NORAD - FAO/UNDP PROJECT GLO 92/013

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF ANGOLA

Cruise Report No 2/94

PART I

Survey of the pelagic resources
2 to 17 August 1994

PART II

Survey of the demersal resources
1 to 19 September 1994

Institute of Marine Research
IMR, Bergen

Institute of Fisheries Research
IIP, Luanda

PART I

Survey of the pelagic resources

2 to 17 August 1994

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CHAPTER 1 INTRODUCTION

1.1 Objectives

- To map the distribution and estimate the abundance of the commercially important pelagic and semipelagic fish species in Angolan waters, north of Benguela, including the two **sardinella** species *Sardinella aurita* and *S. maderensis*, the **Cunene horse mackerel** *Trachurus trecae* and other pelagic species, mainly carangids.

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

- To study the general oceanographic conditions and carry out specific hydrographic sampling in areas of highest concentrations of sardinella.

- On-the-job training for the Angolan participants on the main survey routines would be imparted, including collection and processing of raw data, the use of the acoustic system for stock assessment purposes and general methodology in oceanographic research. This aspect is emphasized in this new phase of the 'Dr. Fridtjof Nansen' programme, which aims, besides the basic resource investigations, to increase national competence in fishery and oceanographic research.

1.2 Participation

The scientific staff consisted of:

From the Institute of Fishery Research, Angola: N'Kossi Luyeye, Chores Pinto Mpungui, Fernando Gombo and David Quissungo.

From the Institute of Marine Research, Norway: Tore Strømme, Gabriella Bianchi, Helge Ullebust, Martin Dahl and Reidar Johannesen.

1.3 Narrative

The vessel left Luanda at 18h00 on 2nd August and steamed southward to Benguela where the actual survey work started on 3 August at about midday.
The survey followed a systematic triangular transect pattern, from shore to the 200 m isobath, the endpoints of the transects being approximately 10 naut.miles apart. In areas where tight sardinella shoals were recorded, surveying was conducted both during day- and nighttime. This happened in the area between Cabeça da Baleia and Lobito and north of the Congo River estuary. As in the previous survey, a 10- nautical- mile wide zone along the coast, in the region between Ambriz and the Congo River, was not covered for security reasons. The Cabinda region was only partially covered because of oil drilling activities.

The survey work was completed on August 16 and the vessel steamed to Pointe Noire (Congo).

1.4 Survey effort

Fig. 1 (a-b) shows the cruise track with fishing stations and the hydrographic profiles.

The number of hauls per area and depth interval, can be summarized as follows:

	Pelagic hauls	Bottom hauls	Distance surveyed
Cabinda-Luanda	10	1	nm
Luanda-Beng.	14	5	nm

The total number of CTD stations were 32.

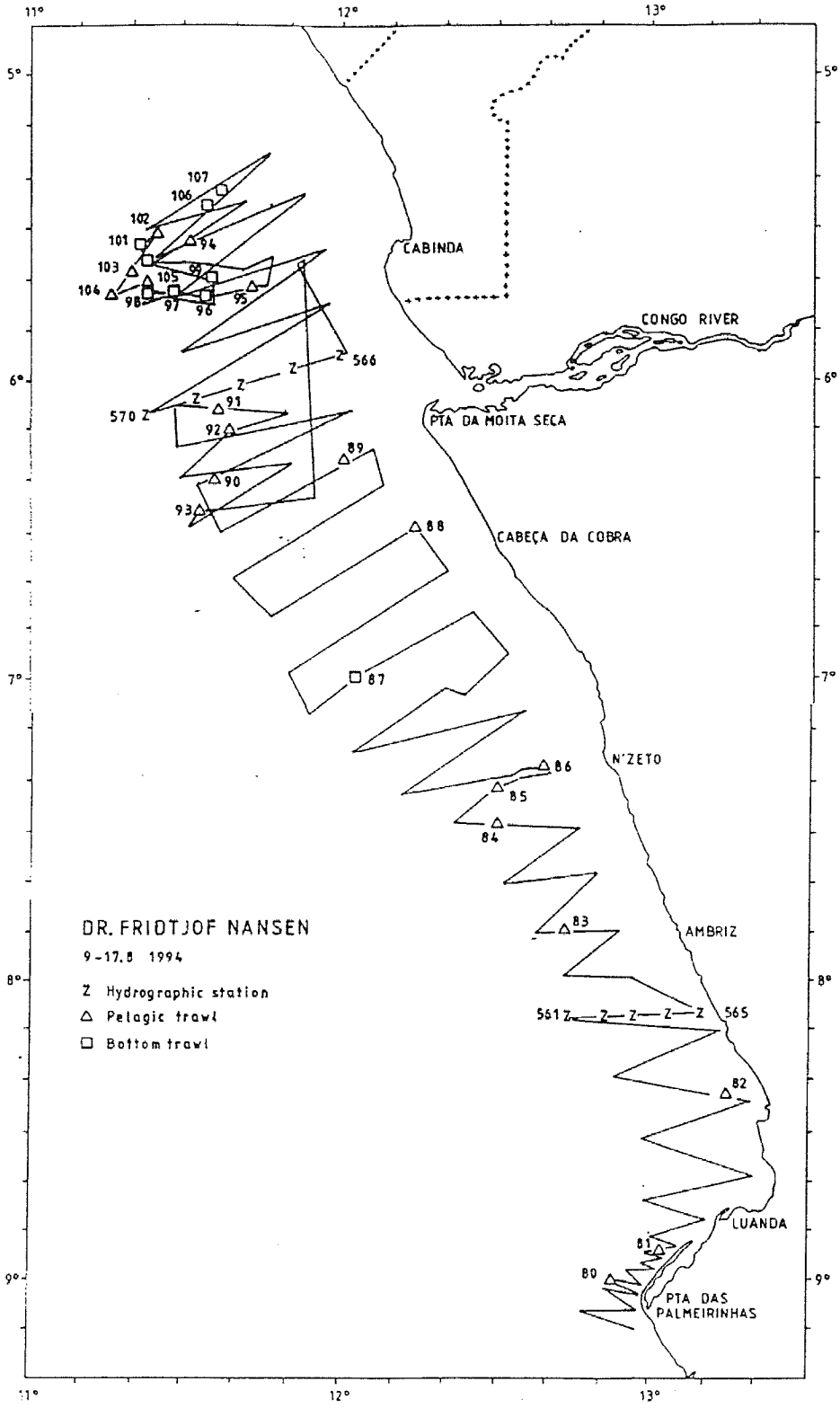


Figure 1a. Course tracks with fishing stations and hydrographic profiles, Cabinda-Luanda.

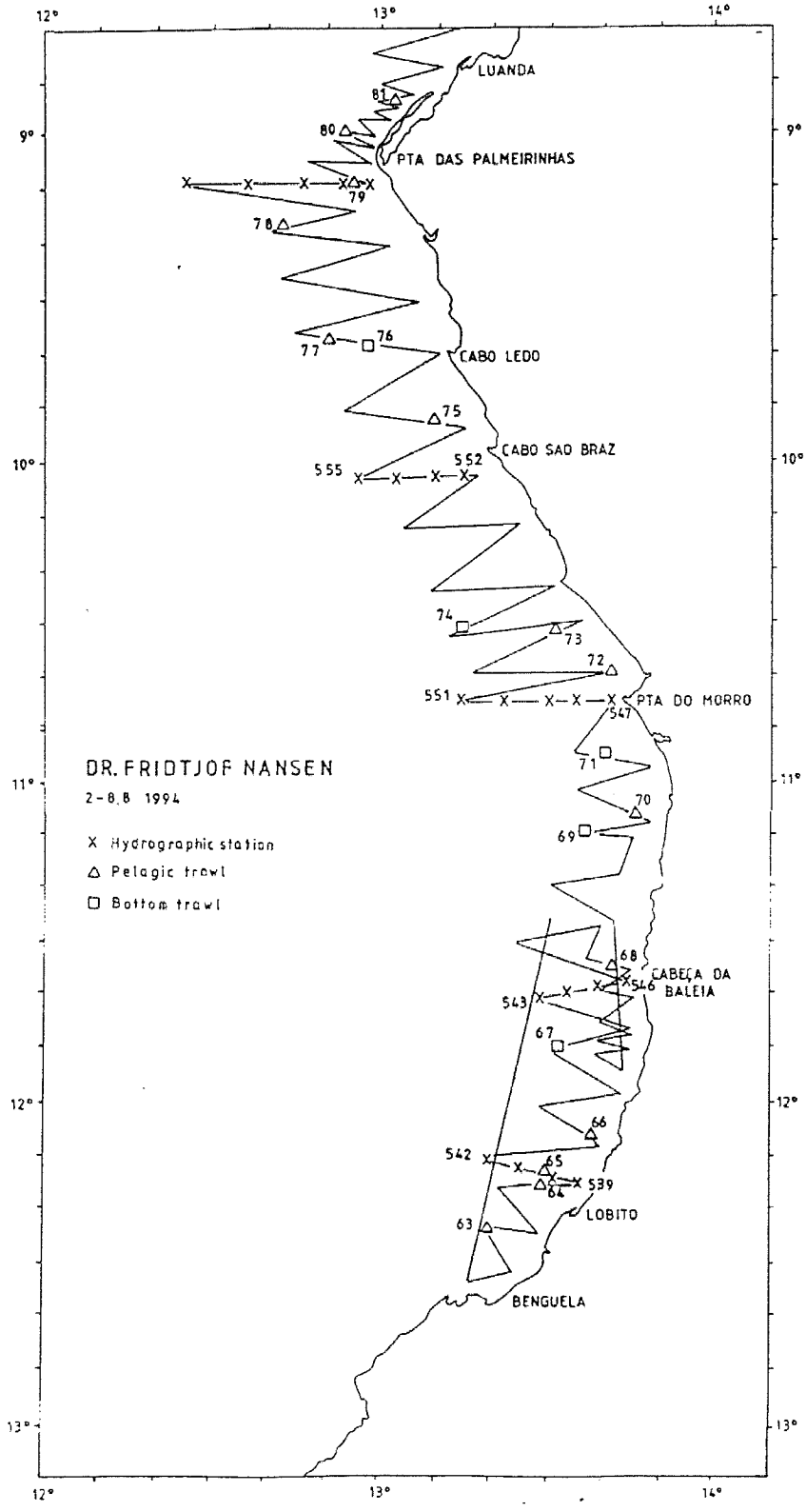


Figure 1b. Course tracks with fishing stations and hydrographic profiles, Luanda-Benguela.

CHAPTER 2 METHODS

2.1 Hydrographic sampling

Continuous profiles of temperature, salinity and oxygen were obtained with a Seabird 911 CTD Plus system. The data were logged 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. Two NISKIN bottles were triggered for water samples. These were usually taken near the bottom and near the surface (typically at 3m depth) for analysis of oxygen and salinity.

2.2 Fish sampling

Abundance determination

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

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

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

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

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

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

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

where

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

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

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

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

In the case of cooccurrence of *Sardinella aurita* and *S. maderensis* (these species cannot be separated in the ecotraces), the respective contribution to the S_A value attributed to the 'sardinella' category was split using a factor obtained from their length frequency distributions and their CPUE in numbers. The biomass of fish per length group (B_i) was calculated by applying observed mean weights per length group (W_i) multiplied by number of fish in the same length groups (N_i). The total biomass in each area was obtained by summing the biomass of each length group:

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

The number and biomass per length group in each concentration were at last summed to obtain the totals for each region.

The mean integrator values in each sampling unit (S_A-values) were divided between the following categories of fish on the basis of trawl catches and characteristics of the echo traces:

- sardinella (*S. aurita* and *S. maderensis*)
- Cunene horse mackerel
- anchovies
- P2 (carangids, scombrids, barracudas and hairtails)
- *Brachydeuterus*
- other demersal fish
- plankton

Biological sampling

Total length and body weight were recorded for sardinella and horse mackerel to the nearest ½ cm or 1 g below, respectively. Sex and reproductive stages were described by macroscopic examination, scoring each individually sampled fish according to the following categories:

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

CHAPTER 3 HYDROGRAPHIC CONDITIONS

Figures 2 a and 2 b show the profiles derived from the hydrographic sampling in northern and central Angola respectively. Off the Congo River and Ambriz the thermocline appears to be very shallow and there is a clear uptilting of the isotherms and isolines of oxygen toward the coast. Off Ambriz very low oxygen waters (O_2 < 1ml/l) were observed over the shelf and upper slope bottom. Surface temperature was about 20-21 degrees but decreased toward the coast confirming the presence of upwelling activity. During the March survey the thermocline was deeper and more pronounced, the surface temperature was at least 5 degrees higher and relatively high oxygen levels (O_2 > 2 ml/l) could be observed throughout the shelf.

The region off Ponta das Palmeirinhas, where schools of pelagic fish usually concentrate, also showed a more pronounced dynamics, with uptilting isolines toward the coast, shallower and less pronounced thermocline and lower temperatures throughout the water column as compared to the March survey.

In the central region four sections were sampled (Fig. 2b). These showed a clear uplifting of the water column, with lower temperatures and oxygen values from the surface to about 200 to 300 m depth. Surface salinity was higher and this possibly reflects the lower total southward transport of surface water in this period of the year. This transport is strong during the summer period, when the Angola Current can easily be identified.

The above results show a typical winter situation in Angola, with lower temperatures and clear signs of upwelling. Another description of the hydrographic regime is available for the September survey of the demersal resources.

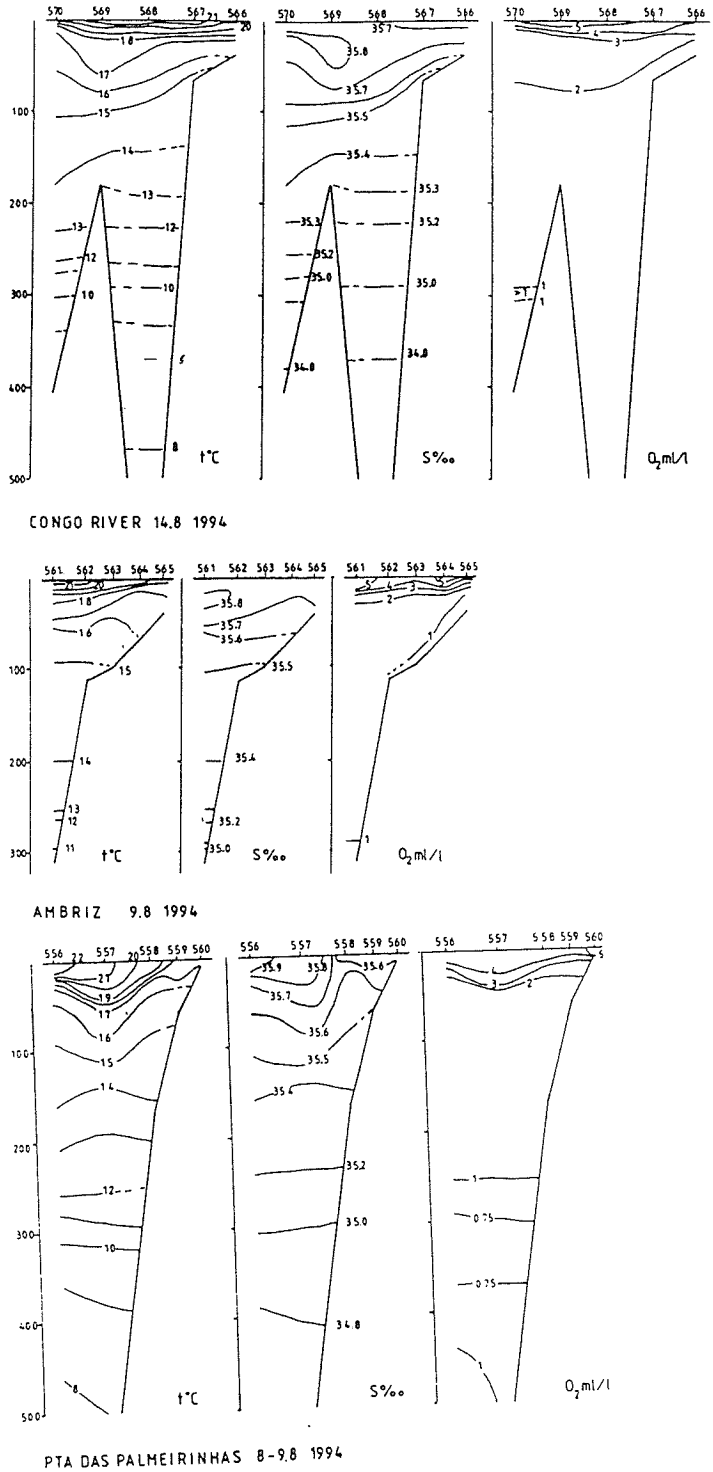
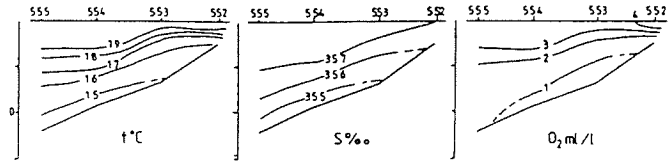


Figure 2 a. Vertical sections of temperature, salinity and oxygen, Cabinda-Ponta das Palmeirinhas



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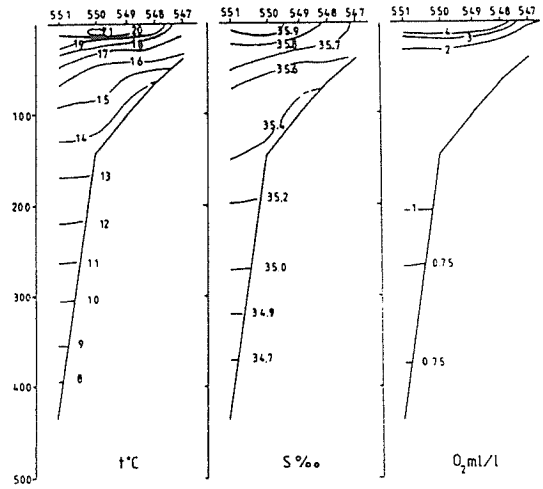

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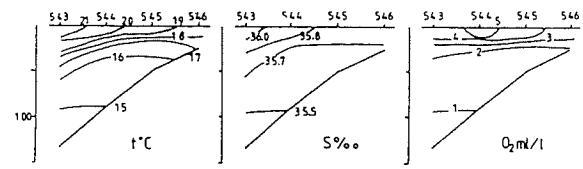

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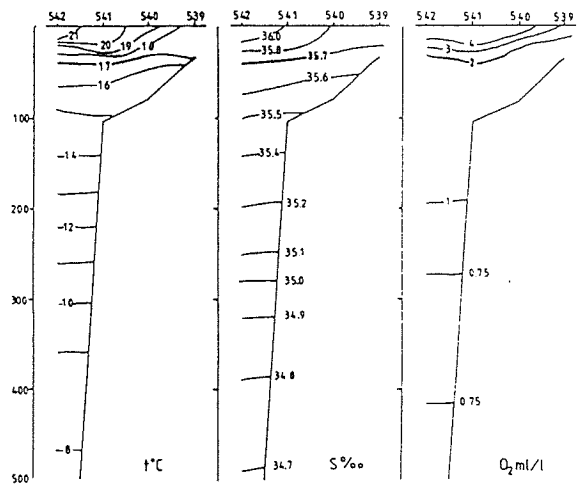

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Figure 2 b. Vertical sections of temperature, salinity and oxygen, Cabo Sao Braz-Lobito

CHAPTER 4 DISTRIBUTION, COMPOSITION AND ABUNDANCE OF PELAGIC FISH

4.1 Cabinda - Luanda

A complete coverage of the shelf was unfortunately not possible because a 10-mile distance from the coast was kept north of Ambriz, for security reasons. The coverage of the shallow waters (25-40 m) off Cabinda was also somewhat limited because of oil extraction activities. As pelagic species appeared to have a more offshore distribution than usual, the coverage was extended to beyond the 200 m isobath. In the northern region, especially in the Congo River area, the survey was extended to 600 m depth because of the incidental observation of sardinella schools well offshore.

Sardinellas

Dense sardinella schools were detected only between Luanda and Ambriz. North of Ambriz schools were more dispersed but distributed over large areas. Sardinella appeared to have a spread distribution and was surprisingly found also well offshore, to depths of about 600 metres (Figure 3). Schools occurred very close to the surface and while they could easily be detected from horizontal ranging sonar images, they hardly appeared in the echo-traces obtained with the vertical echo-sounder. There was no difficulty during this survey to catch sardinella during daytime, contrary to what had happened during the March survey. This was probably because most of the sardinella were ripe or in the spawning phase (see below) and thus easier to catch.

The length distributions show that large adults dominate for both species (Figures 4 and 5). In the case of *S. maderensis* there is a mode of about 31 cm, while for *S. aurita* the mode was 35 cm. In the March '94 survey, two modes of 24 and 31 cm respectively were found for *Sardinella maderensis*.

The biomass in this area was estimated to about 290 000 t, the proportions of flat and round sardinella were about 90 and 10 % respectively.

The estimate from the previous survey in March '94 was 100 000 tonnes. This increase in the estimate of almost 300 % may be explained by a northward migration in connection with the winter period (see below).

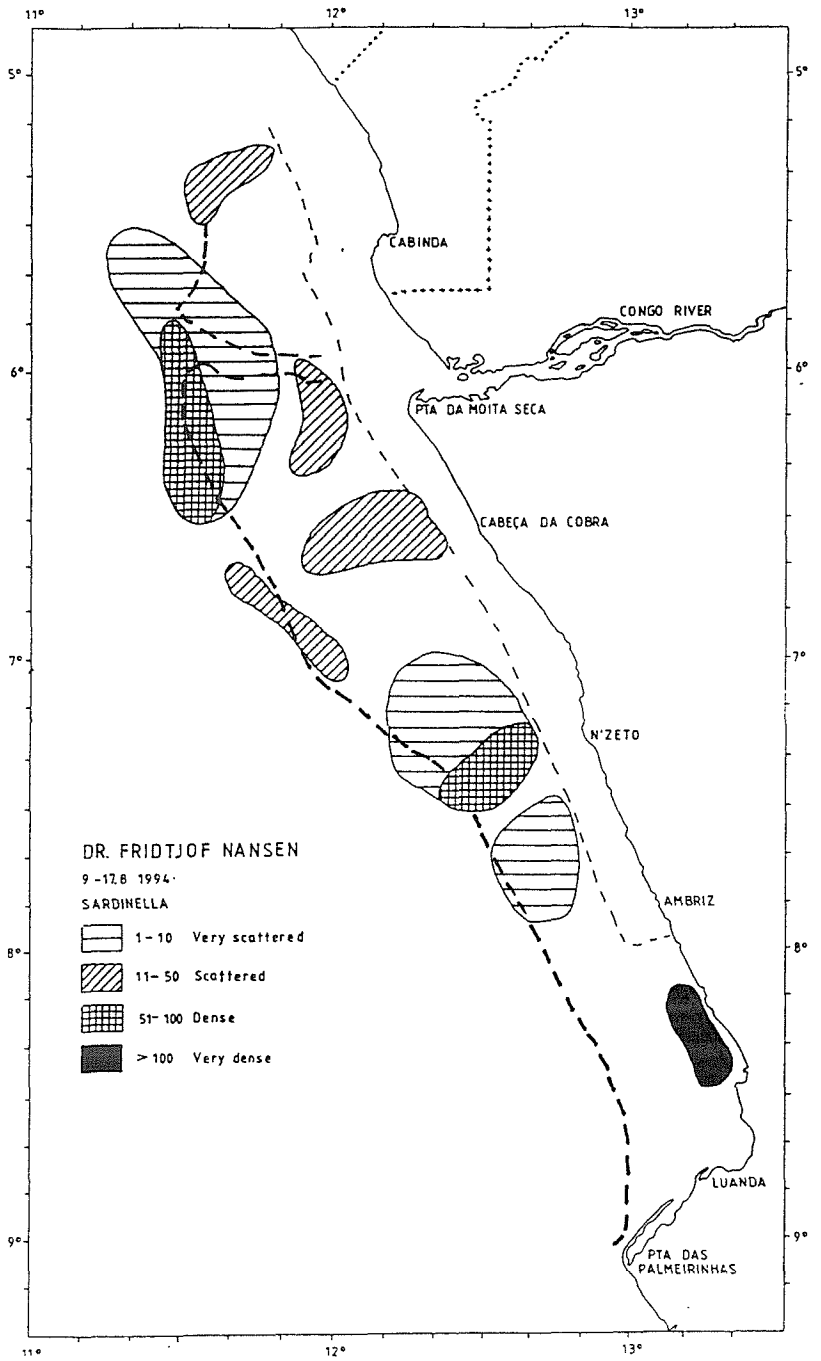


Figure 3. Distribution of sardinella, Cabinda-Luanda

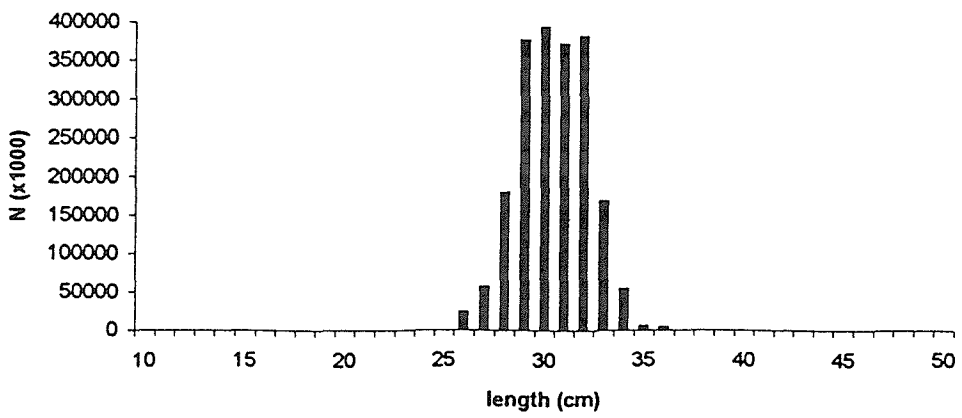


Figure 4. Total length distribution of *Sardinella maderensis* , Cabinda-Luanda

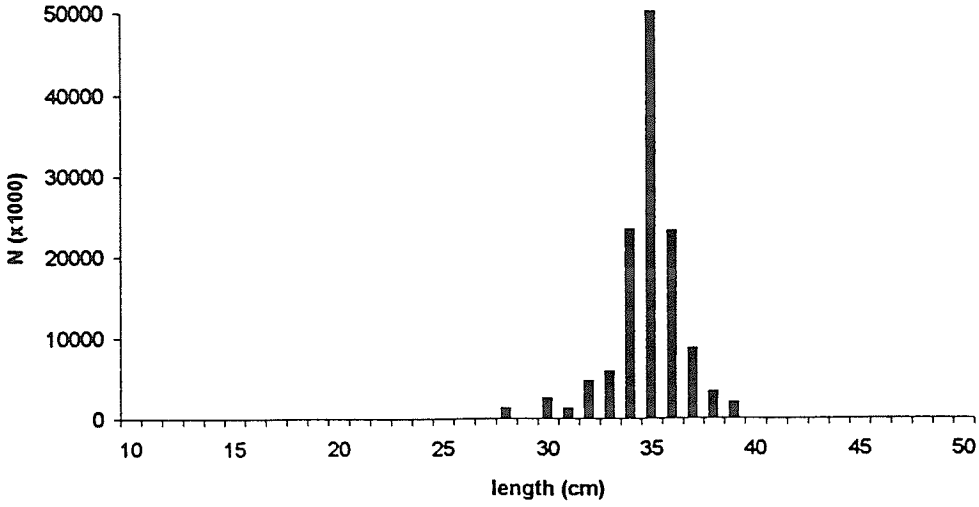


Figure 5. Total length distribution of *Sardinella aurita*, Cabinda-Luanda

Cunene horse mackerel

Figure 6 shows the distribution of the Cunene horse mackerel as detected by the echo-integration system. Although no dense concentrations were found in this region, horse mackerel was found throughout the area, mainly over the intermediate and deeper parts of the shelf and beyond the shelf edge. Schools were observed close to the bottom, especially during daytime and in midwater and surface waters at night but this pattern was not always consistent. The catches consisted mainly of large individuals (Fig. 7), the length frequency distribution having a mode of 35 cm.

The biomass was estimated to about 120 000 tonnes. This value might represent an underestimate because the offshore limit of distribution was not reached. During the March survey almost no horse mackerel was found in this region. This pattern, as it will be shown later, may be attributed to a northward migration in the winter season.

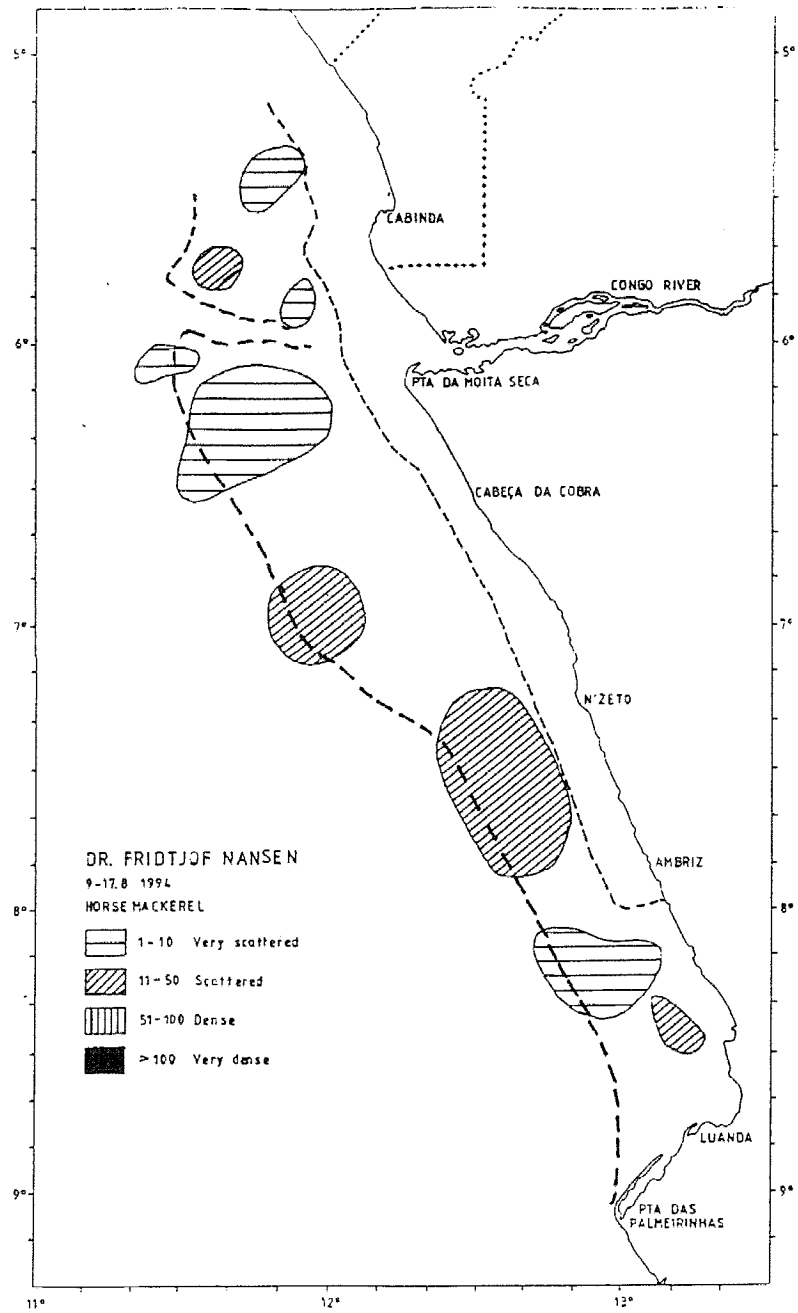


Figure 6. Distribution of *Trachurus trecae*, Cabinda-Luanda

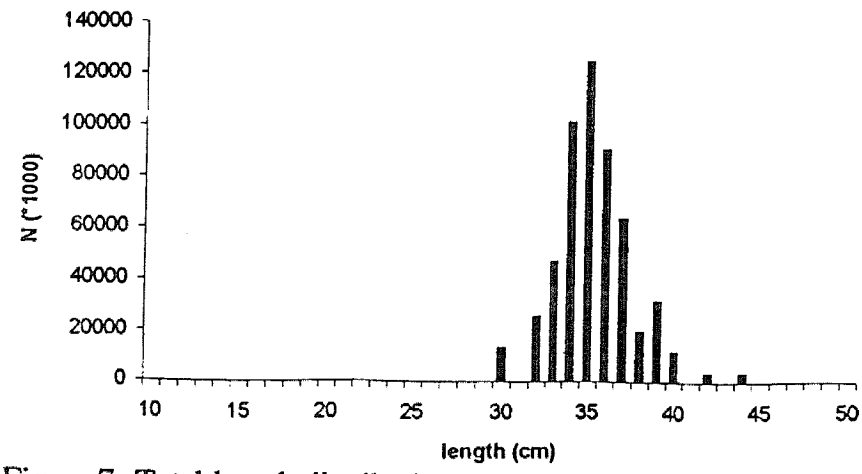


Figure 7. Total length distribution of *Trachurus trecae*, Cabinda-Luanda

Other pelagic fishes P2

Under this category several species are included, both of shallow and deeper waters. *Trichiurus lepturus* was by far the most common species, caught throughout the shelf and over slope areas. *Brachydeuterus auritus*, *Chloroscombrus chrysurus* and *Selene dorsalis* that are usually abundant in the northern region, were caught very seldom, most probably because of the limitations in the survey coverage, that did not include 10 nm from the coast north of Ambriz.Cuttlefish (mainly *Sepiella ornata* and *Sepia officinalis*) were caught in almost all pelagic trawls, especially at the edge of the shelf. Catch rates were however low (up to 14 kg/h). The echo-integrator values attributed to the P2 group were generally low and the total biomass was calculated to 21 000 tonnes, about 60% of which consisted of *Trichiurus lepturus*. However, this is probably a gross underestimate in this region, considering the incomplete coverage of the shallow waters.

4.2 Luanda - Benguela

The shelf was covered between 20 and 200 m depth, but extended to deeper waters in correspondence with the narrowest parts of the shelf.

Sardinellas

The densest concentrations were found off Lobito and Cabeca da Baleia, more dispersed in other parts of the area. The distribution appeared to be limited to shelf waters, only in few instances appeared to go beyond the 200 m isobath (south of Ponta das Palmeirinhas). (Fig.8).

Sardinella maderensis dominated the catches. Only few individuals of *Sardinella aurita* were caught and no attempt was therefore made to estimate the biomass of the two species separately. The catches were dominated by large individuals, with a mode of 33 cm (Fig. 9). The length frequency pattern was similar to the one found in March '94.

The estimated biomass for this region was 245 000 tonnes. The corresponding estimate in the March '94 survey was 410 000 tonnes. The difference between the two estimates (165 000 tonnes) is comparable with the increase noticed in the northern region in this survey, thus indicating the possibility of a northward migration in connection with the upwelling season.

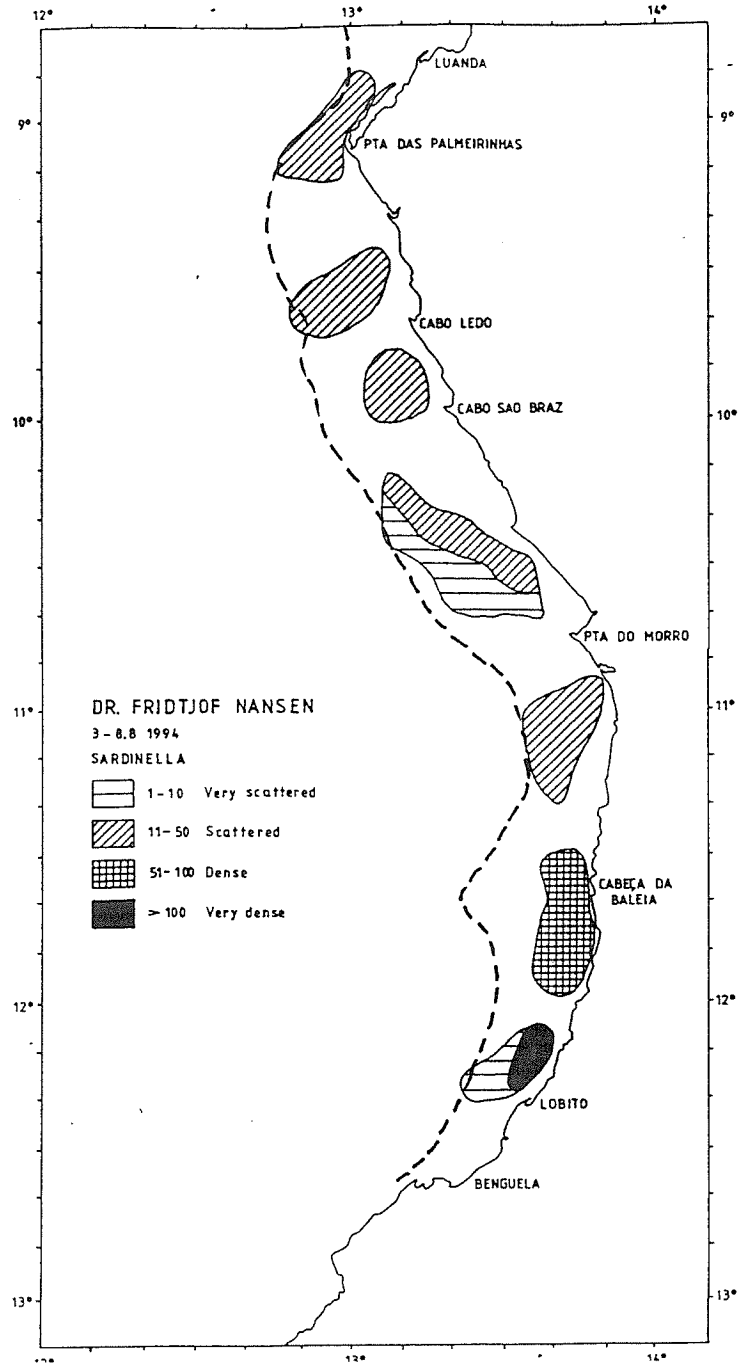


Figure 8. Distribution of sardinella, Luanda-Benguela

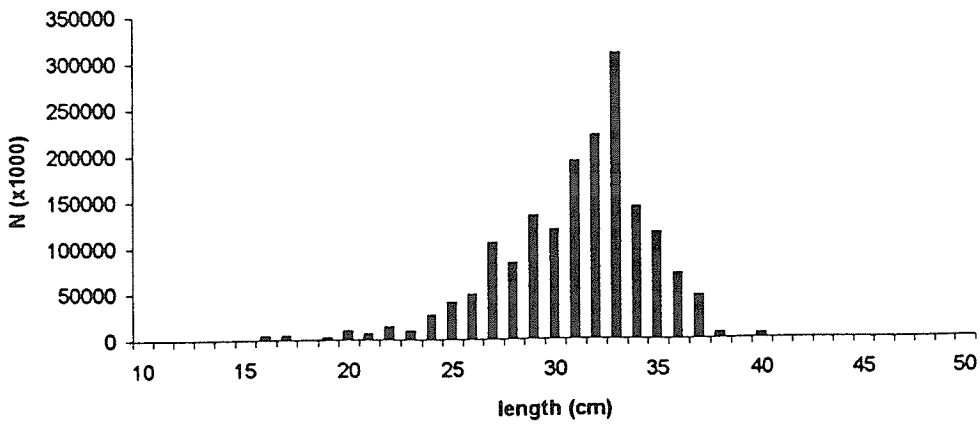


Figure 9. Total length distribution of *Sardinella maderensis* , Luanda-Benguela

Cunene horse mackerel

Also for this species the highest concentration was detected between Benguela and Cabeca da Baleia (Fig. 10). This species was present throughout the shelf and beyond the 200 m isobath. It is therefore possible that part of the stock was not covered as the survey design had initially been limited to the 200 m depth. Large individuals dominated the catches (25 to 45 cm). Figure 11 shows the length frequency distribution. Modes are difficult to detect, probably because of sampling defects.

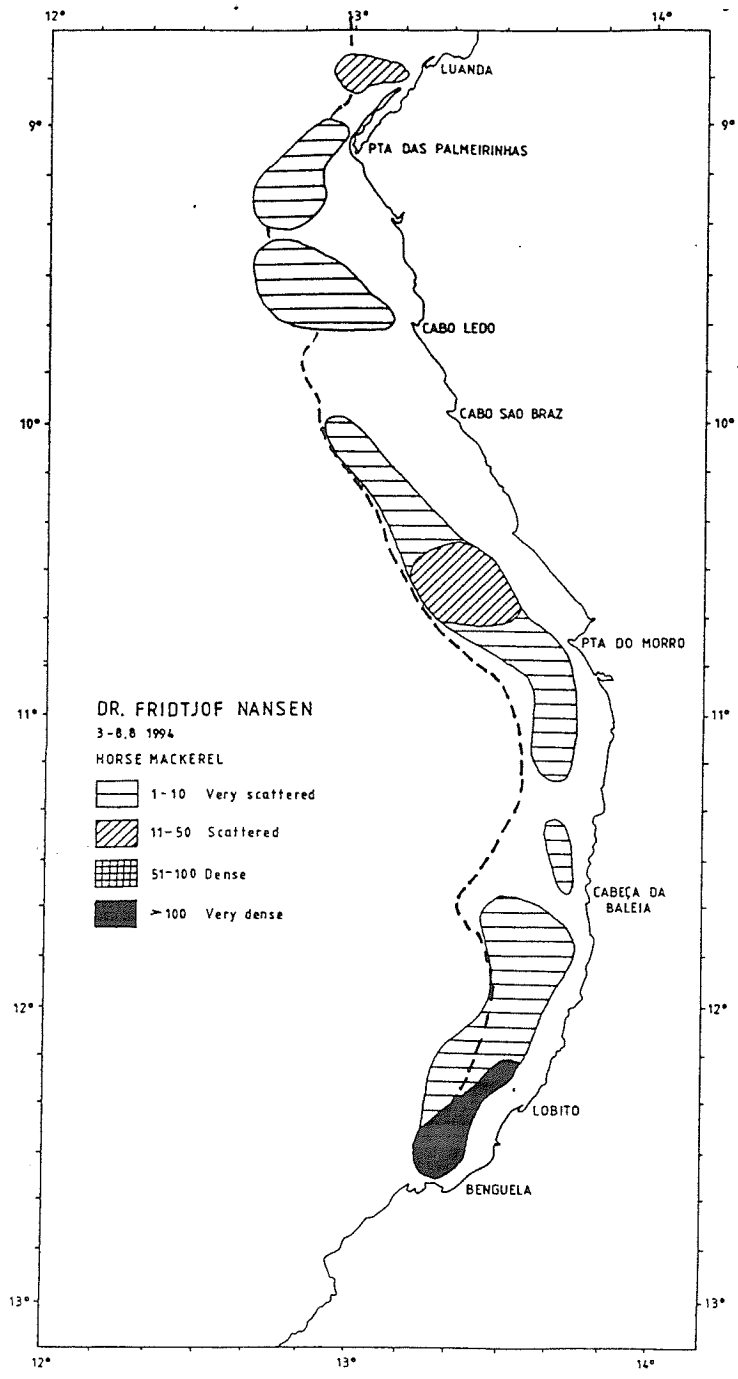


Figure 10. Distribution of *Trachurus trecae*, Luanda-Benguela

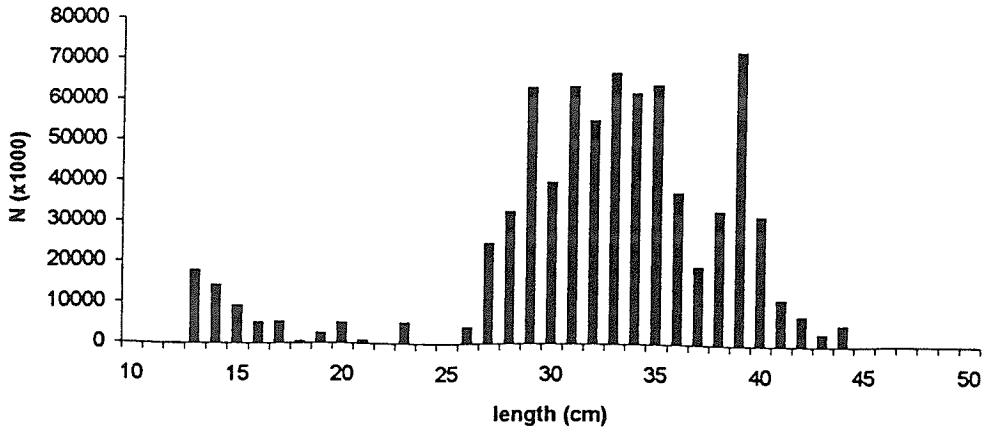


Figure 11. Total length distribution of *Trachurus trecae*, Luanda-Benguela

The total biomass in the area was estimated to 130 000 tonnes, while the estimate obtained in the March survey was about 240 000 tonnes. Also in this case, there is indication of a northward displacement in connection with the upwelling season, keeping in mind the biomass increase in the northern region of 130 000 tonnes.

Pelagic fish type 2 P2

The biomass was estimated to about 80 000 tonnes. Main components were *Trichiurus lepturus*, *Chloroscombrus chrysurus* and *Brachydeuterus auritus*.

CHAPTER 5 BIOLOGICAL SAMPLING

5. 1 Sardinella maderensis

Figure 12 (a and b) shows the results of the sampling for determining the maturity stages of this species, for the northern and central region, respectively.

In the region Luanda-Cabinda 289 specimens were sampled, with a size range of 26 to 34 cm. Almost all sardinella above 29 cm was either spawning or ready to spawn. This surprisingly was the case also for the sardinella found well offshore (over depths of 600 m or more), which was in a clear spawning stage i.e. running. It is probable that eggs, spawned in surface waters and the resulting pelagic larvae are transported by currents and possible eddies to the nursery areas closer inshore. Anon. (1980) shows for *Sardinella aurita* off Southern Gabon a spawning area over the deeper part of the shelf and upper slope.

In the region Luanda-Benguela 263 specimens were sampled, with a size range of 21 to 36 cm. The situation appeared similar to the one found in the northern area, i.e. with most individuals above 29 cm either spawning or ready to spawn. In specimens below 28 cm, the gonads appeared to be totally inactive.

No study was attempted for *S. aurita* because it was caught more seldom and the catches consisted of a few specimens only.

5.2 Trachurus trecae

Figure 13 (a and b) shows the relative frequency of the observed maturity stages for the northern and the central region respectively.

The sampled specimens in the northern region were 119, from 31 to 45 cm. They were all ripe or under spawning. In the central region (85 individuals sampled) also small sizes were available. The range was 23 to 26 cm seemed to be critical. While up to the size of 23 cm all specimens were inactive, above 26 cm they were all ripe or under spawning. No specimen within those sizes was available in the samples.

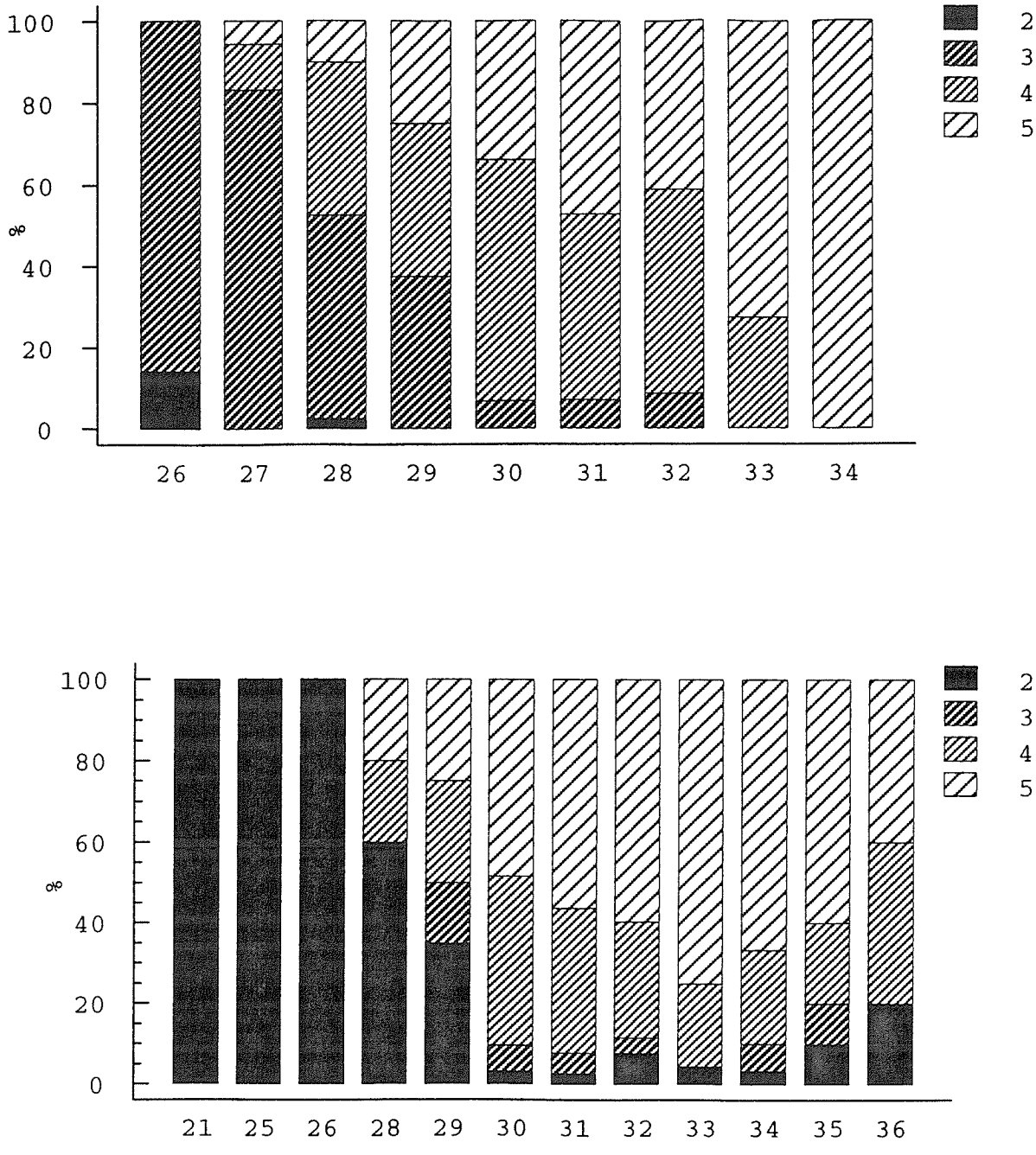


Figure 12. Maturity stages of *Sardinella maderensis* a: Cabinda-Luanda; b: Luanda-Benguela.

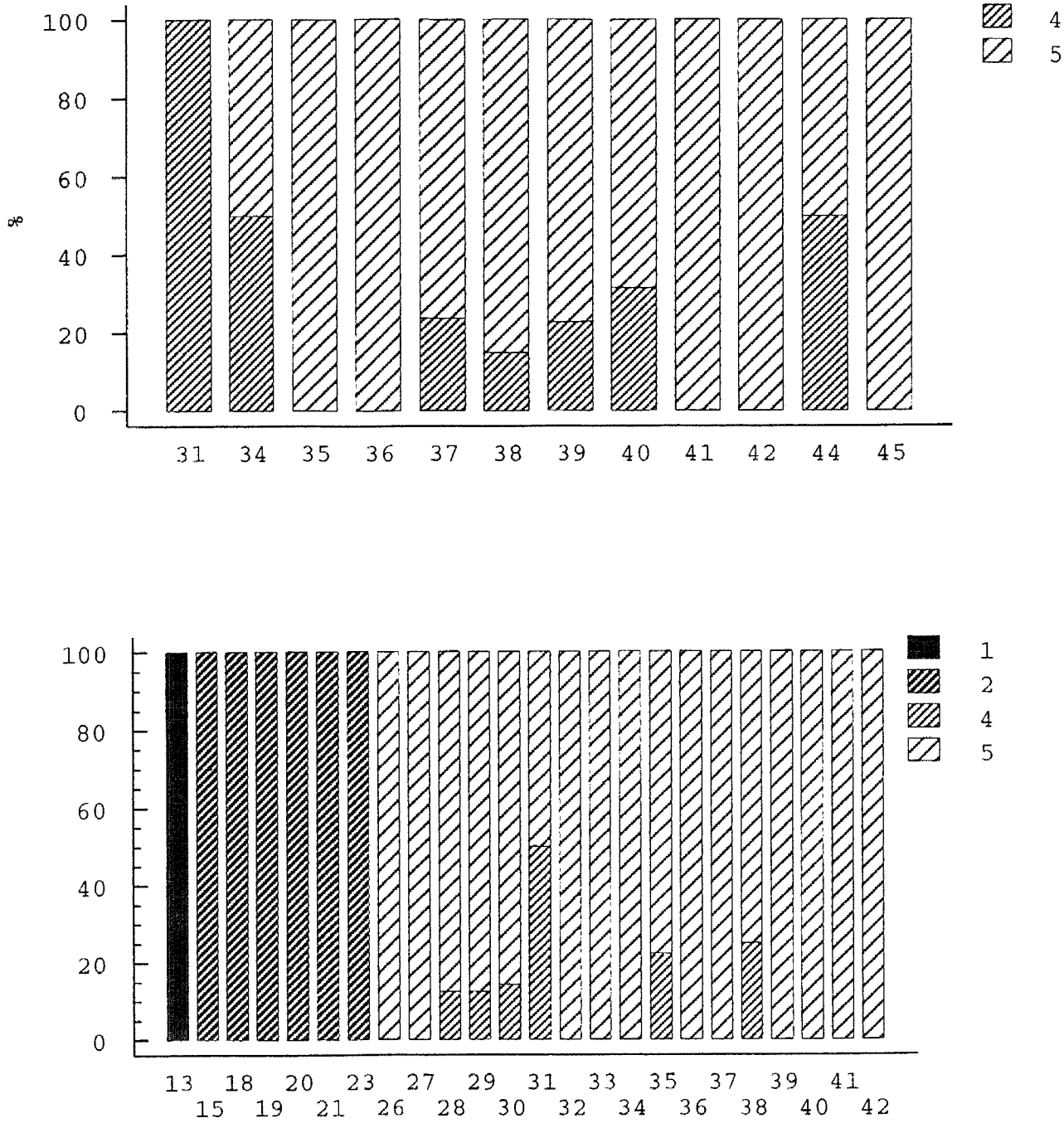


Figure 13. Maturity stages of *Trachurus trecae*: Cabinda-Luanda;
b: Luanda-Benguela

Most of the pelagic species caught appeared to be sexually active indicating that the upwelling season is the most favourable for the survival and growth of the larvae. The environmental dynamics characteristic of this season possibly also ensure the transport of larvae to the nursery areas.

CHAPTER 6 OVERVIEW OF SURVEY RESULTS

The following is an attempt to briefly review the results obtained during this survey and all previous surveys carried out by the RV 'Dr. Fridtjof Nansen' in Angola. The review will only cover sardinella and Cunene horse mackerel.

6.1 Sardinellas

Figure 14 and Table 1 show the biomass estimates from the 'Dr. Fridtjof Nansen' surveys, from 1985 to 1994. Fig. 15 shows the survey estimates averaged for each year and available catch statistics from 1980 to 1990.

Table 1 Estimates of biomass of sardinellas by regions and surveys (1 000 tonnes)

Survey	Cunene-Benguela	Benguela-Luanda	Luanda-Cabinda	Benguela-Cabinda	TOTAL
1/85	25	220	80	300	325
2/85	110	190	180	370	480
3/85	0	70	190	260	260
4/85	0	200	110	310	310
1/86	10	140	110	250	260
2/86	10	130	130	260	270
1/89	40	200	60	260	300
2/89	20	40	130	170	190
3/89	40	100	60	160	200
1/91	+	180	120	300	300
2/91	+	68	154	222	222
1/92	+	119	161	280	280
1/94	*	410	100	510	510
2/94	*	245	290	535	535

* not surveyed

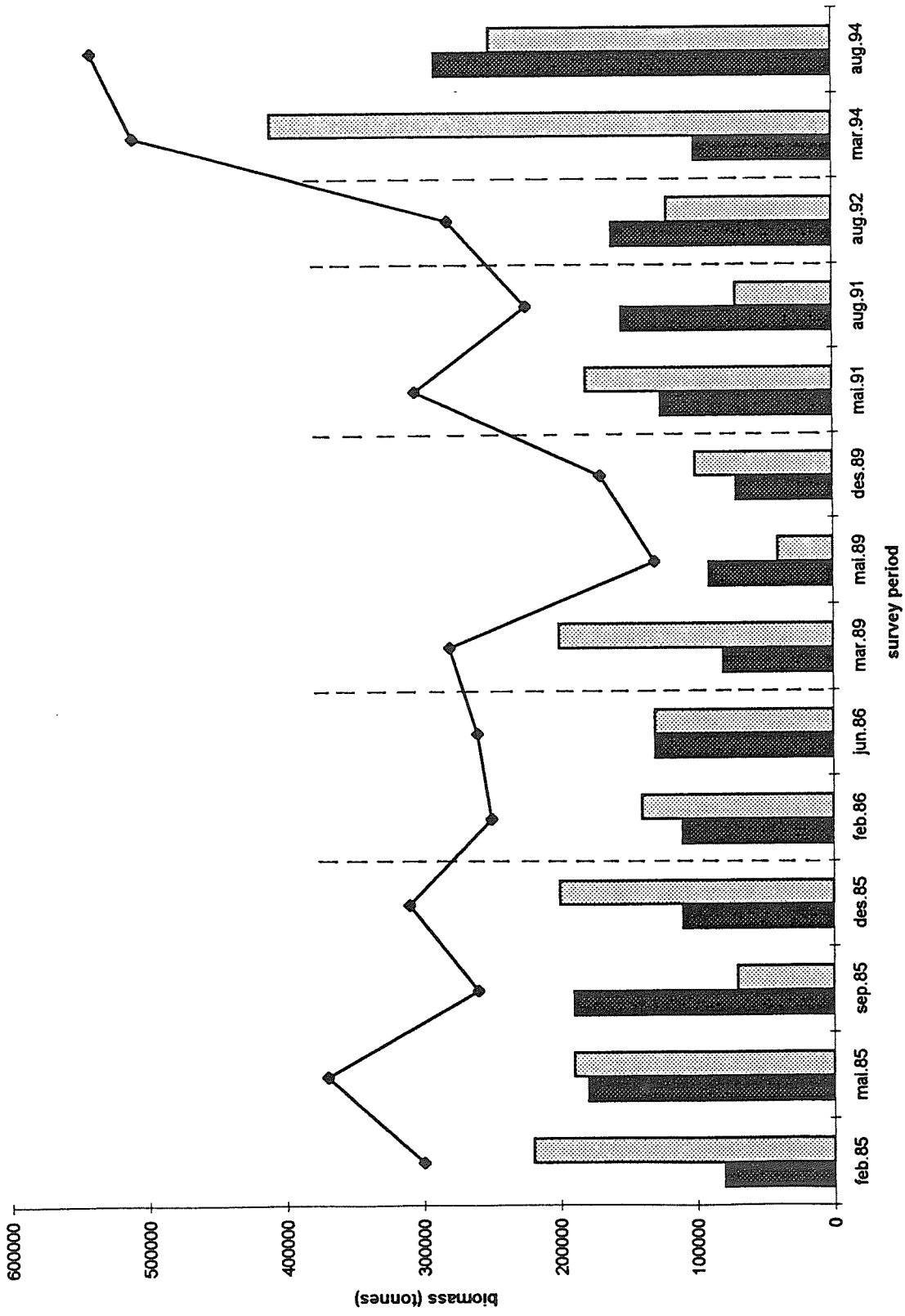


Figure 14. Time series of survey estimates from the 'Dr. Fridtjof Nansen' surveys,*Sardinella* species

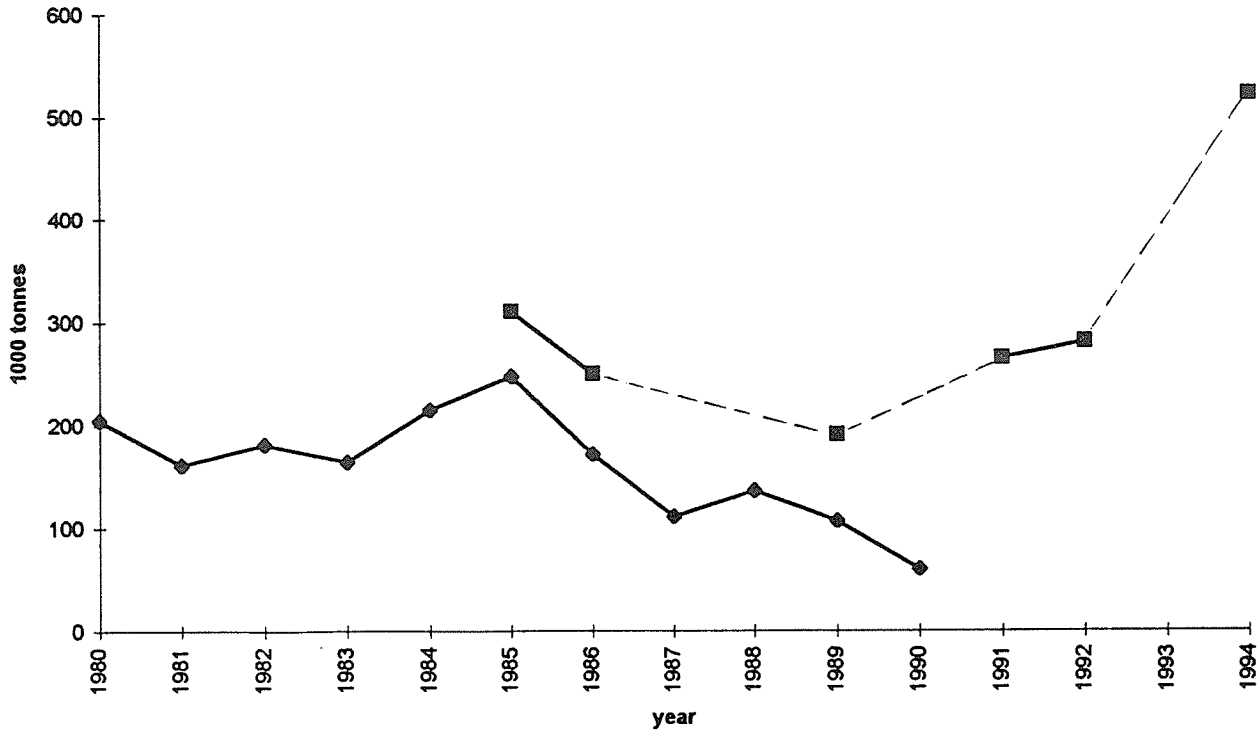
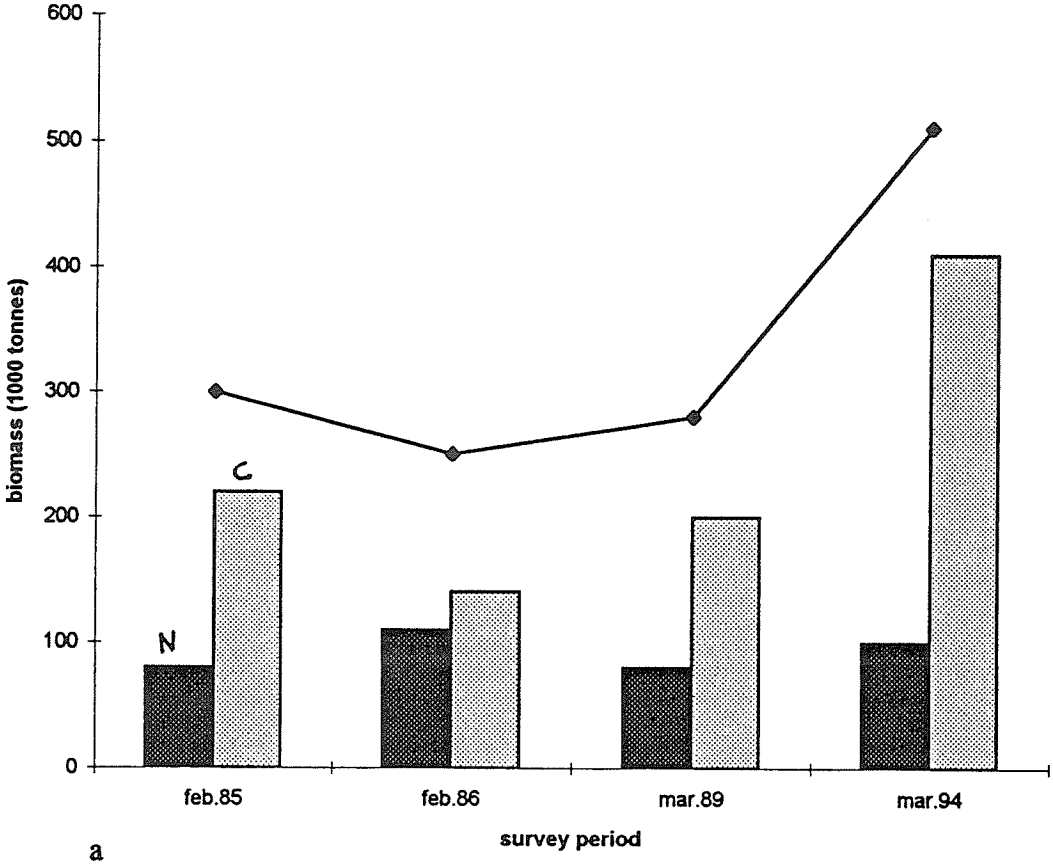


Figure 15. Fishery statistics and biomass estimates by the RV 'Dr.Fridtjof Nansen' for *Sardinella* species in Angola

As already pointed out by Anon. (1991), a clear decline in biomass may be observed in the period 1985 to 1989, from 300 000 to 200 000 tonnes. This was identified as the probable continuation of the stock decline from the early 1980s, when Soviet investigations indicated a stock with a potential annual yield of 230 000 tonnes, corresponding to a standing biomass of 600 000 tonnes. In 1989 a 50% reduction in the TAC was introduced which probably explains the slight recovery in 1991.

In recent years a consistent and considerable increase in biomass has taken place: to almost 300 000 tonnes in 1992 and over 500 000 tonnes in 1994. This could be due to the lower fishing effort exerted in later years.

Figure 16 (a and b) shows the distribution of sardinella in the summer and winter periods respectively, as observed through the surveys with the RV 'DR. Fridtjof Nansen'. The figures show clearly that in the summer period, characterized by more stratified water masses and higher temperatures in the water column, more than 50% of the biomass is found in the central region. On the contrary, the opposite is true in the winter period, characterized by upwellling and colder surface waters. This pattern is probably due to north-south migrations, that possibly apply to both species.



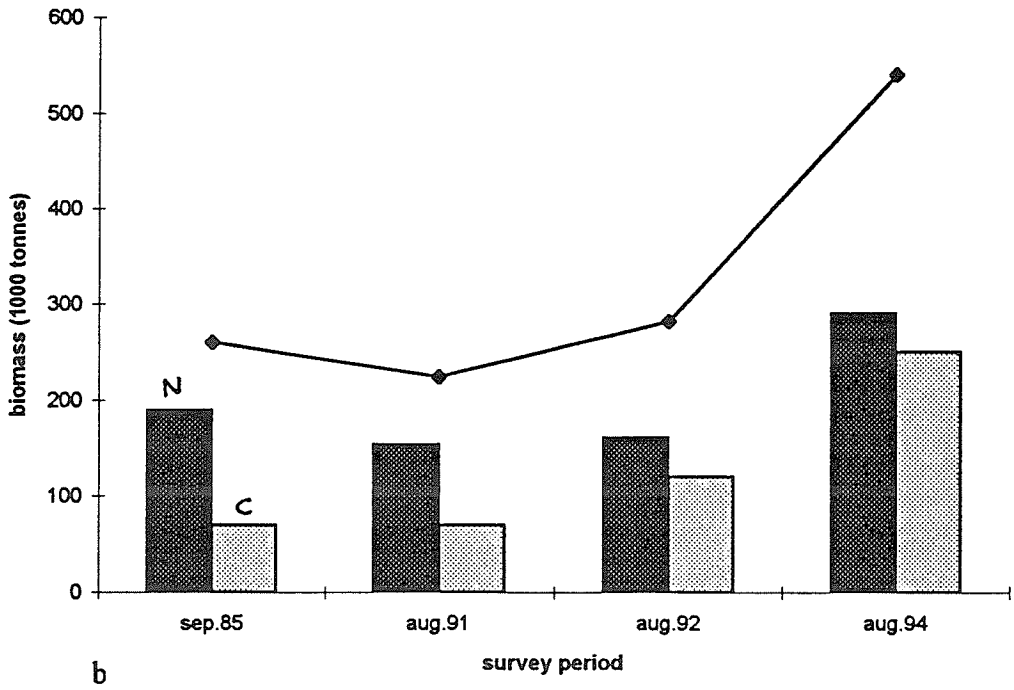


Figure 16. Survey estimates for *Sardinella* species in Central and Northern Angola. a: summer; b: winter.

It is quite remarkable that the substantial increase in biomass regards only *S.maderensis*, while *S.aurita* became more rare in the catches.

Another surprising pattern emerged from the 'Dr. Fridtjof Nansen' surveys is the lack of juveniles in the catches in later years. This had lead Anon.(1991) to be pessimistic about future recruitment. However, this pattern has continued in the 1990s, but the stock has instead increased. It is difficult to understand why the young cohorts are not any longer recorded by our surveys. On the other hand, the 1994 surveys off Congo-Gabon have shown the presence of large concentrations of juveniles in this area, where they actually dominate in numbers and biomass over the adults.

6.2 Cunene horsemackerel

Table 2 shows a summary of the survey results since 1985. In figure 17 these are plotted, including northern and central Angola. The values in figure 18 were obtained by averaging the biomass estimates in different seasons, for the same year. The pattern showed by this figure resembles the one observed for sardinella, i.e. a decrease in the standing biomass from 1985 to the end of the 1980s and a considerable recovery since the beginning of the 1990s. The reasons for this recovery might be the same as for sardinella, i.e. lower fishing pressure.

Table 2 Estimates of Cunene horsemackerel by regions and surveys (1 000 tonnes)

Survey	Cunene-Benguela	Benguela-Luanda	Luanda-Cabinda	Benguela-Cabinda	TOTAL
1/85	30	195	40	235	265
3/85	50	90	40	130	180
4/851/86	100	125	20	145	245
1/89	35	55	40	95	130
3/89	170	40	35	75	245
1/91	100	80	20	100	200
2/91	100	70	30	100	200
1/92	98	86	80	166	264
1/94	*	238	1	239	
2/94	*	130	120	250	

* not surveyed

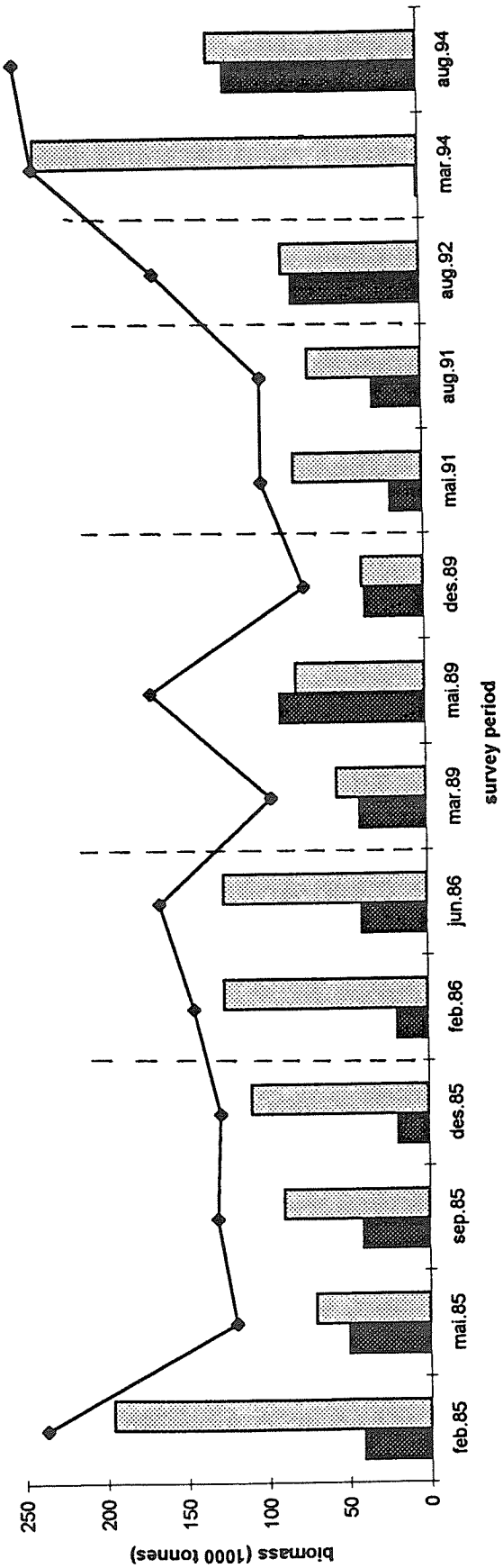


Figure 17. Time series of survey estimates from the 'Dr. Fridtjof Nansen' surveys, *Trachurus trecae*

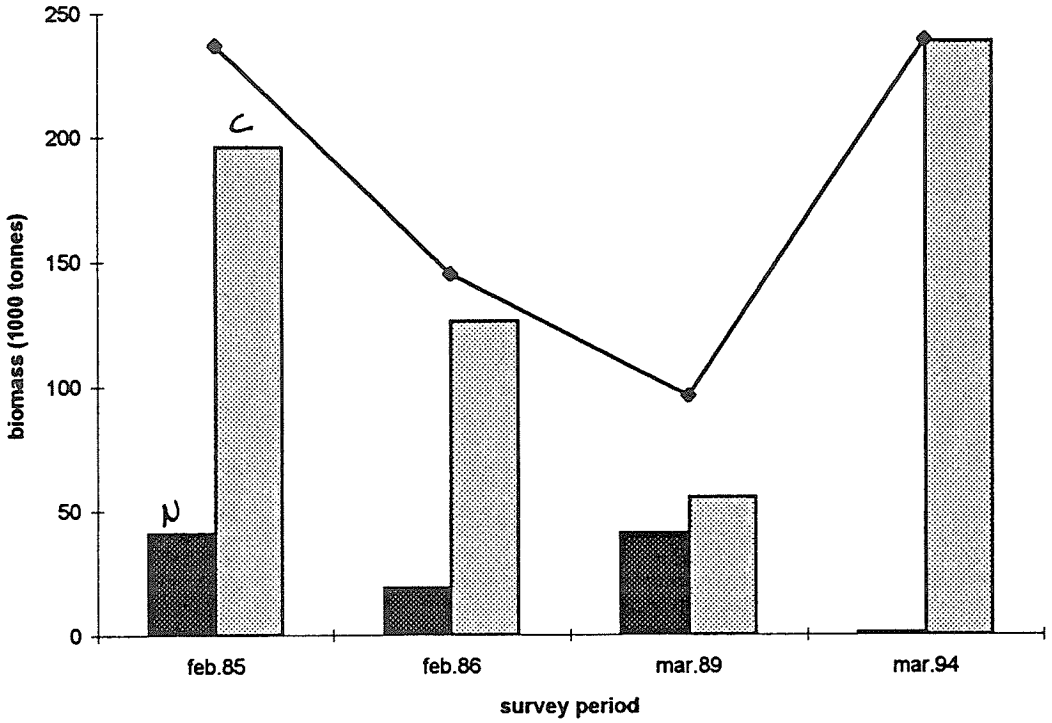
Figure 18. Survey estimates for *Trachurus trecae* (only northern and central regions included)

A similar pattern as for sardinella emerges pointing at a seasonal north-south migration. This is better illustrated in figure 19 (a and b), where the summer and the witer estimates for the northern and central regions are showed. Although more than 50% of the biomass is usually found in the central region, figure 19 shows that in the summer period most of horsemackerel concentrates in the central region, i.e. from Luanda to Benguela.

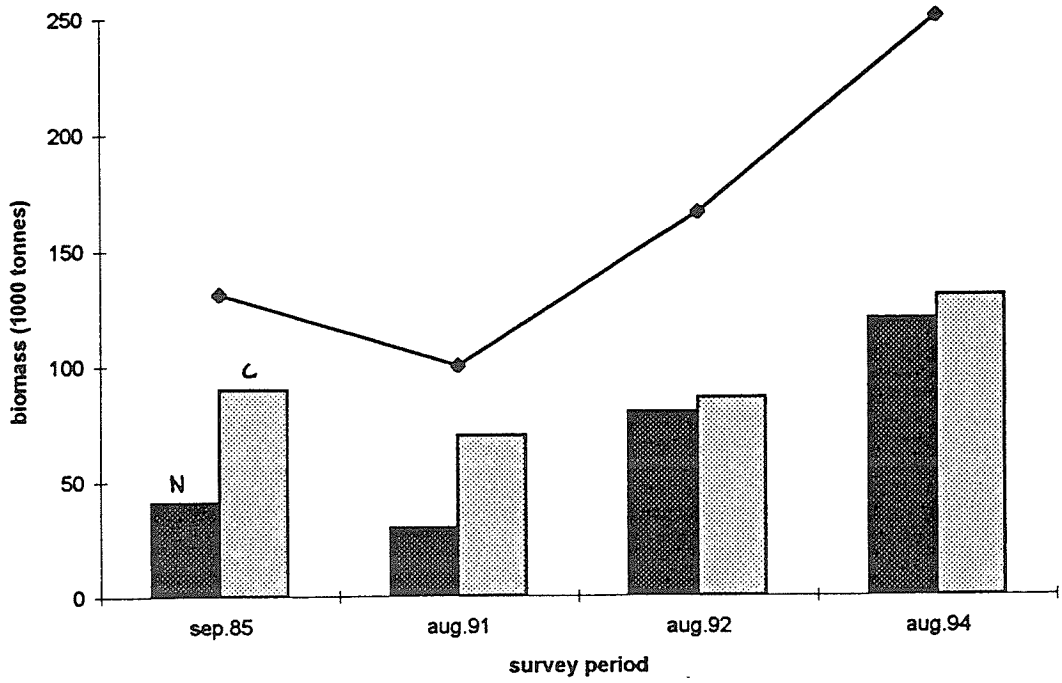
Literature cited

Anon. (1980). Etude regionale sur la pêche maritime dans le Golfe de Guinée. Annexe N 2: La pêche maritime au Congo. Commission des communautés européennes - Fonds européens de développement

Anon. (1991). The state of Angola's main fish resources 1990-1991. (IIP, Internal document)



a



b

Figure 19. Survey estimates for *Trachurus trecae* in Central and Northern Angola. a: summer; b: winter.

ANNEX I Records of fishing stations

PROJECT STATION: 63
DATE: 3/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 1224
start stop duration Long E 1320
TIME :14:20:00 14:48:00 28 (min) Purpose code: 1
LOG : 672.50 674.10 1.60 Area code : 2
FDEPTH: 65 60 GearCond.code: 2
BDEPTH: 105 101 Validity code: 4
Towing dir: 177° Wire out: 250 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 29.00 CATCH/HOUR: 62.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	57.86	261	93.11	126
SALPS	2.14	49	3.44	
Boops boops	1.26	9	2.03	
Trachurus, Juveniles	0.00	9		
Total	61.26		98.58	

PROJECT STATION: 64
DATE: 3/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 1216
start stop duration Long E 1328
TIME :22:39:00 23:09:00 30 (min) Purpose code: 1
LOG : 708.00 709.80 1.80 Area code : 2
FDEPTH: 15 13 GearCond.code: 1
BDEPTH: 88 94 Validity code: 3
Towing dir: 270° Wire out: 120 m Speed: 4 kn*10

Sorted: 133 Kg Total catch: 344.00 CATCH/HOUR: 688.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	599.50	1360	87.14	127
Trachurus trecae	60.00	194	8.72	128
Trichiurus lepturus	17.60	60	2.56	
Atractoscion aequidens	5.24	2	0.76	
Sarda sarda	2.22	2	0.32	
Sardinella aurita	2.00	4	0.29	
Illex coindetii	0.50	24	0.07	
BREBR04	0.24	50	0.03	
Trachurus, Juveniles	0.00	60		
Total	687.30		99.89	

PROJECT STATION: 65
DATE: 4/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 1212
start stop duration Long E 1330
TIME :01:59:00 02:33:00 34 (min) Purpose code: 1
LOG : 729.10 731.20 2.10 Area code : 2
FDEPTH: 20 18 GearCond.code: 1
BDEPTH: 88 77 Validity code: 3
Towing dir: 115° Wire out: 100 m Speed: 3 kn*10

Sorted: 66 Kg Total catch: 164.00 CATCH/HOUR: 289.41

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	202.27	595	69.89	129
Sardinella maderensis	65.06	168	22.48	130
Trichiurus lepturus	20.06	124	6.93	
Sepia officinalis hierredda	1.62	12	0.56	
Boops boops	0.44	4	0.15	
Illex coindetii	0.44	21	0.15	
Total	289.89		100.16	

PROJECT STATION: 66
DATE: 4/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 1208
start stop duration Long E 1338
TIME :06:58:00 07:22:00 24 (min) Purpose code: 1
LOG : 764.20 766.10 1.90 Area code : 2
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 35 49 Validity code: 3
Towing dir: 350° Wire out: 110 m Speed: 4 kn*10

Sorted: 169 Kg Total catch: 3175.00 CATCH/HOUR: 7937.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	7580.00	25515	95.50	131
Sardinella aurita	260.00	815	3.28	132
Trachurus trecae	54.25	90	0.68	
Sarda sarda	43.25	25	0.54	
Total	7937.50		100.00	

PROJECT STATION: 67
DATE: 4/ 8/94 GEAR TYPE: BT No:1 POSITION:Lat S 1150
start stop duration Long E 1332
TIME :12:27:00 12:47:00 20 (min) Purpose code: 1
LOG : 811.60 812.60 1.00 Area code : 2
FDEPTH: 127 127 GearCond.code: 8
BDEPTH: 127 127 Validity code: 3
Towing dir: 180° Wire out: 350 m Speed: 3 kn*10

Sorted: 142 Kg Total catch: 707.80 CATCH/HOUR: 2123.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	1443.75	10080	67.99	134
Trachurus trecae	531.75	2235	25.04	133
Dentex angolensis	75.75	240	3.57	
Torpedo sp.	14.70	15	0.69	
Scorpaena stephanica	13.80	30	0.65	
Peristedion cataphractum	7.65	195	0.36	
Pontinus accraensis	5.85	60	0.28	
Spicara alta	5.55	45	0.26	
Zeus faber	4.95	15	0.23	
Citharus linguatula	4.05	60	0.19	
Uranoscopus polli	3.30	15	0.16	
Monolene microstoma	2.70	135	0.13	
Chaetodon hoefleri	2.55	15	0.12	
Cheilodonichthys gabonensis	2.25	15	0.11	
Lepidotrigla cadmani	2.10	15	0.10	
Aulopus cadenati	1.95	15	0.09	
Todaropsis eblanae	0.75	15	0.04	
Total	2123.40		100.01	

PROJECT STATION: 68
DATE: 4/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 1134
start stop duration Long E 1342
TIME :23:52:00 00:25:00 33 (min) Purpose code: 1
LOG : 910.00 912.00 2.40 Area code : 2
FDEPTH: 6 7 GearCond.code:
BDEPTH: 29 33 Validity code:
Towing dir: 280° Wire out: 105 m Speed: 4 kn*10

Sorted: 125 Kg Total catch: 889.00 CATCH/HOUR: 1616.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	1343.36	4340	83.11	136
Trachurus trecae	198.55	865	12.28	135
Sphyraena guachancho	40.73	51	2.52	
Pomatomus saltatrix	11.45	4	0.71	
Brachydeuterus auritus	9.67	64	0.60	
Mugil cephalus	5.82	4	0.36	
Stromateus fiatola	5.09	5	0.31	
Engraulis encrasicolus	3.05	624	0.19	
Total	1617.72		100.08	

PROJECT STATION: 69
DATE: 5/ 8/94 GEAR TYPE: BT No:1 POSITION:Lat S 1110
start stop duration Long E 1337
TIME :12:46:00 13:06:00 20 (min) Purpose code: 1
LOG : 37.90 39.00 1.10 Area code : 2
FDEPTH: 114 115 GearCond.code: 1
BDEPTH: 114 115 Validity code: 1
Towing dir: 360° Wire out: 400 m Speed: 3 kn*10

Sorted: 59 Kg Total catch: 148.90 CATCH/HOUR: 446.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	240.00	780	53.73	137
Dentex macrophthalmus	93.30	660	20.89	138
Trichiurus lepturus	21.30	51	4.77	
Branchiostegus semifasciatus	19.50	15	4.17	
Brotula barbata	18.00	60	4.03	
Dentex angolensis	13.50	60	3.02	
Pterothrissus belloci	11.70	111	2.62	
Zeus faber	7.50	30	1.68	
Pontinus accraensis	6.90	60	1.54	
Pagellus bellottii	3.30	6	0.74	
Todaropsis eblanae	2.40	66	0.54	
Umbrina canariensis	1.80	6	0.40	
Uranoscopus polli	1.50	15	0.34	
Spicara alta	0.75	6	0.17	
Total	441.45		98.84	

PROJECT STATION: 70
DATE: 5/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 1108
start stop duration Long E 1347
TIME :14:43:00 15:13:00 30 (min) Purpose code: 1
LOG : 53.10 54.80 1.70 Area code : 2
FDEPTH: 16 16 GearCond.code: 1
BDEPTH: 45 44 Validity code: 1
Towing dir: 4° Wire out: 90 m Speed: 4 kn*10

Sorted: Kg Total catch: 10.70 CATCH/HOUR: 21.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	17.60	52	82.24	139
Trichiurus lepturus	3.00	6	14.02	
Pagellus bellottii	0.80	2	3.74	
Total	21.40		100.00	

PROJECT STATION: 71
DATE: 5/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 1055
start stop duration Long E 1340
TIME :19:05:00 19:35:00 30 (min) Purpose code: 1
LOG :1092.50 1094.20 1.70 Area code : 2
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 71 59 Validity code: 1
Towing dir: 108° Wire out: 110 m Speed: 4 kn*10

Sorted: 73 Kg Total catch: 196.30 CATCH/HOUR: 392.60

SPECIES	*CATCH/HOUR* weight	numbers	*% OF TOT. C*	*SAMP*
Sardinella maderensis	149.60	434	38.10	140
Trachurus trecae	136.60	434	34.79	141
Sarda sarda	53.60	38	13.65	
Synagrops microlepis	21.40	6430	5.45	
Trichiurus lepturus	17.60	52	4.48	
Brachydeuterus auritus	10.20	52	2.60	
Sepiella ornata	2.00	46	0.51	
Sardinella aurita	1.00	4	0.25	
Bembrops heterurus	0.04	52	0.01	
BREBR04	0.04	88	0.01	
Trachurus, Juveniles	0.04	56	0.01	
Total	392.12		99.86	

PROJECT STATION: 72
DATE: 6/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 1040
start stop duration Long E 1342
TIME :04:32:00 05:02:00 30 (min) Purpose code: 1
LOG : 171.20 173.20 2.00 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 20 31 Validity code: 1
Towing dir: 260° Wire out: 100 m Speed: 4 kn*10

Sorted: 120 Kg Total catch: 991.44 CATCH/HOUR: 1982.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	566.40	9120	28.56	142
Dentex canariensis	276.80	544	13.96	
Sardinella maderensis	250.40	1024	12.63	143
Pomadasys peroteti	209.60	176	10.57	
Trichiurus lepturus	155.20	5168	7.83	
Stromateus fiatola	153.60	240	7.75	
Trachurus trecae	151.20	832	7.63	144
Chloroscombrus chrysurus	85.44	384	4.31	
Argyrosomus hololepidotus	60.00	2	3.03	
Pagellus bellottii	32.00	80	1.61	
Sphyraena guachancho	12.32	16	0.62	
Galeoides decadactylus	11.52	16	0.58	
Lithognathus mormyrus	10.24	16	0.52	
Lichia amia	8.16	48	0.41	
Total	1982.88		100.01	

PROJECT STATION: 73

DATE: 6/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 1032
start stop duration Long E 1331
TIME :09:32:00 10:02:00 30 (min) Purpose code: 1
LOG :1215.40 1217.30 1.90 Area code : 2
FDEPTH: 10 20 GearCond.code: 1
BDEPTH: 42 50 Validity code: 1
Towing dir: 250° Wire out: 130 m Speed: 4 kn*10

Sorted: 98 Kg Total catch: 122.30 CATCH/HOUR: 244.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	201.00	1012	82.17	145
Sardinella aurita	15.80	88	6.46	146
Stromateus fiatola	10.20	14	4.17	
Trachurus trecae	8.00	14	3.27	
Selene dorsalis	4.20	10	1.72	
Mugil cephalus	3.60	2	1.47	
Trichiurus lepturus	1.80	8	0.74	
Total	244.60		100.00	

PROJECT STATION: 74

DATE: 6/ 8/94 GEAR TYPE: BT No:1 POSITION:Lat S 1032
start stop duration Long E 1314
TIME :14:06:00 14:36:00 30 (min) Purpose code: 1
LOG : 255.20 256.70 1.50 Area code : 2
FDEPTH: 117 115 GearCond.code: 1
BDEPTH: 117 115 Validity code: 1
Towing dir: 340° Wire out: 400 m Speed: 3 kn*10

Sorted: 135 Kg Total catch: 541.57 CATCH/HOUR: 1083.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	656.96	1936	60.65	148
Dentex macrophthalmus	186.80	960	17.25	147
Squatina oculata	44.40	8	4.10	
Zenopsis conchifer	31.52	48	2.91	
Dentex congoensis	30.32	264	2.80	
Dentex angolensis	26.48	128	2.44	
Illex coindetii	21.68	920	2.00	
Pagellus bellottii	13.76	128	1.27	
Sparus pagrus africanus	10.00	16	0.92	
Brotula barbata	9.44	8	0.87	
Citharus linguatula	8.64	176	0.80	
Raja miraletus	8.32	16	0.77	
Hyperoglyphe moselii	6.90	2	0.64	
Lepidotrigla cadmani	6.56	80	0.61	
Trichiurus lepturus	6.32	8	0.58	
Zeus faber	3.60	8	0.33	
Spicara alta	3.52	80	0.32	
Todaropsis eblanae	2.96	56	0.27	
Peristedion cataphractum	1.76	48	0.16	
Sepia bertheloti	1.60	8	0.15	
Saurida brasiliensis	0.80	16	0.07	
Boops boops	0.80	16	0.07	
Lepidotrigla carolae	0.80	32	0.07	
Total	1083.94		100.05	

PROJECT STATION: 75

DATE: 7/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 953
start stop duration Long E 1310
TIME :05:07:00 05:37:00 30 (min) Purpose code: 1
LOG : 396.30 398.10 1.80 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 34 25 Validity code: 1
Towing dir: 80° Wire out: 100 m Speed: 3 kn*10

Sorted: 116 Kg Total catch: 1850.72 CATCH/HOUR: 3701.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	2216.00	18752	59.87	
Brachydeuterus auritus	832.00	8448	22.48	149
Trichiurus lepturus	205.44	224	5.55	
Trachinotus teraia	152.64	352	4.12	
Sardinella maderensis	151.68	768	4.10	151
Trachurus trecae	101.76	704	2.75	150
Sphyraena guachancho	31.68	32	0.86	
Selene dorsalis	5.44	32	0.15	
Sardinella aurita	4.80	32	0.13	
Total	3701.44		100.01	

PROJECT STATION: 76

DATE: 7/ 8/94 GEAR TYPE: BT No:1 POSITION:Lat S 939
start stop duration Long E 1257
TIME :11:04:00 11:34:00 30 (min) Purpose code: 1
LOG :1450.90 1452.30 1.40 Area code : 2
FDEPTH: 92 91 GearCond.code: 1
BDEPTH: 92 91 Validity code: 1
Towing dir: 360° Wire out: 300 m Speed: 3 kn*10

Sorted: 134 Kg Total catch: 509.00 CATCH/HOUR: 1018.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	822.00	2976	80.75	152
Trichiurus lepturus	95.60	156	9.39	
Dentex macrophthalmus	58.80	232	5.78	
Raja miraletus	14.00	6	1.38	
Umbrina canariensis	12.80	22	1.26	
Atractoscion aequidens	5.40	2	0.53	
Zeus faber	4.80	14	0.47	
Dentex angolensis	3.00	30	0.29	
Illex coindetii	0.80	60	0.08	
Citharus linguatula	0.40	6	0.04	
Boops boops	0.40	6	0.04	
Total	1018.00		100.01	

PROJECT STATION: 77

DATE: 7/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 938
start stop duration Long E 1250
TIME :12:43:00 13:14:00 31 (min) Purpose code: 1
LOG : 461.20 463.30 2.10 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 122 124 Validity code: 1
Towing dir: 100° Wire out: 120 m Speed: 4 kn*10

Sorted: 68 Kg Total catch: 236.40 CATCH/HOUR: 457.55

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	373.55	1415	81.64	153
Trachinotus ovatus	46.45	95	10.15	155
Sardinella aurita	37.55	101	8.21	154
Total	457.55		100.00	

PROJECT STATION: 78

DATE: 7/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 918
start stop duration Long E 1242
TIME :22:33:00 23:03:00 30 (min) Purpose code: 1
LOG :1557.80 1559.80 2.00 Area code : 2
FDEPTH: 11 10 GearCond.code: 1
BDEPTH: 207 260 Validity code: 1
Towing dir: 248° Wire out: 120 m Speed: 4 kn*10

Sorted: 31 Kg Total catch: 283.88 CATCH/HOUR: 567.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	474.00	344952	83.49	
Synagrops microlepis	64.00	5472	11.27	
Trachurus trecae	25.40	36	4.47	
Sarda sarda	4.00	2	0.70	
Lestrolepis intermedia	0.36	72	0.06	
Total	567.76		99.99	

PROJECT STATION: 79

DATE: 8/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 910
start stop duration Long E 1254
TIME :08:42:00 09:12:00 30 (min) Purpose code: 1
LOG :1635.00 1636.90 1.90 Area code : 2
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 52 69 Validity code: 1
Towing dir: 270° Wire out: 110 m Speed: 4 kn*10

Sorted: Kg Total catch: 54.90 CATCH/HOUR: 109.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	85.20	272	77.60	156
Sarda sarda	14.40	10	13.11	
Sardinella aurita	3.80	10	3.46	
Mugil cephalus	2.80	2	2.55	
Selene dorsalis	1.40	4	1.28	
Trachinotus ovatus	1.00	2	0.91	
Trachurus trecae	1.00	2	0.91	
Sepiella ornata	0.20	4	0.18	
CARSL91	0.00	10		
Total	109.80		100.00	

PROJECT STATION: 80

DATE: 8/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 911
start stop duration Long E 1253
TIME :15:21:00 15:59:00 38 (min) Purpose code: 1
LOG : 691.30 693.90 2.60 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 333 192 Validity code: 1
Towing dir: 97° Wire out: 151 m Speed: 4 kn*10

Sorted: 36 Kg Total catch: 52.72 CATCH/HOUR: 83.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	50.68	145	60.88	157
Sarda sarda	14.76	8	17.73	
Trachinotus ovatus	10.66	21	12.81	159
Sardinella aurita	7.14	16	8.58	158
Total	83.24		100.00	

PROJECT STATION: 81

DATE: 8/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 854
start stop duration Long E 1302
TIME :19:50:00 20:20:00 30 (min) Purpose code: 1
LOG :1728.70 1730.70 2.00 Area code : 2
FDEPTH: 15 15 GearCond.code: 1
BDEPTH: 116 180 Validity code: 1
Towing dir: 260° Wire out: 110 m Speed: 4 kn*10

Sorted: 73 Kg Total catch: 363.70 CATCH/HOUR: 727.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	410.00	820	56.37	160
Sardinella maderensis	180.00	540	24.75	161
MYCTOPHIDAE	87.00	298180	11.96	
Trichiurus lepturus	40.00	120	5.50	
Synagrops microlepis	5.00	310	0.69	
Sardinella aurita	5.00	10	0.69	
Total	727.00		99.96	

PROJECT STATION: 82

DATE: 9/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 824
start stop duration Long E 1315
TIME :07:25:00 07:55:00 30 (min) Purpose code: 1
LOG :1839.00 1840.80 1.80 Area code : 2
FDEPTH: 15 15 GearCond.code: 1
BDEPTH: 38 31 Validity code: 1
Towing dir: 103° Wire out: 110 m Speed: 3 kn*10

Sorted: 131 Kg Total catch: 1948.00 CATCH/HOUR: 3896.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	2272.00	9206	58.32	162
Stromateus fiatola	706.00	948	18.12	
Trichiurus lepturus	704.00	622	18.07	
Trachurus trecae	62.00	118	1.59	
Sardinella aurita	62.00	148	1.59	
Brachydeuterus auritus	38.40	266	0.99	
Sarda sarda	20.20	10	0.52	
Atractoscion aequidens	19.80	12	0.51	
Lithognathus mormyrus	11.80	30	0.30	
Total	3896.20		100.01	

PROJECT STATION: 83

DATE:10/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 750
start stop duration Long E 1243
TIME :01:20:00 02:03:00 43 (min) Purpose code: 1
LOG : 999.40 1.90 2.50 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 111 105 Validity code: 1
Towing dir: 90° Wire out: 120 m Speed: 3 kn*10

Sorted: 175 Kg Total catch: 906.20 CATCH/HOUR: 1264.47

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	772.67	1577	61.11	163
Sardinella maderensis	418.60	1200	33.10	164
Sarda sarda	36.84	14	2.91	
Trachinotus ovatus	20.16	49	1.59	
Trichiurus lepturus	11.44	28	0.90	
Sepiella ornata	4.74	119	0.37	
Total	1264.45		99.98	

PROJECT STATION: 84

DATE:10/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 728
start stop duration Long E 1230
TIME :10:10:00 10:40:00 30 (min) Purpose code: 1
LOG :2078.50 2080.60 2.10 Area code : 2
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 108 103 Validity code: 1
Towing dir: 90° Wire out: 110 m Speed: 4 kn*10

Sorted: 134 Kg Total catch: 1345.00 CATCH/HOUR: 2690.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	1492.00	5280	55.46	165
Sardinella aurita	1198.00	3040	44.54	166
Total	2690.00		100.00	

PROJECT STATION: 85

DATE:10/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 723
start stop duration Long E 1230
TIME :13:45:00 14:17:00 32 (min) Purpose code: 1
LOG : 102.10 103.90 1.80 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 97 104 Validity code: 1
Towing dir: 240° Wire out: 140 m Speed: 3 kn*10

Sorted: 13 Kg Total catch: 13.75 CATCH/HOUR: 25.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepiella ornata	14.25	345	55.28	168
Sardinella maderensis	11.53	39	44.72	167
Total	25.78		100.00	

PROJECT STATION: 86

DATE:10/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 718
start stop duration Long E 1239
TIME :16:11:00 16:41:00 30 (min) Purpose code: 1
LOG : 118.80 120.60 1.80 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 48 55 Validity code: 1
Towing dir: 270° Wire out: 140 m Speed: 3 kn*10

Sorted: Kg Total catch: 0.37 CATCH/HOUR: 0.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepiella ornata	0.74	14	100.00	
Total	0.74		100.00	

PROJECT STATION: 87

DATE:11/ 8/94 GEAR TYPE: BT No:1 POSITION:Lat S 702
start stop duration Long E 1204
TIME :10:05:00 10:35:00 30 (min) Purpose code: 1
LOG :2287.60 2289.00 1.40 Area code : 2
FDEPTH: 113 116 GearCond.code: 1
BDEPTH: 113 116 Validity code: 1
Towing dir: 230° Wire out: 350 m Speed: 2 kn*10

Sorted: 21 Kg Total catch: 102.84 CATCH/HOUR: 205.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	44.80	320	21.78	
Trachurus trecae, juvenile	35.20	1464	17.11	169
Epinephelus aeneus	18.40	4	8.95	
Dentex congoensis	17.60	472	8.56	
Trachurus trecae	16.20	32	7.88	
Spicara alta	16.00	776	7.78	
Illex coindetii	10.60	344	5.15	
Todaropsis eblanae	8.20	152	3.99	
Lepidotrigla cadmani	7.40	88	3.60	
Atractoscion aequidens	7.20	2	3.50	
Sepia officinalis hierredda	6.40	8	3.11	
Zeus faber	6.00	16	2.92	
Lepidotrigla carolae	3.60	144	1.75	
Brotula barbata	3.60	2	1.75	
Sarda sarda	3.20	2	1.56	
Boops boops	0.88	48	0.43	
Citharus linguatula	0.40	16	0.19	
Total	205.68		100.01	

PROJECT STATION: 88

DATE:11/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 630
start stop duration Long E 1215
TIME :17:51:00 18:21:00 30 (min) Purpose code: 1
LOG :2356.00 2358.00 2.00 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 31 31 Validity code: 1
Towing dir: 160° Wire out: 140 m Speed: 4 kn*10

Sorted: 95 Kg Total catch: 669.20 CATCH/HOUR: 1338.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	768.60	6314	57.43	170
Sardinella maderensis	502.00	2194	37.51	171
Sardinella aurita	37.80	126	2.82	172
Selene dorsalis	15.96	112	1.19	
Trichiurus lepturus	14.14	42	1.06	
Total	1338.50		100.01	

PROJECT STATION: 89

DATE:12/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 617
start stop duration Long E 1200
TIME :05:02:00 05:32:00 30 (min) Purpose code: 1
LOG : 455.60 457.70 2.10 Area code : 2
FDEPTH: 15 15 GearCond.code: 1
BDEPTH: 61 50 Validity code: 1
Towing dir: 60° Wire out: 80 m Speed: 4 kn*10

Sorted: 69 Kg Total catch: 709.19 CATCH/HOUR: 1418.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1096.20	2268	77.29	173
Mola mola	160.00	2	11.28	
Sardinella maderensis	66.78	198	4.71	
Trichiurus lepturus	61.38	54	4.33	
Auxis thazard	20.16	18	1.42	
Sepiella ornata	13.86	90	0.98	
Total	1418.38		100.01	

PROJECT STATION: 90

DATE:11/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 620
start stop duration Long E 1136
TIME :10:05:00 10:50:00 45 (min) Purpose code: 1
LOG :2500.00 2502.70 2.70 Area code : 2
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 166 124 Validity code: 1
Towing dir: 64° Wire out: 110 m Speed: 41 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 91

DATE:12/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 605
start stop duration Long E 1137
TIME :19:20:00 19:55:00 35 (min) Purpose code: 1
LOG :2581.80 2584.20 2.40 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 139 152 Validity code: 1
Towing dir: 280° Wire out: 150 m Speed: 4 kn*10

Sorted: 112 Kg Total catch: 643.96 CATCH/HOUR: 1103.93

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	589.92	2054	53.44	175
Trachurus trecae	278.40	470	25.22	174
Trichiurus lepturus	170.88	96	15.48	
Selene dorsalis	24.38	67	2.21	
Sardinella aurita	19.30	48	1.75	
Sarda sarda	17.83	9	1.62	
Auxis thazard	3.22	2	0.29	
Total	1103.93		100.01	

PROJECT STATION: 92

DATE:12/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 612
start stop duration Long E 1139
TIME :23:05:00 23:35:00 30 (min) Purpose code: 1
LOG :2611.00 2612.60 1.50 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 112 118 Validity code: 1
Towing dir: 235° Wire out: 150 m Speed: 3 kn*10

Sorted: 66 Kg Total catch: 165.43 CATCH/HOUR: 330.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	162.50	530	49.11	178
Trichiurus lepturus	65.00	50	19.65	
Trachurus trecae, juvenile	52.80	1294	15.96	176
Trachurus trecae	40.00	64	12.09	177
Sepiella ornata	5.60	150	1.69	
Trachinotus ovatus	4.96	10	1.50	
Total	330.86		100.00	

PROJECT STATION: 93

DATE:13/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 628
start stop duration Long E 1133
TIME :06:05:00 06:50:00 45 (min) Purpose code: 1
LOG :2670.40 2672.60 2.20 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 320 254 Validity code: 1
Towing dir: 55° Wire out: 140 m Speed: 36 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 94

DATE:15/ 8/94 GEAR TYPE: PT No:5 POSITION:Lat S 533
start stop duration Long E 1131
TIME :14:19:00 14:49:00 30 (min) Purpose code: 1
LOG : 997.80 999.50 1.70 Area code : 2
FDEPTH: 160 160 GearCond.code: 1
BDEPTH: 361 334 Validity code: 1
Towing dir: 60° Wire out: 480 m Speed: 36 kn*10

Sorted: 28 Kg Total catch: 28.80 CATCH/HOUR: 57.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	57.60	48468	100.00	
Total	57.60		100.00	

PROJECT STATION: 95

DATE:16/ 8/94 GEAR TYPE: PT No:1 POSITION:Lat S 540
start stop duration Long E 1144
TIME :06:15:00 06:45:00 30 (min) Purpose code: 1
LOG :3139.00 3140.70 1.70 Area code : 2
FDEPTH: 50 40 GearCond.code: 1
BDEPTH: 83 76 Validity code: 1
Towing dir: 80° Wire out: 190 m Speed: 3 kn*10

Sorted: 23 Kg Total catch: 25.42 CATCH/HOUR: 50.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	37.30	72	73.37	179
Selene dorsalis	5.60	14	11.01	
Scomber japonicus	4.60	6	9.05	
Trichiurus lepturus	2.26	2	4.45	
Sardinella aurita	0.86	2	1.69	
Sepiella ornata	0.22	4	0.43	
Total	50.84		100.00	

PROJECT STATION: 96

DATE:16/ 8/94 GEAR TYPE: BT No:6 POSITION:Lat S 543
start stop duration Long E 1134
TIME :09:05:00 09:58:00 53 (min) Purpose code: 3
LOG :3158.00 3160.60 2.60 Area code : 1
FDEPTH: 195 207 GearCond.code: 1
BDEPTH: 195 207 Validity code: 1
Towing dir: 10° Wire out: 650 m Speed: 3 kn*10

Sorted: 31 Kg Total catch: 569.50 CATCH/HOUR: 644.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	204.91	1936	31.78	
Synagrops microlepis	151.81	8395	23.55	
Pterothrissus belloci	124.30	856	19.28	
Dentex angolensis	47.89	143	7.43	
Brotula barbata	36.68	41	5.69	
Trichiurus lepturus	26.26	245	4.07	
MYCTOPHIDAE	20.38	8823	3.16	
Zenopsis conchifer	11.77	20	1.83	
Parapenaeus longirostris	8.60	1162	1.33	
Todaropsis eblanae	5.32	16	0.83	
Illex coindetii	3.51	61	0.54	
Uranoscopus albesca	1.58	20	0.25	
Sepiella ornata	1.02	20	0.16	
Chlorophthalmus atlanticus	0.23	20	0.04	
Arioma bondi	0.23	20	0.04	
Monolene microstoma	0.23	20	0.04	
Total	644.72		100.02	

PROJECT STATION: 97

DATE:16/ 8/94 GEAR TYPE: BT No:6 POSITION:Lat S 542
start stop duration Long E 1128
TIME :11:41:00 12:11:00 30 (min) Purpose code: 3
LOG :3171.10 3172.70 1.60 Area code : 1
FDEPTH: 304 311 GearCond.code: 1
BDEPTH: 304 311 Validity code: 1
Towing dir: 15° Wire out: 950 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 294.00 CATCH/HOUR: 588.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	261.00	5440	44.39	
Synagrops microlepis	117.00	5140	19.90	
Merluccius polli	78.00	440	13.27	
Trichiurus lepturus	49.00	500	8.33	
Pentheroscion mbizi	24.20	120	4.12	
Nematocarcinus africanus	24.00	11040	4.08	
Pterothrissus belloci	13.40	20	2.28	
SCREC01	5.40	100	0.92	
Parapenaeus longirostris	4.40	440	0.75	
Malacocephalus occidentalis	3.40	20	0.58	
Laemonema laureysi	2.80	60	0.48	
MYCTOPHIDAE	2.80	880	0.48	
MORGA02	2.60	80	0.44	
SCREC00	0.00			
Total	588.00		100.02	

PROJECT STATION: 98

DATE:16/ 8/94 GEAR TYPE: BT No:1 POSITION:Lat S 543
start stop duration Long E 1123
TIME :14:00:00 14:30:00 30 (min) Purpose code: 1
LOG : 184.20 185.70 1.50 Area code : 2
FDEPTH: 411 413 GearCond.code: 1
BDEPTH: 411 413 Validity code: 1
Towing dir: 25° Wire out:1180 m Speed: 3 kn*10

Sorted: 55 Kg Total catch: 165.12 CATCH/HOUR: 330.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	176.10	210	53.32	
Nematocarcinus africanus	59.10	8736	17.90	
Centrophorus uyato	27.06	6	8.19	
Trichiurus lepturus	13.02	162	3.94	
SCREC01	8.46	168	2.56	
Nezumia aequalis	7.98	24	2.42	
Laemonema laureysi	7.86	150	2.38	
MORGA02	6.72	138	2.03	
Parapenaeus longirostris	6.06	918	1.84	
Galeus polli	6.00	60	1.82	
Synagrops microlepis	3.78	168	1.14	
POLYCHAELIDAE	2.40	90	0.73	
Malacocephalus occidentalis	1.80	6	0.55	
Coelorinchus coelorhincus	1.20	48	0.36	
Aristeus antennatus	1.14	42	0.35	
Halosaurus sp.	0.96	24	0.29	
Plesiopenaeus edwardsianus	0.60	6	0.18	
Total	330.24		100.00	

PROJECT STATION: 99

DATE:16/ 8/94 GEAR TYPE: BT No:1 POSITION:Lat S 541
start stop duration Long E 1136
TIME :16:56:00 17:26:00 30 (min) Purpose code: 1
LOG : 202.50 204.00 1.50 Area code : 2
FDEPTH: 181 203 GearCond.code: 1
BDEPTH: 181 203 Validity code: 1
Towing dir: 308° Wire out: 650 m Speed: 3 kn*10

Sorted: 57 Kg Total catch: 482.72 CATCH/HOUR: 965.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	530.40	1392	54.94	
Pterothrissus belloci	216.00	1632	22.37	
Dentex angolensis	89.28	320	9.25	
Synagrops microlepis	33.60	1456	3.48	
Brotula barbata	31.80	30	3.29	
Trachurus trecae	16.20	30	1.68	
Parapenaeus longirostris	15.04	2128	1.56	
Pteroscion peli	10.40	16	1.08	
Scorpaenodes sp.	4.80	32	0.50	
MYCTOPHIDAE	4.64	1184	0.48	
Chlorophthalmus atlanticus	3.36	64	0.35	
Trichiurus lepturus	3.20	32	0.33	
SCREC01	2.24	32	0.23	
Spicara alta	1.92	16	0.20	
Zenopsis conchifer	1.60	2	0.17	
Coelorinchus coelorhincus	0.96	16	0.10	
Total	965.44		100.01	

PROJECT STATION: 100

DATE:16/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 537
start stop duration Long E 1123
TIME :20:00:00 20:32:00 32 (min) Purpose code: 3
LOG :3223.70 3225.30 1.60 Area code : 1
FDEPTH: 495 515 GearCond.code: 1
BDEPTH: 495 515 Validity code: 1
Towing dir: 20° Wire out:1460 m Speed: 3 kn*10

Sorted: 25 Kg Total catch: 77.46 CATCH/HOUR: 145.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deania profundorum	24.58	39	16.92	
Aristeus varidens	20.36	2987	14.02	
Laemonema laureysi	19.69	186	13.56	
Yarella blackfordi	14.06	923	9.68	
Hoplostethus mediterraneus	10.13	186	6.97	
ALEXE02	7.88	163	5.43	
SHRGL10	6.24	467	4.30	
CONGRIDAE	6.19	84	4.26	
Sardinella maderensis	5.46	11	3.76	
Sardinella aurita	5.46	11	3.76	
MORGA02	5.29	118	3.64	
Geryon maritae	4.73	11	3.26	
Halosaurus ovenii	4.50	39	3.10	
Nematocarcinus africanus	3.94	383	2.71	
STOMIIDAE	2.81	34	1.93	
Trachyrinus scabrus	1.69	23	1.16	
Etmopterus spinax	1.13	6	0.78	
Trichiurus lepturus	0.56	6	0.39	
Coelorinchus coelorhincus	0.28	6	0.19	
Lampadena sp.	0.28	11	0.19	
Total	145.26		100.01	

PROJECT STATION: 101

DATE:16/ 8/94 GEAR TYPE: PT No:6 POSITION:Lat S 534
start stop duration Long E 11222
TIME :21:55:00 22:05:00 10 (min) Purpose code: 3
LOG :3231.20 3231.70 0.50 Area code : 1
FDEPTH: 595 601 GearCond.code: 1
BDEPTH: 595 601 Validity code: 1
Towing dir: 15° Wire out:1600 m Speed: 3 kn*10

Sorted: 26 Kg Total catch: 26.41 CATCH/HOUR: 158.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	51.00	168	32.18	
Hoplostethus mediterraneus	22.20	528	14.01	
Deania profundorum	16.80	30	10.60	
Geryon maritae	10.80	12	6.82	
ALEXEC2	9.60	126	6.06	
Yarella blackfordi	9.60	396	6.06	
Sardinella maderensis	7.80	18	4.92	
Aristeus varidens	7.20	306	4.54	
CONGRIDAE	5.94	54	3.75	
SHRGL10	4.80	402	3.03	
STOMIIDAE	4.62	30	2.92	
Trichiurus lepturus	3.60	12	2.27	
Pterothrissus belloci	3.00	6	1.89	
Halosaurus ovenii	1.20	6	0.76	
Trachyrinus scabrus	0.18	6	0.11	
Heterocarpus ensifer	0.12	12	0.08	
Total	158.46		100.00	

PROJECT STATION: 102

DATE:16/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 531
start stop duration Long E 1125
TIME :23:14:00 23:44:00 30 (min) Purpose code: 1
LOG :3236.90 3238.70 1.80 Area code : 1
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 510 460 Validity code: 1
Towing dir: 100° Wire out: 125 m Speed: 3 kn*10

Sorted: 62 Kg Total catch: 120.70 CATCH/HOUR: 241.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	122.80	444	50.87	180
Trichiurus lepturus	110.60	312	45.82	
Sardinella aurita	8.00	22	3.31	181
Total	241.40		100.00	

PROJECT STATION: 103

DATE:17/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 538
start stop duration Long E 1120
TIME :01:20:00 01:51:00 31 (min) Purpose code: 1
LOG : 249.70 251.70 2.00 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 625 719 Validity code: 1
Towing dir: 260° Wire out: 140 m Speed: 3 kn*10

Sorted: 94 Kg Total catch: 165.28 CATCH/HOUR: 319.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	181.55	581	56.75	
Sardinella maderensis	66.58	295	20.81	182
Sardinella aurita	52.94	124	16.55	183
Euthynnus alletteratus	15.48	12	4.84	
Scomber japonicus	1.94	2	0.61	
Auxis thazard	1.41	2	0.44	
Total	319.90		100.00	

PROJECT STATION: 104

DATE:17/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 544
start stop duration Long E 1117
TIME :03:09:00 03:41:00 32 (min) Purpose code: 1
LOG : 260.80 262.80 2.00 Area code : 2
FDEPTH: 0 0 GearCond.code: 1
BDEPTH: 649 644 Validity code: 1
Towing dir: 180° Wire out: 140 m Speed: 4 kn*10

Sorted: 39 Kg Total catch: 117.90 CATCH/HOUR: 219.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	160.31	321	73.07	
MYCTOPHIDAE	59.06	34121	26.92	
Total	219.37		99.99	

PROJECT STATION: 105

DATE:17/ 8/94 GEAR TYPE: PT No:2 POSITION:Lat S 540
start stop duration Long E 1123
TIME :05:06:00 05:36:00 30 (min) Purpose code: 1
LOG : 272.70 274.70 2.00 Area code : 2
FDEPTH: 5 5 GearCond.code: 1
BDEPTH: 465 500 Validity code: 1
Towing dir: 228° Wire out: 140 m Speed: 4 kn*10

Sorted: 46 Kg Total catch: 92.18 CATCH/HOUR: 184.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	78.60	280	42.63	185
Sardinella aurita	74.40	160	40.36	186
Trichiurus lepturus	22.80	64	12.37	
MYCTOPHIDAE	8.56	2780	4.64	
Total	184.36		100.00	

PROJECT STATION: 106

DATE:17/ 8/94 GEAR TYPE: BT No:6 POSITION:Lat S 526
start stop duration Long E 1135
TIME :08:25:00 08:55:00 30 (min) Purpose code: 3
LOG :1297.90 1298.80 0.90 Area code : 1
FDEPTH: 250 250 GearCond.code: 1
BDEPTH: 250 250 Validity code: 1
Towing dir: °' Wire out: 800 m Speed: 3 kn*10

Sorted: 32 Kg Total catch: 188.60 CATCH/HOUR: 377.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Parapenaeus longirostris	75.00	11250	19.88	
Pentheroscion mbizi	74.00	340	19.62	
Pterothrissus belloci	40.00	180	10.60	
Trichiurus lepturus	37.40	750	9.92	
Centrophorus granulosus	32.00	6	8.48	
Heptranchias perlo	32.00	20	8.48	
Shrimps, small, non comm.	27.40	10000	7.26	
Zenopsis conchifer	25.80	22	6.84	
Synagrops microlepis	17.20	860	4.56	
Brotula barbata	8.60	10	2.28	
Merluccius polli	6.00	10	1.59	
MYCTOPHIDAE	3.00	1060	0.80	
Illex coindetii	1.20	20	0.32	
Solenocera africana	0.60	70	0.16	
Peristedion cataphractum	0.10	10	0.03	
Total	380.30		100.82	

PROJECT STATION: 107

DATE:17/ 8/94 GEAR TYPE: BT No:6 POSITION:Lat S 523
start stop duration Long E 1137
TIME :09:50:00 10:20:00 30 (min) Purpose code: 3
LOG :3304.60 3305.40 1.80 Area code : 1
FDEPTH: 142 140 GearCond.code: 1
BDEPTH: 142 140 Validity code: 1
Towing dir: 355° Wire out: 470 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 908.80 CATCH/HOUR: 1817.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	750.00	7082	41.26	
Trichiurus lepturus	536.00	11740	29.49	
Synagrops microlepis	378.00	17356	20.80	
Pterothrissus belloci	64.00	558	3.52	
Uranoscopus albesca	50.00	372	2.75	
Dentex angolensis	18.60	62	1.02	
Zenopsis conchifer	15.40	62	0.85	
Bembrops heterurus	4.40	62	0.24	
Parapenaeus longirostris	1.24	186	0.07	
Total	1817.64		100.00	

ANNEX II 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:

Transceiver settings:

Bandwidth	Wide (3.8 Khz)
Pulse length	Medium (1 ms)
Max Power	2000 Watt
Sv Transducer gain	27.8 dB
Ts Transducer gain	28.1 dB

Printer settings:

Range	0 - 100 or 0 - 250 m
TVG	20 log R
TS Colour min	- 50 dB
Sv Colour min	- 64 dB

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

A calibration experiment using a standard copper sphere, performed in Baia dos Tigres 23/2 1994 gave the following results: Sv Transducer gain 27.8 dB, Ts Transducer gain 28.1 dB.

Glossary:

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

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

Ts Colour min : Lower limit of colour scale relative to 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

Two different sized pelagic trawls and one bottom trawl were used during the survey. The following drawings show the size of these trawls.

Cruise Report No 2/94

PART 2

Survey of the demersal resources

1 to 19 September 1994

TABLE OF CONTENTS (Part 2)

CHAPTER 1 INTRODUCTION

1.1 Objectives

The objectives of the survey were discussed at meetings with the Minister of Fisheries and with the Technical Director and other representatives of Instituto de Investigação Pesqueira (IIP) earlier this year.

The objectives of the survey were to:

- Describe the distribution, composition and abundance of major demersal species, with special emphasis on sparids, hake and deep-water shrimp, from Cabinda to Benguela by a swept-area trawl programme.

- Collect stomach samples of *Merluccius polli* for later quantitative laboratory analysis of the contents, with special emphasis on the content of economically important shrimps.

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

- Conduct current measurements with current meter mooring.

1.2 Participation

The scientific staff consisted of:

From IIP, Angola:

Antónia Nelumba, Fidel Quilanda, Francisco de Almeida, Dilkarina Azevedo, Guilherme Camarada and Ana de Sousa.

From IMR, Bergen:

Martin Dahl, Tor Gammelsrød, Ole Gullaksen, Reidar Johannessen and Sigbjørn Mehl.

1.3 Narrative

The vessel left Pointe Noire (Congo) in the afternoon of 1 September and steamed southwards to Cabinda. The sampling programme commenced north of the Congo River ouside the closed oil-drilling area with course tracks approximately 20 nm apart, covering the inner, middle and the outer shelf and the slope to 800 m depth. Semi-random swept-area hauls were carried out on the shelf during daytime and on the slope deeper than 400 m during dark hours. CTD-stations were taken at almost all trawl stations in addition to those taken for the standard profiles. Acoustic registration and integration of main groups were done throughout the survey.

The northern part of the survey area, Cabinda-Luanda, was covered from 2 to 10 September. Three hydrographic transects were sampled in the region; Cabinda, Pta. da Moita Seca and N'Zeto. The Cabinda region was only partially covered due to oil-drilling activities. In the area north of Ambriz a 10 nm wide zone along the coast was not covered for security reasons. From 10 to 11 September current measurements were coducted off Pta. das Palmeirinhas. The southern part of the survey area, Luanda - Benguela, was covered from 11 to 19 September, including the hydrographic transects Pta. das Palmeirinhas, Pta. do Morro and Lobito. The survey was completed off Lobito on 19 September and the vessel steamed suthwards to Walvis Bay.

1.4 Survey effort

Figure 1a-b shows the cruise tracks with fishing stations and the hydrographic profiles.

The number of hauls by area and depth interval and number of CTD-stations were:

	Swept-area hauls			Total	CTD	Distance surveyed
	0-200m	200-400m	400-800m			
Cabinda-Luanda	32	20	21	73	73	990 nm
Luanda-Benguela	38	18	16	72	80	840 nm
Total	70	38	37	145	153	1830 nm

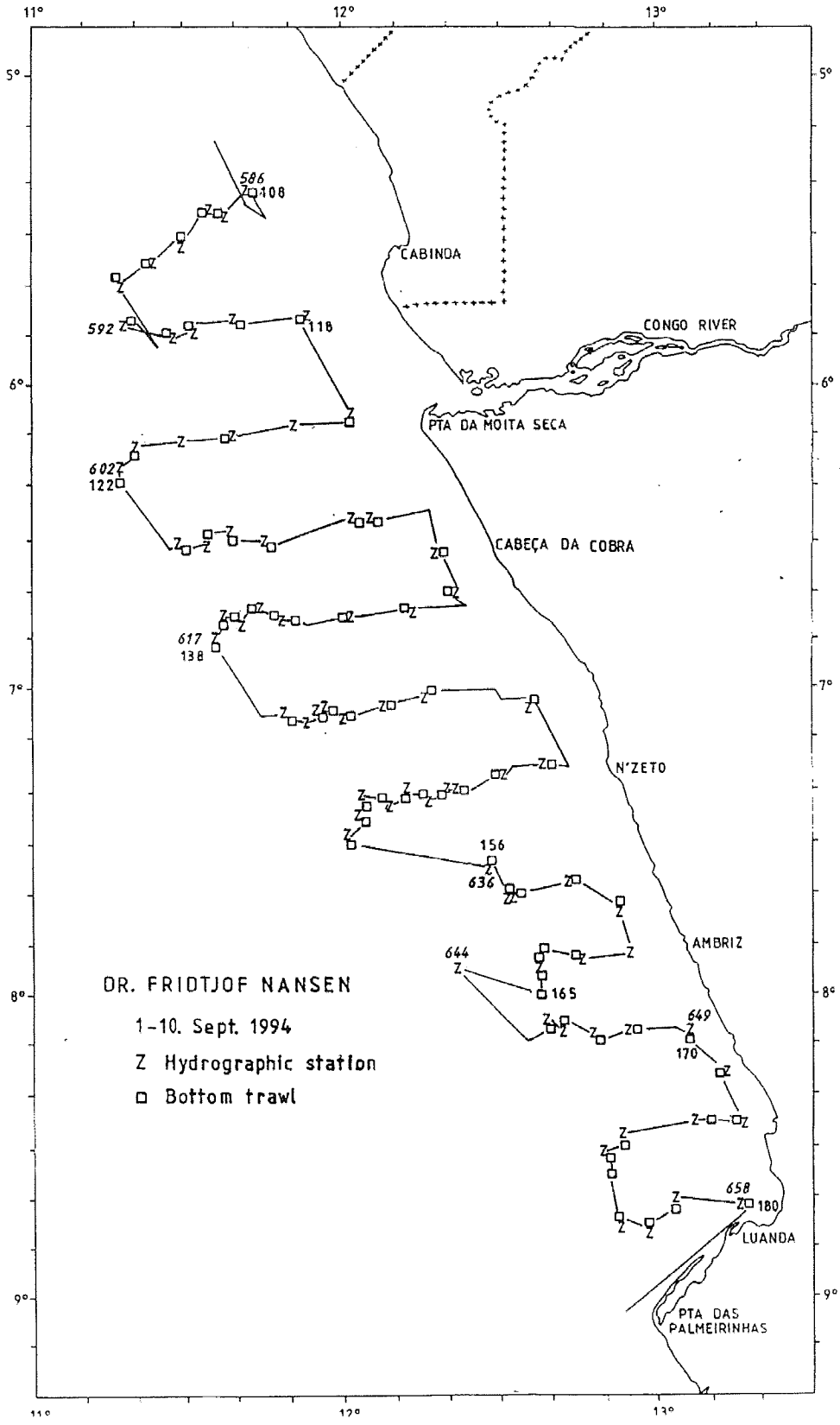


Figure 1a. Cabinda-Luanda. Course tracks with fishing stations and CTD-stations.

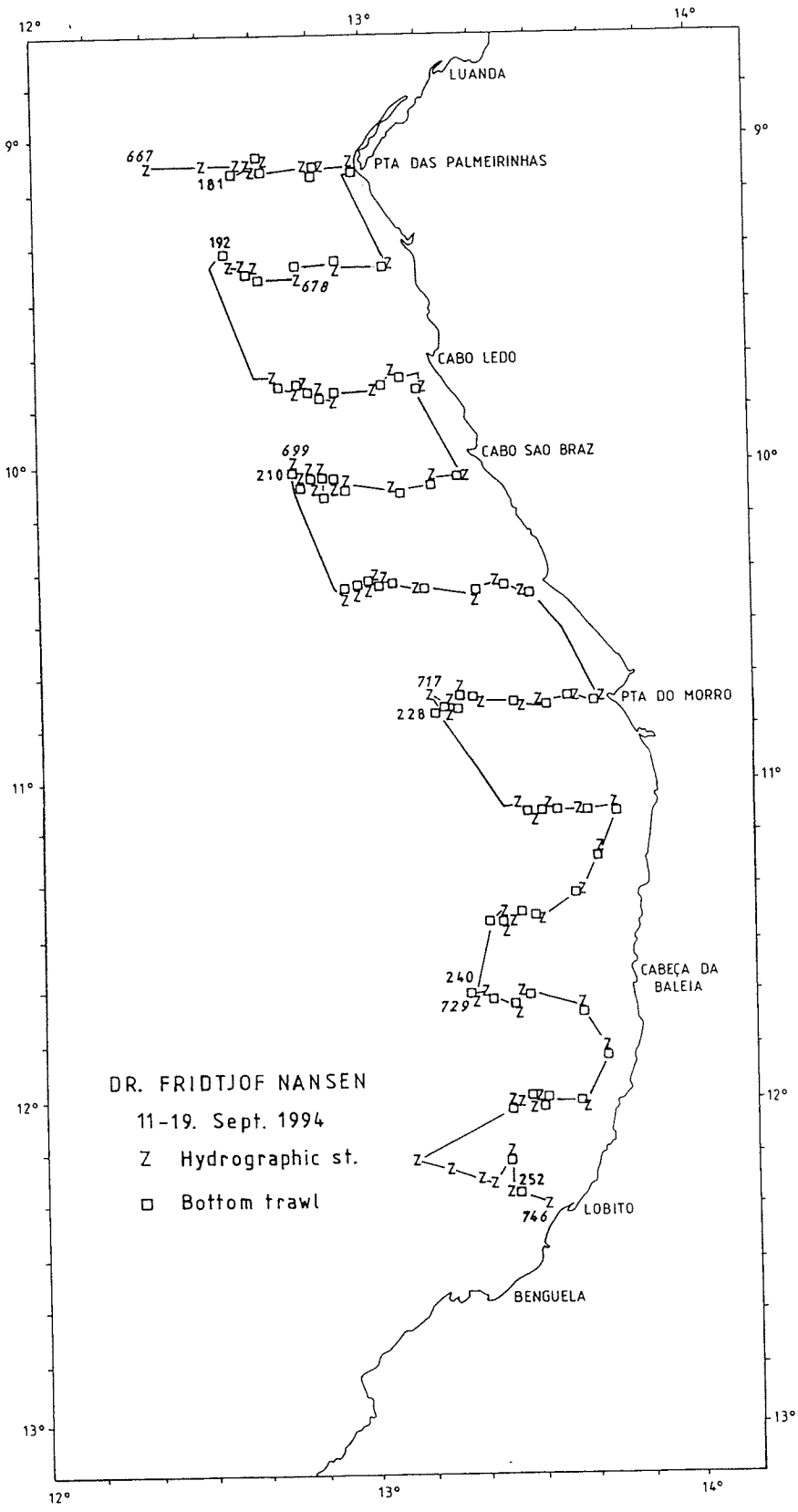


Figure 1b. Luanda-Benguela. Course tracks with fishing stations and CTD-stations.

1.5 Methods

The catches were sampled for species composition by weight and numbers. Length distributions (total length, also for shrimp) were taken for the main species. Biological samples, i.e. length weight, sex and maturity stages, were taken for *M. polli* in connection with stomach sampling. A few samples of *Dentex angolensis* were collected for contamination studies in the areas of highest oil drilling activity. Pooled length frequency distributions (weighted by the catch) of selected species by area, are shown in Annex II. The records of fishing stations are presented in Annex III.

The following areas (nm^2) were used in the swept-area biomass estimates:

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

The bottom trawl has a headline of 31m (float line), footrope 47 m, estimated headline height 5m and distance between wings during towing about 18m. 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 i.e. the retention factor q is 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. The length of a haul, recorded as distance over bottom was measured by Doppler log on the bottom. There was some mid-water occurrence of hake on the slope during dark hours, and this may have affected (reduced) the swept area-estimates for the slope deeper than 400 m.

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

CHAPTER 2 OCEANOGRAPHY

2.1 Instruments and methods

Hydrography

A Seabird 911 CTD plus was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the Seabird Seasave software installed on a PC. The profiles were taken down to a few meters above the bottom. Two Niskin bottles were triggered for water samples on each station, one near the bottom and one near the surface (3m depth). The samples were analyzed for salinity using a Guildline Portasal salinometer, and the oxygen content was determined using the Winkler method. These laboratory values were used for calibration of the CTD after removing obvious outliers.

Using 142 points for the salinity calibration gave a standard error of 0.0085 without any adjustment of CTD values. This was accepted. It should be noted that a better calibration may be obtained using only the bottom samples, where the gradients in T and S usually are smaller.

For oxygen 118 samples were accepted for the calibration. A linear regression gave the following formula for correcting the oxygen values:

$$O_2 = O_{2ctd} * 1.459 + 0.555$$

Applying this formula a standard error of 0.142 was obtained.

Current measurements

Two Aanderaa RCM7 current meters were deployed for about 24 hours to obtain current speed and direction at 2m depth and 45 m depth. The current meters were also equipped with pressure, temperature and conductivity sensors. Thus salinity may also be calculated. The current meters were set to record at 10 min intervals and the data are stored internally. The Data Storing Units were read by a DSU reader using a PC and the P3059 software supplied by Aanderaa Instruments.

Meteorological data

Wind, air temperature, global radiation and sea surface temperature (5 m depth) were logged automatically every nautical mile using an Anderaa meteorological station. The SST were used as additional information for constructing the horizontal distribution maps, and the wind measurements were useful for interpretation of the current measurements.

2.2 Results

Hydrography

A total number of 161 hydrographic stations (including 8 in connection with the current measuremenst) were obtained. This net of CTD-stations represents the most extensive hydrographic program ever performed on the Angolan coast, see station map (Fig.1). In addition to the standard sections, a CTD station was taken in connection with all the bottom trawls.

Surface distribution

The horizontal distributions of temperature and salinity are shown in Figs. 2 and 3, respectively. Both parameters have a rather flat structure, typical for the season, except the influence of the Congo River on the salinity distribution. The fresh water from this river seems to be deflected northwards by a near shore current, but the minimum surface salinities found in the outer part of the sections south of the Congo river indicate that the fresh water is transported southward by the Angolan current further off shore. Note that the minimum salinities were found at a distance from the coast, indicating the non stationarity in the region. This area is probably dominated by eddies, which perhaps could be revealed in satellite imageries due to the different optical properties of the river water and sea water.

The near shore surface salinity minimum north of Luanda may be due to a similar northward advection of the water from the Kwanza River just south of Pta das Palmeirinhas, but note the off-shore bound currents observed in the surface layer in the area (see below).

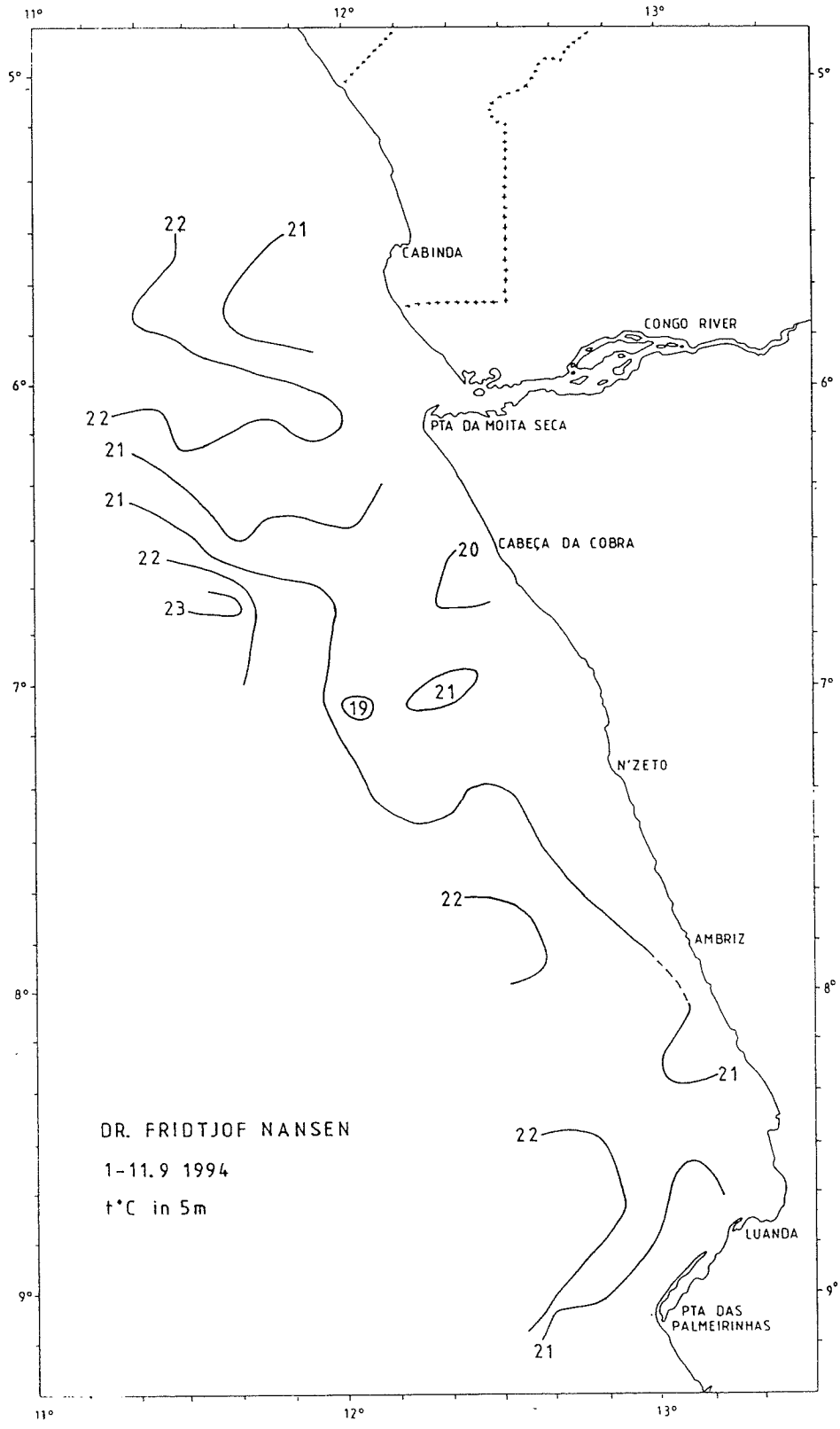


Figure 2a. Horizontal distribution of surface (5m depth) temperature, Cabinda - Luanda.

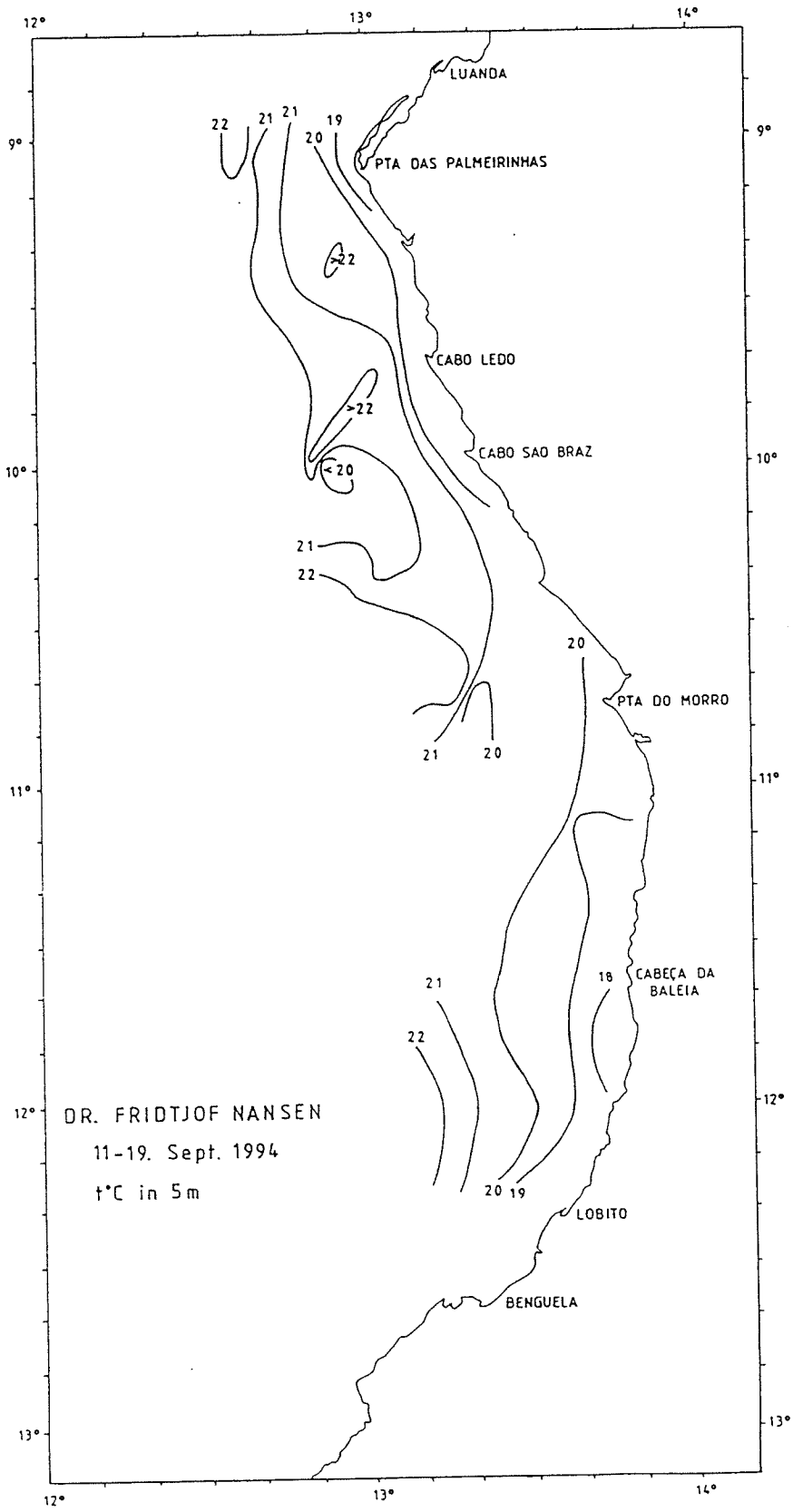


Figure 2b. Horizontal distribution of surface (5m depth) temperature, Luanda - Bebguela.

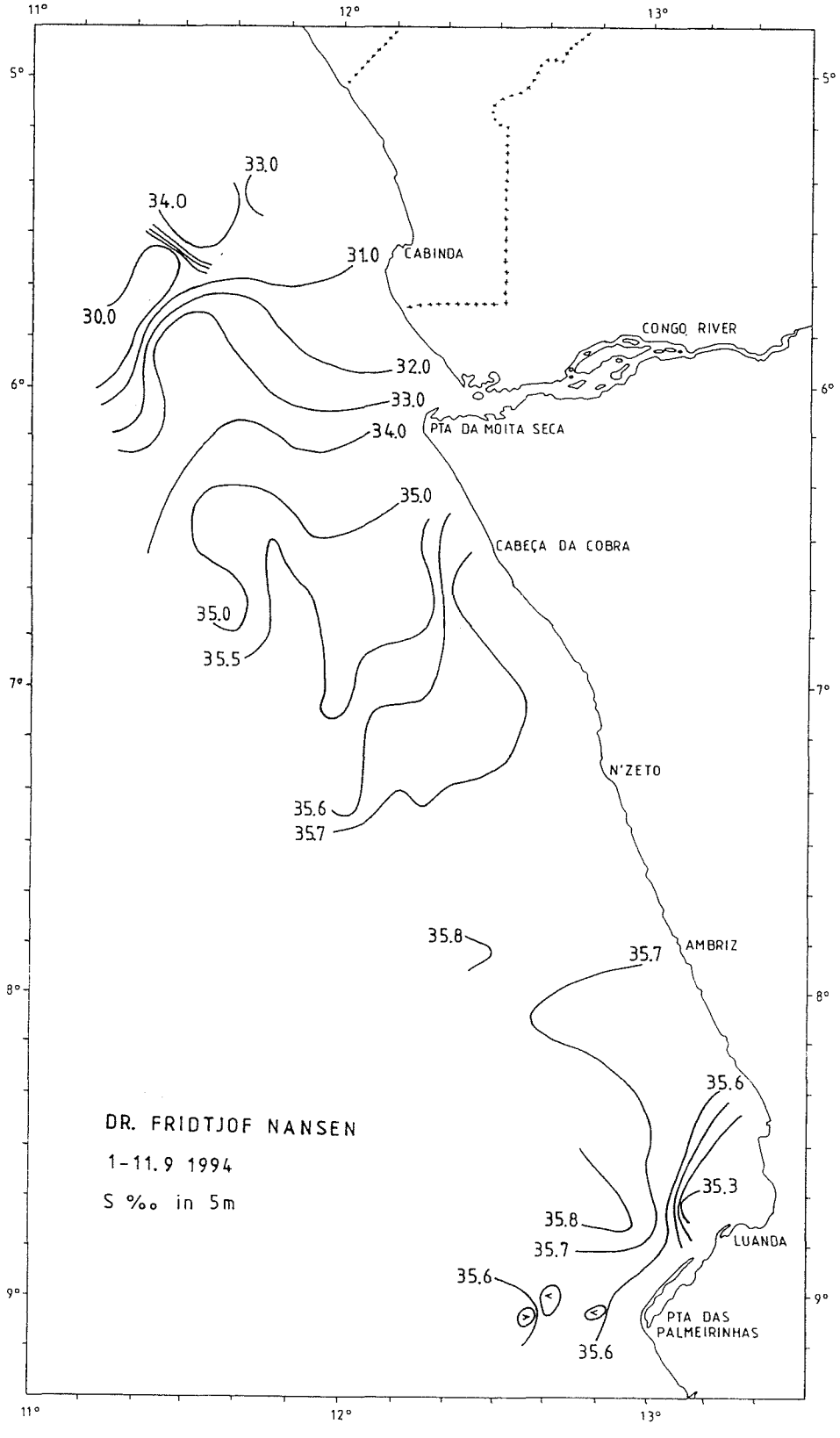


Figure 3a. Horizontal distribution of surface (5m depth) salinity, Cabinda - Luanda.

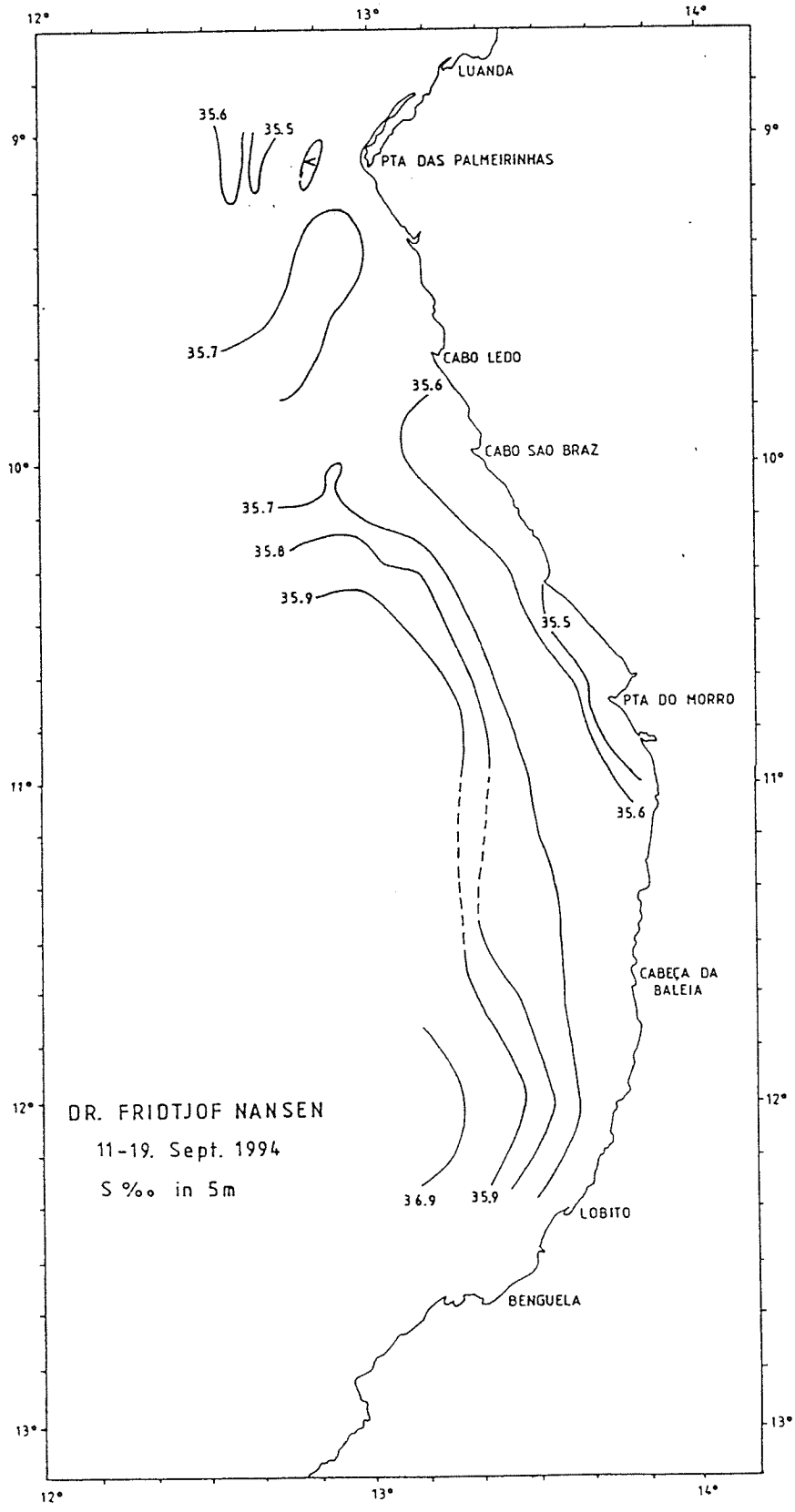


Figure 3b. Horizontal distribution of surface (5m depth) salinity, Luanda - Benguela.

Vertical sections

Several sections were sampled during the cruise (see map Fig.1) and only a subset (the standard sections) are presented here.

Starting in the north, the vertical distributions of temperature, salinity and oxygen are shown in Figs. 4-9. As the density is dominated by the temperature in the region, the maximum temperature is always found near the surface, and the temperature decreases monotonically with depth. A thermocline is often found between 10 and 30 m depth, but note the secondary thermocline at about 300-400 m depth, indicating the influence of different water masses.

A subsurface salinity maximum ($S > 35.8$) may be traced from the northern part as far south as Pta do Morro (Fig. 8), where it hits the surface. Surface salinity above 36 was found in the Lobito section (Fig. 9).

The oxygen distribution reveals an offshore minimum at about 200-400 m depth. This is the same depth range as the deep thermocline, indicating that the water mass penetrating below the upper layer is more rich in oxygen. At the shelf, the bottom oxygen content is also low, especially from Luanda and southward.

From Pta das Palmeirinhas and southward the isotherms, isohalines and the lines for constant oxygen content tend to tilt upwards towards the shore, indicating upwelling. This is particularly visible in the Pta do Morro section (Fig. 8) . However, the low oxygen is also found near the bottom north of Luanda, indicating that biological activity also may contribute to the tilting of the constant oxygen lines.

Current measurements

The current meter rig was anchored at 60 meters water depth near Pta da Palmerinhas at position 9° 05.32' S, 12° 50.63' E, see map Fig.1. The results (Fig. 10) show that both at 45 m and 2 m depth the current is remarkable unidirectional. Surprisingly enough, the current is heading towards West or South-West (although a Northerly current was expected). The current is strongest at 45 m depth, which in the beginning of the registration period revealed speeds above 40 cm/s. Towards the end of the series the speeds at the two levels become more even, but the direction continue to show a difference with the current at 45 m directed towards SW, while the surface flow went approximately westward.

Caution should be taken in drawing conclusion from a short series like this. Thus it is not known if the W and SW currents are representative for the area. One may note however, the absence of a tidal signal, but it should be remembered that the moon phase was near the first quarter at the time of the registration.

In connection with the current registration, a time series of CTD's was taken from the ship near the mooring site (not shown). These measurements show that the opposite trends of the current speeds at the end of the mooring period was associated with a warming of the whole water column. Also the oxygen concentration increased, indicating an advection of warm, oxygen rich water.

On the job training

The Oceanographers, Francisco de Almeida and Fidel Quilanda performed the daily routines for the oceanographic sampling. The vertical sections were analyzed by them. Francisco analyzed most of the horizontal distribution maps. Francisco also analyzed most of the oxygen samples using the Winkler method, while most of the salinity samples were analyzed by Fidel using the Portasal Salinometer. Some training was done on the use of PC for data analyzing.

Fidel wrote a program in QuickBasic for computing the oxygen concentration from the Winkler titration and writing the data to a file. This program is now included in the CTD program library.

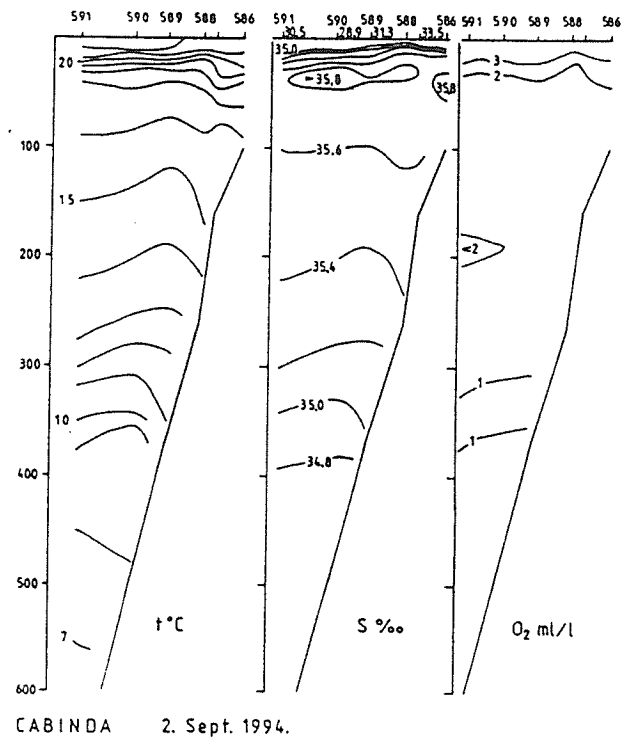


Figure 4. Vertical sections of a) temperature, b) salinity and c) oxygen. Cabinda.

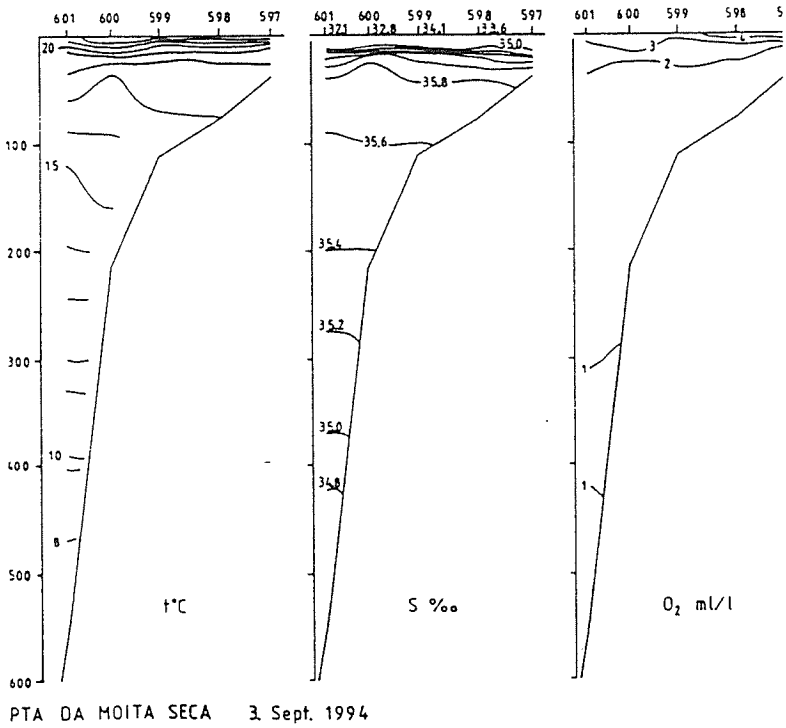


Figure 5. Vertical sections of a) temperature, b) salinity and c) oxygen. Pta da Moita Seca.

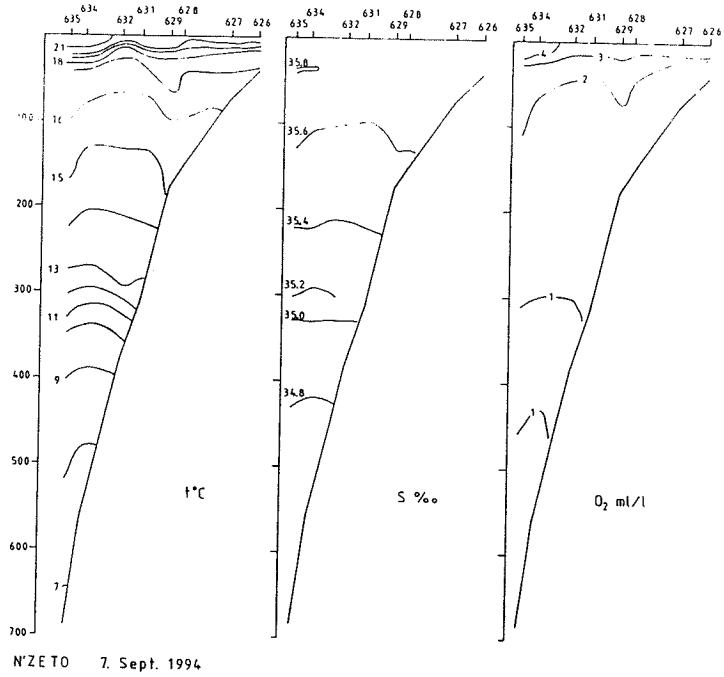


Figure 6. Vertical sections of a) temperature, b) salinity and c) oxygen. N'Zeto.

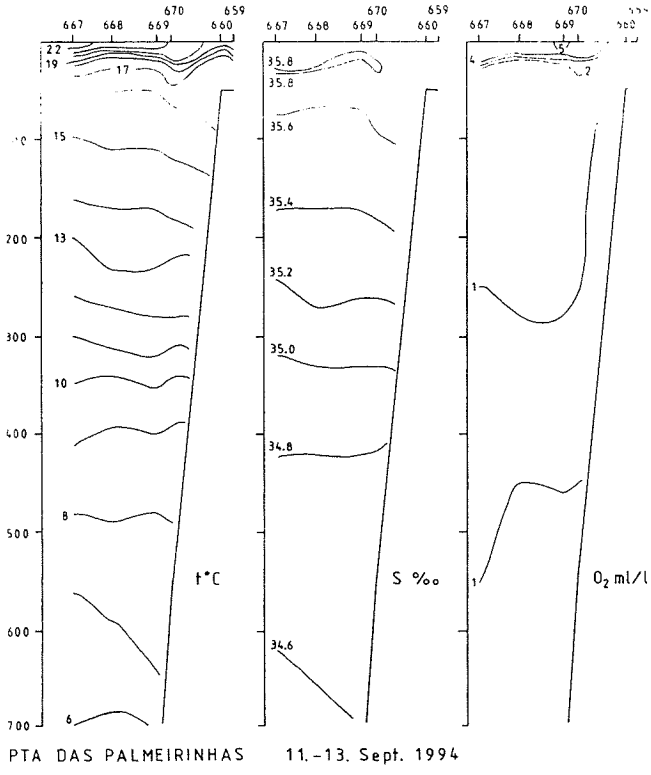


Figure 7. Vertical sections of a) temperature, b) salinity and c) oxygen. Pta das Palmeirhinas.

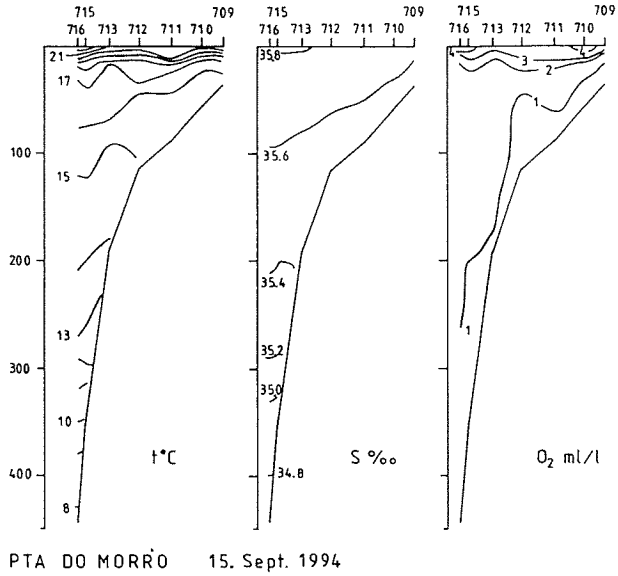


Figure 8. Vertical sections of a) temperature, b) salinity and c) oxygen. Pta do Morro.

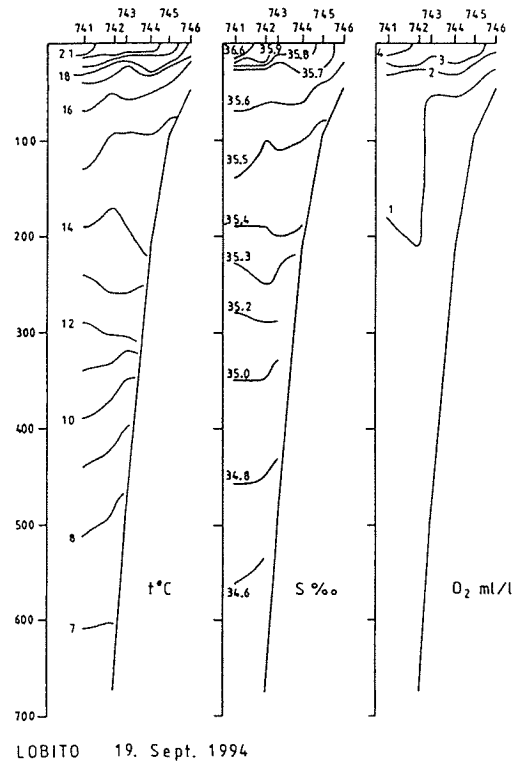


Figure 9. Vertical sections of a) temperature, b) salinity and c) oxygen. Lobito.

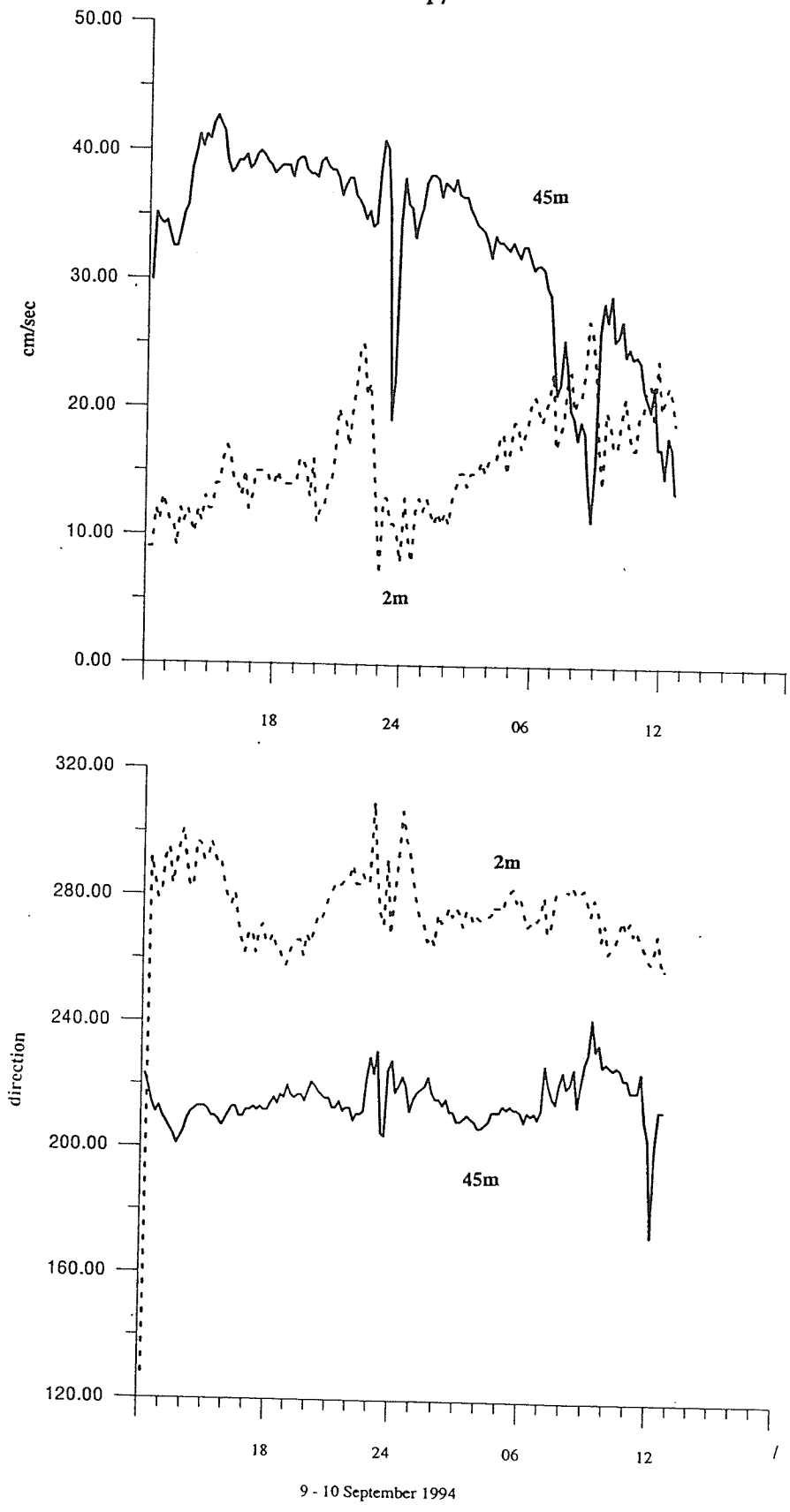


Figure 10. Current measurements Pta das Palmeirhinas: a) Speed, b) Direction.

CHAPTER 3 TRAWL SURVEY: CATCH DISTRIBUTION AND COMPOSITION AND SWEPT-AREA BIOMASS ESTIMATES OF DEMERSAL FISH

The composition of the fish fauna in the catches was studied by dividing the shelf into two parts: an inner shelf, down to 70 m depth and an outer shelf, from 70 to 200 m. In addition, a slope area from 200 m and downwards has been grouped 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 II and records of the catches are presented in Annex III.

In the swept-area biomass estimates for the shelf down to 200 m the depth strata 0-50m, 50-100m and 100-200 m have been applied. In the catch rate anaysis and biomass estimates of the slope species the area has been divided into depth zones 100-200 m, 200-300 m, 300-400 m, 400-500m, 500-600 m and 600-800 m. Mean densities by depth strata of the main species, the incidence and the catch distributions are shown in Annex I.

3.1 CABINDA - LUANDA

In this region, 73 swept-area trawl stations were successfully performed, and 51 of them were dayhauls. Due to safety reasons, no trawl hauls were made closer to the shore than 10 nm. This factor should be taken into account when comparing the results from this survey with previous surveys. Another factor is the new type of bottom trawl gear used in the new 'Dr. Fridtjof Nansen', that has proven to be more efficient in catching demersal species living very close to the bottom. The hauls were distributed as follows: 0-50 m : 9; 50-100 m : 11; 100-200 m : 12 and 200-800 m : 41.

Table 1 shows the catch rates by main species groups for the inner shelf, the outer shelf and the slope. "Demersal" comprises the families Sciaenidae, Haemulidae (=Pomadasyidae), Serranidae, Sparidae, Lutjanidae and Merluccidae, while "Pelagic" includes Engraulidae, Clupeidae, Carangidae, Scombridae, Sphyraenidae and Trichiuridae (the latter family is actually mainly benthopelagic). The catch rates of both) these groups were highest on the inner shelf, and the demersal group had higher catch rates in all three depth zones. Compared with similar analysis from survey I and II in 1989, the catch rates obtained during the present survey of demersal and pelagic species are somewhat higher (25-100%) on the inner shelf and slightly lower

(15-25%) on the outer shelf. Sharks and shrimps were most abundant on the slope, while cephalopods occurred in highest catch rates on the inner shelf. The cath rates of the latter group were 5 times higher than in any of the surveys in 1989, *Illex coindetii*, *Todaropsis eblanae* and *Sepia* sp. being most abundant. Fig. 11 shows the distribution of total cephalopods. They were found all over the shelf and most of the slope, but in few concentrations.

Table 1. CABINDA-LUANDA. Catch rates (kg/hour) by main groupsin swept area bottom trawl hauls for the shelf and the slope.

INNER SHELF 0-70 M

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
118	54	111.54	477.68		5.86	1.40	110.38
119	42	1160.10	34.20			0.72	46.80
127	70	177.76	339.06			142.30	44.88
128	47	60.26	721.44			29.08	8.26
129	24	882.20	159.00			33.00	206.00
130	21	236.14	22.68			43.34	39.12
131	58	274.80				5.16	20.48
145	31	5.94	1.02			70.20	24.00
146	39	122.58				2.16	79.32
160	52	84.78	85.44			1.38	17.28
170	61	81.48	758.18			14.72	25.94
171	38	537.72	90.90			6.70	47.66
172	37	390.10	102.78			4.20	19.98
180	46		2.40			0.12	0.46
MEAN		294.67	199.63		0.42	25.32	49.33

OUTER SHELF 70-200 M

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
108	89	82.00	237.18		0.26	0.34	166.18
109	184	144.16	74.72		8.50	0.54	272.48
117	93	203.56	115.70	36.34	8.26	2.46	202.66
120	121	130.58	6.00			9.68	79.86
126	120		181.54			0.35	0.07
132	80	77.52	4.06	3.40		7.12	46.76
133	142	396.12	77.58		0.24	16.08	264.90
142	151	95.92	173.40			9.56	159.88
143	110	118.40	83.86			9.86	24.62
147	84	113.54	669.06			18.76	66.36
148	141	321.85	2.85			3.70	213.05
158	146	84.52	35.64			8.08	61.45
159	80	134.83	19.18			29.16	23.97
161	107	153.96	22.92				78.00
168	195	5.72	60.88		27.90	5.29	244.94
169	105	158.79	38.37			13.83	163.50
173	78	40.88	97.92		10.72	28.62	421.24
179	122	69.78	188.56			1.80	465.64
MEAN		129.56	116.08	2.21	3.10	9.18	164.20

Table 1. Cont. SLOPE 200-800 m

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
110	299	44.68	1.50	1.50	7.68	1.58	108.70
111	416	69.00	11.00	718.60	32.72	1.04	54.28
112	571			49.10	22.56		57.66
113	798			1.16	15.34		98.96
114	486	3.96		19.02	45.66		221.28
115	312	150.00	12.48	6.00	27.78	8.16	166.24
116	214	254.00	23.40	4.14	7.82	2.34	315.30
121	554			1.26	106.08	0.30	26.52
122	709				1.20	0.78	124.08
123	445	38.00		2.84	2.98		71.32
124	335	94.63	3.63		12.20	27.36	258.18
125	215	36.30	92.94		1.42	10.34	572.32
134	241	59.20	57.98	30.00	7.68	13.40	699.04
135	344	38.26	11.00		13.70	4.76	219.76
136	491	12.60	31.80	22.60	11.12	1.36	143.08
137	615	6.54		3.19	8.15	1.35	220.94
138	769				1.52		164.22
139	527	13.50		0.40	34.90	1.20	223.38
140	326	129.71	46.59		3.63	5.57	348.11
141	269	149.23	37.55		9.59	4.63	1236.13
144	410	69.18	3.80	3.92		33.24	21.30
149	204	53.01	114.25	77.42	19.16	16.75	998.35
150	246	149.04	72.54		21.54	6.58	730.20
151	315	344.18	15.18		10.04	5.84	1610.04
152	376	331.86	29.32	60.00	0.92	4.72	130.68
153	456	111.29	1.55	29.61	1.36		80.98
154	563	41.80	0.46	2.18	260.38	0.66	191.38
155	706						183.20
156	397	12.60	1.72	21.00	313.84		32.26
157	264		104.70		10.62		228.06
162	224	5.90	58.18		26.60	1.90	166.40
163	359	66.98	2.16	0.34	224.40	2.44	40.42
164	484	74.10	0.54	3.30	206.42		39.84
165	581	13.66	0.92	1.76	241.04		46.72
166	495	24.20		6.00	537.60		35.90
167	355	172.40		0.40	11.28	5.64	84.90
174	354	69.36	2.82	20.64	94.14	15.74	82.34
175	553	5.08		12.00	386.20		27.20
176	666			4.32	34.92	3.60	413.64
177	453	55.00		9.48	183.96	1.80	54.74
178	253	272.48	29.08	40.22	46.31	1.56	217.27
MEAN		72.48	18.71	28.11	73.28	4.50	262.10

Catch rates of pelagic groups broken down to families (Table 2) are presented just to give some indication of the forms present. Carangids dominated both the inner and outer shelf, *Trachurus trecae* being the most important species. The catch rates on the inner shelf were much higher than those obtained in 1989, and a little lower on the outer shelf. The length distribution and mean length (27 cm) were similar to those found in 1992, while in 1989 mainly juvenile horsemackerel (15 cm) was found. Hairtails were the second most important pelagic family, with *Trichiurus lepturus* as the only species. The catch rates were quite similar to those obtained during survey II 1989.

Hairtail was the dominating pelagic species in the bottom trawl hauls on the slope (not shown in Table 2). Clupeids were much more common in 1989, especially on the inner shelf. During the present survey *Sardinella aurita* only occurred in one catch on the outer shelf and *Ilisha africana* in one haul on the inner shelf. Barracudas were also more common on the inner shelf in 1989, while scombrids were slightly more abundant on the outer shelf in 1994.

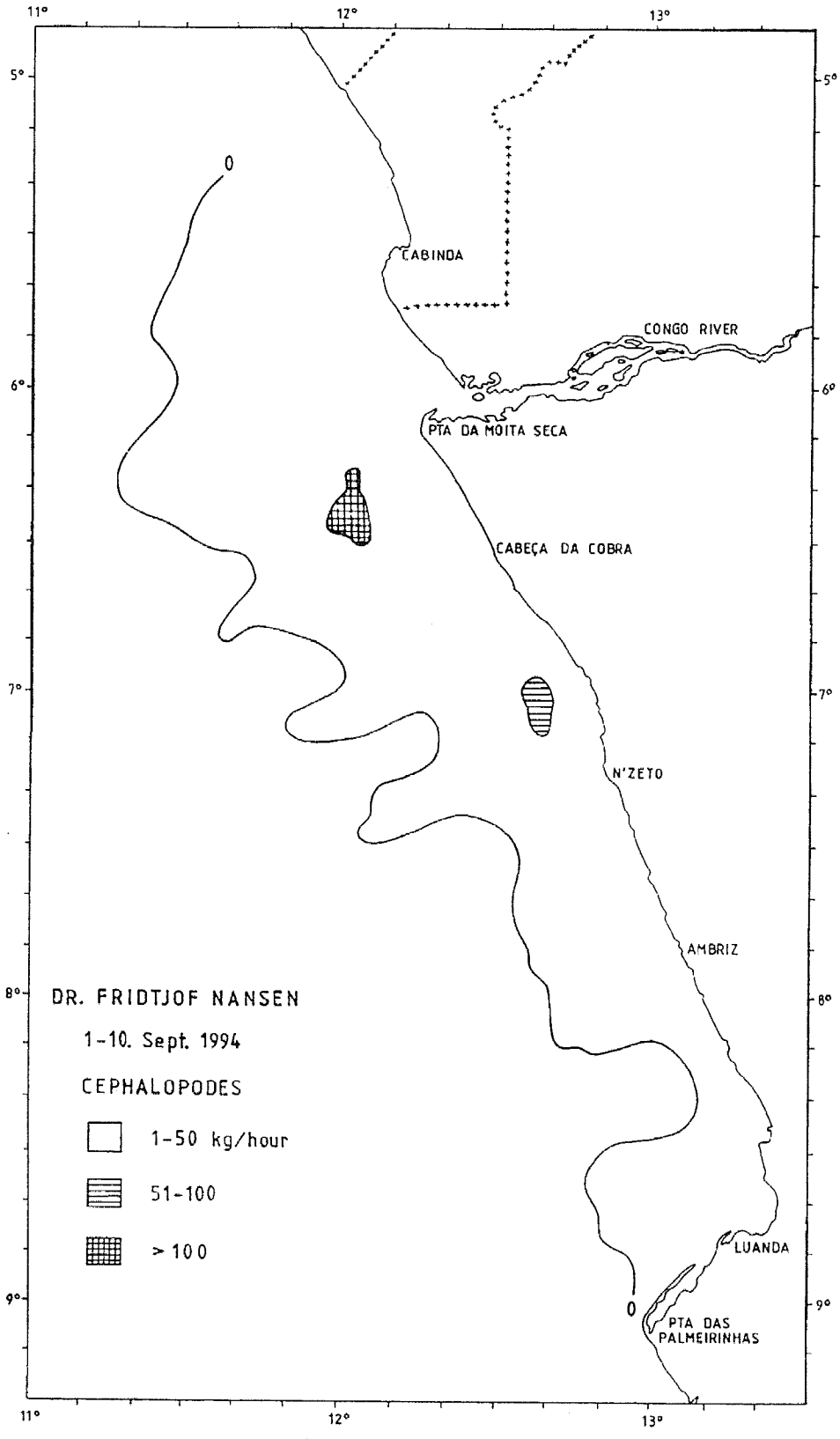


Figure 11. Cabinda - Luanda. Distribution of cephalopods (kg per hour trawling).

Table 2. CABINDA-LUANDA. Catch rates (kg/hour)of main pelagic families in swept-area bottom trawl hauls for the shelf.

INNER SHELF, 0-70 M

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
118	54		289.66	20.16	17.16	150.70	229.18
119	42		0.30	33.90			1207.62
127	70		295.10	4.40	2.70	36.86	364.94
128	47		692.04	4.48		24.92	97.60
129	24	33.60	46.80	7.60		71.00	1121.20
130	21		13.80	6.36		2.52	318.60
131	58						300.44
145	31		1.02				100.14
146	39						204.06
160	52		82.92			2.52	103.44
170	61		745.50	2.24	7.14	3.30	122.14
171	38		29.70			61.20	592.08
172	37		52.98			49.80	414.28
180	46					2.40	0.58
MEAN		2.40	160.70	5.65	1.93	28.94	369.74

OUTER SHELF 70-200 M

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
108	89	19.46	159.46		12.40	45.86	248.78
109	184		0.06			74.66	425.68
117	93		27.68			88.02	453.28
120	121		0.94		0.84	4.22	220.12
126	120		178.36			3.18	0.42
132	80		1.52			2.54	134.80
133	142		56.58			21.00	677.34
142	151		58.40			115.00	265.36
143	110		62.16		5.70	16.00	152.88
147	84		646.52			22.54	198.66
148	141		2.85				538.60
158	146				0.29	35.35	154.05
159	80		0.89			18.29	187.96
161	107		0.06		22.86		231.96
168	195					60.88	283.85
169	105		11.37			27.00	336.12
173	78		21.42			76.50	501.46
179	122		182.70		5.86		537.22
MEAN		1.08	78.39		2.66	33.95	308.25

Table 3 shows the catch rates of the most important demersal families. Both on the inner and outer shelf, seabreams were the most common, followed by grunts on the inner shelf and croakers on the outer shelf. The mean catch rate of sparids on the inner shelf was substantially higher than in 1989, but at about the same level on the outer shelf. *Dentex angolensis, D. canariensis*, and *Pagellus bellottii* (red pandora) were the most abundant species. Mean lengths were about the same as observed in previous surveys, but the length distributions were somewhat "broader".

Table 3. CABINDA-LUANDA. Catch rates (kg/hour)of main demersal families in swept-area bottom trawl hauls for the shelf.

INNER SHELF, 0-70 M

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Hakes	Other
118	54		67.10	44.44			595.32
119	42	1094.28	2.92	5.90	57.00		81.72
127	70	97.90		49.36	30.50		526.24
128	47	60.26					758.78
129	24	77.20	729.00	76.00			398.00
130	21	212.32	9.52		14.30		105.14
131	58	233.00			41.80		25.64
145	31	5.60			0.34		95.22
146	39	122.58					81.48
160	52	40.02	38.70		6.06		104.10
170	61	45.66	14.92		20.90		798.84
171	38	6.60	454.00	71.74	5.38		145.26
172	37	141.06	199.80	10.20	37.90	1.14	126.96
180	46						2.98
MEAN		152.61	108.28	18.40	15.30	0.08	274.69

OUTER SHELF 70-200 M

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Hakes	Other
108	89	15.78		66.12		0.10	403.96
109	184	22.58		87.78	33.80		356.24
117	93	23.52		180.04			365.42
120	121	120.00		9.80	0.78		95.54
126	120						181.96
132	80	77.52					61.34
133	142	74.82		321.30			358.80
142	151	75.00		19.48	1.44		342.84
143	110	106.24		12.16			118.34
147	84	110.74		2.80			754.18
148	141	244.00	3.50	66.30	8.05		219.60
158	146	74.58			9.94		105.17
159	80	134.83					72.31
161	107	15.96			138.00		100.92
168	195	3.23				2.49	339.01
169	105	140.55		18.24			215.70
173	78	37.46		3.42			558.50
179	122	51.16		16.06		2.56	656.00
MEAN		73.78	0.19	44.64	10.67	0.29	294.77

The catch rates of grunts were similar to those in 1989 on the inner shelf, but on the outer shelf this group only occurred on one station in 1994. Like in previous investigations *Brachydeuterus auritus* (big-eye grunt) was very abundant. The mean catch rate of croakers on the inner shelf was about 2/3 of that observed in 1989, while it was almost the double on the outer shelf. The most common croakers were *Miracorvina angolensis* and *Umbrina canariensis*. The catch rates of groupers were also higher than in 1989, *Epinephelus aeneus* being the most abundant.

Table 4. CABINDA-LUANDA. Catch rates (kg/hour)of main demersal families/species in swept-area bottom trawl hauls for the slope.

SLOPE 200-800 M

ST.NO.	DEP.	Seabreams	Hakes	Rose shr.	Str. shr.	Spid.shr.	Other
110	299		39.46	6.68	0.94		118.56
111	416		69.00		2.32	30.40	784.92
112	571				22.52		106.80
113	798				9.54		105.92
114	486		3.96		0.66	45.00	240.30
115	312	62.40	87.60	26.58	1.20		192.88
116	214	89.90		7.82			509.28
121	554				7.68	98.40	28.08
122	709				0.96		125.10
123	445		38.00		0.96	1.06	75.12
124	335		94.63	12.20			289.17
125	215	36.30		1.42			675.60
134	241	52.52	6.68	7.68			800.42
135	344		38.26	10.90			238.32
136	491		12.60		8.36	2.76	198.84
137	615		6.54		1.90	5.71	226.02
138	769				1.52		164.22
139	527		13.50		19.90	15.00	224.98
140	326		129.71	1.16			402.74
141	269	19.74	114.54	8.28			1294.57
144	410	63.50					67.94
149	204	53.01		19.16			1206.77
150	246	74.68	69.14	21.54			814.54
151	315		344.18	10.04			1631.06
152	376		329.66			0.92	226.92
153	456		111.29		0.97		112.53
154	563		41.80		0.56	259.82	194.68
155	706						183.90
156	397		12.60		2.88	310.96	54.98
157	264			10.62			332.76
162	224	3.50	2.40	26.60			226.48
163	359		66.84	0.84	0.42	223.14	45.50
164	484		74.10		16.64	189.30	44.16
165	581		13.66		1.20	239.76	49.48
166	495		24.20		6.60	531.00	41.90
167	355		172.40	11.28			90.94
174	354		69.36	49.58		44.28	121.82
175	553		5.08		6.20	380.00	39.20
176	666				13.32	21.60	421.56
177	453		55.00		21.36	162.60	66.02
178	253	196.46	43.52	46.31			320.63
MEAN		15.90	50.97	6.80	3.62	62.48	319.41

Table 4 presents the most important forms present on the slope. The mean catch rates are not directly comparable with those obtained in 1989 because more hauls were done deeper than 600 m during the present survey and for the earlier mentioned differences in gear type. The catch rates of hake, however, are somewhat lower than in 1989. Sparids, on the other hand, were more common in deepwater hauls in 1994, and *D. angolensis* was the dominating sparid found in deepwater stations. The mean catch rate of total shrimp (see Table 1) was at the same level as in 1989. *Nematocarcinus africanus* (spider shrimp) made up 85% of the catches of shrimp, and its mean catch rate actually exceeded that of hake. The commercially important species *Parapenaeus longirostris* (rose shrimp) and *Aristeus varidens* (striped red shrimp) had mean catch rates of about 10 and 5 % respectively of that of the spider shrimp, and *Plesiopenaeus edwardsianus* (scarlet shrimp) was only found in one haul at 709 m depth . Catch rates and biomass estimates of hake and commercially important shrimp species will be further dealt with in section 4.

In Annex I-A swept-area estimates of mean densities based on 32 random bottom trawl hauls are presented for demersal species on the shelf, to 200 m. Most pelagic species are not included in the estimates shown, but separate runs including important pelagic groups have been done in order to make comparisons with previous estimates of these groups. Like in previous surveys (1989,91,92) *B. auritus* was the species with the highest density in the 0-50 m zone, followed by *Dentex* species and *P. bellottii*. In the 50-100 m zone *Synagrops microlepis* (thinlip splitfin) had the highest density, followed by *Pentheroscion mbizi* (blackmout croaker), *P. bellottii* and *Dentex* species. Also in 1992 *S. microlepsis* had the highest density in this zone, while in many previous investigations *B. auritus* was the dominating species found here. If pelagic groups are included, *T. trecae* and *T. lepturus* had the highest densities in the 50-100 m zone. In the deepest shelf zone (100-200 m) *Chlorophthalmus atlanticus* (Atlantic greeneye) had the highest density, closely followed by *D. angolensis*, *U. canariensis* and *S. microlepis*. In previous investigations *C. atlanticus* had been of less imporance and *S. microlepis* more abundant in this zone.

The mean density of demersal species on the shelf was about 12 tonnes/nm^2, if major pelagic groups are included the mean density increased to 17 tonnes/nm^2. This result is about the same as what was found in 1989 and 1992, and somewhere in the middle of the result of the two surveys in 1991.

At the bottom of Annex I-A summed densities of the most important species by main groups are presented. Seabreams had the highest mean density, more than the double of grunts. These are followed by croakers, squids and groupers. In most previous investigations grunts have been the dominating group, followed by seabreams and croakers. The mean density of squids is the highest reported for this area, while that of so called "commercial shrimps" is higher than in 1992 , in the middle of the results fom 1991 and substantially lower than in 1989.
In Table 5 the densities in each depth zone of some important species and groups are multiplied by the area of the three shallowest depth zones. The results from some previous investigations are also given. This year estimates may be a little biased by the relatively low number of inner shelf trawl hauls, including one large catch of seabreams. The total biomass of demersal valuable groups is about 30% higher than in the two previous surveys, mainly due to a 100% increase in the biomass of seabreams. The present estimate of seabreams is the second largest since the surveys started in 1985, only passed by survey 4/85 (41 800 tonnes). The sum of valuable groups is the third highest in the time series. Groupers and grunts excluding bigeye grunt had about the same biomass as in 1992, while the estimate of croakers is only half of what was found in the two pevious surveys and one of the lowest in the time series.

Table 5. Cabinda-Luanda. Mean densities of main groups and biomass estimates for the shelf to 200 m by year/period of investigation.

Group/ species	Mean density 1994 (t/nm^2)	Biomass (tonnes)		
		1994	1992	1991/II
Seabreams	3.79	32 700	16 000	16 500
Grunts*	0.10	900	1 000	2 900
Croakers	1.19	8 500	14 000	15 600
Groupers	1.71	3 500	3 000	940
Sum dem. val.	6.79	45 600	34 000	35 940
Bigeye grunt	1.61	17 100	21 000	19 700
Horse mackerel	2.42	18 500	20 000	12 000
Other carangids	1.49	13 300	4 000	860
Barracudas	0.08	820	1 000	
Hairtail	1.19	8 900	7 000	8300

* excluding big-eye grunt

The estimated biomasses of bigeye grunt, horse mackerel, barracuda and hairtail are similar to those obtained in 1992, while the estimates of other carangids are 3 times higher. *Decapterus rhonchus* and *Selene dorsalis* were the dominating species in this group.

Fig. 12 presents the distribution (kg/hour trawling) of the summed valuable demersal groups. Catch rates of more than 100 kg/hour were obtained from the middle of the inner shelf to the outer part of the shelf, from Cabinda to just north of Luanda, with the highest rates between Cabinda and N'zeto.

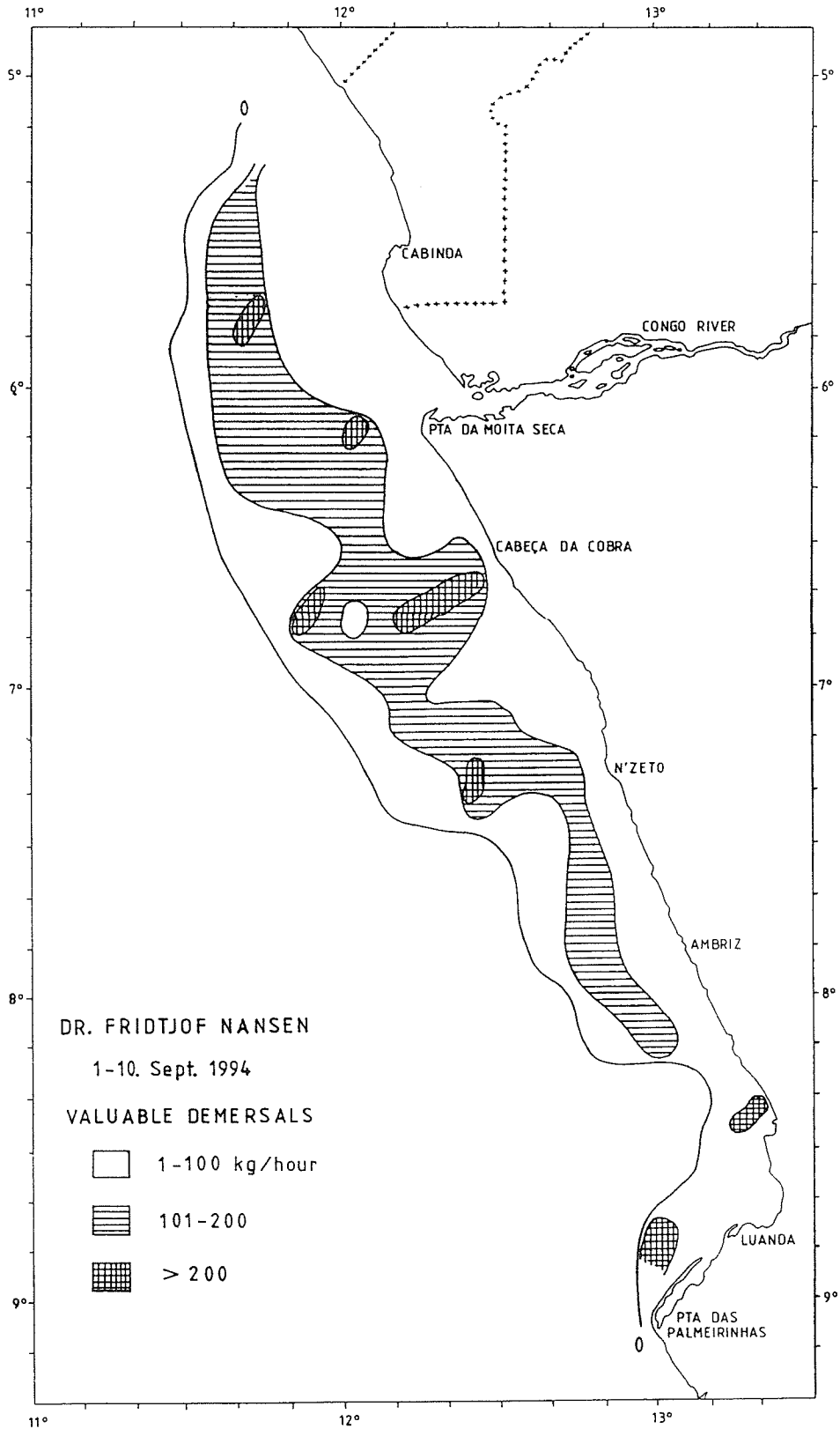


Figure 12. Cabinda - Luanda. Distribution of demersal valuable species (kg per hour trawling).

3.2 Luanda - Benguela

All together 72 swept-area hauls were made in the Luanda-Benguela shelf area. The hauls were distributed as follows: 0-50 m: 11 hauls; 50-100 m: 13 hauls; 100-200 m: 14 hauls and 200-800 m: 34 hauls.

Table 6 presents the catch rates by main groups for the inner shelf, outer shelf and the slope. In contrast with the Cabinda-Luanda region, the pelagic group had the highest catch rates both on the inner and outer shelf, and the catch rates were much higher than in the north. The mean catch rate of the demersal group on the inner shelf was only about 1/5 of that in north, while on the outer shelf it was more than 4 times higher. On the slope, the demersal group was the dominating, and the mean catch rate was about 100 % higher than in the northern region. Compared with similar analysis from survey I and II in 1989, the catch rate of the demersal group is much lower on the inner shelf and at about the same level (II/89) on the outer shelf, while the pelagic group in 1994 had higher catch rates on both shelf areas, especially on the outer. Like in the north cephalopods had the highest catch rate on the inner shelf, and the rates were about the double of those in the north and much higher than the rates obtained in 1989. *Sepia officinalis hierredda* was most abundant on the inner shelf, *Illex coindetii* and *Todaropsis eblanae* on the outer shelf. Fig. 13 shows the distribution of total cephalopods. They were found over most of the region, and with a few more concentrations than in the north. Sharks and shrimps were most abundant on the slope, with somewhat lower catch rates than found in the north.

Cath rates of the most important pelagic families are presented in Table 7. Carangids dominated both the inner shelf, outer shelf and the slope (not shown in the table), and *Trachurus trecae* was the most important species. The catch rates were much higher than in the northern region, especially on the outer shelf, and they were also much higher than the rates obtained in 1989. Like in 1992 both juvenile and adult horse mackerel were caught, with a mean length of 26 cm. In 1989 the catches mainly consisted of juvenile fish. Hairtails were the second most important pelagic family. The catch rates of *Trichiurus lepturus* were lower than in the north on the inner shelf, but much higher on the outer shelf. Compared with 1989, the catch rates were also lower on the inner shelf and substantially higher on the outer shelf. *T. lepturus* also occurred in most hauls on the slope. Scombrids were found in a couple of hauls on the inner shelf and in some more on the outer shelf. The catch rates were low, but higher than those obtained in 1989. *Scomber japonicus* was the dominating species. Like in the Cabinda-Luanda region, clupeids and barracudas were more common in 1989. During the present survey *Sardinella aurita* and *Sphyraena guachancho* were only found in a few hauls on the inner shelf.

Table 6. LUANDA-BENGUELA. Catch rates (kg/hour) by main groups in swept area bottom trawl hauls for the shelf and the slope.

INNER SHELF, 0-70 M

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
186	41	8.48	80.26			6.26	2.88
187	13	7.64	0.44			395.00	5.84
188	68	386.56	1911.26			18.66	136.50
199	41	261.27	312.23			0.55	166.54
200	26	28.12	165.58			27.58	7.12
201	14	12.27	124.62			13.44	10.83
202	55	33.98	375.26			0.40	45.26
218	50	6.64	4.62			5.06	1.14
219	28	10.30	3.00				0.44
220	44	78.60	51.00		33.00		137.60
221	55	25.00	322.08			10.08	33.12
233	63	82.02	114.68		8.70	7.56	47.88
234	20	7.34	6.82			96.52	10.98
235	44	17.64	1474.80			78.00	
245	44		26.00			0.94	15.30
246	61	44.40	24.98		0.32	8.56	13.28
MEAN		63.14	312.35		2.63	41.79	39.67

OUTER SHELF 70-200 M

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
184	159	302.86	67.38		17.03	4.75	294.44
185	88	143.88	476.16			34.78	53.58
189	112	347.10	45.20			2.20	669.06
196	162	231.43	70.85	12.69		92.19	134.66
197	112	228.66	910.38			38.88	260.76
198	72	361.02	32.44	8.00		9.42	4.44
204	118	1518.08	983.06			8.10	262.80
205	192	137.86	48.32		6.50	34.20	563.74
215	192	142.02		36.60	0.48	3.36	370.92
216	110	145.92	7.56	16.80		5.64	44.88
217	80	403.70	8696.38				899.88
222	90	564.71	1323.83				484.04
223	115	1146.00	2552.00			48.00	45.20
224	190	2232.00	63.36		6.24	7.20	910.56
232	103	169.63	175.86			0.38	338.45
236	75	373.76	15.52			39.92	22.08
243	131	1306.50	474.30			20.70	155.63
244	71	233.70	310.00			37.60	39.30
247	106	42.76	7.60	4.36		2.26	18.74
251	192	1050.34	104.05		13.24	51.56	314.70
252	89	369.68	257.06				70.66
MEAN		545.31	791.49	3.74	2.07	21.01	283.74

SLOPE 200-800 M

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
181	740	8.12	14.70		25.76	6.30	340.76
182	571	31.50	13.00	0.66	11.80	1.90	66.00
183	457	73.24	14.32	28.97	30.35	0.87	157.04
190	292	43.30	0.37	68.87	1.73	1.90	496.58
191	340	92.37	6.41		8.69	3.95	153.50
192	551	40.20	0.84	9.72	39.24	5.76	218.28
193	450	129.60		31.18	33.72	12.36	147.42
194	340	160.36	34.36	78.27	57.33	9.16	986.84
195	257	100.99	114.63		88.61	5.31	339.08
206	268	250.00	247.50		4.75	15.00	1186.50
207	362	26.10	5.62		20.80		63.38
208	453	53.74	1.40	50.60	78.10	3.10	105.76
209	555	50.80	7.40	24.40	31.64	2.72	95.68
210	771	10.88	25.60		2.72		167.28
211	541	63.20	11.70	7.02	442.28		85.72
212	451	90.30	43.54	65.70	97.88	4.90	45.74
213	345	65.80	2.10	1.48	52.30	3.78	248.32
225	248	1930.40	46.40		14.00		1749.20
226	352		2.24		2.40	0.04	3.74
227	449	115.80	3.12	1.08	132.24	0.60	83.04
228	549	75.50		6.70	148.40	4.10	29.70
229	475	9.92		4.32	57.12		335.68
230	347	84.00		6.56	8.82	1.88	70.30
231	202	89.28	231.20		12.16		163.20
237	201	338.98	443.24		10.48	4.98	960.92
238	377	34.80		11.44	49.60	0.72	113.44
239	483		0.54	11.38	90.23		265.97
240	601			1.20	21.68		202.60
241	393	28.40		7.70	11.00		199.60
242	206	116.24	239.40		103.65	7.32	940.63
248	234	1212.28	197.24		11.14	18.72	757.22
249	334	8.94		1.24	4.35	0.50	358.76
250	471	42.19		39.87	28.57		92.14
MEAN		162.95	51.72	13.89	52.53	3.51	340.30

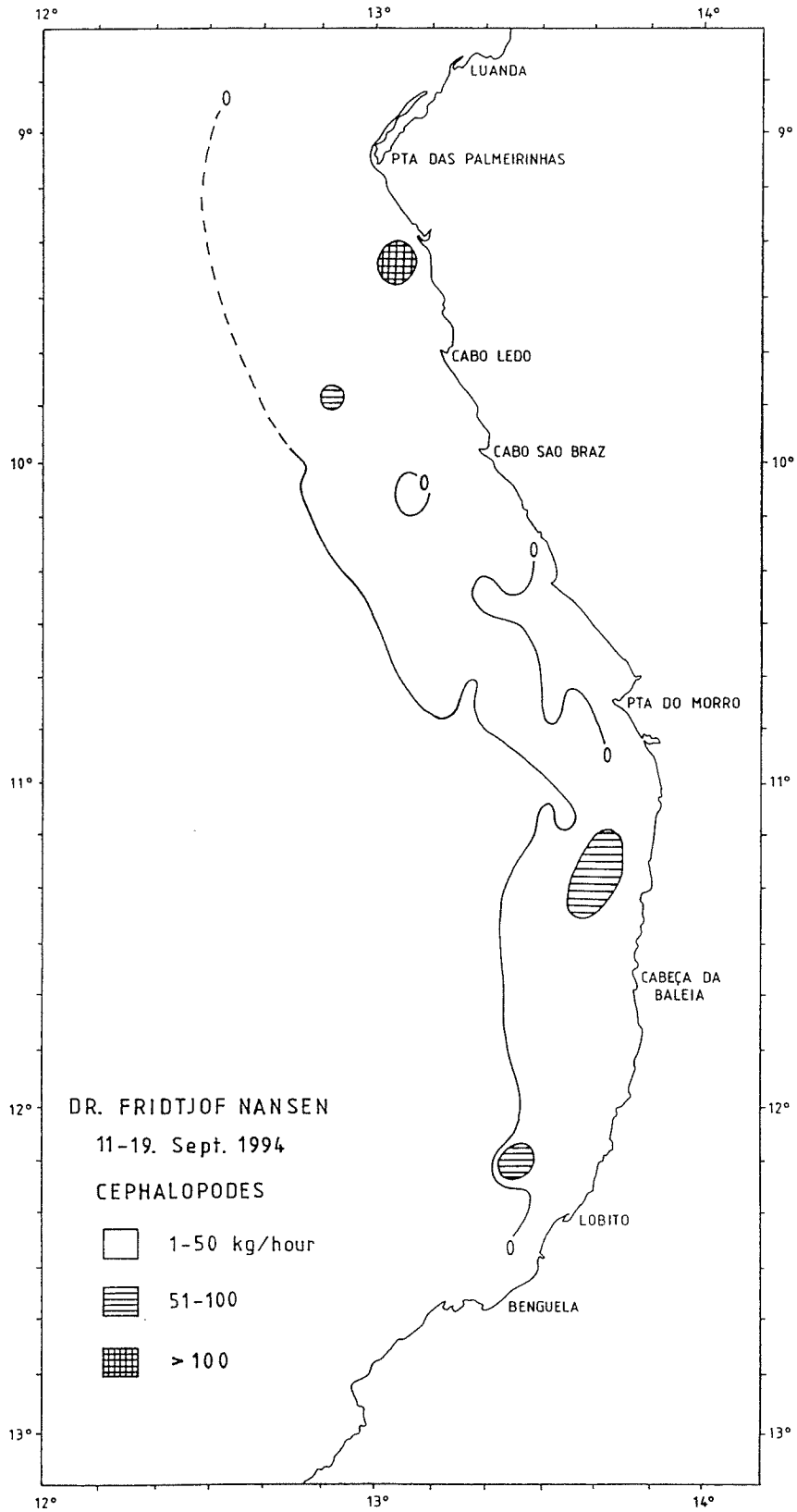


Figure 13. Luanda - Benguela. Distribution of cephalopods (kg per hour trawling).

Table 7. LUANDA-BENGUELA. Catch rates (kg/hour)of main pelagic families in swept-area bottom trawl hauls for the shelf.

INNER SHELF, 0-70 M

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
186	41		79.26	0.90		0.10	17.62
187	13		0.44				408.48
188	68		1844.88		39.72	26.66	541.72
199	41		305.31			6.92	428.36
200	26		130.98			34.60	62.82
201	14	2.33	1.28	114.47		6.54	36.54
202	55	2.10	334.66			38.50	79.64
218	50		4.62				12.84
219	28		3.00				10.74
220	44		24.00		12.20	14.80	249.20
221	55		318.12			3.96	68.20
233	63		102.80			11.88	146.16
234	20	1.18	2.46			3.18	114.84
235	44		1474.80				95.64
245	44		26.00				16.24
246	61		1.28			23.70	66.56
MEAN		0.35	290.87	7.21	3.25	10.68	147.23

OUTER SHELF 70-200 M

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
184	159		4.98			62.40	619.08
185	88		470.50		4.12		233.78
189	112		30.76			14.44	1018.36
196	162		57.38		6.05	7.42	470.97
197	112		867.30		43.08		528.30
198	72		16.36			16.08	382.88
204	118		934.88		48.18		1788.98
205	192		10.04		1.38	36.90	742.30
215	192						553.38
216	110		2.48			5.08	213.24
217	80		3752.42			4943.96	1303.58
222	90		1257.93			65.90	1048.75
223	115		2416.00			136.00	1239.20
224	190					63.36	3156.00
232	103		146.02			29.84	508.46
236	75		15.52				435.76
243	131		472.50			1.80	1482.83
244	71		277.00			33.00	310.60
247	106		7.60				68.12
251	192		104.05				1429.84
252	89		257.06				440.34
MEAN			528.61		4.90	257.91	855.94

Table 8. LUANDA-BENGUELA. Catch rates (kg/hour)of main demersal families in swept-area bottom trawl hauls for the shelf.

INNER SHELF, 0-70 M

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Snappers	Other
186	41	7.90	0.58				89.40
187	13	7.02			0.62		401.28
188	68	301.52	80.24	4.80			2066.42
199	41	186.46	3.55			71.26	479.32
200	26	23.58	4.54				200.28
201	14	1.80	3.21	7.26			148.89
202	55	6.42	23.30	4.26			420.92
218	50	0.64	0.70				16.12
219	28		0.98		1.86		10.90
220	44		75.50	3.10			221.60
221	55	4.56	13.44		7.00		365.28
233	63	75.36		6.48			179.00
234	20	7.34					114.32
235	44		13.44		4.20		1552.80
245	44						42.24
246	61	37.98	5.02	1.40			47.14
MEAN		41.29	14.03	1.71	0.86	4.45	397.24

OUTER SHELF 70-200 M

ST.NO.	DEP.	Seabreams	Grunts	Croakers	Groupers	Hakes	Other
184	159	271.71		23.86		7.29	383.60
185	88	143.88					564.52
189	112	218.78		124.08	3.06	1.18	716.46
196	162	231.43					310.39
197	112	172.26		16.20	40.20		1210.02
198	72	355.66		0.88	4.48		54.30
204	118	822.08		679.50	16.50		1253.96
205	192	92.48		15.76		29.62	652.76
215	192	100.80		7.20	14.70	19.32	411.36
216	110	141.96			3.96		74.88
217	80		403.70				9596.26
222	90	398.38		166.33			1807.87
223	115	1124.40		21.60			2645.20
224	190			1670.40		561.60	987.36
232	103	127.58		32.50	9.55		514.69
236	75	361.92		11.84			77.52
243	131	1306.50					650.63
244	71	217.30	5.30	4.80	6.30		386.90
247	106	42.76					32.96
251	192	952.10		26.94		71.30	483.55
252	89	301.16		68.52			327.72
MEAN		351.58	19.48	136.69	4.70	32.87	1102.04

Table 8 presents the catch rates of the most important demersal families. Like in the northern region seabreams were the most common both on the inner shelf and outer shelf. The catch rates of seabreams on the inner shelf were only about 25% of those in the north, while on the outer shelf the mean rate was almost 5 times higher in the south. Compared with 1989, the catch rates on the inner shelf are comparable to those obtained in 1989, while the rate on the outer shelf was 3 times as high in 1994. *Pagellus bellottii* and *Dentex canariensis* were the most abundant species on the inner shelf, while *Dentex macrophthalmus* dominated on the outer shelf (75% of the seabream catches), followed by *D. angolensis* and *P. bellottii*. Mean lengths and length distributions were similar to those observed in previous surveys.

Brachydeuterus auritus (big-eye grunt) was most abundant on the inner shelf and was only caught in two hauls on the outer shelf. The catch rates on the inner shelf were lower than in the northern region, and much lower than those found in 1989, both on the inner and outer shelf.

The most common croakers were *Umbrina canariensis*, on the inner shelf, and *Pentheroscion mbizi* and *Atractoscion aequidens* on the outer shelf.

Groupers were less abundant than in the Cabinda - Luanda region, and the catch rates were lower than in 1989. *Epinephelus aeneus* and *E. goreensis* were the most abundant groupers. Snappers (*Litjanus goreensis* and *L. endecacanthus*) only occurred on one station on the inner shelf.

Table 9 presents the most important forms on the slope. More deep-water hauls (> 600m) were done during the present survey than in 1989, so the results are not directly comparable. Furthermore, differences in the bottom trawl now used, more efficient in catching those species very close to the bottom, should also be taken into account when comparing present and earlier results. Seabreams, mainly *D. macrophthalmus*, occurred in stations shallower than 250 m. The catch rates were similar to those obtained in survey I 1989. Benguela hake (*M. polli*) was caught in most of the slope stations. The mean catch rate was 40% higher than in the north, but somewhat lower than in both 1989 surveys. Total shrimp (see Table 6) had a lower mean catch rate than in the north, while the rate was at the same level as in survey II 1989. *Nematocarcinus africanus* made up over 60% of the shrimp cathes. The more important *Parapenaeus longirostris* and *Aristeus varidens* had mean catch rates of about 35 and 28% respectively of that of the spider shrimp. Small catches (< 5 kg/h) of *Plesiopenaeus edwardsianus* were obtained in a few stations from 350 m and downwards at similar rates as in survey III 1989. Hake and important shrimps are further described in section 4.

Table 9. LUANDA-BENGUELA. Catch rates (kg/hour)of main demersal families/species in swept-area bottom trawl hauls for the slope.

ST.NO.	DEP.	Seabreams	Hakes	Rose shr.	Str. shr.	Spid. shr.	Other
181	740		8.12		25.34		362.18
182	571		31.50		4.30	7.00	82.06
183	457		73.24		30.35		201.20
190	292		43.30		0.63		568.82
191	340		92.37	5.31	2.15		165.09
192	551		40.20		21.84	17.40	234.60
193	450		129.60		33.06		191.62
194	340		160.36	57.33			1108.63
195	257	22.36	78.63	88.61			459.02
206	268			4.75			1699.00
207	362		26.10	0.90		19.90	69.00
208	453		53.74		48.60	29.00	161.36
209	555		50.80		3.64	28.00	130.20
210	771		8.40		2.00		196.08
211	541		63.20		4.82	436.80	105.10
212	451		90.30		28.92	68.96	159.88
213	345		65.80	52.30			255.68
225	248		12.40	14.00			3713.60
226	352			0.30		2.02	6.10
227	449		115.80		10.08	121.80	88.20
228	549		75.50		39.40	109.00	40.50
229	475		9.92			57.12	340.00
230	347		84.00	6.02			81.54
231	202	42.88	46.40	12.16			394.40
237	201	140.00	12.24	10.48			1595.88
238	377		34.80		3.20	46.40	125.60
239	483				2.85	86.03	279.24
240	601				3.76	17.52	204.20
241	393		26.90			6.50	213.30
242	206	30.89	85.35	100.80		2.85	1187.35
248	234	479.78	708.96	11.14			996.72
249	334		8.94	4.10		0.25	360.50
250	471		42.19		28.57		132.01
MEAN		21.69	69.06	11.16	8.89	32.02	482.08

In Annex I-B swept-area estimates based on 37 bottom trawl hauls are presented for demersal species on the shelf. In the 0-50 m zone *Sepia officinalis hierredda* had the highest density, followed by *Dentex canariensis*, *Synagrops microlepis* and *Brachydeuterus auritus*. In the northern area, as well as in most previous investigations, *B. auritus* was the dominating species in the shallowest zone. *S. microlepis* had the highest density between 50 and 100 m, followed by *D. macrophthalmus*, *P. bellottii* and *B. auritus*. Also in 1992 *S. microlepis* had the highest density in this zone, while in earlier investigations *B. auritus* was the dominating demersal species. *D. macrophthalmus* had the highest density in the deepest shelf zone, almost three times higher than *Pentheroscion mbizi*, which came second. Then followed *Chlorophthalmus atlanticus*, *Umbrina canariensis* and *S. microlepis*.

In previous investigations *S. microlepis* often had the highest density in the 100-200 m zone, but *D. macrophthalmus* has normally been abundant. If pelagic species are included, *T. trecae* had the highest density in all three shelf zones, and *T. lepturus* came second in the 50-100 m zone.

The mean density of demersal species on the shelf was about 18 tonnes/nm^2, which is somewhere in the middle of the results of survey I and II in 1989 and 50% higher than the mean density for

the Cabinda-Luanda region. If pelagic groups are included, the mean density increases to almost 38 tonnes/nm^2 . This is almost exactly the same as found in 1992, and about 25% higher than the results of the two surveys in 1991.

Summed densities of the most important species by main groups are presented at the bottom of Annex I-B. Like in the northern region seabreams had the highest density, more than the double of croakers. Then came squids, grunts and groupers. In most previous investigations grunts has been the dominating group, followed by seabreams and croakers. The mean density of squids is the highest reported, more than the double of what was found in 1992. "Commercial shrimp" had lower mean density than in 1989, but higher than in 1991 and 1992.

Table 10 summarizes the mean densities of some important groups, and biomass estimates for 1994 and some previous investigations are also presented.

Table 10. Luanda-Benguela. Mean densities and biomass estimates by main groups over the shelf to 200 m by year of investigation.

Group/ species	Density (t/nm^2) 1994	Biomass (tonnes)		
		1994	1992	1991
Seabreams	7.30	28 730	28 000	24 580
Grunts*	0.02	120	2 000	5 500
Croakers	2.65	9 250	2 000	19 000
Groupers	0.11	400	1 000	1 000
Sum dem. val.	10.08	38 500	33 000	50 080
Bigeye grunt	0.55	2 990	52 000	18 500
Horse mackerel	13.74	65 100	75 000	48 500
Other carangids	0.46	2 790	1 640	290
Barracudas	0.12	740		
Hairtail	5.02	26 200	1 300	4100

* excluding big-eye grunt

The estimated total biomass of demersal valuable groups is 17% higher than in 1992. Seabreams made up more than 70% of the biomass of demersal valuable groups, and their biomass was the highest measured in the time series, slightly higher than in 1992. *D. macrophthalmus* contributed almost 70% to the biomass of seabreams.

Croakers had less than half of the biomass found in 1991, but much higher than in 1992. The biomass estimates of groupers and grunts excluding big-eye grunt were lower than in the two previous investigations, that of grunts is the lowest in the time series.

The estimated biomass of big-eye grunt is also the lowest in the time series. A big haul of about 25 tonnes was not included in the swept-area estimates because it was difficult to bring the catch on deck for precise registration. Big-eye grunt made up over 70% of the total catch, and including this haul, it would have increased the biomass estimate to about 250.000 tonnes.

The biomass estimate of Cunene horse mackerel in the bottom layer is somewhat lower than in 1992 but well above the result from 1991. Hairtail came out with the highest biomass estimated in the time series. A catch of 5 tonnes contributed 90% to the hairtail biomass. Other carangids and barracudas were also more abundant than in previous investigations.

Fig. 14 shows the distribution of the summed demersal valuable groups. Catches of more than 100 kg/hour were obtained from the middle of the inner shelf to the beginning of the slope (250m) over most of the region. There were also large areas with catch rates > 200 kg/hour.

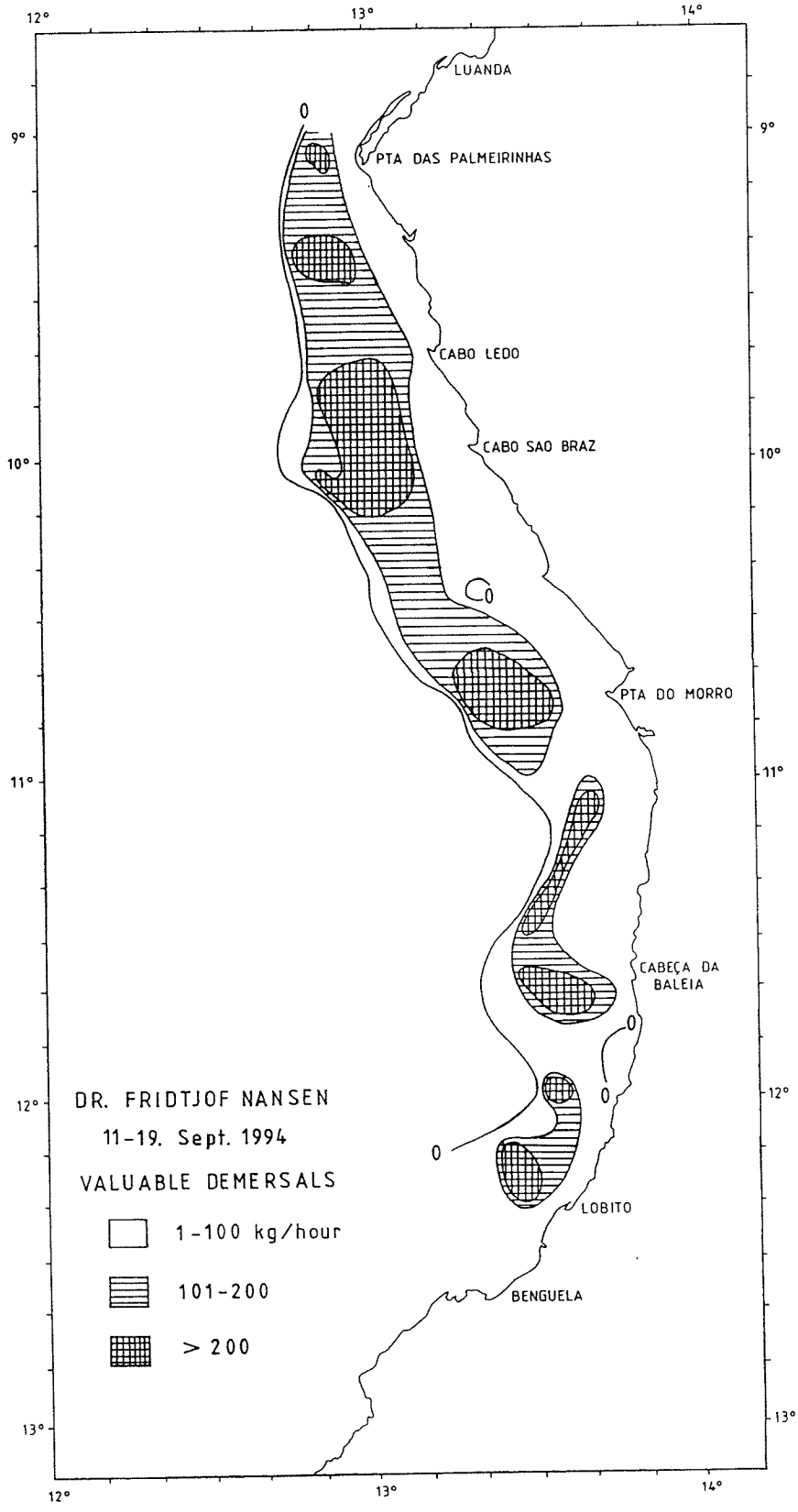


Figure 14. Luanda - Benguela. Distribution of demersal valuable species (kg per hour trawling).

3.3 Review of results

In the category high-value demersal fish we include species of seabreams, croakers, grunts (excluding the bigeye grunt), groupers etc. that constitute the most valuable food fish. Table 11 shows the results of present and previous surveys. The present estimate for the Benguela - Cabinda region is one of the highest in the time series, about 25% higher than the 1992 estimate. However, the difference in the bottom trawl gear used in the new 'Dr. Fridtjof Nansen', probably more efficient than the one previously used, might be critical. Tests on the differences betwen the two gear types are planned for the near future and present results and comparisons should be evaluated again in the light of the information gained from the calibration experiments.

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

Survey	Cunene-Benguela	Benguela-Luanda	Luanda-Cabinda	Benguela-Cabinda	Total
1/85-4/85	N.S.	N.S.	48.8	-	-
1/86-2/86	15.6	21.2	38.3	59.5	78.4
1/89-2/89	28.2	17.9	25.5	43.4	75.1
3/89	N.S.	N.S.	31.7	-	-
Nov/89					68.0*
1/91	26.4	15.0	15.9	30.9	57.3
2/91	36.4	50.1	35.9	86.0	122.4
1/92	47.7	33.0	34.0	67.0	114.7
1/94	N.S.	38.5	45.6	84.1	-

* From GOA survey, seabreams only.

CHAPTER 4 RESULTS FROM THE FISHING ON THE SLOPE

The slope off Cabinda-Luanda was covered with 53 swept-area hauls with the following distribution: 100-200 m: 12 hauls; 200-300 m: 10 hauls; 300-400 m: 10 hauls; 400-500 m: 9 hauls; 500-600 m: 6 hauls and 600-800 m: 6 hauls. The slope from Luanda to Benguela was covered with 47 hauls and these were distributed as follows: 100-200 m: 14 hauls; 200-300 m: 8 hauls; 300-400 m: 9 hauls; 400-500 m: 8 hauls; 500- 600 m: 5 hauls and 600-800 m: 3 hauls.

The swept-area estimates of the main species caught, by depth intervals are given in Annex I A-D and pooled length distributions (TL) for hake and important shrimps (by sex) are shown in Annex II.

4.1 Deep-water shrimp

Table 12 shows the catch rates of *Parapenaeus longirostris* (rose shrimp) by region and depth range, and catch rates from previous investigations are given for comparisons. Like in previous investigations the highest catch rates were obtained in the 200-300 m depth zone. In the Cabinda - Luanda region rose shrimp was found from the outer part of the shelf to about 350 m depth (Fig. 15), with the best cath rates in the southern part. The overall mean catch rate increased by 25% from 1992 to 1994 due to much better catches in the 300-400 m zone, but still the rate is low compared to 1985/86. The rates of occurrence were similar to those from 1992, and the three highest catch rates were 28, 46 and 50 kg/h. Mean length of both males and females is about 1 cm longer than in 1992.

In the Luanda - Benguela region (Fig. 16) rose shrimp had a similar distribution as in the north, with a few areas with catch rates > 20 kg/hour. The catch rates were higher than in 1992 and 1991, especially in the 300-400 m zone, where also the rate of occurrence was higher. However, the mean catch rate was still over 30% lower than the average mean rate for 1985/89. The three highest catch rates were 57, 89 and 101 kg/h, which is above the 1992-level. Mean lengths of both sexes were similar to those found in the northern region and about 0.5 cm longer than in 1992.

Mean catch rates of *Aristeus varidens* (striped red shrimp) are presented in Table 13. Fig. 17 shows the distribution of striped shrimp in the Cabinda - Luanda region. It was found over most

concentrations with catches over 20 kg/h. Like in 1992 the mean catch rate was highest in the 500-600 m depth zone, and the overall mean catch rate increased by 25% due to better catches

Table 12. Rose shrimp. Mean catch rates (kg/hour) by region, depth range and year/period of investigation.

Area/ depth	Year/period of investigation				
	1985/86	1989	1991/I	1992	1994
Cabinda-Luanda					
100-200 m			-	2	3
150-250 m	36	21			
200-300 m			9	18	15
250-350 m	19	11			
300-400 m			2	-	12
Mean	29	12		8	10
Luanda-Benguela					
100-200 m			-	2	3
150-250 m	16	29			
200-300 m			17	26	30
250-350 m	30	17			
300-400 m			2	1	14
Mean	22	19			13

Table 13. Striped shrimp. Mean catch rates (kg/hour) by region, depth range and year/per. of investigation.

Area/ depth	Year/period of investigation				
	1985/86	1989	1991/I	1992	1994
Cabinda-Luanda					
300-400 m			-	1	+
400-500 m			4	6	6
500-600 m				7	10
600-800 m				4	5
Mean	7	4		4	5
Luanda-Benguela					
300-400 m			2	1	1
400-500 m			22	2	23
500-600 m				5	15
600-800 m				15	3
Mean	15	7		6	12

in this zone. The rate is, however, 30% lower than that found in 1985/86. The rates of occurrence were about the same as in 1992, and the three highest catches (20, 21 and 23 kg/h) were slightly above the 1992 level.

The mean catch rate of *Aristeus varidens* in the Luanda - Benguela region was much higher than in the north and the double of that obtained in 1992, almost back at the 1985/86 level. Catch rates were highest in the 400-500 m zone, while in 1992 the best catches were done in the deepest zone (600-800 m). Rates of occurrence were also higher than in 1992, as well as the three highest catch rates (33, 39 and 49 kg/h). The mean length of males was about 1 cm longer than in 1992 and females were 0.7 cm longer. Fig. 18 shows the distribution of striped red shrimp in the Luanda - Benguela region. It was found over most of the region, from about 350 m to beyond 770 m depth. The best catches were obtained between Pta das Palmeirinhas and Pta do Morro.

Biomass estimates of commercially important shrimps are obtained the same way as for fish; by multiplying the densities in the main depth zones where each species is distributed (see Tables 12 - 13 and Annex I) by the area of each depth zone. The results are presented in Table 14, and the biomasses should be treated as indices. The biomasses of rose shrimp and stripped red shrimp in the Cabinda - Luanda region have increased by 80 and 18% respectively from 1992 to 1994. In the Luanda - Benguela region the biomass estimates were 14 and 56% higher than in 1992 for red and striped shrimp respectively. The total biomass of rose shrimp is however still only half of what was estimated in 1985/86. The biomass estimate of striped shrimp is not directly comparable with the results from 1985/86 because of few deepwater hauls in the first investigations. During the present survey only one catch of scarlet shrimp was made in the northern region and no biomass estimate is done. In the southern region a few more catches were done, but the biomass is low compared to previous results. Compared with 1992 the total biomass estimate of important shrimps in the Cabinda - Benguela area increased by over 30% and is now on the 1989 level.

Table 14. Biomass (tonnes) of commercial deep water shrimps by region and year/period of investigation.

Region/ species	Year / period of investigation			
	1985/86	1989	1992	1994
Cabinda-Luanda				
- Rose shrimp	2500		615	1110
- Striped red shr.	230		515	610
- Scarlet shrimp	160		130	+
Luanda-Benguela				
- Rose shrimp	1300		680	710
- Striped red shr.	620		570	890
- Scarlet shrimp	100		60	25
Total	4910	3300	2570	3410

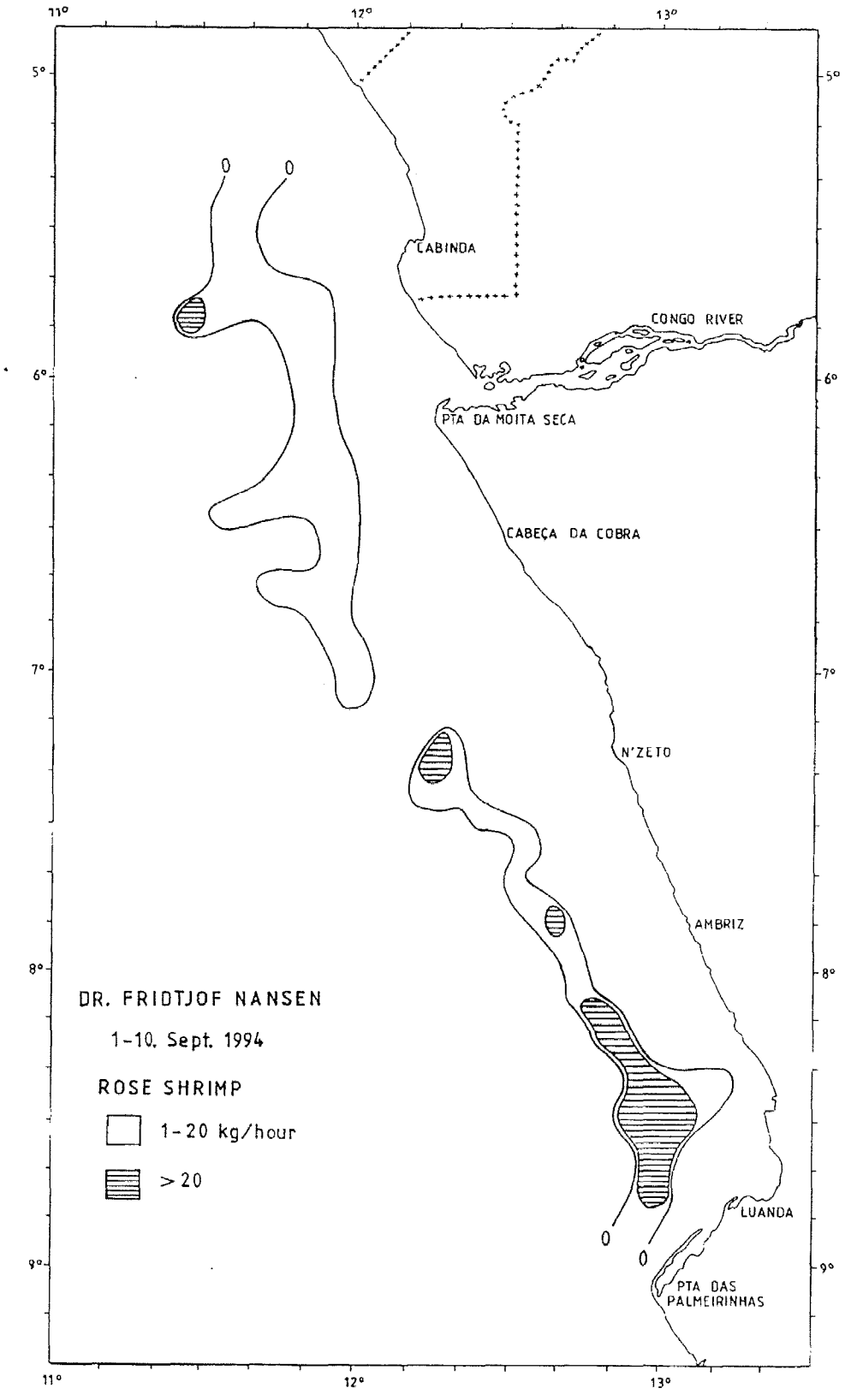


Figure 15. Cabinda - Luanda. Distribution of *Parapenaeus longirostris* (kg per hour trawling).

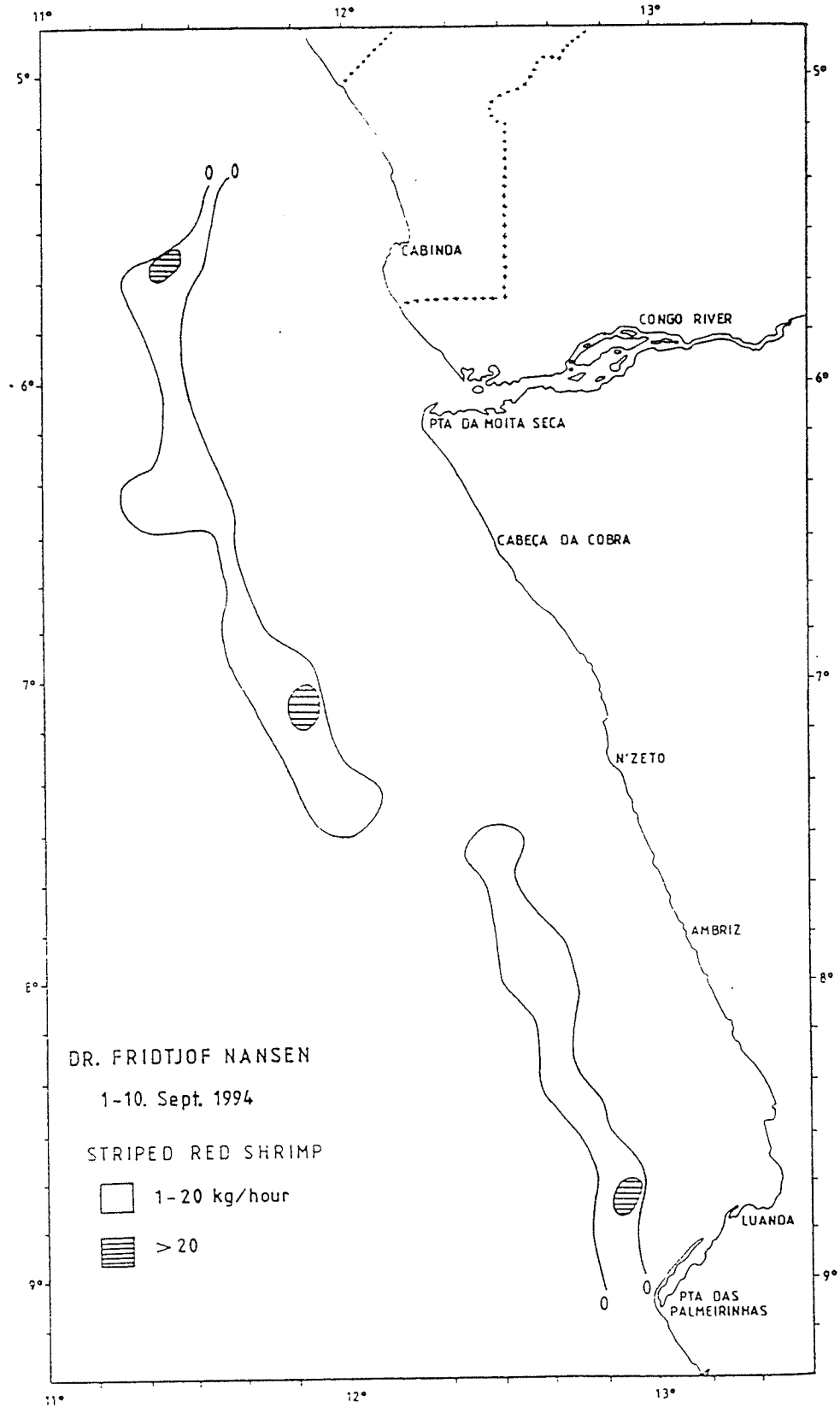


Figure 16. Cabinda - Luanda. Distribution of *Aristeus varidens* (kg per hour trawling).

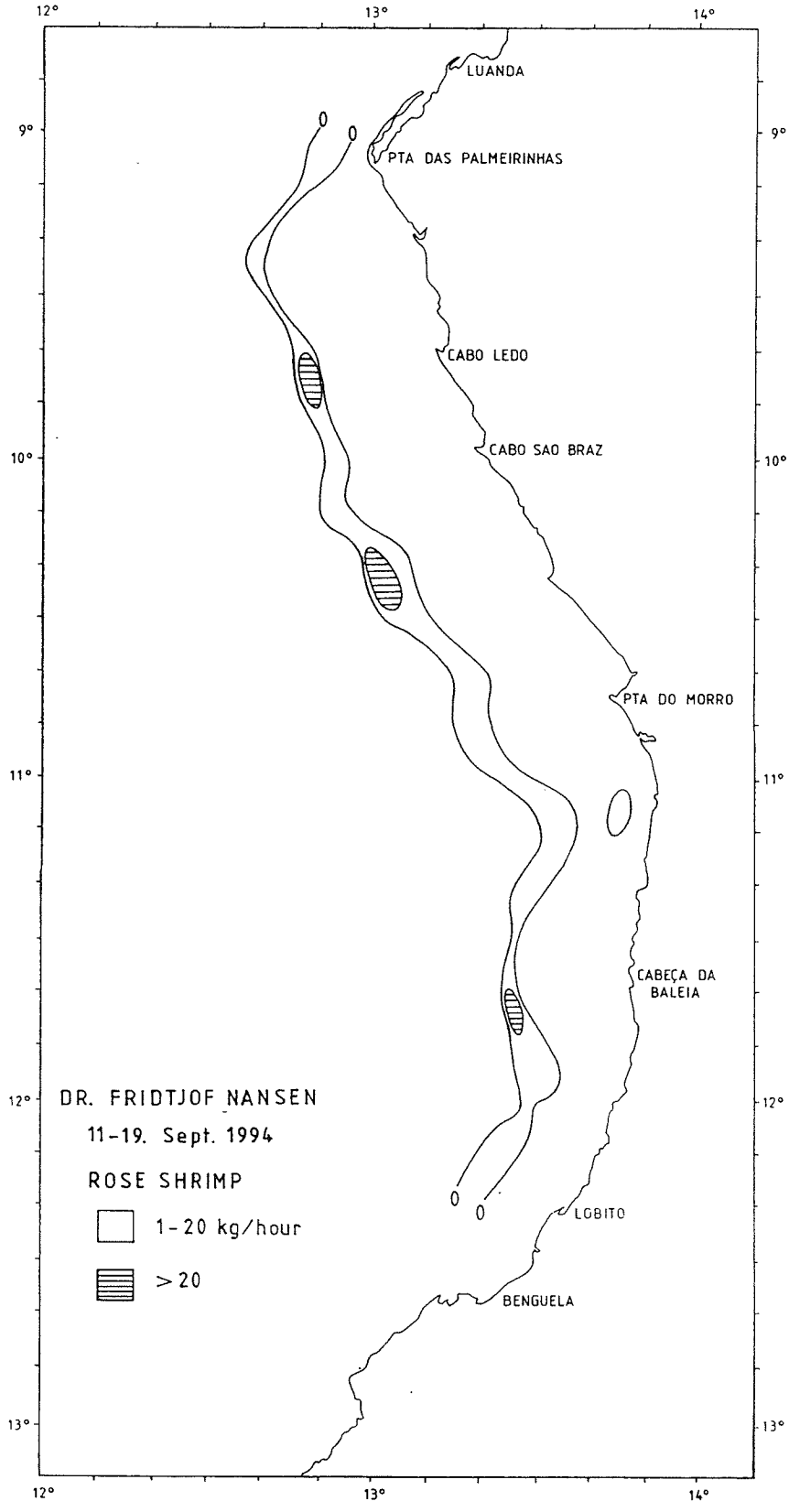


Figure 17. Luanda - Benguela. Distribution of *Parapenaeus longirostris* (kg per hour trawling).

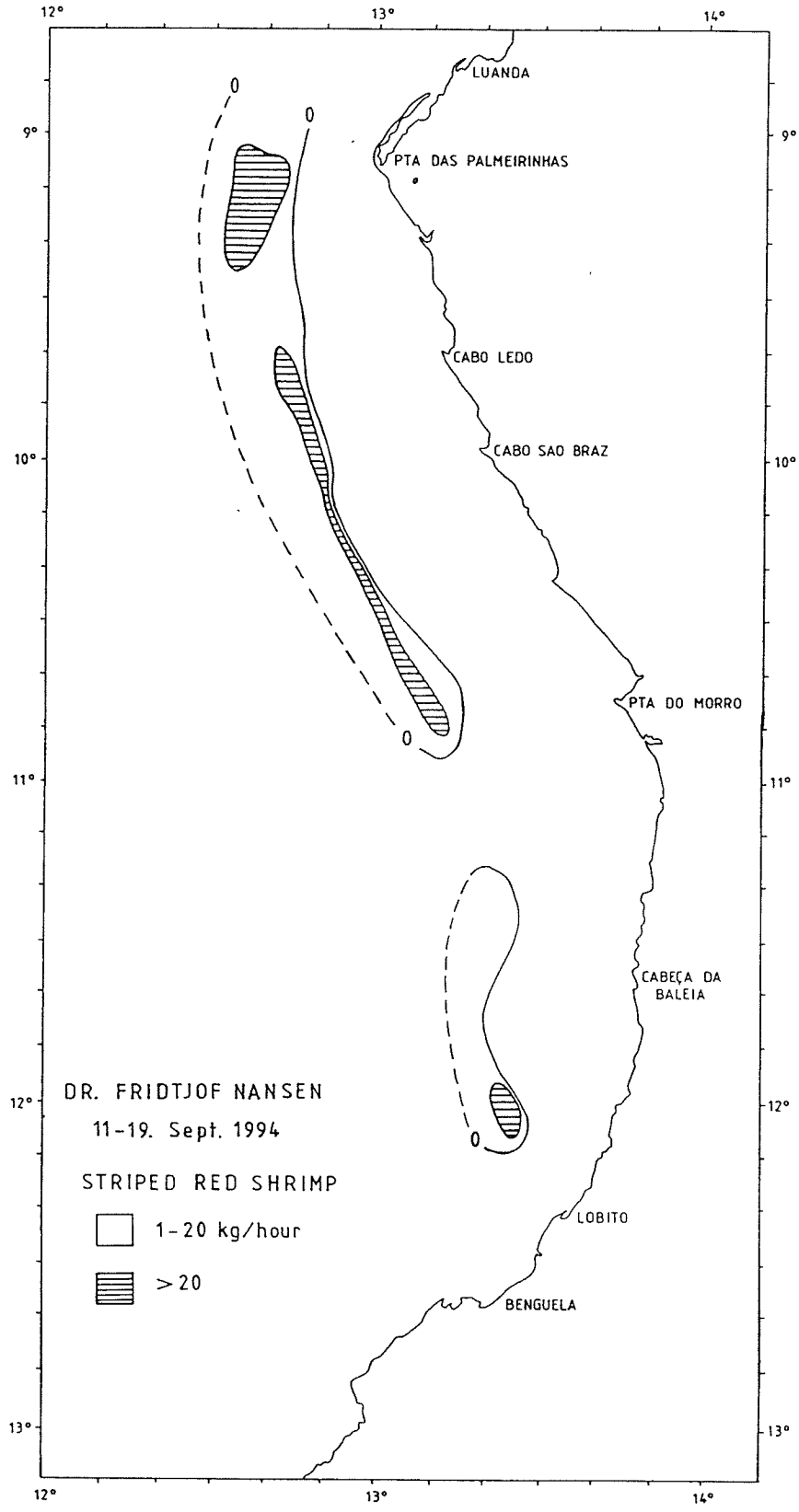


Figure 18. Luanda - Benguela. Distribution of *Aristeus varidens* (kg per hour trawling).

4.2 Benguela hake

The mean catch rates of Benguela hake (*Merluccius polli*) for the two regions and by depth, are shown in Table 15. Catch rates from some previous investigations are also given. Fig. 19 shows the distribution of hake in the Cabinda - Luanda region. It was mainly found on the slope from about 250 to 600 m depth, with the highest concentrations (> 100 kg/h) off N'Zeto. Like in 1992 the hake has a more shallow distribution than found in earlier investigations, with maximum mean catch rate in the 300-400 m zone. Compared with the results of 1992 (and earlier years) there has been a dramatic reduction in catch rates for all depth zones. The absolute decrease in mean catch rates were largest from 200-500 m, and this is the most important depth range for commercial shrimp as a whole. In the 400-500 m zone the mean catch rate decined by about 80%.

Table 15. HAKE. Mean catch rates (kg/hour)by regions, depth range and year/period of investigation.

Area/ depth	Year/period of investigation				
	1985/86	1989	1991/I	1992	1994
Cabinda-Luanda					
100-200 m	49	47	1	13	+
200-300 m	103	39	11	104	28
300-400 m	248	141	372	264	134
400-500 m	524	233	525	224	43
500-600 m	56	56	-	21	12
600-800 m	-	-	-	12	1
Luanda-Benguela					
100-200 m	3	51	-	-	49
200-300 m	177	138	37	96	122
300-400 m	734	109	374	225	55
400-500 m	493	112	377	161	64
500-600 m	66	80	-	29	52
600-800 m	-	-	-	-	5

Hake had a even more shallow distribution in the Luanda - Benguela region, with highest mean catch rate in the 200-300 m zone. The catch rates in most deeper zones (shrimp fishing grounds) have continued to decrease since 1992, and are very low compared to those obtained in the first investigations. The distribution (Fig. 20) was somewhat more patchy than in the northern region.

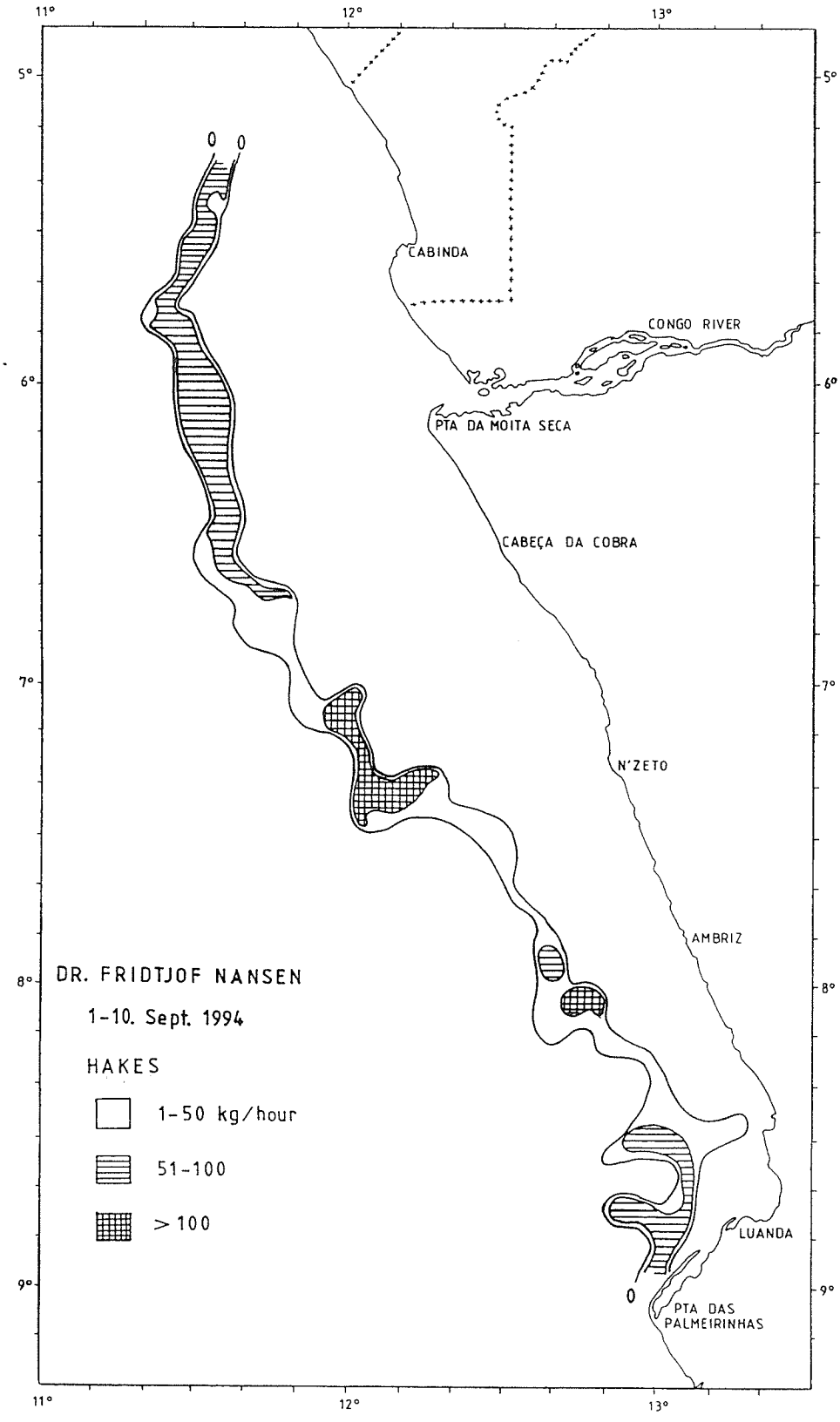


Figure 19. Cabinda - Luanda. Distribution of *Merluccius polli* (kg per hour trawling).

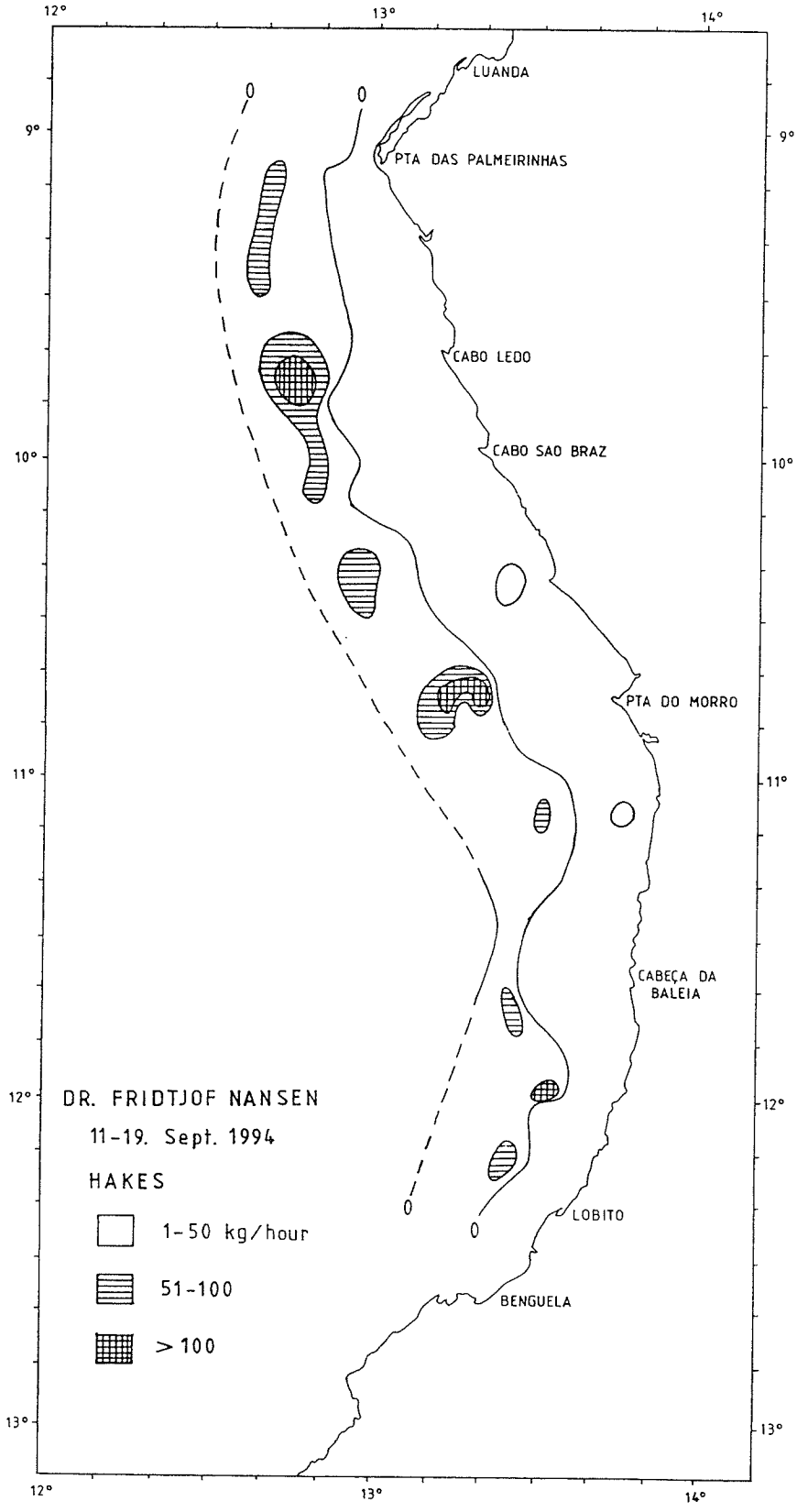


Figure 20. Luanda - Benguela. Distribution of *Merluccius polli* (kg per hour trawling).

Biomass estimates of hake are presented in Table 16. The densities applied in the calculations are shown in Annex I. In the Cabinda - Luanda region there was a 66% reduction in biomass from 1992 to 1994. In the Luanda - Benguela region the reduction was somewhat less (17%). The total biomass estimate for the whole area was only half of that found in 1992 and the biomass estimated is the lowest in the time series.

Table 16. HAKE. Biomass estimates (tonnes) by area and year/period of investigation.

Region	Year/period of investigation				
	1985/86	1989	1991/I	1992	1994
Cabinda-Luanda	22 000	13 000	18 000	14 000	4 700
Luanda-Benguela	20 000	10 000	11 000	8 100	6 670
Total	42 000	23 000	29 000	22 100	11 370

4.3 Co-Occurrence of shrimp and hake and predation studies

Table 17 shows the co-occurence of the commercial important deep water shrimps and hake in the Cabinda - Luanda region. 64% of the rose shrimp occurrence was together with hake, and 50% of the hake occurrence was together with rose shrimp. The density of rose shrimp was on average 79% higher when occurring with hake than when not, and the density of hake was 58% higher when occuring with rose shrimp than when not. One explanation to this is that hake concentrates in areas with high density of rose shrimp, probably to feed on the shrimp.

74% of the striped shrimp occurrence was together with hake, and 47% of the hake occurrence was together with rose shrimp. The density of rose shrimp was on average 72% higher when not occurring with hake than when it was, and the density of hake was 138% higher when not occuring with rose shrimp than when it was. So even if hake was found over the major part of the striped shrimp area, the densities of hake in this area was low and it was not any concentrations towards the densest striped shrimp areas. This could mean that hake prefers the same depth range as rose shrimp, or that hake prefers rose shrimp to striped shrimp as food, or that the catch/by-catch of hake has been higher in the striped shrimp areas or a combination of these factors.

There were only three stations where the three species occurred together, and the densities of all species was lower than the mean density of each species. Rose and striped shrimp were also only found together on these three stations. Hake occured alone on just two stations, but on the other hand the density of hake here was on average 154% higher than the mean density of hake. One of these incidents was juvenile hake on the shelf.

Table 17. Co-occurrence of rose shrimp, striped red shrimp and hake in the Cabinda-Luanda region.

Present/ not present	No.of stat.	Catch			Catch rate		
		Rose	Strp.	Hake	Rose	Strp.	Hake
Rose (R)	25	336	-	-	13.4	-	-
Rose not hake	9	68	-	-	7.6	-	-
Rose and hake	16	268	-	1281	16.6	-	80.1
Hake not rose	16	-	-	814	-	-	50.8
Striped (S)	23	-	149	-	-	6.5	-
Strip. not hake	6	-	56	-	-	9.3	-
Strip. and hake	17	-	93	675	-	5.4	39.7
Hake not strip.	15	-	-	1420	-	-	94.6
Hake (H)	32	-	-	2095	-	-	65.4
H not R not S	2	-	-	332	-	-	166.0
H and R and S	3	34	3	194	11.3	1.0	64.6
Rose not strip.	22	302	-	-	13.7	-	-
Strip. not rose	20	-	146	-	-	7.3	-
Rose and strip.	3	34	3	-	11.3	1.0	-

The results of co-occurrence studies for the Luanda - Benguela region were mainly the same as for the Cabinda - Luanda region (Table 18). 85% of the rose shrimp occurrence was together with hake, and the density of rose shrimp was on average 42% higher when occuring with hake than when not. 49% of the hake occurrence was together with rose shrimp, but the density of hake was on average 140% higher when occurring with rose shrimp than when not.

90% of the striped shrimp occurrence was together with hake, and 49% of the hake occurrence was together with striped shrimp. And like in the northern region the density of hake was higher (69%) when not occurring with striped shrimp than when it was. The only difference was that the density of striped shrimp was much higher when occurring with hake than when not.

Table 18. Co-occurrence of rose shrimp, striped red shrimp and hake in the Luanda-Benguela region.

Present/ not present	No.of stat.	Catch			Catch rate		
		Rose	Strp.	Hake	Rose	Strp.	Hake
Rose (R)	21	474	-	-	22.6	-	-
Rose not hake	3	49	-	-	16.3	-	-
Rose and hake	18	415	-	2063	23.1	-	114.6
Hake not rose	19	-	-	904	-	-	47.6
Striped (S)	20	-	303	-	-	15.2	-
Strip. not hake	2	-	7	-	-	3.5	-
Strip. and hake	18	-	296	1064	-	16.4	59.1
Hake not strip.	19	-	-	1903	-	-	100.2
Hake (H)	37	-	-	2967	-	-	80.2
H not R not S	3	-	-	16	-	-	5.3
H and R and S	2	176	5	176	5.5	2.5	88.0
Rose not strip.	19	463	-	-	24.4	-	-
Strip. not rose	18	-	298	-	-	16.5	-
Rose and strip.	2	11	5	-	5.5	2.5	-

One of the objectives of the survey was to collect stomach samples of hake for later laboratory analysis of the contents. This would be a start of multispecies interaction studies, and hake was chosen as one of the possible shrimp predators. Results of these studies could both tell more about which shrimps hake prefer and thereby explain why hake concentrates in some areas and are vulnerable to by-catch in the shrimp fishery. At a later stage the hakes consumption of shrimps could perhaps be quantified and the impact on the shrimp stocks could be evaluated.

In the Cabinda-Luanda region 164 hake stomachs were collected and in Luanda - Benguela 136, most of them from fish of 30-50 cm length. 60% of the stomachs were jugded to be emty based on an external inspection. Also in other areas, e.g. in Namibian waters, a high percentage of empty stomachs seems to be a problem when collecting stomachs of hake. Sometimes this is caused by regurgitation or inverted stomachs, and if these stomachs are classified as empty the results will be biased. A special study on how to deal with/solve this problem should be initiated.

Annex I Swept-area estimates

SWEPT AREA ANALYSIS FROM STATION 108 TO STATION 180

A. CABINDA-LUANDA. Demersal species shelf.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 50m	50-100m	100-200m	200-200m
Brachydeuterus auritus		1	1	2			13	1.61	5.49	0.20		
Synagrops microlepis	3	2	4				28	0.90		1.43	1.10	
Dentex gibbosus	1			1			6	0.71	2.51		0.01	
Dentex angolensis	9	7	2				56	0.65		0.43	1.35	
Chlorophthalmus atlanticus	2	1		1			13	0.53			1.41	
Pagellus bellottii	10	6	1				53	0.52	1.06	0.64	0.02	
Umbrina canariensis	6	1		1			25	0.49		0.07	1.25	
Dentex canariensis	11	1	2				44	0.41	1.13	0.24	0.03	
Spicara alta	7	1	2				31	0.35		0.01	0.92	
Pterothrissus belloci	6	4	1				34	0.33		0.39	0.52	
Dentex congoensis	5	2	1				25	0.32		0.39	0.49	
Dentex barnardi	5		2				22	0.31	0.55	0.43	0.01	
Dentex macrophthalmus	7	2	1				31	0.31		0.02	0.81	
Brotula barbata	9	4					41	0.31		0.27	0.57	
Pentheroscion mbizi	1	1	1				9	0.29	0.16	0.71		
Boops boops	17		1				56	0.28	0.81	0.10	0.05	
Galeoides decadactylus	1		1				6	0.22	0.78			
Miracorvina angolensis	3	1	1				16	0.21		0.20	0.37	
Epinephelus aeneus	3	4					22	0.20	0.31	0.28	0.05	
Raja miraletus	13	2					47	0.20	0.16	0.32	0.14	
Sepia sp.	12	2					44	0.19	0.35	0.27		
Epinephelus haifensis			1				3	0.18			0.48	
Branchiostegus semifasciatus	10	1					34	0.16		0.19	0.25	
Sepia officinalis hierredda	5	1					19	0.14	0.37	0.06	0.03	
Alloteuthis africana	2		1				9	0.14		0.40		
Sparus caeruleostictus	4	2					19	0.12	0.28	0.11		
Zenopsis conchifer	10						31	0.11		0.04	0.26	
Zeus faber	16						44	0.09	0.12	0.09	0.07	
Sparus pagrus africanus	6	1					22	0.09	0.17	0.09	0.03	
Pseudotolithus typus	1	1					6	0.09	0.30	0.03		
Citharus linguatula	18						56	0.09	0.03	0.06	0.17	
Chelidonichthys gabonensis	5	1					19	0.07		0.03	0.15	
Sparus auriga	5						16	0.07	0.14	0.07	0.01	
Uranoscopus polli	11						34	0.06	0.01	0.07	0.10	
Parapenaeus longirostris, fem.	5	1					19	0.06		0.05	0.12	
Epinephelus goreensis	2	1					9	0.06	0.04		0.13	
Argyrosomus hololepidotus	5						16	0.06	0.09	0.09		
Pomadasys incisus	3	1					13	0.06	0.06	0.12		
Anthias anthias	1	1					6	0.06			0.16	
Stromateus fiatola	4						13	0.05	0.09	0.07		
Illex coindetii	12						38	0.05		0.02	0.11	
Scorpaena angolensis	7						22	0.05		0.05	0.08	
Rhinobatos sp.		1					3	0.05	0.19			
Parapenaeus longirostris, male	5	1					19	0.04		0.02	0.10	
Penaeus notialis, female	1							0.01		0.01		
Penaeus notialis, male	1						3					
Parapenaeus longirostris	1						3					
Other fish								0.56	0.88	0.68	0.39	
Sum all species								11.86	16.08	8.75	11.74	
Sum Snappers												
Sum Groupers								0.47	0.45	0.30	0.66	
Sum Grunts								1.71	5.63	0.37	0.01	
Sum Croakers								1.19	0.67	1.14	1.63	
Sum Seabreams								3.79	6.65	2.52	2.81	
Sum Sharks								0.04		0.14		
Sum Rays								0.34	0.49	0.50	0.15	
Sum Squids								0.58	0.74	0.79	0.26	
Sum Sum commercial shrimps								0.11		0.08	0.22	
Number of stations included in analysis, total and by depth strata								32	9	11	12	

SWEPT AREA ANALYSIS FROM STATION 181 TO STATION 252

B. LUANDA-BENGUELA. Demersal species shelf.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 50m	50-100m	100-200m	200-200m
Dentex macrophthalmus	3	5	6	2	3		51	5.13		2.39	11.51	
Synagrops microlepis	3	3	3	3			32	2.04	0.34	3.71	1.95	
Pentheroscion mbizi	1				1		5	1.52			4.02	
Chlorophthalmus atlanticus	3			2			14	1.14			3.00	
Umbrina canariensis	12	2		1			41	0.85		0.15	2.11	
Pagellus bellottii	15	3	1	1			54	0.83	0.10	2.18	0.24	
Merluccius polli	5	2		1			19	0.63	0.02		1.65	
Dentex angolensis	10	5	2				46	0.61		0.16	1.48	
Brachydeuterus auritus	8	2		1			30	0.55	0.28	1.43		
Sepia officinalis hierredda	7		1	1			24	0.50	1.60	0.06		
Dentex canariensis	15	1	2				49	0.48	0.52	0.99	0.01	
Anthias anthias	2		2				11	0.35		0.02	0.92	
Zenopsis conchifer	8	1	2				30	0.32		0.02	0.82	
Brotula barbata	7	3	1				30	0.25		0.05	0.63	
Atractoscion aequidens	4	1	1				16	0.22		0.59	0.06	
Pterothrissus belloci	11	1					32	0.20		0.07	0.45	
Zeus faber	18	1					51	0.19	0.08	0.12	0.33	
Illex coindetii	11	1	1				35	0.19			0.49	
Branchiostegus semifasciatus	2	3					14	0.19		0.39	0.16	
Sepia sp.	6	3					24	0.13	0.20	0.22		
Spicara alta	6		1				19	0.13		0.02	0.33	
Chelidonichthys capensis	8	1					24	0.12	0.01	0.11	0.21	
Boops boops	3	2					14	0.10		0.13	0.16	
Scorpaena angolensis	9	2					30	0.10	0.01	0.01	0.25	
Torpedo torpedo	6	1					19	0.10		0.06	0.20	
Todaropsis eblanae	7	1					22	0.09			0.23	
Raja miraletus	12						32	0.09	0.07	0.12	0.10	
POMACENTRIDAE		1					3	0.08	0.27			
Alloteuthis africana	5	1					16	0.07	0.06	0.14		
Uranoscopus polli	10						24	0.06		0.05	0.12	
Chelidonichthys gabonensis	6						16	0.05			0.12	
Sparus caeruleostictus	2	1					8	0.05		0.14	0.01	
Squatina oculata	5						14	0.05		0.02	0.11	
Epinephelus goreensis	6						16	0.05		0.02	0.11	
Epinephelus aeneus	3	1					11	0.05	0.02	0.01	0.10	
MACROURIDAE	2	1					8	0.05			0.12	
Lutjanus goreensis		1					3	0.05	0.17			
Citharus linguatula	19						51	0.05		0.05	0.08	
Parapenaeopsis atlantica		1					3	0.03	0.09			
Parapenaeus longirostris, fem.	3						8	0.02		0.02	0.03	
Parapenaeus longirostris	3						8	0.02			0.05	
Parapenaeus longirostris, male	3						8	0.01			0.01	
Penaeus notialis	1						3					
Other fish								0.63	0.43	0.51	0.87	
Sum all species								18.37	4.27	13.96	33.04	
Sum Snappers								0.06	0.20			
Sum Groupers								0.11	0.02	0.05	0.22	
Sum Grunts								0.57	0.31	1.47		
Sum Croakers								2.65	0.03	0.75	6.31	
Sum Seabreams								7.30	0.67	6.07	13.57	
Sum Sharks								0.07		0.02	0.16	
Sum Rays								0.26	0.15	0.29	0.32	
Sum Squids								1.02	1.87	0.46	0.77	
Sum commercial shrimps								0.08	0.09	0.02	0.09	
Number of stations included in analysis, total and by depth strata								37	11	12	14	

SWEPT AREA ANALYSIS FROM STATION 108 TO STATION 180

C. CABINDA-LUANDA. Demersal species slope.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 200-300m	300-400m	400-500m	500-500m
Chlorophthalmus atlanticus	12	3	3	3	1		76	4.17	5.56	6.53		
Synagrops microlepis	7	2	4	3			55	2.71	6.74	1.13		
Merluccius polli	6	10	6	2			79	2.24	0.94	4.22	1.47	
Nematocarcinus africanus	5	1	3	2			38	1.81		2.05	3.55	
Centrophorus granulosus	7	2		1			34	0.83	0.13	0.09	2.45	
MACROURIDAE	14	8					76	0.67	0.14	1.01	0.89	
Dentex angolensis	3	6	1				34	0.65	1.69	0.18	0.01	
GOBIIDAE	2		2				14	0.42	1.23			
Pterothrissus belloci	10	2	1				45	0.31	0.76	0.13		
Miracorvina angolensis	3		1				14	0.22	0.65			
Parapenaeus longirostris, fem.	14	1					52	0.20	0.31	0.28		
Zenopsis conchifer	8	1					31	0.13	0.36	0.01		
Hoplostethus mediterraneus	3	2					17	0.13			0.41	
Squatina aculeata	1	1					7	0.12	0.34			
Parapenaeus longirostris, male	15						52	0.10	0.20	0.10		
LOPHIIDAE	14						48	0.10	0.02	0.13	0.16	
Conger conger	1	1					7	0.10	0.28			
Gephyroberyx darwini		1					3	0.09	0.26			
Illex coindetii	13						45	0.09	0.06	0.18	0.01	
S H A R K S	3	1					14	0.07	0.01	0.19		
Brotula barbata	2	1					10	0.07	0.21			
Todaropsis eblanae	10						34	0.06	0.11	0.06	0.01	
Scorpaena normani	3	1					14	0.06	0.14	0.03		
GONOSTOMATIDAE	8						28	0.06		0.01	0.17	
Hoplostethus atlanticus		1					3	0.05		0.14		
Centroscymnus crepidater		1					3	0.05			0.16	
Aristeus varidens, male	8						28	0.04			0.13	
Aristeus varidens, female	8						28	0.03		0.01	0.10	
Solenocera africana	3						10	0.01	0.01	0.01		
Glyphus marsupialis	3						10				0.01	
Parapenaeus longirostris	3						10		0.01	0.01		
Plesionika martia	1						3			0.01		
Parapandalus narval	1						3					
Aristeus varidens	4						14			0.01		
Other fish								0.68	0.71	0.60	0.83	
Sum all species								16.27	20.87	17.12	10.36	
Sum Snappers												
Sum Groupers											0.01	
Sum Grunts												
Sum Croakers								0.25	0.74	0.01	0.01	
Sum Seabreams								0.72	1.69	0.18	0.23	
Sum Sharks								1.12	0.49	0.35	2.67	
Sum Rays								0.04	0.06		0.04	
Sum Squids								0.20	0.19	0.26	0.14	
Sum												
Sum commercial shrimps								2.19	0.53	2.48	3.79	
Number of stations included in analysis, total and by depth strata								29	10	10	9	

SWEPT AREA ANALYSIS FROM STATION 108 TO STATION 180

C. CABINDA-LUANDA. Demersal species slope cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 500-600m	600-800m	800-800m	800-800m
Nematocarcinus africanus	3		3	1			58	3.05	5.96	0.15		
MACROURIDAE	4	4	4				100	2.25	1.21	3.30		
Hoplostethus cadenati	5	1	1				58	0.83	0.62	1.05		
GONOSTOMATIDAE	8	3					92	0.65	0.86	0.45		
Hoplostethus mediterraneus	2		1				25	0.49	0.04	0.93		
Scyllarides herklotsii	10						83	0.33	0.23	0.42		
Merluccius polli	4	1					42	0.23	0.43	0.04		
Aristeus varidens, female	8						67	0.13	0.17	0.08		
Centrophorus sp.	3	1					33	0.11	0.18	0.03		
Geryon maritae	8						67	0.11	0.06	0.16		
Aristeus varidens, male	7						58	0.10	0.13	0.06		
Paromola cuvieri	1						8	0.07		0.15		
Hoplostethus sp.	2						17	0.06	0.10	0.02		
OPHICHTHIDAE	2						17	0.05	0.02	0.08		
ALEPOCEPHALIDAE	1						8	0.05		0.10		
Glyphus marsupialis	4						33	0.02		0.03		
Aristeus varidens	3						25	0.01	0.01	0.01		
Solenocera africana	1						8					
Plesiopenaeus edwardsianus	1						8					
Other fish								0.26	0.22	0.31		
Sum all species								8.80	10.24	7.37		
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks								0.21	0.34	0.05		
Sum Rays								0.04		0.10		
Sum Squids								0.02	0.01	0.03		
Sum commercial shrimps								3.31	6.27	0.33		
Number of stations included in analysis, total and by depth strata								12	6	6		

SWEPT AREA ANALYSIS FROM STATION 181 TO STATION 252

D. LUANDA-BENGUELA. Demersal species slope.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 200-300m	300-400m	400-500m	500-500m
Chlorophthalmus atlanticus	9	2	1	5	2		76	6.34	16.45	2.94	0.04	
Pentheroscion mbizi	2		2		1		20	2.98	9.29	0.01		
Merluccius polli	6	11	4	1			88	2.63	4.07	1.78	2.13	
Hoplostethus cadenati	5	3	3				44	1.09		0.94	2.35	
Dentex macrophthalmus	1	1	1	1			16	0.87	2.73			
Synagrops microlepis	3	2		1			24	0.66	2.00	0.07		
Nematocarcinus africanus	6	4	1				44	0.57	0.01	0.26	1.48	
Laemonema laureysi	5	6					40	0.53	0.03	0.68	0.88	
Gephyroberyx darwini	7		1				32	0.51	0.17	1.24	0.03	
MACROURIDAE	17	3					76	0.47	0.44	0.52	0.45	
Pterothrissus belloci	9	5					56	0.46	0.74	0.61		
Erythrocles monodi	1		1				8	0.36	1.11			
Parapenaeus longirostris, fem.	8	4					48	0.28	0.54	0.30		
Centrophorus granulosus	4	2					24	0.28	0.28	0.27	0.31	
GOBIIDAE		1	1				8	0.24	0.58		0.18	
S H A R K S	8	2					40	0.22		0.05	0.63	
Parapenaeus longirostris, male	9	2					44	0.19	0.42	0.15		
Aristeus varidens, female	8	1					36	0.17		0.01	0.50	
GONOSTOMATIDAE	7	2					36	0.17		0.02	0.49	
Zenopsis conchifer	12	1					48	0.16	0.44	0.05	0.01	
Deepwater fish mixture		1					4	0.10		0.27		
Aristeus varidens, male	9						36	0.08		0.01	0.25	
LOPHIIDAE	12						48	0.08		0.09	0.15	
Illex coindetii	13						52	0.07	0.04	0.06	0.09	
Geryon maritae	12						48	0.07	0.02	0.09	0.10	
Todaropsis eblanae	5						20	0.05	0.15	0.01		
Parapenaeus longirostris	2						8	0.02	0.05			
Plesiopenaeus edwardsianus	2						8	0.01		0.03		
Solenocera africana	4						16			0.01		
Glyphus marsupialis	4						16				0.01	
Aristeus varidens	1						4					
Other fish								0.68	0.91	0.77	0.35	
Sum all species								20.34	40.47	11.24	10.43	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers								2.99	9.32	0.01		
Sum Seabreams								0.93	2.91			
Sum Sharks								0.53	0.28	0.37	0.96	
Sum Rays								0.01	0.03	0.01		
Sum Squids								0.13	0.21	0.07	0.09	
Sum												
Sum commercial shrimps								1.32	1.02	0.77	2.24	
Number of stations included in analysis, total and by depth strata								25	8	9	8	

SWEPT AREA ANALYSIS FROM STATION 181 TO STATION 252

D. LUANDA-BENGUELA. Demersal species slope cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 500-600m	600-800m	800-800m	800-800m
Nematocarcinus africanus	4		1	1			75	2.64	4.11	0.21		
MACROURIDAE	4	2	2				100	1.77	0.70	3.55		
Merluccius polli	2	5					88	1.21	1.83	0.19		
GONOSTOMATIDAE	6	1	1				100	1.13	0.85	1.60		
Hoplostethus cadenati	6		2				100	1.03	0.83	1.36		
Aristeus varidens, female	6	1					88	0.31	0.35	0.25		
Scyllarides herklotsii	7						88	0.31	0.18	0.52		
Geryon maritae	6						75	0.16	0.15	0.17		
Aristeus varidens, male	7						88	0.14	0.18	0.08		
OPHIDIIDAE	2						25	0.14	0.11	0.19		
C R A B S	1						13	0.12		0.32		
Etmopterus spinax	5						63	0.11	0.16	0.01		
Centrophorus granulosus	1						13	0.11	0.17			
OPHICHTHIDAE	2						25	0.10	0.15	0.01		
Deepwater fish mixture	1						13	0.09	0.14			
CONGRIDAE	4						50	0.08	0.04	0.14		
LOPHIIDAE	5						63	0.06	0.08	0.03		
NETTASTOMATIDAE	2						13	0.05		0.13		
Plesiopenaeus edwardsianus	4						50	0.01	0.01	0.01		
Aristeus varidens	1						13	0.01		0.02		
Glyphus marsupialis	1						13			0.01		
Other fish								0.15	0.14	0.21		
Sum all species								9.73	10.18	9.01		
Sum Snappers												
Sum Groupers								0.01		0.03		
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks								0.22	0.33	0.01		
Sum Rays												
Sum Squids								0.08	0.10	0.07		
Sum												
Sum commercial shrimps								3.11	4.65	0.58		
Number of stations included in analysis, total and by depth strata								8	5	3		

SWEPT AREA ANALYSIS FROM STATION 108 TO STATION 180

A. CABINDA-LUANDA. Demersal species shelf.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 50m	50-100m	100-200m	200-200m
Brachydeuterus auritus		1	1	2			13	1.61	5.49	0.20		
Synagrops microlepis	3	2	4				28	0.90		1.43	1.10	
Dentex gibbosus	1			1			6	0.71	2.51		0.01	
Dentex angolensis	9	7	2				56	0.65		0.43	1.35	
Chlorophthalmus atlanticus	2	1		1			13	0.53			1.41	
Pagellus bellottii	10	6	1				53	0.52	1.06	0.64	0.02	
Umbrina canariensis	6	1		1			25	0.49		0.07	1.25	
Dentex canariensis	11	1	2				44	0.41	1.13	0.24	0.03	
Spicara alta	7	1	2				31	0.35		0.01	0.92	
Pterothrissus belloci	6	4	1				34	0.33		0.39	0.52	
Dentex congoensis	5	2	1				25	0.32		0.39	0.49	
Dentex barnardi	5		2				22	0.31	0.55	0.43	0.01	
Dentex macrophthalmus	7	2	1				31	0.31		0.02	0.81	
Brotula barbata	9	4					41	0.31		0.27	0.57	
Pentheroscion mbizi	1	1	1				9	0.29	0.16	0.71		
Boops boops	17		1				56	0.28	0.81	0.10	0.05	
Galeoides decadactylus	1		1				6	0.22	0.78			
Miracorvina angolensis	3	1	1				16	0.21		0.20	0.37	
Epinephelus aeneus	3	4					22	0.20	0.31	0.28	0.05	
Raja miraletus	13	2					47	0.20	0.16	0.32	0.14	
Sepia sp.	12	2					44	0.19	0.35	0.27		
Epinephelus haifensis			1				3	0.18			0.48	
Branchiostegus semifasciatus	10	1					34	0.16		0.19	0.25	
Sepia officinalis hierredda	5	1					19	0.14	0.37	0.06	0.03	
Alloteuthis africana	2		1				9	0.14		0.40		
Sparus caeruleostictus	4	2					19	0.12	0.28	0.11		
Zenopsis conchifer	10						31	0.11		0.04	0.26	
Zeus faber	16						44	0.09	0.12	0.09	0.07	
Sparus pagrus africanus	6	1					22	0.09	0.17	0.09	0.03	
Pseudotolithus typus	1	1					6	0.09	0.30	0.03		
Citharus linguatula	18						56	0.09	0.03	0.06	0.17	
Chelidonichthys gabonensis	5	1					19	0.07		0.03	0.15	
Sparus auriga	5						16	0.07	0.14	0.07	0.01	
Uranoscopus polli	11						34	0.06	0.01	0.07	0.10	
Parapenaeus longirostris, fem.	5	1					19	0.06		0.05	0.12	
Epinephelus goreensis	2	1					9	0.06	0.04		0.13	
Argyrosomus hololepidotus	5						16	0.06	0.09	0.09		
Pomadasys incisus	3	1					13	0.06	0.06	0.12		
Anthias anthias	1	1					6	0.06			0.16	
Stromateus fiatola	4						13	0.05	0.09	0.07		
Illex coindetii	12						38	0.05		0.02	0.11	
Scorpaena angolensis	7						22	0.05		0.05	0.08	
Rhinobatos sp.		1					3	0.05	0.19			
Parapenaeus longirostris, male	5	1					19	0.04		0.02	0.10	
Penaeus notialis, female	1							0.01		0.01		
Penaeus notialis, male	1						3					
Parapenaeus longirostris	1						3					
Other fish								0.56	0.88	0.68	0.39	
Sum all species								11.86	16.08	8.75	11.74	
Sum Snappers												
Sum Groupers								0.47	0.45	0.30	0.66	
Sum Grunts								1.71	5.63	0.37	0.01	
Sum Croakers								1.19	0.67	1.14	1.63	
Sum Seabreams								3.79	6.65	2.52	2.81	
Sum Sharks								0.04		0.14		
Sum Rays								0.34	0.49	0.50	0.15	
Sum Squids								0.58	0.74	0.79	0.26	
Sum commercial shrimps								0.11		0.08	0.22	
Number of stations included in analysis, total and by depth strata								32	9	11	12	

SWEPT AREA ANALYSIS FROM STATION 181 TO STATION 252

B. LUANDA-BENGUELA. Demersal species shelf.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 50m	50-100m	100-200m	200-200m
Dentex macrophthalmus	3	5	6	2	3		51	5.13		2.39	11.51	
Synagrops microlepis	3	3	3	3			32	2.04	0.34	3.71	1.95	
Pentheroscion mbizi	1				1		5	1.52			4.02	
Chlorophthalmus atlanticus	3			2			14	1.14			3.00	
Umbrina canariensis	12	2		1			41	0.85		0.15	2.11	
Pagellus bellottii	15	3	1	1			54	0.83	0.10	2.18	0.24	
Merluccius polli	5	2		1			19	0.63	0.02		1.65	
Dentex angolensis	10	5	2				46	0.61		0.16	1.48	
Brachydeuterus auritus	8	2		1			30	0.55	0.28	1.43		
Sepia officinalis hierredda	7		1	1			24	0.50	1.60	0.06		
Dentex canariensis	15	1	2				49	0.48	0.52	0.99	0.01	
Anthias anthias	2		2				11	0.35		0.02	0.92	
Zenopsis conchifer	8	1	2				30	0.32		0.02	0.82	
Brotula barbata	7	3	1				30	0.25		0.05	0.63	
Atractoscion aequidens	4	1	1				16	0.22		0.59	0.06	
Pterothrissus belloci	11	1					32	0.20		0.07	0.45	
Zeus faber	18	1					51	0.19	0.08	0.12	0.33	
Illex coindetii	11	1	1				35	0.19			0.49	
Branchiostegus semifasciatus	2	3					14	0.19		0.39	0.16	
Sepia sp.	6	3					24	0.13	0.20	0.22		
Spicara alta	6		1				19	0.13		0.02	0.33	
Chelidonichthys capensis	8	1					24	0.12	0.01	0.11	0.21	
Boops boops	3	2					14	0.10		0.13	0.16	
Scorpaena angolensis	9	2					30	0.10	0.01	0.01	0.25	
Torpedo torpedo	6	1					19	0.10		0.06	0.20	
Todaropsis eblanae	7	1					22	0.09			0.23	
Raja miraletus	12						32	0.09	0.07	0.12	0.10	
POMACENTRIDAE		1					3	0.08	0.27			
Alloteuthis africana	5	1					16	0.07	0.06	0.14		
Uranoscopus polli	10						24	0.06		0.05	0.12	
Chelidonichthys gabonensis	6						16	0.05			0.12	
Sparus caeruleostictus	2	1					8	0.05		0.14	0.01	
Squatina oculata	5						14	0.05		0.02	0.11	
Epinephelus goreensis	6						16	0.05		0.02	0.11	
Epinephelus aeneus	3	1					11	0.05	0.02	0.01	0.10	
MACROURIDAE	2	1					8	0.05			0.12	
Lutjanus goreensis		1					3	0.05	0.17			
Citharus linguatula	19						51	0.05		0.05	0.08	
Parapenaeopsis atlantica		1					3	0.03	0.09			
Parapenaeus longirostris, fem.	3						8	0.02		0.02	0.03	
Parapenaeus longirostris	3						8	0.02			0.05	
Parapenaeus longirostris, male	3						8	0.01			0.01	
Penaeus notialis	1						3					
Other fish								0.63	0.43	0.51	0.87	
Sum all species								18.37	4.27	13.96	33.04	
Sum Snappers								0.06	0.20			
Sum Groupers								0.11	0.02	0.05	0.22	
Sum Grunts								0.57	0.31	1.47		
Sum Croakers								2.65	0.03	0.75	6.31	
Sum Seabreams								7.30	0.67	6.07	13.57	
Sum Sharks								0.07		0.02	0.16	
Sum Rays								0.26	0.15	0.29	0.32	
Sum Squids								1.02	1.87	0.46	0.77	
Sum commercial shrimps								0.08	0.09	0.02	0.09	
Number of stations included in analysis, total and by depth strata								37	11	12	14	

SWEPT AREA ANALYSIS FROM STATION 108 TO STATION 180

C. CABINDA-LUANDA. Demersal species slope.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm						% incidence	Mean dens.	Mean densities by bottom depth strata t/nm²			
	>0	10	30	100	300	1000		t/nm²	200-300m	300-400m	400-500m	500-500m
Chlorophthalmus atlanticus	12	3	3	3	1		76	4.17	5.56	6.53		
Synagrops microlepis	7	2	4	3			55	2.71	6.74	1.13		
Merluccius polli	6	10	6	2			79	2.24	0.94	4.22	1.47	
Nematocarcinus africanus	5	1	3	2			38	1.81		2.05	3.55	
Centrophorus granulosus	7	2		1			34	0.83	0.13	0.09	2.45	
MACROURIDAE	14	8					76	0.67	0.14	1.01	0.89	
Dentex angolensis	3	6	1				34	0.65	1.69	0.18	0.01	
GOBIIDAE	2		2				14	0.42	1.23			
Pterothrissus belloci	10	2	1				45	0.31	0.76	0.13		
Miracorvina angolensis	3		1				14	0.22	0.65			
Parapenaeus longirostris, fem.	14	1					52	0.20	0.31	0.28		
Zenopsis conchifer	8	1					31	0.13	0.36	0.01		
Hoplostethus mediterraneus	3	2					17	0.13			0.41	
Squatina aculeata	1	1					7	0.12	0.34			
Parapenaeus longirostris, male	15						52	0.10	0.20	0.10		
LOPHIIDAE	14						48	0.10	0.02	0.13	0.16	
Conger conger	1	1					7	0.10	0.28			
Gephyroberyx darwini		1					3	0.09	0.26			
Illex coindetii	13						45	0.09	0.06	0.18	0.01	
S H A R K S	3	1					14	0.07	0.01	0.19		
Brotula barbata	2	1					10	0.07	0.21			
Todaropsis eblanae	10						34	0.06	0.11	0.06	0.01	
Scorpaena normani	3	1					14	0.06	0.14	0.03		
GONOSTOMATIDAE	8						28	0.06		0.01	0.17	
Hoplostethus atlanticus		1					3	0.05		0.14		
Centroscymnus crepidater		1					3	0.05			0.16	
Aristeus varidens, male	8						28	0.04			0.13	
Aristeus varidens, female	8						28	0.03		0.01	0.10	
Solenocera africana	3						10	0.01	0.01	0.01		
Glyphus marsupialis	3						10				0.01	
Parapenaeus longirostris	3						10		0.01	0.01		
Plesionika martia	1						3			0.01		
Parapandalus narval	1						3					
Aristeus varidens	4						14			0.01		
Other fish								0.68	0.71	0.60	0.83	
Sum all species								16.27	20.87	17.12	10.36	
Sum Snappers												
Sum Groupers											0.01	
Sum Grunts												
Sum Croakers								0.25	0.74	0.01	0.01	
Sum Seabreams								0.72	1.69	0.18	0.23	
Sum Sharks								1.12	0.49	0.35	2.67	
Sum Rays								0.04	0.06		0.04	
Sum Squids								0.20	0.19	0.26	0.14	
Sum commercial shrimps								2.19	0.53	2.48	3.79	
Number of stations included in analysis, total and by depth strata								29	10	10	9	

SWEPT AREA ANALYSIS FROM STATION 108 TO STATION 180

C. CABINDA-LUANDA. Demersal species slope cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 500-600m	600-800m	800-800m	800-800m
Nematocarcinus africanus	3		3	1			58	3.05	5.96	0.15		
MACROURIDAE	4	4	4				100	2.25	1.21	3.30		
Hoplostethus cadenati	5	1	1				58	0.83	0.62	1.05		
GONOSTOMATIDAE	8	3					92	0.65	0.86	0.45		
Hoplostethus mediterraneus	2		1				25	0.49	0.04	0.93		
Scyllarides herklotsii	10						83	0.33	0.23	0.42		
Merluccius polli	4	1					42	0.23	0.43	0.04		
Aristeus varidens, female	8						67	0.13	0.17	0.08		
Centrophorus sp.	3	1					33	0.11	0.18	0.03		
Geryon maritae	8						67	0.11	0.06	0.16		
Aristeus varidens, male	7						58	0.10	0.13	0.06		
Paromola cuvieri	1						8	0.07		0.15		
Hoplostethus sp.	2						17	0.06	0.10	0.02		
OPHICHTHIDAE	2						17	0.05	0.02	0.08		
ALEPOCEPHALIDAE	1						8	0.05		0.10		
Glyphus marsupialis	4						33	0.02		0.03		
Aristeus varidens	3						25	0.01	0.01	0.01		
Solenocera africana	1						8					
Plesiopenaeus edwardsianus	1						8					
Other fish								0.26	0.22	0.31		
Sum all species								8.80	10.24	7.37		
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks								0.21	0.34	0.05		
Sum Rays								0.04		0.10		
Sum Squids								0.02	0.01	0.03		
Sum												
Sum commercial shrimps								3.31	6.27	0.33		
Number of stations included in analysis, total and by depth strata								12	6	6		

SWEPT AREA ANALYSIS FROM STATION 181 TO STATION 252

D. LUANDA-BENGUELA. Demersal species slope.

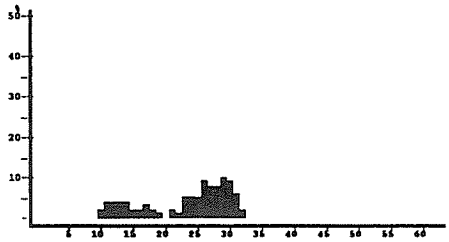
SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 200-300m	300-400m	400-500m	500-500m
Chlorophthalmus atlanticus	9	2	1	5	2		76	6.34	16.45	2.94	0.04	
Pentheroscion mbizi	2		2		1		20	2.98	9.29	0.01		
Merluccius polli	6	11	4	1			88	2.63	4.07	1.78	2.13	
Hoplostethus cadenati	5	3	3				44	1.09		0.94	2.35	
Dentex macrophthalmus	1	1	1	1			16	0.87	2.73			
Synagrops microlepis	3	2		1			24	0.66	2.00	0.07		
Nematocarcinus africanus	6	4	1				44	0.57	0.01	0.26	1.48	
Laemonema laureysi	5	6					40	0.53	0.03	0.68	0.88	
Gephyroberyx darwini	7		1				32	0.51	0.17	1.24	0.03	
MACROURIDAE	17	3					76	0.47	0.44	0.52	0.45	
Pterothrissus belloci	9	5					56	0.46	0.74	0.61		
Erythrocles monodi	1		1				8	0.36	1.11			
Parapenaeus longirostris, fem.	8	4					48	0.28	0.54	0.30		
Centrophorus granulosus	4	2					24	0.28	0.28	0.27	0.31	
GOBIIDAE		1	1				8	0.24	0.58		0.18	
S H A R K S	8	2					40	0.22		0.05	0.63	
Parapenaeus longirostris, male	9	2					44	0.19	0.42	0.15		
Aristeus varidens, female	8	1					36	0.17		0.01	0.50	
GONOSTOMATIDAE	7	2					36	0.17		0.02	0.49	
Zenopsis conchifer	12	1					48	0.16	0.44	0.05	0.01	
Deepwater fish mixture		1					4	0.10		0.27		
Aristeus varidens, male	9						36	0.08		0.01	0.25	
LOPHIIDAE	12						48	0.08		0.09	0.15	
Illex coindetii	13						52	0.07	0.04	0.06	0.09	
Geryon maritae	12						48	0.07	0.02	0.09	0.10	
Todaropsis eblanae	5						20	0.05	0.15	0.01		
Parapenaeus longirostris	2						8	0.02	0.05			
Plesiopenaeus edwardsianus	2						8	0.01		0.03		
Solenocera africana	4						16			0.01		
Glyphus marsupialis	4						16				0.01	
Aristeus varidens	1						4					
Other fish								0.68	0.91	0.77	0.35	
Sum all species								20.34	40.47	11.24	10.43	
Sum Snappers												
Sum Groupers												
Sum Grunts												
Sum Croakers								2.99	9.32	0.01		
Sum Seabreams								0.93	2.91			
Sum Sharks								0.53	0.28	0.37	0.96	
Sum Rays								0.01	0.03	0.01		
Sum Squids								0.13	0.21	0.07	0.09	
Sum commercial shrimps								1.32	1.02	0.77	2.24	
Number of stations included in analysis, total and by depth strata								25	8	9	8	

SWEPT AREA ANALYSIS FROM STATION 181 TO STATION 252

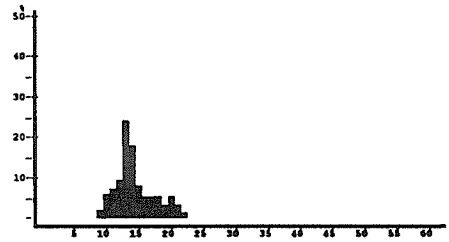
D. LUANDA-BENGUELA. Demersal species slope cont.

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² 500-600m	600-800m	800-800m	800-800m
Nematocarcinus africanus	4		1	1			75	2.64	4.11	0.21		
MACROURIDAE	4	2	2				100	1.77	0.70	3.55		
Merluccius polli	2	5					88	1.21	1.83	0.19		
GONOSTOMATIDAE	6	1	1				100	1.13	0.85	1.60		
Hoplostethus cadenati	6		2				100	1.03	0.83	1.36		
Aristeus varidens, female	6	1					88	0.31	0.35	0.25		
Scyllarides herklotsii	7						88	0.31	0.18	0.52		
Geryon maritae	6						75	0.16	0.15	0.17		
Aristeus varidens, male	7						88	0.14	0.18	0.08		
OPHIDIIDAE	2						25	0.14	0.11	0.19		
C R A B S	1						13	0.12		0.32		
Etmopterus spinax	5						63	0.11	0.16	0.01		
Centrophorus granulosus	1						13	0.11	0.17			
OPHICHTHIDAE	2						25	0.10	0.15	0.01		
Deepwater fish mixture	1						13	0.09	0.14			
CONGRIDAE	4						50	0.08	0.04	0.14		
LOPHIIDAE	5						63	0.06	0.08	0.03		
NETTASTOMATIDAE	2						13	0.05		0.13		
Plesiopenaeus edwardsianus	4						50	0.01	0.01	0.01		
Aristeus varidens	1						13	0.01		0.02		
Glyphus marsupialis	1						13			0.01		
Other fish								0.15	0.14	0.21		
Sum all species								9.73	10.18	9.01		
Sum Snappers												
Sum Groupers								0.01		0.03		
Sum Grunts												
Sum Croakers												
Sum Seabreams												
Sum Sharks								0.22	0.33	0.01		
Sum Rays												
Sum Squids								0.08	0.10	0.07		
Sum												
Sum commercial shrimps								3.11	4.65	0.58		
Number of stations included in analysis, total and by depth strata								8	5	3		

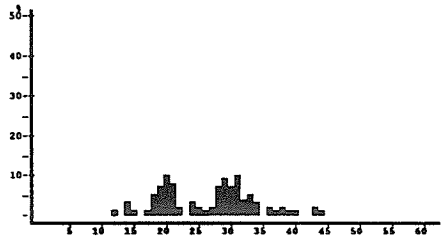
Annex II. Length distributions of main species



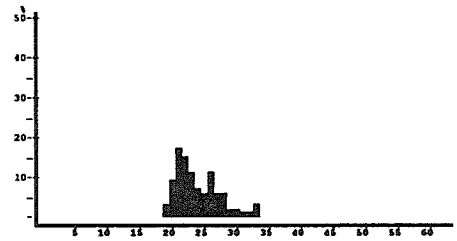
Dentex angolensis
Cabinda - Luanda
MEAN LENGTH = 23.75cm N= 757
NUMBER OF SUBSAMPLES : 19



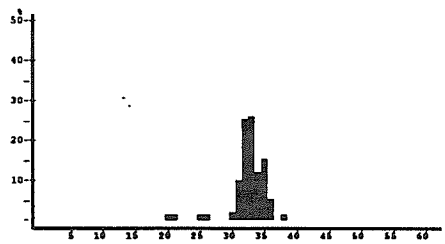
Dentex congoensis
Cabinda - Luanda
MEAN LENGTH = 14.82cm N= 394
NUMBER OF SUBSAMPLES : 6



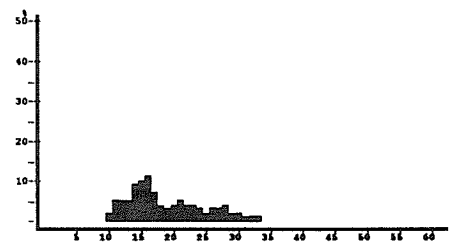
Dentex canariensis
Cabinda - Luanda
MEAN LENGTH = 27.08cm N= 163
NUMBER OF SUBSAMPLES : 4



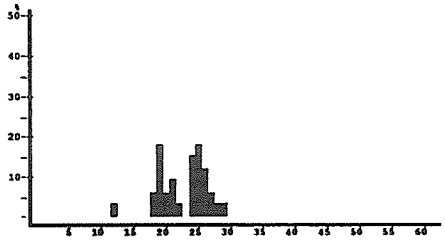
Dentex macrophthalmus
Cabinda - Luanda
MEAN LENGTH = 24.32cm N= 277
NUMBER OF SUBSAMPLES : 3



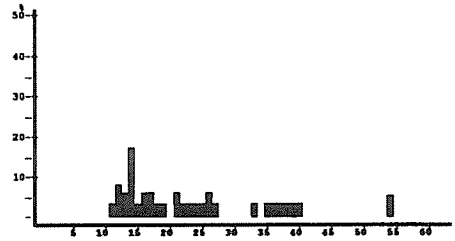
Dentex barnardi
Cabinda - Luanda
MEAN LENGTH = 33.29cm N= 101
NUMBER OF SUBSAMPLES : 3



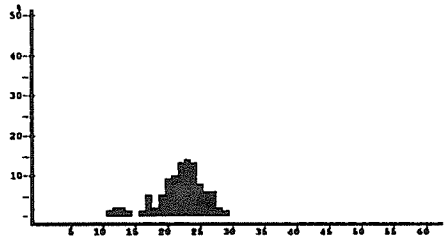
Pagellus bellottii
Cabinda - Luanda
MEAN LENGTH = 19.14cm N= 810
NUMBER OF SUBSAMPLES : 10



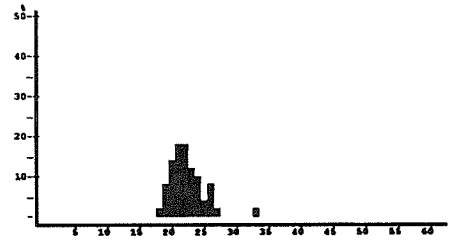
Sparus auriga
Cabinda - Luanda
MEAN LENGTH = 23.21cm N= 34
NUMBER OF SUBSAMPLES : 1



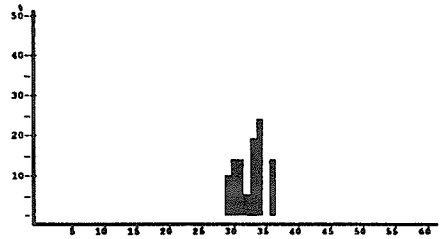
Sparus caeruleostictus
Cabinda - Luanda
MEAN LENGTH = 23.20cm N= 36
NUMBER OF SUBSAMPLES : 2



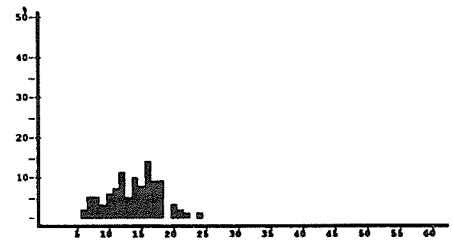
Miracorvina angolensis
Cabinda - Luanda
MEAN LENGTH = 22.30cm N= 312
NUMBER OF SUBSAMPLES : 3



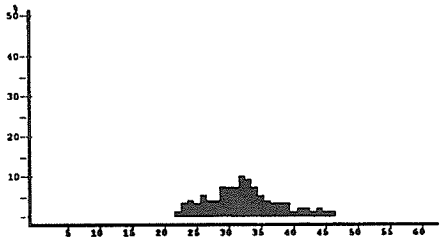
Pentheroscion mbizi
Cabinda - Luanda
MEAN LENGTH = 22.81cm N= 49
NUMBER OF SUBSAMPLES : 1



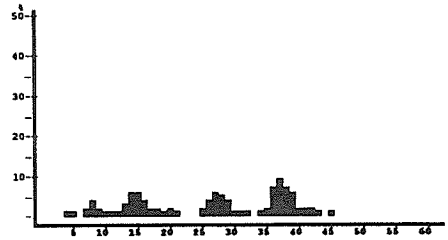
Umbrina canariensis
Cabinda - Luanda
MEAN LENGTH = 33.02cm N= 21
NUMBER OF SUBSAMPLES : 1



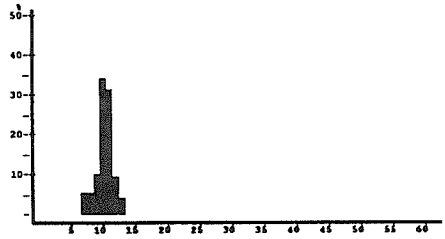
Brachydeuterus auritus
Cabinda - Luanda
MEAN LENGTH = 14.32cm N= 173
NUMBER OF SUBSAMPLES : 1



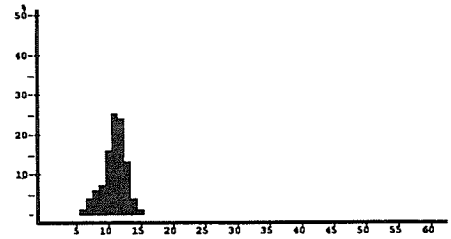
Merluccius polli
Cabinda - Luanda
MEAN LENGTH = 32.48cm N= 864
NUMBER OF SUBSAMPLES : 19



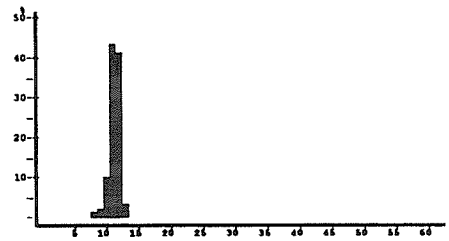
Trachurus trecae
Cabinda - Luanda
MEAN LENGTH = 27.05cm N= 501
NUMBER OF SUBSAMPLES : 15



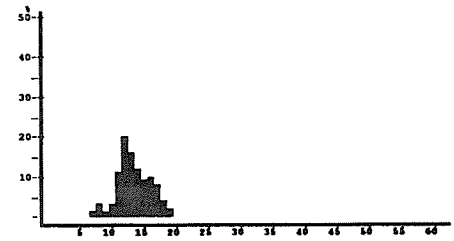
Parapenaeus longirostris, male
Cabinda - Luanda
MEAN LENGTH = 10.76cm N= 1068
NUMBER OF SUBSAMPLES : 21



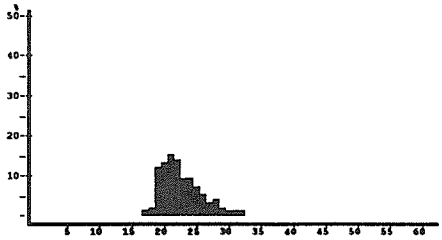
Parapenaeus longirostris, fem.
Cabinda - Luanda
MEAN LENGTH = 11.46cm N= 1757
NUMBER OF SUBSAMPLES : 21



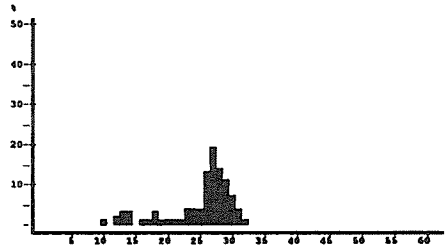
Aristeus varidens, male
Cabinda - Luanda
MEAN LENGTH = 11.78cm N= 601
NUMBER OF SUBSAMPLES : 15



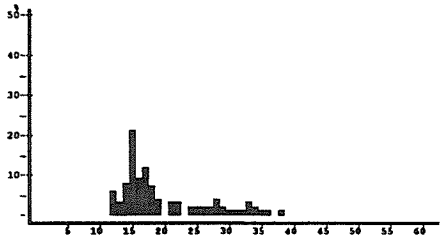
Aristeus varidens, female
Cabinda - Luanda
MEAN LENGTH = 14.00cm N= 506
NUMBER OF SUBSAMPLES : 16



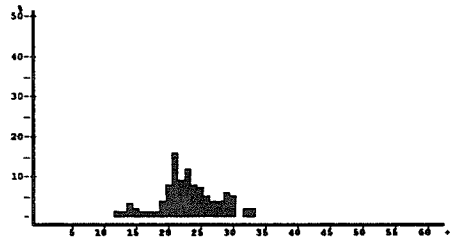
Dentex macrophthalmus
Luanda - Benguela
MEAN LENGTH = 22.96cm N= 1091
NUMBER OF SUBSAMPLES : 22
SAMPLES FOUND BETWEEN ST. NO. 184 AND 252.



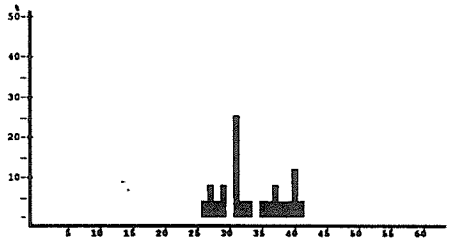
Dentex angolensis
Luanda - Benguela
MEAN LENGTH = 25.81cm N= 246
NUMBER OF SUBSAMPLES : 8



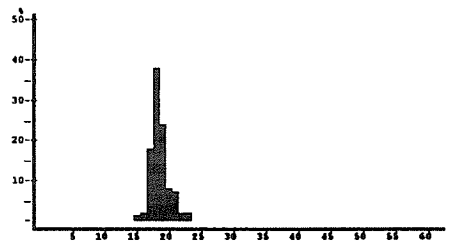
Dentex canariensis
Luanda - Benguela
MEAN LENGTH = 19.83cm N= 166
NUMBER OF SUBSAMPLES : 5



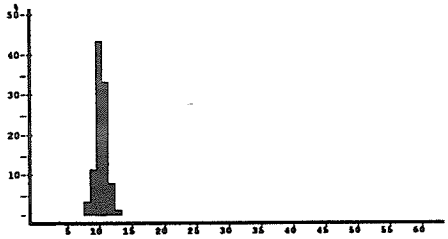
Pagellus bellottii
Luanda - Benguela
MEAN LENGTH = 23.78cm N= 293
NUMBER OF SUBSAMPLES : 8



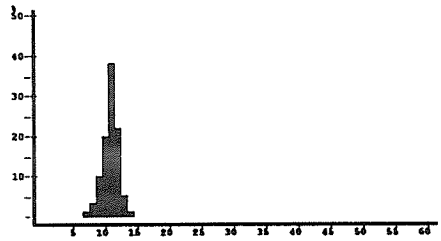
Umbrina canariensis
Luanda - Benguela
MEAN LENGTH = 33.83cm N= 24
NUMBER OF SUBSAMPLES : 1



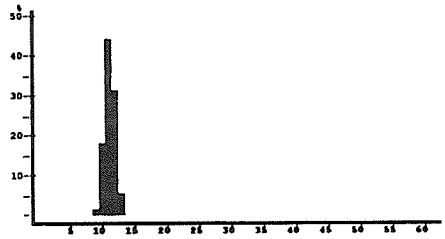
Brachydeuterus auritus
Luanda - Benguela
MEAN LENGTH = 19.01cm N= 184
NUMBER OF SUBSAMPLES : 1



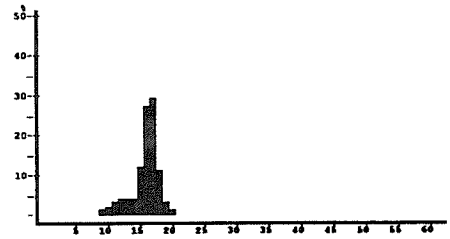
Parapenaeus longirostris, male
Luanda - Benguela
MEAN LENGTH = 10.85cm N= 649
NUMBER OF SUBSAMPLES : 15



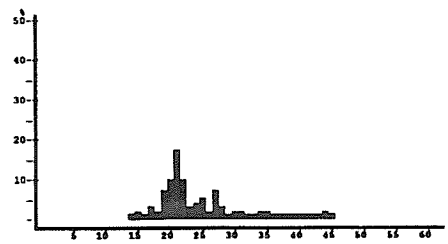
Parapenaeus longirostris, fem.
Luanda - Benguela
MEAN LENGTH = 11.29cm N= 1185
NUMBER OF SUBSAMPLES : 16



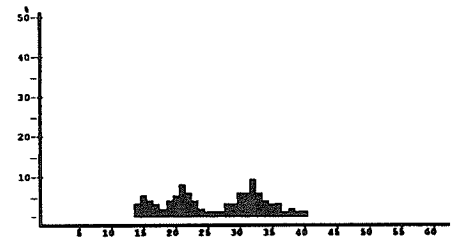
Aristeus varidens, male
Luanda - Benguela
MEAN LENGTH = 11.74cm N= 748
NUMBER OF SUBSAMPLES : 16



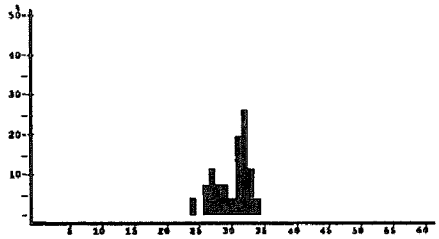
Aristeus varidens, female
Luanda - Benguela
MEAN LENGTH = 16.28cm N= 708
NUMBER OF SUBSAMPLES : 16



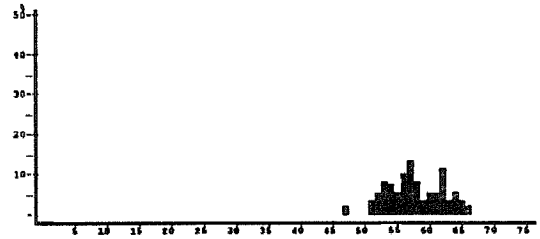
Merluccius polli
Luanda - Benguela
MEAN LENGTH = 25.60cm N= 746
NUMBER OF SUBSAMPLES : 23



Trachurus trecae
Luanda - Benguela
MEAN LENGTH = 26.16cm N= 1839
NUMBER OF SUBSAMPLES : 23



Selene dorsalis
Luanda - Benguela
MEAN LENGTH = 30.61cm N= 27
NUMBER OF SUBSAMPLES : 1



Sphyraena guachancho
Luanda - Benguela
MEAN LENGTH = 58.22cm N= 60
NUMBER OF SUBSAMPLES : 1

Annex III Records of fishing stations

PROJECT STATION: 108

DATE: 2/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 523
start stop duration Long E 435
TIME :06:17:00 06:47:00 30 (min) Purpose code: 3
LOG : 612.90 6130.50 1.50 Area code : 1
FDEPTH: 83 94 GearCond.code:
BDEPTH: 83 94 Validity code: 1
Towing dir: 280° Wire out: 300 m Speed: 32 kn*10

Sorted: 95 Kg *Total catch:* 243.04 *CATCH/HOUR:* 486.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	159.46	330	32.81	187
Synagrops microlepis	115.18	45966	23.70	
Miracorvina angolensis	66.12	688	13.60	188
Trichiurus lepturus	45.86	106	9.43	
Pterothrissus belloci	30.76	186	6.33	190
Sardinella aurita	19.46	42	4.00	189
Dentex angolensis	15.78	58	3.25	191
Sarda sarda	12.40	4	2.55	
Brotula barbata	6.22	16	1.28	
Citharus linguatula	4.84	96	1.00	
Stromateus fiatola	4.62	6	0.95	
Chelidonichthys gabonensis	1.48	10	0.30	
Cynoglossus senegalensis	1.22	6	0.25	
Zeus faber	0.90	6	0.19	
Pegusa lascaris	0.58	6	0.12	
Uranoscopus cadenati	0.30	26	0.06	
Illex coindetii	0.30	10	0.06	
Parapenaeus longirostris	0.26	48	0.05	
Merluccius polli	0.10	6	0.02	
Scorpaena normani	0.04	6	0.01	
Saurida brasiliensis	0.04	16	0.01	
Todaropsis eblanae	0.04	6	0.01	
Total	485.96		99.98	

PROJECT STATION: 109

DATE: 2/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 526
start stop duration Long E 1137
TIME :08:15:00 08:45:00 30 (min) Purpose code: 3
LOG :5138.30 5139.40 1.10 Area code : 1
FDEPTH: 168 200 GearCond.code:
BDEPTH: 168 200 Validity code: 1
Towing dir: 350° Wire out: 500 m Speed: 24 kn*10

Sorted: 100 Kg Total catch: 250.23 CATCH/HOUR: 500.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Diaphus sp.	204.86	93378	40.93	
Miracorvina angolensis	78.16	466	15.62	193
Trichiurus lepturus	74.66	122	14.92	
Epinephelus goreensis	33.80	2	6.75	
Brotula barbata	25.88	28	5.17	
Dentex angolensis	22.58	84	4.51	192
Pterothrissus belloci	15.06	94	3.01	
Zenopsis conchifer	10.26	14	2.05	
Umbrina canariensis	9.62	18	1.92	
Uranoscopus polli	6.62	42	1.32	
Parapenaeus longirostris, fem.	5.56	486	1.11	194
Branchiostegus semifasciatus	4.94	4	0.99	
Parapenaeus longirostris, male	2.94	466	0.59	195
Synagrops microlepis	2.66	122	0.53	
Scorpaena normani	1.26	18	0.25	
Grammoplites gruveli	0.40	4	0.08	
Todaropsis eblanae	0.32	10	0.06	
Coelorinchus coelorhincus	0.24	10	0.05	
Sepia sp.	0.22	10	0.04	
Citharus linguatula	0.18	10	0.04	
Spicara alta	0.12	4	0.02	
Trachurus trecae	0.04	32	0.01	
Selene dorsalis	0.02	4		
Total	500.40		99.97	

PROJECT STATION: 110

DATE: 2/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 5525
start stop duration Long E 1134
TIME :09:47:00 10:17:00 30 (min) Purpose code: 3
LOG :5143.00 5144.40 1.40 Area code : 1
FDEPTH: 286 312 GearCond.code:
BDEPTH: 286 312 Validity code: 1
Towing dir: 359° Wire out: 950 m Speed: 30 kn*10

Sorted: 62 Kg Total catch: 82.82 CATCH/HOUR: 165.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	39.46	210	23.82	196
Scorpaena normani	36.64	208	22.12	
Krill	32.12		19.39	
Pterothrissus belloci	11.42	64	6.89	
Diaphus sp.	7.90	1508	4.77	
MACROURIDAE	7.84	114	4.73	
Zenopsis conchifer	5.94	8	3.59	
Miracorvina angolensis	5.22	18	3.15	
Parapenaeus longirostris, fem.	4.78	482	2.89	198
Chlorophthalmus atlanticus	2.26	42	1.36	
Parapenaeus longirostris, male	1.90	192	1.15	197
Trachurus trecae	1.50	16	0.91	
S H A R K S	1.50	18	0.91	
Coelorinchus coelorhincus	1.14	22	0.69	
Aristeus varidens	0.94	6	0.57	
Todarodes sp.	0.94	18	0.57	
Pegusa lascaris	0.82	24	0.50	
Pontinus accraensis	0.58	2	0.35	
Illex coindetii	0.50	176	0.30	
Malacocephalus occidentalis	0.42	6	0.25	
Hoplostethus mediterraneus	0.40	2	0.24	
Raja clavata	0.38	8	0.23	
Cynoponticus ferox	0.34	8	0.21	
Peristedion cataphractum	0.26	10	0.16	
Synagrops microlepis	0.24	176	0.14	
Sepia sp.	0.14	62	0.08	
Parapandalus narval	0.06	6	0.04	
Total	165.64		100.01	

PROJECT STATION: 111

DATE: 2/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 5315
start stop duration Long E 1130
TIME :12:07:00 12:37:00 30 (min) Purpose code: 3
LOG :5155.90 5157.60 1.70 Area code : 1
FDEPTH: 398 434 GearCond.code:
BDEPTH: 398 434 Validity code: 1
Towing dir: 356° Wire out:1200 m Speed: 31 kn*10

Sorted: 68 Kg *Total catch:* 444.32 *CATCH/HOUR:* 888.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Centrophorus granulosus	670.00	50	75.40	
Merluccius polli	69.00	164	7.76	
Centroscymnus crepidater	48.60	116	5.47	
Nematocarcinus africanus	30.40		3.42	
MACROURIDAE	23.64	576	2.66	
Hoplostethus mediterraneus	13.92	260	1.57	
Trichiurus lepturus	11.00	124	1.24	
GONOSTOMATIDAE	7.12	244	0.80	
Raja clavata	4.56	12	0.51	
Lophius vaillanti	4.40	4	0.50	
Aristeus varidens, female	1.56	120	0.18	199
Illex coindetii	1.04	8	0.12	
Aristeus varidens, male	0.76	68	0.09	200
Scyllarides herklotsii	0.64	52	0.07	
Total	886.64		99.79	

PROJECT STATION: 112

DATE: 2/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 531
start stop duration Long E 1130
TIME :16:31:00 17:01:00 30 (min) Purpose code: 3
LOG :5172.80 5174.50 1.70 Area code : 1
FDEPTH: 543 598 GearCond.code:
BDEPTH: 543 598 Validity code: 1
Towing dir: 22° Wire out:1500 m Speed: 30 kn*10

Sorted: 38 Kg Total catch: 64.66 CATCH/HOUR: 129.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Centrophorus sp.	35.10	72	27.14	
MACROURIDAE	30.90	490	23.89	
Aristeus varidens, male	14.86	1982	11.49	201
RHINOCHIMAERIDAE	14.00	2	10.83	
Hoplostethus mediterraneus	7.80	154	6.03	
Aristeus varidens, female	7.66	510	5.92	202
GONOSTOMATIDAE	5.80	162	4.48	
Geryon maritae	4.80	10	3.71	
OPHICHTHIDAE	4.78	88	3.70	
Halosaurus sp.	3.58	84	2.77	
Glyphus marsupialis	0.04	4	0.03	
Total	129.32		99.99	

PROJECT STATION: 113

DATE: 2/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 5538
start stop duration Long E 1116
TIME :19:31:00 20:01:00 30 (min) Purpose code: 3
LOG :5186.10 5187.60 1.50 Area code : 1
FDEPTH: 765 830 GearCond.code:
BDEPTH: 765 830 Validity code: 1
Towing dir: ° Wire out:2100 m Speed: 30 kn*10

Sorted: 25 Kg Total catch: 57.76 CATCH/HOUR: 115.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MACROURIDAE	52.38	904	45.34	
ALEPOCEPHALIDAE	17.08	68	14.79	
OPHICHTHIDAE	14.76	176	12.78	
Aristeus varidens, female	7.84	466	6.79	204
Glyphus marsupialis	5.80	198	5.02	
Halosaurus sp.	5.52	84	4.78	
Scyllarides herklotsii	5.30	400	4.59	
Hoplostethus sp.	3.92	64	3.39	
Aristeus varidens, male	1.70	272	1.47	203
Centrophorus sp.	1.16	10	1.00	
Total	115.46		99.95	

PROJECT STATION: 114

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 547
start stop duration Long E 1120
TIME :01:30:00 02:00:00 30 (min) Purpose code: 3
LOG :5256.70 5228.30 1.60 Area code : 1
FDEPTH: 455 516 GearCond.code:
BDEPTH: 455 516 Validity code: 1
Towing dir: 180° Wire out:1200 m Speed: 32 kn*10

Sorted: 48 Kg Total catch: 144.32 CATCH/HOUR: 288.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus mediterraneus	210.00	2610	72.75	
Nematocarcinus africanus	45.00	6672	15.59	
Centrophorus granulosus	15.30	36	5.30	
MACROURIDAE	5.82	168	2.02	
GONOSTOMATIDAE	4.80	168	1.66	
Merluccius polli	3.96	6	1.37	
Centroscymnus crepidater *	3.72	72	1.29	
Aristeus varidens, male	0.48	78	0.17	205
Conger conger	0.36	6	0.12	
Scyllarides herklotsii	0.30	72	0.10	
Aristeus varidens, female	0.18	12	0.06	206
Total	289.92		100.43	

PROJECT STATION: 115

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 550

	start	stop	duration				Long E 1126
TIME	:06:33:00	07:03:00	30	(min)	Purpose code:	3	
LOG	:5247.30	5249.00	1.80		Area code :	1	
FDEPTH:	302	321			GearCond.code:		
BDEPTH:	302	321			Validity code:	1	

Towing dir: 300° Wire out: 900 m Speed: 30 kn*10

Sorted: 61 Kg Total catch: 185.33 CATCH/HOUR: 370.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	90.00	132	24.28	
Merluccius polli	87.60	450	23.63	207
Dentex angolensis	62.40	318	16.83	208
MISCELLANEOUS	26.20		7.07	
Parapenaeus longirostris, fem.	21.36	2010	5.76	209
Pterothrissus belloci	18.30	90	4.94	
MACROURIDAE	17.76	510	4.79	
Trichiurus lepturus	12.48	96	3.37	
Scorpaena normani	11.40	420	3.08	
Todaropsis eblanae	7.56	60	2.04	
Centrophorus granulosus	6.00	12	1.62	
Parapenaeus longirostris, male	5.22	522	1.41	210
Aristeus varidens	1.20	336	0.32	
Schedophilus pemarco	1.08	6	0.29	
Synagrops microlepis	0.84	12	0.23	
Sepia sp.	0.60	30	0.16	
CONGRIDAE	0.42	6	0.11	
Hoplostethus mediterraneus	0.24	12	0.06	
Total	370.66		99.99	

PROJECT STATION: 116

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 548

	start	stop	duration				Long E 1131
TIME	:08:40:00	09:10:00	30	(min)	Purpose code:	3	
LOG	:5259.00	5260.50	1.50		Area code :	1	
FDEPTH:	205	222			GearCond.code:		
BDEPTH:	205	222			Validity code:	1	

Towing dir: 330° Wire out: 600 m Speed: 31 kn*10

Sorted: 142 Kg Total catch: 303.50 CATCH/HOUR: 607.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Miracorvina angolensis	158.52	442	26.12	212
Pterothrissus belloci	94.42	654	15.56	
Synagrops microlepis	93.88	3378	15.47	
Dentex angolensis	89.90	260	14.81	211
Conger conger	83.24	10	13.71	
Trichiurus lepturus	23.40	96	3.86	
GOBIIDAE	14.14	4990	2.33	
Zeus faber	10.84	102	1.79	
Parapenaeus longirostris, fem.	6.28	378	1.03	213
Brotula barbata	6.26	10	1.03	
Umbrina canariensis	5.58	10	0.92	
Squatina oculata	4.14	10	0.68	
Uranoscopus polli	3.82	22	0.63	
Chelidonichthys gabonensis	2.70	26	0.44	
Chlorophthalmus atlanticus	2.54	64	0.42	
Todaropsis eblanae	1.92	32	0.32	
Parapenaeus longirostris, male	1.54	196	0.25	214
Raja clavata	1.32	10	0.22	
Spicara alta	1.06	10	0.17	
Scorpaena normani	0.52	6	0.09	
Sepia sp.	0.42	22	0.07	
Peristedion cataphractum	0.42	10	0.07	
SOLEIDAE	0.14	10	0.02	
Total	607.00		100.01	

PROJECT STATION: 117

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 548

	start	stop	duration				Long E 1142
TIME	:11:38:00	12:08:00	30	(min)	Purpose code:	3	
LOG	:5274.60	5275.90	1.30		Area code :	1	
FDEPTH:	96	89			GearCond.code:		
BDEPTH:	96	89			Validity code:	1	

Towing dir: 120° Wire out: 600 m Speed: 31 kn*10

Sorted: 85 Kg Total catch: 284.49 CATCH/HOUR: 568.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	180.04	1716	31.64	217
Trichiurus lepturus	88.02	406	15.47	
Synagrops microlepis	83.36	23084	14.65	
Pterothrissus belloci	38.68	266	6.80	
Squatina oculata	36.34	6	6.39	
Trachurus trecae	27.68	106	4.86	219
Dentex angolensis	21.00	84	3.69	218
Uranoscopus polli	19.68	200	3.46	
Brotula barbata	13.40	20	2.36	
Zeus faber	12.88	14	2.26	
Citharus linguatula	7.60	140	1.34	
Chelidonichthys gabonensis	7.34	66	1.29	
Zenopsis conchifer	6.40	6	1.12	
Parapenaeus longirostris, fem.	6.20	846	1.09	216
Scorpaena normani	4.60	74	0.81	
Scorpaena stephanica	4.60	6	0.81	
GOBIIDAE	3.26	240	0.57	
Dentex canariensis	2.26	14	0.40	
Parapenaeus longirostris, male	2.06	412	0.36	215
Illex coindetii	1.26	86	0.22	
Sepia officinalis hierredda	0.74	106	0.13	
Saurida brasiliensis	0.46	80	0.08	
Todaropsis eblanae	0.46	20	0.08	
Boops boops	0.26	14	0.05	
Chlorophthalmus atlanticus	0.20	14	0.04	
Lepidotrigla carolae	0.20	14	0.04	
Total	568.98		100.01	

PROJECT STATION: 118

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 547

	start	stop	duration				Long E 1153
TIME	:13:40:00	14:10:00	30	(min)	Purpose code:	3	
LOG	:5286.70	5288.20	1.50		Area code :	1	
FDEPTH:	53	54			GearCond.code:		
BDEPTH:	53	54			Validity code:	1	

Towing dir: 165° Wire out: 200 m Speed: 30 kn*10

Sorted: 88 Kg Total catch: 353.43 CATCH/HOUR: 706.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	252.26	932	35.69	220
Trichiurus lepturus	150.70	4216	21.32	
Brachydeuterus auritus	67.10	924	9.49	
T U R T L E S	60.00	2	8.49	
Trachurus trecae	37.40	152	5.29	221
Pentheroscion mbizi	26.04	448	3.68	
Sphyraena guachancho	20.16	14	2.85	
Pterothrissus belloci	20.16	118	2.85	
Scomber japonicus	17.16	74	2.43	
Raja miraletus	10.26	30	1.45	
Pseudotolithus senegalensis	9.90	8	1.40	
Cynoglossus senegalensis	8.58	22	1.21	
Pseudotolithus typus	8.50	8	1.20	
Penaeus notialis, female	4.46	96	0.63	222
Pagusa lascaris	3.22	30	0.46	
Citharus linguatula	3.08	132	0.44	
Torpedo torpedo	3.08	8	0.44	
Sepia officinalis hierredda	1.40	52	0.20	
Parapenaeus longirostris, fem.	0.96	140	0.14	225
Aulopus cadenati	0.74	22	0.10	
Brotula barbata	0.58	14	0.08	
Scorpaena normani	0.44	14	0.06	
Penaeus notialis, male	0.36	22	0.05	223
Parapenaeus longirostris, male	0.08	16	0.01	224
Scyllarides herklotsii	0.08	8	0.01	
Panulirus regius	0.08	8	0.01	
Squilla mantis	0.08	14	0.01	
Total	706.86		99.99	

PROJECT STATION: 119

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 695

	start	stop	duration				Long E 1201
TIME	:17:00:00	17:30:00	30	(min)	Purpose code:	3	
LOG	:5313.00	5314.50	1.50		Area code :	1	
FDEPTH:	40	44			GearCond.code:		
BDEPTH:	40	44			Validity code:	1	

Towing dir: 180° Wire out: 150 m Speed: 31 kn*10

Sorted: 145 Kg Total catch: 620.91 CATCH/HOUR: 1241.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex gibbosus	676.72	420	54.49	
Boops boops	183.22	7906	14.75	
Dentex barnardi	147.52	136	11.88	
Epinephelus aeneus	47.00	6	3.78	
Sparus pagrus africanus	37.06	42	2.98	
Sphyraena sphyraena	33.90	72	2.73	
Sparus caeruleostictus	30.66	42	2.47	
Raja miraletus	29.08	64	2.34	
Dentex canariensis	19.10	42	1.54	
Torpedo torpedo	10.18	10	0.82	
Epinephelus goreensis	10.00	2	0.81	
Zeus faber	7.02	10	0.57	
Argyrosomus hololepidotus	5.90	2	0.48	
Parapristipoma octolineatum	2.30	2	0.19	
Loligo sp.	0.72	2940	0.06	
Plectorhinchus mediterraneus	0.62	10	0.05	
Chaetodon hoefleri	0.52	22	0.04	
Trachurus trecae	0.30	240	0.02	
Total	1241.82		100.00	

PROJECT STATION: 120

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 611

	start	stop	duration				Long E 1138
TIME	:20:18:00	20:48:00	30	(min)	Purpose code:	3	
LOG	:5338.40	5339.50	1.10		Area code :	1	
FDEPTH:	116	126			GearCond.code:		
BDEPTH:	116	126			Validity code:	1	

Towing dir: 265° Wire out: 350 m Speed: 25 kn*10

Sorted: 113 Kg Total catch: 113.35 CATCH/HOUR: 226.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	82.80	1038	36.52	226
Chelidonichthys gabonensis	30.70	480	13.54	
Dentex angolensis	28.20	116	12.44	227
Citharus linguatula	13.00	248	5.73	
Todaropsis eblanae	9.50	384	4.19	
Pterothrissus belloci	9.20	60	4.06	
Spicara alta	8.60	16	3.79	
Brotula barbata	5.92	4	2.61	
Miracorvina angolensis	5.10	6	2.25	
Umbrina canariensis	4.70	14	2.07	
Synagrops microlepis	4.60	250	2.03	
Trichiurus lepturus	4.22	8	1.86	
Boops boops	3.40	198	1.50	
Pagellus bellottii	3.10	74	1.37	228
CONGRIDAE	2.72	186	1.20	
Dentex barnardi	2.50	2	1.10	
Uranoscopus polli	1.62	18	0.71	
Branchiostegus semifasciatus	1.10	2	0.49	
Trachurus trecae	0.94	26	0.41	
Scomberomorus tritor	0.84	4	0.37	
Zeus faber	0.82	2	0.36	
Zeus faber	0.82	2	0.36	
Serranus cabrilla	0.78	30	0.34	
Dicologoglossa hexophthelma	0.42	12	0.19	
Peristedion cataphractum	0.24	6	0.11	
Sepia sp.	0.18	4	0.08	
MACROURIDAE	0.10	4	0.04	
Total	226.12		99.72	

PROJECT STATION: 121

DATE: 3/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 615
start stop duration Long E 1120
TIME :23:45:00 00:15:00 30 (min) Purpose code: 3
LOG : 538.70 5360.00 1.30 Area code : 1
FDEPTH: 556 552 GearCond.code:
BDEPTH: 556 552 Validity code: 1
Towing dir: 180° Wire out:1650 m Speed: 27 kn*10

Sorted: 22 Kg Total catch: 67.08 CATCH/HOUR: 134.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	98.40		73.35	
Hoplostethus cadenati	8.34	132	6.22	
GONOSTOMATIDAE	6.30	180	4.70	
Diaphus sp.	6.00	150	4.47	
Aristeus varidens, female	5.94	456	4.43	230
MACROURIDAE	3.24	54	2.42	
Aristeus varidens, male	1.74	216	1.30	229
Etmopterus spinax	1.26	18	0.94	
Scyllarides herklotsii	0.96	120	0.72	
Geryon maritae	0.66	6	0.49	
Peristedion cataphractum	0.60	18	0.45	
Lepidotrigla carolae	0.42	18	0.31	
Sepia sp.	0.30	12	0.22	
Total	134.16		100.02	

PROJECT STATION: 122

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 620
start stop duration Long E 1117
TIME :02:30:00 03:00:00 30 (min) Purpose code: 3
LOG :5369.70 5371.00 1.30 Area code : 1
FDEPTH: 710 708 GearCond.code:
BDEPTH: 710 708 Validity code: 1
Towing dir: 175° Wire out:2000 m Speed: 27 kn*10

Sorted: 27 Kg Total catch: 63.03 CATCH/HOUR: 126.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MACROURIDAE	70.20	744	55.69	
Paromola cuvieri	22.80	8	18.09	
GONOSTOMATIDAE	15.90	300	12.61	
Scyllarides herklotsii	9.48	486	7.52	
Hoplostethus cadenati	5.70	48	4.52	
Aristeus varidens	0.96	42	0.76	
Illex coindetii	0.78	6	0.62	
Plesiopenaeus edwardsianus	0.24	12	0.19	
Total	126.06		100.00	

PROJECT STATION: 123

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 633
start stop duration Long E 1131
TIME :05:52:00 06:22:00 30 (min) Purpose code: 3
LOG :5388.00 5389.50 1.50 Area code : 1
FDEPTH: 445 445 GearCond.code:
BDEPTH: 445 445 Validity code: 1
Towing dir: 130° Wire out:1300 m Speed: 30 kn*10

Sorted: 57 Kg Total catch: 57.65 CATCH/HOUR: 115.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MACROURIDAE	57.16	1062	49.58	
Merluccius polli	38.00	104	32.96	231
Scyllarides herklotsii	4.36	376	3.78	
LOPHIIDAE	3.04	80	2.64	
Centrophorus granulosus	2.84	58	2.46	
Hoplostethus cadenati	2.56	40	2.22	
EXOCOETIDAE	1.40	4	1.21	
Raja sp.	1.08	2	0.94	
Nematocarcinus africanus	1.06	218	0.92	
Glyphus marsupialis	0.96	16	0.83	
Aristeus varidens, female	0.82	90	0.71	232
Halosaurus sp.	0.66	26	0.57	
OPHIDIIDAE	0.58	2	0.50	
BELONIDAE	0.34	2	0.29	
Chlorophthalmus atlanticus	0.14	2	0.12	
Aristeus varidens, male	0.14	20	0.12	233
Total	115.14		99.85	

PROJECT STATION: 124

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 629
start stop duration Long E 1135
TIME :07:15:00 07:50:00 35 (min) Purpose code: 3
LOG :5394.10 5395.90 1.80 Area code : 1
FDEPTH: 350 319 GearCond.code:
BDEPTH: 350 319 Validity code: 1
Towing dir: 340° Wire out:1080 m Speed: 32 kn*10

Sorted: 57 Kg Total catch: 231.84 CATCH/HOUR: 397.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	185.83	3127	46.76	
Merluccius polli	94.63	514	23.81	234
Illex coindetii	25.65	226	6.45	
MACROURIDAE	24.34	487	6.12	
Synagrops microlepis	13.37		3.36	
MISCELLANEOUS	12.69		3.19	
Ariomma sp.	8.98	315	2.26	
Parapenaeus longirostris, male	7.06	898	1.78	235
Parapenaeus longirostris, fem.	5.14	583	1.29	236
Pterothrissus belloci	4.80	21	1.21	
Trichiurus lepturus	3.63	117	0.91	
BOMOLIDAE	3.02	7	0.76	
LOPHIIDAE	2.13	21	0.54	
Sepia sp.	1.71	27	0.43	
GRAMMICOLEPIDAE	1.51	55	0.38	
Dicologoglossa sp.	1.44	41	0.36	
Peristedion cataphractum	0.07	7	0.02	
Total	396.00		99.63	

PROJECT STATION: 125

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 630
start stop duration Long E 1140
TIME :09:35:00 10:05:00 30 (min) Purpose code: 3
LOG :5403.70 5405.20 1.50 Area code : 1
FDEPTH: 210 220 GearCond.code:
BDEPTH: 210 220 Validity code: 1
Towing dir: 160° Wire out: 600 m Speed: 29 kn*10

Sorted: 61 Kg Total catch: 356.63 CATCH/HOUR: 713.26

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	227.14	7986	31.85	
MYCTOPHIDAE	214.50	138908	30.07	
Trichiurus lepturus	92.40	352	12.95	
Brotula barbata	51.32	22	7.20	
Dentex angolensis	36.30	98	5.09	237
Chlorophthalmus atlanticus	22.44	780	3.15	
Zeus faber	14.30	76	2.00	
Illex coindetii	10.34	274	1.45	
Spicara alta	9.78	52	1.37	
Uranoscopus polli	8.36	32	1.17	
Chelidonichthys gabonensis	7.58	32	1.06	
Grammoplites gruveli	5.60	22	0.79	
Pterothrissus belloci	5.38	10	0.75	
Peristedion cataphractum	4.94	44	0.69	
Parapenaeus longirostris	1.42	384	0.20	
MACROURIDAE	0.76	10	0.11	
Scomberomorus tritor	0.54	10	0.08	
Citharus linguatula	0.22	10	0.03	
Total	713.32		100.01	

PROJECT STATION: 126

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 631
start stop duration Long E 1147
TIME :11:15:00 11:48:00 33 (min) Purpose code: 3
LOG :5412.50 5414.10 1.60 Area code : 1
FDEPTH: 122 118 GearCond.code:
BDEPTH: 122 118 Validity code: 1
Towing dir: 100° Wire out: 360 m Speed: 32 kn*10

Sorted: 100 Kg Total catch: 100.83 CATCH/HOUR: 183.33

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	154.00	409	84.00	239
Trachurus trecae	24.36	44	13.29	238
Trichiurus lepturus	3.18	5	1.73	
Illex coindetii	0.35	4	0.19	
Zenopsis conchifer	0.07	2	0.04	
Total	181.96		99.25	

PROJECT STATION: 127

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 627
start stop duration Long E 1203
TIME :13:50:00 14:20:00 30 (min) Purpose code: 3
LOG :5429.60 5431.10 1.50 Area code : 1
FDEPTH: 72 68 GearCond.code:
BDEPTH: 72 68 Validity code: 1
Towing dir: 140° Wire out: 240 m Speed: 30 kn*10

Sorted: 122 Kg Total catch: 352.00 CATCH/HOUR: 704.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	246.68	632	35.04	244
Alloteuthis africana	124.58	52820	17.70	
Trichiurus lepturus	36.86	34	5.24	
Epinephelus aeneus	30.50	6	4.33	247
Argyrosomus hololepidotus	26.52	12	3.77	246
Trachurus trecae	25.70	264	3.65	240
Branchiostegus semifasciatus	22.94	56	3.26	
Umbrina canariensis	22.84	56	3.24	
Dentex canariensis	20.24	22	2.88	
Decapterus rhonchus	18.04	16	2.56	
Sepia officinalis hierredda	17.60	28	2.50	
Dentex congoensis	17.12	182	2.43	242
Boops boops	15.36	676	2.18	
Sparus auriga	14.04	82	1.99	
Pagellus bellottii	12.22	94	1.74	243
Brotula barbata	11.06	12	1.57	
Sparus caerulaostictus	9.90	6	1.41	245
Dentex angolensis	9.02	44	1.28	241
Chloroscombrus chrysurus	4.68	28	0.66	
Sphyraena guachancho	4.40	12	0.63	
Chaetodon hoefleri	3.42	22	0.49	
Raja miraletus	3.36	6	0.48	
Scomber japonicus	2.70	12	0.38	
Zeus faber	1.54	6	0.22	
Fistularia petimba	1.38	6	0.20	
Scorpaena stephanica	0.78	6	0.11	
Chaetodon marcellae	0.40	12	0.06	
Todaropsis eblanae	0.12	6	0.02	
Total	704.00		100.02	

PROJECT STATION: 128

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 627
start stop duration Long E 1206
TIME :15:10:00 15:40:00 30 (min) Purpose code: 3
LOG :5435.80 5437.30 1.50 Area code : 1
FDEPTH: 47 46 GearCond.code:
BDEPTH: 47 46 Validity code: 1
Towing dir: 160° Wire out: 150 m Speed: 30 kn*10

Sorted: 146 Kg Total catch: 409.52 CATCH/HOUR: 819.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus rhonchus	648.40	560	79.17	249
Pagellus bellottii	52.92	392	6.46	250
Trachurus trecae	43.64	90	5.33	248
Sepia officinalis hierredda	29.08	84	3.55	
Trichiurus lepturus	24.92	22	3.04	
Sparus caeruleostictus	7.34	6	0.90	
Zeus faber	6.34	6	0.77	
Sphyraena guachancho	4.48	6	0.55	
Fistularia petimba	1.92	12	0.23	
Total	819.04		100.00	

PROJECT STATION: 129

DATE: 4/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 632
start stop duration Long E 1218
TIME :17:50:00 18:20:00 30 (min) Purpose code: 3
LOG :5455.50 5456.90 1.40 Area code : 1
FDEPTH: 23 24 GearCond.code:
BDEPTH: 23 24 Validity code: 1
Towing dir: 336° Wire out: 100 m Speed: 28 kn*10

Sorted: 63 Kg Total catch: 639.10 CATCH/HOUR: 1278.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	729.00	3460	57.03	252
Galeoides decadactylus	195.00	800	15.26	251
Pseudotolithus typus	76.00	60	5.95	
Trichiurus lepturus	71.00	600	5.55	
Pagellus bellottii	68.20	380	5.34	253
Trachurus trecae	35.60	1160	2.79	255
Ilisha africana	33.60	520	2.63	254
Sepia sp.	33.00	40	2.58	
Boops boops	9.00	480	0.70	
Sphyraena sphyraena	7.60	20	0.59	
Citharus linguatula	6.20	60	0.49	
Decapterus rhonchus	6.20	60	0.49	
Selene dorsalis	5.00	100	0.39	
Trachinus armatus	4.80	140	0.38	
Total	1280.20		100.17	

PROJECT STATION: 130

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 640
start stop duration Long E 1221
TIME :06:15:00 06:45:00 30 (min) Purpose code: 3
LOG :5477.40 5478.70 1.30 Area code : 1
FDEPTH: 20 21 GearCond.code:
BDEPTH: 20 21 Validity code: 1
Towing dir: 340° Wire out: 100 m Speed: 27 kn*10

Sorted: 102 Kg Total catch: 170.64 CATCH/HOUR: 341.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	90.36	284	26.48	256
Dentex canariensis	84.52	268	24.77	257
Sepia sp.	38.92	46	11.40	
Sparus caeruleostictus	31.08	116	9.11	258
Trachurus trecae	13.80	90	4.04	
Epinephelus alexandrinus *	12.20	6	3.57	
Bodianus speciosus	11.54	4	3.38	
Plectorhinchus mediterraneus	9.52	16	2.79	
Pseudupeneus prayensis	7.96	76	2.33	
Boops boops	6.36	414	1.86	
Sphyraena sphyraena	6.36	16	1.86	
Panulirus sp.	4.68	4	1.37	
Loligo sp.	4.42		1.30	
Balistes capriscus	3.32	30	0.97	
Fistularia petimba	2.84	10	0.83	
Trichiurus lepturus	2.52	6	0.74	
Galeoides decadactylus	2.44	4	0.71	
Chaetodon hoefleri	2.28	36	0.67	
Scorpaena stephanica	2.18	20	0.64	
Cephalopholis taeniops	1.62	4	0.47	
Uranoscopus polli	1.18	4	0.35	
BOTHIDAE	0.70	4	0.21	
Epinephelus goreensis	0.48	4	0.14	
Total	341.28		99.99	

PROJECT STATION: 131

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 644
start stop duration Long E 1212
TIME :09:22:00 09:52:00 30 (min) Purpose code: 3
LOG :5501.70 5503.30 1.50 Area code : 1
FDEPTH: 59 56 GearCond.code:
BDEPTH: 59 56 Validity code: 1
Towing dir: 340° Wire out: 200 m Speed: 30 kn*10

Sorted: 75 Kg Total catch: 150.22 CATCH/HOUR: 300.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex barnardi	121.80	248	40.54	259
Pagellus bellottii	88.20	1172	29.36	260
Epinephelus aeneus	41.80	12	13.91	
Sparus auriga	10.80	30	3.59	
Branchiostegus semifasciatus	8.60	4	2.86	
Sparus pagrus africanus	5.80	8	1.93	
Loligo sp.	5.16	2176	1.72	
Raja miraletus	4.04	8	1.34	
Dentex angolensis	3.60	8	1.20	
Dentex canariensis	2.80	4	0.93	
Erythrocles monodi	2.40	4	0.80	
Torpedo torpedo	1.60	4	0.53	
Chaetodon hoefleri	1.28	8	0.43	
Fistularia petimba	0.88	4	0.29	
Chelidonichthys capensis	0.84	8	0.28	
Scorpaena angolensis	0.52	4	0.17	
BOTHIDAE	0.32	4	0.11	
Total	300.44		99.99	

PROJECT STATION: 132

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 645
start stop duration Long E 1201
TIME :11:25:00 11:55:00 30 (min) Purpose code: 3
LOG :5514.80 5516.40 1.60 Area code : 1
FDEPTH: 79 80 GearCond.code:
BDEPTH: 79 80 Validity code: 1
Towing dir: 340° Wire out: 250 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 69.45 CATCH/HOUR: 138.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	52.10	612	37.51	261
Rhinobatos albomaculatus	23.00	8	16.56	
Dentex barnardi	23.00	54	16.56	262
Fistularia petimba	6.60	14	4.75	
Raja miraletus	5.26	10	3.79	
Sepia sp.	4.38	26	3.15	
Zeus faber	3.80	10	2.74	
Centrophorus granulosus	3.40	2	2.45	
Torpedo torpedo	3.10	6	2.23	
Trichiurus lepturus	2.54	2	1.83	
Dentex canariensis	2.42	8	1.74	
Chaetodon hoefleri	2.20	14	1.58	
Octopus vulgaris	1.84	2	1.32	
Trachurus trecae	1.52	10	1.09	
Chelidonichthys lucerna	1.24	8	0.89	
Alloteuthis africana	0.90	40	0.65	
Cynoponticus ferox	0.68	2	0.49	
Aluterus monoceros	0.36	4	0.26	
Saurida brasiliensis	0.32	96	0.23	
Lepidotrigla carolae	0.16	6	0.12	
Pegusa lascaris	0.02	2	0.01	
C R A B S	0.02	2	0.01	
Total	138.86		99.96	

PROJECT STATION: 133

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 646
start stop duration Long E 1152
TIME :13:16:00 13:46:00 30 (min) Purpose code: 3
LOG :5527.00 5528.50 1.50 Area code : 1
FDEPTH: 142 141 GearCond.code:
BDEPTH: 142 141 Validity code: 1
Towing dir: 340° Wire out: 450 m Speed: 30 kn*10

Sorted: 125 Kg Total catch: 377.01 CATCH/HOUR: 754.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Umbrina canariensis	321.30	702	42.61	263
Spicara alta	111.30	882	14.76	
Pterothrissus belloci	103.80	600	13.77	
Trachurus trecae	56.58	114	7.50	264
Dentex angolensis	48.00	132	6.37	266
Synagrops microlepis	21.60	8640	2.86	
Trichiurus lepturus	21.00	48	2.79	
Dentex congoensis	9.60	102	1.27	265
Illex coindetii	8.94	198	1.19	
Dentex macrophthalmus	7.44	24	0.99	
Octopus vulgaris	7.14	6	0.95	
Citharus linguatula	6.90	138	0.92	
Branchiostegus semifasciatus	6.18	6	0.82	
Lepidotrigla cadmani	4.98	48	0.66	
Raja straeleni	4.26	6	0.56	
Boops boops	3.72	126	0.49	
Sparus auriga	3.30	6	0.44	
Raja miraletus	3.24	6	0.43	
Pagellus bellottii	2.76	18	0.37	
Aulopus cadenati	1.74	30	0.23	
Uranoscopus polli	0.48	6	0.06	
Saurida brasiliensis	0.18	24	0.02	
Parapenaeus longirostris, fem.	0.18	54	0.02	268
Cynoglossus cadenati	0.18	24	0.02	
Chlorophthalmus atlanticus	0.06	24	0.01	
Parapenaeus longirostris, male	0.06	30	0.01	267
Total	754.92		100.12	

PROJECT STATION: 134

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 645
start stop duration Long E 1147
TIME :15:00:00 15:30:00 30 (min) Purpose code: 3
LOG :5534.90 5536.40 1.50 Area code : 1
FDEPTH: 241 241 GearCond.code:
BDEPTH: 241 241 Validity code: 1
Towing dir: 330° Wire out: 750 m Speed: 30 kn*10

Sorted: 64 Kg Total catch: 432.91 CATCH/HOUR: 865.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	503.10	10764	58.11	
Synagrops microlepis	162.50	9062	18.77	
Trichiurus lepturus	57.98	182	6.70	
Dentex angolensis	52.52	122	6.07	269
Squatina aculeata	30.00	2	3.46	
Zenopsis conchifer	21.58	182	2.49	
Todaropsis eblanae	13.40	104	1.55	
Pterothrissus belloci	10.14	52	1.17	
Merluccius polli	6.68	40	0.77	
Parapenaeus longirostris, fem.	5.08	728	0.59	271
Parapenaeus longirostris, male	2.60	494	0.30	270
Aulopus cadenati	1.04	26	0.12	
C R A B S	0.40	14	0.05	
Cynoglossus cadenati	0.14	14	0.02	
Scorpaena angolensis	0.14	14	0.02	
Total	867.30		100.19	

PROJECT STATION: 135

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 646
start stop duration Long E 1144
TIME :17:48:00 18:18:00 30 (min) Purpose code: 3
LOG :5546.00 5547.70 1.70 Area code : 1
FDEPTH: 347 340 GearCond.code:
BDEPTH: 347 340 Validity code: 1
Towing dir: 330° Wire out:1000 m Speed: 30 kn*10

Sorted: 57 Kg Total catch: 143.74 CATCH/HOUR: 287.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	165.76	2414	57.66	
Merluccius polli	38.26	296	13.31	274
MACROURIDAE	22.50	714	7.83	
Synagrops microlepis	13.50	464	4.70	
Trichiurus lepturus	11.00	110	3.83	
Parapenaeus longirostris, fem.	10.50	914	3.65	273
Scorpaena stephanica	10.30	280	3.58	
Illex coindetii	4.76	24	1.66	
LOPHIIDAE	3.30	54	1.15	
Plesionika martia	2.80	564	0.97	
Zenopsis conchifer	1.76	4	0.61	
Pterothrissus belloci	1.16	4	0.40	
BOTHIDAE	0.86	10	0.30	
Parapenaeus longirostris, male	0.40	60	0.14	272
Halosaurus sp.	0.26	4	0.09	
Geryon maritae	0.20	4	0.07	
Peristedion cataphractum	0.16	4	0.06	
Total	287.48		100.01	

PROJECT STATION: 136

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 645
start stop duration Long E 1140
TIME :19:55:00 20:25:00 30 (min) Purpose code: 3
LOG :5555.30 5556.60 1.30 Area code : 1
FDEPTH: 499 483 GearCond.code:
BDEPTH: 499 483 Validity code: 1
Towing dir: 350° Wire out:1500 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 111.28 CATCH/HOUR: 222.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus mediterraneus	53.20	1356	23.90	
MACROURIDAE	35.00	872	15.73	
Trichiurus lepturus	31.80	716	14.29	
LOPHIIDAE	22.92	68	10.30	
Centrophorus granulosus	22.60	72	10.15	
Scyllarides herklotsii	15.12	1080	6.79	
Merluccius polli	12.60	40	5.66	
Paromola cuvieri	9.28	2	4.17	
Aristeus varidens, female	5.16	312	2.32	276
GONOSTOMATIDAE	4.72	208	2.12	
Aristeus varidens, male	3.20	388	1.44	275
Nematocarcinus africanus	2.76	992	1.24	
Todaropsis eblanae	1.36	12	0.61	
Halosaurus sp.	1.00	24	0.45	
Scorpaena angolensis	0.76	12	0.34	
Chlorophthalmus atlanticus	0.60	12	0.27	
ZEIDAE	0.40	8	0.18	
Peristedion cataphractum	0.08	4	0.04	
Total	222.56		100.00	

PROJECT STATION: 137

DATE: 5/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 647
start stop duration Long E 1138
TIME :21:57:00 22:28:00 31 (min) Purpose code: 3
LOG :5561.80 5563.30 1.50 Area code : 1
FDEPTH: 607 622 GearCond.code:
BDEPTH: 607 622 Validity code: 1
Towing dir: 170° Wire out:1800 m Speed: 30 kn*10

Sorted: 49 Kg Total catch: 123.83 CATCH/HOUR: 239.67

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus mediterraneus	156.06	5410	65.11	
MACROURIDAE	31.65	406	13.21	
Scyllarides herklotsii	19.12	1868	7.98	
GONOSTOMATIDAE	11.09	323	4.63	
Merluccius polli	6.54	19	2.73	
Nematocarcinus africanus	5.71	1161	2.38	
Centrophorus sp.	3.19	33	1.33	
Geryon maritae	1.61	4	0.67	
Illex coindetii	1.35	4	0.56	
Aristeus varidens, female	1.03	43	0.43	278
Aristeus varidens, male	0.87	106	0.36	277
Halosaurus sp.	0.83	10	0.35	
LOPHIIDAE	0.39	10	0.16	
Glyphus marsupialis	0.35	23	0.15	
Solenocera africana	0.19	10	0.08	
Peristedion cataphractum	0.19	4	0.08	
Total	240.17		100.21	

PROJECT STATION: 138

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 652
start stop duration Long E 1136
TIME :00:20:00 00:50:00 30 (min) Purpose code: 3
LOG :5569.50 5571.10 1.60 Area code : 1
FDEPTH: 767 771 GearCond.code:
BDEPTH: 767 771 Validity code: 1
Towing dir: 170° Wire out:2100 m Speed: 30 kn*10

Sorted: 19 Kg Total catch: 82.87 CATCH/HOUR: 165.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MACROURIDAE	101.60	1480	61.30	
Scyllarides herklotsii	15.20	824	9.17	
Raja alba	12.96	8	7.82	
GONOSTOMATIDAE	11.76	920	7.10	
LOPHIIDAE	10.64	16	6.42	
Hoplostethus cadenati	4.56	24	2.75	
CONGRIDAE	4.08	24	2.46	
Geryon maritae	3.42	8	2.06	
Aristeus varidens, female	1.52	56	0.92	279
Total	165.74		100.00	

PROJECT STATION: 139

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 708
start stop duration Long E 1151
TIME :04:18:00 04:48:00 30 (min) Purpose code: 3
LOG :5593.20 5594.70 1.50 Area code : 1
FDEPTH: 527 527 GearCond.code:
BDEPTH: 527 527 Validity code: 1
Towing dir: 140° Wire out:1500 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 136.69 CATCH/HOUR: 273.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	87.50	2570	32.01	
GONOSTOMATIDAE	73.50	4640	26.89	
MACROURIDAE	42.50	750	15.55	
Scyllarides herklotsii	15.10	1140	5.52	
Nematocarcinus africanus	15.00	3970	5.49	
Aristeus varidens, female	15.00	450	5.49	281
Merluccius polli	13.50	30	4.94	
Aristeus varidens, male	4.90	120	1.79	280
Geryon maritae	3.58	10	1.31	
Sepia sp.	1.20	50	0.44	
CONGRIDAE	1.00	30	0.37	
Etmopterus spinax	0.40	10	0.15	
LOPHIIDAE	0.20	20	0.07	
Total	273.38		100.02	

PROJECT STATION: 140

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 706
start stop duration Long E 1156
TIME :06:57:00 07:14:00 17 (min) Purpose code: 3
LOG :5606.00 5606.90 0.90 Area code : 1
FDEPTH: 322 329 GearCond.code:
BDEPTH: 322 329 Validity code: 1
Towing dir: 340° Wire out: 900 m Speed: 3 kn*10

Sorted: 60 Kg Total catch: 151.15 CATCH/HOUR: 533.47

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	206.65	3942	38.74	
Merluccius polli	129.71	441	24.31	282
Synagrops microlepis	90.46	2848	16.96	
Trichiurus lepturus	46.59	325	8.73	
MACROURIDAE	41.75	1288	7.83	
Illex coindetii	5.22	60	0.98	
LOPHIIDAE	3.81	7	0.71	
Priacanthus arenatus	2.47	7	0.46	
Solenocera africana	2.47	476	0.46	
Scorpaena angolensis	1.24	7	0.23	
Parapenaeus longirostris	1.16	106	0.22	
Peristedion cataphractum	0.99	35	0.19	
Scyllarides herklotsii	0.46	88	0.09	
Sepia sp.	0.35	18	0.07	
Zenopsis conchifer	0.28	7	0.05	
Total	533.61		100.03	

PROJECT STATION: 141

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 705
start stop duration Long E 1157
TIME :08:38:00 09:17:00 39 (min) Purpose code: 3
LOG :5610.90 5612.70 1.80 Area code : 1
FDEPTH: 262 275 GearCond.code:
BDEPTH: 262 275 Validity code: 1
Towing dir: 145° Wire out: 750 m Speed: 26 kn*10

Sorted: 90 Kg Total catch: 934.33 CATCH/HOUR: 1437.43

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	581.11	8732	40.43	
Synagrops microlepis	545.65	26057	37.96	
Merluccius polli	114.54	540	7.97	285
Pterothrissus belloci	37.86	175	2.63	
Trichiurus lepturus	37.55	95	2.61	
Zenopsis conchifer	25.14	111	1.75	
MACROURIDAE	21.00	223	1.46	
GOBIIDAE	20.05	8877	1.39	
Dentex angolensis	19.74	48	1.37	
Miracorvina angolensis	14.95	15	1.04	
Parapenaeus longirostris, fem.	6.37	652	0.44	284
Illex coindetii	3.35	32	0.23	
Scorpaena angolensis	2.40	32	0.17	
Parapenaeus longirostris, male	1.91	254	0.13	283
Solenocera africana	1.31	238	0.09	
Sepia sp.	1.28	63	0.09	
Peristedion cataphractum	1.15	32	0.08	
CYNOGLOSSIDAE	0.80	32	0.06	
Halosaurus sp.	0.65	15	0.05	
Scyllarides herklotsii	0.32	48	0.02	
Total	1437.13		99.97	

PROJECT STATION: 142

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 706
start stop duration Long E 1201
TIME :10:21:00 10:36:00 15 (min) Purpose code: 3
LOG :5617.00 5618.00 0.80 Area code : 1
FDEPTH: 150 151 GearCond.code:
BDEPTH: 150 151 Validity code: 1
Towing dir: 145° Wire out: 450 m Speed: 35 kn*10

Sorted: 109 Kg Total catch: 109.69 CATCH/HOUR: 438.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	115.00	100	26.21	
Spicara alta	102.80	616	23.43	
Trachurus trecae	58.40	92	13.31	287
Dentex angolensis	58.20	160	13.26	286
Brotula barbata	23.40	16	5.33	
Zenopsis conchifer	19.40	40	4.42	
Umbrina canariensis	15.00	36	3.42	
Todaropsis eblanae	9.56	116	2.18	
Dentex macrophthalmus	8.16	32	1.86	
Sparus pagrus africanus	7.08	4	1.61	
Branchiostegus semifasciatus	6.68	8	1.52	
Miracorvina angolensis	4.48	28	1.02	
Chelidonichthys gabonensis	3.68	28	0.84	
Boops boops	1.56	44	0.36	
SERRANIDAE	1.44	12	0.33	
Bembrops heterurus	1.16	20	0.26	
Citharus linguatula	0.56	200	0.13	
Pterothrissus belloci	0.56	4	0.13	
Uranoscopus polli	0.40	4	0.09	
Peristedion cataphractum	0.40	12	0.09	
GONOSTOMATIDAE	0.32	4	0.07	
GOBIIDAE	0.32	16	0.07	
Squilla mantis	0.20	4	0.05	
Total	438.76		99.99	

PROJECT STATION: 143

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 704
start stop duration Long E 1209
TIME :11:55:00 12:25:00 30 (min) Purpose code: 3
LOG :5626.00 5627.00 1.50 Area code : 1
FDEPTH: 112 108 GearCond.code:
BDEPTH: 112 108 Validity code: 1
Towing dir: 77° Wire out: 330 m Speed: 30 kn*10

Sorted: 71 Kg Total catch: 118.37 CATCH/HOUR: 236.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	70.00	460	29.57	288
Trachurus trecae	62.16	376	26.26	290
Dentex congoensis	33.50	524	14.15	289
Trichiurus lepturus	16.00	10	6.76	
Umbrina canariensis	12.16	26	5.14	
Spicara alta	8.16	286	3.45	
Sepia officinalis hierredda	6.66	6	2.81	
Scomber japonicus	5.70	6	2.41	291
Branchiostegus semifasciatus	4.74	4	2.00	
Chelidonichthys gabonensis	4.44	40	1.88	
Citharus linguatula	3.30	84	1.39	
Todaropsis eblanae	2.14	76	0.90	
Lepidotrigla carolae	1.84	70	0.78	
Zenopsis conchifer	1.26	4	0.53	
Sparus pagrus africanus	1.24	4	0.52	
Illex coindetii	1.06	54	0.45	
Boops boops	0.94	56	0.40	
Dentex canariensis	0.56	4	0.24	
Chaetodon hoefleri	0.54	4	0.23	
Saurida brasiliensis	0.20	34	0.08	
Scorpaena normani	0.14	4	0.06	
Total	236.74		100.01	

PROJECT STATION: 144

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 701
start stop duration Long E 1216
TIME :13:40:00 14:10:00 30 (min) Purpose code: 3
LOG :5634.90 5636.40 1.50 Area code : 1
FDEPTH: 79 741 GearCond.code:
BDEPTH: 79 741 Validity code: 1
Towing dir: 360° Wire out: 170 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 65.72 CATCH/HOUR: 131.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	26.50	216	20.16	292
Alloteuthis africana	19.00	5022	14.46	
Sparus auriga	10.90	68	8.29	294
Sepia officinalis hierredda	9.44	12	7.18	
Dentex barnardi	8.72	24	6.63	295
Boops boops	6.40	200	4.87	
Raja alba	6.20	2	4.72	
Chelidonichthys lucerna	5.38	32	4.09	
Dentex canariensis	4.86	12	3.70	
Fistularia petimba	4.30	8	3.27	
Centrophorus granulosus	3.92	2	2.98	
Trachurus trecae	3.80	18	2.89	296
Dentex angolensis	3.58	102	2.72	293
Argyrosomus hololepidotus	3.06	2	2.33	
Epinephelus aeneus	2.62	2	1.99	
Sparus pagrus africanus	2.54	14	1.93	
Octopus vulgaris	2.50	2	1.90	
Chaetodon hoefleri	2.48	16	1.89	
Zeus faber	2.34	8	1.78	
Illex coindetii	2.20	220	1.67	
Citharus linguatula	0.34	12	0.26	
Anthias anthias	0.18	10	0.14	
Todaropsis eblanae	0.10	8	0.08	
Saurida brasiliensis	0.04	10	0.03	
Chaetodon marcellae	0.04	2	0.03	
Total	131.44		99.99	

PROJECT STATION: 145

DATE: 6/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 704
start stop duration Long E 1236
TIME :17:08:00 17:38:00 30 (min) Purpose code: 3
LOG :5660.60 5662.10 1.50 Area code : 1
FDEPTH: 30 31 GearCond.code:
BDEPTH: 30 31 Validity code: 1
Towing dir: 330° Wire out: 100 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 50.58 CATCH/HOUR: 101.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	70.20	438	69.40	
Fistularia petimba	15.90	46	15.72	
Pagellus bellottii	2.60	16	2.57	
Raja miraletus	2.38	4	2.35	
Zeus faber	1.80	2	1.78	
Dentex barnardi	1.76	4	1.74	
Torpedo torpedo	1.38	2	1.36	
Chaetodon hoefleri	1.30	8	1.29	
Bothus podas africanus	1.04	2	1.03	
Trachurus trecae	1.02	2	1.01	
Boops boops	0.84	50	0.83	
Sparus caeruleostictus	0.40	2	0.40	
Epinephelus alexandrinus *	0.34	2	0.34	
Balistes capriscus	0.20	2	0.20	
Total	101.16		100.02	

PROJECT STATION: 146

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 715
start stop duration Long E 1240
TIME :06:25:00 06:35:00 10 (min) Purpose code: 3
LOG :5686.10 5686.50 0.40 Area code : 1
FDEPTH: 39 39 GearCond.code:
BDEPTH: 39 39 Validity code: 1
Towing dir: 254° Wire out: 150 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 34.01 CATCH/HOUR: 204.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex canariensis	86.70	162	42.49	297
Rhinobatos sp.	41.40	12	20.29	
Boops boops	14.10	1074	6.91	
Pseudupeneus prayensis	9.18	60	4.50	
Sparus auriga	8.88	6	4.35	
Zeus faber	8.40	24	4.12	
Pagellus bellottii	6.84	36	3.35	
Balistes capriscus	6.60	6	3.23	
Sparus pagrus africanus	6.06	6	2.97	
Raja miraletus	4.92	6	2.41	
Raja sp.	3.84	6	1.88	
Fistularia petimba	2.70	12	1.32	
Sepia sp.	2.16	12	1.06	
Scorpaena stephanica	1.14	6	0.56	
Chaetodon hoefleri	0.72	12	0.35	
Chelidonichthys capensis	0.42	6	0.21	
Total	204.06		100.00	

PROJECT STATION: 147

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 717
start stop duration Long E 1224
TIME :08:03:00 08:33:00 30 (min) Purpose code: 3
LOG :5696.30 5697.80 1.50 Area code : 1
FDEPTH: 81 87 GearCond.code:
BDEPTH: 81 87 Validity code: 1
Towing dir: 246° Wire out: 250 m Speed: 30 kn*10

Sorted: Kg Total catch: 433.86 CATCH/HOUR: 867.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	646.52	1190	74.51	298
Raja miraletus	31.64	42	3.65	
Dentex angolensis	29.26	154	3.37	
Dentex congoensis	28.42	840	3.28	299
Sparus caeruleostictus	27.72	28	3.19	
Trichiurus lepturus	22.54	28	2.60	
Dentex canariensis	21.70	70	2.50	
Sepia sp.	18.76	14	2.16	
Scorpaena angolensis	17.08	42	1.97	
Branchiostegus semifasciatus	14.98	42	1.73	
Boops boops	3.64	224	0.42	
Atractoscion aequidens	2.80	14	0.32	
Chaetodon hoefleri	2.10	14	0.24	
TRIGLIDAE	0.56	14	0.06	
Total	867.72		100.00	

PROJECT STATION: 148

DATE: 7/ 8/94 GEAR TYPE: BT No:6 POSITION: Lat S 720
start stop duration Long E 1223
TIME :09:48:00 10:00:00 12 (min) Purpose code: 3
LOG :5705.50 5708.10 0.60 Area code : 1
FDEPTH: 140 142 GearCond.code:
BDEPTH: 140 142 Validity code: 1
Towing dir: 330° Wire out: 450 m Speed: 30 kn*10

Sorted: 81 Kg Total catch: 108.29 CATCH/HOUR: 541.45

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	136.60	505	25.23	301
Spicara alta	101.60	565	18.76	
Dentex angolensis	100.60	285	18.58	300
Umbrina canariensis	66.30	150	12.24	
Synagrops microlepis	34.75	15300	6.42	
Brotula barbata	19.50	15	3.60	
Scorpaena angolensis	12.25	40	2.26	
Citharus linguatula	11.90	145	2.20	
Zenopsis conchifer	9.70	5	1.79	
Epinephelus aeneus	8.05	5	1.49	
Zeus faber	5.95	15	1.10	
Uranoscopus polli	3.70	5	0.68	
Illex coindetii	3.70	35	0.68	
Chelidonichthys sp.	3.70	35	0.68	
Chaetodon hoefleri	3.65	15	0.67	
Balistes capriscus	3.65	15	0.67	
Boops boops	3.55	40	0.66	
Parapristipoma octolineatum	3.50	5	0.65	
Dentex congoensis	3.25	5	0.60	
Trachurus trecae	2.85	5	0.53	
Peristedion cataphractum	2.70	5	0.50	
Total	541.45		99.99	

PROJECT STATION: 149

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 722
start stop duration Long E 1214
TIME :11:13:00 11:44:00 31 (min) Purpose code: 3
LOG :5712.30 5714.00 1.70 Area code : 1
FDEPTH: 190 217 GearCond.code:
BDEPTH: 190 217 Validity code: 1
Towing dir: 240° Wire out: 600 m Speed: 32 kn*10

Sorted: 86 Kg Total catch: 660.78 CATCH/HOUR: 1278.93

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	494.63	25974	38.68	
Chlorophthalmus atlanticus	413.03	10390	32.29	
Trichiurus lepturus	114.25	341	8.93	
Squatina aculeata	77.42	6	6.05	
Pterothrissus belloci	58.20	327	4.55	
Dentex angolensis	53.01	149	4.14	302
Todaropsis eblanae	15.04	141	1.18	
Parapenaeus longirostris, fem.	14.61	2299	1.14	304
Zenopsis conchifer	13.76	85	1.08	
Aulopus cadenati	9.08	99	0.71	
Parapenaeus longirostris, male	4.55	1006	0.36	303
Chelidonichthys gabonensis	2.85	29	0.22	
Uranoscopus albesca	1.28	14	0.10	
Uranoscopus polli	1.28	14	0.10	
Illex coindetii	1.28	29	0.10	
Cynoglossus canariensis	1.14	99	0.09	
Cynoglossus senegalensis	0.99	29	0.08	
C R A B S	0.85	29	0.07	
Hymenocephalus italicus	0.56	14	0.04	
Coelorinchus coelorhincus	0.56	14	0.04	
Octopus vulgaris	0.29	14	0.02	
Unidentified fish	0.14	14	0.01	
Sepia sp.	0.14	43	0.01	
Total	1278.94		99.99	

PROJECT STATION: 150

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 721
start stop duration Long E 1215
TIME :12:40:00 13:10:00 30 (min) Purpose code: 3
LOG :5717.10 5787.70 1.60 Area code : 1
FDEPTH: 246 246 GearCond.code:
BDEPTH: 246 246 Validity code: 1
Towing dir: 317° Wire out: 750 m Speed: 32 kn*10

Sorted: 87 Kg Total catch: 490.91 CATCH/HOUR: 981.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	420.70	29988	42.85	
Diaphus sp.	189.04	67026	19.25	
Dentex angolensis	74.68	192	7.61	307
Trichiurus lepturus	72.54	182	7.39	
Merluccius polli	69.14	294	7.04	308
Chlorophthalmus atlanticus	53.26	872	5.42	
Zenopsis conchifer	43.18	216	4.40	
Parapenaeus longirostris, fem.	16.32	2098	1.66	306
Pterothrissus belloci	10.54	56	1.07	
Coelorinchus coelorhincus	9.64	226	0.98	
Todaropsis eblanae	5.44	56	0.55	
Parapenaeus longirostris, male	5.22	1450	0.53	305
Umbrina canariensis	5.22	12	0.53	
Spicara alta	2.72	12	0.28	
Scorpaena normani	0.90	22	0.09	
Sepia sp.	0.68	34	0.07	
Illex coindetii	0.46	12	0.05	
Cynoponticus ferox	0.22	12	0.02	
Total	979.90		99.79	

PROJECT STATION: 151

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 722
start stop duration Long E 1212
TIME :14:20:00 14:50:00 30 (min) Purpose code: 3
LOG :5722.70 5724.20 1.50 Area code : 1
FDEPTH: 314 315 GearCond.code:
BDEPTH: 314 315 Validity code: 1
Towing dir: 130° Wire out: 900 m Speed: 30 kn*10

Sorted: 85 Kg Total catch: 992.64 CATCH/HOUR: 1985.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	1316.00	28444	66.29	
Merluccius polli	344.18	1214	17.34	311
Synagrops microlepis	226.34	7536	11.40	
Hoplostethus atlanticus	40.84	46	2.06	
MACROURIDAE	24.04	466	1.21	
Trichiurus lepturus	11.44	94	0.58	
Parapenaeus longirostris, fem.	7.70	886	0.39	310
Todaropsis eblanae	5.84	70	0.29	
Scomber japonicus	3.74	24	0.19	
Pontinus accraensis	2.34	234	0.12	
Parapenaeus longirostris, male	2.34	398	0.12	309
Peristedion cataphractum	0.48	24	0.02	
Total	1985.28		100.01	

PROJECT STATION: 152

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 722
start stop duration Long E 1207
TIME :16:20:00 16:50:00 30 (min) Purpose code: 3
LOG :5731.40 5733.00 1.60 Area code : 1
FDEPTH: 375 377 GearCond.code:
BDEPTH: 375 377 Validity code: 1
Towing dir: 317° Wire out: 1100 m Speed: 32 kn*10

Sorted: 75 Kg Total catch: 278.75 CATCH/HOUR: 557.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	329.66	1372	59.13	312
MACROURIDAE	88.32	5532	15.84	
S H A R K S	60.00	14	10.76	
Trichiurus lepturus	29.32	220	5.26	
Chlorophthalmus atlanticus	11.66	194	2.09	
Chlorophthalmus sp.	10.72	194	1.92	
Epigonus pandionis	8.80	126	1.58	
LOPHIIDAE	6.60	274	1.18	
Todaropsis eblanae	4.72	40	0.85	
Pontinus accraensis	3.80	406	0.68	
Pteroscion peli	2.20	60	0.39	
Nematocarcinus africanus	0.92	120	0.17	
MURAENIDAE	0.52	6	0.09	
Peristedion cataphractum	0.26	34	0.05	
Total	557.50		99.99	

PROJECT STATION: 153

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 5723
start stop duration Long E 1204
TIME :18:07:00 18:38:00 31 (min) Purpose code: 3
LOG :5737.80 5739.30 1.50 Area code : 1
FDEPTH: 452 459 GearCond.code:
BDEPTH: 452 459 Validity code: 1
Towing dir: 140° Wire out: 1350 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 116.14 CATCH/HOUR: 224.79

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	111.29	255	49.51	313
MACROURIDAE	60.19	1444	26.78	
Centrophorus granulosus	29.61	12	13.17	
GONOSTOMATIDAE	6.97	286	3.10	
LOPHIIDAE	6.23	120	2.77	
Scyllarides herklotsii	2.90	225	1.29	
Geryon maritae	2.48	4	1.10	
Hoplostethus cadenati	1.94	39	0.86	
Trichiurus lepturus	1.55	58	0.69	
Aristeus varidens	0.97	77	0.43	
Glyphus marsupialis	0.39	8	0.17	
Halosaurus sp.	0.27	8	0.12	
Total	224.79		99.99	

PROJECT STATION: 154

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 728
start stop duration Long E 1204
TIME :19:50:00 20:20:00 30 (min) Purpose code: 3
LOG :5743.50 5745.00 1.50 Area code : 1
FDEPTH: 559 567 GearCond.code:
BDEPTH: 559 567 Validity code: 1
Towing dir: 140° Wire out:1650 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 248.43 CATCH/HOUR: 496.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	259.82	43300	52.29	
MACROURIDAE	125.40	856	25.24	
Merluccius polli	41.80	76	8.41	314
GONOSTOMATIDAE	25.26	2098	5.08	
Scyllarides herklotsii	20.80	2016	4.19	
Hoplostethus sp.	17.28	438	3.48	
Centrophorus sp.	2.18	10	0.44	
LOPHIIDAE	1.42	96	0.29	
Geryon maritae	1.22	10	0.25	
Illex coindetii	0.66	10	0.13	
Aristeus varidens	0.56	20	0.11	
Trichiurus lepturus	0.46	10	0.09	
Total	496.86		100.00	

PROJECT STATION: 155

DATE: 7/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 731
start stop duration Long E 1202
TIME :22:15:00 22:45:00 30 (min) Purpose code: 3
LOG :5751.30 5752.40 1.10 Area code : 1
FDEPTH: 700 711 GearCond.code:
BDEPTH: 700 711 Validity code: 1
Towing dir: 140° Wire out:2100 m Speed: 22 kn*10

Sorted: 19 Kg Total catch: 99.00 CATCH/HOUR: 198.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MACROURIDAE	171.50	3750	86.62	
GONOSTOMATIDAE	6.60	70	3.33	
Hoplostethus mediterraneus	4.90	90	2.47	
Halosaurus sp.	0.90	10	0.45	
Total	183.90		92.87	

PROJECT STATION: 156

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 734
start stop duration Long E 1228
TIME :02:50:00 03:20:00 30 (min) Purpose code: 3
LOG :5780.30 5781.80 1.50 Area code : 1
FDEPTH: 400 393 GearCond.code:
BDEPTH: 400 393 Validity code: 1
Towing dir: 330° Wire out:1200 m Speed: 30 kn*10

Sorted: 40 Kg Total catch: 190.71 CATCH/HOUR: 381.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	310.96	87876	81.53	
SQUALIDAE	20.00	4	5.24	
MACROURIDAE	18.00	548	4.72	
Merluccius polli	12.60	36	3.30	
LOPHIIDAE	4.96	414	1.30	
Hoplostethus cadenati	3.52	90	0.92	
TETRAODONTIDAE	1.98	46	0.52	
GONOSTOMATIDAE	1.98	64	0.52	
Trichiurus lepturus	1.72	54	0.45	
Aristeus varidens, female	1.62	180	0.42	316
Chlorophthalmus atlanticus	1.36	28	0.36	
Aristeus varidens, male	1.26	154	0.33	315
Etmopterus spinax	1.00	28	0.26	
C R A B S	0.36	18	0.09	
Scyllarides herklotsii	0.10	36	0.03	
Total	381.42		99.99	

PROJECT STATION: 157

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 740
start stop duration Long E 1232
TIME :06:49:00 07:19:00 30 (min) Purpose code: 3
LOG :5800.80 5802.00 1.20 Area code : 1
FDEPTH: 270 258 GearCond.code:
BDEPTH: 270 258 Validity code: 1
Towing dir: 330° Wire out: 750 m Speed: 25 kn*10

Sorted: 57 Kg Total catch: 171.69 CATCH/HOUR: 343.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
GOBIIDAE	171.00		49.80	
Trichiurus lepturus	104.70	708	30.49	
Synagrops microlepis	50.70	2634	14.76	
Parapenaeus longirostris, fem.	6.90	1068	2.01	318
LOPHIIDAE	3.96	342	1.15	
Parapenaeus longirostris, male	3.72	678	1.08	317
Chlorophthalmus atlanticus	1.38	48	0.40	
Chelidonichthys capensis	0.90	6	0.26	
Zenopsis conchifer	0.12	6	0.03	
Total	343.38		99.98	

PROJECT STATION: 158

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 740
start stop duration Long E 1233
TIME :08:10:00 08:47:00 37 (min) Purpose code: 3
LOG :7805.20 7807.00 1.80 Area code : 1
FDEPTH: 145 146 GearCond.code:
BDEPTH: 145 146 Validity code: 1
Towing dir: 150° Wire out: 500 m Speed: 29 kn*10

Sorted: 117 Kg Total catch: 116.94 CATCH/HOUR: 189.63

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	37.99	122	20.03	320
Dentex macrophthalmus	35.68	178	18.82	319
Trichiurus lepturus	35.35	47	18.64	
Zenopsis conchifer	27.16	42	14.32	
Spicara alta	16.05	112	8.46	
Epinephelus aeneus	9.65	2	5.09	
Illex coindetii	6.88	109	3.63	
Brotula barbata	6.50	6	3.43	
Chelidonichthys gabonensis	4.02	39	2.12	
Zeus faber	2.64	8	1.39	
Uranoscopus polli	1.23	11	0.65	
Octopus sp.	1.20	2	0.63	
Citharus linguatula	1.18	19	0.62	
Saurida brasiliensis	0.92	120	0.49	
Dentex congoensis	0.62	10	0.33	
SOLEIDAE	0.45	2	0.24	
MURAENIDAE	0.37	5	0.20	
Pterothrissus belloci	0.34	2	0.18	
Scorpaena angolensis	0.31	5	0.16	
Scomberomorus tritor	0.29	2	0.15	
SERRANIDAE	0.29	2	0.15	
Boops boops	0.29	5	0.15	
Bembrops heterurus	0.28	2	0.15	
Total	189.69		100.03	

PROJECT STATION: 159

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 737
start stop duration Long E 1244
TIME :10:20:00 10:55:00 35 (min) Purpose code: 3
LOG :5818.20 5819.90 1.50 Area code : 1
FDEPTH: 83 76 GearCond.code:
BDEPTH: 83 76 Validity code: 1
Towing dir: 62° Wire out: 300 m Speed: 28 kn*10

Sorted: 120 Kg Total catch: 120.83 CATCH/HOUR: 207.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	71.14	1958	34.34	323
Dentex angolensis	41.31	936	19.94	322
Sepia sp.	24.94	31	12.04	
Trichiurus lepturus	18.29	29	8.83	
Pagellus bellottii	17.23	653	8.32	321
Zeus faber	8.23	26	3.97	
Chelidonichthys capensis	7.01	63	3.38	
Illex coindetii	4.22	123	2.04	
Dentex barnardi	4.17	12	2.01	
Zenopsis conchifer	3.77	5	1.82	
Spicara alta	1.97	14	0.95	
Raja miraletus	1.89	3	0.91	
Trachurus trecae	0.89	19	0.43	
Dentex macrophthalmus	0.86	5	0.42	
Citharus linguatula	0.81	21	0.39	
Chaetodon hoefleri	0.29	2	0.14	
Boops boops	0.12	9	0.06	
Total	207.14		99.99	

PROJECT STATION: 160

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 742
start stop duration Long E 1252
TIME :12:18:00 12:28:00 10 (min) Purpose code: 3
LOG :5830.60 5831.10 0.50 Area code : 1
FDEPTH: 52 52 GearCond.code: 9
BDEPTH: 52 52 Validity code: 1
Towing dir: 340° Wire out: 170 m Speed: 30 kn*10

Sorted: Kg Total catch: 31.47 CATCH/HOUR: 188.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Seriola carpenteri	82.80	18	43.85	324
Pomadasys incisus	38.70	276	20.50	
Sparus pagrus africanus	23.28	18	12.33	
Pteromylaeus bovinus	12.78	6	6.77	
Boops boops	12.54	774	6.64	
Epinephelus alexandrinus *	6.06	6	3.21	
Pagellus bellottii	4.20	36	2.22	
Bodianus speciosus	2.58	6	1.37	
Trichiurus lepturus	2.52	6	1.33	
Todaropsis eblanae	1.38	18	0.73	
Chaetodon hoefleri	0.96	6	0.51	
Adioryx hastatus	0.66	6	0.35	
Unidentified fish	0.18	6	0.10	
Scorpaena angolensis	0.12	6	0.06	
Trachurus trecae	0.12	6	0.06	
Total	188.88		100.03	

PROJECT STATION: 161

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S
start stop duration Long E
TIME :15:40:00 15:50:00 10 (min) Purpose code: 3
LOG :5854.30 5854.70 0.40 Area code : 1
FDEPTH: 107 107 GearCond.code: 9
BDEPTH: 107 107 Validity code: 1
Towing dir: 330° Wire out: 330 m Speed: 28 kn*10

Sorted: Kg Total catch: 42.68 CATCH/HOUR: 256.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Epinephelus haifensis	138.00	6	53.89	326
Anthias anthias	38.16	372	14.90	
Raja miraletus	23.10	42	9.02	
Sarda sarda	22.86	12	8.93	325
Zeus faber	8.04	18	3.14	
Branchiostegus semifasciatus	6.48	6	2.53	
Dentex angolensis	6.30	12	2.46	
Dentex canariensis	4.98	12	1.94	
Sparus pagrus africanus	3.42	6	1.34	
Scorpaena normani	1.08	12	0.42	
Chaetodon hoeflari	0.72	6	0.28	
Dentex macrophthalmus	0.72	6	0.28	
Boops boops	0.54	36	0.21	
Citharus linguatula	0.36	6	0.14	
MACROURIDAE	0.06	6	0.02	
Selene dorsalis	0.06	6	0.02	
Total	254.88		99.52	

PROJECT STATION: 162

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 731
start stop duration Long E 1238
TIME :16:55:00 17:25:00 30 (min) Purpose code: 3
LOG :5862.00 5863.60 1.60 Area code : 1
FDEPTH: 221 226 GearCond.code:
BDEPTH: 221 226 Validity code: 1
Towing dir: 324° Wire out: 660 m Speed: 32 kn*10

Sorted: 29 Kg Total catch: 129.49 CATCH/HOUR: 258.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
GOBIIDAE	127.00	88900	49.04	
Trichiurus lepturus	58.18	130	22.47	
Raja miraletus	14.90	10	5.75	
Synagrops microlepis	14.00	720	5.41	
Parapenaeus longirostris, male	13.60	2900	5.25	328
Parapenaeus longirostris, fem.	13.00	2500	5.02	327
Chlorophthalmus atlanticus	10.00	520	3.86	
Dentex angolensis	3.50	10	1.35	
Merluccius polli	2.40	20	0.93	
Illex sp.	1.70	20	0.66	
CYNOGLOSSIDAE	0.30	30	0.12	
Sepia sp.	0.20	20	0.08	
Zenopsis conchifer	0.20	10	0.08	
Total	258.98		100.02	

PROJECT STATION: 163

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 752
start stop duration Long E 1237
TIME :18:11:00 18:41:00 30 (min) Purpose code: 3
LOG :5867.20 5868.50 1.30 Area code : 1
FDEPTH: 359 358 GearCond.code:
BDEPTH: 359 358 Validity code: 1
Towing dir: 135° Wire out:1050 m Speed: 24 kn*10

Sorted: 57 Kg Total catch: 168.37 CATCH/HOUR: 336.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	223.14	56630	66.26	
Merluccius polli	66.84	160	19.85	329
MACROURIDAE	27.64	686	8.21	
LOPHIIDAE	7.34	238	2.18	
Chlorophthalmus atlanticus	3.36	70	1.00	
Illex sp.	2.44	28	0.72	
Trichiurus lepturus	2.16	22	0.64	
Pterothrissus belloci	1.74	8	0.52	
Parapenaeus longirostris	0.84	112	0.25	
Aristeus varidens	0.42	36	0.12	
CONGRIDAE	0.34	8	0.10	
S H A R K S	0.34	8	0.10	
SERRANIDAE	0.14	8	0.04	
Total	336.74		99.99	

PROJECT STATION: 164

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 756
start stop duration Long E 1237
TIME :20:05:00 20:35:00 30 (min) Purpose code: 3
LOG :5873.50 5874.70 1.20 Area code : 1
FDEPTH: 490 478 GearCond.code:
BDEPTH: 490 478 Validity code: 1
Towing dir: 175° Wire out:1650 m Speed: 28 kn*10

Sorted: 54 Kg Total catch: 162.10 CATCH/HOUR: 324.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	189.30	3786	58.39	
Merluccius polli	74.10	162	22.86	330
MACROURIDAE	26.46	1470	8.16	
Aristeus varidens, male	12.20	1374	3.76	332
LOPHIIDAE	4.86	324	1.50	
GONOSTOMATIDAE	4.80	324	1.48	
Aristeus varidens, female	4.44	222	1.37	331
Centrophorus granulosus	3.30	18	1.02	
Hoplostethus cadenati	3.06	108	0.94	
Geryon maritae	0.66	12	0.20	
Trichiurus lepturus	0.54	6	0.17	
Glyphus marsupialis	0.48	12	0.15	
Total	324.20		100.00	

PROJECT STATION: 165

DATE: 8/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 8011
start stop duration Long E 1237
TIME :21:59:00 22:29:00 30 (min) Purpose code: 3
LOG :5880.10 5881.40 1.30 Area code : 1
FDEPTH: 590 572 GearCond.code:
BDEPTH: 590 572 Validity code: 1
Towing dir: 190° Wire out:1700 m Speed: 26 kn*10

Sorted: 43 Kg Total catch: 152.01 CATCH/HOUR: 304.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	239.76	47200	78.86	
GONOSTOMATIDAE	28.92	818	9.51	
Merluccius polli	13.66	36	4.49	
MACROURIDAE	7.22	134	2.37	
Hoplostethus cadenati	6.72	238	2.21	
Scyllarides herklotsii	1.96	238	0.64	
S H A R K S	1.76	14	0.58	
Aristeus varidens	1.20	106	0.39	
LOPHIIDAE	1.12	112	0.37	
Trichiurus lepturus	0.92	14	0.30	
Geryon maritae	0.50	22	0.16	
Halosaurus sp.	0.28	8	0.09	
Glyphus marsupialis	0.08	14	0.03	
Total	304.10		100.00	

PROJECT STATION: 166

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 807
start stop duration Long E 1239
TIME :04:02:00 04:32:00 30 (min) Purpose code: 3
LOG :5925.70 5927.20 1.50 Area code : 1
FDEPTH: 488 502 GearCond.code:
BDEPTH: 488 502 Validity code: 1
Towing dir: 340° Wire out:1450 m Speed: 30 kn*10

Sorted: 19 Kg Total catch: 301.85 CATCH/HOUR: 603.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	531.00	138330	87.96	
Merluccius polli	24.20	44	4.01	333
MACROURIDAE	15.60	360	2.58	
GONOSTOMATIDAE	10.80	450	1.79	
Hoplostethus sp.	7.50	240	1.24	
Etmopterus spinax	6.00	60	0.99	
Aristeus varidens, male	3.90	540	0.65	334
Aristeus varidens, female	2.70	150	0.45	335
Geryon maritae	1.40	2	0.23	
LOPHIIDAE	0.30	60	0.05	
Scyllarides herklotsii	0.30	60	0.05	
Total	603.70		100.00	

PROJECT STATION: 167

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 806
start stop duration Long E 1242
TIME :06:30:00 07:00:00 30 (min) Purpose code: 3
LOG :5934.00 5936.00 2.00 Area code : 1
FDEPTH: 350 360 GearCond.code:
BDEPTH: 350 360 Validity code: 1
Towing dir: 340° Wire out: 1050 m Speed: 35 kn*10

Sorted: 55 Kg Total catch: 137.36 CATCH/HOUR: 274.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	172.40	746	62.75	336
MACROURIDAE	47.54	2544	17.30	
Chlorophthalmus atlanticus	21.10	430	7.68	
Parapenaeus longirostris, fem.	10.34	1390	3.76	337
Hyperoglyphe moselii	7.14	10	2.60	
Illex coindetii	5.64	50	2.05	
LOPHIIDAE	4.04	136	1.47	
Pontinus accraensis	2.04	66	0.74	
Synagrops microlepis	2.00	64	0.73	
Parapenaeus longirostris, male	0.94	150	0.34	338
Epigonus telescopus	0.54	6	0.20	
Geryon maritae	0.50	6	0.18	
S H A R K S	0.40	6	0.15	
Total	274.62		99.95	

PROJECT STATION: 168

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 810
start stop duration Long E 1248
TIME :08:28:00 09:02:00 34 (min) Purpose code: 3
LOG :5944.70 5945.40 0.70 Area code : 1
FDEPTH: 190 200 GearCond.code:
BDEPTH: 190 200 Validity code: 1
Towing dir: 155° Wire out: 600 m Speed: 15 kn*10

Sorted: 65 Kg Total catch: 195.36 CATCH/HOUR: 344.75

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	189.26	5262	54.90	
Trichiurus lepturus	60.88	212	17.66	
Synagrops microlepis	35.47	1869	10.29	
Parapenaeus longirostris, fem.	15.09	2642	4.38	340
Parapenaeus longirostris, male	12.81	2557	3.72	339
Zenopsis conchifer	9.79	79	2.84	
Illex coindetii	5.08	90	1.47	
Pterothrissus belloci	4.76	37	1.38	
Erythrocles monodi	4.39	5	1.27	
Dentex macrophthalmus	3.23	11	0.94	
Merluccius polli	2.49	48	0.72	
MACROURIDAE	0.79	32	0.23	
Uranoscopus polli	0.48	5	0.14	
Sepia sp.	0.21	37	0.06	
Total	344.73		100.00	

PROJECT STATION: 169

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 808
start stop duration Long E 1256
TIME :10:25:00 10:45:00 20 (min) Purpose code: 3
LOG :5955.40 5956.50 1.10 Area code : 1
FDEPTH: 107 103 GearCond.code: 9
BDEPTH: 107 103 Validity code: 1
Towing dir: 83° Wire out: 350 m Speed: 30 kn*10

Sorted: Kg Total catch: 124.83 CATCH/HOUR: 374.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	74.70	273	19.95	341
Branchiostegus semifasciatus	61.05	45	16.30	
Dentex angolensis	52.80	159	14.10	342
Brotula barbata	33.15	27	8.85	
Trichiurus lepturus	27.00	24	7.21	
Raja miraletus	19.05	18	5.09	
Umbrina canariensis	15.15	18	4.05	
Scorpaena angolensis	12.45	21	3.32	
Trachurus trecae	11.37	90	3.04	
Anthias anthias	10.89	93	2.91	
Octopus sp.	9.30	6	2.48	
Citharus linguatula	8.61	150	2.30	
Zeus faber	4.86	18	1.30	
Chaetodon hoefleri	4.62	12	1.23	
Illex coindetii	4.53	210	1.21	
Boops boops	4.53	273	1.21	
Dentex gibbosus	4.35	6	1.16	
Chelidonichthys capensis	3.72	39	0.99	
Uranoscopus polli	3.60	27	0.96	
Dentex canariensis	3.45	9	0.92	
Atractoscion aequidens	3.09	3	0.83	
Zenopsis conchifer	1.02	30	0.27	
Dentex bernardi	0.69	6	0.18	
Spicara alta	0.24	6	0.06	
CYNOGLOSSIDAE	0.21	6	0.06	
LOPHIIDAE	0.03	21	0.01	
Pagellus bellottii	0.03	6	0.01	
Total	374.49		100.00	

PROJECT STATION: 170

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 810
start stop duration Long E 1306
TIME :12:22:00 12:52:00 30 (min) Purpose code: 3
LOG :5967.80 5969.20 1.40 Area code : 1
FDEPTH: 58 63 GearCond.code:
BDEPTH: 58 63 Validity code: 1
Towing dir: 311° Wire out: 180 m Speed: 28 kn*10

Sorted: 122 Kg Total catch: 440.16 CATCH/HOUR: 880.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	745.50	1604	84.69	343
Dentex canariensis	21.36	154	2.43	344
Epinephelus aeneus	20.90	2	2.37	345
Stromateus fiatola	15.68	22	1.78	
Plectorhinchus mediterraneus	14.00	8	1.59	
Pagellus bellottii	10.78	70	1.22	
Dentex angolensis	9.94	70	1.13	
Sepia sp.	8.62	14	0.98	
Raja miraletus	6.52	14	0.74	
Sarda sarda	5.46	2	0.62	346
Alloteuthis africana	5.40	11850	0.61	
Dentex macrophthalmus	3.58	14	0.41	
Trichiurus lepturus	3.30	8	0.37	
Chaetodon hoefleri	2.88	22	0.33	
Sphyraena guachancho	2.24	8	0.25	
Scomber japonicus	1.68	8	0.19	
Pomadasys incisus	0.92	8	0.10	
Brotula barbata	0.78	8	0.09	
Illex coindetii	0.42	28	0.05	
Todaropsis eblanae	0.28	22	0.03	
Citharus linguatula	0.08	14	0.01	
Total	880.32		99.99	

PROJECT STATION: 171

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 815
start stop duration Long E 1312
TIME :14:29:00 14:59:00 30 (min) Purpose code: 3
LOG :5980.90 5982.20 1.30 Area code : 1
FDEPTH: 36 39 GearCond.code:
BDEPTH: 36 39 Validity code: 1
Towing dir: 310° Wire out: 130 m Speed: 26 kn*10

Sorted: 79 Kg Total catch: 341.49 CATCH/HOUR: 682.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	443.56	3464	64.94	
Trichiurus lepturus	61.20	148	8.96	
Pentheroscion mbizi	37.08	3220	5.43	
Pseudotolithus senegalensis	26.92	26	3.94	347
Trachurus trecae	26.74	70	3.92	
Torpedo marmorata	18.40	60	2.69	
Stromateus fiatola	10.16	26	1.49	
Pomadasys incisus	9.82	44	1.44	
Cynoglossus sp.	8.42	164	1.23	
Argyrosomus hololepidotus	7.74	34	1.13	
Sepia sp.	6.70	122	0.98	
Pagellus bellottii	6.60	26	0.97	
Zeus faber	5.56	8	0.81	
Epinephelus alexandrinus *	5.38	18	0.79	
Bodianus speciosus	5.12	8	0.75	
Selene dorsalis	2.96	18	0.43	
Parapristipoma octolineatum	0.62	8	0.09	
Total	682.98		99.99	

PROJECT STATION: 172

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION: Lat S 825
start stop duration Long E 1316
TIME :16:40:00 17:10:00 30 (min) Purpose code: 3
LOG :5995.70 1997.20 1.50 Area code : 1
FDEPTH: 36 37 GearCond.code:
BDEPTH: 36 37 Validity code: 1
Towing dir: 340° Wire out: 130 m Speed: 30 kn*10

Sorted: 83 Kg Total catch: 258.53 CATCH/HOUR: 517.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	188.10	5280	36.38	
Dentex canariensis	79.20	204	15.32	348
Trachurus trecae	52.98	450	10.25	350
Trichiurus lepturus	49.80	162	9.63	
Pagellus bellottii	36.36	108	7.03	349
Epinephelus aeneus	36.10	4	6.98	
Sparus auriga	25.50	60	4.93	
Stromateus fiatola	12.54	24	2.43	
Argyrosomus hololepidotus	10.20	18	1.97	
Plectorhinchus mediterraneus	6.48	8	1.25	
Pomadasys incisus	5.22	18	1.01	
Raja miraletus	4.62	6	0.89	
Sepia sp.	4.20	12	0.81	
Serranus sp.	1.80	102	0.35	
MURAENIDAE	1.44	6	0.28	
Cynoglossus sp.	1.38	42	0.27	
Merluccius capensis	1.14	120	0.22	
Total	517.06		100.00	

PROJECT STATION: 173

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 825
start stop duration Long E 1309
TIME :18:06:00 18:36:00 30 (min) Purpose code: 3
LOG :6004.30 6005.80 1.50 Area code : 1
FDEPTH: 74 81 GearCond.code:
BDEPTH: 74 81 Validity code: 1
Towing dir: 290° Wire out: 300 m Speed: 29 kn*10

Sorted: 67 Kg Total catch: 299.66 CATCH/HOUR: 599.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	259.66	103860	43.33	
Trichiurus lepturus	76.50	226	12.76	
Brotula barbata	54.00	64	9.01	
Raja miraletus	41.22	72	6.88	
Pterothrissus belloci	32.76	252	5.47	
Pagellus bellottii	30.70	172	5.12	
Sepia sp.	28.62	64	4.78	
Trachurus trecae	21.42	54	3.57	
Branchiostegus semifasciatus	16.20	18	2.70	
Torpedo torpedo	13.86	54	2.31	
Parapenaeus longirostris, fem.	7.84	3060	1.31	352
Dentex canariensis	5.40	28	0.90	
Argyrosomus hololepidotus	3.42	10	0.57	
Parapenaeus longirostris, male	2.88	1440	0.48	351
Chelidonichthys capensis	2.08	10	0.35	
Dentex angolensis	1.36	28	0.23	
Citharus linguatula	1.18	36	0.20	
Cynoglossus sp.	0.28	10	0.05	
Total	599.38		100.02	

PROJECT STATION: 174

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 830
start stop duration Long E 1253
TIME :21:07:00 21:37:00 30 (min) Purpose code: 3
LOG :6023.00 6024.50 1.50 Area code : 1
FDEPTH: 355 352 GearCond.code:
BDEPTH: 355 352 Validity code: 1
Towing dir: 160° Wire out:1050 m Speed: 29 kn*10

Sorted: 52 Kg Total catch: 142.45 CATCH/HOUR: 284.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	69.36	198	24.35	355
Nematocarcinus africanus	44.28	16598	15.54	
Parapenaeus longirostris, fem.	34.66	3766	12.17	353
Lagocephalus laevigatus	27.50	314	9.65	
Centrophorus granulosus	20.64	6	7.24	
Illex coindetii	15.74	148	5.52	
Pterothrissus belloci	15.40	100	5.41	
Parapenaeus longirostris, male	14.92	506	5.24	354
MACROURIDAE	12.10	1304	4.25	
Chlorophthalmus atlanticus	7.88	188	2.77	
OPHICHTHIDAE	6.82	132	2.39	
LOPHIIDAE	6.34	270	2.23	
B I V A L V E S	3.64	94	1.28	
Trichiurus lepturus	2.82	34	0.99	
Hoplostethus cadenati	1.44	44	0.51	
Scorpaena angolensis	1.22	6	0.43	
Solenocera africana	0.28	28	0.10	
Total	285.04		100.07	

PROJECT STATION: 175

DATE: 9/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 832
start stop duration Long E 1250
TIME :23:17:00 23:47:00 30 (min) Purpose code: 3
LOG :6032.30 6033.70 1.40 Area code : 1
FDEPTH: 552 553 GearCond.code:
BDEPTH: 552 553 Validity code: 1
Towing dir: 152° Wire out:1650 m Speed: 25 kn*10

Sorted: 21 Kg Total catch: 215.24 CATCH/HOUR: 430.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	380.00	80560	88.27	
SQUALIDAE	12.00	6	2.79	
GONOSTOMATIDAE	9.60	440	2.23	
MACROURIDAE	9.20	380	2.14	
Hoplostethus cadenati	6.20	240	1.44	
Merluccius polli	5.08	10	1.18	356
Aristeus varidens, male	3.60	480	0.84	357
Aristeus varidens, female	2.60	220	0.60	358
Scyllarides herklotsii	2.20	260	0.51	
Total	430.48		100.00	

PROJECT STATION: 176

DATE:10/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 836
start stop duration Long E 1250
TIME :01:00:00 01:30:00 30 (min) Purpose code: 3
LOG :6037.90 6039.50 1.60 Area code : 1
FDEPTH: 680 652 GearCond.code:
BDEPTH: 680 652 Validity code: 1
Towing dir: 170° Wire out:2000 m Speed: 32 kn*10

Sorted: 25 Kg Total catch: 228.24 CATCH/HOUR: 456.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	189.00	6246	41.40	
MACROURIDAE	104.40	990	22.87	
GONOSTOMATIDAE	32.40	486	7.10	
Scyllarides herklotsii	27.72	1314	6.07	
Geryon maritae	24.66	54	5.40	
Diaphus spp.	22.50	3096	4.93	
Nematocarcinus africanus	21.60	4572	4.73	
Aristeus varidens, male	8.82	1170	1.93	359
CONGRIDAE	7.74	180	1.70	
Dasyatis pastinaca	5.22	18	1.14	
Aristeus varidens, female	4.50	288	0.99	360
Etmopterus spinax	4.32	36	0.95	
Todarodes sp.	3.60	18	0.79	
Total	456.48		100.00	

PROJECT STATION: 177

DATE:10/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 843
start stop duration Long E 1252
TIME :03:41:00 04:11:00 30 (min) Purpose code: 3
LOG :6049.30 6050.90 1.60 Area code : 1
FDEPTH: 454 452 GearCond.code:
BDEPTH: 454 452 Validity code: 1
Towing dir: 15° Wire out:1350 m Speed: 32 kn*10

Sorted: 20 Kg Total catch: 152.49 CATCH/HOUR: 304.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	162.60	43356	53.31	
Merluccius polli	55.00	120	18.03	363
Diaphus sp.	16.80	4488	5.51	
Hoplostethus cadenati	11.16	372	3.66	
Aristeus varidens, male	10.80	2064	3.54	361
Aristeus varidens, female	10.56	1968	3.46	362
MACROURIDAE	10.20	456	3.34	
GONOSTOMATIDAE	9.60	408	3.15	
Etmopterus spinax	9.48	192	3.11	
Trachipterus trachypterus	2.54	2	0.83	
Scyllarides herklotsii	2.28	252	0.75	
Todaropsis eblanae	1.80	12	0.59	
CONGRIDAE	1.68	12	0.55	
PORTUNIDAE	0.48	12	0.16	
Total	304.98		99.99	

PROJECT STATION: 178

DATE:10/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 845
start stop duration Long E 1258
TIME :06:26:00 06:58:00 32 (min) Purpose code: 3
LOG :6061.70 6063.40 1.70 Area code : 1
FDEPTH: 257 248 GearCond.code:
BDEPTH: 257 248 Validity code: 1
Towing dir: 20° Wire out: 750 m Speed: 29 kn*10

Sorted: 59 Kg Total catch: 325.44 CATCH/HOUR: 610.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	196.46	454	32.20	366
Gephyroberyx darwini	81.47	62	13.35	
Chlorophthalmus atlanticus	73.54	1063	12.05	
Merluccius polli	43.52	124	7.13	
Centrophorus granulosus	40.22	9	6.59	
Trichiurus lepturus	29.08	557	4.77	
Synagrops microlepis	26.81	1073	4.39	
Parapenaeus longirostris, male	26.10	4528	4.28	365
Parapenaeus longirostris, fem.	20.21	2876	3.31	364
Umbrina canariensis	18.36	21	3.01	
Miracorvina angolensis	14.14	21	2.32	
Bembrops heterurus	11.25	144	1.84	
MACROURIDAE	8.98	71	1.47	
Brotula barbata	5.27	21	0.86	
Epigonus telescopus	2.59	30	0.42	
Pterothrissus belloci	2.18	9	0.36	
SOLEIDAE	1.97	124	0.32	
Peristedion cataphractum	1.65	41	0.27	
Illex coindetii	1.56	30	0.26	
Uranoscopus polli	0.83	9	0.14	
MORIDAE	0.73	9	0.12	
Total	606.92		99.46	

PROJECT STATION: 179

DATE:10/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 842
start stop duration Long E 1303
TIME :07:56:00 08:26:00 30 (min) Purpose code: 3
LOG :6069.60 6071.10 1.50 Area code : 1
FDEPTH: 124 119 GearCond.code:
BDEPTH: 124 119 Validity code: 1
Towing dir: 20° Wire out: 460 m Speed: 26 kn*10

Sorted: 48 Kg Total catch: 362.85 CATCH/HOUR: 725.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	244.06	16890	33.63	
Trachurus trecae	180.00	300	24.80	367
Brotula barbata	87.00	90	11.99	
Chlorophthalmus atlanticus	47.70	4334	6.57	
Pterothrissus belloci	36.46	210	5.02	
Dentex macrophthalmus	26.26	136	3.62	
Dentex angolensis	24.90	90	3.43	
Miracorvina angolensis	16.06	44	2.21	
Cynoglossus sp.	13.80	104	1.90	
Uranoscopus polli	13.66	104	1.88	
Citharus linguatula	8.10	104	1.12	
Chelidonichthys capensis	7.96	60	1.10	
Scomberomorus tritor	5.86	30	0.81	
Scorpaena angolensis	5.10	60	0.70	
Trachurus, Juveniles	2.70	614	0.37	
Merluccius polli	2.56	194	0.35	
Illex coindetii	1.80	44	0.25	
Spicara alta	1.80	44	0.25	
Total	725.78		100.00	

PROJECT STATION: 180

DATE:10/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 842
start stop duration Long E 1316
TIME :10:40:00 11:10:00 30 (min) Purpose code: 3
LOG :6085.30 6086.80 1.50 Area code : 1
FDEPTH: 46 45 GearCond.code: 1
BDEPTH: 46 45 Validity code:
Towing dir: 0° Wire out: 200 m Speed: 30 kn*10

Sorted: 1 Kg Total catch: 1.49 CATCH/HOUR: 2.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	2.40	4	80.54	
C R A B S	0.28	22	9.40	
Citharus linguatula	0.18	4	6.04	
Sepia sp.	0.12	2	4.03	
Total	2.98		100.01	

PROJECT STATION: 181

DATE:11/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 907
start stop duration Long E 1235
TIME :23:55:00 00:25:00 30 (min) Purpose code: 3
LOG :6179.00 6180.50 1.50 Area code : 2
FDEPTH: 739 741 GearCond.code:
BDEPTH: 739 741 Validity code: 1
Towing dir: 210° Wire out:2100 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 197.82 CATCH/HOUR: 395.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
GONOSTOMATIDAE	131.60	2926	33.26	
MACROURIDAE	124.60	1792	31.49	
C R A B S	28.98	70	7.32	
Scyllarides herklotsii	27.16	2240	6.86	
Aristeus varidens, female	20.72	980	5.24	369
Trichiurus lepturus	14.70	406	3.72	
Hoplostethus cadenati	12.04	84	3.04	
CONGRIDAE	9.38	112	2.37	
Merluccius polli	8.12	14	2.05	
Sepia sp.	6.30	28	1.59	
Aristeus varidens, male	4.62	588	1.17	368
Diaphus sp.	4.48	980	1.13	
LOPHIIDAE	2.52	98	0.64	
Plesiopenaeus edwardsianus	0.42	14	0.11	
Total	395.64		99.99	

PROJECT STATION: 182

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 904
start stop duration Long E 1240
TIME :02:43:00 03:13:00 30 (min) Purpose code: 3
LOG :6190.80 6192.30 1.50 Area code : 2
FDEPTH: 570 572 GearCond.code:
BDEPTH: 570 572 Validity code: 1
Towing dir: 40° Wire out:1650 m Speed: 30 kn*10

Sorted: 24 Kg Total catch: 62.43 CATCH/HOUR: 124.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	31.50	60	25.23	372
MACROURIDAE	27.00	790	21.62	
GONOSTOMATIDAE	18.76	2100	15.02	
Trichiurus lepturus	13.00	240	10.41	
Hoplostethus cadenati	9.36	146	7.50	
Nematocarcinus africanus	7.00	1910	5.61	
CONGRIDAE	5.06	190	4.05	
Aristeus varidens, female	3.00	106	2.40	371
Scyllarides herklotsii	2.66	286	2.13	
Diaphus sp.	2.46	326	1.97	
Sepia sp.	1.90	10	1.52	
Aristeus varidens, male	1.30	176	1.04	370
LOPHIIDAE	0.70	26	0.56	
Etmopterus spinax	0.66	10	0.53	
Plesiopenaeus edwardsianus	0.50	66	0.40	
Total	124.86		99.99	

PROJECT STATION: 183

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 905
start stop duration Long E 1241
TIME :05:33:00 06:02:00 29 (min) Purpose code: 3
LOG :6201.40 6202.80 1.40 Area code : 2
FDEPTH: 453 460 GearCond.code:
BDEPTH: 453 460 Validity code: 1
Towing dir: 35° Wire out:1350 m Speed: 28 kn*10

Sorted: 49 Kg Total catch: 147.32 CATCH/HOUR: 304.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	73.24	155	24.03	373
GONOSTOMATIDAE	38.92	2377	12.77	
Hoplostethus cadenati	33.52	1260	11.00	
Laemonema laureysi	18.12	286	5.94	
Aristeus varidens, female	17.63	1206	5.78	374
LOPHIIDAE	16.90	149	5.54	
MACROURIDAE	16.08	300	5.28	
Centrophorus granulosus	15.00	4	4.92	
S H A R K S	13.97	93	4.58	
Aristeus varidens, male	12.72	1999	4.17	375
Trichiurus lepturus	10.37	279	3.40	
Lophiodes kempi	9.00	6	2.95	
OPHIDIIDAE	8.75	25	2.87	
B I V A L V E S	5.77	19	1.89	
Brosmiculus_imberbis *	4.03	192	1.32	
Trachinotus ovatus	3.95	12	1.30	
Centrolophus niger	3.10	6	1.02	
Geryon maritae	2.30	6	0.75	
Illex coindetii	0.87	6	0.29	
Scyllarides herklotsii	0.43	43	0.14	
Chlorophthalmus atlanticus	0.12	12	0.04	
Total	304.79		99.98	

PROJECT STATION: 184

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 905
start stop duration Long E 1249
TIME :07:55:00 08:08:00 13 (min) Purpose code: 3
LOG :6212.80 6213.70 0.90 Area code : 2
FDEPTH: 153 164 GearCond.code:
BDEPTH: 153 164 Validity code: 1
Towing dir: 60° Wire out: 600 m Speed: 30 kn*10

Sorted: 88 Kg Total catch: 148.74 CATCH/HOUR: 686.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	149.86	337	21.83	376
Dentex macrophthalmus	121.85	286	17.75	377
Synagrops microlepis	67.02	3752	9.76	
Trichiurus lepturus	62.40	125	9.09	
Pterothrissus belloci	51.78	277	7.54	
Brotula barbata	39.28	23	5.72	
Zeus faber	38.26	92	5.57	
Chelidonichthys capensis	29.58	208	4.31	
Coelorinchus coelorhincus	26.58	900	3.87	
Uranoscopus polli	14.17	83	2.06	
Miracorvina angolensis	13.48	32	1.96	
Parapenaeus longirostris, fem.	12.60	2742	1.84	378
Umbrina canariensis	10.38	32	1.51	
Merluccius polli	7.29	125	1.06	
GONOSTOMATIDAE	6.69	148	0.97	
Bembrops heterurus	5.58	55	0.81	
Trachurus trecae	4.98	9	0.73	
Epigonus telescopus	4.43	55	0.65	
Parapenaeus longirostris, male	4.43	1094	0.65	379
Octopus vulgaris	3.69	9	0.54	
Chlorophthalmus agassizi	2.40	69	0.35	
Brosmiculus imberbis *	2.31	125	0.34	
Scorpaena angolensis	1.66	14	0.24	
Cynoglossus sp.	1.38	69	0.20	
SOLEIDAE	0.83	14	0.12	
Zenopsis conchifer	0.83	14	0.12	
Illex coindetii	0.74	23	0.11	
Hoplostethus cadenati	0.69	46	0.10	
Peristedion cataphractum	0.51	14	0.07	
Geryon maritae	0.46	9	0.07	
Sepia sp.	0.32	9	0.05	
Total	686.46		99.99	

PROJECT STATION: 185

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 907
start stop duration Long E 1250
TIME :09:07:00 09:37:00 30 (min) Purpose code: 3
LOG :6220.10 6221.50 1.40 Area code : 2
FDEPTH: 85 90 GearCond.code:
BDEPTH: 85 90 Validity code: 1
Towing dir: 20° Wire out: 250 m Speed: 28 kn*10

Sorted: 96 Kg Total catch: 354.19 CATCH/HOUR: 708.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	470.50	7420	66.42	380
Pagellus bellottii	57.62	410	8.13	381
Boops boops	42.06	1380	5.94	
Sepia sp.	34.64	36	4.89	
Sparus caeruleostictus	33.48	72	4.73	
Chelidonichthys capensis	12.18	6	1.72	
Citharus linguatula	9.10	272	1.28	
Uranoscopus polli	9.10	36	1.28	
Zeus faber	8.88	22	1.25	
Dentex congoensis	8.22	234	1.16	
Spicara alta	7.64	314	1.08	
Scomberomorus tritor	4.12	6	0.58	
Chaetodon hoefleri	2.50	14	0.35	
Dentex angolensis	2.50	72	0.35	
Engraulis encrasicolus	1.54	366	0.22	
Lophiodes sp.	1.46	6	0.21	
Lepidotrigla cadmani	1.10	36	0.16	
CONGRIDAE	1.02	6	0.14	
Chlorophthalmus atlanticus	0.30	6	0.04	
Zenopsis conchifer	0.30	6	0.04	
Illex coindetii	0.14	160	0.02	
Total	708.40		99.99	

PROJECT STATION: 186

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 955
start stop duration Long E 1258
TIME :11:14:00 11:44:00 30 (min) Purpose code: 3
LOG :6230.80 6232.30 1.50 Area code : 2
FDEPTH: 25 57 GearCond.code:
BDEPTH: 25 57 Validity code: 1
Towing dir: 360° Wire out: 100 m Speed: 30 kn*10

Sorted: 39 Kg Total catch: 48.94 CATCH/HOUR: 97.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	79.26	1502	80.98	382
Pagellus bellottii	7.58	50	7.74	383
Sepia sp.	6.26	12	6.40	
Raja miraletus	2.22	2	2.27	
Sphyraena guachancho	0.90	2	0.92	
Brachydeuterus auritus	0.58	6	0.59	
Zeus faber	0.58	2	0.59	
Dentex canariensis	0.32	6	0.33	
Trichiurus lepturus	0.10	8	0.10	
Citharus linguatula	0.06	2	0.06	
Saurida brasiliensis	0.02	8	0.02	
Total	97.88		100.00	

PROJECT STATION: 187

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 924
start stop duration Long E 1305
TIME :14:21:00 14:51:00 30 (min) Purpose code: 3
LOG :6254.80 6256.30 1.50 Area code : 2
FDEPTH: 13 12 GearCond.code:
BDEPTH: 13 12 Validity code: 1
Towing dir: 160° Wire out: 105 m Speed: 30 kn*10

Sorted: Kg Total catch: 204.46 CATCH/HOUR: 408.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	395.00	210	96.60	
Dentex canariensis	4.96	8	1.21	384
Lagocephalus laevigatus	2.90	2	0.71	
Cynoglossus browni	2.12	2	0.52	
Dentex barnardi	1.12	2	0.27	
Pagellus bellottii	0.94	2	0.23	
Epinephelus goreensis	0.62	4	0.15	
Trachinus armatus	0.56	8	0.14	
Selene dorsalis	0.44	2	0.11	
Trachinus araneus	0.26	2	0.06	
Total	408.92		100.00	

PROJECT STATION: 188

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 923
start stop duration Long E 1254
TIME :16:25:00 16:55:00 30 (min) Purpose code: 3
LOG :6268.80 6270.40 1.60 Area code : 2
FDEPTH: 67 68 GearCond.code:
BDEPTH: 67 68 Validity code: 1
Towing dir: 330° Wire out: 215 m Speed: 32 kn*10

Sorted: 92 Kg Total catch: 1226.49 CATCH/HOUR: 2452.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1844.88	3892	75.21	386
Pagellus bellottii	297.26	1280	12.12	385
Branchiostegus semifasciatus	94.38	80	3.85	
Brachydeuterus auritus	80.24	426	3.27	
Scomber japonicus	39.72	54	1.62	
Trichiurus lepturus	26.66	26	1.09	
Zeus faber	16.52	54	0.67	
Brotula barbata	11.74	54	0.48	
Sepia officinalis hierredda	10.66	26	0.43	
Chelidonichthys capensis	9.06	54	0.37	
Alloteuthis africana	8.00	2266	0.33	
Umbrina canariensis	4.80	54	0.20	
Citharus linguatula	4.80	134	0.20	
Dentex canariensis	2.40	26	0.10	
Dentex angolensis	1.86	26	0.08	
Total	2452.98		100.02	

PROJECT STATION: 189

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 924
start stop duration Long E 1247
TIME :17:55:00 18:25:00 30 (min) Purpose code: 3
LOG :6278.10 6279.80 1.70 Area code : 2
FDEPTH: 113 110 GearCond.code:
BDEPTH: 113 110 Validity code: 1
Towing dir: 160° Wire out: 390 m Speed: 30 kn*10

Sorted: 62 Kg Total catch: 531.52 CATCH/HOUR: 1063.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	374.00	25704	35.18	
Dentex macrophthalmus	170.00	1122	15.99	387
Brotula barbata	120.70	102	11.35	
Umbrina canariensis	97.74	204	9.19	
Chelidonichthys capensis	71.40	442	6.72	
Scorpaena angolensis	43.34	132	4.08	
Trachurus trecae	30.76	68	2.89	
Dentex angolensis	28.04	256	2.64	
Miracorvina angolensis	26.34	18	2.48	
Boops boops	20.74	510	1.95	
Pterothrissus belloci	16.82	102	1.58	
Trichiurus lepturus	14.44	34	1.36	
Citharus linguatula	10.54	222	0.99	
Zeus faber	10.20	34	0.96	
Spicara alta	6.28	222	0.59	
Zenopsis conchifer	4.24	18	0.40	
Serranus cabrilla	3.06	18	0.29	
Peristedion cataphractum	3.06	68	0.29	
Uranoscopus polli	2.38	18	0.22	
Illex coindetii	2.20	34	0.21	
Anthias anthias	2.04	18	0.19	
SOLEIDAE	1.52	52	0.14	
Lophiodes sp.	1.36	18	0.13	
Dicologoglossa hexophthalma	1.18	18	0.11	
Merluccius polli	1.18	34	0.11	
Total	1063.56		100.04	

PROJECT STATION: 190

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 925
start stop duration Long E 1241
TIME :20:07:00 20:30:00 23 (min) Purpose code: 3
LOG :1290.30 6291.50 1.20 Area code : 2
FDEPTH: 290 294 GearCond.code:
BDEPTH: 290 294 Validity code: 1
Towing dir: 340° Wire out: 900 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 234.89 CATCH/HOUR: 612.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	437.35	8747	71.37	
Centrophorus granulosus	68.87	18	11.24	
Merluccius polli	43.30	99	7.07	388
MACROURIDAE	18.63	321	3.04	
Gephyroberyx darwini	15.52	29	2.53	
Raja miraletus	7.20	10	1.18	
Laemonema laureysi	6.83	175	1.11	
Geryon maritae	5.37	18	0.88	
Illex coindetii	1.90	18	0.31	
Pterothrissus belloci	1.64	10	0.27	
Solenocera africana	1.10	230	0.18	
MORIDAE	0.99	29	0.16	
Synagrops microlepis	0.81	37	0.13	
Citharus linguatula	0.81	18	0.13	
LOPHIIDAE	0.73	29	0.12	
Aristeus varidens	0.63	201	0.10	
CYNOGLOSSIDAE	0.44	10	0.07	
Trichiurus lepturus	0.37	10	0.06	
Scorpaena angolensis	0.26	10	0.04	
Total	612.75		99.99	

PROJECT STATION: 191

DATE:12/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 925
start stop duration Long E 1239
TIME :22:18:00 22:37:00 19 (min) Purpose code: 3
LOG :6299.90 6300.90 1.00 Area code : 2
FDEPTH: 360 320 GearCond.code:
BDEPTH: 360 320 Validity code: 1
Towing dir: 350° Wire out:1150 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 83.89 CATCH/HOUR: 264.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	92.37	202	34.87	393
Laemonema laureysi	56.59	960	21.36	
MACROURIDAE	30.51	707	11.52	
Lophiodes sp.	29.81		11.25	
Schedophilus huttoni	8.15	9	3.08	
LOPHIIDAE	7.55	76	2.85	
Pterothrissus belloci	7.07	32	2.67	
Trichiurus lepturus	6.41	69	2.42	
Parapenaeus longirostris, fem.	5.18	666	1.96	390
Gephyroberyx darwini	4.33	9	1.63	
Illex coindetii	3.95	35	1.49	
Geryon maritae	2.65	22	1.00	
Chlorophthalmus atlanticus	2.21	54	0.83	
TRIGLIDAE	1.64	3	0.62	
Aristeus varidens, female	1.52	212	0.57	392
Zenopsis conchifer	1.45	9	0.55	
Solenocera africana	1.23	224	0.46	
GONOSTOMATIDAE	0.88	22	0.33	
Aristeus varidens, male	0.63	82	0.24	391
Epigonus telescopus	0.41	3	0.15	
Peristedion cataphractum	0.25	3	0.09	
Parapenaeus longirostris, male	0.13	25	0.05	389
Total	264.92		99.99	

PROJECT STATION: 192

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 921
start stop duration Long E 1235
TIME :00:50:00 01:20:00 30 (min) Purpose code: 3
LOG :6308.80 6310.40 1.60 Area code : 2
FDEPTH: 549 552 GearCond.code:
BDEPTH: 549 552 Validity code: 1
Towing dir: 350° Wire out:1600 m Speed: 32 kn*10

Sorted: 26 Kg Total catch: 157.02 CATCH/HOUR: 314.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	104.64	3576	33.32	
MACROURIDAE	59.40	1800	18.91	
Merluccius polli	40.20	72	12.80	394
GONOSTOMATIDAE	27.60	1668	8.79	
Nematocarcinus africanus	17.40	4644	5.54	
Scyllarides herklotsii	14.40	1092	4.59	
Aristaus varidens, female	11.28	576	3.59	396
Geryon maritae	11.16	36	3.55	
Aristeus varidens, male	10.56	1408	3.36	395
Etmopterus spinax	9.72	12	3.10	
Todaropsis eblanae	5.76	36	1.83	
PORTUNIDAE	1.08	12	0.34	
Trichiurus lepturus	0.84	36	0.27	
Total	314.04		99.99	

PROJECT STATION: 193

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 946
start stop duration Long E 1244
TIME :05:27:00 05:57:00 30 (min) Purpose code: 3
LOG :6342.10 6343.60 1.50 Area code : 2
FDEPTH: 454 445 GearCond.code:
BDEPTH: 454 445 Validity code: 1
Towing dir: 170° Wire out:1350 m Speed: 30 kn*10

Sorted: 55 Kg Total catch: 177.14 CATCH/HOUR: 354.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	129.60	384	36.58	399
Laemonema laureysi	58.80	672	16.60	
GOBIIDAE	42.00	22614	11.86	
Centrophorus granulosus	23.80	8	6.72	
Aristeus varidens, female	21.90	928	6.18	397
GONOSTOMATIDAE	16.68	354	4.71	
MACROURIDAE	13.44	210	3.79	
Illex coindetii	12.36	90	3.49	
Aristeus varidens, male	11.16	996	3.15	398
S H A R K S	7.38	120	2.08	
Schedophilus huttoni	5.34	24	1.51	
Hoplostethus cadenati	5.04	120	1.42	
Geryon maritae	4.56	18	1.29	
LOPHIIDAE	0.96	24	0.27	
Glyphus marsupialis	0.66	18	0.19	
Scyllarides herklotsii	0.60	60	0.17	
Total	354.28		100.01	

PROJECT STATION: 194

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 946
start stop duration Long E 1247
TIME :07:14:00 07:25:00 11 (min) Purpose code: 3
LOG :6348.70 6349.30 0.60 Area code : 2
FDEPTH: 322 358 GearCond.code:
BDEPTH: 322 358 Validity code: 1
Towing dir: 350° Wire out:1000 m Speed: 32 kn*10

Sorted: 69 Kg Total catch: 243.50 CATCH/HOUR: 1328.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	380.89	6873	28.68	
Gephyroberyx darwini	292.09	344	21.99	
Merluccius polli	160.36	649	12.07	400
Deepwater fish mixture	80.18		6.04	
Pterothrissus belloci	79.42	382	5.98	
Centrophorus granulosus	78.27	16	5.89	
Laemonema laureysi	42.22	878	3.18	
Trichiurus lepturus	34.36	382	2.59	
Parapenaeus longirostris, fem.	34.20	3147	2.57	401
MACROURIDAE	31.15	436	2.35	
Parapenaeus longirostris, male	23.13	1969	1.74	402
Synagrops microlepis	19.69	458	1.48	
Epigonus telescopus	17.18	115	1.29	
Priacanthus arenatus	9.76	16	0.73	
Illex coindetii	9.16	16	0.69	
Geryon maritae	9.00	38	0.68	
LOPHIIDAE	8.78	55	0.66	
Hoplostethus cadenati	8.24	16	0.62	
Scorpaena angolensis	8.24	16	0.62	
Total	1326.32		99.85	

PROJECT STATION: 195

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 946
start stop duration Long E 1249
TIME :08:29:00 08:48:00 19 (min) Purpose code: 3
LOG :6353.00 6353.90 0.90 Area code : 2
FDEPTH: 259 255 GearCond.code:
BDEPTH: 259 255 Validity code: 1
Towing dir: 160° Wire out: 750 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 205.56 CATCH/HOUR: 649.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
GOBIIDAE	130.74	100554	20.14	
Trichiurus lepturus	114.63	1762	17.66	
Synagrops microlepis	79.01	2046	12.17	
Merluccius polli	71.05	246	10.95	
Parapenaeus longirostris, fem.	51.47	6878	7.93	403
Parapenaeus longirostris, male	37.14	6297	5.72	404
Chlorophthalmus atlanticus	28.61	379	4.41	
Gephyroberyx darwini	23.49	19	3.62	
Dentex angolensis	22.36	57	3.44	
Bembrops heterurus	22.17	133	3.42	
MACROURIDAE	19.89	189	3.06	
Pterothrissus belloci	17.43	57	2.69	
Zenopsis conchifer	7.96	38	1.23	
Epigonus telescopus	7.89	19	1.22	
Merluccius polli, juveniles	7.58	76	1.17	
Sepia sp.	3.79	19	0.58	
CYNOGLOSSIDAE	1.89	76	0.29	
Illex coindetii	1.52	19	0.23	
Total	648.62		99.93	

PROJECT STATION: 196

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 947
start stop duration Long E 1251
TIME :09:47:00 10:22:00 35 (min) Purpose code: 3
LOG :6357.90 6359.60 1.70 Area code : 2
FDEPTH: 147 177 GearCond.code:
BDEPTH: 147 177 Validity code: 1
Towing dir: 170° Wire out: 450 m Speed: 28 kn*10

Sorted: 94 Kg Total catch: 316.07 CATCH/HOUR: 541.83

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	162.07	679	29.91	406
Illex coindetii	92.19	1558	17.01	
Dentex angolensis	65.37	182	12.06	405
Synagrops microlepis	59.37	3156	10.96	
Trachurus trecae	57.38	115	10.59	407
Spicara alta	23.69	120	4.37	
Squatina oculata	11.88	39	2.19	
Zenopsis conchifer	9.87	29	1.82	
Brotula barbata	9.48	5	1.75	
Trichiurus lepturus	7.42	22	1.37	
Pterothrissus belloci	6.39	34	1.18	
Bembrops heterurus	6.22	69	1.15	
Raja miraletus	6.10	17	1.13	
Scomberomorus tritor	6.05	22	1.12	
Branchiostegus semifasciatus	4.34	5	0.80	
Sparus caeruleostictus	3.99	5	0.74	
Zeus faber	3.60	10	0.66	
Chelidonichthys capensis	1.59	10	0.29	
Uranoscopus polli	1.49	10	0.27	
Cynoglossus sp.	1.32	57	0.24	
Scyliorhinus stellaris	0.81	5	0.15	
Scorpaena angolensis	0.81	10	0.15	
Peristedion cataphractum	0.39	10	0.07	
Total	541.82		99.98	

PROJECT STATION: 197

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 948
start stop duration Long E 1254
TIME :11:19:00 11:29:00 10 (min) Purpose code: 3
LOG :6364.30 6364.80 0.50 Area code : 2
FDEPTH: 112 111 GearCond.code:
BDEPTH: 112 111 Validity code: 1
Towing dir: ° Wire out: 360 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 239.78 CATCH/HOUR: 1438.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	867.30	6216	60.28	410
Anthias anthias	141.78	1074	9.85	
Zenopsis conchifer	85.08	42	5.91	
Dentex angolensis	62.58	210	4.35	408
Dentex macrophthalmus	50.40	192	3.50	409
Scomber japonicus	43.08	192	2.99	411
Epinephelus aeneus	40.20	6	2.79	
Boops boops	34.26	1620	2.38	
Raja miraletus	21.84	42	1.52	
Illex coindetii	19.98	630	1.39	
Dentex congoensis	19.56	126	1.36	
Todaropsis eblanae	18.90	294	1.31	
Argyrosomus hololepidotus	16.20	24	1.13	
Citharus linguatula	5.46	84	0.38	
Dentex canariensis	4.62	24	0.32	
Cynoglossus canariensis	1.92	66	0.13	
Chelidonichthys gabonensis	1.92	66	0.13	
Microchirus frechkopi	1.68	24	0.12	
Pagellus bellottii	0.84	24	0.06	
Spicara alta	0.66	24	0.05	
Peristedion cataphractum	0.42	24	0.03	
Total	1438.68		99.98	

PROJECT STATION: 198

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 944
start stop duration Long E 1303
TIME :12:51:00 13:21:00 30 (min) Purpose code: 3
LOG :6374.30 6375.80 1.50 Area code : 2
FDEPTH: 74 70 GearCond.code:
BDEPTH: 74 70 Validity code: 1
Towing dir: 20° Wire out: 240 m Speed: 30 kn*10

Sorted: 85 Kg Total catch: 207.66 CATCH/HOUR: 415.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	331.56	1860	79.83	414
Trichiurus lepturus	16.08	28	3.87	
Dentex angolensis	15.84	280	3.81	413
Trachurus trecae	14.16	168	3.41	412
Squatina oculata	8.00	2	1.93	
Dentex canariensis	6.44	60	1.55	
Octopus vulgaris	5.00	2	1.20	
Epinephelus aeneus	4.48	2	1.08	
Alloteuthis africana	4.42	2040	1.06	
Zeus faber	3.50	10	0.84	
Selene dorsalis	2.20	10	0.53	
Dentex barnardi	1.82	10	0.44	
Chelidonichthys gabonensis	0.94	10	0.23	
Umbrina canariensis	0.88	10	0.21	
Total	415.32		99.99	

PROJECT STATION: 199

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 944
start stop duration Long E 1306
TIME :14:05:00 14:18:00 13 (min) Purpose code: 3
LOG :6378.80 6379.50 0.70 Area code : 2
FDEPTH: 41 41 GearCond.code: 9
BDEPTH: 41 41 Validity code: 1
Towing dir: 140° Wire out: 150 m Speed: 31 kn*10

Sorted: 160 Kg Total catch: 160.46 CATCH/HOUR: 740.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Seriola carpenteri	305.31	55	41.23	417
Dentex canariensis	168.69	2068	22.78	415
POMACENTRIDAE	94.62	1089	12.78	
Lutjanus goreensis	61.38	60	8.29	416
Zeus faber	27.74	55	3.75	
Rhinobatos albomaculatus	15.92	5	2.15	
Raja miraletus	10.25	14	1.38	
Lutjanus endecacanthus	9.88	5	1.33	
Dentex gibbosus	9.14	9	1.23	
Acanthurus monroviae	8.31	14	1.12	
Trichiurus lepturus	6.92	9	0.93	
Sarpa salpa	4.80	5	0.65	
Chastodon hoefleri	4.66	74	0.63	
Pseudupeneus prayensis	2.68	18	0.36	
Fistularia petimba	1.94	9	0.26	
Spondyliosoma cantharus	1.94	5	0.26	
Parapristipoma octolineatum	1.89	18	0.26	
Plectorhinchus mediterraneus	1.66	9	0.22	
Pagellus bellottii	1.29	9	0.17	
Boops boops	0.60	18	0.08	
Sepia officinalis hierredda	0.55	5	0.07	
Scorpaena stephanica	0.37	9	0.05	
Chastodon marcellae	0.05	5	0.01	
Total	740.59		99.99	

PROJECT STATION: 200

DATE:13/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 945
start stop duration Long E 1310
TIME :15:18:00 15:48:00 30 (min) Purpose code: 3
LOG :6385.80 6387.30 1.50 Area code : 2
FDEPTH: 25 26 GearCond.code:
BDEPTH: 25 26 Validity code: 1
Towing dir: 336° Wire out: 100 m Speed: 30 kn*10

Sorted: 114 Kg Total catch: 114.20 CATCH/HOUR: 228.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	121.72	322	53.29	418
Trichiurus lepturus	34.60	52	15.15	
Sepia officinalis hierredda	25.50	112	11.16	
Pagellus bellottii	17.32	82	7.58	419
Trachurus trecae	9.26	560	4.05	
Dentex canariensis	6.26	32	2.74	
Brachydeuterus auritus	4.54	28	1.99	
Alloteuthis africana	2.08	4160	0.91	
Panulirus regius	2.00	2	0.88	
Torpedo marmorata	1.84	2	0.81	
Chelidonichthys capensis	1.72	10	0.75	
Raja miraletus	1.38	2	0.60	
Pseudupeneus prayensis	*0.18*	2	*0.08*	
Total	228.40		99.99	

PROJECT STATION: 201

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1002
start stop duration Long E 1307
TIME :06:23:00 06:55:00 32 (min) Purpose code: 3
LOG :6412.60 6414.00 1.40 Area code : 2
FDEPTH: 14 14 GearCond.code:
BDEPTH: 14 14 Validity code: 1
Towing dir: 335° Wire out: 100 m Speed: 28 kn*10

Sorted: Kg Total catch: 85.94 CATCH/HOUR: 161.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena guachancho	114.47	114	71.04	420
Sepia officinalis hierredda	9.58	43	5.95	
Rhinobatos albomaculatus	8.16	4	5.06	
Pseudotolithus typus	7.26	6	4.51	
Trichiurus lepturus	6.54	86	4.06	
Loligo sp.	3.86	4249	2.40	
Pomadasys jubelini	3.06	4	1.90	
Sardinella aurita	2.33	17	1.45	
Pagellus bellottii	1.80	6	1.12	
Balistes capriscus	1.43	2	0.89	
Alectis alexandrinus	1.07	4	0.66	
Torpedo marmorata	0.62	4	0.38	
Cynoglossus capensis	0.62	2	0.38	
Chloroscombrus chrysurus	0.21	2	0.13	
Brachydeuterus auritus	0.15	4	0.09	
Total	161.16		100.02	

PROJECT STATION: 202

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1003
start stop duration Long E 1312
TIME :07:50:00 08:20:00 30 (min) Purpose code: 3
LOG :6419.40 6421.30 1.40 Area code : 2
FDEPTH: 52 58 GearCond.code:
BDEPTH: 52 58 Validity code: 1
Towing dir: 170° Wire out:1502 m Speed: 28 kn*10

Sorted: 91 Kg Total catch: 227.50 CATCH/HOUR: 455.00

SPECIES	CATCH/HOU weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	329.76	680	72.47	421
Trichiurus lepturus	38.50	134	8.46	
Synagrops microlepis	23.00	3500	5.05	
Brachydeuterus auritus	21.00	220	4.62	
Raja miraletus	16.30	24	3.58	
Stromateus fiatola	4.40	4	0.97	
Argyrosomus hololepidotus	3.66	14	0.80	
Dentex canariensis	3.26	44	0.72	
Pagellus bellottii	3.16	40	0.69	
Decapterus rhonchus	3.10	4	0.68	
Pomadasys incisus	2.30	24	0.51	
Sardinella aurita	2.10	4	0.46	
Selene dorsalis	1.80	10	0.40	
Chelidonichthys capensis	0.80	4	0.18	
Zeus faber	0.76	4	0.17	
Umbrina canariensis	0.60	10	0.13	
Sepia officinalis hierredda	0.40	10	0.09	
Total	454.90		99.98	

PROJECT STATION: 203

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1005
start stop duration Long E 1306
TIME :09:32:00 09:51:00 19 (min) Purpose code: 3
LOG :6428.80 6429.80 1.00 Area code : 2
FDEPTH: 82 80 GearCond.code:
BDEPTH: 82 80 Validity code: 4
Towing dir: 90° Wire out: 250 m Speed: 26 kn*10

Sorted: 63 Kg Total catch: 24996.77 CATCH/HOUR: 78937.17

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	56318.53	554147	71.35	422
Trachurus trecae	20453.69	304424	25.91	423
Atractoscion aequidens	1022.81	1263	1.30	
Trichiurus lepturus	846.03	6313	1.07	
Citharus linguatula	164.15	1263	0.21	
Pagellus bellottii	101.02	5049	0.13	
Zeus faber	37.89	1263	0.05	
Total	78944.12		100.02	

PROJECT STATION: 204

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1005
start *stop* *duration* *Long* E 1256
TIME :11:54:00 12:24:00 30 (min) Purpose code: 3
LOG :6443.80 6445.20 1.40 Area code : 2
FDEPTH: 123 113 GearCond.code:
BDEPTH: 123 113 Validity code: 1
Towing dir: 20° Wire out: 400 m Speed: 28 kn*10

Sorted: 121 Kg Total catch: 1386.02 CATCH/HOUR: 2772.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	934.88	2386	33.73	425
Umbrina canariensis	679.50	1306	24.51	426
Dentex macrophthalmus	641.26	3242	23.13	427
Anthias anthias	226.12	1958	8.16	
Dentex angolensis	159.30	496	5.75	424
Scomber japonicus	44.78	180	1.62	
Chelidonichthys gabonensis	25.42	202	0.92	
Epinephelus goreensis	16.50	2	0.60	
Sparus auriga	13.86	12	0.50	428
Synagrops microlepis	8.10	1912	0.29	
Todaropsis eblanae	5.18	158	0.19	
Dentex congoensis	4.28	46	0.15	
Sarda sarda	3.40	2	0.12	
Pagellus bellottii	3.38	22	0.12	
Illex coindetii	2.92	68	0.11	
Lepidotrigla carolae	1.36	46	0.05	
Scorpaena normani	1.12	22	0.04	
Citharus linguatula	0.68	22	0.02	
Total	2772.04		100.01	

PROJECT STATION: 205

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1003
start stop duration Long E 1254
TIME :13:26:00 13:56:00 30 (min) Purpose code: 3
LOG :6450.60 1.40 1.40 Area code : 2
FDEPTH: 193 190 GearCond.code:
BDEPTH: 193 190 Validity code: 1
Towing dir: 360° Wire out: 600 m Speed: 28 kn*10

Sorted: 86 Kg Total catch: 395.31 CATCH/HOUR: 790.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	431.60	8232	54.59	
Dentex macrophthalmus	81.04	208	10.25	429
Brotula barbata	46.30	50	5.86	430
Trichiurus lepturus	36.90	84	4.67	
Todaropsis eblanae	34.20	424	4.33	
Merluccius polli	29.62	234	3.75	
Zenopsis conchifer	25.12	130	3.18	
Zeus faber	22.42	60	2.84	
Pentheroscion mbizi	15.76	788	1.99	
MACROURIDAE	13.60	486	1.72	
Dentex angolensis	11.44	34	1.45	
Trachurus trecae	10.04	18	1.27	
Pterothrissus belloci	9.36	70	1.18	
Aulopus cadenati	7.36	86	0.93	
Parapenaeus longirostris, fem.	4.24	650	0.54	432
Torpedo marmorata	3.82	8	0.48	
Parapenaeus longirostris, male	2.26	434	0.29	431
Spicara alta	2.26	8	0.29	
Scomber japonicus	1.38	8	0.17	
Uranoscopus cadenati	0.96	8	0.12	
Uranoscopus polli	0.60	8	0.08	
Citharus linguatula	0.34	26	0.04	
Total	790.62		100.02	

PROJECT STATION: 206

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1003
start stop duration Long E 1252
TIME :14:48:00 15:00:00 12 (min) Purpose code: 3
LOG :6454.30 6454.90 0.60 Area code : 2
FDEPTH: 268 268 GearCond.code: 9
BDEPTH: 268 268 Validity code: 1
Towing dir: 150° Wire out: 750 m Speed: 32 kn*10

Sorted: 34 Kg Total catch: 340.75 CATCH/HOUR: 1703.75

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	920.00	16100	54.00	
Pentheroscion mbizi	250.00	9300	14.67	
Trichiurus lepturus	247.50	500	14.53	
Diaphus sp.	215.00	89400	12.62	
Pterothrissus belloci	51.00	250	2.99	
Todaropsis eblanae	15.00	300	0.88	
Parapenaeus longirostris, fem.	2.50	325	0.15	434
Parapenaeus longirostris, male	2.25	375	0.13	433
Citharus linguatula	0.50	50	0.03	
Total	1703.75		100.00	

PROJECT STATION: 207

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1006
start stop duration Long E 1252
TIME :16:05:00 16:35:00 30 (min) Purpose code: 3
LOG :6461.10 6462.80 1.70 Area code : 2
FDEPTH: 362 362 GearCond.code:
BDEPTH: 362 362 Validity code: 1
Towing dir: 350° Wire out:1050 m Speed: 34 kn*10

Sorted: 57 Kg Total catch: 57.95 CATCH/HOUR: 115.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MACROURIDAE	36.10	532	31.15	
Merluccius polli	26.10	168	22.52	435
Nematocarcinus africanus	19.90	7462	17.17	
LOPHIIDAE	7.34	124	6.33	
Gephyroberyx darwini	7.22	10	6.23	438
Trichiurus lepturus	5.62	58	4.85	
Scorpaena normani	3.04	6	2.62	
CONGRIDAE	2.50	70	2.16	
Pterothrissus belloci	2.30	12	1.98	
Geryon maritae	1.32	2	1.14	
Schedophilus huttoni	0.96	2	0.83	
Cynoponticus ferox	0.82	2	0.71	
Diaphus sp.	0.80	306	0.69	
Parapenaeus longirostris, fem.	0.68	96	0.59	437
C R A B S	0.44	12	0.38	
Peristedion cataphractum	0.28	72	0.24	
Parapenaeus longirostris, male	0.22	32	0.19	436
Epigonus telescopus	0.16	2	0.14	
CYNOGLOSSIDAE	0.10	6	0.09	
Total	115.90		100.01	

PROJECT STATION: 208

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1003
start stop duration Long E 1250
TIME :18:23:00 18:53:00 30 (min) Purpose code: 3
LOG :6469.20 6470.80 1.60 Area code : 2
FDEPTH: 449 457 GearCond.code:
BDEPTH: 449 457 Validity code: 1
Towing dir: 155° Wire out:1350 m Speed: 29 kn*10

Sorted: 53 Kg Total catch: 146.25 CATCH/HOUR: 292.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	53.74	120	18.37	439
Laemonema laureysi	48.14	1006	16.46	
Aristeus varidens, female	34.60	2254	11.83	441
Nematocarcinus africanus	29.00	6670	9.91	
Centrophorus granulosus	26.60	6	9.09	
MACROURIDAE	24.50	980	8.38	
S H A R K S	24.00	570	8.21	
Aristeus varidens, male	14.00	1936	4.79	440
LOPHIIDAE	9.30	474	3.18	
GONOSTOMATIDAE	8.70	290	2.97	
BATRACHOIDIDAE	8.54	6	2.92	
Illex coindetii	3.10	26	1.06	
Hoplostethus cadenati	2.30	80	0.79	
Scorpaena angolensis	1.50	6	0.51	
Trichiurus lepturus	1.40	50	0.48	
Zenopsis conchifer	1.24	6	0.42	
Schedophilus huttoni	0.80	6	0.27	
Epigonus telescopus	0.50	6	0.17	
Glyphus marsupialis	0.50	40	0.17	
Geryon maritae	0.24	6	0.08	
Total	292.70		100.06	

PROJECT STATION: 209

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1003
start stop duration Long E 1249
TIME :20:11:00 20:41:00 30 (min) Purpose code: 3
LOG :6474.00 6475.40 1.40 Area code : 2
FDEPTH: 553 556 GearCond.code:
BDEPTH: 553 556 Validity code: 1
Towing dir: 342° Wire out:1650 m Speed: 26 kn*10

Sorted: 58 Kg Total catch: 106.32 CATCH/HOUR: 212.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	50.80	80	23.89	442
Nematocarcinus africanus	28.00	7888	13.17	
Centrophorus granulosus	24.40	20	11.47	
OPHICHTHIDAE	21.00	100	9.88	
Deepwater fish mixture	20.00		9.41	
OPHIDIIDAE	15.48	440	7.28	
Hoplostethus cadenati	9.76	236	4.59	
LOPHIIDAE	7.52	420	3.54	
Trichiurus lepturus	7.40	2916	3.48	
GONOSTOMATIDAE	7.20	122	3.39	
MACROURIDAE	6.88	112	3.24	
Laemonema laureysi	3.40	36	1.60	
Geryon maritae	3.32	12	1.56	
Illex coindetii	2.72	16	1.28	
Aristeus varidens, female	2.48	120	1.17	444
Aristeus varidens, male	1.16	160	0.55	443
Schedophilus huttoni	0.64	4	0.30	
NETTASTOMATIDAE	0.48	16	0.23	
Total	212.64		100.03	

PROJECT STATION: 210

DATE:14/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1002
start stop duration Long E 1004
TIME :22:30:00 23:00:00 30 (min) Purpose code: 3
LOG :6480.90 6483.30 1.40 Area code : 2
FDEPTH: 766 775 GearCond.code:
BDEPTH: 766 775 Validity code: 1
Towing dir: 170° Wire out:2100 m Speed: 28 kn*10

Sorted: 25 Kg Total catch: 103.24 CATCH/HOUR: 206.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MACROURIDAE	105.04	2040	50.87	
Trichiurus lepturus	25.60	384	12.40	
OPHIDIIDAE	16.16	168	7.83	
Scyllarides herklotsii	14.16	456	6.86	
NETTASTOMATIDAE	11.12	112	5.39	
Geryon maritae	9.04	16	4.38	
Merluccius polli	8.40	8	4.07	
Ebinania costaecanaria	6.24	16	3.02	
Cephalopholis sp.	2.48	16	1.20	
Hoplostethus cadenati	2.08	48	1.01	
Aristeus varidens	2.00	152	0.97	
GONOSTOMATIDAE	1.60	16	0.77	
HALOSAURIDAE	0.88	16	0.43	
OPHICHTHIDAE	0.72	8	0.35	
Glyphus marsupialis	0.72	48	0.35	
Synagrops microlepis	0.24	8	0.12	
Total	206.48		100.02	

PROJECT STATION: 211

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1024
start stop duration Long E 1256
TIME :02:37:00 03:07:00 30 (min) Purpose code: 3
LOG :6508.80 6510.30 1.50 Area code : 2
FDEPTH: 536 546 GearCond.code:
BDEPTH: 536 546 Validity code: 1
Towing dir: 315° Wire out:1640 m Speed: 30 kn*10

Sorted: 42 Kg Total catch: 304.96 CATCH/HOUR: 609.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	436.80	107744	71.62	
GONOSTOMATIDAE	66.30	1990	10.87	
Merluccius polli	63.20	108	10.36	447
Trichiurus lepturus	11.70	222	1.92	
Etmopterus spinax	7.02	26	1.15	
Scyllarides herklotsii	6.38	598	1.05	
MACROURIDAE	3.64	222	0.60	
Geryon maritae	3.00	14	0.49	
Hoplostethus cadenati	2.74	92	0.45	
Aristeus varidens, female	2.74	144	0.45	446
LOPHIIDAE	2.08	118	0.34	
Aristeus varidens, male	2.08	300	0.34	445
CONGRIDAE	1.18	78	0.19	
Plesiopenaeus edwardsianus	0.66	144	0.11	
Dasyatis pastinaca	0.40	14	0.07	
Total	609.92		100.01	

PROJECT STATION: 212

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1023
start stop duration Long E 1257
TIME :04:42:00 05:12:00 30 (min) Purpose code: 3
LOG :6516.50 6518.00 1.50 Area code : 2
FDEPTH: 452 450 GearCond.code:
BDEPTH: 452 450 Validity code: 1
Towing dir: 330° Wire out:1350 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 174.01 CATCH/HOUR: 348.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	90.30	154	25.95	448
Nematocarcinus africanus	68.96	17234	19.81	
S H A R K S	56.70	714	16.29	
Trichiurus lepturus	43.54	714	12.51	
MACROURIDAE	33.26	300	9.56	
Aristeus varidens, female	25.00	1196	7.18	450
Centrophorus granulosus	9.00	2	2.59	
LOPHIIDAE	7.22	174	2.07	
EXOCOETIDAE	5.26	6	1.51	
Illex coindetii	4.90	34	1.41	
Aristeus varidens, male	3.92	534	1.13	449
Total	348.06		100.01	

PROJECT STATION: 213

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1022
start stop duration Long E 1300
TIME :06:42:00 07:12:00 30 (min) Purpose code: 3
LOG :6524.20 6525.70 1.50 Area code : 2
FDEPTH: 340 349 GearCond.code:
BDEPTH: 340 349 Validity code: 1
Towing dir: 320° Wire out:1050 m Speed: 29 kn*10

Sorted: 53 Kg Total catch: 186.17 CATCH/HOUR: 372.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	65.80	210	17.67	451
Pterothrissus belloci	61.26	286	16.45	
Chlorophthalmus atlanticus	43.06	1406	11.56	
Parapenaeus longirostris, fem.	34.30	4326	9.21	453
Gephyroberyx darwini	29.82	28	8.01	
Coelorinchus coelorhincus	28.78	2540	7.73	
Miscellaneous fishes	28.70		7.71	
Laemonema laureysi	25.56	398	6.86	
Parapenaeus longirostris, male	18.00	2610	4.83	452
Scorpaena angolensis	17.78	56	4.78	
Geryon maritae	5.68	90	1.53	
Illex coindetii	3.78	48	1.02	
Trichiurus lepturus	2.10	28	0.56	
Trigla lyra	1.90	6	0.51	
Epigonus telescopus	1.76	20	0.47	
S H A R K S	1.48	34	0.40	
Zenopsis conchifer	1.34	6	0.36	
Zenopsis conchifer	1.34	6	0.36	
Raja miraletus	1.34	6	0.36	
Total	373.78		100.38	

PROJECT STATION: 214

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1022
start stop duration Long E 1301
TIME :08:10:00 08:20:00 10 (min) Purpose code: 3
LOG :6529.10 6529.60 0.50 Area code : 2
FDEPTH: 237 244 GearCond.code: 8
BDEPTH: 237 244 Validity code: 4
Towing dir: 160° Wire out: 750 m Speed: 32 kn*10

Sorted: 28 Kg Total catch: 112.88 CATCH/HOUR: 677.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	330.00	13728	48.72	
Chlorophthalmus atlanticus	242.40	5040	35.79	
Parapenaeus longirostris, fem.	30.48	4416	4.50	455
Parapenaeus longirostris, male	23.76	4200	3.51	454
Pterothrissus belloci	10.80	72	1.59	
Dentex angolensis	10.08	24	1.49	
Dentex macrophthalmus	7.20	24	1.06	
Zenopsis conchifer	4.56	24	0.67	
Illex coindetii	4.56	48	0.67	
Bembrops heterurus	4.08	48	0.60	
Scorpaena angolensis	3.12	24	0.46	
Halosaurus sp.	2.16	24	0.32	
Geryon maritae	1.92	24	0.28	
S H A R K S	1.68	48	0.25	
LOPHIIDAE	0.48	48	0.07	
Total	677.28		99.98	

PROJECT STATION: 215

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1023
start stop duration Long E 1304
TIME :09:40:00 10:10:00 30 (min) Purpose code: 3
LOG :6533.50 6535.10 1.60 Area code : 2
FDEPTH: 195 189 GearCond.code:
BDEPTH: 195 189 Validity code: 1
Towing dir: 155° Wire out: 560 m Speed: 31 kn*10

Sorted: 90 Kg Total catch: 276.84 CATCH/HOUR: 553.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenopsis conchifer	112.80	1068	20.37	
Spicara alta	108.00	458	19.51	
Dentex angolensis	62.70	150	11.32	456
Synagrops microlepis	62.40	3600	11.27	
Dentex macrophthalmus	38.10	114	6.88	457
Erythrocles monodi	34.80	42	6.29	
Pterothrissus belloci	30.54	198	5.52	
Centrophorus granulosus	22.20	6	4.01	
Merluccius polli	19.32	240	3.49	
Squatina oculata	14.40	6	2.60	
Epinephelus goreensis	13.50	4	2.44	458
Umbrina canariensis	7.20	12	1.30	
Zeus faber	4.68	12	0.85	
Scorpaena angolensis	4.68	12	0.85	
Chlorophthalmus atlanticus	4.26	186	0.77	
Bembrops heterurus	4.08	54	0.74	
Illex coindetii	3.36	42	0.61	
Epigonus telescopus	2.88	54	0.52	
Uranoscopus polli	1.44	12	0.26	
SERRANIDAE	1.20	6	0.22	
Parapenaeus longirostris	0.48	114	0.09	
Citharus linguatula	0.36	24	0.07	
Total	553.38		99.98	

PROJECT STATION: 216

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1024
start stop duration Long E 1310
TIME :11:30:00 12:00:00 30 (min) Purpose code: 3
LOG :6540.90 6542.40 1.50 Area code : 2
FDEPTH: 110 110 GearCond.code:
BDEPTH: 110 110 Validity code: 1
Towing dir: 143° Wire out: 330 m Speed: 28 kn*10

Sorted: 55 Kg Total catch: 110.40 CATCH/HOUR: 220.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	78.20	208	35.42	461
Sparus pagrus africanus	25.64	36	11.61	462
Dentex macrophthalmus	20.32	88	9.20	459
Squatina oculata	16.80	12	7.61	
Dentex angolensis	16.40	88	7.43	460
Chelidonichthys gabonensis	9.88	64	4.47	
Torpedo torpedo	8.12	12	3.68	
Raja miraletus	7.76	20	3.51	
Trichiurus lepturus	5.08	4	2.30	
Todaropsis eblanae	4.64	144	2.10	
Epinephelus goreensis	3.96	4	1.79	
Citharus linguatula	3.60	80	1.63	
Zeus faber	3.24	12	1.47	
Zenopsis conchifer	2.60	12	1.18	
Trachurus trecae	2.48	56	1.12	
Brotula barbata	2.32	4	1.05	
Lepidotrigla carolae	2.28	68	1.03	
Dentex congoensis	1.40	8	0.63	
Chelidonichthys lucerna	1.16	8	0.53	
Synagrops microlepis	1.04	440	0.47	
Illex coindetii	1.00	56	0.45	
Lagocephalus laevigatus	0.96	4	0.43	
Uranoscopus polli	0.80	4	0.36	
Peristedion cataphractum	0.80	16	0.36	
Microchirus frechkopi	0.28	4	0.13	
Saurida brasiliensis	0.04	8	0.02	
Total	220.80		99.98	

PROJECT STATION: 217

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1025

	start	stop	duration			Long E 1319
TIME	:13:38:00	14:08:00	30	(min)	Purpose code:	3
LOG	:6553.30	6554.80	1.50		Area code :	2
FDEPTH:	80	80			GearCond.code:	
BDEPTH:	80	80			Validity code:	1

Towing dir: 85° Wire out: 240 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 4999.98 CATCH/HOUR: 9999.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	4943.96	13872	49.44	
Trachurus trecae	3752.42	12804	37.52	463
Synagrops microlepis	899.88	160768	9.00	
Brachydeuterus auritus	403.70	3556	4.04	
Total	9999.96		100.00	

PROJECT STATION: 218

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1023

	start	stop	duration			Long E 1325
TIME	:15:13:00	15:43:00	30	(min)	Purpose code:	3
LOG	:6561.70	6563.20	1.50		Area code :	2
FDEPTH:	50	49			GearCond.code:	
BDEPTH:	50	49			Validity code:	1

Towing dir: 145° Wire out: 150 m Speed: 30 kn*10

Sorted: 8 Kg Total catch: 8.73 CATCH/HOUR: 17.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	5.30	592	30.36	
Sepia officinalis hierredda	5.06	18	28.98	
Trachurus trecae	4.62	1788	26.46	
Brachydeuterus auritus	0.70	22	4.01	
Torpedo marmorata	0.66	2	3.78	
Dentex canariensis	0.64	2	3.67	
Scorpaena angolensis	0.48	8	2.75	
Total	17.46		100.01	

PROJECT STATION: 219

DATE:15/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1024

	start	stop	duration			Long E 1329
TIME	:16:25:00	16:55:00	30	(min)	Purpose code:	3
LOG	:6566.70	6568.20	1.50		Area code :	2
FDEPTH:	28	27			GearCond.code:	
BDEPTH:	28	27			Validity code:	1

Towing dir: 150° Wire out: 105 m Speed: 30 kn*10

Sorted: 6 Kg Total catch: 6.87 CATCH/HOUR: 13.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Arius parkii	7.46	4	54.29	
Trachurus trecae	3.00	114	21.83	
Epinephelus aeneus	1.86	2	13.54	
Brachydeuterus auritus	0.98	10	7.13	
Scorpaena stephanica	0.20	4	1.46	
C R A B S	0.18	30	1.31	
Chaetodon marcellae	0.06	2	0.44	
Total	13.74		100.00	

PROJECT STATION: 220

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1045

	start	stop	duration			Long E 1341
TIME	:06:11:00	06:41:00	30	(min)	Purpose code:	3
LOG	:6594.20	6595.40	1.60		Area code :	2
FDEPTH:	40	47			GearCond.code:	
BDEPTH:	40	47			Validity code:	1

Towing dir: 270° Wire out: 160 m Speed: 30 kn*10

Sorted: Kg Total catch: 150.10 CATCH/HOUR: 300.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	118.00	17700	39.31	
Brachydeuterus auritus	75.50	1310	25.15	
Parapenaeopsis atlantica	33.00	19580	10.99	
Trachurus trecae	24.00	130	7.99	
Pegusa lascaris	18.10	320	6.03	
Trichiurus lepturus	14.80	630	4.93	
Sarda sarda	12.20	10	4.06	
Pseudotolithus typus	3.10	250	1.03	
C R A B S	1.50	210	0.50	
Total	300.20		99.99	

PROJECT STATION: 221

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1044

	start	stop	duration			Long E 1336
TIME	:07:32:00	08:02:00	30	(min)	Purpose code:	3
LOG	:6599.80	6601.20	1.40		Area code :	2
FDEPTH:	59	51			GearCond.code:	
BDEPTH:	59	51			Validity code:	1

Towing dir: 90° Wire out: 200 m Speed: 31 kn*10

Sorted: 31 Kg Total catch: 195.14 CATCH/HOUR: 390.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	234.00	3552	59.96	464
Trachurus trecae, juvenile	84.12	38904	21.55	
Torpedo marmorata	28.80	48	7.38	
Brachydeuterus auritus	13.44	372	3.44	
Sepia officinalis hierredda	10.08	24	2.58	
Epinephelus alexandrinus *	7.00	2	1.79	
Dentex canariensis	4.56	48	1.17	
Trichiurus lepturus	3.96	348	1.01	
Pegusa lascaris	2.64	40	0.68	
Thorogobius angolensis	1.20	84	0.31	
Scorpaena stephanica	0.36	12	0.09	
Citharus linguatula	0.12	12	0.03	
Total	390.28		99.99	

PROJECT STATION: 222

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1045

	start	stop	duration			Long E 1332
TIME	:09:20:00	09:49:00	29	(min)	Purpose code:	3
LOG	:6609.50	6610.90	1.40		Area code :	2
FDEPTH:	90	90			GearCond.code:	
BDEPTH:	90	90			Validity code:	1

Towing dir: 140° Wire out: 300 m Speed: 30 kn*10

Sorted: 98 Kg Total catch: 1146.81 CATCH/HOUR: 2372.71

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1257.93	4490	53.02	465
Synagrops microlepis	397.18	111910	16.74	
Dentex canariensis	245.07	579	10.33	467
Dentex macrophthalmus	145.34	627	6.13	466
Atractoscion aequidens	133.99	120	5.65	
Trichiurus lepturus	65.90	507	2.78	
Branchiostegus semifasciatus	50.94	48	2.15	
Umbrina canariensis	32.34	97	1.36	
Torpedo torpedo	18.83	48	0.79	
Pterothrissus belloci	6.99	72	0.29	
Dentex angolensis	5.07	48	0.21	
Scorpaena angolensis	4.57	48	0.19	
Brotula barbata	4.10	25	0.17	
Pagellus bellottii	2.90	25	0.12	
Citharus linguatula	0.95	25	0.04	
Pegusa lascaris	0.48	25	0.02	
Total	2372.58		99.99	

PROJECT STATION: 223

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1045

	start	stop	duration			Long E 1326
TIME	:11:02:00	11:32:00	30	(min)	Purpose code:	3
LOG	:6618.80	6620.50	1.50		Area code :	2
FDEPTH:	115	114			GearCond.code:	
BDEPTH:	115	114			Validity code:	1

Towing dir: 310° Wire out: 360 m Speed: 32 kn*10

Sorted: 94 Kg Total catch: 1895.60 CATCH/HOUR: 3791.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	2416.00	7640	63.73	468
Dentex macrophthalmus	1094.00	5520	28.86	469
Trichiurus lepturus	136.00	1200	3.59	
Todaropsis eblanae	24.00	600	0.63	
Umbrina canariensis	21.60	160	0.57	
Octopus vulgaris	19.60	40	0.52	
Pagellus bellottii	17.20	280	0.45	
Boops boops	13.20	160	0.35	
Pterothrissus belloci	12.40	120	0.33	
Chelidonichthys gabonensis	10.80	80	0.28	
Citharus linguatula	8.40	160	0.22	
Aulopus cadenati	5.20	80	0.14	
Illex coindetii	4.40	400	0.12	
Scorpaena normani	2.80	40	0.07	
Spicara alta	2.40	80	0.06	
Microchirus frechkopi	2.00	40	0.05	
Lepidotrigla carolae	1.20	40	0.03	
Total	3791.20		100.00	

PROJECT STATION: 224

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1044
start stop duration Long E 1319
TIME :12:47:00 13:17:00 30 (min) Purpose code: 3
LOG :6626.90 6628.40 1.50 Area code : 2
FDEPTH: 190 189 GearCond.code:
BDEPTH: 190 189 Validity code: 1
Towing dir: 317° Wire out: 600 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 1609.68 CATCH/HOUR: 3219.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	1670.40	12736	51.89	
Chlorophthalmus atlanticus	780.00	17808	24.23	
Merluccius polli	561.60	8496	17.44	470
Zenopsis conchifer	92.16	768	2.86	
Trichiurus lepturus	63.36	960	1.97	
Torpedo torpedo	22.08	48	0.69	
Pterothrissus belloci	11.52	48	0.36	
Todaropsis eblanae	7.20	96	0.22	
Parapenaeus longirostris	6.24	1152	0.19	
MACROURIDAE	3.36	144	0.10	
Aulopus cadenati	1.44	48	0.04	
Total	3219.36		99.99	

PROJECT STATION: 225

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1044
start stop duration Long E 1317
TIME :14:20:00 14:50:00 30 (min) Purpose code: 3
LOG :6631.80 6633.40 1.60 Area code : 2
FDEPTH: 244 252 GearCond.code:
BDEPTH: 244 252 Validity code: 1
Towing dir: 155° Wire out: 750 m Speed: 31 kn*10

Sorted: 93 Kg Total catch: 1870.00 CATCH/HOUR: 3740.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	1918.00	95920	51.28	
Chlorophthalmus atlanticus	1688.00	38520	45.13	
Trichiurus lepturus	46.40	480	1.24	
Eumunida squamifera	27.60	3160	0.74	
Zenopsis conchifer	14.80	160	0.40	
Merluccius polli	12.40	160	0.33	
Parapenaeus longirostris, fem.	8.00	1320	0.21	472
Pterothrissus belloci	7.20	40	0.19	
Aulopus cadenati	6.40	80	0.17	
Parapenaeus longirostris, male	6.00	1240	0.16	471
MACROURIDAE	2.80	200	0.07	
PORTUNIDAE	1.60	40	0.04	
Cynoglossus canariensis	0.80	80	0.02	
Total	3740.00		99.98	

PROJECT STATION: 226

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1046
start stop duration Long E 1316
TIME :16:07:00 16:37:00 30 (min) Purpose code: 3
LOG :6638.20 6639.90 1.70 Area code : 2
FDEPTH: 353 351 GearCond.code:
BDEPTH: 353 351 Validity code: 1
Towing dir: 140° Wire out:1050 m Speed: 33 kn*10

Sorted: 4 Kg Total catch: 4.21 CATCH/HOUR: 8.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	2.24	6	26.60	
Nematocarcinus africanus	2.02	882	23.99	
Diaphus sp.	1.84	1626	21.85	
MACROURIDAE	1.02	14	12.11	
Cynoponticus ferox	0.64	2	7.60	
Parapenaeus longirostris	0.30	46	3.56	
C R A B S	0.12	6	1.43	
Eumunida squamifera	0.12	18	1.43	
Solenocera africana	0.08	12	0.95	
Todaropsis eblanae	0.04	2	0.48	
Total	8.42		100.00	

PROJECT STATION: 227

DATE:16/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1043
start stop duration Long E 1312
TIME :18:07:00 18:37:00 30 (min) Purpose code: 3
LOG :6646.30 6647.80 1.50 Area code : 2
FDEPTH: 447 450 GearCond.code:
BDEPTH: 447 450 Validity code: 1
Towing dir: 315° Wire out:1350 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 167.94 CATCH/HOUR: 335.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	121.80	19140	36.26	
Merluccius polli	115.80	240	34.48	475
Laemonema laureysi	61.80	1176	18.40	
MACROURIDAE	8.16	156	2.43	
Aristeus varidens, female	6.84	348	2.04	474
Geryon maritae	4.32	12	1.29	
CONGRIDAE	4.08	12	1.21	
Aristeus varidens, male	3.24	396	0.96	473
Trichiurus lepturus	3.12	48	0.93	
Hoplostethus cadenati	2.04	72	0.61	
S H A R K S	1.08	36	0.32	
LOPHIIDAE	0.96	96	0.29	
GONOSTOMATIDAE	0.72	36	0.21	
Illex coindetii	0.60	12	0.18	
OPHICHTHIDAE	0.48	48	0.14	
Epigonus telescopus	0.48	12	0.14	
Glyphus marsupialis	0.36	24	0.11	
Total	335.88		100.00	

PROJECT STATION: 228

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1046
start stop duration Long E 1313
TIME :22:54:00 23:24:00 30 (min) Purpose code: 3
LOG :6664.10 6665.40 1.30 Area code : 2
FDEPTH: 567 530 GearCond.code:
BDEPTH: 567 530 Validity code: 1
Towing dir: 145° Wire out:1700 m Speed: 24 kn*10

Sorted: 26 Kg Total catch: 132.20 CATCH/HOUR: 264.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Nematocarcinus africanus	109.00	24830	41.23	
Merluccius polli	75.50	130	28.56	476
Aristeus varidens, female	29.20	1440	11.04	477
Aristeus varidens, male	10.20	1280	3.86	476
MACROURIDAE	9.70	290	3.67	
GONOSTOMATIDAE	7.10	260	2.69	
Etmopterus spinax	6.70	50	2.53	
Geryon maritae	4.50	10	1.70	
Todaropsis eblanae	4.10	40	1.55	
Scyllarides herklotsii	3.80	330	1.44	
Hoplostethus cadenati	3.20	90	1.21	
LOPHIIDAE	1.40	70	0.53	
Total	264.40		100.01	

PROJECT STATION: 229

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1106
start stop duration Long E 1328
TIME :02:53:00 03:23:00 30 (min) Purpose code: 3
LOG :6691.20 6692.80 1.60 Area code : 2
FDEPTH: 470 480 GearCond.code:
BDEPTH: 470 480 Validity code: 1
Towing dir: 180° Wire out:1500 m Speed: 32 kn*10

Sorted: 25 Kg Total catch: 203.52 CATCH/HOUR: 407.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	318.40	11424	78.22	
Nematocarcinus africanus	57.12	17136	14.03	
Merluccius polli	9.92	16	2.44	
MACROURIDAE	8.48	192	2.08	
GONOSTOMATIDAE	5.12	352	1.26	
Etmopterus spinax	4.32	480	1.06	
Chlorophthalmus atlanticus	1.92	48	0.47	
Scyllarides herklotsii	1.12	80	0.28	
C R A B S	0.32	16	0.08	
LOPHIIDAE	0.32	48	0.08	
Total	407.04		100.00	

PROJECT STATION: 230

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1106
start stop duration Long E 1330
TIME :04:48:00 05:18:00 30 (min) Purpose code: 3
LOG :6697.50 6699.00 1.50 Area code : 2
FDEPTH: 353 341 GearCond.code:
BDEPTH: 353 341 Validity code: 1
Towing dir: 360° Wire out:1050 m Speed: 30 kn*10

Sorted: 23 Kg Total catch: 85.81 CATCH/HOUR: 171.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	84.00	370	48.95	481
Hoplostethus cadenati	45.36	1484	26.43	
MACROURIDAE	8.18	244	4.77	
Trachipterus trachypterus	6.58	14	3.83	
Neoharriotta pinnata	6.00	2	3.50	
Parapenaeus longirostris, fem.	5.18	644	3.02	480
CONGRIDAE	3.36	48	1.96	
Plesiopenaeus edwardsianus	2.52	980	1.47	
Chlorophthalmus atlanticus	2.16	56	1.26	
Todaropsis eblanae	1.88	34	1.10	
Epigonus telescopus	1.88	14	1.10	
Diaphus sp.	1.40		0.82	
Zenopsis conchifer	0.90	6	0.52	
Parapenaeus longirostris, male	0.84	112	0.49	479
Etmopterus spinax	0.56	42	0.33	
LOPHIIDAE	0.48	20	0.28	
Solenocera africana	0.28	14	0.16	
Total	171.56		99.99	

PROJECT STATION: 231

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1106
start stop duration Long E 1334
TIME :06:29:00 06:59:00 30 (min) Purpose code: 3
LOG :6703.70 6705.20 1.50 Area code : 2
FDEPTH: 203 200 GearCond.code:
BDEPTH: 203 200 Validity code: 1
Towing dir: 170° Wire out: 600 m Speed: 27 kn*10

Sorted: 62 Kg Total catch: 248.52 CATCH/HOUR: 497.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	222.00	1880	44.66	483
Diaphus sp.	75.20	23632	15.13	
Synagrops microlepis	64.72	12944	13.02	
Merluccius polli	46.40	272	9.34	484
Dentex macrophthalmus	42.88	168	8.63	482
Trichiurus lepturus	9.20	48	1.85	
Parapenaeus longirostris, fem.	8.24	1696	1.66	486
Chlorophthalmus atlanticus	8.16	152	1.64	
Brotula barbata	8.00	8	1.61	
Pterothrissus belloci	4.48	8	0.90	
Parapenaeus longirostris, male	3.92	880	0.79	485
Zenopsis conchifer	2.64	40	0.53	
Total	495.84		99.76	

PROJECT STATION: 232

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1106
start stop duration Long E 1339
TIME :08:01:00 08:12:00 11 (min) Purpose code: 3
LOG :6710.60 6711.10 0.50 Area code : 2
FDEPTH: 105 100 GearCond.code: 9
BDEPTH: 105 100 Validity code: 1
Towing dir: 80° Wire out: 350 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 125.72 CATCH/HOUR: 685.75

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	146.02	1156	21.29	488
Synagrops microlepis	138.38	10107	20.18	
Dentex macrophthalmus	118.80	518	17.32	487
Branchiostegus semifasciatus	56.51	60	8.24	
Scorpaena angolensis	40.91	87	5.97	
Trichiurus lepturus	29.84	87	4.35	
Brotula barbata	27.49	65	4.01	
Atractoscion aequidens	24.05	11	3.51	
Pterothrissus belloci	18.87	125	2.75	
Uranoscopus polli	15.71	49	2.29	
LOPHIIDAE	12.38	27	1.81	
Epinephelus goreensis	9.55	22	1.39	
Dentex angolensis	8.78	22	1.28	
Umbrina canariensis	8.45	11	1.23	
Zeus faber	7.91	22	1.15	
Cynoglossus sp.	6.00	11	0.87	
Calappa sp.	5.89	27	0.86	
Scorpaena stephanica	5.29	11	0.77	
Citharus linguatula	3.11	27	0.45	
Sepia sp.	0.38	11	0.06	
Total	684.32		99.78	

PROJECT STATION: 233

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1106
start stop duration Long E 1344
TIME :08:12:00 08:42:00 30 (min) Purpose code: 3
LOG :6717.20 6719.00 1.80 Area code : 2
FDEPTH: 62 64 GearCond.code:
BDEPTH: 62 64 Validity code: 1
Towing dir: 193° Wire out: 250 m Speed: 27 kn*10

Sorted: 57 Kg Total catch: 130.47 CATCH/HOUR: 260.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	90.44	360	34.66	490
Dentex macrophthalmus	54.00	212	20.69	489
Pterothrissus belloci	22.68	194	8.69	
Dentex canariensis	15.96	166	6.12	491
Trachurus, Juveniles	12.36	1772	4.74	
Trichiurus lepturus	11.88	80	4.55	
Octopus sp.	7.56	18	2.90	
Zeus faber	7.46	18	2.86	
Parapenaeus longirostris, fem.	7.14	1908	2.74	493
Atractoscion aequidens	6.30	4	2.41	
Pagellus bellottii	5.40	18	2.07	
Brotula barbata	4.36	22	1.67	
Perulibatrachus elminensis	3.10	4	1.19	
Chaetodon hoefleri	2.92	30	1.12	
Citharus linguatula	2.70	26	1.03	
Scorpaena stephanica	2.34	10	0.90	
Parapenaeus longirostris, male	1.56	512	0.60	492
GOBIIDAE	1.34	98	0.51	
Cynoglossus sp.	0.58	4	0.22	
Grammoplites gruveli	0.22	4	0.08	
Umbrina canariensis	0.18	4	0.07	
Scorpaena angolensis	0.18	4	0.07	
Merluccius polli	0.18	14	0.07	
Total	260.84		99.96	

PROJECT STATION: 234

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1114
start stop duration Long E 1342
TIME :10:50:00 11:20:00 30 (min) Purpose code: 3
LOG :6726.10 6727.60 1.50 Area code : 2
FDEPTH: 24 16 GearCond.code:
BDEPTH: 24 16 Validity code: 1
Towing dir: 180° Wire out: 150 m Speed: 28 kn*10

Sorted: 61 Kg Total catch: 61.28 CATCH/HOUR: 122.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	91.70	330	74.82	
Alloteuthis africana	4.04	198	3.30	
Dentex canariensis	3.82	34	3.12	
Pagellus bellottii	3.52	98	2.87	
Cynoglossus canariensis	3.44	8	2.81	
Trichiurus lepturus	3.18	6	2.59	
Scorpaena angolensis	2.98	42	2.43	
Trachurus trecae	2.46	8	2.01	
Fistularia petimba	1.78	4	1.45	
Trachinus armatus	1.52	10	1.24	
Torpedo marmorata	1.24	2	1.01	
Sardinella aurita	1.18	2	0.96	
Octopus vulgaris	0.78	2	0.64	
CENTROLOPHIDAE	0.02	2	0.02	
Total	121.66		99.27	

PROJECT STATION: 235

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1122
start stop duration Long E 1337
TIME :12:30:00 12:55:00 25 (min) Purpose code: 3
LOG :6735.40 6736.70 1.30 Area code : 2
FDEPTH: 40 48 GearCond.code:
BDEPTH: 40 48 Validity code: 1
Towing dir: 230° Wire out: 150 m Speed: 29 kn*10

Sorted: 62 Kg Total catch: 654.35 CATCH/HOUR: 1570.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1474.80	11592	93.91	494
Sepia sp.	62.40	96	3.97	
Alloteuthis africana	15.60	1200	0.99	
Brachydeuterus auritus	13.44	24	0.86	
Epinephelus aeneus	4.20	2	0.27	
Total	1570.44		100.00	

PROJECT STATION: 236

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1126
start stop duration Long E 1330
TIME :14:52:00 15:22:00 30 (min) Purpose code: 3
LOG :6752.20 6753.70 1.50 Area code : 2
FDEPTH: 75 75 GearCond.code:
BDEPTH: 75 75 Validity code: 1
Towing dir: 340° Wire out: 265 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 227.08 CATCH/HOUR: 454.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	324.00	888	71.34	495
Alloteuthis africana	39.92	24	8.79	
Pagellus bellottii	20.08	96	4.42	497
Trachurus trecae	15.52	104	3.42	
Dentex barnardi	12.80	112	2.82	496
Atractoscion aequidens	11.84	8	2.61	
Zenopsis conchifer	7.60	8	1.67	
Lepidotrigla carolae	4.24	40	0.93	
Raja miraletus	3.84	8	0.85	
Torpedo torpedo	3.28	8	0.72	
Dentex canariensis	2.72	8	0.60	
Sparus auriga	2.32	8	0.51	
Chaetodon hoefleri	2.32	24	0.51	
Citharus linguatula	0.80	16	0.18	
Total	451.28		99.37	

PROJECT STATION: 237

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1125
start stop duration Long E 1327
TIME :16:27:00 16:57:00 30 (min) Purpose code: 3
LOG :6762.10 6763.80 1.70 Area code : 2
FDEPTH: 203 199 GearCond.code:
BDEPTH: 203 199 Validity code: 1
Towing dir: 213° Wire out: 600 m Speed: 32 kn*10

Sorted: 67 Kg Total catch: 879.30 CATCH/HOUR: 1758.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	437.50	1150	24.88	498
Diaphus sp.	408.74	239400	23.24	
Erythrocles monodi	280.00	250	15.92	499
Pentheroscion mbizi	179.74	10828	10.22	
Chlorophthalmus atlanticus	149.74	3874	8.51	
Dentex macrophthalmus	140.00	724	7.96	500
Pterothrissus belloci	65.00	50	3.70	
Zenopsis conchifer	32.74	250	1.86	
MACROURIDAE	15.74	874	0.90	
Merluccius polli	12.24	150	0.70	
Parapenaeus longirostris, fem.	7.24	1350	0.41	502
Atractoscion aequidens	7.00	2	0.40	
Trichiurus lepturus	5.74	24	0.33	
Todaropsis eblanae	3.74	74	0.21	
Brotula barbata	3.74	24	0.21	
Parapenaeus longirostris, male	3.24	750	0.18	501
CONGRIDAE	1.24	50	0.07	
Sepia sp.	1.24	24	0.07	
Citharus linguatula	1.24	50	0.07	
Unidentified fish	1.24	24	0.07	
Scorpaena angolensis	1.00	50	0.06	
Cynoglossus sp.	0.50	50	0.03	
Total	1758.60		100.00	

PROJECT STATION: 238

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1127
start stop duration Long E 1324
TIME :10:35:00 19:05:00 30 (min) Purpose code: 3
LOG :6769.20 6770.80 1.60 Area code : 2
FDEPTH: 371 382 GearCond.code:
BDEPTH: 371 382 Validity code: 1
Towing dir: 30° Wire out:1050 m Speed: 31 kn*10

Sorted: 26 Kg Total catch: 105.00 CATCH/HOUR: 210.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Laemonema laureysi	51.20	8392	24.38	
Nematocarcinus africanus	46.40	19720	22.10	
Hoplostethus cadenati	41.92	1552	19.96	
Merluccius polli	34.80	72	16.57	503
S H A R K S	11.44	376	5.45	
MACROURIDAE	6.72	360	3.20	
OPHIDIIDAE	5.04	24	2.40	
Schedophilus huttoni	4.72	8	2.25	
Chlorophthalmus atlanticus	1.76	48	0.84	
Aristeus varidens, male	1.68	280	0.80	504
Aristeus varidens, female	1.52	320	0.72	505
Epigonus telescopus	1.04	8	0.50	
Halosaurus sp.	0.72	56	0.34	
Illex coindetii	0.72	8	0.34	
Geryon maritae	0.32	8	0.15	
Total	210.00		100.00	

PROJECT STATION: 239

DATE:17/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1127
start stop duration Long E 1322
TIME :21:21:00 21:52:00 31 (min) Purpose code: 3
LOG :7780.60 7782.20 1.60 Area code : 2
FDEPTH: 472 494 GearCond.code:
BDEPTH: 472 494 Validity code: 1
Towing dir: 30° Wire out:1350 m Speed: 29 kn*10

Sorted: 27 Kg Total catch: 189.56 CATCH/HOUR: 366.89

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	226.26	1397	61.67	
Nematocarcinus africanus	86.03	4674	23.45	
GONOSTOMATIDAE	15.72	366	4.28	
Geryon maritae	12.06	27	3.29	
S H A R K S	11.38	14	3.10	
Chlorophthalmus atlanticus	6.10	27	1.66	
Halosaurus sp.	5.83	68	1.59	
Aristeus varidens, female	1.63	163	0.44	507
Glyphus marsupialis	1.35	14	0.37	
Aristeus varidens, male	1.22	230	0.33	506
Trichiurus lepturus	0.54	14	0.15	
Total	368.12		100.33	

PROJECT STATION: 240

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1141
start stop duration Long E 1318
TIME :01:06:00 01:36:00 30 (min) Purpose code: 3
LOG :6802.80 6804.20 1.40 Area code : 2
FDEPTH: 604 598 GearCond.code:
BDEPTH: 604 598 Validity code: 1
Towing dir: 360° Wire out:1820 m Speed: 28 kn*10

Sorted: 28 Kg Total catch: 113.24 CATCH/HOUR: 226.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	100.80	3024	44.51	
MACROURIDAE	77.20	2608	34.09	
Nematocarcinus africanus	17.52	6032	7.74	
GONOSTOMATIDAE	10.00	392	4.42	
Geryon maritae	5.36	16	2.37	
Scyllarides herklotsii	4.24	408	1.87	
CONGRIDAE	2.80	152	1.24	
Aristeus varidens, male	2.00	280	0.88	508
Aristeus varidens, female	1.76	112	0.78	509
Chlorophthalmus atlanticus	1.44	40	0.64	
Etmopterus spinax	1.20	16	0.53	
Ebinania costaecanarie	0.76	24	0.34	
Plesiopenaeus edwardsianus	0.40	40	0.18	
Total	225.48		99.59	

PROJECT STATION: 241

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1142
start stop duration Long E 1321
TIME :03:12:00 03:42:00 30 (min) Purpose code: 3
LOG :6810.20 6811.60 1.40 Area code : 2
FDEPTH: 394 391 GearCond.code:
BDEPTH: 394 391 Validity code: 1
Towing dir: 170° Wire out:1200 m Speed: 28 kn*10

Sorted: 21 Kg Total catch: 123.35 CATCH/HOUR: 246.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Hoplostethus cadenati	149.50	4500	60.60	
Merluccius polli	26.90	50	10.90	510
MACROURIDAE	26.50	880	10.74	
Etmopterus spinax	7.70	320	3.12	
Nematocarcinus africanus	6.50	2030	2.63	
Geryon maritae	5.00	10	2.03	
Plesiopenaeus edwardsianus	4.50	1530	1.82	
GONOSTOMATIDAE	4.10	130	1.66	
Diaphus sp.	3.60	2790	1.46	
CONGRIDAE	3.10	270	1.26	
Chlorophthalmus atlanticus	2.60	70	1.05	
Pterothrissus belloci	1.80	10	0.73	
LOPHIIDAE	1.60	10	0.65	
Pentheroscion mbizi	1.50	140	0.61	
Scyllarides herklotsii	0.60	80	0.24	
Ariomma bondi	0.50	10	0.20	
C R A B S	0.40	10	0.16	
Ebinania costaecanarie	0.30	10	0.12	
Total	246.70		99.98	

PROJECT STATION: 242

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1140
start stop duration Long E 1325
TIME :06:18:00 06:49:00 31 (min) Purpose code: 3
LOG :7822.90 7824.50 1.60 Area code : 2
FDEPTH: 206 206 GearCond.code:
BDEPTH: 206 206 Validity code: 1
Towing dir: 345° Wire out: 600 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 728.07 CATCH/HOUR: 1409.17

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Synagrops microlepis	341.42	18331	24.23	
Chlorophthalmus atlanticus	318.35	8170	22.59	
Diaphus sp.	272.32	104011	19.32	
Trachurus trecae	237.77	854	16.87	
Merluccius polli	85.35	732	6.06	
Parapenaeus longirostris, fem.	52.43	9308	3.72	512
Parapenaeus longirostris, male	48.37	10365	3.43	511
Dentex macrophthalmus	30.89	163	2.19	
Illex coindetii	7.32	81	0.52	
Pterothrissus belloci	6.10	41	0.43	
Nematocarcinus africanus	2.85	1870	0.20	
Zenopsis conchifer	2.44	41	0.17	
Trichiurus lepturus	1.63	41	0.12	
Total	1407.24		99.85	

PROJECT STATION: 243

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1141
start stop duration Long E 1328
TIME :07:43:00 08:15:00 32 (min) Purpose code: 3
LOG :6828.70 6830.20 1.50 Area code : 2
FDEPTH: 128 134 GearCond.code:
BDEPTH: 128 134 Validity code: 1
Towing dir: 165° Wire out: 375 m Speed: 29 kn*10

Sorted: 65 Kg Total catch: 1049.88 CATCH/HOUR: 1968.53

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	1306.50	7620	66.37	514
Trachurus trecae	472.50	2850	24.00	513
Zeus faber	35.70	30	1.81	
Brotula barbata	32.40	60	1.65	
Grammoplites gruveli	30.53	90	1.55	
Pterothrissus belloci	22.80	300	1.16	
Illex coindetii	20.70	450	1.05	
Scorpaena angolensis	13.80	90	0.70	
Torpedo torpedo	10.50	30	0.53	
LOPHIIDAE	7.80	30	0.40	
Citharus linguatula	2.10	90	0.11	
Trichiurus lepturus	1.80	30	0.09	
Total	1957.13		99.42	

PROJECT STATION: 244

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1144
start stop duration Long E 1338
TIME :09:41:00 10:11:00 30 (min) Purpose code: 3
LOG :6840.70 6842.20 1.50 Area code : 2
FDEPTH: 71 70 GearCond.code:
BDEPTH: 71 70 Validity code: 1
Towing dir: 170° Wire out: 250 m Speed: 29 kn*10

Sorted: 62 Kg Total catch: 310.30 CATCH/HOUR: 620.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	277.00	2408	44.63	515
Dentex macrophthalmus	103.00	580	16.60	516
Pagellus bellottii	71.60	390	11.54	517
Dentex canariensis	37.60	270	6.06	
Trichiurus lepturus	33.00	140	5.32	
Sepia sp.	33.00	50	5.32	
Raja miraletus	19.10	30	3.08	
Rhinobatos albomaculatus	6.70	10	1.08	
Epinephelus goreensis	6.30	10	1.02	
Parapristipoma octolineatum	5.30	10	0.85	
Chelidonichthys capensis	5.20	50	0.84	
Dentex angolensis	5.10	40	0.82	
Umbrina canariensis	4.80	50	0.77	
Octopus sp.	4.60	10	0.74	
Zeus faber	4.10	20	0.66	
Chaetodon hoefleri	3.60	20	0.58	
Pseudupeneus prayensis	0.50	10	0.08	
Citharus linguatula	0.10	10	0.02	
Total	620.60		100.01	

PROJECT STATION: 245

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1152
start stop duration Long E 1313
TIME :11:25:00 11:55:00 30 (min) Purpose code: 3
LOG :6850.30 6851.80 1.50 Area code : 2
FDEPTH: 44 43 GearCond.code:
BDEPTH: 44 43 Validity code: 1
Towing dir: 180° Wire out: 160 m Speed: 29 kn*10

Sorted: 21 Kg Total catch: 21.12 CATCH/HOUR: 42.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	26.00	52	61.55	518
Raja miraletus	8.76	12	20.74	
Scorpaena stephanica	3.36	68	7.95	
C R A B S	1.16	18	2.75	
Batrachoides liberiensis	0.88	2	2.08	
Squilla mantis	0.64	60	1.52	
CONGRIDAE	0.38	6	0.90	
Octopus sp.	0.34	4	0.80	
Illex coindetii	0.22	2	0.52	
Sepia sp.	0.20	2	0.47	
Todaropsis eblanae	0.18	4	0.43	
Chelidonichthys gabonensis	0.12	2	0.28	
Total	42.24		99.99	

PROJECT STATION: 246

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 12
start stop duration Long E 1338
TIME :13:13:00 13:43:00 30 (min) Purpose code: 3
LOG :6860.40 6862.00 1.60 Area code : 2
FDEPTH: 60 62 GearCond.code:
BDEPTH: 60 62 Validity code: 1
Towing dir: 360° Wire out: 200 m Speed: 32 kn*10

Sorted: 46 Kg Total catch: 45.77 CATCH/HOUR: 91.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	23.70	644	25.89	
Dentex canariensis	21.10	220	23.05	519
Dentex macrophthalmus	13.06	68	14.27	520
Sepia sp.	8.56	56	9.35	
Cynoponticus ferox	6.10	2	6.66	
Pomadasys incisus	5.02	54	5.48	
Pagellus bellottii	2.98	22	3.26	
Zeus faber	2.78	12	3.04	
Raja miraletus	2.34	6	2.56	
Trachurus trecae	1.28	74	1.40	
Umbrina canariensis	0.94	18	1.03	
Sparus auriga	0.84	2	0.92	
Cynoglossus sp.	0.74	4	0.81	
Citharus linguatula	0.48	24	0.52	
Atractoscion aequidens	0.46	2	0.50	
Scorpaena stephanica	0.46	6	0.50	
Penaeus notialis	0.32	12	0.35	
Aulopus cadenati	0.28	6	0.31	
Torpedo torpedo	0.10	2	0.11	
Total	91.54		100.01	

PROJECT STATION: 247

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1201
start stop duration Long E 1330
TIME :15:00:00 15:30:00 30 (min) Purpose code: 3
LOG :6870.80 6872.40 1.60 Area code : 2
FDEPTH: 109 102 GearCond.code:
BDEPTH: 109 102 Validity code: 1
Towing dir: 200° Wire out: 350 m Speed: 32 kn*10

Sorted: 38 Kg Total catch: 37.86 CATCH/HOUR: 75.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	34.40	132	45.43	522
Trachurus trecae	7.60	18	10.04	523
Raja miraletus	4.60	12	6.08	
Squatina oculata	4.36	2	5.76	
Raja straeleni	3.56	2	4.70	
Dentex macrophthalmus	3.36	20	4.44	521
Zeus faber	3.08	8	4.07	
Branchiostegus semifasciatus	2.48	2	3.28	
Sparus auriga	2.36	4	3.12	
Batrachoides liberiensis	1.84	12	2.43	
Brotula barbata	1.36	2	1.80	
Todaropsis eblanae	1.32	60	1.74	
Dentex canariensis	1.12	12	1.48	
Dentex barnardi	0.98	2	1.29	
Sepia sp.	0.68	8	0.90	
Dentex congoensis	0.54	6	0.71	
Citharus linguatula	0.52	16	0.69	
Peristedion cataphractum	0.52	10	0.69	
Chaetodon hoefleri	0.32	2	0.42	
Illex coindetii	0.26	10	0.34	
Scorpaena angolensis	0.18	2	0.24	
Microchirus frechkopi	0.12	2	0.16	
Lepidotrigla carolae	0.10	2	0.13	
Scorpaena normani	0.06	2	0.08	
Total	75.72		100.02	

PROJECT STATION: 248

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1200
start stop duration Long E 1330
TIME :16:42:00 17:12:00 30 (min) Purpose code: 3
LOG :6876.00 6877.50 1.50 Area code : 2
FDEPTH: 231 236 GearCond.code:
BDEPTH: 231 236 Validity code: 1
Towing dir: 21° Wire out: 700 m Speed: 30 kn*10

Sorted: 87 Kg Total catch: 1098.30 CATCH/HOUR: 2196.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	708.96	3596	32.27	525
Chlorophthalmus atlanticus	548.18	13698	24.95	
Dentex macrophthalmus	459.54	1098	20.92	524
Trachurus trecae	192.18	760	8.75	526
MACROURIDAE	49.88	2254	2.27	
Zenopsis conchifer	49.36	254	2.25	
Pterothrissus belloci	32.90	228	1.50	
Scorpaena normani	29.36	228	1.34	
Pentheroscion mbizi	23.54	1772	1.07	
Dentex barnardi	20.24	26	0.92	
Erythrocles monodi	19.24	26	0.88	
Todaropsis eblanae	18.72	228	0.85	
Stromateus fiatola	14.68	26	0.67	
Parapenaeus longirostris	11.14		0.51	
Spicara alta	5.56	26	0.25	
C R A B S	5.30	506	0.24	
Trichiurus lepturus	5.06	26	0.23	
Peristedion cataphractum	2.26	26	0.10	
C R A B S	0.50	26	0.02	
Total	2196.60		99.99	

PROJECT STATION: 249

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1159
start stop duration Long E 1328
TIME :18:02:00 18:31:00 29 (min) Purpose code: 3
LOG :6881.70 6882.80 1.10 Area code : 2
FDEPTH: 334 334 GearCond.code:
BDEPTH: 334 334 Validity code: 1
Towing dir: 185° Wire out:1000 m Speed: 25 kn*10

Sorted: 30 Kg Total catch: 180.66 CATCH/HOUR: 373.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlorophthalmus atlanticus	297.31	5499	79.54	
Gephyroberyx darwini	20.98	25	5.61	
Pterothrissus belloci	14.90	87	3.99	
Laemonema laureysi	12.91	186	3.45	
Merluccius polli	8.94	50	2.39	
MACROURIDAE	5.71	410	1.53	
Zenopsis conchifer	5.46	37	1.46	
Parapenaeus longirostris, fem.	4.10	422	1.10	527
S H A R K S	1.24	62	0.33	
Halosaurus sp.	0.87	37	0.23	
Illex coindetii	0.50	12	0.13	
C R A B S	0.50	37	0.13	
Nematocarcinus africanus	0.25	87	0.07	
Synagrops microlepis	0.12	12	0.03	
Total	373.79		99.99	

PROJECT STATION: 250

DATE:18/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1201
start stop duration Long E 1325
TIME :20:14:00 20:45:00 31 (min) Purpose code: 3
LOG :6888.00 6889.60 1.60 Area code : 2
FDEPTH: 467 475 GearCond.code:
BDEPTH: 467 475 Validity code: 1
Towing dir: 180° Wire out:1300 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 104.80 CATCH/HOUR: 202.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius polli	42.19	70	20.80	528
S H A R K S	39.87	1053	19.66	
GONOSTOMATIDAE	33.60	712	16.56	
Laemonema laureysi	27.41	604	13.51	
Aristeus varidens, female	15.02	917	7.40	529
Aristeus varidens, male	13.55	1742	6.68	530
Gephyroberyx darwini	7.66	8	3.78	
Schedophilus huttoni	7.59	15	3.74	
MACROURIDAE	5.11	46	2.52	
Halosaurus sp.	4.34	209	2.14	
Hoplostethus cadenati	2.55	70	1.26	
Chlorophthalmus atlanticus	1.94	46	0.96	
Zenopsis conchifer	1.94	15	0.96	
Total	202.77		99.97	

PROJECT STATION: 251

DATE:19/ 9/94 GEAR TYPE: BT No:6 POSITION:Lat S 1211
start stop duration Long E 1324
TIME :06:16:00 06:47:00 31 (min) Purpose code: 3
LOG :6942.00 6943.50 1.50 Area code : 2
FDEPTH: 199 184 GearCond.code:
BDEPTH: 199 184 Validity code: 1
Towing dir: 148° Wire out: 600 m Speed: 31 kn*10

Sorted: 66 Kg Total catch: 792.72 CATCH/HOUR: 1534.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex macrophthalmus	896.13	5760	58.41	532
Synagrops microlepis	153.29	4761	9.99	
Trachurus trecae	104.05	372	6.78	
Merluccius polli	71.30	720	4.65	531
Dentex angolensis	55.97	116	3.65	
Illex coindetii	51.56	627	3.36	
Torpedo torpedo	42.27	70	2.76	
MACROURIDAE	32.28	674	2.10	
Umbrina canariensis	26.94	139	1.76	
Pterothrissus belloci	22.76	116	1.48	
Zenopsis conchifer	18.12	139	1.18	
Zeus faber	16.95	23	1.10	
Uranoscopus polli	14.86	23	0.97	
Chlorophthalmus atlanticus	14.17	255	0.92	
Parapenaeus longirostris	13.24	581	0.86	
Total	1533.89		99.97	

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 27.8 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. Only the bottom trawl was used during the survey.

The bottom trawl has a headline of 31m, footrope 47m and 20mm meshsize in the codend with an innernett of 10mm meshsize. The estimated headline hight is 5m and distance between wings during towing about 18m. The trawl is equiped with a 12" rubber bobbins gear. During the present survey two 7.81 m^2, 1670kg 'Thyborøn' combi-doors were used on the trawl. The sweeps are 40m long.

The following drawing show the size of the trawl: