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Programme for the development of fisheries in the Eastern Central Atlantic

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FISHERY COMMITTEE FOR THE EASTERN CENTRAL ATLANTIC

Report on the R/V *Dr Fridtjof Nansen* fish resource surveys off West Africa: Morocco to Ghana and Cape Verde

UNITED NATIONS DEVELOPMENT PROGRAMME

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS ROME

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FISHERIES COMMITTEE FOR THE EASTERN CENTRAL ATLANTIC

REPORT ON THE R/V DR. FRIDTJOF NANSEN FISH RESOURCE SURVEYS OFF WEST AFRICA: MOROCCO TO GHANA, AND CAPE VERDE

May 1981-March 1982

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
UNITED NATIONS DEVELOPMENT PROGRAMME
Rome, 1984

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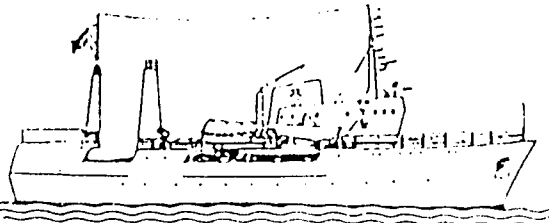

Reports on Surveys with the
R/V Dr Fridtjof Nansen

1 FINAL REPORT OF THE R/V DR. FRIDTJOF NANSEN
FISH RESOURCE SURVEYS OFF WEST AFRICA
FROM AGADIR TO GHANA

May 1981 - March 1982

2 A SURVEY OF THE FISH RESOURCES IN THE
COASTAL WATERS OF THE REPUBLIC OF CAPE VERDE

November 1981

Institute of Marine Research, Bergen

NOTE

The fishery research vessel Dr. Fridtjof Nansen belongs to the Norwegian Agency for International Development (NORAD) and was designed and built for scientific and exploratory investigations of fishery resources of developing countries. Its projects are conducted under a joint plan with the Fisheries Department of FAO based on a funding operation shared by UNDP/FAO and Norway.

The Institute of Marine Research, Bergen, is responsible for the operation of the vessel and the scientific programme under a sub-contract with NORAD and FAO.

ABSTRACT

The Norwegian research vessel Dr. Fridtjof Nansen has, under a joint NORAD/UNDP/FAO programme (GLO/79/011), carried out acoustic surveys off West Africa in the period May 1981 to May 1982. The work included in this report comprises three surveys of the shelf from Cape Blanc to Cape Verga with two of these extended down to Sherbro Island, two coverages of the shelf off the western Sahara and single coverages in Morocco north to Agadir and in the region Liberia-Ghana. A single survey in the Republic of Cape Verde is also included in the report as a separate part.

The work included hydrographical sections and trawling for biomass identification purposes, except off western Sahara where only acoustical transects were carried out.

The two coverages from Cape Blanc to Sherbro Island gave estimates of total biomass of 3 (May-June 1981) and 3.4 (Feb.-Mar. 1982) million tonnes, raised to 4.5 and 5.5 million tonnes to roughly adjust the figures for the un-surveyed shallow parts of the continental shelf. The two coverages off western Sahara gave estimates of 0.4 (December 1981) and 1.4 (March 1982) million tonnes, raised to 0.6 and 2.1 million tonnes for the whole shelf. A total abundance of 7.5 million tonnes for the whole shelf from Cape Juby to Sherbro Island is suggested. The survey in Morocco from Cape Juby to Agadir gave 750 000 tonnes as a rough total estimate, and the single coverage Liberia-Ghana gave 800 000 tonnes.

In the report the total biomass estimates are given according to national EEZs and to pelagic and demersal components. By combining trawl data with the acoustic estimates, tentative assessments of the abundance of the main pelagic species within the surveyed area are given. Assessments of the density of the individual stocks were hampered by a considerable migration on and off the continental shelf of western Sahara where no species

identification by trawling was made. One exception is the triggerfish off Guinea/Guinea-Bissau where the whole stock seemed to be encompassed by the survey track. This stock was estimated to be 1.1 (May-June 1981) and 1.4 million tonnes (February 1982).

From the survey in the waters of the Republic of Cape Verde a total biomass of 100 000 tonnes was estimated, of which 65 000 tonnes were classified as small pelagic fish.

The main report also contains all catch data and length measurements arranged by species.

PREFACE

The reports presented here form part of a large amount of data and documentation produced each year on the fish resources off West Africa. The results of the surveys with the Dr. Fridtjof Nansen are considered valid for the areas covered and with the limitations imposed by species determination through test fishing and problems of coverage in time and space. The results should be preferably used in combination with similar data obtained from other vessels (e.g., R/Vs Capricorne, Cornide de Saavedra, Ibn Sina), from fishery statistics, catch and effort and biological sampling data. This large-scale acoustic survey allowed a determination of major fish distribution patterns in quantitative terms. For detailed assessments other data will also be required in most cases.

The methodology used in acoustic surveys cannot be fully explained in the context of this report. Those interested can find full explanations in the new manual produced by FAO: Johannesson, K. and R.B. Mitson (1983) A practical manual for aquatic biomass estimation. FAO Fish.Tech.Pap.(240), 249 p.

This document consists of two parts: firstly a summary final report on several resource surveys made off West Africa between May 1981 and March 1982 by the R/V Dr. Fridtjof Nansen, and secondly a single cruise report covering a survey made around the Cape Verde Islands in November 1981.

A preliminary version of Part 1 was presented to the CECAF Working Party on Resource Evaluation, 2-6 February 1982: this version has now become obsolete. A limited number of advance copies of the definitive version were made available to the CECAF Sub-Committee on Management, meeting at Tenerife in September 1983.

Part 2 is a full reprint (with the omission of the original Annex V which is already covered in Part 1) of the Cape Verde cruise report, first issued in September 1982 by the Institute of Marine Research, Bergen.

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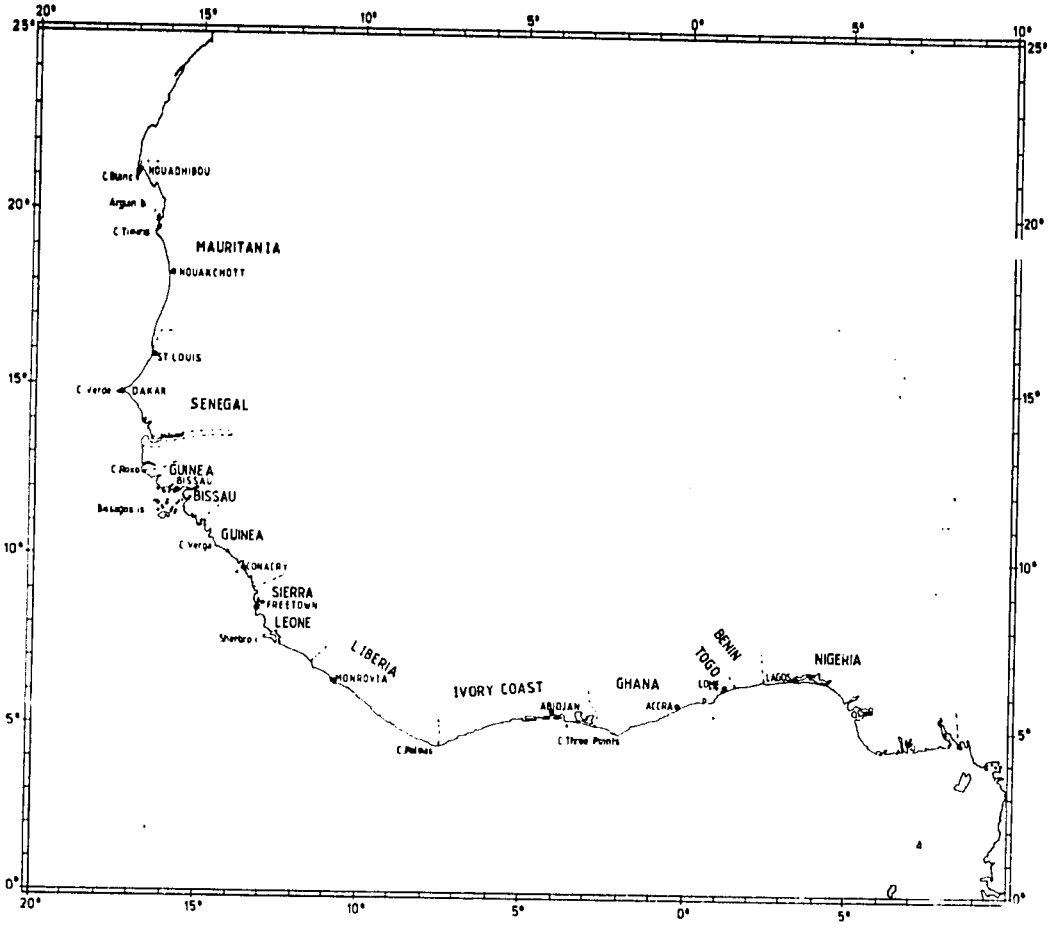
FINAL REPORT OF THE R/V DR. FRIDTJOF NANSEN FISH RESOURCE SURVEYS OFF WEST AFRICA FROM AGADIR TO GHANA MAY 1981 - MAR 1982

by

T. STRØMME

INSTITUTE OF MARINE RESEARCH

BERGEN 1983



Common geographical sites referred to in the report.

Hydrography by J. Blindheim
Drawings by H. Kismul and S. Myklevoll

1 INTRODUCTION

1.1 Background

In the period May 1981 - April 1982 the R/V "Dr. Fridtjof Nansen" operated in West African waters from Morocco to Ghana where the work formed part of the project UNDP/FAO GLO/79/011. A planning meeting was held in Casablanca in January 1981 where the following objectives were agreed upon:

a) to contribute to information on abundance, distribution and composition by species, size and age of fish stocks;

b) to study behaviour and other biological characteristics of the fish species in the area;

c) to contribute to improved methodology for acoustic surveys in this area.

During the period in West African waters 10 surveys were carried out:

1. Survey of the pelagic community from Cape Blanc to Cape Verga, May 1981.
2. Survey of the pelagic community from Cape Verga to Cape St. Paul, June 1981.
3. Survey of the small pelagic and demersal fish resources from Togo to Point Noire, August 1981.
4. Survey of the pelagic community from Bissagos Islands to Cape Blanc, September 1981.
5. Survey of the small pelagic and demersal fish resources in the coastal waters of the Republic of Cape Verde, November 1981.
6. Survey of the small pelagic fish resources in the coastal waters of Mauritania, December 1981.
7. Survey of the fish resources in the coastal waters outside 12 nm limit in Western Sahara, December 1981.
8. Survey of the pelagic community from Freetown to Cape Blanc February-March 1982.

9. Survey of the fish resources in the coastal waters outside 12 nm limit in Western Sahara, March 1982.
10. Survey of the small pelagic fish resources between Cape Juby and Agadir, March 1982.

The scientific programme was planned and conducted in close cooperation with FAO, the CECAF Secretariat and the relevant research organisations in the countries concerned. Preliminary results from the surveys have been presented in short cruise reports, and in a progress report submitted February 1982.

The present report is the final report on all surveys mentioned above except No. 3 (Togo - Point Noire) and No. 5 (Cape Verde Islands)[1/] for which separate reports have been prepared and issued. This report thus represents the results from the coastal shelf area from Morocco to Ghana, with the main survey effort in the area Cape Blanc - Cape Verga, and single coverings of the shelf areas off Liberia - Ghana and Morocco. The work undertaken in accordance with point c) in the objectives includes the introduction of systems for instrument calibration, intercalibration with other vessels and collection of special acoustic observations during surveys. Some results on these matters are given in the appendices, some are reported in separate papers (Sætersdal et al.,1982) and some are still in preparation.

The acoustic/exploratory fishing surveys which are discussed here include the following types of observations:

Acoustic system observing depth, bottom type, and fish biomass by categories.

Fishing system observing catch, its amount and composition, biological data of fish, catchability.

Oceanographic observations of ambient water characteristics (temperature, salinity, oxygen).

1/ Part 2 of this present volume covers the Cape Verde area

The analysis and processing of these data provide information on the quantity and distribution of the fish resources, their composition and aspects of their behaviour and their environment. The survey system has certain limitations particularly regarding the interpretation of the acoustic observations (these will be discussed later). Similar work in other areas has, however, demonstrated that findings from these types of surveys can provide good but often conservative indications of the availability of fish resources.

1.2 Plan and Conduct of the Surveys

Plan

The original purpose was to cover the whole shelf between Cape Blanc and Angola twice if possible. A a later date, however, it was decided to put the main effort on the area off Northwest Africa, between Cape Blanc and Cape Verga. North of Cape Blanc, off Western Sahara jurisdictional problems prevented standard acoustic surveys with trawl sampling. But two partial coverings outside the 12 nm limit were carried out without trawling for identification and provided data for a rough assessment of the fish abundance in the area.

A generator malfunction shortened the Togo - Congo survey (separate report) by a week, and propellor damage during the Cape Verde Islands survey limited the following December survey to only the shelf area from Cape Verde and northwards. Except for this, all surveys were completed in accordance with the plans.

The survey coverages

Figures 1-10 show the cruise tracks and stations worked on all surveys in sequential order. The operational characteristics of the surveys are summarized in Table 1, where the Togo - Congo survey and Cape Verde Islands survey have also been included, to permit an overview of the programme off West Africa. Total

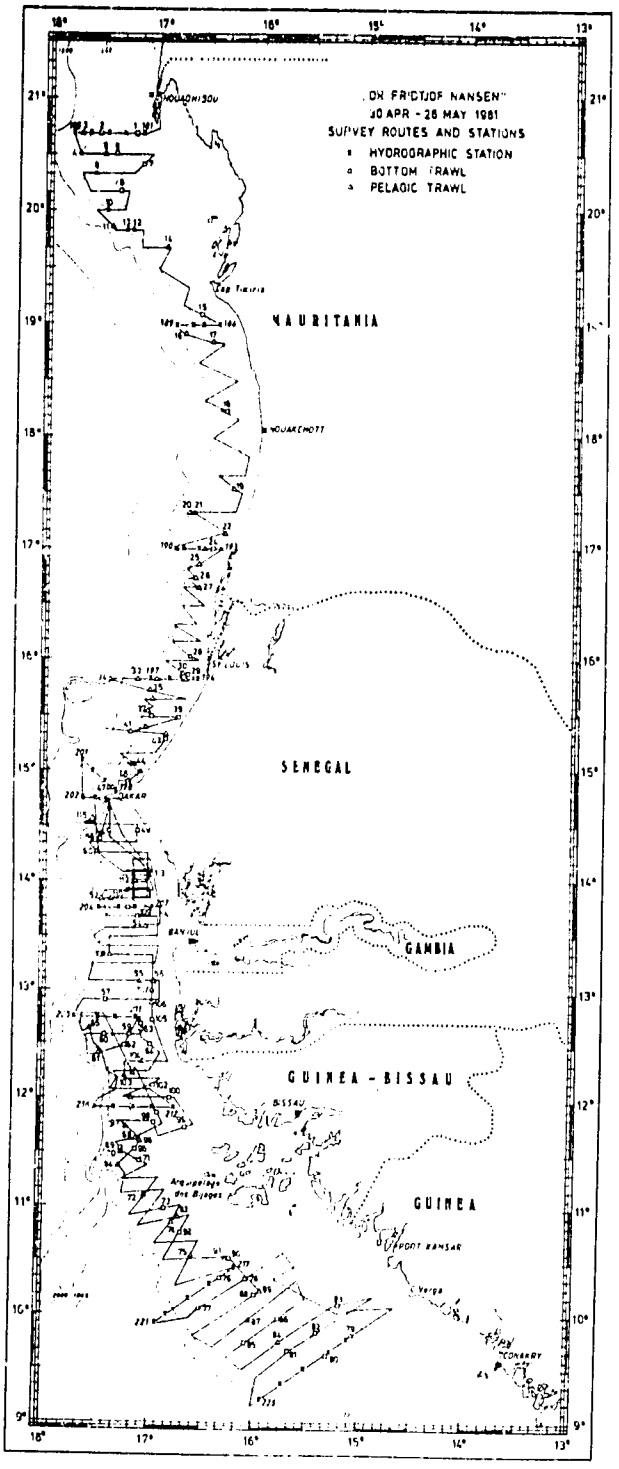


Fig. 1 Survey routes and stations. Apr 30 - May 26 1981.

distance steamed was approximately 35500 nm of which 30700 represented acoustic survey routes on the continental shelf. The mean daily distance advanced was 160 nm in 189 effective survey days. Unexpected time loss was 10 days. Further conclusions regarding the efficiency of the vessel can be extracted from Table 1.

Figure 11 gives an overview of the timing of the surveys off the different countries. Mauritania is the best investigated area with four coverages, Senegambia and Guinea with three coverages and Guinea Bissau, Sierra Leone and Western Sahara with two coverages. The rest of the region is only covered once.

The acoustic system was calibrated four times during the whole period, and four intercalibrations were performed with the R/V "Capricorne" in May-81 and Feb-82, with the R/V "Ibn Sina" in Apr-81 and with the R/V "Cornide de Saavedra" in Apr-82.

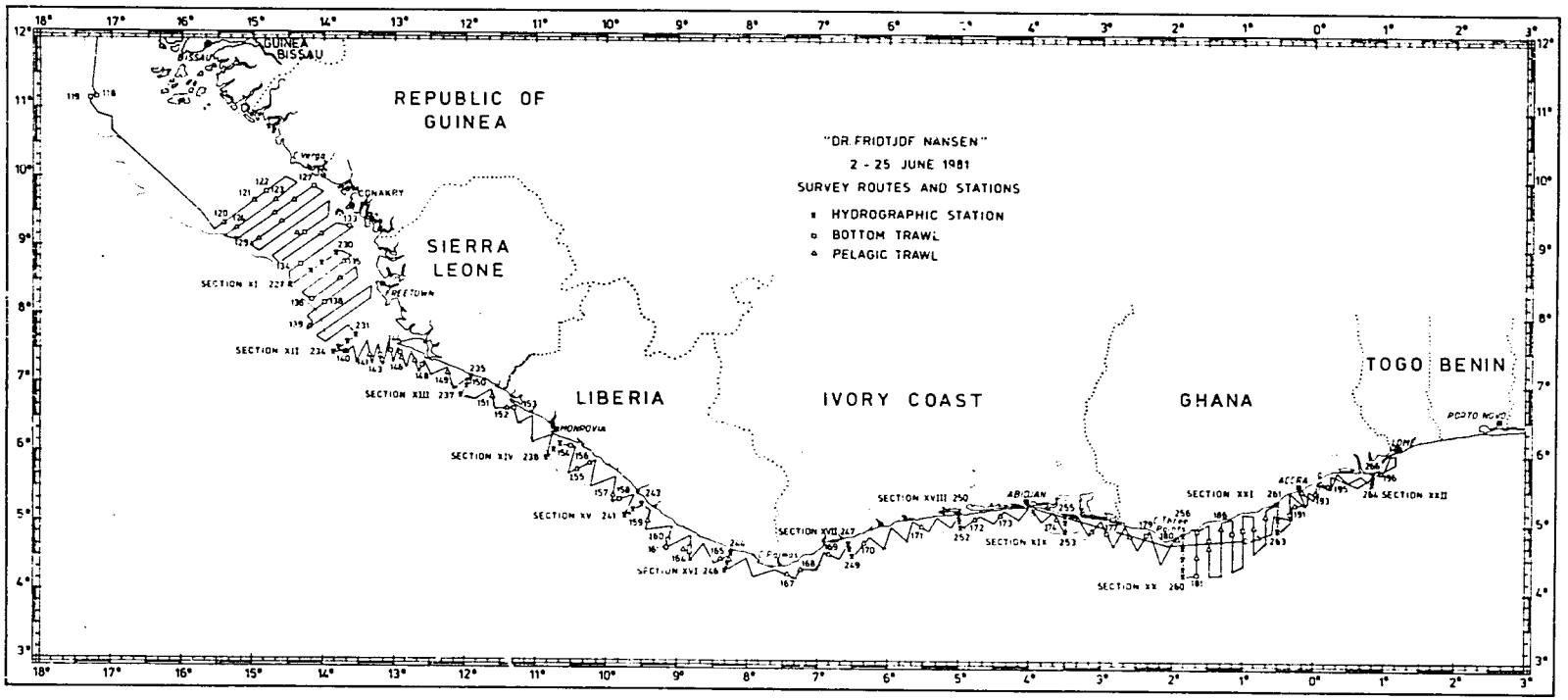


Fig. 2 Survey routes and stations. June 2-25 1981.

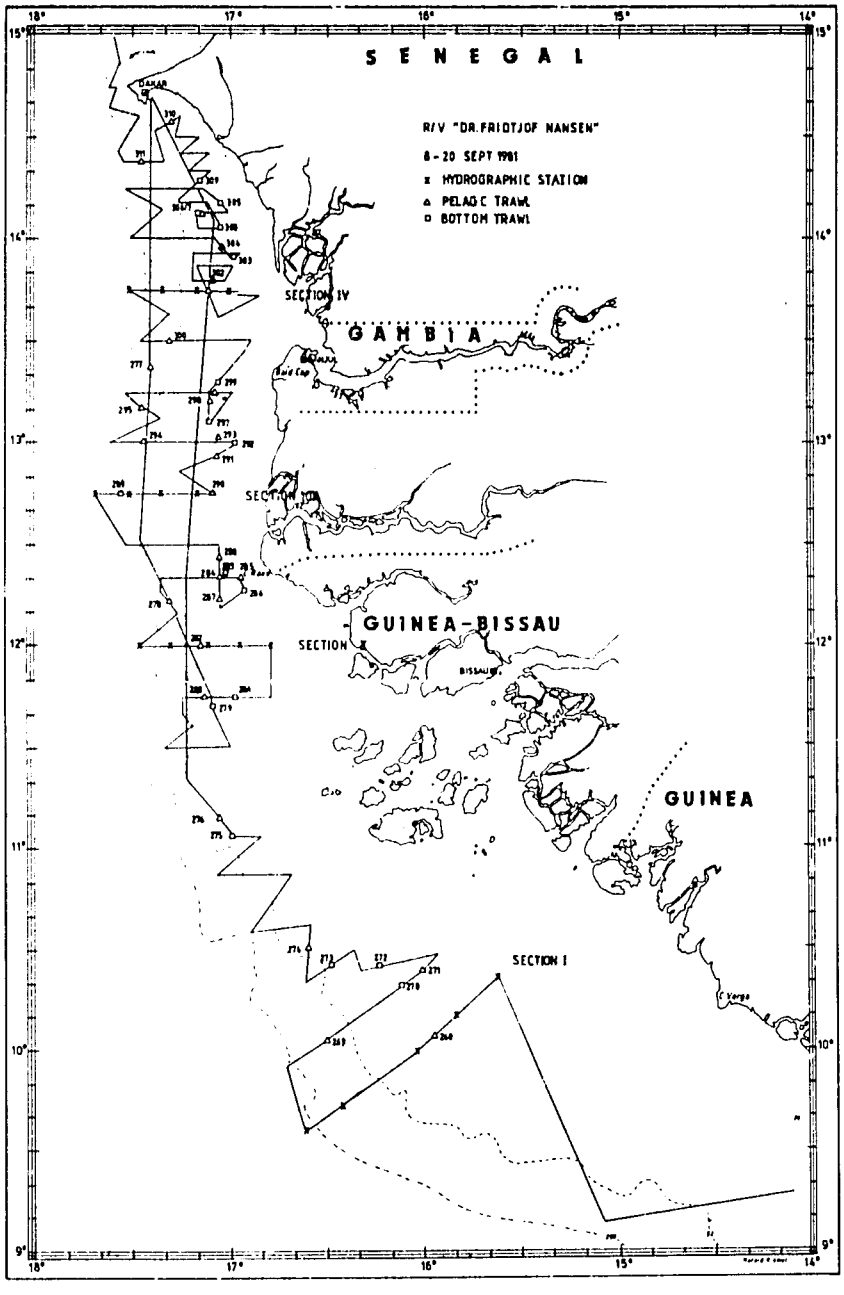


Fig. 3 Survey routes and stations. Sept 8-20 1981

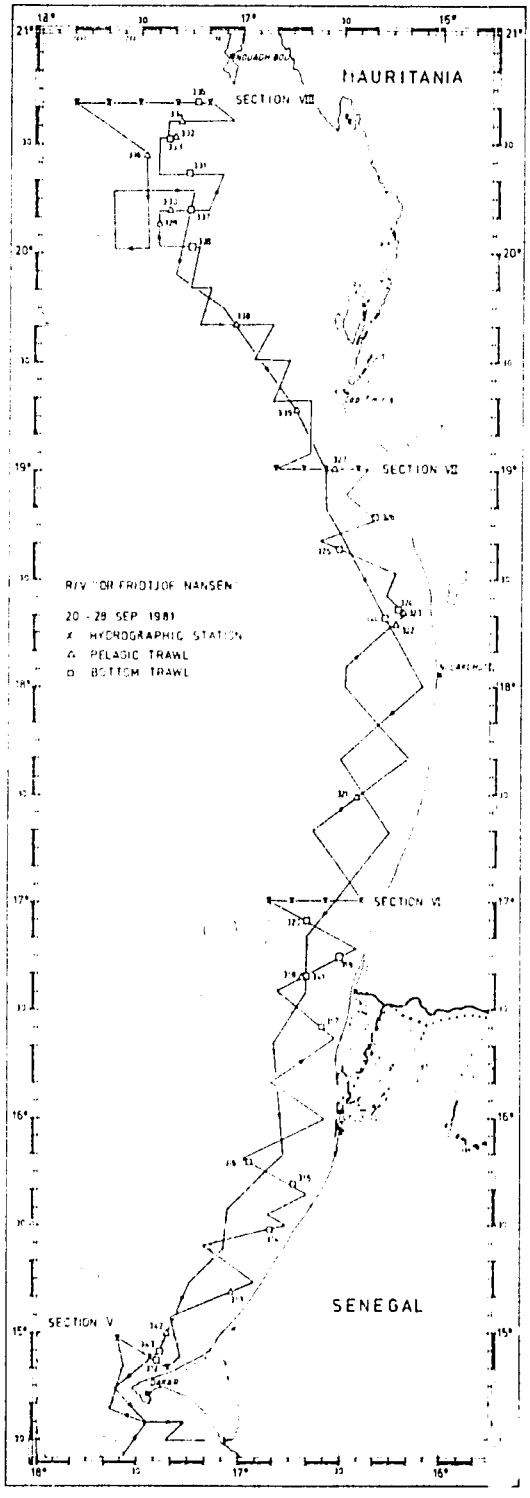


Fig. 4 Survey routes and stations. Sept 20-28 1981.

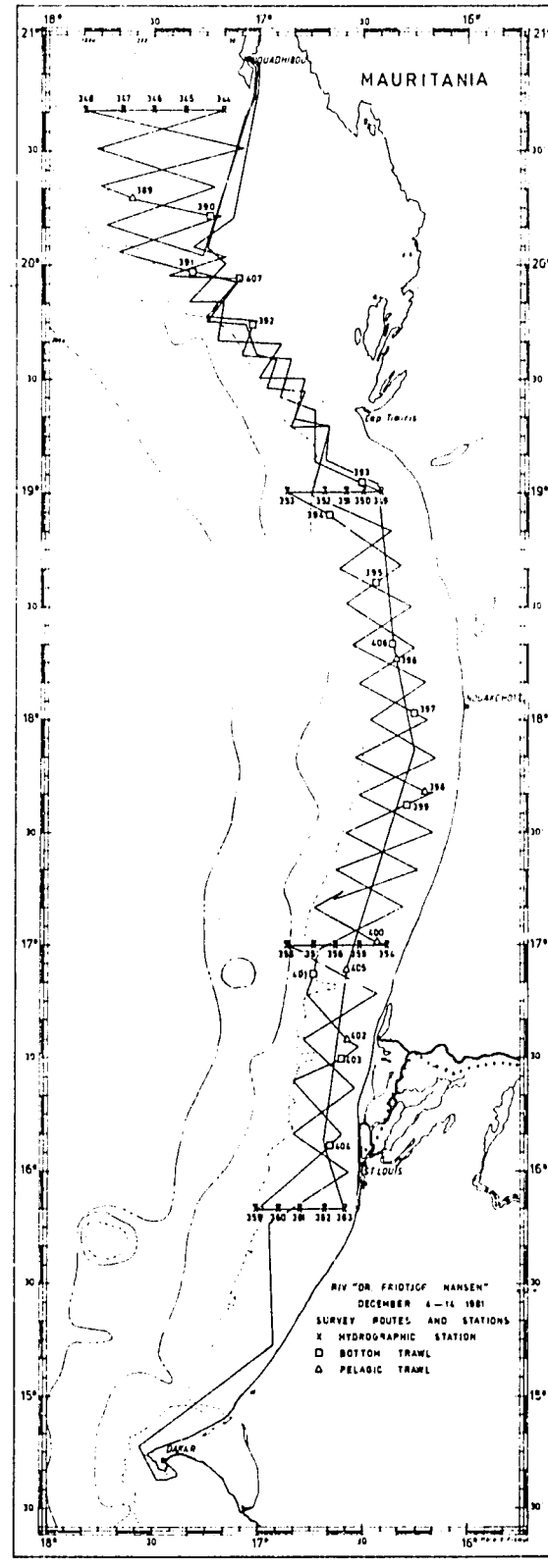


Fig. 5 Survey routes and stations. Dec 4-14 1981.

Table 1. Operational features of the surveys off West Africa.

Cruise no	Location	Dates	Days at sea	Distance travelled in survey area (nm)	Number fishing stations	Hydro-graphic stations
1	Cape Blanc - Cape Verga	25/4 - 26/5-81	29	4600	114	46
2	Cape Verga - Cape St.Paul	1-25/6-81	23	4450	86	40
3	Togo - Congo	4/8 - 3/9-81	23	3340	65	16
4	Bissagos Islands - Cape Blanc	4-30/9-81	25	4020	80	34
5	Cape Verde Islands	3/11 - 2/12-81	22	2700	43	27
6	Mauritania	4-14/12-81	10	2100	19	20
7	West-Sahara	15-19/12-81	4	740	-	-
8	Sherbo Island - Cape Blanc	8/2 - 17/3-82	34	6180	96	39
9	West-Sahara	17-20/3-82	3	750	-	-
10	Cape Bojador - Agadir	20/3 - 5/4-82	16	1860	9	-
Total survey time, distance in survey area and stations worked			189	30740	511	222
Lay-up of vessel, days			119			
Transfer of vessel, days and distance			10	4750		
Unexpected stop due to repair			10			
Days in period 25/4-81 - 5/4-82			345			
Days in harbour except from lay-up and repair			17			

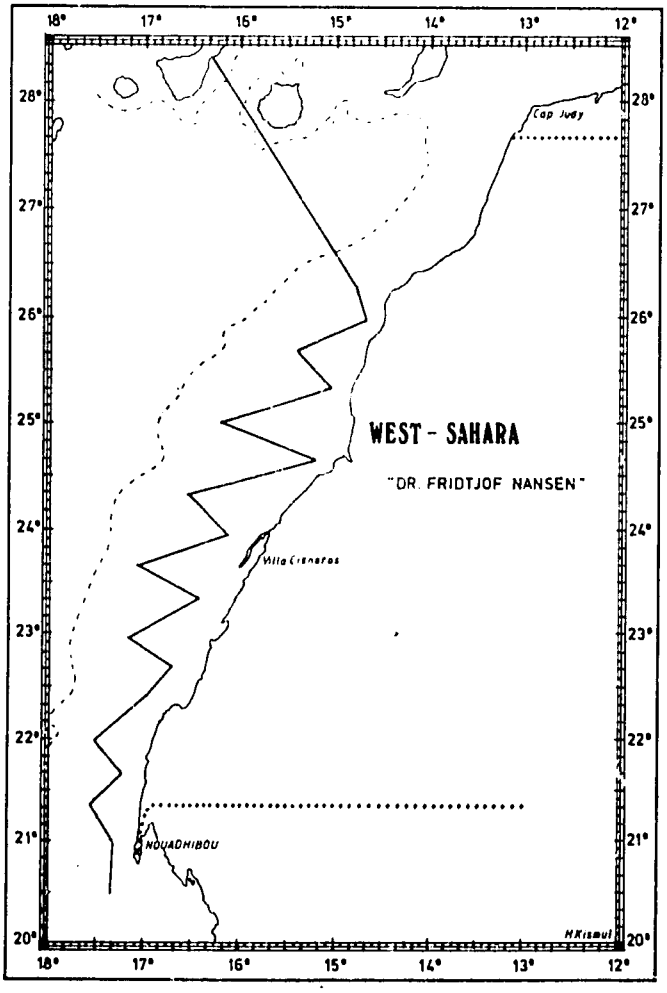


Fig. 6 Survey routes off Western Sahara. Dec 15-19 1981

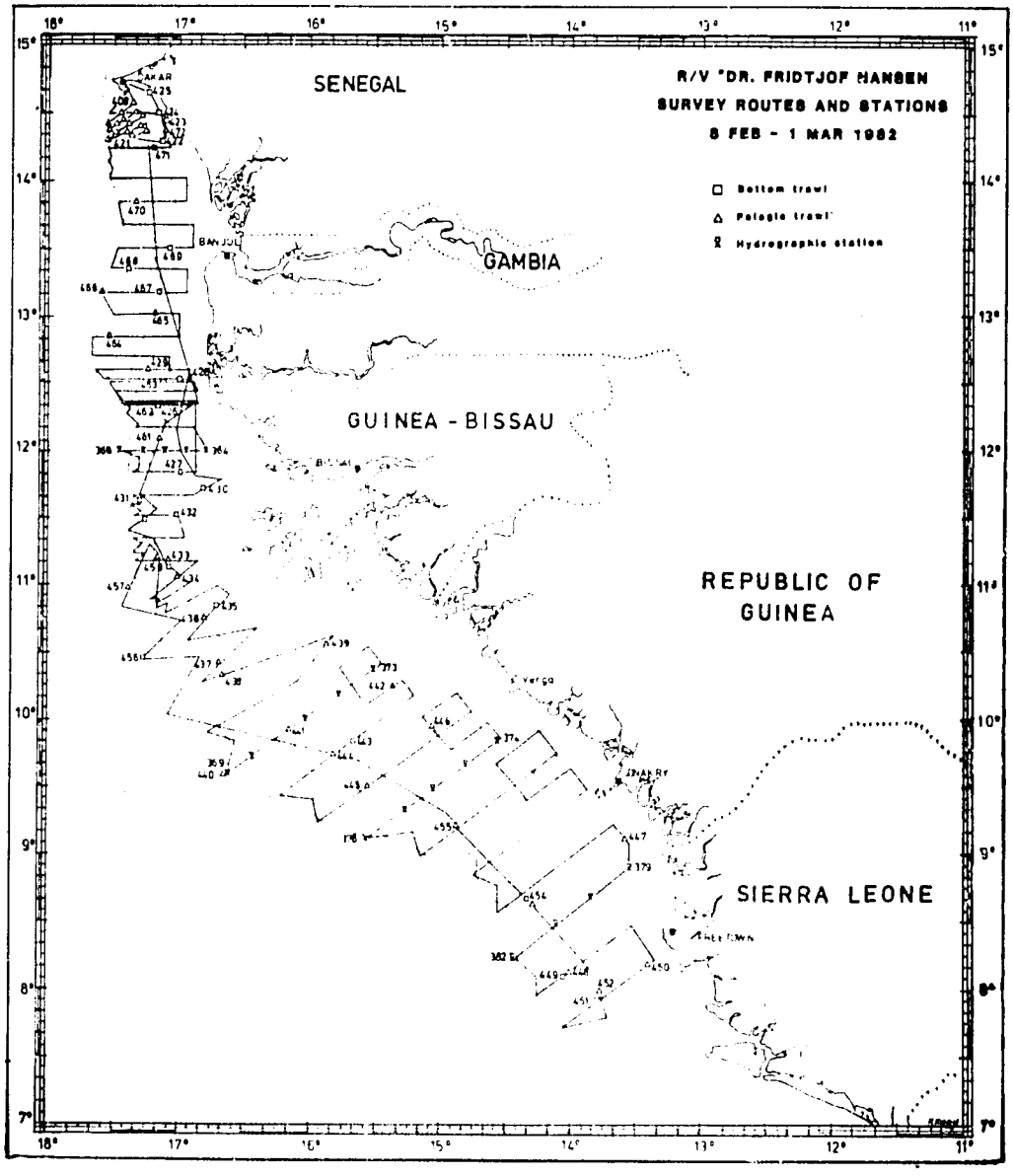


Fig. 7 Survey routes and stations. Feb 8 - Mar 1 1982.

The distance between the main acoustic transects was generally 10 nm and the shelf was usually surveyed from 10 m out to the 200 m depth limit. In Feb-82 the area off the Bissagos Islands was extended to the 500 m depth contour in order to study the deep-sea community.

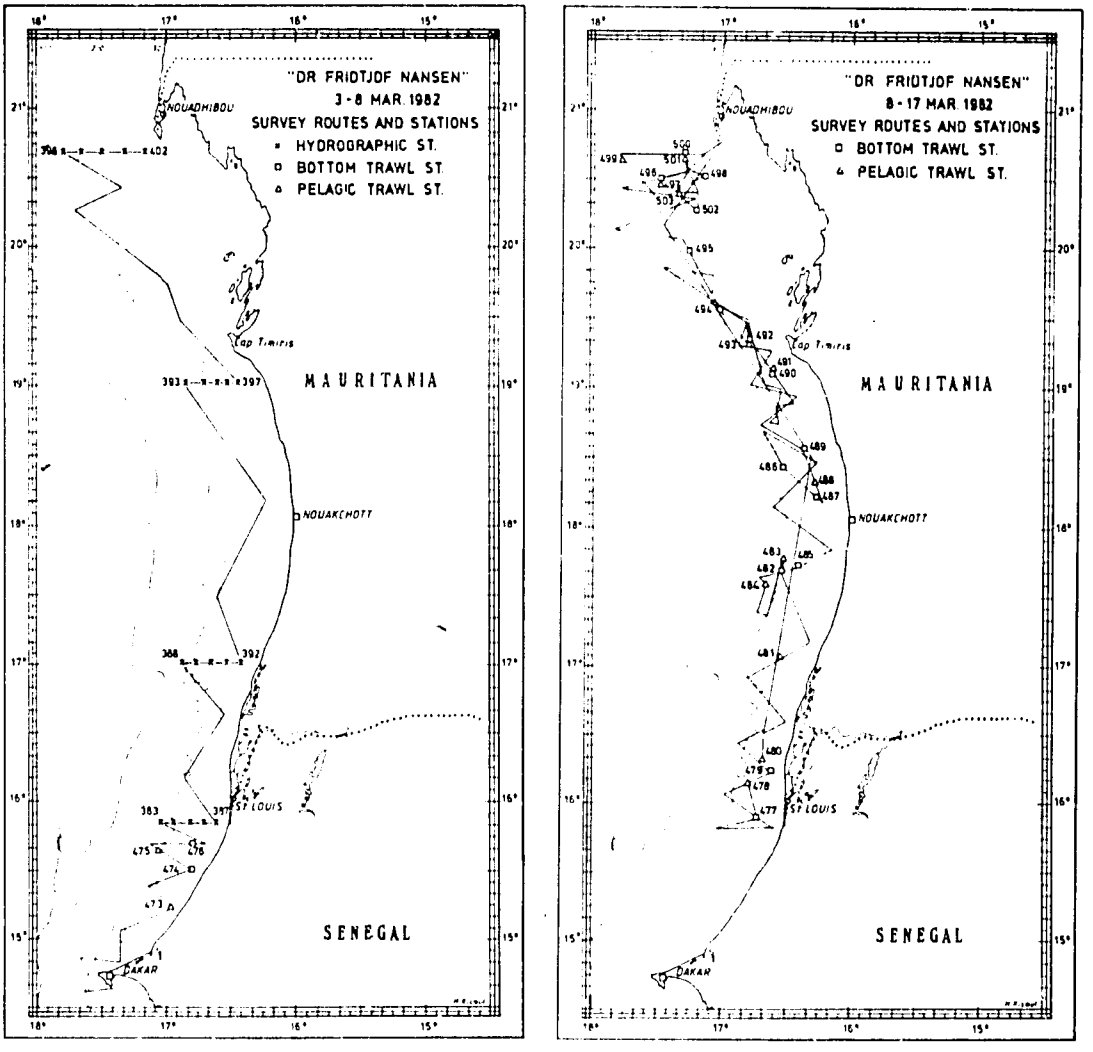


Fig. 8 Survey routes and stations. Mar 3-8 Mar 8-17 1982.

Estimates have been made of the area covered by the investigations, based on the distribution of the survey grids given in Figures 1-10, and these are shown in Table 2. Since the main fish distribution is limited to the shelf area, the shelf area covered by the survey has also been calculated. The outer regions of the shelf (to the defined limit of 200 m depth contour) have generally been fully covered, but the inshore shallow parts could often not be covered because of a safe operation depth limit of about 10 m for the ship. Quite fre-

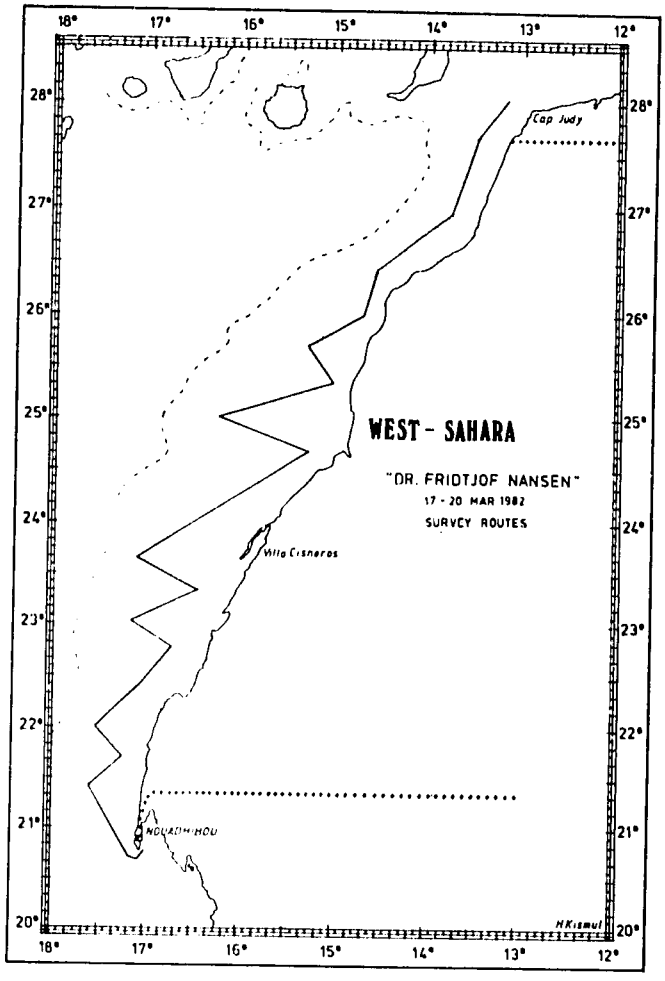


Fig. 9 Survey routes. Mar 17-20 1982

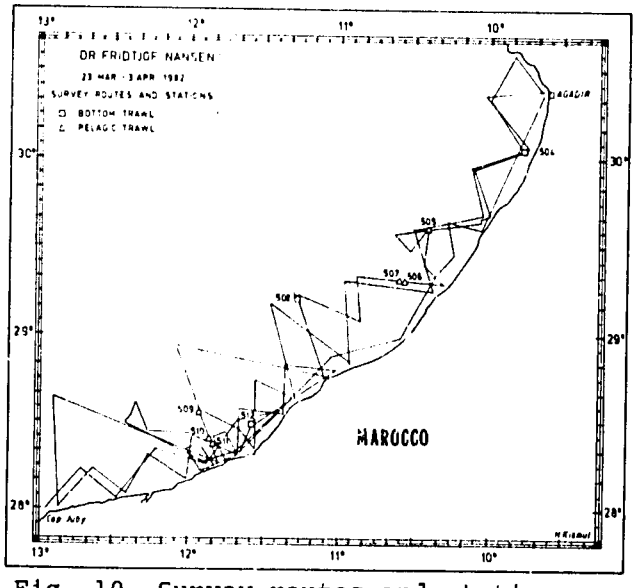


Fig. 10 Survey routes and stations.
Mar 20 - Apr 3 1982.

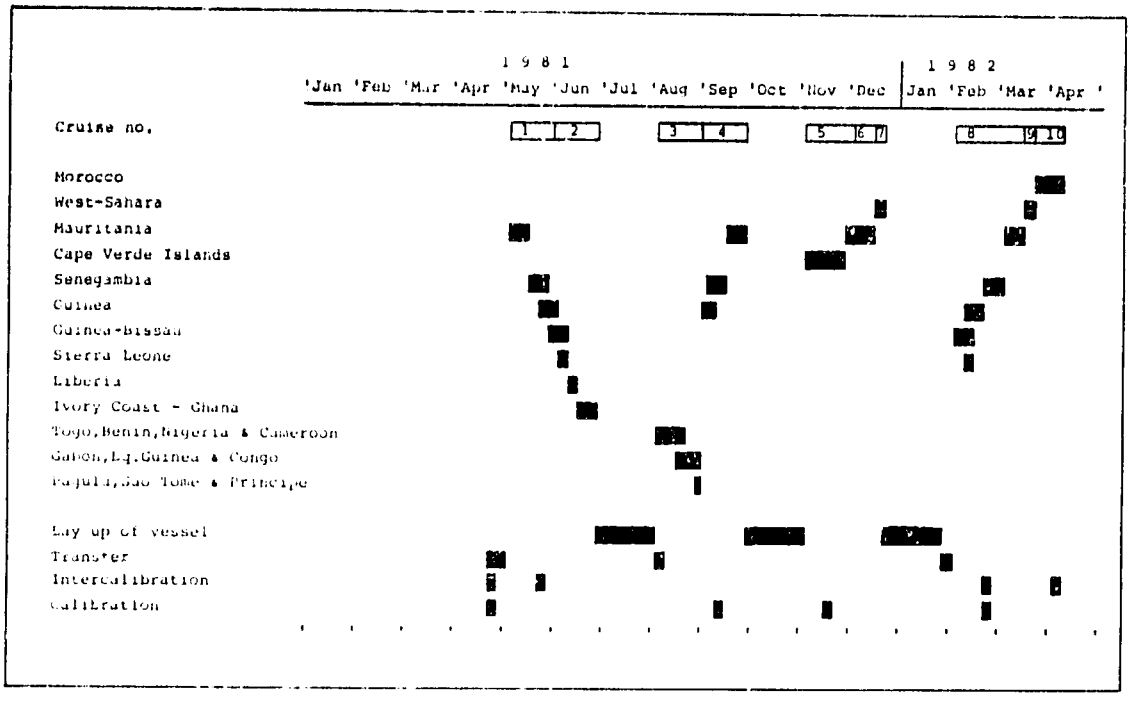


Fig. 11 Work calendar for R/V "Dr Fridtjof Nansen" off West Africa 1981-82.

Table 2. Main features on survey coverage of the cruises.

Area/Period	Shelf area 0 - 200 m (nm^2)	Shelf area covered (nm^2)	Shallow shelf area not covered (nm^2)	Nautical miles steamed	Survey intensity nm/100 nm^2
Marocco/Mar-82, 2 coverings Cape Juby-Agadir	4800	4300	500	1680	39
West Sahara/Dec-81	18200	12600	5600	740	6
/Mar-82	18200	11800	6400	750	6
Mauritania/May-81	10700	7100	3600	900	13
/Sept-81	10700	6900	3800	1160	17
/Dec-81, 2 coverings	10700	7300	3400	2110	29
/Mar-82, 2 coverings	10700	7000	3700	1260	18
Senegambia/May-81	9700	6800	2900	1730	25
/Sept-81	9700	7600	2100	1650	22
/Feb-82	9700	6400	3300	870	14
Cape Verde Islands/Nov-81	1450	1450	-	2000	43
Guinea-Bissau/May-81	11900	6100	5800	1160	19
/Sept-81	11900	6400	5500	640	10
/Feb-82	11900	7200	4700	1130	16
Guinea/May-June-81	13800	10300	3500	1380	13
/Sept, partial covering	10200	4500	5700	224	5
/Feb-82	13800	8600	5200	900	10
Sierra Leone/June	8100	5800	2300	815	14
/Feb-82, partial cov.		2600		355	14
Liberia/June-81	5700	5200	500	690	13
Ivory Coast/June-81	3600	3000	600	475	16
Ghana/June-81	7100	6600	500	1310	20
Togo-Congo/Aug-81	32700	20400	11900	2075	10
All surveys		165950		26000	16

quently this limit had to be set to 20 m due to lack of detailed navigational charts for the area. Estimates have been made of the extent of the shallow inshore shelf left uninvestigated in the various countries. The estimates of the total fish biomass are adjusted for these areas omitted from the surveys.

Estimates of survey intensity are also shown in Table 2, given as ratios between nautical miles steamed and 100 nautical miles^2 covered for the various countries.

The surveys off Morocco, Cape Verde Islands and the Dec-81 survey in Mauritania stand out as the most intensively surveyed areas, and in fact the areas were investigated twice during these surveys. On the lower side of the scale are the preliminary surveys off West-Sahara with only 6 nm travelled per 100 nm^2 covered. The other surveys are dispersed in the range 10-25 nm/100 nm^2 and with a mean of 16 for all surveys.

1.3 General Problems of Interpreting the Acoustic Abundance Estimates

The precision in biomass estimates from acoustic surveys is based on a number of factors which can be summarized in the following key-words:

Detection
Screening effect
Representative sampling
Identification
Conversion factors

Detection

Assessing fish biomass by means of acoustic data is a method which especially lends itself to fish found in schools or other aggregations in midwater. The dominant species in West African waters, in terms of biomass, exhibit this type of behaviour. On the other hand surface schooling tunas and tuna like species and strictly bottom-dwelling fish such as rays and flounders

will escape echo sounder detection. Also any fish found within ½-1 m of the bottom will not be observed by the acoustic system. Recent analysis on paired data from acoustic and trawl surveys (Saetersdal et al. (1983)) indicate that the bias due to lack of information from this zone may be less than earlier expected. For the dominant species in West African waters there does not seem to be any major problem in acoustic detection.

Screening effect

In areas with high densities of plankton it is difficult for the scientists assessing the echotraces to distinguish registrations of fish from those of plankton, and this is still more arduous when the fish densities are low. In West African waters the plankton did not cause any major problems during the surveys northwest of Liberia, but from there to the Congo the plankton occurrences often shaded the generally scattered fish registrations, and the precision of the biomass estimates was significantly affected.

Representative sampling

In all kinds of sampling work it is important that the sampling device does not significantly affect the distribution in situ. However, it is likely that a 150 foot vessel with a 1500 hp engine like "Dr. Fridtjof Nansen" does have an effect on the behaviour of the fish. If the fish dives in response to the approaching vessel, the echo received will change according to the downward angle of the fish, and if the fish swims perpendicular to the ship's track, it may totally escape echo sounder detection.

The problem of avoidance increases in shallow waters and is especially valid during day time and for the fast swimming species. The phenomenon may constitute a serious problem in acoustic surveys and, although investigations have been made, no means of quantification exists. We have therefore in this report not corrected for avoidance. The biomass estimates are

therefore likely to be underestimates, especially in the cases of the sardinellas and horsemackerel. Conversely, the triggerfish (Balistes capriscus) seems not to respond significantly to the vessel, which makes it quite amenable to acoustic investigation.

Identification

The problem of adequate sampling is also relevant when trawling on multi-species fish registrations in order to identify the traces and allocate the density figures to the different species. The fish's catchability may be species- and size dependent, and trawl data must be used with reservations when allotting the echo integrator values to the different species.

During the daily judgements of the echo traces the integrator values were allocated to five main groups: a) plankton, b) clupeoids and anchovies, c) horsemackerels and scads, d) triggerfish and e) other fish. The separation was made partly on basis of the characteristics of the traces and partly on the composition of the catches. If the integrated densities within an area are made up of fish from several of these categories, it is evident that misallocations can occur, especially if the fishes' reactions to the gear are disparate. Thus the total abundance estimates are more reliable than the ones on a more specific level.

In this report we have also made use of the trawl data to separately assess the dominant species' relative importance in the area, using roughly calculated abundance indices. These indices have been combined with the acoustic estimates to provide rough abundance estimates on the species level. From this it follows that the estimates for the species level must only be interpreted as very tentative and are more suggestive of orders of magnitudes than precise estimates.

Conversion factors

The output from the echo integrator gives relative values of fish density. These are to be converted to absolute biomass figures by means of a multiplication factor C which is dependent both on the size and the species of the fish. Lacking special conversion factors from West African species, we have made use of conversion data from cod and herring in our calculations. Corrections have been made for the length of the fish but not for the species.

In spite of the problems and uncertainties mentioned here, acoustic surveys have often proved to provide good if often conservative indications of the abundance of fishery resources.

2 RESULTS FOR THE MAIN OPERATIONAL AREA MAURITANIA - SIERRA LEONE, INCLUDING TWO PARTIAL (ACOUSTIC) SURVEYS OFF WEST-SAHARA

2.1 Hydrography

The hydrography of the survey area was observed in sections across the shelf, extending just beyond the edge. The surface layer temperature was continuously recorded along the cruise track by a sea-surface thermograph.

The temperature distribution as observed in the surface layer during the cruises in May-, Sept- and Dec-81 and Feb to Mar-82, is shown respectively in Figures 12-15. These temperature charts agree well with the general seasonal fluctuations of the hydrographic regime in the area as described in Troadec and Garcia (1980).

During the cruise in May-81 the area north of Cape Verde was still characterized by northern winter. Temperatures below 20°C are indicative of upwelling in this area. The frontal zone to

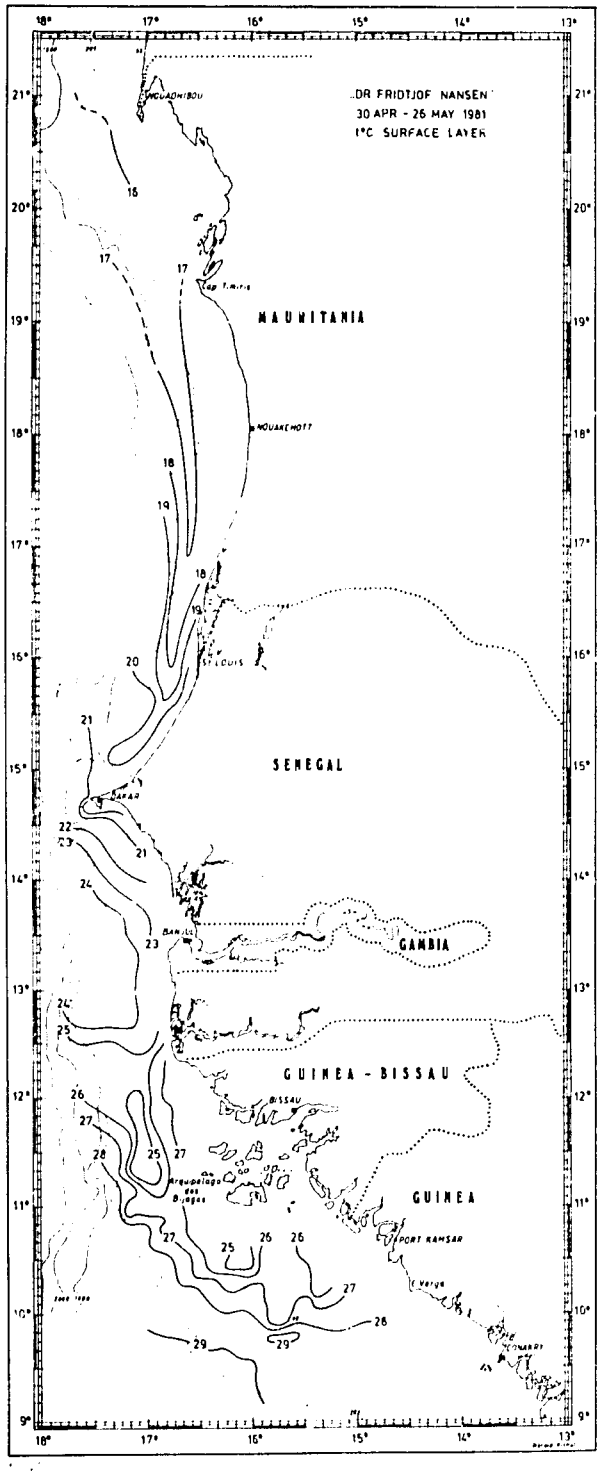


Fig. 12 Temperature in surface layer, Cape Blanc to Cape Verga, Apr 30 - May 26, 1981.

the south of the upwelling area was observed south of Cape Verde, but was not very well defined. The temperature distribution between Cape Verde and Cape Verga was rather complex, possibly in connection with the transition period between northern winter and summer and the associated northward shift of the front between tropical surface water and upwelled water.

In September this front was observed off Cape Timiris where the temperatures in the surface layer increased from about 21°C to above 28°C (Fig. 13a). South of the front the surface layer had tropical characteristics and there was no evidence of upwelling.

In December the shelf area off Mauritania and Senegal (Fig. 14) was characterized by homogeneous surface temperatures close to 24°C. Indications of upwelling were observed only in a small area near Cape Blanc where temperatures were below 21°C. South of this area there was no evidence of upwelling. According to the general

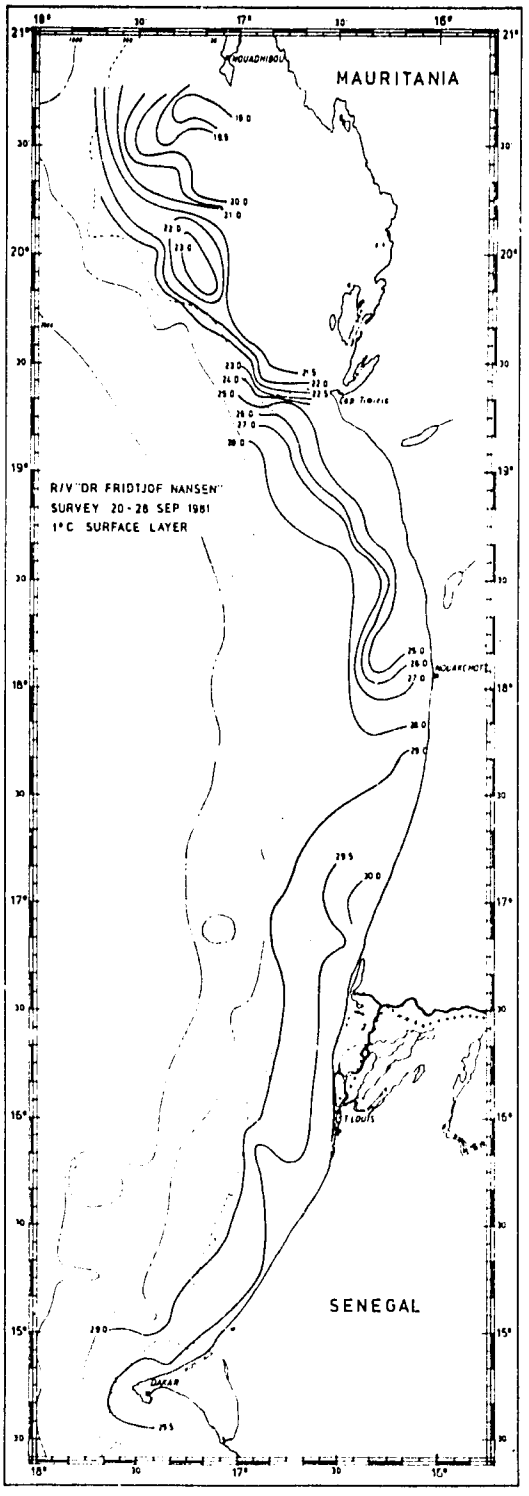


Fig. 13a Temperature in surface layer, Cape Blanc to Cape Verde, Sept 20-28, 1981.

seasonal trends the frontal zone is located off the coast of Guinea in this season. In agreement with this no clear front was observed in the survey area.

In Feb-Mar-82 the characteristics of northern winter were dominant and upwelling obviously occurred along the coast north of about 13°N. The surface temperatures were decreasing towards the coast with inshore temperatures generally below 17°C. Just south of Cape Verde there was an area with temperatures below 15°C (Fig. 15a) and north of Cape Verde extensive areas with temperatures below 16°C were found along the coasts of Mauritania, Western Sahara and Morocco (Figs 15b-d).

South of the Bissagos Islands, tropical surface waters with temperatures above 24°C covered most of the shelf area. The tongue of isotherms in the frontal zone south of the upwelling area was possibly associated with a southward drift of the upwelled waters and a northward current off the edge (Mittelstaedt,1982). In May-81 a similar pattern had been

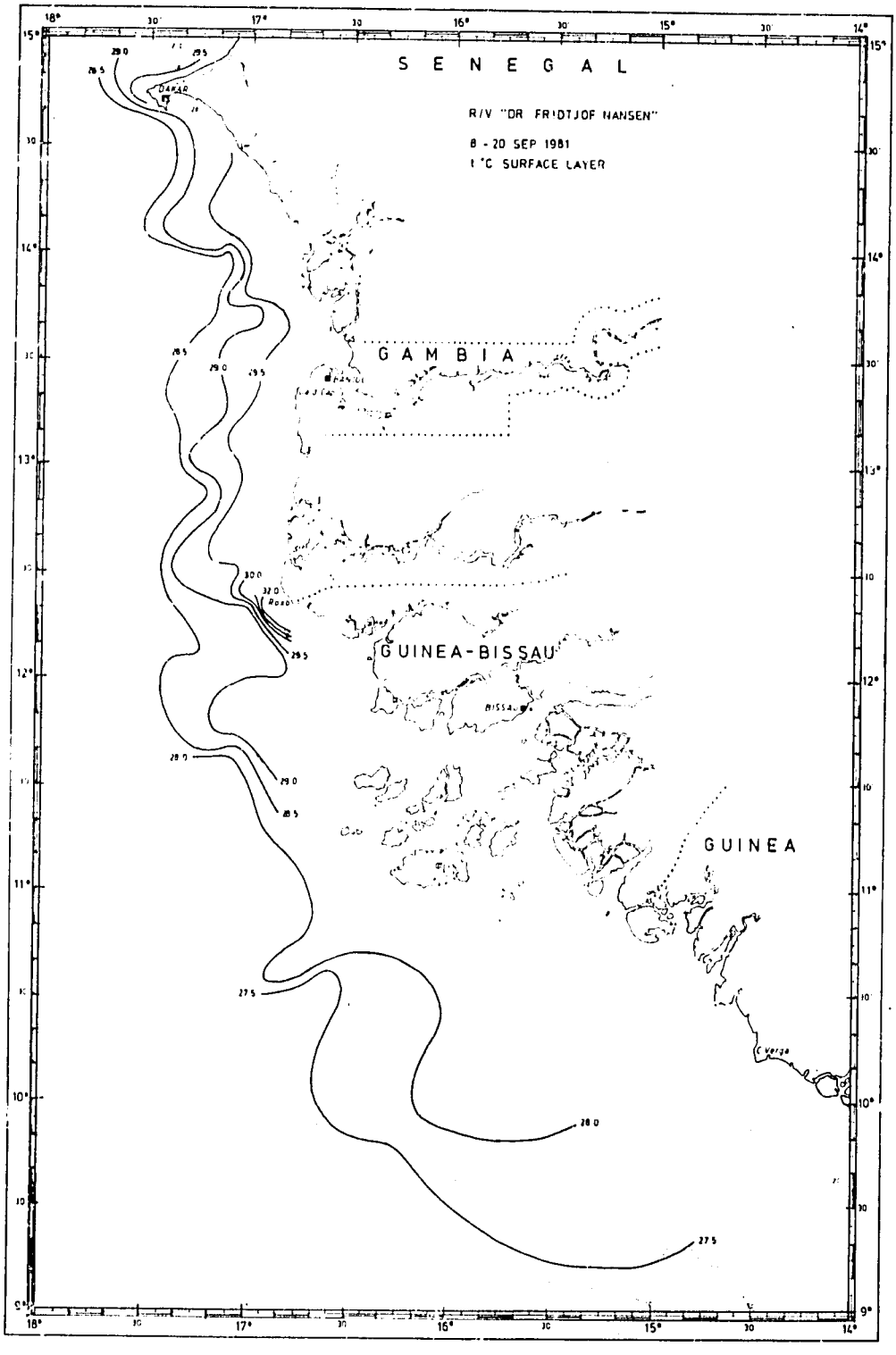


Fig. 13b Temperature in surface layer, Cape Verde to Cape Verga, Sept 8-20, 1981.

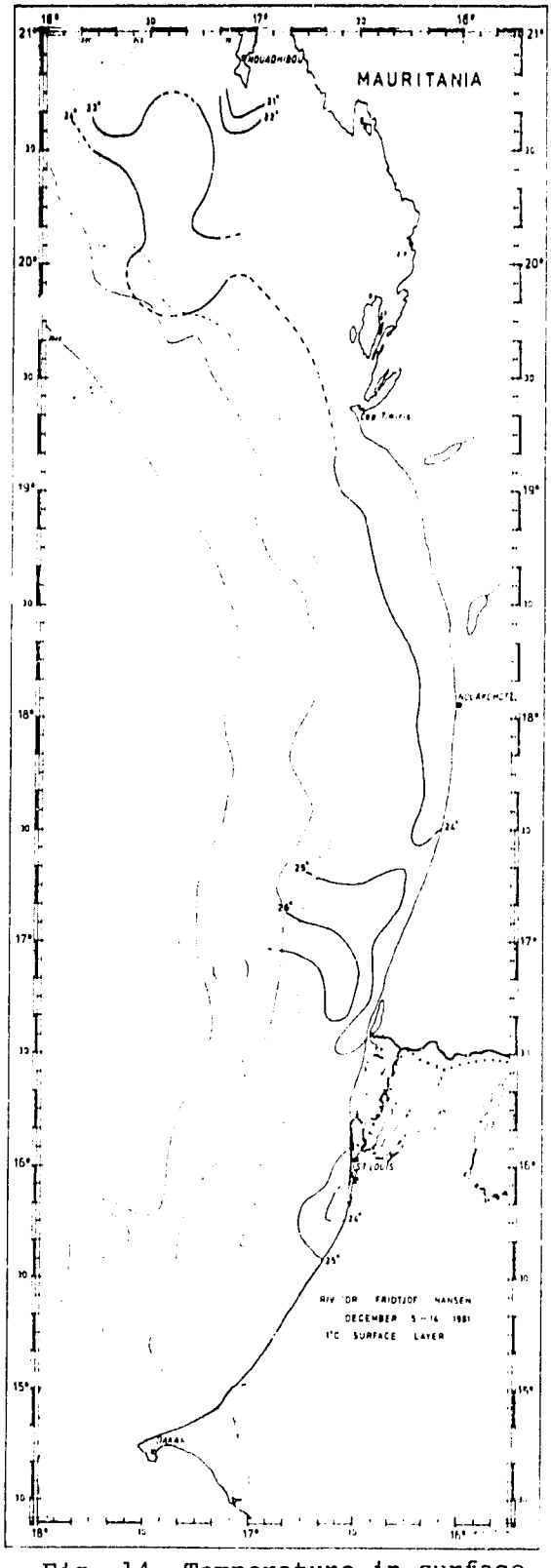


Fig. 14 Temperature in surface layer, Cape Blanc to Cape Verde, Dec 5-14, 1981.

observed just north of Cape Verde (Fig. 12) probably indicating that the upwelling area was dwindling at this time.

The sections covering the Cape Blanc - Cape Verde area in May-81 are shown in Fig. 16. In general the isolines tilted upwards towards the shore. In the two northernmost sections there was evidence of upwelling, but in the sections further south this structure could rather be ascribed to the southward current. South of Cape Verde (Fig. 17) a well defined thermocline was found with no indication of upwelling.

In Sept-81 the section off Cape Blanc revealed clear indications of upwelling (Fig. 18). However, further south a well-defined thermocline between 25 and 50 m depth indicated that no upwelling occurred. The sections worked south of Cape Verde are shown in Fig. 19.

The four sections worked between Cape Blanc and Cape Verde in Dec-81 are shown in Fig. 20. Moderate upwelling is possibly indicated in the two northern sections and the thermocline was observed at somewhat greater depth than in May and Sept-81.

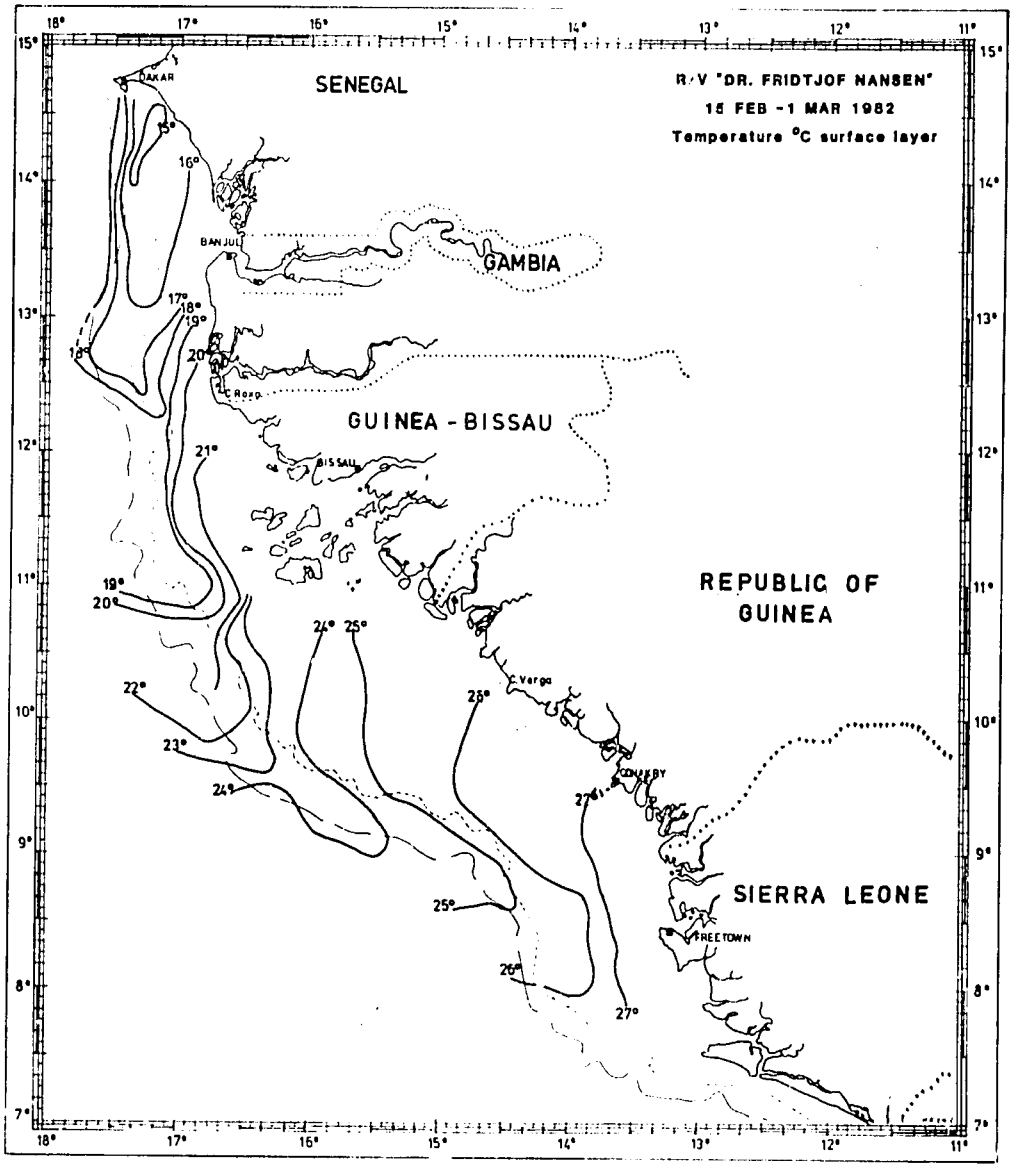


Fig. 15a Temperature in surface layer, Freetown to Cape Verde, Feb 15 - Mar 1, 1982.

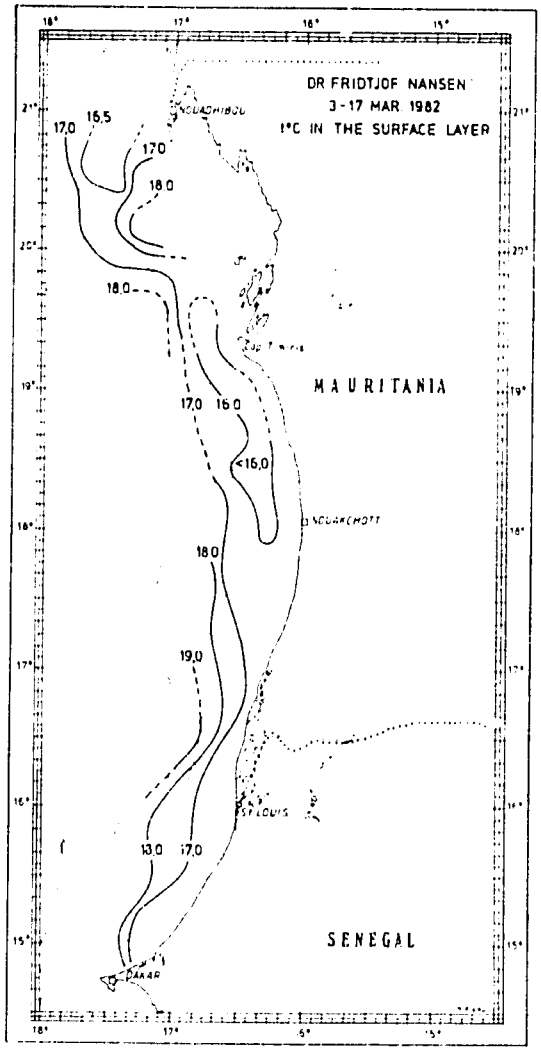


Fig. 15b Temperature in surface layer, Cape Verde to Cape Blanc, Mar 3-17, 1982.

Four sections worked between Cape Blanc and Cape Verde in Mar-82 are shown in Fig. 21. The distribution of temperature, salinity and density in these sections clearly showed an upwelling situation. The temperatures in near surface layers were between 18° and 15°C, decreasing towards the shore. The associated salinities were between 35.6 and 36.0‰. These characteristics indicate that South Atlantic central water was an important component of the upwelling water masses. T-S relationships for the various sections (not shown in figures) revealed a northward decrease in the admixture of South Atlantic central water and a correspondingly increased admixture of North Atlantic central water.

Sections VIII and IX, respectively to the north and south of Bissagos Islands, were worked in February 1982. They did not give any clear indications of upwelling. The density structure was suggestive of a southward flow near the edge and a northward flow of warmer, less saline waters of tropical origin over the shelf.

The surface layer in sections X and XI showed tropical charac-

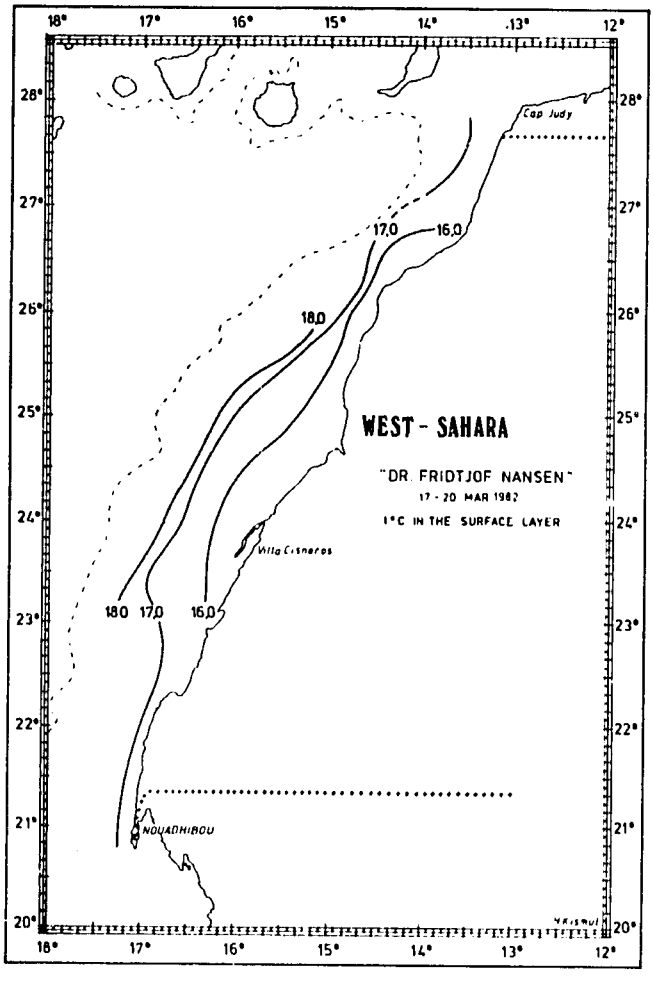
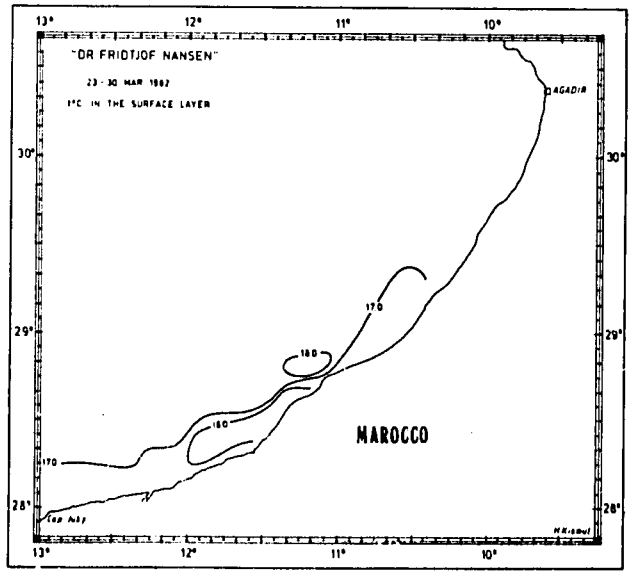


Fig. 15c Temperature in surface layer, Cape Blanc to Cape Juby, Mar 17-20, 1982.

Fig. 15d Temperature in surface layer, Cape Juby to Agadir, Mar 23-30, 1982.



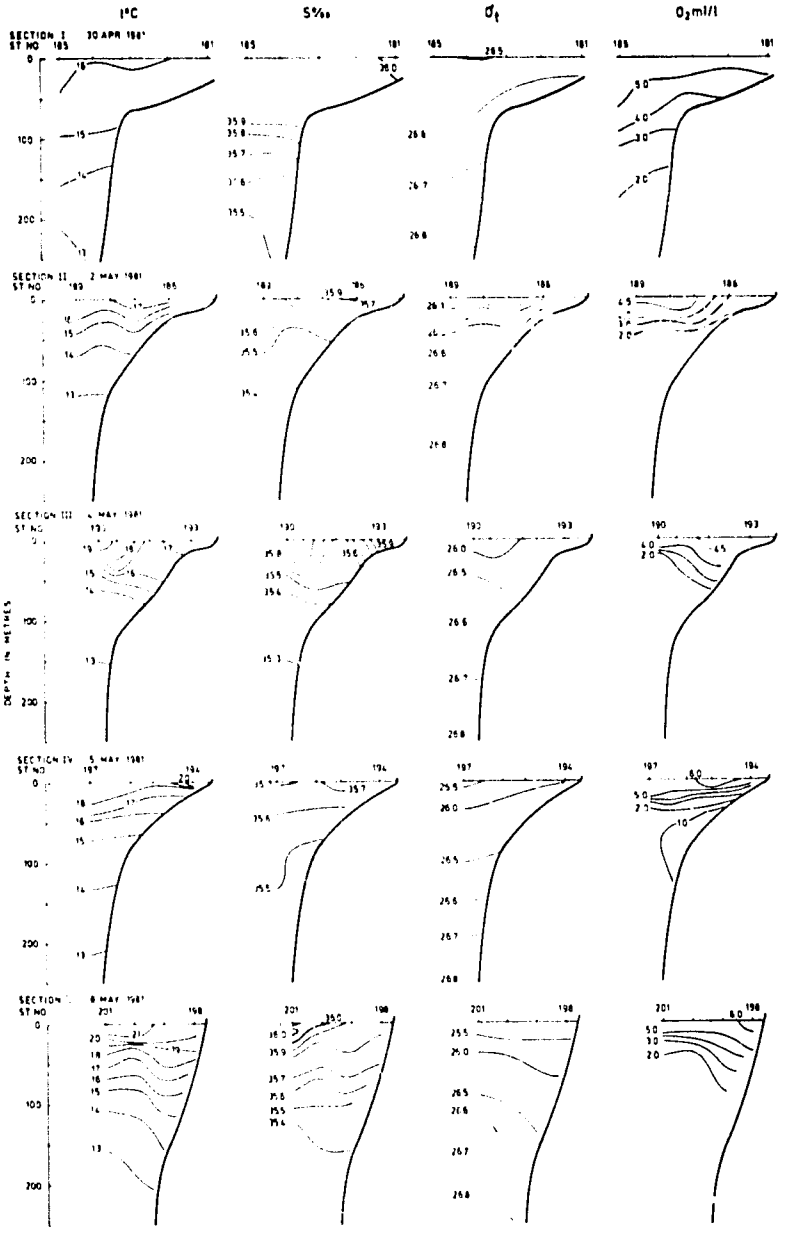


Fig. 16 Hydrographic sections in the area Cape Blanc to Cape Verde, Apr 30 - May 8, 1981.

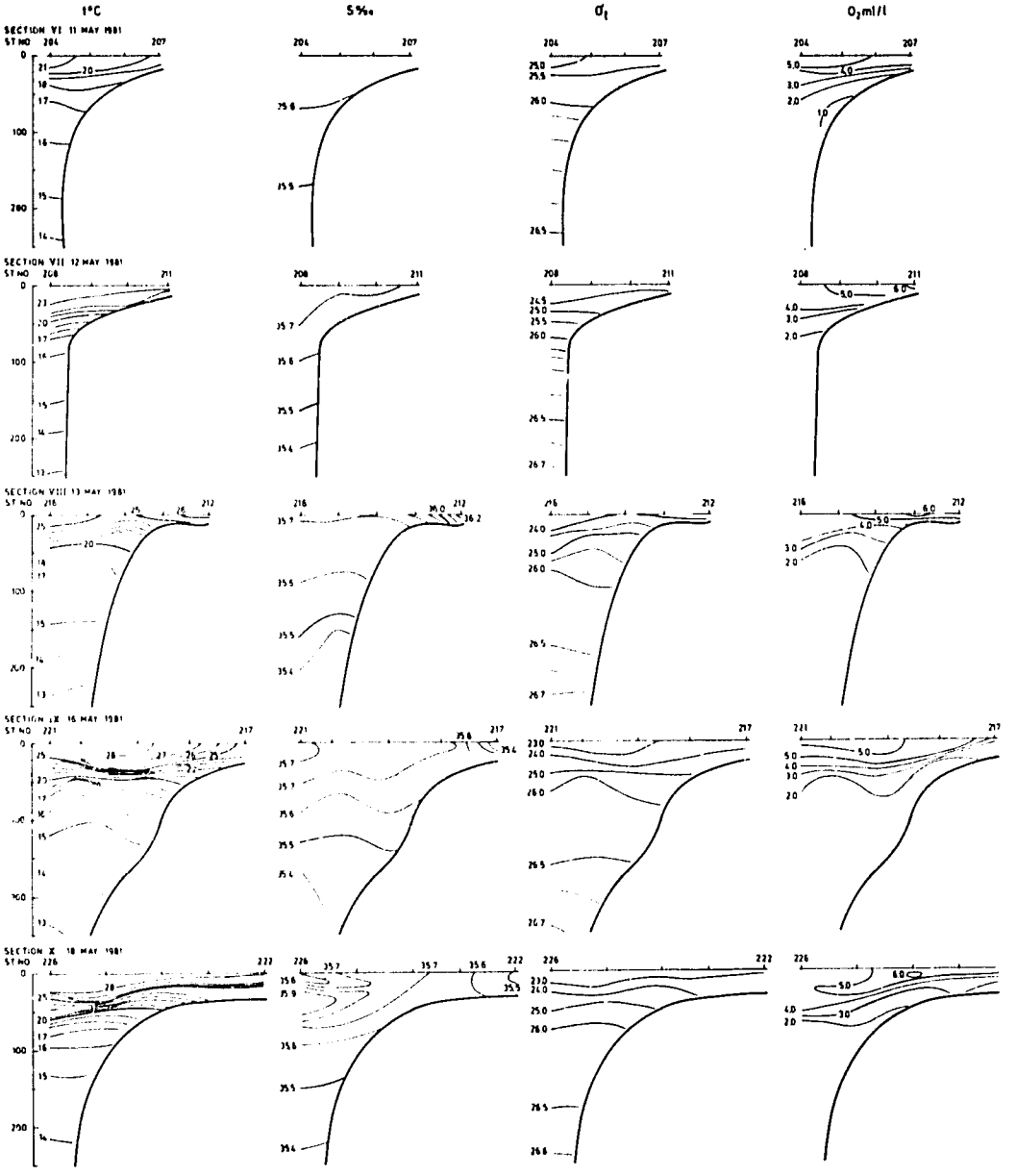


Fig. 17 Hydrographic sections in the area Cape Verde to Cape Verga, May 11-18, 1981.

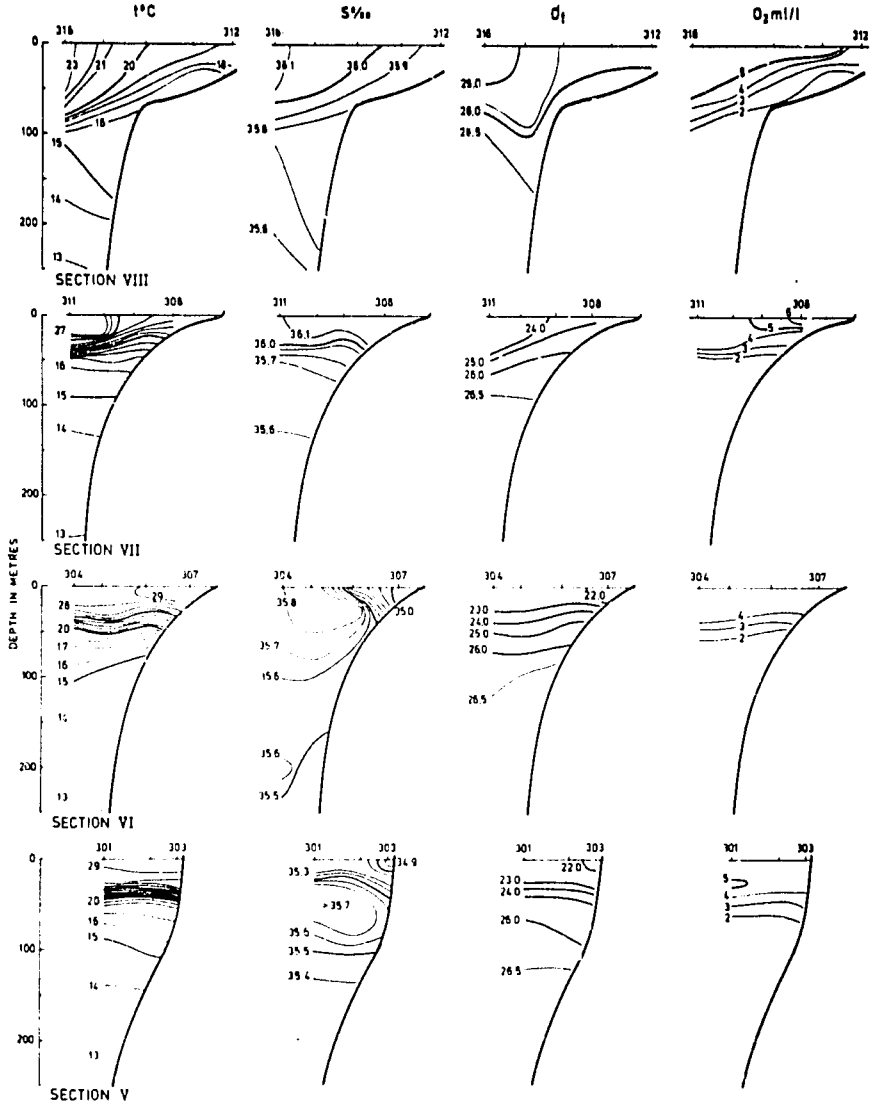


Fig. 18 Hydrographic sections in the area Cape Blanc to Cape Verde, Sept 20-28, 1981.

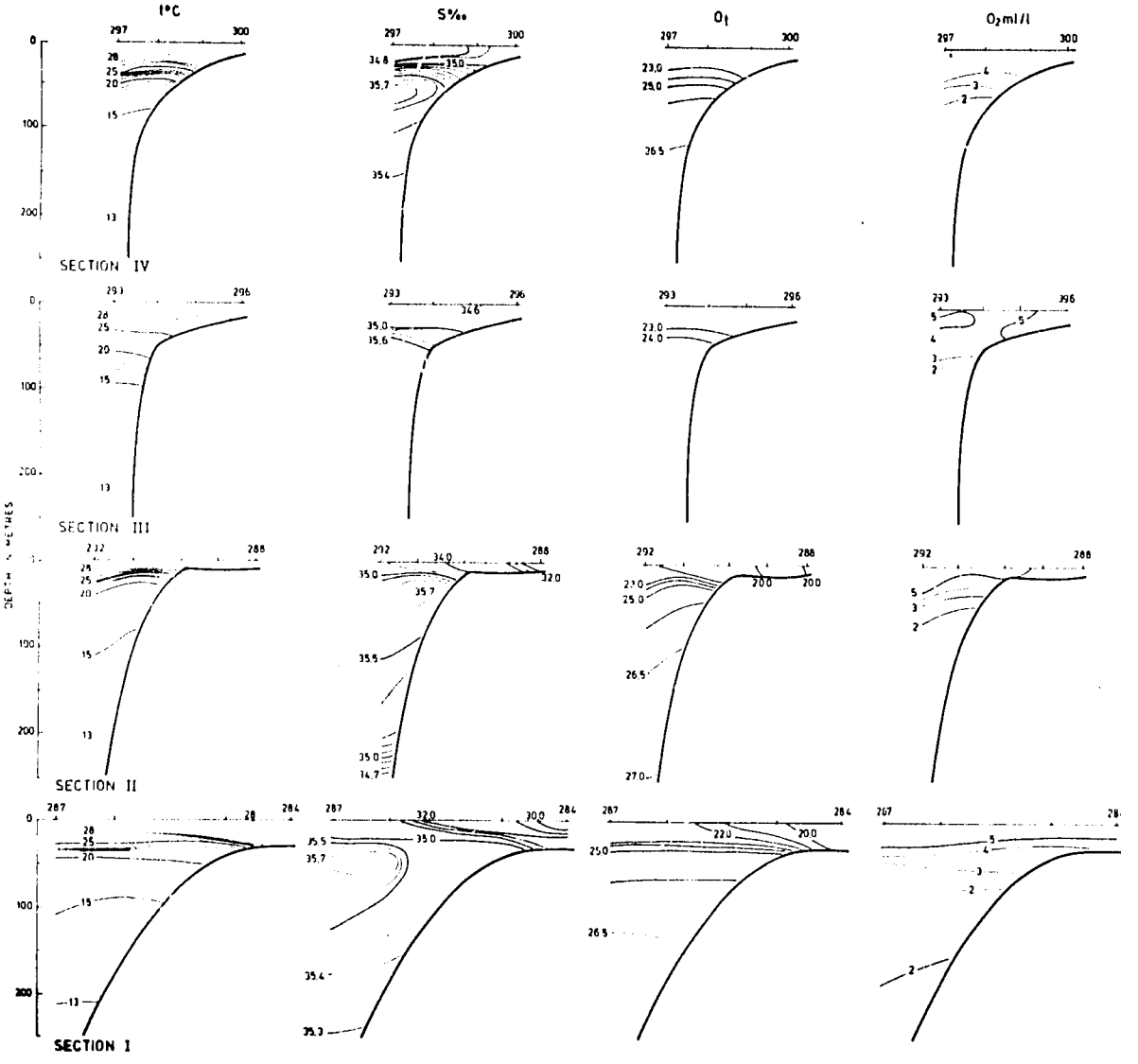


Fig. 19 Hydrographic sections in the area Cape Verde to Cape Verga, Sept 8-20, 1981.

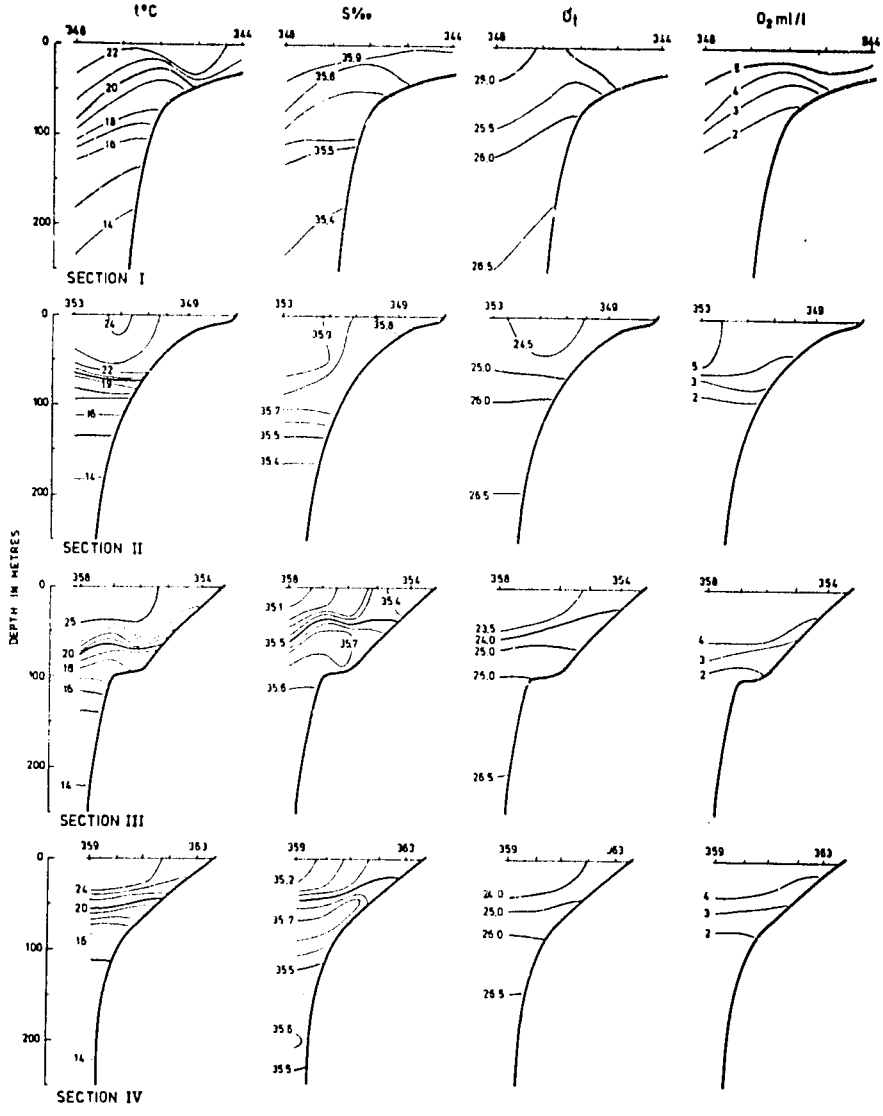


Fig. 20 Hydrographic sections in the area Cape Blanc to Cape Verde, Dec 5-14, 1981.

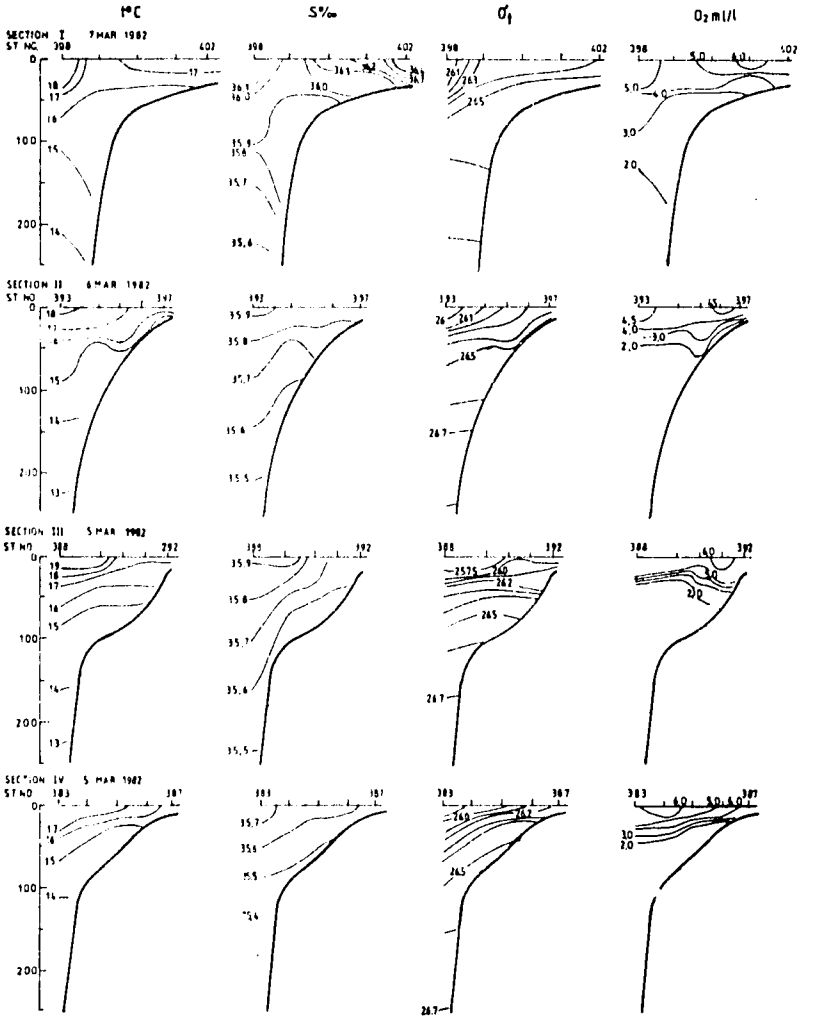


Fig. 21 Hydrographic sections in the area Cape Blanc to Cape Verde, Mar 3-17, 1982.

teristics with temperatures above 25°C and salinities below 35.5°/oo. There were no indications of upwelling.

The density structure in the various sections and the temperature distribution at the surface are in general agreement with the model presented by Mittelstaedt, 1982. When upwelling occurred north of about 13°N during the northern winter there was a southward current near the coast. Further offshore, just past the shelf edge there were indications of a northward countercurrent. In Feb-82 such indications were observed south to the Guinean coast (Fig. 22). Such a structure also possibly occurred north of Cape Verde in May-81 (Fig. 16).

The observations between Cape Blanc and Cape Verde indicated that in May-81 upwelling associated with the past northern winter still occurred south of Cape Blanc. In September there was no upwelling and in December there were indications of moderate upwelling only close to Cape Blanc. In February 1982 the upwelling system was fully developed.

The distribution of dissolved oxygen indicates that an oxycline generally coincides with the thermocline. Here the oxygen content decreases with depth to less than 2 ml/l below the thermocline, i.e. at depths with temperatures below about 18°C. Below the mixed surface layer there is a well-defined interrelation between temperature and oxygen content.

In Jun-81 sea-surface temperatures were observed along the coast between Cape Verga and the Ghana-Togo border. The temperatures were generally between 27°C and 30°C, but close to the Ghana coast, temperatures below 26°C indicated that the local seasonal upwelling had just started (Fig. 23).

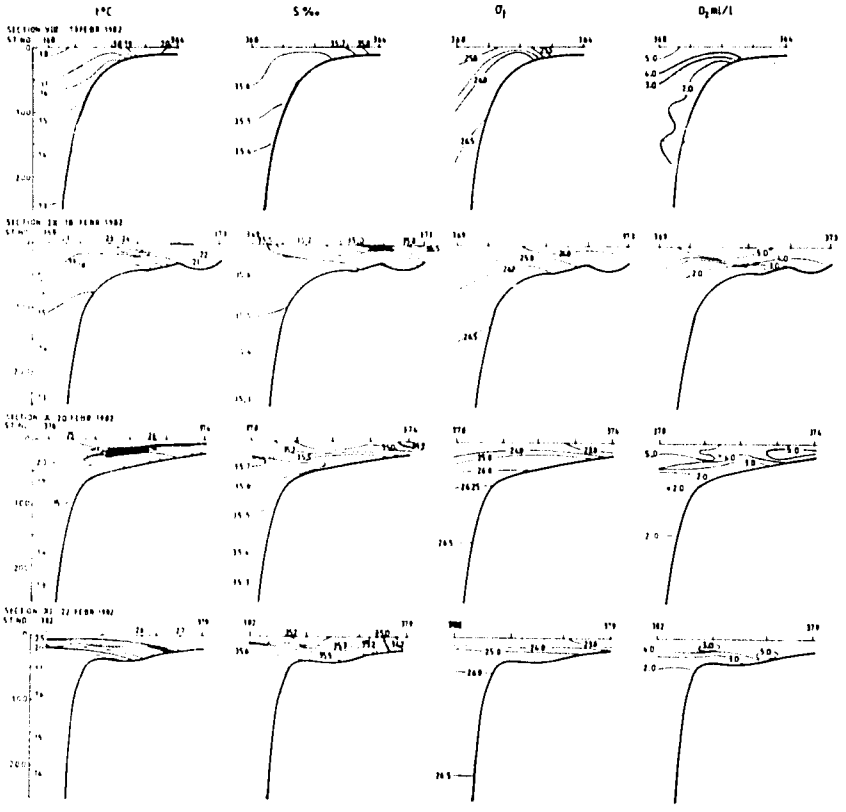


Fig. 22 Hydrographic sections in the area Cape Verde to Freetown, Feb 8 - Mar 1, 1982.

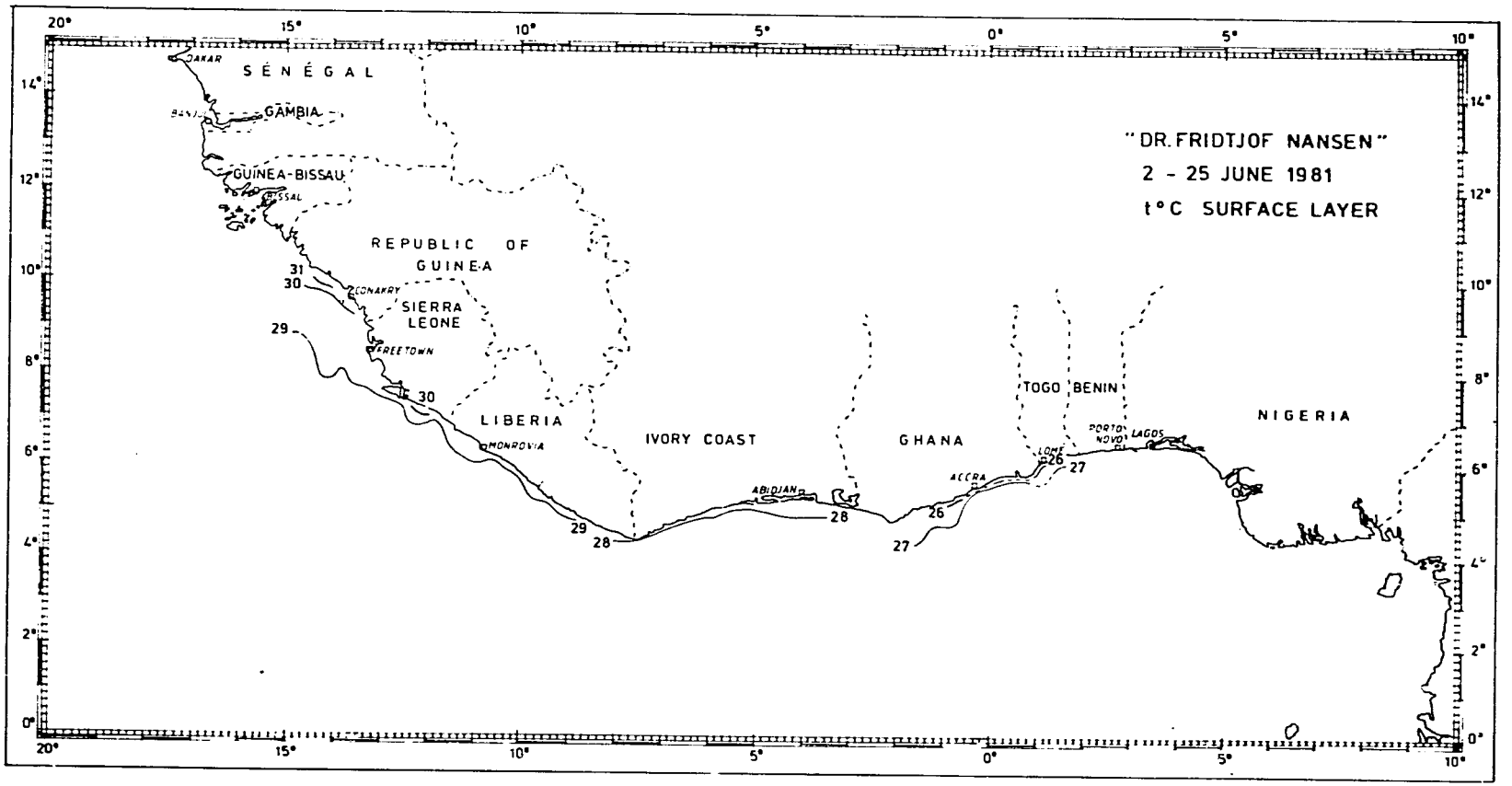


Fig. 23 Temperature in surface layer, Guinea to Ghana, June 2-25, 1981.

2.2 Total Biomass and its Distribution Mauritania - Sierra Leone including Total Fish Estimates off Western Sahara

Figures 24-32 show the fish distributions from all surveys in three density levels: scattered, slightly gathered and dense. In mean absolute densities these levels correspond roughly to 14-140 tonnes/nm^2, 140-280 tonnes/nm^2 and greater than 280 tonnes/nm^2.

The dominant species in the different locations are identified by trawling and marked off in the figures by a species code. The estimates of fish density and abundance for the various countries and surveys are given in Table 3, and illustrated in Fig. 33. The procedure for the estimations is given in Annex I. It will be seen from Table 3 that the grand totals include estimates for the shallow uninvestigated parts of the shelf. These estimates are based on the general assumption that the density per unit area in the shallows is equal to that of the shelf areas surveyed.

Table 3. Estimates of fish biomass Mauritania to Sierra Leone.

	Pelagic 1 Clupeids and anchov.	Pelagic 2 Carangids	Balistes Trigger fish	Other fish	Total	Mean density in surveyed area tonnes/nm^2	Estimate for shallow unsurveyed area	Estimated Grand Total
West Sahara, Dec-81	x	x		x	430	34	190	620
Mar-82	x	x		x	1360	115	730	2090
Mauritania, May-81	60	370	-	30	460	65	230	690
Sep-81	100	190	2	70	360	52	200	560
Dec-81	15	470	0	40	525	72	240	765
Dec-81, replica survey	-	370	0	50	420	58	200	620
Mar-82	50	470	0	260	780	110	400	1180
Mar-82, replica survey	40	170	0	450	660	94	350	1010
Senegambia, May-81	210	570	70	60	910	134	390	1300
Sep-81	380	90	140	60	670	88	180	850
Feb-82	40	90	40	430	600	94	310	910
Guinea Bissau, May-81	90	40	380	140	650	107	620	1270
Sep-81	20	20	350	80	470	73	400	870
Feb-82	70	400	590	130	1190	165	780	1970
Guinea, May-June-81	70	30	510	30	640	62	210	850
Feb-82	30	10	720	10	770	90	470	1240
Sierra Leone, June-81	80	120	80	20	300	52	120	420
Feb-82	15	5	10	40	70	27	~100	170
Total Mauritania - Sierra Leone May-June-81	510	1130	1040	280	2960	82	1570	4530
Feb-Mar-82	205	975	1360	870	3410	107	2060	5470

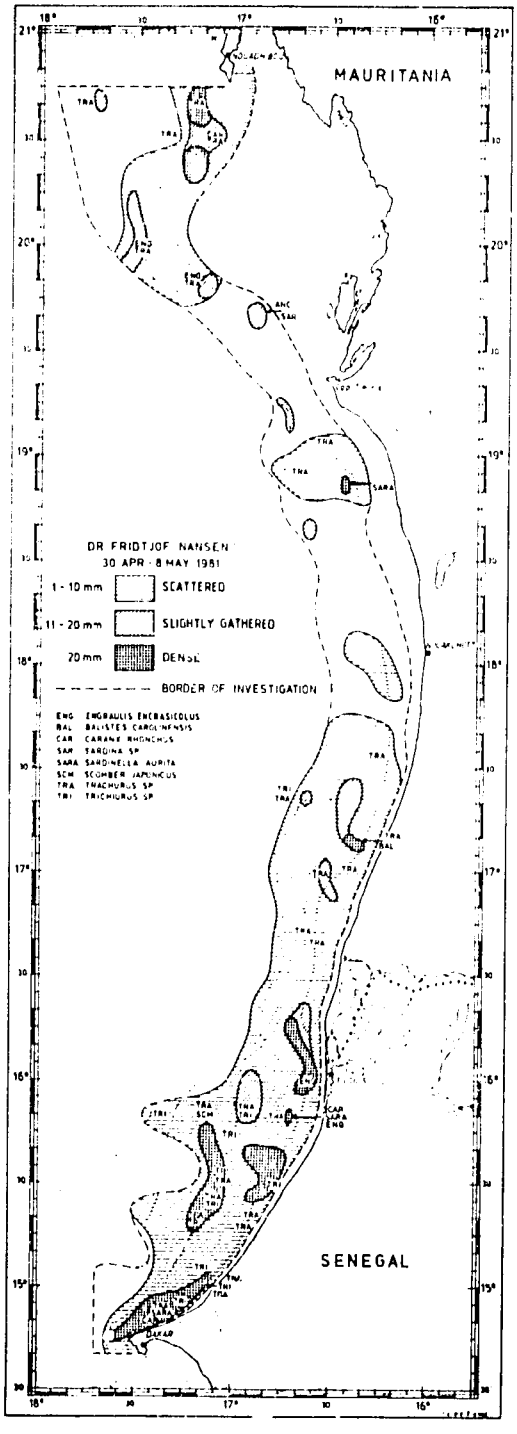


Fig. 24 Fish distributions, Cape Blanc to Cape Verde, Apr 30 - May 8, 1981.

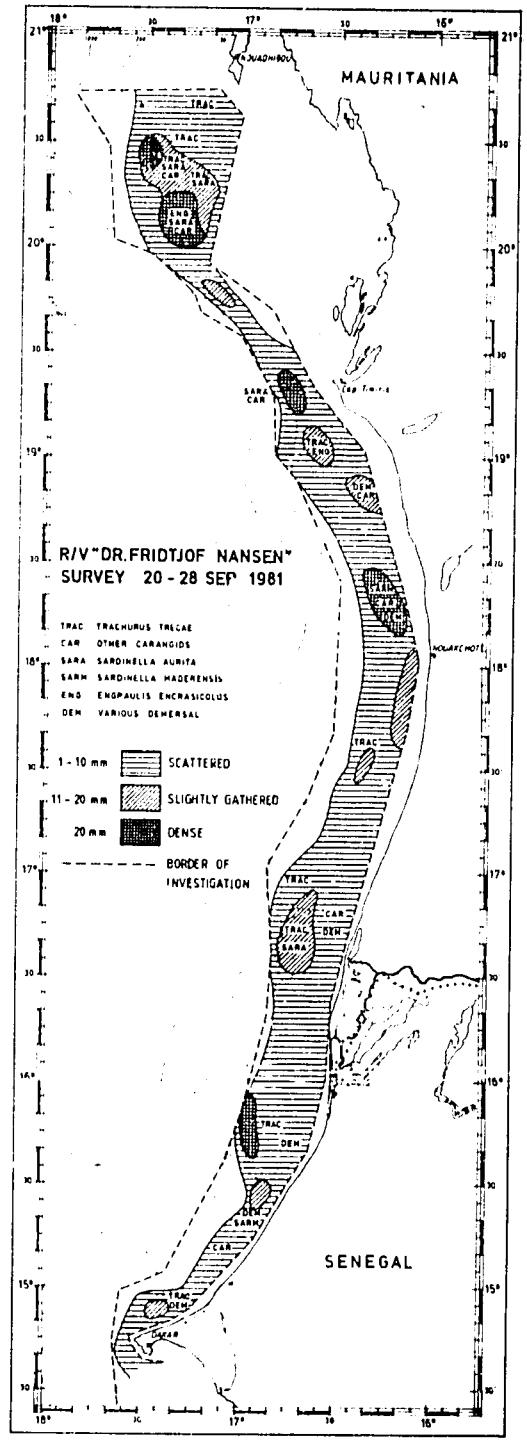


Fig. 25 Fish distributions, Cape Blanc to Cape Verde, Sept 20-28, 1981.

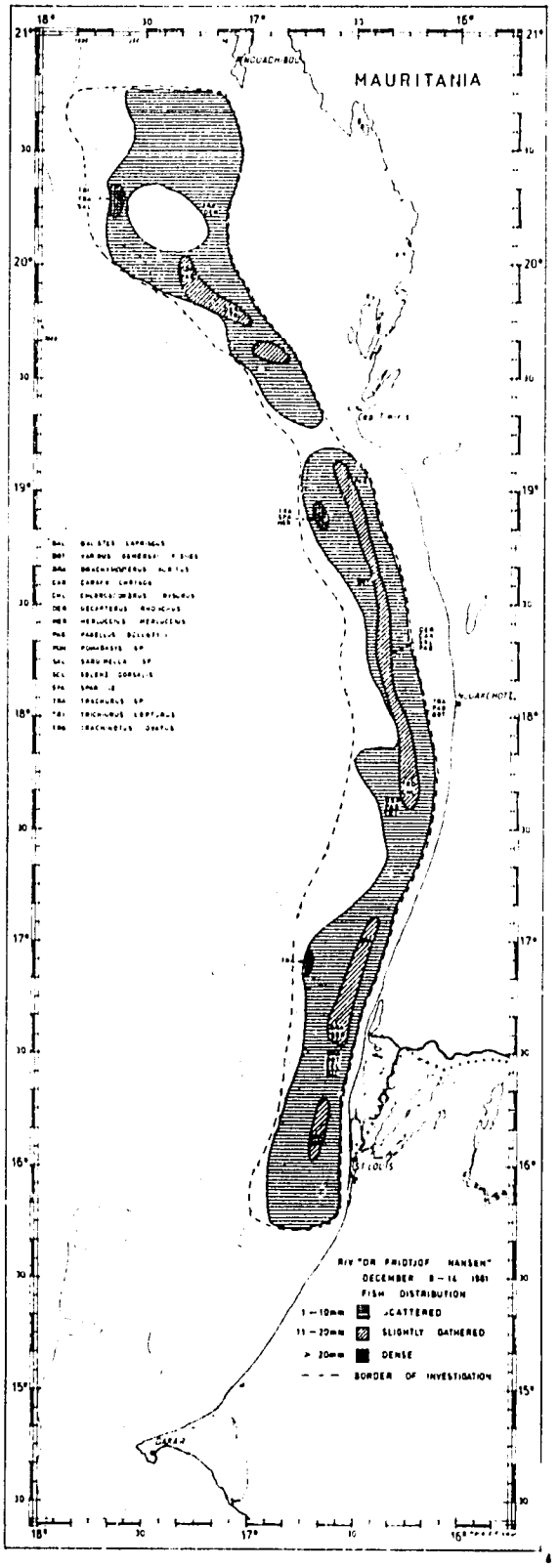


Fig. 26 Fish distributions, Cape Blanc to Cape Verde, Dec 8-14, 1981.

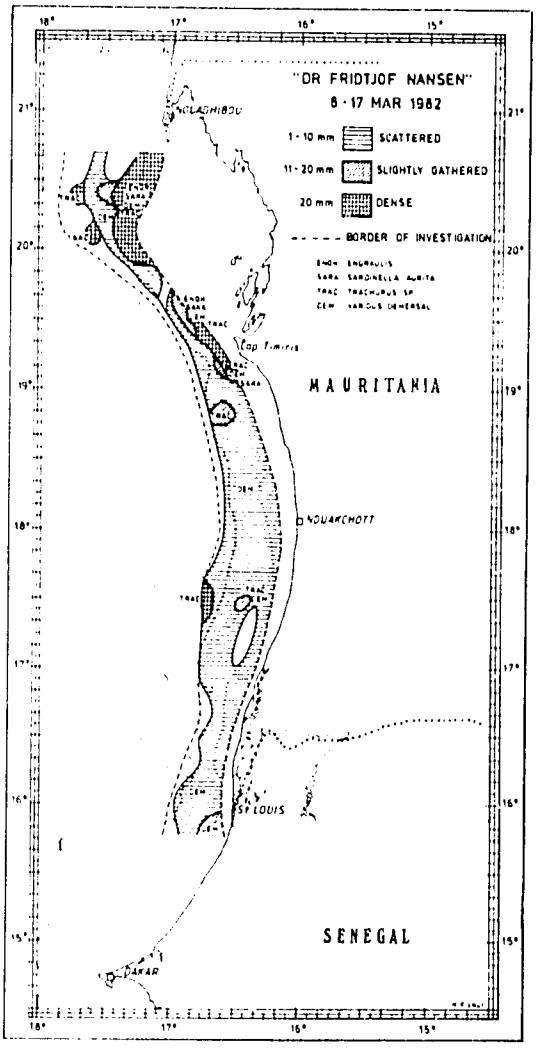


Fig. 27 Fish distributions, Mauritania, Mar 8-17, 1982.

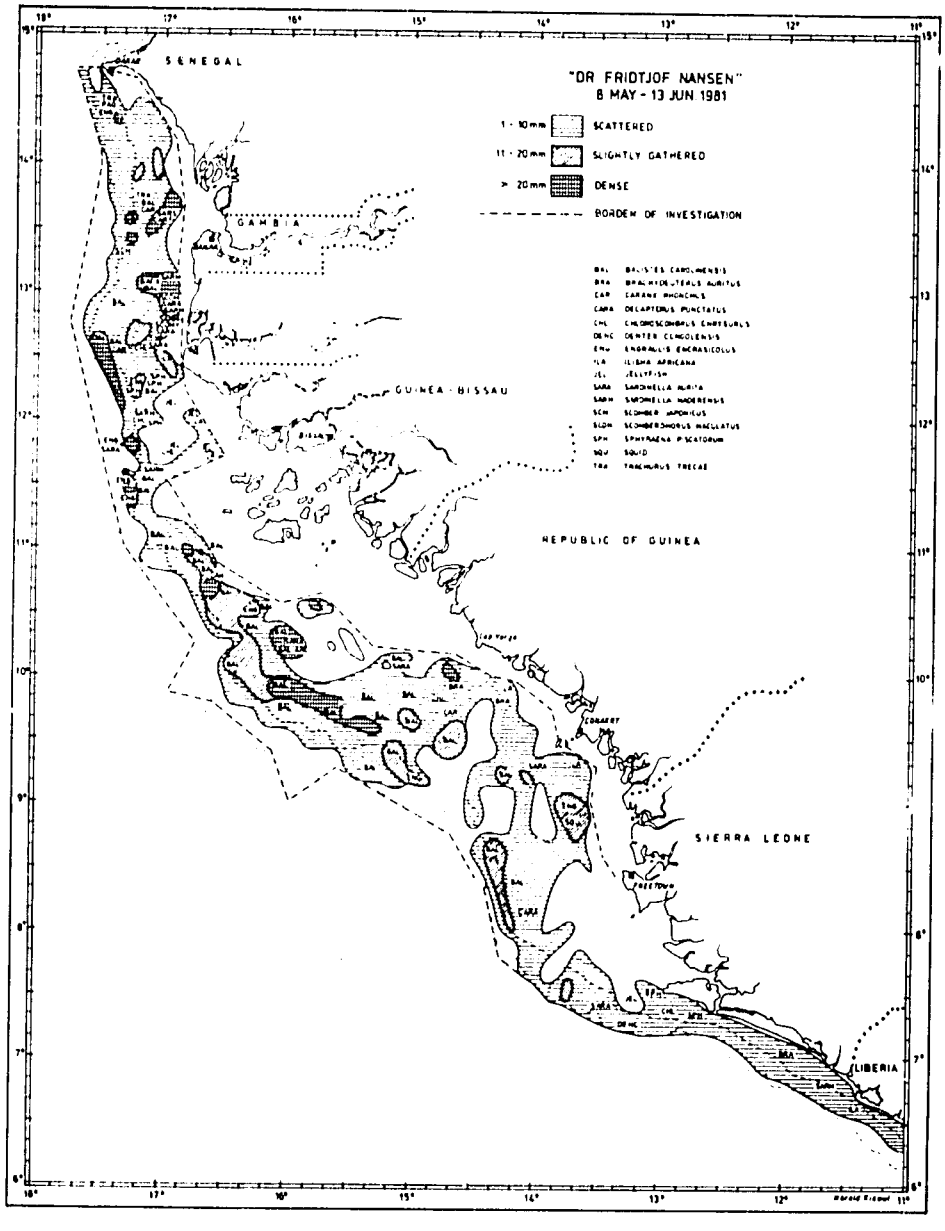


Fig. 28 Fish distributions, Cape Verde to Sierra Leone, May 8 - June 13, 1981.

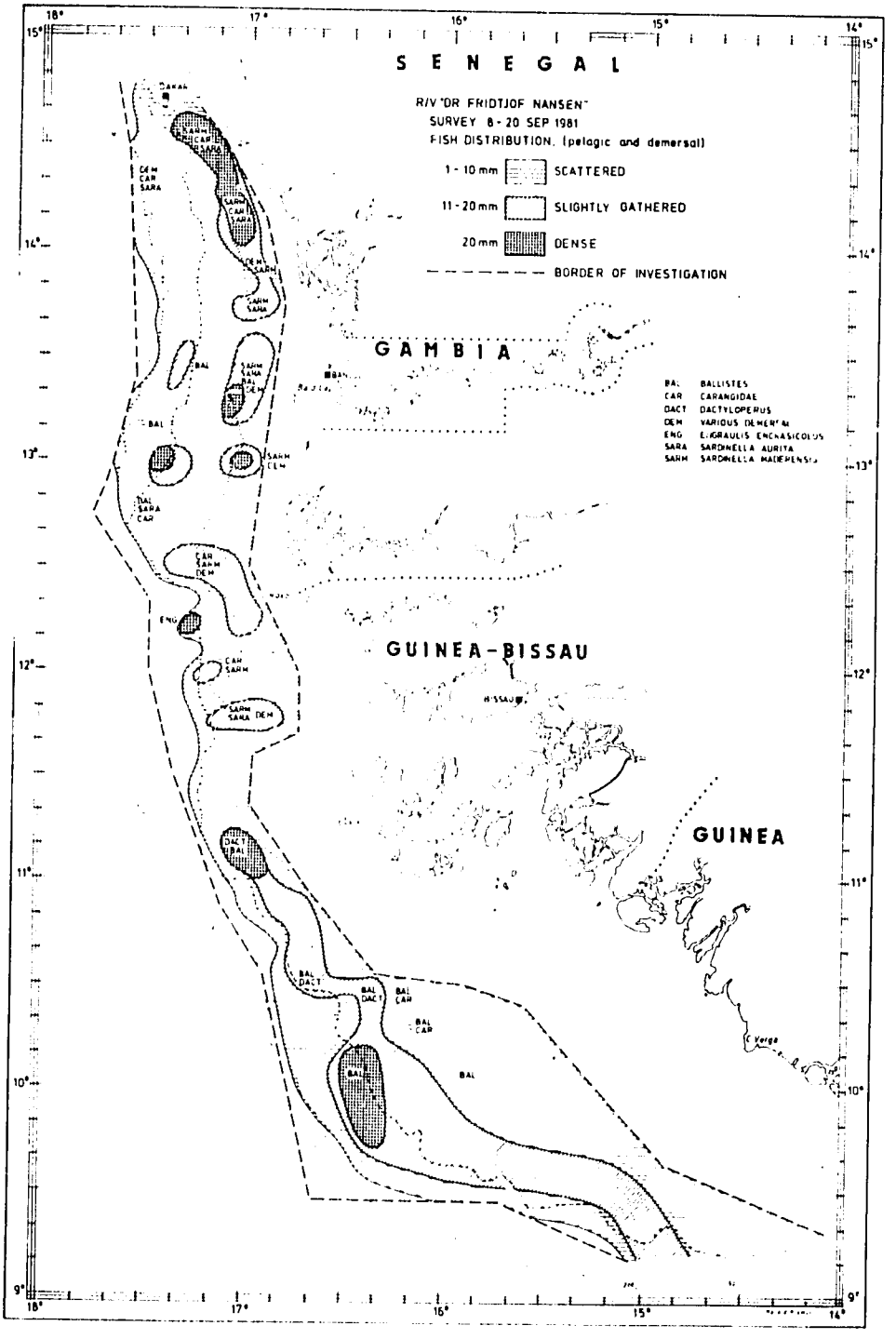


Fig. 29 Fish distributions, Cape Verde to Cape Verga, Sept 8-20, 1981.

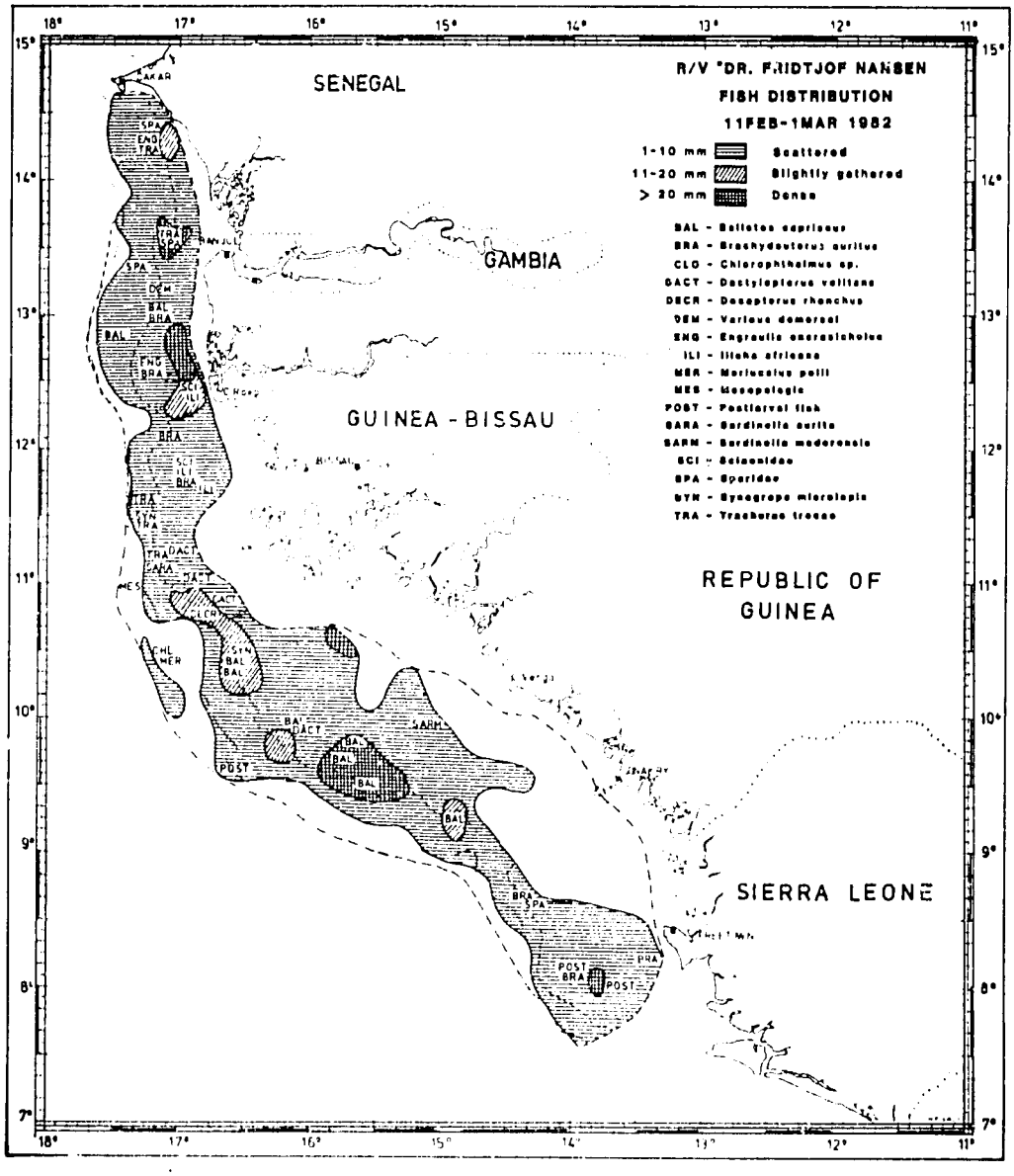


Fig. 30 Fish distributions, Cape Verde to Freetown, Feb 11 - Mar 1, 1982.

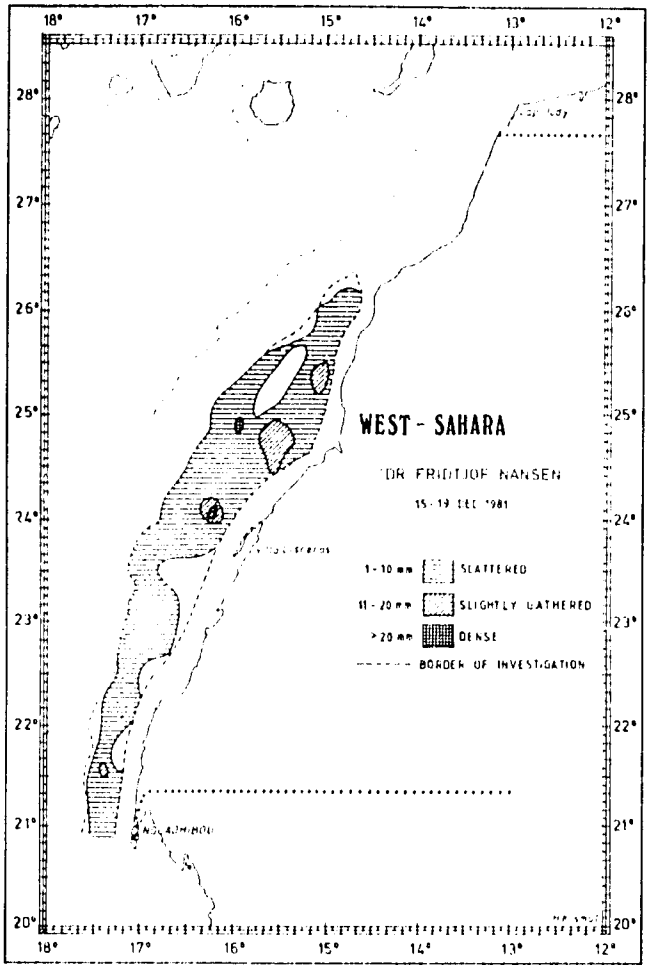


Fig. 31 Fish distributions, Cape Bojador to Cape Blanc, Dec 15-19, 1981.

The region Cape Blanc - Sherbro Island (Mauritania - Sierra Leone) has been fully surveyed twice during the programme, in May-Jun-81 and in Feb-Mar-1982. The total acoustic estimates are about 4.5 and 5.5 million tonnes respectively (Table 3). The distribution of fish groups was as follows (per cent):

	Clupeids and anchovies	Carangids	Trigger fish	Other fish	Total
May-Jun-81	17	38	35	9	99
Feb-Mar-82	6	29	40	25	100

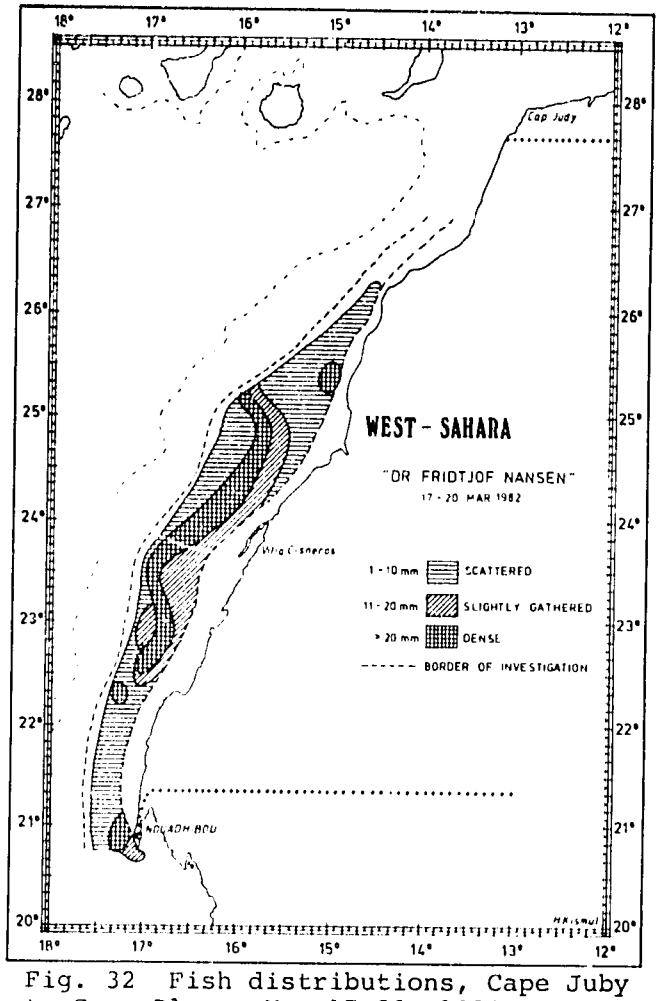


Fig. 32 Fish distributions, Cape Juby to Cape Blanc, Mar 17-20, 1982.

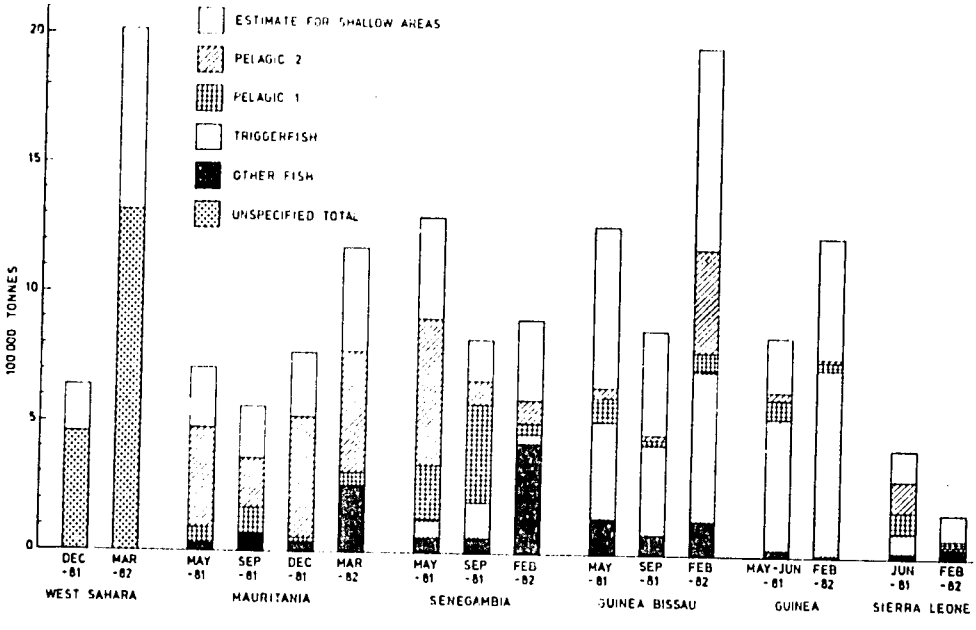


Fig. 33 Graphic illustration of the abundance estimates, in the regions from Western Sahara to Sierra Leone.

Only the triggerfish seems to be completely surveyed during both coverages as the area of investigation encompasses the distribution area of the species. Portions of the clupeid and carangid stocks are distributed north of the survey area as well, and large parts of the 'other fish' group seem to have had an offshore migration between the two coverages.

The two coverages off Western Sahara (Dec-81 and Mar-82) give total estimates of 0.6 and 2.1 million tonnes respectively. During the first survey the fish were located close to the shore, making only parts of it accessible to the vessel. During the second survey the center of distribution was more seaward and the fish community was thus more fully surveyed.

There does not seem to be any major ecological barriers in the whole shelf region from Sherbro Island to Cape Juby (at N 20°) except the seasonally fluctuating cold-water front, and in terms of fish communities the region can reasonably be treated as a single ecological unit.

This whole region was fully covered only once, in Feb-Mar-82. In this period many of the temporary shore-living species seem to have had a more seaward distribution than during the earlier surveys, and the total biomass was thus probably more fully covered by the vessel's sampling track. This therefore represents the most comprehensive survey. If one assumes the same density for the shallow areas as for the surveyed parts of the shelf, a total estimate for the region would be in the order of 7.5 million tonnes. Of this 1.4 million tonnes is allocated to the triggerfish. Separate estimates for the other fish groups are more uncertain as we do not know the species compositions off Western Sahara and in the shallow areas. From other investigations in the area we assume that the majority of the fish off Western Sahara belong to the horsemackerels (Trachurus trachurus, T. trecae and T. picturatus), the sardinellas (Sardinella aurita), the sardines (Sardina pilchardus) and mackerels (Scomber japonicus and S. scombrus). We therefore tentatively suggest that 75% of the fish off Western Sahara are

small pelagics. The large shallow unsurveyed areas in the south, especially in Guinea and Guinea Bissau, probably hold considerable resources, and although the portion of pelagic fishes in this community is unknown, it is probably high. In order to obtain some rough assessments we assume the share of small pelagics as 50%, i.e. 1 million tonnes.

On the basis of the assumptions listed above and the biomass estimates in Table 3, we then arrive at a total estimate of small pelagic fish of 3.7 million tonnes for the region between Cape Juby and Sherbro Island. The resources of other fish are roughly set to 2.5 million tonnes. The regional estimates with their main subestimates and assumptions are summarized in Table 4.

Table 4. Rough estimates of the regional abundance of the three main groups, triggerfish , small pelagic, and other fish. All figures are redistributed from Table 3 on basis of the main assumptions given.

	Abundance million tonnes rounded figures	Remarks
Trigger fish	1.4	
Small pelagics:		
Cape Blanc - Sierra Leone, surveyed area	1.2	
Cape Blanc - Sierra Leone, unsurveyed area*	1.0	Assuming ~50% small pelagic in the area
West Sahara, surveyed area	1.0	Assuming ~75% of total as small pelagics
West Sahara, unsurveyed area*	0.5	Assuming ~75% small pelagic in the area
Total small pelagics, whole region	3.7	
Other fish:		
Cape Blanc - Sierra Leone, surveyed area	0.9	
Cape Blanc - Sierra Leone, unsurveyed area*	1.0	Assuming ~50% small pelagic in the area
West Sahara, surveyed area	0.4	Assuming ~25% of total as other fish
West Sahara, unsurveyed area*	0.2	Assuming ~25% other fish in the area
Total other fish, whole region	2.5	
Grand total estimate, whole region	7.6	

* The unsurveyed areas are assumed to hold the same densities of fish as the surveyed areas.

One can reasonably question the high figures for the southern unsurveyed areas, and until further data are obtained from the area, more conservative assessments could be preferable.
By halving the assumed densities in the area, the pelagic and other fish estimates for the whole region would be lowered to 3.2 and 2 million tonnes respectively.

The "Other Fish" group consists of dominating elements of seabreams (Sparidae), grunts (Brachydeuterus auritus, Pomadasys sp.), croakers (Sciaenidae), groupers (Serranidae), hairtails (Trichiurus lepturus), lizardfishes (Synodontidae) and barracudas (Sphyraenidae).

2.2.1 Composition of the Catches

Tables 5 to 7 present catch distributions by family and bottom depth strata. The tables include all stations in the region from Cape Blanc to Sierra Leone, and the three coverages are

Table 5 Distribution of catches in pelagic and bottom trawl by family and bottom depth strata from stn. 1 to stn. 150 from Cape Blanc to Sherbro Is., May-June 1981.

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of all hauls (kg/h)	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <50m	50-100m	101-150m	151-200m	>200m
EZE	1	1	7	5	11	48	1258.2	41	[illegible]	[illegible]	[illegible]	.0	.0
IGE	6	7	6	2	2	50	693.7	14	246.5	[illegible]	[illegible]	.0	.0
CAF	9	10	7	10	3	61	191.0	6	76.2	109.0	214.9	420.0	.0
JEL	1	1	7		2	[illegible]	245.9	6	114.5	57.2	17.7	.0	.0
CIA	4	6	13	4	2	67	117.0	4	49.7	45.2	119.7	70.8	.0
LAG	4	6	2	1	1	35	109.2	2	[illegible]	53.2	.0	.0	.0
SCI	4	5	4	2	1	37	122.7	1	[illegible]	[illegible]	[illegible]	5.6	.0
ARG	2	2	2	0	0	17	70.1	1	[illegible]	.0	.0	.0	.0
CLU	8	6	6	0	0	36	4[illegible].2	1	4[illegible]	1.0	4.3	.0	.0
PHO	3	1	0	0	1	7	159.7	1	74.[illegible]	.0	1.0	.0	.0
FIX	7	4	7	1	0	28	54.3	1	4[illegible]	[illegible]	.0	.0	.0
SER	7	4	1	1	0	18	41.7	1	[illegible]	6.4	26.1	.0	.0
STH	4	5	2	1	0	20	45.[illegible]	1	17.6	[illegible]	.4	.0	.0
SCU	5	6	4	1	0	27	36.[illegible]	1	4.7	16.0	19.6	.0	.0
TRI	2	8	0	1	0	18	[illegible]	1	0.[illegible]	1.7	.0	.0	.0
Other fish							35.7	2					
MEAN CATCH OF ALL HAULS							1430.5		115.4	148.7	496.0	762.0	.0
TOTAL NUMBER OF HAULS	69								18	30	11	1	0

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of all hauls (kg/h)	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <50m	50-100m	101-150m	151-200m	>200m
PAL	7	6	3	1	4	24	1181.1	31	3.2	706.8	1.9	.1	.0
ENG	1	3	4	1	6	17	996.7	18	6.7	171.5	295.3	72.7	129.6
CAR	10	12	8	8	3	55	168.6	12	6.2	191.4	74.3	46.8	30.0
JEL	5	4	4	1	1	19	520.0	11	.6	26.8	165.2	23.4	25.1
CAP	2	0	0	0	1	1	7520.0	9	.0	.0	.0	300.8	.0
CLU	8	12	8	2	1	35	110.4	4	311.2	42.9	15.1	.1	.0
CRU	3	3	4	0	2	14	171.6	3	.0	.0	33.3	50.4	12.6
POD	6	3	3	3	1	18	159.1	3	23.8	68.7	.9	.0	.0
SPA	2	0	1	0	1	5	657.9	3	.3	74.8	.0	.5	.0
MYC	3	6	3	1	0	15	51.3	1	.0	.0	.0	26.7	43.3
SCP	12	6	2	0	0	23	18.2	1	5.2	2.8	3.9	5.9	9.8
STH	8	6	5	0	0	21	44.1	1	4.9	18.3	7.2	.1	.0
TRI	10	8	4	1	0	26	37.2	1	.2	1.7	3.4	28.5	17.6
Other fish							21.9	2					
MEAN CATCH OF ALL HAULS							913.0		388.8	1423.5	619.7	587.5	302.2
TOTAL NUMBER OF HAULS	89								5	35	24	[illegible]	14

treated separately. Further tables with the data sorted into subregions are given in Annex VI. The family codes used in the tables are explained in the beginning of the annex.

Of the total catch in the pelagic trawl the families Balisti[illegible]ae (triggerfish), Carangidae (horsemackerel, scad), Clupeidae (sardinella) and Engraulidae (anchovy) constituted jointly 60%, 90% and 81% in the three surveys (Tables 4-6). Of the bottom trawl catch the families Carangidae, Balistidae, Pomadasyidae (grunts) and Sparidae (seabreams) comprised 78%, 69% and 59% in the three coverages. The family Dactylopteridae (flying gurnards)

Table 6 Distribution of catches in pelagic and bottom trawl by family and bottom depth strata from stn. 268 to stn. 343 from Guinea Bissau to Cape Blanc, Sept. 1981.

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS [illegible]					[illegible]	[illegible]	[illegible]	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA			
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	>100m
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	221.9
[illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	734.[illegible]	496.8
DAC	6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	175.0	.0
[illegible]	1	4	6	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0	.0
BAL	[illegible]	4	[illegible]	4	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	65.0	.0
CLU	1	[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	40.4	[illegible]	6.7	.0
ENG	[illegible]				1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0	.0
[illegible]		[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0	.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.1	.0	.0
ARI	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	.0	[illegible]	.0
MUL	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	14.3	.0	.0
SPA	[illegible]	[illegible]	1	1		[illegible]	[illegible]	1	[illegible]	13.6	.0	
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	1	[illegible]	.0	.0	.0
[illegible]	1	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	1	[illegible]	[illegible]	.0	.0
[illegible]	4	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	1	7.1	17.6	16.2	1.7
TRI	[illegible]	[illegible]	4	[illegible]		[illegible]	[illegible]	1	17.[illegible]	[illegible]	.0	.0
Other fish							[illegible]					
MEAN OF TOTAL CATCHES							[illegible]		[illegible]	1409.0	[illegible]	779.5
NUMBER OF HAULS	37 TOTAL								15	15	5	2

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h)					% Incidence of hauls	[illegible]	[illegible]	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA			
	1-9	10-49	50-199	200-499	≥500				[illegible] m	20-50m	50-100m	>100m
BAL	2	1	2	1	[illegible]	.3	1666.[illegible]	4.				
ENG	0	0	1	1	1	[illegible]	[illegible]	[illegible]	.3	56.6	1666.5	.0
CAR	0	6	2	5	1	[illegible]	217.1	15	.0	28.5	14.5	4000.0
DAC	2	0	0	1	2	14	476.6	[illegible]	20.3	85.1	458.0	.0
CLU	5	7	0	1	0	41	[illegible]	3	.0	.2	238.0	.0
ARI	2	0	0	1	0	[illegible]	157.9	1	60.7	30.4	4.0	.0
POD	1	0	1	1	0	[illegible]	125.2	1	.2	.1	47.0	.0
SCM	[illegible]	[illegible]	6	1	0	.6	[illegible]	1	57.0	.0	.0	.0
SPA	0	1	2	1	[illegible]	16	111.3	1	5.4	6.9	24.9	.0
TRI	2	4	1	0	[illegible]	16	36.7	1	50.2	1.5	6.0	.0
Other fish							4.1	0	.0	15.8	1.8	.0
MEAN OF TOTAL CATCHES							1076.5		162.2	731.3	2463.2	4009.3
NUMBER OF HAULS	39 TOTAL								10	16	10	3

made notable contributions to the total catches in September, but occurrences were restricted to a few stations with high catches (Table 6). Apogonidae (cardinal fishes) and Caproidae (boarfishes) made similar contributions, appearing in high numbers at single stations. It should be borne in mind that the tables also include the amount of jellyfish in the catches, and the above percentages would be increased if these were excluded.

To conclude, Tables 5-7 show with the cautions mentioned, that the biomass on the shelf from Mauritania to Sierra Leone is made up of some few families. Further analysis at the species

Table 7 Distribution of catches in pelagic and bottom trawl by family and bottom depth strata from stn. 426 to stn. 503 from Cape Blanc to Sherbro Is., Feb-Mar 1982.

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
CAT	10	4	4	[illegible]	4	71	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
BAL	7	1	0	0	1	14	[illegible]	[illegible]	[illegible]	241.0	[illegible]	.0
PEA	3	0	1	0	2	56	164.2	14	.0	[illegible]	[illegible]	66.3
TOD	4	1	3	4	1	50	147.7	11	48.[illegible]	126.1	[illegible]	.0
AFC	0	0	0	0	1	7	[illegible]	[illegible]	.0	[illegible]	[illegible]	.0
CGI	0	4	1	1	1	36	173.8	8	169.1	[illegible]	[illegible]	.0
JEL	0	1	1	1	1	43	179.0	7	[illegible]	[illegible]	[illegible]	.0
TRI	2	0	2	1	0	36	[illegible]	7	[illegible]	[illegible]	[illegible]	.0
ENG	3	1	0	1	0	12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0
PCU	10	0	2	0	0	56	19.6	[illegible]	[illegible]	17.7	[illegible]	6.3
AFD	1	1	2	0	0	18	27.9	1	23.3	[illegible]	[illegible]	.0
CEN	1	2	1	0	0	6	[illegible]	1	[illegible]	[illegible]	.4	10.4
CLU	2	2	2	0	0	18	24.6	1	18.7	1.0	[illegible]	.0
MER	2	0	1	0	0	9	35.9	1	[illegible]	6.8	.0	2.9
FIN	2	1	0	1	0	12	73.5	1	40.0	.0	.0	.0
RAY	4	0	1	0	0	21	16.9	1	1.7	.7	10.2	.0
SER	1	4	1	0	0	18	23.1	1	[illegible]	12.1	.3	.0
SHF	2	1	2	0	0	27	19.5	1	11.1	.6	6.7	.7
TRG	0	1	3	0	0	12	68.3	1	.0	1.4	[illegible]	.0
ZFI	4	4	0	0	0	24	19.2	1	.0	1.2	[illegible]	20.2
Other fish							20.0	[illegible]				
MEAN CATCH OF ALL HAULS							670.4		[illegible]	[illegible]	[illegible]	[illegible]
TOTAL NUMBER OF HAULS	14								7	15	10	2

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BAL	0	3	2	1	4	23	1904.8	70	.0	509.1	1046.0	86.6
FOD	6	1	1	1	1	23	318.4	12	4.8	21.8	273.9	.0
CLU	2	2	0	4	0	18	158.6	5	91.9	24.6	46.6	.0
CAR	7	5	0	0	1	30	62.6	3	4.6	1.5	75.8	1.0
DAC	1	1	1	1	0	9	175.4	3	.4	35.0	.0	.0
ENG	0	2	3	1	0	14	120.0	3	89.3	18.3	.0	.0
JEL	1	4	3	0	0	18	43.4	1	.0	9.0	.3	16.5
MYC	0	0	1	0	0	2	156.8	1	.0	.6	.0	15.7
SCU	6	1	2	0	0	21	22.8	1	2.1	8.1	.6	2.8
TRI	3	3	1	0	0	16	39.1	1	.0	9.5	5.8	2.6
Other fish							9.6	1				
MEAN CATCH OF ALL HAULS							616.9		258.1	524.1	1436.4	132.4
TOTAL NUMBER OF HAULS	44								4	20	10	10

level should reveal that these families are made up of some few species. These species will be dealt with below (see also Annex V).

2.2.2 Allocation of Biomass on EEZ's

As already mentioned Table 3 includes biomass estimates for the various countries in the region. These estimates have obvious limitations as most of the dominant pelagic species migrate seasonally along the coast and form stocks shared between countries.

An exception is the triggerfish (*Balistes capriscus*) with its predominance in Guinea Bissau and Guinea, and only fringes of the distribution reaching into Senegambian and Sierra Leone waters. The estimates are from 350 to 590 thousand tonnes for Guinea Bissau and 510-720 thousand tonnes for Guinea. From two surveys it seems as if the abundance of triggerfish is somewhat higher in Guinea compared with Guinea Bissau, with respective means of 615 and 485 thousand tonnes.

The estimated fish densities (Table 3) can cautiously be taken as rough indications of the productivity in the area when the migration pattern and fishing mortality are taken into account. The estimated densities expressed as the means from all surveys are as follows:

West Sahara	(2 coverages)	75 tonnes/nm^2
Mauritania	(6 coverages)	75 tonnes/nm^2
Senegambia	(3 coverages)	105 tonnes/nm^2
Guinea Bissau	(3 coverages)	115 tonnes/nm^2
Guinea	(2 coverages)	75 tonnes/nm^2
Sierra Leone	(2 coverages)	40 tonnes/nm^2

It is reasonable to increase the first estimate for Western Sahara somewhat as the fish were then located close to the shore and are hence probably underestimated. A mean density in the order of 100 tonnes/nm^2 is more reasonable, and in accordance with the second survey in the area.

Mauritania seems to be the most exploited area and the unfished density is probably considerably higher, perhaps well above 100 tonnes/nm^2. From this we may assume that the fish production along the shelf from Western Sahara to Guinea Bissau is fairly uniform and that density values in the order of 100-150 tonnes are representative for relatively unexploited areas.

Guinea seems to have a slightly lower density level with around 75 tonnes/nm^2, and Sierra Leone, receiving insignificant benefits from the upwelling system, has only 40 tonnes/nm^2 mean density. This is a level usually more representative of steady state tropical communities, as for instance large parts of the shelf in Gulf of Guinea (see also Part 4 and Strømme et al. 1983).

2.2.3 Comparisons with Other Abundance Estimates from Cape Bojador to Sherbro Island

Marchal and Boely (1977) assessed the fish biomass between Cape Verga and Cape Bojador in 1974 at roughly 11.2 million tonnes. As mentioned earlier we have assessed the biomass in the same region to be in the order of 7.5 million tonnes for early 1982.

Although this could indicate that the total biomass has been reduced to 2/3 of its 1974 level, small differences in the methods of calibration for the acoustic equipment and in the conversion factors used may easily have affected the estimates to the same degree. Unfortunately the calibration methods for the electronic equipment and for target strength measurements on fish have hitherto not been internationally standarized. This seriously hampers the comparability of the acoustic estimates.

The area between Cape Blanc and Cape Roxo is the most intensively covered by acoustic surveys conducted mainly by the R/V Capricorne. Table 8 gives the estimates from the 1974 survey and from the three most recent surveys from which reports are available. For comparison the estimates from the R/V Dr. Fridtjof Nansen surveys are transformed to cover the same area and are included in the table.

Table 8. Various biomass estimates covering the region Cape Blanc - Cape Roxo.

Project	Year	Season	Estimated abundance (1000 tonnes)					Reference
			Total	Clupeids and anchovies	Carangids	Balistes	Other	
CAP7408	1974	Oct-Nov	2380	683	1013	-	684	Marchal and Boely 1977
ECHOSAR 1	1980	Feb	1582	n.s.	n.s.	n.s.	n.s.	Marchal, Gerlo and Josse 1981
ECHOSAR 2	1980	Sep	1005	n.s.	n.s.	n.s.	n.s.	Marchal and Josse 1981
ECHOSAR 3	1981	May	2420	625	658	103	1034	Marchal and Josse 1982
NANSEN 1	1981	May	1370	270	940	70	90	Table 3
NANSEN 2	1981	Sep	1030	480	280	140	130	Table 3
NANSEN 3	1982	Feb-Mar	1380	90	560	40	690	Table 3

n.s. = not specified

The most striking feature in the table is the relatively high total estimates from the ECHOSAR 3 survey. The results from the Fridtjof Nansen surveys seem to agree reasonably well with the total estimates from the ECHOSAR 1 and 2 surveys, especially if one allows for some variation due to seasonal fluctuations. The first Nansen survey was carried out almost synchronously with ECHOSAR 3, and unfortunately the results from the two surveys do not correspond, neither in total estimates nor in allocation to species groups. The discrepancies between the estimates on total fish abundance could b due to different target strength reference values, while the differences between the estimated species composition seem to point to methodological differences in the design and execution of the survey particularly with respect to the sampling systems used.

ECHOSAR 3 uses -33.4 dB/kg as target strength for a 17 cm fish on the 120 kHz system, whereas during the Fridtjof Nansen surveys TS = -34.3 dB/kg has been applied on the 38 kHz system. Sætersdal et al. (1983) has pointed to a systematic difference in recorded target strengths when the 120 and 38 kHz systems are run simultaneously. A mean target strength value 3-4 dB lower should be expected on the 38 kHz system. To make the two vessels' TS values comparable we transform the Nansen TS-value from -34.3 dB (ref. 38 kHz) to 31.3 - 30.3 dB (ref. 120 kHz). This systematic difference of 2-3 dB between the two surveys could account for 60-100% higher estimates from the system onboard Capricorne.

The ECHOSAR 2 survey of September 1980 formed part of a joint survey with R/V Cornide de Saavedra covering the shelf from Sierra Leone to Guinea Bissau and R/V Ibn Sina off Western Sahara heading north to Gibraltar. The shelf from Cape Blanc south to, and including, Sierra Leone was estimated to hold roughly 2 million tonnes of fish (FAO/CECAF 1981a). The corresponding figures from the two R/V Dr. Fridtjof Nansen coverages are roughly 3 and 3.4 million tonnes. Some of the difference could be due to seasonal migration of the fish stocks. Some overlapping occurred in south Senegal during the joint survey, but this would account for less than 5% overestimation. During the joint survey the approximately same shelf area was covered by the last Fridtjof Nansen survey as by the Capricorne and Cornide de Saavedra. The magnitude of the disparity between the estimates could indicate that systematic differences either in calibration or in survey methods also have occurred.

2.3 General Findings Regarding the Distribution and Abundance of the Main Pelagic Fish Stocks from Mauritania to Sierra Leone

The general migration pattern and distribution of the dominating species has been descr bed by other authors (FAO/CECAF 1979, Troadec and Garcia 1980, Garcia, 1982). In the following we present the distribution pattern found during three surveys with R/V "Dr. Fridtjof Nansen" (four surveys off Mauritania) for the species *Sardinella aurita*, *Sardinella maderensis* and *Engraulis encrasicolus* classified as the "Pelagic 1" group in the estimates and *Trachurus trachurus*, *Trachurus trecae* and *Decapterus rhonchus* classified as the "Pelagic 2" group.

Abundance estimates will also be presented for each species, but these must be considered very tentative as the survey methods and sampling gear used do not allow a reliable separation at the species level. Two species can be fairly easily separated from the group estimates, the anchovy (*Engraulis encrasicolus*) and the Atlantic horsemackerel (*Trachurus trachurus*), as these species are quite restricted both in distribution and abundance in the area from Cape Blanc to Sherbro Island.

The lack of information of species composition off Western Sahara constitutes a serious limitation of the data collected. Only estimates of total fish abundance are given, as no trawling could be carried out in the area. This reduces the reliability of estimates of stock level for some species and invalidates them for others. The total biomass off Western Sahara is estimated in the order of 2 million tonnes (Table 3) and represents 27% of the total abundance in the area between Cape Bojador and Sherbro Island.

During the preparation of this report it was not possible to find data quantifying the species composition off Western Sahara. Although the composition undoubtedly varies both seasonally and between years, some information can be extracted from the known distribution and migration pattern of the common species (op.cit.). Trachurus trachurus and Scomber scombrus seem to be the dominant species in the area. Other important species are Sardinella aurita, Sardina pilchardus and Trachurus trecae, but their centers of distribution are outside Western Sahara waters. Sardinella maderensis is also present, but of lesser importance.

Since the species composition off Western Sahara was unknown at the time of the surveys, the stock abundance estimates given below are restricted to resources south of Cape Blanc, and only tentative references are given for the stocks further north.

2.3.1 Pelagic 1 group (the Clupeoids)

Figure 34 gives the distribution of the Pelagic 1 group during three surveys, and the estimated densities are given in three levels. The estimated biomasses by country can be summarized as follows (thousand tonnes and the country's share as percentage of total):

	May-Jun-81	Sept-81	Feb-Mar-82
Mauritania	60 (12%)	100 (20%)	50 (24%)
Senegambia	210 (41%)	380 (76%)	40 (20%)
Guinea Bissau	90 (18%)	20 (4%)	70 (34%)
Guinea	70 (14%)	no survey	30 (15%)
Sierra Leone	80 (16%)	no survey	15 (7%)
Total	510 (100%)	500 (100%)	205 (100%)

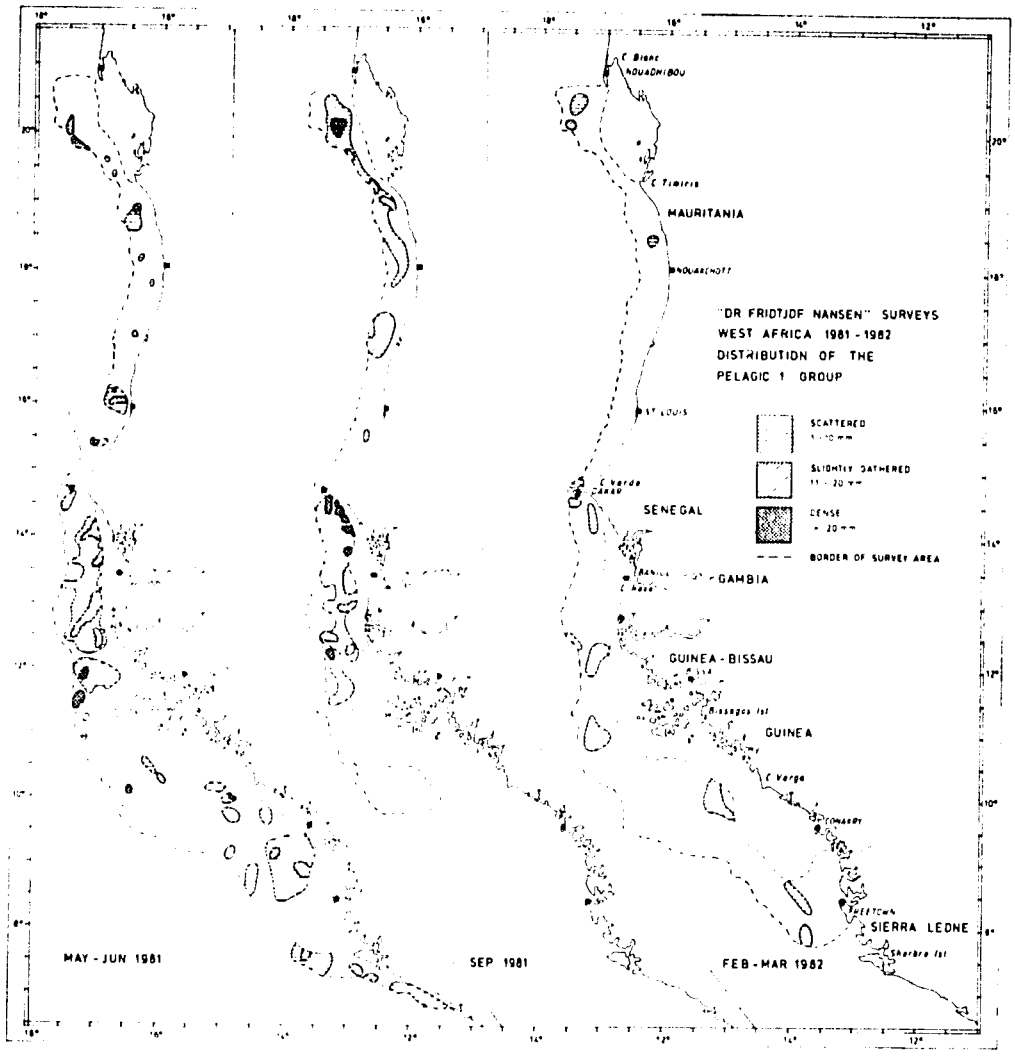


Fig. 34 Distribution of the Pelagic 1 group from three surveys between Cape Blanc and Sherbro Island, 1981-1982.

No corrections for the shallow unsurveyed areas have been included in these estimates. Due to its nearshore distribution the flat sardinella (Sardinella maderensis) is believed to be significantly underestimated. The population of round sardinella (S. aurita) is, on the other hand, assumed to be almost fully encompassed within the depth range surveyed, but the species has an large important stock component north of Cape Blanc, and it is uncertain whether a separate stock exists in this area or migrations into Mauritanian waters occur (Troadec & Garcia, 1980). The anchovy (Engraulis encrasicolus) is mostly found in some few dense patches along the coast and forms only a fraction

of the estimated biomass of clupeoids. The given biomass estimates by country show that the main part of the Pelagic 1 group is located south of Mauritania during all three surveys.

There seems to be a permanent presence of sardinellas betwee Cape Blanc and Cape Timiris and between Cape Verde and the Bissagos Islands. Further south, between Cape Verga and Sherbro Island there are apparently also permanent concentrations of sardinellas, although this has only been found in two coverages. Between Cape Timiris and Cape Verde there are considerable concentrations of the Pelagic 1 group between June and September 1981 whereas the fish are practically absent in Mar-82. The shelf between the Bissagos Islands and Cape Verga seems to be of lesser importance for the distribution of the Pelagic 1 group.

Even if it is accepted that these 1981-82 assessments represent underestimates, they indicate that the stocks of sardinellas in this northern subtropical zone have declined from the mid-1970 level of about 1 million tonnes. The estimates from Feb-Mar-82 are striking, indicating that the sardinellas have been reduced to less than 50% of the level of the previous year. As this finding is from one survey only, it is possible that parts of the biomass have moved into the shallow waters not surveyed by the vessel. As mentioned, the flat sardinellas (S. maderensis) have their main distribution in the more shallow waters of the shelf, and it is possible that they have a seasonal migration perpendicular to the coast. This could explain part of the reduction in the estimates.

Another possibility is that portions of the sardinella stocks have migrated northwards off Western Sahara and there account for some of the increase in biomass in these waters during the February-March survey (Table 3). However this would be contrary to the seasonal migration pattern.

Comparisons with fishing data may show whether the decline is real or not.

Figure 36 and 37 later in this report show the distribution of S. aurita and S. maderensis based on the trawl catches only. It is also evident from these figures that the distributions of both species were drastically reduced in Feb-Mar-82, compared with the two earlier surveys.

In the following we will discuss results relevant to the species of the Pelagic 1 group.

Engraulis encrasicolus

Anchovies (Figure 35) were caught at scattered locations all over the survey area in May-Jun-81, while in Sept-81 and Feb-Mar-82 they were only found in three locations. The species seems to be permanently present in the Cape Blanc—Cape Timiris area and off Cape Roxo, having been found there during all three surveys. This is also the area where the best catches were obtained.

The total lengths measured from samples range from 4.0 to 14.5 cm (Annex III). No clear spawning season is indicated from the samples, as small specimens occur during all three surveys, but clear nursery areas for juvenile fish can be spotted off Cape Roxo and off Freetown, both in Feb-82. The mean length from all samples is 9 cm, a length that is also representative for the May—June and September samples. The mean for the February—March survey is 8 cm. No size-dependent distribution along the coast can be detected (Figure 35). The catches range from incidental specimens up to 12 tonnes/hour (south of Cape Roxo in Sept.-81).

Separate estimates of the abundance of anchovy are hindered by its frequent occurrence together with both sardines and horse-mackerel. Sometimes, the anchovies formed very dense schools during daytime and could easily be caught in large quantities with midwater trawl, in contrast to the sardinellas and horse-mackerels. Thus, the anchovies are clearly overrepresented in the tables of catch distribution.

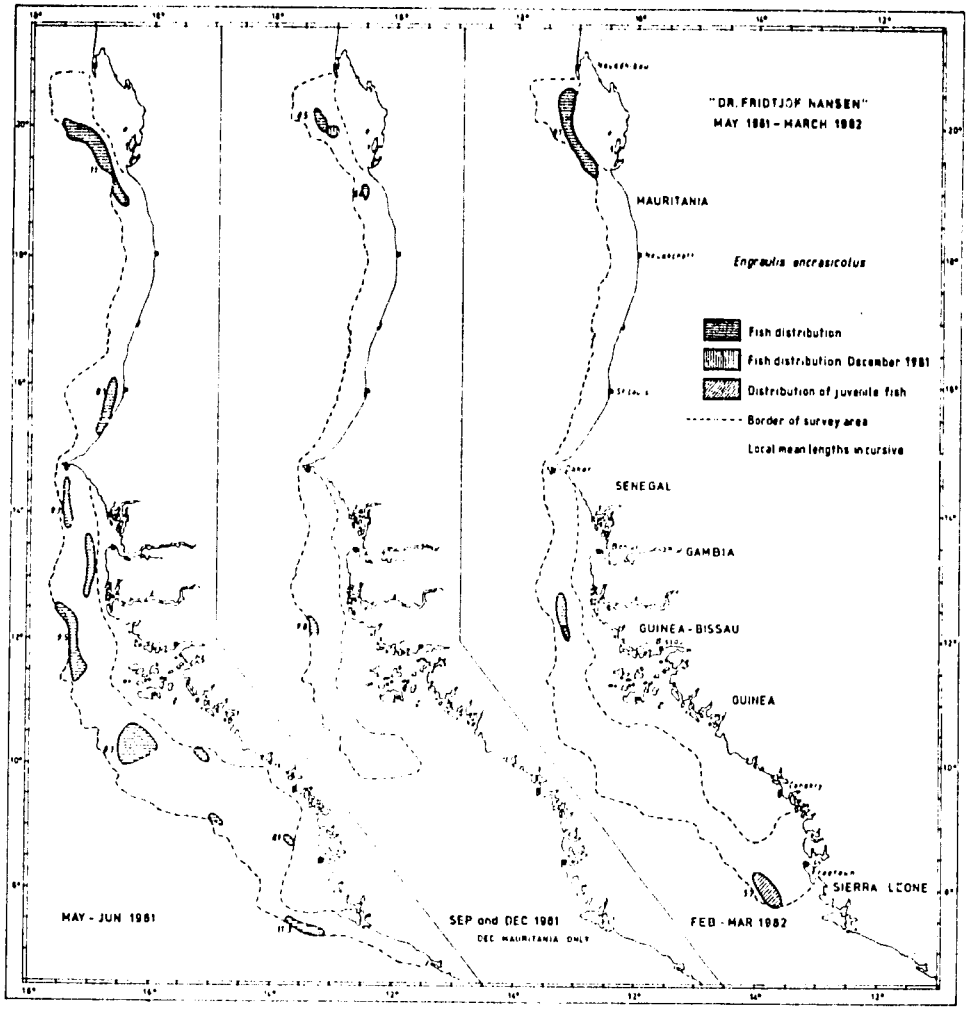


Fig. 35 Distribution of Engraulis encrasicolus from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

In most locations, however, the catches were less than 100 kg/hour. Catches exceeding 1 tonne/hour can all be allocated to around Cape Timiris and around Cape Roxo. Apart from these areas the anchovy is assumed to form only a small fraction of the Pelagic 1 group.

Separate acoustic estimates of dense concentrations of anchovy give figures of from 10-30 thousand tonnes. In May-81 these concentrations constituted 90 thousand tonnes of the Pelagic 1 group and in Sept-81 the corresponding figure was 45 thousand

tonnes. In Feb–Mar-82 no really dense concentrations were located. As these concentrations were quite restricted in their distribution they could easily have been missed by the vessel's sampling track. There may also be seasonal variations in stock size. Taking into account the scattered occurrences of the anchovy we somewhat speculatively suggest the biomass of Engraulis encrasicolus to be in the order of 150 thousand tonnes, with perhaps an additional 50 thousand tonnes for the shallow unsurveyed areas.

Sardinella aurita

The round sardinella occurred along the coast in the whole survey area during the two first surveys (Figure 36). During the last survey, in Feb–Mar-82, the species was found only in some few trawl samples along the coast, and then mostly at catch rates of 2 kg/hour or less. Only off Bissagos Islands were some concentrations of significance located, and further southwards no recordings of Sardinella aurita were made. The species seems to be permanently present in the Cape Blanc–Cape Timiris area, and off Cape Roxo (Figure 36).

The total lengths measured from the samples range from 6 to 39.5 cm. Plots have been made to map the distribution of specimens of length $\leq$ 10 cm in order to trace any restricted nursery areas. In May–June young fish were found in five locations from the Casamanche River Delta south to the Guinea Bissau–Guinea border. In September young fish were spotted only in the north, in the Cape Blanc–Cape Timiris area, while in Feb–Mar-82 no small sardinellas were caught.

Likewise, the distribution of fish of 30 cm length or more have been plotted in an attempt to trace any migration of the adult stock. The old fish were located between St. Louis and Gambia River in May–June, north between Cape Timiris and Nouakchott in September, and in Feb–Mar-82 at two widely separated locations, off Cape Timiris and off Bissagos Islands.

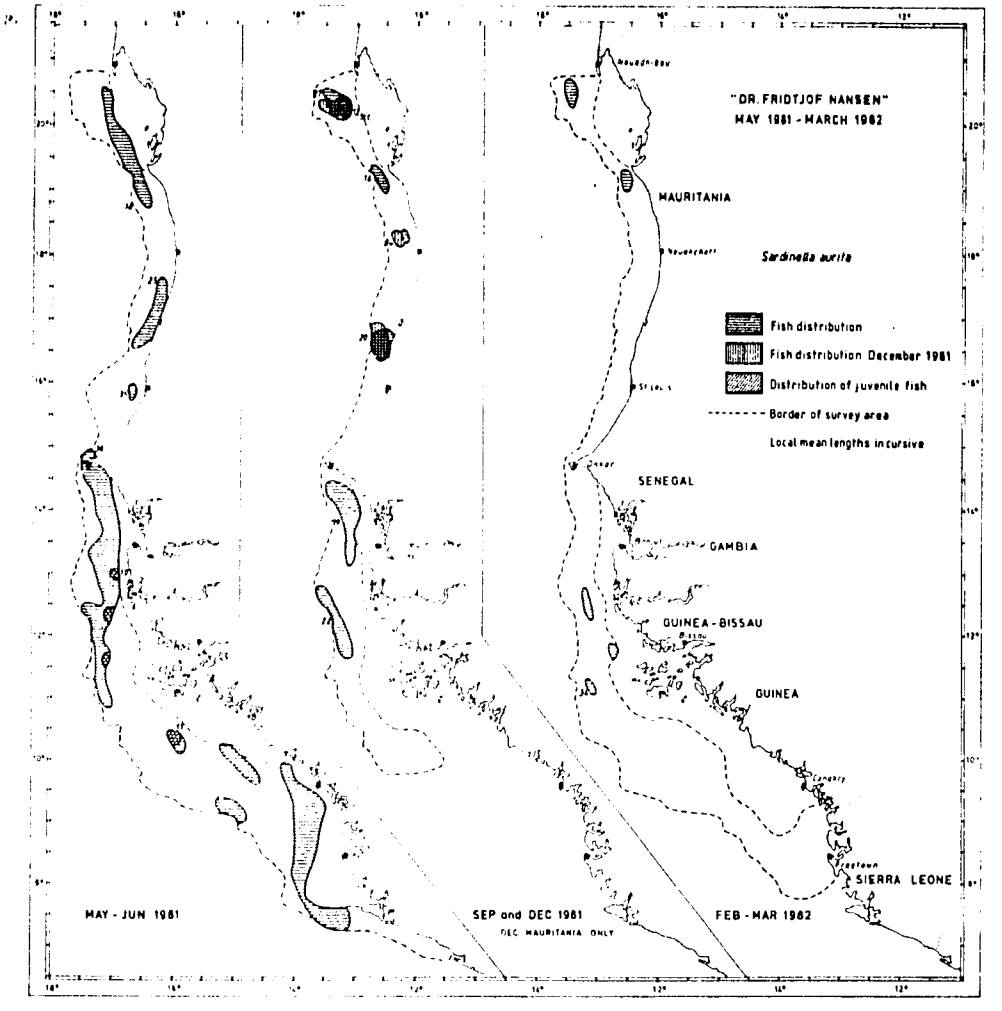


Fig. 36 Distribution of Sardinella aurita from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

If one assumes that the old fish off Cape Timiris in Feb-Mar-82 belong to a Saharan stock at its southern part of the distribution, the findings both for young and old fish correspond well with the general migration and spawning pattern already known and summarized by Garcia (1982).

The catch figures (see Annex V) do not reflect the density and abundance of sardinellas, as the trawling speed is clearly below optimum for the rather fast swimming adult sardinellas. Only two catches exceeded 1 tonne/hour, both off Mauritania in September.

Generally the catchability of the trawl gears is highly species dependent, and the distribution of species in the catch may thus not reflect the composition of species in situ. Since the two sardinella species are quite similar both in shape and size, it seems reasonable to assume that they do not differ substantially in catchability. We have therefore used the catch records to calculate these two species' relative abundance in the various countries. Weighted indices of abundance are produced by counting all stations where the species are present and giving each station a weight in accordance with the size of the catch and the following scale: <1 kg/hour = 0, 1–10 kg/hour = 1, 10–100 kg/hour = 2, 0.1–1 tonne/hour = 3, >1 tonne/hour = 4. This scale was chosen in an attempt to take account of the irregular distribution of pelagic fish. The species' relative importance is calculated in percent. The results from these calculations are given in Table 9, and are applied to the acoustic estimates to give tentative and very rough figures of the abundance of the species.

Table 9 . Indices of occurrence of Sardinella aurita and S. maderensis by means of number of stations present (O) and by number of stations present weighted according to the catch (W) (see text). The species' estimated share of the Pelagic 1 group within a country (%) are given on basis of the weighted indices of occurrence.

	Sardinella aurita			Sardinella maderensis		
Country and survey:	O	W	%	O	W	%
Mauritania, May -81	6	8	89	1	1	11
Sept -81	11	22	73	5	8	27
Dec -81	7	7	47	6	8	53
Mar -82	4	3	75	2	1	25
Senegambia, May -81	22	24	49	15	25	51
Sept -81	10	19	35	21	35	65
Feb/Mar -82	1	0	0	2	3	100
Guinea Bissau,						
May/June -81	8	6	35	7	11	65
Sept -81	1	2	33	2	4	67
Feb -82	3	5	71	3	2	29
Guinea, June -81	9	9	100	2	0	-
Feb -82	-	-	-	1	1	100
Sierra Leone,						
June -81	5	6	38	6	10	62
Feb -82	-	-	-	3	6	100

By subtracting the estimates of anchovy from the ones for the Pelagic 1 group, and applying the figures on the relative importance of the two Sardinella species one arrives at the following very rough figures of the abundance of Sardinella aurita (thousand tonnes):

	May–Jun-81	Sept-81	Dec-81	Feb–Mar-82
Mauritania	20	55	4	40
Senegambia	105	130	n.s.	-
Guinea Bissau	15	5	n.s.	50
Guinea	70	n.s.	n.s.	-
Sierra Leone	30	n.s.	n.s.	-
Total	240	(180)		90

n.s. = no survey

These estimates are believed to encompass most of the Sardinella aurita within the region surveyed, but leave open possible resources north of Mauritania.

Sardinella maderensis

The distribution of the flat sardinella by its occurrence in the trawl catches is shown in Figure 37. Three areas appeared to be of special importance during all coverages; the Cape Blanc–Cape Timiris area, the Cape Verde–Bissagos Islands area, and around Sherbro Island. Between Cape Timiris and Cape Verde the fish was found in several locations in September, while it was virtually absent from there in the May–June and February–March surveys.

Juvenile fish of lengths 10 cm or less were localized off Casamance (south Senegal) and southward from Sherbro Island in May. In September juveniles were found between Cape Blanc and Cape Timiris and off St. Louis, i.e. only in Mauritania, and in Feb–Mar-82 they were caught only in the southern part of the area, off Freetown.

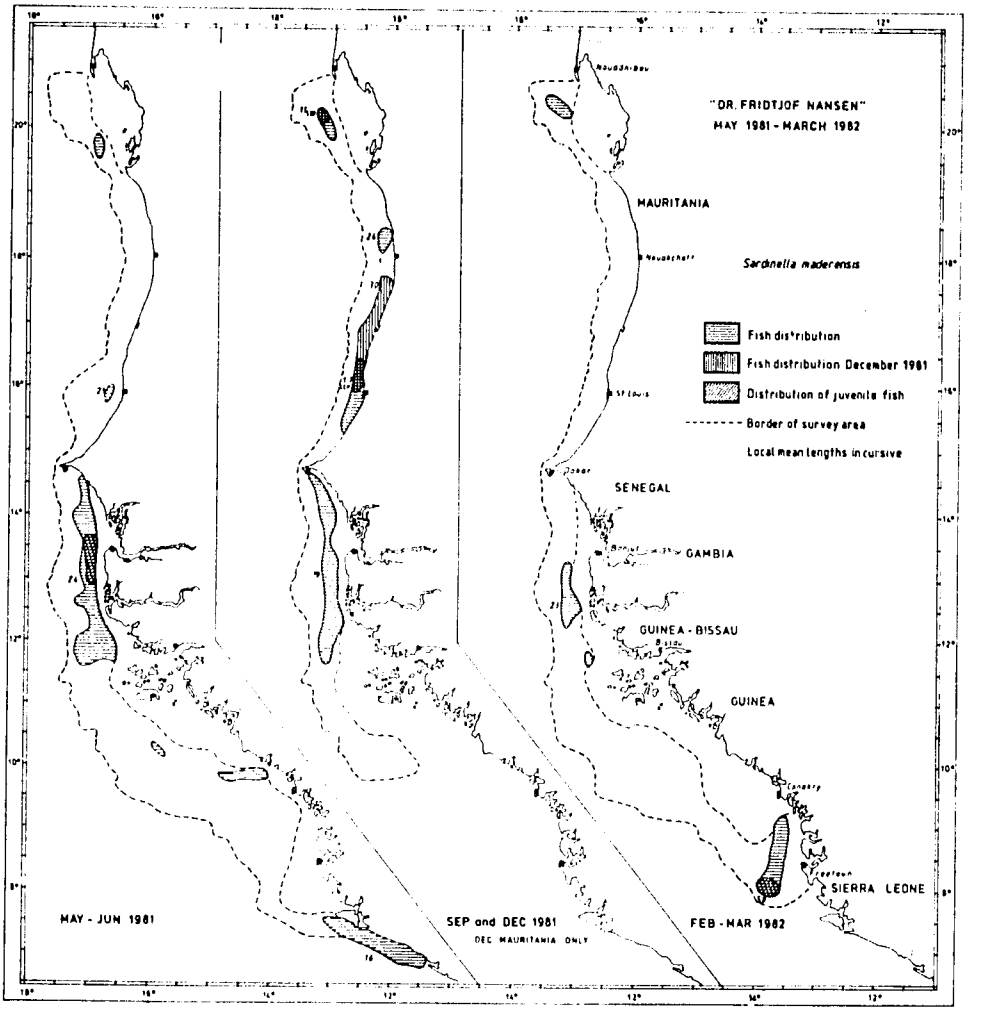


Fig. 37 Distribution of Sardinella maderensis from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

Old fish with lengths of 30 cm or more were found in May–June only between Cape Verde and Bissagos Islands, in September only at three locations in Mauritania, and not at all during the February–March survey.

According to previous reports the species forms three substocks in the area, and no wide range migration is known (FAO/CECAF, 1979, Troadec & Garcia,1980, Garcia,1982). During the "Dr. Fridtjof Nansen" surveys the length frequency of S. maderensis in the important shallow areas is virtually unknown, and it is there-

fore hard to deduce any migration pattern from the samples.

The nursery area localized off Freetown in Feb-82 is not included in the general features on the biology of the species (op.cit.). This ground is shared with S. aurita and Engraulis encrasicolus.

Employing the same procedure as for Sardinella aurita one gets the following very rough estimates of the abundance of S. maderensis (thousand tonnes):

	May-Jun-81	Sept-81	Dec-81	Feb-Mar-82
Mauritania	2	20	4	10
Senegambia	100	230	n.s.	40
Guinea Bissau	30	15	n.s.	20
Guinea	-	n.s.	n.s.	30
Sierra Leone	50	n.s.	n.s.	15
Total	~180	(265)		115

n.s. = no survey

These figures are believed to represent serious underestimates because of the species' quite shallow distribution.

Comparing the totals for the two sardinella species they both seem to be in the order of 200 thousand tonnes during the two first surveys, but reduced to 100 thousand tonnes in the last survey. If one allows that 1/3 of the S. maderensis stock were in the shallow waters one gets estimates for the sum of the two species in the range of 500 thousand tonnes during summer/autumn 1981, with a possible reduction to 250 thousand tonnes in early 1982.

2.3.2 Pelagic 2 group (the Carangids)

This group comprises the four species Trachurus trachurus, T. trecae, Decapterus rhonchus and D. punctatus, and Figure 38 gives the groups' distribution and estimated density in three

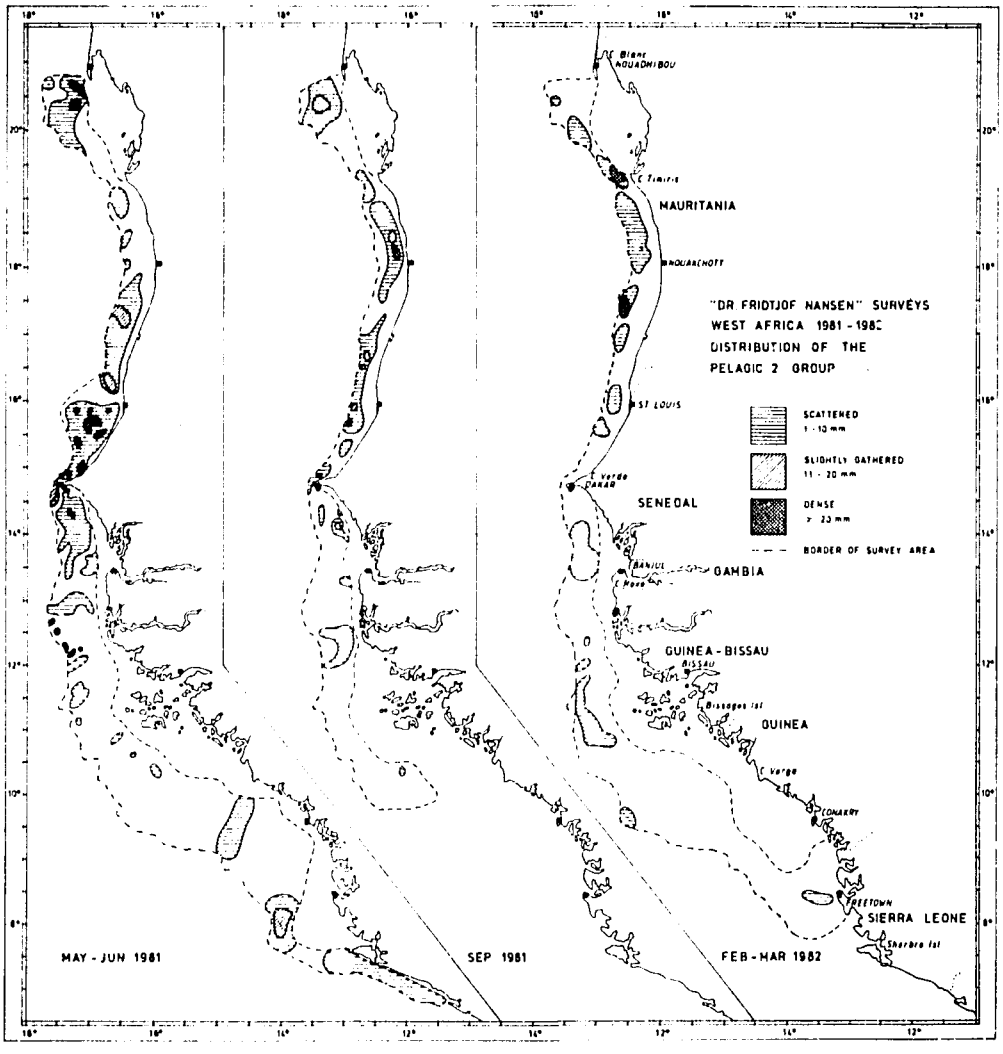


Fig. 38 Distribution of the Pelagic 2 group from three surveys between Cape Blanc and Sherbro Island, 1981-1982.

levels during the three main surveys. Extracted from Table 3 the estimated biomasses by countries are (thousand tonnes):

	May-Jun-81	Sept-81	Dec-81	Feb-Mar-82
Mauritania	370	190	470	350
Senegambia	570	90	n.s.	90
Guinea Bissau	40	20	n.s.	400
Guinea	30	n.s.	n.s.	10
Sierra Leone	120	n.s.	n.s.	5
Total	1130	300	n.s.	975

n.s. = no survey

All the species concerned here may also have parts of their distribution in the shallow areas not surveyed, but we have not attempted to give any estimate for these areas, except the ones given in connection with total fish abundance (see 2.1). Decapterus punctatus is perhaps the most severely underestimated as good registrations and catches were obtained close to the near-shore limit of the survey area at several locations. The other three species have generally their highest abundance over the deep part of the shelf (Boely and Freon, 1980).

The total stock size of these species, perhaps with the exception of Decapterus rhonchus, are believed to be underestimated as they are also distributed outside the region surveyed. On the basis of the general distribution and migration pattern (Garcia, 1982) we assume that Trachurus trachurus had most of its biomass north of Cape Blanc during all surveys, and T. trecae probably also had a significant number in this area, especially during the September survey. Decapterus punctatus made up most of the Pelagic 2 group in Guinea and Sierra Leone during the May–June survey and the species had probably then been covered to its southern limit (off Liberia). In Feb-82 however, the southern survey limit was outside Freetown, and it is possible that D. punctatus is distributed further southwards during this period.

North of Guinea the estimates given are almost entirely comprised of the three species Trachurus trachurus, T. trecae and Decapterus rhonchus, commonly known as horsemackerels. The total estimates for these fluctuates from about 1 million tonnes in May-June to 300 thousand tonnes in September to about 750 thousand tonnes in Feb–Mar-82. The low values in September can generally be explained by a northward distribution during this period, with large portions of the biomass north of the survey area.

However, one should note that even during the February–March survey still close to 40% of the biomass of horsemackerels was located in Mauritanian waters which may indicate that considerable quantities of carangids are distributed still further north. This is a possibility supported by the high estimates of

total fish biomass found off Western Sahara in March 1982. The 250 thousand tonnes reduction between the May-June and the February-March survey thus does not necessarily indicate any actual reduction in the stocks, but the possibility should be kept in mind.

By the same methods as described for the Sardinella species, we have made attempts to split the estimates on horsemackerels to the species level, using the catch records and assuming that the catchability is roughly the same for all three species. Table 10 gives indices of presence and relative abundance on the basis of the catch data, and very tentative abundance estimates are given below where the Pelagic 2 group are discussed species by species.

Table 10. Indices of occurrence of the species belonging to the Pelagic 2 group, by means of number of stations present (O) and by number of stations present according to the catch (W) (see text). The species estimated share of the Pelagic 2 group within a country (%) are given on basis of the weighted indices of abundance.

	Trachurus trachurus			Trachurus trecae			Decapterus rhonchus			Decapterus punctatus		
Country and survey:	O	W	%	O	W	%	O	W	%	O	W	%
Mauritania, May -81	8	6	12	18	38	74	3	7	14	-	-	-
Sept -81	-	-	-	11	26	48	13	28	52	-	-	-
Dec -81	4	8	13	8	20	33	16	32	54	-	-	-
Mar -82	15	18	37	17	21	43	7	10	20	-	-	-
Senegambia, May -81	3	2	2	24	45	56	18	24	42	-	-	-
Sept -81	-	-	-	2	7	25	9	21	75	2	0	0
Feb/Mar -82	1	0	0	13	23	100	1	0	0	-	-	-
Guinea Bissau,												
May/June -81	-	-	-	5	6	35	8	11	65	-	-	-
Sept -81	-	-	-	-	-	-	-	-	-	-	-	-
Feb -82	-	-	-	5	12	80	2	3	20	-	-	-
Guinea, June -81				-	-	-	3	3	50	3	3	50
Feb -82	-	-	-	1	0	0	-	-	-	-	-	-
Sierra Leone,												
June -81	-	-	-	-	-	-	-	-	-	4	7	100
Feb -82	-	-	-	-	-	-	1	0	0	2	0	0

Trachurus trachurus

The information gathered on Trachurus trachurus is inadequate as the surveys have only covered the southern part of the distribution area. In May, the species was found south to Cape Verde, in September it was absent from the survey area, and in Dec-81 and Mar-82 it occurred in various areas along the coast down to St. Louis (Fig. 39).

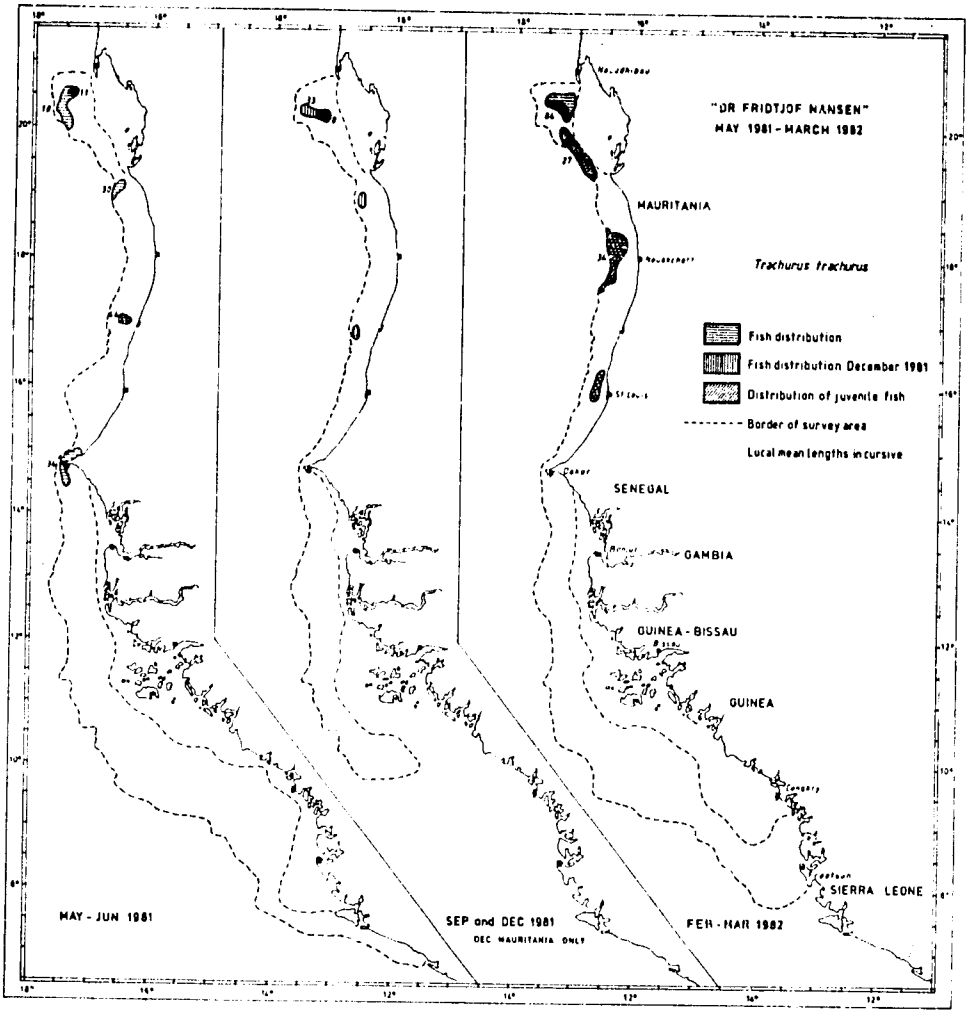


Fig. 39 Distribution of Trachurus trachurus from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

The old fish of lengths 30 cm or more do not form outstanding aggregations or any clearly restricted distributions, and the group is always present in the southernmost samples of the species.

Juveniles of lengths $\leq$ 10 cm were present south to St. Louis in May-81 and Mar-82, while they were only found a little south of Cape Blanc in Dec-81. Particularly samples from Mar-82 indicate a major (post-)spawning period by their distribution and size of juveniles. No juveniles were found in Senegalese waters.

The catches were never quantitatively substantial. The fish were caught on 33 occasions and on 21 of these the catch was less than 10 kg/hour. 7 catches exceeded 50 kg/hour, and only one was more than 200 kg/hour.

By the very rough methods already described we have estimated the biomass by country as follows (thousand tonnes):

	May-81	Sept-81	Dec-81	Feb-Mar-82
Mauritania	45	-	60	170
Senegal (north)	10	-	no survey	0
Total	60	-	60	170

Trachurus trecae

The distribution of Trachurus trecae, by its presence in the trawl catches, is shown in Figure 40. In May-81 and Feb-82 the species was located south to the Bissagos Islands while in Sept-81 the southern limit was around St. Louis. In December of the same year only Mauritania was surveyed and the fish were distributed at least as far south as in September.

The old fish of lengths $\geq$ 30 cm were located around the Bissagos Islands in Feb-82 and formed probably the head of the southward migration. In May-81 the corresponding southern limit was Cape Verde and, in accordance with the general migration picture, the fish were probably moving north. In September a few old fish were located near Nouakchott and the majority thus probably being distributed north of Cape Blanc.

Juveniles of lengths less than 10 cm were located between St. Louis and Bissagos Islands in May, between Nouachott and Cape Blanc in September and between Cape Timiris and Cape Roxo in Feb-Mar-82.

The species was caught at 106 stations during the entire programme. 41% of the catches were less than 10 kg/hour, and 32% of the hauls exceeded 200 kg/hour. Catches exceeding 1 t/hr

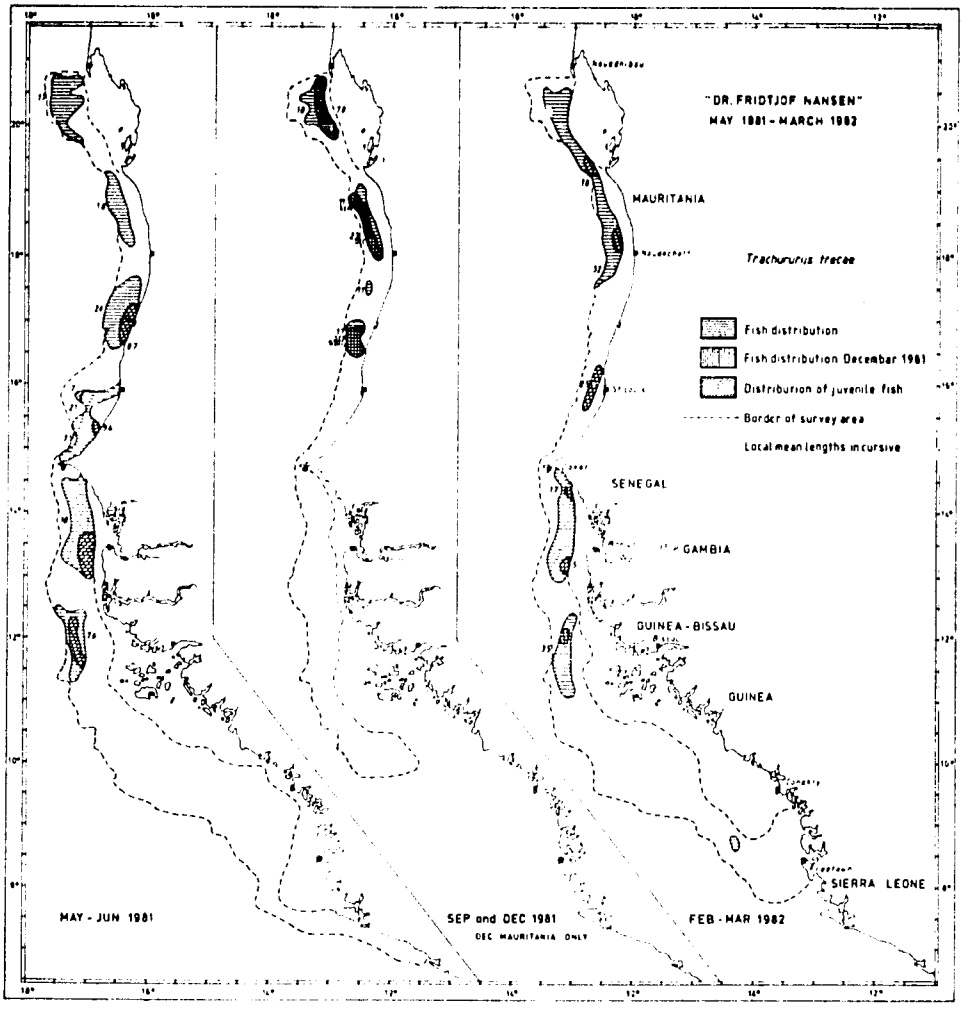


Fig. 40 Distribution of Trachurus trecae from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

were obtained only on 6 occasions, but the catch figures are in no way representative of a commercial fishery as the trawling speed and the gear size was clearly below optimum for this fast swimming pelagic species.

The abundance of Trachurus trecae are roughly estimated as follows (thousand tonnes):

	May–Jun-81	Sept-81	Dec-81	Feb–Mar-82
Mauritania	275	90	150	200
Senegambia	320	20	n.s.	90
Guinea Bissau	15	-	n.s.	150
Guinea	-	n.s.	n.s.	-
Sierra Leone	-	n.s.	n.s.	-
Total	610	110		440

n.s. = no survey

The total estimates vary from about 600 thousand to 100 thousand tonnes during the programme. The major reduction in the estimates from May–June to September can largely be ascribed to migration north of Cape Blanc.

One should also keep in mind that even in February–March nearly 50% of the total biomass of the carangids is allocated to Mauritania, although the general migration picture states the species to be in their southern part of the migration cycle. This makes it possible that T. trecae are still distributed further northwards, off Western Sahara. The high total fish abundance off Western Sahara at this time may support this. Due to the uncertainties of species composition off Western Sahara the reduction of 170 thousand tonnes in T. trecae from spring -81 to early -82 does not give us a firm reason to believe in an actual reduction of the stock.

Decapterus rhonchus

The yellow horsemackerel appears on the Arguin Bank year round, but apart from this the distribution of the species on basis of the trawl catches (Figure 41) suggests a seasonal migration along the coast. In May–Jun-81 the species was found mostly south of St. Louis, while in September and December same year a widespread distribution occurred northwards up to Cape Blanc. In September the southern limit of the distribution was off the Gambia, while in Feb–Mar–82 the fish were found as far south as

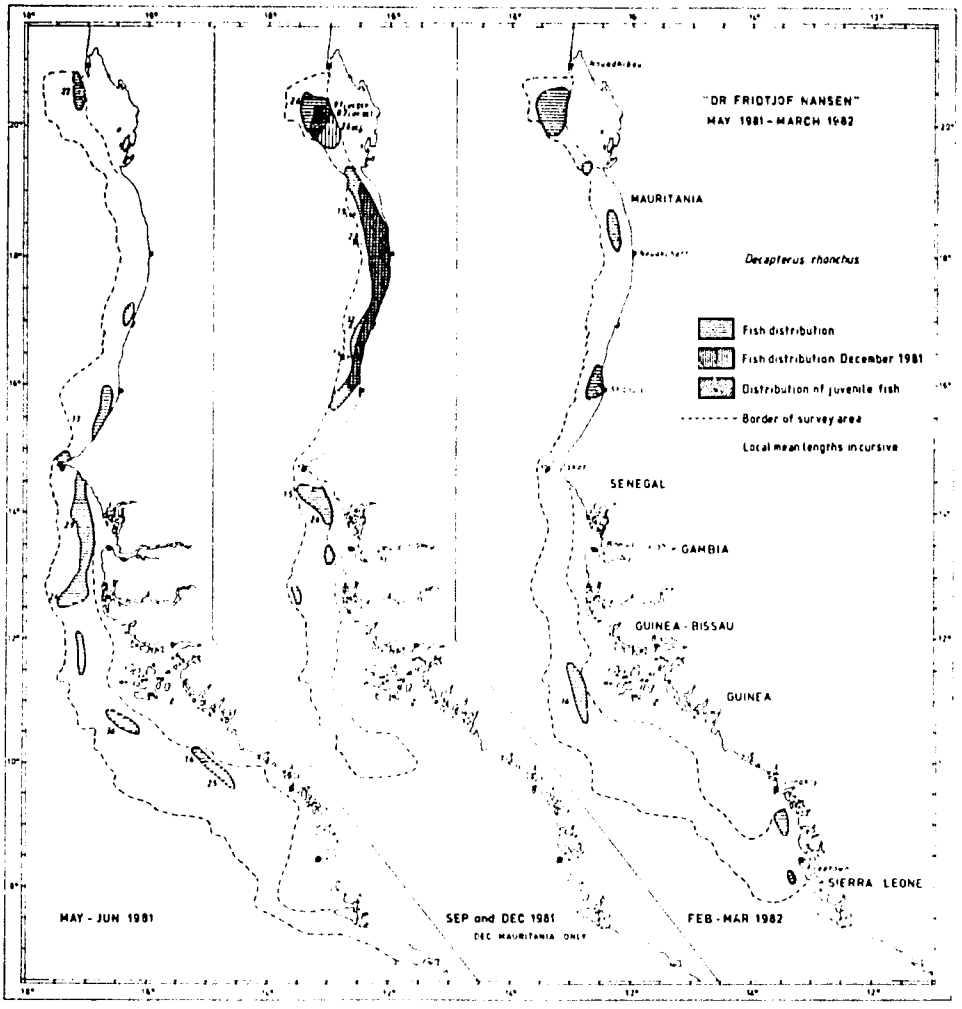


Fig. 41 Distribution of Decapterus rhoncus from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

the Bissagos Islands. Here big fish of mean length 36 cm occurred together with Trachurus trecae and Sardinella aurita, possibly forming the frontier of a southward migration. We find it remarkable that Decapterus rhonchus was not located in Senegal at this time, and that the main part of the biomass was still in Mauritania.

The yellow horsemackerel was also located south of the Bissagos Islands in May-81 and in Feb-82. This fish probably forms an independent southern population already identified by Soviet scientists (FAO/CECAF, 1979).

Juveniles of 10 cm length or less were located between Cape Verde and Cape Blanc in September and on the Arguin Bank in December. In May–Jun-81 and Feb–Mar-82 no juveniles were caught north of Sierra Leone, although in the February–March survey juveniles were located off Freetown along with other species. This seems to be an important nursery ground for the southern area of the investigation.

The species was caught on 86 occasions during the surveys, but in 37% of the hauls the catch was less than 10 kg/hour. Six hauls or 7% exceeded 500 kg/hour. The highest catch was 9800 kg/hour, off St. Louis in Sept–81.

Stressing more the order of magnitude than absolute abundances, the following biomass estimates are given for Decapterus rhonchus (thousand tonnes):

	May–Jun-81	Sept-81	Dec-81	Feb–Mar-82
Mauritania	50	100	250	100
Senegambia	240	70	n.s.	-
Guinea Bissau	25	20	n.s.	40
Guinea	15	n.s.	n.s.	10
Sierra Leone	-	n.s.	n.s.	-
Total	330	190		150

n.s. = no survey

Only small fractions of the stock are generally assumed to be distributed north of Cape Blanc (Troadec & Garcia, 1980). The surveys with "Dr. Fridtjof Nansen" are therefore believed to have encompassed most of the stock, at least of the important northern population. If, as we believe, great parts of the stock did not seasonally move into the very shallow waters unsurveyed by the vessel, the given biomass estimates indicate a reduction of the population in Feb–Mar–82 to near half of the level of May the previous year.

Decapterus punctatus

In Jun-81 this species constituted the majority of the carangids found in Sierra Leone, and a portion of the biomass in the shallow waters of Guinea. In Feb-82, the last survey carried out in the area, the species was identified by trawl only in two locations in Sierra Leone. During this coverage major aggregates of fish close to the bottom were located in shallow waters just south of the Bissagos Islands. Because of very coarse bottom conditions it was not possible to trawl on the registrations, but the characteristics of the traces are clearly that of one of the pelagic species, most likely D. punctatus.

Based on the few data and the methods already described, we have estimated the biomass of the species as follows: (thousand tonnes)

	Jun-81	Feb-82
Guinea Bissau	-	210
Guinea	15	-
Sierra Leone	120	5

The southern limit of the latest survey was off Freetown, so it is possible that part of the population is distributed further south. The species occurred mainly in quite shallow waters and there formed dense schools detected by the sonar. As the species is assumed to have a large fraction of the population in shallow waters, the above given estimates do in no way indicate the size of the stock, but show only the fraction available for off-shore fishing.

The catches were never substantial. Of 25 catches 17 were less than 10 kg/hour and the best were two catches just under 200 kg/hour. Purse-seining the schools in the shallow waters would probably give considerably higher catches.

2.4 General Findings for Other Main Species

Extracted from Table 3 the biomass estimates on the "Other Fish" group are as follows (thousand tonnes):

	May-Jun-81	Sept-81	Feb-Mar-82
Mauritania	30	70	260
Senegambia	60	60	430
Guinea Bissau	140	80	125
Guinea	30	n.s.	10
Sierra Leone	20	n.s.	40
Total	280	210	865

n.s. = no survey

The estimates from the May-June and the September survey seem to be in fair agreement, while the February-March estimates are substantially higher in Mauritania and especially in Senegambia. During the last survey about 50% of the biomass of "Other Fish" was found in dense aggregations in shallow waters off Mauritania and Senegambia, while the two first coverages were characterized by a much more even distribution. The patches consisted mostly of Pomadasyidae (mainly Brachydeuterus auritus), Sciaenidae, Sparidae and Trichiuridae (Trichiurus lepturus). This considerable increase in biomass suggests that a migration had taken place before the last survey from the shallows into the shallow waters covered by the vessel. Such a migration perpendicular to the coast could be a reaction to the cold and oxygen-depleted water replacing the nearshore waters during upwelling.

The surveys carried out with "Dr. Fridtjof Nansen" off Western Africa are essentially acoustic both in purpose and design. Bottom trawling was then carried out only when fish were somewhat aggregated and formed notable contributions to the echo-integrator, contributions that needed to be identified. Schooling species or other species with an aggregated distribution pattern are consequently oversampled in relation to species with a more solitary behaviour and dispersed distribution. This should be kept in mind when making use of the trawl data for biological studies.

Several families made notable contributions to the catches, namely the seabreams (Sparidae), the grunts (Pomadasyidae), hairtails (Trichiuridae), croakers (Sciaenidae), catfish (Ariidae) and threadfins (Polynemidae). Of the families Carangidae and Clupeidae species other than the ones dealt with in the foregoing chapter made important contributions to the catches. To be mentioned are Alectis alexandrinus, Caranx chrysos, C. senegalus, Chloroscombrus chrysurus and Selene dorsalis among the carangids and Ilisha africana among the clupeoids. For further information on these and other species we refer to the Annexes V and IV where catch data and length distributions are presented by species. Included in Annex VII are also maps of all fishing stations for each coverage. The occurrence of a certain species can then be illustrated by marking the stations where the species was caught. By preparing the data this way we hope to have facilitated further specialized study.

Of the many species belonging to the "Other Fish" group, we present distribution charts for two species commonly occurring in the catches; the bigeye grunt (Brachydeuterus auritus) and the hairtail (Trichiurus lepturus). The triggerfish (Balistes capriscus) was treated separately during all surveys and the findings are covered in a separate chapter in this report.

Brachydeuterus auritus

The distribution of the bigeye grunt during the surveys is shown in Figure 42. The species is found along the entire region from Cape Blanc to Sherbro Island, but the distribution pattern seems to be seasonally dependent. In the winter (Feb-Mar-82) and spring (May-Jun-81) the species seems to be mainly restricted to south of Mauritania while in September and December it is widespread in Mauritanian waters up to Cape Timiris. Especially in Dec-81 the fish was spread abundantly between Cape Timiris and St. Louis. The findings coincide with the general migration picture already known (Garcia 1982).

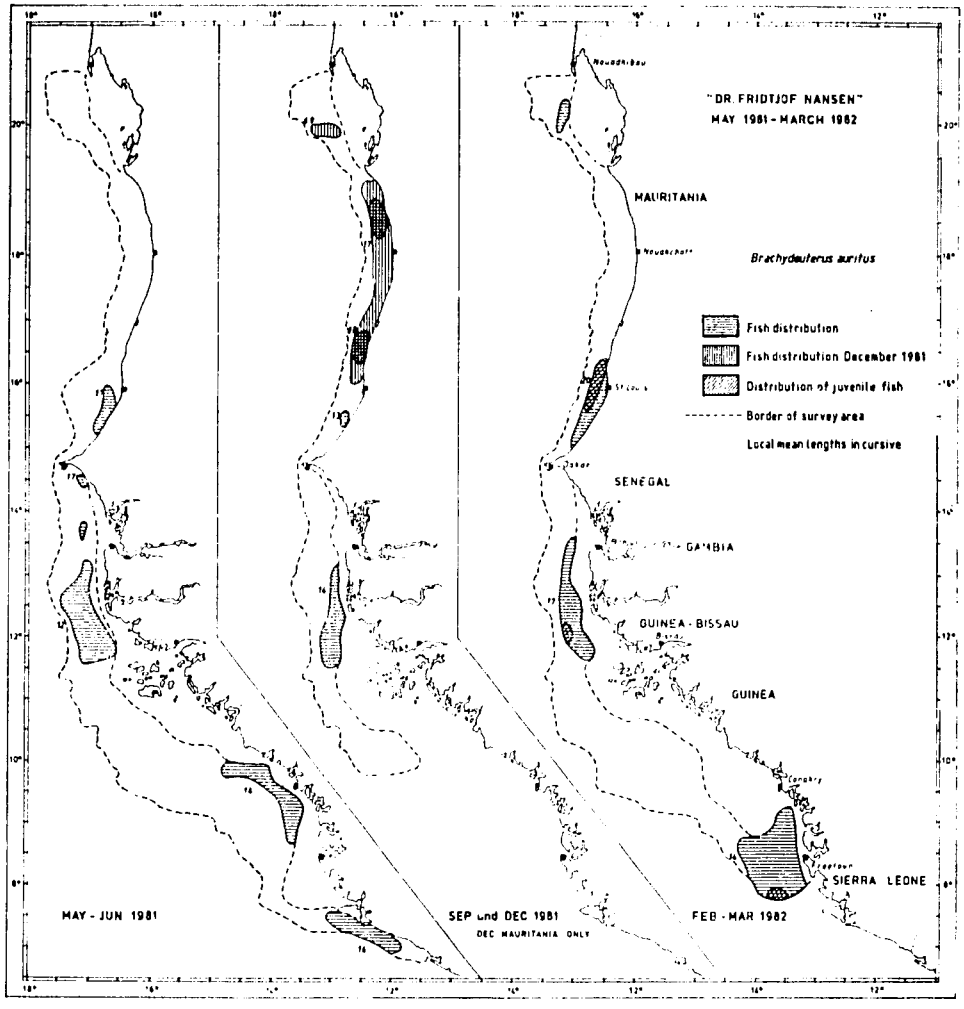


Fig. 42 Distribution of Brachydeuterus auritus from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

Juveniles were caught in Feb–Mar-82 off St. Louis, Cape Roxo and Freetown, and in December between Cape Timiris and St. Louis (southern limit of the December survey).

The species was found in 93 hauls during surveys in the region and of these 8 hauls exceeded 1 tonne/hour. The big catches, except one, were all caught between Cape Verde and Nouachott (between 15°N and 17°N specifically).

Trichiurus lepturus

The distribution of the largehead hairtail by its occurrence in the trawl catches is shown in Figure 43. In May-81 the species seems to form two major distribution clusters in the region north of the Bissagos Islands, one off Senegal, north of Cape Verde and one in the waters off Cape Roxo. In September the species was found mostly north of Cape Verde and up to Cape Blanc, while in Feb-Mar-82 the fish was again concentrated in North Senegal and off Cape Roxo, and also in a cluster on the Arguin Bank (Cape Blanc area). The hairtails were not located between Bissagos Islands and Freetown during the last survey.

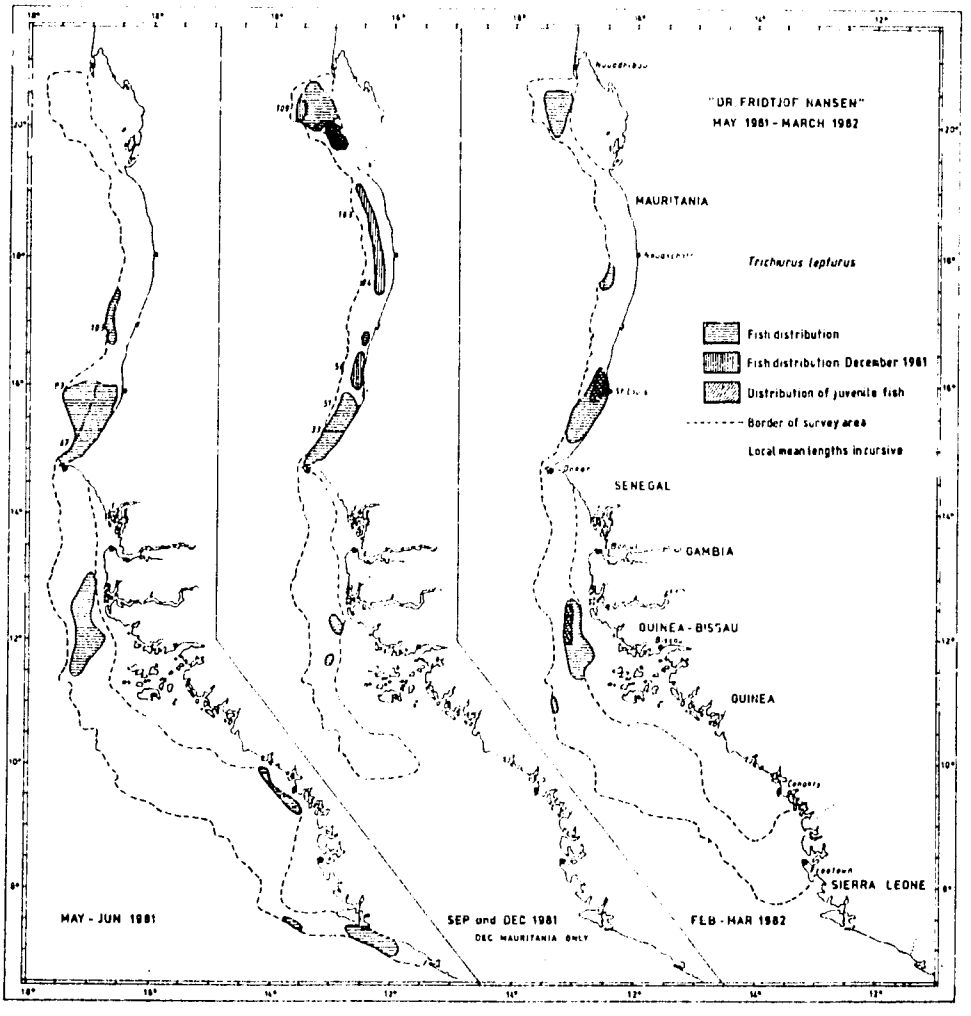


Fig. 43 Distribution of Trichiurus lepturus from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

Juveniles were caught in Feb–Mar-82 off St. Louis and off Cape Roxo and in December on the Arguin Bank.

The species was caught in 90 hauls, generally in small quantities and mixed with other fish. The two best catches were around 300-400 kg/hour and only seven other hauls exceeded 100 kg/hour.

3 RESULTS FROM MOROCCO SURVEY, MARCH–APRIL 1982

3.1 Fish Abundance and Distribution in the Region of Cape Bojador - Agadir

The region was covered twice in the period March 23 - April 3 1982. The first coverage was the most intense including all the sampling work and some acoustic experiments, while the second was carried out with a more open survey grid en route from Agadir to Tenerife. The primary objective of the second coverage was to get a second independent acoustic estimate, but also to check if the distribution pattern had changed significantly in the short period between the two surveys.

The fish distributions found during the two coverages are shown in Figure 44. The main species caught in the trawl are given in the maps and the three levels of density shown correspond roughly to 14-140, 140-280, and more than 280 tonnes/nm^2.

As can be seen from the figures, the distribution pattern changes significantly between the two surveys as the pilchard (*Sardina pilchardus*), previously a dominant species in the area, had moved shoreward during the last survey and was only partially covered by the vessel's sampling track. This feature also affected the second acoustic estimate significantly and made the two estimates statistically incomparable in terms of sampling errors.

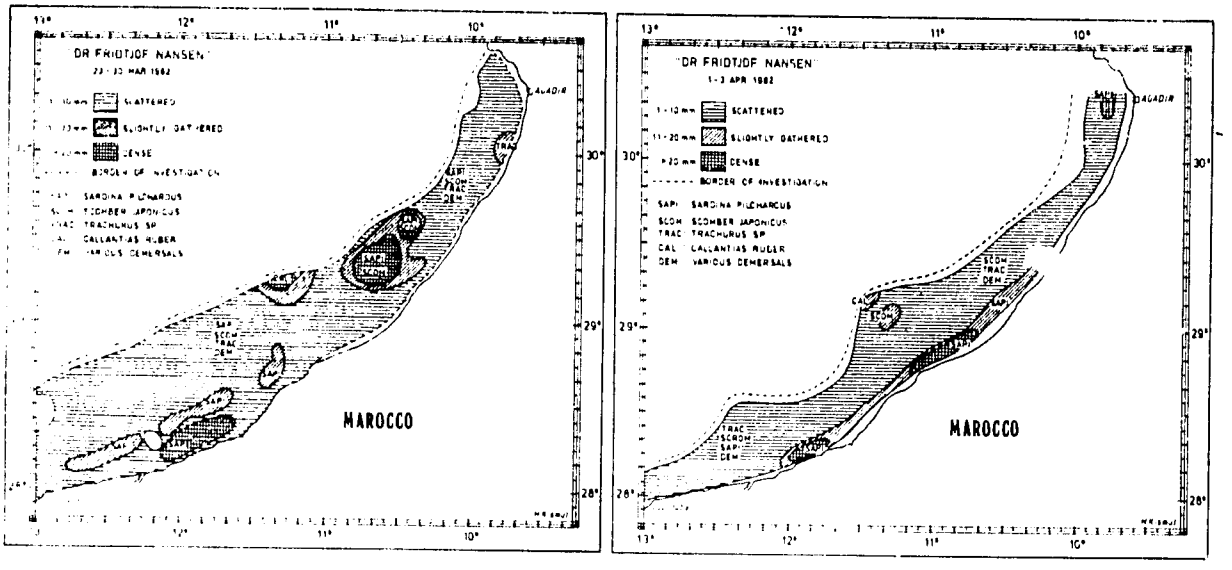


Fig. 44 Fish distribution from Cape Juby to Agadir Mar 23-30 (left) and Apr 1-3 (right) 1982.

The biomass estimates were as follows (thousand tonnes):

	Sardina pilchardus	Scomber japonicus and Trachurus trachurus	Other fish	Total
1 coverage	330	340	80	750
2 coverage	180	→	190	370

As already mentioned we consider the first coverage the most representative for the biomass in the area in that it was both the most detailed survey, and also that it seemed to include most of the biomass, while the second coverage seems to have omitted considerable quantities in the shallow areas. During the second coverage the chub mackerel (Scomber japonicus) was more dispersed and it was difficult to assess its share of the integrated densities as it frequently occurred together with other fish. Consequently the mackerels are included in the "Other Fish" estimate for the second coverage.

Again we like to stress that, as mentioned several times earlier in the report, the group estimates are only to be interpreted as indicative, while we put higher reliance in the total estimates.

The close to 50% reduction in the total between the two surveys may only be partly explained by the loss of fish into the shallow waters. Another important factor seems to be that due to the open survey grid during the second coverage, considerable aggregates of fish seem to have been overlooked by the sampling track.

On the basis of our findings we assume the total biomass in the area surveyed to have been in the order of 750 thousand tonnes. Of this about 90% is made up of about equal shares of pilchard and mackerels (including horsemackerels), while the remaining 10% are allocated to other fish. Of the 80 thousand tonnes classified as "Other Fish", 55 thousand tonnes are made up of Calanthias ruber, along the shelf edge. Apart from this the group on the basis of the very few bottom trawls carried out (3), consists mostly of various seabreams (Sparidae) and john dory (Zeus faber). See also Annexes II, III and V for further data from the catches.

During the survey the main part of the fishing fleet was concentrated in the northern area while the considerable resources in the south seemed virtually unexploited.

4 RESULTS FROM THE SURVEY LIBERIA - GHANA, JUNE 1981

4.1 Fish Abundance and Distribution

Figure 45 shows the fish distribution from Liberia to Ghana, June 1981 and the dominant species in the catches are given in the figure. The total abundance within the part of the shelf surveyed is estimated to about 730 thousand tonnes. The uncovered shallow areas comprised about 10% of the shelf, and if one assumes the same densities in these areas as in the others, the total estimate for the whole shelf would be approximately 800 thousand tonnes. In the surveyed area 70% (500 t.tonnes) of the fish were classified as triggerfish, 17% (130 t.tonnes) as

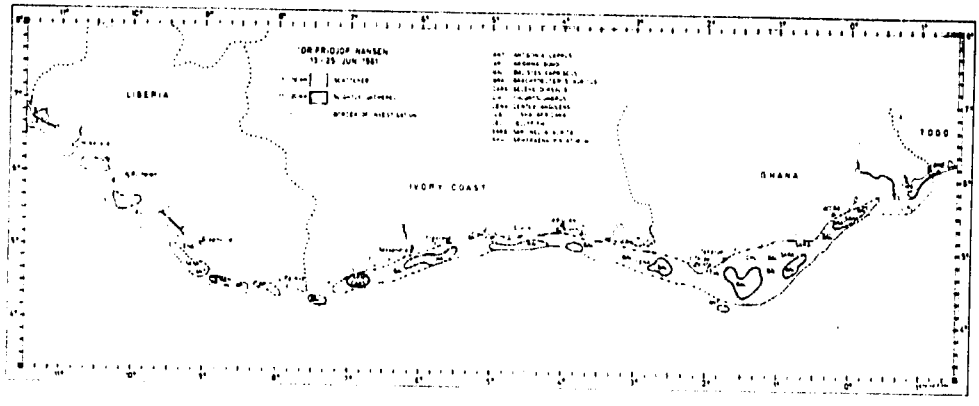


Fig. 45 Fish distribution from Liberia to Ghana, June 1981.

Pelagic 1 and 7% (50 t.tonnes) as Pelagic 2. The "Other Fish" group, consisting mostly of various demersal fishes, comprised only the remaining 7% (50 t.tonnes). Generally, demersal fish were seldom detected by the acoustic system as the species rarely formed aggregates in the area. This is also reflected in the catches in the bottom trawl, Table 11. The table shows that

Table 11. Distribution of catches by family and bottom depth strata from Liberia to Ghana, st 152-200, June 1981. Family codes are explained in Annex VI.

GEAR: BOTTOM TRAWL
NO OF HAULS: 17 TOTAL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. % of c. total >1kg catch		MEAN CATCHES OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA 1 <20m	9 20-50m	7 50-200m	0 >200m
BAL	0	2	1	1	1	29	1085.2	48	.0	600.8	2.7	.0
CAT	0	0	0	1	1	12	1456.9	26	.0	.0	416.5	.0
SPA	1	1	3	2	0	41	138.6	9	.0	14.9	119.5	.0
CLU	2	0	1	2	0	29	123.0	6	1.6	45.7	28.9	.0
CAR	4	2	1	1	0	47	59.1	4	.0	33.2	24.9	.0
ARM	2	0	2	0	0	24	49.6	2	.0	.0	28.4	.0
MUL	1	0	1	0	0	12	35.2	1	.0	7.7	.2	.0
PRI	4	2	1	0	0	41	17.3	1	.0	2.2	14.4	.0
UER	0	3	0	0	0	18	16.9	1	.0	1.1	5.8	.0
SPH	2	1	1	0	0	24	33.4	1	5.2	14.3	.0	.0
Other fish							16.1	2				
MEAN CATCH OF ALL HAULS							661.5		10.0	738.6	655.6	.0
TOTAL NUMBER OF HAULS 17									1	9	7	0

GEAR: PELAGIC TRAWL
NO OF HAULS: 32 TOTAL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. % of c. total >1kg catch		MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA 1 <20m	13 20-50m	18 50-200m	0 >200m
BAL	0	2	6	2	6	50	1203.5	90	.0	871.5	440.3	.0
CLU	5	7	4	0	0	50	27.5	2	24.0	19.0	9.4	.0
ENG	4	0	0	1	0	16	74.0	2	.0	1.1	19.7	.0
JEL	1	1	1	1	0	13	109.4	2	.0	22.9	7.8	.0
ARM	3	3	1	0	0	22	38.0	1	.0	.0	14.8	.0
CAR	7	7	1	0	0	47	18.6	1	13.8	17.2	2.3	.0
SPH	2	4	0	0	0	19	16.6	1	.0	6.9	.5	.0
Other fish							5.2	0				
MEAN CATCH OF ALL HAULS							666.1		135.0	941.8	496.4	.0
TOTAL NUMBER OF HAULS 32									1	13	18	0

pelagic fish also dominate the bottom trawl catches. Of the typical bottom fish only the families Caproidae, Sparidae and Ariommidae contributed more than 1% to the total catch. Of the total catches in the pelagic trawl (Table 11), 90% is triggerfish, Balistes capriscus, while clupeids and anchovies only contribute 2% each to the catches. The carangids are almost absent from the catches with only 1% of the total catch.

4.2 Allocation on EEZ's

Liberia

Rough estimates of the biomass in Liberia in June 1981 were (1000 tonnes):

Triggerfish	2
Pelagic 1	47
Pelagic 2	40
Other Fish	37
Total	126
Mean density	24 tonnes/nm^2

These estimates are for the surveyed shelf area, which was 92% of the shelf. The total estimate could be raised by roughly 10% to compensate for the unsurveyed shallow parts.

The low abundance of fish is also reflected in the catches from 15 trawl hauls, which yielded an average catch of 215 kg/hour. In the entire region from Liberia to Ghana the average catch was 660 kg/hour.

The Pelagic 1 group consists mainly of Sardinella aurita which occurred in 6 of 15 hauls (ratio of occurrence 6/15), S. maderensis (2/15) and Anchoa guineensis (4/15). The Pelagic 2 group consists mostly of Decapterus punctatus (6/15).

Ivory Coast

The biomass estimates for the Ivory Coast were (1000 tonnes):

Triggerfish	188
Pelagic 1	39
Pelagic 2	2
Other Fish	1
Total	230
Mean density	77 tonnes/nm^2

The shallow uncovered parts are 17% of the total shelf, and the total estimate could be raised to 280 thousand tonnes to compensate for this.

The triggerfish amounted to 80% of the total catch in the area. The Pelagic 1 group consisted of *Sardinella aurita*, *S. maderensis* and *Anchoa guineensis* with ratios of occurrence 6/11, 7/11 and 4/11 respectively. The resources belonging to the Pelagic 2 group seem very small, but *Caranx chrysos* and *Selene dorsalis* were present in the catches.

Ghana

The resources in Ghana were estimated to be (thousand tonnes):

Triggerfish	314
Pelagic 1	40
Pelagic 2	10
Other Fish	14
Total	378
Mean density	57 tonnes/nm^2

The shallow unsurveyed areas make up 8% of the total shelf, and the total estimate can be raised to 410 thousand tonnes to roughly correct for this.

As off the Ivory Coast the triggerfish is the dominant species comprising 82% of the total estimated fish abundance. The Pelagic 1 group consists of Sardinella aurita, S. maderensis and Anchoa guineensis with ratios of occurrence 6/23, 9/23 and 2/23 respectively. The sardinella occurred together with the triggerfish in the area, and it proved impossible to separate the species quantitatively by the traces of the echogrammes. Furthermore, the catchability of the species for the gears used is likely to be unequal but unknown. The composition in the catches could therefore not be used directly to split the species. The estimate of the Pelagic 1 group is thus very uncertain. The triggerfish was, however, clearly dominant on all locations, so the aforementioned problems would have less affect on that estimate.

The Pelagic 2 group consists of Decapterus punctatus and D. rhonchus with ratios of occurrence 8/23 and 3/23 respectively. Other carangids found were Chloroscombrus crysurus, Selene dorsalis and Caranx crysos.

4.3 Summary of Small Pelagic Fish Liberia to Ghana, June 1981

The clupeoids along the coast from Liberia to Ghana consisted of anchovy and round and flat sardinellas. For the Ivory Coast the clupeoids are perhaps overestimated. Off Ghana the sardinella was extensively mixed with triggerfish and the estimate of stock biomass is as mentioned above unfortunately not very reliable.

The carangids (Pelagic 2 group) were not located in substantial quantities in the eastern part of the area. In Liberia, 40 thousand tonnes were allocated to the group, mainly of Decapterus punctatus. There the species formed the southern part of the same population as found off Ghana and Sierra Leone.

5 RESULTS ON TRIGGERFISH (Balistes capriscus) FROM ALL SURVEYS

5.1 Fish Distribution and Abundance

The triggerfish (Balistes capriscus) seems to be divided into two separate stocks off West Africa, with no apparent interchange. The western stock, with its center of distribution off Guinea and Guinea Bissau, was fully surveyed twice in the Dr. Fridtjof Nansen programme, in May-81 and Feb-82. In Sept-81 the stock was only partly covered. The eastern stock with its center off Ghana has only been covered once (Jun-81).

Figure 46 based on the integrator readouts classified as triggerfish shows the distribution of the Guinea stock at three levels of density during the three coverages. Figure 47 on the other hand shows the distribution of the same species during the same coverages, but solely on basis of the trawl catches. This figure includes spurious occurrences in the fringes of the distribution area but no density levels. The Guinean stock of triggerfish was distributed north to Cape Timiris and south to Sherbro Island. The main distribution is south of Cape Verde and substantial quantities are from Bissagos Islands and southwards. There seems to be a tendency of increasing length with increasing latitude in the younger part of the population, i.e. for the small and middle sized individuals. Figure 48 shows this for the three coverages. In May-June this pattern is not apparent, but the minimum values show that all fish of 16 cm or less are located south of 11°30'N. The results from the two other coverages show a clear tendency to increasing mean and minimum lengths by latitude. The size distribution could be due to a gradual northward migration within the younger part of the population. A possibility of a location-dependent growth, corresponding with a general decreasing productivity southwards, should also be considered. The maximum values in the samples do not show a similar trend. The figures also indicate that there is little or no recruitment of young fish into the population during the period of the surveys, as the minimum values increase with each survey along the coast.

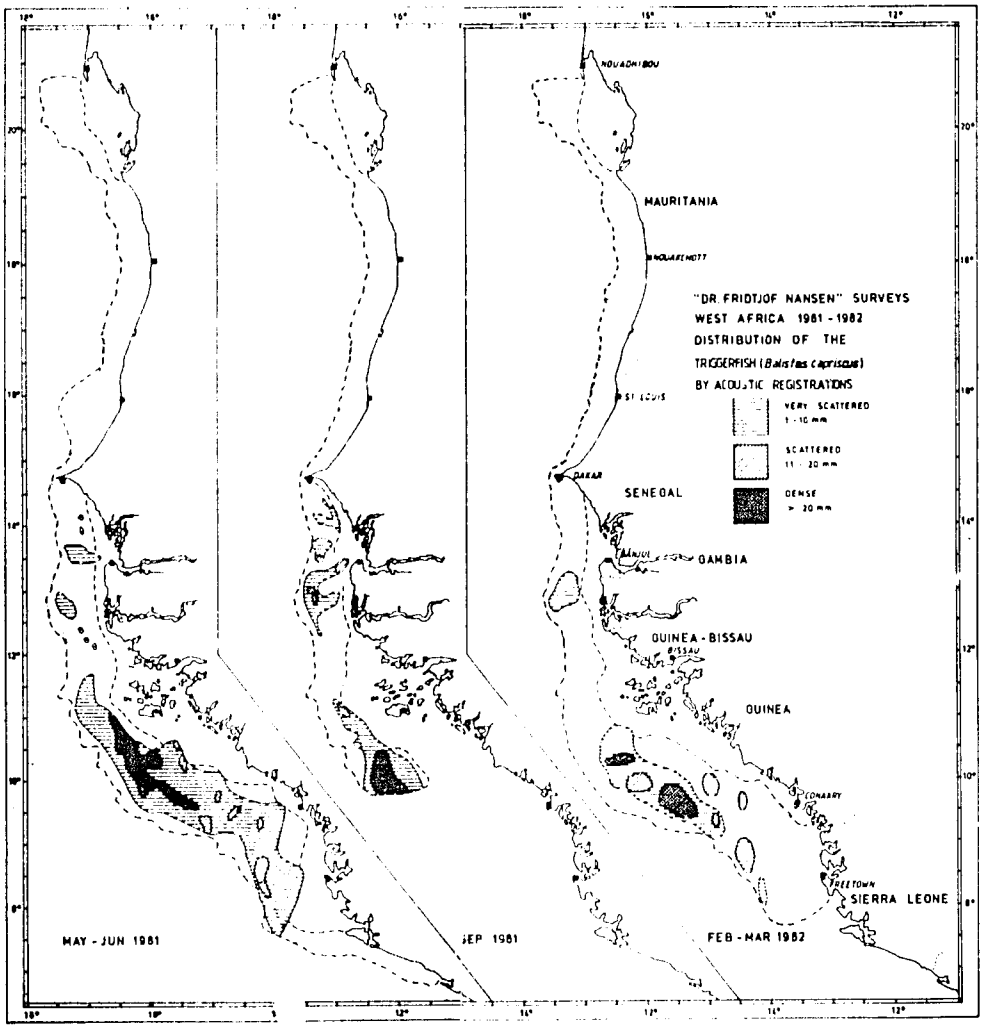


Fig. 46 Distribution of triggerfish (Balistes capriscus) from Cape Verde to Sherbro Island, 1981-1982.

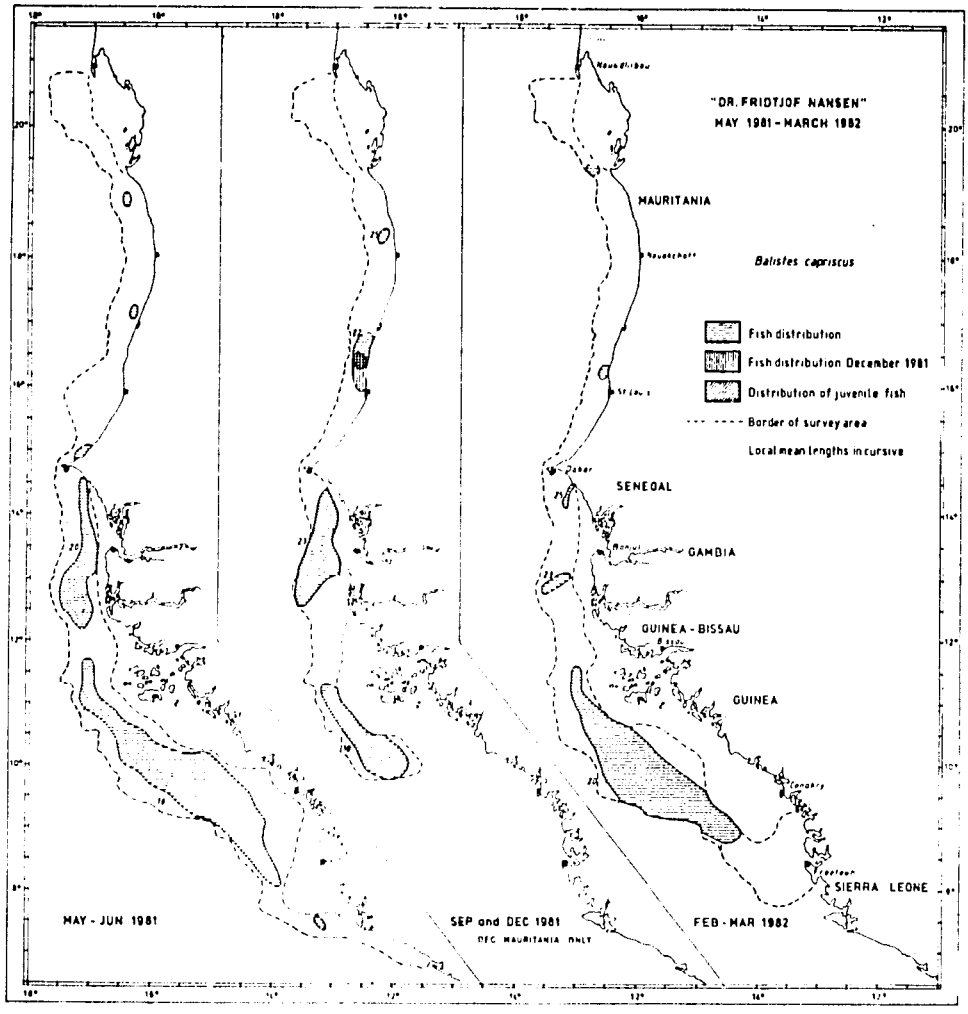


Fig. 47 Distribution of Balistes capriscus from occurrence in trawl catches, Cape Blanc to Sherbro Island, 1981-1982.

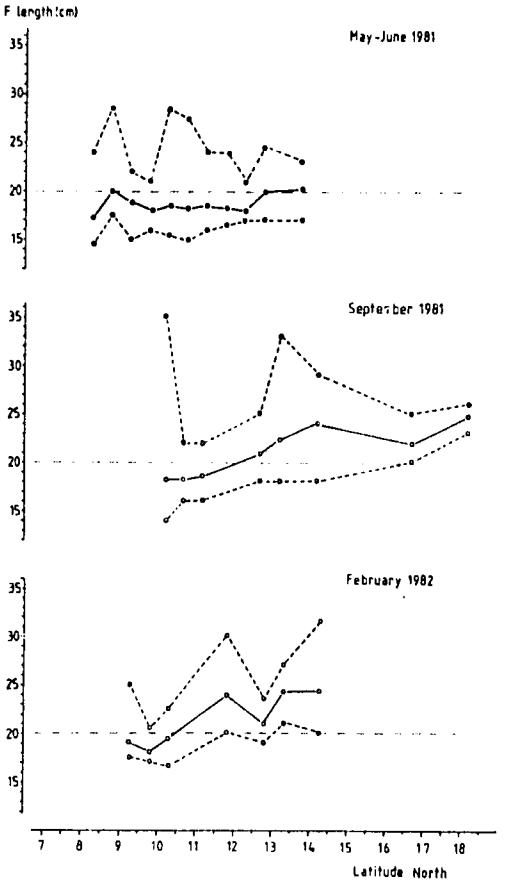


Fig. 48 Recorded maximum, mean and minimum length by latitude and survey in pooled samples of triggerfish (Balistes capriscus).

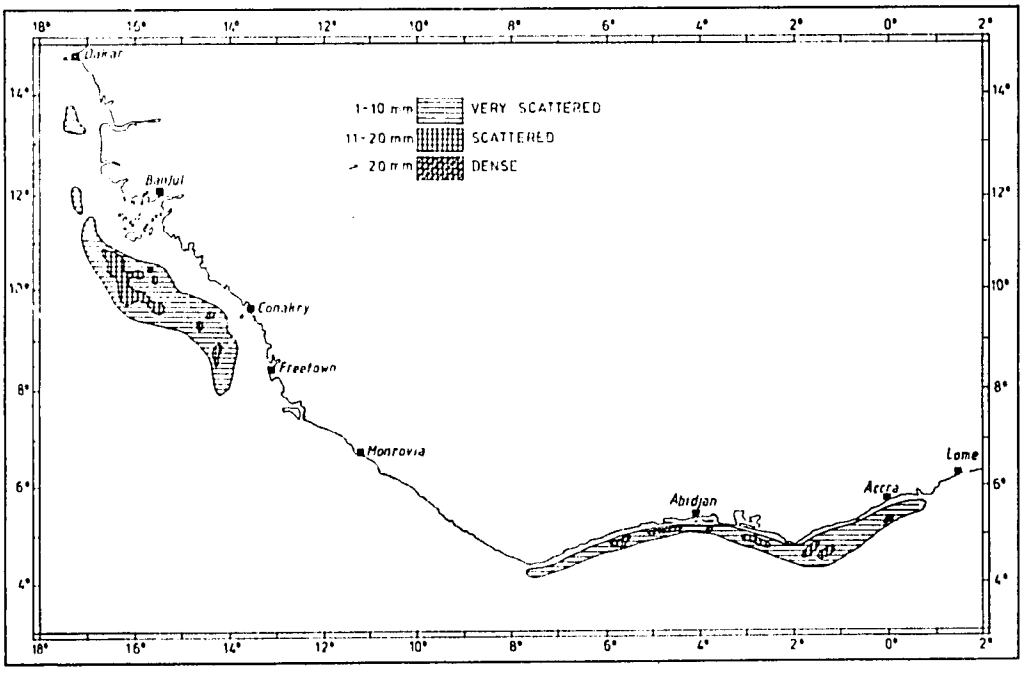


Fig. 49 Distribution of triggerfish (Balistes capriscus) from Cape Verde to Togo, June 1981.

The distribution of the Ghana stock in Jun-81 is shown in Figure 49. The triggerfish is distributed from the border between Liberia and the Ivory Coast and eastward almost to Togo. The length distributions show the same pattern as for the Guinea stock; the mean and minimum lengths observed tend to increase westwards (see Annex III st. 171-200). From Figure 49 it is also seen that the triggerfish is virtually absent from Liberia. From this we assume that the two populations do not mix.

The biomass estimates were as follows (thousand tonnes):

	May-Jun-81	Sept-81	Feb-82
Guinea stock	1050	490*	1350
Ghana stock	500	n.s.	n.s.
By EEZ's:			
Senegambia	70	140	40
Guinea Bissau	380	350	590
Guinea	510	n.s.	720
Sierra Leone	80	n.s.	10
Liberia	2	n.s.	n.s.
Ivory Coast	190	n.s.	n.s.
Ghana	310	n.s.	n.s.

n.s. = no survey * = partly coverage only

The triggerfish seem to react very little to the research vessel, and the species is generally very even in its distribution. We therefore consider the estimates for this species to be the most reliable obtained during the programme.

The first and last surveys fully encompassed the population of the Guinea stock, and the two estimates seem to be in fair agreement, allowing for some growth in the intermediate period. As seen, the western stock is approximately twice the size of the eastern stock.

Earlier estimates (FAO/CECAF, 1981b) of the Ghana stock are 68 thousand tonnes for Ghana (1976) and 8 thousand tonnes for the benthic part on Ivory Coast (1977). The estimate from the "Dr. Fridtjof Nansen" survey thus far exceeds the earlier assessments of the Ghana stock.

Earlier estimates of the Guinea stock are (FAO/CECAF, 1981a and b) (1 000 tonnes):

USSR survey 1975	80
Capricorne Nov 1978	440
Capricorne Mar 1979	440
Cornide de Saavedra 1980	760

The results from the "Dr. Fridtjof Nansen" surveys also indicate a considerable recent growth in the Guinea stock.

The distribution of the catches of triggerfish is shown in Table 12. Except for two cases, both off Cape Roxo, all hauls in the western stock exceeding 1 tonne/hour were obtained from the Bissagos Islands and south to the Guinea - Sierra Leone border. In the Ghana stock four hauls were above the same level, within 60 miles from Cape Three Points. The fish was generally very easy to catch and the best catch (12 tonnes/hour at stn 87) is in no way outside the range of the expected catches.

Table 12. Catch distribution of triggerfish (Balistes capriscus) by survey.

		NUMBER OF HAULS IN CATCH GROUPS (kg/hr)					
		<1	1-10	10-50	50-200	200-1000	>1000
Guinea stock,	May-June 1981	1	8	12	7	11	12
Ghana stock,	June 1981	0	0	4	7	6	4
Guinea stock,	September 1981	0	3	4	7	11	2
Guinea stock,	February 1982	1	2	6	3	2	4

5.2 Aspects on the Biology of Balistes capriscus

The size-dependent distribution along the coast of West Africa has already been touched in the foregoing chapter. The same pattern is shown when the samples are pooled by countries. Figure 50 shows the pooled length distributions from Ghana, Ivory Coast and Guinea Bissau waters from the May-June survey. The distributions from the three areas have clearly distinct modes: Ghana 14.5 cm, Ivory Coast 16 cm and Guinea Bissau 19 cm.

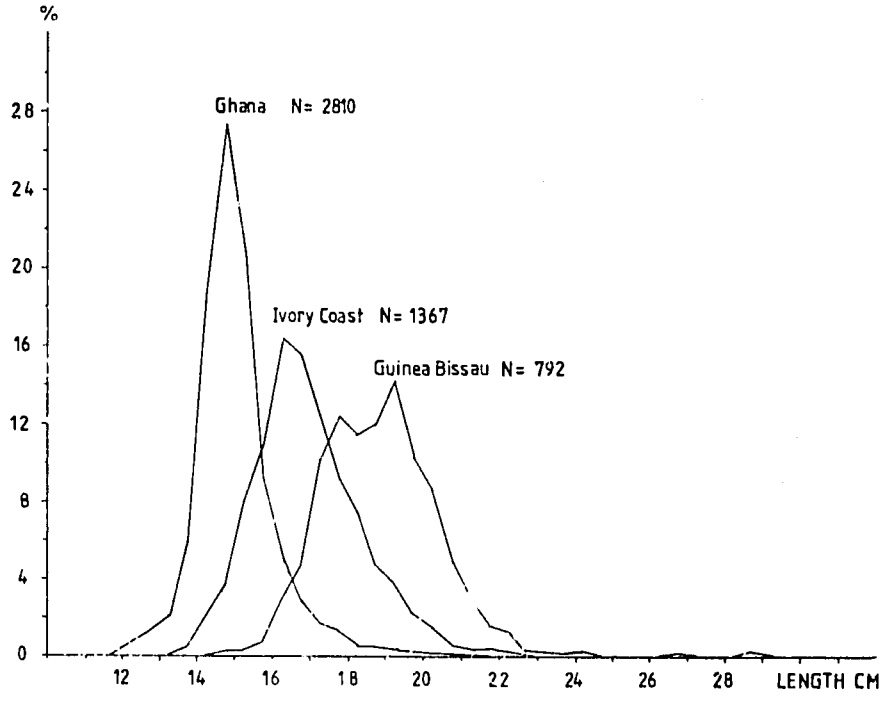


Fig. 50 Length frequency distributions of triggerfish (Balistes capriscus) off Ghana, Ivory Coast and Guinea-Bissau, June 1981.

Weight measurements were carried out on length grouped material, and the weight data were later pooled in ½ cm length groups. The relationship between the fork length and weight is given in

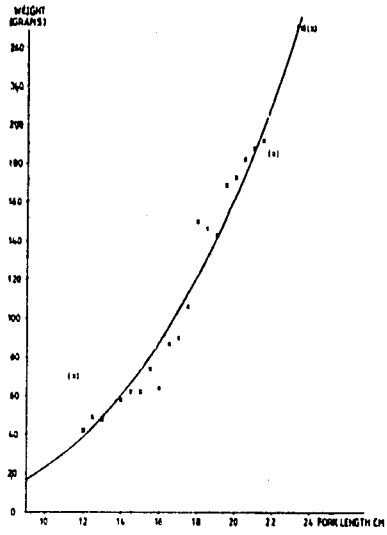


Fig. 51 Relationship between fish length and weight of triggerfish (Balistes capriscus) off Ghana and Guinea, June 1981.

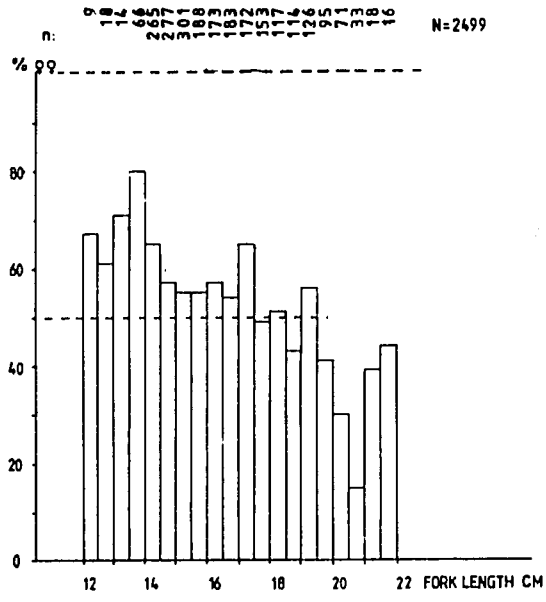


Fig. 52 Percentage of identified females by .5 cm length intervals of triggerfish (Balistes capriscus) off Guinea - Ghana in June 1981.

Figure 51. An exponential regression analysis on all data with more than 5 specimens in the length interval gave the equation

$$W_{(g)} = 0.035209 \cdot L_{(cm)}^{2.1817} \quad r^2 = 0.972$$

for the relationship. This agrees well with earlier results (Gerlotto, Stéquert and Barbieri, 1980).

2 500 specimens were also sex analysed. The difficulties involved in identification of males of Balistes capriscus have earlier been reported (Gerlotto, Stéquert and Barbieri, 1980). Figure 52 shows the percentage of identified females within each 1/2 cm length interval.

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ANNEX I Equipment and methods

Vessel and equipment

The R/V "Dr. Fridtjof Nansen" is a 150 foot stern trawler with a main engine of 1500 horsepower. The vessel is equipped for acoustic surveying, bottom and midwater trawling, hydrographic and plankton observations, and has a satellite navigator for precise positioning.

The bottom trawl was a 134 m headline shrimp trawl adapted for demersal fish trawling. The foot rope was equipped with 0.5 m rubber bobbins. Bridles of 40 m gave it a horizontal distance between the wings of about 25 m. The effective vertical opening of the net was about 6 m. The pelagic trawl was about 120 m in circumference, and the vertical opening was normally 13 m. The pelagic trawl had an inner-net of 1 cm mesh-size in the cod end. Pelagic trawl operations were usually monitored with aid of a 50 kHz acoustic net sonde.

Hydrographic observations were carried out with Nansen bottles with which temperature readings and samples for salinity and oxygen determinations were collected at standard depths. The salinity was determined with an inductive salinometer and dissolved oxygen by the Winkler method.

Two Simrad EK Sounders, 120 kHz and 38 kHz, connected to QM integrators, were run continuously. Settings and performance of the two acoustic systems were:

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	120 kHz*	38 kHz
Basic range	0 - 100 m	0 - 100 m or 0 - 250 m**
Transmitter	1/1	Ext. (2500 W NOM)
Transducer (ceramic)	10% (circular)	8° x 8°
SL + VR		139 dB (13.9.81)
Bandwith and pulse length	3 kHz, 0.6 m/sec	3 kHz, 0.6 m/sec
TVG and gain	20 logR, -0dB	20 logR, -20dB
Recorder gain	3 - 5	7
Integrator threshold	0.5 - 0.8	0.5 - 0.8
Integrator gain	10 dB (x10)	20 dB (x10)
Depth intervals	According to recordings	According to recordings

* The integrator was not coupled to the 120 kHz system during the May - June surveys.

** The depth monitored could be doubled with the aid of a slave recorder.

The 38 kHz system coupled to the integrator was used for abundance estimation of fish, while the 120 kHz system was used as an aid during the daily analysis of the echo recordings.

All data concerning survey routes, station work, catch, and the judged acoustic data are logged onto an onboard computer terminal (type Texas Instruments TI 771) and stored on floppy disks. The data are later transferred to a main computer for sorting and further processing.

Sampling and processing of catch data

For each trawl catch the weight and number of each species were estimated by sampling. Species determination was mainly based on Fischer *et al.* (1981) and partly on Blache *et al.* (1970) Length measurements were frequently taken of the commercially important species. During the June survey a special study was carried out on the trigger fish (*Balistes capriscus*) where length/ weight relations and degree of maturation were recorded.

The catches and their main composition are listed in Annex II and main results from the length measurements are given in Annex III.

In connection with the data logging system mentioned above an 7-character alphanumeric species code was developed. This code contains information on the family and genus to which a species belongs and thus faciliates processing of catch data on different levels.

The echo recordings and their interpretation

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 midwater. This is, moreover, a behaviour typical for some of the fish species found in West African waters. But there are also notable exceptions, e.g. surface schooling tunas and tuna-like species and strictly bottom dwelling fish such as rays and flounders. Any fish within ½-1 m of the bottom or in the very surface layer will escape echo sounder detection. For navigational reasons the work with the R/V "Dr. Fridtjof Nansen" is limited to waters deeper than about 10 m. The extreme inshore waters could thus not be covered.

Because of dissimilarities in behaviour and size, different species or groups of fish species may give rise to different types of echo-recordings. Small-sized pelagic fish are, for instance, often found in well-defined schools, the recordings of which can be distinguished from those of the often looser aggregation in which semi-demersal larger fish are frequently found. Such classification of the echo recordings is of considerable assistance in interpreting the acoustic observations, but a positive identification by fishing operations is still indispensable and also provides the only means of sampling fish in this type of combined survey.

Based on previous experience and on identification by fishing,

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the echo recordings in the surveyed waters were grouped in the following five categories:

Category	Type	Common feature in traces
I	Plankton and juvenile fish	Mostly distributed in scattered layer in upper water. Dusty, fine-grained appearance
II	Clupeids and anchovies (Pelagic 1)	Recordings of true larger schools or dense layer mostly in upper water. Distinct single fish traces when scattered
III	Horse-mackerels and scads (Pelagic 2)	
IV	Trigger fish	Dense to scattered layers mostly in upper water. Distinct single fish traces
V	Other fish (Croakers, grunts, sparids, snappers, sharks etc.	Looser aggregations of smaller and larger fish near bottom

Acoustic abundance estimation

Average integrator deflection per nautical mile was calculated every fifth nautical mile steamed. All echo traces were evaluated daily and combined with the information from the trawl catches. The readings from the integrator were split in the five categories given above.

The integrator deflection was classified into three levels: a) scattered (1-9 mm), b) slightly gathered (10-19 mm) and c) dense (>20 mm). Contour lines were drawn to distinguish between areas of different fish density. This forms the basis for the preparation of charts of fish distributions presented in this report. For each of the areas the mean integrator value and the areas size were calculated and their product gives an index of abundance for that area.

The conversion factor C, used to transform the index of abundance

to absolute abundance, was chosen on the basis of information on target strength of fish in the NE Atlantic. C is linearily dependent upon the length of the fish, and we can correct for this by multiplying the index of abundance with a length-correction f, where $f = \frac{L}{17}$ (L = fish length). After summing up all indices of abundance within a region the length-corrected indices are converted into fish biomass by multiplying with the C value for the fish of standard length 17 cm.

The reason for this procedure is to make it easier to recalculate the biomass figures when better data on target strength is available.

For the 38 kHz system with its standard settings, C_{17} = 13.6 tonnes/nm^2/mm/nm. This corresponds to an average target strength of -34.3 dB/kg, derived from the equation TS = -10 logL -22/dB/kg (Aglen et al.,1982).

ANNEX II Records of Fishing Operations II a

PT = Pelagic Trawl BT = Bottom Trawl

DATE	TIME START	STN NO.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION LATITUDE	POSITION LONGITUDE	CATCH (KG)	EG TIME	SPECIES	WEIGHT (KG)	%
30.04	1235	1	PT	39	39	20°40'	017°34'	1722,0	3464,0	Decapterus rhonchus	77,00	1,6
										Trachurus trecae	252,00	7,2
										Electrogenodus mediterraneus	496,00	14,3
										Dentex canariensis	11,00	0,3
										Diplodus bellottii	2760,00	79,2
30.04	1615	2	PT	72	72	20°39'	017°32'	162,0	640,0	Trachurus trecae	460,76	71,9
										OMMACTREPHIDAE	46,81	7,3
										C E F E A L O P O D A	118,27	18,4
30.04	1900	3	PT	410	40	20°40'	017°45'	49,0	98,0	Irgara trgara	48,00	48,9
										MYCTOPHIDAE	16,00	16,3
										Krill	34,40	34,0
30.04	2240	4	PT	203	1	20°30'	017°45'	7,0	6,0	MYCTOPHIDAE	2,00	33,3
										Krill	2,80	46,6
										OMMACTREPHIDAE	,40	6,6
01.05	0110	5	PT	62	30	20°31'	017°32'	7,0	14,0	Irgara trgara	,70	5,0
										Trachurus trecae	,40	2,8
										C E F E A L O P O D A	12,40	88,5
01.05	0320	6	PT	46	46	20°30'	017°24'	47,0	141,0	Trachurus trachurus	2,25	1,5
										Trachurus trecae	1,50	1,0
										CONGRIDAE	34,80	24,6
										Sepia sp	8,10	5,7
										JELLYFISH	90,00	63,8
01.05	0655	7	PT	20	20	20°20'	017°09'	420,0	840,0	Decapterus rhonchus	270,00	35,8
										Trachinotus ovalifolius	12,00	1,6
										Trachurus trecae	152,00	16,2
										CONGRIDAE	15,00	1,7
										Diplodus bellottii	160,00	22,5
										JELLYFISH	170,00	19,0
01.05	1245	8	PT	107	79	20°00'	017°30'	1000,0	8000,0	Capros aper	7520,00	94,0
										Trachurus trecae	240,00	3,0
01.05	1733	9	PT	29	29	20°10'	017°22'	4,0	24,0	Boreadgyus insinus	12,00	50,0
										Diplodus sp	12,00	50,0
01.05	2045	10	PT	71	15	20°00'	017°29'	172,0	346,0	Trachurus trecae	38,50	11,1
										Sardina pilchardus	15,96	4,6
										Engraulis encrasicolus	286,00	82,6
01.05	2355	11	PT	350	30	19°52'	017°26'	41,0	74,0	Nesiarchus nasutus	14,29	19,3
										MYCTOPHIDAE	14,29	19,3
										Cubiceps gracilis	14,29	19,3
										Cubiceps niger	,99	1,3
										Krill	14,29	19,3
02.05	0320	12	PT	470	95	19°50'	017°15'	27,0	81,0	MYCTOPHIDAE	60,00	74,0
										OMMACTREPHIDAE	20,40	25,1
02.05	0427	13	PT	>500	40	19°50'	017°10'	341,0	2046,0	Engraulis encrasicolus	1815,00	88,7
										MYCTOPHIDAE	204,00	10,0
02.05	0820	14	PT	30	15	19°40'	016°55'	35,0	210,0	Sardina pilchardus	81,18	38,6
										Engraulis encrasicolus	126,00	60,0
02.05	1412	15	PT	70	70	19°06'	016°27'	682,0	1364,0	Trachurus trachurus	,00	,0
										Trachurus trecae	1247,40	91,4
										Dentex congoensis	19,80	1,4
										Zeus faber	37,40	2,7
02.05	2115	16	PT	177	15	18°57'	016°43'	126,0	302,0	Trachurus trachurus	6,96	2,3
										MYCTOPHIDAE	24,00	7,9
										Krill	72,00	23,8
										JELLYFISH	192,00	63,5
03.05	0030	17	PT	29	12	18°51'	016°26'	3000,0	6000,0	Balistes capriscus	71,00	1,1
										Trachurus trecae	79,80	1,3
										Sardinella aurita	177,20	2,9
										Engraulis encrasicolus	5672,00	94,5
03.05	0850	18	PT	63	63	18°14'	016°21'	227,0	454,0	Pseudupeneus prayensis	,30	,0
										Flectorhynchus mediterraneus	25,10	5,5
										Parapristipoma octolineatum	8,40	1,8
										Umbrina canariensis	6,50	1,4
										Epinephelus aeneus	86,00	18,9
										Epinephelus fasciatus	101,80	22,4
										Sparus caeruleostictus	47,80	10,5
										JELLYFISH	60,00	13,2

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	WEIGTH (KG) %
03.05	1835	19	PT	51	25	17°32'	016°16'	448,0	896,0	Trachurus trecae	870,00	97,0
										Scomber japonicus	16,00	1,7
03.05	2345	20	PT	270	20	17°20'	164°05'	141,0	564,0	Trachurus trecae	22,40	3,9
										Trichiurus lepturus	60,[illegible]	10,6
										MYCTOPHIDAE	128,00	22,6
										JELLYFISH	351,20	62,2
04.05	0042	21	PT	216	80	17°20'	016°39'	109,0	218,0	Brama brama	6,50	2,9
										Trachurus trecae	23,20	10,6
										Merluccius polli	13,80	6,3
										Scomber japonicus	3,60	1,6
										Trichiurus lepturus	50,00	22,9
										MYCTOPHIDAE	108,00	49,5
04.05	0345	22	PT	38	15	17°11'	016°21'	376,0	752,0	Balistes capriscus	120,00	15,9
										Decapterus rhonchus	10,80	1,4
										Trachurus trecae	398,40	52,9
										Scomber japonicus	34,80	4,6
										JELLYFISH	180,00	23,9
04.05	1100	23	PT	76	15	17°00'	016°34'	458,0	916,0	Illex sp	,60	,0
										JELLYFISH	900,00	98,2
04.05	1245	24	PT	35	35	17°00'	016°27'	300,0	600,0	Trachurus trachurus	,15	,0
										JELLYFISH	600,00	100,0
04.05	1543	25	PT	68	20	16°52'	016°34'	1500,0	3000,0	JELLYFISH	3000,00	100,0
04.05	1845	26	PT	53	20	16°43'	016°37'	430,0	860,0	Trachurus trecae	400,00	86,9
										Scomber japonicus	7,80	1,6
										Sphyraena dutia	5,60	1,2
										Trichiurus lepturus	26,00	5,6
04.05	2030	27	PT	38	1	16°41'	016°36'	999,0	3996,0	Trachurus trecae	2,00	,0
										JELLYFISH	4000,00	100,1
05.05	0945	28	PT	50	35	16°04'	016°42'	4,0	6,0	Engraulis encrasicolus	,30	5,0
										C E F H A L O P O D A	,52	8,6
										JELLYFISH	4,50	75,0
05.05	1545	29	PT	34	34	15°52'	016°41'	312,0	624,0	Decapterus rhonchus	144,00	23,0
										Brachydeuterus auritus	332,10	53,2
										Trichiurus lepturus	38,40	6,1
										JELLYFISH	96,00	15,3
05.05	1654	30	PT	37	15	15°52'	016°42'	132,0	264,0	Decapterus rhonchus	25,40	9,6
										Sardinella maderensis	10,80	4,0
										Engraulis encrasicolus	22,00	8,3
										Brachydeuterus auritus	41,60	15,7
										Sphyraena sphyraena	27,20	10,3
										JELLYFISH	120,00	45,4
05.05	1940	31	PT	47	22	15°50'	016°44'	1017,0	6102,0	Decapterus rhonchus	1705,80	27,9
										Trachurus trecae	3333,60	54,6
										Brachydeuterus auritus	960,60	15,7
05.05	2240	32	PT	200	1	15°51'	016°59'	119,0	238,0	Trachurus trecae	62,00	26,0
										Pomatomus saltatrix	4,00	1,6
										Trichiurus lepturus	71,00	29,8
										MYCTOPHIDAE	33,40	14,0
										Krill	66,60	27,9
06.05	0124	33	PT	>500	10	15°00'	017°08'	247,0	778,0	Trachurus trecae	352,80	45,3
										Synagropa microlepis	286,65	36,8
										Scomber japonicus	132,30	17,0
06.05	0340	34	PT	>500	8	15°00'	017°23'	114,0	228,0	Trichiurus lepturus	120,00	52,6
										Krill	108,00	47,3
06.05	0635	35	PT	280	1	15°39'	017°02'	3,0	6,0	Trichiurus lepturus	6,00	100,0
06.05	1135	36	PT	127	100	15°41'	017°01'	,0	,0	NO CATCH	,00	,0
06.05	1437	37	PT	139	119	15°34'	017°03'	3,0	5,0	Antigonia capros	,00	,0
										Trachurus trecae	1,60	32,0
										Trichiurus lepturus	3,60	72,0

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) FISH	DOMINANT SPECIES	WEIGHT (KG) FISH	%
06.05	1545	38	PT	130	130	15°51'	017°02'	390,0	390,0	Synagrops microlepis	23,80	3,0
										Antigonia capros	9,80	1,2
										Trachurus trecae	420,00	53,0
										Serranus poli	194,00	24,5
										Lepidopus caudatus	79,80	10,0
06.05	1910	39	PT	20	20	15°30'	016°47'	2500,0	5000,0	Brachydeuterus auritus	4141,20	82,8
										Argyrosomus regius	320,00	6,4
										Pagellus bellottii	51,80	1,0
										Trichiurus lepturus	392,80	7,8
06.05	2205	40	PT	150	1	15°24'	017°07'	620,0	1250,0	Synagrops sp	,60	,0
										Trachurus trecae	96,00	7,6
										Trichiurus lepturus	324,00	25,7
										Krill	820,00	65,1
07.05	0015	41	PT	480	50	15°21'	017°14'	41,0	82,0	Synagrops microlepis	,04	,0
										Trachurus trecae	14,00	17,0
										MYCTOPHIDAE	47,00	57,3
										Trichiurus lepturus	4,20	5,1
										Sphyrna sp	17,20	20,9
07.05	0605	42	PT	30	15	15°20'	016°54'	120,0	240,0	BOTTAREVAL FISH	,00	,0
										Trachurus trecae	5,60	2,3
										Brachydeuterus auritus	4,40	1,8
										Sphyrna zyganeura	13,20	5,5
										BOTTAREVAL FISH	96,00	40,0
										CRUSTACEA	120,00	50,0
07.05	0725	43	PT	25	25	15°18'	016°53'	5000,0	10000,0	Decapterus rhonchus	808,40	8,0
										Trachurus trecae	318,56	3,1
										Brachydeuterus auritus	8147,20	81,4
										Sparus caeruleostictus	120,94	1,2
07.05	1310	44	PT	110	85	15°04'	017°11'	40,0	80,0	Arius heudeloti	2,00	2,5
										Trachurus trecae	11,60	14,5
										Euthynnus alletteratus	5,20	6,5
										Trichiurus lepturus	18,20	22,7
										JELLYFISH	42,00	52,5
07.05	1536	45	PT	29	1	14°59'	017°08'	25,0	50,0	Balistes capriscus	3,20	6,4
										Trachinotus goreensis	4,60	9,2
										Scomberomorus tritor	5,20	10,4
										Pagellus bellottii	,60	1,2
										Trichiurus lepturus	24,40	48,8
										JELLYFISH	10,40	20,8
07.05	1750	46	PT	103	70	14°55'	017°14'	19,0	38,0	Balistes capriscus	1,70	4,4
										Trachurus trachurus	,80	2,1
										Lomatomus saltatrix	8,40	22,1
										Sphyrnena sphyrnena	1,30	3,4
										Trichiurus lepturus	22,00	57,8
07.05	2035	47	PT	100	20	14°51'	017°22'	632,0	1264,0	Decapterus rhonchus	91,20	7,2
										Trachurus trecae	209,60	16,5
										Sardinella aurita	112,00	8,8
										Lomatomus saltatrix	21,30	1,6
										Krill	800,00	63,2
08.05	0120	48	PT	110	55	14°51'	017°21'	235,0	470,0	Caranx crysos	10,80	2,2
										Trachinotus goreensis	11,80	2,5
										Trachurus trachurus	45,60	9,7
										Trachurus trecae	240,00	51,0
										Krill	120,00	25,5
08.05	1540	49	PT	20	20	14°28'	017°08'	520,0	1040,0	Balistes capriscus	43,60	4,2
										Chloroscombrus chrysurus	13,80	1,3
										Decapterus rhonchus	11,20	1,0
										Liza aurata	30,40	2,9
										Trachurus trecae	149,40	14,3
										Brachydeuterus auritus	146,20	14,0
										Boops boops	427,80	41,1
08.05	2040	50	PT	180	1	14°17'	017°32'	19,0	38,0	Arius sp	26,80	70,5
										Trachinotus ovatus	3,60	9,4
										Echeneis naucrates	1,70	4,4
										Lestidium sp	,60	1,5

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
10.05	1225	51	BT	69	69	14°27'	017°25'	408,0	816,0	Trachurus trecae	468,00	57,3
										Pricanthus arenatus	11,70	1,4
										Epinephelus aeneus	9,30	1,1
										Pagellus bellottii	312,00	38,2
10.05	2048	52	PT	350	15	13°50'	017°28'	16,0	32,0	Caranx crysos	,60	1,8
										MYCTOPHIDAE	25,20	78,7
										Krill	6,20	19,3
11.05	0100	53	BT	40	40	13°45'	017°13'	144,0	288,0	Trachurus trecae	33,60	11,6
										Dactylopterus volitans	6,00	2,0
										Pseudupeneus prayensis	7,20	2,5
										Brachydeuterus auritus	14,40	5,0
										Plectorhynchus mediterraneus	32,40	11,2
										Boope boops	43,20	15,0
										Pagellus bellottii	83,40	28,9
										TRIGLIDAE	48,00	16,6
11.05	0550	54	PT	26	10	13°36'	017°03'	85,0	340,0	Balistes capriscus	4,00	1,1
										Decapterus rhonchus	34,08	10,0
										Trachurus trecae	96,00	28,2
										Trachurus trecae	6,40	1,8
										Sardinella maderensis	123,20	36,2
										Pagellus bellottii	52,16	15,3
11.05	2154	55	PT	25	8	13°04'	017°06'	135,0	270,0	Arius sp	3,60	1,3
										Balistes capriscus	22,50	8,3
										Sardinella aurita	49,50	18,3
										Sardinella maderensis	59,40	22,0
										Brachydeuterus auritus	124,20	46,0
12.05	0606	56	PT	14	1	13°05'	016°58'	135,0	270,0	Balistes capriscus	16,20	6,0
										Arius sp	5,20	1,9
										Sardinella maderensis	162,00	60,0
										Brachydeuterus auritus	59,40	22,0
12.05	0508	57	BT	46	46	12°55'	017°26'	121,0	363,0	Balistes capriscus	218,40	60,1
										Monolene microstoma	6,30	1,7
										Dactylopterus volitans	52,50	14,4
										Pricanthus arenatus	6,00	1,6
										Pagellus bellottii	44,25	12,1
12.05	1320	58	BT	14	14	12°42'	017°05'	505,0	1010,0	Balistes capriscus	56,00	5,5
										Caranx crysos	21,40	2,1
										Alectis alexandrinus	155,00	15,3
										Sardinella aurita	53,20	5,2
										Engraulis encrasicolus	616,00	60,9
12.05	1552	59	BT	16	16	12°35'	017°12'	514,0	1028,0	Chloroscombrus chrysurus	215,60	20,9
										Galeoides decadactylus	17,60	1,7
										Brachydeuterus auritus	457,60	44,5
										Pomadasys jubelini	31,90	3,1
										Sphyraena dubia	248,60	24,1
12.05	1850	60	BT	34	34	12°35'	017°26'	2496,0	4992,0	Balistes capriscus	4463,18	89,4
										Decapterus rhonchus	444,20	8,8
12.05	2314	61	PT	83	17	12°24'	017°30'	1085,0	3255,0	Engraulis encrasicolus	3231,60	99,2
13.05	0155	62	BT	15	15	12°28'	017°15'	142,0	852,0	Arius heudeloti	24,00	2,8
										Balistes capriscus	25,50	2,9
										Sphyraenatomus melanopterus	9,00	1,0
										Brachydeuterus auritus	720,00	84,5
13.05	0503	63	PT	12	12	12°39'	017°09'	236,0	472,0	Albula vulpes	20,00	4,2
										Arius sp	20,00	4,2
										Balistes capriscus	15,60	3,3
										Decapterus rhonchus	8,00	1,6
										Brachydeuterus auritus	89,60	18,9
										Pomadasys sp	284,00	60,1
13.05	0709	64	PT	11	11	12°30'	017°00'	203,0	406,0	Arius sp	6,30	1,5
										Balistes capriscus	14,70	3,6
										Chloroscombrus chrysurus	45,50	11,2
										Illisha africana	92,40	22,7
										Brachydeuterus auritus	196,00	48,2
14.05	0930	65	PT	100	80	12°38'	017°36'	,0	,0	NO CATCH	,00	,0

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
14.05	1720	66	PT	29	10	12°15'	017°10'	495,0	990,0	Balistes capriscus	38,70	3,9
										Hemicaranx bicolor	54,00	5,4
										Chloroscombrus chrysurus	34,20	3,4
										Trachinotus sp	12,60	1,3
										Trachydeuterus auritus	432,00	43,6
										Sphyraena piscatorum	146,70	14,8
										Stromateus fiatola	241,20	24,3
14.05	2048	67	PT	11	11	11°52'	016°57'	820,0	1402,0	Arius sp	143,64	10,2
										Ilisha africana	28,72	2,0
										Galeoides decadactylus	14,36	1,0
										Pentanemus quinquarius	134,06	9,5
										Pseudotolithus elongatus	225,03	16,0
										Pseudotolithus sp	215,46	15,3
										Pterocrocis peli	167,58	11,9
										JELLYFISH	272,91	19,4
15.05	0020	68	PT	57	20	11°[illegible]	017°07'	116,0	232,0	Synagrops microlepis	,04	,0
										Balistes capriscus	12,00	5,1
										Pagrus caeruleostictus	168,00	72,4
										Carcax crysos	12,40	5,3
15.05	0300	69	PT	95	95	11°32'	017°17'	51,0	102,0	Engraulis encrasicolus	,00	,0
										Brotula barbata	2,80	2,7
										SCORPAENIDAE	1,20	1,1
										Dentex sp	1,80	1,7
										PANDALIDAE Shrimps	27,20	26,6
										JELLYFISH	62,00	60,7
15.05	0410	70	PT	91	20	11°30'	017°17'	498,0	996,0	Sardinella aurita	,00	,0
										Engraulis encrasicolus	880,00	88,3
										Sphyraena piscatorum	16,00	1,6
										Saurida brasiliensis	96,00	9,6
15.05	0650	71	PT	26	26	11°26'	017°06'	4916,0	8406,0	Balistes capriscus	8406,36	100,0
15.05	1440	72	PT	40	20	11°06'	017°03'	1500,0	2600,0	Balistes capriscus	3000,00	100,0
15.05	1903	73	PT	43	43	10°58'	016°52'	649,0	1298,0	Balistes capriscus	799,20	61,5
										Dactylopterus volitans	229,50	17,6
										Sepia sp	32,40	2,4
										JELLYFISH	232,20	17,8
15.05	2200	74	PT	>500	10	10°32'	016°48'	,0	,0	NO CATCH	,00	,0
16.05	0430	75	PT	50	10	10°35'	016°36'	1500,0	3000,0	Balistes capriscus	3000,00	98,6
										Dactylopterus volitans	40,00	1,3
16.05	1200	76	PT	39	39	10°22'	016°13'	2500,0	7500,0	Balistes capriscus	7500,00	100,0
16.05	2150	77	PT	70	40	10°04'	016°22'	7,0	14,0	Balistes capriscus	13,00	92,8
										Engraulis encrasicolus	,70	5,0
										Saurida brasiliensis	,30	2,1
										S E P H A L O P O D A	,20	1,4
17.05	0145	78	PT	30	30	10°01'	016°05'	194,0	582,0	Balistes capriscus	570,00	97,9
										Dactylopterus volitans	7,50	1,2
18.05	1330	79	PT	39	15	09°48'	015°03'	90,0	199,0	Balistes capriscus	199,80	100,4
18.05	1705	80	PT	32	32	09°38'	015°17'	1513,0	3026,0	Balistes capriscus	2528,74	83,5
										Sparus caeruleostictus	172,40	5,6
										Sepia officinalis hierredda	270,12	8,9
19.05	0440	81	PT	40	40	09°38'	015°39'	1500,0	4500,0	Balistes capriscus	3960,00	88,0
										Dactylopterus volitans	501,00	11,1
19.05	0715	82	PT	24	24	09°49'	015°24'	456,0	912,0	Balistes capriscus	726,00	79,6
										Pseudupeneus prayensis	26,40	2,8
										Paraphristipoma sp	50,60	5,5
										Sparus caeruleostictus	92,40	10,1
19.05	1333	83	PT	19	19	10°07'	015°11'	190,0	380,0	Balistes capriscus	198,90	52,3
										Balistes punctatus	14,96	3,9
										Caranx sp	16,90	4,4
										Sardinella aurita	130,00	34,2
19.05	1830	84	PT	36	20	09°44'	015°45'	,0	,0	NO CATCH	,00	,0

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
20.05	0050	85	IT	50	50	09°43'	016°05'	347,0	694,0	Balistes capriscus	684,80	98,6
20.05	0525	86	PT	23	23	09°58'	016°47'	16,0	32,0	Pothus podas africanus	,00	,0
										Echeneis naucrates	,90	2,8
										Sphyraena piscatorum	25,00	78,1
										Iphippion guttifer	5,40	16,9
20.05	1235	87	PT	39	15	09°56'	016°02'	6000,0	12000,0	Balistes capriscus	12000,00	100,0
20.05	2056	88	PT	26	26	10°13'	015°58'	547,0	1094,0	Balistes capriscus	1224,00	72,2
										Dactylopterus volitans	46,80	2,7
										Fernadaeys jutelini	414,00	24,4
20.05	2217	89	PT	26	1	10°14'	015°56'	375,0	750,0	Alectis alexandrinus	91,00	12,1
										Sardinella aurita	449,40	59,9
										Engraulis encrasicolus	182,20	24,3
										Peprilus triacanthus	24,00	3,2
21.05	0215	90	PT	27	27	10°31'	014°13'	404,0	808,0	Acanthurus monrovine	,40	,0
										Balistes capriscus	234,00	28,9
										Decapterus rhonchus	48,60	6,0
										Alectis alexandrinus	23,40	2,8
										Fernadaeys jutelini	225,00	27,8
21.05	0335	91	PT	27	1	10°31'	016°16'	,0	,0	Engraulis encrasicolus	,00	,0
21.05	1000	92	PT	43	43	10°47'	016°42'	2000,0	4000,0	Balistes capriscus	3182,80	79,5
										Decapterus rhonchus	568,40	14,2
										Dactylopterus volitans	193,20	4,8
21.05	1255	93	PT	41	10	10°54'	016°44'	2000,0	6000,0	Balistes capriscus	6000,00	100,0
21.05	2310	94	PT	85	40	11°32'	017°18'	178,0	712,0	Caranx crysos	10,40	1,4
										Trachurus trecae	10,80	1,5
										Engraulis encrasicolus	646,00	91,0
										Cubiceps sp	36,00	5,0
22.05	0105	95	PT	40	40	11°31'	017°08'	1000,0	2000,0	Balistes capriscus	1435,20	71,7
										Dactylopterus volitans	415,60	20,7
										Ingellus bellottii	69,20	3,4
										Sepia sp	59,40	2,9
22.05	0300	96	PT	42	25	11°36'	017°07'	83,0	166,0	Balistes capriscus	2,00	1,2
										Brevmacerus sp	30,80	18,5
										Decapterus rhonchus	7,20	4,3
										Sardinella maderensis	31,60	19,0
										Sphyraena piscatorum	79,60	47,9
22.05	0525	97	PT	100	10	11°44'	017°16'	511,0	2044,0	Caranx crysos	89,20	4,3
										Sardinella aurita	88,00	4,3
										Sardinella maderensis	61,60	3,0
										Engraulis encrasicolus	1760,00	86,1
22.05	0840	98	PT	11	11	11°47'	016°58'	159,0	318,0	Albula vulpes	4,00	1,2
										Hemicaranx bicolor	11,00	3,4
										Chloroscombrus chrysurus	77,00	24,2
										Ilisha africana	12,00	3,7
										Trichiurus lepturus	35,00	11,0
										JELLYFISH	120,00	37,7
22.05	1125	99	PT	13	13	11°44'	016°40'	200,0	400,0	Arius sp	11,20	2,8
										Chloroscombrus chrysurus	17,20	4,3
										Ilisha africana	40,80	10,2
										Pseudotolithus elongatus	7,20	1,8
										JELLYFISH	300,00	75,0
22.05	1450	100	PT	11	11	12°00'	016°50'	800,0	1600,0	Ilisha africana	150,40	9,4
										Pentanemus quinquarius	476,40	29,7
										Pseudotolithus elongatus	175,60	10,9
										Pseudotholithus sp	125,40	7,8
										JELLYFISH	476,60	29,7
22.05	1822	101	PT	50	30	12°00'	017°11'	438,0	876,0	Chloroscombrus chrysurus	183,60	20,9
										Alectis alexandrinus	90,00	10,2
										Trachinotus sp	24,30	2,7
										Selene dorsalis	68,40	7,8
										Sardinella maderensis	297,00	33,9
										Sphyraena piscatorum	180,00	20,5

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PER HR	SPECIES	WEIGTH (KG) PER HR	%
22.05	2128	102	PT	10	10	12°08'	016°59'	2500,0	5000,0	[illegible] sp	147,00	2,9
										[illegible] quinquarius	88,20	1,7
										[illegible] sp	73,60	1,4
										[illegible] poli	117,60	2,3
										[illegible]	4264,60	83,7
23.05	0210	103	PT	57	20	12°14'	017°17'	97,0	194,0	Pagellus sp	,00	,0
										Trachurus trecae	16,20	8,3
										Sardinella aurita	8,00	4,1
										Engraulis encrasicolus	135,80	70,0
										Sphyraena piscatorum	33,40	17,2
23.05	0455	104	PT	24	10	12°20'	017°05'	281,0	562,0	Chloroscombrus chrysurus	,36	,0
										Illisha africana	81,00	14,4
										Brachydeuterus auritus	315,00	56,0
										Sphyraena piscatorum	162,00	28,8
23.05	0948	105	PT	8	8	12°45'	016°58'	53,0	99,0	Hemiramphus picolor	1,12	1,1
										Chloroscombrus chrysurus	3,55	3,5
										Sardinella aurita	6,17	6,2
										Sardinella maderensis	54,23	54,7
										Scomberomorus tritor	28,98	29,2
23.05	1250	106	PT	16	1	12°54'	016°59'	37,0	74,0	Sardinella aurita	2,60	3,5
										Sardinella maderensis	2,00	2,7
										Scomberomorus tritor	10,00	13,5
										Sphyraena sp	60,00	81,0
23.05	2350	107	PT	17	1	13°01'	016°59'	44,0	88,0	Trachurus trecae	1,00	1,1
										Illisha africana	6,00	6,8
										Sardinella maderensis	4,00	4,5
										Galeoides decadactylus	1,00	1,1
										Brachydeuterus auritus	56,00	63,6
										Scomberomorus tritor	14,20	16,1
24.05	0525	108	PT	68	15	13°20'	017°24'	4,0	8,0	Trachurus trecae	,20	2,5
										Sardinella aurita	,60	7,5
										Cubiceps sp	1,80	22,5
										Scomber japonicus	6,00	75,0
24.05	1225	109	PT	33	33	13°40'	017°08'	294,0	588,0	Balistes capriscus	348,00	59,1
										Decapterus rhonchus	44,40	7,5
										Alectis alexandrinus	12,00	2,0
										Dactylopterus volitans	19,20	3,2
										Pagellus bellottii	117,60	20,0
24.05	1648	110	PT	100	90	13°50'	017°25'	14,0	28,0	Engraulis encrasicolus	2,60	9,2
										Illex sp	25,00	89,2
24.05	2246	111	PT	41	1	13°55'	017°16'	47,0	40,0	Trachurus trecae	,01	,0
										Sardinella aurita	9,46	23,6
										Sardinella maderensis	19,78	49,4
										Pomatomus saltatrix	5,76	14,4
25.05	1600	112	PT	34	34	13°59'	017°11'	291,0	582,0	Balistes capriscus	181,50	31,1
										Balistes punctatus	18,20	3,1
										Decapterus rhonchus	201,30	34,5
										LABRIDAE	13,20	2,2
26.05	0350	113	PT	13	1	14°03'	017°02'	700,0	1400,0	Decapterus rhonchus	14,64	1,0
										Sardinella aurita	117,20	8,3
										Sardinella maderensis	1255,60	89,6
26.05	1025	114	PT	100	80	14°26'	017°30'	,0	,0	NO CATCH	,00	,0
26.05	1320	115	PT	100	85	14°22'	017°34'	,0	,0	NO CATCH	,00	,0
26.05	1610	116	PT	101	101	14°23'	017°32'	9,0	33,0	Umbrina canariensis	3,52	10,6
										SCORPAENIDAE	1,76	5,3
										Pagrus bogos	18,65	56,5
										Dentex congoensis	4,57	13,8
										Torpedo torpedo	4,57	13,8
01.06	1906	117	PT	59	59	14°28'	017°[illegible]	60,0	120,0	Alectis alexandrinus	5,80	4,8
										Chromis sp	1,40	1,1
										Pomadasys perototi	6,80	5,6
										Epinephelus guaza	13,60	11,3
										Pagrus bogos	33,60	28,0
										Pagellus bellottii	37,40	31,1

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PER HR	DOMINANT SPECIES	WEIGHT (KG) PER HR	%
02.06	1515	118	BT	75	75	11°05'	017°05'	,0	,0	NO CATCH	,00	,0
02.06	1611	119	BT	73	73	11°05'	017°02'	1[illegible],0	300,0	Arioma bondi	131,50	43,8
										Balistes capriscus	54,00	18,0
										Chaetodon hoefleri	6,00	2,0
										Fistularia petimba	7,50	2,5
										Lutjanus [illegible]	40,00	13,3
03.06	0855	120	BT	60	20	09°20'	015°34'	3,0	3,0	Balistes capriscus	1,00	33,3
										Echeneis naucrates	1,00	33,3
										UNIDENTIFIED	1,00	33,3
03.06	1445	121	BT	34	10	09°39'	014°58'	3,0	6,0	Balistes capriscus	6,00	101,6
03.06	1650	122	BT	31	31	09°47'	014°48'	389,0	778,0	Balistes capriscus	15,40	1,9
										Chloroscombrus chrysurus	231,00	29,6
										Pseudupeneus prayensis	14,00	1,7
										Galeoides decadactylus	46,20	5,9
										Pracbydeuterus auritus	199,60	25,5
03.06	2247	123	BT	30	1	09°41'	014°42'	17,0	34,0	Balistes capriscus	2,00	5,8
										Decapterus rhoncus	5,40	15,8
										Decapterus punctatus	6,70	19,7
										Sardinella aurita	3,60	10,5
										Lonatrema saltatrix	6,00	17,2
										Pepin sp	5,60	16,4
04.06	0300	124	BT	78	25	09°15'	015°09'	10,0	20,0	Balistes capriscus	20,00	100,0
										Sardinella aurita	,80	4,0
04.06	1014	125	BT	38	10	09°29'	014°41'	135,0	270,0	Balistes capriscus	268,94	99,6
04.06	1302	126	BT	25	1	09°40'	014°25'	,0	,0	NO CATCH	,00	,0
04.06	1640	127	BT	10	10	09°52'	014°08'	200,0	400,0	Albula vulpes	4,80	1,2
										Alectis alexandrinus	6,00	1,5
										Chloroscombrus chrysurus	15,60	3,9
										Hemicaranx bicolor	4,80	1,2
										Ilisha africana	109,20	27,3
										Galeoides decadactylus	66,20	16,5
										Pracbydeuterus auritus	84,00	21,0
04.06	2230	128	BT	30	15	09°22'	014°36'	3,0	6,0	Decapterus tabl	,20	3,3
										Peristedion carpenteri	3,60	60,0
										FISH LARVAE	2,00	33,3
05.06	0155	129	BT	83	30	09°06'	014°55'	107,0	160,0	Arioma bondi	5,85	3,6
										Caranx crysos	2,70	1,6
										Sardinella aurita	19,80	12,3
										Engraulis encrasicolus	130,50	81,5
05.06	1445	130	BT	30	18	09°10'	014°16'	,0	,0	NO CATCH	,00	,0
05.06	1527	131	BT	32	32	09°10'	014°15'	429,0	858,0	Balistes capriscus	630,00	73,4
										Selene dorsalis	208,80	24,3
										Sparus coeruleostictus	14,40	1,6
05.06	2348	132	BT	37	15	09°11'	014°00'	27,0	54,0	Decapterus punctatus	12,00	22,2
										Sardinella aurita	38,00	70,3
										Sphyraena piscatorum	3,40	6,3
06.06	0350	133	BT	11	11	09°17'	013°37'	125,0	375,0	Arius sp	12,00	3,2
										Chloroscombrus chrysurus	6,00	1,6
										Ilisha africana	40,60	10,8
										Lutjanus goreensis	12,00	3,2
										Pseudotolithus senegalensis	79,20	21,1
										Pterocrion peli	42,00	11,2
06.06	1055	134	BT	40	40	08°43'	014°32'	843,0	1686,0	Balistes capriscus	951,80	56,4
										Lactophrys velitans	43,60	2,6
										Aluterus punctatus	20,40	1,2
										Brancadius arenatus	61,20	3,6
										Sparus coeruleostictus	201,60	11,9
07.06	0035	135	BT	19	1	08°46'	013°43'	62,0	112,0	Decapterus punctatus	2,80	2,5
										Sardinella aurita	5,06	4,5
										Engraulis encrasicolus	43,44	38,7
										Galeoides decadactylus	3,42	3,0
										Pepin sp	39,27	35,0

DATE	TIME START	STN NO.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) IN HH	SPECIES	WEIGHT (KG) IN HH	%
07.06	0705	136	PT	20	20	08°13'	014°11'	97,0	276,0	Balistes capriscus	55,00	60,6
										Selene dorsalis	6,00	2,1
										Pseudotrigon peristedi	4,00	1,6
										Lagocephalus laevigatus	4,00	1,6
07.06	1140	137	PT	20	10	08°32'	013°45'	,0	,0	NO CATCH	,00	,0
07.06	1822	138	PT	25	20	08°11'	014°03'	57,0	164,0	Balistes capriscus	45,00	28,3
										Decapterus punctatus	39,00	24,1
										Sardinella aurita	6,00	3,6
										Lactophrys velitans	37,00	22,6
										Sphyraena guachancho	21,00	13,1
07.06	2314	139	PT	>500	40	07°48'	014°14'	9,0	18,0	Arioma bonaci	3,40	18,8
										Hypolydemus bella	2,20	12,2
										Gobylus serpens	1,30	7,2
										MYCTOPHIDAE	,60	3,2
										HIPPOCAMPUS	7,00	40,2
08.06	2343	140	PT	75	45	07°28'	013°45'	32,0	58,0	Arioma bonaci	,87	1,5
										Scherisia maderensis	6,25	10,7
										Engraulis encrasicolus	15,70	26,6
										Sphyraena piscatorum	1,30	2,2
										Churida brasiliensis	34,84	59,3
09.06	0540	141	PT	55	40	07°26'	013°21'	37,0	67,0	Decapterus punctatus	6,49	10,3
										Sardinella aurita	21,80	34,7
										CRUSTACEA	34,20	54,2
09.06	1023	142	PT	51	51	07°26'	013°14'	107,0	206,0	Balistes capriscus	,20	,0
										Sparus pandoratus	3,40	1,6
										CRUSTACEA	200,00	97,0
09.06	1255	143	PT	76	76	07°19'	013°13'	483,0	966,0	Decapterus punctatus	176,00	18,2
										Sardinella aurita	40,00	4,1
										Engraulis encrasicolus	16,00	1,6
										Epinephelus aeneus	24,00	2,5
										Dentex canariensis	598,40	61,9
09.06	1637	144	PT	42	42	07°28'	013°04'	43,0	129,0	Chloroscombrus chrysurus	1,80	1,3
										Selene dorsalis	37,50	26,0
										Sardinella maderensis	7,00	5,2
										Galeoides decadactylus	4,80	3,7
										Sphyraena piscatorum	69,00	53,4
09.06	2300	145	PT	21	21	07°27'	012°54'	128,0	256,0	Arius latiscutatus	3,50	2,9
										CAPRELLIDAE	3,60	1,4
										Ilisha africana	3,60	1,4
										Lutjanus goreensis	14,20	5,5
										Galeoides decadactylus	36,00	14,0
										Pseudotolithus senegalensis	46,20	18,0
										Pterocaesio pisi	37,00	14,7
10.06	0250	146	PT	29	10	07°23'	012°45'	62,0	126,0	Chloroscombrus chrysurus	60,00	47,6
										Selene dorsalis	7,20	5,7
										Ilisha africana	4,80	3,8
										Sardinella maderensis	34,80	27,6
10.06	0545	147	PT	51	25	07°18'	012°43'	72,0	216,0	Brachydeuterus sp	4,50	2,0
										Alectis alexandrinus	5,40	2,5
										Sardinella maderensis	13,20	6,1
										Brachydeuterus auritus	2,70	1,2
										Scomberomorus tritor	60,00	25,0
										Sphyraena piscatorum	100,20	46,3
10.06	0810	148	PT	32	32	07°19'	012°37'	205,0	410,0	Arius heudeloti	9,10	2,2
										Chloroscombrus chrysurus	47,00	11,6
										Selene dorsalis	15,40	3,7
										Ilisha africana	22,60	8,1
										Brachydeuterus auritus	80,50	19,6
										Sphyraena piscatorum	84,70	20,6
10.06	1255	149	PT	40	15	07°10'	012°14'	5,0	10,0	Alectis alexandrinus	1,80	18,0
										Caranx senegallus	2,40	24,0
										Scomberomorus tritor	4,20	42,0
										Sphyraena piscatorum	1,60	16,0
10.06	1840	150	PT	49	49	07°01'	011°57'	191,0	382,0	Chloroscombrus chrysurus	11,90	3,1
										Selene dorsalis	7,00	1,8
										Ilisha africana	91,00	23,8
										Sardinella maderensis	7,70	2,0
										Brachydeuterus auritus	177,00	46,5

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
11.06	0205	151	PT	64	20	06°47'	011°37'	53,0	159,0	Sardinella maderensis	124,50	78,3
										Lutjanus goreensis	27,60	17,3
										FISH LARVAE	6,00	3,7
11.06	0540	152	PT	59	34	06°38'	011°24'	67,0	134,0	Hemicaranx bicolor	,00	,0
										Sardinella maderensis	8,20	6,1
										Scomberomorus tritor	1,70	1,2
										JELLYFISH	120,00	89,5
11.06	0735	153	BT	36	36	06°39'	011°19'	354,0	708,0	Caranx crysos	20,80	2,9
										Chloroscombrus chrysurus	176,80	24,9
										Selene dorsalis	39,00	5,5
										Ilisha africana	254,80	35,9
										Sphyraena piscatorum	114,80	16,2
11.06	2133	154	BT	30	30	06°07'	010°31'	14,0	28,0	Batrachoides liberiensis	,40	1,4
										Chloroscombrus chrysurus	2,00	7,1
										Cynoglossus canariensis	1,20	4,2
										Cynoponticus ferox	1,20	4,2
										Brachydeuterus auritus	7,20	25,7
										Pseudotolithus senegalensis	4,80	17,1
										Pteroscion peli	6,00	21,4
12.06	0255	155	PT	83	20	05°46'	010°25'	5,0	10,0	Arioma bondi	8,60	86,0
										Hypoclydonia bella	,20	2,0
										FISH LARVAE	,40	4,0
12.06	0525	156	PT	48	25	05°51'	010°15'	210,0	420,0	Caranx senegallus	7,20	1,7
										Selene dorsalis	21,60	5,1
										Ilisha africana	7,20	1,7
										Sardinella maderensis	46,80	11,1
										JELLYFISH	296,40	70,5
12.06	1440	157	PT	83	35	05°23'	009°55'	10,0	20,0	JELLYFISH	20,00	100,0
12.06	1725	158	BT	70	70	05°21'	009°50'	171,0	342,0	Arioma bondi	115,20	33,6
										Decapterus punctatus	12,00	3,5
										Pricanthus arenatus	72,00	21,0
										Auxis thazard	7,20	2,1
										Boops boops	84,00	24,5
13.06	0305	159	PT	69	10	05°02'	009°25'	205,0	371,0	Caranx crysos	5,43	1,4
										Sardinella aurita	7,05	1,9
										Engraulis encrasicolus	352,95	95,1
13.06	0825	160	BT	74	74	04°45'	009°09'	224,0	448,0	Arioma bondi	8,40	1,8
										Decapterus punctatus	162,40	36,2
										Sardinella aurita	200,20	44,6
										Pricanthus arenatus	16,80	3,7
13.06	1303	161	BT	161	161	04°38'	009°13'	154,0	308,0	Arioma bondi	73,20	23,7
										Antigonia capros	207,60	67,4
										Zenopsis conchifer	8,00	2,5
										Squatina oculata	12,40	4,0
14.06	1105	162	BT	84	84	04°34'	008°59'	,0	,0	NO CATCH	,00	,0
14.06	1305	163	PT	86	36	04°33'	008°50'	,0	,0	NO CATCH	,00	,0
14.06	1410	164	PT	81	81	04°34'	008°50'	80,0	161,0	Pricanthus arenatus	5,97	3,7
										Helicolenus dactylopterus	4,88	3,0
										Dentex angolensis	103,17	64,0
										Dentex congoensis	16,50	10,2
14.06	2240	165	PT	71	55	04°28'	008°24'	20,0	32,0	Arioma bondi	25,75	80,4
										Decapterus punctatus	,81	2,5
										Sardinella aurita	1,78	5,5
										Dactylopterus volitans	,48	1,5
15.06	0225	166	PT	78	30	04°26'	008°18'	120,0	240,0	Arioma bondi	166,60	69,4
										Decapterus punctatus	21,00	8,7
										Sardinella aurita	48,30	20,1
15.06	1310	167	PT	71	30	04°15'	007°25'	265,0	246,0	Balistes capriscus	245,98	99,9
15.06	1603	168	BT	48	48	04°25'	007°15'	7,0	14,0	Selene dorsalis	3,00	21,4
										Sardinella maderensis	,60	4,2
										Engraulis encrasicolus	,30	2,1
										Dentex angolensis	1,20	8,5
										Brachydeuterus auritus	4,00	28,5
										Trichiurus lepturus	2,00	14,2

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
15.06	2020	169	PT	50	20	04°34'	001°51'	41,0	82,0	Selene dorsalis	24,40	29,7
										Trachinotus ovatus	1,80	2,1
										Ilisha africana	1,40	1,7
										Sardinella aurita	2,00	2,4
										Sphyraena piscatorum	25,60	31,2
16.06	0515	170	PT	53	20	04°43'	001°21'	91,0	182,0	Balistes capriscus	153,76	84,4
										Sardinella maderensis	13,60	7,4
										Sphyraena piscatorum	9,20	5,0
										Saurida brasiliensis	4,00	2,1
16.06	1400	171	PT	59	20	04°57'	005°31'	441,0	882,0	Balistes capriscus	882,00	100,0
16.06	2229	172	PT	40	1	05°04'	004°40'	2,0	4,0	Decapterus sp	,00	,0
										Sardinella maderensis	1,10	27,5
										Engraulis encrasicolus	,40	10,0
										FISH LARVAE	2,00	50,0
17.06	0212	173	PT	49	20	05°08'	004°35'	720,0	360,0	Balistes capriscus	329,32	91,4
										Caranx crysos	60,51	16,8
										Lichia amia	12,87	3,4
										Sardinella aurita	41,49	11,5
18.06	1737	174	PT	54	17	05°04'	003°37'	42,0	84,0	Balistes capriscus	83,46	99,2
19.06	0102	175	PT	38	1	05°05'	003°19'	28,0	56,0	Chloroscombrus chrysurus	16,40	29,2
										Selar crumenophthalmus	1,20	2,1
										Sardinella aurita	7,60	13,5
										Sardinella maderensis	14,20	25,4
										Sphyraena piscatorum	16,80	30,0
19.06	0355	176	PT	78	20	04°52'	003°07'	26,0	52,0	Ariomma bondi	15,10	28,9
										Balistes capriscus	37,20	71,1
19.06	0735	177	PT	68	68	04°52'	002°55'	165,0	330,0	Balistes capriscus	17,20	5,8
										Priacanthus arenatus	4,50	1,3
										Epinephelus aeneus	27,00	7,8
										Lentex angolensis	181,80	55,0
										Pagellus bellottii	72,00	21,8
19.06	1325	178	PT	55	20	04°48'	002°35'	1783,0	3566,0	Balistes capriscus	3565,50	99,9
19.06	1700	179	PT	41	41	04°50'	002°24'	,0	,0	NO CATCH	,00	,0
19.06	2330	180	PT	27	10	04°46'	001°54'	27,0	54,0	Alectis alexandrinus	2,00	3,7
										Chloroscombrus chrysurus	28,60	52,9
										Selene dorsalis	3,20	5,9
										Ilisha africana	9,70	17,9
20.06	0720	181	PT	110	110	04°16'	001°40'	1500,0	3000,0	Antigonia capros	2700,00	90,0
										Lentex angolensis	201,00	6,7
										Lentex aureus	39,00	1,3
										Zeus faber	31,00	1,0
20.06	1000	182	PT	56	15	04°31'	001°43'	2005,0	2005,0	Balistes capriscus	2005,00	100,0
20.06	1350	183	PT	18	18	04°54'	001°40'	13,0	26,0	Chloroscombrus chrysurus	8,60	33,0
										Selene dorsalis	,80	3,0
										Sardinella maderensis	,50	1,9
										Eucinostomus melanopterus	,30	1,1
										Sphyraena piscatorum	12,80	49,2
20.06	1743	184	PT	40	40	04°44'	001°30'	2500,0	5000,0	Balistes capriscus	5000,00	100,0
20.06	1930	185	PT	47	18	04°39'	001°30'	75,0	150,0	Balistes capriscus	147,30	98,2
										Decapterus punctatus	1,80	1,2
21.06	0355	186	PT	27	1	04°57'	001°20'	2,0	4,0	Caranx crysos	,30	7,5
										Chloroscombrus chrysurus	2,60	65,0
										Decapterus punctatus	,30	7,5
										Selene dorsalis	,60	15,0
										Sardinella maderensis	,90	22,5
21.06	0752	187	PT	25	35	04°53'	001°10'	277,0	637,0	Balistes capriscus	179,40	28,1
										Decapterus punctatus	36,80	5,7
										Sardinella aurita	154,10	24,1
										Lutjanus sp	[illegible]	[illegible]
										Pseudupeneus prayensis	[illegible]	[illegible]
										Pagellus bellottii	[illegible]	[illegible]

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	WEIGTH (KG) %
21.06	1627	188	PT	32	32	04°56'	001°03'	105,0	210,0	Balistes capriscus	203,00	96,5
										Caranx crysos	2,60	1,2
21.06	2100	189	PT	35	20	04°58'	000°51'	56,0	112,0	Balistes capriscus	46,00	41,0
										Decapterus punctatus	4,80	4,2
										Sardinella aurita	58,00	51,7
										Lagocephalus laevigatus	2,00	1,7
22.06	0418	190	PT	29	10	05°07'	000°41'	1,0	2,0	Sardinella aurita	1,80	90,0
22.06	1450	191	PT	44	44	05°10'	000°25'	12,0	24,0	Balistes capriscus	24,64	102,6
22.06	2022	192	PT	20	5	05°30'	000°12'	67,0	135,0	Decapterus punctatus	2,80	2,0
										Selar crumenophthalmus	9,00	6,6
										Selene dorsalis	1,40	1,0
										Sardinella aurita	7,60	5,6
										Sardinella maderensis	16,40	12,1
										Brachydeuterus auritus	60,00	44,4
										FISH LARVAE	24,00	17,7
							EAST					
22.06	2300	193	PT	52	20	05°28'	000°02'	81,0	162,0	Ariomma bondi	6,90	4,2
										Balistes capriscus	57,90	35,7
										Decapterus punctatus	6,60	4,0
										Sardinella aurita	90,00	55,5
23.06	0110	194	PT	24	10	05°37'	000°06'	47,0	94,0	Decapterus punctatus	13,20	14,0
										Selar crumenophthalmus	17,40	18,5
										Sardinella maderensis	19,20	20,4
										Engraulis encrasicolus	8,40	8,9
										Brachydeuterus auritus	21,00	22,3
										Sphyraena piscatorum	10,80	11,4
23.06	0310	195	PT	68	30	05°34'	000°13'	65,0	105,0	Balistes capriscus	103,27	98,3
										Sepia officinalis hierredda	2,02	1,9
23.06	1720	196	PT	13	13	05°46'	000°57'	5,0	10,0	Sardinella maderensis	1,60	16,0
										Scomberomorus tritor	3,00	30,0
										Scomberomorus tritor	,20	2,0
										Sphyraena piscatorum	5,20	52,0
							WEST					
24.06	0025	197	PT	100	20	05°33'	000°13'	116,0	232,0	Ariomma bondi	41,20	17,7
										Balistes capriscus	180,00	77,5
										Selene dorsalis	4,40	1,8
										Epigonus telescopus	3,20	1,3
24.06	0720	198	PT	50	30	05°20'	000°15'	164,0	306,0	Balistes capriscus	306,30	100,0
24.06	1555	199	PT	58	20	04°48'	000°48'	306,0	612,0	Balistes capriscus	612,00	100,0
24.06	1928	200	PT	37	20	04°47'	000°59'	5000,0	10000,0	Balistes capriscus	10000,00	100,0

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
08.09	1820	268	PT	40	13	10°04'	015°56'	228,0	912,0	Balistes capriscus	910,80	99,8
09.09	0533	269	PT	55	25	10°03'	016°30'	2300,0	9844,0	Balistes capriscus	8416,62	85,5
										Dactylopterus volitans	1427,38	14,5
09	0910	270	BT	36	36	10°18'	016°09'	460,0	1380,0	Balistes capriscus	834,00	60,4
										Selene dorsalis	298,50	21,6
										Pagellus bellottii	99,60	7,2
										Sparus caeruleostictus	35,70	2,5
09.09	1125	271	PT	43	1	10°23'	016°00'	,0	,0	MISCELLANEOUS	,00	,0
09.09	1420	272	BT	30	30	10°25'	016°13'	400,0	1200,0	Balistes capriscus	763,20	63,6
										Selene dornalis	398,40	33,2
										Sphyraena piscatorum	38,40	3,2
09.09	1835	273	PT	55	55	10°28'	001°63'	400,0	1200,0	Balistes capriscus	325,20	27,1
										Dactylopterus volitans	874,80	72,9
09.09	2123	274	PT	62	20	10°33'	016°39'	168,0	672,0	Dactylopterus volitans	210,00	31,2
										Balistes capriscus	453,60	67,5
10.09	0900	275	PT	44	44	11°03'	017°00'	3000,0	6000,0	Dactylopterus volitans	5334,00	88,9
										Balistes capriscus	562,00	9,3
										Sepia sp	104,60	1,7
10.09	1105	276	PT	45	25	11°07'	017°02'	10,0	24,0	Balistes capriscus	20,40	85,0
										Dactylopterus volitans	3,36	14,0
13.09	2220	277	PT	64	33	13°22'	017°24'	32,0	76,0	Balistes capriscus	64,80	85,2
										Caranx crysos	1,80	2,3
										Ariomma bondi	3,36	4,4
										Dactylopterus volitans	6,00	7,8
14.09	0625	278	PT	131	22	12°13'	017°19'	2000,0	12000,0	Engraulis encrasicolus	12000,00	100,0
14.09	1015	279	PT	18	18	11°44'	017°05'	126,0	252,0	Trichiurus lepturus	110,00	43,6
										Brachydeuterus auritus	22,00	8,7
										Caranx crysos	7,00	2,7
										Pteroscion peli	5,00	1,9
										MISCELLANEOUS	92,60	36,7
14.09	1740	280	PT	35	10	11°45'	017°07'	19,0	76,0	Sardinella aurita	40,00	52,6
										Sardinella maderensis	32,40	42,6
										Selene dorsalis	1,20	1,5
										Caranx senegallus	3,20	4,2
14.09	1923	281	BT	11	11	11°45'	016°59'	1311,0	2621,0	Pseudotolithus typus	498,00	19,0
										MORULIDAE	60,00	2,2
										Arius heudeloti	197,80	7,5
										Pentanemus quinquarius	137,60	5,2
										S H R I M P S	730,00	27,8
										Pteroscion peli	903,00	34,4
15.09	0200	282	PT	21	8	12°00'	017°09'	210,0	630,0	Pomatomus saltatrix	29,70	4,7
										Chloroscombrus chrysurus	414,00	65,7
										STROMATEIDAE	17,40	2,7
										Alectis alexandrinus	51,90	8,2
										Sardinella maderensis	67,20	10,6
15.09	1115	283	BT	20	20	12°22'	017°01'	199,0	398,0	Hemicaranx bicolor	26,60	6,6
										Caranx senegallus	15,40	3,8
										Sphyraena piscatorum	42,00	10,5
										Brachydeuterus auritus	49,00	12,3
										Ilisha africana	98,00	24,6
15.09	1240	284	PT	23	3	12°20'	017°02'	44,0	88,0	Carcharinus sp	20,60	23,4
										Caranx crysos	24,00	27,2
										Scomberomorus tritor	15,40	17,5
										CARANGIDAE	1,80	2,0
										Caranx senegallus	10,60	12,0
15.09	1440	285	PT	20	1	12°20'	016°57'	37,0	74,0	Sardinella maderensis	2,60	3,5
										Caranx senegallus	9,60	12,9
										Trachinotus maxillosus	,80	1,0
										Carcharinus sp	60,00	81,0
15.09	1835	286	BT	12	12	12°17'	016°55'	802,0	1604,0	Pseudotolithus typus	356,40	22,2
										Brachydeuterus auritus	114,00	7,1
										Pteroscion peli	228,00	14,2
										MISCELLANEOUS	114,00	7,1
										Arius heudeloti	360,00	22,4

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
15.09	2050	287	PT	30	7	12°15'	017°03'	103,0	412,0	Carcharinus sp	180,00	43,6
										Carcharinus sp	120,00	29,1
										Caloroscombrus chrysurus	35,20	8,5
										Sardinella maderensis	54,00	13,1
15.09	2305	288	PT	12	5	12°27'	017°03'	6,0	11,0	Scomberomorus tritor	,60	5,4
										Caranx senegallus	,40	3,6
										Sardinella maderensis	1,20	10,9
										Trachinotus maxillosus	,20	1,8
										Trachinotus maxillosus	4,60	41,8
										Illisha africana	1,50	13,6
										Sphyraena piscatorum	2,60	23,6
16.09	0755	289	PT	40	46	12°45'	017°33'	156,0	312,0	Sardinella aurita	10,60	3,3
										Decapterus rhonchus	4,40	1,4
										Balistes capriscus	285,60	91,5
										Dactylopterus volitans	4,20	1,3
81.09	1345	290	PT	15	5	12°46'	017°06'	,0	,0	NO CATCH	,00	,0
16.09	1715	291	PT	17	4	13°15'	017°03'	,0	,0	Sardinella maderensis	,40	,0
81.09	1900	292	PT	12	12	13°00'	016°57'	1026,0	2052,0	Galecides decadactylus	540,00	26,3
										Pomatomus saltatrix	21,60	1,0
										Pomadasys rogeri	43,20	2,1
										Brachydeuterus auritus	1389,60	67,7
81.09	2135	293	PT	18	5	13°02'	017°03'	179,0	429,0	Brachydeuterus auritus	230,40	53,7
										Decapterus rhonchus	10,08	2,3
										Caranx crysos	18,72	4,3
										Sardinella maderensis	169,92	39,6
17.09	0125	294	PT	51	20	13°00'	017°26'	,0	,0	NO CATCH	,00	,0
17.09	0710	295	PT	66	30	13°11'	017°26'	92,0	184,0	Balistes capriscus	182,40	99,1
17.09	1145	296	PT	24	4	13°14'	017°06'	3,0	6,0	Balistes capriscus	6,40	106,6
17.09	1310	297	PT	24	24	13°07'	017°06'	103,0	342,0	Pagellus bellottii	21,31	6,2
										Pseudupeneus prayensis	18,64	5,4
										Balistes capriscus	26,64	7,7
										Sparus caeruleostictus	58,60	17,1
										Epinephelus aeneus	71,26	20,8
										Acanthurus monrovine	58,60	17,1
17.09	1615	298	PT	19	4	13°15'	017°04'	12,0	18,0	Scomberomorus tritor	2,16	7,7
										Caranx senegalius	4,80	17,1
										Sardinella aurita	13,68	48,8
										Sardinella maderensis	8,40	30,0
17.09	1815	299	PT	16	18	13°19'	017°03'	184,0	368,0	Bodianus speciosus	4,20	1,1
										Epinephelus aeneus	4,20	1,1
										Balistes capriscus	109,20	29,6
										Lagocephalus laevigatus	28,00	7,6
18.09	0045	300	PT	64	30	13°30'	017°19'	1500,0	9000,0	Balistes capriscus	7548,00	83,8
										Dactylopterus volitans	736,20	8,1
										Arius heudeloti	470,40	5,2
										Scomber japonicus	245,40	2,7
18.09	0830	301	PT	28	10	13°45'	017°05'	,0	,0	NO CATCH	,00	,0
18.09	1635	302	PT	30	15	13°48'	017°06'	9,0	13,0	Sardinella maderensis	10,80	83,0
										Sardinella aurita	2,10	16,1
18.09	2045	303	PT	10	10	13°56'	016°57'	186,0	372,0	Brachydeuterus auritus	91,00	24,5
										Sardinella maderensis	25,20	6,7
										Balistes capriscus	42,00	11,2
										Galecides decadactylus	46,20	12,4
										Eucinostomus melanopterus	44,80	12,0
										Arius heudeloti	56,00	15,0
18.09	2225	304	PT	16	3	13°58'	017°02'	240,0	480,0	Sardinella maderensis	251,60	52,4
										Sardinella aurita	9,40	1,9
										Brachydeuterus auritus	107,20	22,3
										Decapterus rhonchus	60,60	12,6
19.09	0805	305	PT	11	11	14°10'	017°02'	522,0	1044,0	Epinephelus aeneus	32,40	3,1
										Sardinella aurita	140,40	13,4
										Sardinella maderensis	82,80	7,9
										Sepia sp	39,60	3,7
										Balistes capriscus	190,80	18,2
										Decapterus rhonchus	511,20	48,9

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PER HR	DOMINANT SPECIES	WEIGTH (KG) PER HR	%
19.09	1035	306	PT	24	9	14°08'	017°09'	105,0	210,0	Sardinella maderensis	23,00	10,9
										Sardinella aurita	173,60	82,6
										Caranx cryros	12,64	6,0
19.09	1205	307	PT	23	23	14°08'	017°08'	797,0	1594,0	Balistes capriscus	699,00	43,8
										Bagellus bellottii	118,20	7,4
										Sparus caeruleostictus	134,40	8,4
										Icempterus rhonchus	242,00	15,1
										Lomodeuys incisus	166,60	10,4
19.09	1400	308	PT	18	18	14°03'	017°03'	20,0	40,0	Balistes capriscus	15,12	24,3
										[illegible]IDAE	1,44	2,3
										Sardinella maderensis	39,84	64,2
										Ar[illegible] sp	5,76	9,2
19.09	1730	309	PT	19	19	14°18'	017°07'	120,0	240,0	Chloroscombrus chrysurus	69,00	28,7
										Icempterus rhonchus	50,00	20,8
										Balistes capriscus	92,00	38,3
										Sardinella maderensis	11,00	4,5
20.09	0755	310	PT	32	32	14°34'	017°18'	3,0	9,0	Sardinella maderensis	8,70	96,6
										ECHENEIDAE	,30	3,3
20.09	1110	311	PT	90	90	14°23'	017°28'	735,0	1470,0	Pentex angolensis	1114,80	75,8
										Sardinella aurita	33,60	2,2
										Icempterus rhonchus	103,60	7,0
										Boops boops	155,60	10,5
20.09	2010	312	PT	115	115	14°53'	017°24'	210,0	504,0	Pentex angolensis	427,68	84,8
										PROTELIDAE	13,92	2,7
										Lepidotrigla carolae	27,84	5,5
										Neoscirthe felgori	31,68	6,2
21.09	0220	313	PT	80	10	15°11'	017°02'	3,0	12,0	Selar crumenophthalmus	1,00	8,3
										Caranx cryros	,60	5,0
										Trachinocephalus myopsis	,80	6,6
										Ariomma bondi	6,00	50,0
										Trichiurus lepturus	1,20	10,0
										Auxis thazard	1,60	13,3
21.09	0730	314	PT	25	25	15°30'	016°49'	368,0	736,0	Rhizoprionodon acutus	119,00	16,1
										Selene dorsalis	16,80	2,2
										Trichiurus lepturus	142,00	19,2
										Galeoides decadactylus	43,20	5,8
										Brachydeuterus auritus	212,00	28,8
21.09	1150	315	PT	22	22	15°40'	016°43'	208,0	755,0	Carcharinus sp	51,30	14,4
										Rhizoprionodon acutus	175,44	49,4
										Sphyrnea pirenaorum	78,31	22,0
										Ilisha africana	8,37	2,3
21.09	1430	316	PT	95	95	15°48'	016°56'	3000,0	12000,0	Icempterus rhonchus	9848,00	82,0
										Pentex angolensis	1530,80	12,7
										Boops boops	579,20	4,8
22.09	0200	317	PT	25	25	16°25'	016°36'	128,0	510,0	Brachydeuterus auritus	216,40	42,4
										SPARIDAE	75,60	14,8
										Balistes capriscus	11,20	2,1
										TORPEDINIDAE	14,40	2,8
										Pseudupeneus prayensis	51,20	10,0
										Eucinostomus melanopterus	61,20	12,0
22.09	0535	318	PT	56	20	16°39'	016°41'	150,0	300,0	Trachurus trecae	248,20	82,7
										Sardinella aurita	38,80	12,9
										LOLIGINIDAE	10,40	3,4
	0800	319	PT	20	20	16°44'	016°31'	660,0	1560,0	Balistes capriscus	275,52	17,6
										Bagellus bellottii	258,48	16,5
										Chloroscombrus chrysurus	393,60	25,2
										Alectis alexandrinus	101,28	6,4
										Brachydeuterus auritus	252,96	16,
22.09	1110	320	PT	90	90	16°54'	016°39'	472,0	944,0	Trachurus trecae	544,20	57,6
										Pentex macrophthalmus	267,20	28,3
										Boops boops	20,00	2,1
										Torpedo torpedo	21,80	2,3
22.09	2315	321	PT	100	20	17°30'	016°23'	1020,0	4080,0	Trachurus trecae	4080,00	100,0

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PER HR	DOMINANT SPECIES	WEIGTH (KG) PER HR	%
23.09	0840	322	PT	20	7	18°17'	016°13'	33,0	132,0	Sardinella maderensis	75,20	56,9
										Trachinotus ovatus	45,60	34,5
										Selene dorsalis	6,00	4,5
										Chloroscombrus chrysurus	2,40	1,8
23.09	1035	323	PT	18	7	18°22'	016°14'	14,0	56,0	Scomberomorus tritor	31,60	56,4
										Sardinella maderensis	17,20	30,7
										Trachinotus maxillosus	1,60	2,8
										ECHENEIDAE	2,00	3,5
23.09	1120	324	PT	19	19	18°21'	016°13'	3000,0	6000,0	Decapterus rhonchus	2434,20	40,5
										Balistes capriscus	170,80	2,8
										Brachydeuterus auritus	170,80	2,8
										Pseudupeneus prayensis	384,40	6,4
										Pagellus bellottii	2840,00	47,3
23.09	1520	325	PT	79	79	18°37'	016°23'	1,0	1,0	ECHENEIDAE	1,00	100,0
										Merluccius polli	,20	20,0
23.09	1920	326	PT	14	14	18°45'	016°18'	2000,0	4800,0	Pseudupeneus prayensis	109,92	2,2
										Decapterus rhonchus	156,96	3,2
										Brachydeuterus auritus	109,92	2,2
										POMADASYIDAE	62,64	1,3
										Pagellus bellottii	4313,76	89,8
24.09	0020	327	PT	65	10	19°00'	016°33'	232,0	464,0	Trachurus trecae	202,40	43,6
										Engraulis encrasicolus	144,80	31,2
										Trichiurus lepturus	16,80	3,6
										Alectis alexandrinus	39,40	8,4
										Sphyrna sp	60,40	13,0
24.09	1550	328	PT	24	24	20°02'	017°16'	1003,0	2000,0	Engraulis encrasicolus	2000,00	99,7
24.09	1855	329	PT	40	20	20°08'	017°25'	115,0	230,0	Campogramma glaycos	35,20	15,3
										Decapterus rhonchus	4,00	1,7
										Trachurus trecae	4,80	2,0
										Pagellus bellottii	4,00	1,7
										Trichiurus lepturus	181,60	78,9
24.09	2115	330	PT	30	9	20°12'	017°23'	293,0	586,0	Decapterus rhonchus	57,60	9,8
										Trachurus trecae	6,40	1,0
										Sardinella aurita	22,40	3,8
										Trichiurus lepturus	25,60	4,3
										Engraulis encrasicolus	456,00	77,8
25.09	0225	331	PT	29	10	20°21'	017°15'	240,0	410,0	Decapterus rhonchus	77,20	18,8
										Trachurus trecae	234,44	57,1
										Butyanus alletteratus	33,34	8,1
										Sardinella aurita	42,57	10,3
25.09	0635	332	PT	28	23	20°31'	017°20'	11,0	27,0	Sarda sarda	21,36	82,1
										Trichiurus lepturus	3,36	12,9
										Trachurus trecae	1,20	4,6
25.09	0730	333	PT	39	39	20°28'	017°22'	,0	,0	NO CATCH	,00	,0
25.09	0950	334	PT	37	27	20°35'	171°75'	22,0	54,0	Pagellus bellottii	40,01	74,0
										Zeus faber	1,36	2,5
										C E F H A L O P O D A	13,33	24,6
25.09	1400	335	PT	36	36	20°40'	017°13'	5,0	10,0	Pagellus bellottii	3,40	34,0
										Trachurus trecae	,90	9,0
										C E F H A L O P O D A	5,40	54,0
25.09	2305	336	PT	47	20	02°74'	023°35'	240,0	480,0	Trachurus trecae	244,00	50,8
										Decapterus rhonchus	165,60	34,5
										Trichiurus lepturus	22,60	4,7
										Sardinella aurita	41,80	8,7
26.09	0910	337	PT	17	17	20°11'	017°15'	52,0	104,0	Scomberomorus tritor	23,60	22,6
										Campogramma glaycos	7,60	7,3
										Caranx crysos	4,00	3,8
										Sardinella aurita	27,80	26,7
										LOLIGINIDAE	25,40	24,4
26.09	1430	338	PT	110	80	19°41'	017°02'	,0	,0	NO CATCH	,00	,0
26.09	1850	339	PT	26	26	19°17'	016°44'	575,0	2300,0	Pagellus bellottii	233,60	10,1
										Pomadasys rogeri	212,00	9,2
										Campogramma glaycos	176,80	7,6
										Decapterus rhonchus	155,60	6,7
										Sardinella aurita	1302,00	56,6

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PER HR	DOMINANT SPECIES	WEIGTH (KG) PER HR	%
27.09	0540	340	PT	20	20	18°14'	016°12'	388,0	931,0	Pseudupeneus prayensis	12,96	1,3
										Lentex barnardi	35,76	3,8
										Sepia sp	35,76	3,8
										Pomadasys rogeri	59,60	6,3
										Brachydeuterus auritus	120,72	12,9
										Balistes capriscus	114,24	12,2
										Decapterus rhonchus	176,16	18,9
										Lagellus bellottii	336,00	36,0
27.09	1735	341	PT	41	41	16°40'	016°38'	2618,0	5236,0	Trachurus trecae	1000,40	19,1
										Sardinella aurita	1376,00	26,3
										Lagellus bellottii	519,00	9,9
										Brachydeuterus auritus	1937,60	37,0
28.09	0620	342	PT	380	25	15°00'	017°19'	7,0	28,0	Arioma bondi	26,00	92,8
										Trichiurus lepturus	,80	2,8
										Carcharhinus spp	,40	1,4
28.09	0800	343	PT	150	150	14°56'	017°21'	690,0	1035,0	Boops boops	526,80	50,8
										Trachurus trecae	443,70	42,8
										Lentex angolensis	37,20	3,5
										DELIGINIIAE	11,40	1,1
29.09	1050	344	PT	12	12	14°22'	017°06'	737,0	1768,0	Decapterus rhonchus	133,92	7,5
										Balistes capriscus	841,44	47,5
										Chloroscombrus chrysurus	707,52	40,0
										Sparus caeruleostictus	19,20	1,0
29.09	1450	345	PT	80	80	14°27'	017°26'	3000,0	6000,0	Trachurus trecae	2360,00	39,3
										Sardinella aurita	638,00	10,6
										Lentex angolensis	929,00	15,4
										Boops boops	2012,00	33,5

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
08.12	0355	389	PT	200	70	20°17'	017°30'	72,0	108,0	Sardinella aurita	7,35	6,8
										Trachurus trachurus	8,10	7,5
										Trichiurus lepturus	90,00	83,3
										MYCTOPHIDAE	1,20	1,1
09.12	0720	390	PT	24	24	20°13'	017°15'	364,0	1328,0	Trachurus trecae	787,60	59,3
										Trachurus trachurus	87,60	6,2
										Decapterus rhonchus	118,80	8,9
										Sardina pilchardus	28,60	2,1
										Pagellus bellottii	136,60	10,4
09.12	1400	391	PT	35	35	19°57'	017°17'	265,0	530,0	Pomadasys incisus	361,20	68,1
										Trachydeuterus auritus	6,00	1,1
										Pagellus bellottii	51,00	9,6
										Sparus caeruleostictus	17,00	3,2
09.12	1935	392	PT	90	20	19°44'	017°25'	243,0	486,0	Decapterus rhonchus	300,00	61,7
										Trichiurus lepturus	164,00	33,7
										Arius heudeloti	14,00	2,8
10.12	0350	393	PT	33	33	19°02'	016°30'	132,0	264,0	Pagellus bellottii	61,40	23,2
										Decapterus rhonchus	8,40	3,1
										Caranx rhonchus	19,00	7,1
										Epinephelus aeneus	14,00	5,3
										Arius sp	30,40	11,5
										Lonchurus lanceolatus	77,20	29,2
10.12	1104	394	PT	143	143	18°53'	016°41'	286,0	572,0	Dentex macrophthalmus	57,80	10,1
										Dentex congoensis	44,20	7,7
										Trachurus trachurus	141,80	24,7
										Trachurus trecae	77,80	13,6
										Merluccius merluccius	95,60	16,7
										Capros aper	84,00	14,6
10.12	1540	395	PT	63	63	18°36'	016°26'	34,6	69,2	Torpedo torpedo	2,00	2,8
										Sarpagramma glayeos	7,20	10,4
										Caranx crysos	2,20	3,1
										Decapterus rhonchus	1,20	1,7
										C E F H A L O P O D A	8,40	12,1
										Sepia officinalis hierredda	14,40	20,8
										Pagellus bellottii	13,00	18,7
										Trichiurus lepturus	16,20	23,4
10.12	2107	396	PT	58	40	18°16'	016°20'	24,5	40,6	Decapterus rhonchus	1 62	,6
										Caranx crysos	[illegible]	12,6
										Sardinella aurita	[illegible]	15,1
										Pagellus bellottii	[illegible]	6
11.12	0110	397	PT	33	33	18°02'	016°15'	903,0	1806,0	Epinephelus aeneus	56,00	3,1
										Pagellus bellottii	274,60	15,2
										Sparus caeruleostictus	25,20	1,7
										Boops boops	60,00	3,3
										Argyrosomus sp	247,40	13,6
										Pleuronectes mediterraneus	251,40	13,9
										Trachurus trecae	593,60	32,8
11.12	0647	398	PT	38	17	17°41'	016°13'	59,0	118,0	Trachinotus ovatus	40,40	34,2
										Chloroscombrus chrysurus	16,80	14,2
										Selene dorsalis	6,80	5,7
										Decapterus rhonchus	2,40	2,0
										Stromateus fiatola	23,20	19,6
11.12	0900	399	PT	62	62	17°37'	016°17'	201,0	402,0	Decapterus rhonchus	157,00	39,0
										Alectis alexandrinus	13,00	3,2
										Pagellus bellottii	107,00	26,6
										Trichiurus lepturus	60,90	15,1
11.12	2122	400	PT	32	20	17°01'	016°26'	1045,0	2090,0	Trachydeuterus auritus	1460,00	69,8
										Decapterus rhonchus	406,00	19,4
										Pagellus bellottii	45,60	2,1
										Alectis alexandrinus	75,60	3,6
12.12	0520	401	PT	90	90	16°52'	016°44'	814,0	1628,0	Trachurus trecae	1400,00	85,9
										Trachurus trachurus	42,60	2,6
										Parascuticeps ledanoni	57,50	3,5
										Boops boops	35,00	2,1
12.12	0845	402	PT	27	15	16°36'	016°34'	688,0	1376,0	Trachydeuterus auritus	1250,00	90,8
										Decapterus rhonchus	45,00	3,2
										Chloroscombrus chrysurus	15,00	1,0
										Scomber japonicus	20,00	1,4

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) IN HR	DOMINANT SPECIES	WEIGTH (KG) IN HR	%
12.12	1100	403	PT	31	31	16°30'	016°36'	616,0	924,0	Ilisha africana	42,90	4,6
										Brachydeuterus auritus	527,85	57,1
										Pomadasys incisus	16,15	1,9
										Ilisha bellottii	29,70	3,2
12.12	1625	404	PT	49	49	16°06'	016°40'	234,0	468,0	Brachydeuterus auritus	83,70	17,8
										Ilisha africana	13,50	2,8
										Pseudotolithus elongatus	22,50	4,8
										Pterocelion peli	81,90	17,5
										Trichiurus lepturus	63,00	13,4
13.12	0700	405	PT	47	35	16°23'	016°34'	100,0	200,0	Brachydeuterus auritus	117,60	58,8
										Alectis alexandrina	45,60	22,8
										Decapterus rhonchus	16,80	8,4
										Sphyraena sphyraena	9,40	4,7
13.12	1655	406	PT	54	54	18°20'	016°21'	146,0	292,0	Trachurus trecae	100,80	34,5
										Epinephelus aeneus	20,00	6,8
										Loligo vulgaris	63,80	21,8
										Sepia officinalis hierredda	12,60	4,3
14.12	0730	407	PT	14	14	19°56'	017°06'	946,0	1892,0	Engraulis encrasicolus	359,10	18,9
										Sardinella maderensis	323,00	17,0
										Sardinella maderensis	42,00	2,2
										Trachurus trecae	44,88	2,3
										Pseudotolithus senegalensis	284,50	15,0

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
08.02	1040	408	PT	50	1	14°33'	017°21'	,0	,0	NO CATCH	,00	,0
08.02	1207	409	PT	81	1	14°29'	017°28'	,0	,0	NO CATCH	,00	,0
08.02	1345	410	PT	137	60	14°24'	017°33'	,0	,0	NO CATCH		,0
08.02	1513	411	PT	100	60	14°23'	017°31'	,0	,0	NO CATCH	,00	,0
08.02	1643	412	PT	70	40	14°25'	017°25'	,0	,0	NO CATCH	,00	,0
08.02	1835	413	PT	40	10	14°30'	017°21'	,0	,0	NO CATCH	,00	,0
08.02	2000	414	PT	37	1	14°29'	017°16'	,0	,0	NO CATCH	,00	,0
08.02	2140	415	PT	69	35	14°26'	017°24'	,0	,0	NO CATCH	,00	,0
08.02	2335	416	PT	205	50	14°00'	017°31'	50,0	100,0	MYCTOPHIDAE	100,00	100,0
09.02	0115	417	PT	244	1	[illegible]	[illegible]	,0	,0	NO CATCH	,00	,0
09.02	0315	418	PT	60	1	[illegible]	[illegible]	,0	,0	NO CATCH	,00	,0
09.02	0435	419	PT	40	1	[illegible]	[illegible]	,0	,0	NO CATCH	,00	,0
09.02	0615	420	PT	39	1	[illegible]	017°16'	,0	,0	NO CATCH	,00	,0
09.02	0735	421	PT	60	45	[illegible]	017°22'	,0	,0	NO CATCH	,00	,0
09.02	1045	422	BT	18	18	[illegible]	017°07'	660,0	1320,0	Trachurus trecae Trachinotus goreensis Boops boops Balistes capriscus	236,00 34,40 722,40 215,00	17,8 2,6 54,7 16,2
09.02	1250	423	BT	10	10	14°21'	017°05'	42,8	85,6	Balistes capriscus Sparus caeruleostictus Plectorhynchus mediterraneus Trachurus trecae Sepia officinalis hierredda	39,60 2,40 3,00 1,20 39,40	46,2 2,8 3,5 1,4 41,3
09.02	1425	424	BT	20	20	14°29'	017°09'	25,0	75,0	Trachurus trecae Boops boops	[illegible] [illegible]	70,0 30,0
09.02	1615	425	BT	16	16	14°38'	017°14'	1500,0	3000,0	Boops boops Trachurus trecae Parellus bellottii Balistes capriscus	[illegible] [illegible] 72,00 48,00	76,6 15,3 2,4 1,6
13.02	0115	426	PT	27	10	12°18'	017°04'	76,0	152,0	Brachydeuterus auritus Stromateus fiatola Sphyraena piscatorum Trichiurus lepturus	116,00 15,80 11,00 7,60	76,3 10,3 7,2 5,0
13.02	1900	427	BT	10	10	11°50'	016°58'	713,0	1426,0	Pseudotolithus senegalensis Pseudotolithus senegalensis Illisha africana Brachydeuterus auritus JELLYFISH	680,00 114,00 58,40 65,80 174,00	47,6 7,9 4,0 4,6 12,2
14.02	1155	428	BT	11	11	12°29'	016°57'	210,0	279,3	Pseudotrolithus sp ARIIDAE Pseudotolithus senegalensis Illisha africana	129,27 57,10 41,09 13,56	46,2 20,4 14,7 4,8
14.02	2025	429	PT	18	1	12°36'	017°16'	17,6	35,3	Engraulis encrasicolus Sardinella aurita Sardinella aurita Sardinella maderensis Brachydeuterus auritus	20,00 2,00 ,64 ,40 8,20	56,6 5,6 1,8 1,1 23,2
15.02	0655	430	BT	14	14	11°42'	016°48'	40,5	97,2	Illisha africana Pteroscion peli Brachydeuterus auritus Pseudotolithus senegalensis	50,40 13,68 7,92 5,76	51,8 14,0 8,1 5,9
15.02	1050	431	BT	115	115	11°38'	017°19'	588,0	1176,0	Trachurus trecae Trachurus trecae Dentex maroccanus Spicara alta	488,00 276,00 143,00 120,80	41,4 23,4 12,1 10,2

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
15.02	1525	432	BT	25	25	15°25'	017°01'	49,8	99,5	Trichiurus lepturus	45,40	45,6
										Epinephelus aeneus	27,60	27,7
										Balistes capriscus	15,70	15,7
										Ephippion guttifer	2,90	2,9
15.02	2255	433	PT	40	20	11°12'	017°05'	279,0	558,0	Dactylopterus volitans	480,00	86,0
										Balistes capriscus	44,20	7,9
										Acanthurus monrovine	17,40	3,1
										Torpedo torpedo	15,60	2,7
16.02	0245	434	PT	47	30	11°03'	017°01'	170,0	204,0	Dactylopterus volitans	191,04	93,6
										Balistes capriscus	12,48	6,1
16.02	1100	435	BT	45	45	10°51'	016°43'	24,1	48,2	Dactylopterus volitans	46,00	95,4
										Balistes capriscus	1,80	3,7
16.02	1240	436	PT	85	60	10°45'	016°46'	9,5	14,2	Decapterus rhonchus	13,50	95,0
										Scomber japonicus	,75	5,2
16.02	2005	437	PT	125	11	10°24'	016°40'	117,4	117,4	Balistes capriscus	56,00	47,7
										Synagrops microlepis	60,00	51,1
										Sepia officinalis hierredda	1,20	1,0
17.02	0000	438	PT	163	10	10°18'	016°40'	607,5	810,0	Balistes capriscus	810,00	100,0
17.02	0700	439	PT	23	10	10°35'	015°50'	,0	,0	NO CATCH	,00	,0
17.02	1705	440	PT	>500	20	09°35'	016°37'	5,0	6,6	POSTLARVAL FISH	6,65	100,7
17.02	2245	441	PT	50	20	09°55'	016°09'	51,0	102,0	Balistes capriscus	73,20	71,7
										Dactylopterus volitans	28,80	28,2
18.02	1135	442	PT	21	10	10°14'	015°23'	,0	,0	NO CATCH	,00	,0
18.02	1715	443	BT	32	32	09°50'	015°40'	1822,0	3644,0	Balistes capriscus	3600,00	98,7
18.02	1930	444	PT	40	10	09°44'	015°49'	5500,0	7315,0	Balistes capriscus	7315,00	100,0
19.02	0455	445	PT	41	10	09°33'	015°30'	150,0	300,0	Balistes capriscus	300,00	100,0
19.02	1425	446	PT	30	10	09°56'	015°04'	,0	,0	NO CATCH	,00	,0
21.02	2045	447	PT	23	6	09°07'	013°34'	18,2	36,4	Hemicaranx bicolor	14,40	39,5
										Scomberomorus tritor	4,20	11,5
										Ilisha africana	3,60	9,8
										Sardinella maderensis	2,80	7,6
22.02	1110	448	PT	16	5	08°10'	013°56'	292,0	584,0	Sardinella maderensis	336,00	57,5
										Engraulis encrasicolus	129,60	22,1
										Brachydeuterus auritus	6,80	1,1
										Caranx sp	6,40	1,0
										S H A R K S	100,80	17,2
22.02	1305	449	BT	19	19	08°07'	013°57'	650,0	975,0	Brachydeuterus auritus	177,00	18,1
										Pomadasys rogeri	34,50	3,5
										JELLYFISH	750,00	76,9
22.02	2005	450	PT	23	5	08°11'	013°26'	30,0	60,0	Brachydeuterus auritus	7,00	11,6
										Decapterus rhonchus	,60	1,0
										Lepocephalus laevigatus	,60	1,0
										PENAEIDAE	1,00	1,6
										JELLYFISH	46,20	77,0
22.02	2340	451	BT	18	18	07°57'	013°47'	147,0	220,0	Liconaccus cutaneus	15,30	6,9
										Trachinocephalus myops	10,12	4,6
										S H R I M P S	7,87	3,5
										Penaeus P kerathurus	4,84	2,2
										JELLYFISH	165,00	75,0
23.02	0615	452	PT	20	6	08°00'	013°46'	50,0	200,0	Sphyraena dubia	64,80	32,4
										Engraulis encrasicolus	104,00	52,0
										Sardinella maderensis	28,40	14,2
										Brachydeuterus auritus	2,80	1,4
23.02	1155	453	PT	50	35	08°38'	014°18'	,1	,2	Trachinocephalus myops	,20	100,0
23.02	1325	454	BT	72	72	08°40'	014°18'	18,0	36,0	Brachydeuterus auritus	25,80	71,6
										Sparus caeruleostictus	5,60	15,5
										Dactylopterus volitans	,64	1,7
										Loligo sp	,60	1,6

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	WEIGTH (KG) %
23.02	1845	455	PT	52	10	09°12'	014°53'	4000,0	8000,0	Balistes capriscus	8000,00	100,0
24.02	2050	456	BT	347	347	10°26'	017°17'	17,7	35,4	Hymenocephalus italicus	11,60	32,7
										Chlorophthalmus fraser	10,20	28,8
										Merluccius polli	5,80	16,3
										Malacocephalus laevis	2,20	6,2
25.02	0405	457	PT	>500	10	10°57'	017°23'	2,8	5,6	Paracubiceps ledancei	3,64	65,0
										Cubiceps gracilis	,74	13,2
										Trichiurus lepturus	,20	3,5
										MYCTOPHIDAE	,94	16,7
25.02	0815	458	PT	72	55	11°11'	170°98'	183,6	1101,6	Trachurus trecae	720,00	65,3
										Sardinella aurita	360,00	32,6
										Scomber japonicus	21,60	1,9
25.02	1445	459	BT	84	84	11°09'	017°07'	1,5	3,0	Trachurus trecae	3,00	100,0
25.02	1845	460	BT	86	86	11°28'	017°15'	3000,0	3000,0	Synagrops microlepis	2040,00	68,0
										Trachurus trecae	468,00	15,6
										Trachurus trecae	60,00	2,0
										Lepidotrigla cadmani	132,00	4,4
26.02	0050	461	PT	43	43	12°05'	017°09'	12,1	20,6	Brachydeuterus auritus	19,66	95,4
										Trichiurus lepturus	,32	1,5
										Sepia officinalis hierredda	,30	1,4
26.02	0620	462	PT	24	6	12°20'	017°07'	140,0	239,4	Sardinella maderensis	230,85	96,4
										Stromateus fiatola	6,84	2,8
26.02	1335	463	BT	12	12	12°33'	017°05'	300,0	450,0	Galeoides decadactylus	258,75	57,5
										Pseudotolithus senegalensis	59,25	13,1
										Brachydeuterus auritus	25,20	5,6
										Trichiurus lepturus	20,70	4,6
26.02	2025	464	PT	54	40	12°50'	017°35'	1200,0	2400,0	Balistes capriscus	2400,00	100,0
27.02	0410	465	PT	28	20	13°00'	017°15'	340,0	340,0	Brachydeuterus auritus	289,20	85,0
										Balistes capriscus	37,20	10,9
										Stromateus fiatola	10,00	2,9
										Trachurus trecae	3,60	1,0
27.02	0910	466	PT	222	85	12°09'	017°35'	,0	,0	NO CATCH	,00	,0
27.02	1305	467	BT	30	30	13°10'	017°09'	106,0	212,0	Alloteuthis africana	92,40	43,5
										Pagellus bellottii	47,80	22,5
										Epinephelus aeneus	25,60	12,0
										Sparus caeruleostictus	21,80	10,2
27.02	1910	468	BT	76	76	13°20'	017°24'	340,0	680,0	Dentex maroccanus	552,00	81,1
										Zeus faber	48,00	7,0
										Boops boops	7,20	1,0
										Fistularia petimba	7,20	1,0
28.02	0015	469	BT	26	26	13°25'	017°06'	552,0	1104,0	Trachurus trecae	960,00	86,9
										Pagellus bellottii	60,00	5,4
										Dactylopterus volitans	46,00	4,1
										Brachydeuterus auritus	18,00	1,6
28.02	0910	470	PT	60	20	13°50'	017°19'	,0	,0	NO CATCH	,00	,0
28.02	2055	471	BT	30	30	14°15'	017°20'	671,0	1342,0	Boops boops	1022,40	76,1
										Trachurus trecae	115,20	8,5
										Chelidonichtys sp	62,40	4,6
										Pagellus bellottii	62,40	4,6
28.02	2335	472	PT	15	1	14°20'	017°06'	66,5	133,0	Engraulis encrasicolus	99,40	74,7
										Boops boops	10,00	7,5
										Sphyraena dubia	4,20	3,1
										Trachurus trecae	2,80	2,1
04.03	0155	473	PT	48	43	15°13'	016°58'	1376,0	2752,0	Brachydeuterus auritus	2730,00	99,2
04.03	0720	474	BT	30	30	15°30'	016°48'	404,0	808,0	Brachydeuterus auritus	428,00	52,9
										Pteroscion peli	94,40	11,6
										Pteroscion peli	9,60	1,1
										Pseudotholithus sp	44,80	5,5

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) IN HP	DOMINANT SPECIES	WEIGTH (KG) IN HP	%
04.03	1030	475	PT	180	120	15°39'	017°02'	4,2	4,2	Trichiurus lepturus	4,20	100,0
04.03	1427	476	BT	47	47	15°41'	016°47'	412,0	824,0	Argyrosomus regius	247,00	29,9
										Brachydeuterus auritus	189,80	22,0
										Brachydeuterus auritus	39,60	4,7
										Larapennaeopsis atlantica	85,00	10,3
10.03	0830	477	BT	45	45	15°54'	016°42'	644,0	1288,0	Brachydeuterus auritus	792,00	61,4
										Brachydeuterus auritus	15,40	1,1
										Blectorhynchus mediterraneus	54,00	4,2
										Argyrosomus regius	50,60	3,9
										JELLYFISH	250,00	19,4
10.03	1155	478	PT	97	40	16°10'	016°47'	4,3	8,6	Sepia sp	6,00	69,7
										JELLYFISH	2,60	30,2
10.03	1430	479	BT	27	27	16°15'	016°35'	222,0	444,0	Brachydeuterus auritus	115,40	18,2
										Brachydeuterus auritus	42,80	9,6
										Trichiurus lepturus	75,20	16,9
										Trichiurus lepturus	7,50	1,7
										JELLYFISH	56,60	12,7
10.03	1617	480	PT	50	20	16°19'	016°39'	73,7	147,4	Sepia sp	96,00	65,4
										Sarda sarda	9,00	6,1
										Rhizoprionodon acutus	6,20	4,2
										JELLYFISH	34,00	23,0
11.03	0030	481	PT	90	15	17°05'	016°32'	,0	,0	NO CATCH	,00	,0
11.03	0710	482	PT	180	50	17°41'	016°31'	37,0	74,0	Trichiurus lepturus	14,00	18,9
										JELLYFISH	60,00	81,0
11.03	0905	483	BT	165	150	17°45'	016°30'	38,0	38,0	Trichiurus lepturus	7,70	20,2
										Trachurus trachurus	6,40	16,8
										Trachurus trachurus	4,00	10,5
										JELLYFISH	20,00	52,6
11.03	1435	484	PT	350	100	17°34'	016°38'	20,0	20,0	JELLYFISH	20,00	99,0
11.03	1910	485	BT	98	98	17°44'	016°25'	880,0	1760,0	Trachurus trachurus	762,00	43,2
										Dentex macrophthalmus	594,00	33,7
										Umbrina canariensis	114,00	6,4
										Chelidonichtys lucerna	60,00	3,4
12.03	0930	486	BT	77	77	18°22'	016°27'	154,5	309,0	Trachurus trachurus	177,60	57,4
										Trachurus trachurus	56,00	18,1
										Zeus faber	25,20	8,1
										Raya straleni	16,80	5,4
12.03	1205	487	BT	34	34	18°12'	016°15'	40,8	122,4	Loligo sp	40,80	33,3
										Loligo sp	3,90	3,1
										Pagellus bellottii	19,50	15,9
										Epinephelus guaza	12,00	9,8
12.03	1417	488	PT	23	5	18°18'	016°15'	51,5	103,0	JELLYFISH	100,00	97,0
										Trachurus trachurus	1,50	1,4
12.03	1705	489	BT	40	40	18°32'	016°22'	170,0	340,0	Dentex canariensis	84,00	24,7
										Boops boops	29,20	8,5
										Plectorhynchus mediterraneus	23,20	6,8
										Sparus caeruleostictus	21,20	6,2
										Epinephelus guaza	49,00	14,4
13.03	1455	490	BT	60	60	19°06'	016°34'	95,0	190,0	Trachurus trachurus	169,60	89,2
										Zeus faber	11,80	6,2
										Epinephelus caninus	2,68	1,4
										Sardinella aurita	2,00	1,0
13.03	1600	491	PT	60	50	19°05'	016°34'	,2	,4	Sardinella aurita	,40	100,0
14.03	0625	492	BT	22	22	19°21'	016°46'	63,9	127,8	Pagellus bellottii	28,60	22,3
										Chelidonichtys lucerna	18,80	14,7
										Lithognathus mormyrus	13,40	10,4
										Engraulis encrasicolus	11,26	8,8
14.03	0725	493	PT	23	8	19°21'	016°46'	26,5	53,0	Mycteroperca rubra	22,80	43,0
										Engraulis encrasicolus	18,40	34,7
										Sarda sarda	9,00	16,9
										Spondyliosoma cantharus	2,80	5,2

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DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION WEST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGH (KG) PR HR	%
14.03	1100	494	BT	103	103	19°32'	017°01'	153,0	306,0	Trachurus trachurus	270,00	88,2
										Dentex macrophthalmus	21,60	7,0
										Trachurus trecae	10,60	3,4
										Dentex angolensis	3,40	1,1
14.03	1455	495	BT	37	37	19°57'	017°17'	530,0	1060,0	Pomadasys incisus	34[illegible]	32,4
										Trichiurus lepturus	240,[illegible]	22,[illegible]
										Merluccius sp	100,00	9,4
										Octopus vulgaris	90,00	8,4
										JELLYFISH	185,20	17,4
15.03	0320	496	BT	57	57	20°28'	017°29'	37,0	55,5	Trichiurus lepturus	49,80	89,7
										Sepia officinalis hierredda	1,50	2,7
										Trachurus trecae	1,05	1,9
										Octopus vulgaris	,75	1,3
15.03	0440	497	BT	56	40	20°26'	017°29'	52,7	107,4	Sardinella aurita	40,00	37,2
										Trichiurus lepturus	36,00	33,5
										Decapterus rhonchus	15,44	14,3
										Trachurus trecae	8,90	8,2
15.03	1510	498	BT	28	28	20°30'	017°10'	303,7	607,4	Engraulis encrasicolus	378,80	62,3
										Scomberomorus tritor	71,40	11,7
										Decapterus rhonchus	28,00	4,6
										Trachurus trecurus	21,60	3,5
15.03	2320	499	BT	425	1	20°39'	017°48'	62,0	248,0	MYCTOPHIDAE	156,80	63,2
										Loligo sp	26,80	10,8
										JELLYFISH	64,80	26,1
16.03	0745	500	BT	42	28	20°40'	017°17'	,3	,6	Epinephelus alexandrinus	,60	100,0
16.03	0825	501	BT	41	41	20°38'	017°19'	,0	,0	NO CATCH	,00	,0
16.03	1655	502	BT	17	17	20°16'	017°10'	39,3	31,4	Scomberomorus tritor	10,68	34,0
										Trachinotus ovatus	6,16	19,6
										Engraulis encrasicolus	3,40	10,8
										Sepia officinalis hierredda	2,96	9,4
16.03	2215	503	BT	33	20	20°23'	017°22'	850,0	850,0	Engraulis encrasicolus	348,60	41,0
										Sardina pilchardus	255,[illegible]	30,0
										Trichiurus lepturus	181,[illegible]	21,4
										Sepia officinalis hierredda	6[illegible]	7,3
24.03	1100	504	BT	77	73	30°56'	009°45'	52,0	104,0	Trachurus trachurus	84,80	81,3
										Merluccius merluccius	5,70	5,4
										Scomber japonicus	5,20	5,0
										Loligo sp	4,60	4,4
24.03	2135	505	BT	100	85	29°37'	010°24'	351,6	703,2	Sardina pilchardus	509,80	72,4
										Scomber japonicus	150,20	21,3
										Zeus faber	33,20	4,7
25.03	0245	506	BT	56	30	29°19'	010°34'	,0	,0	NO CATCH	,00	,0
25.03	0345	507	BT	52	5	29°18'	010°24'	37,0	40,3	Sardina pilchardus	40,33	100,0
25.03	1045	508	BT	143	143	29°14'	011°16'	700,[illegible]	1400,0	Callantias ruber	943,60	67,4
										Zeus faber	216,00	15,4
										Sparus pagrus pagrus	90,00	6,4
										Pagellus acarne	61,20	4,3
25.03	2235	509	BT	57	1	28°33'	011°56'	1,5	3,0	Scomber japonicus	2,40	80,0
										BELONIDAE	,50	16,6
26.03	0045	510	BT	46	5	28°24'	011°51'	17,0	34,0	Sardina pilchardus	32,80	96,4
										Scomber japonicus	1,00	2,9
26.03	0150	511	BT	48	10	28°25'	011°51'	345,0	690,0	Sardina pilchardus	690,00	100,0
27.03	1040	512	BT	50	50	28°29'	011°34'	227,0	454,0	Scomber japonicus	168,00	37,0
										Trachurus trachurus	104,00	22,9
										Sardina pilchardus	72,00	15,8
										Pagellus acarne	57,60	12,6

ANNEX III Results from the Length Measurements

III a

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
ACANTHURIDAE	ACA						
Acanthurus monroviae	ACAACO1						
		297	21.0	36.0	28.7	4.2	14
APOGONIDAE	APO						
Synagrops microlepis	APOSYO1						
		33	3.5	7.5	5.1	.8	97
		38	5.5	11.5	7.9	1.7	92
ARIIDAE	ARI						
Arius heudeloti	ARIARO1						
		281	6.0	35.0	15.5	9.6	20
ARIOMMIDAE	ARM						
		129	11.0	17.0	14.2	1.7	46
		139	13.0	17.0	14.8	1.0	51
		155	10.0	17.0	14.0	1.5	121
		158	13.5	17.0	15.6	.7	57
		161	12.0	17.5	14.1	1.1	70
		165	10.0	20.5	14.9	1.3	57
		166	13.5	19.5	15.5	1.2	50
		176	9.0	18.0	13.1	1.9	252
		197	8.0	15.0	10.8	1.9	99
		277	14.0	17.0	15.5	.8	13
		342	7.0	15.0	11.1	1.6	89
BALISTIDAE	BAL						
Balistes capriscus	BALBAO1						
		55	7.0	9.0	8.0	.6	17
		57	18.5	24.5	20.1	1.0	86
		60	17.0	23.5	19.8	1.0	50
		66	17.0	21.0	18.1	1.0	18
		69	16.5	21.0	18.2	1.3	12
		71	16.0	21.0	17.4	1.3	40
		72	16.0	20.0	17.6	.9	61
		75	16.0	22.0	17.3	1.2	52
		76	15.5	20.0	16.8	.9	67
		78	16.0	20.5	17.7	1.2	54
		79	17.0	20.5	18.8	.9	47
		80	17.0	20.5	18.5	.7	50
		81	16.5	19.5	17.4	.7	96
		83	15.5	28.5	20.2	2.7	58
		85	16.0	20.0	17.5	.8	71
		87	16.0	20.0	17.3	.8	65
		88	17.5	22.5	19.2	1.1	50
		90	15.0	27.5	20.6	2.4	63
		92	16.0	23.5	17.6	1.6	46
		93	16.0	19.5	17.2	.7	57
		95	17.0	24.0	18.7	1.7	54
		109	17.0	22.5	19.8	1.2	49
		112	17.0	23.0	20.4	1.5	42
		119	17.5	24.0	20.6	1.4	31
		121	17.0	20.0	18.5	.8	22
		123	17.0	19.0	18.1	.7	8
		124	16.5	22.0	18.8	1.0	50
		125	17.0	21.5	19.0	1.1	163
		131	15.5	21.5	18.5	1.1	131
		134	17.5	28.5	19.8	1.6	157
		136	15.0	24.0	17.4	1.0	169
		138	14.5	19.5	16.8	1.1	61
		171	14.5	20.0	16.6	.9	253
		173	15.0	20.0	16.5	.8	256
		176	12.0	20.0	15.4	1.1	242
		177	12.0	17.5	15.4	1.0	42
		178	11.5	17.5	14.8	1.0	350
		182	12.0	17.0	14.7	.9	324
		184	13.5	23.5	14.9	.9	329
		185	12.0	15.5	14.0	.8	133
		187	13.0	17.0	14.5	.8	53
		188	12.0	22.0	14.6	.8	330
		189	12.5	18.0	14.9	.9	170
		191	12.5	18.0	14.5	.7	201
		193	12.5	21.0	15.2	1.3	134
		195	12.5	21.5	15.5	1.7	99
		197	12.0	21.0	16.9	2.2	98
		198	12.0	19.0	14.7	.9	355
		199	12.0	17.5	14.4	.8	100
		200	12.0	17.0	14.0	.9	102
		268	16.0	19.0	17.4	.8	64
		269	15.0	19.0	17.1	.7	99
		270	16.0	36.0	19.3	2.7	106
		272	17.0	22.0	19.0	1.2	50
		273	16.0	25.0	18.8	1.8	43
		274	16.0	22.0	18.3	1.2	75

III b

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Balistes capriscus (continued)		275	16.0	21.0	18.4	1.4	31
		276	16.0	22.0	18.5	1.2	64
		277	18.0	22.0	20.2	1.0	53
		289	18.0	25.0	20.8	1.5	66
		295	19.0	23.0	20.7	.9	09
		297	24.0	29.0	25.0	1.6	12
		299	20.0	23.0	24.1	0.9	29
		300	19.0	23.0	20.8	1.1	33
		305	24.0	27.0	25.6	.8	16
		307	18.0	26.0	21.1	1.4	68
		308	22.0	29.0	25.2	1.7	19
		309	22.0	29.0	24.2	1.9	35
		319	20.0	23.0	21.4	.7	28
		340	23.0	27.0	24.6	1.0	11
		341	20.0	25.0	22.2	1.7	6
		422	24.0	30.0	26.3	1.4	14
		423	20.0	31.5	24.1	2.1	50
		432	20.0	30.0	23.9	2.6	22
		437	16.5	22.5	19.3	1.4	50
		438	6.5	10.0	8.2	.8	100
		445	17.0	20.5	18.0	.9	51
		455	17.5	25.0	19.1	1.5	50
		464	19.0	23.5	20.9	.9	50
		465	21.0	27.0	24.2	1.8	11
BRAMIDAE	BRA						
Brama brama	BRABRO1	3	25.5	35.5	30.3	2.2	92
CAPROIDAE	CAP						
Antigonia capros	CAPANO1	161	6.0	11.0	9.3	.9	70
		181	6.5	12.5	9.8	1.4	91
Capros aper	CAPCAO1	8	8.0	11.5	9.9	1.0	81
CARANGIDAE	CAR						
Alectis alexandrinus	CARALO1	58	36.0	65.0	49.6	7.6	57
		89	41.0	61.0	51.1	4.7	38
		117	52.0	53.0	52.5	.7	2
		405	35.0	56.0	43.0	4.3	32
Caranx sp	CARCAOO	63	9.5	15.5	11.8	.9	81
Caranx crysos	CARCAO2	58	39.0	51.0	42.8	3.4	12
		284	27.0	39.0	33.6	3.3	17
		396	30.5	31.5	31.0	.6	4
Caranx senegallus	CARCAO3	284	27.0	31.0	29.0	1.1	13
		285	27.0	34.0	30.5	2.1	11
Chloroscombrus chrysurus	CARCHO1	49	22.0	26.0	24.0	1.3	11
		59	17.0	24.0	19.4	1.5	69
		64	14.5	24.5	17.0	1.5	60
		66	21.0	23.5	22.1	.8	22
		98	16.5	29.0	22.8	2.1	86
		99	16.0	22.5	19.0	1.7	38
		101	16.5	29.5	24.0	2.6	51
		122	13.0	17.5	14.5	.9	50
		146	11.0	21.0	16.9	2.9	84
		150	8.5	22.5	19.7	4.0	20
		153	19.0	22.0	20.2	.8	43
		175	11.0	25.5	18.9	3.7	126
		180	8.0	22.5	13.6	2.8	149
		183	5.0	19.5	11.6	2.7	153
		186	14.0	20.0	16.2	1.2	37
		283	16.0	21.0	18.3	1.2	14
		287	15.0	25.0	19.4	1.4	59
		309	17.0	23.0	19.6	1.2	65
		319	20.0	25.0	22.4	1.4	46
		398	28.5	35.5	31.6	1.9	32
Campogramma glaycos	CARCMO1	407	35.0	54.0	46.1	4.3	17
Decapterus punctatus	CARDEO1	123	10.5	23.0	17.6	2.2	58
		132	7.0	20.0	13.6	2.9	74
		135	9.0	19.0	13.5	2.7	28
		138	15.0	23.0	18.2	1.5	117
		141	10.0	17.0	13.5	1.7	86
		143	13.0	23.0	18.1	2.0	100

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Decapterus punctatus (continued)		158	9.5	17.5	11.8	1.5	64
		160	13.0	17.5	15.3	1.0	77
		165	11.5	17.5	15.1	2.0	10
		166	11.5	17.0	13.9	1.4	115
		187	16.5	21.0	18.3	1.0	60
		189	16.5	22.0	18.5	1.4	21
		193	13.0	20.5	16.4	1.8	27
		194	5.0	18.5	11.6	[illegible]	97
Decapterus rhonchus	CARDEO2						
		7	16.0	29.0	21.8	4.5	81
		29	29.0	39.0	32.1	[illegible]	35
		30	28.5	33.0	[illegible]	1.2	10
		31	29.5	37.0	31.7	1.6	27
		43	33.5	39.5	[illegible]	1.7	13
		47	30.5	47.0	36.3	4.5	11
		54	31.0	34.5	33.1	1.4	6
		60	23.5	25.0	24.4	.7	5
		66	21.0	28.0	24.2	1.4	18
		83	12.0	14.5	13.8	1.3	4
		90	30.5	35.0	[illegible]	1.0	8
		92	31.0	45.0	38.4	4.2	35
		98	21.0	22.5	21.6	.7	9
		109	26.0	35.0	30.9	3.0	12
		112	24.0	32.0	27.4	1.6	81
		113	25.5	28.5	26.0	.7	2
		123	23.0	27.0	25.0	1.0	17
		305	24.0	31.0	26.6	1.7	53
		309	23.0	29.0	25.5	1.7	21
		311	10.0	16.0	14.8	1.0	54
		316	15.0	18.0	16.5	.6	80
		319	11.0	26.0	14.9	4.5	19
		324	10.0	35.0	21.6	5.5	63
		326	11.0	24.0	16.0	4.7	12
		330	13.0	29.0	24.4	6.1	14
		336	26.0	30.0	27.0	1.1	27
		337	4.0	15.0	9.2	2.4	116
		340	9.0	31.0	25.6	8.2	30
		341	10.0	13.0	11.3	.7	32
		390	7.5	11.0	9.4	.7	60
		391	6.5	13.5	8.0	1.4	79
		391	15.5	28.0	20.5	3.3	44
		392	22.0	43.0	31.5	4.6	185
		396	20.5	35.0	25.8	4.4	42
		397	14.0	33.0	16.8	4.2	25
		399	16.5	30.0	24.1	2.2	172
		400	18.0	37.0	29.7	3.0	71
		405	32.5	36.5	34.7	1.2	16
		406	14.0	37.0	25.5	9.8	15
		436	33.0	38.0	35.5	1.3	23
Selar crumenophthalmus	CARCAO1						
		194	25.0	30.0	27.8	1.6	10
Selone dorsalis	CARSLO1						
		66	18.5	27.0	19.9	1.0	17
		131	24.0	30.0	27.2	1.5	22
		146	9.5	23.0	16.1	4.8	27
		153	5.0	19.0	11.0	2.5	42
		169	16.5	23.0	18.2	1.0	68
		180	15.0	21.5	16.6	1.6	19
		270	22.0	26.0	24.0	1.0	44
		272	20.0	25.0	23.5	1.4	35
		314	12.0	22.0	19.2	2.6	18
		398	14.0	32.0	22.0	5.8	23
Trachinotus maxillosus	CARTCO1						
		288	13.0	24.0	18.5	2.8	24
Trachinotus ovatus	CARTCO3						
		322	27.0	32.0	29.6	1.2	26
		398	33.0	40.0	35.8	1.4	56
		502	6.0	10.0	8.1	.8	100
Trachurus trachurus	CARTRO1						
		6	6.5	19.5	11.0	3.6	44
		10	17.0	19.5	18.3	1.2	4
		16	27.5	32.0	30.1	1.2	11
		23	2.5	6.0	4.5	.8	138
		48	32.5	36.0	34.4	1.2	9
		389	28.0	39.0	32.9	3.1	17
		390	7.5	10.0	8.4	.6	59
		394	11.0	15.0	12.7	.9	127
		483	26.0	34.5	30.5	2.7	15
		486	14.0	35.0	22.0	6.5	195
		494	17.0	35.0	27.1	2.9	134
		498	6.0	12.0	9.2	1.2	100
		502	5.0	11.0	7.6	1.2	111
		504	13.5	27.0	19.0	2.5	103
		512	15.0	22.0	16.9	1.4	101
Trachurus trocae	CARTRO2						
		1	13.0	26.5	17.3	3.0	78
		2	10.0	24.0	16.6	2.6	78

III d

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Trachurus trecae (continued)		6	11.0	18.5	14.5	2.5	16
		7	11.0	22.5	15.5	1.8	146
		8	16.0	19.5	18.0	1.0	11
		12	11.0	25.5	22.7	3.3	17
		15	12.5	17.0	15.7	.7	59
		16	20.0	26.5	22.6	2.4	5
		17	15.5	17.0	16.4	.6	10
		19	20.0	25.5	22.7	1.3	70
		20	27.5	34.5	30.8	1.6	18
		21	29.0	34.0	31.3	1.1	38
		22	16.0	26.0	23.2	1.6	82
		26	21.0	25.5	22.5	1.0	50
		27	8.0	9.5	8.7	.7	9
		29	17.0	24.5	19.6	3.0	5
		31	15.5	27.5	22.1	3.1	79
		32	17.5	32.0	26.7	4.2	39
		33	5.5	8.0	6.9	.5	149
		38	16.0	25.5	18.9	2.1	102
		40	22.0	36.5	33.1	4.3	37
		41	33.5	40.5	36.1	1.6	17
		42	2.5	8.0	5.4	1.6	88
		43	15.5	23.5	19.4	2.0	45
		44	35.5	41.0	36.3	1.8	12
		47	20.5	37.0	31.0	4.8	26
		48	30.5	41.0	35.2	2.0	49
		49	14.5	22.5	16.6	1.7	74
		51	14.5	23.5	20.1	1.7	81
		53	16.0	29.5	20.4	3.2	40
		54	4.5	11.0	9.4	1.6	62
		54	16.0	20.5	16.9	.6	49
		103	6.5	11.5	7.7	.7	1[illegible]
		113	9.0	15.0	14.4	4.0	8
		318	16.0	20.0	17.5	.8	77
		320	14.0	18.0	15.9	.6	84
		321	9.0	15.0	11.4	1.0	133
		327	9.0	13.0	10.6	.7	118
		331	15.0	19.0	17.1	.9	71
		335	7.0	17.0	6.5	4.7	17
		336	11.0	24.0	16.3	3.0	75
		341	15.0	20.0	17.4	.8	92
		390	6.5	15.5	9.2	1.5	100
		394	13.0	27.5	20.3	2.4	150
		397	22.[illegible]	28.5	24.0	1.4	131
		401	15.[illegible]	19.0	17.7	.6	69
		406	18.0	31.0	23.4	2.6	100
		407	5.5	13.0	9.2	1.1	121
		422	14.0	20.5	15.8	1.[illegible]	49
		425	15.0	17.5	16.2	.7	49
		431	3[illegible].0	39.5	35.0	1.6	65
		431	13.0	22.0	15.0	1.4	100
		458	31.0	40.0	35.0	1.4	80
		467	4.2	6.0	5.5	.4	50
		469	15.0	25.0	15.8	2.1	90
		471	15.0	23.5	18.2	1.[illegible]	35
		479	15.5	29.0	24.7	2.[illegible]	4[illegible]
		483	29.5	35.0	31.6	1.7	22
		485	20.0	40.0	31.6	4.9	100
		490	12.0	41.0	17.8	7.9	247
CHILODIPTERIDAE	CHI						
Epigonus telescopus	CHIEPO1	197	6.0	9.5	7.6	.6	81
Hypoclydonia bella	CHIHYO1	155	7.0	9.0	8.2	.5	29
CLUPEIDAE	CLU						
CLUPEIDAE	CLUAAOO	7	5.5	7.0	6.2	.4	48
Ilisha africana	CLUILO1	64	10.0	19.5	12.5	1.8	109
		67	11.0	21.0	14.2	3.0	26
		98	10.5	24.5	14.4	3.7	48
		99	10.5	22.5	16.8	3.1	60
		100	10.5	23.5	14.8	3.3	60
		104	11.0	17.5	13.2	1.0	49
		107	18.0	22.0	19.6	1.1	54
		127	11.5	21.0	13.9	2.4	50
		133	10.0	24.0	12.3	1.9	79
		150	7.0	20.0	13.5	3.3	60
		153	10.5	21.5	16.4	3.0	49
		169	17.5	25.0	21.1	2.5	10
		180	8.0	16.5	10.3	1.4	199
		281	11.0	24.0	17.7	3.0	16
		282	11.0	18.0	14.0	1.7	16
		283	5.0	18.0	13.3	2.8	84
		314	16.0	23.0	20.0	1.8	30
		315	15.0	22.0	19.8	1.8	20
		403	14.5	26.0	20.7	2.7	42
		404	5.5	13.5	8.9	1.5	242

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Sardina pilchardus	CLUSDO1						
		10	7.5	12.0	10.3	.8	159
		14	7.5	9.5	8.3	.4	108
		390	10.0	15.0	12.3	1.0	112
		498	5.5	12.5	7.4	1.4	100
		502	10.0	14.5	12.4	1.0	50
		502	4.5	7.5	6.1	.5	100
		505	16.5	21.0	19.2	.9	99
		507	16.0	23.0	18.6	1.3	102
		510	16.0	21.0	18.7	1.1	100
		511	16.5	21.0	18.4	.8	100
		512	14.5	20.0	16.1	.9	99
Sardinella aurita	CLUSLO1						
		17	13.5	20.0	17.7	3.4	37
		19	22.5	28.0	25.0	1.2	22
		31	32.0	39.5	35.1	2.4	8
		47	33.5	38.5	35.3	1.3	15
		49	12.0	26.5	19.3	6.1	8
		55	18.0	22.5	20.7	1.0	45
		58	8.0	15.0	10.7	1.9	87
		83	10.0	14.5	11.3	.6	99
		89	9.5	11.5	10.7	.5	67
		97	9.5	13.0	10.9	.8	38
		103	8.5	12.5	10.6	.8	32
		105	11.0	26.5	21.0	6.6	20
		111	21.5	26.0	23.7	1.5	48
		113	13.5	[illegible]	16.7	1.4	70
		123	13.0	22.0	15.7	1.9	55
		124	14.0	25.0	17.3	4.6	8
		129	10.0	18.5	14.2	2.2	98
		132	12.0	18.0	14.7	1.4	69
		135	7.0	14.5	[illegible]	1.2	95
		140	10.0	13.0	[illegible]	1.2	15
		141	10.5	16.5	14.7	1.4	61
		143	11.0	19.5	14.4	2.3	50
		159	7.0	10.5	8.4	.7	101
		160	10.0	19.5	[illegible].1	1.2	70
		165	6.0	12.5	9.7	.9	144
		166	7.5	17.5	13.4	2.4	98
		169	20.5	27.5	24.1	2.1	9
		169	6.0	11.5	8.4	.8	151
		173	21.0	25.0	22.6	1.2	12
		175	11.5	24.0	23.0	2.3	32
		184	18.5	22.0	19.8	.8	57
		187	18.0	22.0	20.0	.8	206
		189	17.5	24.5	19.5	1.2	236
		190	15.0	27.5	19.9	2.5	14
		192	9.5	15.5	12.0	.9	121
		193	15.5	20.5	18.0	.8	102
		200	17.0	22.5	19.6	1.5	16
		280	18.0	24.0	21.2	1.1	72
		289	21.0	25.0	23.3	1.0	31
		298	20.0	23.0	21.5	.8	39
		305	21.0	25.0	22.8	1.0	22
		306	20.0	25.0	21.7	1.0	88
		311	13.0	18.0	13.9	.9	60
		318	17.0	22.0	20.1	1.0	30
		327	8.0	12.0	10.3	1.0	14
		330	20.0	25.0	22.6	1.7	7
		331	17.0	25.0	20.7	1.9	25
		336	23.0	30.0	25.6	2.0	12
		337	10.0	22.0	10.2	1.5	107
		339	19.0	28.0	22.6	2.2	55
		341	20.0	23.0	21.2	.7	50
		389	26.0	30.0	27.3	1.1	10
		390	10.0	18.0	12.2	1.6	35
		396	30.0	39.5	34.1	3.1	10
		458	30.0	39.0	34.0	1.8	77
		497	25.0	33.0	27.7	1.3	111
Sardinella maderensis	CLUSLO2						
		30	19.5	27.0	20.8	.8	33
		49	15.0	26.5	24.2	3.7	9
		54	17.0	30.0	22.9	2.9	61
		55	22.0	28.0	24.1	1.4	35
		56	22.0	27.0	24.3	1.2	44
		96	24.0	32.0	26.8	1.6	41
		101	20.5	26.5	23.0	1.4	52
		105	21.0	27.0	23.1	1.2	69
		107	23.0	27.0	25.6	1.3	12
		111	24.0	32.0	27.3	1.7	106
		113	12.5	20.5	16.7	1.5	107
		144	10.5	25.0	13.5	2.8	42
		146	9.0	23.0	18.4	3.1	146
		147	16.0	24.5	18.3	4.3	57
		150	9.5	16.0	13.0	1.4	27
		151	9.5	22.5	16.1	2.5	256
		152	9.5	24.0	14.1	4.1	112
		156	9.0	23.5	17.4	5.8	31
		168	6.5	13.5	10.6	1.9	15
		169	7.5	13.0	9.2	.9	184

III f

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Sardinella maderensis (continued)		169	12.5	27.0	19.3	3.9	44
		170	9.5	15.0	11.5	.8	119
		172	7.0	11.5	8.5	.8	91
		173	7.5	19.0	11.6	2.9	21
		175	9.0	23.5	13.7	3.9	164
		180	4.5	18.0	11.7	2.9	88
		183	11.0	12.5	11.7	.4	16
		186	15.5	19.5	17.8	1.2	10
		192	9.0	23.5	10.4	1.2	154
		194	7.5	10.0	7.8	.8	96
		196	9.5	13.5	11.1	.9	53
		280	16.0	22.0	19.4	1.3	73
		282	15.0	22.0	18.3	1.2	97
		287	21.5	27.0	23.1	1.4	80
		293	17.0	21.0	18.6	1.4	58
		298	12.5	21.0	16.3	.9	34
		302	16.0	24.0	19.9	1.6	47
		303	15.0	20.0	18.0	1.4	33
		304	15.0	19.0	17.1	.8	28
		305	18.0	23.0	20.0	1.5	19
		306	17.0	24.0	20.0	1.2	26
		308	17.0	22.0	17.7	.9	69
		309	18.0	20.0	19.3	.6	11
		310	19.0	22.0	20.4	1.0	22
		314	10.0	26.0	18.3	6.3	10
		315	9.0	24.0	15.0	6.8	6
		322	20.0	28.0	23.7	2.0	93
		323	19.0	27.0	24.0	1.8	19
		337	10.0	13.0	11.4	.7	30
		398	27.0	35.0	30.4	2.7	22
		437	7.5	11.5	9.2	.8	98
		407	20.0	33.5	27.4	1.5	111
		452	4.5	6.5	5.8	.5	50
		462	21.5	25.5	23.4	.9	50
DACTYLOPTERIDAE	DAC						
Dactylopterus volitans	DACDAO1						
		57	20.0	44.0	28.3	6.0	13
		269	19.0	33.0	24.1	3.0	44
		273	20.0	34.0	22.5	2.5	115
		274	19.0	26.0	21.1	1.6	60
		275	19.0	31.0	22.6	1.9	149
		277	22.0	33.0	27.3	3.1	12
ENGRAULIDAE	ENG						
Engraulis sp	ENGENOO						
		452	5.0	7.0	5.8	.5	50
Engraulis encrasicolus	ENGENO1						
		10	9.0	11.0	9.8	.5	102
		12	12.0	14.0	13.0	.5	16
		13	11.5	14.5	13.1	.7	90
		14	8.0	10.5	8.6	.5	96
		17	8.5	12.5	10.7	.8	104
		28	5.0	11.0	9.7	1.9	26
		42	4.5	9.5	6.5	1.4	16
		58	7.0	12.0	9.2	.9	99
		61	7.5	13.0	9.0	1.1	94
		70	8.0	11.0	9.6	.6	79
		89	7.5	9.0	8.2	.4	68
		91	7.5	9.5	8.5	.4	43
		94	11.0	13.5	12.4	.6	75
		97	6.5	11.5	8.8	1.3	111
		103	7.5	9.0	8.2	.5	110
		110	8.0	11.0	9.3	.7	54
		129	8.5	11.5	9.8	.7	135
		130	5.0	9.5	8.1	.7	128
		141	5.0	12.5	10.4	1.2	74
		142	11.0	13.0	12.1	.5	30
		159	6.5	11.0	8.7	.8	231
		165	9.5	12.5	11.2	.7	43
		168	5.5	9.0	7.4	.9	11
		169	5.0	8.5	6.7	.9	50
		172	4.0	9.0	6.2	1.1	131
		180	7.0	10.0	8.7	.7	45
		194	5.0	7.5	6.0	.5	117
		278	8.0	11.5	9.8	.8	190
		227	7.0	10.0	8.5	1.1	82
		328	6.5	9.0	7.5	.4	142
		339	8.5	12.0	9.6	.6	147
		407	7.0	10.0	8.1	.7	100
		472	6.5	10.5	7.5	.6	99
		492	6.5	12.0	8.8	1.1	100
		498	7.0	11.0	9.2	.8	100
		502	4.5	7.5	5.8	.6	100
GEMPYLIDAE	GEM						
Gempylus serpens	GEMGEO1						
		139	13.5	23.5	14.8	1.7	35

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
GERREILAE	GER						
Eucinostomus melanopterus	GEREUO1						
		303	14.0	19.0	15.8	1.4	33
		317	15.0	19.0	16.8	1.1	30
MAENIDAE	MAE						
Smaris macrophthalmus	MAESMO1						
		394	12.5	14.0	13.5	.4	44
MERLUCCIIDAE	MER						
Merluccius sp	MERMEOO						
		495	10.5	19.0	14.0	1.8	100
Merluccius merluccius	MERMEO1						
		394	22.0	41.0	28.2	3.6	51
		504	17.0	30.0	21.8	3.7	33
Merluccius polli	MERMEO3						
		21	36.0	44.0	40.0	2.4	14
		38	26.5	38.0	32.8	2.3	49
MULLIDAE	MUL						
Pseudupeneus prayensis	MULPSO1						
		112	13.5	23.0	18.8	2.1	24
		122	12.0	16.5	14.9	1.3	12
		187	14.5	27.5	21.9	3.3	43
		297	15.0	21.0	18.6	1.6	22
		307	17.0	22.0	19.2	1.3	21
		317	16.0	23.0	19.4	1.5	23
		324	14.0	21.0	17.8	2.0	15
		340	7.0	18.0	11.8	2.9	24
		397	10.0	24.5	17.5	4.1	30
		399	13.5	25.0	18.7	4.1	14
MYCTOPHIDAE	MYC						
MYCTOPHIDAE	MYCAAOO						
		139	7.0	11.0	8.5	1.2	35
Ceratoscopelus sp	MYCCEOO						
		197	4.5	6.5	5.5	.4	71
OPHIDIIDAE	OPD						
Brotula barbata	OPDBRO1						
		38	28.0	57.0	40.7	8.5	10
POLYNEMIDAE	PLN						
Galeoides decadactylus	PLNGAO1						
		63	11.0	18.0	14.6	2.4	17
		133	10.5	25.0	17.6	4.5	24
		145	14.5	29.0	21.3	3.8	29
		292	9.0	24.0	16.1	2.2	84
		303	15.0	28.0	17.1	2.5	35
		403	14.0	32.0	17.5	3.8	48
		404	12.0	22.5	18.6	3.0	28
POMADASYIDAE	POD						
Brachydeuterus auritus	PODBRO1						
		29	9.0	23.0	19.6	3.3	67
		30	17.0	22.0	20.1	1.2	47
		31	18.5	23.5	21.5	1.0	35
		39	8.0	22.0	13.9	5.5	62
		42	8.5	11.5	9.8	.8	45
		43	8.0	22.0	17.7	4.8	72
		49	13.5	23.5	17.0	2.1	60
		56	21.5	26.0	23.7	1.1	54
		59	10.0	17.0	14.5	1.6	76
		62	9.0	19.0	14.1	2.8	75
		63	8.0	19.0	13.1	2.0	47
		68	6.5	19.0	9.2	2.8	64
		96	6.5	20.0	11.5	4.4	55
		104	6.5	15.5	8.0	1.3	86
		107	8.0	20.0	11.1	3.0	58
		122	7.0	13.5	9.5	1.6	50
		127	12.0	19.5	15.6	2.1	50
		133	12.0	20.0	15.5	2.0	35
		144	7.5	19.5	14.1	3.1	55

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FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Brachydeuterus auritus (continued)		145	10.0	19.0	16.0	2.2	35
		146	8.5	18.0	14.8	2.3	53
		148	9.0	18.5	12.7	2.4	159
		150	8.5	18.5	14.4	2.8	47
		168	6.0	17.5	9.4	2.0	160
		170	8.5	14.0	11.0	1.9	15
		180	7.5	9.0	8.4	.4	23
		192	12.5	17.5	15.3	1.0	70
		194	11.5	19.0	15.3	1.0	79
		279	6.0	20.0	14.1	2.2	68
		283	5.0	17.0	12.4	2.6	57
		287	10.0	19.0	15.4	2.1	18
		292	12.0	20.0	15.2	1.5	91
		293	16.0	19.0	17.3	.7	95
		303	13.0	20.0	15.5	1.8	59
		304	13.0	19.0	16.5	1.3	35
		314	10.0	20.0	12.9	2.9	79
		317	13.0	19.0	17.3	1.1	47
		319	14.0	20.0	17.9	1.2	47
		340	15.0	23.0	19.2	1.6	30
		341	17.0	21.0	19.3	.8	52
		398	20.0	22.0	21.6	.9	13
		400	15.5	22.5	19.3	1.6	100
		402	15.0	22.5	17.9	1.6	100
		403	10.0	20.5	16.4	1.7	132
		404	7.0	22.0	18.7	4.1	106
		405	16.0	24.0	21.5	1.1	100
		406	9.0	19.0	11.2	1.8	55
		407	5.5	9.0	7.0	.8	100
		426	9.5	22.0	17.0	2.1	100
		454	10.5	16.5	14.1	1.5	50
		473	16.5	23.0	20.8	1.1	100
		477	17.5	24.0	21.4	1.2	100
		479	19.5	23.5	21.8	.9	41
		479	6.0	12.5	8.4	1.3	101
Parapristipoma octolineatum	PODPA01						
		18	29.0	39.0	33.1	3.5	7
Plectorhynchus mediterraneus	PODPL01						
		1	32.0	45.0	38.0	3.1	41
		18	29.0	49.0	35.9	4.9	16
		112	19.0	26.5	22.2	2.1	14
		397	12.0	44.0	27.1	10.6	30
Pomadasys sp	PODP000						
		63	23.5	38.0	31.4	3.7	42
Pomadasys jubelini	PODP001						
		59	24.0	30.0	27.5	2.6	8
		88	26.5	33.5	29.7	1.6	33
		90	30.0	37.0	33.9	1.6	24
		133	22.0	25.0	23.4	.9	12
		428	21.5	28.5	24.4	3.0	4
		443	36.0	45.0	40.4	3.0	9
Pomadasys incisus	PODP002						
		297	17.0	23.0	20.6	1.9	12
		307	16.0	23.0	19.1	2.3	23
		391	22.0	29.5	25.9	1.8	132
		397	22.0	28.5	24.6	1.7	16
		495	24.0	29.5	26.7	1.2	72
Pomadasys perotii	PODP003						
		117	21.0	27.0	23.6	1.4	15
Pomadasys rogeri	PODP004						
		339	20.0	24.0	22.3	1.7	14
		340	20.0	24.0	21.4	1.2	11
POMATOMIDAE	POT						
Pomatomus saltatrix	POTP001						
		31	55.0	62.0	58.5	4.9	2
		47	50.0	95.0	66.7	24.7	3
		111	48.0	55.0	50.0	2.7	6
		443	46.0	51.0	48.3	2.2	4
		123	37.0	40.0	38.8	1.2	6
PRIACANTHIDAE	PRI						
Priacanthus arenatus	PRIPR01						
		160	8.5	16.5	12.7	1.3	36
		313	7.0	8.0	7.4	.5	25
SCIAENIDAE	SCI						
Argyrosomus sp	SCIAR00						
		397	50.0	58.0	52.2	2.5	10

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Argyrosomus regius	SCIAR01						
		29	35.0	55.0	52.7	6.0	12
		407	42.0	74.0	60.1	10.3	14
Pseudotolithus sp	SCIPS00						
		67	100.0	114.0	107.7	3.8	3
		428	14.5	20.0	18.0	2.1	100
Pseudotolithus elongatus	SCIPS01						
		99	11.5	20.0	16.6	2.7	24
		404	22.0	38.0	28.8	5.8	38
Pseudotolithus senegalensis	SCIPS02						
		145	14.0	28.0	19.9	4.6	8
		407	51.0	76.0	57.1	8.5	7
		407	93.0	114.0	106.3	6.9	15
Pseudotolithus typus	SCIPS03						
		281	9.0	21.0	15.0	3.0	58
Pteroscion peli	SCIPT01						
		99	8.5	17.0	14.1	2.0	26
		279	7.0	17.0	10.8	2.9	25
		281	8.0	24.0	16.1	2.7	129
		404	7.0	24.0	14.7	4.2	165
		474	9.0	22.0	18.2	3.4	50
Umbrina canariensis	SCIUM01						
		18	29.0	35.0	31.6	2.1	7
SCOMBRIDAE	SCM						
Euthynnus alletteratus	SCMEU01						
		44	45.0	46.0	45.5	.7	2
Scomber japonicus	SCMSC01						
		19	25.0	30.5	27.0	1.3	47
		21	26.5	39.0	32.4	4.9	5
		22	25.5	30.5	27.6	1.4	13
		26	23.0	30.5	26.1	2.2	25
		33	6.5	12.0	9.9	1.5	38
		49	11.5	25.5	16.6	4.6	12
		108	17.0	21.0	19.3	.8	46
		111	21.0	36.0	27.8	1.9	22
		311	20.0	22.0	20.6	.7	13
		458	35.0	45.5	38.1	3.9	6
		504	18.5	29.0	20.5	1.7	36
		505	20.0	27.5	24.3	1.7	50
		512	18.5	25.5	21.2	1.2	100
Scomberomorus tritor	SCMSM01						
		58	40.0	67.0	48.6	5.8	26
		105	30.5	39.5	36.2	1.8	57
		147	36.0	50.0	39.2	3.4	37
SERRANIDAE	SER						
Epinephelus aeneus	SEREP01						
		18	52.0	70.0	61.5	9.9	6
		90	60.0	75.0	65.8	7.2	4
		112	43.0	72.0	57.5	20.5	2
		407	56.0	85.0	70.4	8.8	11
Epinephelus guaza	SEREP02						
		117	75.0	75.0	75.0	.0	1
Epinephelus fasciatus	SEREP03						
		18	35.0	64.0	52.9	9.7	15
		90	41.0	41.0	41.0	.0	1
Mycteroperca rubra	SERMY01						
		493	7.5	11.0	8.8	.5	90
S H R I M P S	SHP						
Penaeus P kerathurus	SHPPE62						
		492	10.0	17.5	13.0	1.4	177
SPARIDAE	SPA						
SPARIDAE	SPAAA00						
		317	12.0	25.0	16.6	3.3	34
Boops boops	SPAB001						
		49	13.0	21.0	14.5	1.4	105
		53	14.0	21.5	19.3	1.7	51
		116	6.5	19.5	16.9	1.8	105
		117	14.5	22.5	19.1	1.6	50
		158	9.0	19.5	10.9	1.6	103

III j

FAMILY/SPECIES		STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
Boops boops (continued)		311	12.0	17.0	14.9	1.0	63
		316	14.0	19.0	15.1	1.6	20
		320	14.0	16.0	14.5	.7	10
		340	7.0	16.0	8.5	2.3	25
		343	15.0	20.0	16.9	1.0	120
		397	11.5	26.0	15.3	4.5	62
Dentex angolensis	SPADE01						
		117	16.0	22.5	19.3	1.3	49
		143	12.0	22.0	16.0	2.8	12
		164	15.5	24.0	21.0	1.9	108
		177	14.0	28.5	23.8	2.9	145
		311	11.0	17.0	14.0	1.5	93
		312	13.0	21.0	15.8	1.8	64
		316	11.0	19.0	15.2	1.9	43
Dentex canariensis	SPADE02						
		18	21.0	42.0	31.4	5.6	17
		187	24.5	29.0	26.3	1.5	10
		489	18.0	32.0	21.2	2.9	100
Dentex macrophthalmus	SPADE03						
		38	15.0	29.0	23.0	3.1	27
		320	11.0	13.0	11.8	.7	87
		394	11.0	22.0	19.1	2.9	97
Dentex congoensis	SPADE04						
		15	10.5	17.5	12.1	1.9	17
		116	18.5	21.5	19.9	1.2	6
		119	7.5	20.0	14.3	3.6	77
		143	10.5	21.5	15.3	3.0	70
		164	12.5	24.0	17.7	2.1	65
		177	11.0	20.5	17.2	2.4	49
		181	10.0	19.0	13.6	2.7	35
		394	11.5	20.5	18.0	1.8	44
Dentex gibbosus	SPADE05						
		18	37.0	48.0	40.4	4.7	8
Dentex barnardi	SPADE06						
		340	6.0	16.0	11.4	3.0	29
Dentex maroccanus	SPADE07						
		468	10.5	20.0	16.5	1.9	50
Diplodus sp	SPADI00						
		49	20.0	29.5	25.8	3.3	6
Diplodus bellottii	SPADI01						
		1	13.5	20.5	17.7	1.4	55
		7	10.0	20.5	15.8	2.4	85
		49	16.5	20.0	18.3	1.4	5
		406	15.0	24.5	18.2	3.0	13
Lithognathus mormyrus	SPALI01						
		82	29.5	38.0	33.4	2.9	7
Pagellus bellottii	SPAPA02						
		1	21.0	30.0	26.3	2.8	11
		7	7.5	19.5	11.4	2.5	19
		16	20.0	32.0	27.1	2.6	46
		49	11.5	25.0	19.0	3.5	70
		53	15.0	24.0	18.2	2.9	74
		57	19.0	24.0	21.3	1.6	14
		90	21.5	33.0	24.1	2.3	21
		109	17.5	27.5	21.2	2.0	71
		112	14.0	24.5	20.2	2.1	40
		117	16.5	26.0	18.9	2.2	49
		122	9.5	19.0	15.6	2.0	93
		164	16.0	20.5	16.9	1.3	16
		177	10.5	24.5	16.9	4.3	143
		187	16.5	27.5	20.8	2.6	39
		270	17.0	21.0	19.3	1.3	25
		297	17.0	22.0	19.9	1.4	20
		319	19.0	25.0	19.8	2.2	31
		324	13.0	19.0	14.6	1.0	97
		336	9.0	21.0	15.3	3.1	74
		334	15.0	24.0	17.5	2.0	73
		335	11.0	17.0	14.2	1.6	21
		337	1.0	16.0	7.5	1.8	98
		339	[illegible]	3.0	1.7	2.1	19
		340	[illegible]	[illegible]	14.4	4.1	124
		341	[illegible]	[illegible]	14.[illegible]	2.6	50
		391	[illegible]	[illegible]	[illegible]	2.3	43
		393	16.0	27.0	18.1	3.3	110
		395	12.0	32.0	19.5	5.4	51
		396	21.5	29.5	27.0	2.2	16
		397	11.5	26.5	19.6	3.8	131
		399	15.0	29.0	19.1	4.0	142
		422	20.0	22.5	21.2	1.0	9
		492	5.0	27.0	15.4	5.4	100

FAMILY/SPECIES			LENGTHS IN SAMPLE				
			LOWEST	HIGHEST	MEAN	ST. DEV.	N
Sparus caeruleostictus	SPASA01		31.0	46.0	36.7	4.0	27
		80	23.0	29.0	25.3	2.5	5
		82	19.0	27.0	23.0	3.0	6
		143	24.0	27.5	25.7	1.8	3
		297	21.0	29.0	23.8	2.3	26
		443	25.0	39.5	31.3	3.6	27
SPHYRAENIDAE	SPH						
Sphyraena dubia	SPHSP01						
		26	41.0	49.0	44.4	2.8	7
		58	42.0	52.0	46.2	2.9	10
		59	33.0	47.0	40.6	3.3	33
		117	49.0	54.0	51.3	1.9	7
		452	40.0	54.0	45.3	4.0	35
Sphyraena sphyraena	SPHSP02						
		30	41.0	48.0	44.8	1.9	16
		49	42.0	50.0	45.9	2.9	8
		405	36.5	40.0	38.3	2.9	23
Sphyraena piscatorum	SPHSP03						
		66	35.0	54.0	47.1	6.5	28
		80	152.0	152.0	152.0	.0	1
		86	91.0	93.0	92.0	1.4	2
		96	40.0	56.0	46.4	5.9	28
		101	38.0	52.0	43.8	4.1	24
		103	34.0	46.0	41.2	4.0	40
		104	28.0	51.0	39.1	5.2	28
		132	21.5	31.0	25.9	2.3	18
		144	12.0	41.0	32.8	6.2	92
		147	19.0	44.0	30.5	6.9	99
		148	15.0	42.0	29.5	8.3	40
		151	16.0	22.0	18.4	1.9	7
		153	19.5	30.0	24.7	3.7	23
		156	16.0	45.0	24.2	7.1	30
		168	19.0	24.5	20.8	1.8	6
		169	17.0	39.0	26.7	5.9	53
		170	20.0	27.5	21.7	1.8	18
		175	13.0	27.5	20.8	2.0	124
		183	35.0	60.0	47.3	8.9	12
		194	22.0	47.0	28.3	6.0	15
		315	40.0	56.0	46.3	4.5	26
C E P H A L O P O D A	SQU						
Loligo vulgaris	SQULO21						
		406	9.0	36.0	16.9	5.2	44
STROMATEIDAE	STR						
Stromateus fiatola	STRSTO1						
		66	30.0	44.5	37.2	4.4	17
		398	37.0	45.0	41.7	2.4	15
SYNODONTIDAE	SYN						
Saurida brasiliensis	SYNSA01						
		68	9.0	13.0	11.1	.9	46
		70	9.0	14.5	10.8	1.0	82
		140	7.5	11.5	9.5	.8	86
TRIGLIDAE	TRG						
Lepidotrigla carolae	TRGLE01						
		57	17.0	24.5	20.9	2.0	24
TRICHIURIDAE	TRI						
Trichiurus lepturus	TRITR01						
		26	93.0	119.0	103.3	6.8	15
		40	45.0	125.0	92.5	21.2	71
		46	45.0	125.0	67.3	21.8	31
		279	20.0	70.0	40.7	15.2	51
		314	22.0	50.0	33.4	6.8	43
		315	20.0	90.0	51.0	24.8	26
		329	75.0	115.0	94.7	9.9	30
		389	92.0	126.0	109.3	8.0	54
		395	91.0	109.0	103.4	5.5	10
		399	43.0	112.0	83.7	25.4	14
		404	33.0	102.0	55.6	23.3	36
ZEIDAE	ZEI						
Zeus faber	ZEIZE01						
		431	24.0	53.0	42.3	8.9	16

ANNEX IV Length Frequency Distributions (raw data) IV a

FREQUENCY IN LENGTH GROUP

FAMILY/SPECIES	STATION	Lowest length	Step length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ACANTHURIDAE																																	
Acanthurus monroviae	297	21.0	1.0	1	0	1	0	1	0	2	2	1	2	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APOGONIDAE																																	
Synagrops microlepis	33	3.5	.5	3	9	23	23	25	8	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	36	5.5	.5	1	9	12	17	24	7	3	0	0	3	2	5	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ARIIDAE																																	
Arius heudeloti	281	6.0	1.0	1	3	3	1	0	1	2	2	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	2	0	0	0	1	0	1
ARIOMMIDAE																																	
Ariomma bondi	129	11.0	.5	2	2	7	2	2	0	5	1	13	4	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	139	13.0	.5	2	6	9	6	11	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	155	10.0	.5	2	0	3	6	7	10	7	9	14	18	26	6	10	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	158	13.5	.5	1	2	1	15	13	14	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	161	12.0	.5	1	2	10	17	17	8	3	3	5	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	165	10.0	.5	1	0	0	0	0	0	1	2	11	12	12	8	3	5	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	166	13.5	.5	1	6	9	7	9	7	5	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	176	9.0	.5	2	6	9	6	18	22	29	27	26	10	26	10	27	13	8	6	5	0	2	0	0	0	0	0	0	0	0	0	0	0
	197	8.0	.5	6	6	17	15	3	4	6	7	4	9	7	9	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	277	14.0	1.0	1	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	342	7.0	1.0	1	3	14	12	14	32	10	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BALISTIDAE																																	
Balistes capriscus	55	7.0	.5	1	6	4	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	57	16.5	.5	1	15	19	25	10	9	2	1	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	60	17.0	.5	1	0	1	1	11	11	13	5	3	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	66	17.0	.5	2	6	3	5	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	68	16.5	.5	2	1	0	4	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	71	16.0	.5	7	6	12	5	2	3	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	72	16.0	.5	2	6	14	15	10	7	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	75	16.0	.5	4	19	8	11	4	3	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	76	15.5	.5	8	8	18	8	12	3	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	78	16.0	.5	1	10	9	19	1	4	2	2	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	79	17.0	.5	2	4	6	12	7	11	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	80	17.0	.5	1	5	11	15	10	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	81	16.5	.5	16	30	21	20	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	83	15.5	.5	1	0	2	3	3	3	5	5	7	6	5	3	4	1	1	2	0	1	1	1	2	0	0	0	0	1	1	0	0	0
	85	16.0	.5	2	12	17	16	11	6	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	87	16.0	.5	3	12	16	18	10	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	88	17.5	.5	5	4	8	12	7	6	3	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	90	15.0	.5	1	0	0	1	0	1	4	4	8	5	8	7	6	4	6	0	0	1	2	1	0	0	1	0	2	1	0	0	0	0
	92	16.0	.5	6	9	12	5	4	2	3	0	1	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	93	16.0	.5	6	5	20	12	11	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	95	17.0	.5	9	9	13	1	10	0	5	0	2	2	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	109	17.0	.5	2	1	2	1	10	2	17	2	9	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	112	17.0	.5	2	2	0	3	2	2	3	8	6	9	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	119	17.5	.5	2	2	0	0	1	4	8	6	1	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	121	17.0	.5	1	3	3	7	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	123	17.0	5	1	1	4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	124	16.5	.5	1	2	2	12	9	12	5	3	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	125	17.0	.5	7	17	23	18	34	25	24	6	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	131	15.5	.5	1	2	2	12	17	11	29	26	13	12	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	134	17.5	.5	3	10	19	28	29	23	21	7	7	3	1	1	2	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0
	136	15.0	.5	1	2	14	19	47	39	24	12	4	4	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	138	14.5	.5	3	2	3	8	15	10	13	1	1	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	167	15.5	.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	170	15.0	.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	171	14.5	.5	1	10	27	53	68	41	29	13	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	173	15.0	.5	13	32	72	55	46	21	11	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	174	14.0	.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	176	12.0	.5	3	0	0	6	22	37	60	34	37	16	12	6	6	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	177	12.0	.5	1	0	0	0	2	7	9	8	8	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	178	11.5	.5	1	5	12	3	8	60	80	88	40	22	19	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	182	12.0	.5	3	5	5	20	58	90	75	31	22	11	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	184	13.5	.5	7	53	99	99	36	19	8	2	3	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	185	12.0	.5	6	5	5	17	34	37	15	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	187	13.0	.5	1	7	10	21	7	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	188	12.0	.5	1	0	4	17	94	99	77	25	5	5	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	189	12.5	.5	1	3	2	29	44	45	17	17	8	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	191	12.5	.5	1	2	21	48	75	33	12	7	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	193	12.5	.5	1	5	7	9	32	26	16	18	4	7	3	1	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	195	12.5	.5	3	4	10	9	8	8	19	14	8	2	4	2	4	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
	197	12.0	.5	1	1	5	5	3	2	4	3	6	9	8	16	6	5	7	6	4	3	2	0	0	0	0	0	0	0	0	0	0	0
	198	12.0	.5	1	1	8	16	81	99	78	40	12	5	7	3	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	199	12.0	.5	1	2	4	11	24	34	15	5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	200	12.0	.5	3	7	7	19	28	19	13	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	268	16.0	1.0	7	29	21	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	269	15.[illegible]	1.0	1	14	61	20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	270	16.[illegible]	1.0	5	16	29	20	16	6	4	4	2	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	272	17.0	1.0	4	14	14	14	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	273	16.0	1.0	1	11	11	7	4	7	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	274	16.0	1.0	1	17	37	9	5	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	275	16.0	1.0	1	7	13	4	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	276	16.0	1.0	1	12	22	19	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	277	18.0	1.0	1	12	22	13	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	269	18.0	1.0	1	7	26	16	9	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	295	19.0	1.0	4	39	39	14	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	297	24.0	1.0	3	5	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	299	20.0	1.0	2	3	6	2	3	3	6	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	300	19.0	1.0	3	12	11	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	305	24.0	1.0	1	7	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	307	18.0	1.0	3	2	17	25	12	7	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	308	22.0	1.0	1	0	7	3	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	309	22.0	1.0	5	10	9	4	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	319	20.0	1.0	2	14	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	340	23.0	1.0	2	2	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	341	20.0	1.0	1	1	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	422	24.0	.5	1	0	2	2	2	3	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	423	20.0	.5	1	1	0	1	4	7	5	3	5	7	4	4	1	2	2	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0
	432	20.0	.5	1	0	1	1	0	4	2	4	4	2	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0
	437	16.5	.5	2	0	2	7	6	8	6	4	2	5	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	438	6.5	.5	3	8	17	27	27	11	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	445	17.0	.5	9	14	9	12	3	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	455	17.5	.5	5	9	9	13	3	5	1	2	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	464	19.0	.5	1	2	9	13	11	2	9	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	465	21.0	1.0	1	1	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IV b

FAMILY/SPECIES	STATION	Lowest length	Step length	FREQUENCY IN LENGTH GROUP 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
BRAHIDAE																																	
Brama brama	3	25.5	.5	1	1	0	5	1	11	5	7	12	7	5	11	5	4	3	1	4	3	2	2	2	0	0	0	0	0	0	0	0	0
CAPROTIDAE																																	
Antigonia capros	161	6.0	.5	1	0	1	1	1	10	18	17	15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	181	6.5	.5	3	5	1	4	4	8	14	15	14	11	7	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capros aper	8	8.0	.5	1	13	11	6	14	16	10	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CARANGIDAE																																	
Alectis alexandrinus	58	36.0	1.0	1	0	0	1	5	1	4	2	2	6	1	3	1	5	3	2	2	1	0	2	1	3	0	3	4	1	0	0	0	3
	89	41.0	1.0	1	0	2	0	0	3	1	1	6	8	2	0	3	0	4	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	117	52.0	1.0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	405	35.0	1.0	1	1	0	1	2	3	3	6	4	2	4	0	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
Caranx sp	83	9.5	.5	1	1	4	12	27	16	10	5	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caranx crysos	58	39.0	1.0	1	3	1	1	2	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	284	27.0	1.0	1	0	0	1	3	1	4	1	2	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	396	30.5	.5	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caranx senegalus	284	27.0	1.0	1	3	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	285	27.0	1.0	1	2	0	2	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chloroscombrus chrysurus	49	22.0	.5	1	0	3	2	1	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	59	17.0	.5	1	8	10	11	5	7	5	5	10	2	3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	64	14.5	.5	1	1	4	13	14	12	14	3	0	1	2	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	66	21.0	.5	4	4	3	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	98	16.5	.5	1	0	0	1	0	0	3	2	0	7	11	11	11	8	7	6	6	3	1	3	2	1	0	0	0	2	0	0	0	0
	99	16.0	.5	4	0	4	0	3	2	10	0	7	3	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	101	16.5	.5	1	0	0	1	0	0	1	0	0	3	3	3	4	6	4	4	3	3	6	3	1	1	1	1	0	0	3	0	0	0
	122	13.0	.5	1	5	17	16	5	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	146	11.0	.5	2	2	7	5	1	3	1	0	2	0	3	2	6	6	12	8	7	6	5	3	3	0	0	0	0	0	0	0	0	0
	150	8.5	.5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	1	2	4	5	2	0
	153	19.0	.5	7	3	17	9	1	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	175	11.0	.5	1	1	0	5	3	5	7	10	4	0	1	2	1	2	2	3	9	7	4	4	19	4	8	4	7	5	4	2	1	1
	180	8.0	.5	1	3	0	2	10	0	11	15	19	7	7	11	6	9	15	4	5	6	4	5	0	1	1	0	0	3	1	2	0	1
	183	5.0	.5	2	1	0	0	1	0	3	1	8	13	19	25	22	16	2	1	0	4	4	7	7	4	2	1	2	1	2	3	1	1
	186	14.0	.5	1	1	3	10	8	5	6	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	283	16.0	1.0	1	2	5	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	287	15.0	1.0	1	0	1	10	21	18	5	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	309	17.0	1.0	2	8	19	23	10	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	319	20.0	1.0	3	8	18	8	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	398	28.5	.5	1	2	3	4	1	3	2	5	2	3	2	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campogrammus glaycus	407	35.0	1.0	1	0	0	0	0	0	0	0	2	2	3	4	0	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0
Decapterus punctatus	123	10.5	.5	1	0	0	0	0	1	2	1	1	2	2	7	2	6	2	4	6	10	3	3	4	0	0	0	1	0	0	0	0	0
	132	7.0	.5	1	1	1	1	0	4	3	4	3	5	2	3	4	3	4	6	6	6	4	3	2	2	2	3	0	0	1	0	0	0
	135	9.0	.5	3	0	0	1	2	2	2	1	2	1	3	2	2	3	0	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0
	138	15.0	.5	1	1	2	10	18	18	20	14	9	5	4	4	6	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	141	10.0	.5	1	6	5	8	4	3	6	5	12	15	13	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	143	13.0	.5	1	0	1	4	7	3	2	3	7	5	19	8	12	6	12	3	4	1	1	0	1	0	0	0	0	0	0	0	0	0
	158	9.5	.5	2	3	8	11	15	9	5	3	1	1	2	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	160	13.0	.5	4	1	0	8	7	24	11	8	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	165	11.5	.5	1	1	0	0	0	0	1	1	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	166	11.5	.5	1	7	18	20	16	13	10	8	8	10	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	187	16.5	.5	5	5	7	12	12	9	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	189	16.5	.5	1	1	3	8	2	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	193	13.0	.5	1	0	1	3	4	2	1	2	7	1	2	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	194	5.0	.5	1	1	1	1	3	2	1	3	7	12	14	3	4	2	6	1	3	0	6	8	5	0	2	5	2	2	1	1	0	0
Decapterus rhonchus	7	16.0	.5	4	7	1	8	12	3	3	3	1	1	0	0	0	0	1	1	0	1	5	6	4	5	5	3	5	0	2	0	0	0
	29	29.0	.5	2	2	6	1	4	4	2	3	3	2	1	0	0	0	1	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
	30	28.5	.5	1	1	4	0	2	6	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	31	29.5	.5	1	2	3	6	4	3	5	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	43	33.5	.5	1	0	2	1	3	1	0	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	47	30.5	.5	1	0	0	1	0	0	0	1	0	1	0	1	1	1	1	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0
	54	31.0	.5	2	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	60	23.5	.5	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	66	21.0	.5	1	3	2	1	1	0	0	0	4	2	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	83	12.0	.5	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	90	30.5	.5	2	0	0	1	0	3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	92	31.0	.5	1	0	0	0	0	1	1	0	1	7	2	1	0	0	1	2	2	2	3	0	4	1	2	2	1	0	0	0	1	0
	98	21.0	.5	4	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	109	26.0	.5	2	0	0	0	1	0	0	0	2	0	2	0	1	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0
	112	24.0	.5	1	0	2	2	9	17	18	12	5	1	2	0	4	3	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	113	25.5	.5	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	123	23.0	.5	1	0	3	1	7	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	305	24.0	1.0	5	14	8	6	13	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	309	23.0	1.0	2	5	4	3	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	311	10.0	1.0	1	0	1	1	8	35	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	316	15.0	1.0	2	40	36	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	319	11.0	1.0	1	6	7	0	0	0	0	0	1	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	324	10.0	1.0	2	4	4	4	0	0	0	0	0	0	1	1	1	7	14	16	7	1	0	0	1	0	0	0	0	0	0	0	0	0
	326	11.0	1.0	2	3	0	1	1	0	0	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	330	13.0	1.0	2	0	1	0	0	0	0	0	0	1	0	0	2	1	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	336	26.0	1.0	2	6	11	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	337	4.0	1.0	5	5	12	10	7	7	26	33	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	340	9.0	1.0	6	3	1	0	0	0	0	0	0	0	0	0	0	0	3	5	8	0	0	2	1	1	0	0	0	0	0	0	0	0
	341	10.0	1.0	2	26	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	390	7.5	.5	1	1	8	20	13	9	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	391	6.5	.5	5	13	25	10	8	6	3	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	391	15.5	.5	4	0	1	0	2	1	3	4	7	6	3	2	1	0	0	0	7	1	1	2	0	1	1	0	2	1	0	0	0	0
	392	22.0	1.0	1	2	2	10	16	16	13	13	12	8	6	13	18	15	9	13	8	4	2	3	0	1	0	0	0	0	0	0	0	0
	396	20.5	.5	1	2	0	6	4	4	1	5	3	1	0	1	1	1	0	1	0	1	0	0	0	1	1	3	0	0	1	3	0	1
	397	14.0	1.0	1	11	5	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	399	16.5	.5	1	0	0	0	0	1	0	1	0	7	6	12	25	23	14	14	7	4	8	15	7	13	5	1	6	1	0	1	0	0
	400	18.0	1.0	1	0	0	0	0	1	1	2	2	6	7	10	18	8	5	4	2	2	0	2	0	0	0	0	0	0	0	0	0	0
	405	32.5	.5	1	2	1	1	4	2	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	406	14.0	1.0	1	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	2	0	2	1	0	0	0	0	0	0	0
	436	33.0	.5	1	1	2	4	2	1	5	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selar crumenophthalmus	194	25.0	1.0	1	2	0	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selene oersella	66	16.5	.5	1	3	6	2	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	131	24.0	1.0	1	1	5	7	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	146	9.5	.5	1	1	1	1	6	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	4	4	4	0	0	0	1	0	0	0
	153	5.0	.5	1	0	2	0	1	2	0	0	0	2	1	5	10	6	7	1	1	0	0	1	0	0	0	1	0	0	0	1	0	0
	169	16.5	.5	2	7	13	20	15	3	4	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	180	15.0	.5	4	1	5	3	2	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	270	22.0	1.0	5	6	19	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	272	20.0	1.0	2	1	5	6	13	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	314	12.0	1.0	1	0	0	0	1	2	2	3	2	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	396	14.0	1.0	1	1	2	1	3	1	2	3	1	1	0	2	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Trachinotus falcatus	286	13.0	1.0	1	1	0	3	4	5	3	2	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trachinotus ovatus	322	27.0	1.0	2	1	11	5	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	398	33.0	.5	1	3	2	5	6	10	10	8	3	3	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	502	6.0	.5	1	2	12	16	24	23	16	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trachurus trachurus	6	6.5	.5	1	2	2	6	5	0	3	3	2	7	2	1	0	2	1	0	0	0	0	0	0	0	4	2	0	1	0	0	0	0
	10	17.0	.5	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FAMILY/SPECIES	STATION	Lowest length	Step length	Frequencies in length classes 1–30
Trachurus trachurus	16	27.5	.5	[illegible]
	23	2.5	.5	[illegible]
	48	32.5	.5	[illegible]
	389	28.0	1.0	[illegible]
	390	7.5	.5	[illegible]
	394	[illegible]	.5	[illegible]
	403	[illegible]	[illegible]	[illegible]
	480	14.0	[illegible]	[illegible]
	494	17.0	1.0	[illegible]
	496	[illegible]	[illegible]	[illegible]
	502	5.0	.5	[illegible]
	504	13.5	[illegible]	[illegible]
	512	15.[illegible]	.5	[illegible]
Trachurus trecae	1	13.0	.5	[illegible]
	2	16.0	.5	[illegible]
	6	11.0	.5	[illegible]
	7	21.0	.5	[illegible]
	8	10.[illegible]	.5	[illegible]
	10	11.0	.5	[illegible]
	15	12.5	.5	[illegible]
	16	20.0	.5	[illegible]
	17	15.5	.5	[illegible]
	19	20.0	.5	[illegible]
	20	27.5	.5	[illegible]
	21	29.0	.5	[illegible]
	22	16.0	.5	[illegible]
	26	21.0	.5	[illegible]
	27	8.0	.5	[illegible]
	29	17.0	.5	[illegible]
	31	15.5	.5	[illegible]
	32	17.5	.5	[illegible]
	33	5.5	.5	[illegible]
	38	16.0	.5	[illegible]
	40	22.0	.5	[illegible]
	41	33.5	.5	[illegible]
	42	2.5	.5	[illegible]
	43	15.5	.5	[illegible]
	44	35.5	.5	[illegible]
	47	20.5	.5	[illegible]
	48	30.5	.5	[illegible]
	49	14.5	.5	[illegible]
	51	14.5	.5	[illegible]
	53	16.0	.5	[illegible]
	54	4.5	.5	[illegible]
	56	30.0	.5	[illegible]
	103	6.5	.5	[illegible]
	113	7.0	.5	[illegible]
	118	26.0	1.0	[illegible]
	120	14.0	1.0	[illegible]
	121	9.0	1.0	[illegible]
	127	9.0	1.0	[illegible]
	331	15.0	1.0	[illegible]
	335	3.0	1.0	[illegible]
	338	11.0	1.0	[illegible]
	341	15.0	1.0	[illegible]
	390	6.5	.5	[illegible]
	394	13.0	.5	[illegible]
	397	22.0	.5	[illegible]
	401	15.0	.5	[illegible]
	406	18.0	.5	[illegible]
	407	5.5	.5	[illegible]
	422	14.0	.5	[illegible]
	425	15.0	.5	[illegible]
	431	12.0	.5	[illegible]
	434	13.0	.5	[illegible]
	458	31.0	.5	[illegible]
	467	4.2	.1	[illegible]
	469	15.0	.5	[illegible]
	471	15.0	.5	[illegible]
	479	15.5	.5	[illegible]
	483	29.5	.5	[illegible]
	485	20.0	1.0	[illegible]
	490	12.0	1.0	[illegible]
CHILODIPTERIDAE				
Epigonus telescopus	197	6.0	.5	[illegible]
Hypoclydonia bella	155	7.0	.5	[illegible]
CLUPEIDAE	7	[illegible].5	.5	[illegible]
Ilisha africana	64	10.0	.5	[illegible]
	87	11.0	.5	[illegible]
	96	10.5	.5	[illegible]
	99	10.5	.5	[illegible]
	100	16.5	.5	[illegible]
	104	11.0	.5	[illegible]
	107	16.0	.5	[illegible]
	127	11.5	.5	[illegible]
	133	10.5	.5	[illegible]
	150	7.0	.5	[illegible]
	153	10.[illegible]	.5	[illegible]
	169	17.5	.5	[illegible]
	180	[illegible]	.5	[illegible]
	281	21.0	1.0	[illegible]
	282	11.0	1.0	[illegible]
	283	5.0	1.0	[illegible]
	316	20.0	1.0	[illegible]
	317	15.0	1.0	[illegible]
	403	14.5	.5	[illegible]
	404	5.5	.5	[illegible]
Sardina pilchardus	10	7.5	.5	[illegible]
	14	7.5	.5	[illegible]
	393	10.0	.5	[illegible]
	498	5.5	.5	[illegible]
	502	10.0	.5	[illegible]

IV d

FAMILY/SPECIES	STATION	Lowest length	Step length	FREQUENCY IN LENGTH GROUP 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Sardina pilchardus	502	4.5	.5	1	1	15	49	28	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	505	16.5	.5	2	0	4	19	9	24	19	21	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	507	16.0	.5	6	8	17	12	19	16	11	4	3	2	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	510	16.0	.5	3	8	17	12	20	24	14	7	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	511	16.5	.5	5	3	13	19	29	17	13	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	512	14.5	.5	1	22	4	44	13	8	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sardinella aurita	17	13.5	.5	2	6	1	1	0	2	4	0	4	3	1	1	0	2	3	2	1	0	0	0	0	3	0	0	0	1	0	0	0	0
	19	22.5	.5	1	1	2	1	2	7	4	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	31	32.0	.5	1	0	1	1	0	1	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	47	33.5	.5	1	2	0	3	3	3	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	49	12.0	.5	1	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1
	55	18.0	.5	1	1	1	4	7	7	11	6	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	58	8.0	.5	7	6	11	4	11	8	15	3	7	3	2	1	1	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	83	10.0	.5	1	11	46	23	9	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	89	9.5	.5	1	11	26	22	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	97	9.5	.5	1	8	5	16	5	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	103	8.5	.5	1	3	9	10	5	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	105	11.0	.5	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	111	21.5	.5	7	1	3	0	1	0	0	0	1	2	3	5	4	6	2	2	2	1	3	0	0	3	2	1	0	2	0	3	0	0
	113	13.5	.5	1	0	0	7	8	13	14	13	6	5	3	4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	123	13.0	.5	4	5	7	6	13	5	4	1	3	0	4	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	124	14.0	.5	1	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
	129	10.0	.5	3	1	12	13	16	8	10	4	5	3	2	2	4	1	9	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	132	12.0	.5	2	7	9	10	12	4	8	3	6	4	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	135	7.0	.5	2	1	10	8	39	15	4	3	6	2	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	140	10.0	.5	1	1	1	2	3	2	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	141	10.5	.5	1	3	2	6	2	5	5	10	8	8	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	143	11.0	.5	3	1	3	2	9	7	8	3	1	1	2	1	2	1	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0
	159	7.0	.5	2	17	21	10	20	8	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	160	10.0	.5	1	0	0	0	0	0	0	0	0	4	7	9	13	22	6	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0
	165	6.0	.5	1	0	0	0	7	15	30	26	41	12	7	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	166	7.5	.5	1	0	1	2	5	7	4	3	3	4	2	8	6	11	6	13	8	4	2	8	0	0	0	0	0	0	0	0	0	0
	169	20.5	.5	1	0	1	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	169	6.0	.5	1	3	6	11	40	50	24	10	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	173	21.0	.5	2	1	3	0	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	175	11.5	.5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	5	10	16	2	0	0	0
	184	18.5	.5	4	10	17	12	4	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	187	18.0	.5	1	2	20	56	57	39	16	8	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	189	17.5	.5	1	18	43	59	40	30	13	11	6	6	3	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	190	15.0	.5	1	0	0	0	1	0	1	3	1	0	0	0	2	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	192	9.5	.5	1	1	7	9	25	33	27	13	1	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	193	15.5	.5	1	1	2	10	27	31	15	15	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	200	17.0	.5	1	0	1	3	1	3	4	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	286	18.0	1.0	1	2	13	29	20	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	289	21.0	1.0	1	6	10	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	298	20.0	1.0	3	19	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	305	21.0	1.0	2	7	8	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	306	20.0	1.0	10	28	36	9	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	311	13.0	1.0	22	27	10	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	318	17.0	1.0	1	2	1	10	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	327	8.0	1.0	1	1	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	330	20.0	1.0	1	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	331	17.0	1.0	1	2	4	5	3	7	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	336	23.0	1.0	2	1	3	4	9	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	337	10.0	1.0	3	29	46	21	4	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	339	19.0	1.0	1	7	9	11	7	8	1	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	341	20.0	1.0	7	26	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	389	36.0	1.0	5	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	390	10.0	.5	1	2	4	7	11	3	3	1	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	396	30.0	.5	1	0	0	2	1	0	1	0	1	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	458	30.0	.5	1	3	1	3	5	2	5	6	10	14	12	4	3	3	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	497	25.0	.5	1	2	9	10	24	17	23	6	6	6	2	1	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Sardinella maderensis	30	19.5	.5	2	5	10	9	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	49	13.0	.5	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5	0	2	0	0	0	0	0	0	0
	54	17.0	.5	1	1	0	0	1	3	6	4	7	3	1	1	6	3	3	5	0	7	2	1	1	1	2	0	1	0	1	0	0	0
	55	27.0	.5	1	3	6	3	2	1	3	3	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	56	22.0	.5	2	4	1	6	8	7	7	6	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	96	24.0	.5	2	6	5	1	10	2	7	1	8	1	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	101	20.5	.5	4	2	3	6	7	10	8	4	4	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	105	21.0	.5	3	4	11	9	15	12	7	3	2	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	107	23.0	.5	1	0	1	1	2	1	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	111	24.0	.5	2	3	3	7	15	13	12	13	10	7	8	1	4	4	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	113	13.5	.5	2	2	5	8	10	21	9	13	12	10	5	3	4	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	144	10.5	.5	4	7	11	5	4	5	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
	146	9.0	.5	2	3	1	1	3	2	2	3	1	0	0	0	1	1	1	0	4	5	18	13	21	14	16	6	13	5	5	1	1	0
	147	10.0	.5	1	1	2	3	3	2	1	2	0	0	0	0	0	0	1	1	3	5	3	6	4	2	1	0	5	1	3	3	3	1
	150	9.5	.5	1	0	0	2	3	1	2	3	9	3	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	151	9.5	.5	2	3	0	0	0	2	0	14	10	29	30	27	10	25	13	18	10	8	11	9	8	10	6	4	3	3	1	0	0	0
	152	9.5	.5	1	3	5	13	13	13	15	11	3	6	2	3	3	1	1	0	1	1	0	0	1	2	0	0	0	0	0	2	5	7
	156	9.0	.5	1	1	1	0	2	2	2	1	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	10
	168	6.5	.5	1	0	0	0	0	3	1	1	2	3	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	169	7.5	.5	2	4	60	55	25	16	5	8	5	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	169	12.5	.5	1	1	0	0	0	0	2	4	0	5	3	1	5	2	3	1	0	1	1	0	1	0	0	2	4	2	1	1	0	1
	170	9.5	.5	2	1	9	37	32	24	10	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	172	7.0	.5	4	6	28	26	12	8	5	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	173	7.5	.5	1	1	0	2	1	1	4	2	0	1	4	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0
	175	9.0	.5	5	3	16	20	21	9	13	7	6	2	1	2	5	1	5	8	5	10	[illegible]	[illegible]	1	0	2	0	1	1	2	3	3	4
	180	4.5	.5	1	1	3	1	1	1	5	2	0	0	2	11	10	7	7	7	3	5	4	2	2	5	3	2	0	1	1	1	0	0
	183	11.0	.5	2	8	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	186	15.5	.5	1	0	1	0	1	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	192	9.0	.5	3	13	58	57	21	2	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	194	6.5	.5	3	31	23	7	19	10	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	196	9.5	.5	3	1	15	14	11	3	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	280	16.0	1.0	1	2	17	23	13	14	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	282	15.0	1.0	1	8	24	28	24	11	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	287	21.0	1.0	8	25	19	13	11	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	293	17.0	1.0	10	26	12	3	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	298	17.0	1.0	4	21	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	302	18.0	1.0	9	16	6	9	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	303	15.0	1.0	2	1	10	6	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	304	15.0	1.0	1	1	22	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	305	18.0	1.0	2	6	7	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FAMILY/SPECIES	STATION	Lowest length	Stn. length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Saurinella maderensis	306	17.0	1.0	1	1	5	11	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	308	17.0	1.0	15	26	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	309	18.0	1.0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	310	19.0	1.0	4	8	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	314	10.0	1.0	1	2	0	0	0	0	2	0	0	0	0	1	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	315	9.0	1.0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	322	20.0	1.0	3	8	2	15	13	14	11	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	323	19.0	1.0	1	0	0	1	5	5	4	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	337	20.0	1.0	0	15	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	390	27.0	.5	1	1	1	1	1	1	0	0	1	0	2	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	407	7.5	.5	1	2	6	12	24	22	21	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	407	20.0	.5	0	0	0	0	0	0	0	0	0	0	4	5	9	7	19	15	19	10	5	0	3	2	1	0	0	0	0	1	0	0
	452	4.0	.5	1	4	13	24	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	462	21.5	.5	1	0	0	15	2	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DACTYLOPTERIDAE																																	
Dactylopterus volitans	57	21.0	1.0	1	0	1	0	0	1	0	1	1	2	4	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	269	19.0	1.0	0	0	7	7	7	9	1	4	2	0	4	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	273	20.0	1.0	0	26	2	16	15	8	5	3	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	274	19.0	1.0	4	21	14	11	3	4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	275	15.0	1	0	15	26	18	12	26	0	4	2	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	277	22.0	1.0	4	0	1	0	4	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ENGRAULIDAE																																	
ENGRAULIDAE	452	5.0	.5	7	21	14	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engraulis encrasicolus	10	9.0	.5	14	35	14	15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12	12.0	.5	1	5	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13	11.5	.5	1	5	26	24	19	8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14	8.0	.5	22	15	15	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15	6.5	.5	1	4	7	18	21	12	16	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16	5.5	.5	3	1	0	0	0	0	0	0	0	1	8	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	42	4.5	.5	1	1	2	5	3	0	1	5	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	58	6.0	.5	1	4	11	6	26	20	21	4	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	61	7.5	.5	1	21	27	18	8	9	2	2	2	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	76	6.0	.5	1	2	16	17	21	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	89	7.5	.5	0	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	91	7.5	.5	0	14	6	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	94	11.0	.5	2	11	17	16	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	97	6.5	.5	1	11	19	27	3	6	9	17	11	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	103	7.5	.5	16	51	25	18	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	110	8.0	.5	1	0	1	13	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	129	8.5	.5	0	16	0	0	4	14	11	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	135	5.0	.5	2	0	0	2	7	23	46	9	11	7	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	140	8.0	.5	4	5	9	6	14	17	6	10	8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	143	11.5	.5	6	13	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	159	6.5	.5	2	6	38	50	51	54	29	13	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	165	9.5	.5	1	4	0	12	10	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	168	5.5	.5	1	6	1	2	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	169	5.0	.5	4	4	6	6	14	10	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	172	4.0	.5	9	12	9	7	20	25	27	17	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	180	7.0	.5	4	1	7	12	14	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	194	5.0	.5	3	39	47	19	5	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	278	8.0	.5	3	22	27	34	43	31	28	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	327	7.0	1.0	26	27	26	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	328	6.5	.5	1	30	70	22	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	330	8.5	.5	7	23	45	36	12	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	407	7.0	.5	5	17	16	25	24	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	472	6.5	.5	6	26	52	6	5	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	497	6.5	.5	0	3	7	21	25	35	16	4	5	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	498	7.0	.5	1	1	8	18	25	27	13	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	502	4.5	.5	1	18	24	32	20	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GEMPYLIDAE																																	
Gempylus serpens	139	13.5	.5	5	10	6	8	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
GERREIDAE																																	
Eucinostomus melanopterus	303	14.0	1.0	6	9	8	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	317	15.0	1.0	1	15	7	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MAENIDAE																																	
Smaris macrophthalma	394	12.5	.5	1	14	11	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MERLUCCIIDAE																																	
Merluccius sp	495	10.5	.5	1	3	3	12	6	7	17	17	7	6	2	7	5	2	0	4	9	1	0	0	0	0	0	0	0	0	0	0	0	0
Merluccius merluccius	394	22.0	1.0	1	1	1	1	10	11	11	1	1	2	2	1	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0
	394	12.0	.5	4	2	0	1	5	1	1	2	1	1	1	0	1	2	2	1	1	1	1	0	2	1	1	0	0	0	1	0	0	0
Merluccius polli	21	36.0	1.0	1	1	1	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	36	26.5	.5	1	0	0	0	1	2	1	5	0	2	2	7	5	2	6	4	2	3	2	2	1	0	1	1	0	0	0	0	0	0
MULLIDAE																																	
Pseudupeneus prayensis	112	13.5	.5	1	0	0	0	1	0	0	4	2	2	1	2	2	3	3	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
	122	12.0	.5	0	0	0	0	1	2	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	187	14.5	.5	1	1	0	0	1	1	2	1	3	2	1	2	2	1	4	0	2	3	3	2	3	2	2	1	3	0	1	0	0	0
	297	15.0	1.0	1	1	4	3	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	307	17.0	1.0	1	7	4	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	317	16.0	1.0	1	2	2	0	8	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	326	14.0	1.0	1	1	0	6	2	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	340	7.0	1.0	0	0	3	3	1	4	5	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	397	10.0	.5	0	0	0	0	0	4	1	0	3	1	1	2	0	0	1	1	2	1	1	2	1	1	0	1	1	0	3	0	1	1
	399	13.5	.5	2	4	0	0	0	0	0	1	1	0	2	1	1	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0
MYCTOPHIDAE	139	7.0	.5	4	8	7	1	6	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceratoscopelus sp	197	4.5	.5	1	20	11	17	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ceratoscopelus sp																																	
Ceratoscopelus sp	0	35.0	.5	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OPHIDIIDAE																																	
Brotula barbata	38	28.0	1.0	1	0	0	1	0	0	0	1	0	0	1	0	1	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	
POLYNEMIDAE																																	
Galeoides decadactylus	61	11.0	.5	1	0	0	1	7	0	2	0	1	1	1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	133	10.5	.5	1	0	0	2	2	2	1	0	0	0	1	1	0	1	1	0	1	2	1	0	0	1	1	1	1	2	0	1	0	1
	145	14.5	.5	1	0	0	1	1	0	2	2	0	1	0	5	1	2	2	1	0	0	0	3	0	0	1	0	0	1	0	0	0	3
	292	9.0	1.0	1	0	1	2	3	5	16	23	20	8	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	301	15.0	1.0	4	15	8	3	2	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	403	14.0	1.0	1	16	6	15	4	2	0	0	1	1	2	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0
	404	12.0	.5	1	0	1	1	0	1	0	1	0	2	1	0	1	1	2	0	2	2	1	3	2	2	0	0	0	0	0	0	0	0
POMADASYIDAE																																	
Brachydeuterus auritus	29	9.0	.5	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	2	4	5	7	16	9	6	1	1	0
	30	17.0	.5	1	1	3	3	3	10	3	8	10	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	31	19.5	.5	1	0	1	2	1	6	12	6	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	37	6.0	.5	0	4	6	8	5	5	3	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2	4	5	3	6	2	0
	42	8.5	.5	4	6	10	10	10	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	43	8.0	.5	1	0	2	1	8	1	2	4	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	4	9	14	11	7	5	0
	49	13.5	.5	2	1	2	9	5	8	4	7	3	3	3	6	0	1	2	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	56	21.5	.5	1	5	7	8	4	5	11	2	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	59	10.0	.5	1	0	2	3	5	2	1	3	5	9	24	7	8	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	62	9.0	.5	1	6	4	5	5	2	1	2	0	1	0	3	8	10	8	6	9	2	1	0	1	0	0	0	0	0	0	0	0	0
	63	8.0	.5	1	0	0	0	0	4	6	6	2	0	1	3	6	12	3	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0
	68	6.5	.5	2	5	12	12	9	3	4	8	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	0	0
	96	6.5	.5	1	4	8	5	4	2	7	1	2	2	0	1	1	0	0	0	0	1	0	0	1	5	3	2	2	1	1	1	0	0

IV f

FAMILY/SPECIES	STATION	Lowest length	Step length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
				FREQUENCY IN LENGTH GROUP																													
Brachydeuterus auritus	104	6.5	.5	2	7	25	34	10	5	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
	107	8.0	.5	1	5	6	7	9	10	10	1	0	0	0	0	0	0	0	0	1	2	0	1	1	0	1	2	0	1	0	0	0	0
	122	7.0	.5	3	3	4	10	3	6	9	0	3	0	4	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	127	12.0	.5	2	5	5	1	2	2	3	4	5	7	4	1	2	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	133	12.0	.5	2	2	1	1	4	3	5	1	3	1	5	3	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	144	7.5	.5	1	1	3	0	2	0	2	3	0	2	3	3	3	4	3	5	2	3	3	2	4	3	1		1	0	0	0	0	0
	145	10.0	.5	2	0	0	1	0	0	1	0	1	1	0	4	6	7	2	2	5	2	1	0	0	0	0	0	0	0	0	0	0	0
	146	8.5	.5	2	0	4	2	0	1	1	1	0	2	1	1	0	7	14	10	4	3	1	2	0	0	0	0	0	0	0	0	0	0
	148	9.0	.5	7	8	8	9	16	18	18	10	8	9	5	3	3	10	9	11	3	2	1	1	0	0	0	0	0	0	0	0	0	0
	150	8.5	.5	2	1	1	1	1	4	0	1	2	3	4	0	0	3	3	4	6	6	3	1	1	0	0	0	0	0	0	0	0	0
	168	6.0	.5	1	1	4	6	23	34	36	13	16	6	5	4	0	1	1	0	1	0	1	1	2	1	1	2	0	0	0	0	0	0
	170	8.5	.5	1	2	2	2	1	2	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	180	7.5	.5	7	3	15	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	192	12.5	.5	1	1	3	6	8	11	18	8	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	194	11.5	.5	1	0	2	0	1	0	12	19	20	14	7	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	279	6.0	1.0	1	0	0	1	2	3	5	8	21	14	6	4	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	281	5.0	1.0	1	3	2	0	0	1	7	10	15	6	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	287	10.0	1.0	1	0	0	1	3	4	4	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	292	12.0	1.0	2	18	0	32	25	13	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	293	16.0	1.0	8	51	30	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	303	13.0	1.0	10	17	44	17	7	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	304	13.0	1.0	1	1	4	13	8	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	314	10.0	1.0	2	36	15	8	3	0	0	3	3	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	317	13.0	1.0	1	0	0	6	23	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	319	14.0	1.0	1	1	1	14	13	14	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	340	15.0	1.0	1	0	2	7	7	9	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	341	17.0	1.0	3	3	23	22	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	398	20.0	.5	1	1	3	3	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	400	15.5	.5	1	11	7	4	3	0	1	4	21	16	16	13	5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	402	15.0	.5	1	2	10	14	23	8	1	7	10	9	8	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	403	10.0	.5	1	0	1	0	1	0	0	0	1	1	12	28	41	18	4	3	1	0	5	5	6	4	0	0	0	0	0	0	0	0
	404	7.0	1.0	1	3	6	2	2	0	0	0	0	2	1	6	3	5	25	37	13	0	0	0	0	0	0	0	0	0	0	0	0	0
	405	16.0	.5	1	0	1	0	0	2	0	1	0	7	27	16	21	19	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	406	9.0	.5	1	2	3	19	15	10	2	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0
	407	5.5	.5	1	13	37	21	7	9	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	426	9.5	.5	2	1	2	1	0	0	1	0	1	0	0	0	4	4	20	6	31	17	6	7	1	0	0	1	0	1	0	0	0	0
	454	10.5	.5	1	1	2	3	7	3	0	5	3	10	11	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	473	16.5	.5	1	1	0	1	0	2	10	7	21	23	22	6	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	477	17.5	.5	1	2	0	1	2	6	10	22	15	16	16	3	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	479	19.5	.5	1	1	3	2	9	14	6	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	479	6.0	.5	3	12	8	8	9	12	26	7	11	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraptristipoma octolineatum	18	29.0	1.0	1	1	1	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plectorhynchus mediterraneus	1	32.0	1.0	1	2	2	3	4	5	8	6	3	2	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18	29.0	1.0	1	1	0	3	0	3	0	1	1	2	1	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	112	19.0	.5	1	0	2	0	1	2	2	1	2	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	397	12.0	2.0	1	7	3	0	0	0	1	0	1	3	4	1	1	5	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pomadasys sp	63	23.5	.5	1	0	0	1	0	1	0	4	1	1	2	2	2	3	2	4	0	1	1	0	0	4	1	3	2	2	1	1	1	1
Pomadasys jubelini	59	24.0	1.0	2	0	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	88	26.5	.5	1	1	4	0	1	2	9	5	5	1	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	90	30.0	.5	1	0	1	0	0	2	4	2	4	2	2	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	133	22.0	.5	1	2	3	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	428	21.5	.5	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	443	36.0	1.0	1	0	0	4	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pomadasys incisus	297	17.0	1.0	1	0	3	2	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	307	16.0	1.0	4	3	2	5	2	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	391	22.0	.5	1	2	5	7	10	15	16	16	12	13	12	6	7	5	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	397	22.0	.5	2	0	0	3	1	3	3	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	495	24.0	.5	1	3	6	3	13	13	9	11	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pomadasys peroteti	117	21.0	.5	1	0	1	3	1	2	3	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pomadasys rogeri	339	20.0	1.0	4	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	340	20.0	1.0	2	6	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
POMATOMIDAE																																	
Pomatomus saltatrix	31	55.0	1.0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	47	50.0	5.0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	111	48.0	1.0	2	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	443	46.0	1.0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pomatomus saltatrix	123	37.0	1.0	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRIACANTHIDAE																																	
Priacanthus arenatus	160	8.5	.5	1	0	0	0	0	0	2	8	10	9	2	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	313	7.0	1.0	14	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCIAENIDAE																																	
Argyrosomus sp	397	50.0	1.0	3	2	2	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Argyrosomus regius	29	35.0	1.0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0
	407	42.0	2.0	1	1	0	0	1	1	1	0	1	0	1	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudotolithus sp	67	100.0	1.0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	428	14.5	.5	1	1	2	12	6	10	13	18	15	10	7	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1
Pseudotolithus elongatus	99	11.5	.5	1	0	2	0	1	2	1	2	1	0	1	1	1	1	4	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0
	404	22.0	1.0	3	6	6	3	2	1	0	1	0	0	0	3	2	5	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Pseudotolithus senegalensis	145	14.0	.5	1	0	1	0	0	0	1	0	0	0	0	0	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0
	407	51.0	1.0	1	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	407	93.0	1.0	1	1	0	0	0	0	0	1	0	2	0	0	2	0	0	1	0	2	1	1	0	3	0	0	0	0	0	0	0	0
Pseudotolithus typus	281	9.0	1.0	1	3	4	3	3	6	6	5	10	7	5	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteroscion peli	99	8.5	.5	1	0	0	0	0	1	1	1	2	1	5	1	2	3	1	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0
	279	7.0	1.0	2	2	5	6	4	1	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	281	8.0	1.0	1	1	1	7	5	3	9	20	26	22	17	5	6	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	404	7.0	1.0	2	9	6	12	18	12	9	13	5	5	18	15	19	3	7	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0
	474	9.0	.5	1	1	1	2	1	0	0	0	0	0	0	0	1	0	1	0	0	5	6	4	3	2	9	4	5	3	1	0	0	0
Labrina canariensis	18	29.0	1.0	2	0	1	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SCOMBRIDAE																																	
Euthynnus alletteratus	44	45.0	1.0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scomber japonicus	19	25.0	.5	2	6	8	8	6	4	4	5	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21	26.5	.5	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	22	25.5	.5	1	2	0	1	5	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26	23.0	.5	4	1	1	1	2	1	3	3	2	1	1	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	33	6.5	.5	1	0	2	4	5	3	2	3	2	6	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	49	11.5	.5	1	2	0	0	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
	108	17.0	.5	1	1	3	6	11	8	12	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	111	21.0	.5	1	0	0	0	0	0	0	0	0	0	1	3	2	1	3	4	4	2	1	0	0	0	0	0	0	0	0	0	0	0
	311	20.0	1.0	6	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	438	15.0	.5	2	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	504	18.5	.5	1	2	8	6	7	7	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	505	20.0	.5	1	0	1	1	2	2	5	5	10	6	6	1	2	1	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	512	18.5	.5	2	3	2	14	7	29	8	22	4	5	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scomberomorus tritor	58	40.0	1.0	1	0	1	3	2	2	0	5	1	1	3	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	105	30.5	.5	1	0	0	0	0	1	1	4	7	6	2	6	6	4	8	3	2	5	1	0	0	0	0	0	0	0	0	0	0	0
	147	36.0	1.0	4	10	8	5	1	3	0	2	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FAMILY/SPECIES	STATION	Lowest length	Step length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
				FREQUENCY IN LENGTH GROUP																													
SERRANIDAE																																	
Epinephelus aeneus	18	52.0	1.0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
	90	60.0	1.0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	112	43.0	1.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	407	56.0	1.0	1	0	0	0	0	0	1	0	0	1	1	1	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1
Epinephelus guaza	117	75.0	1.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Epinephelus fasciatus	18	35.0	1.0	1	0	0	1	0	0	0	0	2	0	0	0	0	1	0	0	0	2	0	0	1	1	0	1	0	1	0	1	0	3
	90	41.0	1.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mycteroperca rubra	493	7.5	.5	1	9	33	41	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
S H R I M P S																																	
Penaeus P kerathurus	492	10.0	.5	1	1	10	16	32	26	30	12	23	7	2	9	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPARIDAE	317	12.0	1.0	4	3	4	1	4	6	3	3	2	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boops boops	49	13.0	.5	12	16	32	19	12	2	3	1	2	1	0	2	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	53	14.0	.5	2	0	1	0	0	1	1	2	3	1	8	9	7	7	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	116	6.5	.5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	6	5	10	7	24	18	18	7	3	3	0	0	0
	117	14.5	.5	1	0	2	1	0	1	3	5	2	11	10	5	2	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	150	9.0	.5	3	10	24	25	21	7	4	1	0	1	0	2	2	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	311	12.0	1.0	1	5	14	21	21	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	316	14.0	1.0	11	3	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	320	14.0	1.0	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	340	7.0	1.0	3	20	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	343	15.0	1.0	6	38	41	28	5	2	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	397	11.5	.5	11	15	5	7	2	0	0	0	1	0	0	0	0	0	1	0	0	2	5	5	3	1	1	0	1	1	0	0	0	1
	492	5.0	1.0	1	4	4	3	4	2	8	3	8	10	10	2	5	5	5	2	5	8	6	3	1	0	1	0	0	0	0	0	0	0
Dentex angolensis	117	16.0	.5	1	0	2	2	6	5	6	10	6	4	5	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	143	12.0	.5	1	1	0	2	2	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	164	15.5	.5	1	2	1	1	2	3	1	2	0	3	1	6	5	22	19	22	10	7	0	0	0	0	0	0	0	0	0	0	0	0
	177	14.0	.5	1	0	0	0	0	2	3	4	1	2	2	1	3	5	3	4	3	6	7	5	7	19	13	17	8	12	10	6	0	1
	311	11.0	1.0	1	10	12	14	27	20	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	312	13.0	1.0	6	12	10	14	11	7	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	316	11.0	1.0	2	1	3	10	11	6	3	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dentex canariensis	15	21.0	1.0	1	0	1	0	0	0	0	2	3	1	2	2	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0
	187	24.5	.5	2	0	2	2	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	489	18.0	1.0	2	23	24	22	15	5	2	0	0	0	0	1	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dentex macrophthalmus	38	16.0	1.0	1	0	1	0	1	8	1	2	8	0	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	320	11.0	1.0	29	46	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	394	11.0	.5	5	10	10	3	2	4	3	3	14	7	9	3	1	1	1	4	8	5	1	1	1	0	1	0	0	0	0	0	0	0
Dentex congoensis	15	10.5	.5	2	1	8	3	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	116	18.5	.5	2	0	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	119	7.5	.5	1	0	0	0	0	6	11	9	5	3	1	1	1	1	2	2	1	3	2	4	5	5	5	1	2	6	0	0	0	0
	143	10.5	.5	1	0	2	8	8	6	6	4	2	2	1	2	3	5	4	3	2	2	1	4	0	2	2	0	0	0	0	0	0	0
	164	12.5	.5	1	1	0	1	0	4	7	5	4	3	4	6	4	8	6	4	3	2	1	1	0	0	0	0	0	0	0	0	0	0
	177	11.0	.5	1	1	0	0	5	2	4	4	1	3	3	3	2	1	4	12	0	1	1	1	0	0	0	0	0	0	0	0	0	0
	181	10.0	.5	2	4	2	2	4	3	2	1	2	1	2	3	1	0	2	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0
	394	11.5	.5	1	0	0	0	0	2	0	2	0	1	0	1	6	8	6	8	4	4	1	0	0	0	0	0	0	0	0	0	0	0
Dentex gibbosus	18	37.0	1.0	5	0	0	0	0	0	0	0	2	0	0	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dentex barnardi	340	6.0	1.0	2	1	4	3	1	1	3	5	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dentex maroccanus	468	10.5	.5	1	1	0	0	0	0	1	1	2	4	5	4	7	9	6	3	0	3	0	3	0	0	0	0	0	0	0	0	0	0
Diplodus sp	49	20.0	.5	1	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Diplodus bellottii	1	13.5	.5	1	0	0	2	3	1	4	8	6	9	5	12	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	10.0	.5	2	2	2	3	1	1	2	4	0	4	4	8	9	8	10	9	7	4	2	1	0	2	0	0	0	0	0	0	0	0
	49	16.5	.5	1	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	406	15.0	.5	1	1	1	3	2	1	0	0	0	0	0	1	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Lithognathus mormyrus	82	29.5	.5	1	0	1	0	0	0	1	1	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Pagellus bellottii	1	21.0	1.0	1	0	1	1	1	2	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	7.5	.5	1	0	0	1	0	3	5	1	2	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	18	20.0	1.0	1	2	0	2	2	1	7	8	10	7	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	49	14.5	.5	1	1	1	1	4	2	2	4	3	1	3	0	0	1	3	2	3	4	3	7	5	8	5	2	2	1	0	1	0	0
	53	13.0	.5	3	0	2	5	2	7	4	2	3	4	8	2	4	5	5	4	2	2	3	1	3	1	2	0	0	0	0	0	0	0
	57	19.0	.5	1	3	1	0	2	2	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	90	21.5	.5	2	1	1	2	3	6	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	109	17.5	.5	1	4	3	6	3	5	8	10	7	6	3	3	3	1	3	0	[illegible]	0	0	0	1	0	0	0	0	0	0	0	0	0
	112	14.0	.5	1	0	0	0	0	0	0	1	5	6	0	2	7	4	2	[illegible]			3	0	1	1	0	0	0	0	0	0	0	0
	117	11.5	.5	1	0	0	0	0	2	0	1	3	2	2	3	0	1	0				4	6	1	2	2	3	0	5	2	0	0	1
	122	8.0	.5	2	11	10	17	8	7	8	8	7	6	3	3	0	0	0	[illegible]			0	0	2	0	1	0	0	0	0	0	0	0
	164	16.0	.5	1	0	2	0	2	0	1	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	177	10.0	.5	2	6	3	8	10	5	5	11	2	7	4	1	1	3	2	3	2	4	9	13	4	8	5	2	4	4	4	5	3	3
	187	16.5	.5	3	1	2	5	2	6	7	2	3	2	7	1	2	3	6	1	1	2	2	0	0	0	1	0	0	0	0	0	0	0
	270	17.0	1.0	2	6	4	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	297	17.0	1.0	1	2	6	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	319	15.0	1.0	1	1	1	7	4	7	4	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	324	13.0	1.0	7	18	24	7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	326	8.0	1.0	2	5	2	0	1	5	8	15	12	7	5	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	334	15.0	1.0	10	20	16	12	6	5	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	335	11.0	1.0	2	0	4	6	5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	337	4.0	1.0	1	7	19	39	16	11	1	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	339	9.0	1.0	1	0	0	0	0	0	0	1	0	0	4	6	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	340	6.0	1.0	1	5	14	7	1	1	3	5	18	22	10	11	6	4	9	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0
	341	9.0	1.0	1	3	5	6	6	4	8	8	4	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	391	10.0	1.0	1	0	1	0	0	0	0	2	7	7	8	6	5	4	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
	393	10.0	1.0	5	9	7	5	1	11	15	24	17	7	1	2	2	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	395	12.0	1.0	1	1	0	5	9	16	0	1	3	4	0	0	0	1	1	3	0	0	2	2	2	0	0	0	0	0	0	0	0	0
	396	21.5	.5	1	0	0	0	0	2	0	1	1	0	1	1	2	3	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	397	11.5	.5	1	0	4	9	4	9	2	6	3	8	2	3	4	2	4	5	8	4	4	6	7	8	8	9	2	6	1	1	0	1
	399	13.0	1.0	1	8	23	17	19	9	7	12	8	3	6	11	6	4	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	422	20.0	.5	2	1	2	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sparus caeruleostictus	18	31.0	1.0	3	2	1	4	1	1	4	2	3	3	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	80	23.0	.5	1	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	62	19.0	.5	1	0	1	0	0	0	0	0	1	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	143	24.0	.5	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	297	21.0	1.0	3	5	8	3	1	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	443	25.0	.5	1	0	0	0	0	0	6	0	5	0	2	0	1	0	2	0	4	0	1	0	2	0	0	0	1	0	0	0	1	1
SPHYRAENIDAE																																	
SPHYRAENIDAE	26	41.0	1.0	1	0	3	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphyraena dubia	56	42.0	1.0	2	0	0	1	2	3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	59	33.0	1.0	1	1	0	1	2	3	4	3	5	5	2	2	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	117	49.0	1.0	2	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	452	40.0	1.0	1	4	7	3	2	3	5	2	2	1	0	0	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphyraena sphyraena	30	41.0	1.0	1	2	0	4	1	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	49	42.0	1.0	1	2	0	0	1	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	405	26.5	.5	1	0	1	2	4	2	3	0	2	3	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
Sphyraena piscatorum	66	35.0	1.0	1	2	0	0	0	1	2	2	2	1	1	1	1	2	1	0	0	1	0	10	0	0	0	0	0	0	0	0	0	0
	80	152.0	1.0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

IV h

FAMILY/SPECIES	STATION	Lowest length	Step length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
				FREQUENCY IN LENGTH GROUP																													
SPHYRAENIDAE																																	
Sphyraena picudilla	86	91.0	1.0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	96	40.0	1.0	4	2	0	5	7	1	0	0	0	1	0	0	1	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
	101	38.0	1.0	1	1	1	6	2	3	3	1	1	0	1	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	103	34.0	1.0	1	3	3	3	1	2	4	3	2	6	2	4	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	104	28.0	1.0	1	0	0	0	0	0	3	3	4	1	3	2	2	1	1	1	0	3	0	1	0	1	0	1	0	0	0	0	0	0
	132	21.5	.5	1	3	2	2	2	4	0	2	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	144	12.0	1.0	1	0	0	1	1	1	1	0	0	0	0	1	0	4	6	2	6	2	2	2	6	4	3	7	8	13	16	6	3	2
	147	19.0	1.0	1	2	3	3	8	5	8	9	5	7	5	0	1	3	0	3	4	8	4	5	1	4	5	1	1	1	0	0	0	0
	148	15.0	1.0	2	0	0	3	5	3	5	4	1	4	1	0	0	0	0	1	1	0	0	2	1	0	0	1	2	1	1	2	0	0
	151	16.0	.5	1	0	0	2	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	153	15.5	.5	1	0	0	0	1	0	0	0	1	0	1	0	1	0	0	1	2	0	0	1	3	2	4	1	1	0	1	0	0	2
	156	16.0	1.0	1	0	1	4	3	5	3	1	5	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1
	168	19.0	.5	1	0	2	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	169	17.0	1.0	1	1	3	3	7	1	3	3	3	4	0	5	0	3	2	3	3	3	1	0	1	2	1	0	0	0	0	0	0	0
	170	20.0	.5	1	0	3	2	3	2	1	0	4	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	175	13.0	.5	1	0	1	0	2	0	0	0	1	1	0	2	6	16	17	16	18	14	10	6	4	2	2	0	2	0	0	1	1	1
	183	35.0	1.0	1	0	2	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0
	194	22.0	1.0	1	3	0	1	0	0	3	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	315	40.0	1.0	2	2	3	1	3	2	2	2	0	1	1	4	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CEPHALOPODA																																	
Loligo vulgaris	406	9.0	1.0	1	1	0	1	6	9	6	1	2	7	2	3	1	0	0	0	0	0	1	0	1	1	0	0	0	0	0	1	0	0
STROMATEIDAE																																	
Stromateus fiatola	66	30.0	.5	1	0	1	0	0	2	0	1	0	0	1	1	0	0	0	2	1	0	3		0	0	1	0	1	0	0	0	0	2
	398	37.0	.5	1	0	0	1	1	0	1	0	3	0	1	1	2	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
SYNODONTIDAE																																	
Saurida brasiliensis	68	9.0	.5	1	1	6	5	15	8	3	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	70	9.0	.5	3	6	17	18	17	9	6	3	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	140	7.5	.5	1	2	11	28	11	22	5	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRIGLIDAE																																	
Lepidotrigla carolae	57	17.0	.5	1	0	2	1	2	1	1	0	4	5	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRICHIURIDAE																																	
Trichiurus lepturus	26	93.0	1.0	1	0	2	1	0	0	1	0	0	1	0	1	2	2	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0
	40	45.0	5.0	1	5	4	0	2	3	1	2	0	8	8	10	10	8	3	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	46	45.0	5.0	1	5	12	0	3	2	2	0	0	0	2	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	279	20.0	5.0	7	3	7	12	3	0	3	6	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	314	22.0	1.0	1	0	1	0	4	7	1	0	4	2	0	6	1	1	1	3	2	0	0	0	3	3	0	1	1	0	0	0	1	0
	315	20.0	5.0	2	0	9	1	3	0	0	0	0	1	2	3	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	329	75.0	5.0	1	4	3	2	7	7	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	389	92.0	2.0	1	0	2	5	2	2	3	5	6	5	4	5	4	6	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
	395	91.0	1.0	1	0	0	0	0	0	0	0	0	2	0	1	0	1	1	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
	399	43.0	3.0	1	0	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	2	1	3	0	1	0	0	0	0	0	0
	404	33.0	3.0	7	3	3	4	1	1	3	0	2	2	0	0	0	1	0	0	1	1	2	1	3	0	0	2	0	0	0	0	0	0
ZEIDAE																																	
Zeus faber	431	24.0	1.0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	4	1	1	0	0	1

ANNEX V List of Species caught off West Africa from Agadir to Ghana, with reference to station numbers where caught and to catch/hour (in brackets). When catch is given as 0.0, species is present but with less than 0.1 kg/hour in catch. V a

ACANTHURIDAE	299(	7.0),												
Acanthurus monroviae	82(	2.4),	93(	.4),	109(	2.0),	187(	2.3),	297(	58.6),	433(	17.4),		
	467(	.5),												
ALBULIDAE	343(	5.7),												
Albula vulpes	63(	20.0),	98(	4.0),	99(	.4),	127(	4.8),						
Pterothrissus belloci	38(	7.0),	304(	10.6),										
ANGUILLIFORMES	1(	31.5),	5(	.1),	50(	.0),								
ANTHIIDAE														
Callantias ruber	506(	943.6),												
APOGONIDAE														
Synagrops sp	40(	.6),												
Synagrops microlepis	33(	286.7),	38(	23.8),	41(	.0),	68(	.0),	437(	60.0),	460(	2040.0),		
ARIIDAE	428(	57.1),												
Arius sp	50(	26.8),	63(	20.0),	64(	6.3),	67(	143.6),	99(	11.2),	100(	10.0),		
	102(	177.0),	133(	12.0),	308(	5.8),	393(	30.4),	474(	44.8),	476(	19.6),		
Arius heudeloti	44(	2.0),	62(	24.0),	148(	9.1),	279(	2.4),	281(	197.8),	283(	8.4),		
	284(	1.0),	286(	360.0),	287(	2.4),	300(	470.4),	303(	56.0),	392(	14.0),		
	397(	27.0),	404(	44.1),	407(	28.8),	427(	82.4),	430(	5.0),	463(	18.8),		
Arius latiscutatus	145(	7.5),												
ARIOMMIDAE														
Ariomma bondi	119(	131.5),	129(	5.9),	139(	3.4),	140(	.9),	151(	.6),	155(	8.6),		
	158(	115.2),	159(	1.8),	160(	8.4),	161(	73.2),	164(	.8),	165(	25.8),		
	166(	166.6),	176(	5.1),	177(	1.8),	193(	6.9),	197(	41.2),	277(	3.4),		
	313(	6.0),	316(	.0),	320(	.0),	342(	26.0),	394(	1.0),				
BALISTIDAE														
Balistes capriscus	17(	71.0),	22(	120.0),	45(	3.2),	46(	1.7),	49(	43.8),	54(	4.0),		
	55(	22.5),	56(	16.2),	57(	218.4),	58(	56.0),	59(	6.6),	60(	4463.2),		
	62(	25.5),	63(	15.6),	64(	14.7),	66(	38.7),	68(	12.0),	71(	8406.4),		
	72(	3000.0),	73(	799.2),	75(	3000.0),	76(	7500.0),	77(	13.0),	78(	570.0),		
	79(	199.8),	80(	3528.7),	81(	3960.0),	82(	726.0),	83(	198.9),	85(	684.8),		
	87(	12000.0),	88(	1224.0),	90(	234.0),	92(	3182.8),	93(	6000.0),	95(	1435.2),		
	96(	2.0),	109(	348.0),	112(	181.5),	119(	54.0),	120(	1.0),	121(	6.1),		
	122(	15.4),	123(	2.0),	124(	20.0),	125(	268.9),	131(	630.0),	134(	951.8),		
	136(	253.5),	138(	43.2),	142(	.2),	167(	246.0),	170(	153.8),	171(	882.0),		
	173(	829.9),	174(	83.2),	176(	37.0),	177(	19.2),	178(	3565.5),	182(	2005.0),		
	184(	5000.0),	185(	147.3),	187(	179.4),	188(	203.0),	189(	46.0),	191(	24.6),		
	193(	57.9),	195(	103.3),	197(	180.0),	198(	306.3),	199(	612.0),	200(	10000.0),		
	268(	910.8),	269(	8416.6),	270(	834.0),	272(	763.2),	273(	325.2),	274(	453.6),		
	275(	562.0),	276(	20.4),	277(	64.8),	289(	285.6),	293(	2.9),	295(	182.4),		
	296(	6.4),	297(	26.6),	299(	109.2),	300(	7548.0),	303(	42.0),	305(	190.8),		
	307(	699.0),	308(	15.1),	309(	92.0),	317(	11.2),	319(	275.5),	324(	170.8),		
	340(	114.2),	341(	207.6),	344(	841.4),	402(	7.5),	403(	37.9),	404(	5.4),		
	422(	215.5),	425(	39.6),	426(	48.0),	432(	15.7),	433(	44.2),	434(	12.5),		
	435(	1.8),	437(	56.0),	438(	310.0),	441(	73.2),	443(	3600.0),	444(	7315.0),		
	445(	300.0),	455(	8000.0),	464(	2400.0),	465(	37.2),	479(	3.6),	492(	.7),		
Balistes punctatus	49(	4.7),	83(	15.0),	112(	18.2),	270(	10.2),	467(	4.4),				
BATRACHOIDIDAE														
Batrachoides liberiensis	154(	.4),												
Batracoides cydactylus	407(	1.0),												
BELONIDAE														
Ablennes hians	509(	.5),												
Belone houttuyni	125(	.9),	131(	4.3),	492(	.3),								
	6(	.6),	10(	1.1),										
BOTHIDAE														
Arnoglossus blanchei	76(	.0),	279(	.0),	326(	15.6),	340(	3.4),	343(	.0),	460(	4.0),		
Bothus podas africanus	143(	.3),												
Chascanopsetta lugubris	86(	.0),	135(	.7),	496(	.0),								
Citharus macrolepidotus	456(	1.6),												
Monolene microstoma	486(	.4),												
Scyacium micrurum	57(	6.3),	401(	2.5),	486(	.2),	496(	.1),						
	119(	.0),	145(	1.8),	270(	2.4),	485(	24.6),	487(	.2),	492(	2.3),		
BRAMIDAE														
Brama brama	3(	48.0),	5(	.7),	21(	6.5),								
BRANCHIOSTEGIDAE														
BREGMACEROTIDAE														
Bregmaceros sp	42(	.0),	66(	168.0),	96(	30.8),	103(	.0),	147(	4.5),	396(	.6),		
BROTULIDAE	312(	13.8),												
Brotula barbata	404(	.0),	485(	15.0),										
CIPHOIDAE	312(	.0),												
Antigonia capros	37(	.0),	38(	5.8),	151(	207.6),	181(	2706.2),	343(	2.8),	394(	5.2),		
	401(	.0),	494(	.2),										
Capros aper	8(	7520.0),	394(	84.0),										
CARANGIDAE	284(	1.6),	313(	.0),										
Alectis alexandrinus	43(	76.4),	58(	155.0),	89(	91.0),	90(	23.4),	101(	90.0),	109(	12.0),		
	117(	5.0),	127(	6.0),	133(	2.4),	147(	5.4),	149(	1.8),	180(	2.0),		
	282(	51.9),	288(	.3),	292(	7.2),	303(	28.0),	317(	16.0),	319(	101.3),		
	327(	39.4),	399(	13.0),	400(	75.6),	405(	45.6),	430(	.0),				
Caranx sp	83(	16.9),	446(	6.4),										
Caranx crysos	48(	10.8),	52(	.6),	58(	21.4),	59(	4.4),	68(	12.4),	94(	10.4),		
	97(	89.2),	129(	2.7),	153(	20.8),	159(	5.4),	166(	1.8),	173(	60.5),		
	186(	.3),	187(	.6),	188(	2.6),	269(	7.1),	270(	7.5),	277(	1.8),		
	279(	7.0),	284(	24.0),	293(	18.7),	297(	6.7),	299(	7.0),	302(	.0),		
	306(	12.6),	313(	.6),	317(	6.0),	337(	4.0),	342(	.4),	395(	2.2),		
	396(	5.1),												
Caranx senegallus	58(	5.3),	149(	2.4),	156(	7.2),	280(	3.2),	283(	15.4),	284(	10.6),		
	285(	9.6),	289(	.4),	297(	5.3),	298(	4.8),	299(	9.8),	307(	32.2),		
	432(	2.0),												
Chloroscombrus chrysurus	49(	12.6),	58(	5.6),	59(	215.6),	63(	4.8),	64(	45.5),	66(	34.2),		
	67(	4.8),	98(	77.0),	99(	17.2),	100(	10.0),	101(	183.6),	102(	14.8),		
	104(	1.8),	104(	.4),	105(	3.6),	106(	.1),	109(	3.6),	122(	231.0),		
	127(	15.6),	132(	.4),	133(	6.0),	144(	1.8),	146(	60.0),	148(	47.6),		
	150(	11.9),	153(	176.8),	154(	2.0),	175(	16.4),	180(	28.6),	183(	8.6),		
	185(	.6),	186(	2.6),	192(	.6),	194(	.6),	282(	414.0),	283(	19.6),		
	284(	1.2),	286(	30.0),	287(	35.2),	292(	.0),	303(	2.8),	307(	10.8),		
	309(	69.0),	314(	16.8),	315(	.9),	319(	393.6),	322(	2.4),	344(	707.5),		
	398(	16.8),	402(	15.0),	403(	1.7),	407(	18.0),	428(	8.2),	463(	2.4),		
Decapterus rhoncus	329(	35.2),	337(	7.6),	339(	176.8),	391(	15.4),	393(	19.0),	395(	7.2),		
	407(	27.6),	502(	1.7),										

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Decapterus sp	172(	.0),												
Decapterus punctatus	122(	.0),123(	6.7),132(	12.0),135(	2.9),138(	39.6),141(	6.5),							
	143(	176.0),158(	12.0),159(	.6),160(	162.4),164(	.5),165(	.8),							
	166(	21.0),185(	1.8),186(	.3),167(	36.8),189(	4.8),192(	2.8),							
	193(	6.6),194(	13.2),200(	.0),289(	.0),297(	.0),450(	.4),							
	451(	.2)												
Decapterus rhonchus	1(	37.8), 7(	276.0), 22(	10.8), 29(	144.0), 30(	25.4), 31(	1705.8),							
	43(	868.4), 47(	91.2), 49(	11.2), 54(	34.1), 55(	2.4), 58(	8.4),							
	59(	6.6), 60(	444.2), 63(	8.0), 66(	54.0), 83(	1.3), 90(	48.6),							
	92(	568.4), 95(	.6), 96(	7.2), 98(	11.0), 99(	.8),101(	4.5),							
	104(	1.8),105(	1.1),109(	44.4),111(	.4),112(	201.3),113(	14.6),							
	122(	5.6),123(	5.4),187(	3.4),189(	.4),289(	4.4),293(	10.1),							
	299(	19.6),304(	60.6),305(	511.2),307(	242.0),309(	50.0),311(	103.6),							
	316(	9848.0),317(	22.4),319(	61.7),324(	2434.2),326(	157.0),328(	.0),							
	329(	4.0),330(	57.6),331(	77.3),336(	165.6),337(	6.2),339(	155.6),							
	340(	176.2),341(	86.6),344(	133.9),390(	118.8),391(	27.6),391(	16.2),							
	392(	300.0),393(	8.4),395(	1.2),396(	11.6),397(	27.0),398(	2.4),							
	399(	157.0),400(	406.0),402(	45.0),403(	14.9),404(	9.9),405(	16.8),							
	406(	24.8),432(	2.7),436(	13.5),447(	.9),450(	.6),450(	.1),							
	477(	.2),479(	3.6),487(	3.9),489(	3.8),492(	2.2),495(	25.6),							
	497(	15.4),498(	28.0),											
Decapterus tabl	128(	.2),												
Hemicaranx bicolor	127(	4.8),152(	.0),283(	26.6),284(	2.6),286(	12.0),447(	14.4),							
Lichia amia	40(	8.0), 49(	30.4),173(	13.8),										
Selar crumenophthalmus	148(	.7),175(	1.2),192(	9.0),194(	17.4),313(	1.0),405(	.8),							
Seriola dumerili	474(	17.6),												
Seriola carpenteri	128(	3.6),187(	4.0),											
Selene dorsalis	55(	2.6), 59(	.4), 62(	1.5), 66(	27.0), 98(	2.5),101(	68.4),							
	107(	.1),127(	6.0),131(	208.8),136(	6.0),144(	37.5),145(	2.1),							
	146(	7.2),147(	.2),148(	15.4),150(	7.0),152(	.4),153(	39.0),							
	154(	.0),156(	21.6),168(	3.0),169(	24.4),180(	3.2),183(	.8),							
	186(	.6),192(	1.4),197(	4.4),270(	298.5),272(	398.4),280(	1.2),							
	283(	36.4),286(	6.0),292(	.0),293(	1.4),299(	16.8),308(	1.2),							
	314(	16.8),315(	3.9),317(	10.4),319(	8.4),322(	6.0),342(	.0),							
	398(	6.8),399(	3.8),402(	12.5),403(	64.4),404(	11.3),407(	21.2),							
	448(	4.2),451(	.2),462(	1.7),495(	.1),									
Trachinotus sp	50(	3.6), 66(	12.6),101(	24.3),										
Trachinotus maxillosus	7(	13.5),285(	.8),288(	.2),288(	4.6),323(	1.6),								
Trachinotus goreensis	45(	4.6), 48(	11.8),422(	34.4),										
Trachinotus ovatus	169(	1.8),282(	5.7),284(	1.8),285(	.4),315(	1.7),322(	45.6),							
	398(	40.4),502(	6.2),											
Trachurus trachurus	5(	.1), 6(	2.3), 8(	60.0), 10(	2.2), 15(	.0), 16(	7.0),							
	23(	9.0), 24(	.2), 46(	.8), 48(	45.6),117(	.2),389(	8.1),							
	390(	83.6),394(	141.8),401(	42.6),477(	.4),479(	18.2),483(	4.0),							
	484(	.1),485(	12.0),486(	177.6),487(	1.6),488(	1.5),492(	4.5),							
	494(	270.0),495(	.2),496(	.5),497(	.2),498(	21.6),502(	1.7),							
	503(	.9),504(	84.6),512(	104.0),										
Trachurus trecae	1(	252.0), 2(	460.8), 5(	.4), 6(	1.5), 7(	153.0), 8(	240.0),							
	10(	38.5), 13(	7.8), 15(	1247.4), 16(	1.2), 17(	79.8), 18(	4.3),							
	19(	870.0), 20(	22.4), 21(	23.2), 22(	398.4), 26(	400.0), 27(	2.0),							
	29(	4.8), 31(	3333.6), 32(	62.0), 33(	352.8), 37(	1.6), 38(	420.0),							
	40(	96.0), 41(	14.0), 42(	5.6), 43(	318.3), 44(	11.6), 47(	209.6),							
	48(	240.0), 49(	149.4), 51(	468.0), 53(	33.6), 54(	6.4), 54(	96.0),							
	61(	6.6), 68(	2.0), 94(	10.8), 96(	1.2), 97(	.0),103(	16.2),							
	104(	.0),107(	1.0),108(	.2),111(	.0),113(	12.6),318(	248.2),							
	320(	544.2),321(	4080.0),327(	202.4),329(	4.8),330(	6.4),331(	234.4),							
	332(	1.2),335(	.9),336(	244.0),341(	1003.4),343(	443.7),345(	2360.0),							
	390(	787.6),394(	77.8),397(	593.6),401(	1400.0),403(	11.5),405(	1.4),							
	406(	100.8),407(	44.9),422(	236.0),423(	1.2),424(	52.5),425(	460.0),							
	426(	1.6),431(	276.0),431(	488.0),454(	.1),458(	720.0),459(	3.0),							
	460(	468.0),460(	60.0),461(	.0),465(	3.6),467(	17.8),468(	4.8),							
	469(	960.0),471(	115.2),472(	5.0),472(	2.8),476(	1.8),479(	32.2),							
	479(	38.8),483(	6.4),484(	.0),485(	762.0),486(	56.0),487(	.7),							
	488(	.7),489(	2.8),490(	169.6),492(	8.0),494(	10.6),496(	1.0),							
	497(	8.9),498(	16.6),502(	.0),503(	.6),									
Uraspis secunda	152(	1.2),												
CENTRACHANTIDAE														
Spicara alta	332(	.2),												
	431(	120.8),485(	3.6),											
CHAETODONTIDAE														
Chaetodon sp	90(	.9),109(	1.2),											
Chaetodon hoefleri	119(	6.0),177(	.6),297(	3.3),307(	.0),423(	.4),460(	6.0),							
	471(	9.6),												
CHILODIPTERIDAE														
Epigonus telescopus	456(	1.2),												
Hypoclydonia bella	197(	3.2),												
	139(	2.2),140(	.2),155(	.2),										
CHLOROPHTHALMIDAE														
Chlorophthalmus atlanticus	38(	.3),												
Chlorophthalmus fraser	456(	10.2),												
CLUPEIDAE														
Alosa fallax	7(	15.0),												
Ethmalosa fimbriata	504(	1.2),												
Ilisha africana	287(	1.6),												
	56(	.5), 59(	2.2), 64(	92.4), 67(	28.7), 98(	12.0), 99(	40.8),							
	100(	150.4),102(	.0),104(	81.0),107(	6.0),127(	109.2),133(	40.8),							
	145(	3.6),146(	4.8),148(	33.6),150(	91.0),153(	254.8),154(	.0),							
	156(	7.2),169(	1.4),180(	9.7),279(	.0),281(	77.4),282(	13.2),							
	283(	98.0),286(	108.0),288(	1.5),292(	.0),314(	62.6),315(	8.4),							
	317(	.0),403(	42.9),404(	13.5),427(	58.4),428(	13.6),430(	50.4),							
	447(	3.6),												
Sardina pilchardus	2(	2.5), 10(	16.0), 14(	81.2), 30(	.0),390(	28.6),498(	15.0),							
	502(	1.1),502(	1.5),503(	255.8),505(	509.8),507(	40.3),510(	32.8),							
	511(	690.0),512(	72.0),											
Sardinella aurita	7(	1.5), 14(	1.4), 17(	177.2), 19(	6.6), 22(	2.4), 26(	1.0),							
	30(	1.6), 31(	21.0), 47(	112.0), 48(	3.0), 49(	7.4), 51(	5.2),							
	54(	1.6), 55(	49.5), 56(	.5), 58(	53.2), 61(	13.5), 68(	.2),							
	70(	.0), 78(	.0), 83(	130.0), 88(	.0), 89(	449.4), 94(	.7),							
	96(	.0), 97(	88.0),103(	8.0),104(	.0),105(	6.2),106(	2.6),							
	107(	.4),108(	.6),111(	9.5),112(	1.6),113(	117.2),117(	.0),							
	119(	.5),122(	.0),123(	3.6),124(	.8),127(	.0),129(	19.8),							
	132(	38.0),133(	3.6),135(	5.1),138(	6.0),140(	.5),141(	21.9),							
	143(	40.0),156(	1.2),158(	1.8),159(	7.1),160(	200.2),165(	1.8),							
	166(	48.3),169(	4.6),169(	2.0),170(	.2),172(	.0),173(	41.5),							
	175(	7.0),183(	.1),184(	.0),186(	.1),187(	154.1),189(	58.0),							
	190(	1.8),192(	7.6),193(	90.0),200(	.0),280(	40.0),282(	7.8),							
	289(	10.6),298(	13.7),302(	2.1),304(	9.4),305(	140.4),306(	173.6),							
	309(	4.0),311(	33.6),317(	.4),318(	38.8),319(	13.4),322(	1.2),							
	327(	1.0),330(	22.4),331(	42.6),336(	41.8),337(	27.8),339(	1302.0),							
	341(	1326.0),345(	638.0),389(	7.4),390(	83.6),396(	6.1),398(	.2),							
	401(	2.5),403(	3.3),404(	2.3),429(	2.0),429(	.6),430(	1.4),							
	458(	360.0),462(	.9),490(	2.0),491(	.4),496(	.0),497(	40.0),							

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Sardinella maderensis	14(	1.4),	30(	10.8),	40(	13.8),	54(	123.2),	54(	.6),	55(	59.4),		
	56(	162.0),	59(	4.4),	63(	3.6),	64(	4.2),	89(	2.4),	96(	31.6),		
	97(	61.6),	98(	4.0),	99(	.8),	101(	287.0),	102(	44.2),	105(	54.2),		
	106(	2.0),	107(	.1),	107(	4.0),	111(	19.8),	113(	1255.6),	122(	.0),		
	127(	.0),	144(	3.0),	146(	34.8),	147(	13.2),	148(	7.0),	150(	7.7),		
	151(	124.5),	152(	8.2),	155(	2.6),	156(	46.8),	168(	.6),	169(	7.6),		
	169(	6.2),	170(	13.6),	172(	1.1),	173(	13.8),	175(	14.2),	180(	2.9),		
	183(	.5),	186(	.9),	192(	16.4),	194(	19.2),	196(	1.6),	280(	31.4),		
	282(	67.2),	283(	2.8),	284(	1.6),	285(	2.6),	286(	18.0),	287(	54.2),		
	288(	1.2),	291(	.4),	293(	169.9),	298(	8.4),	299(	16.8),	302(	10.8),		
	303(	25.2),	304(	25.6),	305(	82.8),	306(	23.0),	308(	39.8),	309(	11.0),		
	310(	8.7),	314(	33.6),	315(	3.4),	317(	4.8),	322(	75.2),	323(	17.2),		
	337(	2.0),	340(	27.8),	344(	12.7),	398(	9.8),	400(	7.2),	403(	6.6),		
	404(	.0),	405(	.0),	407(	42.0),	407(	323.0),	428(	3.1),	429(	.4),		
	430(	1.4),	447(	1.7),	447(	2.8),	448(	336.0),	452(	28.4),	462(	230.9),		
	467(	.6),	497(	6.1),	502(	.0),								
CONGRIDAE	476(	72.8),												
Conger ophisurus serpens	487(	1.2),												
C R A B S	100(	10.0),	127(	7.2),	135(	3.4),	279(	4.0),	281(	.0),	283(	14.0),		
	287(	5.2),	485(	34.6),										
PORTUNIDAE	7(	.0),												
Neptunus variedens	67(	19.2),	102(	.0),										
CRUSTACEANS	15(	11.0),												
Krill	3(	33.4),	4(	2.8),	11(	14.3),	16(	72.0),	34(	10[illegible]),	40(	820.0),		
	46(	.2),	47(	800.0),	48(	120.0),	50(	3.6),	52(	6.2),				
Squilla mantis	6(	.0),	100(	.0),										
CYNOGLOSSIDAE	279(	.0),	281(	.0),	286(	6.0),	430(	3.4),						
Cynoglossus sp	449(	3.0),	451(	2.1),	474(	1.6),								
Cynoglossus canariensis	43(	6.4),	148(	1.8),	154(	1.2),	463(	3.4),						
Cynoglossus senodi	105(	.0),												
DACTYLOPTERIDAE														
Dactylopterus volitans	49(	4.2),	53(	6.0),	57(	52.5),	60(	42.3),	73(	229.5),	75(	40.0),		
	78(	7.5),	80(	28.7),	81(	501.0),	85(	6.4),	88(	46.8),	92(	193.2),		
	95(	415.6),	109(	19.2),	154(	47.6),	158(	37.2),	164(	.8),	165(	.5),		
	185(	.3),	269(	1427.4),	273(	874.8),	274(	210.0),	275(	5334.0),	276(	3.4),		
	277(	6.0),	300(	736.2),	393(	6.8),	397(	5.8),	425(	120.0),	432(	1.6),		
	433(	480.0),	434(	191.0),	435(	46.0),	441(	28.8),	454(	.6),	469(	46.0),		
	472(	1.6),												
DASYATIDAE	281(	8.0),												
DIODONTIDAE	297(	10.0),	323(	4.4),										
Chilomycterus spinosus	403(	4.9),	404(	.0),										
DREPANIDAE														
Drepane africana	127(	6.0),	133(	2.4),	153(	33.8),	154(	.0),	404(	17.1),	428(	4.9),		
	430(	.2),	463(	2.4),										
ECHENEIDAE	310(	.3),	323(	2.0),	325(	1.0),	337(	3.2),						
Echeneis naucrates	50(	1.7),	86(	.9),	103(	.2),	111(	.2),	120(	1.0),	123(	2.9),		
	140(	6.4),	295(	1.2),	322(	.3),	390(	2.9),	395(	1.4),	397(	19.4),		
	402(	15.0),	406(	2.4),	447(	.2),								
Remora sp	120(	.0),												
ELOPIDAE	261(	1.0),												
Elops senegalensis	180(	2.0),												
EMMELICHTHYIDAE														
Erythrocles senodi	129(	.4),												
ENGRAULIDAE														
Engraulis encrasicolus	10(	286.0),	12(	.8),	13(	1815.0),	14(	126.0),	17(	5672.0),	28(	.3),		
	30(	22.0),	42(	.0),	51(	3.9),	54(	.2),	58(	616.0),	61(	3231.6),		
	69(	.0),	70(	880.0),	77(	.7),	78(	1.5),	83(	.0),	88(	.0),		
	89(	182.2),	91(	.6),	94(	648.0),	95(	.0),	97(	1760.0),	103(	135.8),		
	107(	.3),	110(	2.6),	129(	130.5),	135(	43.4),	140(	15.7),	143(	16.0),		
	152(	1.2),	159(	353.0),	165(	.8),	166(	1.1),	168(	.3),	169(	6.4),		
	170(	.1),	172(	.4),	180(	.5),	194(	8.4),	278(	12000.0),	327(	144.8),		
	328(	2000.0),	330(	456.0),	407(	359.1),	429(	20.0),	448(	129.6),	451(	.2),		
	452(	104.0),	461(	.2),	472(	99.4),	492(	11.3),	493(	18.4),	495(	8.2),		
	498(	378.8),	502(	5.4),	503(	348.6),	510(	.1),						
EPHIPPIDAE														
Chaetodipterus goreensis	127(	8.4),	138(	.6),	150(	.0),								
FISTULARIIDAE														
Fistularia petimba	60(	42.3),	95(	.8),	92(	34.1),	119(	7.5),	177(	2.4),	184(	.0),		
	187(	1.7),	289(	3.5),	297(	2.0),	326(	15.6),	334(	.3),	468(	7.2),		
FISH LARVAE	140(	.0),	149(	.8),	151(	6.0),	155(	.4),	172(	3.0),	173(	.0),		
	180(	.6),	190(	.0),	192(	24.0),								
POSTLARVAL FISH	430(	1.1),	440(	6.6),	476(	24.4),								
GEMPYLIDAE														
Gempylus serpens	139(	1.3),												
Neoharchus maculus	11(	14.3),												
Promethichthys prometheus	166(	.4),												
GERREIDAE														
Eucinostomus melanopterus	122(	7.0),	135(	.9),	144(	1.0),	150(	.7),	183(	.3),	303(	44.0),		
	304(	4.6),	317(	61.2),										
GOBIIDAE	328(	.0),												
Bathygobius paganellus	404(	4.1),	495(	.2),										
LABRIDAE	112(	13.2),	283(	1.0),	299(	1.4),								
Bodianus speciosus	134(	13.6),	299(	4.2),										
LETRINIDAE	270(	39.3),												
Lethrinus atlanticus	145(	14.2),	107(	4.0),										
L O B S T E R S	127(	3.6),	145(	11.4),	2[illegible](	.6),	187(	4.0),						
Palinurus sp	42(	2.7),	90(	5.4),	13[illegible](	15.9),	153(	1.2),	427(	19.4),				
Panulirus sp	150(	5.6),												
LUTJANIDAE														
Apsilus fuscus	187(	3.4),												
Lutjanus sp	187(	6.9),												
Lutjanus goreensis	133(	12.0),	151(	27.6),										
Lutjanus agennes	134(	13.2),												

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MAENIDAE																
Smaris macrophtalmus	320(	6.6),														
	394(	14.8),401(	12.5),													
MACROURIDAE																
Hymenocephalus italicus	456(	11.6),														
Malacocephalus laevis	456(	2.2),														
MERLUCCIIDAE																
Merluccius sp	492(	.0),495(	100.0),496(	.2),498(	2.0),502(	.1),										
Merluccius merluccius	394(	95.6),504(	5.7),													
Merluccius polli	6(	.6), 21(	13.8), 38(	194.6),320(	3.4),325(	.2),456(	5.8),									
	479(	.2),														
MOBULIDAE	281(	60.0),														
MONACANTHIDAE																
Aluterus sp	270(	15.0),297(	22.0),299(	19.6),344(	12.7),											
Aluterus punctatus	135(	.7),														
	134(	20.4),														
MUGILIDAE																
Mugil sp	58(	.2),107(	.4),299(	7.0),404(	8.1),											
MULLIDAE																
Mullus surmuleus	508(	4.1),														
Pseudupeneus prayensis	18(	.3), 53(	7.2), 76(	.0), 82(	26.4), 83(	.7),109(	3.6),									
	112(	25.8),119(	4.0),122(	14.0),134(	133.6),135(	.7),138(	3.0),									
	142(	.1),160(	1.4),187(	69.0),188(	.2),270(	.1),297(	18.6),									
	299(	11.2),305(	7.2),307(	145.2),317(	51.2),324(	384.4),326(	109.9),									
	337(	.0),340(	13.0),344(	12.7),393(	6.0),397(	46.4),399(	9.2),									
	403(	2.4),422(	8.6),423(	.6),432(	.2),435(	.4),450(	.1),									
	451(	.1),454(	.2),467(	1.6),471(	2.4),485(	21.0),487(	2.0),									
	489(	16.4),492(	1.2),													
MURAENIDAE	407(	5.0),430(	.7),													
MURAENESOCIDAE																
Cynoponticus ferox	154(	1.2),404(	12.6),474(	32.0),												
MYCTOPHIDAE																
	3(	16.6), 4(	2.0), 12(	60.0), 13(	204.6), 16(	24.0), 20(	128.0),									
	21(	108.0), 32(	33.4), 41(	47.0), 46(	2.2), 50(	1.5), 52(	25.2),									
	135(	.4),342(	.0),389(	1.2),416(	100.0),457(	.9),484(	.0),									
	499(	156.8),														
Ceratoscopelus sp	197(	3.2),														
	118(	.0),126(	.0),130(	.0),137(	.0),162(	.0),163(	.0),									
	179(	.0),290(	.0),294(	.0),301(	.0),333(	.0),338(	.0),									
	408(	.0),409(	.0),410(	.0),411(	.0),412(	.0),413(	.0),									
	414(	.0),415(	.0),417(	.0),418(	.0),419(	.0),420(	.0),									
	421(	.0),439(	.0),442(	.0),446(	.0),466(	.0),470(	.0),									
	481(	.0),501(	.0),506(	.0),												
NOMEIDAE																
Cubiceps sp	85(	3.2), 94(	36.0),108(	1.8),139(	.6),454(	.3),										
Cubiceps gracilis	11(	14.3), 13(	19.8), 16(	1.1),457(	.7),											
Cubiceps niger	11(	1.0),														
Paracubiceps ledanoei	401(	57.5),457(	3.6),													
Paenee sp	21(	.1), 34(	.3),484(	.0),												
OPHIDIIDAE																
Brotula barbata	38(	24.0), 69(	2.8),460(	84.0),												
PARALEPIDIDAE																
Lestidium sp	3[illegible](	.0),														
	41(	.4), 50(	.6), 52(	.0),												
PERISTEDIIDAE																
Peristedion cataphractum	456(	.1),508(	8.5),													
PLATYCEPHALIDAE																
Grammoplites gruveli	476(	[illegible]),														
	154(	.0),404(	.0),													
POLYNEMIDAE																
Galeoides decadactylus	55(	5.0), 56(	1.4), 58(	5.6), 59(	17.6), 62(	9.0), 63(	8.0),									
	64(	10.5), 67(	14.4), 99(	.8),100(	5.0),102(	.0),107(	1.0),									
	109(	18.0),122(	46.2),127(	66.0),133(	30.0),135(	3.4),144(	4.8),									
	145(	36.0),148(	4.9),150(	5.6),153(	15.6),154(	1.2),283(	8.4),									
	286(	108.0),292(	540.0),293(	1.4),303(	46.2),304(	4.6),314(	43.2),									
	315(	2.6),317(	.0),403(	54.4),404(	18.9),407(	6.0),427(	2.2),									
	420(	7.4),430(	1.1),463(	258.8),												
Pentanemus quinquarius	67(	134.1), 98(	3.0), 99(	.8),100(	476.4),102(	88.2),127(	3.0),									
	145(	1.2),148(	3.5),154(	.6),281(	137.6),286(	30.0),427(	24.0),									
	430(	.4),														
POMACENTRIDAE																
Chromis sp	18(	.1),														
Chromis cadenati	53(	1.2),117(	1.4),													
	397(	5.8),														
POMADASYIDAE																
Brachydeuterus auritus	49(	4.2),326(	62.6),													
	29(	332.4), 30(	41.6), 31(	960.6), 39(	4141.2), 42(	4.4), 43(	8147.2),									
	49(	146.2), 53(	14.4), 55(	124.2), 56(	59.4), 58(	2.8), 59(	457.6),									
	60(	.0), 62(	720.0), 63(	89.6), 64(	196.0), 66(	432.0), 67(	2.4),									
	68(	18.4), 96(	4.4), 99(	1.2),100(	2.6),101(	6.3),102(	.0),									
	104(	315.0),107(	56.0),122(	299.6),127(	84.0),133(	24.0),135(	3.4),									
	144(	7.5),145(	13.8),146(	10.8),147(	2.7),148(	80.5),150(	177.8),									
	153(	15.6),154(	7.2),168(	4.0),170(	1.6),177(	.6),180(	.5),									
	183(	1.2),192(	60.0),194(	21.0),279(	22.0),281(	4.4),282(	.3),									
	283(	49.0),286(	114.0),287(	4.0),292(	1389.6),293(	230.4),303(	91.0),									
	304(	107.2),314(	212.0),317(	216.4),319(	253.0),324(	170.8),326(	109.9),									
	340(	120.7),341(	1937.6),391(	6.0),393(	1.6),396(	.7),398(	3.8),									
	399(	2.8),400(	1460.0),402(	1250.0),403(	527.8),404(	83.7),405(	117.6),									
	406(	10.8),407(	185.5),426(	116.0),427(	65.8),428(	3.1),429(	8.2),									
	430(	7.9),447(	2.8),447(	.6),448(	6.8),449(	177.0),450(	7.0),									
	451(	.1),452(	2.8),454(	25.8),461(	19.7),463(	25.2),465(	289.2),									
	469(	18.0),471(	3.4),473(	2730.0),474(	428.0),476(	189.8),476(	39.0),									
	477(	15.4),477(	792.0),479(	125.4),479(	42.8),495(	2.8),502(	.2),									
Paraphristipoma sp	82(	50.6),														
Paraphristipoma octolineatum	18(	8.4),119(	1.0),297(	2.0),												
Plectorhynchus mediterraneus	1(	496.9), 18(	25.1), 49(	5.4), 53(	32.4), 90(	3.6),112(	25.3),									
	117(	1.0),397(	251.4),407(	21.2),425(	3.0),471(	52.8),477(	55.0),									
	487(	3.5),489(	23.2),													
Pomadasys sp	63(	284.0),														
Pomadasys jubelini	54(	9.1), 58(	.6), 59(	31.9), 62(	9.0), 67(	33.5), 78(	2.3),									
	88(	414.0), 90(	225.0),109(	18.0),127(	7.8),133(	28.8),145(	5.4),									
	184(	.0),188(	1.4),286(	36.0),428(	4.1),443(	12.6),463(	18.5),									
	472(	1.4),														
Pomadasys incisus	9(	12.0), 18(	.5),297(	8.6),307(	166.6),317(	20.0),391(	361.2),									
	393(	6.8),397(	71.6),402(	10.0),403(	18.2),407(	95.8),492(	1.8),									
	495(	344.2),														
Pomadasys peroteti	112(	5.5),117(	6.8),136(	4.5),												
Pomadasys rogeri	292(	43.2),299(	30.8),303(	25.2),304(	28.0),314(	57.8),319(	28.1),									
	339(	212.0),340(	58.8),400(	48.0),405(	1.0),407(	1.4),449(	34.5),									

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POMATOMIDAE														
Pomatomus saltatrix	23(	6.6),	31(	51.0),	32(	4.0),	40(	9.8),	46(	8.4),	47(	21.3),		
	49(	.2),	101(	5.4),	111(	5.8),	282(	29.7),	283(	5.6),	292(	21.6),		
	305(	6.0),	383(	7.6),	405(	.6),	407(	41.9),	443(	8.0),	476(	12.4),		
PRIACANTHIDAE														
Priacanthus arenatus	57(	6.0),	95(	10.0),	112(	2.8),	134(	61.2),	156(	72.0),	159(	1.2),		
	160(	16.8),	161(	1.8),	164(	6.0),	165(	.1),	177(	4.5),	187(	18.4),		
	188(	1.3),	192(	.6),	313(	.8),	460(	6.0),						
PSETTODIDAE														
Psettodes belcheri	135(	.7),	390(	2.0),										
R A Y S	100(	2.6),												
Dasyatis margarita	67(	19.2),	102(	250.0),	145(	2.4),	148(	3.5),	430(	1.1),				
Gymura altavela	407(	2.7),												
Zanobatus atlanticus	407(	6.4),												
Raya straleni	486(	16.8),												
Raja miraletus	96(	6.0),	451(	3.3),	465(	9.0),								
Rhinoptera bonasus	463(	7.2),												
Squatina oculata	468(	45.6),												
TORPEDINIDAE	297(	1.3),	317(	14.4),										
Torpedo torpedo	18(	1.4),	116(	4.6),	320(	21.8),	395(	2.0),	399(	1.4),	433(	15.6),		
	468(	14.4),	485(	16.6),	487(	4.1),								
Torpedo marmorata	403(	4.9),												
SALPS	396(	3.5),												
SCARIDAE	339(	7.2),												
Sparisoma rubripinne	492(	.1),												
SCIAENIDAE	100(	10.0),	283(	8.4),	314(	.0),								
Argyrosomus sp	397(	247.4),												
Argyrosomus regius	29(	6.2),	39(	320.0),	58(	16.4),	407(	60.8),	474(	35.2),	476(	247.0),		
	477(	50.6),	479(	16.8),										
Miracorvina angolensis	64(	2.8),	99(	.8),										
Pseudotholithus sp	64(	22.4),	67(	215.5),	67(	47.9),	99(	.8),	100(	125.4),	102(	73.6),		
	428(	129.3),	474(	44.8),	479(	12.2),								
Pseudotolithus elongatus	67(	225.0),	99(	7.2),	100(	175.6),	133(	6.0),	148(	.7),	404(	22.5),		
Pseudotolithus senegalensis	127(	6.0),	133(	79.2),	145(	46.2),	148(	37.1),	150(	28.0),	153(	13.0),		
	194(	4.8),	407(	284.5),	407(	26.2),	427(	114.0),	427(	680.0),	428(	41.1),		
	430(	5.8),	432(	.2),	463(	59.3),								
Pseudotolithus typus	148(	37.8),	154(	2.0),	281(	498.0),	283(	1.4),	286(	356.4),				
Pseudotolithus epipercus	127(	7.2),	133(	3.6),										
Pteromacion peli	64(	.7),	67(	167.6),	99(	7.2),	100(	75.2),	102(	117.6),	127(	2.4),		
	133(	42.0),	145(	27.6),	148(	21.7),	150(	5.6),	153(	2.6),	154(	6.0),		
	279(	5.0),	281(	903.0),	283(	2.8),	286(	228.0),	287(	.0),	314(	2.4),		
	403(	1.7),	404(	81.9),	427(	112.6),	430(	13.7),	474(	9.6),	474(	94.4),		
	476(	58.6),	477(	26.4),	479(	2.4),								
Usbrina canariensis	18(	6.5),	38(	5.6),	116(	3.5),	119(	12.0),	397(	15.4),	404(	.0),		
	406(	3.6),	407(	.0),	460(	16.0),	477(	1.2),	479(	7.4),	485(	114.0),		
	495(	13.8),												
SCOMBRIDAE	129(	.2),	145(	4.2),										
Auxis thazard	111(	.6),	158(	7.2),	313(	1.6),								
Euthynnus alletteratus	44(	5.2),	147(	2.4),	152(	.3),	330(	17.4),	331(	33.3),				
Sarda sarda	332(	21.4),	460(	9.0),	493(	9.0),								
Scomber japonicus	10(	.0),	16(	.6),	19(	16.0),	20(	1.0),	21(	3.6),	22(	34.8),		
	26(	7.8),	31(	1.2),	33(	132.3),	38(	.6),	48(	5.0),	49(	14.4),		
	58(	.3),	85(	3.9),	108(	6.0),	111(	3.6),	289(	.6),	300(	245.4),		
	311(	62.2),	318(	2.0),	345(	19.4),	402(	20.0),	436(	.8),	458(	21.6),		
	472(	1.4),	477(	.6),	479(	1.0),	488(	.0),	503(	2.3),	504(	5.2),		
	505(	150.2),	508(	.2),	509(	2.4),	510(	1.0),	512(	168.0),				
Scomber scombrus	122(	.2),	504(	1.1),										
Scomberomorus tritor	45(	2.2),	58(	40.8),	63(	6.4),	64(	4.2),	66(	9.0),	67(	3.9),		
	89(	24.0),	101(	14.6),	105(	29.0),	106(	10.0),	107(	14.2),	127(	3.0),		
	144(	5.7),	147(	60.6),	149(	4.2),	150(	5.8),	152(	1.7),	153(	1.6),		
	156(	4.4),	175(	.8),	192(	.6),	196(	.2),	196(	3.0),	282(	23.1),		
	283(	7.0),	284(	15.4),	288(	.6),	292(	3.0),	297(	7.3),	298(	2.2),		
	323(	31.6),	337(	23.6),	344(	14.4),	398(	4.4),	407(	4.0),	447(	4.2),		
	450(	4.0),	498(	71.4),	502(	10.7),								
SCORPAENIDAE	69(	1.2),	116(	1.8),	394(	2.2),	431(	21.0),	460(	44.0),				
Helicolenus dactylopterus	164(	4.9),	401(	25.0),										
Neomerinthe folgori	312(	11.7),												
Pontinus kuhlii	38(	4.9),												
Scorpaena sp	407(	.0),	492(	.1),	496(	.0),								
Scorpaena maderensis	404(	1.4),												
Scorpaena angolensis	486(	1.0),												
Scorpaena normani	465(	1.4),												
Scorpaena stephanica	465(	11.4),												
Setarches insularis	139(	1.0),												
SERRANIDAE	297(	4.7),												
Epinephelus sp	112(	.7),												
Epinephelus aeneus	18(	86.0),	51(	9.3),	56(	.4),	58(	3.6),	90(	31.6),	112(	37.4),		
	119(	20.0),	134(	54.4),	143(	34.8),	145(	14.2),	150(	.7),	160(	14.4),		
	177(	26.0),	187(	10.4),	297(	71.3),	299(	4.2),	305(	32.4),	307(	3.0),		
	317(	.0),	344(	1.0),	393(	14.0),	397(	56.0),	404(	10.8),	406(	20.0),		
	407(	133.8),	432(	27.6),	467(	25.6),	487(	8.6),	489(	29.4),	492(	7.0),		
Epinephelus guaza	18(	17.0),	117(	13.6),	487(	12.0),	489(	49.0),	492(	7.4),				
Epinephelus fasciatus	18(	101.8),	53(	2.4),	90(	2.0),	489(	6.4),						
Epinephelus alexandrinus	134(	20.2),	407(	7.2),	489(	1.6),	500(	.6),						
Epinephelus caninus	489(	21.6),	490(	2.7),										
Mycteroperca rubra	18(	5.1),	493(	22.8),										
Serranus sp	397(	9.6),												
Serranus scriba	1(	18.9),												
S H A R K S	58(	7.0),	62(	15.9),	96(	3.6),	398(	5.2),	431(	40.6),	448(	100.8),		
CARCHARHINIDAE	145(	3.6),												
Carcharinus sp	67(	4.5),	284(	20.6),	285(	60.0),	286(	24.0),	287(	1.6),	287(	180.0),		
	287(	120.0),	315(	51.3),										
Rhizoprionodon acutus	136(	7.2),	148(	1.4),	153(	11.0),	314(	119.0),	315(	175.4),	392(	4.0),		
	400(	6.3),												
Leptocephalus smithsi	437(	14.0),												

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Scyliorhinus caricula	508(	.8),												
SPHYRNIDAE	447(	2.8),447(	1.2),											
Sphyrna sp	41(	17.2), 96(	3.0), 99(	5.4),106(	60.0),327(	60.4),								
Sphyrna corardi	148(	6.3),163(	1.6),											
Sphyrna lewini	147(	14.7),283(	22.4),284(	2.8),315(	5.6),407(	56.9),								
Sphyrna zygaena	145(	4.2),281(	1.6),											
Squalus blainvillei	161(	3.0),												
Squatina oculata	143(	13.4),161(	12.4),164(	3.4),										
TRIAKIDAE	281(	2.0),												
Mustelus mustelus	142(	1.6),177(	8.4),328(	2.8),407(	15.6),									
S H R I M P S	99(	4.0),100(	50.2),127(	.0),279(	8.4),281(	730.0),283(	5.6),							
	314(	.0),315(	.5),328(	.0),407(	29.9),430(	1.4),451(	7.9),							
	456(	1.2),477(	3.8),496(	.2),503(	.3),									
PANDALIDAE Chrisp.	69(	27.2),460(	2.0),											
PENAEIDAE	62(	2.1),102(	.0),104(	.0),450(	1.0),									
Parapenaeopsis atlantica	150(	.7),154(	2.0),183(	.1),476(	85.0),									
Parapenaeus longirostris	456(	.3),												
Penaeus sp	406(	1.8),427(	60.6),											
Penaeus F notialis	39(	.0), 67(	36.3),133(	7.2),145(	9.6),150(	1.6),153(	.8),							
	192(	1.2),393(	77.2),397(	3.8),404(	10.8),									
Penaeus F kerathurus	63(	.0), 64(	4.2), 86(	.4), 88(	5.4),135(	1.6),449(	3.3),							
	451(	4.8),492(	5.6),											
SOLEIDAE	6(	.3),393(	3.8),											
Dicolocoglossa cuneata	407(	13.2),469(	1.6),487(	.2),495(	2.6),									
Microchirus frechkopi	135(	.7),												
Solea hexophthalma	53(	3.6), 54(	.0),476(	5.2),										
Synaptura punctatissima	407(	1.1),												
Venatraelenia chirophtelma	486(	.2),496(	.4),498(	.4),										
SPARIDAE	53(	3.0),307(	16.2),317(	75.6),328(	.0),337(	.0),								
Boops boops	49(	427.8), 51(	5.2), 53(	43.2),116(	18.7),117(	33.6),143(	41.6),							
	158(	84.0),160(	7.0),164(	1.1),165(	.0),311(	155.6),312(	1.9),							
	316(	579.2),320(	20.0),340(	8.2),343(	526.8),345(	2012.0),390(	22.0),							
	393(	1.6),394(	1.0),396(	.7),397(	60.0),399(	2.4),400(	6.0),							
	401(	35.0),422(	722.4),423(	.6),424(	22.5),425(	2298.0),431(	33.6),							
	468(	7.2),469(	10.0),471(	1022.4),472(	10.0),489(	29.2),								
Dentex sp	49(	8.6), 69(	1.8),395(	.4),432(	.4),									
Dentex argolensis	117(	11.4),143(	22.4),158(	5.4),160(	7.0),164(	103.2),168(	1.2),							
	177(	181.8),311(	1114.8),312(	427.7),316(	1530.8),320(	3.4),343(	37.2),							
	345(	929.0),394(	5.2),395(	1.4),401(	17.5),460(	112.0),485(	3.6),							
	486(	13.6),490(	.6),494(	3.4),										
Dentex canariensis	1(	81.9), 18(	15.4), 49(	9.6), 53(	2.4),112(	3.8),117(	3.8),							
	134(	45.4),158(	8.4),160(	5.6),187(	40.3),188(	.2),403(	1.7),							
	406(	1.0),487(	7.5),489(	84.0),495(	8.2),498(	1.4),								
Dentex macrophthalmus	38(	79.8),316(	.0),320(	267.2),394(	57.8),401(	10.0),485(	594.0),							
	486(	7.8),494(	21.6),											
Dentex congoensis	15(	19.8), 17(	.0),116(	4.6),119(	40.0),143(	598 4),158(	19.2),							
	160(	4.2),164(	16.5),177(	13.2),181(	201.0),394(	44.2),								
Dentex gibbosus	15(	2.6), 18(	14.0), 49(	3.2),117(	.8),160(	10.2),181(	38.6),							
	396(	1.0),489(	.4),490(	.2),508(	53.0),									
Dentex barnardi	297(	2.7),299(	4.2),305(	14.4),307(	27.0),317(	.0),337(	.4),							
	340(	35.8),397(	15.4),											
Dentex maroccanus	431(	143.0),468(	552.0),505(	1.0),508(	.2),									
Diplodus sp	9(	12.6), 18(	15.7), 49(	16.0),										
Diplodus bellottii	1(	2160.9), 7(	189.0), 49(	5.8),119(	6.5),406(	11.8),407(	.0),							
	423(	1.0),498(	11.6),											
Diplodus vulgaris	1(	50.4),489(	6.0),495(	22.8),504(	1.6),505(	1.0),512(	3.2),							
Diplodus fasciatus	339(	28.4),												
Diplodus sargus	407(	1.1),489(	2.6),											
Lithognathus mormyrus	82(	8.4), 90(	27.0),307(	21.4),344(	4.8),492(	13.4),								
Pagellus acarne	1(	18.9),404(	2.7),505(	1.2),508(	61.2),512(	57.6),								
Pagellus bellottii	1(	176.4), 2(	1.2), 6(	.2), 7(	13.5), 18(	27.8), 39(	51.8),							
	43(	50.9), 45(	.6), 48(	7.2), 49(	81.6), 51(	312.0), 53(	83.4),							
	54(	52.2), 56(	.1), 57(	44.3), 82(	6.6), 83(	6.5), 86(	.0),							
	90(	63.9), 95(	69.2), 96(	.0),107(	.0),109(	117.6),112(	55.0),							
	117(	37.4),122(	42.0),132(	.2),135(	.7),136(	1.2),158(	15.6),							
	160(	5.6),164(	9.2),168(	1.0),177(	72.0),181(	23.2),184(	.0),							
	187(	86.3),270(	99.6),289(	.0),297(	21.3),299(	28.0),307(	118.2),							
	309(	2.0),319(	258.5),320(	.0),324(	2840.0),326(	4313.8),329(	4.0),							
	331(	2.7),334(	40.0),335(	3.4),337(	3.6),339(	233.6),340(	336.0),							
	341(	519.0),345(	38.8),390(	159.6),391(	51.0),393(	6.4),395(	13.0),							
	396(	9.0),397(	274.6),398(	.9),399(	107.0),400(	45.6),423(	29.7),							
	407(	.0),422(	47.2),423(	.0),425(	72.0),467(	47.8),469(	60.0),							
	471(	62.4),476(	4.8),477(	6.6),485(	49.6),487(	19.5),489(	15.6),							
	490(	.9),492(	28.6),495(	7.2),49(	.2),498(	1.8),502(	.0),							
	508(	4.1),												
Pagellus erythrinus	508(	9.4),												
Sparus caeruleostictus	1(	63.0), 18(	47.8), 39(	20.0), 43(	120.9), 80(	172.4), 82(	92.4),							
	83(	6.5), 90(	54.0),112(	6.0),122(	53.2),127(	24.0),131(	14.4),							
	134(	201.6),135(	.7),136(	1.5),138(	21.6),142(	3.4),143(	9.6),							
	145(	12.0),187(	5.2),188(	.8),270(	35.7),297(	58.6),299(	16.8),							
	305(	25.2),307(	134.4),317(	.0),319(	25.2),328(	3.2),344(	19.2),							
	391(	17.0),397(	25.2),400(	15.6),403(	8.3),422(	8.6),423(	2.4),							
	443(	22.6),454(	.4),454(	5.6),467(	21.8),472(	.4),476(	5.8),							
	487(	3.6),499(	21.2),502(	.0),										
Sparus pagrus africanus	90(	59.4),119(	14.0),160(	4.2),454(	.1),									
Sparus auriga	407(	10.4),423(	1.4),											
Sparus pagrus pagrus	508(	90.0),												
Sparus auratus	512(	9.6),												
Spondyliosoma cantharus	1(	15.8), 7(	1.5),334(	.2),337(	.0),339(	21.2),397(	7.8),							
	407(	3.0),489(	12.6),493(	2.8),495(	6.0),498(	2.2),								
SPHYRAENIDAE														
Sphyraena sp	391(	4.2),461(	.0),											
Sphyraena dubia	56(	2.0), 58(	10.6), 59(	248.6), 62(	6.0),117(	4.2),407(	.0),							
	429(	.7),452(	64.8),472(	4.2),										
Sphyraena sphyraena	29(	6.0), 30(	27.2), 31(	9.0), 32(	.9), 45(	.8), 46(	1.3),							
	49(	38.4), 54(	8.3), 58(	.8),398(	2.5),399(	4.6),400(	25.2),							
	403(	18.2),405(	9.4),406(	6.2),										
Sphyraena piscatorum	42(	13.2), 56(	22.4), 66(	146.7), 68(	16.8), 70(	16.0), 80(	26.4),							
	86(	25.0), 96(	79.6),101(	180.0),103(	33.4),104(	162.0),107(	.6),							
	123(	.6),132(	3.4),133(	16.8),140(	1.3),144(	69.0),145(	5.4),							
	146(	8.0),147(	100.2),148(	84.7),149(	1.8),150(	21.0),151(	.4),							
	152(	.2),153(	114.8),156(	34.8),168(	1.0),169(	25.6),170(	9.2),							
	175(	16.8),180(	2.3),183(	12.8),194(	10.8),196(	5.2),270(	43.5),							
	272(	38.4),283(	42.0),284(	2.6),287(	2.8),288(	2.6),292(	50.4),							
	293(	2.9),299(	9.8),304(	14.0),315(	78.3),319(	61.9),344(	3.6),							
	426(	11.0),463(	1.3),											

C E P H A L O P O D A	1(	28.4),	2(	118.0),	6(	12.4),	28(	.0),	42(	.0),	77(	.2),
	119	2.0),334(		13.0),335(		5.4),336(		6.0),341(		138.4),389(		.8),
	391(	12.4),393(		20.4),394(		4.2),395(		8.4),397(		9.6),403(		8.3),
	404(	8.1),406(		16.2),427(		2.2),						
LOLIGINIDAE	15(	19.8),	19(		24(	3.7),	69(	.4),	70(	1.6),103(		.0),
	139(	.6),140(			143(	3.0),153(		1.2),316(		41.2),318(		10.4),
	320(	50.0),328(			337(	25.4),342(		.0),343(		11.4),457(		.2),
	472(	1.8),										
Alloteuthis africana	142(	.0),144(		1	447(	.6),467(		92.4),				
Loligo sp	359(	2.4),435(			454(	.6),466(		18.0),472(		1.8),465(		1.8),
	486(	3.0,497(			487(	40.8),489(		4.4),492(		.3),492(		.8),
	494(	1.0),495(			496(	.2),495(		26.8),502(		.2),504(		4.6),
	504(	.0),506(			511(	4.8),						
Loligo vulgaris	300(	33.2),318(			339(	4.6),401(		10.0),405(		.4),406(		63.8),
OCTOPODIDAE	6(	33.6),	15(		50(	.0),151(		.6),308(		1.4),		
Octopus vulgaris	18(	6.6),486(			495(	90.0),496(		.8),498(		8.0),502(		.2),
SEPIOLIDAE	1(	46.6),	7(		9(	.4),	12(	20.4),	16(	1.9),103(		.0),
Illex sp	18(	5.0),	19(		33(	.6),	26(	.0),150(		25.0),479(		.4),
Illex coindetii	158(	1.6),165(			33),							
Todarodes sp	356(	.2),										
Sepia sp	6(	6.1),	10(		13(	2.2),	22(	4.8),	24(	.4),	53(	6.0),
	54(	2.7),	56(		62(	3.0),	67(	2.4),	68(	.8),	75(	32.4),
	88(	3.4),	92(		62(	19.8),	95(	3.4),	96(	.4),	99(	1.2),
	100(	5.0),102(			111(	1.0),122(		64.4),123(		5.6),127(		1.2),
	132(	.4),134(			136(	33.0),138(		11.4),145(		9.6),145(		.9),
	151(	.8),169(			184(	104.6),247(		2.0),455(		4.2),505(		39.6),
	347(	5.6),444(			475(	.0),477(		9.0,477(		.4),476(		6.0),
	480(	98.0),										
Sepia officinalis hierredda	85(	27.0),184(			192(	11.6),194(		2.4),195(		2.0),395(		14.4),
	399(	7.4),426(			427(	56.0),429(		35.4),429(		2.0),437(		1.2),
	447(	.4),449(			473(	1.4),451(		4.6),461(		.3),463(		20.3),
	479(	6.0),479(			480(	17.4),482(		6.8),486(		1.0),490(		2.0),
	492(	1.0),494(			495(	1.6),497(		.8),498(		4.4),502(		3.0),
	503(	2.0),504(			511(	4.0),						
STROMATEIDAE	277(	1.0),[illegible]		12.4),[illegible]		7.0),[illegible]		.6),287(		5.2),299(		15.4),
	314(	8.6),316(		4.0),[illegible]		.0),330(		16.0),				
Stromateus fiatola	[illegible]	.0),[illegible]		41.0),[illegible]		2.4),[illegible]		.0),165(		2.4),150(		5.6),
	164(	1.0),[illegible]		11.0),[illegible]		1.0),[illegible]		.4.2),398(		8.6),403(		52.2),
	414(	16.0),415(		4.4),417(		1.2),4.0(		15.0),4.0(		1.0),462(		6.8),
	475(	1.0),477(		.0),								
SYNODONTIDAE												
Saurida brasiliensis	5(	.0), 61(		5.4), 68(		5.2), 69(		5.0), 72(		96.0), 77(		.3),
	94(	5.4), 97(		99.4),[illegible]		.0),106(		.0),117(		.0),119(		1.0),
	120(	.0),[illegible]		1.0),142(		33.8),147(		2.1),[illegible]		.4),159(		1.2),
	165(	.6),170(		4.0),[illegible]		.8),447(		.0),				
Synodus sp	413(	.0),										
Synodus saurus	415(	2.0),										
Trachinocephalus myops	441(	.4),446(		1.71,450(		.1),451(		10.1),455(		.2),454(		.3),
TETRAODONTIDAE	[illegible]	1.6),										
Sphoeroides pustifer	[illegible]	5.4),[illegible]		[illegible],133(		55.0),145(		3.0),407(		3.3),432(		2.9),
	47(	.0),[illegible]		.0),								
Lagocephalus lorigatus	[illegible]	4.1),[illegible]		1.6),134(		106.6),136(		4.5),138(		.6),161(		2.4),
	164(	.0),[illegible]		2.0),[illegible]		28.0),434(		.5),450(		.6),		
Liomodous cutaneus	4.1(	12.0),451(		15.0),								
Sphoeroides spengleri	115(	.0),[illegible]		.0),465(		5.2),471(		7.2),492(		.2),		
TRACHINIDAE												
Trachinus sp	[illegible]	.5),[illegible]		14.1),								
Trachinus draconis	170(	.0), 79(		.4), 81(		39.0), 90(		1.8),390(		26.4),496(		.2),
	498(	1.0),										
Trachinus [illegible]	477(	4.0),										
TRIGLIDAE	164(	1.4),[illegible]		7.4),								
Chelidonichthys sp	471(	6.4),										
Chelidonichthys cuculus	95(	10.0),										
Chelidonichthys lucerna	299(	1.0),485(		60.0),486(		.6),490(		.3),492(		18.8),496(		.0),
	502(	1.4),										
Lepidotrigla sp	69(	3.0),										
Lepidotrigla cuculus	6(	1.0), 18(		.2), 28(		.4), 57(		34.5),119(		.0),289(		4.2),
	312(	27.8),341(		17.2),343(		2.8),						
Lep.dentrigla cadenati	395(	1.2),397(		25.2),460(		132.0),						
TRACHOPTERIDAE												
[illegible]	456(	1.2),										
TRICHIURIDAE												
Lepidopus caudatus	59(	6.8),										
Trichiurus lepturus	16(	1.4), 20(		66.0), 21(		50.0), 26(		26.0), 29(		38.4), 30(		13.6),
	31(	19.8), 32(		71.0), 33(		5.7), 34(		120.0), 35(		6.0), 37(		3.6),
	39(	392.8), 40(		324.0), 41(		4.2), 42(		.0), 44(		18.2), 45(		24.4),
	46(	22.0), 47(		47.2), 48(		25.2), 59(		28.6), 62(		4.5), 67(		21.5),
	68(	.4), 69(		.4), 70(		1.6), 97(		5.8), 98(		35.0),100(		19.0),
	101(	1.8),104(		.4),105(		2.8),107(		1.0),127(		12.0),133(		13.2),
	140(	.4),147(		1.0),148(		13.2),150(		3.5),152(		.0),153(		2.6),
	166(	.8),168(		2.0),180(		1.2),183(		.9),279(		110.0),283(		15.4),
	288(	54.0),312(		.0),313(		1.2),314(		142.0),315(		19.3),319(		78.7),
	327(	16.6),328(		.0),329(		181.6),350(		25.6),351(		20.0),352(		3.4),
	356(	[illegible].0),362(		.8),389(		50.0),392(		3.6),392(		164.0),395(		16.2),
	397(	5.6),398(		69.9),402(		9.9),404(		65.0),406(		3.6),407(		.0),
	426(	7.6),427(		50.4),428(		7.7),430(		[illegible].2),432(		45.4),457(		.2),
	461(	.2),467(		5.0),473(		20.7),473(		22.0),474(		24.0),475(		4.2),
	476(	55.6),477(		47.2),477(		35.2),479(		7.8),479(		75.2),482(		14.0),
	485(	7.7),495(		249.0),496(		49.8),497(		36.0),498(		5.6),503(		182.5),
URANOSCOPIDAE												
Uranoscopus sp	78(	4.2),312(		1.9),476(		5.0),						
Uranoscopus polli	86(	.0),120(		.0),150(		.7),496(		.4),				
Uranoscopus cadenati	399(	3.8),										
ZEIDAE												
Zeus faber	1(	44.1), 6(		.0), 15(		37.4), 18(		3.1), 38(		12.6), 48(		1.0),
	181(	31.0),320(		5.4),334(		1.4),394(		20.0),399(		13.0),406(		13.4),
	407(	1.6),431(		40.4),468(		48.0),485(		8.4),486(		25.2),487(		2.7),
	489(	7.6),[illegible]		11.8),492(		9.8),505(		33.2),508(		216.0),512(		14.2),

ANNEX VI Further Catch Data by Region and Survey

Key to the family codes used in the tables on processed catch data :

APO - Apogonidae	PLN - Polynemidae
ARD - Ariidae	POD - Pomadasyidae
BAL - Balistidae	RAY - Rays
CAP - Caproidae	SCI - Sciaenidae
CAR - Carangidae	SCM - Scombridae
CEN - Centropomidae	SER - Serranidae
CLU - Clupeidae	SHA - Sharks
CRU - Krill	SHR - Shrimps
DAC - Dactylopteridae	SPA - Sparidae
ENG - Engraulidae	SPH - Sphyraenidae
JEL - Jellyfish	SQU - Squids
MER - Merluccidae	TRG - Triglidae
MUL - Mullidae	TRI - Trichiuridae
MYC - Myctophidae	ZEI - Zeiidae

Summary of catches from stn. 1 to stn. 47, Cape Verde - Cape Blanc, May 1981

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
ICI	0	2	0	1	2	46	25.37.4	[illegible]	[illegible]	1608.2	11.2	.0
CAR	2	0	1	3	2	72	491.3	16	[illegible]	271.1	576.8	4.0.0
JEL	0	1	5	1	1	72	197.2	8	[illegible]	241.4	26.5	.0
SPA	1	2	4	1	0	73	85.5	7	1[illegible]	[illegible]	48.1	79.8
SCI	1	0	0	1	0	36	84.6	2	16[illegible]	1.4	2.2	5.6
SCU	0	1	2	0	0	46	69.7	2	[illegible]	6.6	66.8	.0
TRI	0	1	0	1	0	18	215.6	[illegible]	1[illegible].4	7.7	.0	.0
MER	0	0	1	0	0	9	194.8	1	.0	.0	.0	194.8
PER	0	0	0	1	0	9	209.9	1	.0	.0	70.0	.0
Other fish							15.8	0				
MEAN CATCH OF ALL HAULS							1861.7		[illegible]	7277.8	819.5	792.0
TOTAL NUMBER OF HAULS	11								2	5	3	1

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20- 50m	50-100m	>100m
JEL	1	2	4	1	2	33	745.0	21	.0	443.5	563.0	30.8
CAR	7	6	3	6	2	67	349.3	20	.0	581.6	231.5	47.6
ENG	0	1	1	1	2	14	1584.2	19	.0	582.0	40.9	95.5
CAP	0	0	0	0	1	3	7520.0	15	.0	.0	.0	395.8
SPA	0	0	0	0	1	3	2567.3	6	.0	256.7	.0	.0
CRU	1	3	3	0	2	25	214.3	5	.0	.0	114.3	59.4
ICO	1	1	0	1	1	11	375.9	4	.0	150.3	.0	.0
MYC	2	5	3	1	0	31	58.2	2	.0	.0	.0	33.7
TRI	5	7	4	1	0	47	48.1	2	.0	5.8	10.5	36.1
AFO	0	0	0	1	0	3	286.7	1	.0	.0	.0	19.1
BAL	2	0	2	0	0	11	49.0	1	.0	19.4	.0	.1
CLU	3	3	3	0	0	25	48.1	1	.0	25.7	19.4	.0
SCM	6	2	1	0	0	25	23.0	1	.0	4.1	3.4	7.5
Other fish							20.5	1				
MEAN CATCH OF ALL HAULS							1168.9		.0	2108.4	985.1	742.2
TOTAL NUMBER OF HAULS	36								0	10	7	19

Summary of catches from stn. 312 to stn. 343, Cape Verde - Cape Blanc, Sept. 1981

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
CAP	[illegible]	2	3	2	[illegible]	[illegible]	[illegible]	40	670.[illegible]	[illegible]	[illegible]	[illegible]
SPA	3	1	1	6	[illegible]	[illegible]	[illegible]	[illegible]	1564.3	[illegible]	[illegible]	[illegible]
POD	0	0	3	4	1	42	432.5	9	160.6	295.[illegible]	[illegible]	.0
CLU	[illegible]	4	1	0	2	42	351.6	7	14.2	[illegible]	[illegible]	.0
ENG	0	0	0	0	1	5	[illegible]	5	.0	[illegible]	[illegible]	.0
BAL	0	1	[illegible]	2	[illegible]	26	[illegible]	2	112.[illegible]	24.9	[illegible]	.0
MUL	[illegible]	1	2	1	[illegible]	[illegible]	139.6	1	121.6	[illegible]	[illegible]	[illegible]
SHA	[illegible]	0	1	1	[illegible]	[illegible]	118.1	1	.0	54.4	[illegible]	[illegible]
SQU	[illegible]	[illegible]	2	[illegible]	[illegible]	42	[illegible]	1	12.2	17.6	[illegible]	5.7
STR	[illegible]	[illegible]	1	0	[illegible]	[illegible]	65.5	1	.0	21.8	[illegible]	[illegible]
TRI	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	1	15.7	17.9	[illegible]	[illegible]
Other fish							27.4	[illegible]				
MEAN CATCH OF ALL HAULS							[illegible]		[illegible]	[illegible]	[illegible]	769.5
TOTAL NUMBER OF HAULS	19								5	3	3	2

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
[illegible]	3	1	2	4	[illegible]	[illegible]	[illegible]	[illegible]	27.6	[illegible]	114.[illegible]	[illegible]
[illegible]	[illegible]	0	1	1	[illegible]	[illegible]	[illegible]	6	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	1	0	[illegible]	[illegible]	34.5	4	46.8	21.4	[illegible]	.0
TRI	2	4	1	0	[illegible]	54	[illegible]	4	.0	[illegible]	4.[illegible]	[illegible]
SCM	2	4	0	0	0	46	17.9	2	15.8	14.4	.9	.0
[illegible]	1	1	0	0	[illegible]	[illegible]	16.0	1	.0	.0	1.5	13.0
SHA	0	0	1	0	0	8	60.4	1	.0	[illegible]	15.1	.0
Other fish							2.6	0				
MEAN CATCH OF ALL HAULS							[illegible]		[illegible]	346.4	[illegible]	[illegible]
TOTAL NUMBER OF HAULS	11								2	5	4	2

Summary of catches from stn. 389 to stn. 407, Mauritania, December 1981

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	45.3	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.4	[illegible]
[illegible]A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4[illegible]	[illegible]	7	[illegible]	[illegible]	[illegible]	.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0	.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]	[illegible]	.0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3	141.[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	[illegible]	[illegible]	4.[illegible]
TRI	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0	15.4	20.2	.0
ARI	0	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	16.9	.0	.0
CAP	0	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	1	.0	.0	.0	89.2
[illegible]	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	.0	.0	.0	95.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	.0	9.1	2.[illegible]	.0
[illegible]	0	[illegible]	1	0	[illegible]	[illegible]	[illegible]	1	.0	.0	14.4	.0
[illegible]	[illegible]	1	1	0	[illegible]	[illegible]	[illegible]	1	[illegible]	1.[illegible]	.0	.0
[illegible]	1	1	0	0	0	17	[illegible]	1	41.9	1.5	.0	.0
SHA	[illegible]	0	1	0	0	[illegible]	[illegible]	1	[illegible]	.0	.0	.0
[illegible]	[illegible]	2	1	0	[illegible]	42	[illegible]	1	[illegible]	15.5	.4	.0
STR	[illegible]	1	1	0	[illegible]	33	[illegible]	1	[illegible]	14.8	[illegible]	.0
ZEI	1	3	0	0	[illegible]	[illegible]	[illegible]	1	1.5	.0	[illegible]	[illegible]
Other fish							[illegible]	[illegible]				
MEAN CATCH OF ALL HAULS							[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
TOTAL NUMBER OF HAULS	12								1	6	4	1

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
[illegible]	[illegible]	0	1	0	[illegible]	57	[illegible]	[illegible]	.0	[illegible]	[illegible]	.0
CAP	1	[illegible]	3	[illegible]	[illegible]	[illegible]	144.3	[illegible]	.0	171.[illegible]	198.4	8.1
[illegible]	[illegible]	0	2	0	0	29	129.8	6	.0	.0	[illegible]	96.0
SPA	0	[illegible]	1	0	0	29	38.9	2	.0	16.6	[illegible]	.0
[illegible]	3	[illegible]	[illegible]	0	[illegible]	57	7.7	1	.0	4.5	3.1	7.4
SCM	1	1	0	0	0	29	12.2	1	.0	6.1	.0	.0
[illegible]	0	1	[illegible]	0	[illegible]	43	12.4	1	.0	9.3	.0	.0
STR	[illegible]	[illegible]	0	[illegible]	0	43	10.4	1	.0	7.4	.7	.0
Other fish							9.5	1				
MEAN CATCH OF ALL HAULS							631.2		.0	946.0	[illegible]	[illegible]
TOTAL NUMBER OF HAULS	7								0	4	2	1

Summary of catches from stn. 473 to stn. 503, Cape Verde - Cape Blanc, March 1982

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. (kg/h)	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
PCD	2	1	1	3	1	50	257.9	45	.0	205.8	36.1	.0
CAP	5	3	3	2	1	88	121.5	24	9.4	55.5	244.5	.0
SFA	2	2	1	0	1	69	90.6	18	.0	43.7	117.7	.0
SCI	0	2	3	1	0	48	121.2	9	.0	54.9	69.9	.0
JEL	1	1	3	1	0	78	101.4	7	1.0	77.4	.0	.0
TRI	1	2	3	1	0	44	71.4	7	.0	48.5	16.4	.0
ENG	2	1	0	1	0	25	100.4	5	1.4	44.9	.0	.0
CLU	2	2	2	0	0	69	19.4	3	1.3	18.4	5.0	.0
SEP	1	2	1	0	0	25	16.4	.	.0	15.9	.4	.0
ARD	0	2	0	0	0	13	5.4	1	.0	5.0	3.3	.0
CCR	1	0	1	0	0	13	27.0	1	.0	.1	13.1	.0
SER	1	0	1	0	0	13	51.0	1	.0	11.4	.0	.0
MUL	2	2	0	0	0	25	10.1	1	.0	.0	5.5	.0
PAY	1	2	0	0	0	19	15.5	1	.0	.4	7.1	.0
SCM	1	1	1	0	0	19	27.7	1	16.7	5.0	.0	.0
SHR	2	0	1	0	0	19	11.5	1	.0	1.0	14.2	.0
TRG	0	1	1	0	0	13	49.4	1	.0	2.1	17.0	.0
ZEI	4	2	0	0	0	38	10.9	1	.0	2.2	7.6	.0
Other fish							14.2	.				
MEAN CATCH OF ALL HAULS							517.1		31.4	533.1	574.1	.0
TOTAL NUMBER OF HAULS	16								1	9	6	0

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. (kg/h)	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
PCL	0	0	0	0	1	7	750.0	62	.0	.0	546.0	.0
ENG	0	1	0	1	0	12	183.5	8	.0	73.4	.0	.0
CLU	0	1	0	1	0	13	156.9	7	.0	51.2	9.2	.0
JEL	1	2	3	0	0	47	43.1	7	.0	5.8	.5	35.0
TRI	2	3	1	0	0	40	44.4	6	.0	7.5	11.6	5.2
PYC	0	0	1	0	0	7	154.9	4	.0	.0	.0	31.4
CCL	2	1	2	0	0	33	76.9	4	.0	52.3	1.2	5.4
PAR	2	2	0	0	0	27	9.7	1	.0	.7	4.9	2.1
SCM	3	0	0	0	0	20	6.8	1	.0	4.1	.0	.0
SER	0	1	0	0	0	7	22.8	1	.0	4.6	.0	.0
Other fish							.5	0				
MEAN CATCH OF ALL HAULS							265.8		.0	236.8	573.7	76.9
TOTAL NUMBER OF HAULS	15								0	5	5	5

Summary of catches from stn. 48 to stn. 116, Cape Verde - Bissagos Is., May 1981

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. (kg/h)	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
PAL	1	4	2	2	3	55	1359.8	49	14.0	1354.0	.0	.0
JEL	1	1	2	3	1	36	490.5	17	455.1	.2	35.7	.0
TCD	3	4	2	2	1	55	174.0	7	16.0	14.7	.0	.0
CAR	4	6	3	5	0	77	120.1	6	7.0	1.1	159.0	.0
SCI	1	3	1	1	1	32	165.0	4	167.0	.0	1.0	.0
SFA	1	2	4	1	1	41	147.0	4	46.0	11.1	114.1	.0
FLN	5	3	2	1	0	50	71.9	3	64.4	2.4	.0	.0
CLU	4	5	4	0	0	59	47.7	2	43.5	.0	1.7	.0
DAC	2	2	1	1	0	27	96.0	2	.0	76.0	.0	.0
ENG	1	0	0	0	1	9	73.0	2	61.5	.0	1.7	.0
ARD	1	4	2	0	0	32	51.7	1	5.0	.0	.0	.0
PAY	3	1	0	1	0	23	56.0	1	53.1	.0	1.5	.0
SFH	1	2	0	1	0	18	76.1	1	5.4	.0	.0	.0
Other fish							54.5	2				
MEAN CATCH OF ALL HAULS							1438.3		1135.7	2466.5	317.2	.0
TOTAL NUMBER OF HAULS	22								12	2	3	0

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. (kg/h)	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
ENG	1	0	1	0	4	23	1100.7	41	.0	.0	665.5	.6
HAL	2	4	0	0	1	27	442.0	19	4.1	383.4	1.2	.0
CLU	3	4	5	1	1	54	171.3	15	387.7	84.1	17.1	.8
CAR	4	4	3	2	0	58	76.0	7	7.1	81.6	14.6	77.9
POD	5	1	3	2	0	35	113.9	6	28.5	111.4	1.8	.0
SPH	1	4	4	0	0	35	74.1	4	6.1	72.1	6.6	.0
STN	0	0	0	1	0	4	241.2	2	.0	36.2	.0	.0
PPE	0	1	1	0	0	8	99.4	1	.0	5.8	16.8	.0
CRU	2	0	1	0	0	12	43.3	1	.0	.0	.0	32.4
SYR	3	1	1	0	0	19	29.1	1	.0	.0	14.5	.0
Other fish							14.8	2				
MEAN CATCH OF ALL HAULS							618.7		458.0	780.5	744.1	142.0
TOTAL NUMBER OF HAULS	26								4	8	10	4

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Summary of catches from stn. 275 to stn. 311, Bissagos Is. - Cape Verde, Sept. 1981

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
DAC	0	3	0	0	1	[illegible]	[illegible]	29	.0	[illegible]	.	.0
BAL	0	4	1	1	2	63	[illegible]	11	44.6	[illegible]	.0	.0
POD	1	4	3	0	1	[illegible]	[illegible]	11	182.5	47.4	.0	.0
SCI	1	1	0	1	2	37	[illegible]	11	[illegible]	.0	.0	.0
SPA	1	2	1	1	1	43	[illegible]	9	[illegible]	[illegible]	[illegible]	.0
CAR	4	3	4	1	1	67	96.5	7	[illegible]	[illegible]	[illegible]	.0
FLN	1	1	2	0	1	33	[illegible]	5	[illegible]	.0	.0	.0
CLU	0	6	3	1	0	37	[illegible]	4	[illegible]	[illegible]	[illegible]	.0
SHR	2	2	0	0	1	70	[illegible]	4	74.4	.0	.0	.0
ARG	3	0	2	1	0	40	[illegible]	3	[illegible]	.0	.0	.0
MIS	0	0	2	0	0	13	[illegible]	1	[illegible]	.0	.0	.0
MUL	1	2	1	0	0	27	[illegible]	1	1.8	[illegible]	.0	.0
SER	2	1	1	0	0	17	[illegible]	1	[illegible]	[illegible]	.0	.0
SFH	1	1	1	0	0	10	74.1	1	[illegible]	.0	.0	.0
SQU	3	1	1	0	0	33	[illegible]	1	[illegible]	[illegible]	.0	.0
THI	0	1	2	0	0	20	[illegible]	1	17.9	.0	.0	.0
Other fish							[illegible]	.				
MEAN CATCH OF ALL HAULS							[illegible]		[illegible]	[illegible]	[illegible]	.0
TOTAL NUMBER OF HAULS	15								10	4	1	0

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
ENG	0	0	0	0	1	5	1,000.0	51	.0	.0	.0	1000.0
BAL	2	1	2	0	1	27	1304.1	35	.4	5.0	1948.0	.0
CLU	4	2	5	1	0	55	74.5	4	64.2	42.5	.0	.0
CAR	4	5	1	1	0	50	[illegible]	5	16.4	55.0	.4	.0
DAC	2	0	0	0	1	14	248.5	5	.0	.4	165.5	.0
ARG	2	0	0	1	0	14	157.9	2	.5	.1	117.6	.0
POD	1	0	1	1	0	14	[illegible]	2	41.2	.0	.0	.0
SHA	0	1	1	1	0	14	[illegible]	2	45.2	2.6	.0	.0
SCM	1	2	0	1	0	18	71.5	1	.3	4.5	61.5	.0
Other fish							4.1	0				
MEAN CATCH OF ALL HAULS							[illegible]		179.3	117.3	[illegible]	1000.0
TOTAL NUMBER OF HAULS	22								8	9	4	1

Summary of catches from stn. 426 to stn. 472, Cape Verde - Bissagos Is., Feb. 1982

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
CAR	4	1	1	0	3	82	[illegible]	25	.7	[illegible]	[illegible]	[illegible]
APG	0	0	0	0	1	9	[illegible]	21	.2	.1	[illegible]	.0
SPA	0	0	4	0	2	55	[illegible]	21	.0	[illegible]	[illegible]	[illegible]
SCI	0	2	2	0	1	46	[illegible]	12	[illegible]	.0	[illegible]	.0
FLA	2	1	0	1	0	36	[illegible]	3	[illegible]	.2	.0	.0
ARG	1	1	2	0	0	36	[illegible]	3	[illegible]	.0	.0	.0
JEL	0	0	1	0	0	9	[illegible]	2	[illegible]	.0	.0	.0
POD	2	2	2	0	0	55	[illegible]	2	31.1	24.7	.0	.0
SQU	2	3	1	0	0	55	[illegible]	2	[illegible]	[illegible]	[illegible]	12.6
TRG	0	5	2	0	0	18	[illegible]	2	.0	[illegible]	44.0	.0
CEN	0	3	1	0	0	9	[illegible]	1	.0	.0	.0	[illegible]
CLU	0	1	2	0	0	27	[illegible]	1	[illegible]	.0	.0	.0
DAC	0	1	0	0	0	9	46.0	1	.0	[illegible]	.0	.0
OFD	0	0	1	0	0	9	84.0	1	.0	.0	[illegible]	.0
RAY	2	0	1	0	0	27	[illegible]	1	[illegible]	.0	[illegible]	.0
SCR	0	2	0	0	0	18	[illegible]	1	.0	.0	14.7	[illegible]
SHR	2	0	1	0	0	27	[illegible]	1	[illegible]	.0	.7	.0
TFI	2	2	0	0	0	36	16.0	1	16.0	.0	.0	.0
SEI	0	2	0	0	0	18	[illegible]	1	.0	.0	16.0	[illegible]
Other fish							16.0	1				
MEAN CATCH OF ALL HAULS							[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
TOTAL NUMBER OF HAULS	11								4	3	3	1

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BAL	0	4	0	0	1	36	623.5	61	.0	15.6	1200.0	.0
DAC	1	0	1	1	0	27	224.2	17	.8	111.8	.0	.0
POD	2	1	1	1	0	46	86.9	11	4.8	70.8	.0	.0
CLU	1	0	0	1	0	18	117.4	6	1.5	58.6	.0	.0
ENG	0	1	1	0	0	18	59.7	3	59.7	.0	.0	.0
STR	2	2	0	0	0	36	8.5	1	.6	5.4	.0	.0
Other fish							8.5	2				
MEAN CATCH OF ALL HAULS							371.1		84.1	252.3	1200.0	.0
TOTAL NUMBER OF HAULS	11								2	6	2	1

Summary of catches from stn. 48 to stn. 151, Bissagos Is. - Sierra Leone, May - June 1981

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BAL	0	2	0	5	11	64	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0
CAP	7	5	3	2	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0
STA	2	5	3	2	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0
POD	7	1	5	3	0	48	[illegible]	4	[illegible]	[illegible]	.0	.0
DAC	2	4	1	1	1	36	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0
CLU	5	3	3	0	0	36	50.8	[illegible]	[illegible]	7.7	[illegible]	.0
JEL	0	1	0	2	0	12	[illegible]	1	.0	[illegible]	.0	.0
MUL	1	2	1	0	0	16	44.3	1	[illegible]	[illegible]	.0	.0
TIB	3	3	1	0	0	28	[illegible]	1	[illegible]	[illegible]	.0	.0
OCI	0	2	3	0	0	[illegible]	[illegible]	1	[illegible]	[illegible]	.0	.0
CFR	0	3	1	0	0	16	[illegible]	1	.0	[illegible]	17.4	.0
NIB	1	4	2	0	0	28	[illegible]	1	[illegible]	[illegible]	.0	.0
SSO	2	0	1	1	0	40	[illegible]	1	[illegible]	[illegible]	[illegible]	.0
CPT	4	2	1	0	0	28	[illegible]	1	[illegible]	[illegible]	.0	.0
Other fish							[illegible]	1				
MEAN CATCH OF ALL HAULS							[illegible]		[illegible]	[illegible]	[illegible]	.0
TOTAL NUMBER OF HAULS	25								4	19	2	0

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BAL	5	2	1	1	3	76	[illegible]	92	.0	[illegible]	4.3	0
CLU	[illegible]	5	1	1	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0
ENG	0	2	2	0	0	14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	.0
CAP	[illegible]	2	[illegible]	0	0	[illegible]	[illegible]	1	[illegible]	[illegible]	1.8	.0
CFR	4	0	1	0	0	16	[illegible]	1	.0	.8	12.7	.0
Other fish							14.1	1				
MEAN CATCH OF ALL HAULS							[illegible]		[illegible]	[illegible]	[illegible]	.0
TOTAL NUMBER OF HAULS	28								1	17	8	2

Summary of catches from stn. 268 to stn. 274, Guinea-Bissau south of Bissagos Is., September 1981

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BAL	0	0	0	1	2	100	644.2	51	.0	[illegible]	[illegible]	.0
DAC	0	0	0	0	1	33	874.8	23	.0	.0	874.8	.0
CAR	0	0	0	2	0	67	[illegible]	19	.0	[illegible]	.0	.0
SFA	0	0	1	0	0	33	135.3	4	.0	67.6	.0	.0
SPH	0	2	0	0	0	67	[illegible]	2	.0	[illegible]	.0	.0
LET	0	1	0	0	0	33	39.4	1	.0	[illegible]	.0	.0
Other fish							4.2	0				
MEAN CATCH OF ALL HAULS							1266.0		.0	1266.0	1266.0	.0
TOTAL NUMBER OF HAULS	3								0	2	1	0

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	>500	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BAL	0	0	0	1	2	75	3260.3	86	.0	455.4	4435.1	.0
DAC	0	0	0	1	1	50	818.7	14	.0	.0	818.7	.0
Other fish							2.4	0				
MEAN CATCH OF ALL HAULS							2857.0		.0	456.0	5258.0	.0
TOTAL NUMBER OF HAULS	4								0	2	2	0

VI f

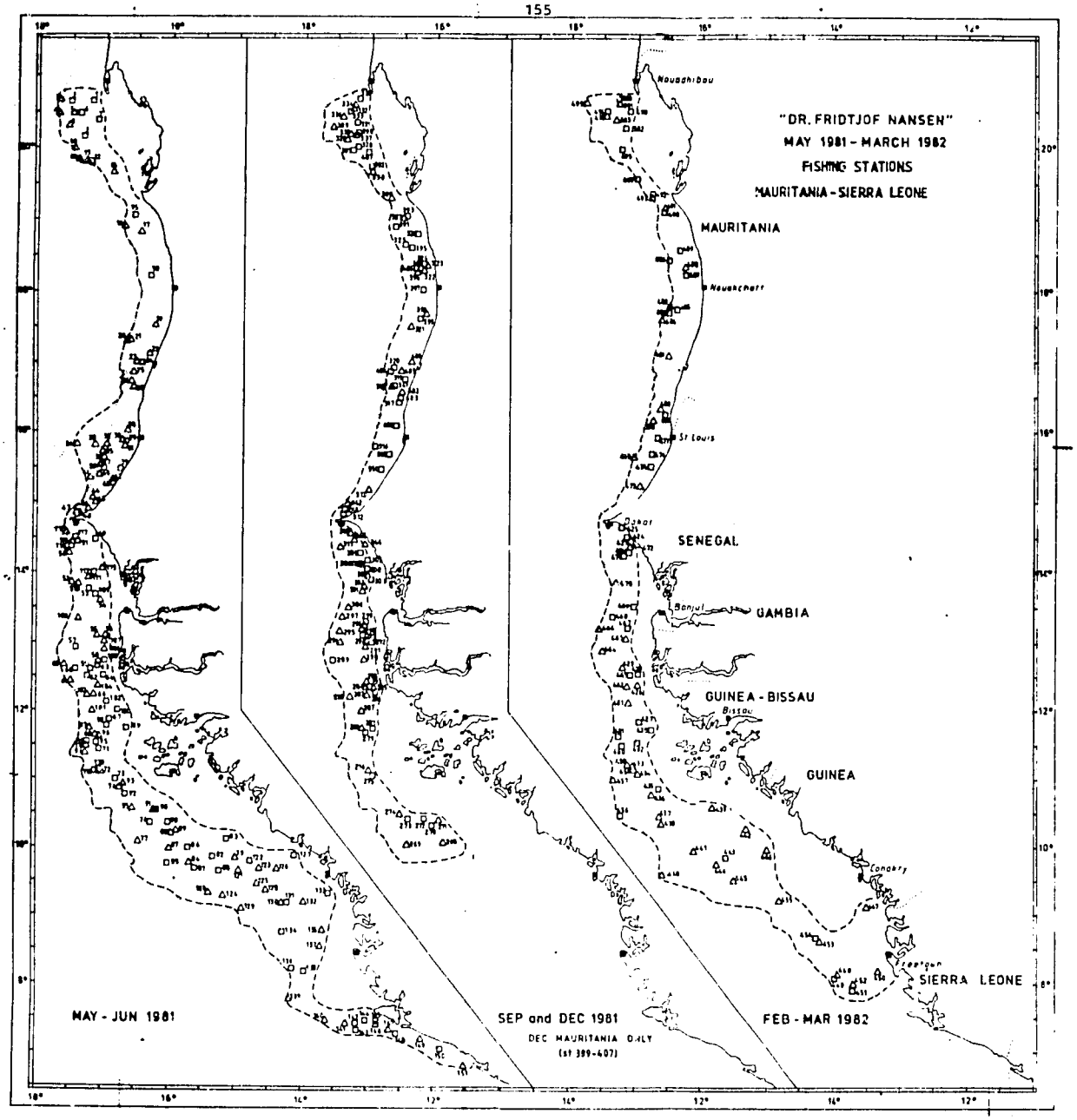
Summary of catches from stn. 426 to stn. 472, Bissagos Is. - Sierra Leone, February 1982

GEAR: BOTTOM TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	500-	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BAL	1	0	0	0	1	33	1800.0	71	.0	1800.0	.0	.0
JEL	1	0	1	0	1	50	305.7	15	457.5	.0	2.0	.0
TOD	0	1	0	1	0	50	67.3	5	135.0	0.3	29.6	.0
LAC	0	1	0	0	0	17	40.0	1	.0	17.0	.0	.0
SFA	1	1	0	0	0	33	14.3	1	.0	14.3	0.3	.0
Other fish							19.0	2				
MEAN CATCH OF ALL HAULS							416.4		592.5	1849.3	32.0	35.4
TOTAL NUMBER OF HAULS	6								2	2	1	1

GEAR: PELAGIC TRAWL

FAMILY	CATCH GROUPS (kg/h) 1-9	10-49	50-199	200-499	500-	% incidence in tot. no. of hauls	Mean c. of c. >1kg	% of total catch	MEAN CATCH OF ALL HAULS REFERRED TO BOTTOM DEPTH STRATA <20m	20-50m	50-100m	>100m
BOL	0	0	2	1	1	35	3790.0	94	.0	854.2	4000.0	216.5
JEL	1	1	0	1	0	18	124.2	2	182.2	.0	.0	.0
XNG	0	0	2	0	0	12	116.8	1	116.8	.0	.0	.0
PRA	1	0	1	0	0	12	52.4	1	50.4	.4	.0	.0
Other fish							16.8	1				
MEAN CATCH OF ALL HAULS							1032.4		349.0	808.2	4007.1	254.9
TOTAL NUMBER OF HAULS	17								2	9	2	4


"DR. FRIDTJOF NANSEN"
MAY 1981 - MARCH 1982
FISHING STATIONS
MAURITANIA - SIERRA LEONE
MAURITANIA
SENEGAL
GAMBIA
GUINEA - BISSAU
GUINEA
SIERRA LEONE
Nouadhibou
Nouakchott
St Louis
Dakar
Banjul
Bissau
Conakry
Freetown
MAY - JUN 1981
SEP and DEC 1981
DEC MAURITANIA DAILY
(st 399-407)
FEB - MAR 1982

A SURVEY OF THE FISH RESOURCES IN THE COASTAL WATERS OF THE REPUBLIC OF CAPE VERDE NOVEMBER 1981

by

T. STRØMME

S. SUNDBY

G. SAETERSDAL

INSTITUTE OF MARINE RESEARCH

BERGEN 1982

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1. INTRODUCTION

1.1 Objectives

In the period May 1981 - April 1982 a programme of acoustic fish resource surveys was conducted in West African waters with the R/V "Dr. Fridtjof Nansen". The programme included ten surveys covering areas between Agadir and Point Noir planned and carried out in close cooperation with the FAO/UNDP/Project: Development of Fisheries in the Eastern Central Atlantic through its headquarters in Dakar.

The work reported here was planned during a meeting in Praia in October 1981. The main objectives were:

a) An acoustic survey of the distribution and abundance of the pelagic and demersal resources.

b) Sampling of the distribution and size composition of the main species with pelagic and bottom trawl and with long lines where bottom conditions do not permit trawling.

c) A pilot acoustic study of the distribution and abundance of mesopelagic fish within the Cape Verde Archipelago.

d) Mapping of bottom conditions suitable for trawling, based on bottom traces from the acoustic system.

e) Investigations of main hydrographical conditions.

The participating scientific and technical staff is listed in Annex 1. All staff took part in sampling and gathering of data and carried out analysis and processing to the extent possible on board the vessel. The preliminary results were presented in a short cruise report.

1.2 Itinerary and survey coverage

The survey started from Dakar on 3 November and the vessel called on Praia on 5 November to pick up personnel from Cape Verde. After a calibration of the acoustic instruments in the bay of Praia, the vessel's propeller was seriously damaged, and the vessel had to return to Dakar for docking. After a ten days' delay the local participants were again embarked in Praia on 16 November.

The survey track together with fishing and hydrographical stations are shown in Figures 1 and 2. The islands were surveyed in a clockwise direction, beginning with Fogo in the west. The shelves of all the islands were covered, including also fishing banks within the archipelago. On the tracks between the islands and also on some broader sweeping tracks pelagic resources over deep water were investigated.

The vessel called on Praia on 27 November to exchange some of the Norwegian crew and the biologist from Cape Verde. The next day the vessel set out for a short trip of three days to resurvey the area around the islands Sal, Boavista and Maio, and this time also an attempt to evaluate the demersal resources by bottom trawling was made. The vessel made a last call on Praia on 1 December.

The Portugese navigational charts provided for the survey proved to be lacking in details for some of the islands with many shoals and breakers unmarked. For safety reasons this made parts of the shelves inaccessible to the vessel. As this mostly concerns the islands Santiago, Fogo, Brava and St. Nicolau where the shelf is extremely small, the lack of important acoustic and catch data seems negligible.

The traditional method of identifying and sampling the echo targets by midwater and bottom trawling could not be fully used as underwater peaks and heavily serrated shoals occurred

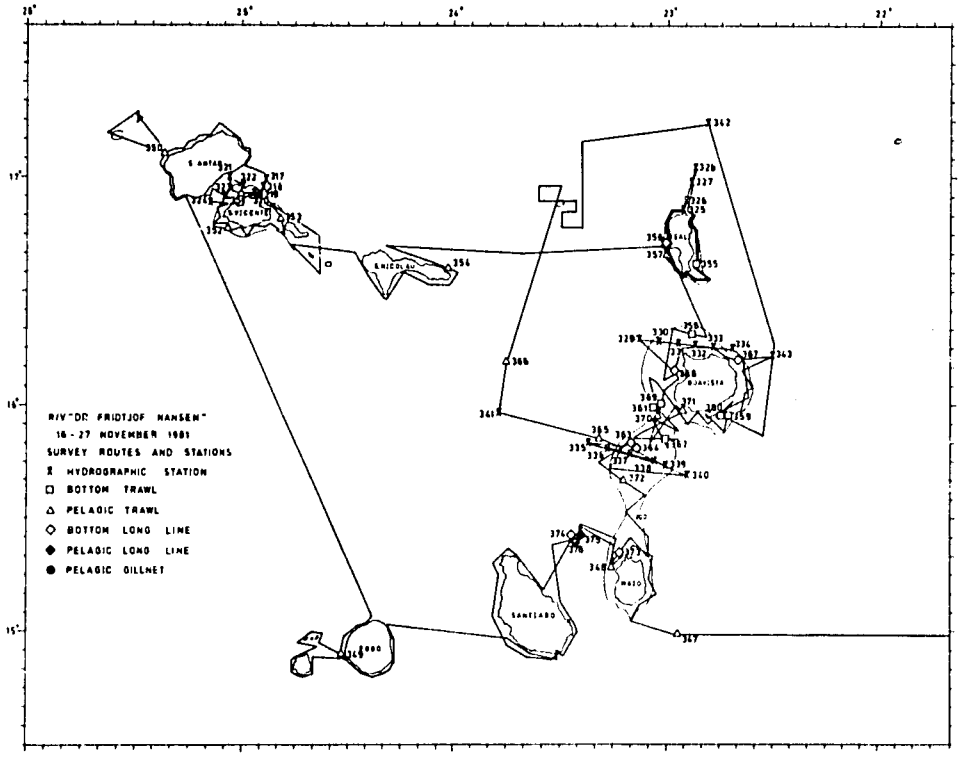

Fig. 1. Cruise track and stations 16 - 27 November 1981.

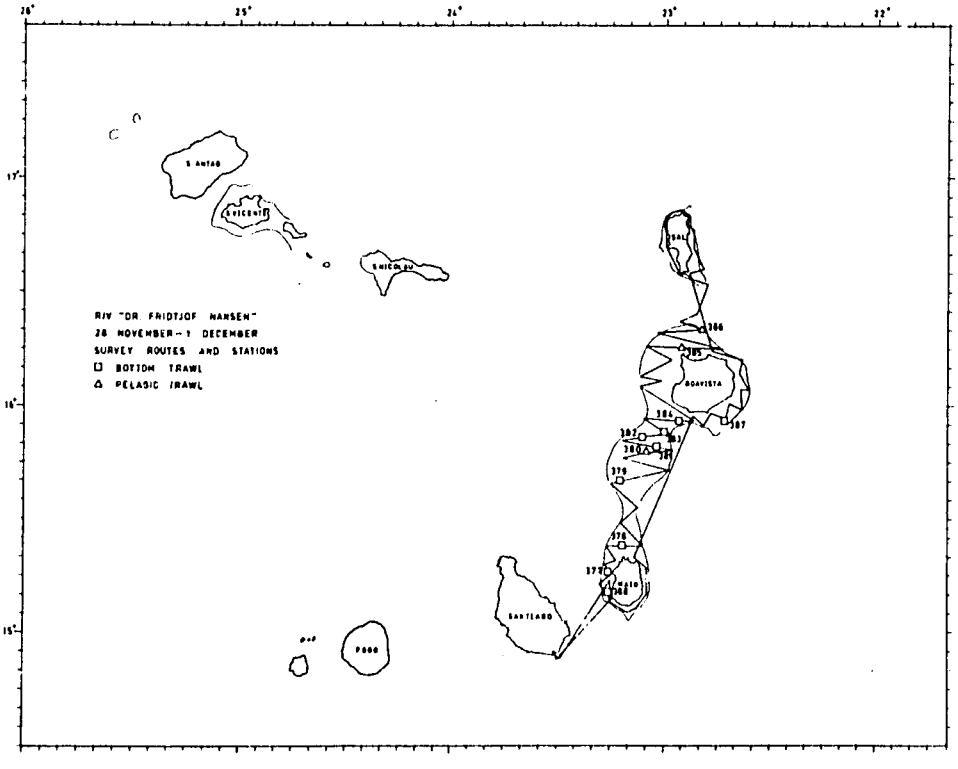

Fig. 2. Cruise track and stations 28 November - 1 December 1981.

frequently both on the shelf and close by. In such locations fishing with long lines was tried.

During the daily study of the echogrammes the bottom which seemed suitable for bottom trawling was marked off.

The survey comprised:

17 bottom trawl stations
17 pelagic trawl stations
8 long line stations
27 hydrographical stations

The total cruise track within the Cape Verde archipelago was 2500 nm.

2. RESULTS

2.1 Hydrography

General features of wind- and current conditions around the Cape Verde Islands

The Cape Verde Islands lie in the southern part of the Canary Current which runs south-westerly along the Northwest African Coast. The current direction is still south-westerly through the Cape Verde archipelago, but beyond this area it turns west and nortwest and then becomes the Northern Equatorial Current. The speed of the residual current is less than 0.5 knots (DIETRICH and ULRICH, 1968). The atmospheric circulation is dominated by the trade-wind of north-easterly direction.

Wind conditions and hydrographic conditions 18-25 november 1981

Standard meteorological observations were taken at the hydrographical stations. The wind velocity during this period was gentle to moderate breeze (4-7 $m \cdot sec^{-1}$), and the direction was constantly of NNE and NE. The wind measurements

from the hydrographic stations around the eastern archipelago (Fogo-Sal) is somewhat more northerly than from the stations in the sound between S. Antao and S. Vicente. Wind speed was also higher in the sound. This may be due to the time lag of 2-4 days between the measurements taken of the two areas. However, it may also be due to the local topography of the two islands S. Antao and S. Vicente, which may give a change of wind direction and an increase of wind speed through the sound.

During the cruise 27 Nansen casts were made. Temperature, salinity, and dissolved oxygen were observed at standard depths to the bottom or maximum 500 m.

In the upper wind-mixed layer the temperature is about 0.7°C lower at the west side of the archipelago Fogo-Sal, while salinity is somewhat higher. At most stations both temperature and salinity decrease towards the bottom. However, in the basin to the west of Fogo-Sal a layer of high saline water exists, about 50 m thick, with the core at about 75 m depth (Fig. 4). T-S analysis of the data shows that this water mass is also present on the east side, but here it is less pronounced.

Fig. 3, 4 and 5 show temperature, salinity and density of the João Valente Bank section. The bank seems to have influence on the vertical circulation. Upwelling occurs at the western edge. It seems to be most vigorous down to 150 m depth, but the salinity distribution indicates that it occurs to a less extent down to 300 m depth.

At the eastern edge of the bank the opposite prosess, downwelling, seems to occur below 125 m depth.

The upper mixed layer extends down to about 30 m depth around the Cape Verde islands. Above the João Valente Bank, it is considerably deeper, extending here to about 50 m depth. The deepening of the mixed layer above the bank is

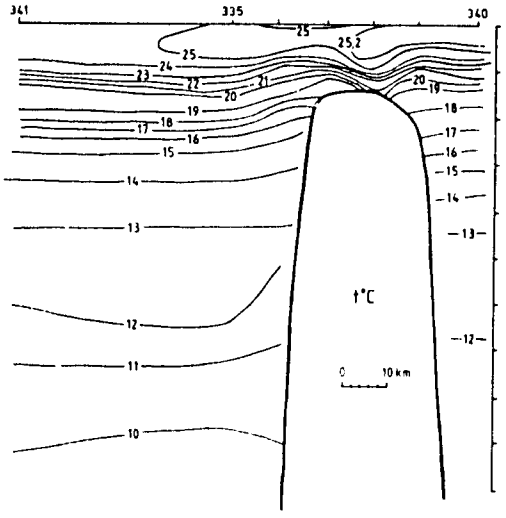

Fig. 3. Temperature, $t^{o}C$, at the João Valente Bank section 23 November 1981.

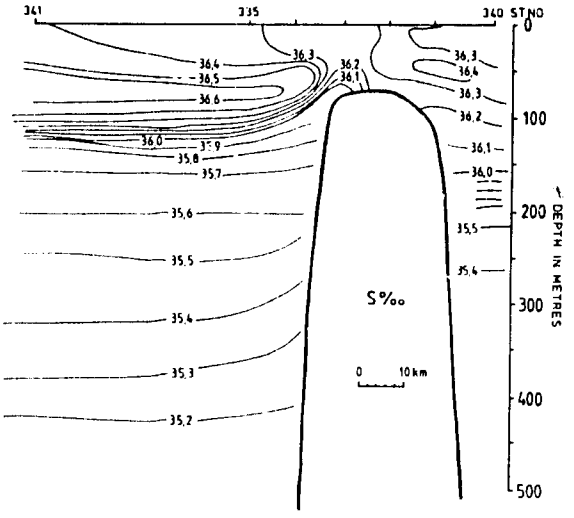

Fig. 4. Salinity, S^{o}/oo, at the João Valente Bank section 23 November 1981.

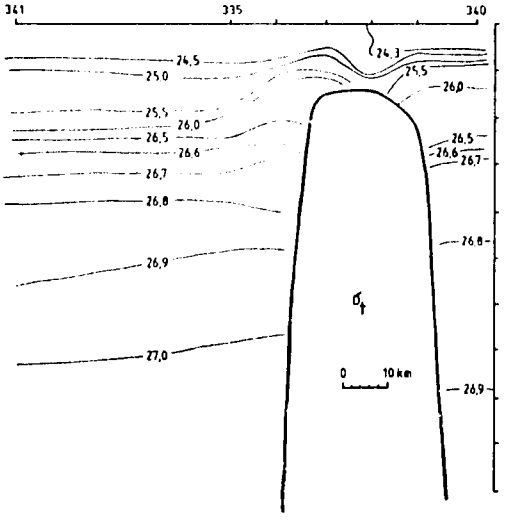

Fig. 5. Density, G_t, at the João Valente Bank sectio 23 November 1981.

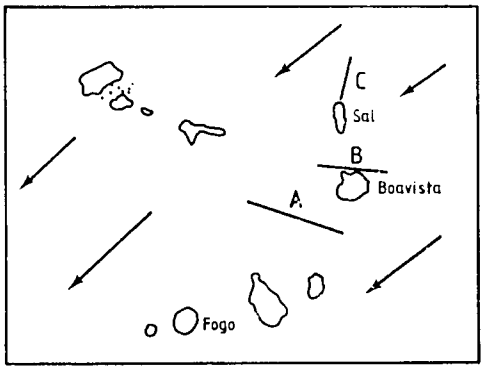

Fig. 6. General features of the current of the upper layer.

A. The João Valente Bank hydrographic section.

B. The Boavista hydrographic section.

C. The Sal hydrographic section.

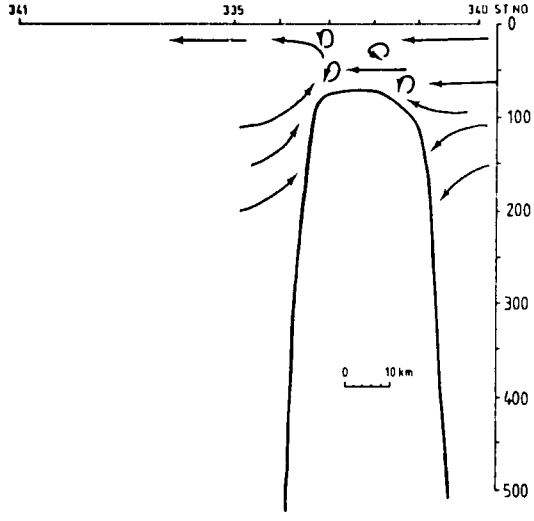

Fig. 7. Tentative vertical circulation across the João Valente Bank November 1981.

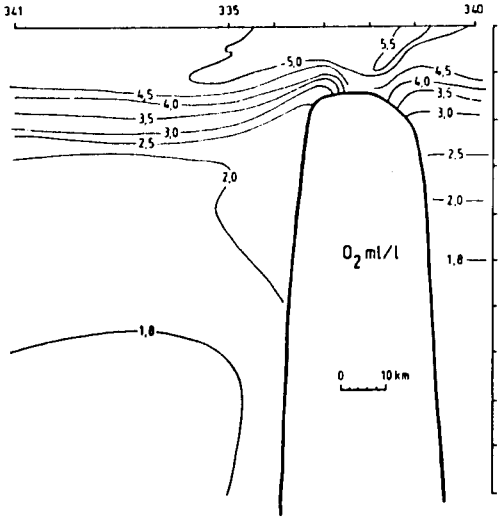

Fig. 8. Oxygen, ml/l, at the João Valente Bank section.

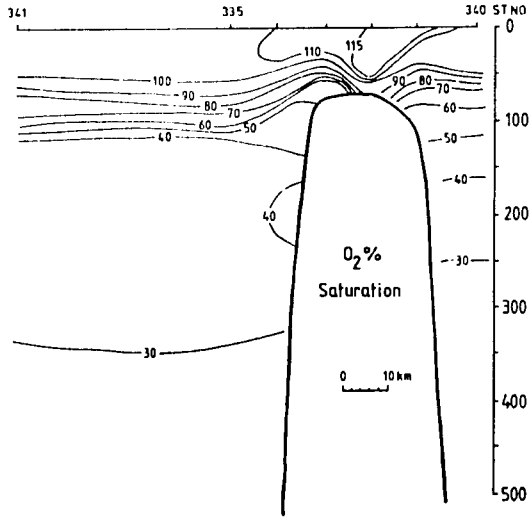

Fig. 9. Oxygen, % saturation, at the João Valente Bank section.

most probably due to higher vertical turbulence generated by waves and current. In the same way the upwelling at the western edge and downwelling at the eastern edge may be explained by an obstacle effect on the eastwest component of the upper layer current.

In Fig. 6 the residual current direction is drawn after DIETRICH and ULRICH (1968). Fig. 7 shows the vertical circulation around the João Valente Bank as described above.

The oxygen distribution at the Joao Valente Bank section shows similar features as the density distribution, indicating upwelling of oxygen poor water on the western edge. Fig. 8 and 9 show oxygen distribution in ml/l and percent saturation, respectively. The upper well mixed layer above the bank has very high concentrations of oxygen (120 percent saturation) indicating high primary production. This must be caused by the combined effect of upwelling and mixing bringing nutrient rich water into the euphotic zone.

The Boavista section shows similar features as the João Valente Bank section, but both upwelling and mixing of the upper layer above the shallow area are less pronounced here. This may, however, be an effect of the position of this section at the north part of the bank.

The surface temperature is shown in Fig. 10.

2.2 Bottom conditions

Fig. 11 shows the distribution of trawlable and non-trawlable bottom inside the 200 m depth contour. The evaluation is based on the degree of smoothness of the recordings from the echo sounder observations and on hauls with the bottom trawl gear. Only the Maio-Boavista shelf has appreciable areas suitable for trawling. A small patch southeast of Sal is also trawlable.

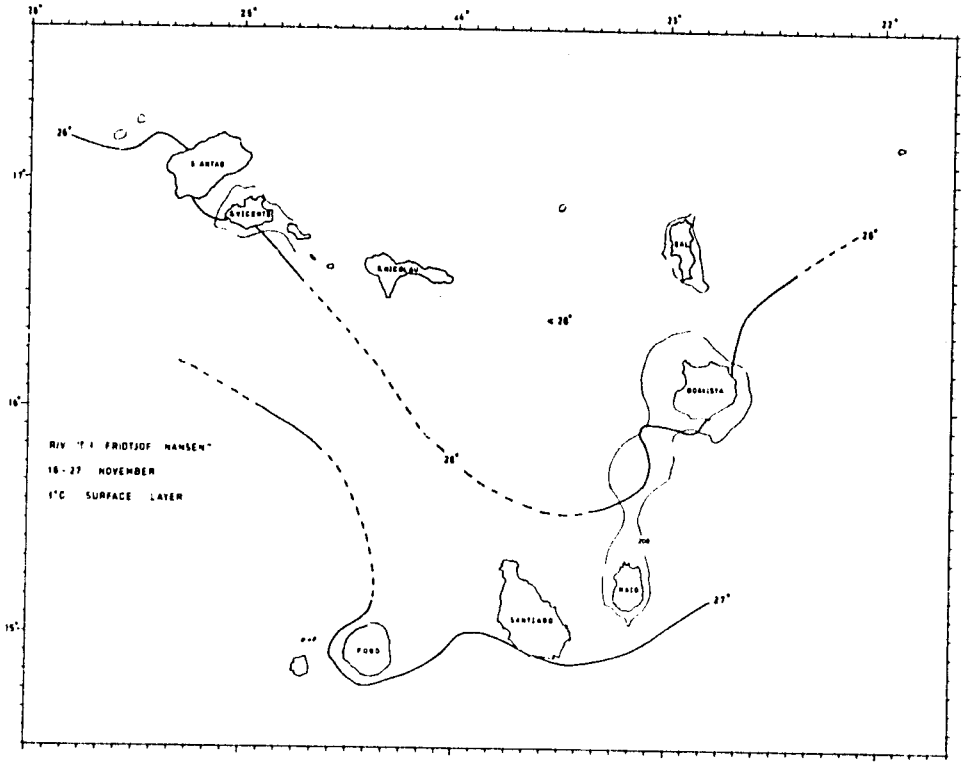

Fig. 10. Temperature °C in surface layer.

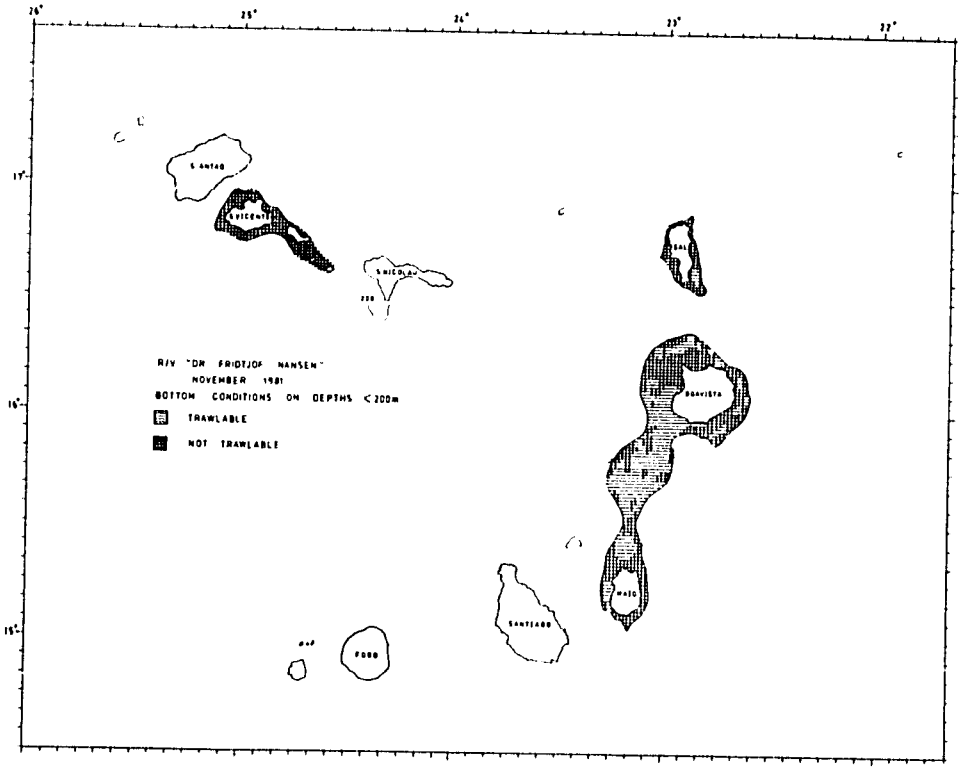

Fig. 11. Bottom conditions at depths less than 200 m.

2.3 Fish distribution and abundance

Figures 12 and 13 show the distributions of fish found during the first and second coverage respectively. The main species in the area when identified by fishing is marked off with a species code in Fig. 12.

Based on the characteristics of the echotraces and partly on the composition of the catches the indices of abundance were split into pelagic and demersal fish. This is a customary classification based on the distributional- and feeding behaviour of the various fish species. The criteria on which the separation is made are, however, uncertain and too much confidence should not be placed in these sub-estimates.

One result of the survey is the demonstration that the distribution of small pelagic and demersal fish is closely restricted to the shelf regions of the islands. No significant recordings of commercial fish were made over the deep-water areas between the islands. One should note, however, that this type of survey is not suitable for large pelagic fish such as tunas, and a possible occurrence of these would not be shown.

The observations of echo-intensity have been converted to measures of fish density in accordance with the conventional method described in Annex V. By area integration estimates of fish biomass are obtained and these are shown in Table 1 split on four sub-areas within the archipelago. The table includes approximate estimates of shelf areas and a calculation of the mean fish density inside the shelf, although this measure of productivity per unit shelf area may be of limited relevance in archipelagos with narrow shelves.

The estimate of total fish biomass for the Cape Verde Islands is 100 thousand tonnes of fish. Of this about half is allocated to pelagic species, mainly the scads Decapterus macarellus, D. punctatus and D. rhonchus.

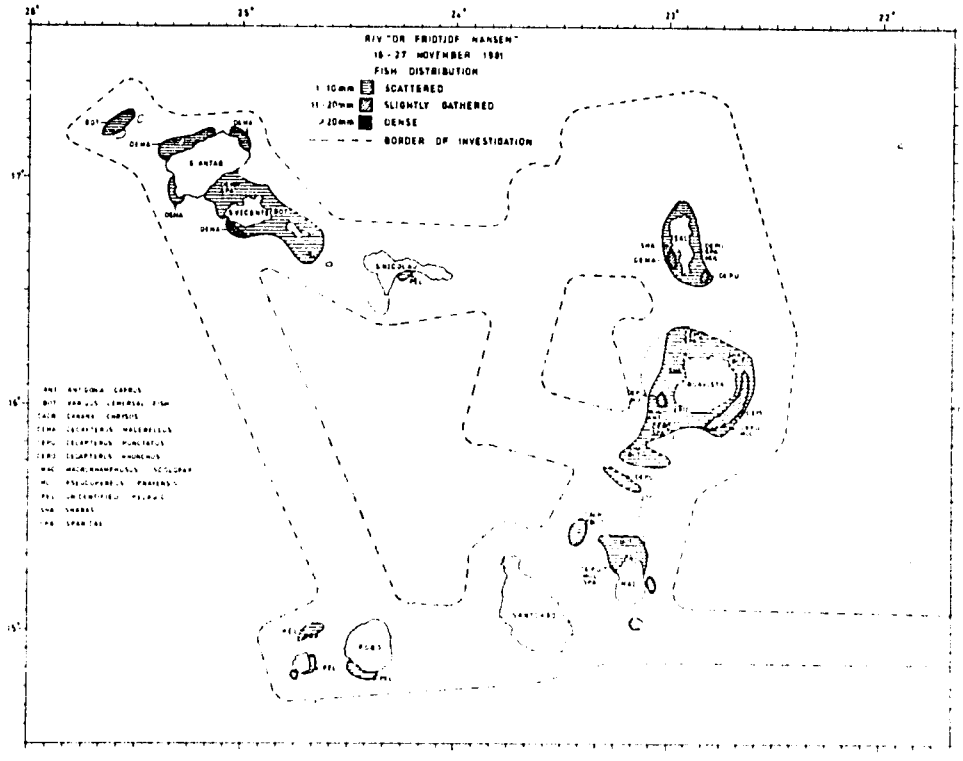

Fig. 12. Fish distribution 16 - 27 November 1981.
Echo-intensity by levels of integrator deflection.

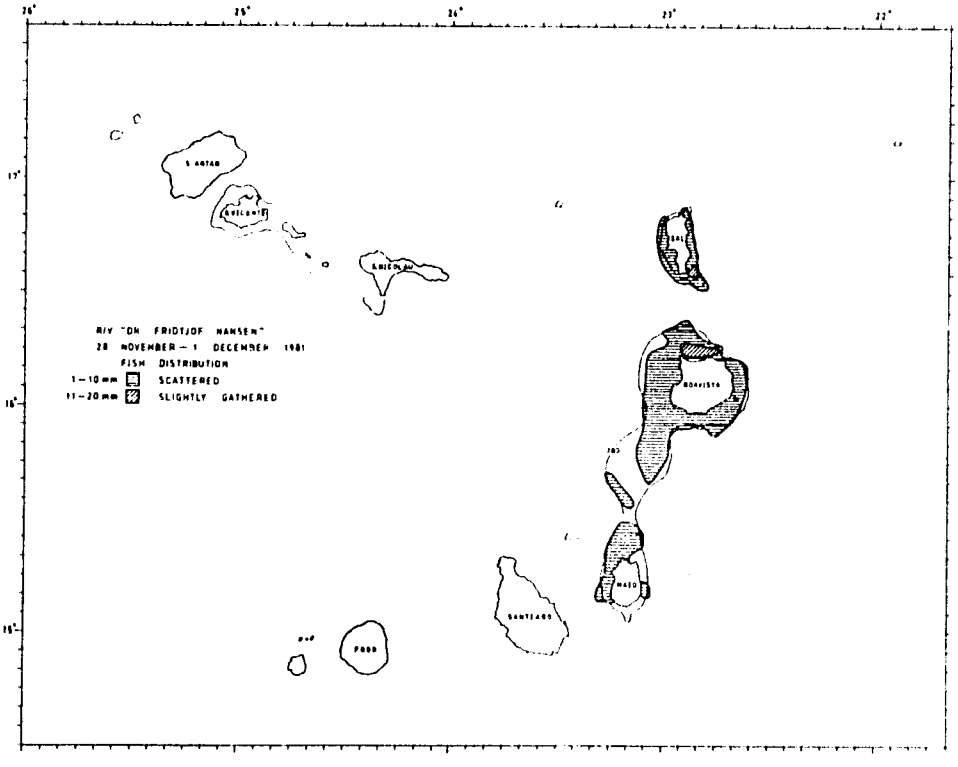

Fig. 13. Fish distribution 28 November - 1 December 1981.
Echo-intensity by levels of integrator deflection.

The islands Fogo and Santiago had only some faint recordings of fish, and the total estimate of 1 500 tonnes is considered to be of very low precision.

The shelf around Sto. Antao, S. Vicente and S. Nicolau contained about 20 thousand tonnes of fish. The pelagic contribution to this is about 15 thousand tonnes, which is mainly Decapterus macarellus around S. Vicente. The amount of demersal fish in the catches in this area is too low to provide any basis for assessment of species composition and distribution.

The shelf around Sal is approximate 150 nm^2. The estimate from the first covering is 9 thousand tonnes of fish. The dominating species were Decapterus macarellus, D. punctatus and Sardinella maderensis.

The shelf around Boavista and Maio and between the two islands is 850 nm^2 and comprises about 60% of the total shelf area belonging to Cape Verde Islands. This makes the area the most interesting in terms of fishery resources. The two repeated surveys of this area resulted in very similar assessments of total fish biomass: 69 thousand tonnes and 64 thousand tonnes respectively.

15 bottom trawl hauls were carried out around the islands Sal, Boavista and Maio. Though some of the hauls were aimed at fish concentrations identified by echo-sounders and thus not statistically random, a biomass estimate based on the catches and area swept by the trawl could give some tentative measure.

With a total shelf area around these islands of about 1 000 nm^2 a "swept area-estimate" of about 20 thousand tonnes of demersal fish is obtained. This is based on an assumed catchability coefficient q equal to one for the area between the wing ends of the trawl.

Catches of pelagic schooling species such as scads in the bottom trawl hauls have been excluded in these assessments. As shown in Table 1 the acoustic estimate of demersal fish on the Sal, Boavista, Maio-shelf is about 43 thousand tonnes. In contrast to the trawl estimates the acoustic assessment will include demersal type of fish traces which occur above the near-bottom layer of about 6 m covered by the trawl. It may on the other hand also include some pelagic fish with distributional characteristics similar to those of demersal fish. The best estimates of demersal fish on this shelf part is probably 20-30 thousand tonnes which leaves 50-60 thousand tonnes of pelagic fish.

The pelagic resources around Boavista and Maio are mainly made up of the species Decapterus punctatus, D. macarellus, D. rhonchus and Sardinella maderensis, mentioned in order of importance.

The demersal fish were mainly representatives of the families Sparidae, Mullidae, Acanthuridae, and Caproidae.

2.4 Results of fishing operations

The records of the fishing operations are shown in Annex II. The catch rates in the 15 successful bottom trawl catches are shown in Table 2. The high catches consisted mainly of scads. Also generally the carangids dominated the catches, being present in 65% of the trawl hauls as shown in Table 3. Other common families were Sparidae and Mullidae.

The pelagic trawl hauls are of less interest from a fishing operations point of view as they were made mainly for the purpose of identifying acoustic scatterers.

A total of 8 bottom line trials of 300-400 hooks each yielded catches from 0 to abt 80 kgs mostly small sized sharks.

Table 1. Estimated biomass and approximate shelf areas in the waters off Cape Verde Islands.

	Pelagic (10^3 tonnes)	Demersal (10^3 tonnes)	Total (10^3 tonnes)	Shelf area 0-200 m (nm^2)	Mean density (tonnes/nm^2)
Fogo, Santiago	1	0.5	1.5	-	-
Sto Antao, S. Vicente, S. Nicolau	15	5	20	440	45.8
Sal, Boavista, Maio, first covering	34	43	77	1008	76.8
Sal, Boavista, Maio, second covering	-	-	79	1008	78.6
Total Cape Verde Islands	50	50	100	1447	69.1

Table 2. Catch rates in bottom trawl.
Catch per hour in kgs.

Catch (kgs)	0-100	100-200	400-500	500-1000	Abt 2000	Abt 4000	Abt 6000
No hauls	3	1	1	7	1	1	1

Table 3. Distribution of trawl catches by main families.

Catch grouping: kg/hr	1-9	10-49	50-199	200-499	>500	% incidence in total no of hauls	Mean catch	% of total catch
TRAWL: BOTTOM NO OF HAULS : 17								
FAMILY:								
CARANGIDAE	0	4	1	2	4	65	1050.3	59
SPARIDAE	0	1	3	4	1	53	301.5	14
MULLIDAE	2	0	4	[illegible]	1	47	212.6	9
CAPROIDAE	2	1	1	2	1	41	233.3	8
POMADASYIDAE	0	1	2	0	0	18	100.0	2
SHARKS	0	5	1	0	0	35	50.3	2
ACANTHURIDAE	0	0	0	1	0	6	248.0	1
DACTYLOPTERIDAE	4	3	1	0	0	47	16.4	1
FISTULARIDAE	5	1	1	0	0	41	13.1	1
MACROURIDAE	1	0	0	1	0	12	131.6	1
PRIACANTHIDAE	2	1	1	0	0	24	14.5	1
Other fish	-	-	-	-	-	-	30.7	2
TOTAL	0	0	3	1	11	88	1155.2	
GEAR: PELAGIC NO OF HAULS : 17								
FAMILY:								
CARANGIDAE	2	3	4	1	0	59	71.2	49
MYCTOPHIDAE	0	1	1	0	1	18	228.2	47
CLUPEIDAE	1	1	0	0	0	12	8.7	1
Other fish	-	-	-	-	-	-	2.0	2
TOTAL	1	6	6	1	1	88	85.2	

2.5 Mesopelagic fish

This category of fish consists of small-sized species of less than 10 cm total length which occur in layers at water depths of 200-600 m, but often rise to the surface layers at night. On all the off-shelf tracks in the archipelago observation of mesopelagic fish formed part of the programme. They were found to occur over wide areas, but nowhere in rates of abundance which might indicate a resource of commercial interest. Catches up to 600 kg/hr were obtained in pelagic trawl hauls, consisting mostly of Myctophids.

2.6 Findings regarding the main species

Decapterus macarellus

This scad was the dominating species in the northern part of Cape Verde Islands. It was caught west of Sto. Antao, around S. Vicente, west of Sal and around Boavista. The highest concentrations were found south of S. Vicente and east of Sal (st. 357). All catches were made with pelagic trawl. The best catch was 136 kg/hr, but this do in no way indicate the best possible catches, as fishing were carried out only to identify the echo targets. *Decapterus macarellus* was found on five stations around Boavista, but in low quantities only. The species was here mixed with *Decapterus punctatus* of which the last was clearly the dominating one. In the region Sal - Boavista the mean length in the samples were within the range 17.4 - 20.1 cm, while in the Sto. Antao - S. Vicente region the mean ranged from 25.2 to 28.1 cm.

Decapterus punctatus

was found around Sal, Boavista and Maio. The best concentrations were on the south-eastern part of Boavista, where good schools formed during the day, and a dense scattering layer during the night. The biomass estimate for these dense concentrations is 6500 tonnes. The best catches of *Decapterus punctatus* were also obtained from these concentrations with

4.8 and 3.9 tonnes/hour. Mean lengths were in the range 11.5 - 21.3 cm. No clear size-dependent distribution could be seen from the samples, but samples from the dense concentrations southeast of Boavista gave mean lengths of 11.2 and 11.5 cm. It is interesting to note that Decapterus punctatus had its center in terms of density southeast of Boavista while D. macarellus was concentrated south of S. Vicente. Only on some part of the shelf off Boavista did the two species mix somewhat, but then only with very disperse concentrations of Decapterus macarellus. The separate habitats of the closely related species seems to be a way to avoid a competitive exclusion, though no hydrological or biological differences is found to explain the phenomenon.

Decapterus rhonchus

The false scad was caught on five stations north and southeast of Boavista. Except two catches of 842 and 81 kg/hr respectively, only scattered specimens were caught. The mean length in samples were from 15.6 to 26.8 cm. The species do not seem to form an important part of the total biomass of pelagic fish.

Sardinella maderensis

Was caught on four locations around Sal and Boavista, but only in small quantities (max. 32 kg/hr). Mean lengths in samples were from 14.5 to 22.4 cm.

Caranx crysos

The blue runner was caught and identified on one location only, on the bank 15 nm northwest of Maio. The species is too fast-swimming to be trapped in the trawl gear used, but was caught on two settings with bottom long line. The fish formed dense schools during the day, easily detected by the echosounders. 26 specimens (37 kg) were caught on 400 hooks. The size range was from 41 to 64 cm.

Sharks

The sharks caught in the area were mainly Mustelus mustelus and Rhizoprionodon acutus. They were caught both in bottom trawl and on bottom long line. The species were caught on nine fishing stations around Sal, Boavista and Maio. The best catch was on a 300 hook, long line station just west of the João Valente Bank (st. 363). The catch was 35 sharks of 79 kg.

Other fish

Pseudupeneus prayensis was caught on 8 locations. The best catches were 1070 and 212 kg/hr. The mean lengths from five samples were within the range 16-20 cm. The commercial valuable groupers Epinephelus guaza and E. alexandrinus were caught only on two locations, st. 364 and st. 370.

3. SUMMARY OF FINDINGS AND DISCUSSION

The survey covered mainly the shelf areas of the islands, but with some course lines extending off the shelves and in-between the islands. The larger shelf Maio - Boavista was covered two times. Observations of bottom conditions showed that only the Maio - Boavista shelf had appreciable areas suitable for trawling. An interesting feature of the findings of the oceanographical observation is the indication of upwelling on the western side of the João Valente Bank. This is judged to be an effect of the prevailing current- and wind systems and since these are active over large parts of the year, it seems likely that the upwelling is a process of significant importance for the biological production in this area. About 3/4 of the total fish biomass estimated for the whole archipelago of about 100 thousand tonnes was found over the shelf areas of Maio - Boavista - Sal. The findings of small pelagic and the demersal fish was almost exclusively located to the island shelf areas. Over the deeper waters off the shelf only very limited resources of mesopelagic

fish were observed. It should be noted, however, that resources of larger pelagic fish such as tunas are not covered by this type of survey.

The acoustic survey indicates that the total biomass of 100 thousand tonnes consists of demersal and small pelagic fish in a 50/50 proportion. An estimate of the stock of demersal fish based on the trawl swept area method suggests that this category may have been somewhat overestimated by the acoustic survey, and that true proportion may be approximately represented by about 65 thousand tonnes of small pelagic fish and 35 thousand tonnes of demersal species. The bulk of the pelagic fish consists of scads. These were also the only species caught in considerable quantities by bottom trawl, up to about 5 tonnes per hour's tow.

A report of previous exploratory resource surveys carried out with the trawler "Ernst Haeckel" of the German Democratic Republic was made available by the Department of Fisheries, Praia (Anon, 1976). In about two weeks survey in each of April and October 1976 good fishing grounds for bottom trawl were located on the shelf around Boa Vista and on the João Valente Bank. Good catches were obtained with the bottom trawl with an average of 5-6 tonnes per hour and ranging up to 30 tonnes per hour. About 50% of the catches was reported to consist of the horse mackerel species Trachurus picturatus. Not a single specimen of this fish was identified in the survey reported here. Boops boops was the next common species in the 1976 surveys with about 19% of the total catch in the October coverage. The high catch rates of Trachurus picturatus by the "Ernst Haeckel" suggests a considerable abundance of this species in the archipelago at that time. Its absence in the autumn of 1981 indicates that the occurrence of this horse mackerel, which otherwise is known from the Azores, Madeira and Canary Islands systems and from Morocco, is only periodic in the Cape Verde archipelago.

4. LITERATURE

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Annex I. Participating scientific staff

From the Institute of Marine Research, Bergen:

Mr T. Strømme (cruise leader)
Mr H. Gjøsaeter (biologist)
Mr K. Strømsnes (research technician)
Mr H.P. Knutsen (instrument chief)
Mr B. Kvinge (instrument technician)

From CECAF, Dakar:

Mr G.V. Everett (CECAF Programme Leader), 3-8 Nov.

From the Republic of Cape Verde:

Miss V. Marques da Silva (biologist) 5-6 Nov. 16-27 Nov.
Mrs M.H. Vieira (biologist) 28 Nov.-1 Dec.

From FAO/UNDP Cape Verde:

Mr G. Beven (fishing master) 5-6 Nov. 16 Nov.-1 Dec.

Annex II. Records of fishing operations

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION EAST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	WEIGTH (KG) %
14.11	1948	346	PT	>500	25	14°43'	018°38'	1000,0	2000,0	SALPS	2000,00	100,0
15.11	1951	347	PT	>500	15	15°00'	022°57'	300,3	600,6	MYCTOPHIDAE	600,00	99,9
16.11	0134	348	PT	44	1	15°18'	023°15'	2,3	4,6	Sardinella maderensis	,40	8,6
										Atlennes hians	,40	8,6
										Decapterus punctatus	,20	4,3
										Selar crumenophthalmus	2,60	56,5
										C E P H A L O P O D A	1,00	21,7
17.11	0736	349	PT	>500	60	14°65'	024°32'	5,0	12,0	Vinciguerria sp	12,00	100,0
18.11	0450	350	PT	250	60	17°06'	025°21'	68,0	136,0	Decapterus macarellus	136,00	100,0
18.11	1457	351	PT	70	60	16°56'	025°00'	10,0	10,7	Spondyliosoma cantharus	3,85	35,9
										Decapterus macarellus	6,95	64,9
18.11	2354	352	PT	85	25	16°47'	025°03'	34,0	56,4	Decapterus macarellus	56,44	100,0
19.11	0350	353	PT	25	1	16°49'	024°49'	,0	,0	NO CATCH	,00	,0
19.11	2324	354	PT	>500	30	16°38'	024°03'	19,0	38,0	Cubiceps sp	2,24	5,8
										Neolatus tripes	,38	1,0
										SALPS	35,14	92,4
20.11	1715	355	BT	23	23	16°37'	022°52'	298,0	810,5	Decapterus punctatus	224,40	27,6
										Pseudupeneus prayensis	122,67	15,1
										Diplodus bellottii	149,60	18,4
										Trachinotus ovatus	59,84	7,3
										Lithognathus mormyrus	92,75	11,4
20.11	2135	356	BL	49	49	16°43'	023°01'	6,0	6,0	Mustelus mustelus	6,00	100,0
20.11	2220	357	PT	60	20	16°41'	023°01'	78,1	141,3	Decapterus macarellus	118,55	83,8
										Sardinella maderensis	2,26	1,5
										Selar crumenophthalmus	4,34	3,0
										Uraspis secunda	4,76	3,3
21.11	0949	358	BT	78	78	16°19'	022°53'	878,1	1317,1	Decapterus punctatus	1236,00	93,8
										Pagellus acarne	22,50	1,7
										Diplodus sp	28,50	2,1
										Mustelus mustelus	13,50	1,0
22.11	0930	359	BT	62	62	15°57'	022°43'	10,0	20,0	SALPS	,00	,0
22.11	1100	360	BT	60	60	15°57'	022°44'	3000,0	6000,0	Lithognathus mormyrus	93,80	1,5
										Decapterus punctatus	4837,60	80,6
										Pseudupeneus prayensis	1068,80	17,8
22.11	1630	361	BT	80	80	15°59'	023°03'	,0	,0	NO CATCH	,00	,0
22.11	2125	362	BT	73	73	15°51'	021°55'	1131,0	2262,0	Decapterus rhonchus	842,00	37,2
										Boops boops	966,00	42,7
										Antigonia capros	234,60	10,3
										Chelidonichthys lastoviza	30,00	1,3
22.11	2320	363	BL	54	54	15°50'	023°10'	79,0	79,0	Mustelus mustelus	79,00	100,0
23.11	1009	364	BL	32	32	15°48'	023°11'	35,0	35,0	Cephalopholis taenopsis	11,30	32,2
										Paraphristipoma sp	4,20	12,0
										Epinephelus guaza	14,00	40,0
										Epinephelus alexandrinus	2,80	8,0
23.11	1900	365	PT	>500	40	15°50'	023°18'	23,3	30,9	MYCTOPHIDAE	23,67	76,6
										Cubiceps gracilis	1,96	6,3
										SALPS	4,92	15,9
24.11	0215	366	PT	500	40	16°21'	023°45'	33,0	66,0	MYCTOPHIDAE	61,00	92,4
										SALPS	1,00	1,5
										S H R I M P S	2,00	3,0
										C E P H A L O P O D A	1,00	1,5
25.11	0704	367	BL	24	24	16°12'	022°39'	75,0	75,0	Mustelus mustelus	38,00	50,6
										Rhizoprionodon acutus	21,00	28,0
										Lethrinus atlanticus	8,30	11,0
										Lagocephalus laevigatus	4,40	5,8
25.11	1210	368	BL	20	20	16°09'	022°58'	27,1	27,1	Mustelus mustelus	2,10	7,7
										Rhizoprionodon acutus	16,50	60,8
										Lethrinus atlanticus	1,70	6,2
										Lagocephalus laevigatus	1,70	6,2
										Lycodontis sp	5,10	18,8

DATE	TIME START	STN No.	GEAR TYPE	DEPTH (M) BOTTOM	DEPTH (M) GEAR	POSITION NORTH	POSITION EAST	CATCH (KG) TOTAL	CATCH (KG) PR HR	DOMINANT SPECIES	WEIGTH (KG) PR HR	%
25.11	1515	369	PT	73	73	16°05'	023°02'	255,0	510,0	Boops boops	16,00	3,1
										Pagellus acarne	25,60	5,0
										Pseudupeneus prayensis	212,80	41,7
										Decapterus punctatus	232,00	45,4
25.11	1655	370	PT	90	90	15°57'	023°03'	229,0	458,0	Macrorhamphosus scolopax	261,00	56,9
										Antigonia capros	122,40	26,7
										Dactylopterus volitans	65,70	14,3
										Epinephelus alexandrinus	7,30	1,5
25.11	2000	371	PT	59	25	15°59'	022°56'	28,8	28,8	Sardinella maderensis	,90	3,1
										Boops boops	,90	3,1
										Decapterus punctatus	21,80	75,6
										Decapterus macarellus	4,70	16,3
26.11	0150	372	PT	72	35	15°40'	023°12'	22,0	44,0	Decapterus punctatus	29,80	67,7
										SALPS	14,20	32,2
26.11	0805	373	PL	24	24	15°21'	021°13'	,0	,0	NO CATCH	,00	,0
26.11	1300	374	PL	40	40	15°26'	023°26'	30,0	12,0	Seriola carpenteri	1,40	11,6
										Caranx crysos	10,32	86,0
										Lycodontis sp	,20	1,6
26.11	1440	375	PL	45	45	15°26'	023°25'	13,0	4,8	Caranx crysos	4,25	88,5
										Diplodus fasciatus	,37	7,7
26.11	1810	376	PN	47	47	15°27'	023°25'	,0	,0	NO CATCH	,00	,0
26.11	1650	377	BT	32	32	15°16'	023°15'	330,0	660,0	Pseudupeneus prayensis	152,40	23,0
										Decapterus punctatus	76,80	11,6
										Decapterus macarellus	18,00	2,7
										Pagellus acarne	312,00	47,2
28.11	1935	378	BT	46	46	15°23'	023°12'	440,0	880,0	Acanthurus monroviae	248,00	28,1
										Priacanthus arenatus	150,40	17,0
										POMADASYIDAE	144,00	16,3
										Boops boops	51,20	5,8
										Mustelus mustelus	144,00	16,3
28.11	2355	379	BT	72	72	15°40'	023°12'	447,0	894,0	MYCTOPHIDAE	15,20	1,7
										Pagellus acarne	22,80	2,5
										Boops boops	463,60	51,8
										Antigonia capros	330,60	36,9
29.11	0435	380	PT	70	20	15°48'	023°05'	30,0	60,0	Decapterus macarellus	25,20	42,0
										Decapterus punctatus	2,40	4,0
										SALPS	32,60	54,3
29.11	0635	381	BT	[illegible]	72	15°49'	023°01'	80,0	160,0	Mustelus mustelus	44,00	27,5
										Fistularia petimba	63,00	39,3
										Zeus faber	8,60	5,3
										Decapterus punctatus	23,40	14,6
29.11	0935	382	BT	112	112	15°52'	023°06'	463,0	926,0	Antigonia capros	924,00	99,7
29.11	1130	383	BT	74	74	15°53'	023°00'	45,0	90,0	Mustelus mustelus	49,60	55,1
										Decapterus punctatus	9,60	10,6
										Antigonia capros	16,40	18,2
										Dactylopterus volitans	6,80	7,5
29.11	1400	384	BT	42	42	13°56'	022°56'	45,0	90,0	Mustelus mustelus	23,00	25,5
										Fistularia petimba	6,80	7,5
										Aluterus punctatus	61,20	68,0
29.11	2151	385	PT	42	15	16°16'	022°55'	124,0	224,4	Decapterus punctatus	123,08	54,8
										Decapterus rhonchus	81,08	36,1
										Sardinella maderensis	15,20	6,7
										Boops boops	3,25	1,4
30.11	0355	386	PT	83	35	16°20'	022°49'	46,0	92,0	Decapterus punctatus	91,60	99,5
30.11	1720	387	BT	68	68	15°56'	022°43'	2000,0	4000,0	Decapterus punctatus	3938,00	98,4
										Pseudupeneus prayensis	62,00	1,5
01.12	0225	388	BT	27	27	15°05'	015°08'	280,0	560,0	Lithognathus mormyrus	282,00	50,3
							23'15			Diplodus prayensis	12,60	2,2
										Pomadasys incisus	125,60	22,4
										Pseudupeneus prayensis	75,20	13,4

ANNEXE III. Results from length measurements

FAMILY/SPECIES	STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
CAPROIDAE						
Antigonia capros						
	379	11.0	16.0	14.2	.8	89
	383	6.5	15.5	13.3	1.9	48
CARANGIDAE						
Caranx crysos						
	374	41.0	64.0	51.9	6.4	18
	375	43.0	63.0	52.7	6.8	8
Decapterus punctatus						
	355	11.5	21.5	18.2	1.8	147
	358	12.5	19.0	14.0	1.0	117
	360	9.0	17.0	11.5	1.3	119
	369	12.5	19.0	14.3	1.1	115
	371	12.0	19.5	15.6	1.5	126
	372	17.5	23.5	21.3	1.1	107
	377	15.0	22.0	17.4	1.1	134
	380	18.0	21.0	19.4	.9	14
	381	19.0	24.0	21.1	1.1	98
	383	18.5	22.0	20.0	.9	32
	385	8.5	18.0	11.7	2.1	96
	386	13.5	21.5	16.2	1.6	159
	387	10.0	13.5	11.2	.9	100
Decapterus rhonchus						
	362	24.0	30.0	26.8	1.2	111
	371	12.0	18.0	15.5	1.8	39
	385	13.0	24.0	15.6	1.4	99
Decapterus macarellus						
	350	19.0	32.0	25.2	3.9	100
	351	28.5	32.0	29.9	1.0	23
	352	21.0	33.5	28.0	2.4	53
	357	11.0	22.0	17.4	2.1	97
	371	16.5	27.0	18.7	2.0	82
	377	17.5	21.5	19.5	1.1	20
	380	17.0	28.5	20.1	1.7	150
Selar crumenophthalmus						
	348	13.5	17.0	15.3	1.0	32
	357	13.5	17.5	14.7	.9	32
CLUPEIDAE						
Sardinella maderensis						
	357	12.0	17.0	14.5	1.2	23
	371	16.0	25.0	20.2	3.0	11
	385	17.5	26.0	22.4	1.7	35
LETRINIDAE						
Lethrinus atlanticus						
	367	35.0	41.0	37.8	2.0	10
LUTJANIDAE						
Lutjanidae indet.	378	41.0	48.0	45.3	2.3	8
MULLIDAE						
Pseudupeneus prayensis						
	355	13.5	19.5	16.2	1.3	80
	360	12.5	21.5	16.3	1.8	115
	369	14.0	22.0	18.0	1.6	104
	377	10.0	24.0	17.4	2.4	166
	388	16.0	24.5	20.0	2.2	34
POMADASYIDAE						
Paraphristipoma sp.						
	364	31.0	36.0	33.7	2.0	8
Pomadasys incisus						
	388	20.0	24.5	22.3	1.0	41
SERRANIDAE						
Cephalopholis taenopsis						
	364	39.0	48.0	44.7	3.5	8

FAMILY/SPECIES	STATION	LENGTHS IN SAMPLE LOWEST	HIGHEST	MEAN	ST. DEV.	N
SHARKS						
Rhizoprionodon acutus						
	367	81.0	92.0	87.4	3.7	8
	368	66.0	85.0	80.0	6.7	7
Mustelus mustelus						
	363	68.0	97.0	84.7	5.8	35
	367	80.0	96.0	86.4	5.6	16
SPARIDAE						
Boops boops						
	369	14.0	16.5	15.3	.7	26
	371	13.5	16.0	15.1	.6	26
	379	22.5	27.5	25.1	1.2	70
Lithognathus mormyrus						
	355	21.0	30.0	25.8	2.9	14
	388	23.5	29.5	26.5	1.4	55
Pagellus acarne						
	369	19.0	22.5	21.1	1.4	12
	377	19.0	31.0	25.2	1.8	122
Spondyliosoma cantharus						
	351	36.0	46.0	40.3	5.1	3

ANNEX IV

List of species caught by R/V Dr. Fridtjof Nansen off Cape Verde Islands November 1981

ACANTHURIDAE	
	Acanthurus monroviae
ANGUILLIFORMES	
BALISTIDAE	
	Balistes capriscus
BELONIDAE	
	Ablennes hians
BRAMIDAE	
	Brama brama
CAPROIDAE	
	Antigonia capros
	Capros aper
CARANGIDAE	
	Caranx crysos
	Decapterus punctatus
	Decapterus rhonchus
	Decapterus macarellus
	Selar crumenophthalmus
	Seriola carpenteri
	Seriola fasciata
	Trachinotus ovatus
	Trachurus trachurus
	Uraspis secunda
CENTRACHANTIDAE	
	Spicara sp.
CLUPEIDAE	
	Sardinella maderensis
CONGRIDAE	
	Rhechias sp.
DACTYLOPTERIDAE	
	Dactylopterus volitans
FISTULARIIDAE	
	Fistularia petimba
GEMPYLIDAE	
	Gempylus serpens
	Neolatus tripes
	Promenthichthys prometheus
GERREIDAE	
	Eucinostomus melanopterus
GONOSTOMATIDAE	
	Vinciguerria sp.
HOLOCENTRIDAE	
	Adioryx hastatus
LABRIDAE	
	Bodianus speciosus
	Xyrichtys novacula
LETRINIDAE	
	Lethrinus atlanticus
LUTJANIDAE	

MACRORHAMPHOSIDAE
- Macrohamphosus scolopax

MONACANTHIDAE
- Aluterus sp.
- Aluterus punctatus
- Stefanolepis hispidus

MULLIDAE
- Pseudupeneus prayensis
- Lycodontis sp.

MYCTOPHIDAE

NOMEIDAE
- Cubiceps sp.
- Cubiceps gracilis
- Psenes sp.

PARALEPIDIDAE
- Lestidium sp.

POLYNEMIDAE
- Galeoides decadactylus

POMADASYIDAE
- Paraphristipoma sp.
- Paraphristipoma octolineatum
- Pomadasys incisus
- Pomadasys peroteti

PRIACANTHIDAE
- Priacanthus arenatus

SALPS

SCARIDAE
- Sparisoma rubripinne

SCORPAENIDAE

SERRANIDAE
- Cephalopholis taenopsis
- Epinephelus guaza
- Epinephelus alexandrinus

S H A R K S
- Rhizoprionodon acutus
- Mustelus mustelus

S H R I M P S

SPARIDAE
- Boops boops
- Dentex sp.
- Dentex macrophthalmus
- Diplodus sp.
- Diplodus bellottii
- Diplodus fasciatus
- Diplodus prayensis
- Lithognathus mormyrus
- Pagellus acarne
- Pagellus bellottii
- Spondyliosoma cantharus
- Viridentex acromegalus

C E P H A L O P O D A

LOLIGINIDAE
- Todaropsis sp.

SYNODONTIDAE
- Synodus sp.
- Synodus saurus
- Synodus synodus

TETRAODONTIDAE	
	Lagocephalus laevigatus
TRACHINIDAE	
	Trachinus sp.
	Trachinus draco
TRIGLIDAE	
	Chelodonichthys sp.
	Chelodonichthys lastoviza
TRICHIURIDAE	
	Aphanophus sp.
ZEIDAE	
	Zeus faber

ANNEX V. Equipment and method

The equipment used and the methods followed were identical to those described in Annex I of the first part of this volume with two minor differences.

(1) The classification of echorecordings was made as follows:

(i) Recordings of true larger schools or dense layer mostly in upper water. These will most often derive from pelagic schooling fish usually of smaller size, e.g., clupeids, scads.

(ii) All other fish recordings which especially comprised looser aggregations of smaller and larger fish near bottom. These are ascribed to demersal or semi-demersal fish such as grunts, seabreams, groupers, croakers, bigeyes, etc.

(iii) Recordings of mesopelagic fish distributed in scattering layers.

(2) The integrator deflection was classified at two levels only: scattered (1-9 mm) and slightly gathered (10-20 mm).

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