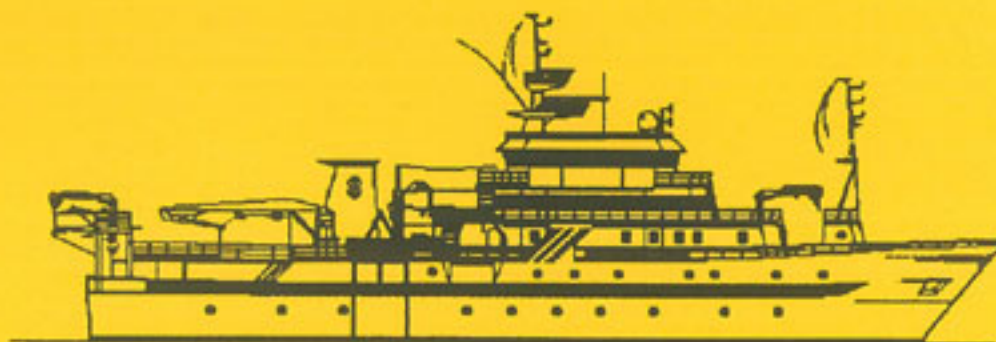


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CRUISE REPORTS 'DR. FRIDTJOF NANSEN'



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

**Cruise report No 2/94**

**20 - 30 August 1994**

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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:
  - \* sardinella
  - \* Cunene horse mackerel
  - \* 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 to monitor the temperature, salt and oxygen regimes on standard profiles.

### 1.2 PARTICIPATION

From the Direction Générale de la Pêche, Brazzaville:

Appolinaire NGOUEMBE, André BITOUMBA and Blaise EBONKOLI.

From the Centre ORSTOM, Pointe Noire:

Lucien MALOUEKI.

From the Direction des Pêches Maritimes, Libreville:

Agnes BOULINGUI ILAMA and Boulanga MOULEKA NZONDO.

From the FAO Fisheries Department, Rome:

Corinna SOMMER

From the Institute of Marine Research, Bergen:

Martin DAHL, Ole GULLAKSEN, Reidar JOHANNESSEN, Sigbjørn MEHL and Helge ULLEBUST.

### 1.3 NARRATIVE

The survey started at Pointe Noire in the morning of 20 August 1994 with the hydrographic profile off Pointe Noire. Systematic transects, about 10 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. A few deep water hauls on the slope were carried out during dark hours. Pelagic trawling with mid-water trawl 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 20 to 23 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 23 to 30 August, and the hydrographic profiles off Pointe Panga and off Iguéla were made on 25 and 30 August respectively.

The survey terminated just south of the protected area on 30 August. Thereafter the vessel steamed southwards to Pointe Noire.

### 1.4 SURVEY EFFORT

Figure 1 shows the course tracks with fishing stations and the hydrographic profiles.

The number of hauls can be summarized as follows:

	Pelagic hauls	Bottom hauls	Distance surveyed
Congo	3	14	370 nm
Gabon	10	41	1 050 nm

The total number of CTD stations was 15.

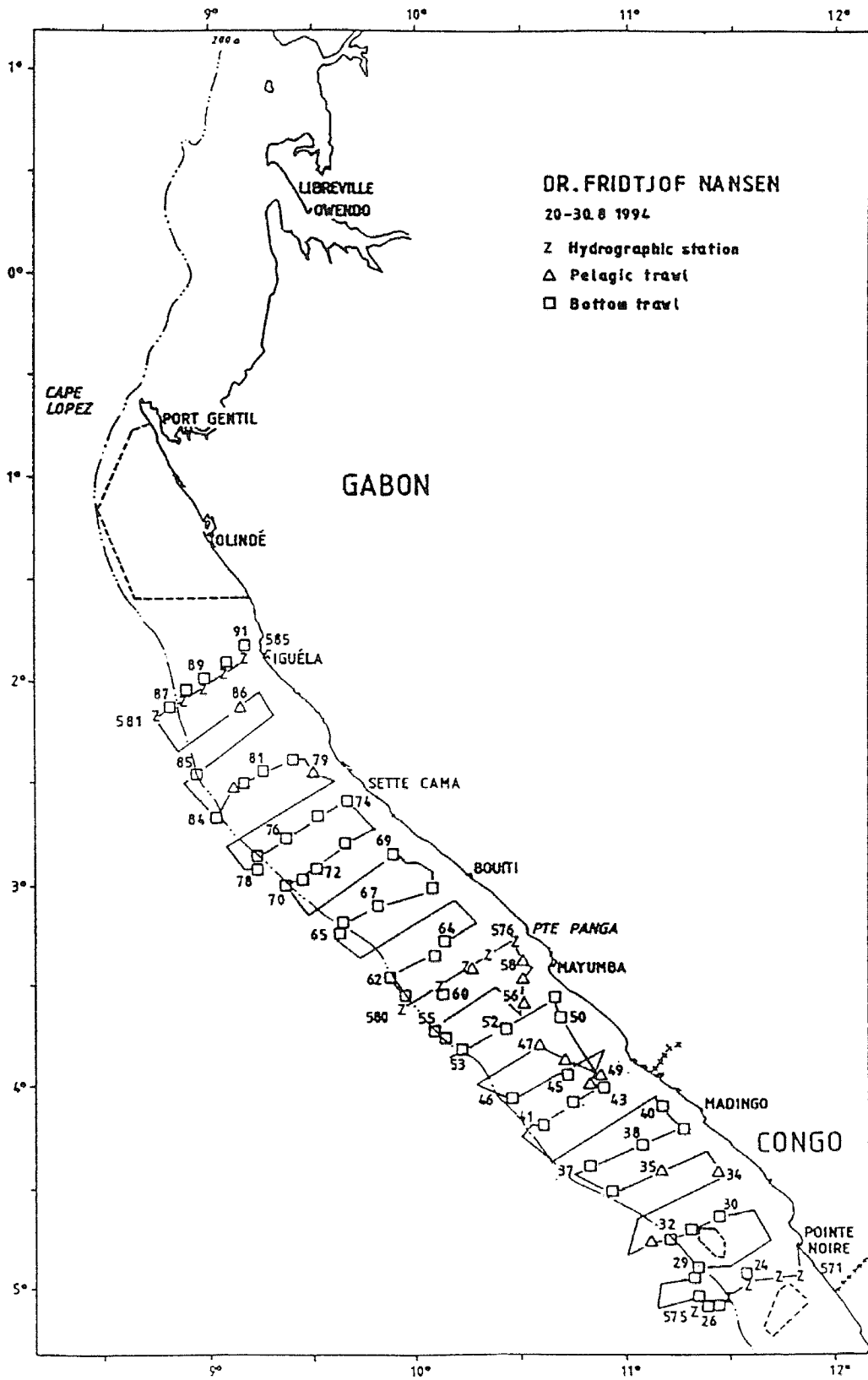


Fig. 1 Course tracks, fishing stations and hydrographic profiles.

## 1.5 METHODS

The catches were sampled for species composition, by weight and numbers. Length distributions (total length, also for shrimp) were taken of the main species, and biological samples, i.e. length, weight, sex and maturity stages were taken of sardinellas (*Sardinella maderensis* and *S. aurita*) and Cunene horse mackerel (*Trachurus trecae*).

A description of the acoustic instruments and their standard settings is given in Annex IV.

The following target strength (TS) function was applied to convert  $S_A$ -values to number of fish (sardinellas and horse mackerel):

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

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

where  $L$  is total length. The following formula was programmed into Excel (5.0) sheets to calculate the number of fish in length groups (cm) in subareas within each region:

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

where:

- $N_i$  = number of fish in length group  $i$
- $A$  = area in  $\text{nm}^2$
- $S_A$  = mean integrator value in the subarea
- $p_i$  = proportion of fish in length group  $i$  in samples from the subarea
- $C_{Fi}$  = fish conversion factor (formula 2) applying the length of fish in length group  $i$

The number per length group were then summed and the total number of fish obtained. The biomass of fish was calculated applying calculated average weight per length group, multiplied by the number of fish in the same length groups. The number and biomass per length group in the subareas were at last summed to obtain the total number and biomass per length group in each region.



The  $S_A$ -values were divided among the following categories of fish on the basis of trawl catches and characteristics of the echotraces:

- plankton
- sardinella
- horse mackerel
- PEL1 (anchovies, clupeids)
- PEL2 (carangids, scombrids, barracudas and hairtails)
- bigeye grunt (*Brachydeuterus auritus*)
- demersal fish

In the trawl survey programme all catches were sampled for composition by weight and numbers by species. The bottom trawl has a headline of 31 m (float line), footrope 47 m, estimated headline height 5 m and distance between wings during towing about 18 m. During trawling a 9.5 m long rope was fastened between the wires 150 m in front of the doors giving a constant distance between the doors of 49-50 m. All trawl hauls were monitored by SCANMAR trawl sensors (bottom contact, headline height and distance between the doors) and the actual time the trawl was fishing on the bottom was determined with improved accuracy. For conversion of catch rates to fish densities the area between the wings is assumed to be the effective fishing area. The catchability coefficient was considered to be equal to 1. With the new vessel a new trawl gear was introduced with smaller bobbins. This gear gives better bottom contact and higher catch rates for some bottom dwelling species (e.g. monk and sole). For other species (e.g. hake) the new gear is assumed to have no difference in performance. The trawl, warp and wire dimensions are as with the former vessel (see Annex IV for details). The length of a haul, recorded as distance over bottom was measured by doppler log on the bottom.

The problem of mid-water occurrence of demersal species and its effect on the swept-area assessments have been covered in cruise reports from Namibia (hake-surveys). Based on the acoustic registrations of demersal species during the present survey, mid-water occurrence constituted only a minor problem in the Congo - Gabon area.

The following areas ( $\text{nm}^2$ ) are used in the swept-area biomass estimates:

	Congo	Gabon
0- 50 m	750	4 182
50-200 m	1 770	2 893

## CHAPTER 2    HYDROGRAPHY

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### 2.1 INSTRUMENTS AND METHODS

Continuous profiles of temperature, salinity and oxygen were obtained with a Seabird 911 CTD Plus system. The data were recorded in real time on a PC on board, using the Seabird SEASAVE software. As a routine the profiles were taken down to a few meters above the bottom, and two NISKIN bottles were triggered for water samples. These were usually taken near the bottom and near the surface (typically at about 5 m depth), and samples were taken for analysis of oxygen and salinity.

### 2.2 RESULTS

#### Vertical sections

In the section off Pointe Noire (Fig. 2) the surface temperature was 21-22°C, which is about 6-7°C lower than in March this year. Like in March the main thermocline was observed near the surface. Also now some signs of off shore low surface salinity were observed, with values below 32 psu (not shown in Fig. 2). This may be related to the Congo Current, which during winter flows westwards off the shelf and merges seawards with the South Equatorial Current. The oxygen distribution gives an impression of an upwelling situation, with low oxygen water penetrating up on the shelf. However, neither the temperature nor the salinity distribution show characteristics typical for upwelling. The oxygen content on the shelf is not likely to limit the distribution of fish.

In the section off Pointe Panga (Fig. 3) the thermocline was a little weaker than off Pointe Noire and the surface temperature was 22°C. The surface layer was more saline, indicating less influence by the Congo River. No subsurface salinity maximum was observed and the water was well stratified. The oxygen content on the shelf was slightly higher than off Point Noire.

In the section off Iguéla (Fig. 4) the surface temperature was 24°C and the thermocline was observed at about 25 m. It was a little stronger than off Pointe Panga. The surface water was less saline than off Pointe Panga, but the salinity was not as low as off Pointe Noire. The oxygen content in the surface layer was slightly lower than in the two other profiles. Like in the section off Pointe Panga both the isotherms, isohalines and the isolines for oxygen were near horizontal, indicating less dynamic activity in this region than off Pointe Noire.

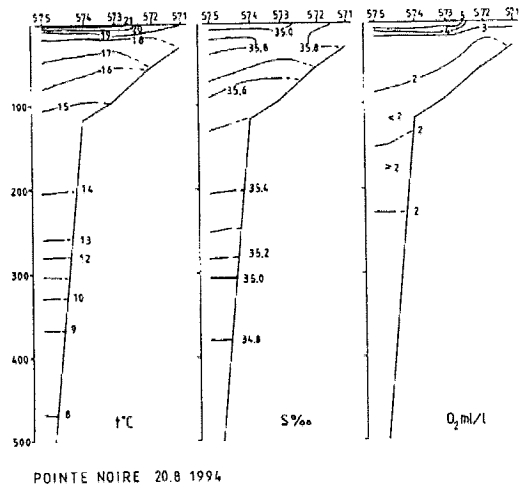


Fig. 2 Pointe Noire. Vertical sections of temperature, salinity and oxygen.

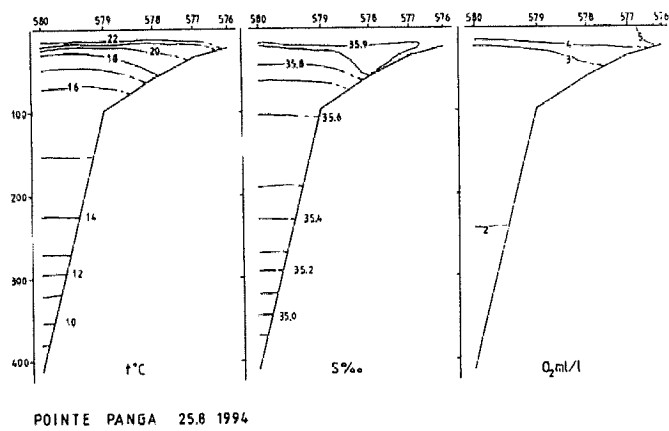


Fig. 3 Pointe Panga. Vertical sections of temperature, salinity and oxygen.

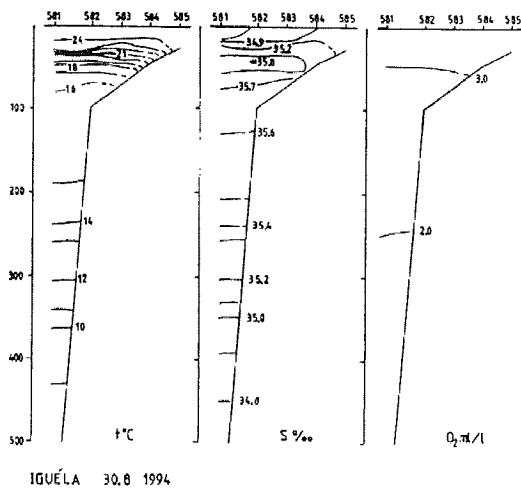


Fig. 4 Iguéla. Vertical sections of temperature, salinity and oxygen.

## CHAPTER 3 ACOUSTIC SURVEY: FISH DISTRIBUTION AND ABUNDANCE ESTIMATES OF PELAGIC SPECIES

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Figures 5 and 7 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  $0.1 \cdot \text{m}^2/\text{nm}^2$ , and an arbitrary scale has been used to illustrate different levels of concentration. The length distributions used in the acoustic estimates are weighted by the acoustic index ( $S_A$ -values on the 5-mile where the sample was taken). The weight by length group used to calculate the biomasses were determined by applying estimated condition factors (CF=0.90 for *S. maderensis*, CF=0.83 for *S. aurita* and CF=0.94 for *T. trecae*).

### 3.1 CONGO

#### Clupeids

Sardinellas were distributed (Fig. 5) over the whole northern part of the Congo shelf to Mayumba (Gabon), with some scattered recordings off Pointe Noire, most of them over deep water. The densest recordings were made in shallow waters. Successful trawling was done only during nighttime. *S. maderensis* (flat sardinella) consisted of mainly adult fish, while *S. aurita* (round sardinella) had a higher proportion of juveniles (Fig. 6).

Both combined and separate estimates of the two sardinella species were made for the Congo area. The total biomass was calculated to 24 000 and 26 000 tonnes by the first and second method respectively, and about 25% of the biomass was *S. aurita*. The total biomass is slightly higher than what was found in March 1994 (22 000 tonnes), and about the double of what was measured in survey II 1989.

*Ilisha africana* was only caught in small amounts on three stations on the inner shelf of Northern Congo and no estimate of abundance was made for this species.

#### Anchovy

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

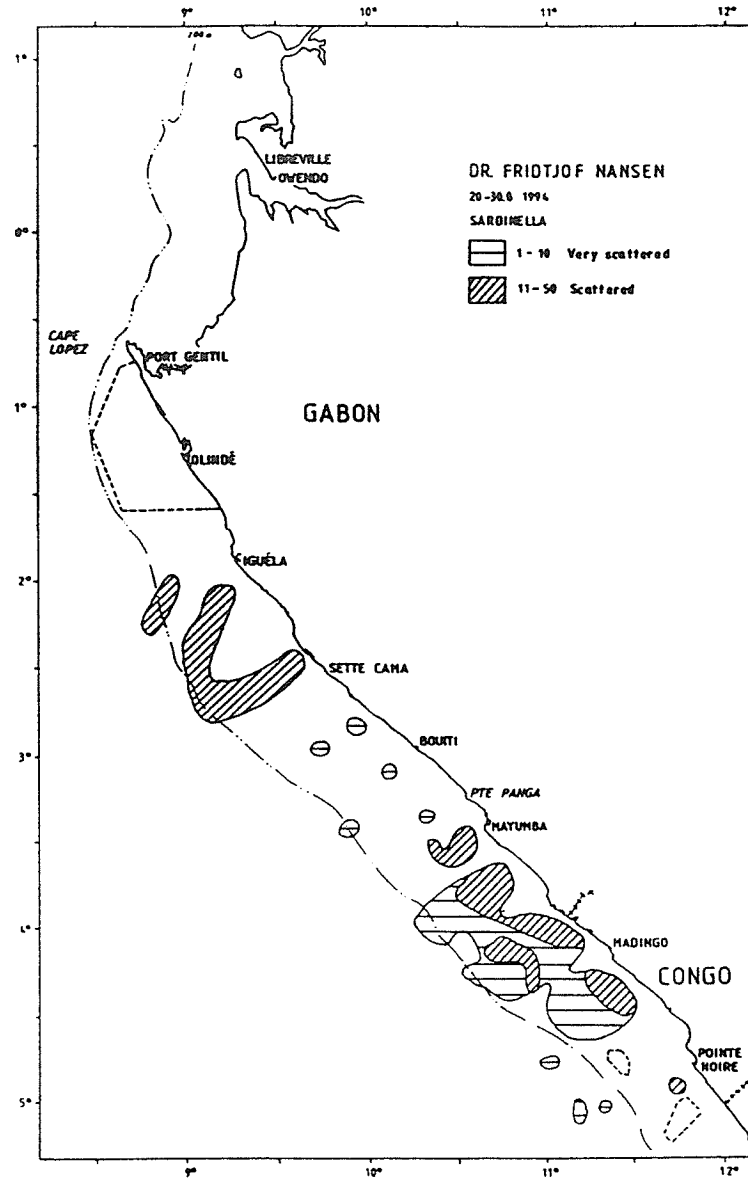


Fig. 5 Distribution and abundance of sardinellas outside Congo - Gabon

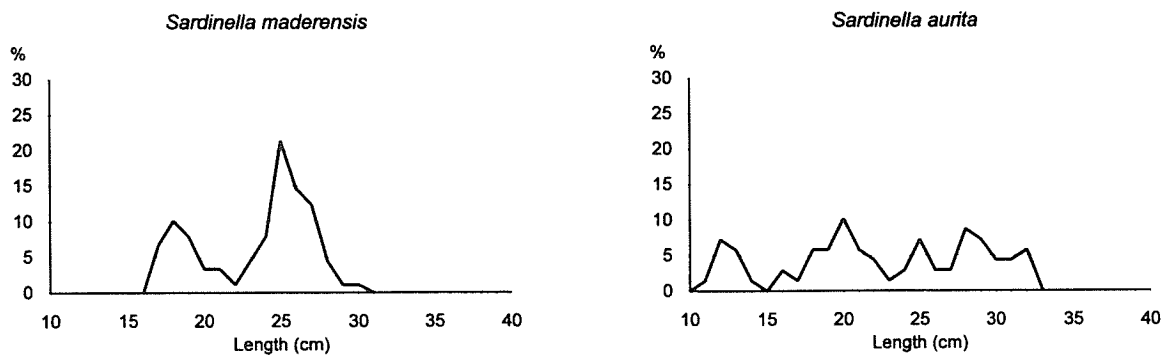


Fig. 6 Total length distributions of sardinellas in the Congo area.

## Horse mackerel

*Trachurus trecae* was recorded over a large area off Pointe Noire, from the middle of the shelf and out to the 200 m isobath (Fig. 7). In addition some scattered schools were recorded on the inner and outer shelf near the Gabon border. Almost all of the horse mackerel in this area was adult fish (Fig. 8). The biomass was estimated to 10 800 tonnes.

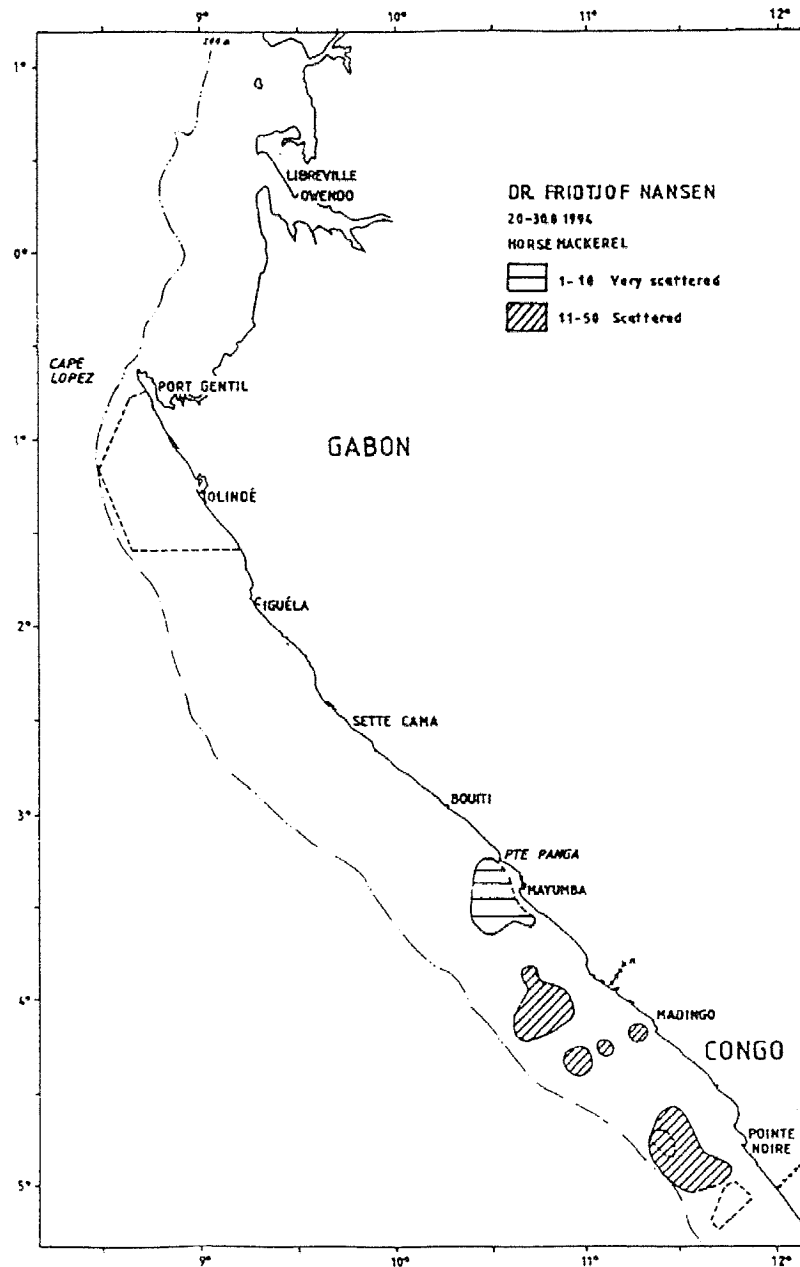


Fig. 7 Distribution and abundance of *Trachurus trecae* outside Congo - Gabon

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

*Chloroscombrus chrysurus* (Atlantic bumper) and *Selene dorsalis* (lookdown) were common in most hauls on the inner part of the shelf, while scombrids were not present. *Sphyraena guachancho* (barracuda) was caught in small numbers 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 outer shelf and slope off Pointe Noire, but no estimate of abundance was made.

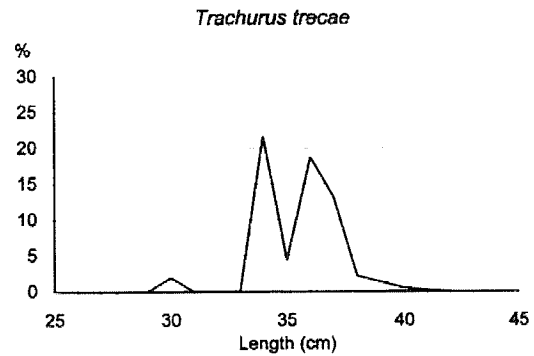


Fig. 8 Total length distribution of *Trachurus trecae* in the Congo area.

## 3.2 GABON

### Clupeids

In the southern part of Gabon sardinellas were distributed over the whole shelf from Mayumba and into Congo (Fig. 5). The densest recordings were made on the inner part of the shelf. About 25% of the sardinella in this area was *S. aurita*, both juvenile (11-14 cm) and adult fish, while all the *S. maderensis* were larger than 16 cm. In the central area of Gabon, from Mayumba to Sette Cama, only scattered schools were recorded. 83% was estimated to be *S. maderensis* with lengths from 13 to 27 cm. In the north, from Sette Cama to Iguéla, sardinellas were again recorded over larger areas, from the inner shelf and out over the slope. 32% was estimated to be *S. aurita*, both juveniles (8-10 cm) and adults, while the *S. maderensis* consisted of fish from 17 to 25 cm. Successful trawling was done only during nighttime. Fig. 9 gives a total length distribution of sardinellas in the Gabon area.

Separate estimates of the two species were made for all three subareas. The total biomass of *S. maderensis* was calculated to 95 500 tonnes and the biomass of *S. aurita* was estimated to 32 500 tonnes, all together 128 000 tonnes. In March this year the total biomass of sardinellas was

estimated to 100 000 tonnes, with about 40% *S. aurita*. The present estimate of *S. maderensis* is more than 50% higher than the one made in March, while that of *S. aurita* is quite similar.

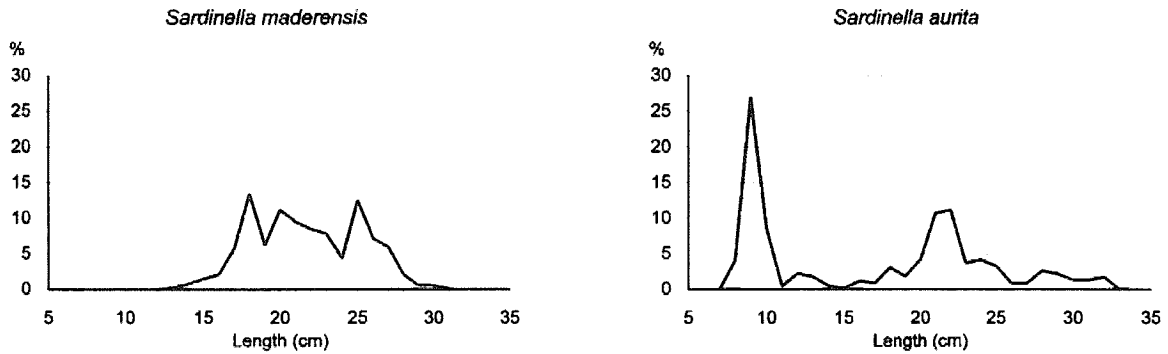


Fig. 9 Total length distribution of sardinellas in the Gabon area.

### Anchovy

A few *E. encrasicolus* were caught on a couple of stations on the inner shelf just north of the Congo border. Some more were caught on one station in shallow waters off Sette Cama, where schools were detected and some low  $S_A$ -values were allocated, but no estimate of abundance was made. The length was 8-10 cm.

### Horse mackerel

Scattered recordings of *Trachurus trecae* were recorded on the outer shelf in an area just north of the Congo border and in shallow waters between Mayumba and Pointe Panga (Fig. 7). Both juvenile and adult mackerels were caught in both areas. Figure 10 shows the total length distribution in the Gabon area. The biomass was estimated to 14 700 tonnes.

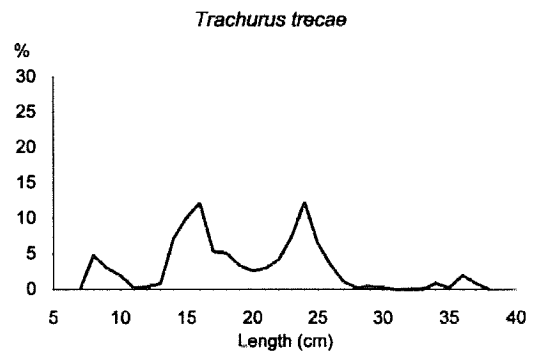


Fig. 10 Total length distribution of *Trachurus trecae* in the Gabon area.



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

Like in the Congo area *Chloroscombrus chrysurus* (Atlantic bumper) and *Selene dorsalis* (lookdown) were common in most hauls on the inner part of the shelf. *Decapterus rhonchus* (false scad) was also present in several inner shelf hauls between Boiti and Iguéla, and most of the  $S_A$ -values allocated to the P2-group in this area came from schools of *D. rhonchus*. *Scomber japonicus* was caught on many stations in the whole area, while *Scomberomorus tritor* only occurred on one inner shelf station. *Sphyraena guachancho* was common on the inner shelf north to Sette Cama, while *Trichiurus lepturus* was caught over the whole area. No estimate of abundance was made for any of the P2-species.

## Review of survey estimates (Sardinella and horse mackerel)

Figure 11 shows a plot of all the biomass estimates obtained through the 'Dr. Fridtjof Nansen' surveys, for sardinella in the Congo-Gabon region. 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. In particular, the results obtained in both 1994 surveys are quite consistent with the results obtained off Angola. While only large sizes dominated off Angola, small sizes dominated off Congo Gabon in March and were also well represented in September. This indicates that this area is an important nursery and recruitment ground probably for the whole sardinella stock. Figure 12 shows the results obtained for the horse mackerel. Here the trend appears to be different, the biomass estimates obtained this year being among the lowest in the time series.

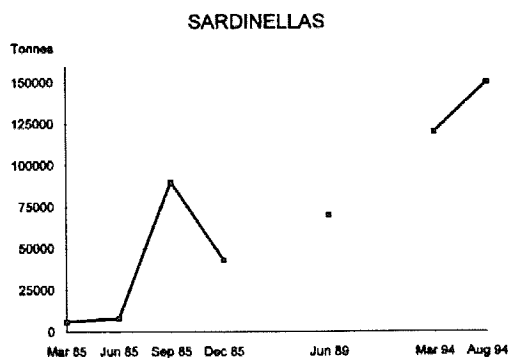


Fig. 11 Congo-Gabon. Biomass estimates for the sardinellas.

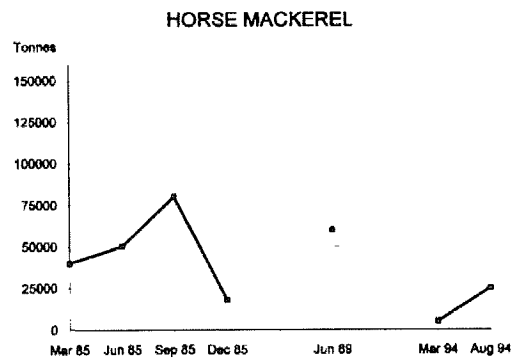


Fig. 12 Congo-Gabon. Biomass estimates for the horse mackerel.

## CHAPTER 4 TRAWL SURVEY: CATCH DISTRIBUTION, COMPOSITION AND SWEEP 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 500 m) was analysed separately. The locations of the trawl stations are shown in Fig. 1, pooled length distributions (weighted by the catch) of main species are shown in Annex I and II and records of the catches are presented in Annex III.

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

### 4.1 CONGO

The results of swept-area trawl stations are summarized in Tables 1 to 3. Only 14 hauls were made in this area, partly due to the many oil rigs and pipelines hindering trawling on the shelf.

Table 1 shows the catch rates (kg/hour) by broad groups of species. "Demersal" comprises the families Sciaenidae, Ariidae, Haemulidae (=Pomadasiidae), Serranidae, Sparidae and Lutjanidae, while "Pelagic" includes Engraulididae, Clupeidae, Carangidae, Scombridae, Sphyraenidae and Trichiuridae. The catch rates of pelagic species dominate both on the inner and outer shelf, and this is the opposite of what was found in both surveys in 1989. The total catch rates of demersal groups are slightly lower than in 1989, especially on the inner shelf, while the catch rates of pelagic species are much higher now in all areas. Both groups have the highest catch rates on the outer shelf. If all demersal species are included, the catch rates are higher than in 1989 (see below).

No lobster was caught on the inner shelf in 1994, while it was common in 1989. The catch rates of shrimps are highest on the slope, and like in 1989 the high rates are mainly due to a few large catches of *Nematocarcinus africanus* (African spider shrimp). *Parapenaeus longirostris* (deep water rose shrimp) was found on most of the stations on the slope with catch rates up to

60 kg/hour, an increase compared to 1989. Mean length was 1-2 cm larger than in 1989 (Annex I).

Sharks were caught on a few stations, mainly on the slope, with catch rates somewhat lower than in survey I 1989. Cephalopods were caught in all areas, but in highest rates on the outer shelf and the slope, and the most common species were *Illex coindetti* and *Sepia* spp. The rates were half of those found in survey I 1989, but higher than the rates from survey II 1989.

Table 1. 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
39	21	68.0	320.6		0.4		21.9
40	17	47.5	74.2		5.6		35.4
MEAN		57.8	197.4		3.0		28.7

OUTER SHELF 55-150 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
24	94	342.2	504.3	10.7	0.6	1.2	117.2
30	71	6.3	1467.1			2.2	153.2
31	108	189.1	414.1	11.9	13.1	23.1	140.5
38	82	49.7	4.1		0.1	6.7	22.8
MEAN		146.8	597.4	5.7	3.4	8.3	108.4

SLOPE 150-500 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
25	178	86.1	35.6		59.4	16.4	316.2
26	304		2.7	4.4	24.5		124.9
27	478			37.8	131.6	4.8	105.5
28	403			129.0	505.5		86.7
29	249	3.4	54.7		52.1	2.8	273.4
32	199	48.0	45.4		41.2	6.6	101.1
36	320		14.9		85.1	16.2	445.1
37	174	31.0	18.1	1.9	3.4	16.8	208.9
MEAN		21.1	21.4	21.6	112.9	8.0	207.7

Catch rates of pelagic fish in bottom trawl hauls (Table 2) are presented to give some indication of the forms present. The dominating species in all areas was *Trichiurus lepturus* (hairtail), and it was much more abundant than in both surveys in 1989. Among the carangids, adult *Trachurus trecae* (Cunene horse mackerel) was the most common, found on both the inner and outer shelf, while *Selene dorsalis* (lookdown) and *Chloroscombrus chrysurus* (Atlantic bumper) were mainly found on the inner shelf. Like in 1989 clupeids were most common on the inner shelf, where *Ilisha africana* (West African ilisha) had the highest catch rates, but also *Sardinella maderensis* (flat sardinella) occurred in the bottom hauls. In the pelagic hauls, however, both *S. maderensis*

and *S. aurita* (round sardinella) were much more abundant. Barracudas were much less abundant than in 1989, found on only one station on the inner shelf, and scombrids did not occur in any of the bottom trawl hauls. Mean lengths of *T. trecae* and *S. maderensis* were larger than in 1989, while that of *C. chrysurus* was similar.

Table 2. 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	Hairtails	Other
39	21	48.4	46.0	5.4		220.8	90.3
40	17	16.7	15.3			42.1	88.5
MEAN		32.6	30.7	2.7		131.5	89.4

OUTER SHELF 55-150 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
24	94		318.1			186.2	471.9
30	71	4.3	709.0			753.8	161.7
31	106	2.2				411.9	377.6
38	82		4.1				79.2
MEAN		1.6	257.8			338.0	272.6

SLOPE 150-500 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
25	178					35.6	478.1
26	304					2.7	153.8
27	478						279.7
28	403						721.2
29	249		0.7			54.0	331.6
32	199	5.5				39.8	196.9
36	320					14.9	546.4
37	174		0.1			18.0	262.0
MEAN		0.7	0.1			20.6	371.2

Table 3 shows the catch rates of demersal families. The croakers were the most common, with the highest catch rates on the outer shelf, and *Pentheroscion mbizi* (blackmouth croaker) and *Umbrina canariensis* (Canary drum) were the most abundant species. *Pteroscion peli* (boe drum) was only found on the inner shelf. On average the catch rates of croakers were comparable to those found in survey I 1989, but the *Pseudolithus* species were less abundant now. Mean lengths were similar to those obtained in 1989.

Table 3. 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	Hakes	Other
39	21	2.9	39.2	25.9			342.8
40	17		26.4	21.1			115.2
MEAN		1.4	32.8	23.5			229.0

OUTER SHELF 55-150 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hakes	Other
24	94	125.0		202.1	15.1		634.0
30	71	6.3					1622.5
31	108	35.7		153.3			602.7
38	82	49.7					33.6
MEAN		54.2		88.9	3.8		723.2

SLOPE 150-500 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hakes	Other
25	178	22.5		63.6			427.6
26	304					99.0	57.5
27	478					72.0	207.7
28	403						721.2
29	249			3.4		24.1	358.9
32	199			48.0			194.3
36	320					156.0	405.4
37	174	21.3		9.7			249.1
MEAN		5.5		15.6		43.9	327.7

Grunts were only found on the inner shelf, and they were much less abundant than in 1989. Like in 1989, *Brachydeuterus auritus* (bigeye grunt) was the dominating species found in this family. 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 were a little higher than those found in both surveys in 1989. *Dentex angolensis* (Angola dentex) was the most abundant species, followed by *Pagellus bellottii* (red pandora). The same species were also most abundant in 1989 and the mean lengths were about the same.

Like in 1989 groupers were not abundant, only *Epinephelus aeneus* (white grouper) was found on one station on the 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. *Brotula barbata* (Bearded brotula) occurred on both the outer shelf and the slope, but the catch rates were somewhat lower than those obtained in survey I 1989.

Table 4 presents the swept area estimates of mean densities based on 14 random bottom trawl hauls. Most pelagic species are not included in the calculations. Like in 1989 bigeye grunt was the species with the highest density in the 0-50 m zone. In the 50-200 m zone *Synagrops microlepis* (thinlip splitfin) had the highest density, followed by *P. mbizi*, *D. angolensis* and *U. canariensis*. *B. auritus*, followed by *P. mbizi* and *D. angolensis* dominated this zone in 1989. In the deepest zone (200-500 m) *N. africanus* came out with the highest densities, followed by *M. polli*. The same was found in 1989.

Table 4. 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	200-500m
<i>Nematocarcinus africanus</i>			1	1		7	1.42			3.99	
<i>Pterothrissus belloci</i>	3	1	2			43	0.86		0.83	1.25	
<i>Merluccius polli</i>	1	2	1			29	0.81			2.28	
<i>Synagrops microlepis</i>	5	4				64	0.79		1.46	0.17	
<i>Pentheroscion mbizi</i>	3	1	1			36	0.57		1.13	0.02	
<i>Dentex angolensis</i>	4	1	1			43	0.50		1.01		
<i>Ectreposebastes ius</i>	1		1			14	0.43		0.01	1.19	
<i>Parapenaeus longirostris</i>	7	2				57	0.41	0.10	0.38	0.58	
<i>Umbrina canariensis</i>		3				21	0.41		0.81		
<i>Deania profundorum</i>		1	1			14	0.38			1.08	
<i>Chlorophthalmus atlanticus</i>	2	2				29	0.31		0.43	0.27	
Shrimps, small, non comm.	3	1				21	0.26	0.01	0.20	0.45	
<i>Brotula barbata</i>	5	1				43	0.20		0.37	0.04	
<i>Zenopsis conchifer</i>	4	1				36	0.17		0.23	0.15	
<i>Brachydeuterus auritus</i>	1	1				7	0.17	1.19			
<i>Raja miraletus</i>	5	1				43	0.16	0.08	0.30		
<i>Cynoponticus ferox</i>	4					29	0.16		0.31		
<i>Pseudolithus brachygnathus</i>	2	1				21	0.15	0.27	0.22		
<i>Illex coindetii</i>	8					57	0.11		0.10	0.16	
<i>Pagellus bellottii</i>	2	1				21	0.11	0.05	0.20		
<i>Pteroscion peli</i>	2					7	0.08	0.54			
<i>Sepiella ornata</i>	3					21	0.08	0.42			
<i>Octopus vulgaris</i>	1					7	0.06		0.12		
<i>Scorpaena angolensis</i>	2					14	0.06			0.17	
<i>Argyrosomus hololepidotus</i>	1					7	0.06		0.13		
<i>Octopus sp.</i>	2					14	0.05		0.10		
<i>Laemonema laureysi</i>	3					21	0.05			0.14	
<i>Chaunax pictus</i>	4					29	0.05			0.13	
<i>Branchiostegus semifasciatus</i>	2					14	0.05		0.11		
<i>Aristeus varidens</i>	2					14	0.04			0.10	
<i>Nematopalaemon hastatus</i>	1					7	0.02			0.05	
<i>Parapenaeopsis atlantica</i>	1					7					
<i>Plesiopenaeus edwardsianus</i>	1					7				0.01	
Other fish						7	0.73	0.60	0.77	0.72	
Sum all species							9.69	3.26	9.22	12.95	
Sum Hakes							0.81			2.28	
Sum Groupers							0.03		0.07		
Sum Grunts							0.17	1.19			
Sum Croakers							1.28	0.86	2.29	0.02	
Sum Seabreams							0.62	0.05	1.24		
Sum Sharks							0.45		0.12	1.11	
Sum Rays							0.18	0.08	0.34		
Sum Squids							0.31	0.52	0.36	0.16	
Sum											
Sum commercial shrimps							1.89	0.10	0.38	4.73	

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

14                      2                      7                      5

The mean density for all demersal species was 9.7 tonnes/nm<sup>2</sup>, while in survey II 1989 the corresponding figure was only 5.5 tonnes/nm<sup>2</sup>. In 1985, however, the estimated mean density was 11.1 tonnes/nm<sup>2</sup>, which is close to what was found in the present survey.

At the bottom of Table 4 summed densities of the most important species by main groups are presented. The group "commercial shrimps" came out with the highest density, and much higher than in 1989. This was mainly caused by a few large catches of *N. africanus*, which is of uncertain commercial value. *P. longirostris* had the second highest density in this group, several times higher than in the previous investigations. Among the fish groups, croakers had the highest mean density, followed by hakes, seabreams, sharks, squids and rays. All this groups had higher densities than in 1989, while grunts came out much lower and grouper at the same level as in 1989.

In Table 5 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.

	0-50 m	50-200 m	Total	1989-total
Seabreams	40	2 200	2 240	1 490
Croakers	650	4 050	4 700	1 970
Groupers	-	120	120	120
Sum dem. val.	690	6 370	7 060	3 580
All demersal	2 400	16 300	18 700	12 500
Bigeye grunt	890	-	890	3 800
Horse mackerel	100	7 800	7 900	
Hairtail	3 550	11 650	15 200	

The summed biomass of seabreams, croakers and grunts was about the same as found in survey II 1989, but bigeye grunt contributed much more (50%) in 1989. The total biomass of all demersal species was almost 50% higher in 1994, mainly due to higher catch rates of *S. microlepis*, *Pterothrissus belloci* and other demersal species of non commercial value.

## 4.2 GABON

The results of the swept-area trawl stations are shown in Tables 6 to 8. Table 6 gives the catch rates (kg/hour) by main species groups, for the inner shelf, the outer shelf and the slope. The demersal fish species dominate in the inner and outer shelf over all other groups. This is different from what was found for the demersal species in Congo during this survey. On the inner and outer

shelves as well as on the slope the catch rates for demersal species were much higher than those for pelagic species. This is consistent with the results from survey I 1989, but different from what was found during survey II 1989, where the catch rates for pelagic species dominated on the outer shelf. The total catch rate for demersal fish in all areas was about 50 % higher than during survey I 1989 and about double the size of the catch rates from survey II 1989.

The catch rate of pelagic species was highest on the inner shelf, lower on the outer shelf and even less on the slope. During this survey in Congo and during both surveys in 1989 pelagic species were caught mainly on the outer shelf. A small amount of sharks was caught in all three areas, but mainly on the outer shelf and the slope. No shrimp was found on the inner and outer shelf. However, on the slope the main catch rate was very high, due to two big catches, one of *Nematocarcinus africanus* (141 kg/hour) and one of *Parapenaeopsis atlantica* (101 kg/hour). Also in the 1989-surveys shrimp was mainly found on the slope. The mean length of *Parapenaeus longirostris* in Gabon was 1-2 cm lower than in Congo during this survey.

Table 6. 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
43	48	466.3	88.7				116.7
50	36	10.2		9.6			30.9
51	31	1579.0	535.3				6.5
64	46	45.0	1.2				39.0
68	27	419.0	422.2				44.9
69	25	245.8	101.8				18.8
73	46	169.3		0.7		3.0	46.3
74	25		10.7				3.4
75	51	71.2					26.7
80	28	10.1	387.3			0.7	11.2
81	52	3.7					19.9
90	43	50.5	16.7				44.2
91	33	40.0	139.4				9.6
MEAN		239.2	131.0	0.8		0.3	32.2

OUTER SHELF 55-150 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
42	91	119.0	311.8			7.9	17.8
45	58	724.5	565.2				68.4
52	74	109.8	52.8	5.6		2.0	5.5
59	63	77.8	15.6			12.3	13.8
60	98	99.0	49.1	10.0		11.6	10.5
62	117	844.1	1.6				51.1
63	58	5.2	1.6			20.9	8.9
65	136	400.9				6.6	235.9
67	71	1673.3	100.8			62.4	21.0
72	89	191.2	0.7			2.3	226.9
76	84	34.1	1.1	14.5		7.4	51.9
82	78	20.1				7.7	13.3
84	148	66.2		15.2		1.2	106.8
88	98	201.2	24.5			19.3	56.2
89	69	102.6	8.1			20.6	14.4
MEAN		311.3	75.5	3.0		12.2	60.2



Table 6. Cont.

SLOPE 150-500 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
41	205	47.6	72.0		12.9	6.6	257.3
46	277	94.1		2.9	1.9		229.4
53	238	20.7	11.8		1.6	31.7	381.4
54	333		20.5	2.5	5.4	8.0	291.9
55	151	364.8	11.6			2.5	405.6
61	175	60.2				17.0	193.8
65	258	51.8	19.6		6.4	37.0	544.9
70	327				1.0	8.3	243.4
71	174	106.7	8.9			73.3	57.3
77	160	117.9		5.6			186.5
78	404		21.0	2.7	141.7	1.8	65.5
85	181	32.9	19.2	8.7		374.6	54.4
87	399	4.7		7.9	101.1	7.1	130.4
MEAN		69.3	14.2	2.3	20.9	43.7	234.0

The highest catch rates for cephalopods were obtained on the slope. The dominating species was *Illex coindetti*, which was caught once with a rate of 374 kg/hour. The mean length of *Illex coindetti* was about 18 cm, a higher value than the one found in survey I 1989 (12.7 cm).

Table 7 summarises the catch rates for the main pelagic fish families in the area. Carangids dominated on the inner and outer shelves, while their catch rates were negligible above the slope.

Table 7. 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	Hairtails	Other
43	48		86.3	2.42			583.0
50	36						50.8
51	31	0.7	478.4	18.00		38.16	1585.4
64	46		1.1		0.08		84.0
68	27		418.1	4.09			463.9
69	25	0.6	100.2	0.92	0.04		264.6
73	46						219.5
74	25		10.7				3.4
75	51						98.0
80	28		387.3				22.0
81	52						23.6
90	43		16.7				94.7
91	33		139.4				49.6
MEAN		0.1	126.0	1.96	0.01	2.94	272.5

OUTER SHELF 55-150 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
42	91		257.1		3.7	51.0	144.8
45	58	5.2	548.1	11.7			793.1
52	74		52.8				122.9
59	63	0.7	9.9		1.4	3.6	103.9
60	98		30.8		0.3	18.0	131.1
62	117		1.4		0.1		895.2
63	58		0.2		1.4		35.1
66	136						643.3
67	71	5.3	71.7		4.2	19.6	1756.7
72	89	0.7					420.4
76	84					1.1	107.9
82	78						41.1
84	148						189.1
88	98		24.5				276.7
89	69		5.7	2.4			137.6
MEAN		0.8	66.8	0.9	0.7	6.2	386.6

Table 7. cont.

SLOPE 150-500 m

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
41	205					72.0	324.3
46	277						328.3
53	238					11.8	435.4
54	333		0.1			20.4	307.9
55	151					11.6	772.9
61	175						271.0
65	258					19.6	640.1
70	327						252.7
71	174					8.9	237.3
77	160						310.0
78	404					21.0	211.7
85	181					19.2	470.7
87	399						251.3
MEAN			0.0			14.2	370.3

Off southern Gabon, *Trachurus trecae* followed by *Chloroscombrus chrysurus* were the main representatives of this family, while in the north only *Decapterus rhonchus* was found.

The mean length distribution of *Trachurus trecae* was substantially smaller in Gabon (17.6 cm) than in Congo (36 cm), while *Chloroscombrus chrysurus* was slightly bigger in Gabon.

Catch rates of *Trichiurus lepturus* were very low as compared to Congo, where *T. lepturus* was the dominating species on the shelf and on the slope.

Clupeids, scombrids, and barracudas were caught with a very low catch rate on the inner and outer shelf and not at all at the slope. During survey II 1989 the catch rates for these families were also very low on the inner shelf, but clupeids and scombrids were taken in high amounts on the outer shelf.

The results for the main demersal fish families, sparids, grunts, croakers, groupers and hakes, are shown in Table 8. Sparids were caught at almost all trawl stations, and their mean catch rates dominated those of the other families on the outer shelf and on the slope. For the two surveys in 1989 no separated data are given for the catch rates on the slope. During these surveys sparids had the highest catch rates on the inner as well as on the outer shelves.

Table 8. 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
43	48	37.3	429.0				205.4
50	36	10.2					40.6
51	31	4.0	1571.4	3.6			541.8
64	46	40.6	4.4				40.2
68	27	419.0					467.1
69	25	245.8					120.6
73	46	169.3					50.1
74	25						14.1
75	51	71.2					26.7
80	28	10.1					399.2
81	52	3.7					19.9
90	43	50.5					60.9
91	33	40.0					149.0
MEAN		84.7	154.2	0.3			164.3

## OUTER SHELF 55-150 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hakes	Other
42	91	119.0					337.5
45	58	183.2	540.0		1.3		633.6
52	74	109.8					66.0
59	63	77.4	0.4				41.8
60	98	99.0					81.2
62	117	169.7		674.4			52.7
63	58	3.7		1.5			31.5
66	136	400.9					242.4
67	71	719.9	953.4				184.2
72	89	61.2	130.0				229.9
76	84	34.1					74.9
82	78	20.1					21.0
84	148	66.2					123.2
88	98	201.2					100.0
89	69	102.2	0.3				43.1
MEAN		157.8	108.3	45.1	0.1		150.9

## SLOPE 150-500 m

ST.NO.	DEP.	Sparids	Grunts	Croakers	Groupers	Hakes	Other
41	205	47.6				1.4	347.3
46	277	94.0	0.1			30.5	203.7
53	238	20.7					426.5
54	333					150.4	178.0
55	151	116.6		248.2			419.7
61	175	60.2					210.7
65	258	51.8				43.4	564.5
70	327					13.0	239.6
71	174	82.8		4.3	19.7		139.5
77	160	117.9					192.1
78	404					23.4	209.3
85	181	32.9					457.1
87	399		2.2		2.5	37.5	209.1
MEAN		48.0	0.2	19.4	1.7	23.1	292.1

*Dentex angolensis* had the same mean length as in Congo this survey, but it was about 5 cm higher than during survey II 1989. *Pagellus bellottii* was 5 cm smaller than in Congo.

On the inner shelf, grunts had the highest mean catch rates, mainly due to one big haul of 1 571 kg/hour of *Bachydeuterus auritus*. This species was the only representative of the family

Haemulidae (= Pomadasyidae) during the whole survey. It was also caught with high catch rates on three other stations on the outer shelf. The mean catch rate on the outer shelf was second behind the sparids. During both surveys in 1989 the mean length for *B. auritus* found in Congo was about 10-11 cm, while now in Gabon the mean length was 16 cm.

Croakers were only found once in a small amount on the inner shelf, and groupers and hakes were not taken here at all. The main croaker species found on the outer shelf and on the slope was *Umbrina canariensis*, of which two big hauls, one in each area, were taken.

The most common Serranidae taken during this survey was *Anthias anthias*. However, for consistency with former reports only groupers are included in the swept area analysis shown in Table 8. Only three single specimens were caught (*Epinephelus aeneus*, *E. haifensis*, *E. goreensis*) on the outer shelf and the slope. The catch rate for groupers is therefore very low compared with the catch rate during former surveys.

The mean catch rate of hakes was second behind the sparids. No separate data were available from former surveys. The mean length was about 26 cm, which is the same as in Congo.

Table 9 presents the swept-area estimates of mean densities based on 41 random bottom trawl hauls. Most pelagic species are not included in the calculations. Like in the Congo area *B. auritus* had the highest density in the 0-50 m zone, followed by *P. bellottii*. The latter had the highest density in this zone in 1989. The two same species also came first in the 50-200 m zone, followed by *U. canariensis* and *D. congoensis*. In 1989 *P. bellottii* also dominated this zone. In the deeper waters *Chlorophthalmus atlanticus* was the most important, followed by *M. polli*, *Synagrops microlepis* and *D. angolensis*. In 1989 *M. polli* and *Chlorophthalmus agassizi* (probably a misidentification) dominated the deepest zone. Among the shrimps, *N. africanus* and *P. atlantica* had the highest densities, but as mentioned above, they only occurred in one station, each in the deepest zone. *P. longirostris* was found in some more stations, but in low densities, the highest catch rate was only 12 kg/hour.

The mean density of all demersal species was 11.6 tonnes/nm<sup>2</sup>. This is a little higher than what was found in the Congo area. 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 during the present investigation.

Table 9. 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	200-500m	500-800m	
	>0	10	30	100	300	1000						
<i>Brachydeuterus auritus</i>	5		1	2	2		24	2.98	6.08	2.52	0.01	
<i>Pagellus bellottii</i>	9	10	3	2			59	1.86	3.08	1.93		
<i>Chlorophthalmus atlanticus</i>	2		5	1			20	0.93			4.76	
<i>Umbrina canariensis</i>	2		1	1			10	0.75		1.40		
<i>Dentex congoensis</i>	5	6	2				32	0.56		1.04		
<i>Dentex angolensis</i>	5	5	3				32	0.54		0.69	0.88	
<i>Illex coindetii</i>	21	1		1			56	0.41	0.02	0.70	0.15	
<i>Synagrops microlepis</i>	4	1	2				17	0.39		0.33	1.09	
<i>Spicara alta</i>	8	2	2				29	0.29		0.55		
<i>Merluccius polli</i>	3	3	1				17	0.25			1.29	
<i>Zenopsis conchifer</i>	8	2	1				27	0.24		0.35	0.26	
<i>Boops boops</i>	16	1	1				44	0.23		0.42		
<i>Sepia officinalis hierredda</i>	6	2					20	0.14	0.39	0.07		
<i>Sparus pagrus africanus</i>	2		1				7	0.13		0.24		
<i>Dasyatis centroura</i>			1				2	0.13		0.24		
<i>Anthias anthias</i>	5		1				15	0.13		0.24		
<i>Neaotocarcinus africanus</i>			1					0.11			0.58	
<i>Aulopus cadenati</i>	9	1					24	0.11		0.09	0.33	
<i>Antigonia capros</i>	7	1					20	0.10		0.18		
<i>Sepia sp.</i>	12						29	0.08	0.06	0.12	0.03	
<i>Parapenaeopsis atlantica</i>			1				2	0.08			0.40	
<i>Priacanthus arenatus</i>	13	1					34	0.07	0.04	0.12		
<i>Zeus faber</i>	8						20	0.06		0.11		
<i>Raja miraletus</i>	15						37	0.06	0.08	0.08		
<i>Pseudupeneus prayensis</i>	12	1					32	0.06	0.15	0.04		
<i>Lepidotrigla carolae</i>	16						39	0.05		0.09		
<i>Saurida brasiliensis</i>	16						39	0.05		0.09		
<i>Sepia bertheloti</i>	2	1					7	0.05		0.09		
<i>Fistularia petimba</i>	14						34	0.05	0.13	0.02		
<i>Parapenaeus longirostris</i>	6						15	0.02			0.09	
<i>Plesionika martia</i>	4						10	0.01			0.04	
HIPPOLYTIDAE	1						2				0.01	
Other fish								0.67	0.52	0.52	1.44	
Sum all species								11.59	10.55	12.27	11.36	
Sum Hakes								0.25			1.29	
Sum Groupers								0.02			0.01	
Sum Grunts								2.98	6.08	2.52	0.01	
Sum Croakers								0.75	0.01	1.41		
Sum Seabreams								3.43	3.27	4.41	0.88	
Sum Sharks								0.06	0.03	0.09	0.06	
Sum Rays								0.21	0.09	0.35	0.01	
Sum Squids								0.76	0.55	1.01	0.40	
Sum												
Sum commercial shrimps								0.22			1.12	

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

41

11

22

8

At the bottom of Table 9 mean densities of main groups of commercial value are presented. Seabreams had the highest density, followed by grunts. The same was found during survey II in 1989, but the densities were much lower then. Also croakers, hakes, sharks, squids and rays were

found in higher densities now, while groupers and snappers gave a higher value in 1989 (the latter was not found in bottom trawl hauls in 1994). Like in the Congo area a few catches of shrimp (*N. africanus* and *P. atlantica*) resulted in a relatively high mean density of shrimps compared to 1989. But like then the density of more important shrimp species was low.

In Table 10 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.

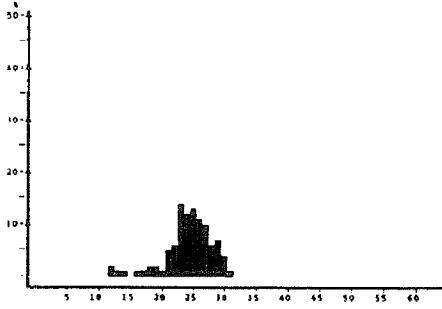
The summed biomass of valuable groups was more than 50% higher than in 1989, mainly because of a larger biomass of sea-

breams. The total biomass of all demersal species was more than the double of what was found in 1989, mainly due to higher catch rates of *B. auritus*, as well as *C. atlanticus*, *Illex coindetii* and *S. microlepis*.

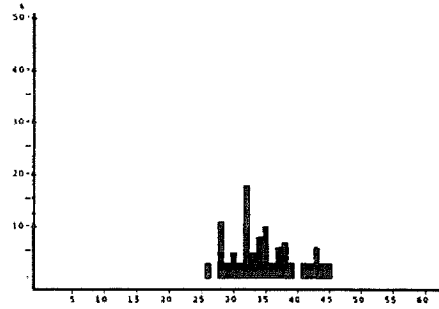
	0-50 m	50-200 m	Total	1989-total
Seabreams	13 700	12 700	26 400	17 000
Croakers	50	4 050	4 100	350
Groupers	-	100	100	600
Snappers	-	-	-	800
Grunts*	-	-	-	600
Sum dem. val.	13 750	16 850	30 600	19 350
All demersal	44 100	35 500	79 600	34 100
Bigeye grunt	25 400	7 300	32 700	2 900
Horse mackerel	4 300	4 000	8 300	
Hairtail	500	600	1 100	

\* Not including bigeye grunt.

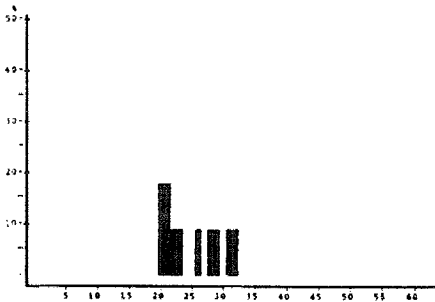
# Annex I CONGO. Length distributions of main species



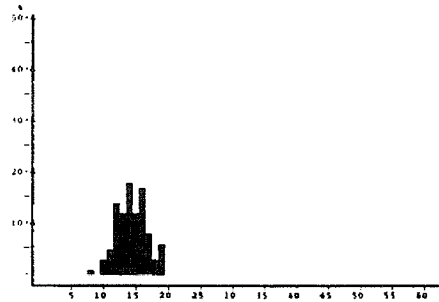
*Dentex angolensis*  
Congo  
MEAN LENGTH = 24.85cm N= 172  
NUMBER OF SUBSAMPLES : 4



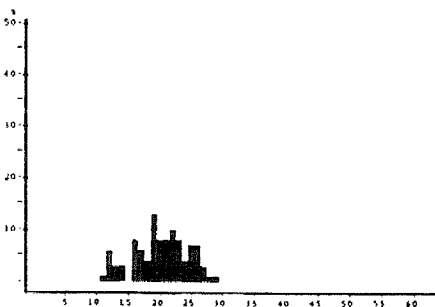
*Umbrina canariensis*  
Congo  
MEAN LENGTH = 35.03cm N= 37  
NUMBER OF SUBSAMPLES : 2



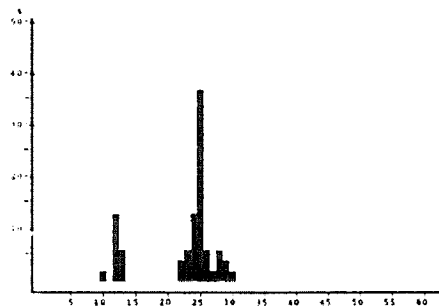
*Dentex canariensis*  
Congo  
MEAN LENGTH = 25.32cm N= 11  
NUMBER OF SUBSAMPLES : 1



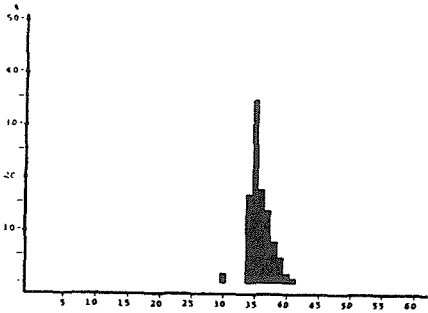
*Pteroscion pelli*  
Congo  
MEAN LENGTH = 14.88cm N= 84  
NUMBER OF SUBSAMPLES : 1



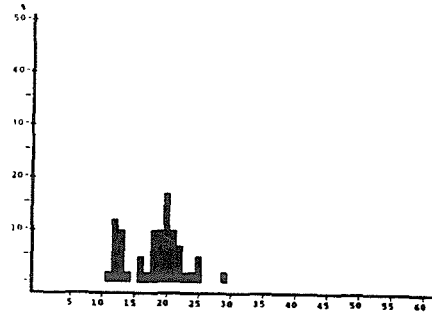
*Pagellus bellottii*  
Congo  
MEAN LENGTH = 20.71cm N= 73  
NUMBER OF SUBSAMPLES : 1



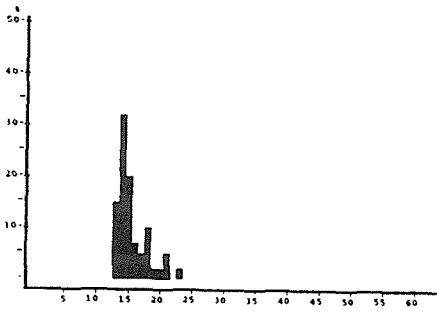
*Pentheroscion mbizi*  
Congo  
MEAN LENGTH = 22.92cm N= 52  
NUMBER OF SUBSAMPLES : 1



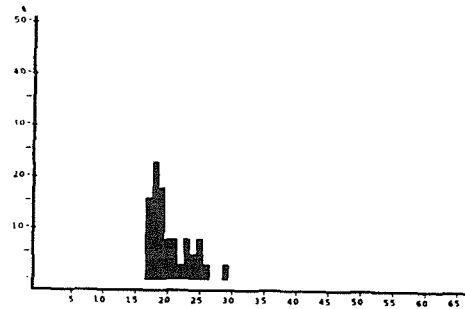
*Trachurus trecae*  
Congo  
MEAN LENGTH = 36.26cm N= 92  
NUMBER OF SUBSAMPLES : 2



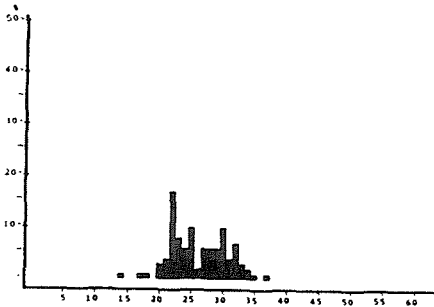
*Sardinella aurita*  
Congo  
MEAN LENGTH = 18.79cm N= 41  
NUMBER OF SUBSAMPLES : 1



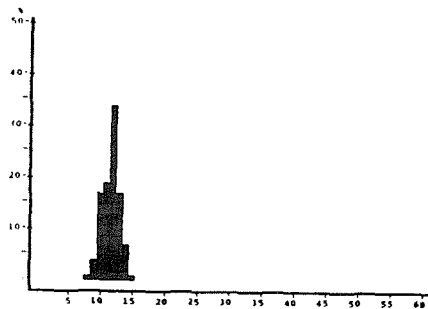
*Chloroscombrus chrysurus*  
Congo  
MEAN LENGTH = 15.94cm N= 59  
NUMBER OF SUBSAMPLES : 1



*Sardinella maderensis*  
Congo  
MEAN LENGTH = 20.68cm N= 91  
NUMBER OF SUBSAMPLES : 2



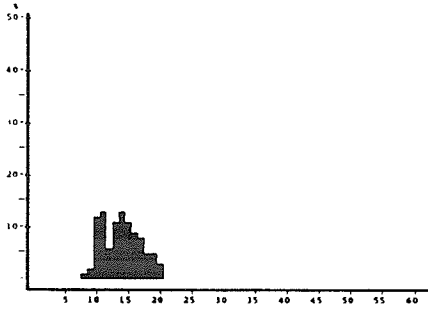
*Merluccius polli*  
Congo  
MEAN LENGTH = 26.82cm N= 124  
NUMBER OF SUBSAMPLES : 2



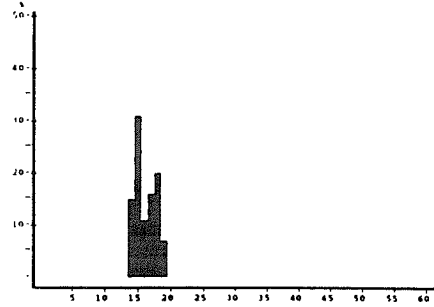
*Parapenaeus longirostris*  
Congo  
MEAN LENGTH = 12.13cm N= 364  
NUMBER OF SUBSAMPLES : 3



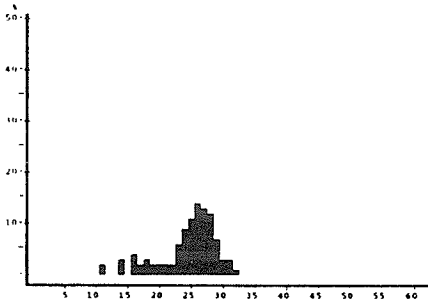
## Annex II GABON. Length distributions of main species



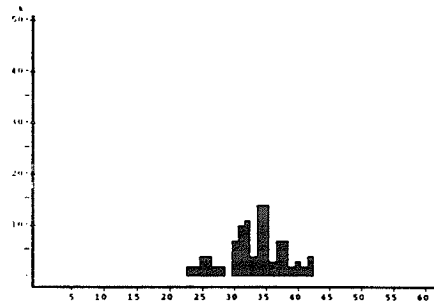
**Dentex congoensis**  
 Gabon  
 MEAN LENGTH = 14.36cm N= 419  
 NUMBER OF SUBSAMPLES : 9



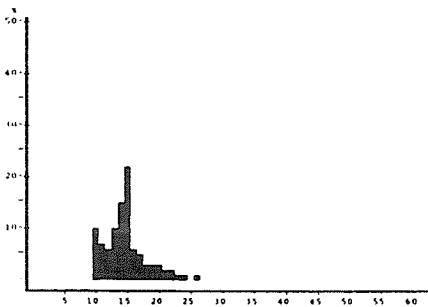
**Boops boops**  
 Gabon  
 MEAN LENGTH = 16.68cm N= 55  
 NUMBER OF SUBSAMPLES : 1



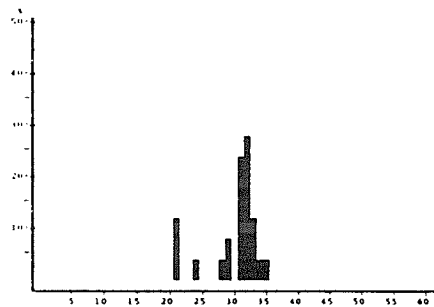
**Dentex angolensis**  
 Gabon  
 MEAN LENGTH = 24.92cm N= 394  
 NUMBER OF SUBSAMPLES : 11



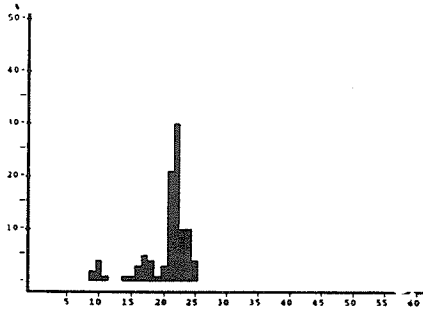
**Sparus pagrus africanus**  
 Gabon  
 MEAN LENGTH = 33.78cm N= 72  
 NUMBER OF SUBSAMPLES : 1



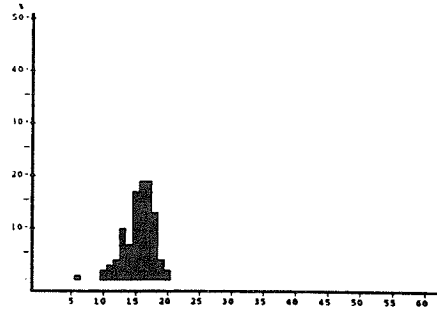
**Pagellus bellottii**  
 Gabon  
 MEAN LENGTH = 15.30cm N= 733  
 NUMBER OF SUBSAMPLES : 16



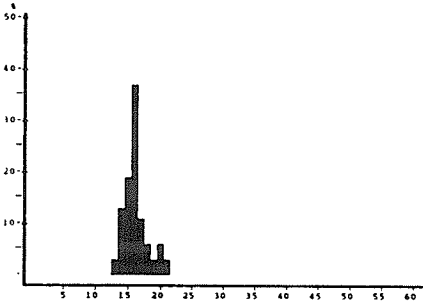
**Dentex gibbosus**  
 Gabon  
 MEAN LENGTH = 30.54cm N= 25  
 NUMBER OF SUBSAMPLES : 1



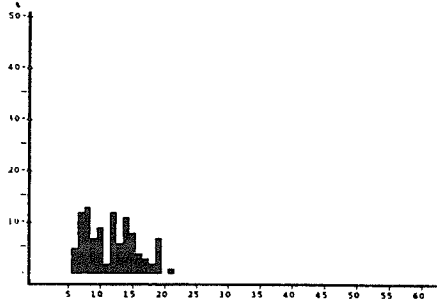
**Sardinella aurita**  
 Gabon  
 MEAN LENGTH = 20.86cm N= 275  
 NUMBER OF SUBSAMPLES : 7



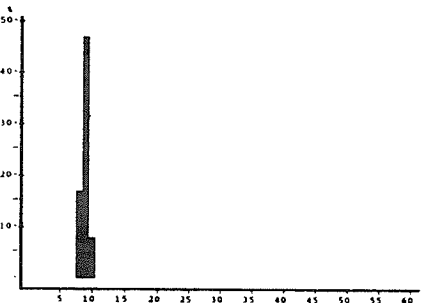
**Brachydeuterus auritus**  
 Gabon  
 MEAN LENGTH = 16.00cm N= 346  
 NUMBER OF SUBSAMPLES : 8



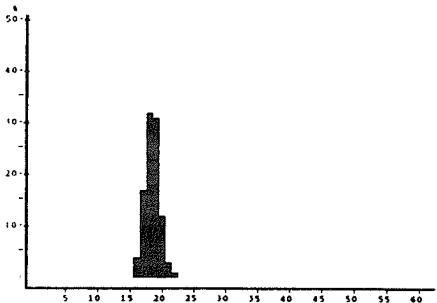
**Sardinella maderensis**  
 Gabon  
 MEAN LENGTH = 16.71cm N= 146  
 NUMBER OF SUBSAMPLES : 5



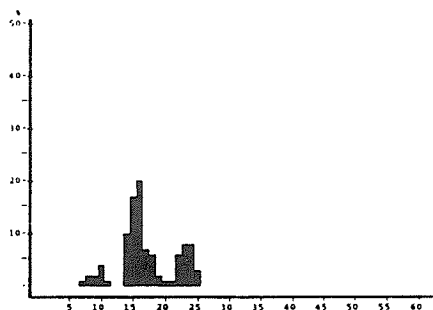
**Anthias anthias**  
 Gabon  
 MEAN LENGTH = 12.20cm N= 172  
 NUMBER OF SUBSAMPLES : 2



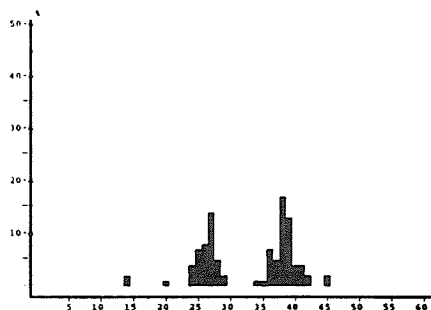
**Engraulis encrasicolus**  
 Gabon  
 MEAN LENGTH = 9.40cm N= 63  
 NUMBER OF SUBSAMPLES : 1



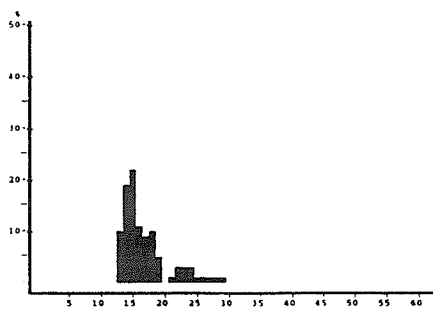
**Spicara alta**  
 Gabon  
 MEAN LENGTH = 18.93cm N= 171  
 NUMBER OF SUBSAMPLES : 3



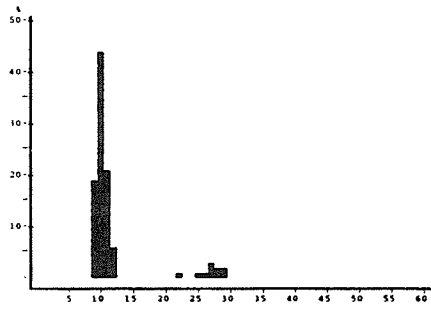
**Trachurus trecae**  
 Gabon  
 MEAN LENGTH = 17.64cm N= 745  
 NUMBER OF SUBSAMPLES : 12



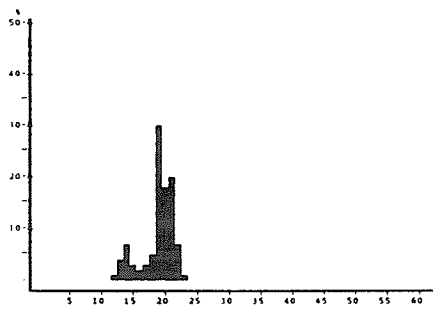
**Decapterus rhonchus**  
 Gabon  
 MEAN LENGTH = 33.10cm N= 158  
 NUMBER OF SUBSAMPLES : 4



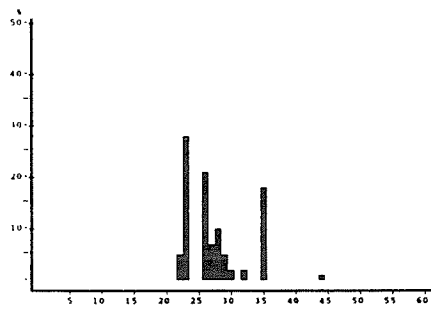
**Selene dorsalis**  
 Gabon  
 MEAN LENGTH = 17.27cm N= 133  
 NUMBER OF SUBSAMPLES : 5



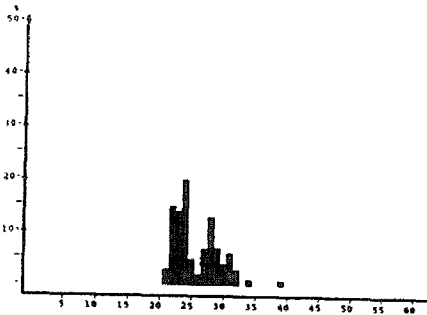
**Scomber japonicus**  
 Gabon  
 MEAN LENGTH = 12.33cm N= 57  
 NUMBER OF SUBSAMPLES : 2



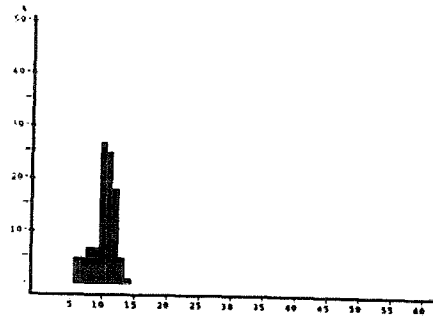
**Chloroscombrus chrysurus**  
 Gabon  
 MEAN LENGTH = 19.48cm N= 240  
 NUMBER OF SUBSAMPLES : 4



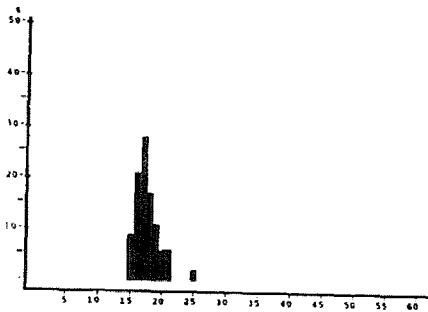
**Sphyræna guachancho**  
 Gabon  
 MEAN LENGTH = 28.15cm N= 30  
 NUMBER OF SUBSAMPLES : 4



*Merluccius polli*  
 Gabon  
 MEAN LENGTH = 26.32cm N= 117  
 NUMBER OF SUBSAMPLES : 4



*Parapenaeus longirostris*  
 Gabon  
 MEAN LENGTH = 10.77cm N= 146  
 NUMBER OF SUBSAMPLES : 1



*Illex coindetii*  
 Gabon  
 MEAN LENGTH = 18.05cm N= 53  
 NUMBER OF SUBSAMPLES : 1

# Annex III Records of fishing stations

PROJECT STATION: 24  
 DATE: 20/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 458  
 start stop duration Long E 1136  
 TIME :13:49:00 14:19:00 30 (min) Purpose code: 3  
 LOG :3422.50 3424.10 1.60 Area code : 1  
 FDEPTH: 95 92 GearCond.code: 1  
 BDEPTH: 95 92 Validity code: 1  
 Towing dir: 350° Wire out: 380 m Speed: 30 kn\*10  
 Sorted: 173 Kg Total catch: 488.12 CATCH/HOUR: 976.24

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trachurus trecae	318.14	62.2	47
Trichurus lepturus	186.20	51.8	
Pentheroscion mbizi	167.92	98.8	
Dentex angolensis	125.00	48.8	45
Brotula barbata	49.00	7.0	46
Umbrina canariensis	34.22	5.8	
Cynoponticus ferox	20.60	1.2	
Synagrops microlepis	18.33	86.5	
Epinephelus aeneus	15.10	2	
Squatina squatina	10.74	6	
Raja miraletus	5.90	1.2	
Zeus faber	5.10	1.2	
Chelidonichthys gabonensis	4.70	3.4	
Pterothrissus belloci	4.40	2.4	
Cynoglossus sp.	2.90	6	
Branchiostegus semifasciatus	2.04	6	
Pegusa lascaris	1.86	1.8	
Pontinus accraensis	1.20	5.8	
Sepia bertheloti	1.16	6	
Uranoscopus albesca	1.16	1.2	
Parapenaeus longirostris	0.58	3.0	
<b>Total</b>	<b>976.25</b>	<b>100.00</b>	

PROJECT STATION: 27  
 DATE: 20/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 503  
 start stop duration Long E 1122  
 TIME :20:22:00 20:52:00 30 (min) Purpose code: 3  
 LOG :4457.80 4459.20 1.40 Area code : 1  
 FDEPTH: 476 480 GearCond.code: 1  
 BDEPTH: 476 480 Validity code: 1  
 Towing dir: 330° Wire out: 1400 m Speed: 29 kn\*10  
 Sorted: 34 Kg Total catch: 140.00 CATCH/HOUR: 280.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	122.40	146.28	43.71
Merluccius polli	72.00	132	25.71
Deania profundorum	37.80	84	13.50
Laemonema laureysi	9.12	288	3.26
Aristeus varidens	8.04	1008	2.87
Gadella imberbis	7.68	312	2.74
Chaunax pictus	6.00	24	2.14
Diplophos sp.	5.16	368	1.84
Illex coindetii	4.80	12	1.71
HALOSAURIDAE	1.68	48	0.60
Nezumia aequalis	1.44	48	0.51
Hoplostethus cadenati	1.20	24	0.43
Dibranchius atlanticus	1.20	12	0.43
Plesiopeneus edwardsianus	1.20	12	0.43
<b>Total</b>	<b>279.72</b>	<b>99.88</b>	

PROJECT STATION: 28  
 DATE: 21/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 457  
 start stop duration Long E 1119  
 TIME :06:43:00 07:13:00 30 (min) Purpose code: 3  
 LOG :4491.10 4492.70 1.60 Area code : 1  
 FDEPTH: 400 406 GearCond.code: 1  
 BDEPTH: 400 406 Validity code: 1  
 Towing dir: 330° Wire out: 1200 m Speed: 30 kn\*10  
 Sorted: 24 Kg Total catch: 360.60 CATCH/HOUR: 721.20

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Nematocarcinus africanus	498.00	278	69.05
Deania profundorum	129.00	270	17.89
Scorpaena angolensis	24.00	480	3.33
HALOSAURIDAE	15.00	30	2.08
Bathysgadus melanobranchus	11.10	30	1.54
Chaunax pictus	10.50	60	1.46
Gadella imberbis	9.00	150	1.25
Laemonema laureysi	8.10	60	1.12
Aristeus varidens	7.50	660	1.04
Stereomastix sp.	4.50	390	0.62
Diplophos sp.	4.50	420	0.62
<b>Total</b>	<b>721.20</b>	<b>100.00</b>	

PROJECT STATION: 29  
 DATE: 21/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 454  
 start stop duration Long E 1120  
 TIME :08:22:00 08:52:00 30 (min) Purpose code: 3  
 LOG :4498.30 4499.70 1.40 Area code : 1  
 FDEPTH: 246 252 GearCond.code: 1  
 BDEPTH: 246 252 Validity code: 1  
 Towing dir: 330° Wire out: 800 m Speed: 31 kn\*10  
 Sorted: 286 Kg Total catch: 193.19 CATCH/HOUR: 386.38

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pterothrissus belloci	172.00	814	44.52
Trichurus lepturus	54.04	1134	13.99
MYCTOPHIDAE	53.20	14000	13.77
Parapenaeus longirostris	52.08	7042	13.48
Merluccius polli	24.08	126	6.23
OPHIDIIDAE	6.58	294	1.70
Synagrops microlepis	5.18	294	1.34
Brotula barbata	5.04	14	1.30
Pentheroscion mbizi	3.36	14	0.87
Illex coindetii	2.80	14	0.72
Bembrops heterurus	2.52	70	0.65
Erythrocles monodi	2.00	2	0.52
Dibranchius atlanticus	1.40	28	0.36
Stereomastix sp.	1.40	112	0.36
Trachurus trecae	0.70	14	0.18
<b>Total</b>	<b>386.38</b>	<b>99.99</b>	

PROJECT STATION: 30  
 DATE: 21/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 439  
 start stop duration Long E 1126  
 TIME :14:05:00 14:35:00 30 (min) Purpose code: 3  
 LOG :3548.30 3550.00 1.70 Area code : 1  
 FDEPTH: 69 72 GearCond.code: 1  
 BDEPTH: 69 72 Validity code: 1  
 Towing dir: 310° Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 144 Kg Total catch: 814.68 CATCH/HOUR: 1629.36

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Trichurus lepturus	753.80	1884	46.26
Trachurus trecae	709.00	1680	43.51
Synagrops microlepis	52.22	11400	3.20
Raja miraletus	51.52	100	3.16
Brotula barbata	15.68	34	0.96
Cynoponticus ferox	15.20	2	0.93
Pamulirus regius	6.16	12	0.38
Dentex angolensis	5.16	12	0.32
Sardinella aurita	4.26	12	0.26
C R A B S	3.36	12	0.21
Torpedo torpedo	3.24	12	0.20
Citharus linguatula	2.36	56	0.14
Priacanthus arenatus	1.80	34	0.11
Sepia sp.	1.12	12	0.07
Sepia bertheloti	1.12	12	0.07
Pagellus bellottii	1.12	12	0.07
Uranoscopus albesca	1.12	12	0.07
Zeus faber	0.56	12	0.03
<b>Total</b>	<b>1628.80</b>	<b>39.95</b>	

PROJECT STATION: 25  
 DATE: 20/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 503  
 start stop duration Long E 1127  
 TIME :16:14:00 16:44:00 30 (min) Purpose code: 3  
 LOG :3437.70 3439.20 1.50 Area code : 1  
 FDEPTH: 178 178 GearCond.code: 1  
 BDEPTH: 178 178 Validity code: 1  
 Towing dir: 330° Wire out: 600 m Speed: 30 kn\*10  
 Sorted: 65 Kg Total catch: 257.00 CATCH/HOUR: 514.00

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Pterothrissus belloci	92.00	528	17.90
Synagrops microlepis	84.00	4200	16.34
MYCTOPHIDAE	76.40	3184	14.86
Pentheroscion mbizi	63.60	416	12.37
Parapenaeus longirostris	59.44	7822	11.56
Trichurus lepturus	35.60	264	6.93
Zenopsis conchifer	32.40	72	6.30
Dentex angolensis	22.48	72	4.37
Octopus sp.	15.60	16	3.04
Chlorophthalmus atlanticus	12.80	1056	2.49
Raja miraletus	6.32	8	1.23
Spicara alta	5.20	48	1.01
Uranoscopus albesca	3.12	24	0.61
Pontinus accraensis	2.40	16	0.47
Illex coindetii	0.80	8	0.16
Peristodion cataphractum	0.80	8	0.16
Homonolepis microstoma	0.48	32	0.09
Macroparalepis macrogeneion	0.20	16	0.04
NOEMEIDAE	0.08	8	0.02
<b>Total</b>	<b>513.72</b>	<b>99.95</b>	

PROJECT STATION: 26  
 DATE: 20/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 502  
 start stop duration Long E 1124  
 TIME :17:33:00 18:03:00 30 (min) Purpose code: 3  
 LOG :3443.20 3445.00 1.80 Area code : 1  
 FDEPTH: 304 304 GearCond.code: 1  
 BDEPTH: 304 304 Validity code: 1  
 Towing dir: 315° Wire out: 950 m Speed: 30 kn\*10  
 Sorted: 16 Kg Total catch: 78.75 CATCH/HOUR: 157.50

SPECIES	CATCH/HOUR	% OF TOT. C	SAMP
	weight numbers		
Merluccius polli	99.00	560	62.86
Parapenaeus longirostris	19.00	1220	12.06
Parapenaeus longirostris	5.50	1670	3.49
Pontinus sp.	5.20	80	3.30
Laemonema laureysi	3.80	90	2.41
Scorpaena angolensis	3.20	60	2.03
Coelorrhinchus coelorrhinchus	3.10	60	1.97
Pterothrissus belloci	3.10	350	1.97
Ariomma bondi	3.00	110	1.90
Trichurus lepturus	2.70	70	1.71
Galeus polli	2.70	20	1.71
Synagrops microlepis	2.00	110	1.27
Squalus mitsukurina	1.70	10	1.08
Bembrops heterurus	1.50	10	0.95
Chaunax pictus	1.00	10	0.63
<b>Total</b>	<b>156.50</b>	<b>99.34</b>	

PROJECT STATION: 31  
 DATE: 21/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 443 Long E 1119  
 start stop duration Purpose code: 3  
 TIME :15:56:00 16:22:00 26 (min) Area code : 1  
 LOG :3559.80 3561.00 1.20 GearCond.code: 1  
 FDEPTH: 109 106 Validity code: 1  
 BDEPTH: 109 106  
 Towing dir: 150° Wire out: 400 m Speed: 30 km\*10  
 Sorted: 134 Kg Total catch: 343.11 CATCH/HOUR: 791.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	411.92	1925	52.02	
Umbriina canariensis	80.03	138	10.11	55
Synagrops microlepis	60.92	23049	7.69	
Pseudolithus brachygnathus	37.11	122	4.69	56
Dentex angolensis	35.72	122	4.51	54
Cynoponticus ferox	26.54	5	3.35	
Argyrosomus hololepidotus	24.92	2	3.15	
Octopus vulgaris	22.48	12	2.84	
Branchiostegus semifasciatus	18.78	21	2.37	
SCORPAENIDAE	16.06	28	2.03	
S H A F K S	13.06	5935	1.65	
Galeorhinus galeus	11.91	5	1.50	
Pentheroscion mbizi	11.28	60	1.42	
Brotula barbata	3.65	23	0.46	
Raja miraletus	2.26	5	0.29	
Sardinella aurita	2.22	5	0.28	
Citharus linguatula	2.22	67	0.28	
Pontinus accraensis	2.15	16	0.27	
Zeus faber	1.98	12	0.25	
Torpedo torpedo	1.55	5	0.20	
Uranoscopus albesca	1.38	23	0.17	
Ilisha ramada	1.11	134	0.14	
Illex coindetii	0.83	12	0.10	
Illex coindetii	0.60	51	0.08	
Chelidonichthys gabonensis	0.55	5	0.07	
Gadella imberbis	0.55	5	0.07	
Total	791.78		99.99	

PROJECT STATION: 32  
 DATE: 21/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 444 Long E 1113  
 start stop duration Purpose code: 3  
 TIME :17:33:00 18:03:00 30 (min) Area code : 1  
 LOG :3569.60 3571.00 1.40 GearCond.code: 1  
 FDEPTH: 198 200 Validity code: 1  
 BDEPTH: 198 200  
 Towing dir: 120° Wire out: 650 m Speed: 29 km\*10  
 Sorted: 121 Kg Total catch: 121.14 CATCH/HOUR: 242.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbriina canariensis	48.00	96	19.81	57
Chlorophthalmus atlanticus	44.64	9504	18.42	
Trichurus lepturus	39.84	456	16.44	
Shrimps, small, non comm.	25.92	33120	10.70	
MYCTOPHIDAE	21.60	12816	8.92	
Parapenaeus longirostris	15.24	2440	6.29	
Synagrops microlepis	12.40	768	5.12	
Pterothrissus belloci	8.96	56	3.70	
Sepia sp.	4.24	432	1.75	
Cynoponticus ferox	4.00	8	1.65	
Sardinella aurita	3.36	8	1.39	
Brotula barbata	3.12	8	1.29	
Illex coindetii	2.40	24	0.99	
Sardinella maderensis	2.16	8	0.89	
Lestidiopsis sp.	2.00	368	0.83	
Spicara alta	1.60	8	0.66	
OPHIIDAE	0.80	16	0.33	
Citharus linguatula	0.80	16	0.33	
Zenopsis conchifer	0.80	8	0.33	
Pontinus accraensis	0.40	8	0.17	
Total	242.28		100.01	

PROJECT STATION: 33  
 DATE: 21/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 445 Long E 1107  
 start stop duration Purpose code: 1  
 TIME :19:15:00 19:46:00 31 (min) Area code : 1  
 LOG :3578.30 3580.90 2.10 GearCond.code: 2  
 FDEPTH: 20 20 Validity code: 4  
 BDEPTH: 760 610  
 Towing dir: 90° Wire out: 110 m Speed: 42 km\*10  
 Sorted: 51 Kg Total catch: 102.83 CATCH/HOUR: 199.03

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	96.77	24387	48.62	
MYCTOPHIDAE	92.90	44981	46.68	
Trachurus trecae	5.85	12	2.94	
Shrimps, small, non comm.	3.21	2570	1.61	
Sepia sp.	0.27	8	0.14	
Lestidiopsis sp.	0.15	12	0.08	
Illex coindetii	0.12	4	0.06	
Total	199.27		100.13	

PROJECT STATION: 34  
 DATE: 22/ 8/94 GEAR TYPE: PT No:2 POSITION: Lat S 425 Long E 1127  
 start stop duration Purpose code: 1  
 TIME :01:28:00 01:58:00 30 (min) Area code : 1  
 LOG :3631.90 3633.80 1.90 GearCond.code: 1  
 FDEPTH: 0 0 Validity code: 1  
 BDEPTH: 23 26  
 Towing dir: 140° Wire out: 140 m Speed: 38 km\*10  
 Sorted: 62 Kg Total catch: 1593.00 CATCH/HOUR: 3166.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella maderensis	1590.00	19240	49.91	58
Sardinella aurita	490.00	6880	15.38	59
S H A F K S	400.00	20	12.55	
SPHYRRIIDAE	300.00	12	9.42	
Brachydeuterus auritus	268.00	21440	8.41	
Ilisha africana	53.20	920	1.67	
Selene dorsalis	44.80	720	1.41	
Sphyræna guachancho	25.60	240	0.80	
Sepia sp.	10.00	280	0.31	
Pteroscion pelli	4.00	160	0.13	
Total	3165.60		99.99	

PROJECT STATION: 35  
 DATE: 22/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 426 Long E 1110  
 start stop duration Purpose code: 1  
 TIME :04:50:00 05:20:00 30 (min) Area code : 1  
 LOG :3658.40 3659.90 1.50 GearCond.code: 1  
 FDEPTH: 30 30 Validity code: 1  
 BDEPTH: 88 82  
 Towing dir: 15° Wire out: 100 m Speed: 34 km\*10  
 Sorted: 51 Kg Total catch: 51.36 CATCH/HOUR: 102.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichurus lepturus	98.80	168	96.18	
Synagrops sp.	2.08	8	2.02	
Stromateus fiatola	1.24	2	1.21	
Sepia sp.	0.40	22	0.39	
Saurida brasiliensis	0.20	14	0.19	
Total	102.72		99.99	

PROJECT STATION: 36  
 DATE: 22/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 432 Long E 1057  
 start stop duration Purpose code: 3  
 TIME :07:45:00 08:15:00 30 (min) Area code : 1  
 LOG :3680.30 3681.80 1.50 GearCond.code: 1  
 FDEPTH: 315 325 Validity code: 1  
 BDEPTH: 315 325  
 Towing dir: 330° Wire out: 1000 m Speed: 32 km\*10  
 Sorted: 32 Kg Total catch: 280.68 CATCH/HOUR: 561.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ectreposebastes imus	179.10	6120	31.90	
Merluccius polli	156.00	1242	27.79	60
Shrimps, small, non comm.	67.68	39060	12.06	
Chlorophthalmus sp.	41.04	1026	7.31	
Zenopsis conchifer	21.96	36	3.91	
Synagrops microlepis	18.00	594	3.22	
Illex coindetii	16.20	90	2.99	
Trichurus lepturus	14.94	90	2.66	
MYCTOPHIDAE	12.24	4590	2.18	
Parapenaeus longirostris	10.26	882	1.83	
Nematopalaemon hastatus	7.20	522	1.28	
Lacemonema sp.	4.32	90	0.77	
Trigla lyra	3.60	18	0.64	
Hoplostethus cadonati	3.60	54	0.64	
Gadella maraldi	2.70	72	0.48	
Chaunax pictus	2.52	36	0.45	
Total	561.36		100.00	

PROJECT STATION: 37  
 DATE: 22/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 414 Long E 1050  
 start stop duration Purpose code: 3  
 TIME :10:34:00 11:04:00 30 (min) Area code : 1  
 LOG :3698.60 3700.00 1.50 GearCond.code: 1  
 FDEPTH: 177 170 Validity code: 1  
 BDEPTH: 177 170  
 Towing dir: 315° Wire out: 550 m Speed: 30 km\*10  
 Sorted: 28 Kg Total catch: 140.05 CATCH/HOUR: 280.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Synagrops microlepis	80.00	6610	28.56	
Pterothrissus belloci	67.50	410	24.10	
Chlorophthalmus atlanticus	30.00	6770	10.71	
Dentex angolensis	21.30	50	7.60	61
Trichurus lepturus	18.00	50	6.43	
Illex coindetii	16.80	390	6.00	
Zenopsis conchifer	14.50	40	5.18	
Pseudolithus brachygnathus	5.80	10	2.07	
Lophiodes kempi	5.20	10	1.86	
Spicara alta	4.90	40	1.75	
Pentheroscion mbizi	3.90	30	1.39	
Parapenaeus longirostris	3.40	10	1.21	
Zeus faber	3.00	10	1.07	
Squatinia sculeata	1.90	10	0.68	
Ectreposebastes imus	1.50	50	0.54	
Bembrops sp.	1.20	20	0.43	
Citharus linguatula	0.60	40	0.21	
Saurida brasiliensis	0.50	70	0.18	
Trachurus trecae	0.10	10	0.04	
Total	280.10		100.01	

PROJECT STATION: 38  
 DATE: 22/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 419 Long E 1104  
 start stop duration Purpose code: 3  
 TIME :13:21:00 13:53:00 32 (min) Area code : 1  
 LOG :3718.20 3719.70 1.50 GearCond.code: 1  
 FDEPTH: 82 81 Validity code: 1  
 BDEPTH: 82 81  
 Towing dir: 355° Wire out: 350 m Speed: 30 km\*10  
 Sorted: 44 Kg Total catch: 44.44 CATCH/HOUR: 83.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	37.69	248	45.23	63
Brotula barbata	10.31	28	12.37	64
Dentex angolensis	6.56	56	7.87	62
Octopus sp.	5.94	4	7.13	
Dentex canariensis	5.14	21	6.41	65
Trachurus trecae	3.66	90	4.39	
Torpedo torpedo	3.34	6	4.01	
Raja miraletus	2.21	6	2.65	
Sriacanthus arcuatus	1.37	9	1.64	
Zeus faber	1.18	6	1.42	
Citharus linguatula	1.07	24	1.28	
Uranoscopus albesca	0.75	2	0.90	
Zenopsis conchifer	0.75	4	0.90	
Echeneis naucrates	0.68	2	0.82	
Todaropsis eblanae	0.58	19	0.70	
Chelidonichthys gabonensis	0.49	8	0.59	
Selene dorsalis	0.45	2	0.54	
Saurida brasiliensis	0.26	32	0.31	
Scorpaena borealis	0.15	2	0.18	
Bembrops sp.	0.13	2	0.16	
Boops boops	0.11	6	0.13	
GOBIIDAE	0.06	4	0.07	
Sepiella ornata	0.06	2	0.07	
Parapenaeopsis atlantica	0.06	6	0.07	
Lophiodes kempi	0.06	4	0.07	
Sepia sp.	0.06	2	0.07	
Illex coindetii	0.02	36	0.02	
Total	83.34		100.00	

PROJECT STATION: 39  
 DATE: 22/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 412 Long E 1116  
 start stop duration  
 TIME :16:09:00 16:39:00 30 (min) Purpose code: 3  
 LOG :3739.80 3741.20 1.40 Area code : 1  
 FDEPTH: 22 20 GearCond. code: 1  
 BDEPTH: 22 20 Validity code: 1  
 Towing dir: 340° Wire out: 140 m Speed: 30 kn\*10  
 Sorted: 34 Kg Total catch: 205.44 CATCH/HOUR: 410.88

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	220.80	6828	53.74	
Ilisha africana	48.40	1044	11.78	
Selene dorsalis	39.60	1068	9.64	
Brachydeuterus auritus	39.24	4176	9.55	
Pseudotolithus brachygnathus	15.00	84	3.65	
Pteroscion pelli	10.92	204	2.66	
Lagocephalus laevigatus	6.20	12	1.51	
Sphyræna guachancho	5.40	24	1.31	
Galeoides decadactylus	5.04	48	1.23	
Trachurus trecae	4.92	144	1.20	
Raja miraletus	4.44	24	1.08	
Pentapneustes quinquequarius	3.96	96	0.96	
Pagellus bellottii	2.88	24	0.70	
Sepiella ornata	2.02	48	0.49	
Chloroscombrus chrysurus	1.44	24	0.35	
Shrimps, small, non comm.	0.36	108	0.09	
Dicologlossa cupeata	0.12	12	0.03	
Citharus linguatula	0.12	12	0.03	
Total	410.86		100.00	

PROJECT STATION: 43  
 DATE: 23/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 405 Long E 1054  
 start stop duration  
 TIME :11:17:00 11:47:00 30 (min) Purpose code: 3  
 LOG :3843.20 3844.70 1.50 Area code : 2  
 FDEPTH: 48 47 GearCond. code: 1  
 BDEPTH: 48 47 Validity code: 1  
 Towing dir: 330° Wire out: 170 m Speed: 31 kn\*10  
 Sorted: 60 Kg Total catch: 335.85 CATCH/HOUR: 671.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	429.00	13816	63.87	77
Sepia officinalis hierredda	84.16	188	12.53	
Trachurus trecae	83.60	3884	12.45	75
Pagellus bellottii	36.30	474	5.40	76
Raja miraletus	12.98	44	1.93	
Priacanthus arenatus	11.66	120	1.74	
Fistularia petimba	4.08	12	0.61	
Alectis alexandrinus	2.72	2	0.40	
Sphyræna guachancho	2.42	12	0.36	
Illex coindetii	1.10	132	0.16	
Cynoglossus canariensis	1.00	12	0.15	
Boops boops	1.00	22	0.15	
Lagocephalus laevigatus	0.78	12	0.12	
Torpedo torpedo	0.78	12	0.12	
Saurida brasiliensis	0.12	12	0.02	
Total	671.70		100.01	

PROJECT STATION: 40  
 DATE: 22/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 405 Long E 1110  
 start stop duration  
 TIME :17:32:00 18:03:00 31 (min) Purpose code: 3  
 LOG :3748.50 3749.90 1.40 Area code : 1  
 FDEPTH: 17 17 GearCond. code: 1  
 BDEPTH: 17 17 Validity code: 1  
 Towing dir: 310° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 28 Kg Total catch: 84.03 CATCH/HOUR: 162.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	42.10	1661	25.89	
Brachydeuterus auritus	26.42	794	16.24	
Sepiella ornata	20.85	987	12.82	
Pteroscion pelli	18.58	488	11.42	69
Sardinella maderensis	14.81	302	9.11	66
Chloroscombrus chrysurus	13.35	343	8.21	68
Parapenaeus longirostris	5.57	761	3.42	67
Sepia officinalis hierredda	5.46	6	3.36	
Cynoglossus senegalensis	4.70	6	2.89	
Dicologlossa cupeata	2.90	87	1.78	
Ilisha africana	1.92	23	1.18	
Pseudotolithus typus	1.92	23	1.18	
Trachurus trecae	1.57	52	0.97	
Galeoides decadactylus	1.51	75	0.93	
Pseudotolithus epiperurus	0.58	6	0.36	
Selene dorsalis	0.41	6	0.25	
Total	162.65		100.01	

PROJECT STATION: 44  
 DATE: 23/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 400 Long E 1052  
 start stop duration  
 TIME :12:25:00 12:55:00 30 (min) Purpose code: 1  
 LOG :3846.40 3848.40 2.00 Area code : 2  
 FDEPTH: 20 20 GearCond. code: 9  
 BDEPTH: 48 47 Validity code: 9  
 Towing dir: 130° Wire out: 80 m Speed: 40 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Total				

PROJECT STATION: 45  
 DATE: 23/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 355 Long E 1045  
 start stop duration  
 TIME :15:40:00 16:10:00 30 (min) Purpose code: 3  
 LOG :3873.70 3875.10 1.40 Area code : 2  
 FDEPTH: 58 57 GearCond. code: 1  
 BDEPTH: 58 57 Validity code: 1  
 Towing dir: 316° Wire out: 260 m Speed: 29 kn\*10  
 Sorted: 75 Kg Total catch: 679.07 CATCH/HOUR: 1358.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	548.10	15318	40.36	80
Brachydeuterus auritus	540.00	17226	39.76	
Pagellus bellottii	84.42	1314	6.22	78
Dentex angolensis	80.82	504	5.95	79
Priacanthus arenatus	37.80	342	2.78	
Raja miraletus	19.08	54	1.40	
Boops boops	13.86	468	1.02	
Sphyræna guachancho	11.70	36	0.86	
Pseudupeneus prayensis	8.10	72	0.60	
Sardinella maderensis	4.68	36	0.34	
Dentex canariensis	4.14	36	0.30	
Epinephelus aeneus	1.28	2	0.09	
Saurida brasiliensis	1.26	72	0.09	
Chilomycterus spinosus mauret.	0.92	2	0.07	
Chelidonichthys gabonensis	0.72	18	0.05	
Sardinella aurita	0.54	36	0.04	
Argocheilichthys imperialis	0.18	36	0.01	
Grazzoplites gruvelli	0.18	18	0.01	
Lepidotrigla carolae	0.18	18	0.01	
Engraulis encrasicolus	0.18	18	0.01	
Total	1358.14		99.97	

PROJECT STATION: 41  
 DATE: 23/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 412 Long E 1036  
 start stop duration  
 TIME :06:35:00 07:05:00 30 (min) Purpose code: 3  
 LOG :3811.70 3813.20 1.50 Area code : 2  
 FDEPTH: 205 205 GearCond. code: 1  
 BDEPTH: 205 205 Validity code: 1  
 Towing dir: 315° Wire out: 650 m Speed: 30 kn\*10  
 Sorted: 28 Kg Total catch: 198.93 CATCH/HOUR: 397.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	156.80	7966	39.41	
Trichiurus lepturus	72.00	224	18.10	
Synagrops microlepis	57.20	2856	14.38	
Dentex angolensis	47.60	126	11.96	70
Pterothrissus belloci	21.00	126	5.28	
Parapenaeus longirostris	12.88	2044	3.24	71
Brotula barbata	7.14	14	1.79	
Chelidonichthys gabonensis	5.32	56	1.34	
Illex coindetii	3.78	140	0.95	
Sepia sp.	2.80	476	0.70	
Aulopus cadonati	2.10	14	0.53	
Bembrops heterus	2.10	28	0.53	
Zenopsis conchifer	2.10	28	0.53	
Merluccius polli	1.40	14	0.35	
Pontinus accraensis	1.12	14	0.28	
C R A B S	0.70	28	0.18	
Symphurus sp.	0.14	14	0.04	
Monolele microstoma	0.14	14	0.04	
Total	396.32		99.63	

PROJECT STATION: 46  
 DATE: 23/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 404 Long E 1027  
 start stop duration  
 TIME :18:40:00 19:10:00 30 (min) Purpose code: 3  
 LOG :3897.40 3898.90 1.50 Area code : 2  
 FDEPTH: 274 280 GearCond. code: 1  
 BDEPTH: 274 280 Validity code: 1  
 Towing dir: 335° Wire out: 800 m Speed: 29 kn\*10  
 Sorted: 32 Kg Total catch: 164.50 CATCH/HOUR: 329.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	163.50	3430	49.70	
Dentex angolensis	94.00	180	28.57	81
Merluccius polli	30.50	324	9.27	82
Malacocephalus occidentalis	8.00	40	2.43	
Peristodion cataphractum	5.00	300	1.52	
Trigla lyra	3.50	60	1.06	
Synagrops microlepis	3.50	40	1.06	
Brosimulus imberbis *	3.00	40	0.91	
Laebonema laureysi	3.00	70	0.91	
Etmopterus pusillus	2.60	10	0.79	
Zenion sp.	2.60	160	0.79	
Pterothrissus belloci	2.00	10	0.61	
Coelorrhinus coelorrhinus	1.50	40	0.46	
Parapenaeus longirostris	1.00	100	0.30	
Pontinus accraensis	1.00	40	0.30	
Plesionika martia	0.90	90	0.27	
Lepidotrigla cadmani	0.80	10	0.24	
Cynoponticus ferox	0.50	10	0.15	
Bathysgadus melanobranchus	0.40	30	0.12	
Scyllorhinus stellaris	0.30	10	0.09	
Chascanopsetta lugubris	0.20	10	0.06	
Monolele microstoma	0.10	10	0.03	
OPHIDIIDAE	0.10	10	0.03	
Brachydeuterus auritus	0.10	10	0.03	
Epigonus pandionis	0.10	10	0.03	
Cyttopsia roseus	0.10	10	0.03	
MYCTOPHIDAE	0.10	20	0.01	
Total	328.32		99.77	

PROJECT STATION: 42  
 DATE: 23/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 910 Long E 1045  
 start stop duration  
 TIME :09:10:00 09:40:00 30 (min) Purpose code: 3  
 LOG :3829.00 3830.50 1.50 Area code : 2  
 FDEPTH: 91 91 GearCond. code: 1  
 BDEPTH: 91 91 Validity code: 1  
 Towing dir: 345° Wire out: 300 m Speed: 31 kn\*10  
 Sorted: 165 Kg Total catch: 228.28 CATCH/HOUR: 456.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	211.18	884	46.25	74
Dentex angolensis	117.74	426	25.79	73
Trichiurus lepturus	50.98	128	11.17	
Selene dorsalis	45.92	276	10.06	72
Branchiostegus semifasciatus	7.68	10	1.68	
Illex coindetii	7.42	924	1.63	
Scomber japonicus	3.68	10	0.81	
Chelidonichthys gabonensis	3.04	36	0.67	
Zenopsis conchifer	2.24	26	0.49	
Citharus linguatula	1.54	42	0.34	
Priacanthus arenatus	1.54	10	0.34	
Saurida brasiliensis	1.00	202	0.22	
Pagellus bellottii	0.80	10	0.18	
Liocarcinus corrugatus	0.80	112	0.18	
Sepia bertheloti	0.52	6	0.11	
Boops boops	0.48	26	0.11	
Microchirus frechkopi	0.00	2		
Spicara alta	0.00	2		
Total	456.56		100.03	

PROJECT STATION: 47  
 DATE: 23/ 8/94 GEAR TYPE: PT No:2 POSITION: Lat S 348  
 start stop duration Long E 1035  
 TIME : 23:00:00 23:30:00 30 (min) Purpose code: 1  
 LOG : 3932.20 3933.70 1.50 Area code : 2  
 FDEPTH: 15 15 GearCond. code: 1  
 BDEPTH: 64 68 Validity code: 1  
 Towing dir: 240° Wire out: 110 m Speed: 35 kn\*10  
 Sorted: 71 Kg Total catch: 71.69 CATCH/HOUR: 143.38

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	50.50	70	35.22	
Trachurus trecae	44.70	316	31.18	83
Sardinella maderensis	29.80	162	20.78	85
Sardinella aurita	11.90	56	8.30	84
Scomber japonicus	4.22	20	2.94	86
Sepia bertheloti	0.64	14	0.45	
Saurida brasiliensis	0.60	122	0.42	
Illex coindetii	0.52	140	0.36	
Selene dorsalis	0.50	4	0.35	
Total	143.38		100.00	

PROJECT STATION: 48  
 DATE: 24/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 353  
 start stop duration Long E 1045  
 TIME : 01:11:00 01:24:00 13 (min) Purpose code: 1  
 LOG : 3947.30 3948.00 0.70 Area code : 2  
 FDEPTH: 12 13 GearCond. code: 1  
 BDEPTH: 56 57 Validity code: 1  
 Towing dir: 300° Wire out: 80 m Speed: 34 kn\*10  
 Sorted: 110 Kg Total catch: 2118.50 CATCH/HOUR: 9777.69

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	7876.15	95866	80.55	87
Trachurus trecae	1799.08	14215	18.40	88
Scomber japonicus	96.92	268	0.99	
Sepia bertheloti	5.54	88	0.06	
Total	9777.69		100.00	

PROJECT STATION: 49  
 DATE: 24/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 356  
 start stop duration Long E 1052  
 TIME : 03:12:00 03:42:00 30 (min) Purpose code: 1  
 LOG : 3962.90 3964.80 1.90 Area code : 2  
 FDEPTH: 10 10 GearCond. code: 1  
 BDEPTH: 38 38 Validity code: 1  
 Towing dir: 330° Wire out: 70 m Speed: 38 kn\*10  
 Sorted: 21 Kg Total catch: 21.86 CATCH/HOUR: 43.72

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella aurita	34.80	3978	79.60	89
Sepia bertheloti	3.66	18	8.37	
Sphyræna quachancho	3.48	10	7.96	90
Trachurus trecae	1.08	10	2.47	
Illex coindetii	0.30	200	0.69	
Brachydeuterus auritus	0.24	2	0.55	
Engraulis encrasicolus	0.08	8	0.18	
Saurida brasiliensis	0.08	10	0.18	
Total	43.72		100.00	

PROJECT STATION: 50  
 DATE: 24/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 3039  
 start stop duration Long E 1042  
 TIME : 06:34:00 07:04:00 30 (min) Purpose code: 3  
 LOG : 3984.80 3986.30 1.50 Area code : 2  
 FDEPTH: 34 37 GearCond. code: 1  
 BDEPTH: 34 37 Validity code: 1  
 Towing dir: 165° Wire out: 125 m Speed: 31 kn\*10  
 Sorted: 12 Kg Total catch: 25.40 CATCH/HOUR: 50.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Ephippion guttifer	13.56	4	26.69	
Pagellus bellottii	10.24	112	20.16	91
Carcharhinus signatus	9.64	4	18.98	
Illex coindetii	4.84	2336	9.53	
Fistularia petimba	3.00	8	5.91	
Peristedion cataphractum	2.80	120	5.51	
Priscanthus arenatus	1.40	8	2.76	
Chlorophthalmus atlanticus	1.20	28	2.36	
Balistes capricornis	1.20	4	2.36	
Geryon maritae	1.08	4	2.13	
Eumunida squamifera	0.80	84	1.57	
Chelidonichthys lucerna	0.56	4	1.10	
Liocarcinus corrugatus	0.32	40	0.63	
Cruriraja parcomaculata	0.16	12	0.31	
Total	50.80		100.00	

PROJECT STATION: 51  
 DATE: 24/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 333  
 start stop duration Long E 1040  
 TIME : 08:24:00 08:54:00 30 (min) Purpose code: 3  
 LOG : 3996.40 3997.90 1.50 Area code : 2  
 FDEPTH: 30 31 GearCond. code: 1  
 BDEPTH: 30 31 Validity code: 1  
 Towing dir: 165° Wire out: 100 m Speed: 31 kn\*10  
 Sorted: 58 Kg Total catch: 1060.38 CATCH/HOUR: 2120.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	1571.40	41428	74.10	93
Trachurus trecae	248.40	2736	11.71	92
Chloroscombrus chrysurus	223.20	4464	10.52	94
Trichiurus lepturus	38.16	576	1.80	
Sphyræna quachancho	18.00	108	0.85	
Selene dorsalis	6.84	72	0.32	
Peristedion cataphractum	6.48	360	0.31	
Pagellus bellottii	3.96	36	0.19	
Pteroscopus pelli	3.60	36	0.17	
Sardinella aurita	0.72	36	0.03	95
Synchropus phaeon	0.00	36		
Total	2120.76		100.00	

PROJECT STATION: 52  
 DATE: 24/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 343  
 start stop duration Long E 1026  
 TIME : 11:00:00 11:30:00 30 (min) Purpose code: 3  
 LOG : 4016.60 4018.00 1.40 Area code : 2  
 FDEPTH: 75 73 GearCond. code: 1  
 BDEPTH: 75 73 Validity code: 1  
 Towing dir: 340° Wire out: 250 m Speed: 28 kn\*10  
 Sorted: 24 Kg Total catch: 87.89 CATCH/HOUR: 175.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Selene dorsalis	52.00	252	29.58	96
Dentex congosensis	49.80	868	28.33	98
Pagellus bellottii	43.00	2276	24.46	97
Boops boops	17.00	854	9.67	
Mustelus mustelus	5.62	2	3.20	
Zeus faber	2.80	8	1.59	
Chelidonichthys gabonensis	1.48	64	0.84	
Illex coindetii	1.20	202	0.68	
Spicara alta	0.84	28	0.48	
Trachurus trecae	0.84	168	0.48	
Sepia bertheloti	0.78	14	0.44	
Citharus linguatula	0.28	28	0.16	
Saurida brasiliensis	0.14	22	0.08	
Total	175.78		99.99	

PROJECT STATION: 53  
 DATE: 24/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 350  
 start stop duration Long E 1013  
 TIME : 13:34:00 14:04:00 30 (min) Purpose code: 3  
 LOG : 4035.80 4037.50 1.70 Area code : 2  
 FDEPTH: 239 236 GearCond. code: 1  
 BDEPTH: 239 236 Validity code: 1  
 Towing dir: 310° Wire out: 740 m Speed: 30 kn\*10  
 Sorted: 26 Kg Total catch: 223.60 CATCH/HOUR: 447.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	345.60	9248	77.28	
Todaropsis sp.	24.96	256	5.58	
Synagrops microlepis	23.68	1200	5.30	
Dentex angolensis	20.50	52	4.58	99
Trichiurus lepturus	11.84	64	2.65	
Illex coindetii	6.56	304	1.47	
Zenopsis conchifer	4.16	16	0.93	
Raja straeleni	1.92	16	0.43	
Parapanaeus longirostris	1.60	176	0.36	
OPHICHTHIDAE	1.60	16	0.36	
Chelidonichthys gabonensis	1.60	16	0.36	
Epigonus pandionis	1.12	274	0.25	
Antigonia capros	0.64	16	0.14	
PORTUNIDAE	0.64	16	0.14	
Pterothrissus belloci	0.46	32	0.10	
Boops boops	0.16	16	0.04	
Sepia sp.	0.16	32	0.04	
Total	447.20		100.01	

PROJECT STATION: 54  
 DATE: 24/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 345  
 start stop duration Long E 1007  
 TIME : 15:47:00 16:17:00 30 (min) Purpose code: 3  
 LOG : 4053.00 4054.40 1.40 Area code : 2  
 FDEPTH: 343 323 GearCond. code: 1  
 BDEPTH: 343 323 Validity code: 1  
 Towing dir: 330° Wire out: 1080 m Speed: 28 kn\*10  
 Sorted: 38 Kg Total catch: 164.20 CATCH/HOUR: 328.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Merluccius polli	150.44	1232	45.81	100
Chlorophthalmus atlanticus	93.00	1776	28.32	
Trichiurus lepturus	20.40	144	6.21	
Etreposebaastes imus	13.00	374	3.96	
Zenopsis conchifer	11.72	16	3.57	
Synagrops microlepis	11.46	322	3.49	
Todaropsis eblanae	4.58	42	1.39	
Parapanaeus longirostris	4.08	408	1.24	
Etomopterus polli	2.54	16	0.77	
Sepia sp.	2.20	102	0.67	
Epigonus pandionis	2.12	92	0.65	
Brosmiculus imberbis *	1.78	50	0.54	
Trigla lyra	1.70	16	0.52	
Plesionika martia	1.36	220	0.41	
Bathygadus melanobranchus	1.36	8	0.41	
Illex coindetii	1.26	24	0.38	
Chascanopeetta lugubris	1.26	8	0.38	
OPHICHTHIDAE	0.84	8	0.26	
Cyttopsis roseus	0.76	16	0.23	
Raja straeleni	0.50	8	0.15	
Laemonema laureysi	0.50	8	0.15	
GONOSTOMATIDAE	0.42	8	0.13	
Lestidiops sp.	0.24	16	0.07	
Coelorrhinus coelorhincus	0.16	8	0.05	
MYCTOPHIDAE	0.16	126	0.05	
Bassanago albescens *	0.16	8	0.05	
Peristedion cataphractum	0.08	8	0.02	
Eumunida squamifera	0.08	8	0.02	
Dibranchius atlanticus	0.08	8	0.02	
Hymenoccephalus sp.	0.08	16	0.02	
Trachurus trecae	0.08	16	0.02	
Total	328.40		99.96	



PROJECT STATION: 55  
 DATE: 24/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 143 Long E 1007  
 start stop duration  
 TIME :17:09:00 17:39:00 30 (min) Purpose code: 3  
 LOG :4059.00 4060.50 1.50 Area code : 2  
 FDEPTH: 152 149 GearCond.code: 1  
 BDEPTH: 152 149 Validity code: 1  
 Towing dir: 300° Wire out: 520 m Speed: 30 kn\*10  
 Sorted: 56 Kg Total catch: 392.28 CATCH/HOUR: 784.56

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	243.60	702	31.05	101
Synagrops microlepis	214.90	10556	27.39	
Spicara alta	131.60	574	16.77	102
Dentex congoensis	108.50	1442	13.83	103
Antigonia capros	19.88	840	2.53	
Zeus faber	16.38	70	2.09	
Trichiurus lepturus	11.62	42	1.48	
Aulopus cadenati	9.24	154	1.18	
Dentex angolensis	8.12	28	1.03	
Zenopsis conchifer	7.56	70	0.96	
Pseudolithus senegalensis	4.62	28	0.59	
Pterothrissus bellocci	2.80	14	0.36	
Illex coindetii	2.52	84	0.32	
Chelidonichthys gabonensis	1.68	28	0.21	
Arnoglossus sp.	1.12	42	0.14	
Lepidotrigla carolae	0.14	28	0.02	
Chascanopsetta lugubris	0.14	14	0.02	
Peristedion cataphractum	0.14	14	0.02	
Total	784.56		99.99	

PROJECT STATION: 59  
 DATE: 25/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 326 Long E 1013  
 start stop duration  
 TIME :06:27:00 06:57:00 30 (min) Purpose code: 3  
 LOG :4151.80 4153.30 1.50 Area code : 2  
 FDEPTH: 63 63 GearCond.code: 1  
 BDEPTH: 63 63 Validity code: 1  
 Towing dir: 330° Wire out: 210 m Speed: 27 kn\*10  
 Sorted: 30 Kg Total catch: 59.76 CATCH/HOUR: 119.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	72.20	2208	60.41	
Sepia officinalis hierredra	11.32	44	9.47	
Trachurus trecae	9.40	108	7.86	
Boops boops	5.20	100	4.35	
Platularia petimba	4.68	4	3.92	
Saurida brasiliensis	4.64	104	3.88	
Trichiurus lepturus	3.60	4	3.01	
Priacanthus arenatus	3.00	24	2.51	
Scomber japonicus	1.40	174	1.17	121
Torpedo torpedo	1.20	4	1.00	
Illex coindetii	1.00	88	0.84	
Sardinella aurita	0.68	4	0.57	
Trachurus trecae, juvenile	0.52	140	0.44	120
Brachydeuterus auritus	0.36	4	0.30	
Chelidonichthys gabonensis	0.32	16	0.27	
Total	119.52		100.00	

PROJECT STATION: 56  
 DATE: 24/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 337 Long E 1031  
 start stop duration  
 TIME :21:28:00 21:48:00 20 (min) Purpose code: 1  
 LOG :4095.20 4096.50 1.30 Area code : 2  
 FDEPTH: 15 15 GearCond.code: 1  
 BDEPTH: 47 48 Validity code: 1  
 Towing dir: 190° Wire out: 105 m Speed: 39 kn\*10  
 Sorted: 29 Kg Total catch: 239.44 CATCH/HOUR: 718.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	562.80	7851	78.35	106
Trachurus trecae	88.80	816	12.36	105
Sardinella maderensis	35.52	264	4.94	104
Trichiurus lepturus	15.36	24	2.14	
Sphyræna guachancho	8.16	24	1.14	
Scomber japonicus	7.68	48	1.07	
Total	718.32		100.00	

PROJECT STATION: 60  
 DATE: 25/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 337 Long E 1007  
 start stop duration  
 TIME :08:32:00 09:02:00 30 (min) Purpose code: 3  
 LOG :4164.50 4165.90 1.40 Area code : 2  
 FDEPTH: 98 98 GearCond.code: 1  
 BDEPTH: 98 98 Validity code: 1  
 Towing dir: 330° Wire out: 330 m Speed: 29 kn\*10  
 Sorted: 30 Kg Total catch: 90.10 CATCH/HOUR: 180.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	64.20	1596	35.63	123
Selene dorsalis	30.06	96	16.68	124
Pagellus bellottii	22.80	276	12.65	122
Trichiurus lepturus	18.00	36	9.99	
Mustelus mustelus	10.00	2	5.55	
Sparus pagrus africanus	9.28	6	5.15	
Sepia officinalis hierredra	8.40	12	4.66	
Raja miraletus	3.54	6	1.96	
Illex coindetii	3.24	360	1.80	
Chelidonichthys gabonensis	2.94	36	1.63	
Boops boops	2.40	168	1.33	
Torpedo torpedo	1.26	6	0.70	
Citharus linguatula	0.78	18	0.43	
Zeus faber	0.72	6	0.40	
Trachurus trecae	0.72	60	0.40	
Saurida brasiliensis	0.66	144	0.37	
Lepidotrigla carolae	0.60	48	0.33	
Dentex angolensis	0.30	12	0.17	
Scomber japonicus	0.30	24	0.17	
Total	180.20		100.00	

PROJECT STATION: 57  
 DATE: 24/ 8/94 GEAR TYPE: PT No:2 POSITION: Lat S 326 Long E 1032  
 start stop duration  
 TIME :23:36:00 23:56:00 20 (min) Purpose code: 1  
 LOG :4110.00 4111.00 1.20 Area code : 2  
 FDEPTH: 0 0 GearCond.code: 1  
 BDEPTH: 31 32 Validity code: 1  
 Towing dir: 190° Wire out: 105 m Speed: 39 kn\*10  
 Sorted: 64 Kg Total catch: 4198.30 CATCH/HOUR: 12594.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	7680.90	299649	60.98	
Sardinella maderensis	3102.00	77607	24.63	107
Brachydeuterus auritus	748.20	24939	5.94	
Sardinella aurita	493.20	10419	3.92	108
Trachurus trecae	329.10	6384	2.61	109
Selene dorsalis	167.70	3393	1.33	110
Sphyræna guachancho	73.80	600	0.59	111
Total	12594.90		100.00	

PROJECT STATION: 61  
 DATE: 25/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 334 Long E 958  
 start stop duration  
 TIME :11:17:00 11:47:00 30 (min) Purpose code: 3  
 LOG :4182.00 4183.50 1.50 Area code : 2  
 FDEPTH: 176 173 GearCond.code: 1  
 BDEPTH: 176 173 Validity code: 1  
 Towing dir: 320° Wire out: 570 m Speed: 32 kn\*10  
 Sorted: 38 Kg Total catch: 135.37 CATCH/HOUR: 270.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spicara alta	93.44	1128	34.51	125
Zenopsis conchifer	56.70	274	20.94	
Dentex congoensis	39.56	498	14.61	127
Dentex angolensis	20.66	78	7.63	126
Antigonia capros	17.44	532	6.44	
Illex coindetii	15.34	560	5.67	
Zeus faber	10.50	22	3.88	
Aulopus cadenati	6.02	56	2.22	
Pterothrissus bellocci	3.08	22	1.14	
Raja miraletus	2.32	8	0.86	
Ophichthus aerepens	2.04	8	0.75	
Chelidonichthys gabonensis	1.68	22	0.62	
Todaropsis eblanae	1.62	28	0.60	
Lepidotrigla carolae	0.14	8	0.05	
Monolepis microstoma	0.08	8	0.03	
Citharus linguatula	0.08	8	0.03	
Microchirus boscanion	0.08	8	0.03	
Peristedion cataphractum	0.08	8	0.03	
Saurida brasiliensis	0.08	14	0.03	
Schedophilus pamarco	0.02	8	0.01	
Total	270.96		100.08	

PROJECT STATION: 58  
 DATE: 25/ 8/94 GEAR TYPE: PT No:2 POSITION: Lat S 323 Long E 1032  
 start stop duration  
 TIME :01:32:00 02:02:00 30 (min) Purpose code: 1  
 LOG :4121.20 4123.10 1.90 Area code : 2  
 FDEPTH: 0 0 GearCond.code: 1  
 BDEPTH: 20 21 Validity code: 1  
 Towing dir: 149° Wire out: 120 m Speed: 38 kn\*10  
 Sorted: 59 Kg Total catch: 809.40 CATCH/HOUR: 1618.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	803.20	24112	49.62	112
Brachydeuterus auritus	494.20	18090	30.53	
Trachurus trecae	133.60	2160	8.25	116
Sphyræna guachancho	47.20	486	2.92	113
Sepia sp.	43.20	54	2.67	
Scomberomorus tritor	21.80	28	1.35	
Galeoides decadactylus	16.00	486	0.99	117
Sardinella maderensis	15.40	298	0.95	115
Pomadasys rogeri	14.40	28	0.89	
Selene dorsalis	14.40	324	0.89	114
Sardinella aurita	6.00	82	0.37	118
Ilisha africana	4.00	108	0.25	119
Eucinostomus melanopterus	3.00	54	0.19	
Trichiurus lepturus	2.20	28	0.14	
Parapennaeus longirostris	0.20	28	0.01	
Total	1618.80		100.02	

PROJECT STATION: 62  
 DATE: 25/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 328 Long E 953  
 start stop duration  
 TIME :13:08:00 13:38:00 30 (min) Purpose code: 3  
 LOG :4193.00 4194.50 1.50 Area code : 2  
 FDEPTH: 115 118 GearCond.code: 1  
 BDEPTH: 115 118 Validity code: 1  
 Towing dir: 138° Wire out: 430 m Speed: 30 kn\*10  
 Sorted: 114 Kg Total catch: 448.38 CATCH/HOUR: 896.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Umbrina canariensis	674.40	1488	75.20	130
Sparus pagrus africanus	135.72	192	15.13	128
Anthias anthias	27.36	312	3.05	129
Boops boops	19.20	936	2.14	
Dentex congoensis	14.76	228	1.65	
Zeus faber	11.76	12	1.31	
Raja straeleni	8.40	12	0.94	
Zenopsis conchifer	1.80	12	0.20	
Trachurus trecae	1.44	456	0.16	
Ariomma bondi	1.12	24	0.15	
Synchiropus phaeton	0.16	12	0.04	
Saurida brasiliensis	0.12	12	0.01	
Scomber japonicus	0.12	12	0.01	
Total	896.76		94.99	

PROJECT STATION: 63  
 DATE: 25/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 319 Long E 1006  
 start stop duration  
 TIME :15:58:00 16:20:00 30 (min) Purpose code: 3  
 LOG :4212.00 4213.40 1.40 Area code : 2  
 FDEPTH: 60 56 GearCond.code: 1  
 BDEPTH: 60 56 Validity code: 1  
 Towing dir: 345° Wire out: 240 m Speed: 28 kn\*10  
 Sorted: 18 Kg Total catch: 18.35 CATCH/HOUR: 36.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sepia sp.	18.50	36	50.41	
Pagellus bellottii	2.66	42	7.25	131
Raja miraletus	2.40	10	6.54	
Alloteuthis africana	1.80		4.90	
Chelidonichthys gabonensis	1.62	38	4.41	
Syacium micrurum	1.54	16	4.20	
Umbra canariensis	1.50	2	4.09	
Fistularia petimba	1.46	6	3.98	
Scomber japonicus	1.42	212	3.87	
Dentex barnardi	0.74	2	2.02	
Lepidotrigla carolae	0.54	22	1.47	
Chilomycterus spinosus mauret.	0.40	2	1.09	
Illex coindetii	0.40	16	1.09	
Dentex gibbosus	0.26	2	0.71	
Citharus linguatula	0.26	8	0.71	
Todaropsis eblanae	0.24	10	0.65	
Trachurus trecae	0.20	20	0.54	
Monolepis mertensi	0.18	22	0.49	
Synchiropus phacton	0.16	6	0.44	
Chelidonichthys lucerna	0.14	2	0.38	
Saurida brasiliensis	0.10	18	0.27	
Anthias anthias	0.10	6	0.27	
Boops boops	0.06	2	0.16	
Antennarius "biocellatus"	0.02	2	0.05	
Total	36.70		99.99	

PROJECT STATION: 66  
 DATE: 26/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 313 Long E 938  
 start stop duration  
 TIME :08:22:00 08:52:00 30 (min) Purpose code: 3  
 LOG :4306.30 4307.70 1.40 Area code : 2  
 FDEPTH: 136 135 GearCond.code: 1  
 BDEPTH: 136 135 Validity code: 1  
 Towing dir: 330° Wire out: 450 m Speed: 30 kn\*10  
 Sorted: 71 Kg Total catch: 321.67 CATCH/HOUR: 643.34

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	216.44	368	33.64	139
Zenopsis conchifer	136.34	126	21.19	135
Boops boops	131.84	2978	20.49	138
Spicara alta	72.90	872	11.33	136
Dentex angolensis	52.64	342	8.10	137
Zeus faber	13.76	36	2.14	
Antigonia capros	5.58	242	0.87	
Todaropsis eblanae	3.78	108	0.59	
Aulopus cadaceni	3.68	54	0.57	
Illex coindetii	2.78	152	0.43	
Arlosoma bondi	1.62	26	0.25	
Lepidotrigla carolae	1.26	54	0.20	
Peristedion cataphractum	0.54	18	0.08	
Sauriglossus capensis	0.18	8	0.03	
Total	643.34		99.99	

PROJECT STATION: 67  
 DATE: 26/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 306 Long E 949  
 start stop duration  
 TIME :10:46:00 11:16:00 30 (min) Purpose code: 3  
 LOG :4323.10 4324.60 1.50 Area code : 2  
 FDEPTH: 73 69 GearCond.code: 1  
 BDEPTH: 73 69 Validity code: 1  
 Towing dir: 340° Wire out: 240 m Speed: 29 kn\*10  
 Sorted: 66 Kg Total catch: 928.76 CATCH/HOUR: 1857.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Brachydeuterus auritus	953.40	11430	51.33	141
Pagellus bellottii	714.84	19320	36.48	142
Trachurus trecae	71.68	1372	3.86	140
Sepia bertheloti	58.24	1792	3.14	
Trichurus lepturus	19.60	78	1.06	
Pseudupeneus prayensis	12.32	196	0.66	
Sardinella aurita	5.22	56	0.29	
Boops boops	5.04	84	0.27	
Alloteuthis africana	4.20	868	0.23	
Scomber japonicus	4.20	532	0.23	
Chelidonichthys gabonensis	3.08	56	0.17	
Lepidotrigla carolae	2.80	140	0.15	
Saurida brasiliensis	2.80	224	0.15	
Total	1857.52		100.02	

PROJECT STATION: 64  
 DATE: 25/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 316 Long E 1008  
 start stop duration  
 TIME :17:45:00 18:15:00 30 (min) Purpose code: 3  
 LOG :4223.40 4224.90 1.50 Area code : 2  
 FDEPTH: 48 43 GearCond.code: 1  
 BDEPTH: 48 43 Validity code: 1  
 Towing dir: 350° Wire out: 200 m Speed: 30 kn\*10  
 Sorted: 42 Kg Total catch: 42.59 CATCH/HOUR: 85.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	40.60	458	47.66	133
Sepia sp.	18.40	30	21.60	
Fistularia petimba	6.90	16	8.10	
Brachydeuterus auritus	4.42	32	5.19	132
Raja miraletus	3.00	46	3.52	
Dactylopterus volitans	2.96	10	3.47	
Chelidonichthys lucerna	1.98	22	2.32	
Decapterus rhonchus	1.08	2	1.27	
Syacium micrurum	0.98	16	1.15	
Zeus faber	0.92	2	1.08	
Torpedo torpedo	0.88	2	1.03	
Dicologlossa hexophthalma	0.58	8	0.68	
Trachinocephalus myops	0.44	4	0.52	
Chelidonichthys gabonensis	0.38	6	0.45	
Prionanthus arenatus	0.36	2	0.42	
Uranoscopus polli	0.28	4	0.33	
Trachinus armatus	0.26	4	0.31	
Pseudupeneus prayensis	0.26	4	0.31	
Grammolites gruvelli	0.16	6	0.19	
Alloteuthis africana	0.12	30	0.14	
Scomber japonicus	0.08	16	0.09	
Citharus linguatula	0.04	4	0.05	
Lepidotrigla carolae	0.04	2	0.05	
Synchiropus phacton	0.02	2	0.02	
Todaropsis eblanae	0.02	2	0.02	
Illex coindetii	0.02	2	0.02	
Total	85.18		99.99	

PROJECT STATION: 68  
 DATE: 26/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 301 Long E 1005  
 start stop duration  
 TIME :14:04:00 14:15:00 11 (min) Purpose code: 3  
 LOG :4348.80 4349.30 0.50 Area code : 2  
 FDEPTH: 27 27 GearCond.code: 1  
 BDEPTH: 27 27 Validity code: 1  
 Towing dir: 150° Wire out: 120 m Speed: 29 kn\*10  
 Sorted: 64 Kg Total catch: 164.04 CATCH/HOUR: 894.76

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	416.62	1244	46.56	143
Pagellus bellottii	166.16	2689	40.92	144
Spicara caeruleostictus	35.62	71	3.98	145
Dentex canariensis	25.91	38	2.90	146
Alloteuthis africana	19.09		2.13	
Fistularia petimba	9.00	27	1.01	
Raja miraletus	8.45	16	0.94	
Sphyræna guachancho	4.09	16	0.46	
Pseudupeneus prayensis	3.44	16	0.38	
Balistes capricornis	3.27	16	0.37	
Chelidonichthys lucerna	1.64	16	0.18	
Decapterus punctatus	1.47	16	0.16	
Total	894.76		99.99	

PROJECT STATION: 65  
 DATE: 26/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 315 Long E 938  
 start stop duration  
 TIME :06:37:00 07:07:00 30 (min) Purpose code: 3  
 LOG :4300.00 4301.50 1.50 Area code : 2  
 FDEPTH: 255 261 GearCond.code: 1  
 BDEPTH: 255 261 Validity code: 1  
 Towing dir: 315° Wire out: 820 m Speed: 31 kn\*10  
 Sorted: 23 Kg Total catch: 329.84 CATCH/HOUR: 659.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	253.40	7168	38.41	
Synagrops microlepis	151.20	11340	22.92	
Dentex angolensis	51.80	150	7.85	134
Merluccius polli	43.40	448	6.58	
Zenopsis conchifer	43.40	56	6.58	
Todaropsis eblanae	23.80	476	3.61	
Trichurus lepturus	19.60	84	2.97	
Peristedion cataphractum	16.80	308	2.55	
Ophisurus serpens	12.60	28	1.91	
Illex coindetii	11.20	672	1.70	
Eumunida squamifera	8.40	840	1.27	
Pterotrissus belloci	8.40	28	1.27	
Plesionika martia	6.16	1344	0.93	
Boops heterurus	3.08	56	0.47	
Epigonus pandionis	2.52	140	0.38	
Sepia sp.	1.96	168	0.30	
Coelorhynchus coelorhynchus	1.40	252	0.21	
Zenion hololepis	0.28	28	0.04	
Parapeneus longirostris	0.28	56	0.04	
Total	659.68		99.99	

PROJECT STATION: 69  
 DATE: 26/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 251 Long E 954  
 start stop duration  
 TIME :16:43:00 17:13:00 30 (min) Purpose code: 3  
 LOG :4370.20 4371.70 1.50 Area code : 2  
 FDEPTH: 26 24 GearCond.code: 1  
 BDEPTH: 26 24 Validity code: 1  
 Towing dir: 340° Wire out: 120 m Speed: 30 kn\*10  
 Sorted: 76 Kg Total catch: 183.20 CATCH/HOUR: 366.40

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	245.80	3184	67.09	148
Chloroscombrus chrysurus	60.02	698	16.38	147
Decapterus rhonchus	24.14	92	6.59	149
Alectia alexandrinus	15.40	44	4.20	
Fistularia petimba	10.58	72	2.89	
Alloteuthis africana	3.76	1182	1.03	
Pseudupeneus prayensis	1.70	12	0.46	
Lagocephalus laevisgatus	1.32	4	0.36	
Chelidonichthys lucerna	1.14	8	0.31	
Sphyræna aphyraena	0.92	4	0.25	
Trachurus trecae juvenile	0.68	238	0.19	
Sardinella aurita	0.64	4	0.17	
Raja miraletus	0.22	4	0.06	
Illex coindetii	0.04	4	0.01	
Scomber japonicus	0.04	8	0.01	
Total	366.40		100.00	

PROJECT STATION: 70  
 DATE: 27/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 300 Long E 939  
 start stop duration  
 TIME :05:37:00 07:07:00 30 (min) Purpose code: 3  
 LOG :4430.80 4432.20 1.40 Area code : 2  
 FDEPTH: 328 325 GearCond.code: 1  
 BDEPTH: 328 325 Validity code: 1  
 Towing dir: 320° Wire out: 1000 m Speed: 29 kn\*10  
 Sorted: 29 Kg Total catch: 126.32 CATCH/HOUR: 252.64

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chlorophthalmus atlanticus	137.20	2056	54.31	
MISCELLANEOUS	43.20	8016	17.10	
Ijimaia loppei	18.90	2	7.48	
Synagrops microlepis	15.36	280	6.08	
Merluccius polli	13.04	88	5.16	
Illex coindetii	7.68	192	3.04	
Gadella imberbis	4.64	128	1.84	
Zenion hololepis	3.76	216	1.49	
Trigla lyra	3.68	40	1.46	
Ectocostobastes imus	1.60	56	0.63	
Coclorinchus coclorinchus	1.20	16	0.47	
Parapenaeus longirostris	0.96	72	0.38	
Sepia clypeata	0.64	24	0.25	
Peristedion cataphractum	0.40	16	0.16	
CONOSTOMATIDAE	0.40	80	0.16	
Total	252.66		100.01	

PROJECT STATION: 74  
 DATE: 28/ 8/94 GEAR TYPE: BT No:1 POSITION: Lat S 235 Long E 940  
 start stop duration  
 TIME :09:15:00 09:45:00 30 (min) Purpose code: 3  
 LOG :4496.40 4497.80 1.40 Area code : 2  
 FDEPTH: 26 24 GearCond.code: 1  
 BDEPTH: 26 24 Validity code: 1  
 Towing dir: 340° Wire out: 90 m Speed: 29 kn\*10  
 Sorted: 7 Kg Total catch: 7.05 CATCH/HOUR: 14.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Alectia alexandrinus	10.70	6	75.89	157
Pistularia petimba	3.40	18	24.11	
Total	14.10		100.00	

PROJECT STATION: 75  
 DATE: 28/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 241 Long E 932  
 start stop duration  
 TIME :11:06:00 11:36:00 30 (min) Purpose code: 3  
 LOG :4509.50 4510.90 1.40 Area code : 2  
 FDEPTH: 51 51 GearCond.code: 1  
 BDEPTH: 51 51 Validity code: 1  
 Towing dir: 230° Wire out: 170 m Speed: 29 kn\*10  
 Sorted: 48 Kg Total catch: 48.90 CATCH/HOUR: 97.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	70.60	1420	72.19	158
Sepia officinalis hierredda	14.50	50	14.83	
Priacanthus arenatus	2.06	26	2.11	
Pistularia petimba	1.98	28	2.02	
Trachinus armatus	1.76	34	1.80	
Chelidonichthys lucerna	1.68	28	1.72	
Trachinocephalus myops	1.36	10	1.39	
Raja miraletus	0.70	2	0.80	
Dactylopterus volitans	0.64	2	0.65	
Dentex barnardi	0.62	2	0.63	
Pseudupeneus prayensis	0.60	6	0.61	
Trachinus sp	0.54	2	0.55	
Torpedo torpedo	0.38	2	0.39	
Alloteuthis africana	0.24	2	0.25	
Uranoscopus polli	0.10	2	0.10	
Chelidonichthys gabonensis	0.08	2	0.08	
Lepidotrigla carolae	0.04	2	0.04	
Total	97.96		100.16	

PROJECT STATION: 71  
 DATE: 27/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 258 Long E 927  
 start stop duration  
 TIME :08:20:00 08:50:00 30 (min) Purpose code: 3  
 LOG :4440.10 4441.60 1.50 Area code : 2  
 FDEPTH: 178 170 GearCond.code: 1  
 BDEPTH: 178 170 Validity code: 1  
 Towing dir: 315° Wire out: 1000 m Speed: 30 kn\*10  
 Sorted: 58 Kg Total catch: 123.11 CATCH/HOUR: 246.22

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex angolensis	73.00	268	30.46	151
Illex coindetii	72.80	212	29.57	192
Spicara alta	45.60		18.52	
Spinephelus halfensis	19.66	2	7.98	
Trichurus lepturus	8.88	20	3.61	
Dentex congolensis	7.76	84	3.15	150
Pterochthys belloci	7.24	56	2.94	
Umbra canariensis	4.32	12	1.75	
Citharus linguatula	0.96	16	0.36	
Chelidonichthys gabonensis	0.92	12	0.37	
Aulopus cadenati	0.80	4	0.32	
Anthias anthias	0.72	8	0.29	
Antigonia capros	0.72	16	0.29	
Todaropsis eblanac	0.52	4	0.21	
Peristedion cataphractum	0.32	8	0.13	
Total	246.22		99.98	

PROJECT STATION: 76  
 DATE: 28/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 247 Long E 923  
 start stop duration  
 TIME :13:08:00 13:38:00 30 (min) Purpose code: 3  
 LOG :4523.50 4524.90 1.40 Area code : 2  
 FDEPTH: 85 83 GearCond.code: 1  
 BDEPTH: 85 83 Validity code: 1  
 Towing dir: 340° Wire out: 340 m Speed: 29 kn\*10  
 Sorted: 54 Kg Total catch: 54.50 CATCH/HOUR: 109.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	31.80	656	31.01	159
Saurida brasiliensis	21.80	4360	20.00	
Squatina oculata	14.50	4	13.30	
Chelidonichthys gabonensis	9.20	180	8.44	
Lepidotrigla carolae	9.14	610	8.39	
Sepia sp.	6.10	56	5.60	
Raja miraletus	3.44	8	3.16	
Priacanthus arenatus	2.72	22	2.50	
Pistularia petimba	2.56	10	2.35	
Octopus sp.	1.28	2	1.17	
Trichurus lepturus	1.10	2	1.01	
Ariomma bondi	1.02	12	0.94	
Chelidonichthys lucerna	0.54	18	0.50	
Spicara alta	0.52	32	0.48	
Citharus linguatula	0.36	20	0.33	
Boops boops	0.28	6	0.26	
Pseudupeneus prayensis	0.24	6	0.22	
Aulopus cadenati	0.14	2	0.13	
Trachinus armatus	0.12	2	0.11	
Sphaeroides pachygaster	0.10	2	0.09	
Alloteuthis africana	0.02	6	0.02	
Arnoglossus imperialis	0.02	2	0.02	
Total	109.00		100.03	

PROJECT STATION: 72  
 DATE: 27/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 254 Long E 932  
 start stop duration  
 TIME :10:30:00 11:00:00 30 (min) Purpose code: 3  
 LOG :4455.30 4456.80 1.50 Area code : 2  
 FDEPTH: 90 87 GearCond.code: 1  
 BDEPTH: 90 87 Validity code: 1  
 Towing dir: 330° Wire out: 300 m Speed: 30 kn\*10  
 Sorted: 25 Kg Total catch: 208.72 CATCH/HOUR: 417.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dasyatis centroura	160.00	2	38.33	
Brachydeuterus auritus	130.00	1340	31.14	155
Dentex congolensis	33.30	1470	7.98	154
Pagellus bellottii	24.10	530	5.77	153
Saurida brasiliensis	22.30	2930	5.27	
Lepidotrigla carolae	16.50	940	3.95	
Erythrocles monodi	5.50	10	1.32	
Priacanthus arenatus	5.30	10	1.27	
Chelidonichthys gabonensis	1.90	80	0.93	
Chelidonichthys gabonensis	1.90	80	0.93	
Ariomma bondi	1.90	80	0.93	
Boops boops	1.90	80	0.93	
Sphaeroides pachygaster	2.30	10	0.67	
Citharus linguatula	2.20	100	0.53	
Sepia sp.	1.50	10	0.36	
Todaropsis eblanac	0.80	10	0.19	
Sardinella aurita	0.70	20	0.17	
Chelidonichthys lucerna	0.60	20	0.14	
Spicara alta	0.30	20	0.07	
Total	421.10		100.86	

PROJECT STATION: 77  
 DATE: 28/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 253 Long E 915  
 start stop duration  
 TIME :15:34:00 15:09:00 35 (min) Purpose code: 3  
 LOG :4540.40 4542.20 1.80 Area code : 2  
 FDEPTH: 158 162 GearCond.code: 1  
 BDEPTH: 158 162 Validity code: 1  
 Towing dir: 300° Wire out: 550 m Speed: 31 kn\*10  
 Sorted: 58 Kg Total catch: 180.82 CATCH/HOUR: 309.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Anthias anthias	127.20	3504	41.03	160
Dentex angolensis	95.69	343	30.87	161
Scorpaena elongata	17.47	36	5.64	
Zeus faber	14.88	36	4.80	
Sparus pagrus africanus	11.49	10	3.71	
Dentex congolensis	10.75	96	3.47	162
Torpedo torpedo	6.72	7	2.17	
Spicara alta	5.64	55	1.82	
Squalus mitsukurini	5.57	2	1.80	
Antigonia capros	3.91	300	1.26	
Aulopus cadenati	3.79	36	1.22	
Raja miraletus	3.07	7	0.99	
Ariomma bondi	2.47	55	0.80	
Pontinus accraensis	0.67	19	0.22	
Chelidonichthys gabonensis	0.60	7	0.19	
Sphaeroides pachygaster	0.07	7	0.02	
Total	309.99		100.01	

PROJECT STATION: 73  
 DATE: 27/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 247 Long E 940  
 start stop duration  
 TIME :12:32:00 13:02:00 30 (min) Purpose code: 3  
 LOG :4469.10 4470.50 1.40 Area code : 2  
 FDEPTH: 46 45 GearCond.code: 1  
 BDEPTH: 46 45 Validity code: 1  
 Towing dir: 335° Wire out: 200 m Speed: 28 kn\*10  
 Sorted: 65 Kg Total catch: 109.73 CATCH/HOUR: 219.46

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	169.34	2402	77.16	156
Sepia officinalis hierredda	38.58	90	17.58	
Pistularia petimba	3.24	10	1.48	
Scyllarides herklotzii	3.04	4	1.39	
Trachinocephalus myops	1.44	6	0.66	
Trachinus armatus	1.14	20	0.52	
Mustelus mustelus	0.74	4	0.34	
Priacanthus arenatus	0.66	6	0.30	
Dactylopterus volitans	0.64	4	0.29	
Chelidonichthys lucerna	0.60	6	0.27	
Dibranchius atlanticus	0.04	4	0.02	
Total	219.46		100.01	

PROJECT STATION: 78  
 DATE: 28/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 255 Long E 914  
 start stop duration Purpose code: 3  
 TIME :17:21:00 17:51:00 30 (min) Area code : 2  
 LOG :4549.70 4551.20 1.50 GearCond.code:  
 FDEPTH: 399 408 Validity code: 2  
 BDEPTH: 399 408 Wire out: 1200 m Speed: 30 kn\*10  
 Towing dir: 295°

Sorted: 23 Kg Total catch: 116.15 CATCH/HOUR: 232.70

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Nematocarcinus africanus	138.50	47600	59.52	
Merluccius polli	23.40	100	10.06	
Trichurus lepturus	21.00	30	9.02	
Chlorophthalmus atlanticus	17.00	280	7.31	
Ectreposebastes isus	5.10	720	2.19	
Chaacanopsetta lugubris	3.60	30	1.55	
HIPPOLITIDAE	2.80	230	1.20	
Dentex spinax	2.70	30	1.16	
Lacsonema laureysi	2.00	30	0.86	
Illex coindetii	1.80	60	0.77	
Trigla lyra	1.70	10	0.73	
Synagrops sp.	1.60	20	0.69	
Gadella imberbis	1.40	30	0.60	
Bathygadus melanobranchus	1.40	10	0.60	
Hyaenocoepalus italicus	1.40	150	0.60	
Malacocephalus laevis	1.40	20	0.60	
Stereomastix sp.	1.30	110	0.56	
Dibranchius atlanticus	1.10	30	0.47	
Ariomma bondi	1.10	20	0.47	
Bumunda squamifera	1.00	10	0.43	
Trachipterus trachipterus	0.60	20	0.26	
Plesionika martia	0.40	70	0.17	
MYCTOPHIDAE	0.40	100	0.17	
Total	232.70		99.99	

PROJECT STATION: 82  
 DATE: 29/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 232 Long E 910  
 start stop duration Purpose code: 3  
 TIME :10:20:00 10:50:00 30 (min) Area code : 2  
 LOG :4644.80 4646.30 1.50 GearCond.code:  
 FDEPTH: 77 78 Validity code: 1  
 BDEPTH: 77 78 Wire out: 250 m Speed: 31 kn\*10  
 Towing dir: 330°

Sorted: 20 Kg Total catch: 20.56 CATCH/HOUR: 41.16

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	17.60	724	42.76	
Sepia sp.	7.72	100	10.76	
Lepidotrigla carolae	4.14	274	10.06	
Raja miraletus	2.80	10	6.80	
Cheilodichthys lucerna	1.78	28	4.32	
Dentex gibbosus	1.50	2	3.64	
Priacanthus arenatus	1.02	8	2.48	
Dentex congoensis	0.90	44	2.19	
Torpedo torpedo	0.84	2	2.04	
Cheilodichthys gabonensis	0.78	14	1.90	
Pseudupeneus prayensis	0.60	8	1.46	
Dactylopterus volitans	0.46	2	1.12	
Ariomma bondi	0.40	6	0.97	
Spicara alta	0.16	10	0.39	
Fistularia petimba	0.16	2	0.39	
Trachinus armatus	0.10	2	0.24	
Citharus linguatula	0.04	2	0.10	
Boops boops	0.04	2	0.10	
Dentex angolensis	0.02	2	0.05	
Total	41.06		99.77	

PROJECT STATION: 79  
 DATE: 29/ 8/94 GEAR TYPE: PT No:2 POSITION: Lat S 227 Long E 931  
 start stop duration Purpose code: 1  
 TIME :21:15:00 00:15:00 60 (min) Area code : 2  
 LOG :4603.50 4607.10 3.60 GearCond.code:  
 FDEPTH: 0 0 Validity code: 1  
 BDEPTH: 27 26 Wire out: 100 m Speed: 37 kn\*10  
 Towing dir: 125°

Sorted: 51 Kg Total catch: 123.18 CATCH/HOUR: 123.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardinella maderensis	66.90	738	54.31	164
Decapterus rhombus	28.40	126	23.06	163
Engraulis encrasicolus	13.04	2738	10.59	166
Sardinella aurita	7.46	1094	6.06	165
Sphyræna guachancho	6.36	8	5.16	167
Chloroscombrus chrysurus	0.40	10	0.32	
Echeneis naucrates	0.32	2	0.26	
Ilisha africana	0.26	6	0.21	
Trachurus trecae	0.02	2	0.02	
Saurida brasiliensis	0.02	2	0.02	
Total	123.18		100.01	

PROJECT STATION: 83  
 DATE: 29/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 231 Long E 909  
 start stop duration Purpose code: 1  
 TIME :11:55:00 12:22:00 27 (min) Area code : 2  
 LOG :4651.30 4653.10 1.80 GearCond.code:  
 FDEPTH: 45 45 Validity code: 4  
 BDEPTH: 79 75 Wire out: 120 m Speed: 36 kn\*10  
 Towing dir: 30°

Sorted: Kg Total catch: 0.39 CATCH/HOUR: 0.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
ARGONAUTIDAE	0.80	2	91.95	
Illex coindetii	0.02	2	2.30	
Trachurus trecae	0.02	7	2.30	
Sciæna dorsalis	0.02	7	2.30	
Total	0.86		98.85	

PROJECT STATION: 84  
 DATE: 29/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 240 Long E 903  
 start stop duration Purpose code: 3  
 TIME :14:33:00 15:03:00 30 (min) Area code : 2  
 LOG :4671.80 4673.30 1.50 GearCond.code:  
 FDEPTH: 147 149 Validity code: 1  
 BDEPTH: 147 149 Wire out: 520 m Speed: 30 kn\*10  
 Towing dir: 125°

Sorted: 47 Kg Total catch: 94.68 CATCH/HOUR: 189.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex congoensis	62.80	1452	33.16	169
Antigonia capros	59.40	3336	31.37	
Aulopus cadenati	16.12	212	8.51	
Squatina aculeata	15.20	4	8.03	
Lepidotrigla carolae	9.64	400	5.09	
Lepidotrigla cadmahi	7.84	164	4.14	
Raja miraletus	5.24	12	2.77	
Zenopsis conchifer	5.04	4	2.66	
Boops boops	3.36	60	1.77	
Spicara alta	3.00	136	1.58	
Illex coindetii	0.68	36	0.36	
Todaropsis eblanae	0.52	28	0.27	
Cheilodichthys lucerna	0.44	16	0.23	
Saurida brasiliensis	0.04	8	0.02	
Anthias anthias	0.04	4	0.02	
Total	189.36		99.98	

PROJECT STATION: 80  
 DATE: 29/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 224 Long E 926  
 start stop duration Purpose code: 3  
 TIME :06:52:00 07:22:00 30 (min) Area code : 2  
 LOG :4622.10 4623.60 1.50 GearCond.code:  
 FDEPTH: 27 29 Validity code: 1  
 BDEPTH: 27 29 Wire out: 80 m Speed: 28 kn\*10  
 Towing dir: 300°

Sorted: 68 Kg Total catch: 204.66 CATCH/HOUR: 409.32

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhombus	387.30	714	94.62	168
Pagellus bellottii	6.18	78	1.51	
Lethrinus atlanticus	3.60	6	0.88	
Pseudupeneus prayensis	3.60	18	0.80	
Dentex canariensis	2.64	24	0.64	
Fistularia petimba	2.58	30	0.63	
Citharichthys stampflii	1.44	6	0.35	
Sparus caeruleostictus	1.26	6	0.31	
Stereomastix sp.	0.72	6	0.18	
Total	409.32		100.00	

PROJECT STATION: 85  
 DATE: 29/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 229 Long E 857  
 start stop duration Purpose code: 3  
 TIME :17:09:00 17:39:00 30 (min) Area code : 2  
 LOG :4690.80 4692.40 1.60 GearCond.code:  
 FDEPTH: 185 177 Validity code: 1  
 BDEPTH: 185 177 Wire out: 620 m Speed: 30 kn\*10  
 Towing dir: 330°

Sorted: 70 Kg Total catch: 244.98 CATCH/HOUR: 489.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Illex coindetii	372.40	11004	76.01	
Dentex congoensis	12.90	546	6.71	
Aulopus cadenati	22.04	308	4.50	
Trichurus lepturus	19.24	28	3.93	
Antigonia capros	15.04	580	3.07	
Squalus blainvilliei	9.10	6	1.86	
Todaropsis eblanae	8.74	6	1.78	
Lepidotrigla carolae	2.24	42	0.46	
Citharus linguatula	1.60	70	0.33	
Raja miraletus	1.60	28	0.33	
Cheilodichthys gabonensis	1.54	6	0.31	
Saurida brasiliensis	1.18	20	0.24	
Spicara alta	0.70	76	0.14	
Ariomma bondi	0.70	20	0.14	
Lionarcidus corrugatus	0.34	6	0.07	
Synchropus phacton	0.20	20	0.04	
Arnoqueosua capensis	0.14	10	0.03	
Monoleone microstoma	0.06	6	0.01	
Peristedion cataphractum	0.06	6	0.01	
Total	489.96		100.00	

PROJECT STATION: 81  
 DATE: 29/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 227 Long E 917  
 start stop duration Purpose code: 3  
 TIME :08:35:00 09:05:00 30 (min) Area code : 2  
 LOG :4633.30 4634.70 1.40 GearCond.code:  
 FDEPTH: 52 52 Validity code: 1  
 BDEPTH: 52 52 Wire out: 170 m Speed: 31 kn\*10  
 Towing dir: 330°

Sorted: 5 Kg Total catch: 11.80 CATCH/HOUR: 23.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sepia officinalis hierredra	8.84	24	37.46	
Pagellus bellottii	3.60	36	15.59	
Trachinus armatus	3.20	60	13.56	
Fistularia petimba	2.76	56	11.69	
Trachinocephalus myops	1.28	8	5.42	
Cheilodichthys lucerna	1.04	16	4.41	
Pseudupeneus prayensis	0.84	12	3.56	
Citharichthys stampflii	0.76	4	3.22	
Priacanthus arenatus	0.56	4	2.37	
Uranoscopus polli	0.52	8	2.20	
Bothus podas africanus	0.12	4	0.51	
Total	23.60		99.99	

PROJECT STATION: 86  
 DATE: 29/ 8/94 GEAR TYPE: PT No:1 POSITION: Lat S 208 Long E 909  
 start stop duration  
 TIME : 22:24:00 22:44:00 20 (min) Purpose code: 1  
 LOG : 4738.20 4739.20 1.00 Area code : 2  
 FDEPTH: 15 15 GearCond. code: 1  
 BDEPTH: 43 41 Validity code: 1  
 Towing dir: 60° Wire out: 100 m Speed: 38 kn\*10  
 Sorted: 53 Kg Total catch: 3891.30 CATCH/HOUR: 11673.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Chloroscombrus chrysurus	6894.00	93960	59.05	170
Sardinella aurita	4716.00	48960	40.40	171
Lutjanus gorenensis	63.90	6	0.55	
Total	11673.90		100.00	

PROJECT STATION: 87  
 DATE: 30/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 209 Long E 849  
 start stop duration  
 TIME : 03:58:00 04:28:00 30 (min) Purpose code: 3  
 LOG : 4783.80 4785.40 1.60 Area code : 2  
 FDEPTH: 397 400 GearCond. code: 1  
 BDEPTH: 397 400 Validity code: 1  
 Towing dir: 145° Wire out: 1150 m Speed: 32 kn\*10  
 Sorted: 38 Kg Total catch: 125.63 CATCH/HOUR: 251.26

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Parapenaeopsis atlantica	101.14	18668	40.25	
Aulopus cadenati	83.30	1224	33.15	
Merluccius polli	37.52	182	14.93	172
Carcharias sp.	7.80	2	3.10	
Illex coindetii	3.78	48	1.50	
Malacocephalus occidentalis	3.42	252	1.36	
Todaropsis eblanae	3.36	22	1.34	
Epinephelus gorenensis	2.52	6	1.00	
Antimora rostrata	2.44	20	0.97	
Brachydeuterus auritus	2.16	62	0.86	
Dibranchius atlanticus	1.46	22	0.58	
Chascanopsetta lugubris	0.76	14	0.30	
Gadella imberbis	0.76	36	0.30	
Cyttopsis roseus	0.28	6	0.11	
Scorpaena angolensis	0.20	48	0.08	
C R A B S	0.14	6	0.06	
Elmopterus spinax	0.14	14	0.06	
TETRAODONTIDAE	0.08	20	0.03	
Total	251.26		99.98	

PROJECT STATION: 88  
 DATE: 30/ 8/94 GEAR TYPE: BT No:3 POSITION: Lat S 205 Long E 854  
 start stop duration  
 TIME : 07:30:00 08:00:00 30 (min) Purpose code: 3  
 LOG : 4797.90 4799.40 1.50 Area code : 2  
 FDEPTH: 97 98 GearCond. code: 1  
 BDEPTH: 97 98 Validity code: 1  
 Towing dir: 360° Wire out: 320 m Speed: 29 kn\*10  
 Sorted: 60 Kg Total catch: 150.52 CATCH/HOUR: 301.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	82.00	740	27.24	
Boops boops	61.00	1266	20.26	
Dentex gibbosus	46.26	126	15.37	173
Trachurus trecae	24.50	325	8.14	
Priacanthus arenatus	18.76	56	6.23	
Sepia sp.	17.90	210	5.95	
Ariomma bondi	10.50	266	3.49	
Dentex barnardi	6.86	26	2.28	
Raja miraletus	5.60	20	1.86	
Dentex canariensis	5.06	10	1.68	
Lepidotrigla carolae	4.76	246	1.58	
Lepidotrigla cadmani	3.80	76	1.26	
Chelidonichthys lucerna	3.16	50	1.05	
Anthias anthias	3.16	216	1.05	
Scorpaena elongata	2.70	6	0.90	
Illex coindetii	1.36	46	0.45	
Citharus linguatula	1.30	46	0.43	
Sargocentron hastatus	0.96	6	0.32	
Pseudupeneus prayensis	0.56	6	0.19	
Saurida brasiliensis	0.40	50	0.13	
Grammolites gruweli	0.30	6	0.10	
Spherooides pachyaster	0.16	6	0.05	
Chascanopsetta lugubris	0.10	6	0.03	
Total	301.16		100.04	

PROJECT STATION: 89  
 DATE: 30/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 202 Long E 859  
 start stop duration  
 TIME : 08:55:00 09:25:00 30 (min) Purpose code: 3  
 LOG : 4805.30 4806.70 1.40 Area code : 2  
 FDEPTH: 70 67 GearCond. code: 1  
 BDEPTH: 70 67 Validity code: 1  
 Towing dir: 70° Wire out: 230 m Speed: 29 kn\*10  
 Sorted: 36 Kg Total catch: 72.84 CATCH/HOUR: 145.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	77.40	1504	53.13	
Dentex coqueensis	23.68	1040	16.25	
Sepia sp.	20.60	112	14.14	
Trachurus trecae	5.68	28	3.90	
Lepidotrigla carolae	5.60	272	3.84	
Lepidotrigla cadmani	3.60	128	2.47	
Sphyracna sphyraena	2.40	8	1.65	
Saurida brasiliensis	1.20	152	0.82	
Boops boops	1.16	28	0.80	
Chilomycterus spinosus mauret.	1.00	4	0.69	
Pseudupeneus prayensis	0.80	12	0.55	
Chelidonichthys lucerna	0.72	16	0.49	
Citharus linguatula	0.68	28	0.47	
Priacanthus arenatus	0.48	12	0.33	
Brachydeuterus auritus	0.32	4	0.22	
Grammolites gruweli	0.24	8	0.16	
Spherooides pachyaster	0.08	4	0.05	
Arboglossus imperialis	0.04	4	0.03	
Total	145.68		99.99	

PROJECT STATION: 90  
 DATE: 30/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 156 Long E 905  
 start stop duration  
 TIME : 10:27:00 10:57:00 30 (min) Purpose code: 3  
 LOG : 4814.10 4815.60 1.50 Area code : 2  
 FDEPTH: 44 41 GearCond. code: 1  
 BDEPTH: 44 41 Validity code: 1  
 Towing dir: 10° Wire out: 160 m Speed: 30 kn\*10  
 Sorted: 27 Kg Total catch: 55.68 CATCH/HOUR: 111.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Pagellus bellottii	50.20	912	45.08	
Pseudupeneus prayensis	40.40	612	36.28	
Decapterus rhonchus	13.40	28	12.03	
Trachurus trecae	3.28	44	2.95	
Sycium microrum	1.60	20	1.44	
Sepia sp.	0.96	12	0.86	
Sepia officinalis hierredda	0.80	4	0.72	
Chelidonichthys lucerna	0.32	4	0.29	
Boops boops	0.28	4	0.25	
Todaropsis eblanae	0.12	4	0.11	
Total	111.36		100.01	

PROJECT STATION: 91  
 DATE: 30/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 153 Long E 909  
 start stop duration  
 TIME : 11:53:00 12:23:00 30 (min) Purpose code: 3  
 LOG : 4821.30 4822.90 1.60 Area code : 2  
 FDEPTH: 30 35 GearCond. code: 1  
 BDEPTH: 30 35 Validity code: 1  
 Towing dir: 220° Wire out: 100 m Speed: 32 kn\*10  
 Sorted: 37 Kg Total catch: 94.48 CATCH/HOUR: 188.96

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	118.00	266	62.45	174
Pagellus bellottii	40.00	344	21.17	175
Chloroscombrus chrysurus	10.10	136	5.35	
Alectis alexandrinus	9.30	6	4.92	
Rachycentron canadum	3.90	6	2.06	
Psettodes belcheri	2.86	6	1.51	
Sepia officinalis hierredda	2.80	10	1.48	
Selene dorsalis	2.00	26	1.06	
Total	188.96		100.00	



## **Annex IV Instruments and fishing gear used**

### **Acoustic instruments**

The SIMRAD EK500/38 Khz scientific sounder was used during the survey for estimation of fish density. The EK500 has a built- in digital echo integrator, but the Bergen Echo Integrator system (BEI) was used throughout the survey. The details of the instrument settings are as follows:

#### **Tranceiver settings:**

Bandwith:	Wide (3.8 Khz)
Pulse length:	Medium (1 ms)
Max Power:	2000 Watt
Sv Transducer gain:	28.1 dB
Ts Transducer gain:	28.1 dB

#### **Printer settings:**

Range:	0 - 100 or 0 - 250 m
TVG:	20 log R
Sv Colour min:	- 64 dB

An ES38B with a 6.8° -3dB beamwith transducer was used for integration.

A calibration experiment using a standard copper sphere, performed in Baia dos Tigres 4/6 1994 gave the following results: Sv Transducer gain 28.1 dB, Ts Transducer gain 28.1 dB.

#### **Glossary:**

Sv Transducer gain: Peak transducer gain assumed during computation of volum backscattering strength.

Ts Transducer gain: Peak transducer gain assumed during computation of target strength.

Sv Colour min: Lower limit of colour scale relative to Volume back scattering.

## Hydrography

Conductivity, temperature, density and oxygen were sampled regularly at CTD stations with a Seabird CTD-sonde. The salinity was calculated by a computer.

## Fishing gear

The vessel has two different sized 'Åkrahamn' pelagic trawls and one Gisund super bottom trawl. During the present survey two 7.81 m<sup>2</sup>, 1670kg 'Thyborøn-7' combi-doors were used on all trawls.

The bottom trawl has a headline of 31m, footrope 47m and 20mm meshsize in the codend with an innernet of 10mm meshsize. The estimated headline height is 5m and distance between wings during towing about 18m. The trawl is equipped with a 12" rubber bobbins gear. The sweeps are 40m long.

The following drawings show the size of these trawls.

