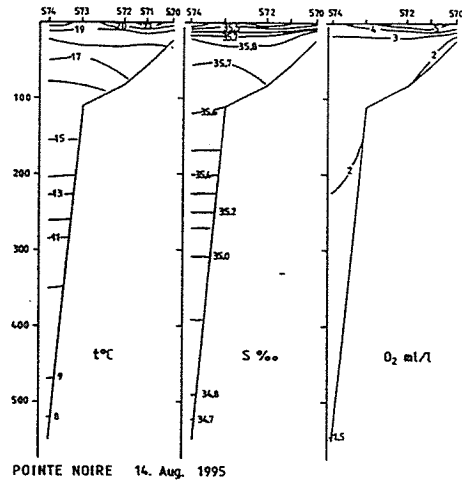


Fig. 4 Pointe Noire. Vertical sections of temperature, salinity and oxygen.

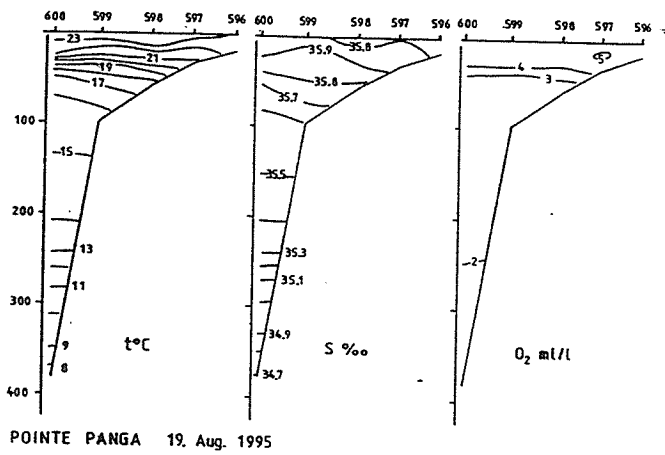


Fig. 5 Pointe Panga. Vertical sections of temperature, salinity and oxygen.

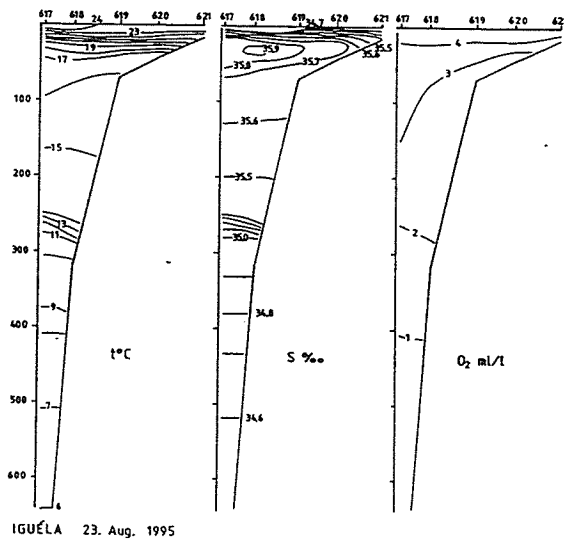


Fig.6 Iguéla. Vertical sections of temperature, salinity and oxygen

## CHAPTER 4 ACOUSTIC SURVEY: FISH DISTRIBUTION AND ABUNDANCE ESTIMATES OF PELAGIC SPECIES

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Figures 7 and 10 illustrate the distribution of sardinellas and horse mackerel respectively for the total survey area as observed with the acoustic integration system. The units of acoustic reflection are  $m^2/nm^2$ , and an arbitrary scale was used to illustrate different levels of concentration.

### 4.1 CONGO

#### Clupeids

Only *S. maderensis* (flat sardinella) was found in the Congo waters. It was distributed (Fig.7) off Pointe Noire from the middle of the shelf to beyond the slope and in shallow waters (20-30 m) along the inner shelf north of Pointe Noire to Madingo. The densest recordings were made in shallow waters. Successful trawling was done only during nighttime and both adult fish and juveniles were caught. Fig. 8 presents the estimated total length distribution of *S. maderensis* in the area. The distribution was quite similar to that estimated in August 1994, with both juvenile and adult fish, the latter being most numerous.

The total biomass of *S. maderensis* was calculated to 69 000, which is about 3 times higher than what was found in March and August 1994 (22 000 and 26 000 tonnes respectively).

*Ilisha africana* was caught in small amounts on all stations on the inner shelf of Congo. However, only low  $S_A$ -values were attributed to this species and no estimate of abundance was made.

#### Anchovy

Like last year no typical schools of *Engraulis encrasicolus* were recorded and the species was not caught in any of the trawl hauls in the area.

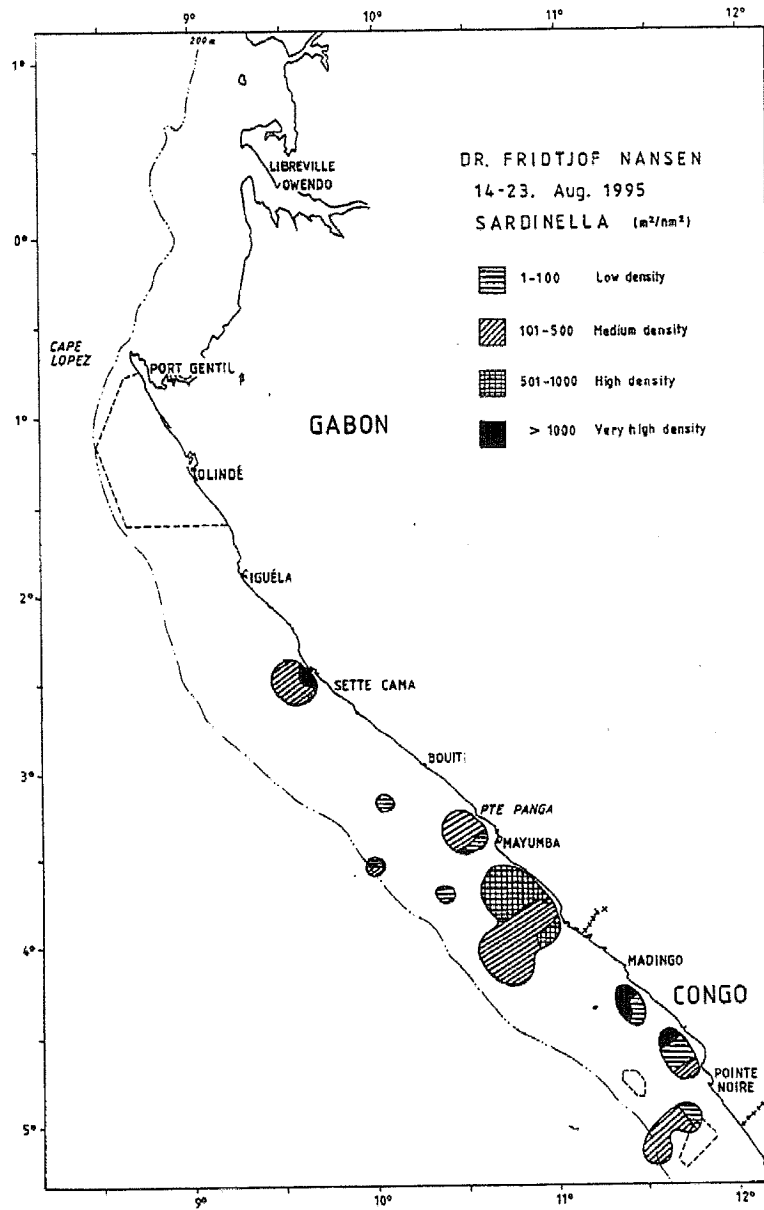


Fig. 7 Distribution and abundance of sardinellas outside Congo - Gabon

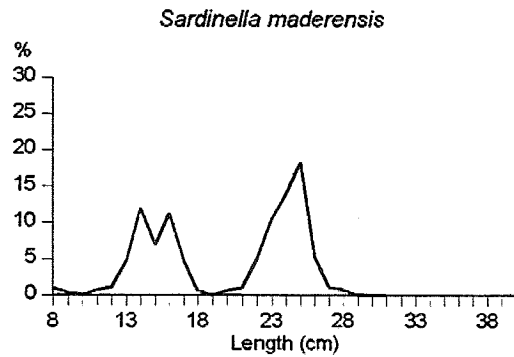


Fig. 8 Total length distributions of *Sardinella maderensis* in the Congo area.



## Cunene horse mackerel

*Trachurus trecae* was caught in small amounts on a few stations on the inner and outer shelf off Madingo. Only a low  $S_A$ -values on one 5-mile was attributed to horse mackerel and no estimate of abundance was made. Last year the biomass was estimated to 10 800 tonnes.

## P2 (carangids, scombrids, barracudas and hairtail)

*Chloroscombrus chrysurus* (Atlantic bumper), *Selene dorsalis* (lookdown) and scombrids (*Sarda sarda* and *Scomber japonicus*) were caught in some hauls both on the inner and outer part of the shelf. *Sphyraena guachancho* (barracuda) was caught on one station on the inner shelf. *Trichiurus lepturus* (hairtail) was common both in pelagic and bottom trawl hauls over the whole area, from the inner shelf to the slope beyond the 200 m isobath.  $S_A$ -values were allocated to some schools of this group on the middle and inner part of the shelf from north of Pointe Noire to the Gabon border, with the highest values off Madingo where the best catch (582 kg/h) of *C. chrysurus* was made. No estimate of abundance was made for this group.

## 4.2 GABON

### Clupeids

In the southern part of Gabon dense recordings of juvenile *S. aurita* (10-14 cm) were made on the inner part of the shelf from the Congo border to Pointe Panga (Fig. 7). On the outer shelf in the same area schools of adult sardinella were found, consisting of 73 % *S. aurita* and 27% *S. maderensis*. In the central area only scattered schools were recorded and 90 % was estimated to be adult *S. maderensis* (20-33 cm). In shallow waters on the inner shelf just north of Sette Cama dense recordings of *S. maderensis* were made. They consisted of both juveniles and adults (12-26 cm). Fig. 9 gives the estimated total length distribution of sardinellas in the Gabon area.

Separate estimates of the two species were made for the various subareas. The total biomass of *S. maderensis* was calculated to only 49 000 tonnes and the biomass of *S. aurita* was estimated to 54 000 tonnes, all together 103 000 tonnes. In March and August 1994 the total biomass of sardinellas was estimated to 100 000 and 128 000 tonnes respectively, with about 40 and 25 % *S. aurita*. The present estimate of *S. aurita* is 66% higher than the biomass found in August 1994, while that of *S. maderensis* is only 51 % of what was estimated during the previous survey. However, the total biomass estimate of sardinellas in the Congo-Gabon area is about 10 % higher than the estimate from August 1994.

*Ilisha africana* was caught on the inner shelf, most abundant off Boiti. Here a few low  $S_A$ -values were attributed to this species but no estimate of abundance was made.

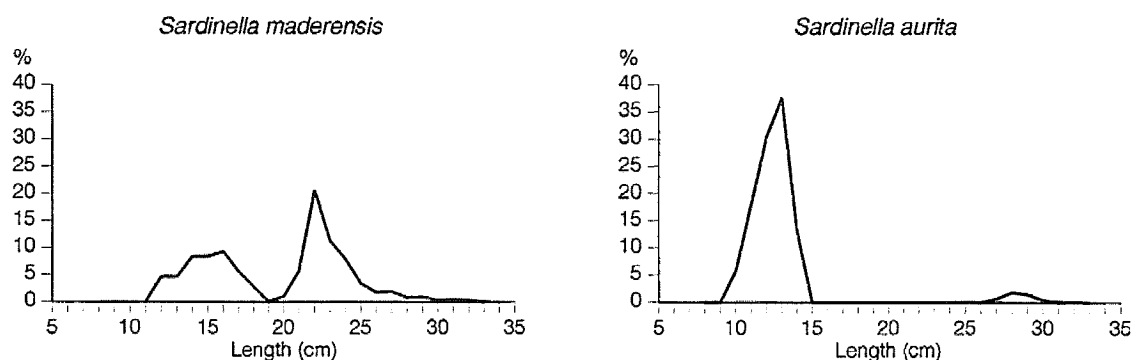


Fig. 9 Total length distribution of sardinellas in the Gabon area.

### Anchovy

Like in the Congo area no schools of *E. encrasicolus* were recorded and the species was only caught on two stations, one off Boiti and one off Iguéla.

### Cunene horse mackerel

Recordings of *Trachurus trecae* were made on the outer shelf in an area just north of the Congo border to south of Mayumba (Fig. 10). Only adults (35-39 cm) were caught in the area, while juveniles occurred in a few trawl hauls in other areas where no  $S_A$ -values were allocated to *T. trecae*. Figure 11 shows the total length distribution in the Gabon area. The biomass was estimated to 19 300 tonnes, which is 30 % higher than the estimate from August 1994.

### P2 (carangids, scombrids, barracudas and hairtail)

$S_A$ -values were allocated to schools of this group on the inner shelf from off Pointe Panga to Iguéla. Most of the recordings came from *C. chrysurus*, which was common in most hauls on the inner part of the shelf, and three large catches (600-1000 kg/h) were made between Boiti and Iguéla. *S. dorsalis* also occurred on most stations on the inner shelf. *Decapterus rhonchus* (false scad), *S. japonicus*, *S. tritor* and *S. guachancho* occurred in low numbers in some hauls in the shelf area, while *T. lepturus* was caught in higher numbers on most stations over the whole area. No estimate of abundance was made for any of the P2-species.

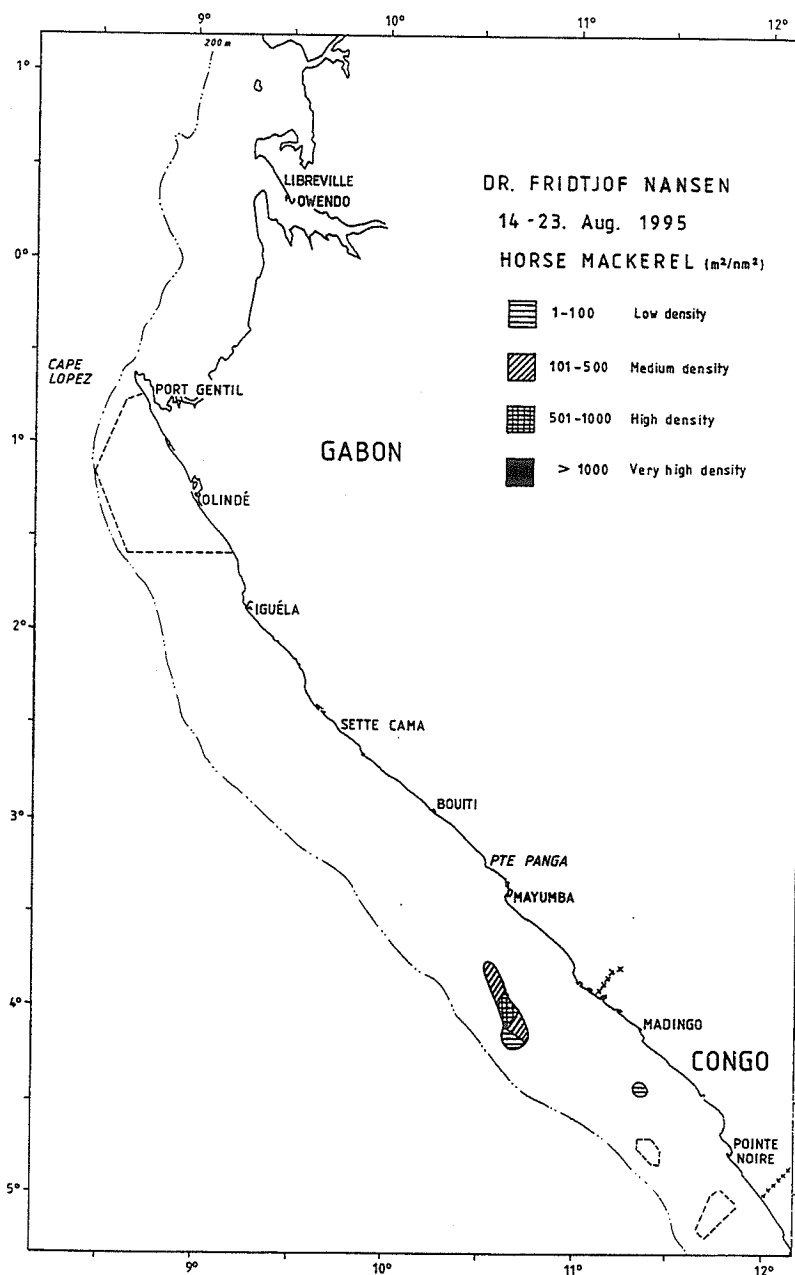


Fig. 10 Distribution and abundance of *Trachurus trecae* outside Congo - Gabon

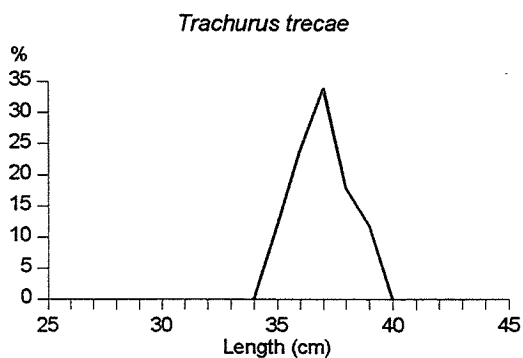


Fig. 11 Total length distribution of *Trachurus trecae* in the Gabon area.

### Review of survey estimates (sardinella and Cunene horse mackerel)

Figure 12 shows a plot of all the biomass estimates obtained through the 'Dr. Fridtjof Nansen' surveys, for sardinella in the Congo-Gabon area. Although important seasonal variability in the estimates may be observed (i.e. in 1985), the later estimates suggest an increase in the biomass of sardinellas. Small sizes were abundant both in 1994 and 1995, indicating that this area is an important nursery and recruitment ground probably for the whole sardinella stock in the region. Figure 13 shows the results obtained for the horse mackerel. Here the trend appears to be different, the biomass estimates obtained the last years being among the lowest in the time series.

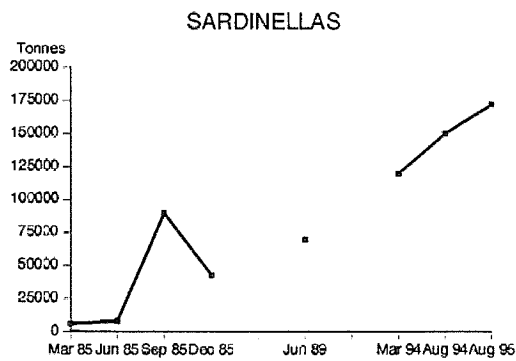


Fig. 12 Congo-Gabon. Biomass estimates for the sardinellas.

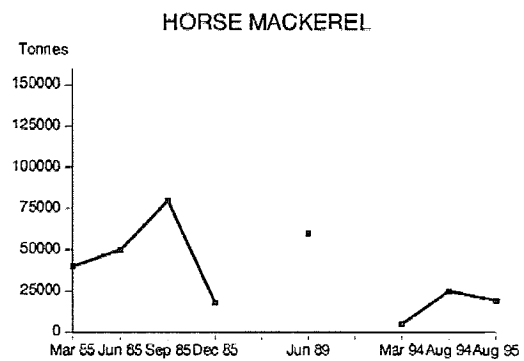


Fig. 13 Congo-Gabon. Biomass estimates for the horse mackerel.

## CHAPTER 5 TRAWL SURVEY: CATCH DISTRIBUTION, COMPOSITION AND SWEEPED AREA BIOMASS ESTIMATES OF DEMERSAL FISH

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The composition of the fish fauna on the shelf and slope changes with depth. The analyses were therefore performed for the inner shelf, down to 55 m depth, and the outer shelf from 55 m to 150 m. In addition, the slope area (150 m to 400 m) was analyzed separately. The locations of the trawl stations are shown in Fig. 1, records of the catches are presented in Annex I and pooled length distributions (weighted by the catch) of main species are shown in Annex II and III.

In the swept-area biomass estimates, only the shelf area down to 200 m has been included, divided into the depth zones 0-50 m and 50-200 m.

### 5.1 CONGO

The results of swept-area trawl stations are summarized in Tables 3 to 5. Twenty hauls were made in this area.

Table 1 shows the catch rates (kg/hour) by broad groups of species. 'Demersal' comprises the families Sciaenidae, Ariidae, Haemulidae (=Pomadasiidae), Serranidae, Sparidae, Lutjanidae and Merluccidae, while 'Pelagic' includes Engraulidae, Clupeidae, Carangidae, Scombridae, Sphyraenidae and Trichiuridae. The demersal group had the highest catch rates on the inner shelf, much higher than during the previous survey in August 1994. On the outer shelf, where the pelagic group dominated, both the pelagic and demersal group had much lower catch rates than during the previous survey. The pelagic group also dominated on the slope, and here the catch rate of both groups were higher than those obtained last year.

Like in 1994 no lobster was caught on the inner shelf in 1995, while it was common in 1989. The catch rates of shrimps were highest on the inner shelf (*Parapenaeopsis atlantica*) and on the slope (*Nematocarcinus africanus*). *Parapenaeus longirostris* was less common than during the previous survey. Sharks were caught on a few stations with catch rates somewhat lower than in

1994. Cephalopods were caught in all areas, but in highest rates on the outer shelf and on the slope, where the mean catch rate was the double of last year. Like in 1994 the most common species were *Illex coindetti* and *Sepia* spp.

Table 3. CONGO. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls for the shelf and the slope.

INNER SHELF 0-55 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Lobster	Other
97	24	142.40	72.90		49.00		28.70
98	23	96.70	121.30		13.80		8.60
105	35	534.00	279.00		3.00		21.60
106	21	277.76	238.28	40.00	136.92		84.28
112	38	765.64	81.76				39.98
113	19	89.70	707.40		36.90		33.14
MEAN		317.70	250.11	6.67	39.94		36.05

OUTER SHELF 55-150 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
95	110	48.02	64.00			7.98	3.04
96	74	75.66	849.38		0.42	0.38	5.12
103	124	24.50	12.10			9.58	0.74
104	65	20.16	52.56		1.64		22.82
110	117	21.36	8.94	8.72		24.92	28.56
111	72	123.86	110.50		7.50		91.30
MEAN		52.26	182.91	1.45	1.59	7.14	25.26

SLOPE 150-400 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
92	354	161.00	6.60	4.80	67.20	3.80	290.60
93	259	62.00	43.80		11.40	7.20	184.60
94	158	50.80	1.74			6.84	37.12
100	357	106.00	7.00		126.60	3.00	130.60
101	309	7.22	27.66		6.24	41.80	145.68
102	165	11.04	169.00			16.90	40.46
108	270	106.02	49.62		5.01	22.89	96.30
109	176	7.86	1121.88			42.72	4.66
MEAN		63.99	178.41	0.60	27.06	18.14	116.25

Catch rates of pelagic fish in bottom trawl hauls (Table 4) are presented to give some indication of the forms present. Like in 1994 the dominating species on the outer shelf and slope was *Trichiurus lepturus* (hairtail), and it was much more abundant than in both surveys in 1989. Among the carangids, which had the highest catch rates in the pelagic group on the inner shelf, *Trachurus trecae* (Cunene horse mackerel), *Selene dorsalis* (lookdown) and *Chloroscombrus chrysurus* (Atlantic bumper) were found on some stations on both the inner and outer shelf. Clupeids were only found on the inner shelf, where *Ilisha africana* (West African ilisha) had the highest catch rates, but also *Sardinella maderensis* (flat sardinella) occurred in small numbers in a couple of bottom hauls.

Table 4. CONGO. Catch rates (kg/hour) of main pelagic families in swept area bottom trawl hauls for the shelf and the slope.

INNER SHELF 0-55 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtail	Other
97	24	17.20	0.70			55.00	220.10
98	23	18.80				102.50	119.10
105	35	4.50	177.00			97.50	558.60
106	21	111.44	3.64			123.20	538.96
112	38		42.46			39.30	805.62
113	19	41.70	584.70	30.00		51.00	159.74
MEAN		32.27	134.75	5.00		78.08	400.35

OUTER SHELF 55-150 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtail	Other
95	110					64.00	59.04
96	74		126.56		0.02	722.80	81.58
103	124					12.10	34.82
104	65		5.26			47.30	44.62
110	117		0.30		4.94	3.70	83.56
111	72		29.50			81.00	222.66
MEAN			26.94		0.83	155.15	87.71

SLOPE 150-400 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtail	Other
92	354					6.60	527.40
93	259					43.80	265.20
94	158					1.74	94.76
100	357					7.00	366.20
101	309					27.66	200.94
102	165		61.00			108.00	68.40
108	270					49.62	230.22
109	176		32.28			1089.60	55.24
MEAN			11.66			166.75	226.05

Table 5 shows the catch rates of demersal families. Grunts was the most common family on the inner shelf and *Brachydeuterus auritus* (bigeye grunt) was the dominating species, and the catch rates were much higher than those obtained in 1994. On the outer shelf grunts occurred on some stations but at much lower rates. Croakers was the second most important family on the inner shelf. It was more abundant than during the previous survey, while on the outer shelf and slope the catch rates were lower than those found last year. *Pentheroscion mbizi* (blackmouth croaker), *Pteroscion peli* (boe drum) and *Pseudolithus typus* (longneck croaker) were the most abundant species.

Table 5. CONGO. Catch rates (kg/hour) of main demersal families in swept area bottom trawl hauls for the shelf and the slope.

## INNER SHELF 0-55 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hake	Other
97	24		109.00	33.40			150.60
98	23		87.00	9.70			143.70
105	35		274.20	118.80			444.60
106	21		234.64	33.32			509.28
112	38	29.70	533.48	190.96	11.50		121.74
113	19		66.30	23.40			777.44
MEAN		4.95	217.44	68.26	1.92		357.89

## OUTER SHELF 55-150 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hake	Other
95	110	48.02					75.02
96	74	2.18	70.20	3.28			855.30
103	124	24.50					22.42
104	65	1.22	2.90	16.04			77.02
110	117	21.36					71.14
111	72	36.20	29.00	14.66	43.50	0.50	209.30
MEAN		22.25	17.02	5.66	7.25	0.08	218.37

## SLOPE 150-400 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hake	Other
92	354					161.00	373.00
93	259			0.80		61.20	247.00
94	158	28.90		21.90			45.70
100	357					106.00	267.20
101	309					7.22	221.38
102	165	11.04					226.36
108	270					100.56	179.28
109	176	7.86					1169.26
MEAN		5.98		2.84		54.50	341.15

Sparids occurred in all areas, with very low rates on the inner shelf and the slope and somewhat higher rates on the outer shelf. The catch rates on the outer shelf were lower than those obtained in 1994. *Dentex angolensis* was the most abundant species, followed by *D. congoensis* and *Pagellus bellottii* (red pandora). Mean length of *D. angolensis* was 5 cm less than in 1994.

Like in 1994 groupers were not abundant, only *Epinephelus goreensis* (dungat grouper) was found on two station (inner and outer shelf). However, these species cannot be properly evaluated by the swept area method because they mostly occur on rocky bottoms inaccessible to bottom trawl. *Merluccius polli* (Benguela hake) was found on most stations deeper than 200 m at similar catch rates as during the previous survey. *Brotula barbata* (Bearded brotula) occurred on both the outer shelf and the slope, and the abundance was about the same as found last year.



Table 6 presents the swept area estimates of mean densities based on 20 random bottom trawl hauls. Pelagic species are not included in the calculations. Like in 1989 and 1994 bigeye grunt was the species with the highest density in the 0-50 m zone, followed by *P. typus* and *Pomadasys jubelini*. In the 50-200 m zone *D. angolensis* had the highest density, while *Synagrops microlepis* and *P. mbizi* were most abundant in 1994. In the deepest zone (200-400 m) *M. polli* came out with the highest densities, followed by *Scorpaena* spp. and *N. africanus*.

Table 6. CONGO. Swept area estimates of demersal species in tonnes/nm<sup>2</sup> by depth ranges.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>			
	>0	10	30	100	300			1000	- 50m	50-200m	200-400m
<i>Brachydeuterus auritus</i>	3	3	2	1		45	1.91	5.81	0.37		
<i>Merluccius polli</i>	2	1	3			25	0.71			2.84	
<i>Pseudolithus typus</i>	6	1	1			40	0.39	1.27	0.02		
<i>Scorpaena</i> sp.			1			5	0.37			1.49	
<i>Nematocarcinus africanus</i>	1	1	1			15	0.32			1.30	
<i>Pomadasys jubelini</i>			1	1		10	0.31	1.04			
<i>Illex coindetii</i>	9	2				55	0.27		0.37	0.41	
<i>Dentex angolensis</i>	6	2				40	0.26	0.18	0.47		
<i>Arius parkii</i>	2		1			15	0.26	0.83		0.03	
<i>Zenopsis conchifer</i>	3	3				30	0.22		0.16	0.58	
<i>Parapenaeopsis atlantica</i>	7		1			40	0.22	0.70	0.02		
<i>Setarches guentheri</i>			1			5	0.20			0.81	
<i>Pteroscion peli</i>	5	1				30	0.19	0.63			
<i>Pterothrissus belloci</i>	2	1				15	0.19			0.76	
<i>Synagrops microlepis</i>			3			15	0.18			0.72	
S H R I M P S	4	1				25	0.17	0.54	0.01		
<i>Brotula barbata</i>	3	1				20	0.11		0.18	0.11	
<i>Spicara alta</i>	4					20	0.11		0.24		
<i>Pentanemus quinquarius</i>	6					30	0.10	0.32			
<i>Epinephelus goreensis</i>	1	1				10	0.09	0.07	0.14		
<i>Aulopus cadenati</i>	4	1				25	0.09		0.02	0.33	
MACROURIDAE	2	1				15	0.08			0.30	
<i>Argyrosomus regius</i>		1				5	0.07	0.22			
S H A R K S		1				5	0.06	0.21			
<i>Umbrina canariensis</i>	2	1				15	0.06	0.17	0.03		
<i>Pentheroscion mbizi</i>	4					20	0.06	0.02	0.12	0.01	
MURAEINIDAE	3					15	0.06	0.18			
CYNOGLOSSIDAE	2					10	0.06	0.16	0.03		
<i>Parapenaeus longirostris</i>	3					15	0.03			0.11	
<i>Aristeus varidens</i>	2					10	0.01			0.03	
Other fish							0.64	1.03	0.52	0.39	
Sum all species							7.80	13.38	2.70	10.22	
Sum Snappers											
Sum Groupers							0.09	0.07	0.14		
Sum Grunts							2.34	7.24	0.37		
Sum Croakers							0.78	2.31	0.20	0.01	
Sum Seabreams							0.35	0.18	0.66		
Sum Sharks							0.08	0.21	0.03	0.03	
Sum Rays							0.06	0.15	0.04		
Sum Squids							0.33	0.09	0.40	0.48	
Sum											
Sum commercial shrimps							0.75	1.24	0.03	1.44	

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

20

6

9

5

The overall mean density for all demersal species was 7.8 tonnes/nm<sup>2</sup>, while in 1994 the corresponding figure was 9.7 tonnes/nm<sup>2</sup>. Compared with the results from last year the mean density was higher on the inner shelf, lower on the outer shelf and about the same on the slope. In 1985 the estimated mean density was 11.1 tonnes/nm<sup>2</sup>.

In Table 7 the densities of some important species and groups are multiplied by the area of the two shallowest depth zones (0-50 and 50-200 m). Some results from 1994 and survey II in 1989 are also given.

The summed biomass of seabreams, croakers and grunts was about the same as found in 1994 and in survey II 1989, but bigeye grunt contributed much more in 1995 and 1989 than in 1994. The total biomass of all demersal species was highest in 1994, mainly due to higher catch rates of *N. africanus*, *S. microlepis*, *Pterothrissus belloci* and other demersal species of non commercial value. The biomass of *T. trecae* estimated from swept-area hauls was only 12 % of that obtained last year, while the estimated biomass of *T. lepturus* was about the same as found in 1994.

Table 7. CONGO. Biomass estimates (tonnes) of important species/groups by depth strata.					
	0-50 m	50- 200m	Total	1994	1989
Seabreams	130	1170	1300	2240	1490
Croakers	1730	350	2080	4700	1970
Groupers	50	250	300	120	120
Grunts*	1070	-	1070	-	-
Sum dem. val.	2980	1770	4750	7060	3580
All demersal	10000	4800	14800	18700	12500
Bigeye grunt	4360	650	5010	890	3800
Horse mackerel	920	50	970	7900	
Hairtail	1850	13650	15500	15200	

\* Not including bigeye grunt.

## 5.2 GABON

The results of the swept-area trawl stations are shown in Tables 8 to 10. A total of 33 hauls were made in the Gabon area. Table 8 gives the catch rates (kg/hour) by main species groups, for the inner shelf, the outer shelf and the slope. The pelagic group had the highest catch rates on the inner shelf, slightly higher than the demersal group. The catch rates were somewhat lower than those obtained in the Congo area, but the pelagic group was more abundant now than during the previous survey. On the outer shelf the demersal group dominated, and this is the opposite of what was found in the Congo area, where the demersal group had much lower catch rates and the pelagic group had much higher. Both groups were less abundant than during the survey in August 1994. On the slope the two groups had about equal catch rates, and much lower than those found in the Congo area.

A small amount of sharks was caught in all three areas. Shrimps were much less abundant than in the Congo area, and on the slope the catch rates were considerable lower than those obtained last year. Lobsters occurred on two stations on the inner shelf, while cephalopods were caught on most stations on the outer shelf and on the slope. The catch rates were somewhat higher than those found in the Congo area, and *Illex coindetii*, *Todaropsis eblanae* and *Sepia* spp. dominated.

Table 8. GABON. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls for the shelf and the slope.

### INNER SHELF 0-55 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Lobster	Other
114	34	247.38	44.34	42.00	24.50		34.74
118	24	170.62	93.40	42.70	19.60		39.50
128	46	81.58	159.88			1.13	9.72
129	19	341.68	143.46	20.00		0.60	76.32
136	44	463.66	1065.46				5.04
150	43	1.40	65.00				26.78
155	28	85.04	33.70		0.72		12.28
MEAN		198.77	229.32	14.96	6.40	0.25	29.20

### OUTER SHELF 55-150 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
115	57	125.16	10.26		6.96		43.44
120	72	1471.98	95.22	62.40			46.32
121	116	155.72	15.10	26.40		7.72	28.68
125	148	36.50	87.50			122.30	36.94
126	122	312.00		10.80		10.38	28.80
127	70	3.54	50.70			20.64	9.24
134	128	78.10				3.47	35.16
135	65	12.36	45.52			44.94	2.00
141	141	106.90	4.90			4.70	52.50
142	90	4.54	3.06			1.06	6.08
146	144	35.64				1.80	152.12
147	112	881.80				31.80	326.60
148	82	4.59	0.19			6.86	2.31
149	62		0.02			1.86	0.58
153	139	10.74		17.20		119.28	214.62
154	76	30.16	0.16			6.23	14.57
MEAN		204.36	19.54	7.30	0.44	23.94	62.50

Table 8. Continued.

SLOPE 150-400 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
122	179	31.54	22.50	14.50		39.60	214.14
123	352	29.26		50.56	5.06	1.80	109.18
124	246	6.40	18.64		0.28	24.22	235.60
131	358	35.00	63.00		1.32	20.40	198.36
132	244	15.34	4.10	4.60		76.60	203.50
133	175	15.50	8.40			14.38	11.74
139	339	12.54	38.40	5.50	5.70	20.80	166.70
140	188	31.06	9.60			4.06	7.72
145	344	4.78	28.16		2.16	10.96	152.80
152	256			0.72	0.96	18.24	550.98
MEAN		18.14	19.28	7.59	1.55	23.11	185.07

Table 9 summarizes the catch rates for the main pelagic fish families in the area. Carangids dominated on the inner shelf, with *C. chrysurus* as most abundant species. It was found on most stations on the inner shelf and sometimes in large quantities. Other common species were *S. dorsalis*, *T. trecae* and *D. rhonchus*.

Table 9. GABON. Catch rates (kg/hour) of main pelagic families in swept area bottom trawl hauls for the shelf and the slope.

INNER SHELF 0-55 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtail	Other
114	34		17.04			27.30	348.62
118	24	46.90	2.00			44.50	272.42
128	46	0.49	32.52		3.31	123.56	92.43
129	19	86.10	42.00	15.36			438.60
136	44	21.10	1012.82	17.64	8.24	5.46	468.90
150	43	7.40	56.30	0.56	0.74		28.18
155	28	4.32	9.54	3.80		1.60	112.48
MEAN		23.76	167.46	5.34	1.76	28.92	251.66

OUTER SHELF 55-150 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtail	Other
115	57		0.96			9.30	175.56
120	72	14.52	33.00			47.70	1580.70
121	116				9.10	6.00	218.52
125	148					87.50	195.74
126	122						361.98
127	70		16.18		0.02	34.50	33.42
134	128						116.73
135	65	1.20	29.22			15.10	59.30
141	141					4.90	164.10
142	90		0.10		0.06	2.90	11.68
146	144						189.56
147	112						1240.20
148	82		0.05		0.14		13.76
149	62		0.02				2.44
153	139						361.84
154	76		0.08		0.08		50.96
MEAN		0.98	4.98		0.59	12.99	298.53

Table 9.. Continued

SLOPE 150-400 m

ST. NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtail	Other
122	179					22.50	299.78
123	352						195.86
124	246					18.64	266.50
131	358					63.00	255.08
132	244					4.10	300.04
133	175					8.40	41.62
139	339					38.40	211.24
140	188					9.60	42.84
145	344					28.16	170.70
152	256						570.90
MEAN						19.28	235.46

Catch rates of *T. lepturus* were very low as compared to Congo, but the rates were higher than those obtained last year and it was the dominating species in the pelagic group both on the outer shelf and on the slope.

The results for the main demersal fish families, sparids, grunts, croakers, groupers and hakes, are shown in Table 10. Sparids were caught at almost all trawl stations, and like last year their mean catch rates dominated those of the other families on the outer shelf and on the slope. The catch rates were however considerable lower than those obtained in 1994. *D. congolensis* was the most common species, followed by *D. angolensis*, *D. gibbosus*, *P. bellottii* and *Boops boops*. Mean lengths were comparable to those obtained during the previous survey except for *P. bellottii*, which was more than 10 cm longer during the present survey.

Like in the Congo area and like last year grunts had the highest catch rates on the inner shelf, but the rates were somewhat lower this year. *B. auritus* was the dominating species, but also *Pomadasys* spp. occurred on several stations. Croakers was the second most important family on the inner shelf, with much higher catch rates than those obtained last year. *Umbrina canariensis* was most abundant, followed by *P. typus*, *P. senegalensis*, *P. peli* and *P. mbizi*.

Like last year the most common Serranidae was *Anthias anthias*. However, for consistency with former reports only groupers are included in the analysis. Only four single specimens were caught (*Epinephelus aeneus*) on one station. Hake (*M. polli*) had the second highest catch rates on the slope, but lower than those obtained last year and much lower than found in the Congo area. Snappers (Lutjanidae) occurred on three stations on the inner shelf in higher rates than previously.

Table 10. GABON. Catch rates (kg/hour) of main demersal families in swept area bottom trawl hauls for the shelf and the slope.

## INNER SHELF 0-55 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hakes	Other
114	34		122.22	63.56			207.18
118	24		64.06	99.90			201.86
128	46	13.73	16.09	3.04			219.45
129	19	67.30	119.68	124.70			270.38
136	44	56.48	407.18				1070.50
150	43	1.40					91.78
155	28	10.74	74.30				46.70
MEAN		21.38	114.79	41.60			301.12

## OUTER SHELF 55-150 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hakes	Other
115	57	11.10	86.70	27.36			60.66
120	72	157.38	924.00	390.60			203.94
121	116	72.32		83.40			77.90
125	148	36.50					246.74
126	122	213.90		98.10			49.98
127	70	3.54					80.58
134	128	78.10					38.63
135	65	12.36					92.46
141	141	102.30		4.60			62.10
142	90	4.54					10.20
146	144	35.64					153.92
147	112	557.60		274.00	50.20		358.40
148	82	4.59					9.36
149	62						2.46
153	139	10.74					351.10
154	76	30.16					20.96
MEAN		83.17	63.17	54.88	3.14		113.71

## SLOPE 150-400 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hakes	Other
122	179	25.04		6.50			290.74
123	352					29.26	166.60
124	246	4.42				1.98	278.74
131	358					35.00	283.08
132	244	15.34					288.80
133	175	15.50					34.52
139	339					12.54	237.10
140	188	31.06					21.38
145	344					4.78	194.08
152	256						570.90
MEAN		9.14		0.65		8.36	236.59

Table 11 presents the swept-area estimates of mean densities based on 33 random bottom trawl hauls. Most pelagic species are not included in the calculations. Like previous years and like in the Congo area *B. auritus* had the highest density in the 0-50 m zone, followed by *P. typus*. *B. auritus* also had the highest density in the 50-200 m zone, followed by *D. congoensis* and *U. canariensis*. In the deeper waters *Chlorophthalmus atlanticus* was the most important, followed by *Zenion hololepis*. Among the shrimps, *P. atlantica* and *P. longirostris* were most common, but the densities were low.

The mean density of all demersal species was 8.7 tonnes/nm<sup>2</sup>. This is a little higher than what was found in the Congo area, but lower than the result from last year in all depth zones, when the overall mean density was 11.6 tonnes/nm<sup>2</sup>. In survey II 1989 the mean density for Gabon was only 4.7 tonnes/nm<sup>2</sup>, but all demersal species of non commercial value may not have been included. The mean density found in 1985 was at about the same level as what found in 1994..

Table 11. GABON. Swept-area estimates of demersal species in tonnes/nm<sup>2</sup> by depth range

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES					% inci- dence	Mean dens. t/nm <sup>2</sup>	Mean densities by bottom depth strata t/nm <sup>2</sup>				
	Lower limits, Kg/nm							- 50m	50-200m	200-400m	400-600m	
	>0	10	30	100	300	1000						
Brachydeuterus auritus	2	3	1	1	1		24	1.64	3.07	1.71		
Chlorophthalmus atlanticus		3	5				24	0.91		0.12	3.94	
Dentex congoensis	8	4	3				45	0.72		1.24	0.01	
Umbrina canariensis	1	1	3				15	0.59		1.02		
Spicara alta	10	1	1				36	0.41		0.71		
Illex coindetii	18	2	1				64	0.36			0.45	0.48
Boops boops	8			1			27	0.33	0.04	0.56		
Pseudolithus senegalensis	1	1	1				9	0.32	0.28	0.45		
Antigonia capros	5		2				21	0.30		0.52		
Squalus megalops	7	4					33	0.26	0.44	0.20	0.27	
Dentex angolensis	9	3					36	0.21	0.25	0.24	0.09	
Zenion hololepis			1					0.19			0.91	
Pseudolithus typus	1	3					12	0.15	0.71			
Todaropsis ablanae	16	2					55	0.14		0.13	0.30	
Pagellus bellottii	10	1					33	0.14	0.39	0.10		
Dentex gibbosus	4	2					18	0.13	0.03	0.22		
Alloteuthis africana	6	1					21	0.11	0.20	0.12		
Pomadasys jubelini		2					6	0.11	0.49			
Ariomma bondi	9	1					30	0.11		0.17	0.04	
Setarches guentheri	2	1					9	0.09			0.43	
Eumunida squamifera	1	1					6	0.09		0.01	0.41	
Aulopus cadenati	10						30	0.09		0.02	0.34	
Galeoides decadactylus	3	1					12	0.08	0.34	0.01		
Merluccius polli	4	1					15	0.08			0.39	
Synagrops microlepis	5	1					18	0.08		0.02	0.34	
Pentheroscion mbizi	2	1					9	0.07	0.19	0.05		
Arius parkii	1	1					6	0.06	0.29			
Epinephelus aeneus		1					3	0.05		0.09		
Anthias anthias	4						12	0.05		0.09		
S H R I M P S	2						6	0.02	0.09		0.01	
Parapenaeus longirostris	6						18	0.01			0.06	
Parapenaeopsis atlantica	3						9	0.01	0.03	0.01		
Shrimps, small, non comm.	1						3	0.01	0.06			
Penaeus kerathurus	1						3					
Penaeus notialis	1						3					
Other fish								0.74	1.20	0.57	0.83	
Sum all species								8.66	8.10	8.83	8.85	
Sum Snappers								0.08	0.38			
Sum Groupers								0.05		0.09		
Sum Grunts								1.81	3.71	1.76		
Sum Croakers								1.15	1.28	1.54		
Sum Seabreams								1.60	0.72	2.47	0.10	
Sum Sharks								0.28	0.44	0.22	0.30	
Sum Rays								0.03	0.02	0.03	0.08	
Sum Squids								0.67	0.22	0.76	0.84	
Sum												
Sum commercial shrimps								0.04	0.12	0.01	0.07	

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

33

7

19

7

In Table 12 the densities of some important species and groups are multiplied by the area of the two shallowest depth zones (0-50 and 50-200 m). Some results from survey II 1989 are also given.

The summed biomass of valuable groups was 20 % lower than in 1994 because the biomass of seabreams was more than halved. The total biomass of all demersal species was also somewhat lower than in 1994 but almost the double of what was found in 1989, mainly due to higher catch rates of *B. auritus*.

Table 12. GABON. Biomass estimates (tonnes) of important species/groups by depth strata.					
	0-50 m	50- 200m	Total	1994	1989
Seabreams	3010	7150	10160	26400	17000
Croakers	5350	4450	9800	4100	350
Groupers	-	260	260	-	600
Snappers	1590	-	1590	-	800
Grunts*	2680	140	2820	-	600
Sum dem. val.	12630	12000	24630	30600	19350
All demersal	33900	25500	59400	79600	34100
Bigeye grunt	12850	4950	17800	32700	2900
Horse mackerel	-	230	230	8300	
Hairtail	3800	1200	5000	1100	

\* Not including bigeye grunt.



# Annex I Records of fishing stations

PROJECT STATION: 92  
 DATE: 15/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 500  
 start stop duration Long E 1123  
 TIME :05:52:00 06:22:00 30 (min) Purpose code: 3  
 LOG :2673.70 2675.20 1.50 Area code : 1  
 FDEPTH: 353 354 GearCond.code:  
 BDEPTH: 353 354 Validity code:  
 Towing dir: 150° Wire out:1000 m Speed: 30 kn\*10  
 Sorted: 19 Kg Total catch: 267.00 CATCH/HOUR: 534.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Scorpaena sp.	224.00	6272	41.95	
Merluccius polli	161.00	646	30.15	176
Nematocarcinus africanus	67.20		12.58	
MACROURIDAE	40.60	1260	7.60	
Nezumia aequalis	13.20	140	2.47	
Trichiurus lepturus	6.60	420	1.24	
Trigla lyra	4.80	28	0.90	
Etmopterus spinax	4.80	28	0.90	
Malacocephalus sp.	4.00	84	0.75	
Illex coindetii	3.80	56	0.71	
Lophius sp.	1.20	84	0.22	
Halosaurus ovenii	1.20	28	0.22	
MYCTOPHIDAE	1.00	252	0.19	
Coelorinchus coelorhincus	0.60	28	0.11	
Total	534.00		99.99	

PROJECT STATION: 96  
 DATE: 15/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 452  
 start stop duration Long E 1135  
 TIME :12:45:00 13:15:00 30 (min) Purpose code: 3  
 LOG : 703.90 705.40 1.50 Area code : 1  
 FDEPTH: 76 72 GearCond.code:  
 BDEPTH: 76 72 Validity code:  
 Towing dir: 350° Wire out: 250 m Speed: 30 kn\*10  
 Sorted: 359 Kg Total catch: 465.48 CATCH/HOUR: 930.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	722.80	9456	77.64	
Selene dorsalis	122.60	510	13.17	182
Brachydeuterus auritus	70.20	29126	7.54	
Trachurus sp.	2.96	24	0.43	
Raja miraletus	2.82	4	0.30	
Pagellus bellottii	1.44	10	0.15	
Pseudotolithus typus	1.38	10	0.15	
Brotula barbata	1.18	2	0.13	
Pteroscion peli	1.00	2	0.11	
Torpedo torpedo	0.98	2	0.11	
Miracorvina angolensis	0.90	2	0.10	
Dentex congolensis	0.74	2	0.08	
Parapanaeopsis atlantica	0.42	18	0.05	
Illex coindetii	0.22	2	0.02	
Sepia sp.	0.16	6	0.02	
Citharus linguatula	0.14	2	0.02	
Scomber japonicus	0.02	2		
Total	930.96		100.02	

PROJECT STATION: 93  
 DATE: 15/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 500  
 start stop duration Long E 1124  
 TIME :07:40:00 08:10:00 30 (min) Purpose code: 3  
 LOG :2678.60 2680.10 1.50 Area code : 1  
 FDEPTH: 258 260 GearCond.code:  
 BDEPTH: 258 260 Validity code:  
 Towing dir: 330° Wire out: 750 m Speed: 30 kn\*10  
 Sorted: 54 Kg Total catch: 154.50 CATCH/HOUR: 309.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pterothrissus belloci	65.60	380	21.23	
Merluccius polli	61.20	308	19.81	178
Zenopsis conchifer	45.80	72	14.82	
Trichiurus lepturus	43.80	140	14.17	
Synagrops microlepis	38.60	1782	12.49	
Brotula barbata	16.00	10	5.18	
MYCTOPHIDAE	13.00	5144	4.21	
Parapanaeus longirostris	10.00	1054	3.24	177
Illex coindetii	5.60	72	1.81	
Pamulirus argus	2.20	38	0.71	
Sepia sp.	1.60	94	0.52	
Nematocarcinus africanus	1.40		0.45	
Aulopus cadenati	1.20	94	0.39	
CONGRIDAE	0.80	22	0.26	
Pentheroscion mbizi	0.80	4	0.26	
Chlorophthalmus atlanticus	0.60	12	0.19	
Coelorinchus coelorhincus	0.40	4	0.13	
PORTUNIDAE	0.40	4	0.13	
Total	309.00		100.00	

PROJECT STATION: 97  
 DATE: 15/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 441  
 start stop duration Long E 1142  
 TIME :15:00:00 15:30:00 30 (min) Purpose code: 3  
 LOG : 719.90 721.50 1.60 Area code : 1  
 FDEPTH: 25 23 GearCond.code:  
 BDEPTH: 25 23 Validity code:  
 Towing dir: 325° Wire out: 100 m Speed: 32 kn\*10  
 Sorted: 29 Kg Total catch: 146.50 CATCH/HOUR: 293.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	109.00	520	37.20	184
Trichiurus lepturus	55.00	1180	18.77	
S H R I M P S	40.00		13.65	
Pteroscion peli	19.00	600	6.48	
Ilisha africana	17.20	230	5.87	185
Pentanemus quinquarius	15.80	520	5.39	
Pseudotolithus typus	14.40	380	4.91	
SOLEIDAE	9.20	90	3.14	
Parapanaeopsis atlantica	9.00	876	3.07	183
Sepia sp.	2.70	80	0.92	
MURAENIDAE	1.00	10	0.34	
Chloroscombrus chrysurus	0.70	10	0.24	
Total	293.00		99.98	

PROJECT STATION: 94  
 DATE: 15/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 459  
 start stop duration Long E 1124  
 TIME :08:58:00 09:28:00 30 (min) Purpose code: 3  
 LOG :2682.80 2684.30 1.50 Area code : 1  
 FDEPTH: 156 159 GearCond.code:  
 BDEPTH: 156 159 Validity code:  
 Towing dir: 145° Wire out: 450 m Speed: 30 kn\*10  
 Sorted: 48 Kg Total catch: 47.96 CATCH/HOUR: 95.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spicara alta	29.10	32	30.34	
Dentex angolensis	28.90	96	30.13	180
Pentheroscion mbizi	21.90	142	22.83	179
Illex coindetii	6.84	154	7.13	
Zenopsis conchifer	5.40	14	5.63	
Branchiostegus semifasciatus	1.76	2	1.83	
Trichiurus lepturus	1.74	16	1.81	
Uranoscopus cadenati	0.50	2	0.52	
Zeus faber	0.36	2	0.38	
Total	96.50		100.60	

PROJECT STATION: 98  
 DATE: 15/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 436  
 start stop duration Long E 1137  
 TIME :16:10:00 16:40:00 30 (min) Purpose code: 3  
 LOG : 726.70 728.40 1.70 Area code : 1  
 FDEPTH: 23 23 GearCond.code:  
 BDEPTH: 23 23 Validity code:  
 Towing dir: 310° Wire out: 100 m Speed: 34 kn\*10  
 Sorted: 24 Kg Total catch: 120.20 CATCH/HOUR: 240.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	102.50	1974	42.64	
Brachydeuterus auritus	87.00	400	36.19	186
Ilisha africana	18.80	460	7.82	187
Parapanaeopsis atlantica	7.80	1070	3.24	188
S H R I M P S	6.00		2.50	
Pseudotolithus typus	6.00	180	2.50	
Pentanemus quinquarius	4.30	190	1.79	
Pentheroscion mbizi	3.70	200	1.54	
Sepia sp.	2.50	70	1.04	
Drepane africana	0.70	20	0.29	
Galeoides decadactylus	0.60	30	0.25	
Cynoglossus mondi	0.50	10	0.21	
Total	240.40		100.01	

PROJECT STATION: 95  
 DATE: 15/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 457  
 start stop duration Long E 1127  
 TIME :10:24:00 10:54:00 30 (min) Purpose code: 3  
 LOG :2688.80 2690.30 1.50 Area code : 1  
 FDEPTH: 110 109 GearCond.code:  
 BDEPTH: 110 109 Validity code:  
 Towing dir: 360° Wire out: 350 m Speed: 30 kn\*10  
 Sorted: 62 Kg Total catch: 61.52 CATCH/HOUR: 123.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	64.00	66	52.02	
Dentex angolensis	40.70	168	33.08	181
Illex coindetii	7.98	320	6.49	
Dentex barnardi	5.22	4	4.24	
Dentex gibbosus	2.10	4	1.71	
Zenopsis conchifer	1.36	2	1.11	
Raja miraletus	1.14	2	0.93	
Lepidotrigla cadmani	0.30	4	0.24	
Citharus linguatula	0.24	4	0.20	
Total	123.04		100.02	

PROJECT STATION: 99  
 DATE: 15/ 8/95 GEAR TYPE: PT No:2 POSITION: Lat S 434  
 start stop duration Long E 1134  
 TIME :17:51:00 18:21:00 30 (min) Purpose code: 1  
 LOG :2734.00 2735.60 1.60 Area code : 1  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 25 34 Validity code:  
 Towing dir: 240° Wire out: 100 m Speed: 32 kn\*10  
 Sorted: 27 Kg Total catch: 1021.85 CATCH/HOUR: 2043.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella maderensis	1473.50	16976	72.10	190
Brachydeuterus auritus	221.20	5180	10.82	
SQUALIDAE	160.00	2	7.83	
Trichiurus lepturus	89.60	2310	4.38	
Ilisha africana	77.70	1820	3.80	189
Pentheroscion mbizi	9.80	140	0.48	
Sarda sarda	7.00	70	0.34	
Sepia sp.	4.90	70	0.24	
Total	2043.70		99.99	

PROJECT STATION: 100  
 DATE:16/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 440 Long E 1107  
 start stop duration  
 TIME :05:47:00 06:17:00 30 (min) Purpose code: 3  
 LOG :2786.00 2785.50 1.50 Area code : 1  
 FDEPTH: 367 346 GearCond.code:  
 BDEPTH: 367 346 Validity code:  
 Towing dir: 326° Wire out:1050 m Speed: 30 kn\*10

Sorted: 19 Kg Total catch: 186.60 CATCH/HOUR: 373.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	126.00		33.76	
Setarches guentheri	122.00	2986	32.69	
Merluccius polli	106.00	520	28.40	191
Trichiurus lepturus	7.00	80	1.88	
Malacocephalus occidentalis	3.00	40	0.80	
Illex coindetii	3.00	40	0.80	
MACROURIDAE	2.80	80	0.75	
Chlorophthalmus atlanticus	1.80	20	0.48	
Coelorinchus coelorhincus	1.00	20	0.27	
Aristeus varidens	0.40	20	0.11	
Parapenaeus longirostris	0.20	40	0.05	
Total	373.20		99.99	

PROJECT STATION: 101  
 DATE:16/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 439 Long E 1107  
 start stop duration  
 TIME :07:19:00 07:49:00 30 (min) Purpose code: 3  
 LOG :2789.90 2791.60 1.70 Area code : 1  
 FDEPTH: 361 256 GearCond.code:  
 BDEPTH: 361 256 Validity code:  
 Towing dir: 130° Wire out: 750 m Speed: 34 kn\*10

Sorted: 33 Kg Total catch: 114.30 CATCH/HOUR: 228.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zenopsis conchifer	44.80	42	19.60	
Synagrops microlepis	42.70	178	18.68	
Illex coindetii	35.22	690	15.41	
Aulopus cadenati	34.30	4944	15.00	
Trichiurus lepturus	27.66	120	12.10	
Pterothrissus bellocci	23.80	204	10.41	
Merluccius polli	7.22	50	3.16	
Sepia sp.	6.58	32	2.88	
Parapenaeus longirostris	6.24	1022	2.73	192
Peristedion cataphractum	0.08	8	0.03	
Total	228.60		100.00	

PROJECT STATION: 102  
 DATE:16/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 439 Long E 1108  
 start stop duration  
 TIME :08:24:00 08:54:00 30 (min) Purpose code: 3  
 LOG :2793.50 2794.70 1.20 Area code : 1  
 FDEPTH: 165 165 GearCond.code:  
 BDEPTH: 165 165 Validity code:  
 Towing dir: 310° Wire out: 510 m Speed: 24 kn\*10

Sorted: 33 Kg Total catch: 118.70 CATCH/HOUR: 237.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	108.00	180	45.49	
Trachurus. Juveniles	61.00	50020	25.70	
Zenopsis conchifer	28.30	20	11.92	
Illex coindetii	16.80	658	7.08	
Spicara alta	12.16	120	5.12	
Dentex angolensis	11.04	32	4.65	193
Sepia sp.	0.10	20	0.04	
Total	237.40		100.00	

PROJECT STATION: 103  
 DATE:16/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 438 Long E 1108  
 start stop duration  
 TIME :09:40:00 10:10:00 30 (min) Purpose code: 3  
 LOG :2797.50 2799.10 1.60 Area code : 1  
 FDEPTH: 123 124 GearCond.code:  
 BDEPTH: 123 124 Validity code:  
 Towing dir: 140° Wire out: 370 m Speed: 32 kn\*10

Sorted: 24 Kg Total catch: 23.46 CATCH/HOUR: 46.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	19.90	86	42.41	194
Trichiurus lepturus	12.10	12	25.79	
Illex sp.	9.58	668	20.42	
Dentex gibbosus	3.84	4	8.18	
Dentex congoensis	0.76	2	1.62	
Zeus faber	0.44	2	0.94	
Chaetodon hoefleri	0.30	2	0.64	
Total	46.92		100.00	

PROJECT STATION: 104  
 DATE:16/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 430 Long E 1120  
 start stop duration  
 TIME :12:05:00 12:35:00 30 (min) Purpose code: 3  
 LOG :815.30 816.70 1.40 Area code : 1  
 FDEPTH: 67 62 GearCond.code:  
 BDEPTH: 67 62 Validity code:  
 Towing dir: \* Wire out: 240 m Speed: 28 kn\*10

Sorted: 48 Kg Total catch: 48.59 CATCH/HOUR: 97.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	47.30	178	48.67	
Pentheroscion mbizi	9.80	66	10.08	
Brotula barbata	8.90	16	9.16	
Trachurus trecae	5.00	10	5.15	
Stromateus fiatola	4.30	6	4.42	
Uranoscopus albesca	3.82	44	3.93	
SOLEIDAE	3.58	50	3.68	
Brachydeuterus auritus	2.90	310	2.98	
Pseudolithus typus	2.40	2	2.47	
Atractoscion aequidens	2.26	2	2.33	
Parapenaeopsis atlantica	1.64	56	1.69	195
Torpedo torpedo	1.56	4	1.61	
Umbrina canariensis	0.94	4	0.97	
Pagellus bellottii	0.66	6	0.68	
Pseudolithus senegalensis	0.64	2	0.66	
Dentex angolensis	0.56	2	0.58	
Scorpaena normani	0.50	22	0.51	
Selene dorsalis	0.26	2	0.27	
Pseudupeneus prayensis	0.12	4	0.12	
Fistularia petimba	0.02	2	0.02	
Zeus faber	0.02	2	0.02	
Total	97.18		100.00	

PROJECT STATION: 105  
 DATE:16/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 425 Long E 1123  
 start stop duration  
 TIME :13:30:00 14:00:00 30 (min) Purpose code: 3  
 LOG :822.80 824.30 1.50 Area code : 1  
 FDEPTH: 37 33 GearCond.code:  
 BDEPTH: 37 33 Validity code:  
 Towing dir: 360° Wire out: 160 m Speed: 30 kn\*10

Sorted: 67 Kg Total catch: 418.80 CATCH/HOUR: 837.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	267.00	3596	31.88	
Trachurus trecae	177.00	218	21.13	196
Arius parkii	141.00	120	16.83	
Trichiurus lepturus	97.50	42	11.94	
Pteroscion pelli	48.00	368	5.73	
Argyrosomus regius	38.80	2	4.63	
Pseudolithus typus	32.00	16	3.82	
Galeoides decadactylus	13.50	30	1.61	
Pomadasys incisus	7.20	30	0.86	
Pentaneus quinquarius	6.60	120	0.79	
Ilisha africana	4.50	60	0.54	
Parapenaeopsis atlantica	3.00	120	0.36	
Cynoglossus senegalensis	1.50	30	0.18	
Total	837.60		100.00	

PROJECT STATION: 106  
 DATE:16/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 423 Long E 1125  
 start stop duration  
 TIME :14:40:00 15:10:00 30 (min) Purpose code: 3  
 LOG :827.40 829.00 1.60 Area code : 1  
 FDEPTH: 22 19 GearCond.code:  
 BDEPTH: 22 19 Validity code:  
 Towing dir: 340° Wire out: 140 m Speed: 32 kn\*10

Sorted: 46 Kg Total catch: 388.62 CATCH/HOUR: 777.24

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pomadasys jubelini	162.40	280	20.89	
Trichiurus lepturus	123.20	3696	15.85	
Ilisha africana	111.16	2442	14.30	
Parapenaeopsis atlantica	105.00	10500	13.51	197
Brachydeuterus auritus	72.24	3278	9.29	
S H A R K S	40.00	20	5.15	
S H R I M P S	31.92	30	4.11	
CYNOGLOSSIDAE	30.52	112	3.93	
Dasyatis margarita	21.00	28	2.70	
Pseudolithus typus	18.20	364	2.34	
MURAEINIDAE	15.96	84	2.05	
Pteroscion pelli	15.12	812	1.95	
Pentaneus quinquarius	11.76	252	1.51	
Arius parkii	9.80	112	1.26	
Sepia sp.	4.48	252	0.58	
Selene dorsalis	3.64	56	0.47	
Galeoides decadactylus	0.56	28	0.07	
Sardinella maderensis	0.28	28	0.04	
Total	777.24		100.00	

PROJECT STATION: 107  
 DATE:16/ 8/95 GEAR TYPE: PT No:2 POSITION:Lat S 504 Long E 1120  
 start stop duration  
 TIME :20:45:00 21:00:00 15 (min) Purpose code: 1  
 LOG :2865.00 2865.90 0.90 Area code : 1  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 23 23 Validity code:  
 Towing dir: 140° Wire out: 100 m Speed: 36 kn\*10

Sorted: 36 Kg Total catch: 712.20 CATCH/HOUR: 2848.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella maderensis	2484.00	23000	87.19	198
Brachydeuterus auritus	188.80	7616	6.63	
Pentheroscion mbizi	77.60	1120	2.72	
Trichiurus lepturus	71.20	1120	2.56	
Ilisha africana	27.20	720	0.95	
Total	2848.80		99.99	

PROJECT STATION: 108  
 DATE:17/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 427 Long E 1052  
 start stop duration  
 TIME :05:50:00 06:10:00 20 (min) Purpose code: 3  
 LOG :2930.20 2931.10 1.10 Area code : 1  
 FDEPTH: 297 242 GearCond.code:  
 BDEPTH: 297 242 Validity code:  
 Towing dir: 350° Wire out: 800 m Speed: 33 kn\*10

Sorted: 53 Kg Total catch: 93.28 CATCH/HOUR: 279.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	100.56	639	35.93	199
Trichiurus lepturus	49.62	171	17.73	
Synagrops microlepis	34.65	258	12.38	
Pterothrissus bellocci	30.45	162	10.88	
Aulopus cadenati	20.43	333	7.30	
Illex coindetii	19.95	153	7.13	
Arius parkii	5.46	6	1.95	
Aristeus varidens	5.01	426	1.79	200
Sepia sp.	2.94	198	1.05	
Coelorinchus coelorhincus	2.79	51	1.00	
Zenopsis conchifer	2.52	6	0.90	
Malacocephalus occidentalis	2.49	36	0.89	
MACROURIDAE	1.80	51	0.64	
CONGRIDAE	0.63	12	0.23	
Scorpaena normani	0.48	6	0.17	
Cyttopsis roseus	0.06	6	0.02	
Total	279.84		99.99	

PROJECT STATION: 109  
 DATE: 17/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 424 Long E 1044  
 start stop duration  
 TIME :07:28:00 07:58:00 30 (min) Purpose code: 3  
 LOG :2936.60 2958.20 1.60 Area code : 1  
 FDEPTH: 174 177 GearCond.code:  
 BDEPTH: 174 177 Validity code:  
 Towing dir: 130° Wire out: 510 m Speed: 32 kn\*10  
 Sorted: 29 Kg Total catch: 588.56 CATCH/HOUR: 1177.12

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	1089.60	1296	92.56
Illex coindetii	42.72	1200	3.63
Carangidae juveniles	31.20	24960	2.65
Dentex angolensis	7.44	18	0.63
Aulopus cadenati	2.88	48	0.24
Trachurus trecae	1.08	2	0.09
Citharus linguatula	0.96	48	0.08
Zeus faber	0.68	2	0.06
Dentex congongensis	0.42	2	0.04
Spicara alta	0.14	2	0.01
Total	1177.12	99.99	

PROJECT STATION: 110  
 DATE: 17/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 423 Long E 1050  
 start stop duration  
 TIME :08:40:00 09:10:00 30 (min) Purpose code: 3  
 LOG :2940.50 2942.10 1.60 Area code : 1  
 FDEPTH: 119 115 GearCond.code:  
 BDEPTH: 119 115 Validity code:  
 Towing dir: 320° Wire out: 380 m Speed: 32 kn\*10  
 Sorted: 46 Kg Total catch: 46.25 CATCH/HOUR: 92.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Illex coindetii	24.50	1224	26.49
Spicara alta	22.70	198	24.54
Dentex angolensis	17.80	134	19.24
Heptranchias perlo	8.72	2	9.43
Sarda sarda	4.94	2	5.34
Trichiurus lepturus	3.70	8	4.00
Ariomma bondi	2.68	42	2.90
Dentex congongensis	2.54	50	2.75
Branchiostegus semifasciatus	1.82	2	1.97
Saurida brasiliensis	1.12	186	1.21
Dentex gibbosus	0.56	2	0.61
Pagellus bellottii	0.46	6	0.50
Sepia officinalis hierredda	0.42	6	0.45
Trachurus trecae	0.30	6	0.32
Lepidotrigla cadmani	0.16	2	0.17
Chelidonichthys lucerna	0.08	2	0.09
Total	92.50	100.01	

PROJECT STATION: 111  
 DATE: 17/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 413 Long E 1100  
 start stop duration  
 TIME :11:00:00 11:30:00 30 (min) Purpose code: 3  
 LOG : 958.30 960.00 1.70 Area code : 1  
 FDEPTH: 75 68 GearCond.code:  
 BDEPTH: 75 68 Validity code:  
 Towing dir: 20° Wire out: 300 m Speed: 34 kn\*10  
 Sorted: 56 Kg Total catch: 166.58 CATCH/HOUR: 333.16

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichiurus lepturus	81.00	3804	24.31
Epinephelus goreensis	43.50	6	13.06
Brotula barbata	42.00	140	12.61
Trachurus, Juveniles	29.50	60	8.85
Brachydeuterus auritus	29.00	3400	8.70
Dentex congongensis	15.90	70	4.77
Dentex canariensis	10.50	20	3.45
Uranoscopus cadenati	10.60	110	3.18
Pagellus bellottii	8.80	50	2.64
CYNOGLOSSIDAE	8.50	110	2.55
Citharus linguatula	7.50	220	2.25
Pteroscion sp.	7.40	200	2.22
Umbrina canariensis	7.26	26	2.18
Scorpaena noronhai	5.20	210	1.56
Stromateus fiatola	5.30	10	1.53
Parapenaeopsis atlantica	4.00	80	1.20
S H R I M P S	3.50	1.05	
Zeus faber	2.40	10	0.72
Aulopus cadenati	2.30	80	0.69
Torpedo torpedo	2.20	10	0.66
Chaetodon hoefleri	1.70	10	0.51
Lepidotrigla cadmani	1.50	10	0.45
Ariomma bondi	0.80	10	0.24
Trigla lyra	0.70	10	0.21
Pseudupeneus prayensis	0.60	20	0.18
Merluccius polli	0.50	20	0.15
Squilla mantis	0.10	10	0.03
Lophius vaillanti	0.10	10	0.03
Total	333.16	99.98	

PROJECT STATION: 112  
 DATE: 17/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 409 Long E 1104  
 start stop duration  
 TIME :12:20:00 12:50:00 30 (min) Purpose code: 3  
 LOG : 965.80 967.20 1.40 Area code : 1  
 FDEPTH: 39 36 GearCond.code:  
 BDEPTH: 39 36 Validity code:  
 Towing dir: 360° Wire out: 150 m Speed: 28 kn\*10  
 Sorted: 77 Kg Total catch: 443.69 CATCH/HOUR: 887.38

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	474.76	5760	53.50
Pseudotolithus typus	140.26	168	15.81
Trichiurus lepturus	39.30	172	4.43
Trachurus trecae	39.00	90	4.39
Dentex angolensis	29.70	46	3.35
Umbrina canariensis	28.20	60	3.18
Pteroscion peli	22.50	256	2.54
Pomadasy peroteti	21.50	16	2.42
Plectorhynchus mediterraneus	20.56	16	2.32
Pomadasy incisus	16.66	76	1.88
MURAENIDAE	16.00	10	1.80
SQUILLIDAE	14.00	8	1.58
Epinephelus goreensis	11.50	2	1.30
Raja sp.	6.06	16	0.68
Selene dorsalis	3.46	30	0.39
Pentanemus quinquarius	3.16	46	0.36
Chaetodon hoefleri	0.76	16	0.09
Total	887.38	100.02	

PROJECT STATION: 113  
 DATE: 17/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 405 Long E 1108  
 start stop duration  
 TIME :13:50:00 14:20:00 30 (min) Purpose code: 3  
 LOG : 974.00 975.70 1.70 Area code : 1  
 FDEPTH: 18 19 GearCond.code:  
 BDEPTH: 18 19 Validity code:  
 Towing dir: 305° Wire out: 150 m Speed: 34 kn\*10  
 Sorted: 30 Kg Total catch: 433.57 CATCH/HOUR: 867.14

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Chloroscombrus chrysurus	582.00	14382	67.12
Trichiurus lepturus	51.00	660	5.88
Pomadasy jubelini	40.50	450	4.67
Sphyræna guachancho	30.00	30	3.46
Ilisha africana	29.40	720	3.39
S H R I M P S	27.00		3.11
Brachydeuterus auritus	25.80	900	2.98
Pentanemus quinquarius	20.40	630	2.35
Sardinella maderensis	12.30	450	1.42
Pseudotolithus typus	12.30	390	1.42
Pteroscion peli	11.10	270	1.28
Parapenaeopsis atlantica	9.90	690	1.14
Sepia officinalis hierredda	9.00	300	1.04
Ephippion guttifer	3.74	2	0.43
Selene dorsalis	2.70	30	0.31
Total	867.14	100.00	

PROJECT STATION: 114  
 DATE: 17/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 401 Long E 1058  
 start stop duration  
 TIME :15:40:00 16:10:00 30 (min) Purpose code: 3  
 LOG : 987.20 988.90 1.70 Area code : 2  
 FDEPTH: 34 33 GearCond.code:  
 BDEPTH: 34 33 Validity code:  
 Towing dir: 320° Wire out: 180 m Speed: 34 kn\*10  
 Sorted: 40 Kg Total catch: 196.48 CATCH/HOUR: 392.96

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	103.74	1630	26.40
Arius parkii	61.60	28	15.68
Squalus megalops	42.00	42	10.69
Pseudotolithus typus	40.60	262	10.33
Trichiurus lepturus	27.30	770	6.95
Pteroscion peli	22.96	630	5.84
S H R I M P S	21.00		5.34
Pomadasy incisus	18.48	70	4.70
Caranx hippos	14.10	2	3.59
Pentanemus quinquarius	10.92	238	2.78
Galeoides decadactylus	10.50	28	2.67
MURAENIDAE	8.00	10	2.04
Raja miraletus	4.06	14	1.03
Parapenaeopsis atlantica	3.50	476	0.89
Selene dorsalis	2.94	28	0.75
Sepia officinalis hierredda	1.26	42	0.32
Total	392.96	100.00	

PROJECT STATION: 115  
 DATE: 17/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 402 Long E 1052  
 start stop duration  
 TIME :16:55:00 17:25:00 30 (min) Purpose code: 3  
 LOG :2994.80 2996.40 1.60 Area code : 2  
 FDEPTH: 59 55 GearCond.code:  
 BDEPTH: 59 55 Validity code:  
 Towing dir: 340° Wire out: 220 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 92.91 CATCH/HOUR: 185.82

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Brachydeuterus auritus	73.90	258	39.72
Pentheroscion mbizi	25.22	168	14.11
MURAENIDAE	24.00	8	12.92
Pomadasy incisus	12.90	54	6.94
Pagellus bellottii	11.10	48	5.97
Trichiurus lepturus	9.30	192	5.00
Aulopus cadenati	7.08	324	3.81
Parapenaeopsis atlantica	6.96	252	3.75
Brotula barbata	4.62	18	2.49
Cynoglossus sp.	3.18	54	1.71
Citharus linguatula	1.50	30	0.81
Torpedo torpedo	1.38	42	0.74
Umbrina canariensis	1.14	6	0.61
Trigla lyra	1.02	6	0.55
Trachurus trecae	0.96	6	0.52
CONGRIDAE	0.30	36	0.16
Pseudupeneus prayensis	0.24	6	0.13
Squilla mantis	0.12	66	0.06
Total	185.82	100.00	

PROJECT STATION: 116  
 DATE: 17/ 8/95 GEAR TYPE: PT No:2 POSITION: Lat S 406 Long E 1044  
 start stop duration  
 TIME :18:59:00 19:29:00 30 (min) Purpose code: 1  
 LOG :3009.20 3011.00 1.80 Area code : 2  
 FDEPTH: 5 5 GearCond.code:  
 BDEPTH: 100 94 Validity code:  
 Towing dir: 56° Wire out: 100 m Speed: 36 kn\*10  
 Sorted: 120 Kg Total catch: 119.54 CATCH/HOUR: 239.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	120.60	288	50.44
Sardinella aurita	62.20	272	26.02
Trichiurus lepturus	24.20	66	10.12
Sardinella maderensis	21.30	110	8.91
Brachydeuterus auritus	7.00	3562	2.93
Selene dorsalis	1.58	8	0.66
Scomber japonicus	1.14	6	0.48
Stromateus fiatola	1.00	2	0.42
Sepia sp.	0.06	8	0.03
Total	239.08	100.01	

PROJECT STATION: 117  
 DATE:18/ 8/95 GEAR TYPE: PT No:2 POSITION:Lat S 358 Long E 1054  
 start stop duration  
 TIME :01:20:00 01:50:00 30 (min) Purpose code: 1  
 LOG : 72.40 73.90 1.50 Area code : 2  
 FDEPTH: 5 5 GearCond.code:  
 BDEPTH: 36 38 Validity code:  
 Towing dir: 146° Wire out: 100 m Speed: 30 kn\*10

Sorted: 33 Kg Total catch: 595.26 CATCH/HOUR: 1190.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	1058.40	88200	88.90	212
Aleocis alexandrinus	70.20	36	5.90	
Brachydeuterus auritus	33.48	612	2.81	
Trichiurus lepturus	20.88	396	1.75	
Sardinella aurita	3.96	36	0.33	
Ilisha africana	3.60	36	0.30	
Total	1190.52		99.99	

PROJECT STATION: 118  
 DATE:18/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 342 Long E 1051  
 start stop duration  
 TIME :03:54:00 04:24:00 30 (min) Purpose code: 3  
 LOG :3102.30 3104.10 1.80 Area code : 2  
 FDEPTH: 24 24 GearCond.code:  
 BDEPTH: 24 24 Validity code:  
 Towing dir: 322° Wire out: 150 m Speed: 36 kn\*10

Sorted: 91 Kg Total catch: 182.91 CATCH/HOUR: 365.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pseudolithus typus	51.40	52	14.05	213
Pentheroscion mbizi	48.50	1008	13.26	
Ilisha africana	46.40	3050	12.68	
Trichiurus lepturus	44.50	460	12.16	
Squalus megalops	42.70	26	11.67	
Pomadourus jubelini	42.26	90	11.55	
Galeoides decadactylus	23.18	120	6.34	
Shrimps, small, non comm.	14.50		3.96	
Brachydeuterus auritus	13.10	460	3.58	
Pomadourus incisus	8.70	30	2.38	
Arius parkii	6.66	10	1.82	
Pentapenaeus quinquecaris	5.78	250	1.58	
Parapenaeopsis atlantica	4.50	830	1.23	214
Drepane africana	2.78	2	0.76	
Citharus linguatula	2.60	40	0.71	
Sepia officinalis hierredda	2.60	50	0.71	
Chloroscombrus chrysurus	2.00	60	0.55	
Balistes capricus	1.08	2	0.30	
Stromateus fiatola	0.98	4	0.27	
Penaeus kerathurus	0.60	10	0.16	
Aulopus cadenati	0.50	20	0.14	
Sardinella aurita	0.50	50	0.14	
Total	365.82		100.00	

PROJECT STATION: 119  
 DATE:18/ 8/95 GEAR TYPE: PT No:2 POSITION:Lat S 338 Long E 1044  
 start stop duration  
 TIME :07:42:00 08:12:00 30 (min) Purpose code: 1  
 LOG :3114.10 3115.60 1.50 Area code : 2  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 29 26 Validity code:  
 Towing dir: 50° Wire out: 80 m Speed: 30 kn\*10

Sorted: 24 Kg Total catch: 24.00 CATCH/HOUR: 48.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	47.40	2634	98.75	215
Sardinella maderensis	0.34	2	0.71	
Total	47.74		99.46	

PROJECT STATION: 120  
 DATE:18/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 349 Long E 1034  
 start stop duration  
 TIME :10:40:00 10:50:00 10 (min) Purpose code: 3  
 LOG :3135.60 3136.10 0.50 Area code : 2  
 FDEPTH: 72 72 GearCond.code:  
 BDEPTH: 72 72 Validity code:  
 Towing dir: 150° Wire out: 300 m Speed: 30 kn\*10

Sorted: 46 Kg Total catch: 279.32 CATCH/HOUR: 1675.92

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	905.10	48	54.01	
Pseudolithus senegalensis	252.00	12	15.04	
Umbrina canariensis	138.60	276	8.27	216
Dentex congoensis	85.92	126	5.13	
Squalus megalops	62.40	42	3.72	
Trichiurus lepturus	47.70	126	2.85	
Dentex gibbosus	34.68	108	2.07	
Trachurus trecae	33.00	108	1.97	
Parapristipoma humile	18.90	24	1.13	
Sardinella aurita	14.52	66	0.87	
Chaetodon hoefleri	13.68	84	0.82	
Pagellus bellottii	12.60	108	0.75	
Dentex canariensis	12.42	24	0.74	
Priacanthus arenatus	10.92	42	0.65	
Spondyliostoma cantharus	10.50	84	0.63	
Pseudupeneus prayensis	9.66	42	0.58	
Galeoides decadactylus	8.22	24	0.49	
Sargocentron hastatus	2.76	24	0.16	
Boops boops	1.26	24	0.08	
Chaetodon marcellae	1.08	24	0.06	
Total	1675.92		100.02	

PROJECT STATION: 121  
 DATE:18/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 358 Long E 1023  
 start stop duration  
 TIME :14:18:00 14:48:00 30 (min) Purpose code: 3  
 LOG : 156.30 158.10 1.80 Area code : 2  
 FDEPTH: 121 110 GearCond.code:  
 BDEPTH: 121 110 Validity code:  
 Towing dir: 320° Wire out: 400 m Speed: 30 kn\*10

Sorted: 116 Kg Total catch: 116.81 CATCH/HOUR: 233.62

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	80.30	222	34.37	217
Dentex congoensis	68.10	434	29.15	218
Squatina oculata	16.40	12	7.02	
Anthias anthias	11.04	102	4.73	
Squalus megalops	10.00	2	4.28	
Sarda sarda	9.10	6	3.90	
Spicara alta	8.34	102	3.57	
Illex coindetii	7.72	512	3.30	
Ariomma bondi	6.26	150	2.68	
Trichiurus lepturus	6.00	6	2.57	
Pseudolithus senegalensis	3.10	2	1.33	
Zeus faber	3.04	4	1.30	
Dentex angolensis	2.76	18	1.18	
Dentex gibbosus	1.40	2	0.60	
Boops boops	0.06	2	0.03	
Total	233.62		100.01	

PROJECT STATION: 122  
 DATE:18/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 356 Long E 1020  
 start stop duration  
 TIME :16:05:00 16:35:00 30 (min) Purpose code: 3  
 LOG : 162.00 163.70 1.70 Area code : 2  
 FDEPTH: 173 184 GearCond.code:  
 BDEPTH: 173 184 Validity code:  
 Towing dir: 310° Wire out: 550 m Speed: 30 kn\*10

Sorted: 44 Kg Total catch: 161.14 CATCH/HOUR: 322.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MYCTOPHIDAE	99.50	60496	30.87	
Chlorophthalmus atlanticus	78.50	2376	24.36	
C E P H A L O P O D A	38.80	1108	12.04	
Trichiurus lepturus	22.50	40	6.98	
Dentex angolensis	19.10	158	5.93	220
Squalus megalops	14.50	10	4.50	
Synagrops microlepis	13.80	470	4.28	
Zeus faber	7.60	20	2.36	
Dentex congoensis	5.94	74	1.84	219
Antigonia capros	4.64	132	1.44	
Ariomma bondi	4.50	400	1.40	
Aulopus cadenati	4.10	50	1.27	
Miracorvina angolensis	3.30	10	1.02	
Pteroscion pelli	3.20	20	0.99	
Sepia officinalis hierredda	0.80	40	0.25	
Citharus linguatula	0.80	20	0.25	
Zenion sp.	0.30	10	0.09	
Trigla lyra	0.20	10	0.06	
Spicara alta	0.20	2	0.06	
Total	322.28		99.99	

PROJECT STATION: 123  
 DATE:18/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 354 Long E 1015  
 start stop duration  
 TIME :17:26:00 17:56:00 30 (min) Purpose code: 3  
 LOG :3168.30 3169.80 1.50 Area code : 2  
 FDEPTH: 357 346 GearCond.code:  
 BDEPTH: 357 346 Validity code:  
 Towing dir: 320° Wire out:1000 m Speed: 3 kn\*10

Sorted: 54 Kg Total catch: 97.88 CATCH/HOUR: 195.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	67.76	1040	34.61	
Squalus megalops	45.50	10	23.24	
Merluccius pollii	29.26	146	14.95	221
Setarches guentheri	26.60	872	13.59	
Etmopterus spinax	4.80	80	2.45	
MACROURIDAE	2.86	84	1.46	
S H R I M P S	2.70		1.38	
MYCTOPHIDAE	2.70		1.38	
Parapenaeus longirostris	2.36	356	1.21	222
Epigonus telescopus	2.16	34	1.10	
Illex coindetii	1.80	20	0.92	
CYNOGLOSSIDAE	1.76	26	0.90	
MURAENIDAE	1.60	2	0.82	
Malacocephalus occidentalis	1.36	30	0.69	
Coelorinchus coelorhincus	0.96	26	0.49	
Hoplostethus cadenati	0.76	10	0.39	
Cyttopsis roseus	0.66	6	0.34	
SQUALIDAE	0.26	6	0.13	
Total	195.86		100.05	

PROJECT STATION: 124  
 DATE:19/ 8/95 GEAR TYPE: BT No:8 POSITION:Lat S 333 Long E 956  
 start stop duration  
 TIME :05:43:00 06:13:00 30 (min) Purpose code: 3  
 LOG :3273.90 3275.40 1.50 Area code : 2  
 FDEPTH: 239 253 GearCond.code:  
 BDEPTH: 239 253 Validity code:  
 Towing dir: 146° Wire out: 750 m Speed: 30 kn\*10

Sorted: 33 Kg Total catch: 142.57 CATCH/HOUR: 285.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	106.66	2928	37.41	
MYCTOPHIDAE	99.36	44712	34.85	
Illex coindetii	20.08	314	7.04	
Synagrops microlepis	19.98	708	7.01	
Trichiurus lepturus	18.64	72	6.54	
Chelidonichthys gabonensis	5.40	54	1.89	
Dentex angolensis	4.42	12	1.55	223
Sepia officinalis hierredda	4.14	162	1.45	
Merluccius pollii	1.98	18	0.59	
Peristedion cataphractum	1.72	62	0.60	
Zenopsis conchifer	1.44	8	0.51	
Epigonus telescopus	0.46	36	0.16	
Parapenaeus longirostris	0.28	44	0.10	
Zenion sp.	0.28	44	0.10	
C R U S T A C E A N S	0.10	8	0.04	
Coelorinchus coelorhincus	0.10	8	0.04	
Trigla lyra	0.10	8	0.04	
Total	285.14		100.02	

PROJECT STATION: 125  
 DATE: 19/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 333  
 start stop duration Long E 957  
 TIME :07:22:00 07:52:00 30 (min) Purpose code: 3  
 LOG :3278.00 3279.50 1.50 Area code : 2  
 FDEPTH: 149 146 GearCond.code:  
 BDEPTH: 149 146 Validity code:  
 Towing dir: 315° Wire out: 450 m Speed: 30 km\*10  
 Sorted: 28 Kg Total catch: 141.62 CATCH/HOUR: 283.24

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Illex coindetii	109.50	38.66	
Trichiurus lepturus	87.50	30.89	
Dentex congoensis	26.60	9.39	224
Antigonia capros	24.40	8.61	
Todaropsis eblanae	12.80	4.52	
Spicara alta	10.80	3.81	
Dentex angolensis	9.90	3.50	225
Aulopus cadenati	1.00	0.35	
Peristedion cataphractum	0.74	0.26	
Total	283.24	99.99	

PROJECT STATION: 129  
 DATE: 19/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 310  
 start stop duration Long E 1020  
 TIME :15:20:00 15:50:00 30 (min) Purpose code: 3  
 LOG :326.90 328.40 1.50 Area code : 2  
 FDEPTH: 19 19 GearCond.code:  
 BDEPTH: 19 19 Validity code:  
 Towing dir: 300° Wire out: 140 m Speed: 30 km\*10  
 Sorted: 139 Kg Total catch: 291.03 CATCH/HOUR: 582.06

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Ilisha africana	96.10	14.79	232
Pomadasy's jubelini	68.58	11.78	
Pseudolithus typus	66.70	11.46	230
Pseudolithus senegalensis	58.00	9.96	
Dentex angolensis	53.20	9.14	
Brachydeuterus auritus	51.10	8.78	
Galeoides decadactylus	42.84	7.36	
Chloroscombrus chrysurus	42.00	7.22	
Lutjanus goreensis	30.00	5.15	
Erythrocles monodi	25.04	4.30	
Squalus megalops	20.00	3.44	
Sphyræna guachancho	15.36	2.64	231
Pagellus bellottii	14.10	2.42	
Chaetodipterus goreensis	6.70	1.15	
Pentanemus quinquarius	1.74	0.30	
Scyllarides sp.	0.60	0.10	
Total	582.06	99.99	

PROJECT STATION: 126  
 DATE: 19/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 332  
 start stop duration Long E 957  
 TIME :08:31:00 09:01:00 30 (min) Purpose code: 3  
 LOG :3281.10 3282.60 1.50 Area code : 2  
 FDEPTH: 119 124 GearCond.code:  
 BDEPTH: 119 124 Validity code:  
 Towing dir: 160° Wire out: 360 m Speed: 30 km\*10  
 Sorted: 64 Kg Total catch: 180.99 CATCH/HOUR: 361.98

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Dentex congoensis	187.20	51.72	227
Umbriina canariensis	98.10	27.10	228
Dentex angolensis	25.98	7.18	226
Anthias anthias	12.24	3.38	
Erythrocles monodi	10.80	2.98	
Squalus megalops	10.80	2.98	
Illex coindetii	9.18	2.54	
Zeus faber	3.90	1.08	
Todaropsis eblanae	1.20	0.33	
Chaetodon hoefleri	0.90	0.25	
Boops boops	0.72	0.20	
Ariomma bondi	0.48	0.13	
Spicara alta	0.48	0.13	
Total	361.98	100.00	

PROJECT STATION: 127  
 DATE: 19/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 324  
 start stop duration Long E 1008  
 TIME :11:00:00 11:30:00 30 (min) Purpose code: 3  
 LOG :297.40 298.90 1.50 Area code : 2  
 FDEPTH: 69 70 GearCond.code:  
 BDEPTH: 69 70 Validity code:  
 Towing dir: 140° Wire out: 250 m Speed: 30 km\*10  
 Sorted: 42 Kg Total catch: 42.03 CATCH/HOUR: 84.06

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trichiurus lepturus	34.50	68	41.04
Alloteuthis africana	19.90	5364	23.67
Selene dorsalis	16.02	110	19.06
Erythrocles monodi	5.28	10	5.28
Boops boops	2.38	300	2.83
Fistularia petimba	1.86	6	2.21
Panulirus argus	1.00	2	1.19
Dentex canariensis	0.74	2	0.88
Zeus faber	0.72	2	0.86
Todaropsis eblanae	0.38	10	0.45
Illex coindetii	0.36	14	0.43
Dactylopterus volitans	0.34	2	0.40
Pagellus bellottii	0.32	4	0.38
Trachurus juveniles	0.16	118	0.19
Dentex congoensis	0.10	2	0.12
Saurida brasiliensis	0.04	16	0.05
Scomber japonicus	0.02	16	0.02
Total	84.12	100.06	

PROJECT STATION: 128  
 DATE: 19/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 320  
 start stop duration Long E 1012  
 TIME :13:22:00 13:38:00 16 (min) Purpose code: 3  
 LOG :312.50 313.30 0.80 Area code : 2  
 FDEPTH: 47 45 GearCond.code:  
 BDEPTH: 47 45 Validity code:  
 Towing dir: \* Wire out: 150 m Speed: 31 km\*10  
 Sorted: 67 Kg Total catch: 67.27 CATCH/HOUR: 252.26

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Trichiurus lepturus	123.56	623	48.98
Apsilus fuscus	40.88	71	16.21
Seriola carpenteri	29.51	26	11.70
Brachydeuterus auritus	13.88	863	5.50
Boops boops	8.48	1241	3.36
Alloteuthis africana	7.91	15	3.14
Lutjanus fulgens	7.84	15	3.11
Dentex gibbosus	5.25	8	2.08
Pseudolithus typus	4.04	4	1.21
Scomberomorus tritor	2.59	4	1.03
Pomadasy's incisus	2.21	15	0.88
Decapterus rhonchus	1.88	4	0.75
Fistularia petimba	1.28	4	0.51
SCYLLARIDAE	1.13	4	0.45
Trachurus juveniles	1.09	71	0.43
Sarda sarda	0.64	4	0.25
UNIDENTIFIED FISH	0.53	4	0.21
Sardinella aurita	0.49	113	0.19
Scomber japonicus	0.08	60	0.09
Selene dorsalis	0.04	26	0.02
Total	252.31	100.04	

PROJECT STATION: 130  
 DATE: 19/ 8/95 GEAR TYPE: PT No:2 POSITION: Lat S 309  
 start stop duration Long E 1015  
 TIME :18:42:00 19:12:00 30 (min) Purpose code: 1  
 LOG :3336.20 3338.10 1.90 Area code : 2  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 23 29 Validity code:  
 Towing dir: 230° Wire out: 100 m Speed: 38 km\*10  
 Sorted: 51 Kg Total catch: 288.19 CATCH/HOUR: 576.38

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Ilisha africana	165.90	4962	28.78
Galeoides decadactylus	66.50	588	11.54
Chaetodipterus goreensis	44.38	98	7.70
Sphyræna guachancho	41.02	168	7.12
Dentex gibbosus	39.90	112	6.92
Scomberomorus tritor	32.48	28	5.64
Sepia sp.	30.38	56	5.27
Chloroscombrus chrysurus	26.88	406	4.66
Alectis alexandrinus	23.80	8	4.13
Brachydeuterus auritus	20.72	378	3.59
Trichiurus lepturus	13.72	238	2.38
Elops lacerta	13.30	14	2.31
Plectorhynchus mediterraneus	12.88	14	2.23
Sardinella maderensis	11.20	56	1.94
Lutjanus fulgens	11.06	14	1.92
Pteroscopus pell	8.26	28	1.43
Selene dorsalis	7.56	14	1.31
Pseudupeneus prayensis	6.44	14	1.12
Total	576.38	99.99	

PROJECT STATION: 131  
 DATE: 20/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 318  
 start stop duration Long E 939  
 TIME :05:49:00 06:19:00 30 (min) Purpose code: 3  
 LOG :3401.80 3403.40 1.60 Area code : 2  
 FDEPTH: 352 363 GearCond.code:  
 BDEPTH: 352 363 Validity code:  
 Towing dir: 315° Wire out: 1000 m Speed: 32 km\*10  
 Sorted: 42 Kg Total catch: 159.04 CATCH/HOUR: 318.08

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Chlorophthalmus atlanticus	78.72	1396	24.75
Trichiurus lepturus	63.00	276	19.81
Setarches guentheri	50.76	2278	15.96
Merluccius polli	35.00	240	11.00
Aulopus cadenati	27.00	624	8.49
MYCTOPHIDAE	18.12	8336	5.70
Illex coindetii	13.56	120	4.26
Ariomma bondi	9.00	792	2.83
Todaropsis eblanae	6.84	72	2.15
Synagrops microlepis	5.04	120	1.58
Epigonus telescopus	3.72	60	1.17
Trigla lyra	2.28	24	0.72
Paromola cuvieri	1.56	2	0.49
Parapenaeus longirostris	1.32	228	0.41
Cyttopsis roseus	0.96	24	0.30
MACROURIDAE	0.84	24	0.26
Fomatomus saltatrix	0.36	12	0.11
Total	318.08	99.99	

PROJECT STATION: 132  
 DATE: 20/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 315  
 start stop duration Long E 938  
 TIME :07:32:00 08:02:00 30 (min) Purpose code: 3  
 LOG :3407.00 3408.40 1.40 Area code : 2  
 FDEPTH: 240 247 GearCond.code:  
 BDEPTH: 240 247 Validity code:  
 Towing dir: 130° Wire out: 750 m Speed: 28 km\*10  
 Sorted: 38 Kg Total catch: 152.07 CATCH/HOUR: 304.14

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
weight	numbers		
Chlorophthalmus atlanticus	176.50	5684	58.03
Todaropsis eblanae	39.90	590	13.12
Illex coindetii	36.70	544	12.07
Zenopsis conchifer	17.50	30	5.75
Dentex angolensis	13.68	42	4.50
Synagrops microlepis	5.40	200	1.78
Squalus megalops	4.60	2	1.51
Trichiurus lepturus	4.10	10	1.35
Beryx splendens	2.20	10	0.72
Dentex congoensis	1.66	24	0.55
Pterothrissus belloci	1.60	10	0.53
Cyttopsis roseus	0.20	10	0.07
Peristedion cataphractum	0.10	10	0.03
Total	304.14	100.01	

PROJECT STATION: 133  
 DATE: 20/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 316  
 start stop duration Long E 939  
 TIME :08:38:00 09:08:00 30 (min) Purpose code: 3  
 LOG :3410.10 3411.60 1.50 Area code : 2  
 FDEPTH: 175 175 GearCond.code: 2  
 BDEPTH: 175 175 Validity code:  
 Towing dir: 320° Wire out: 510 m Speed: 30 kn\*10  
 Sorted: 25 Kg Total catch: 25.01 CATCH/HOUR: 50.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	14.98	218	29.95	235
Trichiurus lepturus	8.40	12	16.79	
Illex coindetii	7.58	96	15.15	
Todaropsis eblanae	6.80	104	13.59	
Antigonia capros	5.36	202	10.72	
Zenopsis conchifer	4.30	6	8.60	
Spicara alta	1.20	16	2.40	
Zeus faber	0.66	2	1.32	
Dentex angolensis	0.52	2	1.04	
Lepidotrigla cadmani	0.12	2	0.24	
UNIDENTIFIED FISH	0.08	4	0.16	
Peristedion cataphractum	0.02	2	0.04	
Total	50.02		100.00	

PROJECT STATION: 134  
 DATE: 20/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 315  
 start stop duration Long E 939  
 TIME :09:40:00 10:20:00 40 (min) Purpose code: 3  
 LOG :3413.60 3415.10 1.50 Area code : 2  
 FDEPTH: 127 128 GearCond.code: 2  
 BDEPTH: 127 128 Validity code:  
 Towing dir: 135° Wire out: 390 m Speed: 30 kn\*10  
 Sorted: 32 Kg Total catch: 77.80 CATCH/HOUR: 116.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	76.70	1571	65.72	236
Ariomma bondi	21.65	1061	18.55	
Spicara alta	11.52	186	9.87	
Illex coindetii	2.37	20	2.03	
Raja straeleni	1.86	2	1.59	
Todaropsis eblanae	1.10	27	0.94	
Boops boops	0.95	27	0.81	
Dentex angolensis	0.45	12	0.39	
Chelidonichthys lucerna	0.08	5	0.07	
Peristedion cataphractum	0.05	5	0.04	
Total	116.73		100.01	

PROJECT STATION: 135  
 DATE: 20/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 306  
 start stop duration Long E 950  
 TIME :11:55:00 12:25:00 30 (min) Purpose code: 3  
 LOG : 430.10 431.60 1.50 Area code : 2  
 FDEPTH: 69 60 GearCond.code: 2  
 BDEPTH: 69 60 Validity code:  
 Towing dir: 44° Wire out: 240 m Speed: 30 kn\*10  
 Sorted: 52 Kg Total catch: 52.41 CATCH/HOUR: 104.82

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alloteuthis africana	39.40	11992	37.59	
Decapterus rhonchus	18.22	28	17.38	238
Trichiurus lepturus	15.10	22	14.41	
Pagellus bellottii	12.36	56	11.79	237
Trachurus trecae	10.08	120	9.62	
Octopus vulgaris	2.48	2	2.37	
Sepiella ornata	1.72	16	1.64	
Fistularia petimba	1.20	4	1.14	
Todaropsis eblanae	1.20	12	1.14	
Selene dorsalis	0.92	6	0.88	
Sardinella aurita	0.70	6	0.67	
Sardinella maderensis	0.50	4	0.48	
Prisacanthus arenatus	0.38	2	0.36	
Lepidotrigla cadmani	0.22	2	0.21	
Illex coindetii	0.14	2	0.13	
UNIDENTIFIED FISH	0.12	2	0.11	
Peristedion cataphractum	0.08	2	0.08	
Total	104.82		100.00	

PROJECT STATION: 136  
 DATE: 20/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 301  
 start stop duration Long E 955  
 TIME :13:10:00 13:40:00 30 (min) Purpose code: 3  
 LOG : 436.80 438.30 1.50 Area code : 2  
 FDEPTH: 44 44 GearCond.code: 2  
 BDEPTH: 44 44 Validity code:  
 Towing dir: 46° Wire out: 160 m Speed: 30 kn\*10  
 Sorted: 86 Kg Total catch: 765.01 CATCH/HOUR: 1530.02

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	1012.20	12652	66.16	
Brachydeuterus auritus	402.14	31746	26.28	
Pagellus bellottii	56.48	610	3.69	
Sardinella maderensis	19.50	162	1.27	239
Sphyraena guachancho	17.64	22	1.15	
Scomberomorus tritor	8.24	8	0.54	
Trichiurus lepturus	5.46	22	0.36	
Pseudupeneus prayensis	5.04	22	0.33	
Pomadasy incisus	5.04	22	0.33	
Sardinella aurita	1.60	44	0.10	240
Decapterus punctatus	0.62	22	0.04	
Engraulis encrasicolus	0.20	42	0.01	
Total	1534.16		100.26	

PROJECT STATION: 137  
 DATE: 20/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 256  
 start stop duration Long E 959  
 TIME :14:30:00 15:00:00 30 (min) Purpose code: 3  
 LOG : 444.30 443.70 1.40 Area code : 2  
 FDEPTH: 25 23 GearCond.code: 8  
 BDEPTH: 25 23 Validity code: 9  
 Towing dir: 320° Wire out: 130 m Speed: 28 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
NO CATCH	0.00			
Total				

PROJECT STATION: 138  
 DATE: 20/ 8/95 GEAR TYPE: PT No:2 POSITION: Lat S 253  
 start stop duration Long E 944  
 TIME :19:39:00 20:17:00 38 (min) Purpose code: 1  
 LOG :3472.00 3474.30 2.30 Area code : 2  
 FDEPTH: 5 5 GearCond.code: 2  
 BDEPTH: 49 44 Validity code:  
 Towing dir: 52° Wire out: 100 m Speed: 40 kn\*10  
 Sorted: 77 Kg Total catch: 781.00 CATCH/HOUR: 1233.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	972.63	12968	78.87	241
Sardinella maderensis	53.53	284	4.34	243
Sphyraena guachancho	37.58	32	3.05	
Brachydeuterus auritus	28.11	186	2.28	
Sardinella aurita	25.11	379	2.04	244
Trachurus trecae	22.42	379	1.82	242
Alectis alexandrinus	22.42	6	1.82	
Scomber japonicus	15.32	47	1.24	
Dactylopterus volitans	14.05	32	1.14	
Selene dorsalis	12.63	32	1.02	
Decapterus rhonchus	11.84	16	0.96	
Sepia officinalis hierredda	10.26	32	0.83	
Pseudupeneus prayensis	7.26	32	0.59	
Total	1233.16		100.00	

PROJECT STATION: 139  
 DATE: 21/ 8/95 GEAR TYPE: BT No: POSITION: Lat S 301  
 start stop duration Long E 923  
 TIME :06:00:00 06:30:00 30 (min) Purpose code: 3  
 LOG :3525.30 3526.80 1.50 Area code : 2  
 FDEPTH: 331 346 GearCond.code: 2  
 BDEPTH: 331 346 Validity code:  
 Towing dir: 130° Wire out: 1000 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 124.67 CATCH/HOUR: 249.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	121.00	2364	48.53	
Trichiurus lepturus	38.40	170	15.40	
Illex coindetii	19.00	180	7.62	
Aulopus cadenati	15.00	490	6.02	
Merluccius polli	12.54	114	5.03	246
UNIDENTIFIED FISH	11.10	270	4.45	
Synagrops microlepis	8.40	240	3.37	
Parapanaeus longirostris	5.70	986	2.29	245
Squalus megalops	5.50	2	2.21	
Trigla lyra	4.70	40	1.88	
Cynoglossus sp.	2.70	40	1.08	
Todaropsis eblanae	1.20	10	0.48	
Malacocephalus occidentalis	0.80	70	0.32	
Zenion sp.	0.80	70	0.32	
Cyttopsis roseus	0.80	10	0.32	
MACROURIDAE	0.70	20	0.28	
Sepia officinalis hierredda	0.60	30	0.24	
Nezumia aequalis	0.30	10	0.12	
C R U S T A C E A N S	0.20	10	0.08	
Chaetodon marcellae	0.10	10	0.04	
Peristedion cataphractum	0.10	10	0.04	
Total	249.64		100.12	

PROJECT STATION: 140  
 DATE: 21/ 8/95 GEAR TYPE: BT No: POSITION: Lat S 259  
 start stop duration Long E 924  
 TIME :08:18:00 08:48:00 30 (min) Purpose code: 3  
 LOG :3535.20 3536.70 1.50 Area code : 2  
 FDEPTH: 189 187 GearCond.code: 2  
 BDEPTH: 189 187 Validity code:  
 Towing dir: 298° Wire out: 572 m Speed: 30 kn\*10  
 Sorted: 26 Kg Total catch: 26.22 CATCH/HOUR: 52.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	30.90	108	58.92	247
Trichiurus lepturus	9.60	18	18.31	
Spicara alta	3.28	28	6.25	
Illex coindetii	2.64	26	5.03	
Zeus faber	2.26	4	4.31	
Lepidotrigla cadmani	1.46	16	2.78	
Todaropsis eblanae	1.42	32	2.71	
Antigonia capros	0.30	6	0.57	
Pterothrissus belloci	0.22	2	0.42	
Uranoscopus cadenati	0.18	2	0.34	
Dentex congoensis	0.16	2	0.31	
Trigla lyra	0.02	2	0.04	
Total	52.44		99.99	

PROJECT STATION: 141  
 DATE: 21/ 8/95 GEAR TYPE: BT No: POSITION: Lat S 258  
 start stop duration Long E 924  
 TIME :09:24:00 09:54:00 30 (min) Purpose code: 3  
 LOG :3539.60 3541.20 1.60 Area code : 2  
 FDEPTH: 144 137 GearCond.code: 2  
 BDEPTH: 144 137 Validity code:  
 Towing dir: 120° Wire out: 430 m Speed: 30 kn\*10  
 Sorted: 84 Kg Total catch: 84.79 CATCH/HOUR: 169.58

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	52.00	280	30.66	249
Dentex congoensis	50.30	578	29.66	248
Antigonia capros	30.30	900	17.87	
Spicara alta	11.96	122	7.05	
Trichiurus lepturus	4.90	6	2.89	
Pentheroscion mbizi	4.60	38	2.71	
Todaropsis eblanae	2.74	136	1.62	
Pterothrissus belloci	2.16	16	1.27	
Illex coindetii	1.96	42	1.16	
Lepidotrigla cadmani	1.96	24	1.16	
Zenopsis conchifer	1.74	2	1.03	
Raja straeleni	1.56	2	0.92	
Ariomma bondi	0.90	10	0.53	
Aulopus cadenati	0.60	6	0.35	
Peristedion cataphractum	0.48	2	0.28	
Citharus linguatula	0.44	12	0.26	
Chelidonichthys lastoviza	0.38	12	0.22	
Cynoglossus sp.	0.02	2	0.01	
Total	169.00		99.65	

PROJECT STATION: 142  
 DATE: 21/ 8/95 GEAR TYPE: BT No: POSITION: Lat S 252 Long E 930  
 start stop duration  
 TIME :11:08:00 11:38:00 30 (min) Purpose code: 3  
 LOG : 549.50 551.00 1.50 Area code : 2  
 FDEPTH: 90 89 GearCond.code:  
 BDEPTH: 90 89 Validity code:  
 Towing dir: 320° Wire out: 270 m Speed: 30 kn\*10  
 Sorted: 7 Kg Total catch: 7.37 CATCH/HOUR: 14.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Boops boops	3.90	106	25.46	
Ariomma bondi	3.36	530	22.80	
Trichurus lepturus	2.90	4	19.67	
Torpedo torpedo	0.76	2	5.16	
Raja miraletus	0.74	2	5.02	
Illex coindetii	0.66	88	4.48	
Dentex congoensis	0.64	14	4.34	
Chelidonichthys lastoviza	0.44	6	2.99	
Priacanthus arenatus	0.40	2	2.71	
Todaropsis eblanae	0.40	20	2.71	
Lepidotrigla cadmani	0.18	8	1.22	
Citharus linguatula	0.10	2	0.68	
Trachurus trecae	0.10	2	0.68	
Saurida brasiliensis	0.08	14	0.54	
Scomber japonicus	0.06	6	0.41	
Ephippion guttifer	0.02	4	0.14	
Total	14.74		100.01	

PROJECT STATION: 146  
 DATE: 22/ 8/95 GEAR TYPE: BT No:9 POSITION: Lat S 234 Long E 903  
 start stop duration  
 TIME :08:06:00 08:36:00 30 (min) Purpose code: 3  
 LOG :3657.10 3658.60 1.50 Area code : 2  
 FDEPTH: 142 146 GearCond.code:  
 BDEPTH: 142 146 Validity code:  
 Towing dir: 320° Wire out: 420 m Speed: 30 kn\*10  
 Sorted: 47 Kg Total catch: 94.78 CATCH/HOUR: 189.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Antigonia capros	92.60	4500	48.85	
Spicara alta	57.80	570	30.49	252
Dentex congoensis	31.28	582	16.50	253
Dentex angolensis	2.20	24	1.16	
Boops boops	2.16	32	1.14	
Todaropsis eblanae	1.80	100	0.95	
Lagocephalus laevigatus	0.92	4	0.49	
Lepidotrigla cadmani	0.68	12	0.36	
Citharus linguatula	0.08	4	0.04	
Chaetodon marcellae	0.04	4	0.02	
Total	189.56		100.00	

PROJECT STATION: 143  
 DATE: 21/ 8/95 GEAR TYPE: BT No:8 POSITION: Lat S 244 Long E 934  
 start stop duration  
 TIME :12:48:00 13:00:00 12 (min) Purpose code: 3  
 LOG : 559.50 561.90 0.60 Area code : 2  
 FDEPTH: 57 55 GearCond.code: 8  
 BDEPTH: 57 55 Validity code: 9  
 Towing dir: 50° Wire out: 200 m Speed: 30 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 147  
 DATE: 22/ 8/95 GEAR TYPE: BR No:9 POSITION: Lat S 233 Long E 904  
 start stop duration  
 TIME :09:16:00 09:46:00 30 (min) Purpose code: 3  
 LOG :3661.90 3663.40 1.50 Area code : 2  
 FDEPTH: 114 110 GearCond.code:  
 BDEPTH: 114 110 Validity code:  
 Towing dir: 135° Wire out: 350 m Speed: 30 kn\*10  
 Sorted: 85 Kg Total catch: 618.10 CATCH/HOUR: 1236.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Boops boops	306.00	7928	24.75	255
Spicara alta	280.00	1654	22.65	
Umbriina canariensis	274.00	600	22.16	254
Dentex congoensis	137.40	2040	11.11	
Dentex gibbosus	80.60	100	6.52	
Epinephelus aeneus	50.20	4	4.06	
Illex coindetii	30.00	2400	2.43	
Anthias anthias	27.40	2640	2.22	
Ariomma bondi	18.80	820	1.52	
Dentex barnardi	18.60	20	1.50	
Pagellus bellottii	15.00	80	1.21	
Todaropsis eblanae	1.80	140	0.15	
Chelidonichthys lyra *	0.40	20	0.03	
Total	1240.20		100.31	

PROJECT STATION: 144  
 DATE: 21/ 8/95 GEAR TYPE: PT No:7 POSITION: Lat S 228 Long E 934  
 start stop duration  
 TIME :19:10:00 19:40:00 30 (min) Purpose code: 1  
 LOG :3588.10 3590.00 0.90 Area code : 2  
 FDEPTH: 5 5 GearCond.code:  
 BDEPTH: 20 19 Validity code:  
 Towing dir: 140° Wire out: 100 m Speed: 38 kn\*10  
 Sorted: 30 Kg Total catch: 59.64 CATCH/HOUR: 119.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella maderensis	48.60	682	40.74	250
Brachydeuterus auritus	26.72	1164	22.40	
Galeoides decadactylus	24.28	328	20.36	
Ilisha africana	5.56	296	4.66	
Sphyræna guachancho	5.12	28	4.29	
Pomadasy jubelini	3.72	16	3.12	
Chloroscombus chrysurus	2.92	48	2.45	
Pomadasy rogeri	1.60	4	1.34	
Selene dorsalis	0.56	8	0.47	
Pseudupeneus prayensis	0.08	12	0.07	
Penaus kerathurus	0.08	12	0.07	
Penaus notialis	0.08	4	0.07	
Total	119.32		100.04	

PROJECT STATION: 148  
 DATE: 22/ 8/95 GEAR TYPE: BT No:9 POSITION: Lat S 228 Long E 907  
 start stop duration  
 TIME :10:43:00 11:08:00 25 (min) Purpose code: 3  
 LOG :3667.60 3668.70 1.10 Area code : 2  
 FDEPTH: 81 83 GearCond.code:  
 BDEPTH: 81 83 Validity code:  
 Towing dir: 320° Wire out: 240 m Speed: 30 kn\*10  
 Sorted: 6 Kg Total catch: 5.81 CATCH/HOUR: 13.94

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alloteuthis africana	4.20	840	30.13	
Dentex gibbosus	3.17	5	22.74	
Illex coindetii	2.35	437	16.86	
Lepidotrigla cadmani	1.42	14	10.19	
Pagellus bellottii	1.42	14	10.19	
Priacanthus arenatus	0.89	5	6.38	
Sepiella ornata	0.31	2	2.22	
Scomber japonicus	0.14	10	1.00	
Trachurus trecae, juvenile	0.05	5	0.36	
Total	13.95		100.07	

PROJECT STATION: 145  
 DATE: 22/ 8/95 GEAR TYPE: BT No:9 POSITION: Lat S 240 Long E 901  
 start stop duration  
 TIME :05:46:00 06:16:00 30 (min) Purpose code: 3  
 LOG :3642.90 3644.60 1.50 Area code : 2  
 FDEPTH: 332 356 GearCond.code:  
 BDEPTH: 332 356 Validity code:  
 Towing dir: 140° Wire out: 1000 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 99.43 CATCH/HOUR: 198.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	92.80	1568	46.67	
Trichurus lepturus	28.16	48	14.16	
Aulopus cadenatl	27.52	1172	13.84	
Setarches guentheri	15.92	1076	8.01	
Epigonus sp.	8.48	520	4.26	
Illex coindetii	6.00	56	3.02	
Todaropsis eblanae	4.96	48	2.49	
Merluccius polli	4.78	32	2.40	
MYCTOPHIDAE	3.60	464	1.81	
Trigla lyra	2.72	32	1.37	
Parapenaeus longirostris	2.16	440	1.09	251
Nezumia aequalis	1.12	176	0.56	
Cyttopsis roseus	0.40	32	0.20	
Ceelorhinchus coelorhynchus	0.16	8	0.08	
Scorpaena stephanica	0.08	8	0.04	
Total	198.86		100.00	

PROJECT STATION: 149  
 DATE: 22/ 8/95 GEAR TYPE: BT No:9 POSITION: Lat S 228 Long E 915  
 start stop duration  
 TIME :12:50:00 13:20:00 30 (min) Purpose code: 3  
 LOG :3682.10 3683.60 1.50 Area code : 2  
 FDEPTH: 62 61 GearCond.code:  
 BDEPTH: 62 61 Validity code:  
 Towing dir: 320° Wire out: 200 m Speed: 30 kn\*10  
 Sorted: 1 Kg Total catch: 1.23 CATCH/HOUR: 2.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alloteuthis africana	1.64	392	66.67	
Priacanthus arenatus	0.50	2	20.33	
Illex coindetii	0.22	36	8.94	
Fistularia petimba	0.02	2	0.81	
Selene dorsalis, juveniles	0.02	6	0.81	
Lepidotrigla carolae	0.02	2	0.81	
Lagocephalus laevigatus	0.02	2	0.81	
Ephippion guttifer	0.02	2	0.81	
Total	2.46		99.99	

DATE:22/ 8/95 GEAR TYPE: BT No:9 PROJECT STATION: 150  
 start stop duration POSITION:Lat S 224  
 Long E 919  
 TIME :14:55:00 15:25:00 30 (min) Purpose code: 3  
 LOG :3694.50 3696.00 1.50 Area code : 2  
 FDEPTH: 44 42 GearCond.code:  
 BDEPTH: 44 42 Validity code:  
 Towing dir: 360° Wire out: 150 m Speed: 30 kn\*10

Sorted: 47 Kg Total catch: 46.59 CATCH/HOUR: 93.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	56.30	1468	60.42	257
Alloteuthis africana	23.80	12982	25.54	
Sardinella aurita	7.40	1040	7.94	256
Balistes capricornis	1.46	2	1.57	
Pagellus bellottii	1.40	20	1.50	
Scomber japonicus	0.74	76	0.79	
Sphyraena guachancho	0.56	2	0.60	
Cynoglossus sp.	0.46	2	0.49	
Sepiella ornata	0.42	2	0.45	
Dactylopterus volitans	0.30	2	0.32	
Lagocephalus laevigatus	0.18	2	0.19	
Fistularia petimba	0.10	6	0.11	
Saurida brasiliensis	0.06	10	0.06	
Total	93.18		99.98	

DATE:23/ 8/95 GEAR TYPE: BT No:9 PROJECT STATION: 153  
 start stop duration POSITION:Lat S 210  
 Long E 852  
 TIME :07:08:00 07:38:00 30 (min) Purpose code: 3  
 LOG :3821.70 3823.20 1.50 Area code : 2  
 FDEPTH: 139 138 GearCond.code:  
 BDEPTH: 139 138 Validity code:  
 Towing dir: 345° Wire out: 420 m Speed: 30 kn\*10

Sorted: 66 Kg Total catch: 180.92 CATCH/HOUR: 361.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Antigonia capros	139.80	4448	38.64	
Illex coindetii	83.10	2336	22.97	
Todaropsis eblanae	36.18	1180	10.00	
Ariomma bondi	33.54	412	9.27	
Squalus megalops	17.20	14	4.75	
Spicara alta	15.84	132	4.38	259
Dentex coenensis	10.74	234	2.97	260
Raja sp.	8.88	6	2.45	
Emunida squamifera	4.62	408	1.28	
Peristedion cataphractum	4.38	174	1.21	
Priacanthus arenatus	3.66	12	1.01	
Lagocephalus laevigatus	2.76	18	0.76	
Aulopus cadenati	0.84	6	0.23	
Zenopsis conchifer	0.30	6	0.08	
Total	361.84		100.00	

DATE:22/ 8/95 GEAR TYPE: PT No:2 PROJECT STATION: 151  
 start stop duration POSITION:Lat S 212  
 Long E 212  
 TIME :19:35:00 20:05:00 30 (min) Purpose code: 1  
 LOG :3730.90 3732.60 1.70 Area code : 2  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 25 25 Validity code:  
 Towing dir: 150° Wire out: 70 m Speed: 34 kn\*10

Sorted: 81 Kg Total catch: 1013.23 CATCH/HOUR: 2026.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	1501.24	19376	74.08	258
Brachydeuterus auritus	343.74	5562	16.96	
Sphyraena guachancho	84.00	250	4.15	
Pomadasys jubelini	69.74	200	3.44	
Sardinella maderensis	19.00	4726	0.94	
Galeoides decadactylus	4.50	200	0.22	
Selene dorsalis	3.50	250	0.17	
Trachurus trecae	0.74	50	0.04	
Total	2026.46		100.00	

DATE:23/ 8/95 GEAR TYPE: BT No:9 PROJECT STATION: 154  
 start stop duration POSITION:Lat S 204  
 Long E 858  
 TIME :08:50:00 08:58:00 8 (min) Purpose code: 3  
 LOG :3832.10 3832.50 0.40 Area code : 2  
 FDEPTH: 76 76 GearCond.code:  
 BDEPTH: 76 76 Validity code:  
 Towing dir: 150° Wire out: 225 m Speed: 3 kn\*10

Sorted: 14 Kg Total catch: 6.81 CATCH/HOUR: 51.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sarpa salpa	16.13	165	31.58	
Priacanthus arenatus	7.65	30	14.98	
Todaropsis eblanae	6.23	465	12.20	
Dentex canariensis	4.05	8	7.93	
Pagellus bellottii	3.98	38	7.79	
Dentex gibbosus	3.45	15	6.75	
Zeus faber	2.70	8	5.29	
Sparus pagrus africanus *	2.55	8	4.99	
Fistularia petimba	1.88	8	3.68	
Chaetodon sp.	0.60	8	1.17	
Spicara alta	0.60	8	1.17	
Pseudupeneus prayensis	0.53	8	1.04	
Ariomma bondi	0.30	8	0.59	
Peristedion cataphractum	0.23	8	0.43	
Chelidionichthys lucerna	0.08	8	0.16	
Selene dorsalis	0.08	8	0.16	
Scomber japonicus	0.08	8	0.16	
Total	51.12		100.09	

DATE:23/ 8/95 GEAR TYPE: BT No:9 PROJECT STATION: 152  
 start stop duration POSITION:Lat S 210  
 Long E 851  
 TIME :05:33:00 06:03:00 30 (min) Purpose code: 3  
 LOG :3814.00 3815.00 1.50 Area code : 2  
 FDEPTH: 260 252 GearCond.code:  
 BDEPTH: 260 252 Validity code:  
 Towing dir: 165° Wire out: 750 m Speed: 30 kn\*10

Sorted: 31 Kg Total catch: 285.45 CATCH/HOUR: 570.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Zenion hololepis	191.28	20172	33.50	
Chlorophthalmus atlanticus	176.40	5444	30.90	
Emunida squamifera	85.92	6074	15.05	
Synagrops microlepis	31.92	2040	5.59	
Dasyatis centroura	16.74	2	2.93	
Lepidotrigla cadmani	10.80	144	1.89	
Epigonus telescopus	9.60	1968	1.68	
Sepia officinalis hierredda	8.16	384	1.43	
Todaropsis eblanae	7.92	96	1.39	
Bembrops heterurus	6.96	144	1.22	
Trigla lyra	6.00	72	1.05	
Peristedion cataphractum	4.80	216	0.84	
Aulopus cadenati	4.08	48	0.71	
Illex coindetii	2.16	24	0.38	
Nesunia aequalis	1.68	48	0.29	
Cypselurus sp.	1.20	24	0.21	
Epigonus sp.	1.20	24	0.21	
Parapenaeus longirostris	0.96	168	0.17	
Cyttopsis roseus	0.96	48	0.17	
SQUALIDAE	0.72	48	0.13	
Hoplostethus mediterraneus	0.72	24	0.13	
Coelorinchus coelorhincus	0.72	24	0.13	
Total	570.90		100.00	

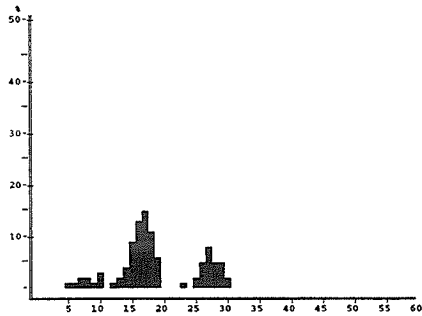
DATE:23/ 8/95 GEAR TYPE: BT No:9 PROJECT STATION: 155  
 start stop duration POSITION:Lat S 155  
 Long E 911  
 TIME :11:00:00 11:30:00 30 (min) Purpose code: 3  
 LOG :3849.10 3850.60 1.50 Area code : 2  
 FDEPTH: 29 27 GearCond.code:  
 BDEPTH: 29 27 Validity code:  
 Towing dir: 140° Wire out: 150 m Speed: 30 kn\*10

Sorted: 65 Kg Total catch: 65.87 CATCH/HOUR: 131.74

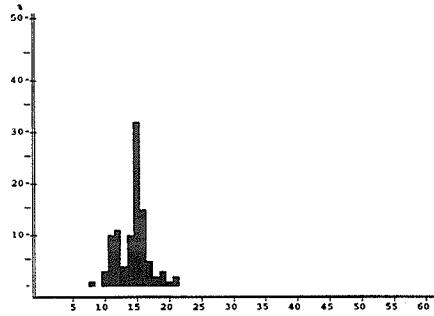
SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	74.30	1310	56.40	262
Engraulis encrasicolus	14.44	3790	10.96	
Alloteuthis africana	10.92	4658	8.29	
Pagellus bellottii	9.70	128	7.36	
Decapterus rhonchus	8.70	76	6.60	
Sphyraena guachancho	3.80	74	2.88	261
Sardinella aurita	3.56	1038	2.70	
Trichiurus lepturus	1.60	116	1.21	
Sarpa salpa	1.04	10	0.79	
Sardinella maderensis	0.76	32	0.58	
Penaeus notialis	0.72	24	0.55	
Cynoglossus sp.	0.56	2	0.43	
Selene dorsalis	0.56	2	0.43	
Fistularia petimba	0.34	6	0.26	
Trachurus, Juveniles	0.28	420	0.21	
Torpedo torpedo	0.28	2	0.21	
Pseudupeneus prayensis	0.10	6	0.08	
Sepia officinalis hierredda	0.04	2	0.03	
Anthias anthias	0.04	6	0.03	
Total	131.74		100.00	



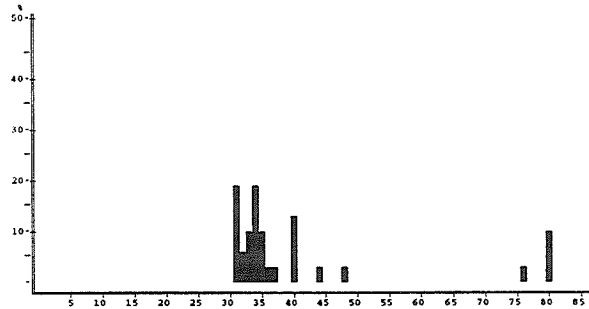
## Annex II. CONGO. Length distributions of main species



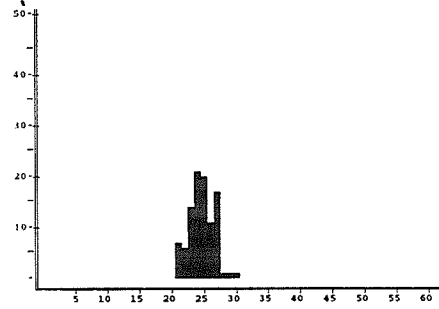
**Dentex angolensis**  
 CONGO  
 MEAN LENGTH = 19.07cm N= 235  
 NUMBER OF SUBSAMPLES : 6



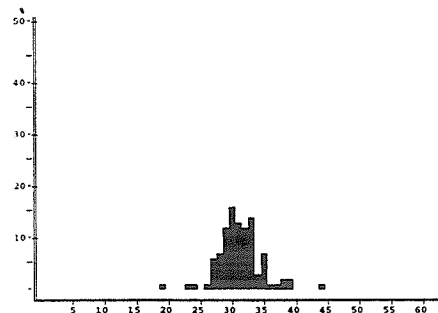
**Brachydeuterus auritus**  
 CONGO  
 MEAN LENGTH = 15.00cm N= 92  
 NUMBER OF SUBSAMPLES : 2



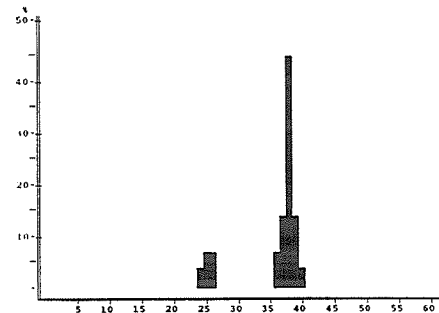
**Pseudotolithus typus**  
 CONGO  
 MEAN LENGTH = 41.15cm N= 32  
 NUMBER OF SUBSAMPLES : 1



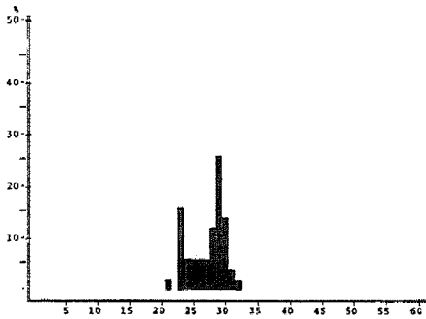
**Pentheroscion mbizi**  
 CONGO  
 MEAN LENGTH = 25.18cm N= 71  
 NUMBER OF SUBSAMPLES : 1



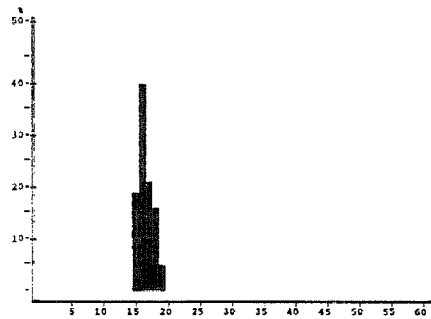
**Merluccius polli**  
 CONGO  
 MEAN LENGTH = 31.66cm N= 180  
 NUMBER OF SUBSAMPLES : 4



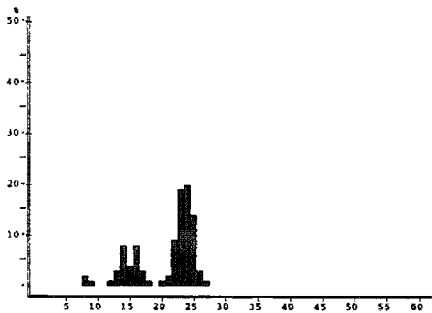
**Trachurus trecae**  
 CONGO  
 MEAN LENGTH = 36.21cm N= 29  
 NUMBER OF SUBSAMPLES : 1



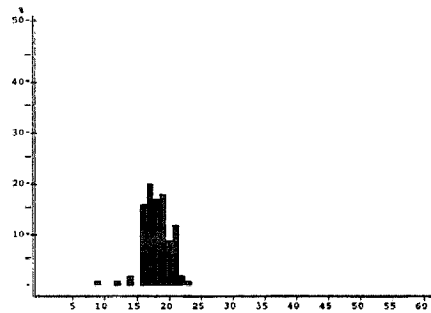
*Selene dorsalis*  
 CONGO  
 MEAN LENGTH = 27.69cm N= 50  
 NUMBER OF SUBSAMPLES : 1



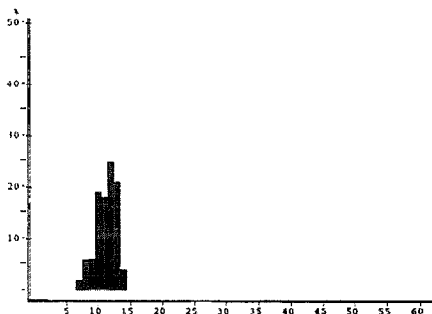
*Chloroscombrus chrysurus*  
 CONGO  
 MEAN LENGTH = 16.99cm N= 43  
 NUMBER OF SUBSAMPLES : 1



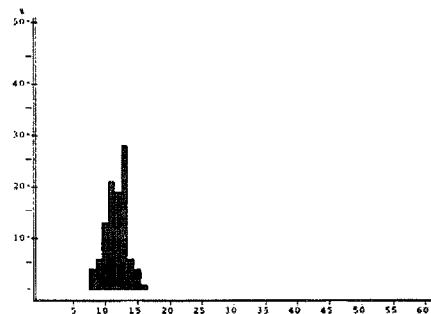
*Sardinella maderensis*  
 CONGO  
 MEAN LENGTH = 21.35cm N= 200  
 NUMBER OF SUBSAMPLES : 2



*Ilisha africana*  
 CONGO  
 MEAN LENGTH = 18.63cm N= 95  
 NUMBER OF SUBSAMPLES : 3

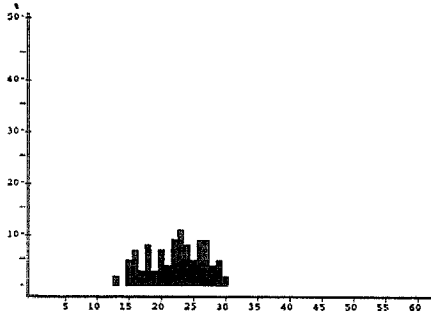


*Parapenaeopsis atlantica*  
 CONGO  
 MEAN LENGTH = 11.71cm N= 225  
 NUMBER OF SUBSAMPLES : 4

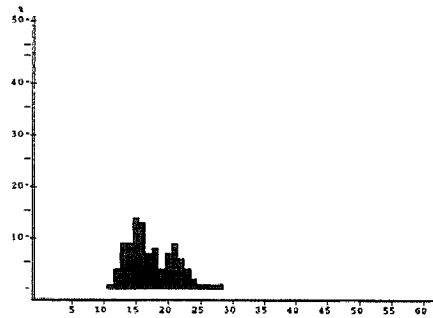


*Parapenaeus longirostris*  
 CONGO  
 MEAN LENGTH = 12.26cm N= 204  
 NUMBER OF SUBSAMPLES : 2

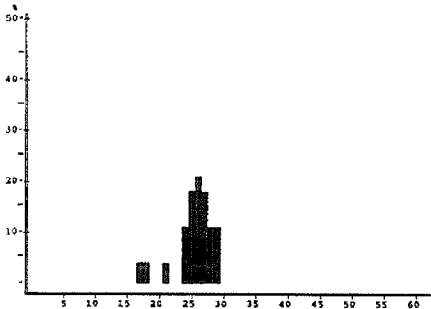
# Annex III. GABON. Length distributions of main species



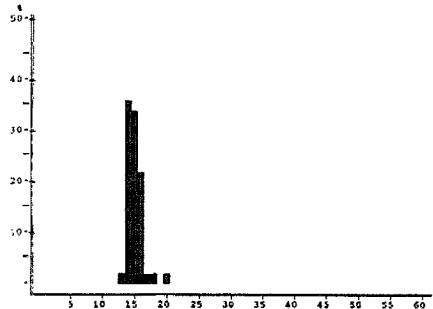
*Dentex angolensis*  
GABON  
MEAN LENGTH = 22.82cm N= 255  
NUMBER OF SUBSAMPLES : 7



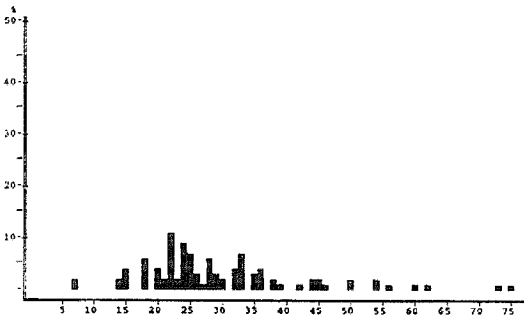
*Dentex congoensis*  
GABON  
MEAN LENGTH = 17.65cm N= 656  
NUMBER OF SUBSAMPLES : 9



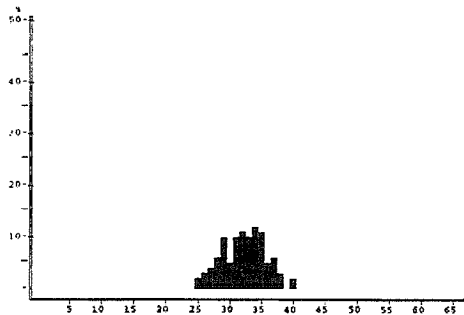
*Pagellus bellottii*  
GABON  
MEAN LENGTH = 26.04cm N= 28  
NUMBER OF SUBSAMPLES : 1



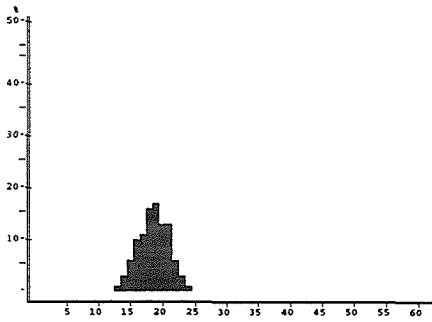
*Roops boops*  
GABON  
MEAN LENGTH = 15.52cm N= 50  
NUMBER OF SUBSAMPLES : 1



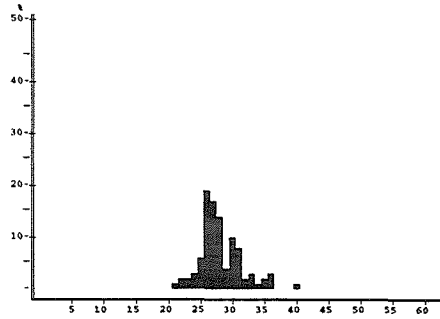
*Pseudotolithus typus*  
GABON  
MEAN LENGTH = 30.32cm N= 69  
NUMBER OF SUBSAMPLES : 3



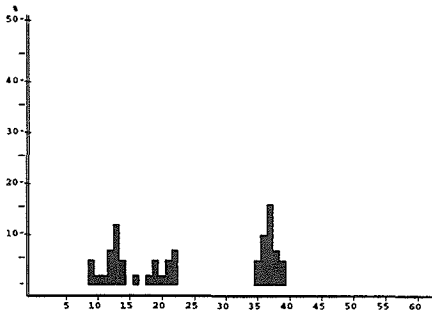
*Umbrina canariensis*  
GABON  
MEAN LENGTH = 32.63cm N= 131  
NUMBER OF SUBSAMPLES : 4



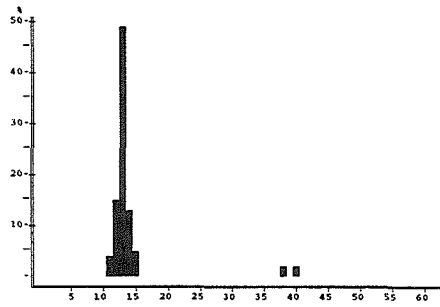
*Spicara alta*  
 GABON  
 MEAN LENGTH = 19.16cm N= 119  
 NUMBER OF SUBSAMPLES : 2



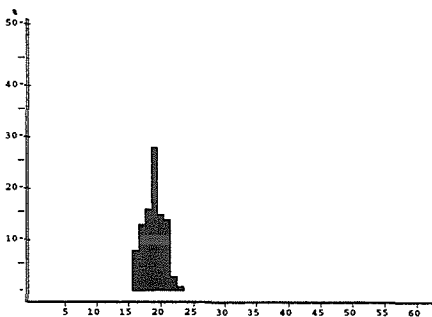
*Merluccius polli*  
 GABON  
 MEAN LENGTH = 28.66cm N= 204  
 NUMBER OF SUBSAMPLES : 3



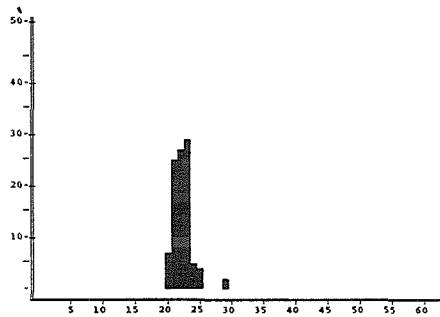
*Trachurus trecae*  
 GABON  
 MEAN LENGTH = 25.14cm N= 74  
 NUMBER OF SUBSAMPLES : 2



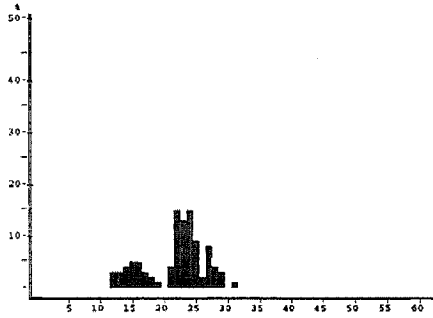
*Decapterus rhonchus*  
 GABON  
 MEAN LENGTH = 14.96cm N= 68  
 NUMBER OF SUBSAMPLES : 2



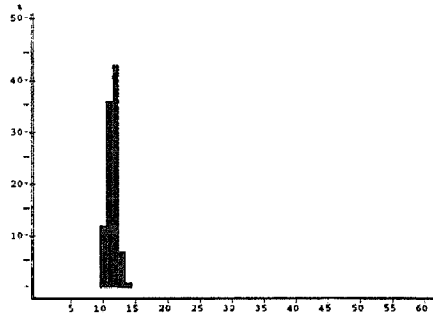
*Chloroscombrus chrysurus*  
 GABON  
 MEAN LENGTH = 19.43cm N= 185  
 NUMBER OF SUBSAMPLES : 2



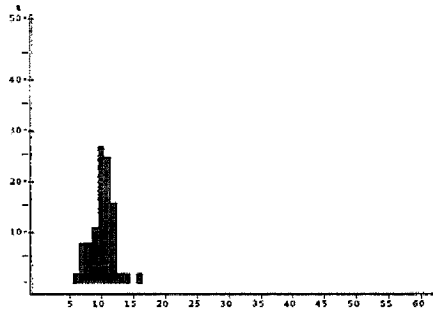
*Selene dorsalis*  
 GABON  
 MEAN LENGTH = 22.74cm N= 55  
 NUMBER OF SUBSAMPLES : 1



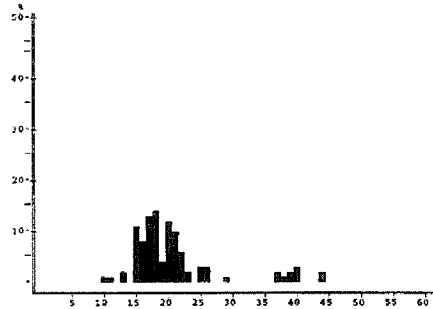
*Sardinella maderensis*  
 GABON  
 MEAN LENGTH = 22.28cm N= 249  
 NUMBER OF SUBSAMPLES : 4



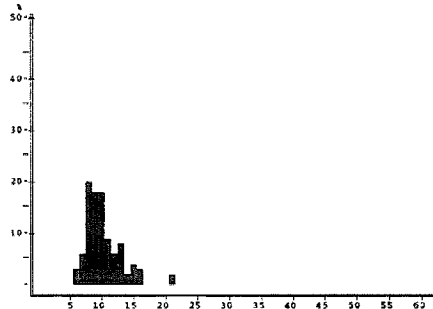
*Sardinella aurita*  
 GABON  
 MEAN LENGTH = 12.03cm N= 249  
 NUMBER OF SUBSAMPLES : 6



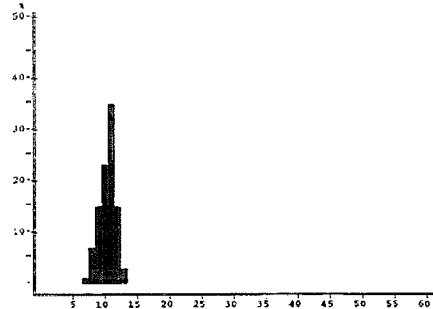
*Ilisha africana*  
 GABON  
 MEAN LENGTH = 10.70cm N= 64  
 NUMBER OF SUBSAMPLES : 1



*Sphyræna guachancho*  
 GABON  
 MEAN LENGTH = 21.01cm N= 85  
 NUMBER OF SUBSAMPLES : 2



*Parapenaeopsis atlantica*  
 GABON  
 MEAN LENGTH = 10.84cm N= 159  
 NUMBER OF SUBSAMPLES : 3



*Parapenaeus longirostris*  
 GABON  
 MEAN LENGTH = 10.89cm N= 323  
 NUMBER OF SUBSAMPLES : 3

## **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	0.00 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	28.0 dB
TS transducer gain	27.9 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	100, 250 and 500 m
Range start	0
Bottom range	12 m
Bottom range start	10 m
Sv colour min	-72 dB
TVG	20 log R

**Bottom detection menu** Minimum level -50 dB

### **Fishing gear**

The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super bottom trawl". Both the bottom trawl and the smallest pelagic trawl were used during the survey.

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm meshsize in the codend with an innernett of 10 mm meshsize. The estimated opening is 6 m (observed 5.7) and distance between wings during towing about 18 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. The doors are of 'Thyborøn' combi type, 7.81 m<sup>2</sup>, 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).

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.

