

**Reports on Surveys with the
R/V Dr Fridtjof Nansen**

A Joint Programme NORAD and UNDP/FAO GLO/82/001

**SURVEY OF THE ABUNDANCE AND DISTRIBUTION OF THE
FISH RESOURCES OF CONGO AND GABON**

REPORT OF CRUISE NO.2

30 MAY TO 12 JUNE

1985

August 1985

Institute of Marine Research, Bergen

1. INTRODUCTION

Under an agreement between the Governments of Congo and Gabon, the United Nations Food and Agricultural Organisation (FAO) and the Norwegian Agency for Development Aid (NORAD) the fishery research vessel DR FRIDTJOF NANSEN will conduct a series of surveys of the fish resources of Congo and Gabon. This work forms part of the UNDP/FAO programme GLO/82/001.

This cruise report is the second of a series of interim reports to be issued upon the completion of each individual survey. The surveys will be further analysed in investigational reports.

The following scientific personell participated:

From IMR Bergen:

O. Haldorson (cruise leader), K. Pittman, H. Ullebust

T. Haugland (instrument chief), E. Molvær

From Congo:

Prosper Mfina, Francois Bileko

From Gabon:

Leon Mba Nguema, Jean Alhogo Nang

From Zaire:

Enganya Mpia Wango

2. NARRATIVE

The vessel departed pointe Noire on 30 May at 1700 hours. The shelf was covered northwards with an acoustic survey grid with approximately 10 nm between the transects. Semi random bottom trawl stations were laid out along the cruise track during daylight to assess the demersal biomass by the so called swept-area method. The area just south of Cape Lopez is restricted due to heavy oil drilling activities. This area was not surveyed as no permit to navigate there had been received. A call was made on Owendo on 11 June where the Gabonese scientists disembarked. Thereafter the cruise continued to the northern Gabonese border. The vessel arrived Port Gentile on 12 June to disembark crew and remaining scientists and for layup. Fishing stations included 49 bottom trawl stations and 22 pelagic trawl stations. The total distance surveyed was 2000 nm.

3. HYDROGRAPHY

The positions of the three hydrographic transects taken off the Congo Gabon coast are shown in Figure 1. Figure 2 shows the distribution of temperature, salinity and oxygen in each section. The surface temperature increased northwards, lowest off Pointe Noire, 20 C and highest on Equator (27 C). The termocline for all the hydrographical sections lay between 30 and 50 m. The sharpest termocline was observed on Equator, but off Pointe Noire and Pte Milango the temperature decreased more gradually with depth. As shown in the figures, the oxygen content decreases with depth, however values below 1 ml/l are found only beyond the continental shelf and should thus not limit the fish distribution on the shelf.

4. FISH DISTRIBUTION AND ABUNDANCE.

The acoustic data from the echo sounders and integrators are processed

and classified in a procedure based on experience of the types of echo recordings produced by various forms of organisms and on the information gained from the fishing experiments. Three categories are usually distinguished:

1. Pelagic fish type I : Clupeids e.g. sardinellas, sardines, anchovies.
2. Pelagic fish type II: Other schooling pelagic fish such as horse mackerel, other carangids, scombrids, hairtails, barracudas etc.
3. Demersal fish : Other than pelagic schooling fish such as hakes, sparids, sciaenids, catfishes, snappers etc.

In addition signals caused by plankton and by mesopelagic fish such as myctophids are recorded, but no further processing is being made of these data.

Assessment of the abundance of fish resources based on acoustic observations combined with experimental fishing is a method which especially lends itself to fish found in schools or other aggregations in mid water. Fish close to the bottom will not be detected by the echosounder, nor will fish in the very surface layer, but schools may be detected by horizontal ranging sonar. For navigational reasons the work with the R/V "Dr. Fridtjof Nansen" is limited to waters deeper than about 15m. The effects of any of these factors on the acoustic assessment will be towards an underestimate of the actual resources.

A common feature during the survey was the presence of very dense registrations of plankton which screened the faint traces of the fish resources. This will effect the precision of the acoustic estimates and makes the trawl survey assessment useful for comparison.

During this survey the abundance of the pelagic resources was very low and it was not considered meaningful to separate the pelagic recordings into Pelagic I and Pelagic II as introduced above.

Figure 3 shows the distribution of pelagic fish while Figure 4 shows the demersal resources recorded by the acoustic system. Where pelagic resources were found they were generally of low level and no true fish schools were located which could form basis for large scale fisheries. The only exception from the very scattered registrations was a few Sardinella aurita schools off Madingo. In the area from Pointe Noire to Sette Cama the pelagic resources in shallow waters consisted of Chloroscombrus chrysurus, Ilisha africana, Sphyraena gauchancho and Selene dorsalis, while Trachurus trecae and Decapterus rhonchus dominated the outer shelf. In the area from Cape Lopez to the northern Gabonese border, the triggerfish, Balistes capriscus was the most dominant species within the pelagic group. In shallow waters north of Sette Cama to just north of Iguela small juveniles of Brachydeuterus auritus, Sardinella maderensis, S. aurita and Decapterus sp. were located. Small juveniles of these species were also located in a small area just north of Port Gentil. As for the pelagic resources, the demersal registrations were very poor. In the area from Pointe Noire to Sette Cama the bigeye grunt (Brachydeuterus auritus) and croakers (Pseudolithes spp.) dominated the shallow waters, while the seabreams (Dentex spp., Sparus spp., and Pagellus bellottii) and groupers (Epinephelus aenus) dominated the outer shelf. North of Cape Lopez in deeper waters the bigeye (Priacanthus arenatus) was common.

Rounded figures of the estimated biomass from the two surveys are:(thousand tonnes):

	Congo			Gabon			Both		
	Pel	Dem	Tot	Pel	Dem	Tot	Pel	Dem	Tot
Survey 2-15 March	30	5	35	70	25	95	100	30	130
Survey 30 may- 12 June	50	10	60	40	25	65	90	35	125

A moderate increase in the biomass of small pelagic fish has taken place in Congo. This could be fish migrating in from Cabinda or from north from Gabon. The unsurveyed oil drilling area south of Cape Lopez makes it difficult to see if variations in biomass in Gabon are due to growth/mortality causes or due to migration in/out of the restricted area.

As a general picture the resources for Gabon-Congo seems relatively constant in the period between the two surveys. Any major migration of pelagic fish from south had not taken place. It is likely that a migration will be monitored during the next coverage, in September.

As already mentioned above the demersal resources are likely underestimated by the acoustic method, and the swept area method is more reliable for assessing the demersal fish. During the last survey 43 semi-random trawl stations were carried out. From this a biomass of 160 thousand tonnes were estimated while the corresponding figures from the March survey was 125 thousand tonnes. During the last survey one extraordinary big catch raised the mean and the variance of the data series considerably. We therefore again assume that no real changes has taken place in the biomass since the first survey.

Records of fishing stations and catch of dominant species are shown in Appendix II.

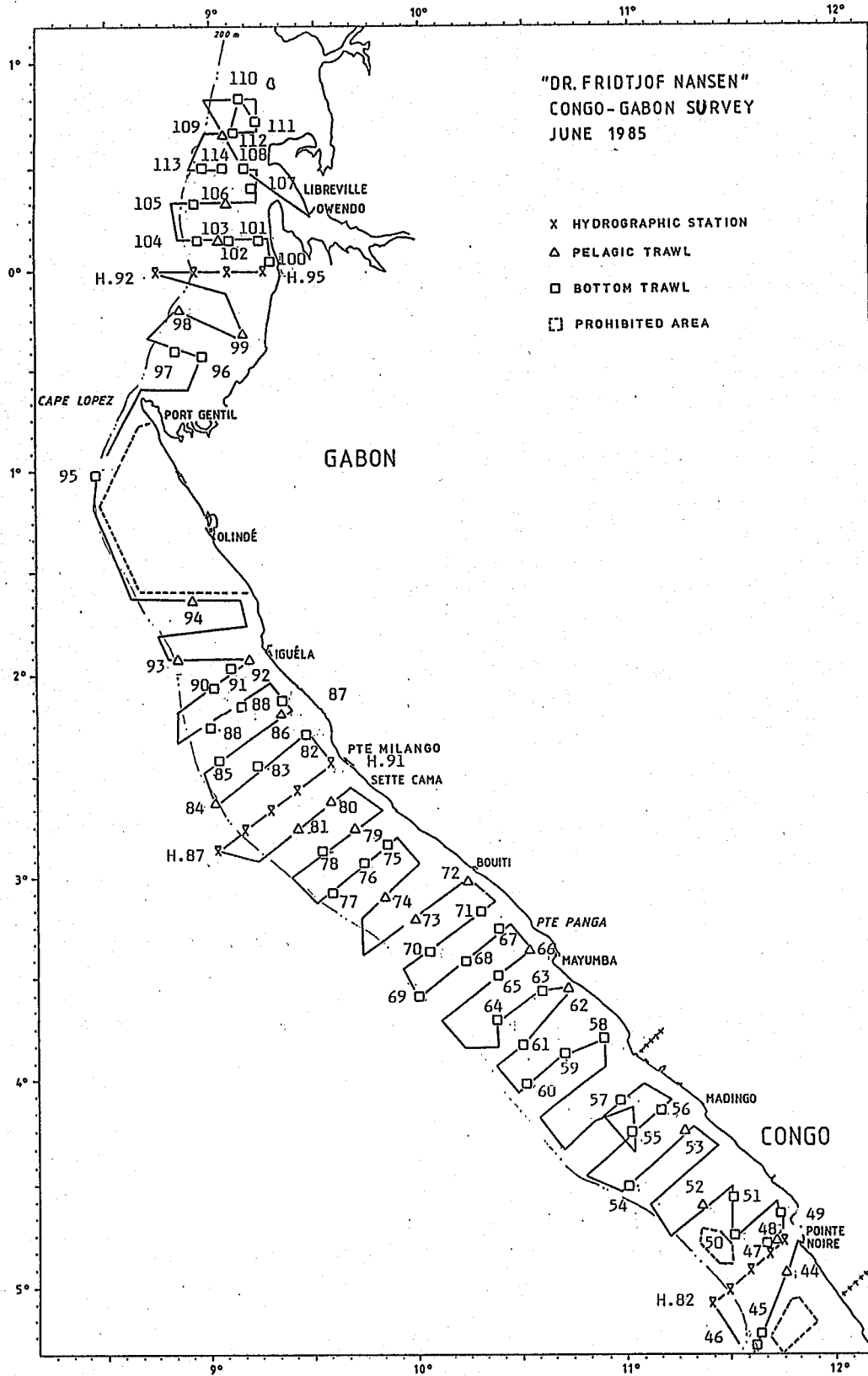
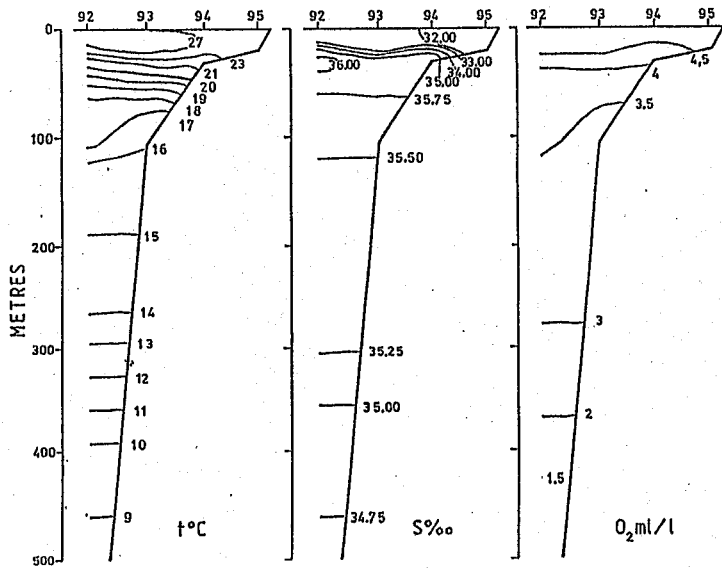
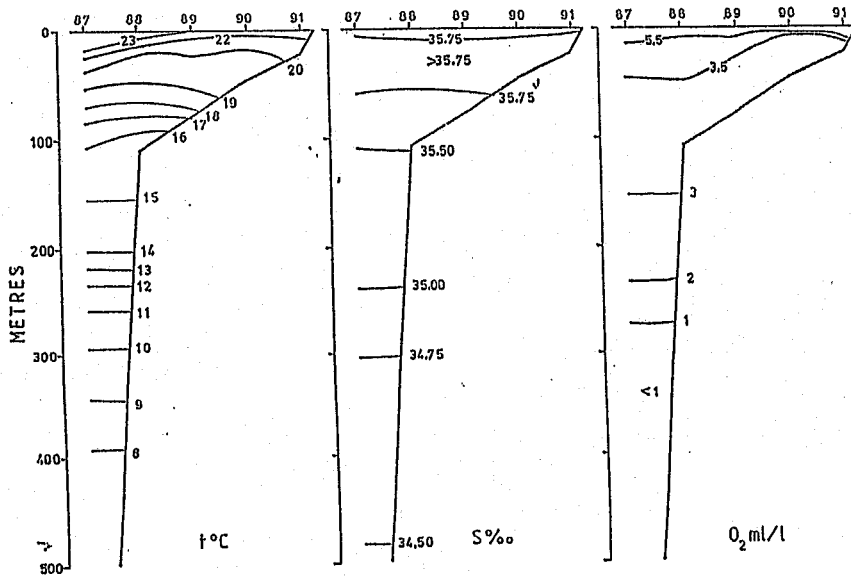


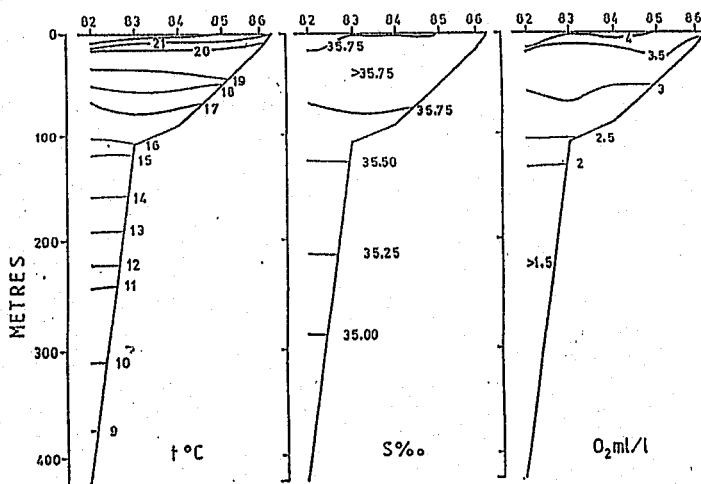
Figure 1. Cruise track and stations. "Dr. Fridtjof Nansen", Congo-Gabon Survey No.2/1985



EQUATOR 10 JUN 1985



PTE MILANGO 6 JUN 1985



POINTE NOIRE 31 MAY 1985

Figure 2.
Distribution of temperature, salinity and oxygen at hydrographical sections on Equator and off Pte Milango and Pointe Noire.

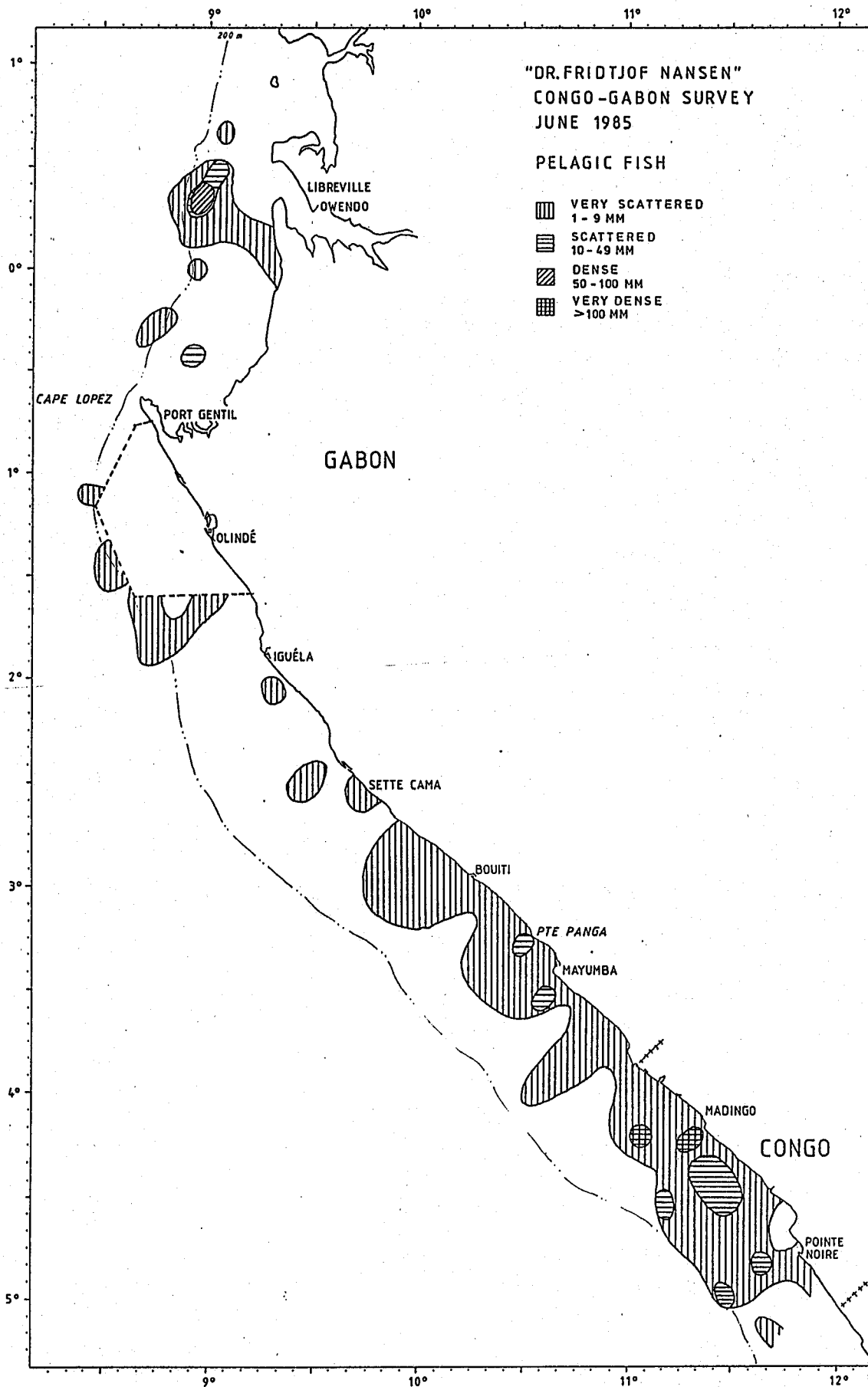


Figure 3. The distribution of pelagic fish from acoustic registrations. "Dr. Fridtjof Nansen", Congo-Gabon Survey No.2/1985.

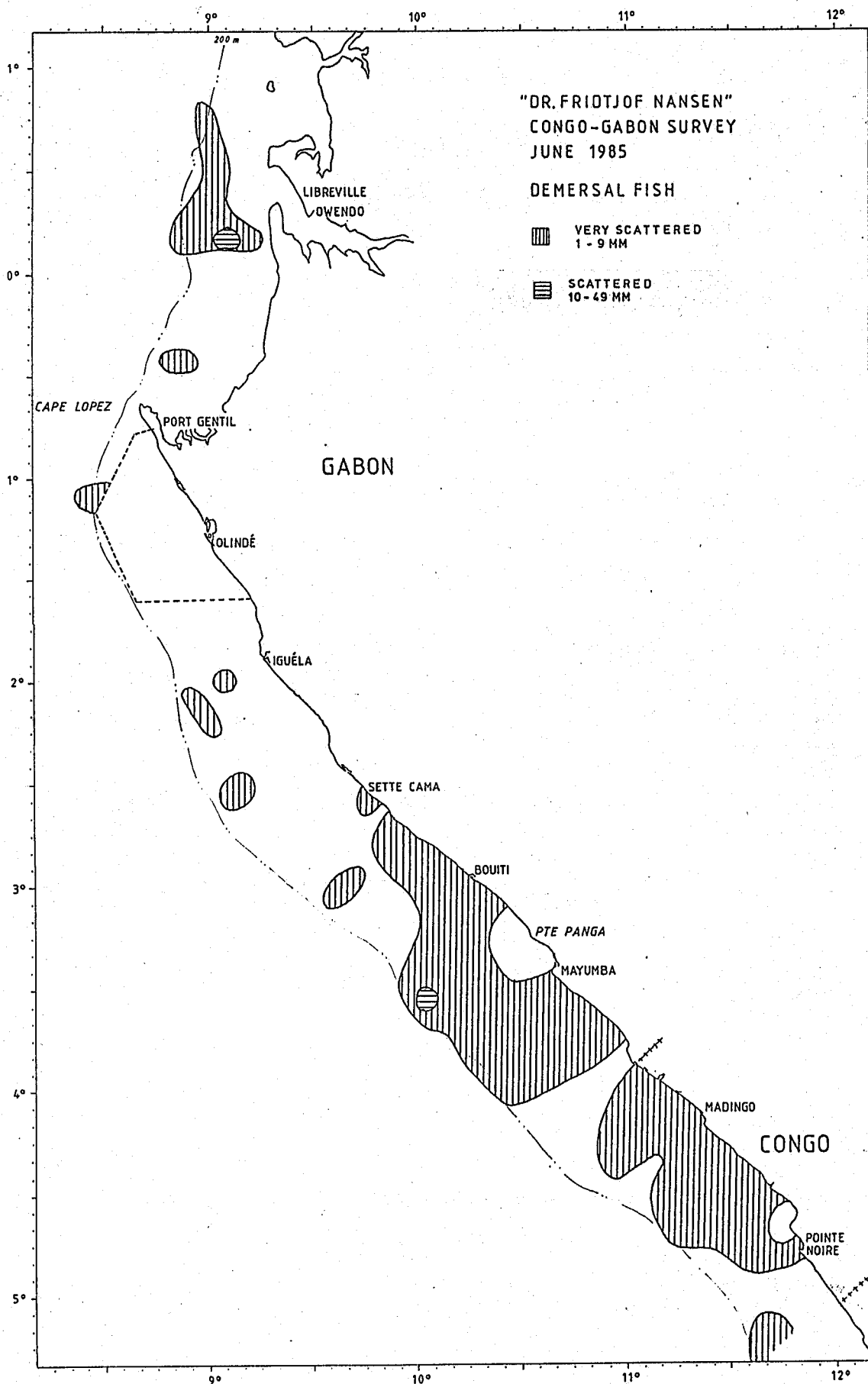


Figure 4. The distribution of demersal fish from acoustic registrations. "Dr. Fridtjof Nansen", Congo-Gabon Survey No.2/1985.

APPENDIX I

INSTRUMENTS AND FISHING GEAR USED

Acoustic instruments

SIMRAD echo sounder EK 400, 38 kHz was used during the survey for estimation of fish density.

Instrument settings:

	EK400/38
Range	0-100 m
Transmitter	High (5000 W nom.)
Bandwidth	3.3 kHz
Pulse length	1 ms
TVG	20 log R
Attenuator	20 dB
Recorder gain	7
Transducer	Ceramic (8 ⁰ x8 ⁰)

EK 400/38 was coupled to the digital integrator QD and to one analog integrator QM.

QD settings:	Gain	30 dB
	Threshold	25 mV
QM settings:	Gain	20 dB x 10
	Threshold	10

An ST sonar was used to detect fish schools close to the surface. Recorder range: 0-250 m.

Calibration on standard target (Baia dos Tigres, 28.4.1985)

EK 400/38 : SL + VR = 140.8 dB (Cu 60)

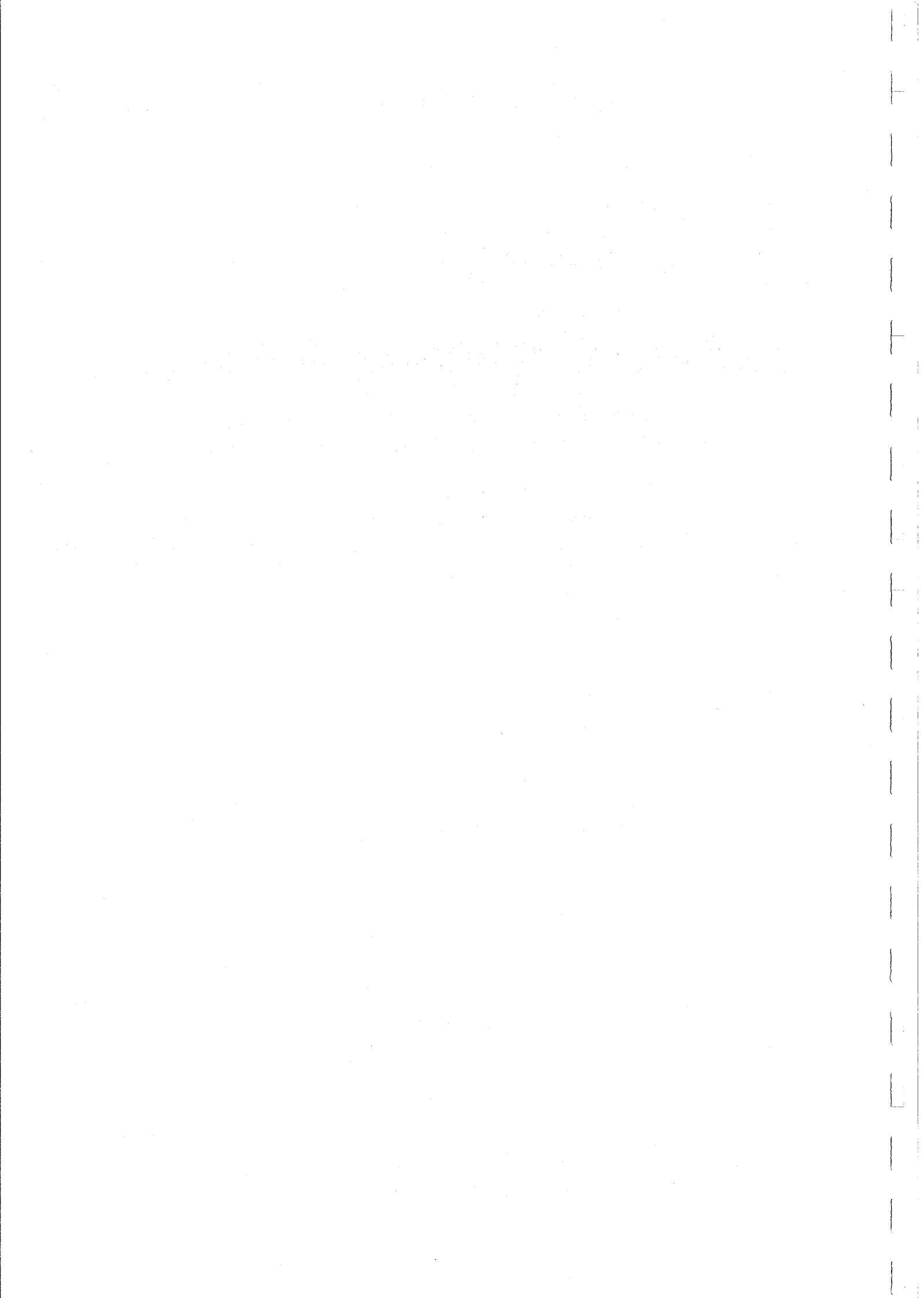
Hydrography

Temperature, salinity and oxygen content 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 thermograph.

Fishing gear

Bottom trawl: High opening shrimp and fish trawl with rubber bobbins gear, headline 31 m, headline height during trawling about 6 m.

Pelagic trawls: Type "Harstadtrawl", width about 30 m, vertical opening 14-16 m. Type modified "Bastrawl", width about 25 m, vertical opening about 25 m. All trawls with fine meshed inner lining in cod ends.



APPENDIX II

Record of fishing stations with dominant species.

BT: Bottom trawl

PT: Pelagic trawl

DATE	TIME	STN No.	GEAR TYPE	DEPTH (M)		POSITION		CATCH (KG)		DOMINANT SPECIES	WEIGHT (KG)	
	START			BOTTOM	GEAR	LATIT.	LONGIT.	TOTAL	PR HR		PR HR	%
30.05	1852	44	PT	62	25	S04 57'	E011 45'	,3	,7	Hemiraphus balao Trichiurus lepturus	,40 ,30	57,1 42,8
30.05	2215	45	BT	112	112	S05 14'	E011 38'	,0	,0	N O C A T C H	,00	,0
30.05	2325	46	BT	111	111	S05 14'	E011 37'	84,0	168,0	Dentex angolensis Chelidonichthys gabonensis Brotula barbata Pentheroscion mbizi	84,00 22,20 19,20 10,80	50,0 13,2 11,4 6,4
31.05	0703	47	BT	45	45	S04 49'	E011 42'	240,3	480,6	Brachydeuterus auritus Pteroscion peli Ilisha africana Trichiurus lepturus	297,60 44,80 40,00 40,00	61,9 9,3 8,3 8,3
31.05	0850	48	PT	33	10	S04 46'	E011 44'	7,7	15,4	Chloroscombrus chrysurus Stromateus fiatola Sphyraena guachancho Sardinella maderensis	12,00 1,40 1,06 ,60	77,9 9,0 6,8 3,8
31.05	1205	49	BT	13	13	S04 37'	E011 42'	233,1	466,2	Pseudolithus typus Drepane africana Arius parkii Pseudolithus moorii	285,00 29,00 28,00 27,00	61,1 6,2 6,0 5,7
31.05	1500	50	BT	72	72	S04 44'	E011 31'	15,7	31,4	Trichiurus lepturus Selene dorsalis Sardinella aurita Pentheroscion mbizi	14,80 7,00 5,60 1,80	47,1 22,2 17,8 5,7
31.05	1700	51	BT	42	42	S04 33'	E011 29'	91,6	183,2	Pteroscion peli Brachydeuterus auritus Galeichthys feliceps Pseudolithus senegalensis Trichiurus lepturus	78,00 28,80 23,40 22,20 19,80	42,5 15,7 12,7 12,1 10,8
31.05	1935	52	PT	80	7	S04 37'	E011 21'	70,0	140,0	Selene dorsalis Trachurus trecae Sardinella maderensis Sarda sarda	44,00 33,60 30,80 25,40	31,4 24,0 22,0 18,1
01.06	0250	53	PT	39	1	S04 17'	E011 15'	9,6	11,5	Sphyraena guachancho Brachydeuterus auritus Ilisha africana Stromateus fiatola	4,32 2,76 2,04 1,80	37,5 24,0 17,7 15,6
01.06	0635	54	BT	111	111	S04 30'	E011 01'	69,1	138,2	Dentex angolensis Dentex gibbosus Dentex canariensis Trachurus trecae	58,80 28,00 21,00 6,54	42,5 20,2 15,1 4,7

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M)		POSITION		CATCH (KG)		DOMINANT SPECIES	WEIGHT (KG)	
				BOTTOM	GEAR	LATIT.	LONGIT.	TOTAL	PR HR		PR HR	%
01.06	1038	55	BT	78	78	S04 16'	E011 02'	124,7	249,4	Pagellus bellottii Dentex canariensis Sparus caeruleostictus Argyrosomus hololepidotus	44,40 42,40 38,00 20,60	17,8 17,0 15,2 8,2
01.06	1250	56	BT	24	24	S04 08'	E011 09'	158,7	317,4	Pseudolithus typus Brachydeuterus auritus Pseudolithus senegalensis Galeoides decadactylus	110,00 43,00 35,00 23,00	34,6 13,5 11,0 7,2
01.06	1600	57	BT	62	62	S04 06'	E010 56'	148,7	297,4	Brachydeuterus auritus Pteroscion peli Arius heudeloti Pseudolithus typus	90,00 65,00 33,00 22,00	30,2 21,8 11,0 7,3
02.06	0643	58	BT	27	27	S03 46'	E010 51'	242,1	484,2	Mobula diabolus Sparus caeruleostictus Pseudolithus typus Lutjanus fulgens	140,00 90,00 73,80 49,20	28,9 18,5 15,2 10,1
02.06	0850	59	BT	64	64	S03 52'	E010 42'	95,2	190,4	Selene dorsalis Pagellus bellottii Brachydeuterus auritus Trichiurus lepturus Gymnura sp	25,40 24,60 16,00 14,20 80,00	13,3 12,9 8,4 7,4 42,0
02.06	1145	60	BT	111	111	S04 02'	E010 30'	5,0	10,0	Dentex angolensis Echeneis naucrates Dentex canariensis Anthias anthias	7,00 1,80 1,00 ,20	70,0 18,0 10,0 2,0
02.06	1455	61	BT	86	86	S03 50'	E010 29'	,0	,0	N O C A T C H	,00	,0
03.06	0853	62	PT	20	1	S03 31'	E010 42'	285,3	570,6	Chloroscombrus chrysurus Sphyraena quachancho Brachydeuterus auritus Stromateus fiatola	352,80 86,40 63,00 32,40	61,8 15,1 11,0 5,6
03.06	1040	63	BT	35	35	S03 33'	E010 36'	70,0	113,4	Pseudolithus senegalensis Sphyraena quachancho Sparus caeruleostictus Selene dorsalis	23,32 15,22 12,15 11,17	20,5 13,4 10,7 9,8
03.06	1255	64	BT	66	66	S03 42'	E010 32'	5000,0	10000,0	Brachydeuterus auritus Priacanthus arenatus Trachurus trecae Boops boops	5836,20 3017,60 547,80 281,80	58,3 30,1 5,4 2,8

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M)		POSITION		CATCH (KG)		DOMINANT SPECIES	WEIGHT (KG)	
				BOTTOM	GEAR	LATIT.	LONGIT.	TOTAL	PR HR		PR HR	%
03.06	1815	65	BT	57	57	S03 31'	E010 19'	67,3	134,6	Pagellus bellottii Decapterus sp Trachurus trecae Priacanthus arenatus	68,00 28,40 11,20 8,60	50,5 21,0 8,3 6,3
03.06	2120	66	PT	24	1	S03 19'	E010 26'	126,2	252,4	Sphyraena guachancho Scomberomorus tritor Lutjanus agennes Stromateus fiatola Mobula sp	68,80 28,00 24,60 2,80 120,00	27,2 11,0 9,7 1,1 47,5
04.06	0640	67	BT	24	24	S03 15'	E010 23'	45,5	91,0	Selene dorsalis Sparus caeruleostictus Sphyraena guachancho Ephippion guttifer	32,20 18,00 10,00 7,40	35,3 19,7 10,9 8,1
04.06	0910	68	BT	62	62	S03 25'	E010 13'	66,7	133,4	Decapterus sp Pagellus bellottii Decapterus rhonchus Epinephelus aeneus	30,80 30,40 28,00 20,40	23,0 22,7 20,9 15,2
04.06	1132	69	BT	120	120	S03 36'	E010 00'	24,9	49,8	Dentex gibbosus Mustelus mustelus Dentex canariensis Sparus pagrus africanus	13,80 13,00 12,80 5,70	27,7 26,1 25,7 11,4
04.06	1430	70	BT	75	75	S03 23'	E010 04'	6,8	13,6	Dentex gibbosus SEPIIDAE Pagellus bellottii Dentex congoensis	5,40 5,20 1,40 ,60	39,7 38,2 10,2 4,4
04.06	1705	71	BT	27	27	S03 10'	E010 17'	130,5	261,0	Sphyraena guachancho Decapterus rhonchus Sparus caeruleostictus Pseudotolithus senegalensis	135,00 46,00 45,00 7,00	51,7 17,6 17,2 2,6
04.06	1922	72	PT	21	1	S03 02'	E010 13'	90,6	181,2	Ilisha africana Sphyraena guachancho Brachydeuterus auritus Galeoides decadactylus	94,02 43,20 31,80 4,80	51,8 23,8 17,5 2,6
04.06	2220	73	PT	67	1	S03 13'	E009 58'	107,2	214,4	Decapterus rhonchus Decapterus sp Sarda sarda Echeneis naucrates	192,00 10,40 6,80 3,00	89,5 4,8 3,1 1,3
05.06	0250	74	PT	70	1	S03 06'	E009 49'	43,0	86,0	Decapterus sp Trachurus trecae Saurida brasiliensis	82,80 1,40 ,90	96,2 1,6 1,0

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M)		POSITION		CATCH (KG)		DOMINANT SPECIES	WEIGHT (KG)	
				BOTTOM	GEAR	LATIT.	LONGIT.	TOTAL	PR HR		PR HR	%
05.06	0640	75	BT	32	32	S02 51'	E009 52'	57,6	115,2	Drepane africana Brachydeuterus auritus Pomadasys jubelini Pagellus bellottii	37,00 31,80 25,60 7,40	32,1 27,6 22,2 6,4
05.06	0825	76	BT	62	62	S02 56'	E009 43'	57,5	115,0	Seriola carpenteri Decapterus sp Scyllarides herklotsii Pagellus bellottii	90,00 15,20 2,80 2,40	78,2 13,2 2,4 2,0
05.06	1040	77	BT	107	107	S03 05'	E009 35'	56,4	112,8	Spicara alta Epinephelus aeneus Dentex gibbosus Dentex congoensis	46,40 22,00 12,60 10,00	41,1 19,5 11,1 8,8
05.06	1415	78	BT	78	78	S02 52'	E009 33'	151,1	302,2	Sparus pagrus africanus Dentex gibbosus Epinephelus aeneus Sparus caeruleostictus Dentex canariensis	57,60 57,60 52,00 43,40 34,20	19,0 19,0 17,2 14,3 11,3
05.06	1610	79	PT	47	1	S02 47'	E009 39'	,3	,7	Echeneis naucrates Lagocephalus laevigatus	,40 ,30	57,1 42,8
05.06	2008	80	PT	41	1	S02 37'	E009 34'	10,7	21,4	Decapterus sp Sphyræna quachancho Scomberomorus tritor Brachydeuterus auritus	5,00 4,68 4,20 3,00	23,3 21,8 19,6 14,0
05.06	2235	81	PT	79	65	S02 45'	E009 25'	1,7	5,6	Torpedo torpedo Saurida brasiliensis Trigla capensis Trachurus trecae	1,66 1,33 ,63 ,49	29,6 23,7 11,2 8,7
06.06	0902	82	BT	18	18	S02 17'	E009 26'	44,0	114,4	Lutjanus goreensis Selene dorsalis Dentex canariensis Chaetodipterus goreensis	30,94 20,54 10,40 9,62	27,0 17,9 9,0 8,4
06.06	1130	83	BT	63	63	S02 28'	E009 14'	6,8	13,6	Trachurus trecae Sparus caeruleostictus Torpedo torpedo Decapterus sp Pagellus bellottii	4,00 2,00 1,90 1,70 1,50	29,4 14,7 13,9 12,5 11,0
06.06	1440	84	PT	190	150	S02 38'	E009 01'	31,2	37,4	Myctophum sp Dactylopterus volitans	36,00 1,50	96,2 4,0

DATE	TIME	STW	GEAR	DEPTH (M)	POSITION	CATCH (KG)		DOMINANT SPECIES	WEIGHT (KG)																										
						START No.	TYPE		BOTTOM GEAR	LATTI. LONGIT.	TOTAL	PR HR	%																						
06.06	1745	85	BT	101	101	S02 27' E009 03'	40,2	80,4	Spicara alta Dentex gibbosus Squatina oculata Squalus blainvillei	20,06	24,9																								
												16,80	20,8																						
														12,60	15,6																				
																10,80	13,4																		
06.06	2110	86	PT	24	1	S02 13' E009 20'	63,9	153,3	Sphyræna guachancho Sardinella aurita Brachydeuterus auritus Decapterus sp	69,60	45,4																								
												34,80	22,7																						
														18,33	11,9																				
																10,99	7,1																		
07.06	0645	87	BT	16	16	S02 07' E009 20'	12,3	24,6	Pomadasys rogeri Decapterus rhonchus Chloroscombrus chrysurus Brachydeuterus auritus	7,60	30,8																								
												3,40	13,8																						
														3,40	13,8																				
																2,80	11,3																		
07.06	0920	88	BT	48	48	S02 08' E009 09'	4,4	8,7	Dentex canariensis Sparus caeruleostictus Epinephelus aeneus	3,56	40,9																								
												2,74	31,4																						
														2,44	28,0																				
																07.06	1140	89	BT	90	90	S02 16' E009 00'	47,7	143,1	Epinephelus aeneus Dentex gibbosus Sparus pagrus africanus	66,60	46,5								
53,40	37,3																																		
		21,90	15,3																																
				07.06	1530	90	BT	65	65	S02 03' E009 01'	178,9	357,8	Dentex gibbosus Epinephelus aeneus Dentex canariensis Sparus caeruleostictus	93,40	26,1																				
																72,40	20,2																		
59,40	16,6																																		
		58,80	16,4																																
				07.06	1735	91	BT	44	44	S01 56' E009 06'	4,4	8,8	Decapterus sp Lagocephalus laevigatus Pagellus bellottii Torpedo torpedo	2,64	30,0																				
																1,20	13,6																		
1,00	11,3																																		
		,84	9,5																																
				07.06	1940	92	PT	23	1	S01 53' E009 11'	60,0	120,0	Brachydeuterus auritus Sardinella aurita Sphyræna guachancho Sardinella maderensis	63,86	53,2																				
																30,82	25,6																		
22,00	18,3																																		
		2,64	2,2																																
				07.06	2250	93	PT	109	10	S01 54' E008 53'	1200,0	2400,0	Balistes capricus	2400,00	100,0																				
																08.06	0555	94	PT	55	30	S01 38' E008 53'	,0	,0	N O C A T C H	,00	,0								
08.06	1143																											95	BT	68	68	S01 02' E008 29'	54,0	108,0	Trachurus trecae Dentex congouensis Ariomma bondi Decapterus punctatus
		27,20	25,1																																
				10,00	9,2																														
						5,20	4,8																												

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M)		POSITION		CATCH (KG)		DOMINANT SPECIES	WEIGHT (KG)	
				BOTTOM	GEAR	LATIT.	LONGIT.	TOTAL	PR HR		PR HR	%
09.06	1350	96	BT	24	24	S00 26'	E008 56'	92,1	184,2	Pagellus bellottii Epinephelus aeneus Alectis alexandrinus Balistes capriscus	146,40 16,00 8,40 5,22	79,4 8,6 4,5 2,8
09.06	1525	97	BT	148	148	S00 24'	E008 50'	60,5	121,0	Ariomma bondi Dentex angolensis Priacanthus arenatus Spicara alta	40,00 25,20 22,00 10,60	33,0 20,8 18,1 8,7
09.06	1830	98	PT	149	1	S00 12'	E008 51'	,1	,3	MYCTOPHIDAE	,30	100,0
09.06	2200	99	PT	25	1	S00 17'	E009 08'	39,1	78,2	Brachydeuterus auritus Rachycentron canadus Sphyræna guachancho Saurida brasiliensis	17,74 17,00 16,12 14,50	22,6 21,7 20,6 18,5
10.06	0735	100	BT	17	17	N00 03'	E009 17'	11,4	22,8	Alectis alexandrinus Ephippion guttifer Sparus caeruleostictus Psettodes belcheri	9,60 5,00 3,00 1,60	42,1 21,9 13,1 7,0
10.06	0940	101	BT	24	24	N00 10'	E009 14'	14,6	29,2	Alectis alexandrinus Sparus caeruleostictus Caranx hippos Epinephelus aeneus	13,20 6,84 2,50 2,00	45,2 23,4 8,5 6,8
10.06	1132	102	BT	47	47	N00 10'	E009 06'	111,1	222,2	Pagellus bellottii Priacanthus arenatus Sparus caeruleostictus Decapterus punctatus	157,60 22,00 10,80 6,56	70,9 9,9 4,8 2,9
10.06	1305	103	PT	54	20	N00 11'	E009 03'	,0	,0	N O C A T C H	,00	,0
10.06	1500	104	BT	72	72	N00 10'	E008 57'	134,1	268,2	Dentex congoensis Epinephelus aeneus Priacanthus arenatus Sparus caeruleostictus	170,00 33,60 18,00 11,20	63,3 12,5 6,7 4,1
10.06	1815	105	BT	90	90	N00 20'	E008 56'	11,2	336,0	Priacanthus arenatus Dentex congoensis Dentex angolensis Torpedo marmorata	198,00 48,00 34,80 30,00	58,9 14,2 10,3 8,9
10.06	1940	106	PT	52	10	N00 20'	E009 02'	300,0	600,0	Balistes capriscus Dactylopterus volitans Decapterus sp Ariomma bondi	493,40 62,00 26,60 17,80	82,2 10,3 4,4 2,9

DATE	TIME	STN No.	GEAR TYPE	DEPTH (M)		POSITION		CATCH (KG)		DOMINANT SPECIES	WEIGHT (KG)	
	START			BOTTOM	GEAR	LATIT.	LONGIT.	TOTAL	PR HR		PR HR	%
11.06	0635	107	BT	20	20	N00 24'	E009 12'	8,9	17,8	Sparus caeruleostictus Pagellus bellottii Psettodes belcheri Balistes capriscus	8,00 2,70 2,40 2,20	44,9 15,1 13,4 12,3
11.06	0845	108	BT	31	31	N00 30'	E009 10'	13,9	27,8	Alectis alexandrinus Pomadasys jubelini Selene dorsalis	26,40 ,90 ,54	94,9 3,2 1,9
11.06	2255	109	PT	53	13	N00 40'	E009 05'	5,3	10,6	MISCELLANEOUS Ariomma bondi Decapterus sp Cynoponticus ferox	9,30 ,66 ,40 ,20	87,7 6,2 3,7 1,8
12.06	0630	110	BT	43	43	N00 50'	E009 08'	4,8	9,6	Pagellus bellottii Balistes capriscus Epinephelus aeneus Fistularia petimba Panaeus notialis	3,10 1,60 1,40 1,20 1,10	32,2 16,6 14,5 12,5 11,4
12.06	0835	111	BT	17	17	N00 44'	E009 13'	16,8	33,6	Ehippion guttifer SEPIIDAE Lagocephalus laevigatus Priacanthus arenatus	15,00 14,00 1,20 1,00	44,6 41,6 3,5 2,9
12.06	1035	112	BT	52	52	N00 40'	E009 06'	24,0	57,6	Pagellus bellottii Dentex canariensis Epinephelus aeneus Sparus caeruleostictus	31,20 9,60 7,20 5,28	54,1 16,6 12,5 9,1
12.06	1412	113	BT	85	85	N00 27'	E008 57'	385,5	771,0	Ariomma bondi Dentex congoensis Priacanthus arenatus Pagellus bellottii	298,50 253,50 189,00 12,00	38,7 32,8 24,5 1,5
12.06	1553	114	BT	52	52	N00 29'	E009 03'	97,3	194,6	Ariomma bondi Dentex congoensis Trachurus trecae Priacanthus arenatus	126,00 28,80 14,40 9,00	64,7 14,7 7,3 4,6