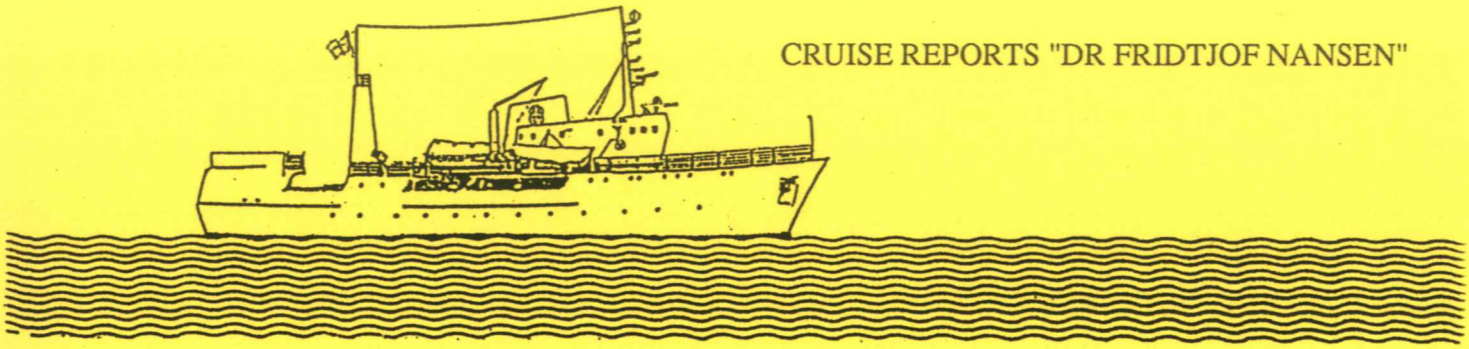


CRUISE REPORTS "DR FRIDTJOF NANSEN"

SURVEYS OF THE FISH RESOURCES OF CONGO AND GABON

Preliminary Report Cruise No II
31 May -12 June 1989

NORAD - FAO/UNDP GLO 82/001

IMR, Bergen

The DR FRIDTJOF NANSEN RESEARCH PROGRAMME is sponsored by The Norwegian Agency for Development Assistance NORAD, The Food and Agriculture Organization of the United Nations FAO, and the United Nations Development Programme UNDP. The programme is being conducted and planned under agreements between the participating countries, FAO's Department of Fisheries and the Institute of Marine Research, Norway. Its execution is the responsibility of the Institute of Marine Research in cooperation with FAO and national fisheries administrations.

The programme will comprise several surveys. This cruise report describes the work and some of the findings of the second survey. Full reports will be issued after the completion of the programme.

This report has been prepared by O. Hagstrøm and H. Ullebust IMR.

1 Introduction

Objectives of the survey

Under the same programme in 1985 four seasonal surveys were carried out on the shelf of Congo and Gabon. The findings of the surveys in 1985 are summerized in the preliminary report from the first survey in 1989. For references to general objectives, amendments and methology see part 1 of the same report.

Participation

The following participated from Congo and Gabon respectively:

Agnes Boulingui Ilama, Direction de Peches Maritime et Cultures Marines, Libreville, Gabon
Jean Alogho Nang, Direction General de l'Economie Forestiere, Libreville, Gabon
Felix Domba, Secretariat General a la Peche, Brazzaville, Congo
Prosper M'Fina, ORSTOM, Pointe Noire, Congo.

The scientific staff from IMR was:

O. Hagstrøm, H. Ullebust, K. Strømsnes, T. Haugland, A. Totland.

The participant from FAO was:

W. Schneider.

Narrative

The survey on the shelf of Congo started of Pointe Noire at the 31 of May, somewhat later than the plan due to late incomming fligth, with the hydrografic profile off Pointe Noire. During 31 May to 4 June the shelf and the slope areas of Congo were surveyed. The sampling for swept area estimate was carried out during day time and deep water hauls for hake and shrimps as well as hauls for species identification were mainly concentrated to dark hours. Integration was carried out throughout the day and the survey grid of transects were about 10 nm apart. The course tracks and fishing station are shown in Figure 1. The survey intensity was highest in the inshore area were shoals of sardinella were observed in very shallow waters. Fishing with bottom trawl was in many areas restricted by rough bottom and in particular at the depth zone about 100 m. Two bottom trawls were damaged,one on coral reef and one on otherwise favourable bottom.

The vessel steamed 450 nm and in total 20 bottom trawl station and 3 pelagic trawl station were worked.

The Gabon shelf south of the protected area of Cap Lopez was surveyed during 4 to 10 June. Fishing station and cruise tracks are shown in Figure 1. Two hydrografic profiles were worked at Pte. Panga and at the Equator. Also in Gabonese waters the survey intensity was highest in inshore areas but a number of hauls were also made in the slope area. Rough bottom condition especially at about 90-100 m depth and in shallow waters

restricted bottom trawling along the coast and some trawls were damaged. The distance steamed in Gabones water was 1200 nm and 55 bottom and 3 pelagic trawl stations were carried out. The survey ended in Port Gentile at 10 June.

2 Hydrography

Figure 2 shows the distribution of surface temperature observed with the thermograph at 4 m of depth and Figure 3 the distribution of temperature, salinity and oxygen in the profiles worked over the shelf off Pointe Noire and off Pte. Panga and at the Equator.

The features of the hydrographic situation is different from the situation observed during the first survey in January-February. The surface temperature is about 3-5^{o}C lower,decreasing northward along the coast to minimun of 23^{o}C and a thermocline is not developed. The salinity in the surface layer is 35 ‰ or more and decreases gradually with depth at Pointe Noire and Pointe Panga as well as at the Equator. The isohalines at Pointe Panga indicate a moderate upwelling close to the coast.The present hydrografic situation shows that the discharges from the Congo River is not transported northwest ward over the shelf. The oxygen content on the shelf is not likely to limit the distribution of fish.

3 Fish distribution

Figure 4 illustrates the distribution of fish as observed with the acoustic integration system. The units of acoustic reflection is 0.1 x m/nm^2 reflecting surface. An arbitrary scale has been used to illustrate different levels of concentration. The intergrator values were allocated to the following groups on the basis of the species composition in the trawl catches and characteristic behaviour and shoaling:

Pelagic fish type 1, Clupeids and anchovies;
Pelagic fish type 2, Carangids, scombrids, barracudas etc.;
Demersal fish in mid water.

Details of the pelagic trawl used for species identification are shown in Annex IV.

CONGO

The pelagic 1 fish was recorded in a band along the coast mostly at depth shallower than 30 m.No offshore registration of pelagic 1 fish was observed. The inshore distribution was a mixture of West African ilisha, *Ilisha africana*, and Madeiran sardinella, *Sardinella maderensis*. The mean length of the sardinella was 14.8 cm and the length frequency distribution was polymodal, see Annex I. The length frequency distribution of ilisha was polymodal with a mean length of about 13.7 cm. The sardinella was concentrated in shoals during both day and nigth where as the ilisha dispearsed during nigth. Most of

the integration was made during nigth and based on the contribution of shoals during night about 65 % of the biomass could be allocated to sardinella.

The pelagic 2 registration formed a continious scattered band of low strength from inshore areas over the shelf to about 120 m depth. The distribution appears to be a continuation of the findings off Angola and horse mackerel, *Trachurus trecae*, and partly Spanish mackerel, *Scomber japonicus*, was found over the deeper part of the shelf. In inshore areas African lookdown, *Selene dorsalis*, Guachanche barracuda, *Sphyrena guachancho*, and some Atlantic bumper, *Chloroscombrus chrysurus*, contributed to the biomass. Length frecuency distributions are given in Annex I.

Estimates of biomass

Preliminary estimates of pelagic 1 and 2 fish are shown below:

Sardinella maderensis	8 800 tonnes
Total pelagic 1	13 500 "
Total pelagic 2	12 100 "
Grand total	25 600 "

The corresponding estimates of total pelagic biomass in the 1985 surveys are:

March 1985	28 000 tonnes
June 1985	51 000 "
September 1985	57 000 "
December 1985	7 000 "

The present acoustic estimate is only half of the June estimate in 1985. It is however to early in the program to make conclusions whether the decline in biomass is caused by reduced stocks or merely a reflection of migrations in and out of this restricted area.

GABON

The distribution of the two categories of pelagic fish in Gabonese waters are shown in Figure 2. The pelagic 1 type fish mainly Maderian sardinella, *Sardinella maderenis*, was found distributed in shallow waters. Most of the pelagic 1 fish was obtained in the southern area with a concentration of biomass in the area Pte. Panga to Mayumba and an other area at the boarder of Congo where some African ilisha, *Ilisha africana*, were mixted with the sardinella. The later area is indicated to be a continuation of the distribution in Congo water. In the northern area at Igue'la small patches of sardinella was observed. The observation of round sardinella, *Sardinella aurita*, was very sparse and only in few small single shoals at depth of about 50-60 m. The length frequency distribution of Maderian sardinella was polymodal with two dominating modes at 9 cm and 22 cm respectively. All the round sardinella were mature fish with a mean length of 21.4 cm. The length frequency distribution are given in Annex II.

The pelagic 2 fish was found to be distributed over a large part of the shelf. Most of the distribution is of low densities but patches of higher density were observed in mid-shelf off Sette Cama. Inshore the distribution consisted of several species of carangids, lookdown, *Selene dorsalis*, false scad, *Decapterus rhoncus*, bumpers, *Chloroscombrus*

chrysurus, and barracudas mostly, *Sphyraena guachancho*. Off shore Cunene horse mackerel, *Trachurus trecae*, dominated followed by chub mackerel, *Scomber japonicus*. The mean length of horse and chub mackerel were about 15 cm and 20 cm respectively. The pooled size distribution of pelagic 2 species are given in Annex II. The mackerels formed shoals at bottom during day and appeared to lift of bottom at nigth time. Several attempts were made to locate mackerel during nigth time over the same depth interval where shoals were observed during day but without success. The findings indicate that the mackerel could have dispersed in the surface layers and possibly above the transducer level. The dense plankton layers occuring during nigth time in the upper layers could also contributed to the difficulties to observe these species when dispearsed.

The contribution of demersal species to the acoustic biomass were neglible.

Estimates of biomass

The preliminary estimates of pelagic 1 and 2 components and what is allocated to sardinella are shown below:

Sardinella maderensis	52 000 tonnes
Total Pelagic 1	56 000 "
Total Pelagic 2	53 000 "
Grand total	109 000 "

Corresponding estimates of total pelagic biomass in 1985 are:

Mars	25-30 000 tonnes
June	25-30 000 "
September	160 000 "
December	60 000 "

The present June estimate is about double the corresponding estimates from June 1985.The difference is maily due to higher estimate of sardinella.

4 RESULTS OF THE FISHING EXPERIMENTS, CATCHCOMPOSITIONS AND SWEPT AREA BIOMASS ESTIMATES

The result of the fishing experiments with bottom trawl for Congo and Gabon are summarized in Tables 1 to 5 and 6 to 10 respectively. It should be noted that most of the fishing forms a part of randomized swept area programme and trawl stations is prepositioned in advance in the different depth stratas with the intention to estimate fish density and not to obtain high catches. The catch rates thus do not simulate those of commersial fishery where additional information is used to increase catch rates. Details of the bottom trawl used are given in Annex IV.

All catches were sampled for composition in weigth and number by species and size sampling was made of important species,using total length.

The composition of the fish fauna on the shelf and the slope changes with depth and a partition in an inner shelf down to 55 m and an outer shelf from 55 m to 150 m has been used in the analysis of the data. In addition a slope area from 150 m and downwards have been grouped seperately. The location of the trawl stations are shown in Figure 1 and the catches standardized to kg per hour trawling are given in Annex III for both Congo and Gabon.

CONGO

Table 1 shows the catch rates of bottom hauls on the two parts of the shelf. The catch rates of demersal species dominates both on the inner and the outer shelf with mean values of 122 kg/hour and 82 kg/hour respectively. The second highest catch rate is obtained of the pelagic group. Sharks and shrimps are indicated to be more abundent on

Table 1. Congo. Catch rates by main groups in bottom trawl hauls, standardized to kg/hour.

INNER SHELF

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Lobster	Other
101	47	21.00	27.80	22.00	0.20	4.00	2.20
102	15	208.80	124.80		25.20		57.60
107	28	388.80	119.70				
108	31	8.60	15.00	2.80			1.20
109	18	299.79	114.41			14.48	26.07
110	34	118.00	142.50	15.00	1.00		
111	46	25.40	24.40		0.80		1.20
114	15	248.80	92.40		8.40	19.20	27.60
115	51		29.30	7.20	0.30		0.80
MEAN		146.58	76.70	5.22	3.99	4.19	12.96

OUTER SHELF

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
99	97	74.40	225.60			7.20	46.80
100	59	10.60	8.60		0.30	0.80	4.40
105	104	143.00	70.00			1.00	54.50
106	60	190.40	65.60		1.60	0.80	3.20
116	71	3.80	82.60			0.40	1.00
117	101	150.40	24.80	2.00		4.00	71.60
118	73	58.40	147.20				16.80
MEAN		90.14	89.20	0.29	0.27	2.03	28.33

SLOPE

ST.NO.	DEP.	Demersal	Pelagic	Sharks	Shrimps	Cephalopod	Other
97	707	10.40	1.60	9.60	9.20		90.00
98	343						
104	503	28.00	2.00	6.80	7.20		68.60
112	452	28.70	14.00	2.10	79.10		57.40
MEAN		16.78	4.40	4.63	23.88		54.00

Total number of stations : 4

the inner shelf and squids on the outer shelf. Lobsters were only caugth on the inner shelf.The catch rates on the slope were generally lower than on the shelf with the exception of the catch rate of shrimps. The increased catches of shrimp are mainly due to one large catch of African spider shrimp, *Nematocarcinus africanus*, station no.112. The catch rates are generally lower for all groups compared with the results from the February survey with the catch rates of lobster as the only exception.

The pelagic group brooken down on families are shown in Table 2. The clupeids were most common on the inner shelf and were not recorded on the outer shelf. The dominating specie was West African ilisha, *Ilisha africana* and sardinellas were only occasionally recorded. Among the carangids lookdown, *Selene dorsalis*, was most common on the inner shelf but lookdown was also frequent on the outer shelf where Cunene horse mackerel, *Trachurus trecae*, dominated. The catch rates of scombrids and hairtails were low over the whole shelf area. Barracudas were mostly obtained on the inner shelf.

Table 2. Congo. Catch rates of main pelagic families in bottom trawl hauls, standardized to kg/hour.

INNER SHELF

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
101	47	0.40	4.40	18.00	4.80	0.20	49.40
102	15	87.60	25.20	3.60		8.40	291.60
107	28	55.80	17.10	27.00	19.80		388.80
108	31	0.60	14.00	0.40			12.60
109	18	53.59	20.27	31.86		8.69	340.34
110	34	3.50	61.00	70.00	6.00	2.00	134.00
111	46	4.40	4.80	10.40		4.80	27.40
114	15	20.40	24.00	6.00		42.00	304.00
115	51	0.90	25.40	3.00			8.30
MEAN		25.24	21.80	18.92	3.40	7.34	172.94

OUTER SHELF

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
99	97		219.60			6.00	128.40
100	59		7.60	1.00			16.10
105	104		60.00			10.00	198.50
106	60		51.20	8.00	6.40		196.00
116	71		73.00	4.00	5.60		5.20
117	101		19.20	5.60			228.00
118	73		135.20	1.60	9.60	0.80	75.20
MEAN			80.83	2.89	3.09	2.40	121.06

Table 3. shows the catch rates of demersal fish by families and zones. The grunts dominated the catches on the whole shelf and consisted mainly of the bigeye grunt, *Brachydeuterus auritus*, and followed by sompat grunt, *Pomadasys jubelini*, in waters shallower than 50 m. Among the croakers the commersially important longneck croaker, *Pseudotolithus typus*, and cassava croaker, *Pseudotolithus senegalensis*, were most common in inshore areas with the highest catch rates in the depth interval 10-20 m followed by blackmouth croaker, *Pentheroscion mbizi*, in the deeper zone. Angola dentex, *Dentex angolensis*, followed by red pandora, *Pagellus belottii*, were most abundent among the seabreams.

Table 3. Congo. Catch rates by families for demersal fish, kg/hour.

INNER SHELF

ST.NO.	DEP.	Grunts	Croakers	Catfish	Sparids	Groupers	Other
101	47	14.00			5.00	2.00	56.20
102	15	105.60	42.00	26.40			242.40
107	28	324.00	30.60				153.90
108	31	1.60			4.40	2.60	19.00
109	18	31.86	186.83	21.72			214.34
110	34	108.00					168.50
111	46	22.80	1.20		1.40		26.40
114	15	158.40	34.00	1.20			202.80
115	51						37.60
MEAN		85.14	32.74	5.48	1.20	0.51	124.57

OUTER SHELF

ST.NO.	DEP.	Grunts	Sparids	Croakers	Groupers	Other
99	97	54.00	12.00	8.40		279.60
100	59	2.60	8.00			14.10
105	104		18.00	125.00		125.50
106	60	176.00	12.80	1.60		71.20
116	71		3.00	0.80		84.00
117	101	36.00	91.80	5.60	17.00	102.40
118	73	4.00	54.40			164.00
MEAN		38.94	28.57	20.20	2.43	120.11

Table 4 shows the swept area estimates of mean densities by species and depth strata,based on 23 successfull random botten hauls. The catchability coefficient applied in the estimation is 1.0. The bigeye grunt dominates both the 0-50 m and 50-200 m zone, followed by sompat grunt, *Pomadasys jubelini*, in the shallow zone and Angolan dentex, *Dentex angolensis*, in the deeper zone. In the depth zone 50-200 m, Angolan dentex followed by boe drum, *Pentheroscion mbizi*, showed the highest densities.The deeper waters were dominated by spider shrimp, *Nematocarcinus africanus*, and hake, *Merluccius polli*. The catch rates of red shrimp varied between 4-7 kg/hour which gives a density of 0.19 kg per nm^2.

Table 5 shows the the estimated area by depth zone and total for the shelf down to 200 m for all demersal species and seperately for some selected species.

Table 5. Congo. Biomass estimates of demersal species by depth strata. Tonnes.

	Total	0-50m	50-200 m
Shelf area nm^2	2520	750	1770
Brachydeuterus auritus	3800	1900	1900
Pomadasys jubelini	500	500	
Dentex angolensis	900		900
Pseudtolithus sp.	700	700	
All demersal	12500	5700	6800

Table 4. Congo. Swept area estimates of demersal fish densities by species and depth ranges.

SPECIES NAME	CATCH DISTRIBUTION BY KG/nM GROUPS						% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm²			
	<10	10-30	30-100	100-300	300-1000	>1000			- 50m	50-200m	200-800m	800-802
Brachydeuterus auritus	7	2	3	1			68	1.55	2.59	1.09		
Sphyraena guachancho	12	2					74	0.33	0.70	0.10		
Pomadasys jubelini	1		1				11	0.28	0.66			
Dentex angolensis	3	2					26	0.22		0.53		
Pentheroscion mbizi	3		1				21	0.22	0.01	0.51		
Pseudotolithus typus	2		1				16	0.20	0.48			
Pseudotolithus senegalensis	3	1					21	0.20	0.47			
Galeoides decadactylus	2	2					21	0.14	0.34			
Ariomma bondi	4	1					26	0.14		0.33		
Nematocarcinus africanus		1						0.12			0.78	
Merluccius polli	3						16	0.12			0.75	
Saurida brasiliensis	3	1					21	0.11		0.27		
Pteroscion peli	4						21	0.10	0.24			
Drepane africana	5						26	0.10	0.23			
Chloroscombrus chrysurus	5						26	0.09	0.21			
Arius heudeloti	2	1					16	0.09	0.22			
Paragaleus pectoralis	3						16	0.08	0.15	0.03		
Pentanemus quinquarius	2	1					16	0.08	0.19			
Pagellus bellottii	7						37	0.07	0.05	0.13		
Sarda sarda	4						21	0.07	0.08	0.09		
Panulirus regius	3						16	0.06	0.15			
Cynoglossus browni	3						11	0.06	0.14			
Dentex gibbosus	1						5	0.05		0.11		
Parapenaeus longirostris	4						21	0.05	0.11			
Stereomastis sculpta	3						16	0.05			0.29	
Cynoglossus monodi	1						5	0.05	0.12			
Aristeus varidens	3						11	0.03			0.19	
Penaeus notialis	7						37	0.01	0.02	0.01		
Parapenaeopsis atlantica	1						5	0.01	0.03			
Solenocera africana	2						11				0.03	
Sergia robusta	1						5					
Sergestes sp.	1						5					
Glyphus marsupialis	2						11				0.01	
Penaeus kerathurus	1						5		0.01			
Heterocarpus grimaldii	1						5					
Acanthephyra sp.	2						11					
Plesiopenaeus edwardsianus	2						11				0.03	
S H R I M P S	1						5				0.02	
Other fish								0.85	0.45	0.65	2.51	
Sum all species								5.53	7.65	3.85	4.61	
Sum Snappers												
Sum Groupers								0.04	0.02	0.07		
Sum Grunts								1.83	3.25	1.09		
Sum Croakers								0.77	1.23	0.59		
Sum Seabreams								0.37	0.05	0.84		
Sum Sharks								0.12	0.16	0.04	0.21	
Sum Rays								0.05	0.11	0.02		
Sum Squids								0.05	0.05	0.06		
Sum												
Sum shrimps (excl. SHRAA01)								0.22	0.17	0.01	1.06	
Number of stations included in analysis, total and by depth strata								19	8	8	3	

GABON

Table 6 shows the catch rates by main groups divided by inner shelf, outer shelf and the slope. The demersal group dominated on the inner shelf with a mean catch rate of 76 kg/hour followed by the pelagic group, 21 kg/hour. The catch rates of squids, shrimps and lobster were less than 3 kg/hour.

Table 6. Gabon. Catch rates for main groups in trawl stations standardized to kg/hour.

INNER SHELF

ST.NO.	DEP.	Demersal	Pelagic	Cephalop.	Shrimps	Lobster	Other
123	55	114.60	10.20	1.00			0.50
124	25	86.20	4.80				44.40
125	16	101.60	104.80				18.40
126	19	54.80	46.40		0.40		2.40
127	46	19.00	9.20				2.60
131	29	57.80	19.30				5.10
132	37	30.00	12.40	2.40			17.80
134	41	54.20	3.80				15.80
135	45	306.00	1.20				9.00
138	32	135.00	4.00	3.00	0.80	3.60	134.00
139	39	49.50	2.70	7.50			33.00
140	50	18.00	5.00	14.00			7.80
143	43	33.20	2.40	5.80			9.00
144	33	284.40	10.40	1.60	0.80		16.00
145	31	164.80	2.40		6.00		67.20
146	28	65.60		2.00	3.60		33.60
149	47	19.80	16.00	6.00			7.10
150	18	58.80	46.40		0.60		11.60
152	24	13.20	101.80				1.20
153	38	57.00	7.50	7.50			6.30
157	36	46.00	5.20				4.40
158	15	0.80	22.80				
159	14	3.40	4.80				2.20
160	21	26.20	14.60	4.00			2.40
161	54	111.20	77.80		0.80		3.60
MEAN		76.44	21.44	2.19	0.52	0.14	18.22

OUTER SHELF

ST.NO.	DEP.	Demersal	Pelagic	Cephalop.	Shrimps	Lobster	Other
122	93	182.40	32.00	8.80			4.80
128	67	94.40	121.60				4.80
129	104						
133	75	240.80	155.40	11.20			2.80
136	64	217.00	196.00	12.60			16.80
141	83	108.00	3480.00	36.00			48.00
142	88	360.00	131.20	54.40			4.80
148	76	8.00	448.00				6.40
156	57	72.80	333.20	4.20			11.20
MEAN		173.80	586.04	14.13			15.69

SLOPE

ST.NO.	DEP.	Demersal	Pelagic	Cephalop.	Shrimps	Lobster	Other
121	349	45.00	38.00	3.00	26.70		154.50
137	467	55.00	20.00		49.50		54.50
147	465	15.40	6.30		39.20	0.70	64.30
154	699	3.90	1.50		5.70	3.00	64.50
155	628	2.00	0.80		6.20	3.00	35.20
MEAN		24.26	13.32	0.60	25.46	1.34	74.60

On the outer shelf the catch rate of the pelagic group increased to about 590 kg/hour mainly due large catches of cunene horse mackerel. The catch rate of demersals was more than doubbled to 174 kg/hour compared to the catch rates on the inner shelf. Squids were also more common on the outer shelf. The group of non commersial interest labeled "other" dominated the catches on the slope area followed by increased catch rates of shrimps to about 25 kg/hour. The catch rates of all other groups decreased.

The pelagic group brooken down on families are shown in Table 7. The carangids were the dominating family in all areas with the highest catch rates on the outer shelf where also scombrids and clupeids were common in the bottom trawl catches. It should, however, be noted that the bottom trawl catches reflects accessebility of pelagic species rather than abundance. The abundance of the pelagic species are given in section on acoustic estimates.

Table 7. Gabon. Catch rates by families for pelagic fish, kg/hour.

INNER SHELF

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
123	55		5.60		4.60		116.10
124	25			1.20	3.60		130.60
125	16	33.60	4.00	60.00	5.60	1.60	120.00
126	19	24.40		17.60	1.60	2.80	57.60
127	46		6.20	3.00			21.60
131	29	3.00	13.00	3.00		0.30	62.90
132	37		4.60	6.00	1.80		50.20
134	41		0.80	3.00			70.00
135	45		1.20				315.00
138	32			4.00			276.40
139	39			2.70			90.00
140	50		5.00				39.80
143	43		2.40				48.00
144	33		0.80	9.60			302.80
145	31			2.40			238.00
146	28						104.80
149	47		16.00				32.90
150	18	0.80	37.60	8.00			71.00
152	24	2.80	97.00	2.00			14.40
153	38		3.90		3.60		70.80
157	36		5.20				50.40
158	15		20.00	0.80	2.00		0.80
159	14		2.00		2.80		5.60
160	21		11.40	1.20	2.00		32.60
161	54		77.80				115.60
MEAN		2.58	12.58	4.98	1.10	0.19	97.52

OUTER SHELF

ST.NO.	DEP.	Clupeids	Carangids	Barracudas	Scombrids	Hairtails	Other
122	93		32.00				196.00
128	67		120.00		1.60		99.20
129	104						
133	75		133.00		22.40		254.80
136	64	105.00	70.00		21.00		246.40
141	83		2760.00		720.00		192.00
142	88		131.20				419.20
148	76		448.00				14.40
156	57	182.00	147.00		4.20		88.20
MEAN		31.89	467.24		86.91		203.62

The catch rates of the main demersal families are shown in Table 8. The sparids or seabreams were the most common family with increasing dominance with depth. The unspecified group "others" forms the main component in the outer shelf. The catch rates of grunts and groupers increased with depth but the rates were still low. For snappers the catch rates were highest on the inner shelf. Among the seabreams red pandora, *Pagellus bellottii*, was most common followed by bluespotted seabream, *Sparus caeruleostictus*. The most common grunt was the bigeye, *Brachydeuterus auritus*. Among the groupers, white grouper, *Epinephelus aeneus*, dominated.

Table 8. Gabon. Catch rates by families for demersal fish, kg/hour.

INNER SHELF

ST.NO.	DEP.	Sparids	Snappers	Grunts	Groupers	Croak+Catf	Other
123	55	113.60		1.00			11.70
124	25	48.00	17.20				70.20
125	16			19.20		31.20	174.40
126	19			28.40		16.80	58.80
127	46	3.00		16.00			11.80
131	29	2.10		38.10			42.00
132	37	18.00		12.00			32.60
134	41	43.40		0.80	10.00		19.60
135	45	68.40	104.40	126.00		7.20	10.20
138	32	108.00	2.00	21.00			149.40
139	39	49.50					43.20
140	50	18.00					26.80
143	43	33.00		0.20			17.20
144	33	232.80		32.00	14.80		33.60
145	31	136.00	4.80	16.80	0.80		82.00
146	28	39.20		18.40	0.40	2.80	44.00
149	47	19.80					29.10
150	18	3.20		4.00			110.20
152	24	6.40		5.20			104.60
153	38	57.00					21.30
157	36	46.00					9.60
158	15	0.80					22.80
159	14	3.40					7.00
160	21	24.20					23.00
161	54	35.20		68.00			90.20
MEAN		44.36	5.14	16.28	1.04	2.32	49.81

OUTER SHELF

ST.NO.	DEP.	Sparids	Snappers	Grunts	Groupers	Croak+Catf	Other
122	93	102.40					125.60
128	67	72.80		21.60			126.40
129	104						
133	75	238.00					172.20
136	64	217.00					225.40
141	83	96.00					3576.00
142	88	272.00			48.00		230.40
148	76	8.00					454.40
156	57	70.00					351.40
MEAN		124.20		11.64	5.33		648.49

Table 9 gives the swept area estimates of mean densities by selected species and groups and by depth strata,based on 55 random bottom hauls. The red pandora dominates the shelf area down to 100 m,followed by bigeye grunt.The deeper waters are dominated by hake, *Merluccius polli*, and greeneye, *Chloropthalmus agassizi*. Among the shrimp,

African spider shrimp, *Nematocarcinus africanus* and scarlet shrimp, *Plesiopenaeus - edwardsianus*, shows the highest densities, followed by red shrimp, *Aristeus varidens*. The catch rates for red shrimp varied between 1.4 to 7 kg/hour and the scarlet shrimp between 1-40 kg/hour. The catchability coefficient applied in the estimation is 1.0.

Table 9. Gabon. Swept area estimates of demersal fish densities by species and depth ranges.

SPECIES NAME	CATCH DISTRIBUTION BY KG/NM GROUPS						% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm²			
	<10	10-30	30-100	100-300	300-1000	>1000			- 50m	50-100m	100-200m	200-800
Pagellus bellottii	17	9	4				77	1.13	0.78	2.37		
Brachydeuterus auritus	14	3	1				44	0.35	0.34	0.53		
Sparus caeruleostictus	14	2	1				44	0.27	0.42	0.07		
Arionma bondi	3	2	1				15	0.25		0.89		
Sepia officinalis hierredda	12	2					36	0.14	0.07	0.35		
Chelidonichthys capensis	14	2					41	0.13	0.14	0.17		
Sparus pagrus africanus	3		1				10	0.12	0.02	0.37		
Sphyraena guachancho	14	1					38	0.11	0.18			
Boops boops	6	1					18	0.11		0.38		
Merluccius polli	3	2					13	0.11				0.82
Chloroscombrus chrysurus	3		1				10	0.10	0.17			
Alectis alexandrinus	4	1					13	0.10	0.05	0.23		
Chlorophthalmus agassizi			1				3	0.09				0.70
Dentex angolensis	2	1					8	0.08		0.28		
Dentex gibbosus	1	2					8	0.07	0.07	0.12		
Benthodesmus tenuis	4	1					13	0.06				0.45
Dentex congoensis	6	1					18	0.06		0.23		
Nematocarcinus africanus	3	1					10	0.06				0.44
Epinephelus aeneus	2	1					8	0.06	0.04	0.15		
Galeoides decadactylus	9						23	0.06	0.10			
Drepane africana	4	1					13	0.06	0.10			
Dentex canariensis	5						13	0.05	0.08			
Pomadasys incisus	5						13	0.05	0.09			
Pseudupeneus prayensis	15	1					41	0.05	0.08	0.02		
Lutjanus fulgens	3	1					8	0.05	0.09			
Plesiopenaeus edwardsianus	1	1					5	0.04				0.28
Aristeus varidens	5						13	0.02				0.12
Penaeus notialis	6						15	0.01	0.01			
Sergia robusta	2						5					0.02
Nematopalaemon hastatus	1						3					0.01
Penaeus kerathurus	3						8		0.01			
Parapenaeus longirostris	2						5					
Heterocarpus grimaldii	1						3					
Acanthephyra sp.	1						3					0.01
Other fish								0.89	0.81	0.35		2.11
Sum all species								4.68	3.65	6.51		4.96
Sum Snappers								0.10	0.19			
Sum Groupers								0.06	0.04	0.15		
Sum Grunts								0.43	0.49	0.53		
Sum Croakers								0.06	0.08			
Sum Seabreams								1.92	1.40	3.84		
Sum Sharks								0.04	0.02			0.17
Sum Rays								0.07	0.06	0.09		0.03
Sum Squids								0.16	0.07	0.38		0.02
Sum												
Sum shrimps (excl. SHRAA01)								0.13	0.02			0.88
Number of stations included in analysis, total and by depth strata								39	23	11		5

Table 10 shows the estimated area of the shelf and the resulting biomass for all demersal species and seperately for the dominating species in each depth zone.

Table 10. Gabon. Biomass estimates of demersal fish by depth strata.

	Total	0-50m	50-100m
Shelf area nm^2	7 075	4 182	2 893
Pagellus bellottii	10 200	3 300	6 900
Brachydeuterus auritus	2 900	1 400	1 500
Sparus caeruleostictus	2 000	1 800	200
Dentex spp.	2 400	600	1 800
All demersal	34 100	15 300	18 800

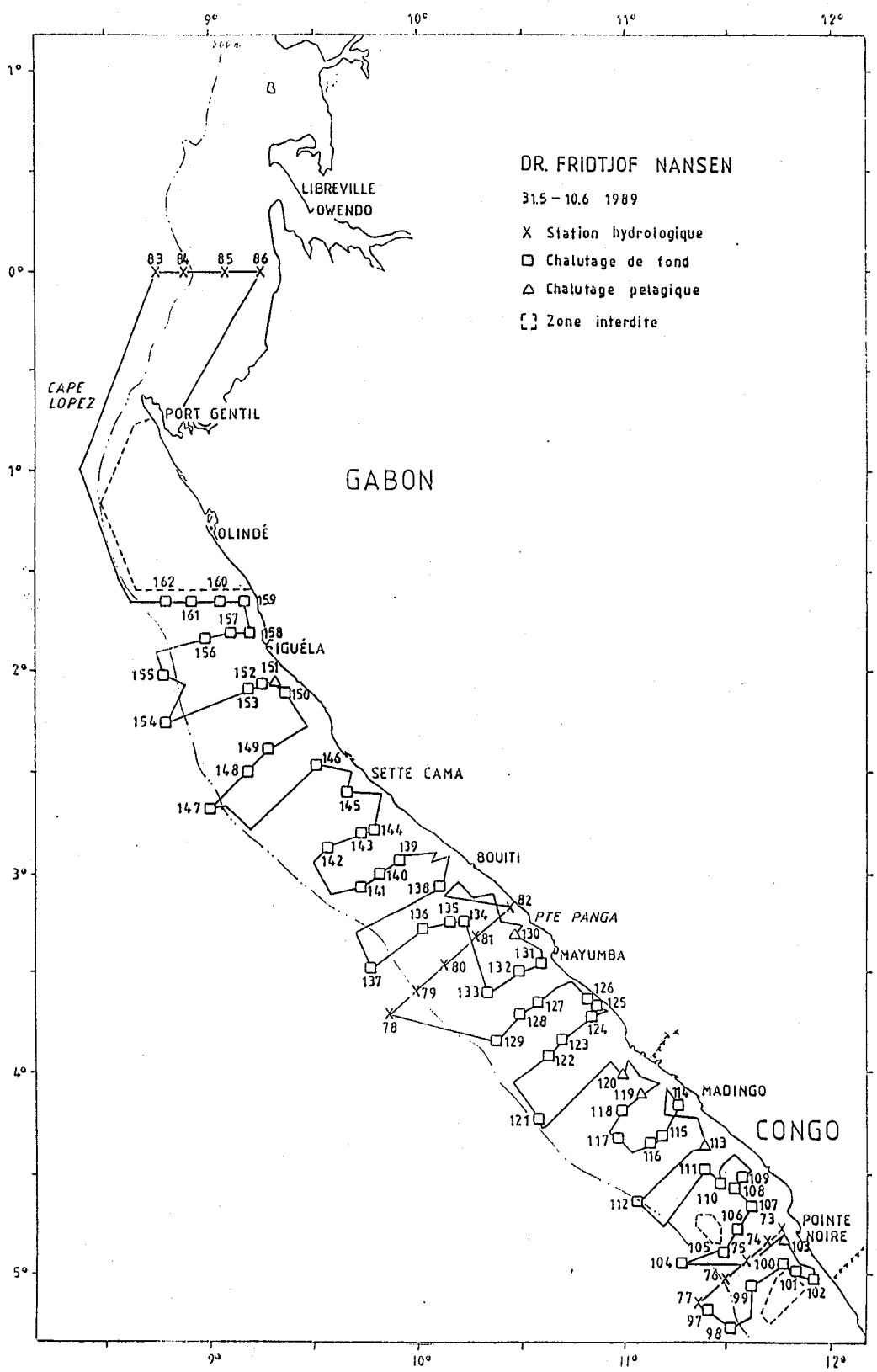


Figure 1. Course tracks, fishing stations and hydrographical profiles.

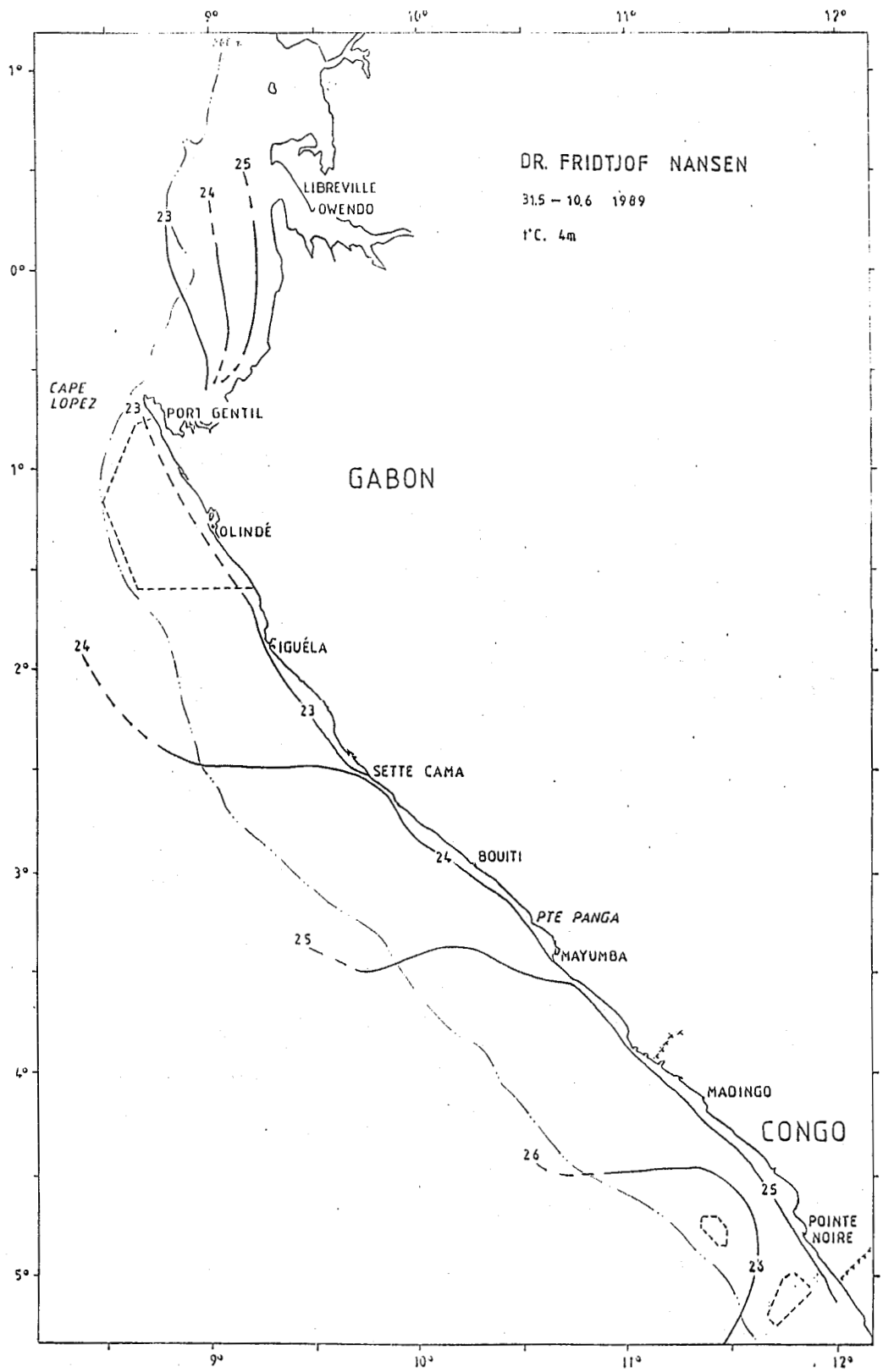
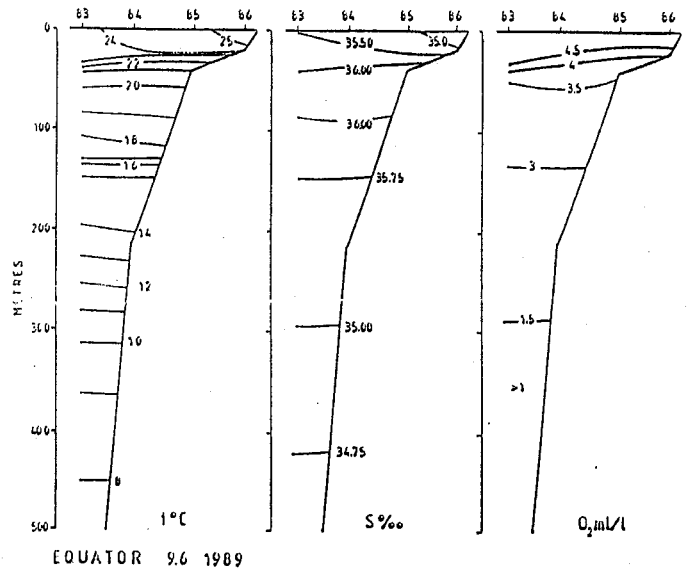
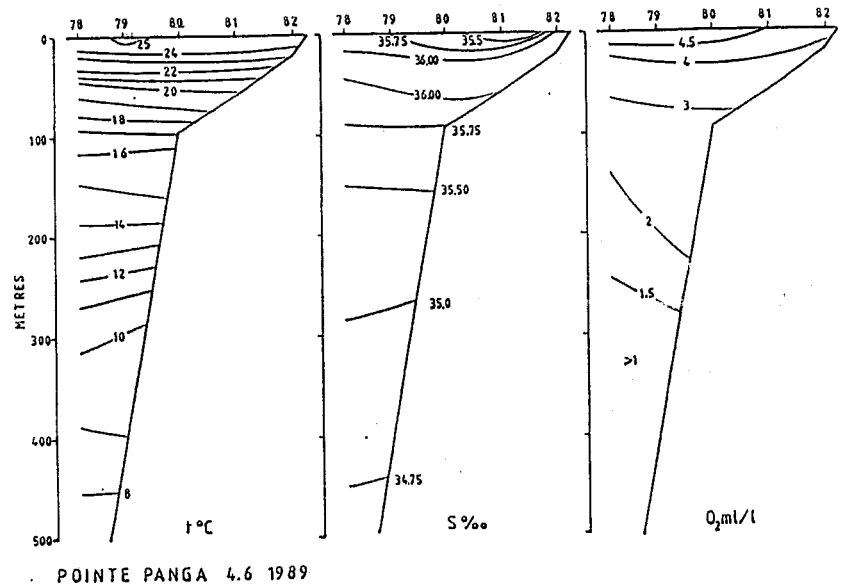


Figure 2. Temperature at sea surface.





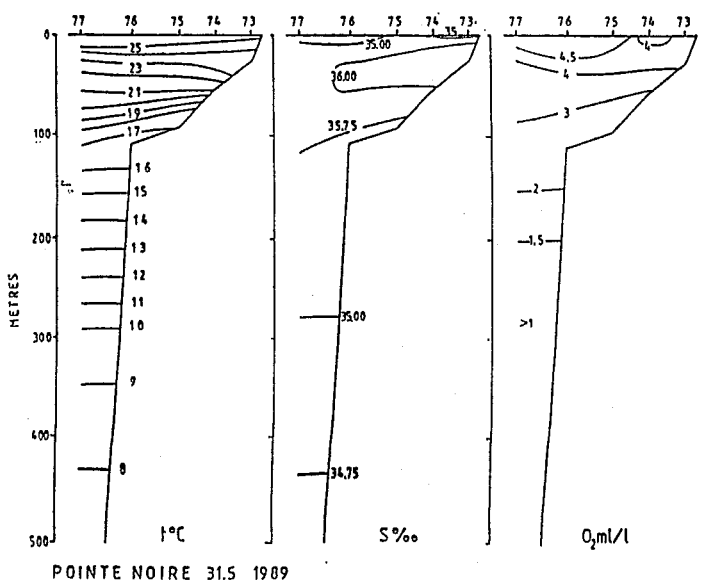


Figure 3. Hydrographic profiles.

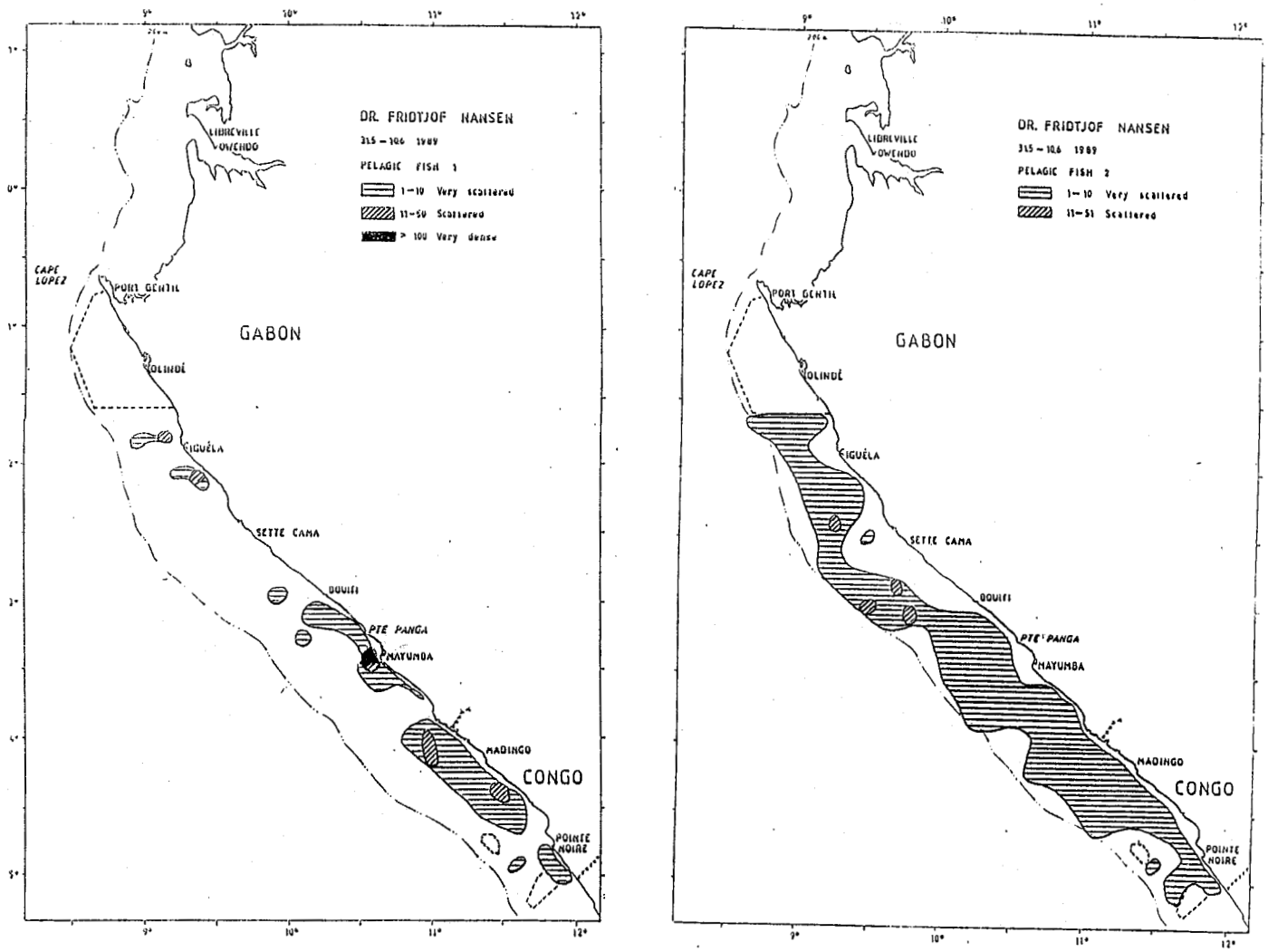
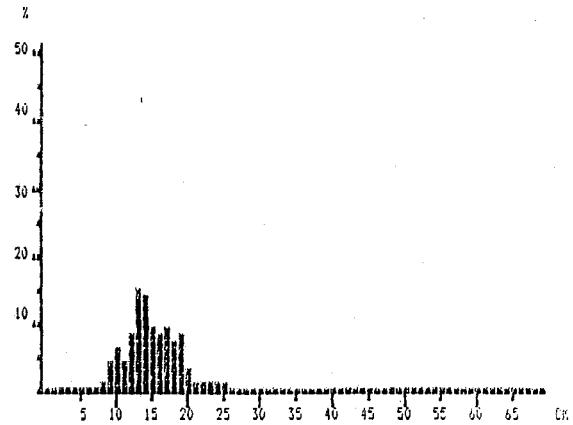


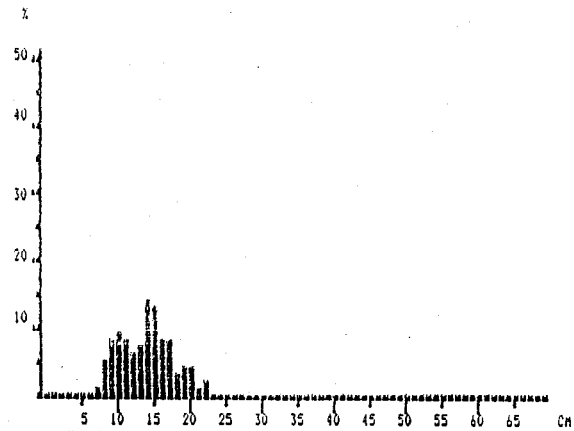
Figure 4. Distribution of pelagic fish 1 and pelagic fish 2.

ANNEX I. CONGO. LENGTH DISTRIBUTIONS OF SAMPLES OF MAIN SPECIES



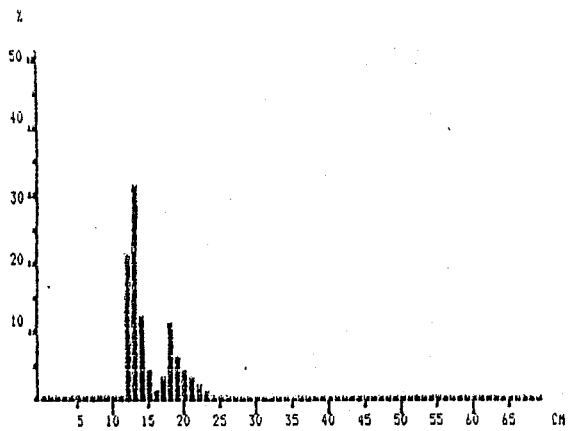
Sardinella maderensis
Congo

Pooled sample (simple adding)
MEAN LENGTH = 14.84cm N= 336
NUMBER OF SUBSAMPLES : 10
SAMPLES FOUND BETWEEN ST. NO. 521 AND 537.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



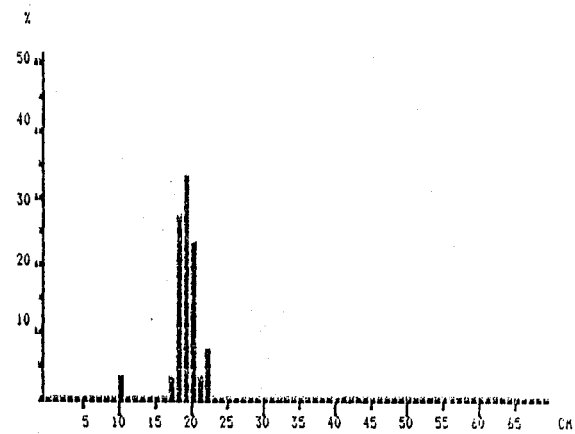
Ilisha africana
Congo

Pooled sample (simple adding)
MEAN LENGTH = 13.73cm N= 340
NUMBER OF SUBSAMPLES : 6
SAMPLES FOUND BETWEEN ST. NO. 520 AND 537.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



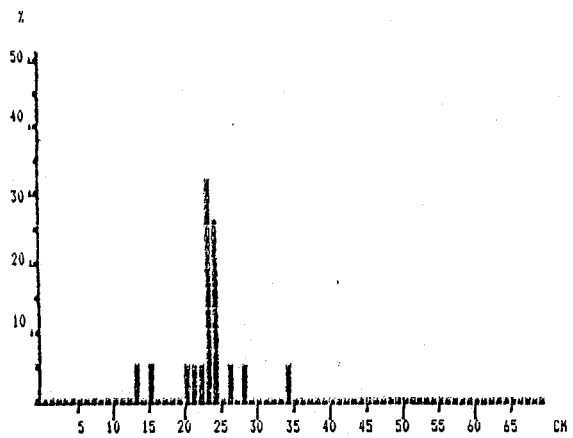
Trachurus trecae
Congo

Pooled sample (simple adding)
MEAN LENGTH = 15.00cm N= 324
NUMBER OF SUBSAMPLES : 4
SAMPLES FOUND BETWEEN ST. NO. 517 AND 535.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



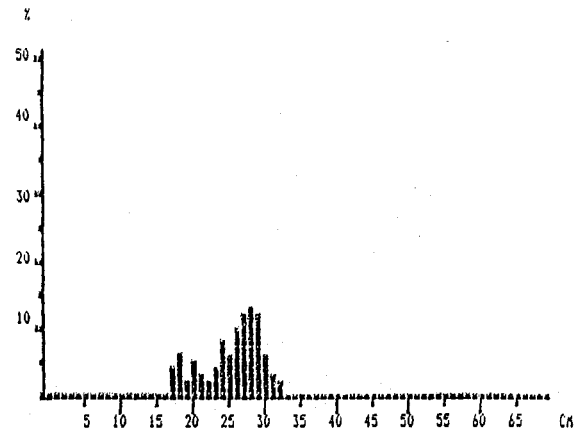
Chloroscombrus chrysurus
Congo

Pooled sample (simple adding)
MEAN LENGTH = 18.87cm N= 30
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 532 AND 532.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



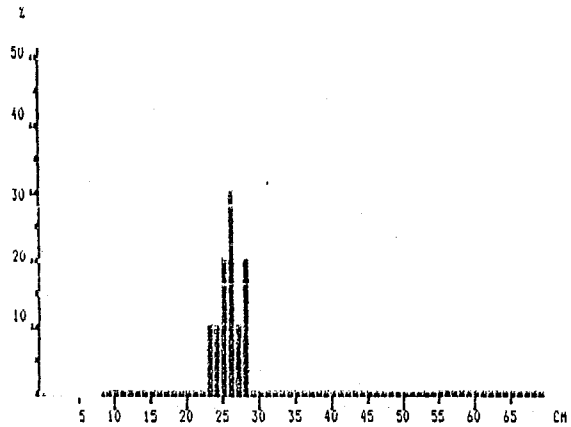
Decapterus rhonchus
Congo

Pooled sample (simple adding)
MEAN LENGTH = 23.00cm N= 19
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 524 AND 524.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



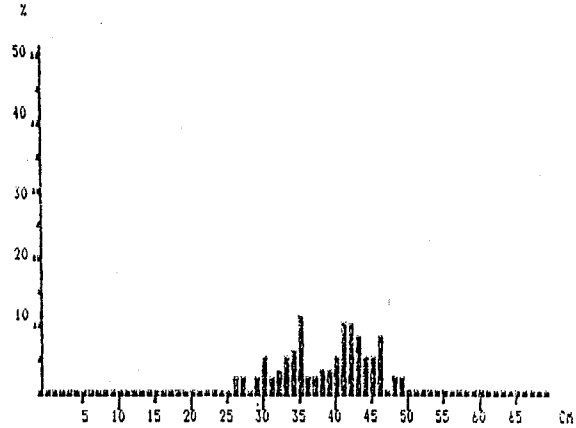
Selene dorsalis
Congo

Pooled sample (simple adding)
MEAN LENGTH = 25.26cm N= 206
NUMBER OF SUBSAMPLES : 5
SAMPLES FOUND BETWEEN ST. NO. 524 AND 537.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



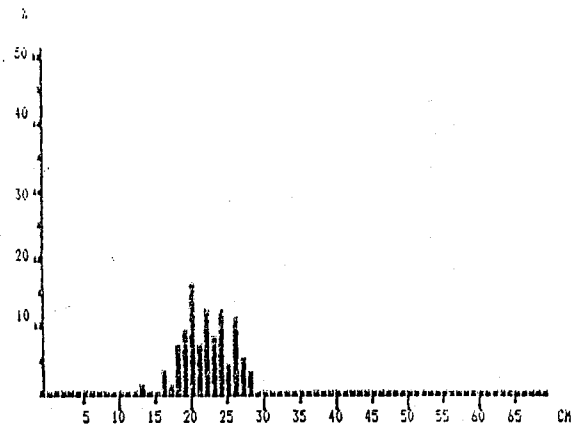
Hemicaranx bicolor
Congo

Pooled sample (simple adding)
MEAN LENGTH = 25.80cm N= 10
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 521 AND 521.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



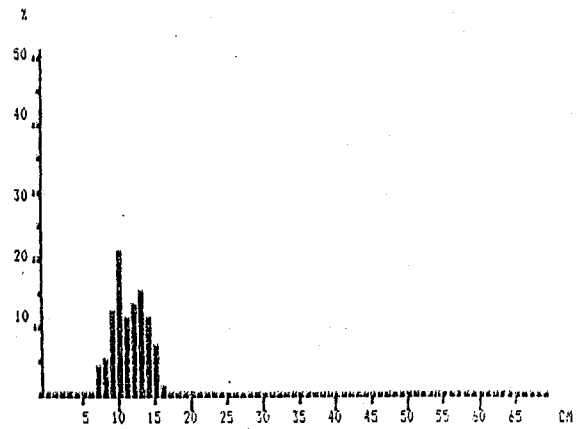
Sphyraena guachancho
Congo

Pooled sample (simple adding)
MEAN LENGTH = 38.73cm N= 62
NUMBER OF SUBSAMPLES : 2
SAMPLES FOUND BETWEEN ST. NO. 528 AND 537.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



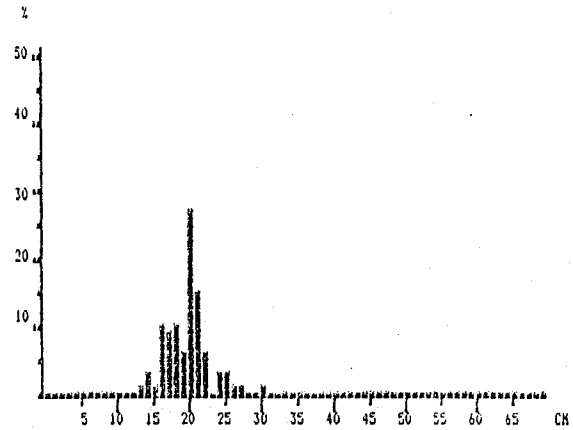
Dentex angolensis
Congo

Pooled sample (simple adding)
MEAN LENGTH = 22.01cm N= 74
NUMBER OF SUBSAMPLES : 2
SAMPLES FOUND BETWEEN ST. NO. 535 AND 536.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



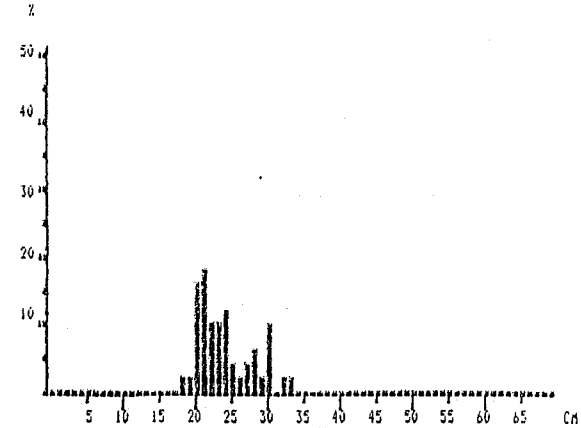
Brachydeuterus auritus
Congo

Pooled sample (simple adding)
MEAN LENGTH = 11.31cm N= 383
NUMBER OF SUBSAMPLES : 6
SAMPLES FOUND BETWEEN ST. NO. 517 AND 529.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



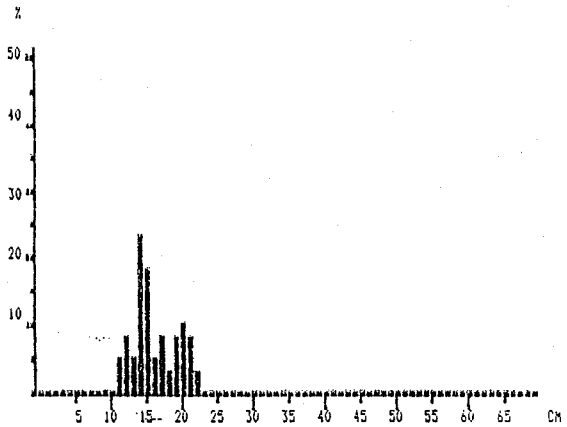
Pagellus bellottii
Congo

Pooled sample (simple adding)
MEAN LENGTH = 19.57cm N= 67
NUMBER OF SUBSAMPLES : 3
SAMPLES FOUND BETWEEN ST. NO. 518 AND 536.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



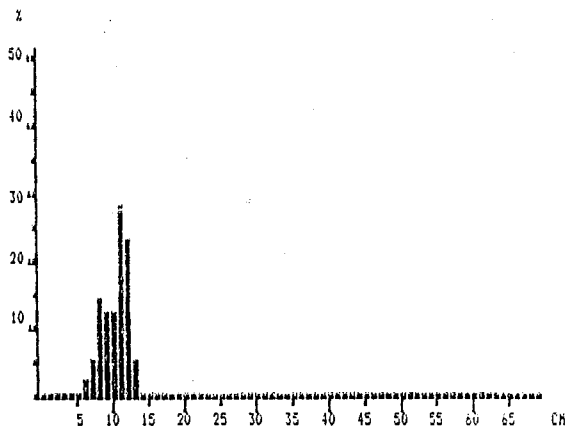
Pomadasys jubelini
Congo

Pooled sample (simple adding)
MEAN LENGTH = 23.78cm N= 51
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 532 AND 532.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



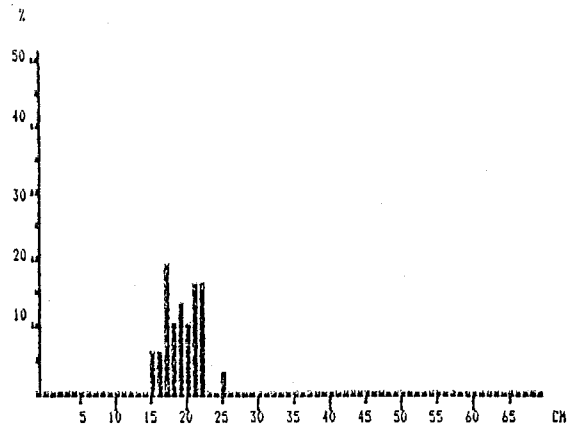
Pteroscion peli
Congo

Pooled sample (simple adding)
MEAN LENGTH = 15.95cm N= 40
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 527 AND 527.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



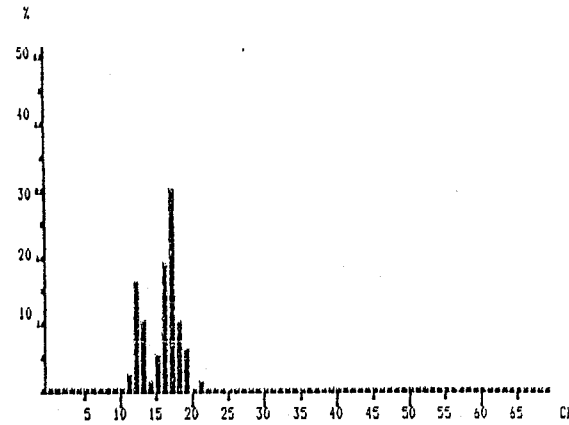
Parapenaeus longirostris
Congo

Pooled sample (simple adding)
MEAN LENGTH = 10.26cm N= 43
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 520 AND 520.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



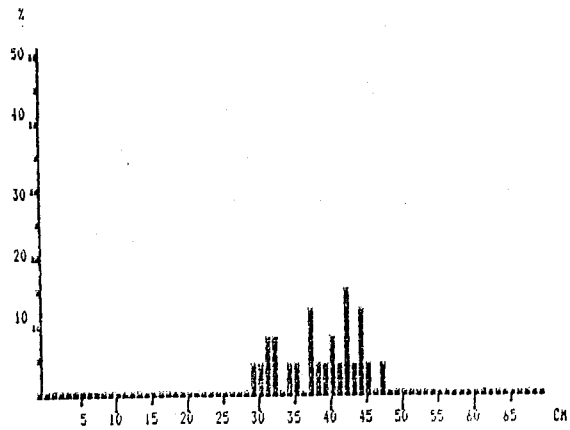
Pentheroscion mbizi
Congo

Pooled sample (simple adding)
MEAN LENGTH = 19.16cm N= 31
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 523 AND 523.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



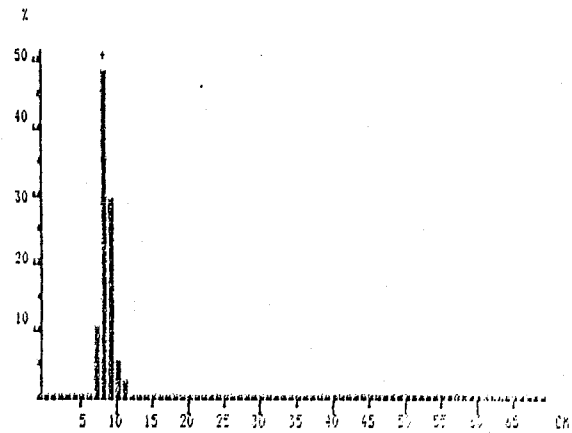
Aristeus varidens
Congo

Pooled sample (simple adding)
MEAN LENGTH = 15.60cm N= 81
NUMBER OF SUBSAMPLES : 2
SAMPLES FOUND BETWEEN ST. NO. 515 AND 530.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



Merluccius polli
Congo

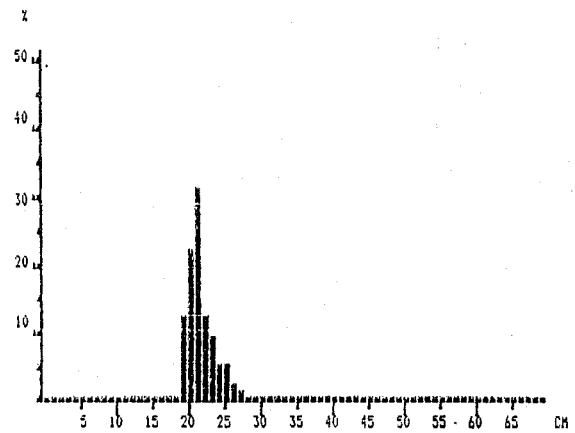
Pooled sample (simple adding)
MEAN LENGTH = 38.38cm N= 26
NUMBER OF SUBSAMPLES : 2
SAMPLES FOUND BETWEEN ST. NO. 522 AND 530.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .



Nematocarcinus africanus
Congo

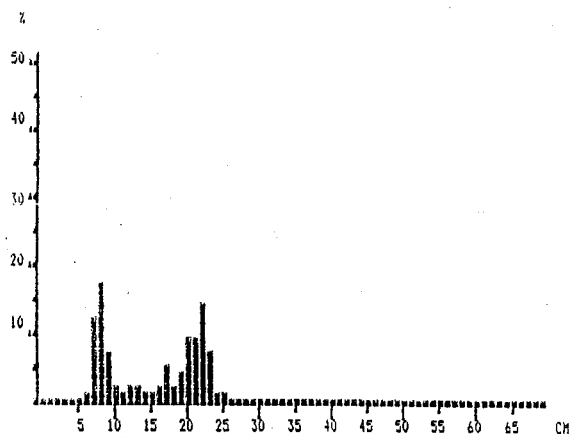
Pooled sample (simple adding)
MEAN LENGTH = 8.34cm N= 58
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 530 AND 530.
SAMPLES SEARCHED BETWEEN ST. NO. 515 AND 537 .

ANNEX II. GABON. LENGTH DISTRIBUTIONS OF SAMPLES OF MAIN SPECIES



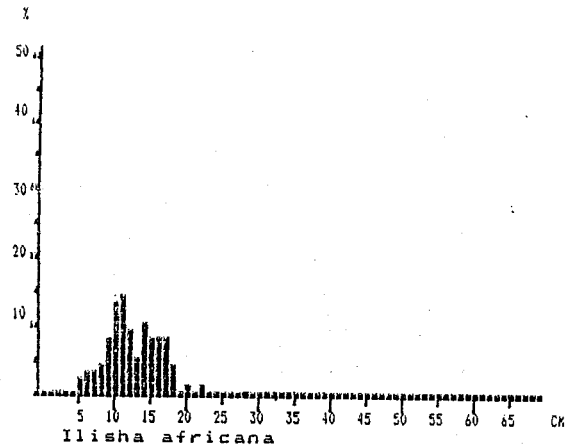
Sardinella aurita
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 21.36cm N= 98
NUMBER OF SUBSAMPLES : 4
SAMPLES FOUND BETWEEN ST. NO. 538 AND 574.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



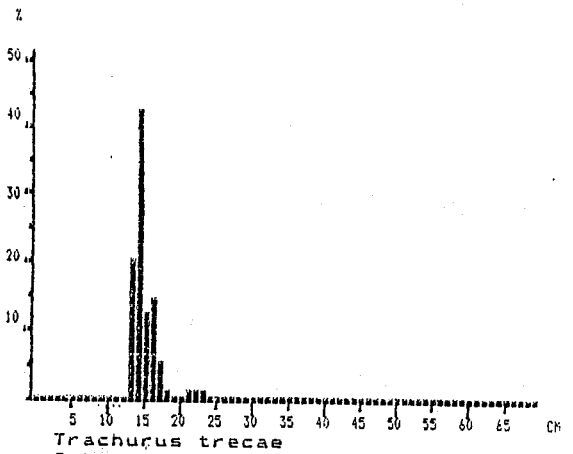
Sardinella maderensis
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 15.19cm N= 361
NUMBER OF SUBSAMPLES : 4
SAMPLES FOUND BETWEEN ST. NO. 537 AND 549.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



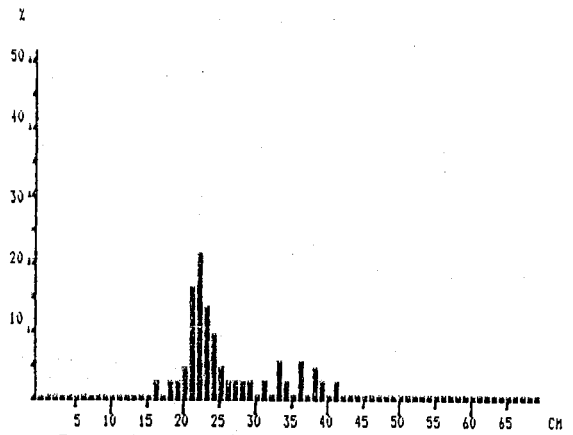
Ilisha africana
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 12.36cm N= 196
NUMBER OF SUBSAMPLES : 3
SAMPLES FOUND BETWEEN ST. NO. 537 AND 543.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



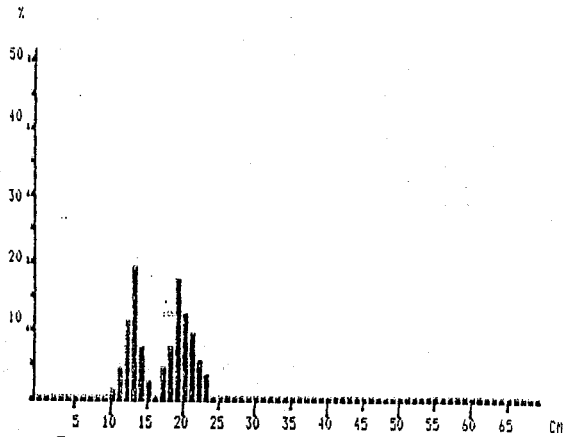
Trachurus trecae
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 14.77cm N= 622
NUMBER OF SUBSAMPLES : 9
SAMPLES FOUND BETWEEN ST. NO. 540 AND 580.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



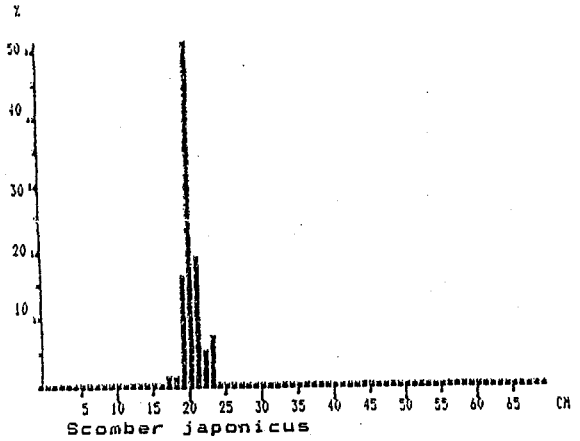
Decapterus rhonchus
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 25.27cm N= 56
NUMBER OF SUBSAMPLES : 3
SAMPLES FOUND BETWEEN ST. NO. 550 AND 578.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



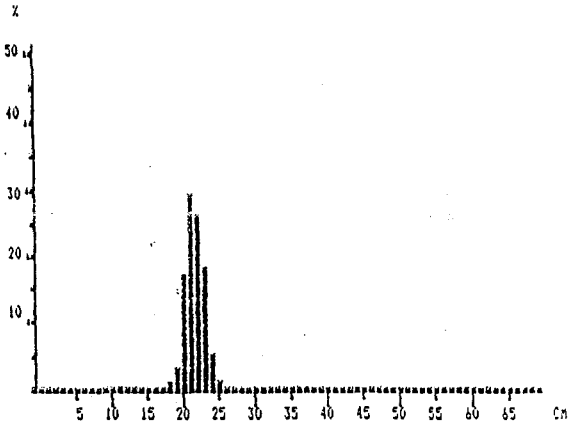
Decapterus punctatus
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 16.68cm N= 161
NUMBER OF SUBSAMPLES : 3
SAMPLES FOUND BETWEEN ST. NO. 554 AND 574.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



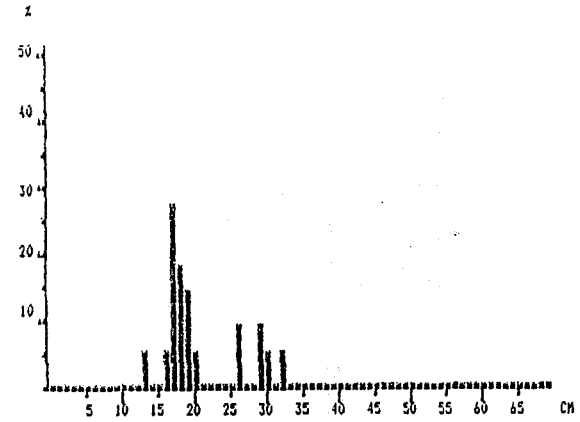
Scomber japonicus
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 20.27cm N= 75
NUMBER OF SUBSAMPLES : 3
SAMPLES FOUND BETWEEN ST. NO. 551 AND 559.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



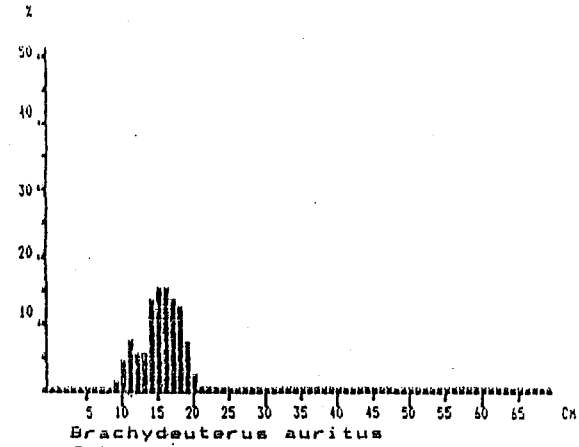
Chloroscombrus chrysurus
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 21.56cm N= 115
NUMBER OF SUBSAMPLES : 2
SAMPLES FOUND BETWEEN ST. NO. 568 AND 570.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



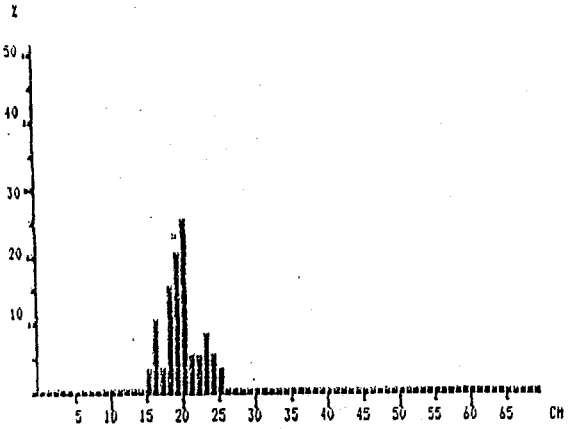
Selene dorsalis
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 20.55cm N= 522
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 537 AND 537.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



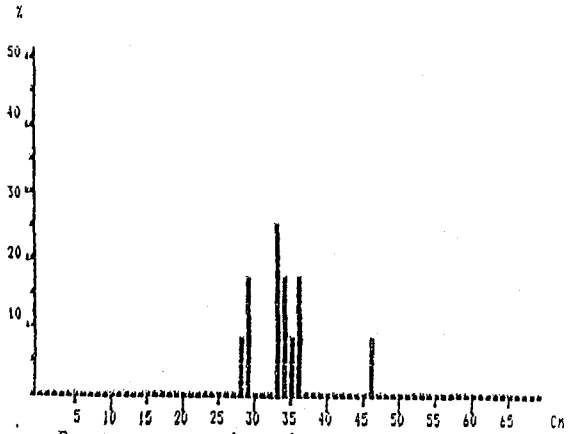
Brachydeuterus auritus
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 15.24cm N= 336
NUMBER OF SUBSAMPLES : 6
SAMPLES FOUND BETWEEN ST. NO. 544 AND 580.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



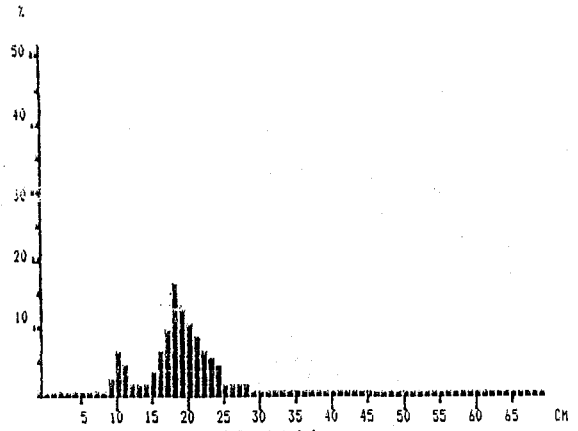
Dentex angolensis
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 19.60cm N= 40
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 540 AND 540.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



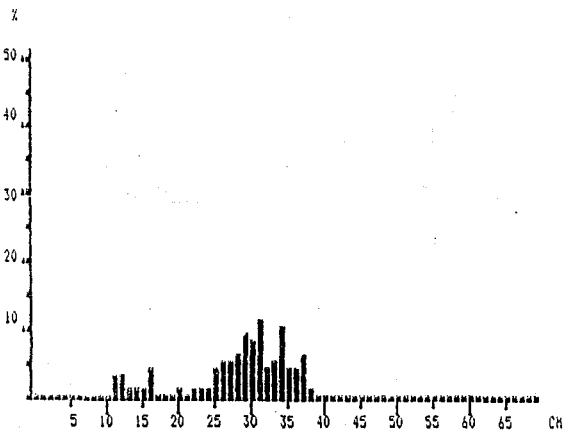
Dentex canariensis
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 33.83cm N= 12
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 552 AND 552.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



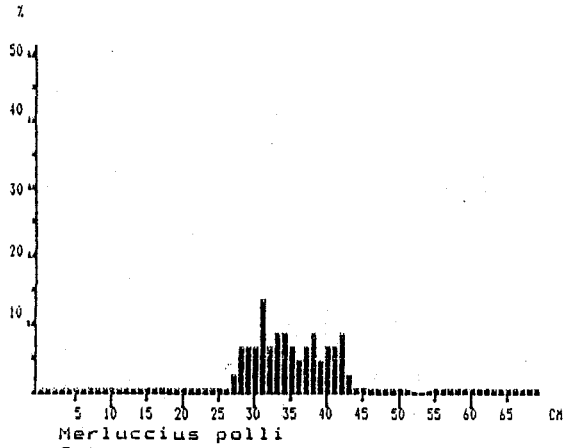
Pagellus bellottii
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 18.22cm N= 888
NUMBER OF SUBSAMPLES : 18
SAMPLES FOUND BETWEEN ST. NO. 541 AND 579.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



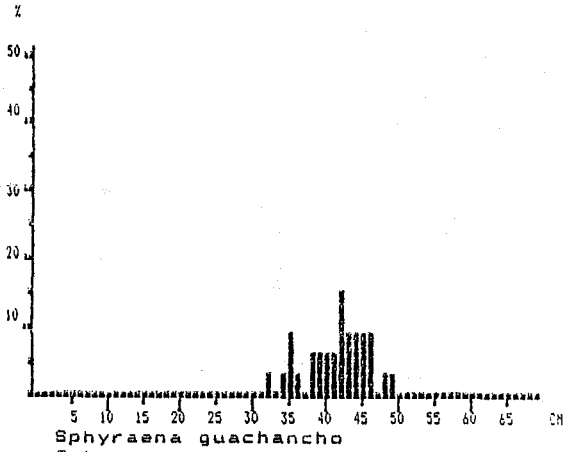
Sparus caeruleostictus
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 28.48cm N= 79
NUMBER OF SUBSAMPLES : 4
SAMPLES FOUND BETWEEN ST. NO. 542 AND 562.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



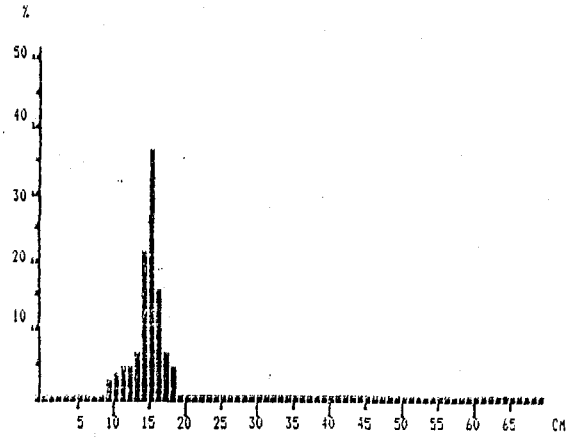
Merluccius polli
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 34.74cm N= 53
NUMBER OF SUBSAMPLES : 2
SAMPLES FOUND BETWEEN ST. NO. 539 AND 555.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



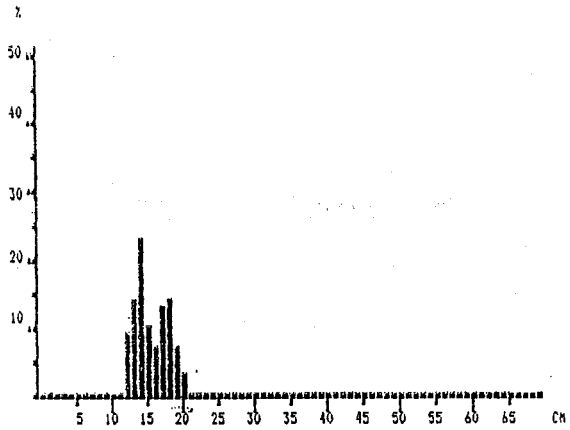
Sphyraena guachancho
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 41.33cm N= 33
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 537 AND 537.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



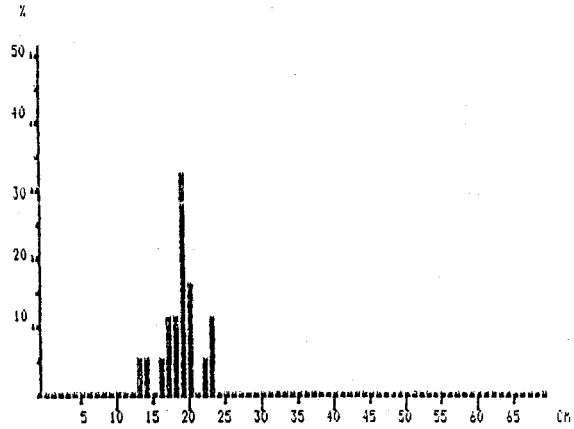
Ariomma bondi
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 14.56cm N= 108
NUMBER OF SUBSAMPLES : 2
SAMPLES FOUND BETWEEN ST. NO. 540 AND 580.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



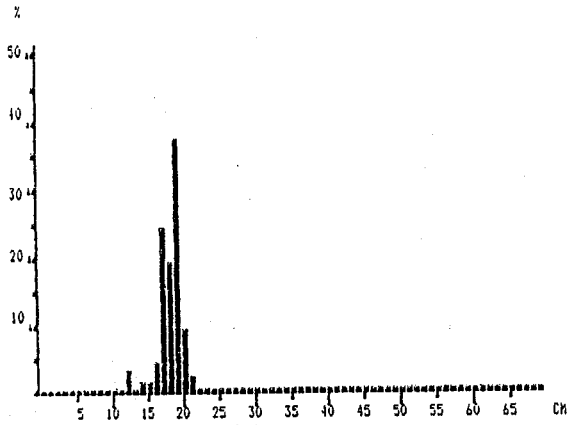
Penaeus notialis
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 15.41cm N= 70
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 563 AND 563.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



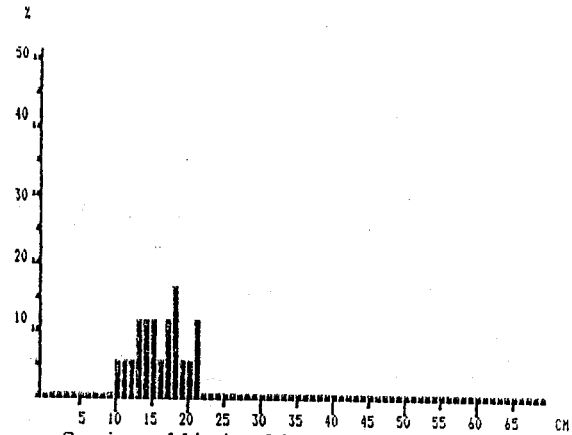
Penaeus kerathurus
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 18.68cm N= 19
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 564 AND 564.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



Aristeus varidens
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 18.04cm N= 97
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 572 AND 572.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .



Sepia officinalis hierredda
Gabon

Pooled sample (simple adding)
MEAN LENGTH = 15.89cm N= 19
NUMBER OF SUBSAMPLES : 1
SAMPLES FOUND BETWEEN ST. NO. 558 AND 558.
SAMPLES SEARCHED BETWEEN ST. NO. 537 AND 580 .

ANNEX III. RECORDS OF FISHING STATIONS

PROJECT STATI

DATE:31/ 5/89 GEAR TYPE: BT No:1 POSITION:Lat S 1000
start stop duration Long E 1122
TIME :06:31:00 07:31:00 60 (min) Purpose code: 3
LOG :1806.00 1808.00 3.00 Area code : 3
FDEPTH: 704 709 GearCond.code:
BDEPTH: 704 709 Validity code:
Towing dir: 160° Wire out:1700 m Speed: 3 kn*10

Sorted: 30 Kg Total catch: 120.80 CATCH/HOUR: 120.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Stereomastis sculpta	14.00	972	11.59	
Merluccius polli	10.40	24	8.61	
Triplophos sp	10.00	1250	8.28	
Talismania oregonia	8.00	88	6.62	
Deania profundorum	6.80	24	5.63	
Trachyrinus scabrus	6.00	28	4.97	
Malacocephalus occidentalis	6.00	96	4.97	
Yarella blackfordi	6.00	84	4.97	
Lamprogrammus exatus	6.00	12	4.97	
Bathygadus sp	4.80	32	3.97	
Sphagemacrurus hirundo	4.00	12	3.31	
Monomitopus sp	4.00	144	3.31	
Physiculus sp	4.00	112	3.31	
Halosaurus sp	4.00	44	3.31	
Aristeus varidens	4.00	140	3.31	1
Xenodermichthys socialis	3.20	36	2.65	
Solenocera africana	2.40	348	1.99	
S H R I M P S	2.00	600	1.66	
Bathygadus melanobranchus	2.00	28	1.66	
Malanous zugmayeri	1.60	12	1.32	
Nezumia aequalis	1.60	8	1.32	
Bathyuroconger vicinus	1.60	16	1.32	
Trichiurus lepturus	1.60	4	1.32	
Hydrolagus sp.	1.60	8	1.32	
Hoplostethus mediterraneus	1.60	8	1.32	
Leptoderma sp.	1.20	48	0.99	
Etmopterus polli	1.20	4	0.99	
Diceratias pileatus	0.40	8	0.33	
Sergestes sp.	0.40	16	0.33	
Heterocarpus grimaldii	0.20	16	0.17	
Glyphus marsupialis	0.20	12	0.17	
Gnathophausia zoea	0.00	12		
Sternoptyx pseudobscura	0.00	8		
Acanthephyra sp.	0.00	40		
Total	120.80		99.99	

PROJECT STATION: 98

DATE:31/ 5/89 GEAR TYPE: BT No:1 POSITION:Lat S 510
start stop duration Long E 1132
TIME :09:13:00 09:33:00 20 (min) Purpose code: 1
LOG :1819.10 1819.10 1.00 Area code : 3
FDEPTH: 335 351 GearCond.code: 8
BDEPTH: 335 351 Validity code: 9
Towing dir: 150° Wire out:1200 m Speed: 3 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
N O C A T C H	0.00			
Total				

PROJECT STATION: 99

DATE:31/ 5/89 GEAR TYPE: BT No:1 POSITION:Lat S 504
start stop duration Long E 1138
TIME :13:09:00 13:39:00 30 (min) Purpose code: 3
LOG :1839.20 1840.70 1.50 Area code : 3
FDEPTH: 96 97 GearCond.code:
BDEPTH: 96 97 Validity code:
Towing dir: 160° Wire out: 450 m Speed: 3 kn*10

Sorted: 30 Kg Total catch: 177.00 CATCH/HOUR: 354.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Trachurus trecae	132.00	3260	37.29	3
Selene dorsalis	87.60	492	24.75	
Brachydeuterus auritus	54.00	3138	15.25	2
Ariomma bondi	27.60	696	7.80	
Priacanthus arenatus	12.00	36	3.39	
Dentex angolensis	12.00	108	3.39	
Trichiurus lepturus	6.00	24	1.69	
Octopus vulgaris	4.80	12	1.36	
Umbrina canariensis	4.80	12	1.36	
Miracorvina angolensis	3.60	12	1.02	
Chalidonichthys gabonensis	3.60	36	1.02	
Todarodes sagittatus	2.40	12	0.68	
Pterothrissus belloci	2.40	12	0.68	
Setarches guentheri	1.20	12	0.34	
Alopias superciliosus	0.00	12		
Total	354.00		100.02	

PROJECT STATION: 100

DATE:31/ 5/89 GEAR TYPE: BT No:1 POSITION:Lat S 457
start stop duration Long E 1147
TIME :15:05:00 15:35:00 30 (min) Purpose code: 3
LOG :1851.90 1853.50 1.50 Area code : 3
FDEPTH: 60 57 GearCond.code:
BDEPTH: 60 57 Validity code:
Towing dir: 120° Wire out: 300 m Speed: 3 kn*10

Sorted: Kg Total catch: 12.35 CATCH/HOUR: 24.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	8.00	86	32.39	4
Selene dorsalis	7.60	34	30.77	
Brachydeuterus auritus	2.60	166	10.53	
Raja miraletus	1.20	6	4.86	
Chelidonichthys capensis	1.20	8	4.86	
Sphyraena guachancho	1.00	14	4.05	
Chelidonichthys gabonensis	1.00	10	4.05	
Cynoglossus canariensis	0.60	2	2.43	
Sepia officinalis hierredda	0.60	6	2.43	
Uranoscopus albesca	0.40	2	1.62	
Parapenaeus longirostris	0.20	26	0.81	
Alloteuthis africana	0.20	110	0.81	
Penaeus notialis	0.10	4	0.40	
Saurida brasiliensis	0.00	4		
Trachurus trecae	0.00	2		
Total	24.70		100.01	

PROJECT STATION: 101

DATE:31/ 5/89 GEAR TYPE: BT No:1 POSITION:Lat S 506
start stop duration Long E 1149
TIME :16:12:00 16:42:00 30 (min) Purpose code: 3
LOG :1857.80 1859.10 1.50 Area code : 3
FDEPTH: 46 48 GearCond.code:
BDEPTH: 46 48 Validity code:
Towing dir: 320° Wire out: 250 m Speed: 3 kn*10

Sorted: Kg Total catch: 38.60 CATCH/HOUR: 77.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Paragaleus pectoralis	22.00	8	28.50	
Sphyraena guachancho	18.00	78	23.32	
Brachydeuterus auritus	14.00	420	18.13	5
Pagellus bellottii	5.00	34	6.48	
Scomberomorus tritor	4.80	8	6.22	
Selene dorsalis	4.00	20	5.18	
Panulirus regius	4.00	4	5.18	
Torpedo torpedo	2.00	6	2.59	
Spinephelus aeneus	2.00	2	2.59	
Sardinella maderensis	0.40	10	0.52	
Trachurus trecae	0.40	2	0.52	
Todarodes sagittatus	0.20	2	0.26	
Penaeus notialis	0.20	6	0.26	
Trichiurus lepturus	0.20	22	0.26	
Saurida brasiliensis	0.00	2		
Selar crumenophthalmus	0.00	2		
Total	77.20		100.01	

PROJECT STATION: 102

DATE:31/ 5/89 GEAR TYPE: BT No:1 POSITION:Lat S 502
start stop duration Long E 1156
TIME :18:08:00 18:38:00 30 (min) Purpose code: 3
LOG :1870.40 1871.70 1.30 Area code : 3
FDEPTH: 15 16 GearCond.code:
BDEPTH: 15 16 Validity code:
Towing dir: 320° Wire out: 100 m Speed: 2 kn*10

Sorted: 35 Kg Total catch: 208.20 CATCH/HOUR: 416.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Brachydeuterus auritus	105.60	3600	25.36	
Ilisha africana	84.00	2520	20.17	6
Pentanemus quinquarius	26.40	550	6.34	
Arius heudelotii	26.40	492	6.34	
Cynoglossus senodi	24.00	252	5.76	
Pseudotolithus senegalensis	24.00	216	5.76	
Parapenaeus longirostris	22.80	2450	5.48	7
Chloroscombrus chrysurus	14.40	276	3.46	
Pteroscion peli	14.40	240	3.46	
Ephippion guttifer	12.00	12	2.88	
Trichiurus lepturus	8.40	540	2.02	
Pteromylaeus bovinus	7.20	12	1.73	
Hemicaranx bicolor	7.20	24	1.73	
Caleoides decadactylus	6.00	72	1.44	
Dasyatis margarita	4.80	24	1.15	
Cynoglossus browni	4.80	12	1.15	
Dicologlossa cuneata	4.80	72	1.15	
Sphyraena guachancho	3.60	12	0.86	
Selene dorsalis	3.60	72	0.86	
Pseudotolithus typus	3.60	12	0.86	
Sardinella maderensis	3.60	48	0.86	
Penaeus notialis	2.40	24	0.58	
Drepane africana	2.40	24	0.58	
Total	416.40		99.98	

PROJECT STATION: 103

DATE:31/ 5/89 GEAR TYPE: BT No: POSITION:Lat S 447
start stop duration Long E 1146
TIME :21:20:00 21:50:00 30 (min) Purpose code: 1
LOG :1893.30 1894.70 1.40 Area code : 3
FDEPTH: 7 7 GearCond.code:
BDEPTH: 30 29 Validity code:
Towing dir: 340° Wire out: 150 m Speed: 2 kn*10

Sorted: Kg Total catch: 17.10 CATCH/HOUR: 34.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Ilisha africana	20.00	570	58.48	10
Stromateus fiatola	5.40	16	15.79	
Hemicaranx bicolor	4.00	20	11.70	9
Brachydeuterus auritus	1.20	40	3.51	
Trichiurus lepturus	1.00	22	2.92	
Scomberomorus tritor	1.00	2	2.92	
Selene dorsalis	1.00	8	2.92	
Sardinella maderensis	0.40	10	1.17	8
Saurida brasiliensis	0.20	14	0.58	
Total	34.20		99.99	

PROJECT STATION: 104

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 457
start stop duration Long E 1118
TIME :01:52:00 02:52:00 60 (min) Purpose code: 3
LOG :1930.10 1932.60 3.00 Area code : 3
FDEPTH: 500 505 GearCond.code:
BDEPTH: 500 505 Validity code:
Towing dir: 330° Wire out:1400 m Speed: 3 kn*10

Sorted: 28 Kg Total catch: 112.60 CATCH/HOUR: 112.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Merluccius polli	28.00	80	24.87	11
Halosaurus sp	10.80	288	9.59	
Laemonema sp	9.20	76	8.17	
Melanostomias sp.	9.20	204	8.17	
Bathygadus sp	8.00	216	7.10	
Triplophos sp	8.00	1350	7.10	
Aristeus varidens	6.00	492	5.33	
Yarella blackfordi	6.00	128	5.33	
Malacocephalus occidentalis	4.80	72	4.26	
Deania profundorum	4.80	32	4.26	
Cubiceps sp	3.20	4	2.84	
Stereomastis sculpta	2.00	152	1.78	
Etmopterus polli	2.00	64	1.78	
Xenodermichthys socialis	2.00	44	1.78	
Physiculus sp	2.00	44	1.78	
Gonosthoma elongatum	1.20	36	1.07	
Synaphobranchus affinis	0.80	4	0.71	
Synaphobranchus sp.	0.80	24	0.71	
Plesiopenaeus edwardsianus	0.80	4	0.71	
Bathygadus melanobranchus	0.80	40	0.71	
Xenodermichthys socialis	0.80	32	0.71	
Diretmoides sp.	0.40	12	0.36	
Acanthephyra sp.	0.40	8	0.36	
Dibranchus atlanticus	0.40	8	0.36	
Hoplostethus mediterraneus	0.20	4	0.18	
Trachyrinus scabrus	0.00	4		
Total	112.60		100.02	

PROJECT STATION: 105

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 454
Long E 1130

	start	stop	duration		
TIME	:06:11:00	06:41:00	30 (min)	Purpose code:	3
LOG	:1950.30	1951.40	1.50	Area code :	3
FDEPTH:	104	104		GearCond.code:	
BDEPTH:	104	104		Validity code:	

Towing dir: 104° Wire out: 500 m Speed: 3 kn*10

Sorted: 27 Kg Total catch: 134.25 CATCH/HOUR: 268.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pentheroscion mbizi	120.00	1430	44.69	13
Trachurus trecae	60.00	2400	22.35	12
Ariosma bondi	33.00	750	12.29	
Dentex angolensis	18.00	90	6.70	
Trichiurus lepturus	10.00	250	3.72	
Saurida brasiliensis	8.00	1100	2.98	
Uranoscopus albesca	5.00	30	1.86	
Umbrina canariensis	5.00	20	1.86	
Chelidonichthys gabonensis	5.00	50	1.86	
Pterothrissus belloci	3.00	20	1.12	
Todarodes sagittatus	1.00	20	0.37	
Citharus linguatula	0.50	10	0.19	
Total	268.50		99.99	

PROJECT STATION: 106

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 446
Long E 1134

	start	stop	duration		
TIME	:07:56:00	08:26:00	30 (min)	Purpose code:	3
LOG	:1960.60	1962.20	1.60	Area code :	3
FDEPTH:	60	59		GearCond.code:	
BDEPTH:	60	59		Validity code:	

Towing dir: 130° Wire out: 300 m Speed: 3 kn*10

Sorted: 33 Kg Total catch: 130.80 CATCH/HOUR: 261.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Brachydeuterus auritus	176.00	16192	67.20	16
Selene dorsalis	32.00	152	12.23	15
Decapterus rhonchus	19.20	192	7.34	14
Pagellus bellottii	12.80	64	4.89	
Sphyraena guachancho	8.00	112	3.06	
Sarda sarda	6.40	8	2.45	
Raja miraletus	3.20	8	1.22	
Pentheroscion mbizi	1.60	24	0.61	
Sepia officinalis hierredda	0.80	8	0.31	
Parapenaeus longirostris	0.80	8	0.31	
Penaeus notialis	0.80	8	0.31	
Total	261.60		100.01	

PROJECT STATION: 107

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 439
Long E 1138

	start	stop	duration		
TIME	:09:33:00	10:03:00	30 (min)	Purpose code:	3
LOG	:1970.90	1972.20	1.50	Area code :	3
FDEPTH:	29	27		GearCond.code:	
BDEPTH:	29	27		Validity code:	

Towing dir: 340° Wire out: 150 m Speed: 3 kn*10

Sorted: 28 Kg Total catch: 254.25 CATCH/HOUR: 508.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Brachydeuterus auritus	324.00	14580	63.72	19
Ilisha africana	48.60	3948	9.56	17
Sphyraena guachancho	27.00	90	5.31	
Drepane africana	27.00	108	5.31	
Pseudotolithus senegalensis	21.60	36	4.25	
Sarda sarda	19.80	18	3.89	
Pteroscion peli	9.00	324	1.77	
Selene dorsalis	9.00	144	1.77	
Galeoides decadactylus	7.20	18	1.42	
Chloroscombrus chrysurus	7.20	36	1.42	
Sardinella maderensis	7.20	288	1.42	18
Alectis alexandrinus	0.90	36	0.18	
Total	508.50		100.02	

PROJECT STATION: 108

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 434
Long E 1133

	start	stop	duration		
TIME	:10:47:00	11:17:00	30 (min)	Purpose code:	3
LOG	:1977.40	1978.80	1.50	Area code :	3
FDEPTH:	29	33		GearCond.code:	
BDEPTH:	29	33		Validity code:	

Towing dir: 308° Wire out: 150 m Speed: 3 kn*10

Sorted: Kg Total catch: 13.80 CATCH/HOUR: 27.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Selene dorsalis	14.00	64	50.72	22
Pagellus bellottii	4.40	26	15.94	20
Mustelus mustelus	2.80	2	10.14	
Epinephalus aeneus	2.60	2	9.42	
Brachydeuterus auritus	1.60	112	5.80	
Lagocephalus laevigatus	1.20	4	4.35	
Sardinella maderensis	0.60	26	2.17	21
Sphyraena guachancho	0.40	2	1.45	
Total	27.60		99.99	

PROJECT STATION: 109

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 431
Long E 1130

	start	stop	duration		
TIME	:12:10:00	12:39:00	29 (min)	Purpose code:	3
LOG	:1984.80	1985.80	1.50	Area code :	3
FDEPTH:	18	17		GearCond.code:	
BDEPTH:	18	17		Validity code:	

Towing dir: 330° Wire out: 100 m Speed: 3 kn*10

Sorted: 30 Kg Total catch: 219.60 CATCH/HOUR: [illegible]

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pseudotolithus typus	94.14	101	20.70	
Pseudotolithus senegalensis	57.93	174	12.74	
Ilisha africana	50.69	2104	11.15	
Galeoides decadactylus	34.76	232	7.64	
Sphyraena guachancho.	31.86	145	7.01	
Pteroscion peli	27.52	579	6.05	
Arius heudeloti	21.72	87	4.78	
Cynoglossus browni	15.95	58	3.50	
Pomadasys jubelini	15.93	43	3.50	
Brachydeuterus auritus	15.93	594	3.50	
Drepane africana	14.48	45	3.18	
Selene dorsalis	13.03	145	2.87	
Panulirus regius	12.41	33	2.73	
Trichiurus lepturus	8.69	724	1.91	
Dasyatis margarita	7.24	14	1.59	
Pseudotolithus epipercus	7.24	29	1.59	
Pentanemus quinquarius	7.24	101	1.59	
Chloroscombrus chrysurus	4.34	43	0.95	
Portunus validus	2.90	14	0.64	
Sardinella maderensis	2.90	203	0.64	24
Hemicaranx bicolor	2.90	14	0.64	
Stromateus fiatola	2.90	14	0.64	
Scyllarides herklotsii	2.07	6	0.46	
Total	454.75		100.00	

PROJECT STATION: 110

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 433
Long E 1129

	start	stop	duration		
TIME	:15:19:00	15:49:00	30 (min)	Purpose code:	3
LOG	:2005.90	2007.00	1.50	Area code :	3
FDEPTH:	34	33		GearCond.code:	
BDEPTH:	34	33		Validity code:	

Towing dir: 320° Wire out: 200 m Speed: 3 kn*10

Sorted: 28 Kg Total catch: 138.25 CATCH/HOUR: 276.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Brachydeuterus auritus	108.00	4644	39.08	26
Sphyraena guachancho	70.00	290	25.32	20
Selene dorsalis	60.00	890	21.70	
Paragaleus pectoralis	15.00	10	5.42	
Drepane africana	10.00	10	3.62	
Euthynnus alletteratus	6.00	10	2.17	
Sardinella maderensis	3.00	80	1.08	27
Trichiurus lepturus	2.00	190	0.73	
Penaeus notialis	1.00	20	0.36	
Chloroscombrus chrysurus	1.00	10	0.36	
Ilisha africana	0.50	10	0.18	
Total	276.50		99.99	

PROJECT STATION: 111

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 426
Long E 1124

	start	stop	duration		
TIME	:16:33:00	17:03:00	30 (min)	Purpose code:	3
LOG	:2011.50	2012.50	1.50	Area code :	3
FDEPTH:	47	45		GearCond.code:	
BDEPTH:	47	46		Validity code:	

Towing dir: 340° Wire out: 250 m Speed: 3 kn*10

Sorted: Kg Total catch: 25.90 CATCH/HOUR: 51.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Brachydeuterus auritus	22.80	798	44.02	30
Sphyraena guachancho	10.40	56	20.08	
Selene dorsalis	4.80	42	9.27	
Trichiurus lepturus	4.80	250	9.27	
Sardinella maderensis	4.40	194	8.49	29
Pagellus bellottii	1.40	8	2.70	
Pentheroscion mbizi	1.20	38	2.32	
Alloteuthis africana	0.80	140	1.54	
Penaeus notialis	0.80	24	1.54	
Torpedo torpedo	0.40	2	0.77	
Parapenaeus longirostris	0.00	2		
Total	51.80		100.00	

PROJECT STATION: 112

DATE: 1/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 458
Long E 1126

	start	stop	duration		
TIME	:21:00:00	22:00:00	60 (min)	Purpose code:	3
LOG	:2049.30	2052.40	3.00	Area code :	3
FDEPTH:	450	454		GearCond.code:	
BDEPTH:	450	454		Validity code:	

Towing dir: 145° Wire out:1250 m Speed: 3 kn*10

Sorted: 26 Kg Total catch: 181.30 CATCH/HOUR: 181.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Nematocarcinus africanus	70.00	9450	38.61	31
Merluccius polli	28.70	77	15.83	33
Bathygadus melanobranchus	14.00	70	7.72	
Benthodesmus tenuis	14.00	448	7.72	
Stereomastis sculpta	9.80	791	5.41	
Laemonema sp	8.40	161	4.63	
Aristeus varidens	7.00	322	3.86	32
Malacocephalus laevis	3.50	63	1.93	
Triplophos sp	3.50	336	1.93	
Yarella blackfordi	3.50	56	1.93	
Colloconger cadenati	2.60	26	1.54	
Hoplostethus mediterraneus	2.80	14	1.54	
Xenodermichthys socialis	2.80	63	1.54	
Laemonema laureysi	2.10	35	1.16	
Dibranchus atlanticus	1.40	21	0.77	
Plesiopenaeus edwardsianus	1.40	42	0.77	
Deania profundorum	1.40	7	0.77	
Halosaurus ovenii	1.40	28	0.77	
Stomias affinis	0.70	7	0.39	
Chaunax pictus	0.70	7	0.39	
Glyphus marsupialis	0.70	21	0.39	
Stemopterus polli	0.70	7	0.39	
Sergia robusta	0.00	14		
Polymetme corythaeola	0.00	7		
Solenocera africana	0.00	7		
Total	181.30		99.99	

PROJECT STATION: 113

DATE: 2/ 6/89 GEAR TYPE: PT No: POSITION: Lat S 421
start stop duration Long E 1124
TIME :01:50:00 02:50:00 60 (min) Purpose code: 1
LOG :2084.60 2087.40 3.00 Area code : 3
FDEPTH: 7 7 GearCond.code:
BDEPTH: 20 20 Validity code:
Towing dir: 300° Wire out: 200 m Speed: 3 kn*10

Sorted: 21 Kg Total catch: 20.80 CATCH/HOUR: 20.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Ilisha africana	10.00	364	48.08	35
Sardinella maderensis	5.90	142	28.37	34
Sphyraena guachancho	3.70	12	17.79	
Carcharhinus sp	0.80	1	3.85	
Brachydeuterus auritus	0.30	10	1.44	
Selene dorsalis	0.10	1	0.48	
Total	20.80		100.01	

PROJECT STATION: 114

DATE: 2/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 409
start stop duration Long E 1116
TIME :06:19:00 06:49:00 30 (min) Purpose code: 3
LOG :2116.80 2118.00 1.50 Area code : 3
FDEPTH: 14 15 GearCond.code:
BDEPTH: 14 15 Validity code:
Towing dir: 330° Wire out: 100 m Speed: 3 kn*10

Sorted: 31 Kg Total catch: 198.20 CATCH/HOUR: 396.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pomadasys jubelini	144.00	612	36.33	36
Trichiurus lepturus	42.00	2834	10.60	
Caleoides decadactylus	33.60	216	8.48	
Chloroscombrus chrysurus	21.60	360	5.45	36
Pseudotolithus typus	20.40	32	5.15	39
Panulirus regius	19.20	36	4.84	
Ilisha africana	18.00	408	4.54	
Brachydeuterus auritus	14.40	456	3.63	
Sepia officinalis hierredda	12.00	12	3.03	
Cynoglossus browni	12.00	36	3.03	
Stromateus fiatola	12.00	36	3.03	
Pentanemus quinquarius	8.40	252	2.12	
Pseudotolithus senegalensis	7.60	26	1.92	40
Parapenaeopsis atlantica	7.20	528	1.82	
Sphyraena guachancho	6.00	12	1.51	
Pteroscion peli	6.00	108	1.51	
Selene dorsalis	2.40	12	0.61	
Sardinella maderensis	2.40	84	0.61	37
Penaeus kerathurus	1.20	12	0.30	
Torpedo marmorata	1.20	12	0.30	
Lagocephalus laevigatus	1.20	12	0.30	
Arius heudeloti	1.20	12	0.30	
Dicologoglossa cuneata	1.20	12	0.30	
Drepane africana	1.20	24	0.30	
Total	398.40		100.01	

PROJECT STATION: 115

DATE: 2/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 410
start stop duration Long E 1111
TIME :08:47:00 09:17:00 30 (min) Purpose code: 3
LOG :2134.60 2135.60 1.50 Area code : 3
FDEPTH: 51 50 GearCond.code:
BDEPTH: 51 50 Validity code:
Towing dir: 320° Wire out: 250 m Speed: 3 kn*10

Sorted: 8 Kg Total catch: 18.80 CATCH/HOUR: 37.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Selene dorsalis	21.00	246	55.85	42
Paragaleus pectoralis	7.20	2	19.15	
Alectis alexandrinus	4.40	2	11.70	
Sphyraena guachancho	3.00	12	7.98	
Sardinella maderensis	0.90	44	2.39	41
Lagocephalus laevigatus	0.80	2	2.13	
Penaeus notialis	0.30	2	0.80	
Pteromylaeus bovinus	0.00	2		
Total	37.60		100.00	

PROJECT STATION: 116

DATE: 2/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 420
start stop duration Long E 1109
TIME :10:18:00 10:48:00 30 (min) Purpose code: 3
LOG :2143.00 2144.00 1.50 Area code : 3
FDEPTH: 72 70 GearCond.code:
BDEPTH: 72 70 Validity code:
Towing dir: 320° Wire out: 350 m Speed: 3 kn*10

Sorted: Kg Total catch: 43.90 CATCH/HOUR: 87.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Selene dorsalis	50.00	236	56.95	
Trachurus trecae	18.00	202	20.50	43
Sarda sarda	5.60	6	6.36	
Alectis alexandrinus	5.00	2	5.69	
Sphyraena guachancho	4.00	22	4.56	
Pagellus bellottii	2.00	14	2.28	
Ariomma bondi	1.00	14	1.14	
Dentex angolensis	1.00	8	1.14	
Pentheroscion mbizi	0.80	4	0.91	
Todarodes sagittatus	0.40	4	0.46	
Total	87.80		100.01	

PROJECT STATION: 117

DATE: 2/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 415
start stop duration Long E 1059
TIME :12:28:00 12:58:00 30 (min) Purpose code: 3
LOG :2157.60 2159.60 1.50 Area code : 3
FDEPTH: 102 100 GearCond.code:
BDEPTH: 102 100 Validity code:
Towing dir: 115° Wire out: 500 m Speed: 3 kn*10

Sorted: 26 Kg Total catch: 126.40 CATCH/HOUR: 252.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Saurida brasiliensis	56.00	5532	22.15	
Dentex angolensis	50.40	280	19.94	
Brachydeuterus auritus	36.00	12000	14.24	
Dentex gibbosus	25.40	8	10.05	
Trachurus trecae	19.20	1144	7.59	
Epinephelus aeneus	17.00	2	6.72	
Boops boops	16.00	616	6.33	
Ariomma bondi	14.40	1240	5.70	
Miracorvina angolensis	5.60	8	2.22	
Sphyraena guachancho	5.60	24	2.22	
Todarodes sagittatus	3.20	88	1.27	
Mustelus mustelus	2.00	2	0.79	
Sepia officinalis hierredda	0.80	6	0.32	
Uranoscopus albesca	0.80	8	0.32	
Chelidonichthys gabonensis	0.40	8	0.16	
Total	252.80		100.01	

PROJECT STATION: 118

DATE: 2/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 411
start stop duration Long E 1100
TIME :14:39:00 15:09:00 30 (min) Purpose code: 3
LOG :2173.40 2174.20 1.50 Area code : 3
FDEPTH: 72 73 GearCond.code:
BDEPTH: 72 73 Validity code:
Towing dir: 300° Wire out: 350 m Speed: 3 kn*10

Sorted: 28 Kg Total catch: 111.20 CATCH/HOUR: 222.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Selene dorsalis	128.00	710	57.55	50
Dentex angolensis	46.40	312	20.86	46
Sarda sarda	9.60	8	4.32	
Priacanthus arenatus	9.60	24	4.32	
Pagellus bellottii	8.00	96	3.60	
Trachurus trecae	7.20	72	3.24	
Ariomma bondi	4.00	24	1.80	
Brachydeuterus auritus	4.00	32	1.80	
Sphyraena guachancho	1.60	8	0.72	
Pistularia petimba	1.60	8	0.72	
Pseudupeneus prayensis	1.60	8	0.72	
Trichiurus lepturus	0.80	8	0.36	
Total	222.40		100.01	

PROJECT STATION: 119

DATE: 2/ 6/89 GEAR TYPE: PT No:4 POSITION: Lat S 406
start stop duration Long E 1106
TIME :19:34:00 20:04:00 30 (min) Purpose code: 1
LOG :2190.60 2191.70 1.10 Area code : 3
FDEPTH: 5 5 GearCond.code:
BDEPTH: 31 32 Validity code:
Towing dir: 320° Wire out: 200 m Speed: 2 kn*10

Sorted: 32 Kg Total catch: 191.70 CATCH/HOUR: 383.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Selene dorsalis	168.00	1320	43.82	51
Sphyraena guachancho	126.00	996	32.86	55
Ilisha africana	44.40	2108	11.58	52
Brachydeuterus auritus	24.00	5210	6.26	
Sarda sarda	13.20	12	3.44	
Sardinella maderensis	3.60	228	0.94	56
Trichiurus lepturus	3.60	84	0.94	
Saurida brasiliensis	0.60	84	0.16	
Carcharhinus limbatus	0.00	36		
Total	383.40		100.00	

PROJECT STATION: 119

DATE: 2/ 6/89 GEAR TYPE: PT No: POSITION: Lat S 4130
start stop duration Long E 1100
TIME :23:36:00 00:15:00 39 (min) Purpose code: 1
LOG :2220.60 2221.90 1.30 Area code : 3
FDEPTH: 9 9 GearCond.code:
BDEPTH: 26 26 Validity code:
Towing dir: 312° Wire out: 150 m Speed: 2 kn*10

Sorted: 27 Kg Total catch: 93.00 CATCH/HOUR: 81.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Sardinella maderensis	69.23	1231	84.90	55
Illisha africana	4.92	188	6.03	57
Sarda sarda	3.38	3	4.15	
Sardinella aurita	2.15	18	2.64	56
Sphyraena guachancho	1.23	6	1.51	
Trichiurus lepturus	0.62	46	0.76	
Total	81.53		99.99	

PROJECT STATION: 121

DATE: 3/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 419
start stop duration Long E 1035
TIME :03:45:00 04:45:00 60 (min) Purpose code: 3
LOG :2254.30 2255.70 3.00 Area code : 3
FDEPTH: 328 370 GearCond.code:
BDEPTH: 328 370 Validity code:
Towing dir: 320° Wire out:1100 m Speed: 3 kn*10

Sorted: 26 Kg Total catch: 267.20 CATCH/HOUR: 267.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Chlorophthalmus agassizi	105.00	2100	39.30	
Merluccius polli	45.00	140	16.84	58
Benthocomemus tenuis	38.00	1190	14.22	
Nematocarcinus africanus	24.00	12000	8.98	
Malacocephalus occidentalis	10.00	70	3.74	
Deania profundorum	10.00	50	3.74	
Bathygadus sp	7.00	40	2.62	
Laemonema sp	7.00	130	2.62	
Todarodes sagittatus	3.00	20	1.12	
Coelorinchus coelorhincus	3.00	30	1.12	
Satarches guentheri	3.00	130	1.12	
Physiculus sp	2.00	50	0.75	
Pterothrissus belloci	2.00	10	0.75	
Aristaeus varidens	1.40	29	0.52	
Pontinus kuhlii	1.00	20	0.37	
Nymenocephalus italicus	1.00	50	0.37	
Cyttopsis roseus	1.00	30	0.37	
Gennops greyi	1.00	10	0.37	
Etmopterus polli	1.00	10	0.37	
Nematopalaemon hastatus	0.90	34	0.34	
Epigonus telescopus	0.50	10	0.19	
Parapenaeus longirostris	0.40	19	0.15	
Triplophos sp	0.00	20		
Synagrops microlepis	0.00	10		
Peristedion cataphractum	0.00	10		
Total	267.20		99.97	

PROJECT STATION: 122

DATE: 3/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 356
start stop duration Long E 1038
TIME :07:38:00 08:08:00 30 (min) Purpose code: 3
LOG :2279.40 2280.30 1.50 Area code : 3
FDEPTH: 93 93 GearCond.code:
BDEPTH: 93 93 Validity code:
Towing dir: 320° Wire out: 450 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 114.00 CATCH/HOUR: 228.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Dentex angolensis	80.00	550	35.09	61
Ariomma bondi	80.00	1926	35.09	59
Trachurus trecae	32.00	1194	14.04	60
Boops boops	12.00	368	5.26	
Dentex congoensis	9.60	192	4.21	
Alloteuthis africana	8.00	5200	3.51	
Chalidonichthys gabonensis	1.00	16	0.70	
Spicara alta	1.20	96	0.53	
Priacanthus arenatus	1.20	8	0.53	
Todarodes sagittatus	0.80	8	0.35	
Citharus linguatula	0.80	8	0.35	
Pagellus bellottii	0.80	16	0.35	
Peristedion cataphractum	0.50	8		
Total	228.00		100.01	

PROJECT STATION: 123

DATE: 3/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 351
start stop duration Long E 1042
TIME :09:41:00 10:11:00 30 (min) Purpose code: 3
LOG :2292.90 2293.90 1.50 Area code : 3
FDEPTH: 54 55 GearCond.code:
BDEPTH: 54 55 Validity code:
Towing dir: 300° Wire out: 250 m Speed: 3 kn*10

Sorted: 22 Kg Total catch: 63.15 CATCH/HOUR: 126.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	100.00	678	79.18	62
Seriola rivoliana	5.60	10	4.43	
Dentex angolensis	5.00	30	3.96	
Sarda sarda	4.60	6	3.64	
Sparus caeruleostictus	4.00	4	3.17	
Sparus pagrus africanus	2.00	2	1.58	
Dentex barnardi	1.60	2	1.27	
Sepia officinalis hierredda	1.00	4	0.79	
Brachydeuterus auritus	1.00	4	0.79	
Dentex congoensis	1.00	10	0.79	
Pseudupeneus prayensis	0.50	4	0.40	
Total	126.30		100.00	

PROJECT STATION: 124

DATE: 3/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 344
start stop duration Long E 1051
TIME :12:03:00 12:33:00 30 (min) Purpose code: 3
LOG :2309.70 2311.10 1.50 Area code : 3
FDEPTH: 23 26 GearCond.code:
BDEPTH: 23 26 Validity code:
Towing dir: 310° Wire out: 150 m Speed: 3 kn*10

Sorted: 20 Kg Total catch: 67.70 CATCH/HOUR: 135.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Sparus caeruleostictus	30.00	54	22.16	64
Chaetodipterus lippei	22.80	54	16.84	
Lutjanus goreensis	16.00	8	11.82	63
Drepane africana	15.00	60	11.08	
Sparus pagrus africanus	13.20	18	9.75	
Bodianus speciosus	12.00	6	8.86	
Acanthurus monroviae	6.00	6	4.07	
Balistes punctatus	6.00	6	4.43	
Dentex gibbosus	4.80	12	3.55	
Scomberomorus tritor	3.60	6	2.66	
Zanobatus schoenleinii	3.00	6	2.22	
Sphyraena guachancho	1.20	6	0.89	
Lutjanus fulgens	1.20	2	0.89	
Total	135.40		100.02	

PROJECT STATION: 125

DATE: 3/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 341
start stop duration Long E 1053
TIME :13:30:00 14:00:00 30 (min) Purpose code: 3
LOG :2318.60 2320.10 1.50 Area code : 3
FDEPTH: 16 16 GearCond.code:
BDEPTH: 16 16 Validity code:
Towing dir: 135° Wire out: 100 m Speed: 3 kn*10

Sorted: 20 Kg Total catch: 112.40 CATCH/HOUR: 224.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Sphyraena guachancho	60.00	224	26.69	
Illisha africana	33.60	2912	14.95	66
Stromateus fiatola	24.00	48	10.68	65
Caleoides decadactylus	24.00	392	10.68	
Pseudotolithus senegalensis	19.20	80	8.54	67
Brachydeuterus auritus	17.60	584	7.83	
Ephippion guttifer	13.60	8	6.05	
Pseudotolithus typus	6.40	8	2.85	
Pentheroscion mbizi	5.60	80	2.49	
Scomberomorus tritor	5.60	8	2.49	
Portunus validus	3.20	8	1.42	
Hemicaranx bicolor	2.40	8	1.07	
Pomadasys rogeri	1.60	8	0.71	
Sarda dorsalis	1.60	24	0.71	
Eucinostomus melanopterus	1.60	16	0.71	
Trichiurus lepturus	1.60	40	0.71	
Drepane africana	1.60	16	0.71	
Pentanemus quinquarius	1.60	40	0.71	
Alectis alexandrinus	0.00	8		
Sardinella maderensis	0.00	8		
Total	224.80		100.00	

PROJECT STATION: 126

DATE: 3/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 339
start stop duration Long E 1051
TIME :14:47:00 15:17:00 30 (min) Purpose code: 3
LOG :2326.40 2328.50 1.50 Area code : 3
FDEPTH: 20 18 GearCond.code:
BDEPTH: 20 18 Validity code:
Towing dir: 130° Wire out: 100 m Speed: 3 kn*10

Sorted: 26 Kg Total catch: 52.00 CATCH/HOUR: 104.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Illisha africana	24.00	3000	23.08	
Brachydeuterus auritus	22.00	660	21.15	68
Sphyraena guachancho	17.60	72	16.92	
Pseudotolithus senegalensis	15.60	36	15.00	
Pomadasys rogeri	6.40	24	6.15	
Caleoides decadactylus	6.40	72	6.15	
Trichiurus lepturus	2.00	136	2.69	
Stromateus fiatola	2.40	4	2.31	
Scomberomorus tritor	1.60	4	1.54	
Pentheroscion mbizi	1.20	60	1.15	
Psettodes belcheri	1.20	4	1.15	
Eucinostomus melanopterus	0.80	8	0.77	
Parapenaeus longirostris	0.40	28	0.38	
Chaetodipterus goreensis	0.40	4	0.38	
Sardinella maderensis	0.40	20	0.38	
Pentanemus quinquarius	0.40	8	0.38	
Drepane africana	0.40	4	0.38	
Chloroscombrus chrysurus	0.00	4		
Total	104.00		99.08	

PROJECT STATION: 127

DATE: 4/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 340
start stop duration Long E 1035
TIME :07:22:00 07:52:00 30 (min) Purpose code: 3
LOG :2352.80 2353.90 1.50 Area code : 3
FDEPTH: 46 45 GearCond.code:
BDEPTH: 46 45 Validity code:
Towing dir: 320° Wire out: 250 m Speed: 3 kn*10

Sorted: Kg Total catch: 15.40 CATCH/HOUR: 30.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Brachydeuterus auritus	16.00	272	51.95	70
Trachurus trecae	6.00	56	19.48	69
Sphyraena guachancho	3.00	10	9.74	
Pagellus bellottii	3.00	22	9.74	
Uranoscopus polli	1.40	4	4.55	
Trachinus armatus	0.60	10	1.95	
Dicologlossa hexophthalma	0.40	2	1.30	
Decapterus punctatus	0.20	2	0.65	
Chelidonichthys capensis	0.20	2	0.65	
Total	30.80		100.01	

PROJECT STATION: 128

DATE: 4/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 343
start stop duration Long E 1030
TIME :08:52:00 09:22:00 30 (min) Purpose code: 3
LOG :2360.80 2361.80 1.50 Area code : 3
FDEPTH: 67 67 GearCond.code:
BDEPTH: 67 67 Validity code:
Towing dir: 320° Wire out: 300 m Speed: 3 kn*10

Sorted: 28 Kg Total catch: 110.40 CATCH/HOUR: 220.80

ECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
achurus trecae	120.00	3082	54.36	71
gellus bellottii	52.00	884	23.55	
achydeuterus auritus	21.60	232	9.78	
ntex angolensis	8.00	40	3.62	
ops boops	8.00	152	3.62	
ntex congoensis	4.80	88	2.17	
iacanthus arenatus	4.80	24	2.17	
omber japonicus	1.60	16	0.72	
tal	220.80		99.98	

PROJECT STATION: 129

DATE: 4/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 351
start stop duration Long E 1024
TIME :11:05:00 11:35:00 30 (min) Purpose code: 1
LOG :2376.20 2377.10 1.50 Area code : 3
FDEPTH: 104 104 GearCond.code: 8
BDEPTH: 104 104 Validity code: 9
Towing dir: 320° Wire out: 500 m Speed: 3 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

ECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
C A T C H	0.00			
tal				

PROJECT STATION: 130

DATE: 5/ 6/89 GEAR TYPE: PT No: POSITION:Lat S 320
start stop duration Long E 1029
TIME :09:25:00 09:55:00 30 (min) Purpose code: 1
LOG :2524.00 2525.30 1.30 Area code : 3
FDEPTH: 2 2 GearCond.code:
BDEPTH: 20 18 Validity code:
Towing dir: 310° Wire out: 150 m Speed: 3 kn*10

Sorted: 25 Kg Total catch: 37.50 CATCH/HOUR: 75.00

ECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
dinella maderensis	72.00	1032	96.00	72
dinella aurita	3.00	32	4.00	73
tal	75.00		100.00	

PROJECT STATION: 131

DATE: 5/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 328
start stop duration Long E 1036
TIME :08:10:00 08:40:00 30 (min) Purpose code: 3
LOG :2543.90 2545.00 1.50 Area code : 3
FDEPTH: 29 28 GearCond.code:
BDEPTH: 29 28 Validity code:
Towing dir: 320° Wire out: 150 m Speed: 3 kn*10

Sorted: 17 Kg Total catch: 41.10 CATCH/HOUR: 82.20

ICIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
chydeuterus auritus	36.00	734	43.80	74
pane africana	17.00	26	20.68	
ctis alexandrinus	13.00	6	15.82	
dinella maderensis	3.00	576	3.65	75
yraena guachancho	3.00	196	3.65	
chydeuterus auritus	2.10	1110	2.55	
pedo torpedo	2.10	16	2.55	
gellus bellottii	2.10	18	2.55	
tunus validus	1.50	4	1.82	
ium micrurum	0.90	6	1.09	
loides decadactylus	0.60	4	0.73	
rodes belcheri	0.60	4	0.73	
chirus lepturus	0.30	4	0.36	
tal	82.20		99.98	

PROJECT STATION: 132

DATE: 5/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 330
start stop duration Long E 1030
TIME :09:34:00 10:04:00 30 (min) Purpose code: 3
LOG :2552.00 2553.00 1.50 Area code : 3
FDEPTH: 37 36 GearCond.code:
BDEPTH: 37 36 Validity code:
Towing dir: 330° Wire out: 200 m Speed: 3 kn*10

Sorted: Kg Total catch: 31.30 CATCH/HOUR: 62.60

CIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
ellus bellottii	18.00	152	28.75	77
galeus pectoralis	14.00	4	22.36	
chydeuterus auritus	12.00	200	19.17	
yraena guachancho	6.00	22	9.58	
pterus rhonchus	4.40	36	7.03	76
is officinalis hierredda	2.40	4	3.83	
da sarda	1.80	2	2.88	
a mirabletus	1.40	4	2.24	
pedo torpedo	0.80	6	1.28	
oglossus canariensis	0.60	2	0.96	
lomycterus spinosus mauret.	0.40	2	0.64	
narus linguatula	0.20	2	0.32	
udupeneus prayensis	0.20	2	0.32	
lidonichthys capensis	0.20	2	0.32	
pterus punctatus	0.20	12	0.32	
al	62.60		100.00	

PROJECT STATION: 133

DATE: 5/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 337
start stop duration Long E 1021
TIME :11:38:00 12:08:00 30 (min) Purpose code: 3
LOG :2566.50 2567.50 1.50 Area code : 3
FDEPTH: 74 75 GearCond.code:
BDEPTH: 74 75 Validity code:
Towing dir: 320° Wire out: 350 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 205.10 CATCH/HOUR: 410.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	189.00	1918	46.08	80
Trachurus trecae	133.00	5692	32.42	79
Boops boops	49.00	1932	11.95	
Scomber japonicus	22.40	322	5.46	78
Sepia officinalis hierredda	11.20	56	2.73	
Ariomma bondi	2.80	28	0.68	
Priacanthus arenatus	2.80	14	0.68	
Total	410.20		100.00	

PROJECT STATION: 134

DATE: 5/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 315
start stop duration Long E 1014
TIME :14:30:00 15:00:00 30 (min) Purpose code: 3
LOG :2588.70 2590.00 1.50 Area code : 3
FDEPTH: 40 41 GearCond.code:
BDEPTH: 40 41 Validity code:
Towing dir: 338° Wire out: 200 m Speed: 3 kn*10

Sorted: Kg Total catch: 36.90 CATCH/HOUR: 73.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO
Pagellus bellottii	26.00	230	35.23	83
Dentex canariensis	12.00	24	16.26	82
Epinephelus aeneus	10.00	4	13.55	
Fistularia petimba	8.40	84	11.38	
Sparus caeruleostictus	5.40	20	7.32	81
Sphyraena guachancho	3.00	18	4.07	
Trachinus radiatus	1.60	2	2.17	
Chelidonichthys capensis	1.40	10	1.90	
Pseudupeneus prayensis	1.40	12	1.90	
Trachinocephalus myops	0.80	6	1.08	
Brachydeuterus auritus	0.80	4	1.08	
Decapterus rhonchus	0.80	6	1.08	
Trachinus armatus	0.60	6	0.81	
Priacanthus arenatus	0.60	2	0.81	
Alutera punctata	0.40	2	0.54	
Syacium micrurum	0.40	4	0.54	
Chaetodon robustus	0.20	2	0.27	
Trachurus trecae	0.00	2		
Total	73.80		99.99	

PROJECT STATION: 135

DATE: 5/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 315
start stop duration Long E 1010
TIME :15:38:00 16:08:00 30 (min) Purpose code: 3
LOG :2593.80 2595.00 1.50 Area code : 3
FDEPTH: 45 45 GearCond.code:
BDEPTH: 45 45 Validity code:
Towing dir: 333° Wire out: 200 m Speed: 3 kn*10

Sorted: 26 Kg Total catch: 158.10 CATCH/HOUR: 316.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Brachydeuterus auritus	94.80	1474	29.98	84
Lutjanus fulgens	52.80	84	16.70	
Apsilus fuscus	51.60	72	16.32	
Pagellus bellottii	27.60	276	8.73	85
Pomadasys rogeri	19.20	12	6.07	
Sparus auriga	18.00	12	5.69	
Dentex canariensis	15.60	12	4.93	
Pomadasys incisus	12.00	60	3.80	
Umbrina canariensis	7.20	12	2.28	
Chelidonichthys capensis	7.20	36	2.28	
Sparus caeruleostictus	7.20	12	2.28	
Pseudupeneus prayensis	1.20	24	0.38	
Decapterus punctatus	1.20	12	0.38	
Grammoplites gruveli	0.60	24	0.19	
Total	316.20		100.01	

PROJECT STATION: 136

DATE: 5/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 317
start stop duration Long E 1002
TIME :17:11:00 17:41:00 30 (min) Purpose code: 3
LOG :2603.00 2604.20 1.50 Area code : 3
FDEPTH: 64 64 GearCond.code:
BDEPTH: 64 64 Validity code:
Towing dir: 335° Wire out: 350 m Speed: 3 kn*10

Sorted: 32 Kg Total catch: 221.20 CATCH/HOUR: 442.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	217.00	4194	49.05	
Sardinella aurita	105.00	1460	23.73	88
Decapterus punctatus	42.00	700	9.49	89
Trachurus trecae	28.00	854	6.33	87
Scomber japonicus	21.00	280	4.75	86
Sepia officinalis hierredda	9.80	28	2.22	
Torpedo torpedo	7.00	14	1.58	
Dactylopterus volitans	7.00	14	1.58	
Todarodes sagittatus	2.80	14	0.63	
Trachinocephalus myops	1.40	14	0.32	
Chelidonichthys capensis	1.40	14	0.32	
Fistularia petimba	0.00	14		
Dentex congoensis	0.00	28		
Total	442.40		100.00	

PROJECT STATION: 137

DATE: 5/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 329
start stop duration Long E 947
TIME :20:25:00 21:25:00 60 (min) Purpose code: 3
LOG :2628.20 2630.20 3.00 Area code : 3
FDEPTH: 453 481 GearCond.code:
BDEPTH: 453 481 Validity code:
Towing dir: 315° Wire out:1250 m Speed: 3 kn*10

Sorted: 36 Kg Total catch: 179.00 CATCH/HOUR: 179.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Merluccius polli	55.00	195	30.73	90
Plesiopenaeus edwardsianus	40.00	307	22.35	
Benthodesmus tenuis	20.00	440	11.17	
Bathyraja sp	12.50	90	6.98	
Laemonema sp	8.50	55	4.75	
Nemstocarcinus africanus	7.50	1200	4.19	
Lophiodes kempi	5.50	5	3.07	
Etmopterus polli	5.00	30	2.79	
Dasnia profundorum	3.50	5	1.96	
Halosaurus sp	3.00	80	1.68	
Coelorinchus coelorhincus	2.50	45	1.40	
Laemonema laureysi	2.50	40	1.40	
Malacocephalus laevis	2.00	15	1.12	
Aristeus varidens	2.00	65	1.12	
Nezumia aequalis	1.50	40	0.84	
Chaunax pictus	1.50	35	0.84	
Dibranchus atlanticus	1.50	40	0.84	
Caryon maritae	1.00	5	0.56	
Coloconger sp	1.00	5	0.56	
Triplophos sp	1.00	60	0.56	
Hymenocephalus italicus	1.00	25	0.56	
Physiculus sp	0.50	5	0.28	
Setarches guentheri	0.50	5	0.28	
Stereomastis sculpta	0.00	10		
Total	179.00		100.03	

PROJECT STATION: 138

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 304
start stop duration Long E 1007
TIME :02:13:00 02:43:00 30 (min) Purpose code: 3
LOG :2672.30 2673.40 1.50 Area code : 3
FDEPTH: 32 31 GearCond.code:
BDEPTH: 32 31 Validity code:
Towing dir: 330° Wire out: 200 m Speed: 3 kn*10

Sorted: 28 Kg Total catch: 140.20 CATCH/HOUR: 280.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Chelidonichthys capensis	42.00	530	14.98	
Dentex gibbosus	41.00	40	14.62	
Sparus caeruleosticus	38.00	170	13.55	92
Pseudupeneus prayensis	33.00	890	11.77	
Pomadasys incisus	21.00	210	7.49	
Pagellus bellottii	20.00	180	7.13	91
Trachinocephalus myops	10.00	150	3.57	
Syacium micrurum	10.00	190	3.57	
Dentex canariensis	9.00	20	3.21	
Psettodes belcheri	7.00	10	2.50	
Torpedo torpedo	7.00	20	2.50	
Trachinus radiatus	5.00	10	1.78	
Sphyraena guachancho	4.00	20	1.43	
Chlorides decadactylus	4.00	30	1.43	
Trachinus armatus	4.00	60	1.43	
Octopus vulgaris	3.00	10	1.07	
Uranoscopus polli	3.00	20	1.07	
Fistularia petimba	3.00	40	1.07	
Panulirus regius	2.00	2	0.71	
Lutjanus fulgens	2.00	20	0.71	
Grammoplites gruveli	2.00	50	0.71	
Dicolocoglossa hexophthalma	2.00	40	0.71	
Pegusa lascaris	2.00	10	0.71	
Apogon sp	2.00	140	0.71	
Scyllarides herklotsii	1.60	2	0.57	
Bothus podas africanus	1.00	20	0.36	
Alurera punctata	1.00	10	0.36	
Peneaus notialis	0.40	8	0.14	
Penaeus kerathurus	0.40	8	0.14	
Arnoglossus capensis	0.00	4		
Total	280.40		100.00	

PROJECT STATION: 139

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 257
start stop duration Long E 955
TIME :06:21:00 06:41:00 20 (min) Purpose code: 3
LOG :2699.10 2700.00 1.00 Area code : 3
FDEPTH: 39 39 GearCond.code:
BDEPTH: 39 39 Validity code:
Towing dir: 320° Wire out: 200 m Speed: 3 kn*10

Sorted: Kg Total catch: 30.90 CATCH/HOUR: 92.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	27.00	237	29.13	93
Fistularia petimba	24.00	159	25.89	
Sparus caeruleosticus	12.00	45	12.94	
Dentex canariensis	10.50	24	11.33	
Sepia officinalis hierredda	7.50	18	8.09	
Raja miraletus	3.60	6	3.88	
Sphyraena guachancho	2.70	9	2.91	
Pseudupeneus prayensis	1.50	24	1.62	
Dactylopterus volitans	1.20	3	1.29	
Syacium micrurum	0.90	6	0.97	
Chelidonichthys capensis	0.90	3	0.97	
Dasyatis marmorata	0.60	3	0.65	
Dibranchus atlanticus	0.30	3	0.32	
Total	92.70		99.99	

PROJECT STATION: 140

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 300
start stop duration Long E 950
TIME :07:36:00 08:06:00 30 (min) Purpose code: 3
LOG :2706.80 2708.00 1.50 Area code : 3
FDEPTH: 50 49 GearCond.code:
BDEPTH: 50 49 Validity code:
Towing dir: 330° Wire out: 250 m Speed: 3 kn*10

Sorted: Kg Total catch: 22.40 CATCH/HOUR: 44.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Sepia officinalis hierredda	14.00	58	31.25	95
Pagellus bellottii	14.00	196	31.25	94
Seriola carpenteri	5.00	6	11.16	
Raja miraletus	4.00	12	8.93	
Sparus caeruleosticus	4.00	6	8.93	
Dactylopterus volitans	1.00	4	2.23	
Fistularia petimba	0.80	6	1.79	
Syacium micrurum	0.60	6	1.34	
Pseudupeneus prayensis	0.60	6	1.34	
Uranoscopus polli	0.40	2	0.89	
Bothus podas africanus	0.20	2	0.45	
Chelidonichthys capensis	0.20	2	0.45	
Total	44.80		100.01	

PROJECT STATION: 141

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 304
start stop duration Long E 944
TIME :09:29:00 09:59:00 30 (min) Purpose code: 3
LOG :2719.50 2720.80 1.50 Area code : 3
FDEPTH: 82 83 GearCond.code:
BDEPTH: 82 83 Validity code:
Towing dir: 325° Wire out: 400 m Speed: 3 kn*10

Sorted: 31 Kg Total catch: 1836.00 CATCH/HOUR: 3672.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Trachurus trecae	2760.00	98344	75.16	97
Scomber japonicus	720.00	11520	19.61	96
Pagellus bellottii	48.00	1080	1.31	
Chelidonichthys capensis	48.00	960	1.31	
Sepia officinalis hierredda	36.00	120	0.98	
Dentex congoensis	36.00	600	0.98	
Ariomma bondi	12.00	120	0.33	
Boops boops	12.00	120	0.33	
Microchirus boscanion	0.00	120		
Total	3672.00		100.01	

PROJECT STATION: 142

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 253
start stop duration Long E 934
TIME :12:51:00 13:21:00 30 (min) Purpose code: 3
LOG :2746.60 2747.80 1.50 Area code : 3
FDEPTH: 88 87 GearCond.code:
BDEPTH: 88 87 Validity code:
Towing dir: 330° Wire out: 450 m Speed: 3 kn*10

Sorted: 31 Kg Total catch: 275.20 CATCH/HOUR: 550.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Trachurus trecae	131.20	5604	23.84	99
Sparus pagrus africanus	118.40	176	21.51	98
Pagellus bellottii	64.00	4266	11.63	100
Sepia officinalis hierredda	54.40	288	9.88	
Epinephelus aeneus	48.00	6	8.72	
Ariomma bondi	40.00	1200	7.27	
Dentex gibbosus	40.00	48	7.27	
Boops boops	28.80	1024	5.23	
Sparus caeruleosticus	14.40	16	2.62	
Dentex barnardi	6.40	16	1.16	
Chelidonichthys gabonensis	4.80	224	0.87	
Total	550.40		100.00	

PROJECT STATION: 143

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 249
start stop duration Long E 944
TIME :15:44:00 16:14:00 30 (min) Purpose code: 3
LOG :2766.30 2767.30 1.50 Area code : 3
FDEPTH: 45 40 GearCond.code:
BDEPTH: 45 40 Validity code:
Towing dir: 330° Wire out: 250 m Speed: 3 kn*10

Sorted: Kg Total catch: 25.20 CATCH/HOUR: 50.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	33.00	390	65.48	101
Sepia officinalis hierredda	5.80	20	11.51	
Fistularia petimba	3.80	50	7.54	
Chelidonichthys capensis	2.00	20	3.97	
Seriola carpenteri	2.00	2	3.97	
Syacium micrurum	1.40	20	2.78	
Trachinus armatus	0.40	4	0.79	
Dacapterus rhonchus	0.40	2	0.79	
Chilomycterus spinosus mauret.	0.40	2	0.79	
Xyrichtys novacula	0.20	2	0.40	
Bothus podas africanus	0.20	2	0.40	
Dicolocoglossa hexophthalma	0.20	2	0.40	
Brachydeuterus auritus	0.20	2	0.40	
Uranoscopus albesca	0.20	2	0.40	
Trachinocephalus myops	0.20	2	0.40	
Grammoplites gruveli	0.00	2		
Total	50.40		100.02	

PROJECT STATION: 144

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 248
start stop duration Long E 948
TIME :17:22:00 17:52:00 30 (min) Purpose code: 3
LOG :2776.90 2777.00 1.50 Area code : 3
FDEPTH: 33 33 GearCond.code:
BDEPTH: 33 32 Validity code:
Towing dir: 320° Wire out: 200 m Speed: 3 kn*10

Sorted: 37 Kg Total catch: 156.00 CATCH/HOUR: 313.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Sparus caeruleostictus	139.20	344	44.44	103
Pagellus bellottii	84.00	612	26.82	102
Brachydeuterus auritus	24.00	560	7.66	
Epinephelus aeneus	14.80	2	4.73	
Sphyraena guachancho	9.60	56	3.07	
Dentex canariensis	9.60	24	3.07	
Pomadasys incisus	8.00	48	2.55	
Pseudupeneus prayensis	5.60	88	1.79	
Caleoides decadactylus	4.80	56	1.53	
Eucinostomus melanopterus	3.20	48	1.02	
Calappa rubroguttata	2.40	8	0.77	
Syacium micrurum	2.40	16	0.77	
Alloteuthis africana	1.60	616	0.51	
Torpedo torpedo	1.60	16	0.51	
Penaeus notialis	0.80	16	0.26	
Chelidonichthys capensis	0.80	8	0.26	
Decapterus punctatus	0.80	64	0.26	
Sardinella aurita	0.00	8		
Total	313.20		100.02	

PROJECT STATION: 145

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 230
start stop duration Long E 940
TIME :20:09:00 20:39:00 30 (min) Purpose code: 3
LOG :2757.30 2798.40 1.50 Area code : 3
FDEPTH: 30 31 GearCond.code:
BDEPTH: 30 31 Validity code:
Towing dir: 325° Wire out: 150 m Speed: 3 kn*10

Sorted: 30 Kg Total catch: 120.20 CATCH/HOUR: 240.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	96.00	960	39.93	
Sparus caeruleostictus	40.00	120	16.64	
Chelidonichthys capensis	26.40	422	10.98	
Pomadasys incisus	16.00	144	6.66	
Rhinobatos albomaculatus	9.60	8	3.99	
Syacium micrurum	8.00	272	3.33	
Caleoides decadactylus	6.40	80	2.66	
Pseudupeneus prayensis	5.60	104	2.33	
Cynoglossus canariensis	4.80	16	2.00	
Lutjanus fulgens	4.80	48	2.00	
Penaeus notialis	4.40	140	1.83	104
Grammoplites gruveli	4.00	192	1.66	
Sphyraena guachancho	2.40	8	1.00	
Raja miraletus	2.40	8	1.00	
Arnoglossus imperialis	2.00	88	0.83	
Ariosoma sp	1.60	88	0.67	
Penaeus kerathurus	1.60	32	0.67	
Squilla mantis	1.20	24	0.50	
Trachinocephalus myops	0.80	8	0.33	
Torpedo torpedo	0.80	8	0.33	
Serranus cabrilla	0.80	24	0.33	
Brachydeuterus auritus	0.80	8	0.33	
Total	240.40		100.00	

PROJECT STATION: 146

DATE: 6/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 229
start stop duration Long E 921
TIME :22:29:00 22:59:00 30 (min) Purpose code: 3
LOG :2815.10 2816.60 1.50 Area code : 3
FDEPTH: 29 27 GearCond.code:
BDEPTH: 29 27 Validity code:
Towing dir: 340° Wire out: 150 m Speed: 3 kn*10

Sorted: 23 Kg Total catch: 52.40 CATCH/HOUR: 104.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	36.00	374	34.35	105
Chelidonichthys capensis	14.40	374	13.74	
Pomadasys rogeri	10.40	16	9.92	
Pomadasys incisus	6.00	36	5.73	
Caleoides decadactylus	4.80	64	4.58	
Syacium micrurum	3.20	232	3.05	
Sparus caeruleostictus	3.20	8	3.05	
Penaeus kerathurus	2.80	28	2.67	106
Eucinostomus melanopterus	2.80	20	2.67	
Sepia officinalis hierredda	2.40	24	2.29	
Brachydeuterus auritus	2.00	4	1.91	
Grammoplites gruveli	2.00	96	1.91	
Raja miraletus	1.60	144	1.53	
Torpedo torpedo	1.60	4	1.53	
Ariosoma sp	1.60	20	1.53	
Chilomycterus spinosus mauret.	1.20	32	1.15	
Trachinocephalus myops	1.20	4	1.15	
Uranoscopus polli	1.20	40	1.15	
Pseudupeneus prayensis	1.20	4	1.15	
Penaeus notialis	0.80	8	1.15	
Fistularia petimba	0.80	32	0.76	
Psettodes belcheri	0.80	4	0.76	
Squilla mantis	0.60	4	0.76	
Pegusa lascaris	0.60	2	0.57	
Serranus cabrilla	0.60	4	0.57	
Bothus podas africanus	0.40	12	0.38	
Trachinus armatus	0.00	4		
	0.00	8		
Total	104.80		100.01	

PROJECT STATION: 147

DATE: 7/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 241
start stop duration Long E 900
TIME :03:47:00 04:47:00 60 (min) Purpose code: 3
LOG :2861.50 2863.20 3.00 Area code : 3
FDEPTH: 465 465 GearCond.code:
BDEPTH: 465 465 Validity code:
Towing dir: 315° Wire out:1250 m Speed: 3 kn*10

Sorted: 16 Kg Total catch: 125.90 CATCH/HOUR: 125.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Nematocarcinus africanus	32.20	3162	25.58	
Hymenocephalus italicus	21.00	1904	16.68	
Ateleopus barnardi	16.00	4	12.71	
Merlucoius polli	15.40	42	12.23	
Bathygadus sp	8.40	77	6.67	
Aristeus varidens	7.00	28	5.56	
Benthodesmus tenuis	6.30	126	5.00	
Deania profundorum	4.20	7	3.34	
Halacocephalus laevis	3.50	35	2.78	
Laemonema sp	3.50	70	2.78	
Snyderidia bothrops	1.40	35	1.11	
Etmopterus polli	1.40	7	1.11	
Coelorinchus coelorhincus	1.40	21	1.11	
Melanostomias sp.	1.05	7	0.83	
Physiculus sp	1.05	14	0.83	
Diplophos sp.	0.70	7	0.56	
Stereomastis sculpta	0.70	546	0.56	
Halosaurus sp	0.70	7	0.56	
Total	125.90		100.00	

PROJECT STATION: 148

DATE: 7/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 230
start stop duration Long E 911
TIME :07:20:00 07:50:00 30 (min) Purpose code: 3
LOG :2884.40 2885.40 1.50 Area code : 3
FDEPTH: 76 76 GearCond.code:
BDEPTH: 76 76 Validity code:
Towing dir: 325° Wire out: 350 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 231.20 CATCH/HOUR: 462.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Trachurus trachs	448.00	11946	96.89	107
Pagellus bellottii	6.40	80	1.38	
Chilomycterus spinosus mauret.	4.80	2	1.04	
Chelidonichthys gabonensis	1.60	32	0.35	
Scops boops	1.60	16	0.35	
Total	462.40		100.01	

PROJECT STATION: 149

DATE: 7/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 224
start stop duration Long E 917
TIME :09:54:00 10:24:00 30 (min) Purpose code: 3
LOG :2899.00 2900.00 1.50 Area code : 3
FDEPTH: 47 47 GearCond.code:
BDEPTH: 47 47 Validity code:
Towing dir: 340° Wire out: 250 m Speed: 3 kn*10

Sorted: Kg Total catch: 24.45 CATCH/HOUR: 48.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	17.00	244	34.76	108
Seriola carpenteri	16.00	14	32.72	
Sepia officinalis hierredda	6.00	12	12.27	
Raja miraletus	3.00	4	6.13	
Sparus caeruleostictus	1.40	2	2.86	
Sparus pagrus africanus	1.40	2	2.86	
Uranoscopus polli	1.00	2	2.04	
Torpedo torpedo	0.60	4	1.23	
Pseudupeneus prayensis	0.60	4	1.23	
Trachinocephalus myops	0.60	6	1.23	
Xyrichtys novacula	0.40	2	0.82	
Trachinus armatus	0.40	4	0.82	
Chelidonichthys capensis	0.40	2	0.82	
Canthigaster sp	0.10	6	0.20	
Total	48.90		99.99	

PROJECT STATION: 150

DATE: 7/ 6/89 GEAR TYPE: BT No:1 POSITION:Lat S 207
start stop duration Long E 923
TIME :13:17:00 13:47:00 30 (min) Purpose code: 3
LOG :2927.60 2929.20 1.50 Area code : 3
FDEPTH: 18 18 GearCond.code:
BDEPTH: 18 18 Validity code:
Towing dir: 145° Wire out: 100 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 58.70 CATCH/HOUR: 117.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Drepane africana	38.00	116	32.37	
Chloroscombrus chrysurus	24.40	260	20.78	109
Caleoides decadactylus	13.60	124	11.58	
Sphyraena guachancho	8.00	24	6.81	
Selene dorsalis	8.00	40	6.81	
Brachydeuterus auritus	4.00	1000	3.41	
Cynoglossus canariensis	3.60	12	3.07	
Rhinobatos albomaculatus	3.20	4	2.73	
Alectis alexandrinus	2.40	8	2.04	
Eucinostomus melanopterus	2.40	44	2.04	
Sparus caeruleostictus	2.00	8	1.70	
Seriola carpenteri	2.00	8	1.70	
Adioryx hastatus	1.20	4	1.02	
Pagellus bellottii	1.20	4	1.02	
Sardinella maderensis	0.80	24	0.68	
Psettodes belcheri	0.80	4	0.68	
Decapterus punctatus	0.60	12	0.51	
Penaeus notialis	0.60	4	0.51	
Chaetodon robustus	0.40	4	0.34	
Decapterus rhonchus	0.20	4	0.17	
Total	117.40		99.97	

PROJECT STATION: 151

DATE: 7/ 6/89 GEAR TYPE: PT No: POSITION: Lat S 205
start stop duration Long E 919
TIME :15:04:00 15:34:00 30 (min) Purpose code: 1
LOG :2939.50 2940.70 1.50 Area code : 3
FDEPTH: 2 2 GearCond.code:
BDEPTH: 17 18 Validity code:
Towing dir: 340° Wire out: 200 m Speed: 3 kn*10

Sorted: Kg Total catch: 13.00 CATCH/HOUR: 26.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Scomberomorus tritor	26.00	30	100.00	110
Total	26.00		100.00	

PROJECT STATION: 152

DATE: 7/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 204
start stop duration Long E 917
TIME :16:08:00 16:38:00 30 (min) Purpose code: 3
LOG :2943.90 2944.90 1.50 Area code : 3
FDEPTH: 23 24 GearCond.code:
BDEPTH: 23 24 Validity code:
Towing dir: 325° Wire out: 125 m Speed: 3 kn*10

Sorted: 29 Kg Total catch: 58.10 CATCH/HOUR: 116.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Chloroscombrus chrysurus	92.00	1210	79.17	111
Pagellus bellottii	5.60	40	4.82	112
Pomadasys jubelini	4.40	8	3.79	
Selene dorsalis	4.00	20	3.44	
Sardinella maderensis	2.80	16	2.41	
Sphyraena guachancho	2.00	56	1.72	
Caleoides decadactylus	1.60	16	1.38	
Echeneis naucrates	0.80	4	0.69	
Decapterus punctatus	0.80	64	0.69	
Brachydeuterus auritus	0.80	144	0.69	
Sparus caeruleostictus	0.80	4	0.69	
Psettodes belcheri	0.40	4	0.34	
Decapterus rhonchus	0.20	4	0.17	
Total	116.20		100.00	

PROJECT STATION: 153

DATE: 7/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 206
start stop duration Long E 912
TIME :17:31:00 18:01:00 30 (min) Purpose code: 3
LOG :2952.00 2952.90 1.50 Area code : 3
FDEPTH: 37 38 GearCond.code:
BDEPTH: 37 38 Validity code:
Towing dir: 340° Wire out: 200 m Speed: 3 kn*10

Sorted: 26 Kg Total catch: 39.15 CATCH/HOUR: 78.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	57.00	778	72.80	114
Sepia officinalis hierredda	7.50	30	9.58	
Decapterus punctatus	3.90	186	4.98	113
Scomberomorus tritor	3.60	2	4.60	
Psettodes belcheri	1.50	2	1.92	
Torpedo torpedo	1.20	2	1.53	
Syacium micrurum	1.20	6	1.53	
Fistularia petimba	0.90	14	1.15	
Cheilidonichthys capensis	0.60	2	0.77	
Pseudupeneus prayensis	0.60	6	0.77	
Trachinocephalus myops	0.30	2	0.38	
Sardinella maderensis	0.00	6		
Total	78.30		100.01	

PROJECT STATION: 154

DATE: 7/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 216
start stop duration Long E 848
TIME :21:00:00 22:00:00 60 (min) Purpose code: 3
LOG :2981.30 2984.20 2.00 Area code : 3
FDEPTH: 713 685 GearCond.code:
BDEPTH: 713 685 Validity code:
Towing dir: 150° Wire out: 1550 m Speed: 2 kn*10

Sorted: 25 Kg Total catch: 78.60 CATCH/HOUR: 78.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Trachyrinus scabrus	16.50	84	20.99	
Maja sp.	15.90	6	20.23	
Bathygadus sp	8.10	63	10.31	
Yarella blackfordi	7.80	135	9.92	
Merluccius polli	3.90	3	4.96	
Mauliasia mauli	3.60	60	4.58	
Aristeus varidens	3.00	97	3.82	115
Stereomastis sculpta	3.00	123	3.82	
Bathyraja sp.	2.40	3	3.05	
Stomias affinis	1.80	18	2.29	
Ebinania costaecanariae	1.80	3	2.29	
Malacocephalus occidentalis	1.50	21	1.91	
Benthodesmus tenuis	1.50	15	1.91	
Sergia robusta	1.20	81	1.53	
Raja miraletus	1.20	3	1.53	
Dibranchus atlanticus	1.20	15	1.53	
Lamprogrammus exetus	0.90	3	1.15	
Plesiopenaeus edwardsianus	0.90	6	1.15	
Lepidion guentheri	0.60	6	0.76	
Acanthephyra sp.	0.60	30	0.76	
Bathygadus melanobranchus	0.60	6	0.76	
Halosaurus sp	0.60	6	0.76	
Total	78.60		100.01	

PROJECT STATION: 155

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 202
start stop duration Long E 847
TIME :00:45:00 01:45:00 60 (min) Purpose code: 3
LOG :3006.30 3008.10 3.00 Area code : 3
FDEPTH: 613 642 GearCond.code:
BDEPTH: 615 642 Validity code:
Towing dir: 355° Wire out: 1400 m Speed: 3 kn*10

Sorted: 24 Kg Total catch: 47.20 CATCH/HOUR: 47.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Yarella blackfordi	11.00	251	23.31	
Stomias affinis	6.80	100	14.41	
Lamprogrammus exetus	6.00	74	12.71	
Bathygadus sp	4.00	50	8.47	
Aristeus varidens	3.20	156	6.78	
Stereomastis sculpta	2.60	194	5.51	
Nematocarcinus africanus	2.20	344	4.66	
Merluccius polli	2.00	2	4.24	
Triplophos sp	1.80	156	3.81	
Ebinania costaecanaria	1.20	2	2.54	
Onathophausia zoea	0.80	154	1.69	
Sergia robusta	0.80	136	1.69	
Lepidion guentheri	0.80	16	1.69	
Ariosoma sp	0.66	14	1.40	
Benthodesmus tenuis	0.80	14	1.69	
Mauliasia mauli	0.60	26	1.27	
Naphropsis atlantica	0.40	6	0.85	
Conosthoma elongatum	0.40	6	0.85	
Etmopterus polli	0.40	4	0.85	
Dibranchus atlanticus	0.40	4	0.85	
Lampadena luminosa	0.20	4	0.42	
Heterocarpus grimaldii	0.00	2		
Total	47.20		99.98	

PROJECT STATION: 156

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 152
start stop duration Long E 859
TIME :06:22:00 06:52:00 30 (min) Purpose code: 3
LOG :3032.00 3033.00 1.50 Area code : 3
FDEPTH: 56 57 GearCond.code:
BDEPTH: 56 57 Validity code:
Towing dir: 340° Wire out: 200 m Speed: 3 kn*10

Sorted: 30 Kg Total catch: 210.70 CATCH/HOUR: 421.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Sardinella aurita	102.00	2230	43.19	117
Decapterus punctatus	147.00	1800	34.88	116
Pagellus bellottii	70.00	798	16.61	
Sepia officinalis hierredda	4.20	14	1.00	
Trachinus radiatus	4.20	14	1.00	
Scomber japonicus	4.20	14	1.00	
Ariomma bondi	2.80	14	0.66	
Uranoscopus polli	2.80	14	0.66	
Priacanthus arenatus	1.40	14	0.33	
Trachinus armatus	1.40	14	0.33	
Pseudupeneus prayensis	1.40	14	0.33	
Total	421.40		99.99	

PROJECT STATION: 157

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 150
start stop duration Long E 906
TIME :08:15:00 08:45:00 30 (min) Purpose code: 3
LOG :3044.50 3045.30 1.50 Area code : 3
FDEPTH: 36 36 GearCond.code:
BDEPTH: 36 36 Validity code:
Towing dir: 340° Wire out: 200 m Speed: 3 kn*10

Sorted: Kg Total catch: 27.80 CATCH/HOUR: 55.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	46.00	342	82.73	118
Decapterus rhonchus	4.60	46	8.27	119
Fistularia petimba	1.20	14	2.16	
Raja miraletus	0.80	2	1.44	
Alutera punctata	0.80	2	1.44	
Uranoscopus polli	0.60	2	1.08	
Decapterus punctatus	0.60	18	1.08	
Xyrichtys novacula	0.40	4	0.72	
Pseudupeneus prayensis	0.40	6	0.72	
Trachinocephalus myops	0.20	2	0.36	
Total	55.60		100.00	

PROJECT STATION: 158

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 150
start stop duration Long E 912
TIME :10:00:00 10:30:00 30 (min) Purpose code: 3
LOG :3056.00 3057.00 1.50 Area code : 3
FDEPTH: 13 17 GearCond.code:
BDEPTH: 13 17 Validity code:
Towing dir: 330° Wire out: 75 m Speed: 3 kn*10

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

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Alectis alexandrinus	20.00	8	84.75	
Euthynnus alletteratus	2.00	2	8.47	
Sphyraena guachancho	0.80	4	3.39	
Pagellus bellottii	0.80	6	3.39	
Total	23.60		100.00	

PROJECT STATION: 159

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 140
start stop duration Long E 910
TIME :11:29:00 11:59:00 30 (min) Purpose code: 3
LOG :3065.60 3067.40 1.50 Area code : 3
FDEPTH: 13 14 GearCond.code:
BDEPTH: 13 14 Validity code:
Towing dir: 170° Wire out: 75 m Speed: 3 kn*10

Sorted: Kg Total catch: 5.20 CATCH/HOUR: 10.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Sparus caeruleostictus	3.40	6	32.69	
Scomberomorus tritor	2.80	2	26.92	
Chloroscombrus chrysurus	2.00	16	19.23	
Rhinobatos albomaculatus	1.60	2	15.38	
Eucinostomus melanopterus	0.40	2	3.85	
Trachinocephalus myops	0.20	2	1.92	
Total	10.40		99.99	

PROJECT STATION: 160

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 140
start stop duration Long E 903
TIME :12:54:00 13:24:00 30 (min) Purpose code: 3
LOG :3075.30 3076.50 1.50 Area code : 3
FDEPTH: 22 19 GearCond.code:
BDEPTH: 22 19 Validity code:
Towing dir: 330° Wire out: 150 m Speed: 3 kn*10

Sorted: Kg Total catch: 25.60 CATCH/HOUR: 47.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Pagellus bellottii	24.60	214	50.85	121
Decapterus rhonchus	11.00	30	23.31	120
Sepia officinalis hierredda	4.00	6	8.47	
Balistes punctatus	2.00	2	4.24	
Sarda sarda	2.00	6	4.24	
Psettodes belcheri	1.80	6	3.81	
Sphyraena guachancho	1.20	6	2.54	
Decapterus punctatus	0.40	4	0.85	
Xyrichtys novacula	0.20	2	0.42	
Fistularia petimba	0.20	2	0.42	
Rucinostomus melanopterus	0.20	2	0.42	
Sparus caeruleostictus	0.20	4	0.42	
Total	47.20		99.99	

PROJECT STATION: 161

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 140
start stop duration Long E 855
TIME :14:39:00 15:09:00 30 (min) Purpose code: 3
LOG :3087.30 3088.40 1.50 Area code : 3
FDEPTH: 53 54 GearCond.code:
BDEPTH: 53 54 Validity code:
Towing dir: 340° Wire out: 300 m Speed: 3 kn*10

Sorted: 15 Kg Total catch: 96.70 CATCH/HOUR: 193.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Alectis alexandrinus	77.00	22	39.81	
Brachydeuterus auritus	66.00	1760	35.16	123
Pagellus bellottii	27.20	368	14.06	122
Balistes punctatus	8.00	8	4.14	
Sparus caeruleostictus	4.80	16	2.48	
Dentex congoensis	3.20	40	1.65	
Dactylopterus volitans	2.40	8	1.24	
Pseudupeneus prayensis	1.20	8	0.62	
Pomadasys incisus	0.80	8	0.41	
Trachurus trecae	0.80	8	0.41	
Total	193.40		99.98	

PROJECT STATION: 162

DATE: 8/ 6/89 GEAR TYPE: BT No:1 POSITION: Lat S 140
start stop duration Long E 848
TIME :16:22:00 16:52:00 30 (min) Purpose code: 3
LOG :3098.90 3099.80 1.50 Area code : 3
FDEPTH: 74 71 GearCond.code:
BDEPTH: 74 71 Validity code:
Towing dir: 330° Wire out: 350 m Speed: 3 kn*10

Sorted: 27 Kg Total catch: 349.70 CATCH/HOUR: 699.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP.NO.
Trachurus trecae	364.00	12390	52.04	124
Ariomma bondi	156.00	4290	22.30	125
Brachydeuterus auritus	83.20	1248	11.90	126
Torpedo torpedo	23.40	26	3.35	
Dentex congoensis	20.80	780	2.97	
Scomber japonicus	13.00	182	1.86	
Boops boops	13.00	624	1.86	
Pagellus bellottii	7.80	234	1.12	
Priacanthus arenatus	7.80	52	1.12	
Cheilodonichthys capensis	5.20	78	0.74	
Fistularia petimba	2.60	26	0.37	
Pseudupeneus prayensis	2.60	26	0.37	
Total	699.40		100.00	

ANNEX IV INSTRUMENTS AND FISHING GEAR USED

Acoustic instruments

Two SIMRAD scientific echo sounders, EK 400/38 kHz and EK 400/120 kHz were used during the survey for estimation of fish density. The EK 400/38 was coupled to a digital integrator QD as well as to an analog integrator QM. The details of the instrument settings used are as follows:

	EK 400/38	EK 400/120
Range	0-100 m or 0-250 m	0-100 m
Transmitter	High (5000 W Nom)	High (1250 W Nom)
Bandwith	3.3 kHz	3.3 kHz
Pulselength	1.0 ms	1.0 ms
TVG	20 log R	20 log R
Attenuator	20 dB	0
Rec. gain	8 or 9	5
Transducer	split beam (ES)	Ceramic 10cm

QD settings: Threshold 10 to 24 mv. Gain: -35.7 dB

QM settings: Gain 20 dB x 10. Threshold 7

A calibration experiment using standard copper spheres performened in Baia dos Tigres 26/4/89 gave the following results: 30x30 transducer, SL+VR: 141.46 dB, instr. constants 1ms: 1.18, 0.5 ms: 2.30. ES transducer: SL+VR: 135.47 dB , instr. constant: 3.69.The result of the calibration showed that the 30x30 transducer was instable and hence the split beam transducer was used for integration.

Hydrography

Temperature, salinity and oxygen were sampled at standard depths with Nansen bottles. Oxygen was measured with the Winkler method and salinity determined with an inductive salinometer. Surface temperature was recorded at 4 m depth with a thermograph.

Fishing gear

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

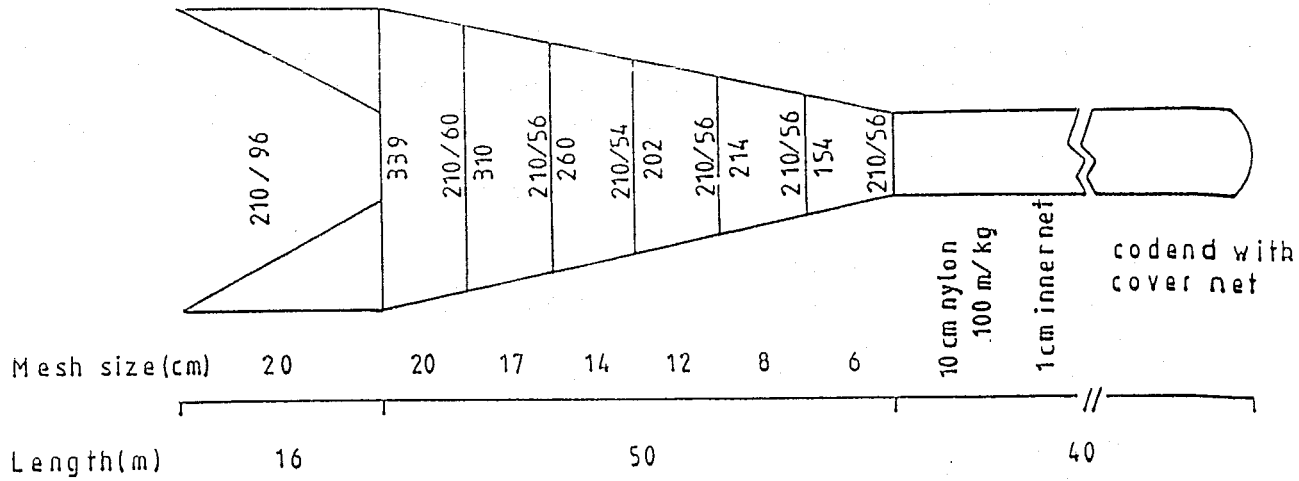
Pelagic trawl: Type "Harstadtrawl", width about 30 m, vertical opening 10-15m.

Cod ends of trawls with fine meshed inner lining.

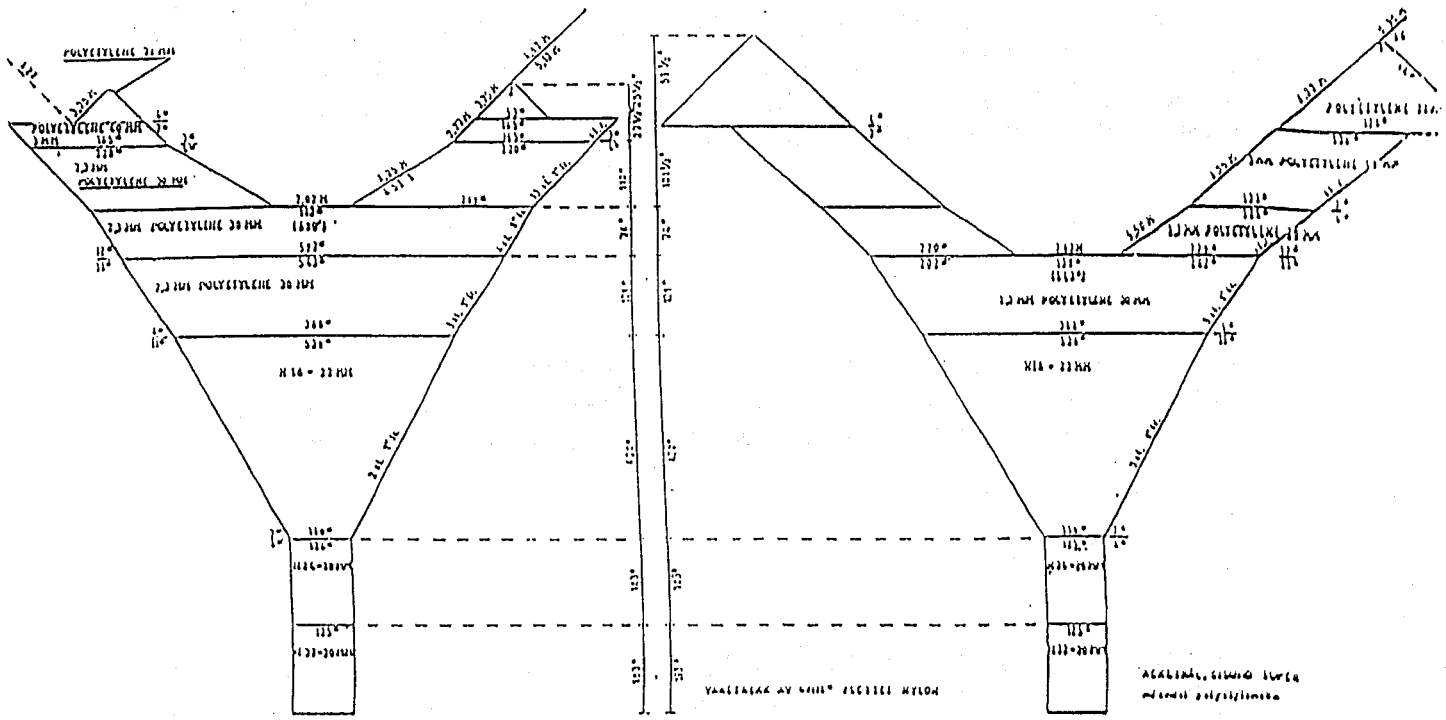
Figures giving details of the trawls are attached.

PELAGIC TRAWL

Four equal parts



BOTTOM TRAWL



Upper part
Headline 41 m
Sweep 40 m

Lower part
Groundrope 47 m
Sweep 40 m