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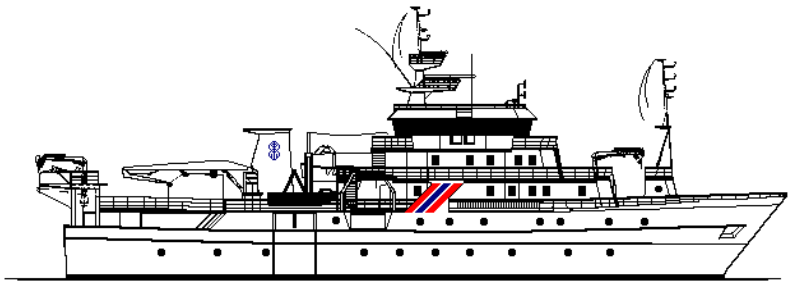
CRUISE REPORTS "DR. FRIDTJOF NANSEN"



SURVEYS OF THE FISH RESOURCES OF THE WESTERN GULF OF GUINEA (Bénin, Togo, Ghana & Côte d'Ivoire)

Survey of the pelagic and demersal resources

14 May - 08 June 2004

Preliminary report

Centre de Recherches Oceanologiques
Abidjan
Côte d'Ivoire

Marine Fisheries Research Division
Tema
Ghana

Direction des Pêches
Cotonou
Bénin

Centre Béninois de Recherche Scientifique et Technique
Cotonou
Bénin

Direction de l'Elevage et de la Pêche
Lomé
Togo

Institute of Marine Research (IMR)
Bergen
Norway

The DR FRIDTJOF NANSEN RESEARCH PROGRAMME is sponsored by the Norwegian Agency for Development Cooperation (NORAD). The Food and Agriculture Organization of the United Nations (FAO) provide support to the Programme through Project GCP/INT/730/NOR: International Cooperation with the Nansen Programme: Fisheries Management and Marine Environment. This project is the follow-up to the Project NORAD/FAO/UNDP GLO/92/013. The Institute of Marine Research (IMR), Bergen, Norway is responsible for the implementation of the Programme in cooperation with FAO Fisheries Department and the local fisheries administrations. The aim of the Nansen Programme is to assist developing countries in fisheries research, management and institutional strengthening.

The programme has previously conducted the following surveys in the Gulf of Guinea:

Area	Period
Cape Verga (Rep. of Guinea) to Cape St. Paul (Ghana)	02 - 25 June 1981
Togo to Cameroon	07 - 20 August 1981
Côte d'Ivoire and Ghana	12 - 20 October 1989
Bénin, Togo, Ghana and Côte d'Ivoire	19 April - 06 May 1999
	29 August - 17 September 2000
	16 July - 09 August 2002

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SURVEYS OF THE FISH RESOURCES OF THE WESTERN GULF OF GUINEA (Bénin, Togo, Ghana & Côte d'Ivoire)

Survey of the pelagic and demersal resources

14 May - 08 June 2004

by

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CHAPTER 1 INTRODUCTION

Following a request from the Government of Ghana, later supported by the Governments of Bénin, Togo and Côte d'Ivoire, IMR, NORAD and FAO agreed to conduct a survey in the western Gulf of Guinea covering the waters of the above four countries. This was a follow-up to similar surveys conducted 19 April – 6 May 1999, 29 August – 17 September 2000 and 16 July – 9 August 2002. The survey was organised by IMR and FAO under the project GCP/INT/730/NOR: International cooperation with the Nansen Programme: Fisheries Management and Marine Environment. This project is the continuation of a series of projects and agreements between NORAD, IMR and FAO involving surveys with the research vessel "Dr. Fridtjof Nansen". The objectives of the survey had been previously discussed and agreed upon during a pre-survey meeting held onboard "Dr. Fridtjof Nansen" in Tema, Ghana on 14 May 2004 where representatives from Côte d'Ivoire, Ghana, Togo, Bénin and Norway participated.

1.1 Objectives

The main objectives of the survey were:

- to map the distribution and estimate the acoustic abundance of the main pelagic species/groups
- to describe the distribution, composition and estimate the abundance of the main demersal species on the shelf by a swept-area trawl programme
- to do fishing trials on the deep continental shelf and upper slope
- to collect zooplankton samples for distribution and abundance estimation
- to map the general hydrographic regime by using a CTD-sonde to monitor the temperature, salinity and oxygen at bottom trawl stations and in five hydrographical transects
- to do on-the-job training on the main survey routines

1.2 Participation

Direction des Pêches, Cotonou, Bénin:

Sébastien Ahouandjogbe

Centre Béninois de Recherche Scientifique et Technique, Cotonou, Bénin:

Amélie Gbaguidi

Zacharie Sohou (01.06-10.06)

Division des Pêches et de l'Aquaculture, Lomé, Togo:

Kossi Ahoedo

Yaovi Acakpo-Addra

Marine Fisheries Research Division, Tema, Ghana:

Samuel N. K. Quaatey

Kofi Debrah Mireku

Theophilius T. Addi

Jones Tetteh

Kofi Amador

Nettesheim Kwame Damoah

Centre de Recherches Oceanologiques, Abidjan, Côte d'Ivoire:

Konan N'Da

Tapé Joanny

Institute of Marine Research, Bergen, Norway:

Terje Hovland, Thor Egil Johansson, Sigbjørn Mehl (cruise leader), Magne Olsen (14.05-01.06), Oddgeir Alvheim (01.06-10.06)

1.3 Narrative

The vessel left Tema (Ghana) in the afternoon of 14 May and steamed westwards to the western part of Côte d'Ivoire where the survey started at noon 16 May. From noon 17 May to the morning of 18 May there was a break in the survey to celebrate the Norwegian constitutional day. The shelf was surveyed during daytime (0600 to 1800) by parallel course tracks about 20 NM (nautical miles) apart. In Bénin and Togo the inter-transect distance was 10 NM, allowing for 6 transects in Bénin and 3 in Togo. Semi-random swept-area hauls were carried out on the shelf within the depth zones 20-30 m, 31-50 m and 51-100 m during daytime. In addition 7 bottom trawl hauls were made at depths greater than 100 m in areas with suitable trawling grounds. Continuous acoustic registrations were done throughout the survey. To obtain a denser acoustic coverage, night time registrations were made in between the daytime course tracks. Pelagic trawling on registrations was carried out also during dark hours. Additional random blind trawl hauls were made close to the surface, mainly at the inner shelf, with pelagic trawl or bottom trawl equipped with large floats.

CTD-stations were taken at most of the bottom trawl stations. In addition, five hydrographical profiles were made with CTD from the surface down to the bottom or 500 m depths. Zooplankton samples were taken with 1 m diameter ICITA net in step oblique hauls at 30-60 m depth, 3 off Côte d'Ivoire (at Tabou, Grand Lahou and Assini), 4 in the Ghana area (at Cape Three Points, Cape Coast, Tema and Keta) and 1 each off Togo (Kpeme) and Bénin (Cotonou).

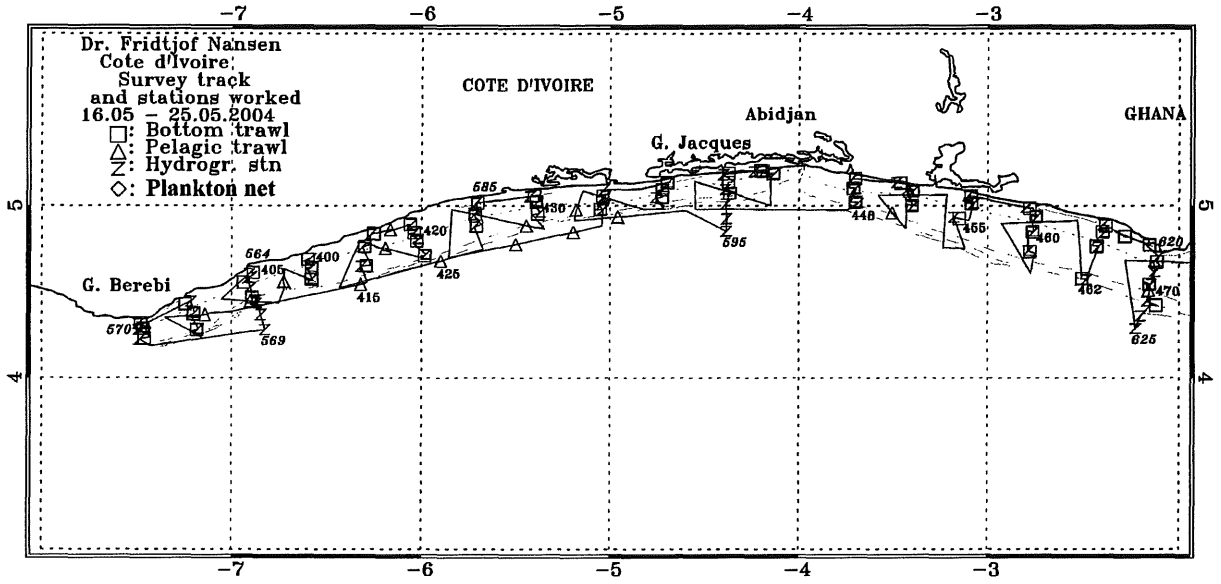
The shelf off Côte d'Ivoire was covered from 16 to 23 May. Two hydrographic transects were made, off Grand Bérébi in the west and off Grand Jacques on the central part. The shelf off Ghana was surveyed from 24 to 31 May, and hydrographic transects were made off Accra and Cape Three Points. The vessel called at Tema 31 May - 2 June for change of crew. The Bénin area was surveyed from 3 to 5 June and Togo from 6 to 7 June. One hydrographic transect was made off Contonou. The survey was completed at the Togo-Ghana border at noon 7 June and the vessel arrived in Tema in the afternoon 8 June.

1.4 Survey effort

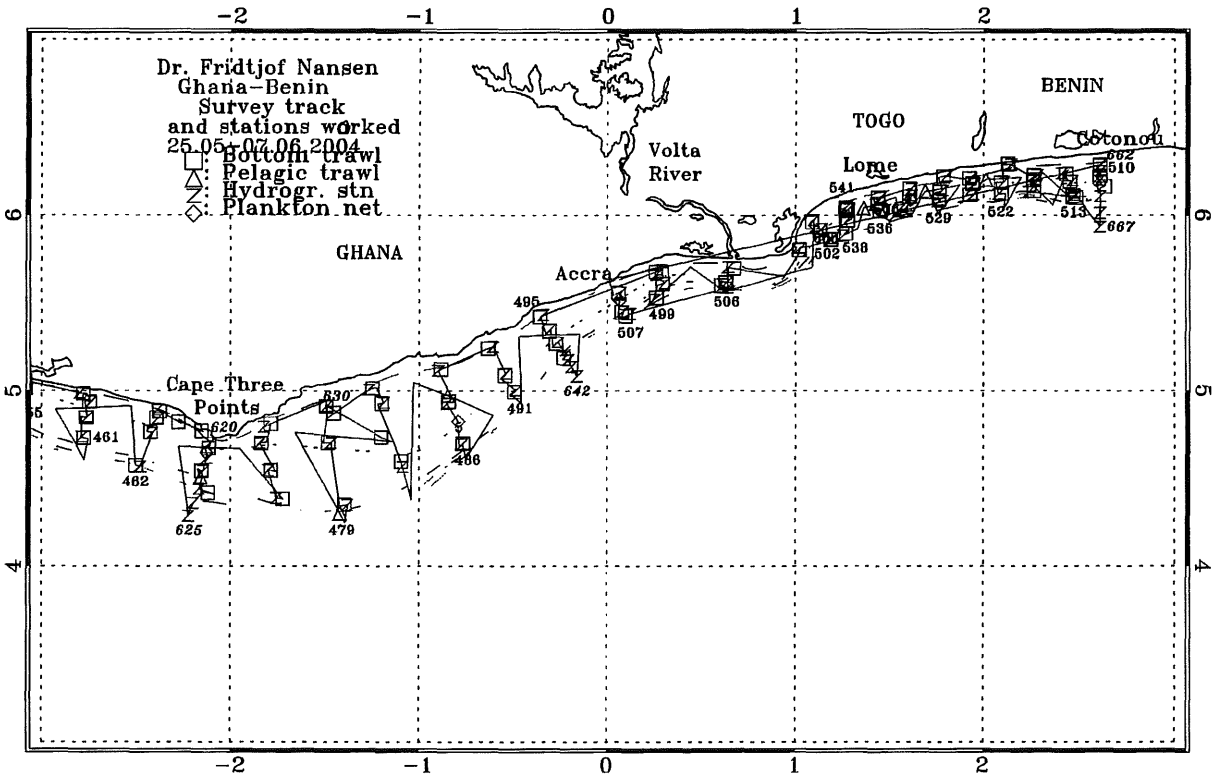
Figure 1.1 shows the cruise tracks with trawl, hydrographic and plankton stations. Table 1.1 summarises the survey effort in each sector.

Table 1.1 Number of hydrographic (CTD), plankton (P), pelagic trawl (PT) and bottom trawl (BT) stations, successful swept-area hauls, distance surveyed (NM) and size of survey area (NM^2).

					Swept-area hauls			Distance
Region	CTD	P	PT	BT	0-30 m	31-50m	51-100 m	surveyed
Côte D'Ivoire	48	3	13	42	11	13	18	1 170
Area (NM^2)					563	701	2 752	
Ghana	53	4	4	51	12	15	16	1 185
Area (NM^2)					1 412	2 064	2 751	
Togo	10	1	1	10	3	3	3	145
Area (NM^2)					149	78	100	
Bénin	23	1	2	19	6	6	7	340
Area (NM^2)					387	134	244	
Total	134	9	20	122	32	37	43	2 840
Area (NM^2)					2 511	2 977	4 714	



a) Côte d'Ivoire - Ghana



b) Ghana - Bénin

Figure 1.1 Course track with fishing, plankton and hydrographic stations for a) Côte d'Ivoire - Ghana and b) Ghana - Bénin. Depth contours at 20 m, 50 m, 100 m, 200 m and 500 m are indicated.

CHAPTER 2 METHODS

2.1 Meteorological and hydrographical sampling

Temperature, salinity and oxygen

CTD stations were taken in connection with most bottom trawl stations and at five hydrographic transects. Annex VIII presents positions and depths for the CTD stations taken on the five transects. A Seabird 911 CTD plus was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the Seabird Seasave software installed on a PC. The profiles were usually taken down to a few metres above the bottom, but not deeper than 500 m. At some stations two Niskin bottles were triggered in stable water to collect samples for calibration of the salinity and oxygen sensors. The samples are normally analysed for salinity using a Guildline Portasal salinometer, and the oxygen content is determined using the Winkler method.

For oxygen, 20 samples out of 20 from the central part of Côte d'Ivoire were accepted for the calibration. A linear regression gave the following formula for correcting the oxygen values:

$$O_2 = O_{2ctd}\ 1.1644 - 0.0015$$

For the salinity, the analyses of 25 April 2004 were applied. The average differences between the salinometer and CTD values were very small and the CTD values were accepted.

Current speed and direction measurements (ADCP)

The ship-born Acoustic Doppler Current Profiler (ADCP) was not in order.

Meteorological observations

Wind direction and speed, air temperature, global radiation and sea surface temperature (5 m depth) were logged automatically every nautical mile on an Aanderaa meteorological station.

2.2 Biological sampling

The trawl catches were sampled for species composition by weight and numbers. The deck sampling procedure is described in more detail by Strømme (1992). Length measurements (total length) were taken for target species. The length of each fish was recorded to the nearest 1 cm below. The carapace length was measured to the nearest 0.5 cm below for shrimp. The mantle length was measured to the nearest 1 cm below for *Sepia* spp. In addition, at a few stations total length and body weight (g) were recorded for the target species in the acoustic survey. Basic information recorded at each fishing stations, i.e. trawl hauls, is presented in Annex I. Pooled length frequency distributions, raised to catch per hour, of selected species by area are shown in Annex II. Groups/families included in the species composition and swept area analysis are given in Annex III. The swept-area estimates are presented in Annex IV.

A description of the fishing gears used, acoustic instruments and their standard settings is given in Annex VII.

2.3 Biomass estimates

Acoustic abundance estimation

A SIMRAD EK500 Echo sounder was used and the echograms were stored on both paper and files. The acoustic biomass estimates were based on the integration technique. The Bergen Integrator (BEI, see Knudsen 1990) was used for analysis and allocation of the integrated s_A-values (average area back scattering coefficient in m^2/NM^2) The splitting and allocation of the integrator outputs (s_A-values) was based on a combination of a visual scrutiny of the behaviour pattern as deduced from echo diagrams, the BEI analysis and the catch composition. The mean integrator value in each sampling unit (s_A-values) was divided between the standard categories/groups of fish, as noted below, on the basis of trawl catches and characteristics of echo traces:

- plankton
- sardinella (*Sardinella aurita* and *S. maderensis*)
- anchovy (*Engraulis encrasicolus*)
- PEL 1 (other clupeids than sardinella and anchovy)
- PEL 2 (carangids, scombrids, barracudas, hairtail)
- mesopelagic fish
- demersal fish

The following target strength (TS) function was applied to convert s_A-values (mean integrator value for a given area) to number of fish (sardinella, anchovy, PEL 2):

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

or in the form

$$C_F = 1.26 \cdot 10^6 \cdot L^{-2} \qquad (2)$$

where L is total length and C_F is the reciprocal back scattering strength, or the so-called fish conversion factor. In order to split and convert the allocated s_A-values (m^2/NM^2) to fish densities (number per length group per NM^2) the following formula was used

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

where: N_i = number of fish in length group i
A = area (NM^2) of fish concentration
s_A = mean integrator value (echo density) in area A (m^2/NM^2)
p_i = proportion of fish in length group i in samples from the area
C_{Fi} = fish conversion factor for length group i

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

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

The length distribution of a given species within an area was computed by simple adding of the length frequencies obtained in the pelagic trawl samples within the area. In the case of co-occurrence of target species, the s_A value was split in accordance with length distribution and catch rate in numbers in the trawl catches. Biomass per length group (B_i) was estimated by applying measured weights by length (W_i) when available or theoretical weights (calculated by using condition factors), multiplied with number of fish in the same length group (N_i). The total biomass in each area was obtained by summing the biomass of each length group:

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

The number and biomass per length group in each concentration were then added up to obtain totals for each region.

Biomass estimates based on swept-area method

In the bottom trawl survey, stock biomasses was estimated by the swept-area method with catch per haul as the index of abundance (see Strømme 1992). The general formula to estimate biomass B, using this method is:

$$B = \frac{A}{a} \cdot \frac{\overline{X}}{q} \qquad (6)$$

A is the total area surveyed, a is the swept area of the net per haul, $\overline{X}$ is the average catch per haul (the index of abundance) and q is the proportion of fish in the path of the net that are actually caught. The density of the resource is estimated as biomass per unit area. In a stratified survey of k non-overlapping strata, if the mean catch per haul in stratum *i* and its variance are denoted by $\overline{X}_i$ and s_i^2 respectively, then an unbiased estimate of the population mean $\overline{X}$ is the stratified mean $\overline{X}_{st}$, which is given by:

$$\overline{X}_{st} = \frac{1}{N}\sum_{i=1}^{k} N_i \overline{X_i} = \sum_{i=1}^{k} W_i \overline{X_i} \qquad (7)$$

where $Wi = \frac{Ni}{N} = \frac{A_i}{A}$ is the relative size of the i^{th} stratum (A_i is the area of the i^{th} stratum and A is the total area surveyed). The variance of the stratified mean is given by

$$\text{var}(\overline{X}_{st}) = \sum_{i=1}^{k} W_i^2 \,\text{var}\,\overline{X}_i = \sum_{i=1}^{k} W_i^2 \frac{s_i^2}{n_i} \qquad (8)$$

where n_i is number of hauls in the i^{th} stratum and n is the total number of hauls in the survey.

Table 1.1 shows the areas used in the swept-area method to estimate biomass for the different regions. A stratified semi-random design was used with depth and country as stratification factors. Estimated total biomass by species/group was obtained by summing estimates for each depth stratum.

For conversion of catch rates (kg/hour) to fish densities (t/NM²), the effective fishing area was considered as the product of the wing spread and the haul length, or distance over the bottom, as measured by means of the SCANMAR® equipment based on GPS readings. The area swept for each haul was thus 18.5 times the distance trawled, raised to NM²/hour. The catchability coefficient (q), i.e the fraction of the fish encountered by the trawl that was actually caught, was conservatively (and for comparison with previous surveys) assumed

equal to 1. Mean fish densities by species and strata were calculated by the swept-area module in NAN-SIS.

Total biomass estimates by species and their confidence intervals were obtained from a stratified mean density estimator (using equations 1, 2, and 4 in ANNEX V on a spread-sheet, ANNEX VI) and raised to total area. Since NAN-SIS does not produce variance estimates of the mean densities (ANNEX III), the 95% confidence limits for the biomass estimates were calculated with the underlying assumption that the coefficient of variation (CV = SD/mean) is constant when catch rates in kg/hour are converted to densities (t/NM^2). In other words the area swept (normalised per hour) was approximately constant for each haul. Coefficients of variation of the catch rates, by depth strata for each species or group, were obtained using the WinGrafer module of NAN-SIS. Variance of the densities were estimated from the mean and the CV, and equations 2, 3, 6 and 7 in ANNEX V were used to calculate standard error (SE) on the arithmetic mean and confidence intervals (see the spreadsheet BIOMASS.xls, and example in ANNEX VI). GRAFER was also used to produce the figures and tables with grouped catch-rates and time-series presented in this report. SE and confidence intervals in the figures are based on the arithmetic mean, but the lognormal based Pennington's estimator can also be calculated (equations 8 to 12 in ANNEX V).

CHAPTER 3 OCEANOGRAPHIC CONDITIONS

Surface distribution

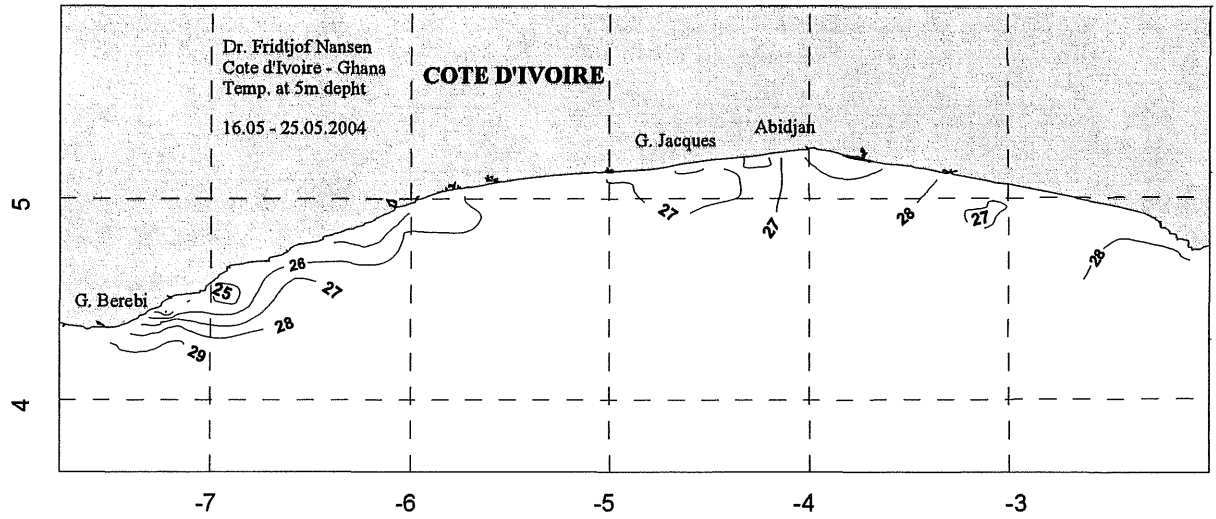
The surface layer temperature was continuously recorded during the cruise. Figures 2.1a and b show the horizontal distribution of sea surface temperature (SST) for the Côte d'Ivoire - western Ghana and the Ghana - Bénin areas respectively. The highest temperature of 29° C was recorded off Grand Bérébi in the western part of Côte d'Ivoire, while in most of the area the temperature ranged between 27-28° C. Coastal temperatures were at some places lower than in offshore areas, e.g. 25° C east of Grand Bérébi and at Cape Three Points.

The surface salinity (Figures 2.2a and b) ranged between 32.1 psu and 35.5 psu in the whole survey area. In general the salinity was lowest in coastal areas around the river estuaries, especially off Bénin.

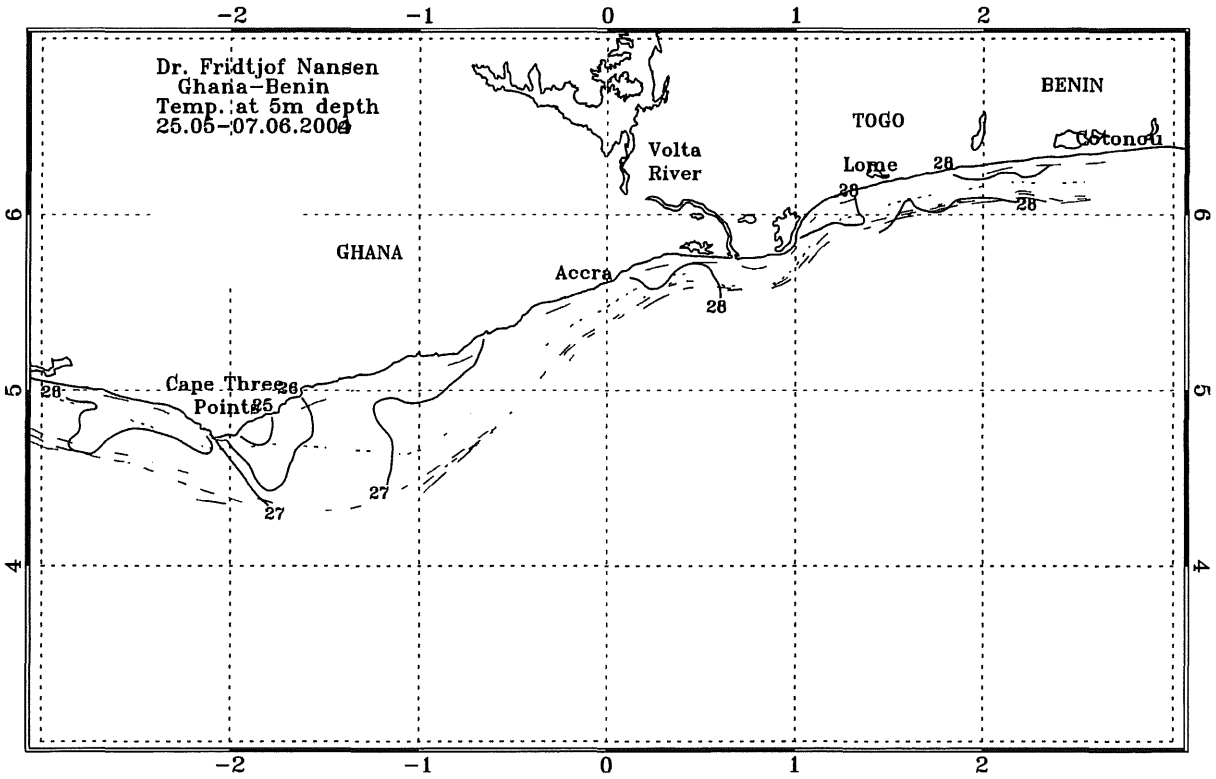
Vertical sections

Figures 2.3a-e show the vertical distribution of temperature, salinity and dissolved oxygen as recorded on the five hydrographic transects worked during the survey. There were only small differences between the profiles. The thermocline was found between 25 and 50 m depth. A relatively flat structure was observed in most sections with no clear signs of vertical water displacement and upwelling.

Temperature ranged from 25.2-29.0° C (off Grand Bérébi) at the surface to 8° at 400-500 m depth. Salinity ranged from 32.1 psu (off Cotonou) and 35.5 psu (off Accra) at the surface to 34.8 psu at 400-500 m depth. Dissolved oxygen values ranged between 2 ml/l at the bottom and 4 ml/l at the surface. There was no sign of low bottom oxygen content on the shelf.

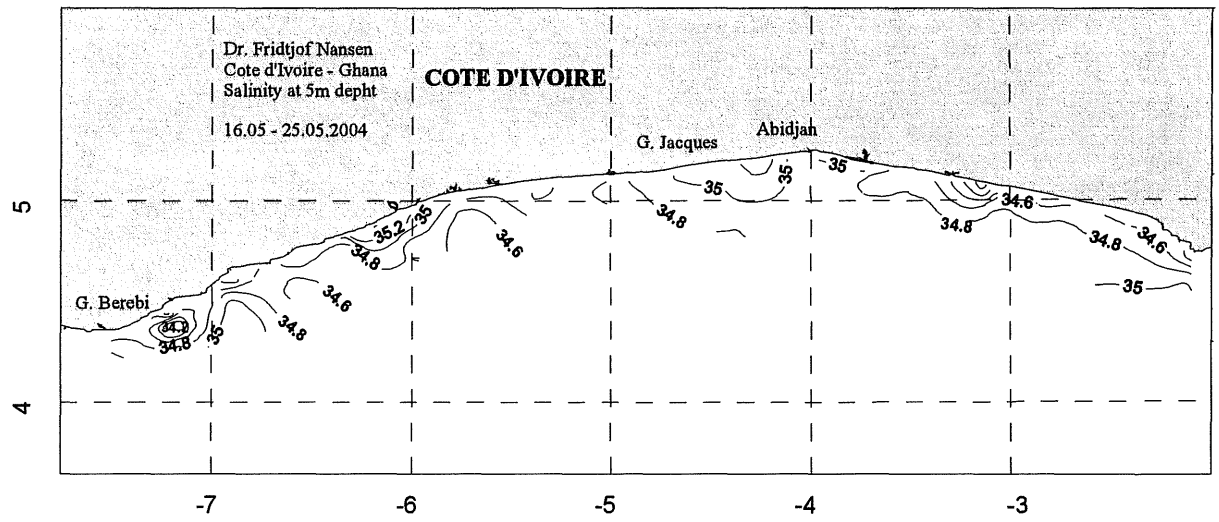


a) Côte d'Ivoire - Ghana

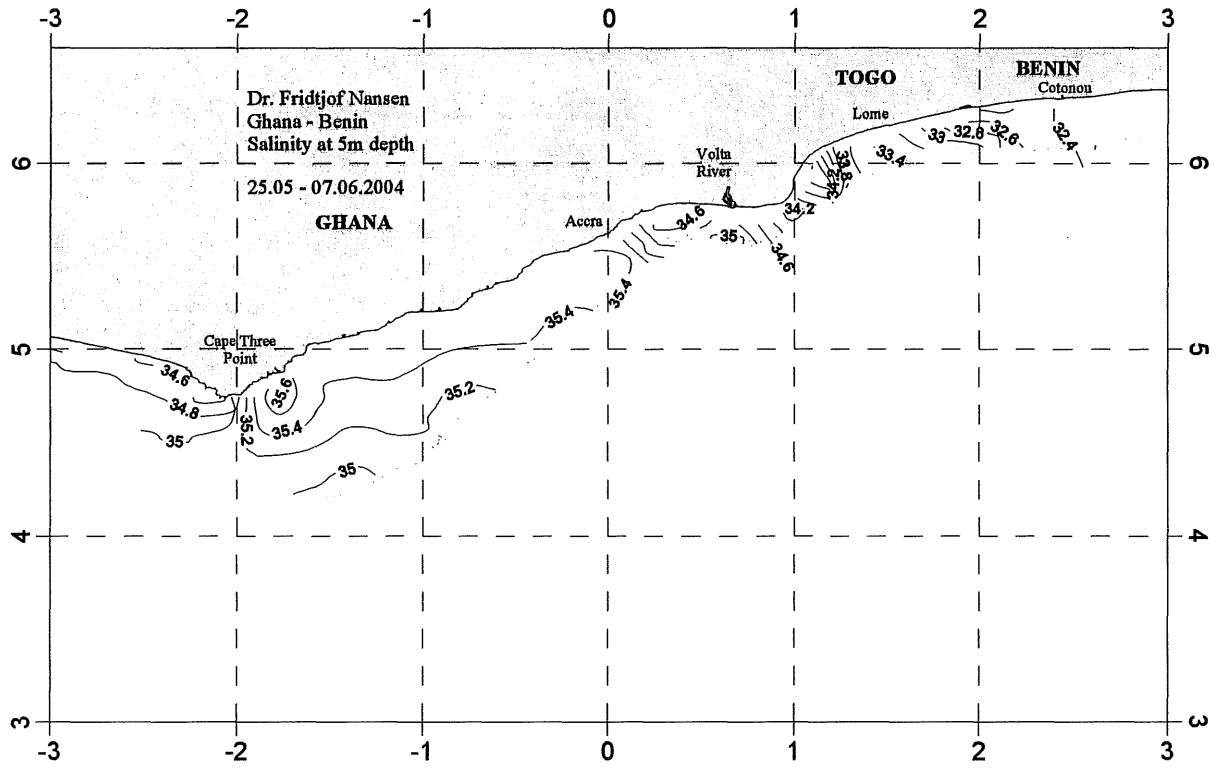


b) Ghana - Bénin

Figure 2.1 Horizontal distribution of surface temperature (5 m depth) at a) Côte d'Ivoire - Ghana and b) Ghana - Bénin. Depth contours as in Fig. 1.

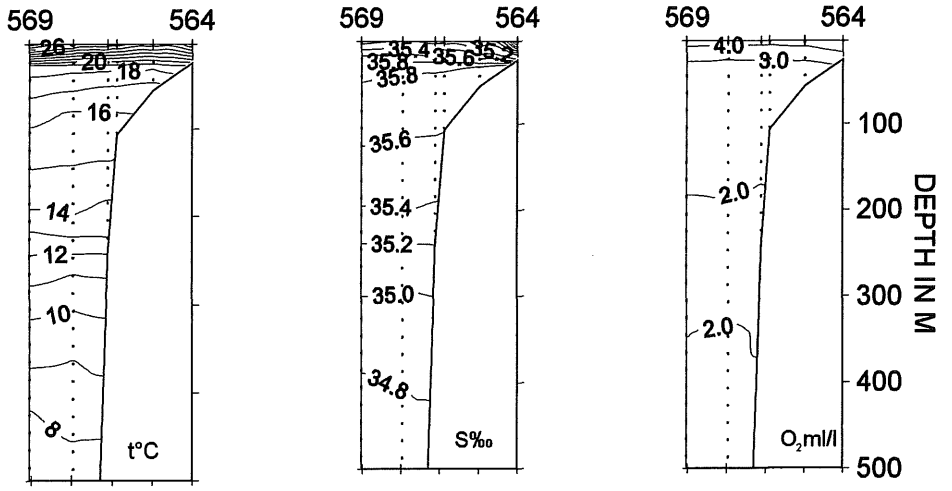


a) Côte d'Ivoire - Ghana

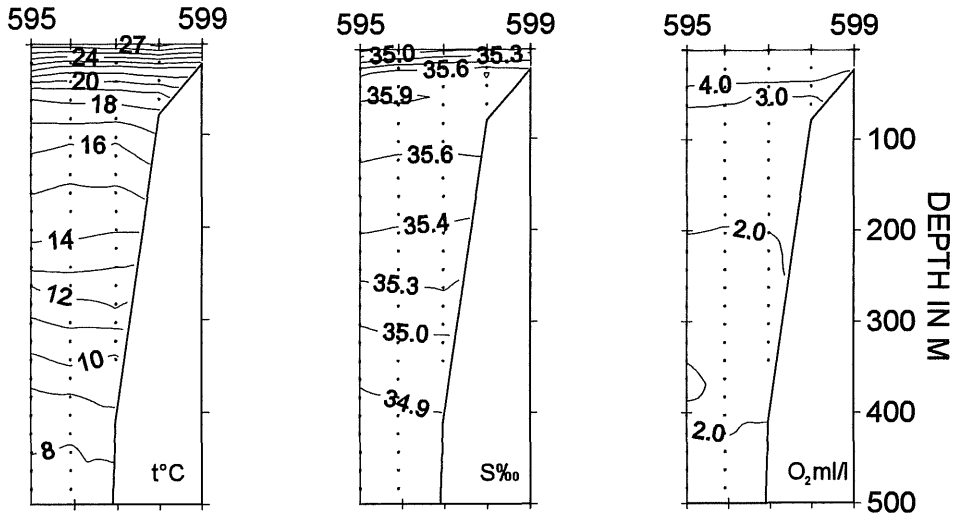


b) Ghana - Bénin

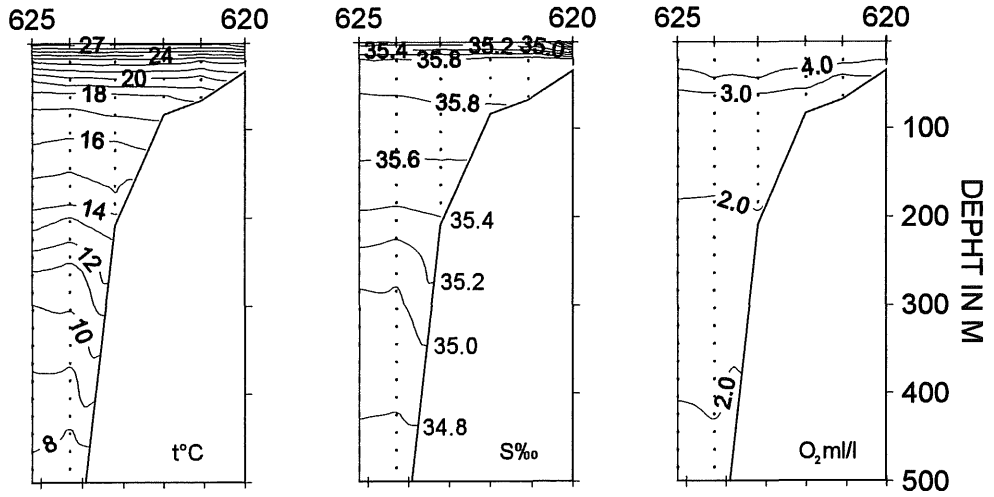
Figure 2.2 Horizontal distribution of salinity (5 m depth) at a) Côte d'Ivoire - Ghana and b) Ghana - Bénin. Depth contours as in Fig. 1.



a) Grand Bérébi – 17.05.2004

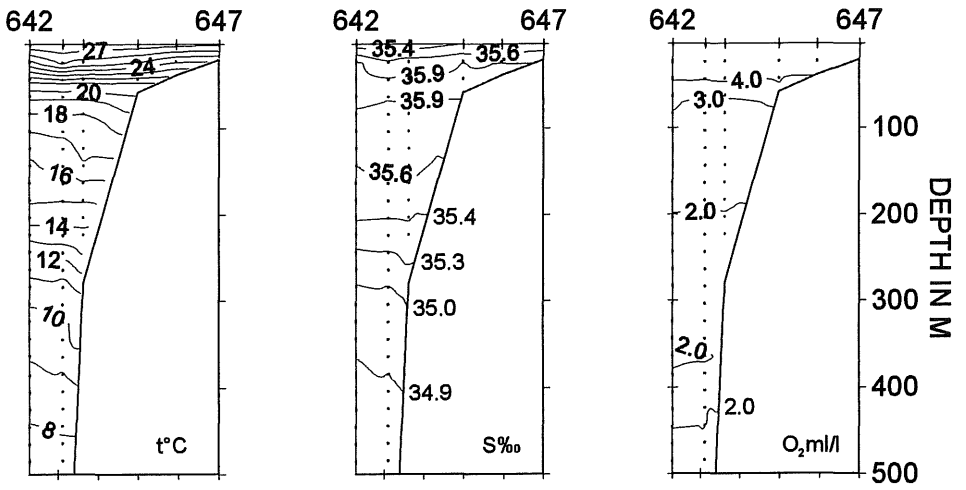


b) Grand Jacques – 22.05.2004

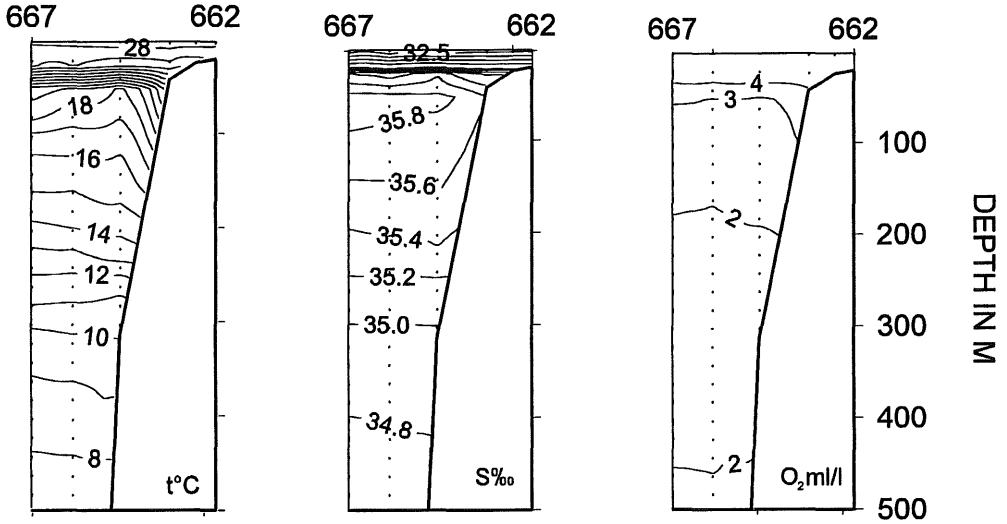


c) Cape Three Points – 25.05.2004

Figure 2.3 Vertical sections of temperature, salinity and oxygen at a) Grand-Bérébi, b) Grand Jacques, c) Cape Three Points, d) Accra and e) Cotonou.



d) Accra – 29.05.2004



e) Cotonou – 03.06.2004

Figure 2.3 Continuation

CHAPTER 4 RESULTS OF THE ACOUSTIC SURVEY: FISH DISTRIBUTION AND ABUNDANCE ESTIMATE OF PELAGIC SPECIES

The next maps of the main groups of pelagic fish, i.e. sardinellas, anchovies and PEL 2 (mainly carangids), show the distribution as observed with the acoustic integration system. The acoustic densities (in m^2/NM^2) are illustrated by a scale normally used on acoustic surveys with "Dr. Fridtjof Nansen".

4.1 Côte d'Ivoire

Clupeids

Sardinellas were recorded along the whole coast of Côte d'Ivoire, with highest concentrations in shallow waters off Grand Jaques (Fig. 4.1). Both *Sardinella aurita* (6-21 cm) and *S. maderensis* (6-29 cm) occurred frequently in the bottom trawl catches, and were also caught in the pelagic trawl hauls. *S. aurita* was most abundant and was found both on inner and outer shelf, wile *S. maderensis* mainly was caught on the inner shelf. The total biomass was estimated to about 65 000 tonnes, applying pooled and weighted length distributions from both bottom and pelagic trawl hauls and a measured condition factor of 0.96 for *S. maderensis* and 0.88 for *S. aurita*. *S. aurita* contributed about 70 % to the acoustic estimate. Most of the *S. maderensis* was juvenile (8-10 cm), while some of the *S. aurita* was larger (16-22 cm, Fig. 4.2).

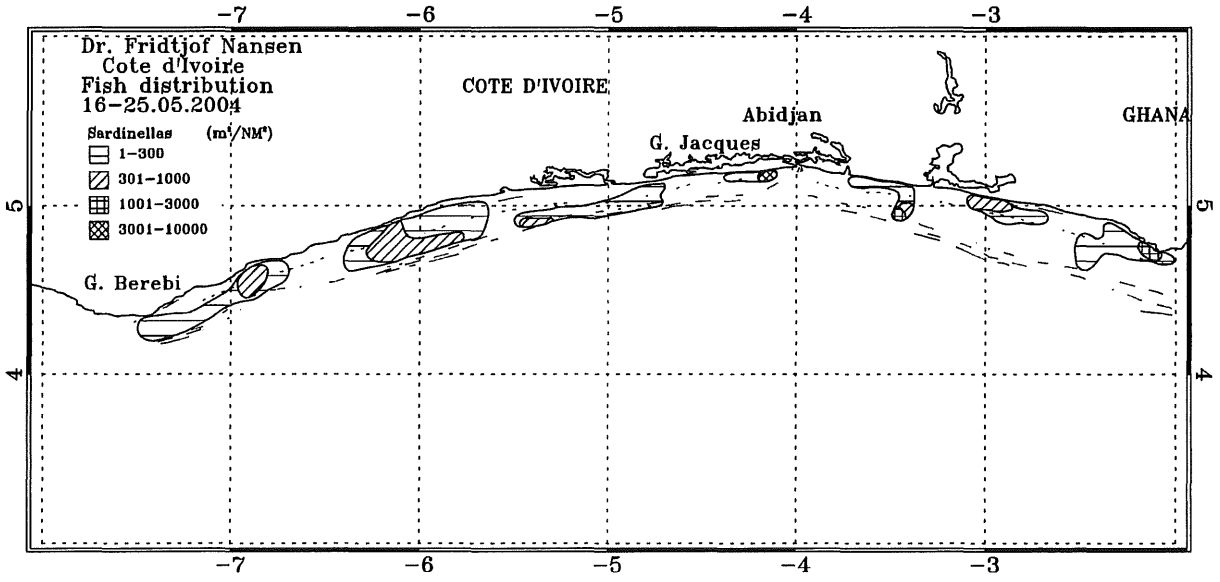


Figure 4.1 Distribution of *Sardinella* spp. off Côte d'Ivoire - Ghana. Depth contours as in Fig. 1.

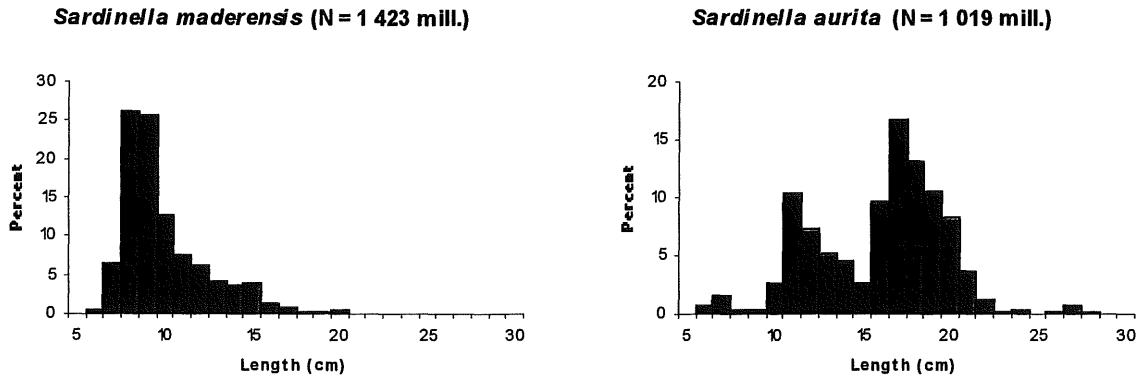


Figure 4.2. Length distribution of *Sardinella maderensis and S. aurita* in Côte d'Ivoire.

Ilisha africana was taken in some bottom trawl hauls on the shallow part of the shelf. A few low-density schools with small s_A-values were allocated to the PEL1 group, but no estimate of abundance was made.

Anchovy

Small (5-9 cm) anchovy (*Engraulis encrasicolus*) was caught in the bottom trawl on the inner shelf several places along the coast. A few low-density schools were recorded in the western part of Côte d'Ivoire and some dense near the Côte d'Ivoire-Ghana border. The biomass was estimated to about 3 000 tonnes, applying length distributions from the nearest bottom trawl hauls and a measured condition factor of 0.73.

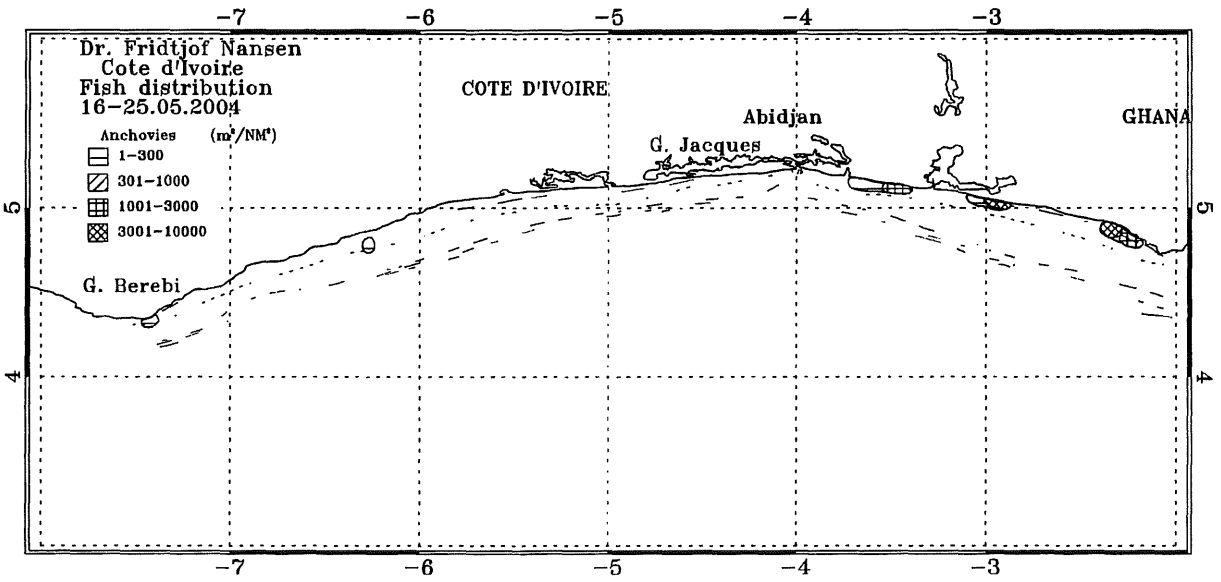


Figure 4.3 Distribution of anchovy off Côte d'Ivoire - Ghana. Depth contours as in Fig.1.

PEL 2 (carangids, scombrids, barracudas and hairtail)

The species category PEL 2 consisted mostly of carangids. Juvenile *Trachurus trecae* (11-20 cm) and *Selene dorsalis* (15-35 cm) were the dominant species in the bottom trawl catches, *T. trecae* mainly at the outer shelf and *S. dorsalis* also at the inner shelf. They were also caught in pelagic trawl hauls. Other carangids such as *Chloroscombrus chrysurus*, *Decapterus punctatus* and *D. rhonchus* occurred in lower densities, mainly at the inner shelf. Most of the carangids were juveniles (10-20 cm). *Scomber japonicus* (16-31 cm) was the most abundant scombrid in both bottom and pelagic trawl hauls, and it was mainly found on the outer shelf. *Scomberomorus tritor was* also caught at a few stations. Barracudas, dominated by *Sphyraena guachancho*, were common in bottom trawl hauls and pelagic blind trawl hauls. Hairtail (*Trichiurus lepturus*) occurred in bottom trawl stations on both the inner and outer shelf. It was also found in pelagic blind trawl hauls.

Schools of PEL 2 species, mainly of low density, were found over most of the shelf along the whole coastline (Fig. 4.4). Applying added length distributions of the most common carangids (*T. trecae, S. dorsalis, D. punctatus* and *C. chrysurus*) and *S. japonicus* from both bottom and pelagic trawl hauls and a measured condition factor of 0.91 (*S. japonicus*), the biomass of PEL 2 was estimated to about 19 000 tonnes.

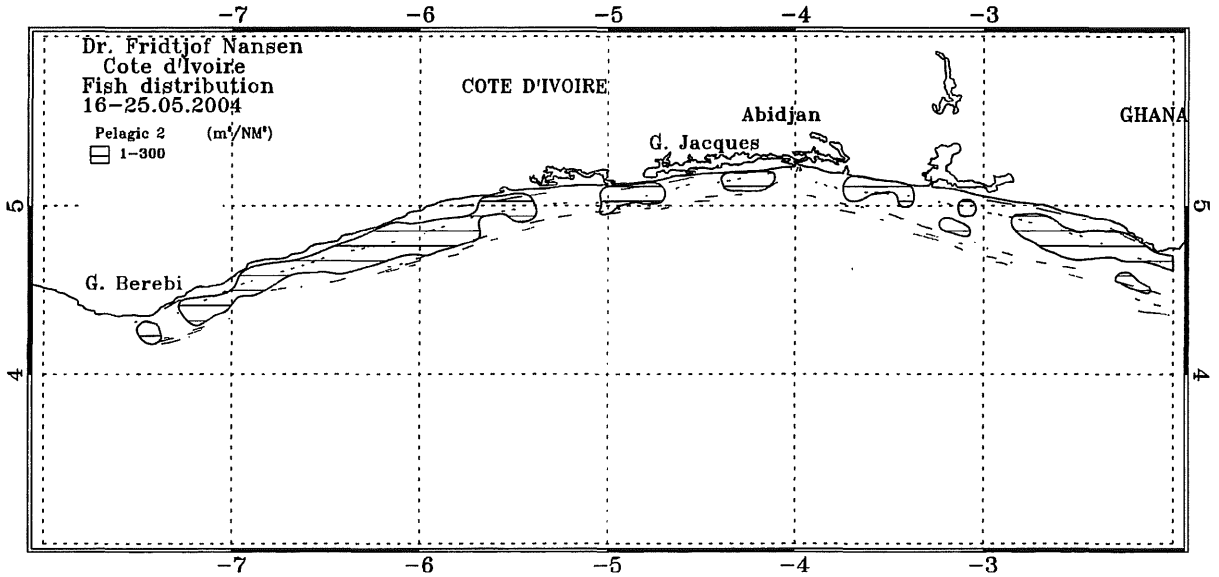


Figure 4.4 Distribution of PEL 2 (Carangids, scombrids, barracudas and hairtail) off Côte d'Ivoire – Ghana. Depth contours as in Fig. 1.

4.2 Ghana

Clupeids

Sardinellas were caught in both bottom trawl hauls and in pelagic blind trawl hauls. *Sardinella aurita* (6-27 cm) dominated and was found over most of the shelf area, while juvenile *S. maderensis* (6-17 cm) only occurred a few places on the inner shelf. Several small and some larger schools of low-medium density and a few of high density were allocated to sardinellas (Fig. 4.5). The highest concentrations were recorded west of Cape Three Points. The total biomass of sardinellas was estimated to be about 40 000 tonnes, applying pooled and weighted length distributions from both bottom and pelagic trawl hauls and a measured condition factor of 0.88 for *S. aurita* and 0.96 for *S. maderensis*. *S. aurita* contributed over 90 % to the estimated biomass. In the acoustic estimate *S. maderensis* of 8-9 cm and *S. aurita* of 15-16 cm were most abundant (Fig. 4.6).

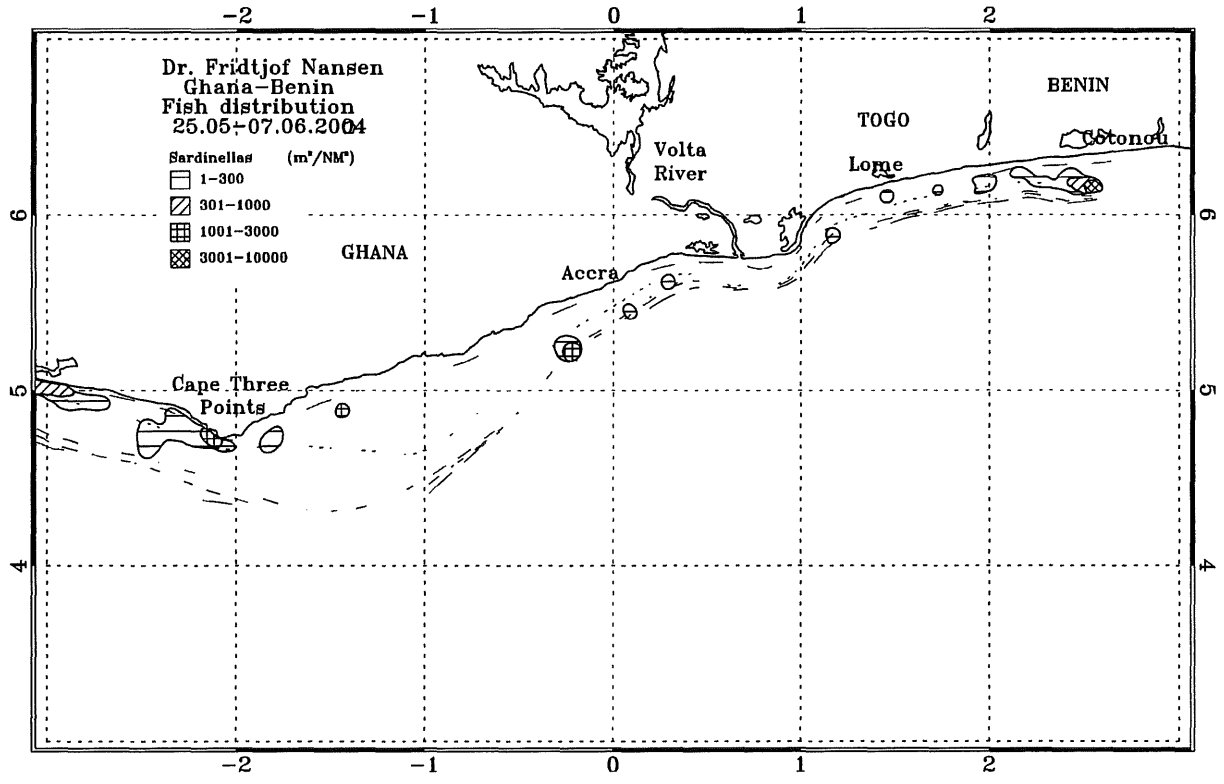


Figure 4.5 Distribution of *Sardinella* spp. off Ghana - Bénin. Depth contours as in Fig. 1.

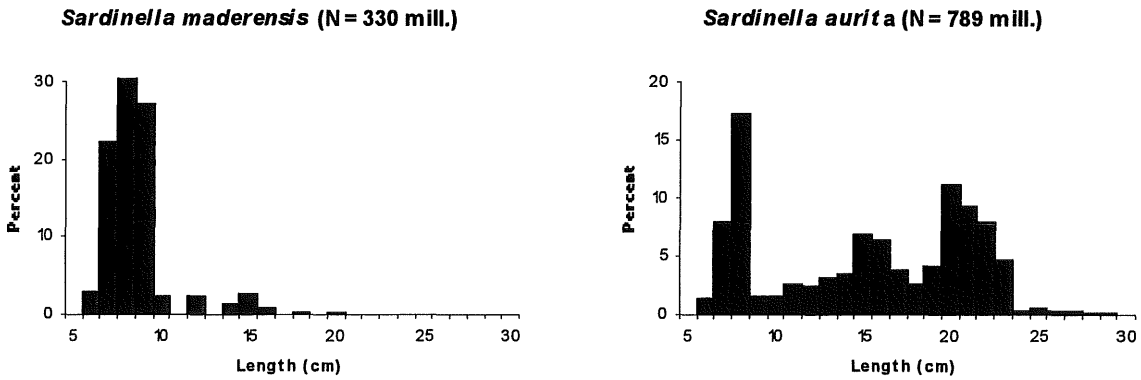


Figure 4.6 Length distribution of *Sardinella maderensis and S. aurita* in Ghana.

Ilisha africana was caught in a few bottom trawl hauls in shallow waters (20-40 m) in the western part of Ghana. Some low-density schools with small s_A-values were allocated to the PEL1 group, but no estimate of abundance was made.

Anchovy

Dense schools of *Engraulis encrasicolus* were recorded in shallow waters west of Cape Three Points and a few smaller ones further east (Fig. 4.7). Catches of anchovy (3-13 cm) were obtained in bottom trawl hauls in the areas of acoustic registrations. The biomass of anchovy was estimated to be about 28 000 tonnes, applying added length distributions and an estimated condition factor of 0.73.

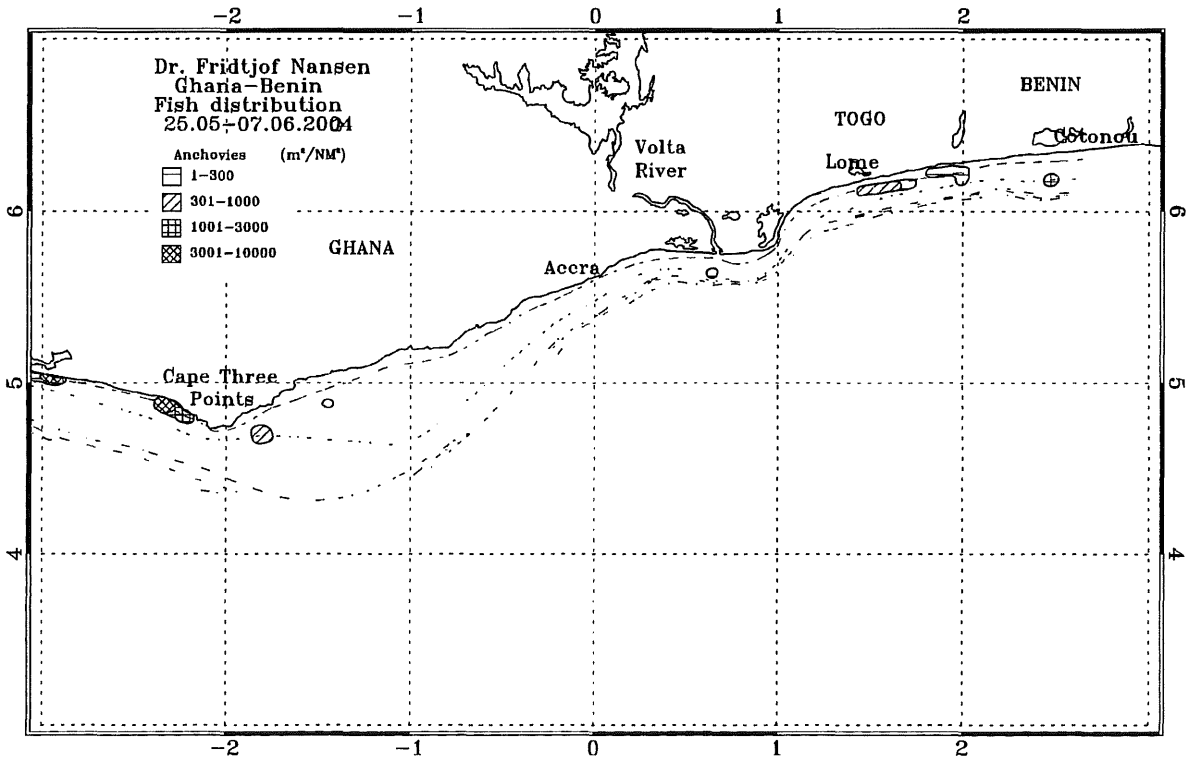


Figure 4.7 Distribution of anchovy (*Engraulis encrasicolus*) off Ghana - Bénin. Depth contours as in Fig. 1.

PEL 2 (carangids, scombrids, barracudas and hairtail)

As in Côte d'Ivoire waters, this group consisted mainly of carangids. *Chloroscombrus chrysurus* (6-25 cm), *Decapterus punctatus* (4-24 cm) and *Selene dorsalis* (4-40 cm) was the most abundant species in the bottom trawl catches, the two first on the whole shelf area and the latter mainly on the inner shelf. *Trachurus trecae* was less abundant. The carangids were also caught in pelagic blind trawl hauls. Most of the carangids were juveniles (6-22 cm). *Scomber japonicus* was the most abundant scombrid in the bottom trawl hauls, but *Scomberomorus tritor was* also quite common. *S. japonicus* was also caught in pelagic trawl hauls. The barracudas, *Sphyraena guachancho*, *S. sphyraena* and *S. afra,* were found in less than half of the bottom trawl hauls, mainly at the inner shelf. The hairtail *Trichiurus lepturus* was caught at some bottom trawl stations. Small schools of PEL 2 species were detected at most of the shelf, both the inner and outer part (Fig. 4.8). The schools were mainly of low density. Only a couple of direct pelagic trawl hauls were made on these schools. The biomass of PEL 2 was estimated to be approximately 37 000 tonnes, applying added length distributions of the most common carangids (mainly *D. punctatus* and *C. chrysurus*) and *S. japonicus* from both bottom and pelagic trawl hauls and a measured condition factor of 0.91 (*S. japonicus*).

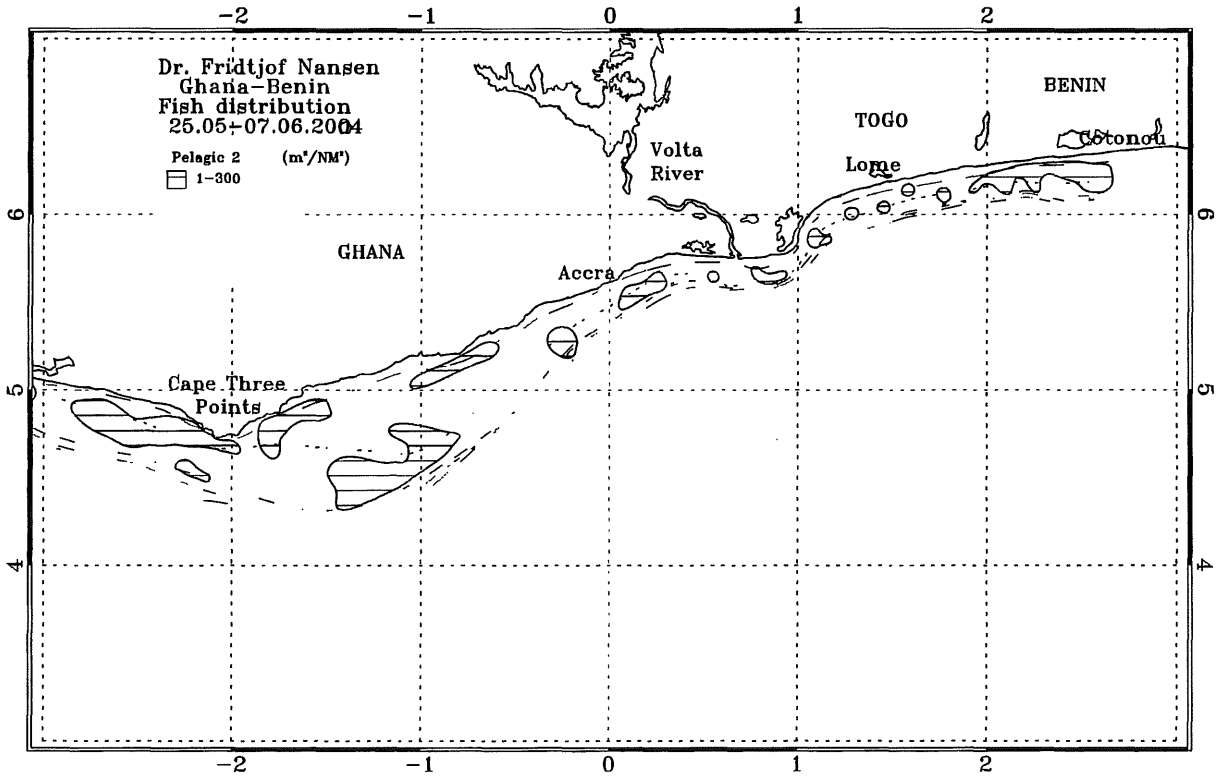


Figure 4.8 Distribution of PEL 2 (Carangids, scombrids, barracudas and hairtail) off Ghana - Bénin. Depth contours as in Fig. 1.

4.3 Togo

Clupeids

Juvenile *Sardinella maderensis* (4-8 cm) and *S. aurita* (5-10 cm) were caught in small quantities in some of the bottom trawl hauls and one pelagic blind trawl haul. There was also one catch of larger *S. aurita* (10-19 cm). A few small low density schools were recorded and allocated to sardinella (Fig. 4.5). The biomass was estimated to about 200 tonnes, applying added and weighted length distributions and a measured condition factor of 0.88 for *S. aurita* and 0.96 for *S. maderensis*.

Anchovy

Juvenile *Engraulis encrasicolus* (3-7 cm) was caught in the bottom trawl and one pelagic blind trawl haul on the inner shelf. A few medium-high density schools were recorded (Fig. 4.7). The biomass of anchovy was estimated to be about 3 000 tonnes, applying added length distributions and an estimated condition factor of 0.73.

Ilisha africana (3-17 cm) was caught in bottom trawl haul on the inner shelf. No schools were allocated to the PEL1 group.

PEL 2 (carangids, scombrids, barracudas and hairtail)

Carangids were caught in the bottom trawl over the entire shelf. *Decapterus punctatus* (5-23 cm) and *Selene dorsalis* (3-35 cm) were the most abundant species. Scombrids, mainly *Scomberomorus tritor,* were caught in some bottom trawl hauls. The barracudas, *Sphyraena guachancho, S. sphyraena* and *S. afra* (28-85 cm), were caught in a most of the bottom trawl hauls. Hairtails (*Trichiurus lepturus*) were also caught in some hauls. Only scattered layers and a couple of small low density schools were recorded by the acoustic registration (Fig. 4.8). Based on a pooled length distribution of the most common carangids and an estimated condition factor of 0.91, the biomass of this group was estimated to be 200 tonnes.

4.4 Bénin

Clupeids

Juvenile *Sardinella maderensis* (5-17 cm) was caught in small quantities in one pelagic blind trawl haul and in most of the bottom trawl hauls on the inner shelf, while *S. aurita* (5-26 cm) was found in larger quantities on the outer shelf. Medium-high density schools were recorded on the central-outer part of the shelf (Fig. 4.5). The biomass of sardinella was estimated to be about 17 000 tonnes (80 % *S. aurita*), applying added and weighted length distributions from

both bottom and pelagic trawl hauls and a measured condition factor of 0.88 for *S. aurita* and 0.96 for *S. maderensis*.

Ilisha africana (2-20 cm) was caught in some of the bottom-trawl hauls on the inner shelf area. A couple of low-density school was allocated to the PEL1 group, but no estimate of abundance was made.

Anchovy

Juvenile *Engraulis encrasicolus* (3-9 cm) was caught in the bottom trawl and pelagic blind trawl hauls on the inner shelf. Some low density and a few high density schools were recorded (Fig. 4.7). The biomass of anchovy was estimated to be about 1 600 tonnes, applying added length distributions and an estimated condition factor of 0.73.

PEL 2 (carangids, scombrids, barracudas and hairtail)

This group consisted mainly of carangids with *Chloroscombrus chrysurus*, *Selene dorsalis*, *Selar crumenophthalmus* and *Decapterus punctatus* as the most abundant species in the bottom trawl hauls. Most of the carangids were juveniles (4-16 cm). The scombrid *Scomberomorus tritor* was mainly caught on the inner shelf. The barracudas, *Sphyraena guachancho*, *S. sphyraena* and *S. afra*, were distributed over the entire inner shelf area, while only a few were caught at the outer shelf. The hairtail *Trichiurus lepturus* was caught both on the inner and outer shelf. Scattered schools were recorded along the whole coast, all of low density (Fig. 4.8). Based on a pooled length distribution of the most common carangids and an estimated condition factor of 0.91, the biomass of this group was estimated to be 1 900 tonnes.

4.5 Review of results

Estimated biomasses of PEL 1 species (sardinellas and anchovy) and PEL 2 species (carangids, scombrids, barracudas and hairtails) based on the Dr. Fridtjof Nansen surveys in 1981 (Strømme 1984), 1989 (Anon. 1989), 1999 (Mehl *et al.* 1999), 2000 (Torstensen *et al.* 2000) and 2002 (Mehl *et al.* 2002), are presented in Table 4.1 together with results from the 2004 survey. Bénin and Togo sectors were in earlier years covered as one area due to the narrow coastlines. During the last surveys the effort has been increased in this area, allowing for three transects in Togo and six in Bénin. Still there are few stations and relatively small areas covered by acoustic registrations in this region, and the precision of the results are accordingly low.

As shown during the previous surveys, pelagic fish were present over large parts of the area, especially the central and western parts. Most pelagic hauls were taken as blind hauls as

relatively few schools were seen on the echo sounder during night time. This was partly due to a dispersed distribution and partly due to high abundance of plankton that made acoustic detection and separation very difficult. During daytime it was sometimes difficult to catch schools of pelagic fish with the trawls. Sardinellas and anchovy dominated on the inner shelf, while carangids, scombrids and barracudas were more widely distributed over the entire shelf. Schools shallower than 20 m, especially of anchovy, were not recorded.

The total 2004 biomass estimates for the sardinellas-anchovy group were the second highest in the time series 1981-2004. The estimate for Côte d'Ivoire was two times higher than the 2002 estimate, but close to the 1999-2002 average. In Ghana the estimated biomass was just slightly lower than the 2002 estimate and somewhat above the 1999-2002 average. The estimate for Bénin was record high (mainly sardinellas), while in Togo the estimate for anchovy was similar to the 2000 estimate and that for sardinellas was much lower.

The total biomass estimate of PEL 2 was the lowest in the time series 1999-2004, but close to the 2002 estimate. The estimate for Côte d'Ivoire was almost two times higher than the 2002 estimate and at the 1999-2002 average, while in Ghana it was about 30 % lower than in 2002 and well below the 1999-2002 average. The estimates for Togo and Bénin are similar to the results obtained in 2002.

Table 4.1. Acoustic biomass estimates of main pelagic groups (tonnes) a) Sardinellas and anchovies (PEL 1) and b) carangids, scombrids, barracudas and hairtail (PEL 2) from surveys with "Dr. Fridtjof Nansen" off Côte d'Ivoire, Ghana, and Bénin-Togo in 1981, 1989, 1999, 2000, 2002 and 2004.

a) Sardinellas and anchovies (PEL 1)

Survey Year	Survey period	Côte d'Ivoire	Ghana	Bénin – Togo	Bénin	Togo	Total
1981	June	39 000	40 000	[1]			79 000
1989	12 - 20.10	6 000	41 000	not covered			47 000
1999	19.4 - 8.5	42 000	40 000	5 000			87 000
2000[2]	29.8 - 15. 9	111 000	56 500		1 700	6 500	175 700
2002[2]	16.7 - 9.8	34 000	73 000		1 500	-	108 500
2004	16.5 - 9.6	68 000	68 000		18 600	3 200	157 800

b) Carangids, scombrids, barracudas and hairtail (PEL 2)

Survey Year	Survey period	Côte d'Ivoire	Ghana	Bénin – Togo	Bénin	Togo	Total
1981	June	2 000	10 000	[1]			12 000
1989	12 - 20.10	33 000	57 000	not covered			90 000
1999	19.4 - 8.5	30 000	50 000	4 000			84 000
2000[2]	29.8 – 15. 9	18 000	61 000		1 500	2 500	83 000
2002[2]	16.7 – 12.8	10 500	52 000		2 600	100	65 200
2004	16.5 - 9.6	19 000	37 000		1 900	200	58 100

[1] The estimated biomass for pelagic species (PEL 1 + PEL 2) was 14 000 tonnes (Strømme, T., Føyn, L. and Sætersdal, G. 1983). [2] Upwelling season

CHAPTER 5 RESULTS FROM THE TRAWL SURVEY: CATCH DISTRIBUTION, COMPOSITION AND SWEPT-AREA BIOMASS ESTIMATES OF DEMERSAL FISH

The composition of the fish fauna on the continental shelf and slope of the western Gulf of Guinea changes with depth (Williams 1968). The catch-distribution analyses were therefore performed for two depth strata on the shelf, 0-50 m (inner shelf) and 51-100 m (outer shelf). In the analyses the "Demersal" group includes commercially important families as Sciaenidae, Haemulidae (=Pomadasyidae), Serranidae, Sparidae and Lutjanidae, while the "Pelagic" group includes Engraulidae, Clupeidae, Carangidae, Scombridae, Sphyraenidae and Trichiuridae (the latter family is actually mainly benthopelagic). For the different analysis the "other" group includes all species not accounted for in the groups listed. Therefore, the content of "other" will change from table to table.

The locations of the trawl stations are shown in Figure 1.1. Records of fishing stations and catches are presented in Annex I and pooled length distributions (weighted by catch) of main species by area are shown in Annex II.

In the swept-area biomass estimates, only the shelf area down to depths of 100 m was included, divided into 0-30 m, 31-50 m and 51-100 m. Mean densities of the main demersal species by depth strata, occurrence and catch distributions are shown in Annex IV.

5.1 Côte d'Ivoire

A total of 42 swept-area trawl hauls were made on the Ivorian shelf. Due to lack of suitable bottom, no trawl haul was made in waters deeper than 100 m. Tables 5.1 a and b show catch rates by main groups for the inner (0-50 m) and outer (51-100 m) shelf, respectively. The demersal group had the highest average catch rate on the inner shelf with a relative contribution of 47 %. The pelagic group was the second most important contributing 38 % of the catches, followed by the "other" group (14 %). There were low catch rates and contributions of shrimps (0.4 %), cephalopods (0.6 %) and sharks (0.1 %) on this part of the shelf. The most abundant shrimp species were *Penaeus notialis* and *Parapenaeus atlantica*. *Sepia officinalis hierredda* was the dominating cephalopod.

Table 5.1 Côte d'Ivoire. Catch rates (kg/h) by main groups in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
400	36	187.8	169.7	2.9	0.5	0.0	47.4	408.3
405	28	223.9	336.3	6.8	0.0	0.0	54.0	621.0
406	43	377.6	257.0	11.2	24.0	0.0	291.8	961.6
409	42	192.0	163.8	5.9	4.0	9.3	95.7	470.6
410	28	95.6	245.2	4.3	0.0	0.0	17.9	363.0
411	46	939.0	390.2	0.0	0.0	0.0	110.5	1 439.7
417	45	67.1	39.0	0.0	9.6	0.0	2.3	118.0
418	27	65.3	203.0	0.8	1.8	0.0	27.9	298.7
420	23	17.1	26.0	0.1	0.0	0.0	606.9	650.1
421	41	250.1	67.4	0.0	0.0	0.0	1.4	318.9
427	44	98.7	72.2	0.0	1.6	3.9	8.0	184.4
428	21	50.0	137.2	4.3	0.0	0.0	37.4	228.9
429	24	56.7	59.5	3.0	0.0	0.0	27.9	147.0
430	39	10.0	5.9	0.0	4.3	0.0	8.3	28.5
436	35	42.9	187.4	0.2	3.2	0.0	12.0	245.6
437	22	45.2	257.6	0.0	0.0	0.0	16.1	318.9
438	39	1 176.8	370.7	0.0	0.0	0.0	0.6	1 548.1
444	22	139.5	176.3	0.0	0.0	0.0	59.7	375.5
445	24	12.9	168.3	0.0	1.9	0.0	36.1	219.2
446	33	7.7	3.1	0.0	9.2	0.0	31.9	52.0
449	45	571.7	97.3	0.0	2.0	0.0	41.0	712.0
450	24	248.5	250.5	0.7	0.0	0.0	34.6	534.2
451	23	43.1	576.0	0.0	0.0	0.0	41.4	660.5
452	40	611.0	202.6	3.1	7.3	0.0	9.9	833.8
Mean	33	230.4	185.9	1.8	2.9	0.6	67.5	489.1
SE		62.3	28.1	0.6	1.1	0.4	26.4	80.4
% Catch		47.1	38.0	0.4	0.6	0.1	13.8	

The demersal group dominated the catches also on the outer shelf (47 %), followed by the pelagic group (40 %) and the "other" group (10 %). Cephalopods and sharks had higher catch rates than on the inner shelf, while no shrimps were caught.

Table 5.1 cont.

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
401	55	346.0	55.5	0.0	5.1	0.0	24.2	430.7
402	81	64.2	42.0	0.0	20.8	0.0	59.3	186.3
407	80	174.6	249.8	0.0	24.8	0.0	158.8	608.0
408	77	88.8	10.2	0.0	14.7	0.0	114.7	228.3
412	66	864.3	70.8	0.0	22.1	2.3	103.7	1 063.2
413	82	310.8	992.2	0.0	13.6	0.0	67.8	1 384.4
416	79	32.6	186.4	0.0	22.4	6.4	37.2	285.0
422	60	16.4	210.6	0.0	1.6	0.0	20.0	248.6
423	95	23.7	161.5	0.0	6.9	9.0	38.6	239.7
426	65	287.3	166.0	0.0	16.3	0.3	22.9	492.7
431	76	176.3	171.3	0.0	7.0	0.0	8.3	362.8
435	82	724.2	226.9	0.0	10.2	0.0	30.9	992.2
439	73	310.8	101.2	0.0	7.7	0.0	21.3	441.0
442	85	279.9	6.6	0.0	0.0	2.9	7.3	296.7
443	59	209.2	423.8	0.0	9.6	2.0	93.4	738.0
447	57	271.4	37.4	0.0	3.2	4.8	81.6	398.2
448	88	135.1	635.0	0.0	0.0	0.0	36.8	806.8
453	71	117.5	26.1	0.0	2.6	0.0	33.4	179.6
Mean	74	246.3	209.6	0.0	10.5	1.5	53.3	521.2
SE		53.6	59.3	0.0	1.9	0.6	9.9	81.4
% Catch		47.3	40.2	0.0	2.0	0.3	10.2	

Tables 5.2a and b show the catch rates of the most important pelagic families caught in the bottom trawl. The carangids were the most abundant pelagic group on the inner shelf with an average catch rate of about 78 kg/h, constituting 16 % of the catch. The most frequently caught species were *Chloroscombrus chrysurus, Selene dorsalis* and *Trachurus trecae.* The second most important group was clupeids, with an average catch rate of around 73 kg/h, constituting 15 % of the catch. The clupeid species that occurred most frequently were *Sardinella aurita, S. maderensis* and *Ilisha africana.* Barracudas (*Sphyraena* spp.) were third and contributed about 5 % to the total. Hairtails (*Trichiurus lepturus*) were less abundant and scombrids were scarce.

Carangids also had the highest average catch rate on the outer shelf (140 kg/h or 27 % of the catch). The most frequently caught carangid on the outer shelf was *T. trecae,* which also had the highest catch rates of this group. Clupeids were somewhat less abundant than on the inner shelf (46 kg/h or 9 % of the catch), and the dominating species was *S. aurita.* Scombrids (mainly *Scomber japonicus*) was more abundant than on the inner shelf, while the catch rates of barracudas were lower and hairtails were scarce.

Table 5.2 Côte d'Ivoire. Catch rates (kg/h) by main pelagic families in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
400	36	40.0	72.7	0.0	8.0	49.1	238.6	408.3
405	28	118.1	143.3	0.0	33.8	41.1	284.7	621.0
406	43	8.0	126.4	0.0	91.2	31.4	704.6	961.6
409	42	9.7	89.6	0.0	18.2	46.2	306.9	470.6
410	28	211.7	13.7	0.0	19.9	0.0	117.8	363.0
411	46	12.8	319.5	0.0	37.7	20.3	1 049.5	1 439.7
417	45	15.0	18.0	0.0	0.8	5.2	79.0	118.0
418	27	98.3	74.8	0.0	22.3	7.8	95.7	298.7
420	23	17.5	6.9	0.9	0.3	0.5	624.1	650.1
421	41	21.6	19.7	0.0	4.9	21.2	251.5	318.9
427	44	7.3	41.1	0.0	0.0	23.7	112.2	184.4
428	21	71.4	49.0	1.6	8.4	6.8	91.7	228.9
429	24	44.5	8.7	1.7	4.1	0.5	87.5	147.0
430	39	0.5	3.8	0.0	0.0	1.6	22.6	28.5
436	35	1.2	26.8	3.0	1.2	155.2	58.2	245.6
437	22	57.0	166.2	0.0	4.9	29.5	61.3	318.9
438	39	243.6	116.2	0.0	0.0	10.9	1 177.4	1 548.1
444	22	78.5	75.0	0.0	0.0	22.8	199.2	375.5
445	24	1.9	148.2	3.8	0.0	14.4	50.9	219.2
446	33	0.0	3.1	0.0	0.0	0.0	48.9	52.0
449	45	0.0	85.1	0.0	0.0	12.2	614.7	712.0
450	24	183.0	46.8	11.2	0.0	9.5	283.8	534.2
451	23	527.4	35.7	0.3	0.0	12.6	84.5	660.5
452	40	0.6	196.7	0.0	3.1	2.3	631.2	833.8
Mean	33	73.7	78.6	0.9	10.8	21.9	303.2	489.1
SE		24.4	15.5	0.5	4.2	6.5	66.5	80.4
% Catch		15.1	16.1	0.2	2.2	4.5	62.0	

b) Outer shelf, 51-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
401	55	8.8	44.3	0.0	1.4	1.0	375.2	430.7
402	81	24.9	0.9	16.2	0.0	0.0	144.3	186.3
407	80	78.5	169.5	0.5	0.0	1.3	358.2	608.0
408	77	2.1	7.0	0.3	0.7	0.0	218.2	228.3
412	66	33.0	32.0	0.0	0.0	5.8	992.4	1 063.2
413	82	13.2	946.0	33.0	0.0	0.0	392.2	1384.4
416	79	183.2	2.4	0.8	0.0	0.0	98.6	285.0
422	60	182.8	13.8	0.0	0.0	14.0	38.0	248.6
423	95	2.1	158.9	0.5	0.0	0.0	78.2	239.7
426	65	40.0	100.0	0.0	0.0	26.0	326.7	492.7
431	76	48.4	82.6	0.0	6.8	33.5	191.5	362.8
435	82	62.9	155.5	2.5	1.7	4.2	765.3	992.2
439	73	16.4	61.5	14.8	0.0	8.5	339.8	441.0
442	85	0.3	6.3	0.0	0.0	0.0	290.1	296.7
443	59	10.6	409.8	1.4	0.0	2.0	314.2	738.0
447	57	0.0	33.8	0.0	3.6	0.0	360.9	398.2

448	88	113.0	305.4	216.6	0.0	0.0	171.8	806.8
453	71	18.0	0.4	3.2	0.0	4.4	153.5	179.6
Mean	74	46.6	140.6	16.1	0.8	5.6	311.6	521.2
SE		13.7	54.3	12.0	0.4	2.3	55.9	81.4
% Catch		8.9	27.0	3.1	0.2	1.1	59.8	

Catch rates of the most valuable demersal groups on the shelf are presented in Tables 5.3a and b. The catch rates were in general low on the inner shelf. Grunts had the highest mean catch rate (25 kg/h), mainly due to one large catch (400 kg/h) of *Pomadasys peroteti.* Other common grunts were *P. jubelini* and *P. incisus.* Croakers (15 kg/h) were the second most important group, with *Pseudotolithus senegalensis* and *Pteroscion peli* as the most common species. Seabreams occurred less frequent but had a similar mean catch rate as croakers (14 kg/h), and *Pagellus bellottii* was the most abundant species. Groupers were scarcer with some catches of *Epinephelus aeneus.* Snappers were only found on one station with a very small catch of juvenile *Lutjanus fulgens.*

Table 5.3 Côte d'Ivoire. Catch rates (kg/h) of valuable demersal species grouped by families in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
400	36	0.9	0.0	2.1	27.0	1.8	376.5	408.3
405	28	0.0	0.0	5.8	23.4	58.3	533.6	621.0
406	43	118.4	0.0	3.2	0.0	38.4	801.6	961.6
409	42	0.0	0.0	0.0	1.3	28.2	441.1	470.6
410	28	0.0	0.0	0.0	0.0	18.0	345.0	363.0
411	46	47.8	0.0	1.8	10.4	74.7	1 305.1	1 439.7
417	45	1.0	0.0	0.0	0.5	4.8	111.8	118.0
418	27	0.0	0.0	0.0	39.0	8.3	251.4	298.7
420	23	0.5	0.0	0.0	3.7	4.8	641.1	650.1
421	41	4.6	0.0	0.0	20.2	12.3	281.8	318.9
427	44	3.0	0.0	2.4	12.3	0.0	166.7	184.4
428	21	0.0	0.0	0.6	14.5	30.5	183.3	228.9
429	24	0.0	0.0	2.7	8.0	27.3	109.1	147.0
430	39	1.4	0.0	1.7	6.0	0.0	19.5	28.5
436	35	0.0	0.0	0.0	5.6	8.5	231.5	245.6
437	22	0.0	0.0	0.0	13.0	4.7	301.2	318.9
438	39	0.0	0.0	0.0	3.6	0.0	1 544.5	1 548.1
444	22	0.0	0.0	0.0	5.3	21.2	349.0	375.5
445	24	12.1	0.8	0.0	0.0	0.0	206.3	219.2
446	33	7.7	0.0	0.0	0.0	0.0	44.2	52.0
449	45	124.3	0.0	43.0	399.8	0.0	144.9	712.0
450	24	0.0	0.0	0.1	3.2	1.0	529.9	534.2
451	23	0.5	0.0	0.0	4.4	10.3	645.3	660.5
452	40	21.3	0.0	2.8	1.7	0.0	808.1	833.8
Mean	33	14.3	0.0	2.8	25.1	14.7	432.2	489.1
SE		7.1	0.0	1.8	16.4	4.0	77.4	80.4
% Catch		2.9	0.0	0.6	5.1	3.0	88.4	

b) Outer shelf, 51-100 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
401	55	2.7	0.0	0.3	0.0	0.0	427.7	430.7
402	81	42.6	0.0	0.0	0.0	8.1	135.6	186.3
407	80	102.3	0.0	0.0	0.0	2.0	503.7	608.0
408	77	22.8	0.0	0.0	0.0	57.8	147.7	228.3
412	66	662.8	0.0	24.3	0.0	147.2	228.9	1 063.2
413	82	269.2	0.0	19.6	0.0	0.0	1 095.6	1 384.4
416	79	14.8	0.0	0.4	0.0	16.6	253.2	285.0
422	60	11.6	0.0	0.0	0.0	0.0	237.0	248.6
423	95	12.4	0.0	0.0	0.0	5.2	222.0	239.7
426	65	162.8	2.1	0.0	0.0	0.0	327.9	492.7
431	76	11.8	0.0	0.0	0.0	0.0	351.0	362.8
435	82	11.9	0.0	0.0	0.0	13.6	966.7	992.2
439	73	14.8	0.0	0.0	0.0	10.5	415.6	441.0
442	85	275.8	0.0	0.0	0.0	4.1	16.7	296.7
443	59	195.5	0.0	0.0	0.0	0.0	542.5	738.0
447	57	105.8	0.0	0.0	55.8	9.0	227.7	398.2
448	88	28.6	0.0	0.0	0.0	17.9	760.4	806.8
453	71	110.1	0.0	0.0	0.0	4.0	65.5	179.6
Mean	74	114.3	0.1	2.5	3.1	16.5	384.7	521.2
SE		38.6	0.1	1.7	3.1	8.3	70.1	81.4
% Catch		21.9	0.0	0.5	0.6	3.2	73.8	

On the outer shelf, seabreams dominated the valuable demersal species with a relative contribution of 22 % and an average catch rate of 114 kg/h. *Dentex angolensis, Pagellus bellottii* and *D. canariensis* were the most frequently occurring seabreams. Croakers (16 kg/h) constituted the second most important group, *Umbrina canariensis* being the dominant species. Grunts were much less abundant than on the inner shelf with only one catch of *P. incisus*. Groupers also occurred less frequent with a couple of catches of *E. aeneus*. As on the inner shelf snappers were only found on one station with a small catch of *L. fulgens*.

Appendix IV gives the swept-area estimates of mean densities (t/NM^2) based on 42 random trawl stations on the shelf. Of the demersal species, *Brachydeuterus auritus* had the highest mean densities in both of the two depth zones on the inner shelf (0-30 m, 31-50 m). It was followed by *Galeoides decadactylus, Polydactylus quadrifilis* and *P. senegalensis* in the shallowest depth zone and *P. peroteti* and *P. bellottii* in the 31-50 m zone. *B. auritus* was the most abundant demersal species also in the 51-100 m depth zone followed by *P. bellottii, D. angolensis, Umbrina canariensis* and *Boops boops. B. auritus* had the highest all over mean density, followed by *P. bellottii, P. peroteti* and *D. angolensis.*

Table 5.4 presents the swept-area biomass estimates for the valuable demersal groups and other groups that occur in sizeable quantities. The estimated total biomass of valuable demersal groups was about 10 000 tonnes of which seabreams made up almost 70 %. The highest biomass of seabreams was found in the deepest zone. Croakers were most abundant in the shallowest depth zone and grunts in the 31-50 m zone.

Of the pelagic and semi-pelagic species, bigeye grunt (*B. auritus*) had the highest estimated biomass (about 12 000 tonnes). Carangids followed with 10 000 tonnes and barracudas had an estimated biomass of 1 200 tonnes.

Table 5.4 Côte d'Ivoire. Biomass estimates (tonnes) of important species/groups of fish on the shelf, by depth.

Group/species	0-30 m	31-50 m	51-100m	Sum	95 % Confidence limits	
Seabreams	17	575	6 249	6 841	2 356	11326
Grunts	191	862	162	1 216	0	2 660
Croakers	298	280	907	1 485	468	2 503
Groupers	17	105	146	268	13	522
Snappers	2	0	11	13	0	36
Sum dem. val.	**525**	**1 823**	**7 475**	**9 823**	**4 073**	**15 573**
Bigeye grunt	1 098	5 994	4 938	11 959	5 499	18 420
Carangids	1 272	1 900	7 496	10 668	4 638	16 698
Barracudas	242	659	275	1 176	589	1 764

5.2 Ghana

A total of 43 swept-area trawl hauls were made on the shelf off Ghana. In addition 5 bottom trawl hauls were made in waters deeper than 100 m. Tables 5.5 a and b present catch rates by main groups for the inner (0-50 m) and outer (51-100 m) shelf respectively. The demersal species group had the highest average catch rate on the inner shelf with a relative contribution of 39 %. The pelagic group contributed 35 % to the total followed by the "other" group, which had a relative contribution of about 24 %. Cephalopods made up 2.3 % of the catch, while shrimps were scarce and sharks only were caught on one station. Also on the outer shelf the demersal group dominated the catches, contributing 54 % to the total. The pelagic group had a relative contribution of 20 % and "other" about 19 %. Cephalopods and sharks had both higher catch rates than on the inner shelf. No shrimps were found on the outer shelf in Ghana. In general, the average catch rates were highest in the western part of Ghana. The average catch rates of the demersal group was more than two times higher on the outer shelf than on the inner shelf, while for the pelagic group they were similar.

Table 5.5 Ghana. Catch rates (kg/h) by main groups in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
456	43	175.0	63.8	0.0	1.6	0.0	29.2	269.6
457	25	294.6	201.2	0.0	0.0	0.0	126.2	622.0
458	26	42.7	13.3	0.0	0.0	0.0	35.0	91.0
459	40	282.8	15.7	0.0	1.2	0.0	25.3	325.0
464	39	127.8	35.5	0.2	9.3	0.0	9.6	182.4
466	28	32.6	196.2	0.0	3.0	0.0	0.0	231.8
467	28	48.3	71.2	2.0	0.0	0.0	56.0	177.5
468	46	239.3	38.3	0.0	20.0	0.0	49.6	347.2
474	47	204.1	824.5	0.0	4.7	0.0	116.9	1 150.1
475	28	75.8	28.3	4.0	0.6	0.0	15.6	124.3
476	29	211.8	303.0	0.0	3.5	0.0	54.4	572.7
480	47	719.8	69.4	0.0	5.8	1.2	9.0	805.3
482	25	1.5	4.5	0.0	4.8	0.0	37.1	47.9
483	35	82.0	94.7	0.0	6.4	0.0	2.1	185.1
487	38	64.8	2.1	0.0	13.4	0.0	89.6	169.9
488	23	0.0	3.0	0.0	0.0	0.0	0.4	3.5
489	23	48.2	38.8	0.0	6.1	0.0	648.8	741.9
490	44	53.8	25.0	0.0	9.7	0.0	224.1	312.6
494	41	18.6	8.5	0.0	14.6	0.0	52.9	94.6
496	26	4.3	2.6	0.0	0.0	0.0	27.1	34.0
497	41	47.9	4.7	0.0	16.4	0.0	21.5	90.4
500	27	2.9	9.4	0.0	0.0	0.0	0.7	12.9
501	46	7.3	77.2	0.0	8.1	0.0	3.2	95.8
503	39	31.1	22.6	0.0	15.8	0.0	13.6	83.1
504	24	54.2	118.1	0.4	1.7	0.0	98.8	273.3
505	37	48.2	326.2	0.0	0.0	0.0	13.4	387.7
509	43	0.5	19.6	0.0	25.5	0.0	20.3	65.8
Mean	35	108.1	96.9	0.3	6.4	0.0	65.9	277.7
SE		29.1	32.8	0.2	1.4	0.0	24.4	53.7
% Catch		38.9	34.9	0.1	2.3	0.0	23.8	

Table 5.5 cont.

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
455	70	80.6	5.8	0.0	9.7	0.0	65.7	161.8
460	61	213.5	0.0	0.0	7.2	0.0	41.4	262.1
461	77	111.9	116.0	0.0	2.6	0.0	36.7	267.3
463	59	804.4	262.0	0.0	1.0	0.0	47.8	1 115.2
469	84	110.1	26.0	0.0	17.1	8.8	148.2	310.1
472	81	35.5	0.0	0.0	11.2	46.0	44.6	137.3
473	61	57.5	7.3	0.0	18.3	0.0	50.6	133.8
479	85	9.4	0.5	0.0	14.9	3.0	55.8	83.6
484	53	98.9	174.7	0.0	0.0	0.0	87.7	361.3
486	99	571.2	7.8	0.0	3.5	11.7	90.3	684.5
491	65	617.0	259.6	0.0	21.0	22.1	499.5	1 419.1
493	60	52.3	20.1	0.0	32.5	0.0	84.7	189.6
498	70	166.2	57.5	0.0	8.7	0.0	10.6	243.1
502	83	17.3	423.8	0.0	108.7	7.6	38.9	596.3
506	51	310.4	136.9	0.0	34.4	0.0	22.7	504.4
508	85	868.6	62.7	0.0	37.1	51.4	114.2	1 134.1
Mean	72	257.8	97.6	0.0	20.5	9.4	90.0	475.2
SE		72.6	31.3	0.0	6.6	4.1	28.7	102.9
% Catch		54.3	20.5	0.0	4.3	2.0	18.9	

Tables 5.6a and b show catch rates of the most important pelagic families caught in the bottom-trawl hauls. Clupeids dominated on the inner shelf with catch rates of 58 kg/h. *Sardinella aurita* was most common clupeid and was found on both the inner and outer shelf, while *S. maderensis* was only observed on the inner shelf. The second most important group was carangids (25 kg/h) and barracudas (12 kg/h) came third. The most frequently occurring species of carangids were *Decapterus punctatus, Chloroscombrus chrysurus. Selene dorsalis, Trachurus trecae* and *Alectis alexandrinus*. Carangids were the most abundant group on the outer shelf (52 kg/h). Clupeids had the second highest catch rate on the outer shelf (38 kg/h). Scombrids had low catch rates on both the inner and outer shelf. Hairtails (*Trichiurus lepturus*) were found in relatively low catch rates at a couple of stations on the inner shelf but not on the outer. Barracudas were scarcer on the outer shelf.

Table 5.6 Ghana. Catch rates (kg/h) by main pelagic families in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
456	43	4.5	51.3	0.0	0.0	8.0	205.8	269.6
457	25	157.7	38.5	0.9	0.0	4.1	420.8	622.0
458	26	1.5	11.8	0.0	0.0	0.0	77.7	91.0
459	40	0.0	11.5	0.0	0.0	4.2	309.3	325.0
464	39	0.5	35.0	0.0	0.0	0.0	146.9	182.4
466	28	171.5	24.3	0.4	0.0	0.1	35.6	231.8
467	28	11.2	24.0	0.6	7.6	27.8	106.3	177.5
468	46	0.0	34.7	0.0	0.0	3.6	308.9	347.2
474	47	756.3	44.6	2.8	0.0	20.8	325.7	1 150.1
475	28	13.4	3.3	0.6	9.6	1.3	96.0	124.3
476	29	200.8	17.9	7.7	0.0	76.6	269.7	572.7
480	47	0.0	69.4	0.0	0.0	0.0	735.8	805.3
482	25	0.0	4.5	0.0	0.0	0.0	43.4	47.9
483	35	2.4	64.3	2.6	0.0	25.5	90.5	185.1
487	38	0.0	2.1	0.0	0.0	0.0	167.8	169.9
488	23	0.0	3.0	0.0	0.0	0.0	0.4	3.5
489	23	0.0	5.4	6.6	0.0	26.8	703.1	741.9
490	44	0.0	22.4	1.6	0.0	1.0	287.5	312.6
494	41	3.1	5.4	0.0	0.0	0.0	86.1	94.6
496	26	0.0	2.6	0.0	0.0	0.0	31.4	34.0
497	41	0.0	2.9	0.0	0.0	1.8	85.7	90.4
500	27	0.2	1.2	2.1	0.0	5.8	3.6	12.9
501	46	26.7	46.9	0.0	0.0	3.7	18.6	95.8
503	39	2.7	17.3	0.0	0.0	2.6	60.5	83.1
504	24	1.5	44.5	0.6	0.6	70.9	155.2	273.3
505	37	208.9	75.2	7.7	0.0	34.4	61.5	387.7
509	43	0.0	19.6	0.0	0.0	0.0	46.2	65.8
Mean	35	57.9	25.3	1.3	0.7	11.8	180.7	277.7
SE		29.7	4.3	0.5	0.4	4.0	37.0	53.7
% Catch		20.8	9.1	0.5	0.2	4.3	65.1	

Table 5.6 cont.

b) Outer shelf, 51-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
455	70	0.0	3.9	0.0	0.0	2.0	156.0	161.8
460	61	0.0	0.0	0.0	0.0	0.0	262.1	262.1
461	77	85.9	3.8	26.3	0.0	0.0	151.3	267.3
463	59	3.1	246.6	2.5	0.0	9.8	853.2	1 115.2
469	84	24.2	1.8	0.0	0.0	0.0	284.1	310.1
472	81	0.0	0.0	0.0	0.0	0.0	137.3	137.3
473	61	1.9	2.6	2.9	0.0	0.0	126.4	133.8
479	85	0.0	0.5	0.0	0.0	0.0	83.1	83.6
484	53	41.5	132.7	0.0	0.0	0.5	186.6	361.3
486	99	0.6	2.4	4.8	0.0	0.0	676.7	684.5
491	65	17.8	213.8	0.0	0.0	28.0	1 159.5	1 419.1
493	60	5.0	8.0	5.8	0.0	1.3	169.5	189.6
498	70	21.3	32.9	0.0	0.0	3.4	185.6	243.1
502	83	338.4	85.4	0.0	0.0	0.0	172.4	596.3
506	51	42.8	71.5	3.5	0.0	19.0	367.5	504.4
508	85	33.3	29.4	0.0	0.0	0.0	1 071.3	1 134.1
Mean	72	38.5	52.2	2.9	0.0	4.0	377.7	475.2
SE		20.8	19.9	1.6	0.0	2.0	88.9	102.9
% Catch								

Catch rates of the most valuable demersal groups on the shelf are presented in Tables 5.7a and b. Seabreams had the highest catch rates both on the inner and outer shelf with average catch rates of 27 kg/h and 149 kg/h, respectively. The most common species of seabreams were *Pagellus bellottii, Dentex canariensis, Pagrus caeruleostictus* and *D. gibbosus. D. congoensis* was found only on the outer shelf, while *D. canariensis, P. caeruleostictus* and *P. bellottii* were found both on the inner and outer shelf (See Annex IV). The second most important group on the inner shelf was the grunts with an average catch rate of around 2.8 kg/h followed by croakers (1.8 kg/h) and groupers (1.5 kg/h). Snappers were scarce on the inner shelf, while they were the second largest family on the outer shelf (1.9 kg/h) due to one relatively large catch (25 kg/h). Croakers came third (1.5 kg/h), groupers were scarce and grunts were not caught on the outer shelf.

Annex IV gives the swept-area estimates of mean densities (t/NM^2) based on 43 random trawl stations on the shelf. Of the demersal fish species *Brachydeuterus auritus* had the highest densities in both of the two shallowest depth zones followed by Galeoides decadactylus in the $\leq$ 30 m zone and *P. bellottii* in the 31-50 m zone. *P. bellottii* had the highest mean density in the deepest depth zone (51-100 m) followed by *B. auritus* and *Boops boops. B. auritus, P. bellottii* and B. *boops* had the highest overall mean density. In 2000, the scallop *Chlamys purpuratus* had high density in both the shallowest zone (2.96 t/ NM^2) and the 31-50m zone (2.25 t/ NM^2) and was caught on 30 % of the stations in Ghana, mainly from

0° 10' W to 1° 15' W. During the 2002 survey it was only caught in low numbers on a few stations in the same area. The catch rate was found to be very much dependent on the performance of the trawl gear. During the present survey *C. purpuratus* was caught on 9 % of the stations and had a density of 1.78 t/ NM^2 on the inner shelf, which is more than the double of the *B. auritus* density. However, most of the scallops were dead.

Table 5.7 Ghana. Catch rates (kg/h) of valuable demersal species grouped by families in swept area bottom trawl hauls on the shelf. A: Inner shelf (0-50 m), B: Outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
456	43	67.9	0.0	0.1	0.0	0.0	201.6	269.6
457	25	6.3	0.0	0.0	7.8	0.0	607.8	622.0
458	26	24.1	4.3	0.0	1.8	0.0	60.8	91.0
459	40	67.6	0.0	0.4	0.0	0.0	257.1	325.0
464	39	5.0	0.0	2.4	0.0	0.0	174.9	182.4
466	28	0.9	0.0	0.1	0.0	0.0	230.8	231.8
467	28	0.0	0.0	0.0	0.0	1.3	176.2	177.5
468	46	92.8	0.0	2.5	0.0	0.0	251.9	347.2
474	47	20.6	0.0	2.0	49.5	6.6	1 071.4	1 150.1
475	28	0.0	0.0	0.0	12.0	32.2	80.1	124.3
476	29	1.8	0.0	0.0	1.3	6.4	563.3	572.7
480	47	162.6	0.0	0.0	0.0	0.0	642.6	805.3
482	25	1.2	0.0	0.0	0.0	0.0	46.8	47.9
483	35	15.2	0.4	0.0	0.2	0.0	169.4	185.1
487	38	55.1	4.8	0.0	0.0	0.0	110.0	169.9
488	23	0.0	0.0	0.0	0.0	0.0	3.5	3.5
489	23	48.2	0.0	0.0	0.0	0.0	693.7	741.9
490	44	52.8	0.0	0.0	0.0	0.0	259.7	312.6
494	41	13.7	0.0	1.9	0.0	0.0	79.1	94.6
496	26	4.3	0.0	0.0	0.0	0.0	29.7	34.0
497	41	47.9	0.0	0.0	0.0	0.0	42.6	90.4
500	27	1.9	0.0	0.9	0.0	0.0	10.1	12.9
501	46	4.4	0.0	0.0	0.0	0.0	91.3	95.8
503	39	6.0	0.0	25.1	0.0	0.0	52.0	83.1
504	24	17.1	0.0	0.0	1.7	0.2	254.3	273.3
505	37	16.3	0.0	6.0	0.0	0.9	364.5	387.7
509	43	0.5	0.0	0.0	0.0	0.0	65.4	65.8
Mean	35	27.2	0.4	1.5	2.8	1.8	244.1	277.7
SE		7.2	0.2	0.9	1.9	1.2	49.9	53.7
% Catch		9.8	0.1	0.6	1.0	0.6	87.9	

Tab. 5.11 cont.

b) Outer shelf, 51-100 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
455	70	76.5	0.0	0.0	0.0	0.0	85.4	161.8
460	61	198.8	0.0	0.6	0.0	0.0	62.8	262.1
461	77	104.2	0.0	0.0	0.0	7.7	155.4	267.3
463	59	205.3	0.0	0.0	0.0	0.0	909.9	1 115.2
469	84	90.9	0.0	2.4	0.0	6.5	210.2	310.1
472	81	35.5	0.0	0.0	0.0	0.0	101.8	137.3
473	61	54.8	0.0	0.0	0.0	0.0	79.0	133.8
479	85	9.4	0.0	0.0	0.0	0.0	74.2	83.6
484	53	93.0	5.1	0.0	0.0	0.0	263.2	361.3
486	99	389.4	0.0	0.0	0.0	0.0	295.1	684.5
491	65	448.4	25.3	0.0	0.0	9.1	936.3	1 419.1
493	60	44.4	0.0	2.3	0.0	0.0	142.9	189.6
498	70	34.6	0.0	0.0	0.0	0.0	208.5	243.1
502	83	16.0	0.0	0.0	0.0	0.0	580.3	596.3
506	51	45.6	0.0	1.3	0.0	0.0	457.5	504.4
508	85	535.8	0.0	0.0	0.0	0.0	598.3	1 134.1
Mean	72	148.9	1.9	0.4	0.0	1.5	322.5	475.2
SE		41.3	1.6	0.2	0.0	0.8	72.6	102.9
% Catch		31.3	0.4	0.1	0.0	0.3	67.9	

Table 5.8 presents swept-area biomass estimates for the valuable demersal groups and other groups that occur in sizeable quantities. The estimated total biomass was about 17 000 tonnes, of which seabreams made up more than 90 %. The highest biomass of seabreams was found between depths of 51 and 100 m. Grunts had the second highest biomass with around 300 tonnes. Croakers had the third highest biomass followed by groupers and snappers. Of the pelagic and semi-pelagic groups, the bigeye grunt (*B. auritus*) had an estimated biomass of around 14 000 tonnes, carangids 7 400 tonnes and barracudas 1 600 tonnes.

Table 5.8 Ghana. Biomass estimates (tonnes) of important species/groups of fish on the shelf, by depth.

Group/species	**0-30 m**	**31-50 m**	**51-100m**	**Sum**	**95 % confidence limits**	
Seabreams	395	2 807	12 985	16 187	8 806	23 568
Grunts	99	227	0	326	0	792
Croakers	155	21	110	286	9	563
Groupers	0	165	55	220	10	431
Snappers	14	21	165	200	0	475
Sum dem. val.	**664**	**3 240**	**13 315**	**17 219**	**9 729**	**24 709**
Bigeye grunt	2 344	6 130	5 392	13 866	4 945	22 787
Carangids	692	2 229	4 484	7 405	3 897	10 913
Barracudas	805	454	330	1 589	716	2 462

5.3 Togo

Nine swept-area trawl stations were made on the shelf off Togo. One deep-water bottom trawl was taken at 201-255 m. Tables 5.9a and b present catch rates by main groups for the inner and outer shelf. On the inner shelf the pelagic group dominated with a relative contribution of 44 %, while demersal fish made up 35 % of the catch. The group "other" species had a relative contribution of about 17 %. The mean catch of cephalopods made up 3.5 % of the total catch at the inner shelf. No shrimps or sharks were caught. On the outer shelf cephalopods had the highest contribution with 37 % of the total catch, and *Sepia officinalis hierredda* was the dominant species. Then followed the demersal group (29 %), pelagic (16 %) and "other" (15 %). Some sharks were caught, while no shrimps were found in this zone either.

Table 5.9 Togo. Catch rates (kg/h) by main groups in swept-area bottom trawl hauls on a) inner shelf, 0-50 m, and b) outer shelf, 51-100 m.

a) Inner shelf, 0-50 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
532	41	64.2	50.5	0.0	17.8	0.0	27.0	159.4
533	22	53.1	74.6	0.0	1.5	0.0	36.8	166.1
534	24	107.2	59.3	0.0	2.7	0.0	31.9	201.1
535	43	58.2	141.4	0.0	3.5	0.0	7.8	210.9
540	36	7.5	31.9	0.0	1.1	0.0	14.6	55.0
541	28	0.5	3.6	0.0	1.8	0.0	24.0	29.8
Mean	32	48.4	60.2	0.0	4.7	0.0	23.7	137.1
SE		16.1	19.1	0.0	2.6	0.0	4.4	31.2
% Catch		35.3	43.9	0.0	3.5	0.0	17.3	

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
531	68	28.2	51.8	0.0	12.3	2.8	21.7	116.8
536	53	34.5	2.9	0.0	72.6	8.8	19.3	138.2
539	52	51.2	7.0	0.0	57.4	0.0	16.4	132.0
Mean	58	38.0	20.6	0.0	47.4	3.9	19.1	129.0
SE		6.9	15.7	0.0	18.1	2.6	1.5	6.3
% Catch		29.4	16.0	0.0	36.8	3.0	14.8	

Catch rates of the most important pelagic families, caught by bottom trawl in the swept-area survey, are presented in Tables 5.10 and b. Carangids were the dominant species group on both the inner and outer shelf, with highest average catch rate (33 kg/h) on the former. *Decapterus punctatus* occurred most frequently, followed by *Selene dorsalis*. Clupeids were caught in relative low numbers at some of the stations, *Sardinella maderensis* and *Ilisha africana* only on the inner shelf, *S. aurita* also on the outer shelf. Hairtails (*Trichiurus*

lepturus) were the second most important pelagic group on the inner shelf, but were not found on the outer shelf. Barracudas (*Sphyraena* spp.) were the third most abundant group on the inner shelf, while they were more scarce on the outer shelf. Scombrids (*Scomberomorus tritor* and *Scomber japonicus*) occurred in low numbers both on the inner and outer shelf.

Table 5.10 Togo. Catch rates (kg/h) by main pelagic families in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
532	41	0.0	22.2	0.0	28.3	0.0	108.9	159.4
533	22	30.1	23.3	0.5	1.8	19.0	91.4	166.1
534	24	3.7	48.7	4.7	0.0	2.2	141.8	201.1
535	43	0.5	76.3	0.0	58.5	6.1	69.5	210.9
540	36	0.0	26.3	0.0	0.2	5.4	23.2	55.0
541	28	0.0	0.1	0.0	0.0	3.5	26.3	29.8
Mean	32	5.7	32.8	0.9	14.8	6.0	76.9	137.1
SE		4.9	10.7	0.8	9.9	2.7	19.1	31.2
% Catch		4.2	23.9	0.6	10.8	4.4	56.1	

b) Outer shelf, 50-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
531	68	24.3	25.9	0.4	0.0	1.2	65.0	116.8
536	53	0.0	0.6	0.0	0.0	2.3	135.2	138.2
539	52	0.0	7.0	0.0	0.0	0.0	125.0	132.0
Mean	58	8.1	11.2	0.1	0.0	1.2	108.4	129.0
SE		8.1	7.6	0.1	0.0	0.7	21.9	6.3
% Catch		6.3	8.7	0.1	0.0	0.9	84.0	

Tables 5.11 and b present catch rates of the most commercially important demersal species on the shelf down to depths of 100 m. The seabreams dominated both the inner and outer parts of the shelf with catch rates of 16 kg/h and 36 kg/h, respectively. *Dentex canariensis, Pagrus caeruleostictus* and *Pagellus bellottii* were the most common sparids. Snappers were the second most important family on the inner shelf, mainly due to one catch of *Lutjanus goreensis* (35 kg/h), but were not encountered on outer parts. Groupers were caught in low numbers on both parts of the shelf, croakers and grunts only on the inner shelf.

Table 5.11 Togo. Catch rates (kg/h) of commercially important demersal species grouped by families in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (50-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
532	41	11.3	0.0	2.0	7.6	0.0	138.4	159.4
533	22	3.5	0.0	0.0	6.6	5.1	151.0	166.1
534	24	44.4	36.3	0.0	0.0	0.0	120.4	201.1
535	43	31.2	4.5	0.0	4.6	0.0	170.6	210.9
540	36	6.7	0.0	0.0	0.0	0.0	48.4	55.0
541	28	0.5	0.0	0.0	0.0	0.0	29.3	29.8
Mean	32	16.3	6.8	0.3	3.1	0.8	109.7	137.1
SE		7.2	5.9	0.3	1.5	0.8	23.5	31.2
% Catch		11.9	5.0	0.2	2.3	0.6	80.0	

b) Outer shelf, 50-100 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
531	68	28.0	0.0	0.0	0.0	0.0	88.8	116.8
536	53	34.2	0.0	0.0	0.0	0.0	104.0	138.2
539	52	47.2	0.0	4.1	0.0	0.0	80.7	132.0
Mean	58	36.5	0.0	1.4	0.0	0.0	91.2	129.0
SE		5.6	0.0	1.4	0.0	0.0	6.8	6.3
% Catch		28.3	0.0	1.1	0.0	0.0	70.7	

Annex IV gives the swept-area estimates of mean densities (t/NM^2) based on the 9 random bottom trawl stations on the shelf of Togo. Of the demersal species *Lethrinus atlanticus* and *Lutjanus goreensis* had the highest mean density in the shallowest zone ($\leq$ 30 m), *Brachydeuterus auritus* and *Pagellus bellottii* in the 31-50 m zone and *S. officinalis hierredda* and *P. bellottii* in the 51-100 m zone. *S. officinalis hierredda, B. auritus* and *P. bellottii* had the highest overall mean densities.

Table 5.12 presents swept-area biomass estimates for valuable demersal groups and other groups that occurred in sizeable quantities in the hauls taken off Togo. Estimated total biomass of valuable demersal groups averaged to about 350 tonnes. Seabreams made up most of this. The highest total biomass was estimated in the shallowest zone, but the seabreams were most abundant in the deepest zone. Snappers had the second highest estimated biomass, while the estimates for grunts, croakers and groupers were very low. Of the presented pelagic and semi-pelagic groups, carangids had the highest estimated biomass.

Table 5.12 Togo. Biomass estimates (tonnes) of important species/groups of fish on the shelf, by depth.

Group/species	0-30 m	31-50 m	51-100 m	Sum	95 % confidence limits	
Seabreams	80	42	120	243	92	394
Grunts	12	11	0	23	-4	49
Croakers	9	0	0	9	-9	27
Groupers	0	2	4	6	-3	14
Snappers	60	4	0	64	-56	183
Sum dem. val.	**161**	**59**	**124**	**343**	**87**	**600**
Bigeye grunt	45	55	0	99	-10	209
Carangids	124	107	36	267	90	444
Barracudas	43	9	4	57	-1	114

5.4 Bénin

19 swept-area trawl stations were made on the shelf off Bénin. Due to a steep slope and rough bottom it was difficult to trawl in the deeper areas. Tables 5.13a and b show catch rates by main groups for the inner shelf (0-50 m) and outer shelf (51-100 m) respectively.

Pelagic fish dominated on the inner shelf with a relative contribution of 41 %. The demersal group was the second most important, contributing 35 % to the catches, followed by the "other" group (15 %), cephalopods (3.3 %), sharks (2.7 %) and shrimps (1.3 %). Also on the outer shelf the pelagic group was the most important with 51 % of the average catch rate. The demersal group made up 31 % of the catches and "other" fish 8.2 %. Cephalopods had higher mean catch rate than on the inner shelf and made up 7.9 % of the catches. *Sepia officinalis hierredda* was the dominant cephalopod. Sharks were less abundant (1.1 %), while shrimps were only found on one station.

Table 5.13. Bénin. Catch rates (kg/h) by main groups in swept-area bottom trawl hauls on a) inner shelf, 0-50 m, and b) outer shelf, 51-100 m.

a) Inner shelf, 0-50 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
510	21	31.4	14.2	1.1	1.4	0.0	14.9	63.0
511	33	48.3	84.0	2.5	3.9	0.0	17.3	156.0
514	40	69.8	308.8	3.4	5.5	0.0	8.9	396.3
515	26	33.0	48.1	0.9	8.5	0.0	70.2	160.8
518	42	132.9	52.7	17.3	6.7	10.5	11.7	231.7
519	26	19.3	6.6	0.0	2.4	0.0	49.6	77.8
520	17	27.5	24.2	0.7	0.3	0.0	14.8	67.6
521	43	137.9	5.6	1.2	23.8	45.9	60.1	274.5
525	33	75.7	17.0	0.0	1.9	0.0	6.6	101.2
526	23	19.6	99.8	0.8	1.7	0.0	29.6	151.4
527	19	63.1	119.7	0.1	0.0	0.0	39.2	222.1
528	45	94.2	101.1	0.0	13.7	0.0	7.0	215.9
Mean	31	62.7	73.5	2.3	5.8	4.7	27.5	176.5
SE		12.0	24.4	1.4	2.0	3.9	6.4	28.3
% Catch		35.5	41.6	1.3	3.3	2.7	15.6	

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Sharks	Other	Total
512	65	14.6	10.2	0.0	7.5	0.0	5.3	37.6
513	82	122.0	190.6	0.0	6.3	0.0	3.4	322.3
516	97	169.6	1.4	2.4	35.9	0.0	19.4	228.6
517	73	20.8	530.8	0.0	1.0	9.7	27.2	589.5
522	84	102.0	3.2	0.0	16.1	0.0	19.4	140.8
524	63	30.2	20.8	0.0	20.7	5.1	23.9	100.7
529	63	12.4	15.6	0.0	30.9	1.4	24.5	84.8
Mean	75	67.4	110.4	0.3	16.9	2.3	17.6	214.9
SE		23.9	74.6	0.3	4.9	1.4	3.6	72.2
% Catch		31.4	51.4	0.2	7.9	1.1	8.2	

Catch rates of the most important pelagic families, caught by bottom trawl in the swept-area survey, are presented in Tables 5.14a and b. Clupeids were the dominant species group on both the inner and outer shelf, with highest average catch rate (87 kg/h) on the latter. *Ilisha africana*, *Sardinella maderensis* and *S. aurita* were caught regularly. *S. aurita* was most abundant and was mainly found on the outer shelf, while the two others only were found on the inner shelf. Carangids had the second highest mean catch rates with about 20 kg/h on both the inner and outer shelf. Of the carangids *Selene dorsalis*, *Selar crumenophthalmus*, *Decapterus punctatus* and *Chloroscombrus chrysurus* occurred most frequently. Barracudas (Sphyraenidae) were the third most important group with highest mean catch rate on the inner

shelf (17 kg/h). Hairtails were mainly caught on the inner shelf. Some scombrids (*Scomberomorus tritor*) were found on both the inner and outer shelf.

Table 5.14 Bénin. Catch rates (kg/h) by main pelagic families in swept-area bottom-trawl hauls on the a) Inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
510	21	2.8	5.0	0.2	4.4	1.7	48.8	63.0
511	33	14.8	23.4	0.0	7.5	38.3	72.0	156.0
514	40	264.9	13.2	0.0	16.0	14.7	87.5	396.3
515	26	5.0	24.3	0.3	3.9	14.6	112.7	160.8
518	42	0.4	19.0	1.4	30.5	1.4	179.0	231.7
519	26	0.0	4.6	1.3	0.0	0.7	71.2	77.8
520	17	1.9	6.6	0.7	13.0	1.9	43.4	67.6
521	43	0.0	1.4	0.0	2.3	1.9	268.8	274.5
525	33	0.0	6.1	7.6	0.0	3.3	84.2	101.2
526	23	25.4	13.4	3.1	3.8	54.2	51.5	151.4
527	19	3.7	28.4	7.6	10.3	69.7	102.4	222.1
528	45	0.0	96.2	0.0	4.1	0.7	114.8	215.9
Mean	31	26.6	20.1	1.9	8.0	16.9	103.0	176.5
SE		21.8	7.4	0.8	2.5	6.9	18.5	28.3
% Catch		15.1	11.4	1.1	4.5	9.6	58.4	

b) Outer shelf, 51-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
512	65	1.3	0.2	0.0	2.5	6.2	27.4	37.6
513	82	149.5	41.1	0.0	0.0	0.0	131.7	322.3
516	97	0.2	0.6	0.6	0.0	0.0	227.2	228.6
517	73	442.6	88.2	0.0	0.0	0.0	58.7	589.5
522	84	0.0	2.8	0.4	0.0	0.0	137.5	140.8
524	63	7.1	11.5	0.0	0.0	2.3	79.9	100.7
529	63	9.6	6.0	0.0	0.0	0.0	69.2	84.8
Mean	75	87.2	21.5	0.2	0.4	1.2	104.5	214.9
SE		62.7	12.4	0.1	0.4	0.9	25.3	72.2
% Catch		40.6	10.0	0.1	0.2	0.6	48.6	

Tables 5.15a and b show catch rates of the most commercially important demersal species on the shelf down to 100 m. Seabreams had an average catch rate of 14 kg/h on the inner shelf, all the other groups had low catch rates. Seabreams dominated also on the outer shelf with an average catch rate of 54 kg/h or 25 % of the total average catch rate. The most commonly occurring species were *Pagrus caeruleostictus, Pagellus bellottii* and *Dentex angolensis.* Croakers, groupers and snappers had low catch rates also on the outer shelf, while no grunts were caught.

Table 5.15 Bénin. Catch rates (kg/h) of commercially important demersàl species grouped by families in swept-area bottom-trawl hauls on the a) inner shelf (0-50 m) and b) outer shelf (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
510	21	0.0	1.0	0.0	0.3	25.7	36.0	63.0
511	33	0.3	0.0	0.0	0.0	5.4	150.2	156.0
514	40	2.5	0.0	0.1	0.0	0.8	392.9	396.3
515	26	16.6	6.2	0.1	0.8	1.5	135.7	160.8
518	42	1.5	0.0	0.9	0.0	0.0	229.2	231.7
519	26	19.0	0.0	0.0	0.0	0.0	58.8	77.8
520	17	0.6	1.8	0.0	7.3	12.9	45.0	67.6
521	43	70.3	2.7	6.2	45.1	0.0	150.2	274.5
525	33	55.0	16.0	4.7	0.0	0.0	25.5	101.2
526	23	0.7	0.0	0.0	1.1	9.5	140.1	151.4
527	19	0.0	0.0	0.0	0.0	14.5	207.5	222.1
528	45	2.9	0.4	1.0	5.7	0.0	206.0	215.9
Mean	31	14.1	2.3	1.1	5.0	5.9	148.1	176.5
SE		6.9	1.4	0.6	3.7	2.4	30.1	28.3
% Catch		8.0	1.3	0.6	2.8	3.3	83.9	

b) Outer shelf, 51-100 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
512	65	5.3	0.0	0.0	0.0	4.6	27.7	37.6
513	82	121.1	0.0	0.0	0.0	0.8	200.4	322.3
516	97	111.6	0.0	0.0	0.0	22.7	94.3	228.6
517	73	16.5	0.0	0.0	0.0	0.0	572.9	589.5
522	84	101.1	0.9	0.0	0.0	0.0	38.7	140.8
524	63	23.0	0.0	7.2	0.0	0.0	70.5	100.7
529	63	1.3	0.0	11.0	0.0	0.0	72.5	84.8
Mean	75	54.3	0.1	2.6	0.0	4.0	153.9	214.9
SE		20.5	0.1	1.7	0.0	3.2	73.1	72.2
% Catch		25.3	0.1	1.2	0.0	1.9	71.6	

Annex IV gives the swept-area estimates of mean densities (t/NM^2) based on the 19 random bottom trawl stations on the shelf of Bénin. Of the demersal species, *Brachydeuterus auritus, Galeoides decadactylus* and *Pseudotolithus typus* had the highest mean density in the shallowest zone ($\leq$ 30 m), *B. auritus* and *Pagellus bellottii* in the 31-50 m zone, while *Dentex congoensis* and *D. angolensis* had the highest density in the 51-100 m zone. *B. auritus, D. congoensis,* and *D. angolensis* had the highest overall mean densities.

Table 5.16 presents swept-area biomass estimates for valuable demersal groups and some other groups that occurred in sizeable quantities. Estimated total biomass of valuable demersal groups was about 1 000 tonnes. Seabreams had the highest biomass followed by croakers. The highest biomass of seabreams was found between 51-100 m depth and that of croakers between 0-30 m. Grunts, groupers and snappers all had low biomass estimates. Of the pelagic and semi-pelagic groups, carangids had the highest estimated biomass.

Table 5.16 Bénin. Biomass estimates (tonnes) of important species/groups of fish on the shelf, by depth.

Group/species	**0-30 m**	**31-50 m**	**51-100 m**	**Sum**	**95 % confidence limits**	
Seabreams	85	99	454	638	270	1 006
Grunts	19	38	0	57	0	124
Croakers	147	5	34	187	63	310
Groupers	0	9	22	31	1	62
Snappers	23	15	2	40	2	79
Sum dem. val.	**275**	**166**	**512**	**953**	**559**	**1 348**
Bigeye grunt	143	252	7	402	156	649
Carangids	182	115	203	500	206	794
Barracudas	302	47	12	361	51	671

5.5 Review of results

Some of the 1999 and 2000 catch rates and biomass estimates were corrected in 2002. The new values are included in revised editions of the 1999 and 2000 reports, and in the time series tables of later reports.

Côte d'Ivoire

Figures 5.1 and 5.2 show the mean catch rates of the main groups "Demersal" and "Pelagic" for the whole shelf area from 0 to 100 m in the four last surveys. The "Demersal" group had highest average catch rate and largest confidence intervals in 2000 due to one large catch of *B. auritus* (> 4/h). The average catch rate was lowest in 1999, but within the 95 % confidence limits of the 2000 estimate. The pelagic fish also had the highest mean catch rate in 2000, outside the 95% confidence intervals of the 1999 and 2004 estimate, which were the lowest.

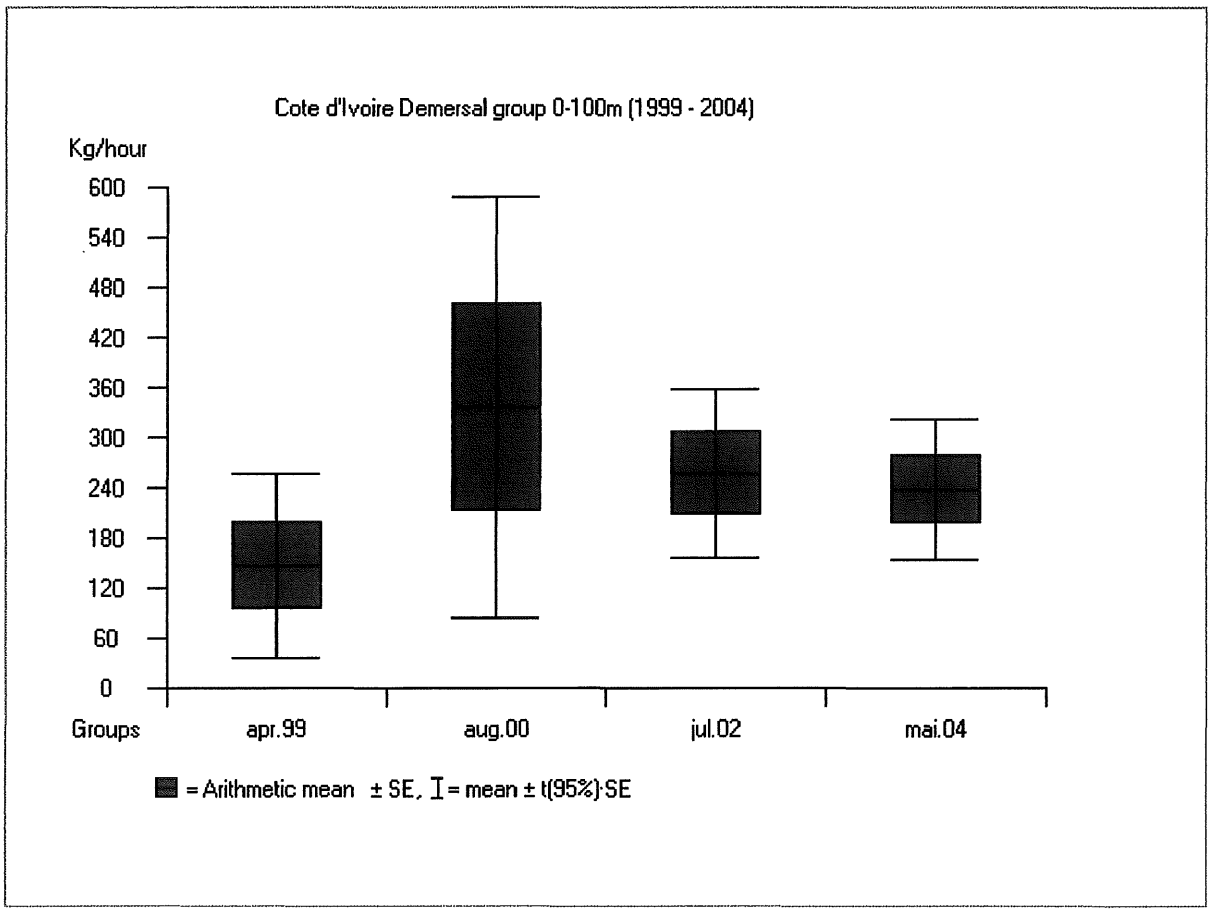


Figure 5.1 Mean catch rates of the main group "demersal" from 0 to100 m in Côte d'Ivoire 1999-2004.

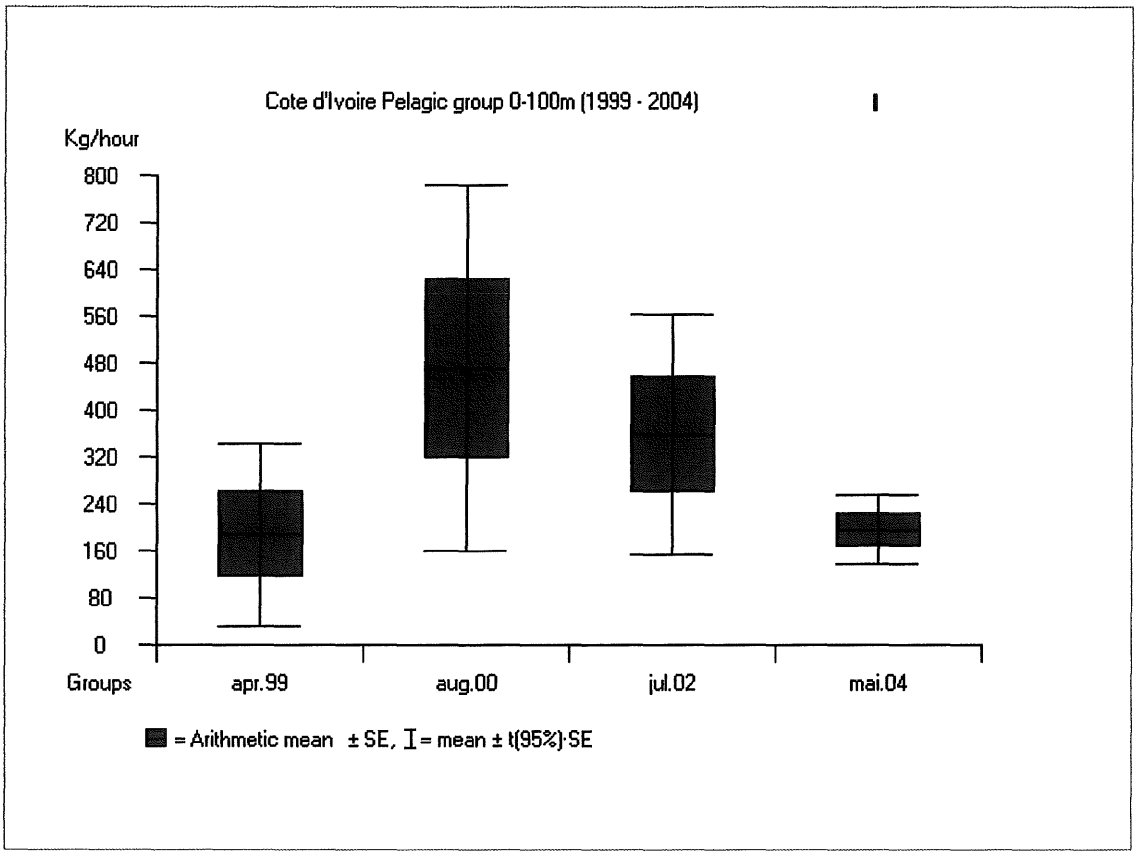


Figure 5.2 Mean catch rates of the main group "pelagic" from 0 to100 m in Côte d'Ivoire 1999-2004.

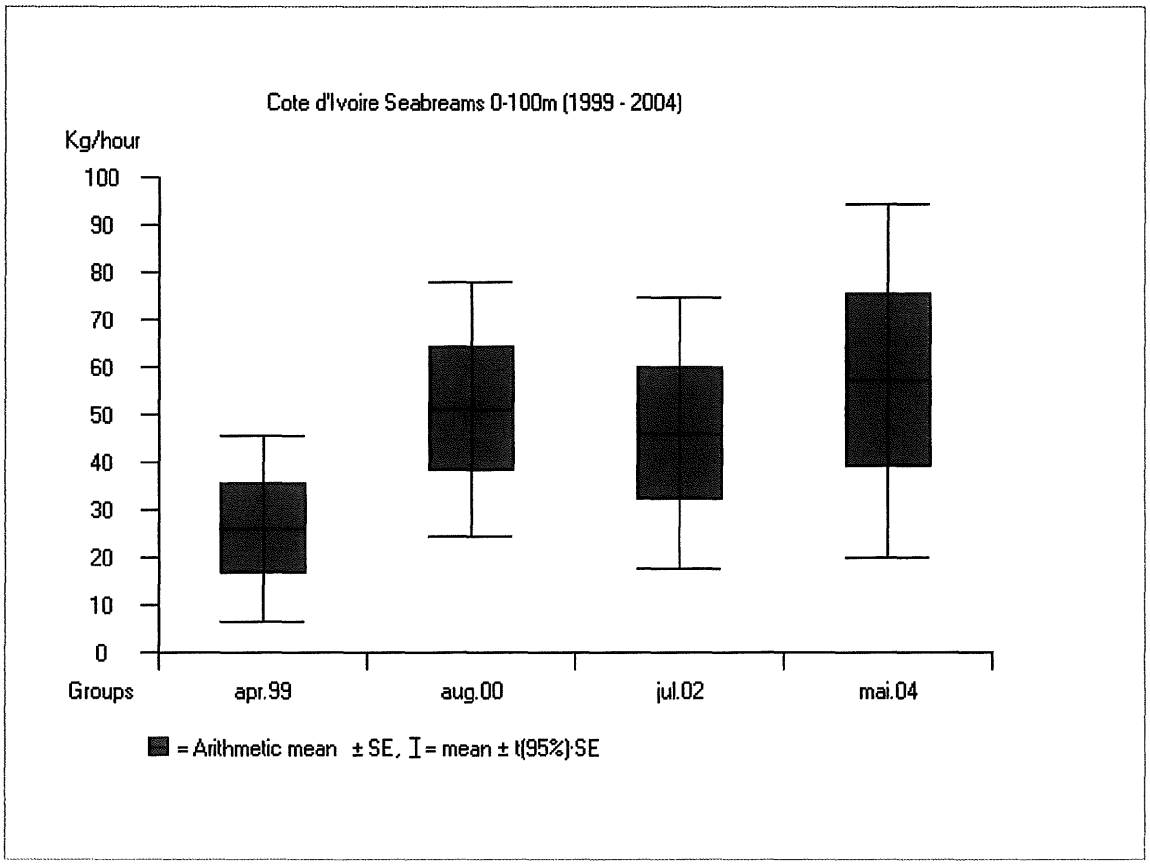


Figure 5.3 Mean catch rates of seabreams from 0 to100 m in Côte d'Ivoire 1999-2004.

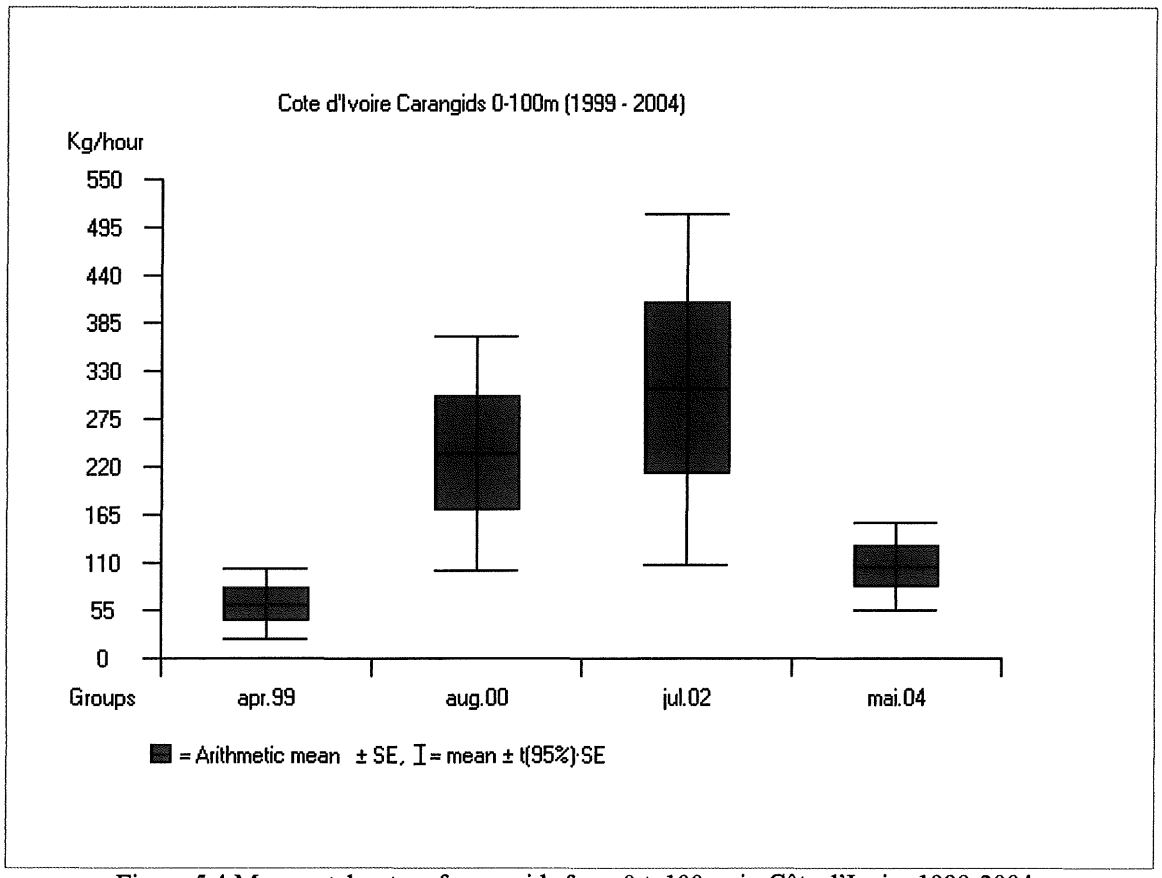


Figure 5.4 Mean catch rates of carangids from 0 to100 m in Côte d'Ivoire 1999-2004.

Figs. 5.3 and 5.4 show the mean catch rates of Seabreams and Carangids, the most abundant families in the "demersal" and "pelagic" groups. The 2000 - 2004 seabream estimates are quite similar, but outside the 95% confidence intervals of the much lower 1999 estimate. The carangids had the highest average catch rate in 2002. The low 1999 and 2004 estimates were outside the 95% confidence intervals of both the 2000 and 2002 estimates.

Table 5.17 summarizes more details on mean catch rates and swept area biomass estimates of valuable demersal groups and a few other common groups covered during the present and three previous surveys in the Côte d'Ivoire waters. The valuable demersal species had lowest average catch rates in 1999. It should be noted that the high 2002 estimate of snappers is based on one large catch of *Aspilus fuscus*, which is commercially less important than the other snappers. The time series of biomass estimates show the same picture. Bigeye grunt had much higher catch rates and estimated biomass in 2000, mainly due to one large catch. Carangids were most abundant in 2002.

Table 5.17 Mean catch rates (kg/h) and biomass estimates (tonnes) of valuable demersal species and some other groups from swept-area bottom trawl hauls on the shelf (0 - 100 m) off Côte d'Ivoire from the 1999, 2000, 2002 and 2004 survey. 2000 and 2002 survey in upwelling season.

Group/Species	Mean catch rates (kg/h)				Biomass (tonnes)			
	1999	2000	2002	2004	1999	2000	2002	2004
Seabreams	26.1	51.2	46.1	57.2	3 457	6 666	5 307	6 841
Grunts	6.0	15.7	8.5	15.7	417	1 667	695	1 216
Croakers	9.5	22.5	31.8	15.5	941	2 731	3 108	1 485
Groupers	2.5	2.1	2.7	2.6	305	283	311	268
Snappers	2.3	0.3	12.8	0.1	145	38	1 566	13
Sum dem. val.	**47.0**	**91.8**	**101.9**	**91.0**	**5 265**	**11 385**	**10 987**	**9 823**
Bigeye grunt	91.9	216.3	108.4	138.6	9 913	14 245	8 530	11 959
Carangids	62.2	235.5	309.7	105.2	5 477	26 369	36 554	10 668
Barracudas	13.2	3.5	7.3	14.9	811	259	569	1 176

Ghana

Figures 5.5 and 5.6 show the mean catch rates of the main groups "Demersal" and "Pelagic" for the whole shelf area from 0 to 100 m in the four last surveys. The "Demersal" group had quite similar mean catch rates in all surveys, but slightly higher and with much larger confidence intervals in 1999 due to one large catch of *B. auritus* (>5 t/h). Pelagic fish had similar mean catch rates in 2000 and 2002, but much lower in 1999 and 2004, in 1999 outside and in 2004 almost outside the 95% confidence intervals of the two former.

Figs. 5.7 and 5.8 show the mean catch rates of Seabreams and Carangids, the most abundant families in the "Demersal" and "Pelagic" groups. The 2000, 2002 and 2004 seabream estimates are quite similar, while that in 1999 is much lower and just within their 95% confidence intervals. The carangids show the same picture as the whole "Pelagic" group; low average catch rate in 1999 and 2004, outside the 95% confidence intervals of the 2000 and 2002 estimates.

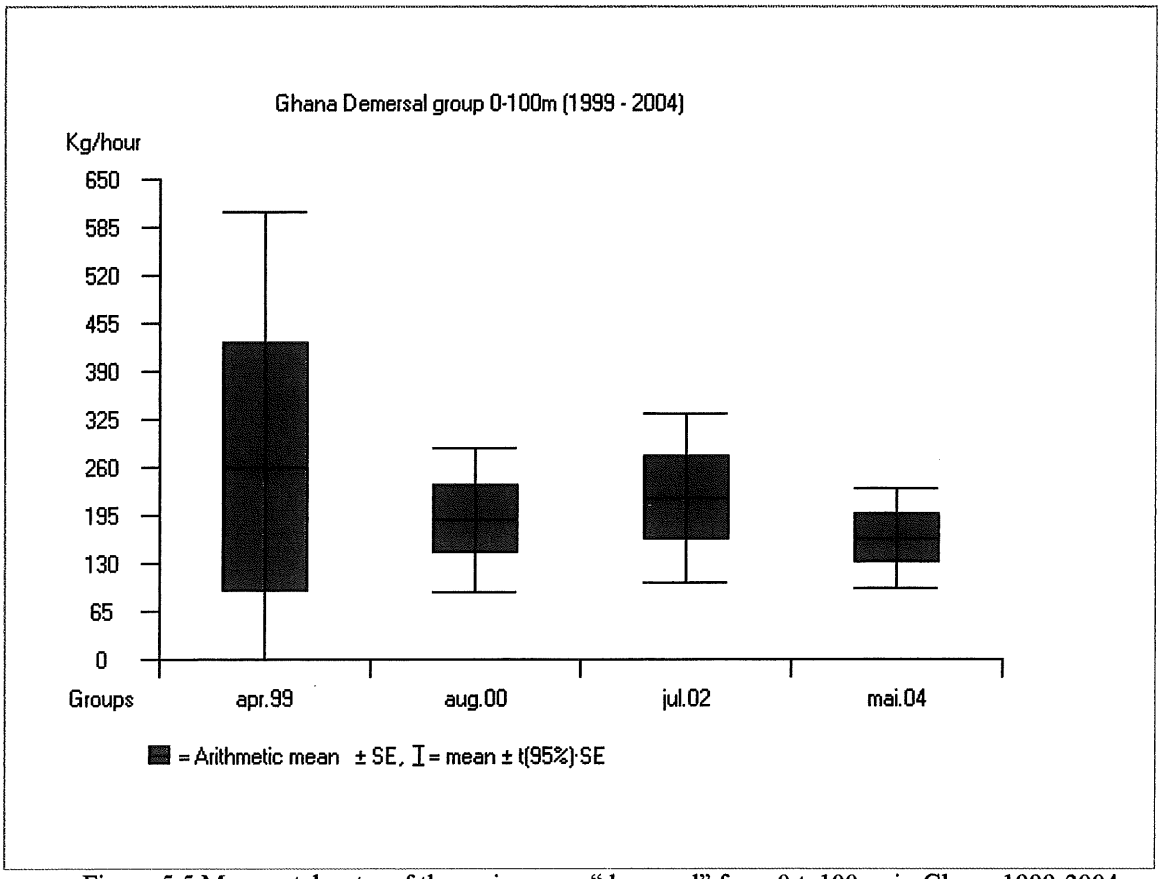


Figure 5.5 Mean catch rates of the main group "demersal" from 0 to100 m in Ghana 1999-2004.

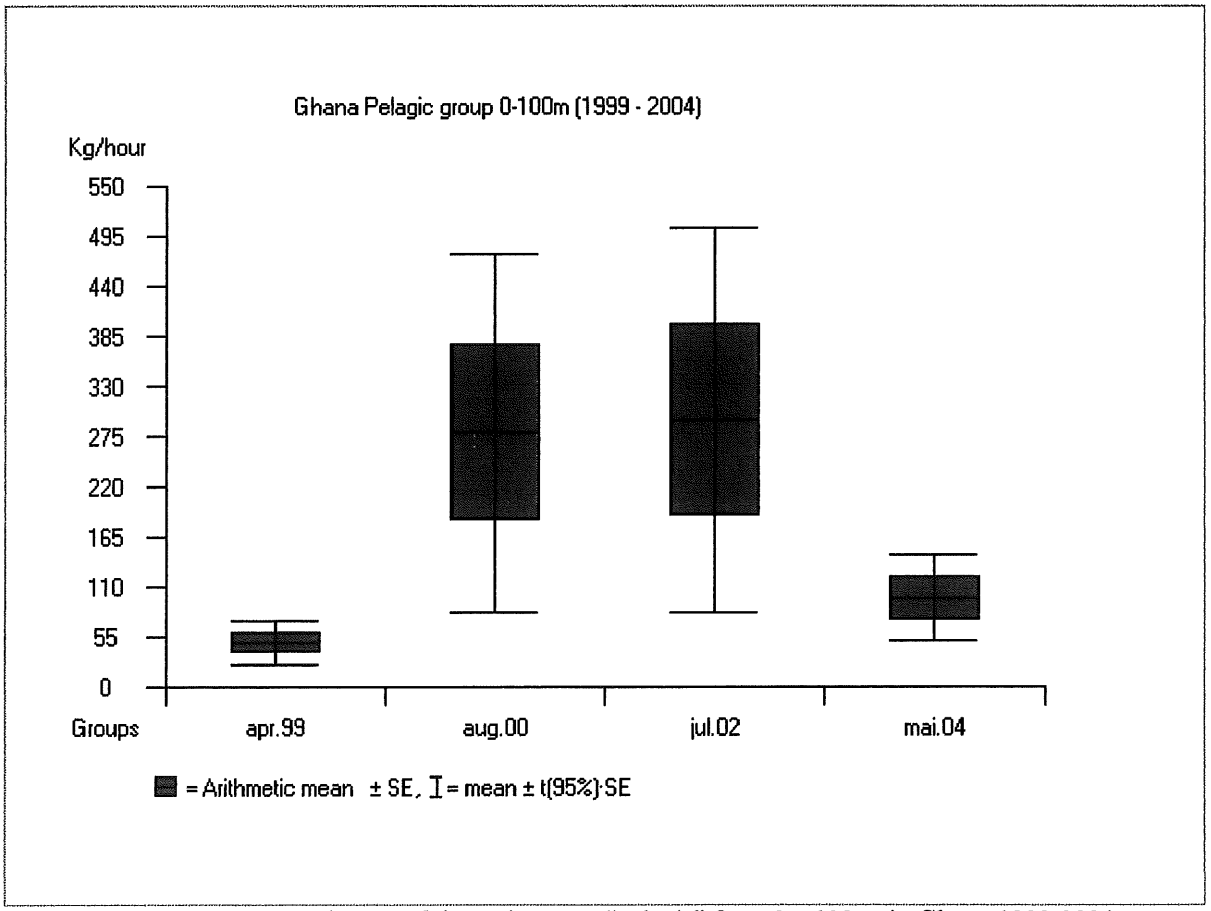


Figure 5.6 Mean catch rates of the main group "pelagic" from 0 to100 m in Ghana 1999-2004

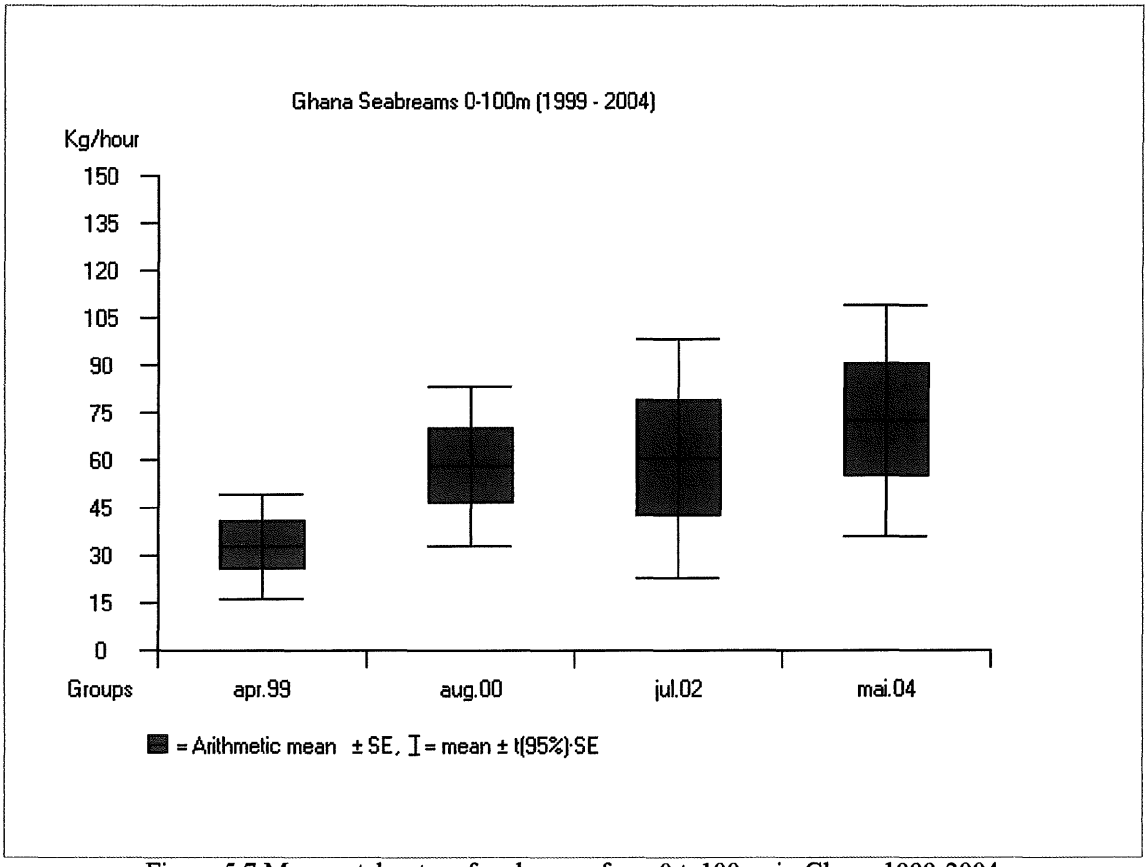


Figure 5.7 Mean catch rates of seabreams from 0 to100 m in Ghana 1999-2004

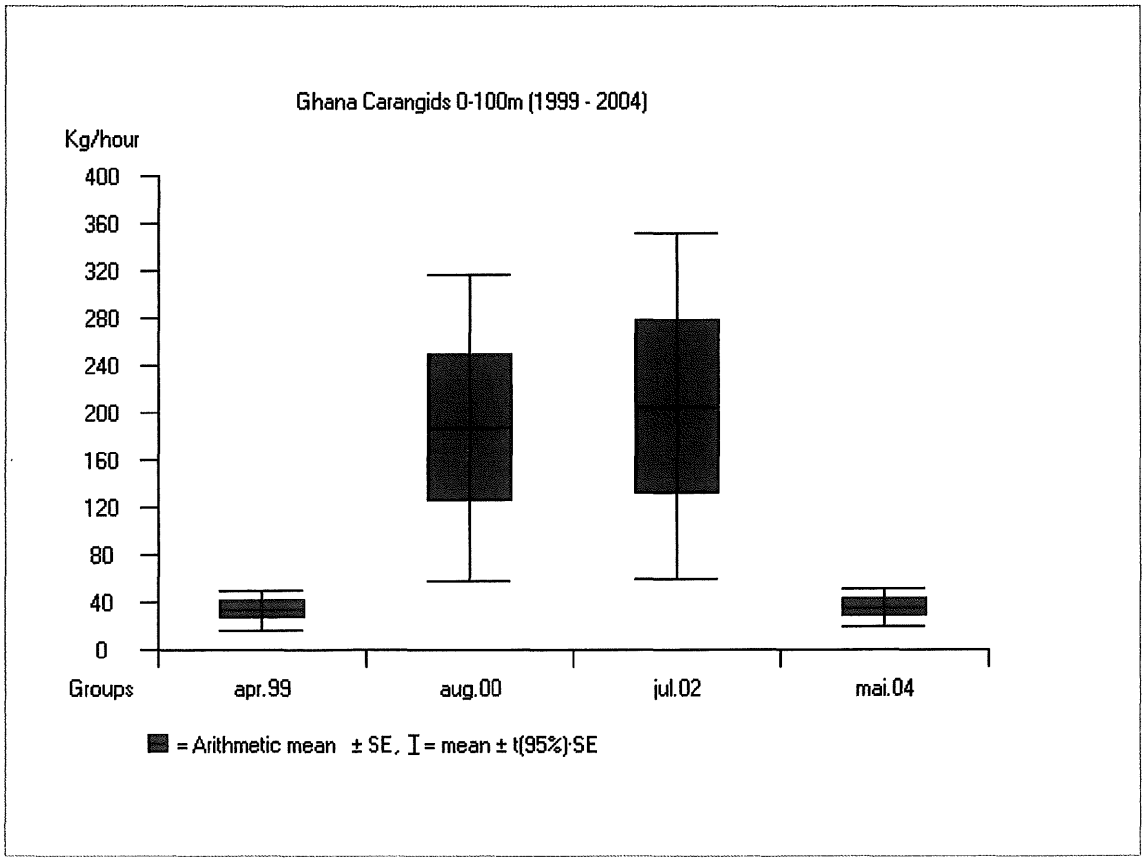


Figure 5.8 Mean catch rates of carangids from 0 to100 m in Ghana 1999-2004.

Table 5.18 summarizes more details on mean catch rates and swept area biomass estimates of valuable demersal groups and a few other common groups covered during the present and three previous surveys in the Ghana waters. Seabreams had the highest average catch rate in 2004, while most of the other valuable demersal species had highest average catch rates in 2000 and with a few exceptions lowest in 1999. The time series of biomass estimates show the same trend, but the estimated biomass of seabreams has been quite stable in the three last surveys. Bigeye grunts had much higher catch rate and estimated biomass in 1999 due to one large catch. Carangids were most abundant in 2000 and 2002.

Table 5.18 Mean catch rates (kg/h) and biomass estimates (tonnes) of valuable demersal species and some other groups from swept-area bottom trawl hauls on the shelf (0 - 100 m) off Ghana from the 1999, 2000, 2002 and 2004 surveys. 2000 and 2002 survey in upwelling season.

Group/Species	Mean catch rates (kg/h)				Biomass (tonnes)			
	1999	2000	2002	2004	1999	2000	2002	2004
Seabreams	32.8	58.3	60.7	72.5	8 478	13 346	14 181	16 187
Grunts	7.1	14.6	6.5	1.7	1 431	4 397	1 168	326
Croakers	0.7	3.2	4.4	1.7	125	1 046	850	286
Groupers	2.5	7.6	1.0	1.1	557	1 921	254	220
Snappers	0.7	22.5	1.9	0.9	151	5 322	422	200
Sum dem. val.	**43.8**	**106.2**	**74.5**	**77.9**	**10 743**	**26 032**	**16 876**	**17 219**
Bigeye grunt	213.4	39.1	110.3	69.1	70 314	9 120	21 182	13 866
Carangids	33.3	187.7	205.4	35.3	6 860	47 054	45 332	7 405
Barracudas	5.9	5.6	11.1	8.9	1 084	915	1 999	1 589

Togo - Bénin

Figs. 5.9 and 5.10 show the mean catch rates of the main groups "Demersal" and "Pelagic" for the whole shelf area from 0 to 100 m in the four last surveys. The catch rates were highest in 2000, mainly due to a few large catch of seabreams and carangids. The mean catch rates in the other years are within the 95% confidence intervals of the 2000 estimates.

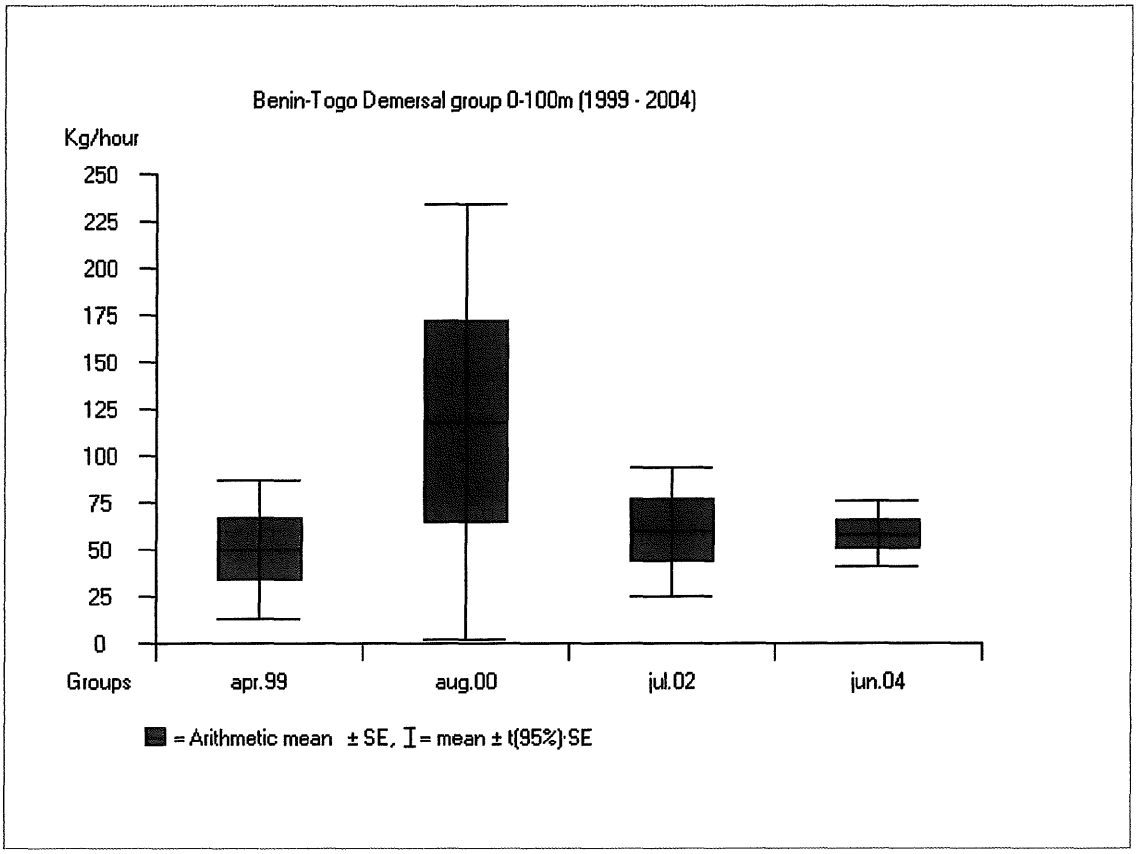


Figure 5.9 Mean catch rates of the main group "demersal" from 0 to100 m in Togo - Bénin 1999-2004.

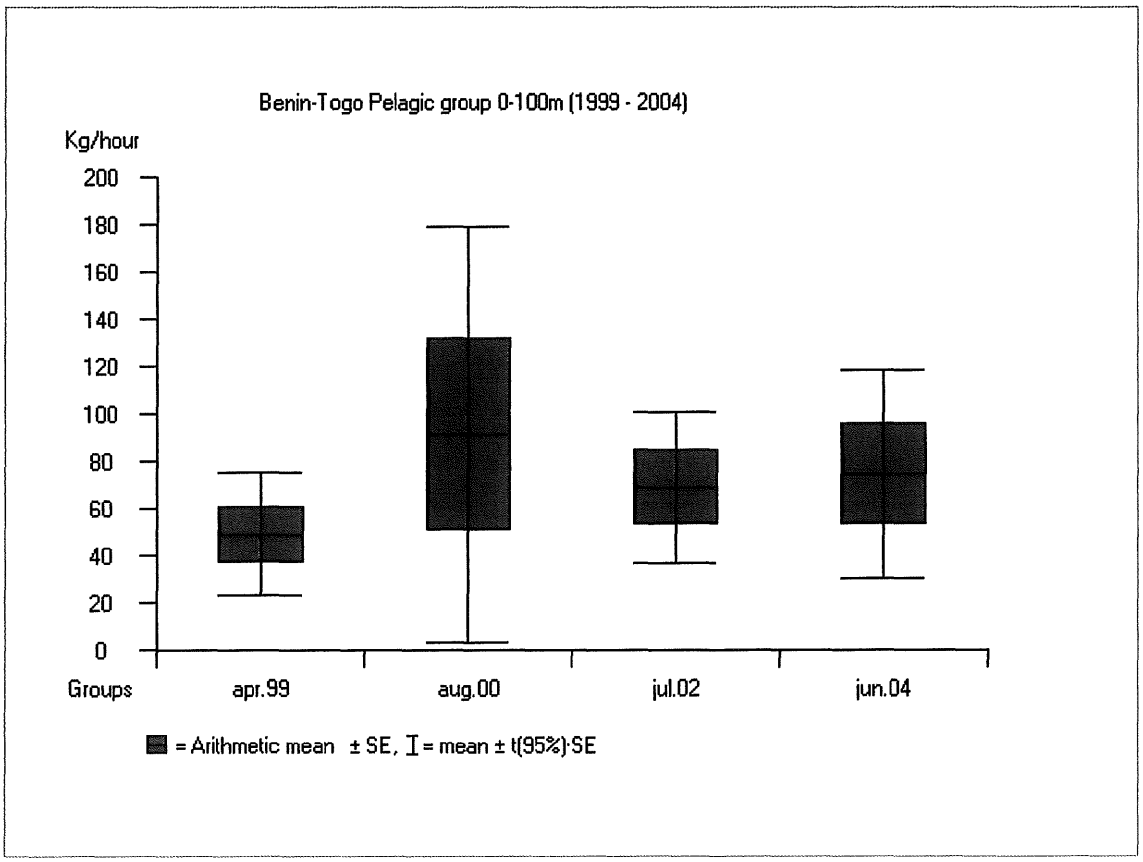


Figure 5.10 Mean catch rates of the main group "pelagic" from 0 to100 m in Togo - Bénin 1999-2004.

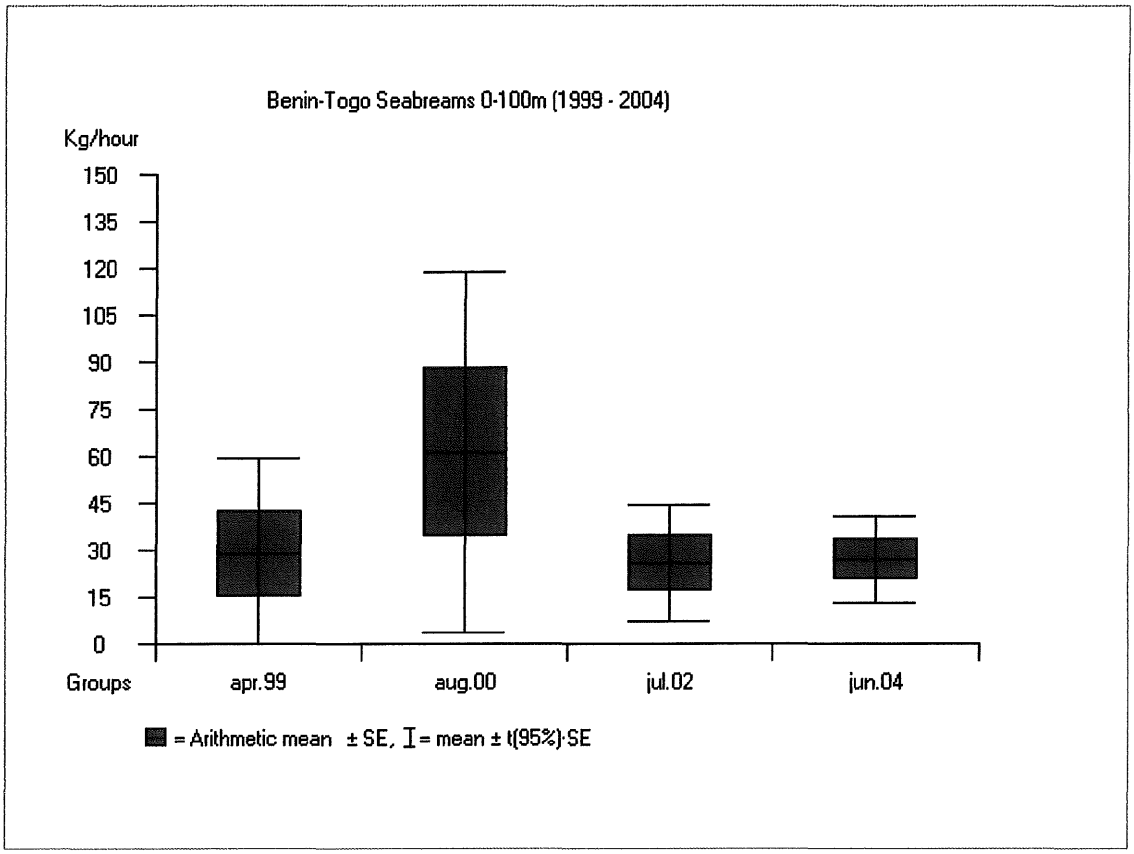


Figure 5.11 Mean catch rates of seabreams from 0 to100 m in Togo - Bénin 1999-2004.

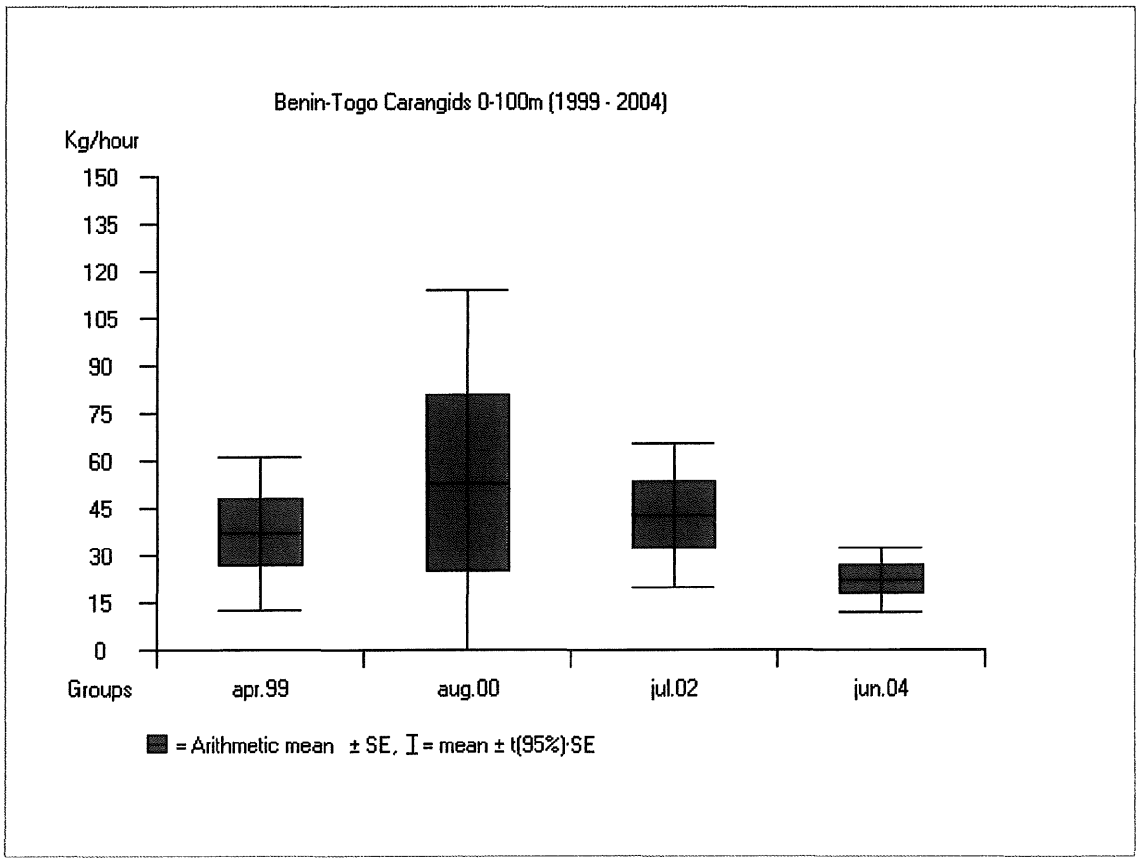


Figure 5.12 Mean catch rates of carangids from 0 to100m in Togo - Bénin 1999-2004.

Figures 5.11 and 5.12 show the mean catch rates of Seabreams and Carangids, normally the most abundant families in the "Demersal" and "Pelagic" groups. The 1999, 2000 and 2004 seabreams estimates are quite similar, while in 2000 one large catch of *Dentex congoensis* in Togo (292 kg/h) gave high mean and confidence intervals outside the 95% confidence intervals of the other years. The 2000 carangids estimate also had the highest mean and confidence intervals, mainly due to one catch of *Decapterus punctatus* in Bénin (419 kg/h). The 2004 estimate is the lowest, but within the 95% confidence intervals of the other years.

Table 5.19 summarizes more details on mean catch rates of valuable demersal groups and a few other common groups covered during the present and two previous surveys in the Bénin and Togo waters. Except from the high mean catch rate of seabreams in 2000 and snappers in 2002 in Togo, the results are quite similar, with few clear trends. The time series of biomass estimates (Table 5.20) show the same. Some of these results are influenced by a few large catches in some years. When comparing the results one should keep in mind that the surveys were conducted in two different seasons.

Table 5.19 Mean catch rates (kg/h) of valuable demersal and some other groups in swept-area bottom trawl hauls on the shelf (0 - 100 m) off Bénin and Togo for the Nansen surveys in 1999, 2000 and 2002. The 2000 and 2002 surveys in the upwelling season.

Group/species	**Togo-Bénin**	**Bénin**			**Togo**		
	1999	**2000**	**2002**	**2004**	**2000**	**2002**	**2004**
Seabreams	28.6	29.9	28.7	28.9	108.7	19.9	23.0
Grunts	0.9	3.5	1.2	3.2	0.0	2.2	2.1
Croakers	4.6	2.9	7.6	5.2	1.5	0	0.6
Groupers	10.3	2.3	1.2	1.6	4.1	1.0	0.7
Snappers	0.3	1.3	1.4	1.5	1.0	13.6	4.5
Sum dem. val.	**44.7**	**39.9**	**40.0**	**40.4**	**115.3**	**36.7**	**30.9**
Bigeye grunt	5.5	10.1	12.1	21.5	0.6	0	9.8
Carangids	37.0	64.2	54.8	20.6	35.9	19.9	25.6
Barracudas	6.3	4.7	18.0	11.1	2.0	5.4	4.4

Table 5.20 Biomass estimates (tonnes) of valuable demersal species and some other groups from swept-area bottom-trawl hauls on the shelf (0 - 100 m) off Bénin and Togo from the 1999, 2000, 2002 and 2004 surveys. 1999 values are splitted proportional to the shelf area (in parenthesis in NM^2). The 2000 and 2002 surveys in the upwelling season.

Group/Species	**Bénin** (765)				**Togo** (327)			
	1999	**2000**	**2002**	**2004**	**1999**	**2000**	**2002**	**2004**
Seabreams	568	700	734	638	255	1 102	215	243
Grunts	41	66	35	57	18	5	25	23
Croakers	193	83	265	187	87	11	0	9
Groupers	215	59	26	31	97	33	9	6
Snappers	15	34	39	40	7	8	198	64
Sum dem. val.	**1 032**	**942**	**1 098**	**953**	**464**	**1 159**	**447**	**343**
Bigeye grunt	118	222	237	402	53	0	0	99
Carangids	788	1 490	1 306	500	354	339	171	267
Barracudas	170	102	485	361	76	25	79	57

Gulf of Guinea

Table 5.21 summarises the swept-area biomass estimates from the four last surveys for the whole region. The seabreams estimate for the three last years are quite similar and all more than 60 % above the 1999 result. Most of the other valuable demersal groups had the highest estimated biomass in 2000 and lowest in 1999. The sum of valuable demersal groups in 1999 was less than 50% of the corresponding 2000 estimate, while the 2002 and 2004 estimates are about 70-75 % of the 2000 one. Among the other groups, the estimated biomasses of carangids were much lower in 2004 than in 2000 and 2002, but a little higher than in 1999. Bigeye grunt had the highest estimate in 1999 and lower and more similar in the three last surveys. It should, however, be noted that the 1999 estimate of bigeye grunt is very much driven by one large catch. The estimated biomasses of barracudas have varied somewhat less in the period.

Table 5.21 Biomass estimates (tonnes) of valuable demersal species and some other groups from swept-area bottom trawl hauls on the shelf (0 - 100 m) from surveys with "Dr. Fridtjof Nansen" off Bénin, Togo, Ghana and Côte d'Ivoire in 1999, 2000, 2002 and 2004. The 2000 and 2002 surveys in the upwelling season.

Group/Species	**Biomass** (tonnes)			
	1999	**2000**	**2002**	**2004**
Seabreams	12 757	21 814	20 437	23 909
Grunts	1 907	6 135	1 922	1 621
Croakers	1 346	3 871	4 223	1 967
Groupers	1 174	2 296	600	525
Snappers	318	5 402	2 225	317
Sum dem. val.	**17 502**	**39 518**	**29 407**	**28 339**
Bigeye grunt	80 398	23 587	29 949	26 327
Carangids	13 480	75 252	83 364	18 839
Barracudas	2 141	1 301	3 133	3 183

CHAPTER 6 FISHING TRIALS ON THE DEEP CONTINENTAL SHELF AND UPPER SLOPE

Following the request expressed by Ghana to consolidate the observations on resources in waters deeper than 100 m, an effort was made during the survey to trawl at such depths. Generally, trawling at such depths was extremely difficult because of uneven bottom topography. 7 hauls were made as follows: 1 each off Bénin (97 m) and Togo and 5 off Ghana at depths of between 100 and 400 m (Table 6.1). No deep water hauls were made in the Côte d'Ivoire because of general lack of suitable bottom conditions where the continental shelf is very narrow and the slope is extremely steep.

Table 6.1 Positions, catch rates and principal species encountered in trawl hauls taken beyond 100 m depth.

Country	Station	Position		Depth (m)	Catch (kg/h)	Top three species caught at the station
		Latitude	Longitude			
Bénin	516	06° 06′ N	02° 29′ E	94 – 97	228.6	*Dentex angolensis* *Dentex congoensis* *Boops boops*
Togo	538	05° 54′ N	01° 16′ E	201 – 255	195.4	*Promethichthys prometheus* *Squatina oculata* *Dentex angolensis*
Ghana	499	05° 32′ N	00° 16′ E	320 – 330	486.2	*Centrophorus uyato* *Parasudis fraser-bruenneri* *Chlorophthalmus atlanticus*
	507	05° 26′ N	00° 06′ W	227 – 228	1 155.5	*Centrophorus squamosus* *Squatina oculata* *Aulopus cadnati*
	492	05° 11′ N	00° 14′ W	103 – 103	393.9	*Pagellus bellottii* *Priacanthus arenatus* *Boops boops*
	471	04° 25′ N	02° 07′ W	253 – 259	731.7	*Zenion longipinnis* *Zenopsis conchifer* *Centrophorus uyato*
	462	04° 35′ N	02° 30′ W	256 – 263	347.5	*Zenion longipinnis* *Merluccius polli* *Parasudis fraser-bruenneri*

Catch rates between 195 and 1 155 kg/h (average 505 kg/h) were obtained from the 7 hauls. The average catch rate amounted to a stock density of 16.4 t/NM^2 for all species combined. The corresponding figure for the area between 20 and 100 m was 11.8 t/NM^2, confirming the somewhat higher catch rates found on the upper continental slope than on the shelf in previous surveys. However, whereas catch rates of commercially important species on the

shelf were high, other less known species made up the bulk of the catch at the deeper stations. Table 6.1 also gives the three most abundant species recorded in each deep.

Table 6.2 Deep stations: catch rates (kg/h) of the most commercially valuable species and 'others' in the swept-area bottom trawl hauls, 100 – 400 m.

Station	Depth	Zeidae	Sparidae	Merluccidae	*Aristeus varidens*	*Parapenaeus longirostris*	Other	Total
462	260	156.8	2.0	38.1	0.0	0.0	150.6	347.5
471	256	389.3	0.0	25.9	0.0	0.0	316.5	731.7
492	103	0.0	152.8	0.0	0.0	0.0	241.2	393.9
499	325	3.7	0.0	0.0	0.0	1.7	480.8	486.2
507	228	0.0	24.0	8.1	0.0	2.7	1 120.7	1 155.5
516	101	0.0	129.3	0.0	0.0	0.0	99.3	228.6
538	228	5.9	15.7	0.0	5.4	0.7	167.7	195.4
Mean	214	79.4	46.2	10.3	0.8	0.7	368.1	505.6
SE		56.1	24.8	5.9	0.8	0.4	134.3	127.6
% Catch		15.7	9.2	2.0	0.2	0.1	72.8	

Dories (Zeidae) (mainly *Zenopsis conchifer*) was most abundant among the more commercially interesting groups with an average catch rate of 79 kg/h (Table 6.2). Seabreams also constituted an important group of species with an average catch rate of 46 kg/h, which is comparable to what was obtained on the shelf. The most abundant seabreams were *Dentex angolensis* and *D. congoensis*. Striped red shrimp (*Aristeus varidens*) and rose shrimp (*Parapenaeus longirostris*) were less abundant than in 2002 with low mean catch rates, 0.8 and 0.7 kg/h, respectively. They only occurred in a few hauls. *Merluccius polli* (Benguela hake) also occurred in some hauls with an average catch rate of 10 kg/h.

Table 6.3 shows the 15 most abundant species that made up at least 1 % of the catch in all 7 hauls and their overall assessed density. For comparison the mean densities found in the 2000 and 2002 surveys are given. The most abundant species were *Centrophorus squamosus* and *Zenion longipinnis*. In 2002 *Centrophorus uyato* and *Zenopsis conchifer* came first, while in 2000 *Priacanthus arenatus* dominated due to one large catch. Other species that occurred in over 50 % of the hauls in some quantities were *Squatina oculata, Promethichtys prometheus, Dentex angolensis* and *Chlorophthalmus atlanticus.*

Table 6.3 15 most abundant species in the deep hauls with common English names, percent incidence, mean density (t/NM^2) and mean density found in the 2000 and 2002 surveys.

Rank	Scientific Name	Common English Name	% incidence	Density 2004	Density 2002	Density 2000
1	*Centrophorus squamosus*	Leafscale gulper shark	43	3.41	-	-
2	*Zenion longipinnis*		43	2.07	-	-
3	*Centrophorus uyato*	Little gulper shark	29	1.25	5.53	-
4	*Squatina oculata*	Smoothback angelshark	86	0.81	0.56	0.55
5	*Parasudis fraser-bruenneri*	Greeneye	43	0.71	0.87	0.12
6	*Zenopsis conchifer*	Silvery John dory	29	0.53	5.26	1.17
7	*Promethichtys prometheus*	Promethean escolar	71	0.48	-	0.65
8	*Dentex angolensis*	Angola dentex	57	0.46	0.55	0.65
9	*Chlorophthalmus atlanticus*	Atlantic greeneye	57	0.45	0.75	2.56
10	*Boops boops*	Bogue	29	0.39	0.22	-
11	*Priacanthus arenatus*	Atlantic bigeye	57	0.38	2.04	12.37
12	*Pagellus bellottii*	Red pandora	14	0.36	-	-
13	*Merluccius polli*	Benguela hake	43	0.34	0.21	0.07
14	*Aulopus cadenati*	Guinean flagfin	43	0.34	-	-
15	*Trigla lyra*	Piper gurnard	29	0.26	0.28	0.24

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Annex 1 Records of fishing stations

PROJECT STATION: 400

DATE:16/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 441
start stop duration Long W 636
TIME :12:04:53 12:34:34 30 (min) Purpose code: 3
LOG :4631.31 4632.87 1.55 Area code : 1
FDEPTH: 35 36 GearCond.code:
BDEPTH: 35 36 Validity code:
Towing dir: 250ø Wire out: 160 m Speed: 31 kn*10

Sorted: 28 Kg Total catch: 202.81 CATCH/HOUR: 405.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	156.00	18552	38.46	1921
Selene dorsalis	58.80	1576	14.50	1918
Sphyraena guachancho	49.08	1224	12.10	1924
Sardinella maderensis	38.88	3444	9.59	1926
Ephippion guttifer	24.80	6	6.11	
Pomadasys jubelini	21.76	26	5.36	1916
Alectis alexandrinus	9.30	4	2.29	1923
Trichiurus lepturus	8.04	240	1.98	
Galeoides decadactylus	7.90	12	1.95	
Galeoides decadactylus	5.52	72	1.36	1922
Pomadasys incisus	5.28	156	1.30	
Chloroscombrus chrysurus	4.08	24	1.01	1925
Raja miraletus	2.90	6	0.71	
Penaeus notialis	2.88	168	0.71	1920
Grammoplites gruveli	2.28	108	0.56	
Epinephelus aeneus	2.10	2	0.52	1917
Pteroscion peli	1.80	36	0.44	
Torpedo torpedo	1.60	4	0.39	
Saurida brasiliensis	1.44	204	0.36	
Pagrus caeruleostictus	0.90	2	0.22	
Sardinella aurita	0.72	96	0.18	1919
Sepia officinalis hierredda	0.48	8	0.12	
Antennarius sp.	0.48	24	0.12	
Decapterus punctatus	0.48	48	0.12	
Scyllarides herklotsii	0.36	48	0.09	
Ilisha africana	0.36	12	0.09	
GOBIIDAE	0.12	12	0.03	
Total	408.34		100.67	

PROJECT STATION: 401

DATE:16/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 438
start stop duration Long W 635
TIME :13:20:10 13:21:31 30 (min) Purpose code: 3
LOG :4638.99 4640.51 1.52 Area code : 1
FDEPTH: 55 54 GearCond.code:
BDEPTH: 55 54 Validity code:
Towing dir: 250ø Wire out: 240 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 215.42 CATCH/HOUR: 430.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	330.40	55230	76.69	1934
Decapterus punctatus	39.48	2618	9.16	1933
Brotula barbata	12.20	34	2.83	1927
Citharus linguatula	7.28	210	1.69	
Sardinella maderensis	4.62	308	1.07	1929
Selene dorsalis	4.60	44	1.07	1930
Octopus vulgaris	3.96	8	0.92	
Grammoplites gruveli	3.92	126	0.91	
Sardinella aurita	3.78	154	0.88	
Stromateus fiatola	3.28	4	0.76	
Raja miraletus	2.12	8	0.49	
Pagellus bellottii	2.00	38	0.46	1928
Pegusa lascaris	1.96	14	0.45	
Trichiurus lepturus	1.40	28	0.32	
Chelidonichthys gabonensis	1.30	8	0.30	
Saurida brasiliensis	1.26	168	0.29	
Sphyraena guachancho	1.00	6	0.23	1935
Sepia officinalis hierredda	0.98	4	0.23	
Dentex angolensis	0.70	2	0.16	
Pseudupeneus prayensis	0.68	20	0.16	1931
GOBIIDAE	0.56	84	0.13	
Batrachoides liberiensis	0.54	6	0.13	
Sphoeroides marmoratus	0.42	28	0.10	
Engraulis encrasicolus	0.42	70	0.10	
Boops boops	0.34	14	0.08	
Epinephelus aeneus	0.32	2	0.07	
Antennarius sp.	0.28	14	0.06	
Chloroscombrus chrysurus	0.20	2	0.05	
Squilla mantis	0.14	14	0.03	
Scorpaena scrofa	0.14	14	0.03	
Scyllarides herklotsii	0.14	70	0.03	
Alloteuthis africana	0.14	22	0.03	
Fistularia petimba	0.14	14	0.03	
Total	430.70		99.94	

PROJECT STATION: 402

DATE:16/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 434
start stop duration Long W 635
TIME :15:00:57 16:40:45 30 (min) Purpose code: 3
LOG :4648.31 4649.89 1.57 Area code : 1
FDEPTH: 82 80 GearCond.code:
BDEPTH: 82 80 Validity code:
Towing dir: 250ø Wire out: 350 m Speed: 31 kn*10

Sorted: 93 Kg Total catch: 93.15 CATCH/HOUR: 186.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	30.00	428	16.10	1941
Sardinella aurita	24.90	654	13.37	1939
Trigla lyra	24.80	360	13.31	
Scomber japonicus	16.20	112	8.70	1937
Brotula barbata	13.40	62	7.19	1938
Sepia officinalis hierredda	10.10	48	5.42	1942
Citharus linguatula	10.10	258	5.42	
Loligo vulgaris	10.00	34	5.37	
Dentex canariensis	7.10	10	3.81	1943
Uranoscopus albesca	6.10	28	3.27	
Pagellus bellottii	5.50	86	2.95	1940
Uranoscopus polli	5.10	20	2.74	
Umbrina canariensis	4.60	58	2.47	1936
Pentheroscion mbizi	3.50	22	1.88	
Pegusa lascaris	2.30	10	1.23	
Grammoplites gruveli	1.90	46	1.02	
Zeus faber	1.80	14	0.97	
Raja miraletus	1.80	4	0.97	
Priacanthus arenatus	1.70	22	0.91	
Branchiostegus semifasciatus	1.70	12	0.91	
Microchirus frechkopi	1.10	24	0.59	
Decapterus punctatus	0.90	52	0.48	1944
Pseudupeneus prayensis	0.80	12	0.43	
Octopus vulgaris	0.70	2	0.38	
Fistularia petimba	0.10	4	0.05	
Boops boops	0.10	4	0.05	
Total	186.30		99.99	

PROJECT STATION: 403

DATE:16/ 5/04 GEAR TYPE: PT No: 4 POSITION:Lat N 433
start stop duration Long W 644
TIME :20:50:18 21:22:58 33 (min) Purpose code: 1
LOG :4674.13 4676.05 1.92 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 69 77 Validity code:
Towing dir: 184ø Wire out: 130 m Speed: 35 kn*10

Sorted: 29 Kg Total catch: 29.45 CATCH/HOUR: 53.55

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomber japonicus	12.00	122	22.41	1949
Trachurus trecae	11.64	776	21.74	1950
Selene dorsalis	8.18	87	15.28	1946
Saurida brasiliensis	5.45	1118	10.18	
Sardinella aurita	3.64	82	6.80	1945
Sardinella maderensis	2.73	24	5.10	
Sepia officinalis hierredda	1.91	5	3.57	
Alloteuthis africana	1.82	682	3.40	
Scomberomorus tritor	1.45	2	2.71	
Ariomma bondi	1.09	27	2.04	
Sphyraena guachancho	1.00	16	1.87	1948
Trachinotus ovatus	0.91	4	1.70	
Trichiurus lepturus	0.55	9	1.03	
Engraulis encrasicolus	0.45	442	0.84	1947
Decapterus punctatus	0.27	9	0.50	
Lagocephalus laevigatus	0.27	2	0.50	
Priacanthus arenatus	0.18	2	0.34	
Total	53.54		100.01	

PROJECT STATION: 404

DATE:17/ 5/04 GEAR TYPE: PT No: 2 POSITION:Lat N 427
start stop duration Long W 654
TIME :01:11:24 01:41:24 30 (min) Purpose code: 1
LOG :4694.41 4696.31 1.88 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 104 126 Validity code:
Towing dir: 100ø Wire out: 135 m Speed: 35 kn*10

Sorted: 28 Kg Total catch: 524.62 CATCH/HOUR: 1049.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	680.68	57896	64.87	1951
Sardinella aurita	337.96	8702	32.21	1952
Scomber japonicus	22.44	34	2.14	
Trachinotus ovatus	8.16	34	0.78	
Total	1049.24		100.00	

PROJECT STATION: 405

DATE:17/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 437
start stop duration Long W 653
TIME :06:22:04 06:45:44 24 (min) Purpose code: 3
LOG :4728.79 4730.04 1.24 Area code : 1
FDEPTH: 27 28 GearCond.code:
BDEPTH: 27 28 Validity code:
Towing dir: 70ø Wire out: 130 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 248.36 CATCH/HOUR: 620.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	136.50	12233	21.98	1953
Sardinella maderensis	95.38	10203	15.36	
Selene dorsalis	71.75	2048	11.56	1959
Chloroscombrus chrysurus	61.25	753	9.86	1962
Pteroscion peli	42.88	2170	6.91	
Trichiurus lepturus	33.75	715	5.44	1957
Sphyraena guachancho	33.25	648	5.36	
Galeoides decadactylus	23.63	683	3.81	
Ilisha africana	21.00	1190	3.38	1958
Pomadasys incisus	14.88	83	2.40	1963
Pseudotolithus senegalensis	11.88	58	1.91	1955
Galeoides decadactylus	10.63	88	1.71	1961
Chloroscombrus chrysurus	9.75	100	1.57	
Pomadasys jubelini	8.50	28	1.37	1964
Sphyraena guachancho	7.88	68	1.27	1960
Epinephelus aeneus	5.75	5	0.93	
Cynoglossus monodi	4.50	10	0.72	1956
Penaeus notialis	4.15	190	0.67	1954
Dasyatis margarita	4.13	13	0.67	
Pseudotolithus senegalensis	3.50	53	0.56	
Perulibatrachus elminensis	3.38	8	0.54	
Parapenaeopsis atlantica	2.63	298	0.42	
Ephippion guttifer	2.25	8	0.36	
Sardinella aurita	1.75	105	0.28	
Torpedo torpedo	1.75	5	0.28	
Elops lacerta	1.25	3	0.20	
Albula vulpes	1.00	3	0.16	
Grammoplites gruveli	0.88	35	0.14	
Panulirus regius	0.50	3	0.08	
Alectis alexandrinus	0.50	3	0.08	
Pseudupeneus prayensis	0.13	3	0.02	
Total	620.96		100.00	

PROJECT STATION: 406

DATE:17/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 433
start stop duration Long W 656
TIME :08:05:34 08:35:06 30 (min) Purpose code: 3
LOG :4738.31 4739.85 1.53 Area code : 1
FDEPTH: 43 42 GearCond.code:
BDEPTH: 43 42 Validity code:
Towing dir: 62ø Wire out: 170 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 480.82 CATCH/HOUR: 961.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	211.20	10218	21.96	1965
Pagellus bellottii	118.40	704	12.31	1966
Selene dorsalis	118.40	1760	12.31	1967
Raja miraletus	99.20	256	10.32	
Trichiurus lepturus	91.20	2816	9.48	1968
Galeoides decadactylus	62.40	480	6.49	
Pteroscion peli	38.40	1056	3.99	
Sphyraena guachancho	31.40	224	3.27	
Cynoglossus senegalensis	25.60	192	2.66	
Grammoplites gruveli	16.00	1184	1.66	
'Unidentfied crab'	16.00	320	1.66	
Pegusa cadenati	14.40	224	1.50	
Octopus vulgaris	12.80	32	1.33	
Echelus myrus	12.80	64	1.33	
Sepia officinalis hierredda	11.20	32	1.16	
Penaeus notialis	11.20	928	1.16	
Scyllarides herklotsii	11.20	1792	1.16	
Maja squinado	9.60	704	1.00	
Sardinella maderensis	8.00	192	0.83	
Chloroscombrus chrysurus	8.00	96	0.83	
Pisodonophis semicinctus	6.40	32	0.67	
Brotula barbata	6.40	160	0.67	
Citharus linguatula	6.40	448	0.67	
Perulibatrachus elminensis	6.40	32	0.67	
Serranus accraensis	3.20	64	0.33	
Squilla mantis	3.20	128	0.33	
GOBIIDAE	1.60	128	0.17	
Blennius normani	0.32	32	0.03	
Antennarius sp.	0.32	96	0.03	
Total	961.64		99.98	

PROJECT STATION: 407

DATE:17/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 428
start stop duration Long W 654
TIME :09:49:00 10:19:18 30 (min) Purpose code: 3
LOG :4748.07 4749.63 1.54 Area code : 1
FDEPTH: 81 79 GearCond.code:
BDEPTH: 81 79 Validity code:
Towing dir: 60ø Wire out: 250 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 304.00 CATCH/HOUR: 608.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	169.50	3900	27.88	1975
Priacanthus arenatus	96.00	7962	15.79	1977
Sardinella aurita	78.50	2716	12.91	1976
Boops boops	54.00	1350	8.88	
Pagellus bellottii	33.20	408	5.46	1973
Dentex canariensis	28.60	36	4.70	1970
Dentex angolensis	22.40	304	3.68	1972
Sepia officinalis hierredda	19.80	50	3.26	1974
Trigla lyra	19.50	330	3.21	
Brotula barbata	16.30	38	2.68	1969
Dentex gibbosus	15.60	36	2.57	1971
Citharus linguatula	9.50	510	1.56	1978
Scorpaena scrofa	8.40	16	1.38	
Raja miraletus	7.30	24	1.20	
Grammoplites gruveli	7.00	90	1.15	
Zeus faber	2.90	14	0.48	
Anthias anthias	2.50	510	0.41	
Dentex congoensis	2.50	50	0.41	
Pseudupeneus prayensis	2.10	16	0.35	
Octopus vulgaris	2.00	12	0.33	
Umbrina canariensis	2.00	6	0.33	
Uranoscopus polli	1.50	10	0.25	
Loligo vulgaris	1.50	10	0.25	
Alloteuthis africana	1.50	470	0.25	
Sphyraena guachancho	1.30	4	0.21	
Chaetodon hoefleri	0.80	4	0.13	
Scomber japonicus	0.50	10	0.08	
Calappa rubroguttata	0.50	10	0.08	
Branchiostegus semifasciatus	0.50	2	0.08	
Chaetodon marcellae	0.30	6	0.05	
Total	608.00		100.00	

PROJECT STATION: 408

DATE:18/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 414
start stop duration Long W 728
TIME :09:01:19 09:31:30 30 (min) Purpose code: 3
LOG :4825.02 4826.63 1.61 Area code : 1
FDEPTH: 75 78 GearCond.code:
BDEPTH: 75 78 Validity code:
Towing dir: 70ø Wire out: 230 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 114.17 CATCH/HOUR: 228.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pseudotolithus senegalensis	57.76	714	25.30	1983
Pegusa lascaris	48.30	448	21.15	1981
Uranoscopus albesca	21.00	104	9.20	
Dentex angolensis	19.00	280	8.32	1979
Sepia officinalis hierredda	14.00	188	6.13	
Trigla lyra	12.60	160	5.52	1984
Brotula barbata	6.40	56	2.80	
GOBIIDAE	6.00	650	2.63	
Citharus linguatula	6.00	132	2.63	1980
Trachurus trecae	5.96	302	2.61	1986
Raja miraletus	5.24	14	2.29	
Perulibatrachus elminensis	4.60	14	2.01	
Pagellus bellottii	3.84	34	1.68	
Saurida brasiliensis	2.10	336	0.92	1982
Sardinella aurita	2.10	188	0.92	1985
Fistularia petimba	1.76	42	0.77	
Boops boops	1.40	76	0.61	
Ariomma bondi	1.40	28	0.61	
Priacanthus arenatus	1.06	20	0.46	
Decapterus punctatus	1.06	42	0.46	
VENERIDAE	1.04	56	0.46	
Antennarius sp.	1.04	6	0.46	
Trichiurus lepturus	0.70	20	0.31	
Octopus vulgaris	0.70	14	0.31	
Microchirus frechkopi	0.70	14	0.31	
Grammoplites gruveli	0.70	14	0.31	
Brachydeuterus auritus	0.40	6	0.18	
Pontinus accraensis	0.36	14	0.16	
Sphoeroides marmoratus	0.36	14	0.16	
Scomber japonicus	0.34	6	0.15	
Dactylopterus volitans	0.14	6	0.06	
Calappa rubroguttata	0.14	6	0.06	
Blennius normani	0.14	6	0.06	
Total	228.34		100.01	

PROJECT STATION: 409

DATE:18/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 417
start stop duration Long W 728
TIME :11:21:07 11:51:09 30 (min) Purpose code: 3
LOG :4835.50 4837.18 1.67 Area code : 1
FDEPTH: 39 45 GearCond.code:
BDEPTH: 39 45 Validity code:
Towing dir: 65ø Wire out: 160 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 235.73 CATCH/HOUR: 471.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	162.50	17712	34.47	1989
Selene dorsalis	89.62	1922	19.01	1993
Lepidochelys olivacea	60.00	2	12.73	
Sphyraena sphyraena	46.20	442	9.80	1990
Pteroscion peli	28.20	598	5.98	1994
Galeoides decadactylus	21.44	234	4.55	1987
Trichiurus lepturus	18.20	558	3.86	1991
Mustelus mustelus	9.30	8	1.97	
Sardinella maderensis	7.14	494	1.51	1988
Penaeus notialis	5.90	342	1.25	1992
Dasyatis marmorata	3.20	2	0.68	
Sardinella aurita	2.60	94	0.55	
Cynoglossus senegalensis	2.60	12	0.55	
Mystriophis rostellatus	1.90	4	0.40	
Stromateus fiatola	1.60	4	0.34	
Raja miraletus	1.60	4	0.34	
Sepia officinalis hierredda	1.60	2	0.34	
Octopus vulgaris	1.40	2	0.30	
Pegusa lascaris	1.30	12	0.28	
Todaropsis eblanae	1.00	2	0.21	
Citharus linguatula	0.64	64	0.14	
Pomadasys jubelini	0.64	12	0.14	
Pomadasys jubelini	0.64	12	0.14	
Balistes capriscus	0.50	2	0.11	
Scyllarides herklotsii	0.26	26	0.06	
Grammoplites gruveli	0.26	26	0.06	
GOBIIDAE	0.26	38	0.06	
Squilla mantis	0.12	26	0.03	
Total	470.62		99.86	

PROJECT STATION: 410

DATE:18/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 419
start stop duration Long W 729
TIME :12:48:49 13:18:13 29 (min) Purpose code: 3
LOG :4843.17 4844.97 1.78 Area code : 1
FDEPTH: 27 29 GearCond.code:
BDEPTH: 27 29 Validity code:
Towing dir: 90ø Wire out: 130 m Speed: 35 kn*10

Sorted: 29 Kg Total catch: 175.45 CATCH/HOUR: 363.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	130.97	10477	36.08	1999
Brachydeuterus auritus	77.59	3490	21.37	2001
Engraulis encrasicolus	36.00	10666	9.92	1998
Sardinella aurita	31.03	4070	8.55	1996
Trichiurus lepturus	19.86	583	5.47	1995
Pteroscion peli	15.52	559	4.28	1997
Ilisha africana	13.66	434	3.76	2000
Galeoides decadactylus	9.93	99	2.74	
Selene dorsalis, juveniles	6.83	1603	1.88	2002
Selene dorsalis	6.83	50	1.88	
Raja miraletus	4.66	10	1.28	
Parapenaeopsis atlantica	4.34	1390	1.20	2003
Pseudotolithus senegalensis	2.48	62	0.68	
Portunus validus	1.97	10	0.54	
Cynoglossus senegalensis	1.14	4	0.31	
Pisodonophis semicinctus	0.21	2	0.06	
Total	363.02		100.00	

PROJECT STATION: 411

DATE:18/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 426
start stop duration Long W 715
TIME :14:45:56 15:15:00 29 (min) Purpose code: 3
LOG :4859.20 4860.86 1.65 Area code : 1
FDEPTH: 44 48 GearCond.code:
BDEPTH: 44 48 Validity code:
Towing dir: 50ø Wire out: 185 m Speed: 33 kn*10

Sorted: 49 Kg Total catch: 695.85 CATCH/HOUR: 1439.69

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	800.03	33778	55.57	2005
Selene dorsalis	317.17	6530	22.03	2004
Pseudotolithus senegalensis	52.14	521	3.62	2009
Pagellus bellottii	47.79	463	3.32	2006
Trichiurus lepturus	37.66	1303	2.62	2008
Cynoglossus senegalensis	34.76	203	2.41	
Sphyraena sphyraena	20.28	319	1.41	
Galeoides decadactylus	17.38	203	1.21	
Cymbium sp.	16.55	6	1.15	
Pegusa lascaris	14.48	29	1.01	
Umbrina canariensis	11.30	29	0.78	
Pomadasys incisus	10.43	87	0.72	
Grammoplites gruveli	10.14	782	0.70	
Sardinella maderensis	9.85	550	0.68	2007
Pseudotolithus senegalensis	6.00	2	0.42	
Raja miraletus	5.79	12	0.40	
Pteroscion peli	5.21	608	0.36	
Brotula barbata	4.34	58	0.30	
Sardinella aurita	2.90	116	0.20	
Stromateus fiatola	2.38	4	0.17	
Decapterus punctatus	2.32	58	0.16	
Chaetodon hoefleri	2.32	29	0.16	
Perulibatrachus elminensis	2.03	87	0.14	
Dasyatis marmorata	1.86	2	0.13	
Epinephelus aeneus	1.76	2	0.12	
Citharus linguatula	1.45	87	0.10	
Microchirus frechkopi	0.58	58	0.04	
Torpedo torpedo	0.52	2	0.04	
GOBIIDAE	0.29	58	0.02	
Total	1439.71		99.99	

PROJECT STATION: 412

DATE:18/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 422
start stop duration Long W 712
TIME :16:23:53 16:45:03 21 (min) Purpose code: 3
LOG :4866.99 4867.96 0.97 Area code : 1
FDEPTH: 66 66 GearCond.code:
BDEPTH: 66 66 Validity code:
Towing dir: 250ø Wire out: 280 m Speed: 27 kn*10

Sorted: 50 Kg Total catch: 372.12 CATCH/HOUR: 1063.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	662.80	7691	62.34	2012
Umbrina canariensis	147.20	680	13.84	2014
Sardinella aurita	33.00	3300	3.10	2013
Decapterus punctatus	30.00	540	2.82	
Pseudupeneus prayensis	28.60	380	2.69	2011
Epinephelus aeneus	24.29	9	2.28	
Brotula barbata	22.00	100	2.07	
Priacanthus arenatus	19.00	100	1.79	
Scorpaena scrofa	13.00	20	1.22	
Sepia officinalis hierredda	13.00	26	1.22	
Lophiodes kempi	10.20	20	0.96	
Octopus vulgaris	9.14	20	0.86	
Chilomycterus spinosus mauret.	8.60	20	0.81	
Boops boops	8.00	420	0.75	
Syacium micrurum	6.00	680	0.56	2010
Sphyraena barracuda	5.80	40	0.55	
Grammoplites gruveli	4.60	140	0.43	
Chaetodon hoefleri	4.00	40	0.38	
Raja miraletus	3.43	11	0.32	
Trigla lyra	2.80	120	0.26	
Mustelus mustelus	2.29	3	0.22	
Trachurus trecae	2.00	160	0.19	
Sargocentron hastatus	1.14	6	0.11	
Fistularia petimba	1.00	6	0.09	
Dactylopterus volitans	0.71	3	0.07	
Chaetodon marcellae	0.60	20	0.06	
Total	1063.20		99.99	

PROJECT STATION: 413

DATE:18/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 417
start stop duration Long W 711
TIME :17:55:10 18:25:10 30 (min) Purpose code: 3
LOG :4874.55 4876.06 1.49 Area code : 1
FDEPTH: 82 82 GearCond.code:
BDEPTH: 82 82 Validity code:
Towing dir: 250ø Wire out: 280 m Speed: 30 kn*10

Sorted: 36 Kg Total catch: 692.18 CATCH/HOUR: 1384.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	946.00	51354	68.33	2018
Dentex canariensis	124.00	190	8.96	
Pagellus bellottii	116.60	1364	8.42	2016
Sphoeroides pachgaster	33.00	528	2.38	
Scomber japonicus	33.00	616	2.38	
Boops boops	22.00	880	1.59	
Epinephelus aeneus	19.60	2	1.42	
Dentex congoensis	15.40	704	1.11	
Sepia officinalis hierredda	13.60	30	0.98	2015
Sardinella aurita	13.20	572	0.95	
Dentex gibbosus	13.20	44	0.95	
Cepola macrophthalma	8.80	44	0.64	
Syacium micrurum	8.80	1144	0.64	2017
Trigla lyra	6.60	352	0.48	
Grammoplites gruveli	6.60	132	0.48	
Dactylopterus volitans	2.20	220	0.16	
Dicologoglossa hexophthalma	1.32	44	0.10	
Raja miraletus	0.44	44	0.03	
Total	1384.36		100.00	

PROJECT STATION: 414

DATE:18/ 5/04 GEAR TYPE: PT No: 4 POSITION:Lat N 422
start stop duration Long W 709
TIME :22:32:24 23:01:30 29 (min) Purpose code: 1
LOG :4906.96 4908.74 1.76 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 69 70 Validity code:
Towing dir: 90ø Wire out: 130 m Speed: 34 kn*10

Sorted: 40 Kg Total catch: 106.70 CATCH/HOUR: 220.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	101.79	2086	46.11	2021
Decapterus punctatus	41.59	919	18.84	2023
Scomber japonicus	25.45	292	11.53	2019
Sepia officinalis hierredda	15.31	39	6.94	2024
Sphyraena guachancho	11.79	74	5.34	2020
Alloteuthis africana	8.69	2520	3.94	
Trachurus trecae	7.45	403	3.37	2022
Saurida brasiliensis	3.72	677	1.69	
Lagocephalus laevigatus	3.10	56	1.40	
Ariomma bondi	1.86	31	0.84	
Total	220.75		100.00	

PROJECT STATION: 415

DATE:19/ 5/04 GEAR TYPE: PT No: 2 POSITION:Lat N 432
start stop duration Long W 619
TIME :03:14:02 03:44:46 31 (min) Purpose code: 1
LOG :4957.58 4959.76 2.18 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 844 866 Validity code:
Towing dir: 80ø Wire out: 130 m Speed: 44 kn*10

Sorted: 9 Kg Total catch: 39.42 CATCH/HOUR: 76.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	32.25	4196	42.27	2026
GEMPYLIDAE	21.83	1839	28.61	2025
Small shrimps	10.24	204906	13.42	
Loligo vulgaris	6.04	118	7.92	
Sardinella aurita	3.85	58	5.05	
Scomber japonicus	2.09	25	2.74	
Total	76.30		100.01	

PROJECT STATION: 416

DATE:19/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 439
start stop duration Long W 618
TIME :06:33:05 07:03:09 30 (min) Purpose code: 3
LOG :4971.63 4973.17 1.54 Area code : 1
FDEPTH: 79 78 GearCond.code:
BDEPTH: 79 78 Validity code:
Towing dir: 90ø Wire out: 260 m Speed: 30 kn*10

Sorted: 38 Kg Total catch: 142.50 CATCH/HOUR: 285.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	183.20	5552	64.28	2027
Sepia officinalis hierredda	22.00	40	7.72	2029
Umbrina canariensis	15.00	128	5.26	
Priacanthus arenatus	14.00	240	4.91	
Pagellus bellottii	10.80	144	3.79	2028
Zeus faber	8.00	48	2.81	
Pseudupeneus prayensis	8.00	120	2.81	
Squatina oculata	6.40	8	2.25	
Dentex angolensis	4.00	72	1.40	
Fistularia tabacaria	3.60	8	1.26	
Trachurus trecae	2.40	144	0.84	2030
Uranoscopus polli	2.00	8	0.70	
Pentheroscion mbizi	1.60	8	0.56	
Scomber japonicus	0.80	8	0.28	
Fistularia petimba	0.80	16	0.28	
Trigla lyra	0.40	8	0.14	
Serranus africana	0.40	8	0.14	
Saurida brasiliensis	0.40	200	0.14	
Alloteuthis africana	0.40	216	0.14	
Brotula barbata	0.40	8	0.14	
Boops boops	0.40	24	0.14	
Total	285.00		99.99	

PROJECT STATION: 417

DATE:19/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 446
start stop duration Long W 618
TIME :08:35:52 09:06:03 30 (min) Purpose code: 3
LOG :4984.79 4986.40 1.59 Area code : 1
FDEPTH: 45 44 GearCond.code:
BDEPTH: 45 44 Validity code:
Towing dir: 75ø Wire out: 160 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 59.02 CATCH/HOUR: 118.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	60.50	7528	51.25	2031
Selene dorsalis	17.00	486	14.40	2034
LOLIGINIDAE	8.40	6000	7.12	
Sardinella aurita	7.90	206	6.69	2032
Engraulis encrasicolus	5.62	1950	4.76	2036
Pseudotolithus senegalensis	4.46	6	3.78	
Sphyraena guachancho	4.40	80	3.73	2035
Sardinella maderensis	1.50	142	1.27	2033
Alloteuthis africana	1.20	380	1.02	
Raja miraletus	1.00	2	0.85	
Pagellus bellottii	1.00	10	0.85	
Chloroscombrus chrysurus	1.00	14	0.85	
Trichiurus lepturus	0.80	30	0.68	
Sphyraena sphyraena	0.80	2	0.68	
GOBIIDAE	0.60	128	0.51	
Pomadasys incisus	0.50	10	0.42	
Zeus faber	0.30	2	0.25	
Priacanthus arenatus	0.30	4	0.25	
Pentheroscion mbizi	0.30	2	0.25	
Boops boops	0.30	2	0.25	
Galeoides decadactylus	0.06	2	0.05	
Citharus linguatula	0.06	6	0.05	
Parapenaeopsis atlantica	0.02	2	0.02	
Scyllarides herklotsii	0.02	4	0.02	
Total	118.04		100.00	

PROJECT STATION: 418

DATE:19/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 450
start stop duration Long W 615
TIME :10:00:38 10:12:14 12 (min) Purpose code: 3
LOG :4991.47 4992.08 0.60 Area code : 1
FDEPTH: 27 27 GearCond.code:
BDEPTH: 27 27 Validity code:
Towing dir: 85ø Wire out: 140 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 59.73 CATCH/HOUR: 298.65

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Ilisha africana	49.50	1760	16.57	2039
Sardinella maderensis	47.50	5700	15.90	2042
Chloroscombrus chrysurus	44.25	720	14.82	2037
Pomadasys jubelini	31.00	135	10.38	2040
Selene dorsalis	30.50	890	10.21	2043
Trichiurus lepturus	22.25	545	7.45	2044
Brachydeuterus auritus	18.00	905	6.03	2038
Stromateus fiatola	8.50	30	2.85	
Sphyraena guachancho	7.75	35	2.60	2045
Galeoides decadactylus	7.75	60	2.60	2041
Raja miraletus	5.75	15	1.93	
Pteroscion peli	5.75	250	1.93	2046
Pomadasys peroteti	5.75	25	1.93	
Cynoglossus monodi	3.25	20	1.09	
Pseudotolithus typus	2.50	15	0.84	
Pomadasys incisus	2.25	20	0.75	
Octopus vulgaris	1.75	5	0.59	
Sardinella aurita	1.25	130	0.42	
Portunus validus	1.00	5	0.33	
Cepola macrophthalma	0.90	5	0.30	
Penaeus notialis	0.75	150	0.25	
Ephippion guttifer	0.50	20	0.17	
Lagocephalus laevigatus	0.25	10	0.08	
Total	298.65		100.02	

PROJECT STATION: 419

DATE:19/ 5/04 GEAR TYPE: PT No: 7 POSITION:Lat N 452
start stop duration Long W 610
TIME :11:19:34 11:45:02 25 (min) Purpose code: 1
LOG :4999.40 5000.96 1.40 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 26 29 Validity code:
Towing dir: 85ø Wire out: 140 m Speed: 30 kn*10

Sorted: 17 Kg Total catch: 17.36 CATCH/HOUR: 41.66

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sardinella aurita	21.00	1423	50.41	2048
Sardinella maderensis	17.04	934	40.90	2047
Trichiurus lepturus	1.58	12	3.79	
Scomberomorus tritor	1.30	5	3.12	
Selene dorsalis	0.17	2	0.41	
Ilisha africana	0.14	5	0.34	
Brachydeuterus auritus	0.14	2	0.34	
Pseudupeneus prayensis	0.12	2	0.29	
Octopus vulgaris	0.07	2	0.17	
Sphyraena guachancho	0.05	2	0.12	
Lagocephalus laevigatus	0.02	2	0.05	
Pteroscion peli	0.02	2	0.05	
Total	41.65		99.99	

PROJECT STATION: 420

DATE:19/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 453
start stop duration Long W 604
TIME :13:04:20 13:27:44 23 (min) Purpose code: 3
LOG :5010.52 5011.78 1.25 Area code : 1
FDEPTH: 23 22 GearCond.code:
BDEPTH: 23 22 Validity code:
Towing dir: 270ø Wire out: 120 m Speed: 32 kn*10

Sorted: 5 Kg Total catch: 249.23 CATCH/HOUR: 650.17

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
J E L L Y F I S H	542.61	209	83.46	
Polydactylus quadrifilis	44.35	5	6.82	
Sardinella maderensis	12.78	1826	1.97	2050
Drepane africana	10.83	10	1.67	
Brachydeuterus auritus Juv.	7.04	1643	1.08	2051
Galeoides decadactylus	7.04	65	1.08	
Selene dorsalis	4.17	39	0.64	
Pseudotolithus senegalensis	3.65	10	0.56	
Ilisha africana	3.39	673	0.52	2052
Pomadasys incisus	3.26	13	0.50	
Chloroscombrus chrysurus	2.61	39	0.40	
Dasyatis margarita	1.43	3	0.22	
Sardinella aurita	1.30	141	0.20	2049
Pteroscion peli	1.17	39	0.18	
Brachydeuterus auritus	1.04	18	0.16	
Scomberomorus tritor	0.91	3	0.14	
Sphyraena guachancho	0.52	104	0.08	
Pagellus bellottii	0.52	3	0.08	
Stromateus fiatola	0.52	3	0.08	
Pomadasys peroteti	0.39	3	0.06	
Trichiurus lepturus	0.26	10	0.04	
Eucinostomus melanopterus	0.13	3	0.02	
Selene dorsalis, juveniles	0.10	37	0.02	
Penaeus kerathurus	0.10	3	0.02	
Total	650.12		100.00	

PROJECT STATION: 421

DATE:19/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 451
start stop duration Long W 602
TIME :14:26:53 14:56:55 30 (min) Purpose code: 3
LOG :5018.02 5019.66 1.63 Area code : 1
FDEPTH: 41 41 GearCond.code:
BDEPTH: 41 41 Validity code:
Towing dir: 250ø Wire out: 170 m Speed: 33 kn*10

Sorted: 30 Kg Total catch: 159.45 CATCH/HOUR: 318.90

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	213.00	19900	66.79	2054
Sphyraena guachancho	21.20	330	6.65	2057
Pomadasys peroteti	19.40	70	6.08	
Selene dorsalis	16.60	370	5.21	2053
Sardinella maderensis	15.80	1380	4.95	2056
Pseudotolithus senegalensis	12.30	16	3.86	
Sardinella aurita	5.80	280	1.82	2055
Trichiurus lepturus	4.90	100	1.54	
Pagellus bellottii	4.60	30	1.44	
Chloroscombrus chrysurus	3.10	60	0.97	
Pseudupeneus prayensis	0.80	10	0.25	
Pomadasys incisus	0.80	10	0.25	
Citharus linguatula	0.40	10	0.13	
Galeoides decadactylus	0.20	20	0.06	
Total	318.90		100.00	

PROJECT STATION: 422

DATE:19/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 448
start stop duration Long W 602
TIME :16:00:22 16:30:26 30 (min) Purpose code: 3
LOG :5026.30 5027.81 1.51 Area code : 1
FDEPTH: 60 60 GearCond.code:
BDEPTH: 60 60 Validity code:
Towing dir: 250ø Wire out: 220 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 124.28 CATCH/HOUR: 248.56

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sardinella aurita	180.80	4632	72.74	2058
Sphyraena sphyraena	14.00	136	5.63	
Pagellus bellottii	11.60	96	4.67	
Selene dorsalis	7.60	144	3.06	2059
Balistes capriscus	6.80	8	2.74	
Trachurus trecae	5.60	296	2.25	2061
Scorpaena scrofa	4.40	8	1.77	
Brotula barbata	2.80	8	1.13	
Lagocephalus laevigatus	2.40	8	0.97	
Chelidonichthys gabonensis	2.00	8	0.80	
Brachydeuterus auritus	2.00	24	0.80	
Pseudupeneus prayensis	2.00	56	0.80	2060
Sardinella maderensis	2.00	16	0.80	
Octopus vulgaris	1.60	8	0.64	
Dactylopterus volitans	1.60	8	0.64	
Stephanolepis hispidus	0.80	8	0.32	
Selar crumenophthalmus	0.56	8	0.23	
Total	248.56		99.99	

PROJECT STATION: 423

DATE:19/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 442
start stop duration Long W 559
TIME :17:41:03 18:11:15 30 (min) Purpose code: 3
LOG :5035.69 5037.26 1.56 Area code : 1
FDEPTH: 96 94 GearCond.code:
BDEPTH: 96 94 Validity code:
Towing dir: 250ø Wire out: 320 m Speed: 30 kn*10

Sorted: 62 Kg Total catch: 119.86 CATCH/HOUR: 239.72

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Decapterus punctatus	158.90	2064	66.29	2062
Ariomma bondi	28.34	566	11.82	
Dentex angolensis	12.42	104	5.18	2063
Squatina oculata	9.00	4	3.75	
Brotula barbata	4.80	6	2.00	
Umbrina canariensis	4.20	24	1.75	
Fistularia petimba	4.00	30	1.67	
Octopus vulgaris	2.80	4	1.17	
Sepia officinalis hierredda	2.60	4	1.08	
Priacanthus arenatus	2.10	32	0.88	
Sardinella aurita	2.10	42	0.88	
Brotula barbata	1.22	4	0.51	
Pentheroscion mbizi	1.04	14	0.43	
Fistularia petimba	1.04	6	0.43	
Zeus faber	1.04	6	0.43	
Raja miraletus	1.00	2	0.42	
Alloteuthis africana	0.94	70	0.39	
Trigla lyra	0.70	10	0.29	
C E P H A L O P O D A	0.58	190	0.24	
Scomber japonicus	0.52	18	0.22	
Citharus linguatula	0.34	6	0.14	
Total	239.68		99.97	

PROJECT STATION: 424

DATE:19/ 5/04 GEAR TYPE: PT No: 4 POSITION:Lat N 445
start stop duration Long W 612
TIME :20:44:11 21:14:19 30 (min) Purpose code: 1
LOG :5056.39 5058.26 1.49 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 56 64 Validity code:
Towing dir: 200ø Wire out: 130 m Speed: 35 kn*10

Sorted: 48 Kg Total catch: 111.61 CATCH/HOUR: 223.22

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sardinella maderensis	97.20	3318	43.54	2070
Brachydeuterus auritus	26.40	1122	11.83	2069
Sphyraena guachancho	23.80	88	10.66	2066
Selene dorsalis	22.50	540	10.08	2065
Chloroscombrus chrysurus	16.38	336	7.34	2064
Sphyraena guachancho	16.20	180	7.26	
Trachurus trecae	3.90	258	1.75	2067
Sepia officinalis hierredda	3.40	14	1.52	
Selar crumenophthalmus	3.20	16	1.43	
Scomberomorus tritor	2.50	6	1.12	
Sardinella aurita	2.22	120	0.99	2068
Trichiurus lepturus	2.10	24	0.94	
C E P H A L O P O D A	1.50	900	0.67	
Alloteuthis africana	1.02	228	0.46	
Decapterus punctatus	0.60	18	0.27	
Engraulis encrasicolus	0.30	60	0.13	
Total	223.22		99.99	

PROJECT STATION: 425

DATE:20/ 5/04 GEAR TYPE: PT No: 2 POSITION:Lat N 441
start stop duration Long W 554
TIME :03:24:02 03:55:08 31 (min) Purpose code: 1
LOG :5120.90 5123.23 2.31 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 717 534 Validity code:
Towing dir: 73ø Wire out: 150 m Speed: 45 kn*10

Sorted: 30 Kg Total catch: 168.35 CATCH/HOUR: 325.84

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Priacanthus arenatus	184.84	22181	56.73	2074
Small shrimps	88.06	176129	27.03	
Euthynnus alletteratus	31.94	35	9.80	
GEMPYLIDAE	10.84	1113	3.33	2071
Sardinella maderensis	4.26	116	1.31	2073
Ablennes hians	2.32	19	0.71	
Loligo vulgaris	0.97	58	0.30	
MYCTOPHIDAE	0.97	126	0.30	2072
Ariomma bondi	0.58	29	0.18	
Trichiurus lepturus	0.39	10	0.12	
Chloroscombrus chrysurus	0.39	10	0.12	
Brachydeuterus auritus	0.29	10	0.09	
Total	325.85		100.02	

PROJECT STATION: 426

DATE:20/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 453
start stop duration Long W 542
TIME :06:55:24 07:25:23 30 (min) Purpose code: 3
LOG :5148.91 5150.43 1.52 Area code : 1
FDEPTH: 65 64 GearCond.code:
BDEPTH: 65 64 Validity code:
Towing dir: 70ø Wire out: 230 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 246.37 CATCH/HOUR: 492.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	120.66	1380	24.49	2076
Brachydeuterus auritus	108.80	1750	22.08	2075
Decapterus punctatus	80.00	2228	16.24	2077
Sardinella aurita	40.00	3534	8.12	2078
Dentex canariensis	30.00	74	6.09	2080
Sphyraena guachancho	20.80	96	4.22	
Boops boops	13.60	752	2.76	2079
Selene dorsalis	12.80	288	2.60	
Loligo vulgaris	11.20	8912	2.27	
Trachurus trecae	7.20	96	1.46	
Fistularia petimba	7.20	96	1.46	
Dentex gibbosus	5.70	12	1.16	
Priacanthus arenatus	4.80	48	0.97	
Sphyraena sphyraena	4.00	48	0.81	
Dactylopterus volitans	3.20	16	0.65	
Alloteuthis africana	3.20	816	0.65	
Zeus faber	2.40	16	0.49	
Pseudupeneus prayensis	2.40	32	0.49	
Dentex angolensis	2.40	32	0.49	
Pagrus caeruleostictus	2.40	10	0.49	
Lutjanus fulgens	2.10	4	0.43	
Saurida brasiliensis	1.92	48	0.39	
Sepia officinalis hierredda	1.90	2	0.39	
Dentex congoensis	1.60	16	0.32	
Sphyraena guachancho	1.20	4	0.24	
Anthias anthias	0.80	80	0.16	
Mustelus mustelus	0.30	4	0.06	
Citharus linguatula	0.16	16	0.03	
Total	492.74		100.01	

PROJECT STATION: 427

DATE:20/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 457
start stop duration Long W 543
TIME :08:47:37 09:17:13 30 (min) Purpose code: 3
LOG :5158.58 5160.09 1.49 Area code : 1
FDEPTH: 44 44 GearCond.code:
BDEPTH: 44 44 Validity code:
Towing dir: 75ø Wire out: 170 m Speed: 30 kn*10

Sorted: 25 Kg Total catch: 92.19 CATCH/HOUR: 184.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	81.00	1548	43.93	2081
Selene dorsalis	20.70	506	11.23	2085
Sphyraena guachancho	18.00	198	9.76	
Decapterus punctatus	10.80	282	5.86	2086
Chloroscombrus chrysurus	9.00	84	4.88	2084
Sardinella maderensis	6.60	594	3.58	2082
Pomadasys peroteti	6.40	24	3.47	
Sphyraena guachancho	5.70	24	3.09	2083
Pomadasys jubelini	4.10	6	2.22	
Mustelus mustelus	3.90	2	2.12	
Galeoides decadactylus	2.70	42	1.46	
Epinephelus aeneus	2.40	2	1.30	
Pagellus bellottii	2.40	12	1.30	
Pomadasys incisus	1.80	24	0.98	
Sepia officinalis hierredda	1.60	2	0.87	
Stromateus fiatola	1.30	2	0.71	
Fistularia petimba	1.20	18	0.65	
Torpedo torpedo	1.00	2	0.54	
Balistes capriscus	0.90	6	0.49	
Pagrus caeruleostictus	0.62	2	0.34	
Selene dorsalis	0.62	2	0.34	
Trigla lyra	0.60	12	0.33	
Ilisha africana	0.48	12	0.26	
Pseudupeneus prayensis	0.30	6	0.16	
Sardinella aurita	0.26	4	0.14	
Total	184.38		100.01	

PROJECT STATION: 428

DATE:20/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 501
start stop duration Long W 542
TIME :10:20:58 10:50:22 29 (min) Purpose code: 3
LOG :5167.40 5168.96 1.55 Area code : 1
FDEPTH: 20 21 GearCond.code:
BDEPTH: 20 21 Validity code:
Towing dir: 80ø Wire out: 140 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 110.65 CATCH/HOUR: 228.93

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ilisha africana	55.86	4328	24.40	2088
Chloroscombrus chrysurus	43.45	546	18.98	
Stromateus fiatola	17.38	54	7.59	2089
Sardinella maderensis	15.52	1887	6.78	2092
Pseudotolithus senegalensis	14.69	19	6.42	
Pomadasys jubelini	12.62	25	5.51	
Pteroscion peli	8.69	968	3.80	2093
Trichiurus lepturus	8.38	174	3.66	
Pseudotolithus senegalensis	7.14	93	3.12	2091
Sphyraena guachancho	6.83	143	2.98	2090
Selene dorsalis	5.59	689	2.44	2094
Galeoides decadactylus	5.17	10	2.26	
Elops lacerta	5.07	17	2.21	
Brachydeuterus auritus	4.34	416	1.90	2087
Parapenaeopsis atlantica	3.72	503	1.62	
Galeoides decadactylus	2.79	50	1.22	
Pomadasys peroteti	1.86	12	0.81	
Pentanemus quinquarius	1.86	81	0.81	
Lagocephalus laevigatus	1.66	4	0.73	
Drepane africana	1.55	19	0.68	
Scomberomorus tritor	1.55	12	0.68	
Drepane africana	1.03	4	0.45	
Panulirus regius	0.93	10	0.41	
Epinephelus aeneus	0.62	6	0.27	
Penaeus notialis	0.62	19	0.27	
Total	228.92		100.00	

PROJECT STATION: 429

DATE:20/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 503
start stop duration Long W 524
TIME :12:57:16 13:27:47 31 (min) Purpose code: 3
LOG :5185.58 5187.16 1.56 Area code : 1
FDEPTH: 24 24 GearCond.code:
BDEPTH: 24 24 Validity code:
Towing dir: 80ø Wire out: 130 m Speed: 31 kn*10

Sorted: 25 Kg Total catch: 75.97 CATCH/HOUR: 147.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ilisha africana	37.88	7490	25.76	2096
Pseudotolithus senegalensis	19.35	8	13.16	
Polydactylus quadrifilis	15.97	2	10.86	
Lethrinus atlanticus	10.26	25	6.98	
Brachydeuterus auritus	8.42	892	5.73	2095
Pteroscion peli	6.64	739	4.52	2098
Sardinella maderensis	6.00	786	4.08	2097
Galeoides decadactylus	4.88	25	3.32	
Chloroscombrus chrysurus	4.84	60	3.29	
Pomadasys peroteti	4.16	15	2.83	
Lagocephalus laevigatus	4.16	10	2.83	
Trichiurus lepturus	4.12	486	2.80	
Pomadasys jubelini	3.87	19	2.63	
Selene dorsalis	3.39	279	2.31	2099
Epinephelus aeneus	2.71	4	1.84	
Penaeus kerathurus	1.82	120	1.24	
Scomberomorus tritor	1.74	14	1.18	
Umbrina canariensis	1.26	2	0.86	
Elops lacerta	1.16	4	0.79	
Zanobatus shoenleinii	0.97	2	0.66	
Parapenaeopsis atlantica	0.91	120	0.62	
Trachinocephalus myops	0.58	31	0.39	
Engraulis encrasicolus	0.58	31	0.39	
Caranx hippos	0.48	2	0.33	
Sphyraena guachancho	0.48	6	0.33	
Penaeus notialis	0.27	6	0.18	
Vanstraelenia chirophthalmus	0.14	4	0.10	
Total	147.04		100.01	

PROJECT STATION: 430

DATE:20/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 501
start stop duration Long W 523
TIME :14:13:03 14:43:09 30 (min) Purpose code: 3
LOG :5191.37 5193.01 1.63 Area code : 1
FDEPTH: 39 39 GearCond.code:
BDEPTH: 39 39 Validity code:
Towing dir: 260ø Wire out: 170 m Speed: 32 kn*10

Sorted: 14 Kg Total catch: 14.24 CATCH/HOUR: 28.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys jubelini	5.96	8	20.93	
Balistes capriscus	3.94	16	13.83	
Octopus vulgaris	3.84	6	13.48	
Chloroscombrus chrysurus	3.34	40	11.73	
Epinephelus aeneus	1.68	2	5.90	
Sphyraena guachancho	1.60	6	5.62	
Panulirus regius	1.44	4	5.06	
Pagellus bellottii	1.38	8	4.85	
Lethrinus atlanticus	0.98	2	3.44	
Albula vulpes	0.80	2	2.81	
Dactylopterus volitans	0.70	2	2.46	
Galeoides decadactylus	0.60	2	2.11	
Aluterus heudelotii	0.50	2	1.76	
Alloteuthis africana	0.46	186	1.62	
Selene dorsalis	0.42	10	1.47	
Ilisha africana	0.30	8	1.05	
Chelidonichthys lastoviza	0.30	2	1.05	
Sardinella maderensis	0.24	22	0.84	
Total	28.48		100.01	

PROJECT STATION: 431

DATE:20/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 457
start stop duration Long W 523
TIME :15:59:51 16:29:16 29 (min) Purpose code: 3
LOG :5201.44 5203.08 1.63 Area code : 1
FDEPTH: 77 75 GearCond.code:
BDEPTH: 77 75 Validity code:
Towing dir: 250ø Wire out: 270 m Speed: 32 kn*10

Sorted: 29 Kg Total catch: 175.35 CATCH/HOUR: 362.79

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	162.62	3050	44.82	2104
Decapterus punctatus	58.97	2547	16.25	2102
Sardinella aurita	48.41	3211	13.34	2103
Sphyraena guachancho	33.52	286	9.24	2101
Selene dorsalis	23.59	612	6.50	2100
Dentex angolensis	9.31	137	2.57	
Alloteuthis africana	6.95	2458	1.92	
Trichiurus lepturus	6.83	124	1.88	
Priacanthus arenatus	3.10	25	0.85	
Dentex gibbosus	2.48	12	0.68	
Zeus faber	1.86	25	0.51	
Boops boops	1.86	37	0.51	
Saurida brasiliensis	1.12	261	0.31	
Raja miraletus	1.03	2	0.28	
Fistularia petimba	0.52	4	0.14	
Pseudupeneus prayensis	0.50	12	0.14	
GOBIIDAE	0.12	12	0.03	
Total	362.79		99.97	

PROJECT STATION: 432

DATE:20/ 5/04 GEAR TYPE: PT No: 5 POSITION:Lat N 453
start stop duration Long W 527
TIME :19:37:15 20:07:20 30 (min) Purpose code: 1
LOG :5222.02 5223.88 1.84 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 104 111 Validity code:
Towing dir: 110ø Wire out: 140 m Speed: 35 kn*10

Sorted: 63 Kg Total catch: 286.07 CATCH/HOUR: 572.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomber japonicus	499.04	6182	87.22	2105
Sardinella aurita	36.44	666	6.37	2106
MYCTOPHIDAE	15.74	3672	2.75	
Trachurus trecae	7.64	530	1.34	2107
Ariomma bondi	5.84	126	1.02	
Sphyraena guachancho	3.14	36	0.55	
Auxis thazard	1.00	6	0.17	
Sphyraena sphyraena	0.90	8	0.16	
Sepia officinalis hierredda	0.80	2	0.14	
Euthynnus alletteratus	0.60	2	0.10	
Echeneis naucrates	0.50	2	0.09	
GEMPYLIDAE	0.44	26	0.08	
Total	572.08		99.99	

PROJECT STATION: 433

DATE:21/ 5/04 GEAR TYPE: PT No: 2 POSITION:Lat N 446
start stop duration Long W 530
TIME :02:59:23 03:29:17 30 (min) Purpose code: 1
LOG :5291.83 5293.61 1.74 Area code : 1
FDEPTH: 35 40 GearCond.code:
BDEPTH: 1079 981 Validity code:
Towing dir: 250ø Wire out: 120 m Speed: 35 kn*10

Sorted: 12 Kg Total catch: 12.55 CATCH/HOUR: 25.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	22.30	6912	88.84	2108
Gempylus sp.	0.90	4	3.59	
TRICHIURIDAE	0.80	6	3.19	
GEMPYLIDAE	0.70	80	2.79	2109
Loligo vulgaris	0.40	16	1.59	
Total	25.10		100.00	

PROJECT STATION: 434

DATE:21/ 5/04 GEAR TYPE: PT No: 2 POSITION:Lat N 451
start stop duration Long W 512
TIME :05:31:39 05:48:22 17 (min) Purpose code: 1
LOG :5315.67 5316.51 0.83 Area code : 1
FDEPTH: 20 28 GearCond.code:
BDEPTH: 1087 1122 Validity code:
Towing dir: 250ø Wire out: 100 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 250.40 CATCH/HOUR: 883.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	883.76	6155	100.00	
Total	883.76		100.00	

PROJECT STATION: 435

DATE:21/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 459
start stop duration Long W 503
TIME :08:09:33 08:39:16 30 (min) Purpose code: 3
LOG :5333.97 5335.47 1.49 Area code : 1
FDEPTH: 81 82 GearCond.code:
BDEPTH: 81 82 Validity code:
Towing dir: 270ø Wire out: 270 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 495.91 CATCH/HOUR: 991.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	685.94	13290	69.16	2110
Trachurus trecae	131.74	5708	13.28	2113
Sardinella aurita	62.90	1478	6.34	2114
Selene dorsalis	23.80	594	2.40	2115
Priacanthus arenatus	17.00	306	1.71	2111
Pentheroscion mbizi	13.60	102	1.37	
Boops boops	12.74	696	1.28	2112
Dentex angolensis	11.90	152	1.20	
Sepia officinalis hierredda	5.94	16	0.60	
Stromateus fiatola	4.24	16	0.43	
Sphyraena sphyraena	4.24	16	0.43	
Octopus vulgaris	4.24	16	0.43	
Scomber japonicus	2.54	16	0.26	
Pontinus accraensis	2.54	16	0.26	
Fistularia petimba	2.54	16	0.26	
Citharus linguatula	2.54	16	0.26	
Zeus faber	1.70	16	0.17	
Trichiurus lepturus	1.70	34	0.17	
Sphoeroides marmoratus	0.34	16	0.03	
Total	992.18		100.04	

PROJECT STATION: 436

DATE:21/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 503
start stop duration Long W 502
TIME :10:51:33 11:21:05 30 (min) Purpose code: 3
LOG :5347.73 5349.25 1.52 Area code : 1
FDEPTH: 35 35 GearCond.code:
BDEPTH: 35 35 Validity code:
Towing dir: 260ø Wire out: 140 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 122.82 CATCH/HOUR: 245.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena guachancho	155.20	672	63.18	2117
Brachydeuterus auritus	28.80	1376	11.72	2120
Chloroscombrus chrysurus	23.20	366	9.44	2118
Pseudotolithus senegalensis	7.70	14	3.13	
Pomadasys peroteti	5.60	26	2.28	
Drepane africana	5.00	10	2.04	
Selene dorsalis	3.60	912	1.47	2119
Scomberomorus tritor	3.00	8	1.22	
Alloteuthis sp.	2.00	800	0.81	
Galeoides decadactylus	1.60	32	0.65	
Trichiurus lepturus	1.20	48	0.49	
Sepia officinalis hierredda	1.20	8	0.49	
Stromateus fiatola	1.20	2	0.49	
Raja miraletus	1.20	2	0.49	
Panulirus regius	1.20	4	0.49	
Fistularia petimba	1.00	2	0.41	
Pteroscion peli	0.80	32	0.33	
Ilisha africana	0.80	24	0.33	
Balistes capriscus	0.70	2	0.28	
Sardinella maderensis	0.40	112	0.16	2121
Penaeus notialis	0.16	8	0.07	
Scyllarides herklotsii	0.08	8	0.03	
Total	245.64		100.00	

PROJECT STATION: 437

DATE:21/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 508
start stop duration Long W 443
TIME :15:19:50 15:49:32 30 (min) Purpose code: 3
LOG :5377.97 5379.49 1.52 Area code : 1
FDEPTH: 22 22 GearCond.code:
BDEPTH: 22 22 Validity code:
Towing dir: 170ø Wire out: m Speed: kn*10

Sorted: 30 Kg Total catch: 159.45 CATCH/HOUR: 318.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	141.50	2830	44.37	2122
Sardinella maderensis	53.50	6172	16.78	2128
Sphyraena guachancho	29.50	620	9.25	2124
Brachydeuterus auritus	27.50	3378	8.62	2123
Selene dorsalis	18.50	1294	5.80	2125
Galeoides decadactylus	13.30	130	4.17	2126
Pomadasys peroteti	11.20	42	3.51	2127
Alectis alexandrinus	5.50	20	1.72	
Trichiurus lepturus	4.90	20	1.54	
Pseudotolithus senegalensis	4.70	4	1.47	
Sardinella aurita	3.50	10	1.10	
Pomadasys jubelini	1.80	4	0.56	
Lagocephalus laevigatus	1.70	2	0.53	
Raja miraletus	1.10	4	0.34	
Caranx crysos	0.70	10	0.22	
Total	318.90		99.98	

PROJECT STATION: 438

DATE:21/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 506
start stop duration Long W 444
TIME :16:32:12 17:01:43 30 (min) Purpose code: 3
LOG :5382.76 5384.30 1.55 Area code : 1
FDEPTH: 40 38 GearCond.code:
BDEPTH: 40 38 Validity code:
Towing dir: 250ø Wire out: 180 m Speed: 32 kn*10

Sorted: 27 Kg Total catch: 774.05 CATCH/HOUR: 1548.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	655.20	19370	42.32	2129
Brachydeuterus auritus Juv.	518.00	78904	33.46	2130
Sardinella maderensis - Juv.	229.60	37500	14.83	2132
Chloroscombrus chrysurus	61.60	1232	3.98	2131
Decapterus punctatus	16.80	616	1.09	
Caranx crysos	16.80	56	1.09	
Trachurus trecae	14.00	112	0.90	
Engraulis encrasicolus	14.00	3248	0.90	2133
Sphyraena guachancho	10.90	38	0.70	
Alectis alexandrinus	7.00	2	0.45	
Pomadasys peroteti	3.60	10	0.23	
Raja miraletus	0.60	2	0.04	
Total	1548.10		99.99	

PROJECT STATION: 439

DATE:21/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 503
start stop duration Long W 443
TIME :17:42:17 18:12:44 30 (min) Purpose code: 3
LOG :5389.18 5390.74 1.54 Area code : 1
FDEPTH: 74 71 GearCond.code:
BDEPTH: 74 71 Validity code:
Towing dir: 250ø Wire out: 250 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 220.49 CATCH/HOUR: 440.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	284.90	4494	64.61	2135
Trachurus trecae	61.46	1344	13.94	2134
Scomber japonicus	14.84	154	3.37	
Sardinella aurita	13.58	224	3.08	
Dentex angolensis	12.04	196	2.73	
Priacanthus arenatus	11.48	126	2.60	
Umbrina canariensis	8.68	98	1.97	
Sphyraena sphyraena	6.16	28	1.40	
Pseudupeneus prayensis	4.76	28	1.08	
Sepia officinalis hierredda	4.28	8	0.97	
Pagellus bellottii	2.80	14	0.63	
Sardinella maderensis	2.80	112	0.63	
Sphyraena guachancho	2.38	28	0.54	
Citharus linguatula	2.10	28	0.48	
Octopus vulgaris	1.84	4	0.42	
Pentheroscion mbizi	1.82	14	0.41	
Ommastrephes pteropus	1.54	14	0.35	
Scorpaena scrofa	1.24	4	0.28	
Fistularia petimba	0.64	4	0.15	
Boops boops	0.56	28	0.13	
Grammoplites gruveli	0.56	14	0.13	
Sphoeroides marmoratus	0.28	14	0.06	
Trigla lyra	0.24	2	0.05	
Total	440.98		100.01	

PROJECT STATION: 440

DATE:21/ 5/04 GEAR TYPE: PT No: 4 POSITION:Lat N 459
start stop duration Long W 511
TIME :22:52:22 23:22:10 30 (min) Purpose code: 1
LOG :5431.88 5433.50 1.62 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 74 107 Validity code:
Towing dir: 195ø Wire out: 140 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 87.69 CATCH/HOUR: 175.38

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	74.10	5700	42.25	2138
Brachydeuterus auritus	43.56	630	24.84	2140
Selene dorsalis	21.78	492	12.42	2139
Sardinella aurita	12.48	138	7.12	2136
Sardinella maderensis	8.10	114	4.62	2137
Trachinotus ovatus	3.66	30	2.09	
Selar crumenophthalmus	2.46	12	1.40	
Sphyraena guachancho	2.28	24	1.30	
Lagocephalus laevigatus	2.04	12	1.16	
Scomber japonicus	2.04	6	1.16	
Ariomma bondi	1.02	18	0.58	
Trichiurus lepturus	0.90	18	0.51	
Engraulis encrasicolus	0.42	90	0.24	
Caranx crysos	0.36	6	0.21	
Trachurus trecae	0.12	6	0.07	
MYCTOPHIDAE	0.06	18	0.03	
Total	175.38		100.00	

PROJECT STATION: 441

DATE:22/ 5/04 GEAR TYPE: PT No: 2 POSITION:Lat N 456
start stop duration Long W 458
TIME :01:17:17 01:47:08 30 (min) Purpose code: 1
LOG :5451.05 5452.58 1.52 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 619 543 Validity code:
Towing dir: 265ø Wire out: 120 m Speed: 31 kn*10

Sorted: 25 Kg Total catch: 999.00 CATCH/HOUR: 1998.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	1896.00	186800	94.89	2141
Ariomma bondi	56.00	1200	2.80	
GEMPYLIDAE	16.40	562	0.82	
Sardinella aurita	16.00	80	0.80	
MYCTOPHIDAE	12.00	480	0.60	
Trichiurus lepturus	1.60	2	0.08	
Gempylus sp.	0.40	2	0.02	
Total	1998.40		100.01	

PROJECT STATION: 442

DATE:22/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 504
start stop duration Long W 422
TIME :08:04:59 08:34:10 29 (min) Purpose code: 3
LOG :5507.02 5508.50 1.48 Area code : 1
FDEPTH: 86 84 GearCond.code:
BDEPTH: 86 84 Validity code:
Towing dir: 80ø Wire out: 270 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 142.88 CATCH/HOUR: 295.61

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	152.07	1097	51.44	2145
Dentex congoensis	105.41	1057	35.66	2144
Pagellus bellottii	14.17	166	4.79	2143
Umbrina canariensis	4.14	23	1.40	
Trachurus trecae	3.21	50	1.09	2142
Fistularia petimba	3.21	23	1.09	
Decapterus rhonchus	3.10	4	1.05	
Squatina oculata	2.90	2	0.98	
Dentex gibbosus	2.48	21	0.84	
Dentex canariensis	1.66	10	0.56	
Trigla lyra	1.66	19	0.56	
Raja miraletus	0.83	2	0.28	
Pseudupeneus prayensis	0.72	6	0.24	
Zeus faber	0.43	2	0.15	
Ephippion guttifer	0.41	2	0.14	
Sardinella aurita	0.25	4	0.08	
Total	296.65		100.35	

PROJECT STATION: 443

DATE:22/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 508
start stop duration Long W 423
TIME :09:43:01 10:13:12 30 (min) Purpose code: 3
LOG :5515.98 5517.51 1.51 Area code : 1
FDEPTH: 59 58 GearCond.code:
BDEPTH: 59 58 Validity code:
Towing dir: 81ø Wire out: 210 m Speed: 30 kn*10

Sorted: 61 Kg Total catch: 368.80 CATCH/HOUR: 737.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	409.80	8114	55.56	2150
Pagellus bellottii	190.80	4496	25.87	2147
Pseudupeneus prayensis	43.20	1068	5.86	2146
Dactylopterus volitans	37.44	144	5.08	
Sardinella aurita	10.56	240	1.43	2149
Brachydeuterus auritus	9.96	180	1.35	2148
Sepia officinalis hierredda	9.60	24	1.30	
Lagocephalus laevigatus	5.04	24	0.68	
Boops boops	3.72	156	0.50	
Raja miraletus	3.12	12	0.42	
Dentex angolensis	2.88	48	0.39	
Sphyraena sphyraena	2.04	12	0.28	
Mustelus mustelus	2.04	2	0.28	
Balistes capriscus	1.80	2	0.24	
Priacanthus arenatus	1.56	12	0.21	
Scomber japonicus	1.44	12	0.20	
Dentex canariensis	1.32	12	0.18	
Fistularia petimba	1.20	12	0.16	
Dentex gibbosus	0.48	12	0.07	
Total	738.00		100.06	

PROJECT STATION: 444

DATE:22/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 511
start stop duration Long W 422
TIME :11:19:31 11:49:08 30 (min) Purpose code: 3
LOG :5525.11 5526.64 1.52 Area code : 1
FDEPTH: 22 22 GearCond.code:
BDEPTH: 22 22 Validity code:
Towing dir: 90ø Wire out: 140 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 187.75 CATCH/HOUR: 375.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	78.00	12792	20.77	2156
Brachydeuterus auritus Juv.	69.50	10842	18.51	2152
Chloroscombrus chrysurus	61.50	860	16.38	2154
Polydactylus quadrifilis	44.70	4	11.90	
Brachydeuterus auritus	43.50	734	11.58	2151
Sphyraena guachancho	21.50	2350	5.73	2155
Pseudotolithus senegalensis	17.20	28	4.58	
Galeoides decadactylus	12.50	140	3.33	
Selene dorsalis	6.00	80	1.60	
Trachurus trecae	4.00	60	1.07	
Pteroscion peli	4.00	50	1.07	
Selene dorsalis, juveniles	3.50	734	0.93	2153
Pomadasys peroteti	3.12	6	0.83	
Pseudupeneus prayensis	2.50	20	0.67	
Pomadasys jubelini	2.22	4	0.59	
Sphyraena guachancho	1.26	6	0.34	
Engraulis encrasicolus	0.50	30	0.13	
Total	375.50		100.01	

PROJECT STATION: 445

DATE:22/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 512
start stop duration Long W 412
TIME :12:56:58 13:26:20 29 (min) Purpose code: 3
LOG :5536.46 5538.02 1.56 Area code : 1
FDEPTH: 24 24 GearCond.code:
BDEPTH: 24 24 Validity code:
Towing dir: 260ø Wire out: 140 m Speed: 32 kn*10

Sorted: 106 Kg Total catch: 105.95 CATCH/HOUR: 219.21

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus punctatus	73.34	1477	33.46	2160
Decapterus rhonchus	39.62	151	18.07	2161
Caranx crysos	34.24	188	15.62	2159
Pseudupeneus prayensis	28.03	397	12.79	2158
Sphyraena afra	14.38	2	6.56	
Pagellus bellottii	10.55	85	4.81	2157
Euthynnus alletteratus	3.83	19	1.75	
Aluterus monoceros	2.59	4	1.18	
Balistes capriscus	2.17	12	0.99	
Sepia officinalis hierredda	1.86	2	0.85	
Sardinella aurita	1.86	31	0.85	
Lagocephalus laevigatus	1.86	6	0.85	
Dentex canariensis	1.55	17	0.71	
Chloroscombrus chrysurus	1.03	12	0.47	
Lutjanus fulgens	0.83	39	0.38	
Dactylopterus volitans	0.72	2	0.33	
Trachinocephalus myops	0.31	2	0.14	
Fistularia petimba	0.21	2	0.10	
Aluterus heudelotii	0.21	2	0.10	
Total	219.19		100.01	

PROJECT STATION: 446

DATE:22/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 512
start stop duration Long W 412
TIME :14:32:20 15:02:55 31 (min) Purpose code: 3
LOG :5542.95 5544.57 1.61 Area code : 1
FDEPTH: 32 34 GearCond.code:
BDEPTH: 32 34 Validity code:
Towing dir: 260ø Wire out: 170 m Speed: 31 kn*10

Sorted: 27 Kg Total catch: 26.87 CATCH/HOUR: 52.01

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pseudupeneus prayensis	19.84	211	38.15	2163
Balistes capriscus	10.26	99	19.73	2164
Sepia officinalis hierredda	9.17	12	17.63	
Pagellus bellottii	5.90	62	11.34	2162
Dentex canariensis	1.84	15	3.54	
Caranx crysos	1.45	8	2.79	
Hemicaranx bicolor	1.26	4	2.42	
Aluterus monoceros	1.26	2	2.42	
Lagocephalus laevigatus	0.58	2	1.12	
Trachurus trecae	0.39	8	0.75	
Total	51.95		99.89	

PROJECT STATION: 447

DATE:22/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 511
start stop duration Long W 408
TIME :16:05:36 16:26:03 20 (min) Purpose code: 3
LOG :5551.98 5553.07 1.08 Area code : 1
FDEPTH: 57 56 GearCond.code:
BDEPTH: 57 56 Validity code:
Towing dir: 250ø Wire out: 220 m Speed: 31 kn*10

Sorted: 43 Kg Total catch: 132.74 CATCH/HOUR: 398.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	91.80	5253	23.05	2166
Pagellus bellottii	77.40	1209	19.44	2167
Pseudupeneus prayensis	63.45	1791	15.93	2169
Pomadasys incisus	55.80	579	14.01	2168
Trachurus trecae	33.75	1638	8.48	2170
Pagrus caeruleostictus	18.90	117	4.75	
Dentex canariensis	9.45	45	2.37	
Umbrina canariensis	9.00	45	2.26	
Boops boops	9.00	342	2.26	2165
Fistularia petimba	6.60	12	1.66	
Mustelus mustelus	4.80	3	1.21	
Trichiurus lepturus	3.60	27	0.90	
Lagocephalus laevigatus	3.60	27	0.90	
Anthias anthias	3.60	18	0.90	
Sepia officinalis hierredda	3.15	9	0.79	
Chaetodon hoefleri	2.70	36	0.68	
Dactylopterus volitans	1.35	9	0.34	
Chaetodon marcellae	0.27	9	0.07	
Total	398.22		100.00	

PROJECT STATION: 448

DATE:23/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 501
start stop duration Long W 342
TIME :06:29:46 06:59:09 29 (min) Purpose code: 3
LOG :5658.92 5660.44 1.51 Area code : 1
FDEPTH: 87 88 GearCond.code:
BDEPTH: 87 88 Validity code:
Towing dir: 270ø Wire out: 300 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 389.94 CATCH/HOUR: 806.77

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	305.38	17783	37.85	2175
Scomber japonicus	216.62	4744	26.85	2174
Sardinella aurita	112.97	2433	14.00	2173
Boops boops	85.90	3269	10.65	2171
Dentex angolensis	23.83	236	2.95	2172
Priacanthus arenatus	22.22	745	2.75	2176
Pentheroscion mbizi	17.88	174	2.22	
Uranoscopus albesca	4.59	12	0.57	
Dentex gibbosus	2.73	12	0.34	
Brachydeuterus auritus	2.73	37	0.34	
Fistularia petimba	2.61	25	0.32	
Ariomma bondi	2.61	50	0.32	
Trigla lyra	2.11	50	0.26	
Pagellus bellottii	1.99	74	0.25	
Pseudupeneus prayensis	1.49	12	0.18	
Citharus linguatula	1.12	25	0.14	
Total	806.78		99.99	

PROJECT STATION: 449

DATE:23/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 506
start stop duration Long W 343
TIME :08:27:09 08:57:05 30 (min) Purpose code: 3
LOG :5669.17 5670.71 1.52 Area code : 1
FDEPTH: 45 44 GearCond.code:
BDEPTH: 45 44 Validity code:
Towing dir: 265ø Wire out: 170 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 356.00 CATCH/HOUR: 712.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys peroteti	388.84	2102	54.61	2178
Pagellus bellottii	112.74	2380	15.83	2177
Epinephelus aeneus	43.00	6	6.04	
Selene dorsalis	41.68	164	5.85	2179
Pseudupeneus prayensis	37.72	836	5.30	2180
Alectis alexandrinus	23.60	26	3.31	
Sphyraena sphyraena	12.20	54	1.71	
Pomadasys jubelini	11.00	32	1.54	
Chloroscombrus chrysurus	10.12	88	1.42	
Selar crumenophthalmus	9.12	54	1.28	
Pagrus caeruleostictus	5.82	54	0.82	
Brachydeuterus auritus	4.62	142	0.65	
Dentex canariensis	3.40	32	0.48	
Dentex gibbosus	2.30	10	0.32	
Octopus vulgaris	2.00	2	0.28	
Priacanthus arenatus	1.76	10	0.25	
Citharus linguatula	0.88	22	0.12	
Grammoplites gruveli	0.66	44	0.09	
Trachurus trecae	0.54	32	0.08	
Total	712.00		99.98	

PROJECT STATION: 450

DATE:23/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 509
start stop duration Long W 342
TIME :08:20:15 10:00:19 30 (min) Purpose code: 3
LOG :5675.47 5676.97 1.49 Area code : 1
FDEPTH: 24 24 GearCond.code:
BDEPTH: 24 24 Validity code:
Towing dir: 90ø Wire out: 140 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 267.12 CATCH/HOUR: 534.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	244.16	49916	45.70	2183
Engraulis encrasicolus	148.96	41606	27.88	2186
Sardinella maderensis	33.60	5104	6.29	2184
Elops lacerta	29.40	92	5.50	2187
Chloroscombrus chrysurus	26.04	350	4.87	2182
Selene dorsalis	20.76	312	3.89	2185
Scomberomorus tritor	10.22	322	1.91	2181
Sphyraena guachancho	8.50	32	1.59	2188
Galeoides decadactylus	3.36	70	0.63	
Pomadasys peroteti	3.16	16	0.59	
Scomberomorus tritor	1.00	4	0.19	
Pseudotolithus typus	1.00	2	0.19	
Sphyraena guachancho	0.98	154	0.18	
Pseudupeneus prayensis	0.84	28	0.16	
Penaeus notialis	0.70	70	0.13	
Drepane africana	0.50	2	0.09	
Calappa pelii	0.50	2	0.09	
Sardinella aurita	0.42	98	0.08	
Epinephelus aeneus	0.14	14	0.03	
Total	534.24		99.99	

PROJECT STATION: 451

DATE:23/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 508
start stop duration Long W 328
TIME :11:58:22 12:23:31 25 (min) Purpose code: 3
LOG :5689.83 5691.13 1.31 Area code : 1
FDEPTH: 23 23 GearCond.code:
BDEPTH: 23 23 Validity code:
Towing dir: 90ø Wire out: 140 m Speed: 31 kn*10

Sorted: 34 Kg Total catch: 275.20 CATCH/HOUR: 660.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	427.56	194345	64.73	2194
Sardinella maderensis - Juv.	56.95	19925	8.62	2190
Sardinella aurita - Juveniles	42.84	16493	6.49	2191
Selene dorsalis	32.16	106	4.87	2192
Brachydeuterus auritus Juv.	27.89	6122	4.22	2189
Sphyraena guachancho	10.75	29	1.63	
Drepane africana	10.20	31	1.54	2195
Pseudotolithus senegalensis	8.76	12	1.33	
Chaetodipterus goreensis	6.50	10	0.98	
Drepane africana	6.22	50	0.94	
Chaetodipterus lippei	4.97	7	0.75	
Selene dorsalis, juveniles	3.53	722	0.53	2193
Galeoides decadactylus	3.48	14	0.53	
Pomadasys jubelini	3.34	7	0.51	
Dasyatis margarita	2.76	2	0.42	
Elops lacerta	2.74	7	0.41	
Eucinostomus melanopterus	2.02	34	0.31	
Sphyraena guachancho	1.85	336	0.28	
Pteroscion peli	1.51	50	0.23	
Galeoides decadactylus	1.51	50	0.23	
Pomadasys peroteti	1.10	5	0.17	
Balistes punctatus	1.03	2	0.16	
Dentex gibbosus	0.48	2	0.07	
Scomberomorus tritor	0.34	2	0.05	
Total	660.49		100.00	

PROJECT STATION: 452

DATE:23/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 505
start stop duration Long W 324
TIME :13:16:49 13:46:23 30 (min) Purpose code: 3
LOG :5696.79 5698.30 1.50 Area code : 1
FDEPTH: 40 40 GearCond.code:
BDEPTH: 40 40 Validity code:
Towing dir: 280ø Wire out: 170 m Speed: 31 kn*10

Sorted: 28 Kg Total catch: 417.91 CATCH/HOUR: 835.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus Juv.	565.60	158570	67.67	2196
Selene dorsalis	174.54	876	20.88	
Chloroscombrus chrysurus	21.84	28	2.61	
Pagellus bellottii	21.28	224	2.55	
Brachydeuterus auritus	19.60	616	2.35	
Dactylopterus volitans	7.28	28	0.87	
Octopus vulgaris	4.80	6	0.57	
Trichiurus lepturus	3.08	56	0.37	
Epinephelus aeneus	2.80	4	0.34	
Sepia officinalis hierredda	2.54	6	0.30	
Sphyraena guachancho	2.28	8	0.27	
Penaeus notialis	2.24	84	0.27	
Pomadasys incisus	1.68	28	0.20	
Raja miraletus	0.90	2	0.11	
Penaeus kerathurus	0.84	56	0.10	
Sardinella maderensis	0.56	56	0.07	
Pseudupeneus prayensis	0.56	28	0.07	
Fistularia petimba	0.56	56	0.07	
Saurida brasiliensis	0.28	28	0.03	
Monolene mertensi	0.28	28	0.03	
Decapterus punctatus	0.28	28	0.03	
Total	833.82		99.76	

PROJECT STATION: 453

DATE:23/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 500
start stop duration Long W 324
TIME :16:31:51 17:01:24 30 (min) Purpose code: 3
LOG :5717.37 5718.95 1.57 Area code : 1
FDEPTH: 71 71 GearCond.code:
BDEPTH: 71 71 Validity code:
Towing dir: 280ø Wire out: 240 m Speed: 32 kn*10

Sorted: 90 Kg Total catch: 89.79 CATCH/HOUR: 179.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	88.70	976	49.39	2197
Pagellus bellottii	20.50	270	11.42	2198
Sardinella aurita	18.00	292	10.02	2200
Lepidotrigla cadmani	6.86	98	3.82	
Pseudupeneus prayensis	4.68	46	2.61	2199
Sphyraena sphyraena	4.42	14	2.46	
Brotula barbata	3.40	8	1.89	
Zeus faber	3.28	8	1.83	
Scomber japonicus	3.24	38	1.80	2201
Grammoplites gruveli	3.12	90	1.74	
Umbrina canariensis	3.08	28	1.72	
Lepidotrigla carolae	2.92	120	1.63	
Fistularia petimba	2.64	36	1.47	
Uranoscopus albesca	2.24	16	1.25	
Priacanthus arenatus	1.96	26	1.09	
Citharus linguatula	1.82	90	1.01	
Branchiostegus semifasciatus	1.60	4	0.89	
Sepia officinalis hierredda	1.30	2	0.72	
Octopus vulgaris	1.26	4	0.70	
Pentheroscion mbizi	0.94	6	0.52	
Raja miraletus	0.90	2	0.50	
Dentex gibbosus	0.86	4	0.48	
Selene dorsalis	0.44	2	0.25	
Microchirus frechkopi	0.38	8	0.21	
Chaetodon hoefleri	0.38	4	0.21	
Dactylopterus volitans	0.32	2	0.18	
Scorpaena scrofa	0.20	2	0.11	
Syacium micrurum	0.14	6	0.08	
Total	179.58		100.00	

PROJECT STATION: 454

DATE:23/ 5/04 GEAR TYPE: PT No: 1 POSITION:Lat N 458
start stop duration Long W 330
TIME :19:50:27 20:20:11 30 (min) Purpose code: 1
LOG :5737.43 5739.20 1.77 Area code : 1
FDEPTH: 20 30 GearCond.code:
BDEPTH: 88 100 Validity code:
Towing dir: 140ø Wire out: 150 m Speed: 35 kn*10

Sorted: 11 Kg Total catch: 11.26 CATCH/HOUR: 22.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomber japonicus	17.72	222	78.69	2203
Sardinella aurita	4.06	72	18.03	2202
Priacanthus arenatus	0.64	42	2.84	
Ariomma bondi	0.10	2	0.44	
Total	22.52		100.00	

PROJECT STATION: 455

DATE:24/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 456
start stop duration Long W 309
TIME :07:20:00 07:51:01 31 (min) Purpose code: 3
LOG :5819.73 5821.29 1.55 Area code : 2
FDEPTH: 70 70 GearCond.code:
BDEPTH: 70 70 Validity code:
Towing dir: 85ø Wire out: 240 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 83.63 CATCH/HOUR: 161.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	53.23	766	32.89	2207
Pseudupeneus prayensis	26.17	329	16.17	2208
Dentex angolensis	12.10	265	7.48	2206
Fistularia petimba	12.00	52	7.41	
Dentex congoensis	9.48	252	5.86	2205
Cynoglossus canariensis	7.78	39	4.81	
Octopus vulgaris	5.23	8	3.23	
Sepia officinalis hierredda	4.49	15	2.77	
Lepidotrigla cadmani	4.35	87	2.69	
Brotula barbata	4.10	14	2.53	
Trachurus trecae	3.87	81	2.39	2209
Lepidotrigla carolae	2.65	149	1.64	
Grammoplites gruveli	2.46	97	1.52	2204
Stromateus fiatola	1.97	10	1.22	
Sphyraena sphyraena	1.97	10	1.22	
Citharus linguatula	1.97	87	1.22	
Microchirus frechkopi	1.26	33	0.78	
Dentex canariensis	1.20	4	0.74	
Pegusa lascaris	1.16	10	0.72	
Syacium micrurum	0.87	139	0.54	
Zeus faber	0.81	4	0.50	
Branchiostegus semifasciatus	0.81	4	0.50	
Uranoscopus polli	0.62	4	0.38	
Priacanthus arenatus	0.48	10	0.30	
Dentex gibbosus	0.48	4	0.30	
Microchirus ocellatus	0.29	4	0.18	
Blennius normani	0.04	4	0.02	
Total	161.84		100.01	

PROJECT STATION: 456

DATE:24/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 501
start stop duration Long W 305
TIME :09:04:17 09:34:06 30 (min) Purpose code: 3
LOG :5830.00 5831.52 1.51 Area code : 2
FDEPTH: 42 43 GearCond.code:
BDEPTH: 42 43 Validity code:
Towing dir: 280ø Wire out: 160 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 134.81 CATCH/HOUR: 269.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	107.00	660	39.69	2215
Pagellus bellottii	52.70	1060	19.55	2211
Chloroscombrus chrysurus	32.20	340	11.94	2210
Pseudupeneus prayensis	21.80	330	8.09	2212
Trachurus trecae	9.70	110	3.60	2214
Pagrus caeruleostictus	9.50	30	3.52	
Sphyraena sphyraena	6.30	30	2.34	
Dentex canariensis	5.70	40	2.11	
Decapterus rhonchus	4.40	40	1.63	
Selene dorsalis	3.30	30	1.22	
Sardinella aurita	3.20	120	1.19	2213
Lagocephalus laevigatus	2.40	10	0.89	
Fistularia petimba	1.90	30	0.70	
Sphyraena guachancho	1.70	10	0.63	
Decapterus punctatus	1.70	30	0.63	
Octopus vulgaris	1.62	2	0.60	
Sardinella maderensis	1.30	40	0.48	
Stephanolepis hispidus	1.20	10	0.45	
Citharus linguatula	1.10	70	0.41	
Grammoplites gruveli	0.70	40	0.26	
Hippocampus sp.	0.10	10	0.04	
Serranus accraensis	0.10	10	0.04	
Total	269.62		100.01	

PROJECT STATION: 457

DATE:24/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 503
start stop duration Long W 305
TIME :10:47:42 11:17:19 30 (min) Purpose code: 3
LOG :5840.32 5841.88 1.55 Area code : 2
FDEPTH: 25 25 GearCond.code:
BDEPTH: 25 25 Validity code:
Towing dir: 100ø Wire out: 130 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 310.95 CATCH/HOUR: 621.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus Juv.	257.40	89192	41.39	2220
Sardinella maderensis	80.64	14784	12.97	2222
Galeoides decadactylus	79.02	1746	12.71	2219
Engraulis encrasicolus	69.48	20686	11.17	2223
Drepane africana	47.16	188	7.58	2216
Selene dorsalis	31.60	172	5.08	2217
Brachydeuterus auritus	23.04	936	3.70	2221
Sardinella aurita	7.56	2826	1.22	2218
Pomadasys jubelini	6.92	10	1.11	
Alectis alexandrinus	5.26	16	0.85	
Pagrus caeruleostictus	4.36	10	0.70	
Sphyraena guachancho	4.14	198	0.67	
Dentex canariensis	1.96	6	0.32	
Chloroscombrus chrysurus	1.60	16	0.26	
Scomberomorus tritor	0.92	4	0.15	
Pomadasys peroteti	0.90	2	0.14	
Total	621.96		100.02	

PROJECT STATION: 458

DATE:24/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 459
start stop duration Long W 247
TIME :13:12:53 13:31:54 19 (min) Purpose code: 3
LOG :5859.51 5860.55 1.04 Area code : 2
FDEPTH: 26 25 GearCond.code:
BDEPTH: 26 25 Validity code:
Towing dir: 100ø Wire out: 140 m Speed: 31 kn*10

Sorted: 29 Kg Total catch: 28.81 CATCH/HOUR: 90.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pseudupeneus prayensis	17.27	117	18.98	2226
Dentex canariensis	15.32	129	16.84	2224
Lethrinus atlanticus	12.51	41	13.75	
Pagrus caeruleostictus	8.75	28	9.62	
Chaetodipterus lippei	6.85	19	7.53	
Chloroscombrus chrysurus	5.94	51	6.53	
Decapterus punctatus	5.08	95	5.58	2225
Lagocephalus laevigatus	4.42	13	4.86	
Lutjanus fulgens	4.33	95	4.76	2227
Acanthurus monroviae	2.43	6	2.67	
Aluterus monoceros	2.21	3	2.43	
Sardinella maderensis	1.48	32	1.63	
Pomadasys jubelini	1.01	3	1.11	
OSTRACIIDAE	0.88	3	0.97	
Pomadasys peroteti	0.79	3	0.87	
Alectis alexandrinus	0.76	3	0.84	
Chaetodipterus goreensis	0.60	3	0.66	
Chaetodon robustus	0.19	3	0.21	
Bothus podas africanus	0.16	3	0.18	
Total	90.98		100.02	

PROJECT STATION: 459

DATE:24/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 456
start stop duration Long W 245
TIME :14:16:39 14:46:34 30 (min) Purpose code: 3
LOG :5864.80 5866.37 1.57 Area code : 2
FDEPTH: 40 40 GearCond.code:
BDEPTH: 40 40 Validity code:
Towing dir: 280ø Wire out: 170 m Speed: 31 kn*10

Sorted: 25 Kg Total catch: 162.51 CATCH/HOUR: 325.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	214.80	4296	66.09	2228
Pagellus bellottii	60.72	1174	18.68	2229
Alectis alexandrinus	9.02	4	2.78	
Pseudupeneus prayensis	6.30	84	1.94	
Galeoides decadactylus	5.16	60	1.59	
Stromateus fiatola	4.38	6	1.35	
Sphyraena guachancho	4.20	10	1.29	
Pagrus caeruleostictus	4.08	36	1.26	
Dentex canariensis	2.76	36	0.85	
Balistes capriscus	2.53	13	0.78	
Chloroscombrus chrysurus	2.52	36	0.78	
Fistularia petimba	1.94	10	0.60	
Torpedo torpedo	1.38	2	0.42	
Octopus vulgaris	1.20	2	0.37	
Dactylopterus volitans	0.98	4	0.30	
Grammoplites gruveli	0.84	36	0.26	
Trachinocephalus myops	0.64	4	0.20	
Citharus linguatula	0.56	24	0.17	
Epinephelus aeneus	0.42	2	0.13	
Syacium micrurum	0.36	36	0.11	
Cynoglossus canariensis	0.24	2	0.07	
Total	325.03		100.02	

PROJECT STATION: 460

DATE:24/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 451
start stop duration Long W 246
TIME :15:48:06 16:18:08 30 (min) Purpose code: 3
LOG :5873.60 5875.16 1.55 Area code : 2
FDEPTH: 60 61 GearCond.code:
BDEPTH: 60 61 Validity code:
Towing dir: 280ø Wire out: 240 m Speed: 31 kn*10

Sorted: 25 Kg Total catch: 131.06 CATCH/HOUR: 262.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	181.50	3816	69.24	2231
Pseudupeneus prayensis	13.30	190	5.07	2232
Brachydeuterus auritus	13.00	250	4.96	2230
Dentex canariensis	12.10	190	4.62	
Lepidotrigla carolae	7.60	380	2.90	
Fistularia petimba	5.60	32	2.14	
Loligo vulgaris	5.00	10	1.91	
Pagrus caeruleostictus	4.10	20	1.56	
Lepidotrigla cadmani	4.00	90	1.53	
Trachinocephalus myops	2.20	10	0.84	
Priacanthus arenatus	2.20	30	0.84	
Grammoplites gruveli	2.10	130	0.80	
Raja miraletus	1.30	4	0.50	
Sepia officinalis hierredda	1.24	4	0.47	
Torpedo torpedo	1.16	2	0.44	
Spondyliosoma cantharus	1.16	4	0.44	
Dentex gibbosus	1.10	10	0.42	
Octopus vulgaris	1.00	2	0.38	
Microchirus frechkopi	0.60	20	0.23	
Dactylopterus volitans	0.60	20	0.23	
Epinephelus aeneus	0.56	2	0.21	
Scorpaena scrofa	0.40	20	0.15	
Citharus linguatula	0.20	30	0.08	
Syacium micrurum	0.10	20	0.04	
Total	262.12		100.00	

PROJECT STATION: 461

DATE:24/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 444

	start	stop	duration			Long W 247
TIME	:17:28:00	17:57:29	29	(min)	Purpose code:	3
LOG	:5883.76	5885.32	1.55		Area code :	2
FDEPTH:	77	77			GearCond.code:	
BDEPTH:	77	77			Validity code:	

Towing dir: 100ø Wire out: 260 m Speed: 31 kn*10

Sorted: 27 Kg Total catch: 129.19 CATCH/HOUR: 267.29

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	85.90	1994	32.14	2233
Pagellus bellottii	43.37	722	16.23	2237
Dentex congoensis	31.53	596	11.80	2234
Scomber japonicus	26.32	414	9.85	2235
Dentex canariensis	22.82	52	8.54	2236
Sphoeroides pachgaster	10.18	74	3.81	
Pseudupeneus prayensis	5.46	66	2.04	
Priacanthus arenatus	5.13	83	1.92	
Umbrina canariensis	4.47	17	1.67	
Dentex gibbosus	4.16	17	1.56	
Decapterus punctatus	3.81	74	1.43	
Umbrina canariensis	3.19	12	1.19	
Sepia officinalis hierredda	2.63	4	0.98	
Raja miraletus	2.42	6	0.91	
Fistularia petimba	2.23	10	0.83	
Zeus faber	2.07	8	0.77	
Dactylopterus volitans	1.49	8	0.56	
Lepidotrigla carolae	1.41	66	0.53	
Sphoeroides pachgaster	1.34	2	0.50	
Zeus faber	1.01	4	0.38	
Scorpaena scrofa	0.99	2	0.37	
Dentex angolensis	0.95	4	0.36	
Pagrus caeruleostictus	0.79	2	0.30	
Echeneis naucrates	0.74	8	0.28	
Priacanthus arenatus	0.64	2	0.24	
Dentex angolensis	0.58	8	0.22	
Syacium micrurum	0.58	74	0.22	
Grammoplites gruveli	0.50	17	0.19	
Citharus linguatula	0.50	58	0.19	
Boops boops	0.08	2	0.03	
Total	267.29		100.04	

PROJECT STATION: 462

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 435

	start	stop	duration			Long W 230
TIME	:04:05:12	04:35:09	30	(min)	Purpose code:	3
LOG	:5964.30	5965.83	1.52		Area code :	2
FDEPTH:	256	263			GearCond.code:	
BDEPTH:	256	263			Validity code:	

Towing dir: 105ø Wire out: 670 m Speed: 31 kn*10

Sorted: 18 Kg Total catch: 173.71 CATCH/HOUR: 347.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenion longipinnis	156.80	37856	45.13	
Merluccius polli	38.10	278	10.97	
Parasudis fraser-bruenneri	28.70	1190	8.26	
Lophiodes kempi	21.80	4	6.27	
Sphoeroides pachgaster	20.16	210	5.80	
Squatina oculata	17.64	24	5.08	
Chascanopsetta lugubris	16.52	196	4.76	
Peristedion cataphractum	8.26	140	2.38	
Centrophorus squamosus	7.40	4	2.13	
Oxynotus centrina	4.42	2	1.27	
Coelorinchus coelorhincus	4.34	126	1.25	
Raja miraletus	4.34	14	1.25	
Priacanthus arenatus	3.64	98	1.05	
Lepidotrigla sp.	3.14	10	0.90	
Squalus blainvillei	3.10	2	0.89	
Dentex angolensis	2.00	4	0.58	
GEMPYLIDAE	1.82	42	0.52	
Raja sp.	1.80	2	0.52	
Brotula barbata	1.70	2	0.49	
Raja straeleni	1.38	2	0.40	
MYCTOPHIDAE	0.28	28	0.08	
Penaeus notialis	0.14	28	0.04	
Total	347.48		100.02	

PROJECT STATION: 463

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 446

	start	stop	duration			Long W 226
TIME	:06:37:11	07:07:16	30	(min)	Purpose code:	3
LOG	:5980.21	5981.77	1.54		Area code :	2
FDEPTH:	60	58			GearCond.code:	
BDEPTH:	60	58			Validity code:	

Towing dir: 290ø Wire out: 200 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 557.62 CATCH/HOUR: 1115.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	593.10	18854	53.18	2238
Trachurus trecae	241.92	6966	21.69	2241
Pagellus bellottii	176.94	3406	15.87	2240
Pseudupeneus prayensis	27.36	432	2.45	2239
Dentex gibbosus	16.38	108	1.47	
Sphyraena guachancho	9.84	26	0.88	
Dentex angolensis	8.28	36	0.74	
Diodon sp.	3.96	18	0.36	
Trigla lyra	3.24	180	0.29	
Sardinella aurita	3.06	126	0.27	
Boops boops	3.06	126	0.27	
Brotula barbata	2.90	6	0.26	
Cynoglossus monodi	2.70	18	0.24	
Torpedo torpedo	2.60	4	0.23	
Pagrus caeruleostictus	2.54	32	0.23	
Scomber japonicus	2.52	18	0.23	
Chloroscombrus chrysurus	2.52	36	0.23	
Selene dorsalis	2.16	18	0.19	
Microchirus frechkopi	1.80	36	0.16	
Chaetodon hoefleri	1.44	18	0.13	
Grammoplites gruveli	1.26	36	0.11	
Dentex canariensis	1.20	4	0.11	
Fistularia petimba	1.10	4	0.10	
Sepia officinalis hierredda	1.00	4	0.09	
Dactylopterus volitans	0.90	18	0.08	
Lophiodes kempi	0.70	2	0.06	
Trachinocephalus myops	0.40	2	0.04	
Citharus linguatula	0.36	18	0.03	
Total	1115.24		99.99	

PROJECT STATION: 464

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 451

	start	stop	duration			Long W 224
TIME	:08:24:41	08:55:18	31	(min)	Purpose code:	3
LOG	:5990.32	5991.87	1.53		Area code :	2
FDEPTH:	39	39			GearCond.code:	
BDEPTH:	39	39			Validity code:	

Towing dir: 290ø Wire out: 160 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 94.43 CATCH/HOUR: 182.77

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus Juv.	120.23	32764	65.78	2242
Selene dorsalis	18.29	54	10.01	2243
Alectis alexandrinus	11.85	10	6.48	
Pagellus bellottii	4.88	29	2.67	
Alloteuthis africana	4.35	1645	2.38	
Octopus vulgaris	2.81	4	1.54	
Trachurus trecae	2.75	58	1.50	
Epinephelus aeneus	2.40	6	1.31	
Ephippion guttifer	2.23	2	1.22	
Fistularia petimba	2.03	10	1.11	
Decapterus punctatus	1.90	722	1.04	2244
Sepia officinalis hierredda	1.74	4	0.95	
Saurida brasiliensis	1.68	255	0.92	
Citharus linguatula	1.26	58	0.69	
Lagocephalus laevigatus	0.97	2	0.53	
Syacium micrurum	0.58	23	0.32	
Torpedo torpedo	0.58	4	0.32	
Sardinella aurita	0.48	68	0.26	
Loligo vulgaris	0.43	290	0.24	
Penaeus notialis	0.21	4	0.11	
Chloroscombrus chrysurus	0.19	2	0.10	
Grammoplites gruveli	0.14	14	0.08	
Dentex canariensis	0.14	4	0.08	
Boops boops	0.10	10	0.05	
GOBIIDAE	0.10	23	0.05	
Scyllarides herklotsii	0.04	10	0.02	
Total	182.36		99.76	

PROJECT STATION: 465

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 453

	start	stop	duration			Long W 223
TIME	:09:54:35	10:02:46	8	(min)	Purpose code:	1
LOG	:5998.83	5999.26	0.42		Area code :	2
FDEPTH:	26	28			GearCond.code:	
BDEPTH:	26	28			Validity code:	

Towing dir: 120ø Wire out: 150 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 7063.84 CATCH/HOUR: 52978.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	50244.00	18841500	94.84	2245
Sardinella aurita - Juveniles	2114.70	534240	3.99	2246
Selene dorsalis	524.70	6360	0.99	
Scomber japonicus	79.50	9540	0.15	
Brachydeuterus auritus	15.90	4770	0.03	
Total	52978.80		100.00	

PROJECT STATION: 466

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 449

	start	stop	duration			Long W 217
TIME	:11:26:03	11:56:14	30	(min)	Purpose code:	3
LOG	:6008.14	6009.71	1.57		Area code :	2
FDEPTH:	28	28			GearCond.code:	
BDEPTH:	28	28			Validity code:	

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

Sorted: 34 Kg Total catch: 115.89 CATCH/HOUR: 231.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	170.70	60768	73.65	2247
Brachydeuterus auritus Juv.	31.62	16740	13.64	2250
Selene dorsalis	16.00	46	6.90	2248
Alectis alexandrinus	8.32	16	3.59	
Alloteuthis africana	3.00	924	1.29	
Pagellus bellottii	0.86	6	0.37	
Sardinella maderensis - Juv.	0.78	156	0.34	2249
Scomber japonicus	0.36	24	0.16	
Epinephelus aeneus	0.08	2	0.03	
Sphyraena-juveniles	0.06	12	0.03	
Total	231.78		100.00	

PROJECT STATION: 467

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 446

	start	stop	duration			Long W 209
TIME	:13:12:19	13:42:46	30	(min)	Purpose code:	3
LOG	:6021.37	6022.93	1.56		Area code :	2
FDEPTH:	27	29			GearCond.code:	
BDEPTH:	27	29			Validity code:	

Towing dir: 280ø Wire out: 140 m Speed: 31 kn*10

Sorted: 20 Kg Total catch: 88.75 CATCH/HOUR: 177.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Elops lacerta	34.10	76	19.21	
Brachydeuterus auritus Juv.	33.42	12664	18.83	2252
Sphyraena guachancho	25.44	108	14.33	2256
Selene dorsalis	18.66	156	10.51	2254
Drepane africana	17.20	42	9.69	
Brachydeuterus auritus	13.62	282	7.67	2251
Ilisha africana	10.74	920	6.05	2253
Trichiurus lepturus	7.56	186	4.26	
Chloroscombrus chrysurus	2.82	36	1.59	
Selene dorsalis, juveniles	2.52	756	1.42	2255
Sphyraena-juveniles	2.34	306	1.32	
Galeoides decadactylus	1.44	12	0.81	
Dasyatis margarita	1.32	4	0.74	
Pteroscion peli	1.26	48	0.71	
Parapenaeopsis atlantica	1.14	156	0.64	
Lagocephalus lagocephalus	0.84	6	0.47	
Penaeus notialis	0.82	18	0.46	
Scomberomorus tritor	0.64	8	0.36	
Sardinella aurita - Juveniles	0.48	60	0.27	
Cynoglossus canariensis	0.42	12	0.24	
Portunus validus	0.32	4	0.18	
Pegusa lascaris	0.22	2	0.12	
Panulirus regius	0.18	2	0.10	
Total	177.50		99.98	

PROJECT STATION: 468

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 440
start stop duration Long W 207
TIME :14:56:36 15:26:36 30 (min) Purpose code: 3
LOG :6032.46 6033.99 1.53 Area code : 2
FDEPTH: 46 45 GearCond.code:
BDEPTH: 46 45 Validity code:
Towing dir: 285ø Wire out: 180 m Speed: 31 kn*10

Sorted: 28 Kg Total catch: 173.61 CATCH/HOUR: 347.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	144.00	13066	41.47	2257
Pagellus bellottii	88.00	940	25.34	2258
Selene dorsalis	29.40	160	8.47	2259
Fistularia petimba	21.10	96	6.08	
Sepia officinalis hierredda	17.60	52	5.07	
Raja miraletus	9.00	34	2.59	
Trigla lyra	7.20	350	2.07	
Alectis alexandrinus	5.30	6	1.53	
Dentex canariensis	4.80	180	1.38	
Citharus linguatula	4.20	190	1.21	
Sphyraena guachancho	3.64	4	1.05	
Grammoplites gruveli	3.30	170	0.95	
Epinephelus aeneus	2.52	2	0.73	
Alloteuthis africana	2.40	680	0.69	
Pseudupeneus prayensis	1.60	40	0.46	
Lagocephalus laevigatus	1.54	2	0.44	
Torpedo torpedo	0.62	2	0.18	
Dactylopterus volitans	0.60	2	0.17	
Saurida brasiliensis	0.40	30	0.12	
Total	347.22		100.00	

PROJECT STATION: 469

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 433
start stop duration Long W 209
TIME :17:31:22 18:00:39 29 (min) Purpose code: 3
LOG :6045.77 6047.34 1.57 Area code : 2
FDEPTH: 84 83 GearCond.code:
BDEPTH: 84 83 Validity code:
Towing dir: 285ø Wire out: 260 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 149.89 CATCH/HOUR: 310.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	123.62	4790	39.86	2260
Dentex angolensis	48.41	434	15.61	2261
Sardinella aurita	24.21	321	7.81	2264
Dentex congoensis	23.90	548	7.71	2262
Sepia officinalis hierredda	17.07	23	5.50	2265
Lepidotrigla cadmani	13.55	52	4.37	
Squatina oculata	8.79	4	2.83	
Pagellus bellottii	7.97	186	2.57	2263
Dentex gibbosus	7.76	31	2.50	
Umbrina canariensis	6.52	72	2.10	
Boops boops	5.17	114	1.67	
Brotula barbata	4.99	10	1.61	
Dentex canariensis	2.90	10	0.94	
Fistularia petimba	2.59	12	0.84	
Epinephelus aeneus	2.44	2	0.79	
Zeus faber	1.55	10	0.50	
Pseudupeneus prayensis	1.55	10	0.50	
Lepidotrigla carolae	1.45	31	0.47	
Decapterus punctatus	1.45	31	0.47	
Sphoeroides pachgaster	1.03	10	0.33	
Raja miraletus	0.89	2	0.29	
Branchiostegus semifasciatus	0.60	2	0.19	
Microchirus frechkopi	0.52	10	0.17	
Scorpaena scrofa	0.52	2	0.17	
Trachurus trecae	0.37	21	0.12	
Syacium micrurum	0.31	31	0.10	
Total	310.13		100.02	

PROJECT STATION: 470

DATE:25/ 5/04 GEAR TYPE: PT No: 1 POSITION:Lat N 430
start stop duration Long W 210
TIME :19:11:10 19:38:44 28 (min) Purpose code: 1
LOG :6054.08 6055.77 1.11 Area code : 2
FDEPTH: 50 29 GearCond.code:
BDEPTH: 104 90 Validity code:
Towing dir: 3ø Wire out: 230 m Speed: 36 kn*10

Sorted: 7 Kg Total catch: 7.23 CATCH/HOUR: 15.49

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomber japonicus	14.91	191	96.26	2266
Priacanthus arenatus	0.39	24	2.52	
Ariomma bondi	0.09	2	0.58	
Sardinella aurita	0.06	2	0.39	
Trachurus trecae	0.04	2	0.26	
Total	15.49		100.01	

PROJECT STATION: 471

DATE:25/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 425
start stop duration Long W 207
TIME :21:29:47 21:59:25 30 (min) Purpose code: 3
LOG :6066.88 6068.41 1.51 Area code : 2
FDEPTH: 253 259 GearCond.code:
BDEPTH: 253 259 Validity code:
Towing dir: 285ø Wire out: 720 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 365.87 CATCH/HOUR: 731.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenion longipinnis	278.40	50112	38.05	
Zenopsis conchifer	103.10	84	14.09	
Centrophorus uyato	60.20	16	8.23	
Parasudis fraser-bruenneri	32.48	1040	4.44	
Raja sp.	31.70	44	4.33	
Peristedion sp.	26.72	240	3.65	
Lophius vaillanti	26.50	6	3.62	
Merluccius polli	25.92	80	3.54	
Plesiopenaeus edwardsianus, f.	25.12	944	3.43	
Perestedion cataphractum *	15.04	368	2.06	
Aulopus cadenati	13.28	64	1.81	
Squalus megalops	12.94	10	1.77	
Chascanopsetta lugubris	12.48	96	1.71	
Lepidotrigla cadmani	11.20	112	1.53	
Trigla lyra	11.20	112	1.53	
Zenopsis conchifer	7.84	48	1.07	
Gadella imberbis	7.20	64	0.98	
Malacocephalus occidentalis	5.60	80	0.77	
MACROURIDAE	3.52	16	0.48	
Todarodes sagittatus	2.56	64	0.35	
Lophiodes kempi	2.56	4	0.35	
Epigonus sp.	2.08	32	0.28	
Uranoscopus polli	2.08	16	0.28	
Sphoeroides pachgaster	1.92	32	0.26	
Bembrops greyi	1.76	16	0.24	
Chlorophthalmus atlanticus	1.44	32	0.20	
Ijimaia loppei	1.24	2	0.17	
Promethichthys prometheus	1.12	16	0.15	
Coelorinchus coelorhincus	0.96	32	0.13	
Bassanago albescens	0.80	80	0.11	
Squatina oculata	0.74	2	0.10	
Nezumia sp.	0.64	16	0.09	
Pontinus accraensis	0.54	2	0.07	
Torpedo marmorata	0.48	2	0.07	
Photichthys argenteus	0.22	10	0.03	
NETTASTOMATIDAE	0.16	16	0.02	
Total	731.74		99.99	

PROJECT STATION: 472

DATE:26/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 423
start stop duration Long W 144
TIME :07:38:04 08:08:16 30 (min) Purpose code: 3
LOG :6151.84 6153.43 1.59 Area code : 2
FDEPTH: 80 81 GearCond.code:
BDEPTH: 80 81 Validity code:
Towing dir: 280ø Wire out: 250 m Speed: 30 kn*10

Sorted: 68 Kg Total catch: 68.66 CATCH/HOUR: 137.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Squatina oculata	46.00	2	33.50	
Fistularia petimba	25.08	148	18.26	
Dentex gibbosus	15.32	46	11.16	2268
Dentex canariensis	14.48	34	10.54	2267
Sepia officinalis hierredda	11.20	16	8.16	2271
Pseudupeneus prayensis	6.96	66	5.07	2272
Ephippion guttifer	4.40	2	3.20	
Pagrus caeruleostictus	4.26	20	3.10	2270
Dactylopterus volitans	3.36	14	2.45	
Zeus faber	2.58	4	1.88	
Pagellus bellottii	1.42	24	1.03	2269
Trigla lyra	0.94	10	0.68	
Anthias anthias	0.68	26	0.50	
Chaetodon hoefleri	0.38	2	0.28	
Sargocentron hastatus	0.26	2	0.19	
Total	137.32		100.00	

PROJECT STATION: 473

DATE:26/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 433
start stop duration Long W 147
TIME :09:50:50 10:20:47 30 (min) Purpose code: 3
LOG :6165.59 6167.15 1.55 Area code : 2
FDEPTH: 61 60 GearCond.code:
BDEPTH: 61 60 Validity code:
Towing dir: 100ø Wire out: 200 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 66.88 CATCH/HOUR: 133.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	39.80	548	29.75	2277
Pseudupeneus prayensis	21.80	190	16.30	2279
Priacanthus arenatus	11.14	162	8.33	2280
Sepia officinalis hierredda	9.40	12	7.03	
Fistularia petimba	9.20	50	6.88	
Octopus vulgaris	8.90	20	6.65	
Dentex gibbosus	6.62	50	4.95	2275
Pagrus caeruleostictus	4.20	40	3.14	2278
Dentex canariensis	4.16	24	3.11	2274
Dactylopterus volitans	3.36	14	2.51	
Sarda sarda	2.78	4	2.08	
Boops boops	2.76	94	2.06	2273
Decapterus punctatus	2.58	78	1.93	2276
Zeus faber	2.38	8	1.78	
Sardinella aurita	1.86	96	1.39	2281
Raja miraletus	0.76	2	0.57	
Trigla lyra	0.72	38	0.54	
Lagocephalus laevigatus	0.34	2	0.25	
Grammoplites gruveli	0.24	8	0.18	
Lepidotrigla cadmani	0.22	2	0.16	
Syacium micrurum	0.16	18	0.12	
Scomber japonicus	0.10	4	0.07	
Anthias anthias	0.10	4	0.07	
Citharus linguatula	0.08	2	0.06	
Chaetodon marcellae	0.06	2	0.04	
Chromis lineatus	0.04	2	0.03	
Total	133.76		99.98	

PROJECT STATION: 474

DATE:26/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 442
start stop duration Long W 150
TIME :12:05:33 12:35:17 30 (min) Purpose code: 3
LOG :6181.09 6182.59 1.49 Area code : 2
FDEPTH: 47 47 GearCond.code:
BDEPTH: 47 47 Validity code:
Towing dir: 80ø Wire out: 180 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 575.07 CATCH/HOUR: 1150.14

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	631.80	86760	54.93	2285
Brachydeuterus auritus	125.40	16122	10.90	2287
Sardinella aurita	124.50	18270	10.82	2286
Elops lacerta	59.70	130	5.19	
Pomadasys incisus	40.80	630	3.55	
Selene dorsalis	31.30	90	2.72	2283
Pagrus caeruleostictus	14.10	58	1.23	2282
Drepane africana	13.20	32	1.15	
Sphyraena guachancho	13.00	58	1.13	2284
Chloroscombrus chrysurus	12.60	60	1.10	
Priacanthus arenatus	12.00	30	1.04	
Galeoides decadactylus	11.40	46	0.99	
Pomadasys jubelini	8.74	16	0.76	
Sphyraena-juveniles	7.80	900	0.68	
Pagellus bellottii	5.40	30	0.47	
Pseudotolithus senegalensis	5.10	10	0.44	
Octopus vulgaris	4.70	8	0.41	
Stromateus fiatola	4.64	6	0.40	
Eucinostomus melanopterus	4.20	30	0.37	
Cymbium sp.	3.40	4	0.30	
Raja miraletus	3.06	14	0.27	
Scomberomorus tritor	2.78	2	0.24	
Grammoplites gruveli	2.40	60	0.21	
Epinephelus aeneus	1.98	4	0.17	
Saurida brasiliensis	1.80	150	0.16	
Umbrina canariensis	1.46	2	0.13	
Dentex canariensis	1.12	6	0.10	
Alectis alexandrinus	0.68	2	0.06	
Cynoglossus senegalensis	0.58	6	0.05	
Pegusa lascaris	0.50	2	0.04	
Total	1150.14		100.01	

PROJECT STATION: 475

DATE:26/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 449
start stop duration Long W 147
TIME :14:00:31 14:30:32 30 (min) Purpose code: 3
LOG :6193.24 6194.87 1.63 Area code : 2
FDEPTH: 27 28 GearCond.code:
BDEPTH: 27 28 Validity code:
Towing dir: 244ø Wire out: 140 m Speed: 32 kn*10

Sorted: 17 Kg Total catch: 62.14 CATCH/HOUR: 124.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pseudotolithus senegalensis	30.54	62	24.57	2289
Brachydeuterus auritus Juv.	27.00	4258	21.73	2291
Ilisha africana	12.86	1928	10.35	2293
Pomadasys peroteti	12.00	66	9.66	2288
Trichiurus lepturus	9.64	68	7.76	2294
Galeoides decadactylus	8.64	20	6.95	
Brachydeuterus auritus	4.62	86	3.72	2290
Selene dorsalis	2.52	68	2.03	2292
Penaeus notialis	2.32	72	1.87	
Stromateus fiatola	2.00	2	1.61	
Ephippion guttifer	1.80	2	1.45	
Parapenaeopsis atlantica	1.72	204	1.38	
Pteroscion peli	1.62	60	1.30	
Sphyraena-juveniles	0.90	30	0.72	
Cynoponticus ferox	0.88	6	0.71	
Scomberomorus tritor	0.62	4	0.50	
Squilla mantis	0.60	30	0.48	
Sepia officinalis hierredda	0.60	4	0.48	
Elops lacerta	0.60	4	0.48	
Cynoglossus canariensis	0.60	6	0.48	
Chloroscombrus chrysurus	0.48	30	0.39	
Sphyraena guachancho	0.42	2	0.34	
Caranx crysos	0.32	4	0.26	
Ethmalosa fimbriata	0.32	2	0.26	
Calappa rubroguttata	0.30	2	0.24	
Sardinella maderensis	0.20	8	0.16	
Lagocephalus laevigatus	0.10	6	0.08	
Perulibatrachus elminensis	0.06	2	0.05	
Total	124.28		100.01	

PROJECT STATION: 476

DATE:26/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 455
start stop duration Long W 130
TIME :17:58:27 18:28:08 30 (min) Purpose code: 3
LOG :6221.18 6222.78 1.60 Area code : 2
FDEPTH: 30 28 GearCond.code:
BDEPTH: 30 28 Validity code:
Towing dir: 15ø Wire out: 140 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 286.36 CATCH/HOUR: 572.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	202.40	13728	35.34	2295
Ilisha africana	190.72	13472	33.30	2296
Sphyraena-juveniles	72.48	1264	12.66	2298
Chlamys purpuratus	50.40	4528	8.80	
Chloroscombrus chrysurus	9.12	224	1.59	
Scomberomorus tritor	7.68	96	1.34	
Pseudotolithus brachygnathus	6.36	2	1.11	
Sardinella maderensis	5.28	128	0.92	
Engraulis encrasicolus	4.80	1152	0.84	2297
Sphyraena guachancho	4.14	12	0.72	
Selene dorsalis	3.68	64	0.64	
Galeoides decadactylus	3.52	32	0.61	
Octopus vulgaris	3.50	2	0.61	
Caranx crysos	3.20	32	0.56	
Decapterus punctatus	1.92	48	0.34	
Pagellus bellottii	1.44	80	0.25	
Pomadasys incisus	1.28	16	0.22	
Synodus saurus	0.48	16	0.08	
Pagrus caeruleostictus	0.32	48	0.06	
Total	572.72		99.99	

PROJECT STATION: 477

DATE:26/ 5/04 GEAR TYPE: PT No: 4 POSITION:Lat N 444
start stop duration Long W 112
TIME :21:35:43 22:05:16 30 (min) Purpose code: 1
LOG :6247.47 6249.02 1.54 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 45 46 Validity code:
Towing dir: 120ø Wire out: 130 m Speed: 32 kn*10

Sorted: 17 Kg Total catch: 16.99 CATCH/HOUR: 33.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selar crumenophthalmus	18.60	116	54.74	2301
Sardinella aurita	7.86	150	23.13	2299
Decapterus punctatus	2.24	60	6.59	2300
Euthynnus alletteratus	1.96	4	5.77	
Caranx crysos	1.34	2	3.94	
Lagocephalus laevigatus	0.80	2	2.35	
Trachinotus ovatus	0.58	2	1.71	
Chloroscombrus chrysurus	0.28	2	0.82	
Sardinella maderensis	0.26	2	0.77	
Parexocoetus brachypterus	0.06	4	0.18	
Total	33.98		100.00	

PROJECT STATION: 478

DATE:27/ 5/04 GEAR TYPE: PT No: 2 POSITION:Lat N 418
start stop duration Long W 125
TIME :04:33:10 04:46:55 14 (min) Purpose code: 1
LOG :6314.69 6315.63 0.94 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 104 89 Validity code:
Towing dir: 330ø Wire out: 140 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 421.16 CATCH/HOUR: 1804.97

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	790.29	56447	43.78	
Scomber japonicus	603.43	10851	33.43	2302
Sardinella aurita	413.14	7389	22.89	2303
Total	1806.86		100.10	

PROJECT STATION: 479

DATE:27/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 421
start stop duration Long W 124
TIME :06:34:36 07:04:08 30 (min) Purpose code: 3
LOG :6329.78 6331.35 1.56 Area code : 2
FDEPTH: 85 85 GearCond.code:
BDEPTH: 85 85 Validity code:
Towing dir: 245ø Wire out: 260 m Speed: 30 kn*10

Sorted: 42 Kg Total catch: 41.78 CATCH/HOUR: 83.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Fistularia petimba	20.50	68	24.53	
Sphoeroides pachgaster	18.10	122	21.66	
Sepia officinalis hierredda	12.34	26	14.77	2305
Lepidotrigla carolae	6.94	356	8.31	
Dentex congoensis	6.66	122	7.97	2304
Lepidotrigla cadmani	4.52	106	5.41	
Mustelus mustelus	2.96	2	3.54	
Alloteuthis africana	2.58	1224	3.09	
Priacanthus arenatus	2.28	38	2.73	
Zeus faber	2.24	8	2.68	
Dentex gibbosus	1.14	12	1.36	
Pagellus bellottii	0.98	32	1.17	
Chelidonichthys gabonensis	0.66	6	0.79	
Dentex canariensis	0.58	2	0.69	
Trachurus trecae	0.48	6	0.57	
Dactylopterus volitans	0.32	2	0.38	
Syacium micrurum	0.24	6	0.29	
Blennius normani	0.04	2	0.05	
Total	83.56		99.99	

PROJECT STATION: 480

DATE:27/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 442
start stop duration Long W 129
TIME :09:38:36 10:08:31 30 (min) Purpose code: 3
LOG :6354.93 6356.46 1.53 Area code : 2
FDEPTH: 47 47 GearCond.code:
BDEPTH: 47 47 Validity code:
Towing dir: 250ø Wire out: 180 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 402.64 CATCH/HOUR: 805.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	557.20	13502	69.19	2306
Pagellus bellottii	161.14	1728	20.01	2308
Chloroscombrus chrysurus	30.94	378	3.84	2307
Caranx crysos	23.80	56	2.96	
Selar crumenophthalmus	14.70	126	1.83	
Fistularia petimba	5.50	14	0.68	
Priacanthus arenatus	3.50	28	0.43	
Octopus vulgaris	3.30	4	0.41	
Sepia officinalis hierredda	2.50	2	0.31	
Pagrus caeruleostictus	1.50	4	0.19	
Mustelus mustelus	1.20	2	0.15	
Total	805.28		100.00	

PROJECT STATION: 481

DATE:27/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 452
start stop duration Long W 127
TIME :11:39:23 11:53:44 14 (min) Purpose code: 1
LOG :6369.36 6370.18 0.81 Area code : 2
FDEPTH: 35 36 GearCond.code:
BDEPTH: 35 36 Validity code:
Towing dir: 229ø Wire out: 130 m Speed: 34 kn*10

Sorted: 30 Kg Total catch: 660.02 CATCH/HOUR: 2828.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus Juv.	1461.43	159060	51.67	2309
Chlamys purpuratus	459.17	81339	16.23	
Sardinella aurita	321.51	23100	11.37	2313
Brachydeuterus auritus	170.66	3960	6.03	2310
Decapterus punctatus	106.54	12729	3.77	2311
Chloroscombrus chrysurus	80.14	1414	2.83	
Engraulis encrasicolus	73.54	11259	2.60	2312
Scomberomorus tritor	56.57	1414	2.00	
Sphyraena-juveniles	38.66	1226	1.37	
Selene dorsalis	28.29	283	1.00	
Sphyraena afra	9.21	4	0.33	
Caranx crysos	6.00	9	0.21	
Sphyraena guachancho	4.41	13	0.16	
Lagocephalus laevigatus	4.37	13	0.15	
Scomber japonicus	2.83	283	0.10	
Ilisha africana	2.83	94	0.10	
Stromateus fiatola	2.49	4	0.09	
Total	2828.65		100.01	

PROJECT STATION: 482

DATE:27/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 501
start stop duration Long W 115
TIME :13:48:19 14:18:18 30 (min) Purpose code: 3
LOG :6386.76 6388.28 1.51 Area code : 2
FDEPTH: 25 25 GearCond.code:
BDEPTH: 25 25 Validity code:
Towing dir: 75ø Wire out: 135 m Speed: 30 kn*10

Sorted: 24 Kg Total catch: 23.97 CATCH/HOUR: 47.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlamys purpuratus	36.90	8856	76.97	
Alectis alexandrinus	4.26	6	8.89	
Sepia officinalis hierredda	3.74	4	7.80	
Pagrus caeruleostictus	1.18	18	2.46	
Sepia off. h. eggs	1.06	2	2.21	
Brachydeuterus auritus	0.32	20	0.67	
Trachinocephalus myops	0.20	6	0.42	
Chloroscombrus chrysurus	0.16	2	0.33	
Selene dorsalis	0.10	2	0.21	
Decapterus punctatus	0.02	4	0.04	
Total	47.94		100.00	

PROJECT STATION: 483

DATE:27/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 456
start stop duration Long W 112
TIME :15:18:52 15:43:09 24 (min) Purpose code: 3
LOG :6394.99 6396.21 1.23 Area code : 2
FDEPTH: 34 35 GearCond.code:
BDEPTH: 34 35 Validity code:
Towing dir: 265ø Wire out: 170 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 74.05 CATCH/HOUR: 185.13

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus Juv.	35.50	13148	19.18	2315
Decapterus punctatus	32.50	7905	17.56	2321
Brachydeuterus auritus	29.00	783	15.66	2314
Sphyraena-juveniles	19.35	1233	10.45	2319
Chloroscombrus chrysurus	18.30	253	9.88	2317
Pagrus caeruleostictus	12.00	28	6.48	
Selene dorsalis	9.90	95	5.35	2316
Sphyraena guachancho	6.13	13	3.31	
Octopus vulgaris	4.38	5	2.37	
Selar crumenophthalmus	3.00	20	1.62	
Scomberomorus tritor	2.55	23	1.38	
Sepia officinalis hierredda	2.00	3	1.08	
Boops boops	1.75	280	0.95	2318
Dentex canariensis	1.68	3	0.91	
Pagellus bellottii	1.55	25	0.84	
Trachinocephalus myops	1.35	40	0.73	
Engraulis encrasicolus	1.30	340	0.70	2320
Sardinella aurita - Juveniles	1.05	120	0.57	
Caranx crysos	0.60	5	0.32	
Lutjanus fulgens	0.40	3	0.22	
Paronchelius stauchi	0.25	5	0.14	
Syacium micrurum	0.25	5	0.14	
Galeoides decadactylus	0.20	5	0.11	
Pomadasys incisus	0.15	5	0.08	
Total	185.14		100.03	

PROJECT STATION: 484

DATE:27/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 436
start stop duration Long W 106
TIME :18:08:47 18:38:07 29 (min) Purpose code: 3
LOG :6418.27 6419.76 1.49 Area code : 2
FDEPTH: 52 53 GearCond.code:
BDEPTH: 52 53 Validity code:
Towing dir: 165ø Wire out: 150 m Speed: 30 kn*10

Sorted: 64 Kg Total catch: 174.70 CATCH/HOUR: 361.45

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Caranx crysos	74.48	341	20.61	2323
Pagellus bellottii	64.28	608	17.78	2322
Decapterus punctatus	43.63	592	12.07	2325
Sardinella aurita	41.52	573	11.49	2326
Chromis cadenati	34.86	755	9.64	
Pseudupeneus prayensis	28.16	186	7.79	2324
Pagrus caeruleostictus	15.06	62	4.17	
Dentex canariensis	13.66	33	3.78	
Decapterus rhonchus	13.53	46	3.74	
Priacanthus arenatus	11.15	56	3.08	
Acanthurus monroviae	5.01	4	1.39	
Fistularia petimba	3.29	23	0.91	
Apsilus fuscus	3.19	10	0.88	
Trachinus radiatus	2.38	4	0.66	
Lutjanus fulgens	1.92	4	0.53	
Trigla lyra	1.08	10	0.30	
Syacium micrurum	1.08	23	0.30	
Selar crumenophthalmus	1.01	4	0.28	
Boops boops	0.79	124	0.22	2327
Sphyraena sphyraena	0.50	4	0.14	
Dicologoglossa hexophthalma	0.39	4	0.11	
Synodus saurus	0.23	4	0.06	
Paronchelius stauchi	0.10	4	0.03	
Total	361.30		99.96	

PROJECT STATION: 485

DATE:28/ 5/04 GEAR TYPE: PT No: 7 POSITION:Lat N 458
start stop duration Long W 51
TIME :01:08:43 01:38:39 30 (min) Purpose code: 1
LOG :6483.38 6485.14 1.74 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 33 37 Validity code:
Towing dir: 113ø Wire out: 150 m Speed: 35 kn*10

Sorted: 1 Kg Total catch: 1.64 CATCH/HOUR: 3.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus rhonchus	2.44	14	74.39	
Sargocentron hastatus	0.54	2	16.46	
Decapterus punctatus	0.30	2	9.15	
Total	3.28		100.00	

PROJECT STATION: 486

DATE:28/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 442
start stop duration Long W 46
TIME :06:18:16 06:48:13 30 (min) Purpose code: 3
LOG :6523.48 6525.02 1.51 Area code : 2
FDEPTH: 98 99 GearCond.code:
BDEPTH: 98 99 Validity code:
Towing dir: 230ø Wire out: 300 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 342.24 CATCH/HOUR: 684.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	304.80	5940	44.53	2328
Boops boops	181.80	5136	26.56	2329
Dentex angolensis	84.60	816	12.36	2330
Lepidotrigla cadmani	48.60	804	7.10	
Fistularia petimba	19.20	82	2.81	
Squatina oculata	11.70	6	1.71	
Sphoeroides pachgaster	6.00	24	0.88	
Scomber japonicus	4.80	108	0.70	
Lepidotrigla carolae	4.20	120	0.61	
Zeus faber	4.00	8	0.58	
Trachurus trecae	2.40	84	0.35	
Raja miraletus	2.30	6	0.34	
Torpedo marmorata	2.30	2	0.34	
Sepia officinalis hierredda	2.12	6	0.31	
Branchiostegus semifasciatus	1.50	2	0.22	
Pseudupeneus prayensis	1.44	12	0.21	
Octopus vulgaris	1.16	2	0.17	
Sardinella aurita	0.60	12	0.09	
Grammoplites gruveli	0.48	12	0.07	
Alloteuthis africana	0.24	84	0.04	
Citharus linguatula	0.24	12	0.04	
Total	684.48		100.02	

PROJECT STATION: 487

DATE:28/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 456
start stop duration Long W 51
TIME :09:29:07 09:59:47 31 (min) Purpose code: 3
LOG :6543.93 6545.58 1.63 Area code : 2
FDEPTH: 38 38 GearCond.code:
BDEPTH: 38 38 Validity code:
Towing dir: 45ø Wire out: 160 m Speed: 30 kn*10

Sorted: 88 Kg Total catch: 87.78 CATCH/HOUR: 169.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	36.97	296	21.76	2331
Lagocephalus laevigatus	36.48	85	21.47	
Chlamys purpuratus	26.90	3658	15.83	
Fistularia petimba	21.48	101	12.64	
Sepia officinalis hierredda	12.58	23	7.40	2334
Pagrus caeruleostictus	11.32	58	6.66	2332
Dentex canariensis	6.79	15	4.00	
Lethrinus atlanticus	4.84	10	2.85	
Apsilus fuscus	4.78	12	2.81	
Caranx crysos	2.09	10	1.23	
Pseudupeneus prayensis	1.99	35	1.17	2333
Syacium micrurum	1.16	17	0.68	
Dactylopterus volitans	1.16	2	0.68	
Octopus vulgaris	0.81	2	0.48	
Sea urchins (strong spines)	0.41	6	0.24	
Boops boops	0.08	2	0.05	
Bothus podas africanus	0.04	2	0.02	
Total	169.88		99.97	

PROJECT STATION: 488

DATE:28/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 507
start stop duration Long W 53
TIME :11:35:15 12:05:24 30 (min) Purpose code: 3
LOG :6558.01 6559.58 1.57 Area code : 2
FDEPTH: 23 23 GearCond.code:
BDEPTH: 23 23 Validity code:
Towing dir: 65ø Wire out: 130 m Speed: 31 kn*10

Sorted: 2 Kg Total catch: 1.73 CATCH/HOUR: 3.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	3.04	52	87.86	2335
Zanobatus shoenleinii	0.42	2	12.14	
Total	3.46		100.00	

PROJECT STATION: 489

DATE:28/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 514

	start	stop	duration			Long W 38
TIME	:13:44:27	14:14:39	30	(min)	Purpose code:	3
LOG	:6574.85	6576.37	1.51		Area code :	2
FDEPTH:	22	23			GearCond.code:	
BDEPTH:	22	23			Validity code:	

Towing dir: 65ø Wire out: 130 m Speed: 30 kn*10

Sorted: 114 Kg Total catch: 370.95 CATCH/HOUR: 741.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlamys purpuratus	561.60	69410	75.70	
Dentex canariensis	28.10	204	3.79	2338
Sphyraena sphyraena	26.80	84	3.61	2341
Pagrus caeruleostictus	19.46	244	2.62	2339
Balistes punctatus	17.10	50	2.30	2336
Pseudupeneus prayensis	16.30	240	2.20	2340
Lagocephalus laevigatus	10.06	10	1.36	
Acanthostracion quadricornis	9.34	42	1.26	
Bodianus speciosus	7.10	18	0.96	
Scomberomorus tritor	6.60	2	0.89	
Octopus vulgaris	6.10	4	0.82	
Chloroscombrus chrysurus	4.44	60	0.60	2337
Acanthurus monroviae	4.38	16	0.59	
Starfish	3.80	10	0.51	
Scorpaena scrofa	2.52	10	0.34	
Dactylopterus volitans	2.26	6	0.30	
Aluterus heudelotii	2.22	6	0.30	
Chaetodon robustus	1.86	32	0.25	
Ephippion guttifer	1.76	2	0.24	
Diodon holocanthus	1.76	6	0.24	
Rhinobatos albomaculatus	1.64	2	0.22	
Perulibatrachus elminensis	1.62	4	0.22	
Syacium micrurum	0.96	18	0.13	
Alectis alexandrinus	0.86	2	0.12	
Fistularia petimba	0.82	8	0.11	
Pagellus bellottii	0.64	10	0.09	
Chilomycterus spinosus mauret.	0.52	2	0.07	
Stephanolepis hispidus	0.42	6	0.06	
Anthias anthias	0.22	6	0.03	
Coris julis	0.14	2	0.02	
Trachinocephalus myops	0.12	2	0.02	
Bothus podas africanus	0.12	6	0.02	
Pegusa lascaris	0.10	2	0.01	
Antennarius sp.	0.10	2	0.01	
Decapterus punctatus	0.06	2	0.01	
Total	741.90		100.02	

PROJECT STATION: 490

DATE:28/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 505

	start	stop	duration			Long W 33
TIME	:15:49:19	16:19:19	30	(min)	Purpose code:	3
LOG	:6587.92	6589.49	1.56		Area code :	2
FDEPTH:	45	43			GearCond.code:	
BDEPTH:	45	43			Validity code:	

Towing dir: 230ø Wire out: 180 m Speed: 31 kn*10

Sorted: 26 Kg Total catch: 156.28 CATCH/HOUR: 312.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pseudupeneus prayensis	137.54	2274	44.00	2343
Acanthurus monroviae	26.10	48	8.35	
Dentex canariensis	23.80	54	7.61	2345
Pagellus bellottii	13.90	138	4.45	2342
Pagrus caeruleostictus	13.44	624	4.30	2346
Decapterus punctatus	12.60	1560	4.03	2344
Fistularia petimba	9.70	82	3.10	
Sepia officinalis hierredda	9.66	10	3.09	
Sea cucumbers	9.06	6	2.90	
Dactylopterus volitans	7.48	34	2.39	
Priacanthus arenatus	6.22	34	1.99	
Caranx crysos	5.58	16	1.79	
Lycodontis afer	5.12	2	1.64	
Uraspis helvola	4.26	4	1.36	
Lagocephalus laevigatus	4.20	4	1.34	
Sparisoma rubripinne	3.48	4	1.11	
Chromis lineatus	3.02	272	0.97	
Zeus faber	2.72	4	0.87	
Balistes punctatus	2.72	2	0.87	
Pagrus caeruleostictus	1.68	6	0.54	
Scomberomorus tritor	1.58	2	0.51	
Chaetodon robustus	1.32	20	0.42	
Diodon holocanthus	1.18	2	0.38	
Sphyraena guachancho	1.00	2	0.32	
Lethrinus atlanticus	0.94	4	0.30	
Rypticus saponaceus	0.84	6	0.27	
Chelidonichthys gabonensis	0.80	4	0.26	
Syacium micrurum	0.76	14	0.24	
Coris julis	0.70	14	0.22	
Bothus podas africanus	0.62	14	0.20	
Dicologoglossa hexophthalma	0.34	6	0.11	
Sphoeroides marmoratus	0.20	6	0.06	
Total	312.56		99.99	

PROJECT STATION: 491

DATE:28/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 500

	start	stop	duration			Long W 29
TIME	:17:31:43	18:01:06	29	(min)	Purpose code:	3
LOG	:6597.84	6599.41	1.76		Area code :	2
FDEPTH:	65	64			GearCond.code:	
BDEPTH:	65	64			Validity code:	

Towing dir: 240ø Wire out: 250 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 685.88 CATCH/HOUR: 1419.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	321.41	8499	22.65	2349
Chromis cadenati	260.90	4250	18.39	
Decapterus punctatus	213.83	13287	15.07	2348
Boops boops	134.21	5917	9.46	2347
Pseudupeneus prayensis	117.27	1372	8.26	2350
Dentex gibbosus	100.59	54	7.09	
Fistularia petimba	94.14	215	6.63	
Pagrus caeruleostictus	26.36	161	1.86	
Lutjanus fulgens	25.28	27	1.78	
Mustelus mustelus	22.06	27	1.55	
Sepia officinalis hierredda	20.98	161	1.48	
Raja miraletus	18.02	27	1.27	
Sardinella aurita	17.75	888	1.25	2351
Sphyraena guachancho	15.60	27	1.10	
Sphyraena sphyraena	12.37	54	0.87	
Umbrina canariensis	9.14	27	0.64	
Priacanthus arenatus	4.30	27	0.30	
Chaetodon marcellae	2.42	27	0.17	
Chaetodon robustus	2.15	54	0.15	
Citharus linguatula	0.27	54	0.02	
Total	1419.05		99.99	

PROJECT STATION: 492

DATE:29/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 511

	start	stop	duration			Long W 14
TIME	:02:30:08	03:00:13	30	(min)	Purpose code:	3
LOG	:6673.98	6675.57	1.59		Area code :	2
FDEPTH:	103	103			GearCond.code:	
BDEPTH:	103	103			Validity code:	

Towing dir: 40ø Wire out: 320 m Speed: 31 kn*10

Sorted: 29 Kg Total catch: 196.97 CATCH/HOUR: 393.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	78.96	1622	20.04	2352
Priacanthus arenatus	72.12	864	18.31	2355
Boops boops	69.00	1428	17.52	2353
Trachurus trachurus	54.72	636	13.89	2354
Promethichthys prometheus	26.04	372	6.61	
Chelidonichthys gabonensis	17.04	324	4.33	
Sepia officinalis hierredda	10.58	38	2.69	
Raja miraletus	10.20	22	2.59	
Umbrina canariensis	9.36	60	2.38	
Brotula barbata	6.24	36	1.58	
Torpedo torpedo	5.98	6	1.52	
Sphoeroides pachgaster	4.92	26	1.25	
Squatina oculata	3.82	2	0.97	
Scomber japonicus	3.12	24	0.79	
Dentex canariensis	3.12	8	0.79	
Ariomma bondi	2.76	36	0.70	
Paraconger notialis	2.30	12	0.58	
NETTASTOMATIDAE	2.28	120	0.58	
Dicologoglossa hexophthalma	2.04	48	0.52	
Citharus linguatula	1.68	60	0.43	
Pontinus kuhlii	1.32	24	0.34	
Ophidion sp.	1.20	48	0.30	
Trichiurus lepturus	1.20	24	0.30	
Pagrus caeruleostictus	1.14	4	0.29	
Fistularia petimba	0.62	2	0.16	
Erythrocles monodi	0.60	12	0.15	
Dentex gibbosus	0.56	2	0.14	
Hypoclydonia bella	0.36	12	0.09	
MORIDAE	0.24	12	0.06	
Antigonia capros	0.24	12	0.06	
Uranoscopus cadenati	0.18	12	0.05	
Total	393.94		100.01	

PROJECT STATION: 493

DATE:29/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 516

	start	stop	duration			Long W 16
TIME	:06:16:44	06:46:26	30	(min)	Purpose code:	3
LOG	:6683.59	6685.03	1.44		Area code :	2
FDEPTH:	59	60			GearCond.code:	
BDEPTH:	59	60			Validity code:	

Towing dir: 220ø Wire out: 200 m Speed: 30 kn*10

Sorted: 20 Kg Total catch: 94.78 CATCH/HOUR: 189.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Fistularia petimba	42.10	150	22.21	
Pagellus bellottii	33.24	942	17.54	2356
Sepia officinalis hierredda	18.40	30	9.71	2359
Lepidotrigla carolae	11.40	654	6.01	
Sepia juveniles	9.66	420	5.10	2357
Pseudupeneus prayensis	9.66	192	5.10	2360
Decapterus punctatus	6.90	408	3.64	2358
Dentex canariensis	6.90	30	3.64	
Lepidotrigla cadmani	6.54	156	3.45	
Scomberomorus tritor	5.80	2	3.06	
Sardinella aurita	4.98	162	2.63	2361
Octopus vulgaris	4.46	6	2.35	
Brachydeuterus auritus	4.20	60	2.22	
Zeus faber	2.88	6	1.52	
Pagrus caeruleostictus	2.64	90	1.39	
Serranus accraensis	2.28	126	1.20	
Chromis cadenati	2.28	102	1.20	
Citharus linguatula	1.98	78	1.04	
Grammoplites gruveli	1.74	102	0.92	
Boops boops	1.38	60	0.73	
Sphyraena sphyraena	1.32	6	0.70	
Sphoeroides pachgaster	1.20	6	0.63	
Dentex gibbosus	1.08	12	0.57	
Selar crumenophthalmus	1.08	30	0.57	
Priacanthus arenatus	0.90	6	0.47	
Chaetodon marcellae	0.84	30	0.44	
Syacium micrurum	0.84	90	0.44	
Echelus myrus	0.60	2	0.32	
Saurida brasiliensis	0.60	96	0.32	
Microchirus frechkopi	0.60	6	0.32	
Dactylopterus volitans	0.48	30	0.25	
Dentex congoensis	0.30	42	0.16	
Dentex angolensis	0.24	6	0.13	
Sphoeroides marmoratus	0.06	6	0.03	
Total	189.56		100.01	

PROJECT STATION: 494

DATE:29/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 520

	start	stop	duration			Long W 18
TIME	:07:57:46	08:27:45	30	(min)	Purpose code: 3	
LOG	:6693.22	6694.80	1.56		Area code : 2	
FDEPTH:	40	41			GearCond.code:	
BDEPTH:	40	41			Validity code:	

Towing dir: 220ø Wire out: 160 m Speed: 30 kn*10

Sorted: 10 Kg Total catch: 47.31 CATCH/HOUR: 94.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Fistularia petimba	17.10	110	18.07	
Pseudupeneus prayensis	11.28	300	11.92	2365
Syacium micrurum	11.20	416	11.84	
Sepia officinalis hierredda	9.00	12	9.51	2364
Pagrus caeruleostictus	5.98	12	6.32	
Cymbium sp.	5.46	4	5.77	
Decapterus punctatus	5.36	588	5.66	2368
Octopus vulgaris	4.50	2	4.76	
Pagrus caeruleostictus	4.32	204	4.57	2366
Sardinella aurita	3.12	292	3.30	2362
Dactylopterus volitans	2.56	8	2.71	
Lethrinus atlanticus	2.34	16	2.47	
Dentex canariensis	1.96	4	2.07	
Epinephelus aeneus	1.82	4	1.92	
Grammoplites gruveli	1.40	72	1.48	
Pagellus bellottii	1.40	64	1.48	2367
Sepia juveniles	1.12	112	1.18	2363
Sea cucumbers	0.98	2	1.04	
Torpedo torpedo	0.96	2	1.01	
Priacanthus arenatus	0.84	12	0.89	
Boops boops	0.48	24	0.51	
Chaetodon robustus	0.40	8	0.42	
Scorpaena scrofa	0.28	4	0.30	
Brachydeuterus auritus	0.24	4	0.25	
Bothus podas africanus	0.20	12	0.21	
Citharus linguatula	0.16	4	0.17	
Monochirus hispidus	0.08	2	0.08	
Serranus accraensis	0.04	4	0.04	
Saurida brasiliensis	0.04	8	0.04	
Total	94.62		99.99	

PROJECT STATION: 495

DATE:29/ 5/04 GEAR TYPE: BT No:14 POSITION:Lat N 525

	start	stop	duration			Long W 21
TIME	:09:25:49	09:34:22	9	(min)	Purpose code: 3	
LOG	:6702.41	6702.87	0.47		Area code : 2	
FDEPTH:	21	21			GearCond.code: 8	
BDEPTH:	21	21			Validity code: 4	

Towing dir: 45ø Wire out: 130 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 66.58 CATCH/HOUR: 443.87

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lutjanus fulgens	97.00	1067	21.85	2370
Pagrus caeruleostictus	62.40	667	14.06	2373
Lethrinus atlanticus	48.13	320	10.84	2372
Rachycentron canadum	41.33	7	9.31	
Bodianus speciosus	40.13	33	9.04	
Dentex canariensis	34.93	140	7.87	2369
Umbrina steindachneri	31.13	60	7.01	
Lagocephalus laevigatus	11.80	13	2.66	
Lutjanus goreensis	11.73	7	2.64	
Pseudupeneus prayensis	11.27	240	2.54	2371
Sparisoma rubripinne	11.07	47	2.49	
Drepane africana	6.67	27	1.50	
Alectis alexandrinus	5.87	13	1.32	
Scorpaena scrofa	4.80	20	1.08	
Acanthostracion quadricornis	4.13	20	0.93	
Pomadasys incisus	3.27	47	0.74	
Chaetodon robustus	3.27	73	0.74	
Pagellus bellottii	3.20	40	0.72	
Epinephelus aeneus	2.80	7	0.63	
Acanthurus monroviae	2.27	40	0.51	
Dactylopterus volitans	1.53	7	0.34	
Fistularia petimba	1.00	7	0.23	
Rypticus saponaceus	0.87	7	0.20	
Priacanthus arenatus	0.73	13	0.16	
Balistes punctatus	0.67	20	0.15	
Chromis cadenati	0.53	27	0.12	
Chloroscombrus chrysurus	0.40	7	0.09	
Apsilus fuscus	0.40	13	0.09	
Anthias anthias	0.27	27	0.06	
Coris julis	0.27	7	0.06	
Total	443.87		99.98	

PROJECT STATION: 496

DATE:29/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 541

	start	stop	duration			Long E 16
TIME	:14:10:55	14:37:49	27	(min)	Purpose code: 3	
LOG	:6744.05	6745.37	1.31		Area code : 2	
FDEPTH:	26	26			GearCond.code:	
BDEPTH:	26	26			Validity code:	

Towing dir: 65ø Wire out: 130 m Speed: 30 kn*10

Sorted: 15 Kg Total catch: 15.28 CATCH/HOUR: 33.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Kyphosus sectatrix	9.18	4	27.03	
Bodianus speciosus	6.47	4	19.05	
Fistularia tabacaria	5.89	4	17.34	
Dentex canariensis	4.31	4	12.69	
Fistularia petimba	3.56	11	10.48	
Decapterus punctatus	2.58	200	7.60	2374
Uranoscopus polli	1.67	2	4.92	
Acanthostracion quadricornis	0.31	2	0.91	
Total	33.97		100.02	

PROJECT STATION: 497

DATE:29/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 540

	start	stop	duration			Long E 18
TIME	:15:21:17	15:51:25	30	(min)	Purpose code: 3	
LOG	:6747.99	6749.55	1.57		Area code : 2	
FDEPTH:	40	41			GearCond.code:	
BDEPTH:	40	41			Validity code:	

Towing dir: 260ø Wire out: 180 m Speed: 31 kn*10

Sorted: 45 Kg Total catch: 45.21 CATCH/HOUR: 90.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	45.40	13296	50.21	2375
Sepia officinalis hierredda	15.76	24	17.43	
Pseudupeneus prayensis	12.50	422	13.82	2377
Lagocephalus laevigatus	4.28	8	4.73	
Aluterus blankerti	3.22	12	3.56	
Pagrus caeruleostictus	1.92	52	2.12	2376
Sphyraena sphyraena	1.78	4	1.97	
Fistularia petimba	1.44	8	1.59	
Alectis alexandrinus	1.22	2	1.35	
Decapterus rhonchus	1.16	12	1.28	
Alloteuthis africana	0.64	192	0.71	
Dentex canariensis	0.54	6	0.60	
Decapterus punctatus	0.30	12	0.33	
Chloroscombrus chrysurus	0.24	2	0.27	
Echeneis naucrates	0.02	2	0.02	
Total	90.42		99.99	

PROJECT STATION: 498

DATE:29/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 537

	start	stop	duration			Long E 18
TIME	:17:03:24	17:33:27	30	(min)	Purpose code: 3	
LOG	:6754.97	6756.60	1.62		Area code : 2	
FDEPTH:	71	69			GearCond.code:	
BDEPTH:	71	69			Validity code:	

Towing dir: 260ø Wire out: 230 m Speed: 32 kn*10

Sorted: 28 Kg Total catch: 121.54 CATCH/HOUR: 243.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	131.60	2840	54.14	2378
Decapterus rhonchus	32.08	560	13.20	2380
Sardinella aurita	21.28	392	8.75	2379
Dentex congoensis	13.84	448	5.69	2381
Dentex canariensis	9.38	64	3.86	
Pagellus bellottii	6.96	106	2.86	
Sepia officinalis hierredda	6.80	12	2.80	2382
Lagocephalus laevigatus	4.88	20	2.01	
Sphyraena sphyraena	3.36	16	1.38	
Fistularia petimba	2.40	10	0.99	
Priacanthus arenatus	1.92	24	0.79	
Dentex angolensis	1.70	18	0.70	
Dentex gibbosus	1.42	22	0.58	
Pagrus caeruleostictus	1.32	10	0.54	
Octopus vulgaris	1.02	2	0.42	
Alloteuthis africana	0.88	288	0.36	
Pseudupeneus prayensis	0.88	16	0.36	
Trachurus trachurus	0.80	8	0.33	
Pseudupeneus prayensis	0.56	2	0.23	
Total	243.08		99.99	

PROJECT STATION: 499

DATE:29/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 532

	start	stop	duration			Long E 16
TIME	:19:03:15	19:33:26	30	(min)	Purpose code: 3	
LOG	:6764.92	6766.44	1.51		Area code : 2	
FDEPTH:	320	330			GearCond.code:	
BDEPTH:	320	330			Validity code:	

Towing dir: 50ø Wire out: 930 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 243.09 CATCH/HOUR: 486.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Centrophorus uyato	203.00	60	41.75	
Parasudis fraser-bruenneri	90.00	6448	18.51	
Chlorophthalmus atlanticus	86.48	1488	17.79	
Plesiopenaeus edwardsianus, f.	27.68	800	5.69	2383
Todarodes sagittatus	17.28	184	3.55	
Squatina oculata	16.50	2	3.39	
Malacocephalus occidentalis	5.68	24	1.17	
Trichiurus lepturus	5.20	40	1.07	
Neoharriotta pinnata	5.00	2	1.03	
PERISTEDIIDAE	3.60	12	0.74	
Zenion longipinnis	3.12	168	0.64	
Laemonema laureysi	2.72	16	0.56	
SQUILLIDAE	2.40	2	0.49	
Sphyraena sphyraena	2.32	8	0.48	
OPHICHTHIDAE	1.68	16	0.35	
Parapenaeus longirostris	1.68	96	0.35	
Gadella imberbis	1.52	40	0.31	
NOMEIDAE	1.44	16	0.30	
Epigonus constanciae	1.36	72	0.28	
Scomber japonicus	1.12	8	0.23	
Malacocephalus laevis	0.96	16	0.20	
Bembrops greyi	0.96	8	0.20	
Solenocera africana	0.72	62	0.15	
Chascanopsetta lugubris	0.64	24	0.13	
GEMPYLIDAE	0.56	8	0.12	
Cyttopsis roseus	0.56	32	0.12	
Galeus polli	0.40	8	0.08	
Decapterus punctatus	0.40	8	0.08	
Setarches guentheri	0.32	32	0.07	
MORIDAE	0.24	8	0.05	
Nezumia sp.	0.24	8	0.05	
Benthodesmus tenuis	0.16	8	0.03	
Photichthys argenteus	0.08	8	0.02	
Plesionika martia	0.08	24	0.02	
S H R I M P S	0.08	8	0.02	
Total	486.18		100.02	

PROJECT STATION: 500

DATE:30/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 558
start stop duration Long E 105
TIME :06:13:56 06:43:10 29 (min) Purpose code: 3
LOG :6847.60 6849.09 1.48 Area code : 2
FDEPTH: 27 27 GearCond.code:
BDEPTH: 27 27 Validity code:
Towing dir: 230ø Wire out: 130 m Speed: 30 kn*10

Sorted: 6 Kg Total catch: 6.26 CATCH/HOUR: 12.95

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena afra	4.66	4	35.98	
Scomberomorus tritor	2.09	2	16.14	
Pagrus caeruleostictus	1.90	10	14.67	
Decapterus punctatus	1.24	546	9.58	2384
Epinephelus aeneus	0.91	2	7.03	
Sphyraena sphyraena	0.74	2	5.71	
Sphyraena guachancho	0.41	2	3.17	
Sphoeroides marmoratus	0.33	8	2.55	
Pseudupeneus prayensis	0.31	4	2.39	
Sardinella aurita	0.19	29	1.47	
Brachydeuterus auritus Juv.	0.08	112	0.62	
Trichiurus lepturus	0.04	2	0.31	
Priacanthus arenatus	0.04	2	0.31	
Total	12.94		99.93	

PROJECT STATION: 501

DATE:30/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 555
start stop duration Long E 108
TIME :08:15:23 08:45:06 30 (min) Purpose code: 3
LOG :6855.71 6857.27 1.55 Area code : 2
FDEPTH: 47 45 GearCond.code:
BDEPTH: 47 45 Validity code:
Towing dir: 240ø Wire out: 180 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 47.88 CATCH/HOUR: 95.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus punctatus	31.10	6036	32.48	2385
Sardinella aurita	26.40	4100	27.57	2388
Selene dorsalis	10.24	36	10.69	2387
Sepia officinalis hierredda	6.12	6	6.39	
Alectis alexandrinus	5.52	6	5.76	
Sphyraena sphyraena	2.92	12	3.05	
Brachydeuterus auritus	2.90	368	3.03	2389
Pagrus caeruleostictus	2.74	14	2.86	
Alloteuthis africana	1.92	552	2.01	
Pagellus bellottii	1.36	10	1.42	
Balistes capriscus	1.22	2	1.27	
Fistularia petimba	0.90	10	0.94	
Sphyraena guachancho	0.74	4	0.77	
Aluterus heudelotii	0.54	2	0.56	
Priacanthus arenatus	0.32	6	0.33	
Dentex canariensis	0.32	4	0.33	
Engraulis encrasicolus	0.26	62	0.27	2386
Pseudupeneus prayensis	0.10	2	0.10	
Sphoeroides marmoratus	0.08	2	0.08	
Sepia juveniles	0.04	46	0.04	
Saurida brasiliensis	0.02	2	0.02	
Total	95.76		99.97	

PROJECT STATION: 502

DATE:30/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 552
start stop duration Long E 111
TIME :10:00:02 10:00:04 30 (min) Purpose code: 3
LOG :6865.81 6867.35 1.53 Area code : 2
FDEPTH: 84 81 GearCond.code:
BDEPTH: 84 81 Validity code:
Towing dir: 240ø Wire out: 250 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 298.06 CATCH/HOUR: 596.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	338.40	17798	56.77	2392
Sepia officinalis hierredda	106.56	218	17.88	2394
Decapterus punctatus	84.40	2350	14.16	2390
Fistularia petimba	24.80	216	4.16	
Dentex congoensis	9.52	680	1.60	2391
Priacanthus arenatus	7.76	224	1.30	2393
Squatina oculata	7.60	8	1.27	
Pagellus bellottii	5.12	88	0.86	
Zeus faber	3.90	2	0.65	
Sepia juveniles	1.82	62	0.31	2395
Pseudupeneus prayensis	1.68	48	0.28	
Dentex angolensis	1.36	56	0.23	
Boops boops	1.28	40	0.21	
Selar crumenophthalmus	1.04	8	0.17	
Loligo vulgaris	0.32	40	0.05	
Ariomma bondi	0.32	24	0.05	
Sphoeroides cutaneus	0.24	8	0.04	
Trigla lyra	0.16	8	0.03	
Total	596.28		100.02	

PROJECT STATION: 503

DATE:30/ 5/04 GEAR TYPE: BT No: 8 POSITION:Lat N 548
start stop duration Long E 101
TIME :11:59:14 12:30:36 31 (min) Purpose code: 3
LOG :6877.43 6879.09 1.64 Area code : 2
FDEPTH: 39 38 GearCond.code:
BDEPTH: 39 38 Validity code:
Towing dir: 196ø Wire out: 180 m Speed: 31 kn*10

Sorted: 43 Kg Total catch: 42.87 CATCH/HOUR: 82.97

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Epinephelus aeneus	25.06	8	30.20	
Sepia officinalis hierredda	13.90	21	16.75	
Alectis alexandrinus	12.97	12	15.63	
Balistes capriscus	7.20	12	8.68	
Pagrus caeruleostictus	5.03	15	6.06	
Decapterus punctatus	4.37	614	5.27	2396
Sphyraena afra	2.57	2	3.10	
Fistularia petimba	2.46	21	2.96	
Diodon holocanthus	2.11	4	2.54	
Alloteuthis africana	1.86	434	2.24	
Sardinella aurita	1.61	25	1.94	
Sardinella aurita - Juveniles	1.10	141	1.33	2397
Dentex canariensis	1.01	2	1.22	
Lagocephalus laevigatus	0.93	2	1.12	
Aluterus monoceros	0.79	2	0.95	
Remora remora	0.06	2	0.07	
Priacanthus arenatus	0.02	2	0.02	
Lutjanus fulgens	0.02	2	0.02	
Total	83.07		100.10	

PROJECT STATION: 504

DATE:30/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 542
start stop duration Long E 40
TIME :15:07:06 15:37:12 30 (min) Purpose code: 3
LOG :6904.10 6905.64 1.54 Area code : 2
FDEPTH: 24 24 GearCond.code:
BDEPTH: 24 24 Validity code:
Towing dir: 280ø Wire out: 130 m Speed: 31 kn*10

Sorted: 50 Kg Total catch: 136.65 CATCH/HOUR: 273.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Elops lacerta	86.00	296	31.47	
Sphyraena-juveniles	61.60	2138	22.54	2398
Brachydeuterus auritus	35.20	1614	12.88	2399
Alectis alexandrinus	14.76	26	5.40	
Selene dorsalis	10.68	874	3.91	2400
Chloroscombrus chrysurus	10.20	368	3.73	2401
Pagrus caeruleostictus	8.44	164	3.09	2403
Trachinotus teraia	5.84	2	2.14	
Sphyraena guachancho	5.24	2	1.92	
Pagrus caeruleostictus	5.18	10	1.90	
Galeoides decadactylus	4.60	48	1.68	
Sphyraena guachancho	4.08	32	1.49	
Pagellus bellottii	3.52	76	1.29	2404
Ephippion guttifer	3.52	2	1.29	
Drepane africana	3.22	12	1.18	
Chloroscombrus chrysurus	2.92	20	1.07	
Sepia officinalis hierredda	1.70	2	0.62	
Pomadasys jubelini	1.66	2	0.61	
Sardinella maderensis	1.52	80	0.56	2402
Scomberomorus tritor	0.60	8	0.22	
Trichiurus lepturus	0.56	32	0.20	
Pseudupeneus prayensis	0.56	28	0.20	
Calappa rubroguttata	0.50	4	0.18	
Penaeus notialis	0.44	28	0.16	
Pteroscion peli	0.24	8	0.09	
Grammoplites gruveli	0.20	16	0.07	
Chaetodipterus goreensis	0.20	2	0.07	
Decapterus rhonchus	0.08	4	0.03	
Octopus vulgaris	0.04	2	0.01	
Total	273.30		100.00	

PROJECT STATION: 505

DATE:30/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 537
start stop duration Long E 38
TIME :16:45:55 17:15:24 29 (min) Purpose code: 3
LOG :6912.25 6913.90 1.64 Area code : 2
FDEPTH: 36 38 GearCond.code:
BDEPTH: 36 38 Validity code:
Towing dir: 280ø Wire out: 180 m Speed: 31 kn*10

Sorted: 29 Kg Total catch: 187.40 CATCH/HOUR: 387.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	204.00	88593	52.62	2408
Alectis alexandrinus	72.41	29	18.68	2405
Sphyraena guachancho	34.34	54	8.86	2406
Brachydeuterus auritus	24.91	2532	6.42	2410
Pagrus caeruleostictus	14.48	39	3.73	2407
Scomberomorus tritor	7.72	48	1.99	
Epinephelus aeneus	6.04	6	1.56	
Sardinella aurita	4.88	571	1.26	2409
Elops lacerta	4.68	8	1.21	
Balistes capriscus	3.60	2	0.93	
Chaetodipterus goreensis	3.04	6	0.78	
Chloroscombrus chrysurus	1.82	25	0.47	
Portunus validus	1.53	2	0.39	
Pagellus bellottii	1.16	17	0.30	
Pentheroscion mbizi	0.91	17	0.23	
Selene dorsalis	0.77	8	0.20	
Dentex canariensis	0.68	2	0.18	
Pseudupeneus prayensis	0.33	25	0.09	
Decapterus punctatus	0.17	41	0.04	
Trachinocephalus myops	0.17	17	0.04	
Sphyraena-juveniles	0.08	25	0.02	
Total	387.72		100.00	

PROJECT STATION: 506

DATE:30/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 536
start stop duration Long E 36
TIME :17:47:03 18:17:12 30 (min) Purpose code: 3
LOG :6916.54 6918.15 1.60 Area code : 2
FDEPTH: 49 53 GearCond.code:
BDEPTH: 49 53 Validity code:
Towing dir: 114ø Wire out: 220 m Speed: 30 kn*10

Sorted: 46 Kg Total catch: 252.18 CATCH/HOUR: 504.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	238.04	8342	47.20	2415
Decapterus punctatus	71.54	3536	14.18	2414
Sardinella aurita	42.84	2484	8.49	2413
Sepia officinalis hierredda	34.20	56	6.78	2416
Boops boops	25.46	1044	5.05	2412
Pagellus bellottii	17.76	246	3.52	2411
Sphyraena guachancho	14.18	24	2.81	
Pagrus caeruleostictus	10.80	152	2.14	
Dentex canariensis	9.00	36	1.78	
Pagrus caeruleostictus	7.16	20	1.42	
Sphyraena afra	4.78	2	0.95	
Albula vulpes	3.86	6	0.77	
Scomberomorus tritor	3.54	2	0.70	
Pseudupeneus prayensis	3.50	126	0.69	
Chilomycterus spinosus mauret.	3.42	18	0.68	
Ariomma bondi	2.96	54	0.59	
Balistes capriscus	1.84	2	0.36	
Syacium micrurum	1.80	162	0.36	
Grammoplites gruveli	1.34	80	0.27	
Priacanthus arenatus	1.26	18	0.25	
Raja miraletus	1.24	4	0.25	
Citharus linguatula	1.08	98	0.21	
Epinephelus aeneus	1.08	2	0.21	
Dentex canariensis	0.64	2	0.13	
Dentex congoensis	0.26	8	0.05	
Serranus accraensis	0.18	8	0.04	
Sepia juveniles	0.18	18	0.04	
Sphoeroides marmoratus	0.18	8	0.04	
Stephanolepis hispidus	0.08	8	0.02	
Microchirus frechkopi	0.08	8	0.02	
Fistularia petimba	0.08	8	0.02	
Total	504.36		100.02	

PROJECT STATION: 507

DATE:30/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 526

	start	stop	duration			Long E 6
TIME	:23:17:57	23:47:18	29	(min)	Purpose code: 3	
LOG	:6953.66	6955.20	1.53		Area code : 2	
FDEPTH:	228	227			GearCond.code:	
BDEPTH:	228	227			Validity code:	

Towing dir: 235ø Wire out: 650 m Speed: 30 kn*10

Sorted: 22 Kg Total catch: 558.49 CATCH/HOUR: 1155.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Centrophorus squamosus	742.35	248	64.24	
Squatina oculata	97.34	192	8.42	
Aulopus cadenati	59.83	286	5.18	
Trigla lyra	40.22	348	3.48	
Uranoscopus cadenati	30.79	124	2.66	
Peristedion cataphractum	26.69	583	2.31	
Glyphus marsupialis	25.57	1279	2.21	
Dentex angolensis	23.96	112	2.07	2417
Chelidonichthys lucerna	18.62	186	1.61	
Octopus vulgaris	14.15	50	1.22	
Ijimaia loppei	13.24	6	1.15	
Promethichthys prometheus	11.17	99	0.97	
Gadella imberbis	9.19	211	0.80	
Merluccius polli	8.07	50	0.70	
Illex coindetii	6.95	174	0.60	
Bembrops heterurus	4.72	50	0.41	
Trichiurus lepturus	4.59	50	0.40	
Parapenaeus longirostris	2.73	223	0.24	
Chlorophthalmus atlanticus	2.61	37	0.23	
TORPEDINIDAE	2.38	2	0.21	
Penaeus notialis	2.11	174	0.18	
Lophiodes kempi	1.90	2	0.16	
Antigonia capros	1.61	25	0.14	
Umbrina canariensis	1.28	2	0.11	
Raja miraletus	1.24	2	0.11	
Epigonus sp.	0.99	25	0.09	
Hoplostethus cadenati	0.62	12	0.05	
Torpedo marmorata	0.43	2	0.04	
MYCTOPHIDAE	0.12	12	0.01	
Total	1155.47		100.00	

PROJECT STATION: 508

DATE:31/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 527

	start	stop	duration			Long E 5
TIME	:05:54:28	06:24:12	30	(min)	Purpose code: 3	
LOG	:6967.11	6968.61	1.49		Area code : 2	
FDEPTH:	83	87			GearCond.code:	
BDEPTH:	83	87			Validity code:	

Towing dir: 235ø Wire out: 250 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 567.03 CATCH/HOUR: 1134.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	467.50	15300	41.22	2420
Boops boops	331.50	10726	29.23	2419
Dentex angolensis	54.40	1682	4.80	2423
Sepia officinalis hierredda	35.40	54	3.12	2418
Sardinella aurita	33.32	628	2.94	2421
Lepidotrigla cadmani	33.14	628	2.92	
Mustelus mustelus	28.70	26	2.53	
Squatina oculata	22.70	28	2.00	
Trachurus trecae	19.88	526	1.75	2422
Lepidotrigla carolae	19.04	680	1.68	
Priacanthus arenatus	16.48	288	1.45	
Fistularia petimba	16.00	44	1.41	
Dentex gibbosus	12.06	34	1.06	
Dactylopterus volitans	9.52	782	0.84	
Decapterus punctatus	9.52	306	0.84	
Uranoscopus cadenati	5.78	16	0.51	
Sphoeroides pachgaster	3.74	50	0.33	
Raja miraletus	3.10	8	0.27	
Zeus faber	2.90	4	0.26	
Pseudupeneus prayensis	2.20	34	0.19	
Dentex gibbosus	1.80	4	0.16	
Sepia juveniles	1.70	84	0.15	
Brachydeuterus auritus	1.36	34	0.12	
Sphoeroides pachgaster	1.30	2	0.11	
Ariomma bondi	0.68	68	0.06	
Grammoplites gruveli	0.34	16	0.03	
Total	1134.06		99.98	

PROJECT STATION: 509

DATE:31/ 5/04 GEAR TYPE: BT No:15 POSITION:Lat N 533

	start	stop	duration			Long E 4
TIME	:08:21:03	08:51:07	30	(min)	Purpose code: 3	
LOG	:6979.70	6981.29	1.58		Area code : 2	
FDEPTH:	43	43			GearCond.code:	
BDEPTH:	43	43			Validity code:	

Towing dir: 240ø Wire out: 160 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 32.92 CATCH/HOUR: 65.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	21.14	32	32.11	2425
Selene dorsalis	19.42	38	29.50	2424
Lagocephalus laevigatus	12.00	26	18.23	
Fistularia petimba	5.60	22	8.51	
Alloteuthis africana	4.32	1728	6.56	
Raja miraletus	1.88	4	2.86	
Syacium micrurum	0.56	6	0.85	
Pagrus caeruleostictus	0.40	8	0.61	
Decapterus punctatus	0.18	6	0.27	
Dactylopterus volitans	0.18	14	0.27	
Pagellus bellottii	0.08	4	0.12	
Saurida brasiliensis	0.06	6	0.09	
Pseudupeneus prayensis	0.02	2	0.03	
Total	65.84		100.01	

PROJECT STATION: 510

DATE: 3/ 6/04 GEAR TYPE: BT No:15 POSITION:Lat N 617

	start	stop	duration			Long E 237
TIME	:06:50:46	07:20:26	30	(min)	Purpose code: 3	
LOG	:7163.80	7165.13	1.32		Area code : 4	
FDEPTH:	21	21			GearCond.code:	
BDEPTH:	21	21			Validity code:	

Towing dir: 260ø Wire out: 140 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 31.50 CATCH/HOUR: 63.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pseudotolithus typus	22.20	74	35.24	2430
Elops lacerta	6.80	28	10.79	
Trichiurus lepturus	4.44	260	7.05	
Brachydeuterus auritus	3.66	108	5.81	2426
Pteroscion peli	3.52	126	5.59	2431
Galeoides decadactylus	2.52	88	4.00	2428
Ilisha africana	2.50	428	3.97	2429
Selar crumenophthalmus	2.30	6	3.65	
Sphyraena guachancho	1.74	14	2.76	
Sepia officinalis hierredda	1.40	16	2.22	
Drepane africana	1.32	16	2.10	
Parapenaeopsis atlantica	1.12	382	1.78	
Chloroscombrus chrysurus	1.10	130	1.75	2427
Diodon holocanthus	1.04	6	1.65	
Polydactylus quadrifilis	1.00	4	1.59	
Lutjanus goreensis	0.96	2	1.52	
Lagocephalus laevigatus	0.92	2	1.46	
Caranx senegallus	0.86	6	1.37	
Selene dorsalis	0.76	172	1.21	2432
Lethrinus atlanticus	0.74	6	1.17	
Pomadasys peroteti	0.32	2	0.51	
Sardinella maderensis	0.28	16	0.44	
Branchiostegus semifasciatus	0.20	2	0.32	
Scomberomorus tritor	0.20	2	0.32	
Cynoglossus canariensis	0.18	10	0.29	
Chaetodipterus goreensis	0.18	6	0.29	
Portunus validus	0.16	22	0.25	
Sphoeroides marmoratus	0.14	6	0.22	
Pentanemus quinquarius	0.12	2	0.19	
Synaptura cadenati	0.10	2	0.16	
Bothus podas africanus	0.08	4	0.13	
Trachinocephalus myops	0.06	4	0.10	
Squilla mantis	0.04	2	0.06	
Pseudupeneus prayensis	0.04	2	0.06	
Total	63.00		100.02	

PROJECT STATION: 511

DATE: 3/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 613

	start	stop	duration			Long E 237
TIME	:06:41:02	08:20:42	30	(min)	Purpose code: 3	
LOG	:7170.04	7171.57	1.50		Area code : 4	
FDEPTH:	32	33			GearCond.code:	
BDEPTH:	32	33			Validity code:	

Towing dir: 260ø Wire out: 140 m Speed: 30 kn*10

Sorted: 45 Kg Total catch: 77.98 CATCH/HOUR: 155.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	42.60	1510	27.31	2433
Sphyraena afra	14.40	2	9.23	
Ilisha africana	13.94	4380	8.94	2436
Chloroscombrus chrysurus	13.26	3536	8.50	2434
Sphyraena-juveniles	13.22	2060	8.48	2439
Sphyraena guachancho	10.68	60	6.85	2438
Galeoides decadactylus	10.52	188	6.75	2435
Trichiurus lepturus	7.50	354	4.81	
Selene dorsalis	5.54	210	3.55	2437
Pseudotolithus typus	5.40	26	3.46	
Sepia officinalis hierredda	3.90	22	2.50	
Selar crumenophthalmus	3.12	14	2.00	
Penaeus notialis	2.48	68	1.59	
Drepane africana	2.12	18	1.36	
Caranx hippos	1.44	6	0.92	
Panulirus regius	1.34	2	0.86	
Portunus validus	1.00	2	0.64	
Sardinella maderensis	0.86	38	0.55	
Chilomycterus spinosus mauret.	0.68	8	0.44	
Trachinocephalus myops	0.48	14	0.31	
Syacium micrurum	0.42	6	0.27	
Chaetodipterus goreensis	0.36	24	0.23	
Pagrus caeruleostictus	0.30	6	0.19	
Eucinostomus melanopterus	0.30	8	0.19	
Remora remora	0.06	4	0.04	
Pteroscion peli	0.04	4	0.03	
Total	155.96		100.00	

PROJECT STATION: 512

DATE: 3/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 610

	start	stop	duration			Long E 238
TIME	:10:32:51	11:02:32	30	(min)	Purpose code: 3	
LOG	:7180.10	7181.56	1.44		Area code : 4	
FDEPTH:	64	65			GearCond.code:	
BDEPTH:	64	65			Validity code:	

Towing dir: 270ø Wire out: 200 m Speed: 30 kn*10

Sorted: 19 Kg Total catch: 18.78 CATCH/HOUR: 37.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia juveniles	5.82	270	15.50	2450
Pagellus bellottii	5.22	50	13.90	2454
Sphyraena-juveniles	5.16	154	13.74	2451
Brachydeuterus auritus Juv.	4.50	806	11.98	2455
Priacanthus arenatus	3.86	738	10.28	2452
Trichiurus lepturus	2.54	30	6.76	
Alloteuthis africana	1.72	682	4.58	
Umbrina canariensis	1.68	8	4.47	
Pentheroscion mbizi	1.60	4	4.26	
Pseudotolithus typus	1.30	10	3.46	
Sphyraena guachancho	1.00	10	2.66	
Engraulis encrasicolus	0.72	160	1.92	2453
Sardinella aurita	0.60	66	1.60	2456
Chilomycterus spinosus mauret.	0.54	2	1.44	
Lepidotrigla cadmani	0.26	6	0.69	
Saurida brasiliensis	0.16	6	0.43	
Lagocephalus laevigatus	0.16	6	0.43	
Brotula barbata	0.16	2	0.43	
Chloroscombrus chrysurus	0.14	2	0.37	
Lepidotrigla carolae	0.12	8	0.32	
Dentex canariensis	0.10	6	0.27	
Syacium micrurum	0.06	12	0.16	
Citharus linguatula	0.06	6	0.16	
Decapterus punctatus	0.04	12	0.11	
Scyllarides herklotsii	0.02	2	0.05	
Fistularia petimba	0.02	4	0.05	
Total	37.56		100.02	

PROJECT STATION: 513

DATE: 3/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 607
start stop duration Long E 228
TIME :15:15:18 15:45:19 30 (min) Purpose code: 3
LOG :7210.46 7211.92 1.45 Area code : 4
FDEPTH: 82 82 GearCond.code:
BDEPTH: 82 82 Validity code:
Towing dir: 264ø Wire out: 260 m Speed: 30 kn*10
Sorted: 32 Kg Total catch: 161.11 CATCH/HOUR: 322.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	149.50	12168	46.40	2460
Dentex congoensis	69.70	1456	21.63	2458
Dentex angolensis	33.20	550	10.30	2457
Decapterus punctatus	29.60	2148	9.19	2461
Dentex canariensis	16.90	630	5.24	2459
Seriola dumerili	6.70	30	2.08	
Alloteuthis africana	5.30	1820	1.64	
Selar crumenophthalmus	4.00	20	1.24	
Pagrus caeruleostictus	1.30	10	0.40	
Trigla lyra	1.00	30	0.31	
Fistularia petimba	0.98	12	0.30	
Sepia officinalis hierredda	0.98	2	0.30	
Pentheroscion mbizi	0.80	10	0.25	
Decapterus rhonchus	0.80	10	0.25	
Raja miraletus	0.50	2	0.16	
Dicologoglossa hexophthalma	0.40	10	0.12	
Saurida brasiliensis	0.20	70	0.06	
Priacanthus arenatus	0.20	20	0.06	
Syacium micrurum	0.10	10	0.03	
Boops boops	0.10	10	0.03	
Total	322.26		99.99	

PROJECT STATION: 514

DATE: 3/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 612
start stop duration Long E 227
TIME :16:55:50 17:21:42 26 (min) Purpose code: 3
LOG :7219.05 7220.30 1.18 Area code : 4
FDEPTH: 44 35 GearCond.code:
BDEPTH: 44 35 Validity code:
Towing dir: 280ø Wire out: 160 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 171.72 CATCH/HOUR: 396.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	202.50	77822	51.10	2462
Brachydeuterus auritus	66.35	11532	16.74	2464
Sardinella aurita - Juveniles	62.42	13218	15.75	2463
Trichiurus lepturus	14.77	923	3.73	
Sphyraena guachancho	8.84	35	2.23	
Sphyraena-juveniles	5.88	185	1.48	
Sepia officinalis hierredda	5.45	23	1.38	
Selene dorsalis, juveniles	5.31	808	1.34	2465
Selene dorsalis	4.41	18	1.11	
Penaeus notialis	3.35	238	0.85	
Uraspis helvola	3.02	2	0.76	
Galeoides decadactylus	2.31	35	0.58	
Lagocephalus laevigatus	1.82	2	0.46	
Pagrus caeruleostictus	1.68	14	0.42	
Balistes capriscus	1.20	2	0.30	
Trichiurus lepturus	1.18	12	0.30	
Dactylopterus volitans	0.97	2	0.24	
Pteroscion peli	0.81	23	0.20	
Pagellus bellottii	0.58	5	0.15	
Pisodonophis semicinctus	0.58	2	0.15	
Monochirus hispidus	0.46	69	0.12	
Scyllarides herklotsii	0.46	104	0.12	
Selar crumenophthalmus	0.37	2	0.09	
Syacium micrurum	0.23	35	0.06	
Trachinocephalus myops	0.23	12	0.06	
Dentex angolensis	0.23	23	0.06	
Pseudupeneus prayensis	0.23	46	0.06	
Decapterus punctatus	0.12	23	0.03	
Anthias anthias	0.12	23	0.03	
Microchirus frechkopi	0.12	12	0.03	
Serranus accraensis	0.12	12	0.03	
Grammoplites gruveli	0.12	12	0.03	
Penaeus kerathurus	0.07	2	0.02	
Total	396.31		100.01	

PROJECT STATION: 515

DATE: 3/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 614
start stop duration Long E 226
TIME :16:41:37 18:21:03 29 (min) Purpose code: 3
LOG :7223.23 7224.55 1.30 Area code : 4
FDEPTH: 25 26 GearCond.code:
BDEPTH: 25 26 Validity code:
Towing dir: 260ø Wire out: 120 m Speed: 30 kn*10

Sorted: 78 Kg Total catch: 77.71 CATCH/HOUR: 160.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Galeoides decadactylus	27.83	623	17.31	2466
Chloroscombrus chrysurus	19.55	699	12.16	2470
Dasyatis pastinaca	16.74	4	10.41	
Pagrus caeruleostictus	14.57	31	9.06	
Sphyraena-juveniles	11.32	633	7.04	2471
Brachydeuterus auritus	6.83	383	4.25	2468
Lutjanus goreensis	6.21	4	3.86	
Ephippion guttifer	5.54	6	3.45	
Drepane africana	5.13	27	3.19	
Sepia officinalis hierredda	4.92	4	3.06	
Trachinocephalus myops	4.12	139	2.56	
Ilisha africana	3.95	308	2.46	2467
Trichiurus lepturus	3.87	118	2.41	
Sepia juveniles	3.62	81	2.25	2472
Elops lacerta	3.21	17	2.00	
Eucinostomus melanopterus	2.69	68	1.67	
Sphyraena guachancho	2.28	8	1.42	
Dentex canariensis	2.03	6	1.26	
Chaetodipterus goreensis	1.82	6	1.13	
Selene dorsalis	1.68	83	1.04	2469
Caranx hippos	1.63	10	1.01	
Pseudotolithus typus	1.34	6	0.83	
Lethrinus atlanticus	1.08	2	0.67	
Sardinella maderensis	1.06	23	0.66	
Sphyraena afra	1.03	2	0.64	
Dasyatis margarita	0.99	2	0.62	
Penaeus kerathurus	0.93	48	0.58	
Alectis alexandrinus	0.81	10	0.50	
Bothus podas africanus	0.79	46	0.49	
Chilomycterus spinosus mauret.	0.64	6	0.40	
Pomadasys jubelini	0.54	2	0.34	
Cynoglossus monodi	0.39	4	0.24	
Caranx crysos	0.37	4	0.23	
Pseudupeneus prayensis	0.29	10	0.18	
Decapterus rhonchus	0.27	6	0.17	
Scomberomorus tritor	0.25	2	0.16	
Pomadasys peroteti	0.23	2	0.14	
Pteroscion peli	0.14	6	0.09	
Epinephelus aeneus	0.06	2	0.04	
Squilla mantis	0.04	2	0.02	
Total	160.79		100.00	

PROJECT STATION: 516

DATE: 4/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 606
start stop duration Long E 229
TIME :01:03:07 01:17:34 14 (min) Purpose code: 3
LOG :7275.99 7276.74 0.71 Area code : 4
FDEPTH: 99 94 GearCond.code:
BDEPTH: 99 94 Validity code:
Towing dir: 70ø Wire out: 320 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 53.34 CATCH/HOUR: 228.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	56.36	1089	24.65	2474
Dentex congoensis	49.54	1029	21.67	
Boops boops	17.61	553	7.70	2475
Sepia juveniles	17.44	1020	7.63	
Brotula barbata	17.14	107	7.50	
Sepia officinalis hierredda	16.71	39	7.31	
Pentheroscion mbizi	13.54	90	5.92	2473
Umbrina canariensis	9.13	34	3.99	
Priacanthus arenatus	7.71	64	3.37	
Pagrus caeruleostictus	5.74	13	2.51	
Trigla lyra	4.50	141	1.97	
Plesionika martia	2.36	870	1.03	
Epigonus telescopus	1.76	274	0.77	
Alloteuthis africana	1.71	514	0.75	
Promethichthys prometheus	1.20	47	0.52	
Fistularia petimba	1.16	4	0.51	
Uranoscopus polli	1.11	4	0.49	
Scorpaena scrofa	0.81	13	0.35	
Scomber japonicus	0.60	4	0.26	
Ephippion guttifer	0.51	4	0.22	
Brachydeuterus auritus Juv.	0.51	34	0.22	
Decapterus punctatus	0.43	4	0.19	
Anthias anthias	0.26	13	0.11	
Sardinella aurita - Juveniles	0.21	30	0.09	
Scyllarides sp.	0.17	4	0.07	
Microchirus frechkopi	0.13	4	0.06	
Trachurus trecae	0.13	4	0.06	
Citharus linguatula	0.09	13	0.04	
Total	228.57		99.96	

PROJECT STATION: 517

DATE: 4/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 608
start stop duration Long E 216
TIME :06:29:23 06:40:18 11 (min) Purpose code: 3
LOG :7299.74 7300.21 0.44 Area code : 4
FDEPTH: 74 71 GearCond.code:
BDEPTH: 74 71 Validity code:
Towing dir: 85ø Wire out: 240 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 108.07 CATCH/HOUR: 589.47

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	442.64	26755	75.09	2476
Decapterus punctatus	79.20	2744	13.44	2477
Dentex angolensis	9.82	115	1.67	
Squatina oculata	9.71	5	1.65	
Zeus faber	8.62	5	1.46	
Priacanthus arenatus	8.02	98	1.36	
Selar crumenophthalmus	6.22	49	1.06	
Boops boops	4.25	131	0.72	
Fistularia petimba	4.20	5	0.71	
Pagellus bellottii	3.44	49	0.58	
Pagrus caeruleostictus	3.27	16	0.55	
Scorpaena scrofa	2.62	5	0.44	
Pseudupeneus prayensis	2.45	49	0.42	
Selar crumenophthalmus	1.64	5	0.28	
Seriola dumerili	1.09	5	0.18	
Raja miraletus	0.98	5	0.17	
Alloteuthis africana	0.98	327	0.17	
Saurida brasiliensis	0.16	82	0.03	
Fistularia petimba	0.16	16	0.03	
Total	589.47		100.01	

PROJECT STATION: 518

DATE: 4/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 612
start stop duration Long E 216
TIME :08:16:06 08:45:59 30 (min) Purpose code: 3
LOG :7309.89 7311.40 1.49 Area code : 4
FDEPTH: 40 44 GearCond.code:
BDEPTH: 40 44 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 30 kn*10

Sorted: 21 Kg Total catch: 115.85 CATCH/HOUR: 231.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	130.40	23300	56.28	2479
Trichiurus lepturus	30.48	968	13.15	
Selene dorsalis	18.48	160	7.98	2480
Penaeus notialis	17.14	1150	7.40	2478
Squatina oculata	10.50	2	4.53	
Sepia officinalis hierredda	3.82	6	1.65	
Octopus vulgaris	2.86	2	1.23	
Pisodonophis semicinctus	2.58	4	1.11	
Torpedo torpedo	1.82	2	0.79	
Pagellus bellottii	1.52	16	0.66	
Sphyraena guachancho	1.44	24	0.62	
Scomberomorus tritor	1.38	2	0.60	
Syacium micrurum	1.28	88	0.55	
Scyllarides herklotsii	1.04	216	0.45	
Portunus validus	1.02	2	0.44	
Epinephelus aeneus	0.94	4	0.41	
Cynoglossus monodi	0.80	2	0.35	
Psettodes belcheri	0.58	2	0.25	
Trachinocephalus myops	0.56	32	0.24	
Grammoplites gruveli	0.56	24	0.24	
Decapterus punctatus	0.48	16	0.21	
Sardinella aurita	0.40	8	0.17	
Anthias anthias	0.32	88	0.14	
Aluterus monoceros	0.32	2	0.14	
Monochirus hispidus	0.24	32	0.10	
Sicyonia galeata	0.16	104	0.07	
Bothus podas africanus	0.16	8	0.07	
Antennarius sp.	0.16	32	0.07	
Cynoponticus ferox	0.10	2	0.04	
Scorpaena scrofa	0.08	8	0.03	
GOBIIDAE	0.08	24	0.03	
Total	231.70		100.00	

PROJECT STATION: 519

DATE: 4/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 614
start stop duration Long E 216
TIME :09:48:05 10:18:34 30 (min) Purpose code: 3
LOG :7317.18 7318.73 1.53 Area code : 4
FDEPTH: 26 25 GearCond.code:
BDEPTH: 26 25 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 30 kn*10

Sorted: 39 Kg Total catch: 38.92 CATCH/HOUR: 77.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ephippion guttifer	34.00	24	43.68	
Pagrus caeruleostictus	16.08	40	20.66	2481
Lagocephalus laevigatus	6.18	8	7.94	
Drepane africana	3.98	20	5.11	
Dentex canariensis	2.94	4	3.78	
Selene dorsalis	2.92	20	3.75	
Sepia officinalis hierredda	2.38	2	3.06	
Chlamys purpuratus	2.08	160	2.67	
Aluterus monoceros	1.48	2	1.90	
Scomberomorus tritor	1.34	2	1.72	
Portunus validus	1.20	2	1.54	
Chloroscombrus chrysurus	0.78	8	1.00	
Sphyraena sphyraena	0.68	4	0.87	
Alectis alexandrinus	0.48	6	0.62	
Caranx hippos	0.40	2	0.51	
Cynoponticus ferox	0.36	2	0.46	
Brachydeuterus auritus	0.26	4	0.33	
Trachinocephalus myops	0.12	4	0.15	
Galeoides decadactylus	0.10	2	0.13	
Raja miraletus	0.06	2	0.08	
'Spider crab'	0.02	2	0.03	
Total	77.84		99.99	

PROJECT STATION: 520

DATE: 4/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 617
start stop duration Long E 208
TIME :11:32:45 12:02:15 30 (min) Purpose code: 3
LOG :7326.59 7328.06 1.44 Area code : 4
FDEPTH: 17 17 GearCond.code:
BDEPTH: 17 17 Validity code:
Towing dir: 270ø Wire out: 100 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 33.78 CATCH/HOUR: 67.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	13.02	258	19.27	
Pseudotolithus senegalensis	7.86	56	11.63	2491
Pomadasys peroteti	7.26	20	10.75	
Dasyatis margarita	4.58	4	6.78	
Chloroscombrus chrysurus	4.40	118	6.51	2483
Pentanemus quinquarius	3.42	80	5.06	
Galeoides decadactylus	2.98	98	4.41	2488
Pseudotolithus typus	2.90	20	4.29	2490
Brachydeuterus auritus	2.82	66	4.17	2485
Pteroscion peli	2.14	106	3.17	2489
Lethrinus atlanticus	2.06	10	3.05	
Sphyraena guachancho	1.90	18	2.81	
Sardinella maderensis	1.08	46	1.60	2482
Lutjanus goreensis	0.98	4	1.45	
Selene dorsalis	0.96	48	1.42	2486
Drepane africana	0.86	14	1.27	
Lutjanus fulgens	0.82	44	1.21	2487
Ilisha africana	0.82	68	1.21	2484
Decapterus punctatus	0.80	2	1.18	
Scomberomorus tritor	0.74	6	1.10	
Myrichthys perdalis	0.70	2	1.04	
Ephippion guttifer	0.68	6	1.01	
Pagrus caeruleostictus	0.64	2	0.95	
Chilomycterus spinosus mauret.	0.60	2	0.89	
Parapenaeus longirostris	0.58	108	0.86	
Caranx hippos	0.48	2	0.71	
Eucinostomus melanopterus	0.42	2	0.62	
Sepia officinalis hierredda	0.34	4	0.50	
Elops lacerta	0.26	2	0.38	
Callinectes pallidus	0.18	4	0.27	
Penaeus kerathurus	0.16	6	0.24	
Lagocephalus laevigatus	0.12	4	0.18	
Total	67.56		99.99	

PROJECT STATION: 521

DATE: 4/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 611
start stop duration Long E 206
TIME :13:13:41 13:43:23 30 (min) Purpose code: 3
LOG :7335.70 7337.25 1.52 Area code : 4
FDEPTH: 45 41 GearCond.code:
BDEPTH: 45 41 Validity code:
Towing dir: 265ø Wire out: 180 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 137.67 CATCH/HOUR: 275.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagellus bellottii	68.46	554	24.86	2493
Carcharhinus sp.	45.90	24	16.67	
Pomadasys incisus	42.32	280	15.37	2492
Sepia officinalis hierredda	23.80	80	8.64	
Brachydeuterus auritus	13.60	202	4.94	2494
Dasyatis marmorata	12.46	4	4.53	
Cynoponticus ferox	10.50	18	3.81	
Fistularia petimba	9.06	48	3.29	
Dactylopterus volitans	6.24	24	2.27	
Epinephelus aeneus	6.18	18	2.24	
Torpedo torpedo	6.00	8	2.18	
Psettodes belcheri	4.28	10	1.55	
Pomadasys peroteti	2.74	8	1.00	
Trichiurus lepturus	2.34	30	0.85	
Aluterus monoceros	2.10	6	0.76	
Stromateus fiatola	2.04	12	0.74	
Syacium micrurum	1.98	36	0.72	
Sphyraena guachancho	1.92	18	0.70	
Myrichthys perdalis	1.92	6	0.70	
Pagrus pagrus	1.86	18	0.68	
Pseudupeneus prayensis	1.50	18	0.54	
Selene dorsalis	1.38	12	0.50	
Lutjanus fulgens	1.38	18	0.50	
Apsilus fuscus	1.32	6	0.48	
Penaeus notialis	1.20	12	0.44	
Priacanthus arenatus	1.14	6	0.41	
Trachinocephalus myops	0.48	6	0.17	
Uranoscopus polli	0.18	6	0.07	
Ephippion guttifer	0.18	6	0.07	
Total	274.46		99.68	

PROJECT STATION: 522

DATE: 4/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 607
start stop duration Long E 206
TIME :15:12:28 15:39:49 27 (min) Purpose code: 3
LOG :7346.00 7347.34 1.31 Area code : 4
FDEPTH: 85 83 GearCond.code:
BDEPTH: 85 83 Validity code:
Towing dir: 90ø Wire out: 280 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 63.35 CATCH/HOUR: 140.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	61.11	1627	43.41	2496
Dentex angolensis	40.00	1138	28.41	2495
Sepia officinalis hierredda	14.22	22	10.10	
Fistularia petimba	8.84	22	6.28	
Priacanthus arenatus	7.42	120	5.27	2497
Raja miraletus	2.51	7	1.78	
Trachurus trecae	2.40	31	1.70	
Loligo vulgaris	1.47	240	1.04	
Apsilus fuscus	0.93	18	0.66	
Scomber japonicus	0.44	4	0.31	
Decapterus punctatus	0.40	9	0.28	
Ariomma bondi	0.40	4	0.28	
Octopus vulgaris	0.38	2	0.27	
Sphoeroides marmoratus	0.24	7	0.17	
Total	140.76		99.96	

PROJECT STATION: 523

DATE: 4/ 6/04 GEAR TYPE: PT No: 7 POSITION:Lat N 612
start stop duration Long E 201
TIME :21:33:45 22:03:14 29 (min) Purpose code: 1
LOG :7377.93 7379.52 1.19 Area code : 4
FDEPTH: 0 0 GearCond.code:
BDEPTH: 26 32 Validity code:
Towing dir: 229ø Wire out: 120 m Speed: kn*10

Sorted: 2 Kg Total catch: 2.02 CATCH/HOUR: 4.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	2.13	286	50.96	2498
Engraulis encrasicolus	0.91	943	21.77	2499
Selene dorsalis	0.41	2	9.81	
Selar crumenophthalmus	0.31	10	7.42	
Ariomma bondi	0.27	4	6.46	
Trachurus trecae	0.14	2	3.35	
Total	4.17		99.77	

PROJECT STATION: 524

DATE: 5/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 607
start stop duration Long E 156
TIME :06:17:05 06:47:00 30 (min) Purpose code: 3
LOG :7401.86 7403.30 1.42 Area code : 4
FDEPTH: 64 62 GearCond.code:
BDEPTH: 64 62 Validity code:
Towing dir: 265ø Wire out: 220 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 50.35 CATCH/HOUR: 100.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Fistularia petimba	20.90	128	20.75	
Pagellus bellottii	14.04	142	13.94	2502
Decapterus punctatus	10.48	550	10.41	2501
Alloteuthis africana	10.44	3952	10.37	
Sepia officinalis hierredda	8.80	14	8.74	
Epinephelus aeneus	7.20	4	7.15	
Dentex angolensis	7.14	50	7.09	2503
Sardinella aurita	7.06	242	7.01	2500
Mustelus mustelus	5.14	4	5.10	
Sphyraena sphyraena	2.30	10	2.28	
Priacanthus arenatus	2.06	12	2.05	
Octopus vulgaris	1.42	4	1.41	
Dentex canariensis	0.92	2	0.91	
Pagrus caeruleostictus	0.86	4	0.85	
Pseudupeneus prayensis	0.84	16	0.83	
Trachurus trachurus	0.52	6	0.52	
Selene dorsalis	0.46	2	0.46	
Lepidotrigla cadmani	0.12	2	0.12	
Total	100.70		99.99	

PROJECT STATION: 525

DATE: 5/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 611
start stop duration Long E 157
TIME :08:11:52 08:41:44 30 (min) Purpose code: 3
LOG :7411.07 7412.55 1.46 Area code : 4
FDEPTH: 33 32 GearCond.code:
BDEPTH: 33 32 Validity code:
Towing dir: 260ø Wire out: 130 m Speed: 30 kn*10

Sorted: 51 Kg Total catch: 50.62 CATCH/HOUR: 101.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex canariensis	44.60	88	44.05	2504
Lutjanus fulgens	16.00	512	15.80	2505
Pagrus caeruleostictus	9.98	20	9.86	
Scomberomorus tritor	7.64	8	7.55	
Alectis alexandrinus	5.92	12	5.85	
Epinephelus aeneus	4.70	2	4.64	
Sphyraena guachancho	3.28	10	3.24	
Acanthurus monroviae	2.12	4	2.09	
Sepia officinalis hierredda	1.90	6	1.88	
Albula vulpes	1.88	2	1.86	
Aluterus monoceros	0.72	2	0.71	
Priacanthus arenatus	0.64	4	0.63	
Pseudupeneus prayensis	0.56	8	0.55	
Pagellus bellottii	0.44	4	0.43	
Fistularia petimba	0.38	2	0.38	
Stephanolepis hispidus	0.28	2	0.28	
Decapterus punctatus	0.16	8	0.16	
Remora remora	0.02	2	0.02	
Apsilus fuscus	0.02	2	0.02	
Total	101.24		100.00	

PROJECT STATION: 526

DATE: 5/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 613
start stop duration Long E 156
TIME :09:43:09 10:13:42 31 (min) Purpose code: 3
LOG :7418.31 7419.92 1.59 Area code : 4
FDEPTH: 22 23 GearCond.code:
BDEPTH: 22 23 Validity code:
Towing dir: 260ø Wire out: 120 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 78.22 CATCH/HOUR: 151.39

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sphyraena-juveniles	32.26	809	21.31	2511
Sphyraena guachancho	18.62	91	12.30	2512
Ilisha africana	12.52	2472	8.27	2510
Engraulis encrasicolus	11.03	8425	7.29	2508
Galeoides decadactylus	9.23	213	6.10	2509
Drepane africana	8.65	39	5.71	
Chloroscombrus chrysurus	7.30	2506	4.82	2507
Elops lacerta	5.57	17	3.68	
Brachydeuterus auritus	4.88	110	3.22	2506
Pteroscion peli	3.87	135	2.56	
Selene dorsalis	3.81	261	2.52	2513
Trichiurus lepturus	3.77	726	2.49	
Pseudotolithus typus	3.54	2	2.34	
Sphyraena afra	3.31	2	2.19	
Scomberomorus tritor	3.08	6	2.03	
Ephippion guttifer	2.32	2	1.53	
Arius latiscutatus	2.15	2	1.42	
Pseudotolithus senegalensis	2.13	19	1.41	
Sepia officinalis hierredda	1.65	6	1.09	
Lethrinus atlanticus	1.26	2	0.83	
Aluterus monoceros	1.22	2	0.81	
Selar crumenophthalmus	1.16	4	0.77	
Pomadasys peroteti	1.06	4	0.70	
Sardinella maderensis	0.97	91	0.64	
Sardinella aurita - Juveniles	0.91	542	0.60	2514
Caranx senegallus	0.87	4	0.57	
Trachinocephalus myops	0.81	48	0.54	
Parapenaeopsis atlantica	0.77	145	0.51	
Pagrus caeruleostictus	0.66	2	0.44	
Chaetodipterus goreensis	0.62	10	0.41	
Raja miraletus	0.52	4	0.34	
Eucinostomus melanopterus	0.39	4	0.26	
Alectis alexandrinus	0.23	4	0.15	
Cynoglossus monodi	0.14	4	0.09	
Bothus podas africanus	0.10	4	0.07	
Total	151.38		100.01	

PROJECT STATION: 527

DATE: 5/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 613
start stop duration Long E 147
TIME :11:20:18 11:50:03 30 (min) Purpose code: 3
LOG :7426.96 7428.57 1.57 Area code : 4
FDEPTH: 19 18 GearCond.code:
BDEPTH: 19 18 Validity code:
Towing dir: 260ø Wire out: 120 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 111.03 CATCH/HOUR: 222.06

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sphyraena guachancho	60.90	494	27.43	2516
Brachydeuterus auritus	48.60	1044	21.89	2517
Polydactylus quadrifilis	29.80	2	13.42	
Chloroscombrus chrysurus	17.76	686	8.00	2515
Pseudotolithus typus	12.90	108	5.81	
Trichiurus lepturus	10.26	258	4.62	
Sphyraena guachancho	8.82	12	3.97	
Scomberomorus tritor	7.56	42	3.40	
Selene dorsalis	6.72	314	3.03	2519
Galeoides decadactylus	5.76	120	2.59	
Decapterus punctatus	2.70	24	1.22	
Sardinella maderensis	1.98	126	0.89	
Ilisha africana	1.70	208	0.77	2518
Drepane africana	1.68	30	0.76	
Pteroscion peli	1.62	54	0.73	
Hemicaranx bicolor	1.26	12	0.57	
Elops lacerta	0.66	6	0.30	
Ephippion guttifer	0.54	12	0.24	
Pentanemus quinquarius	0.48	12	0.22	
Parapenaeus longirostris	0.12	24	0.05	
Pseudupeneus prayensis	0.12	6	0.05	
Lagocephalus laevigatus	0.12	6	0.05	
Total	222.06		100.01	

PROJECT STATION: 528

DATE: 5/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 608
start stop duration Long E 146
TIME :12:51:00 13:19:00 28 (min) Purpose code: 3
LOG :7434.80 7436.30 1.50 Area code : 4
FDEPTH: 44 46 GearCond.code:
BDEPTH: 44 46 Validity code:
Towing dir: 180ø Wire out: 150 m Speed: 30 kn*10

Sorted: 40 Kg Total catch: 100.74 CATCH/HOUR: 215.87

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Selene dorsalis	95.85	407	44.40	2521
Brachydeuterus auritus	84.24	1279	39.02	2520
Sepia officinalis hierredda	13.29	21	6.16	
Stromateus fiatola	4.18	4	1.94	
Trichiurus lepturus	3.99	28	1.85	
Pomadasys incisus	3.15	26	1.46	
Pomadasys peroteti	2.53	2	1.17	
Pagellus bellottii	2.34	4	1.08	
Syacium micrurum	1.35	34	0.63	
Epinephelus aeneus	0.99	4	0.46	
Raja miraletus	0.88	2	0.41	
Sphyraena guachancho	0.73	4	0.34	
Galeoides decadactylus	0.54	11	0.25	
Pagrus caeruleostictus	0.54	11	0.25	
Lutjanus fulgens	0.39	4	0.18	
Chloroscombrus chrysurus	0.39	4	0.18	
Alloteuthis africana	0.39	131	0.18	
Trichiurus lepturus	0.15	4	0.07	
Total	215.92		100.03	

PROJECT STATION: 529

DATE: 5/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 605
start stop duration Long E 146
TIME :14:18:25 14:49:23 31 (min) Purpose code: 3
LOG :7440.75 7442.41 1.64 Area code : 4
FDEPTH: 63 63 GearCond.code:
BDEPTH: 63 63 Validity code:
Towing dir: 265ø Wire out: 215 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 43.80 CATCH/HOUR: 84.77

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Alloteuthis africana	24.77	8477	29.22	
Fistularia petimba	24.17	95	28.51	
Epinephelus aeneus	11.03	2	13.01	
Sardinella aurita	9.60	2265	11.32	2522
Sepia officinalis hierredda	6.10	8	7.20	
Decapterus punctatus	5.25	223	6.19	2521
Squatina oculata	1.39	2	1.64	
Pagellus bellottii	1.18	17	1.39	
Trachurus trecae	0.72	10	0.85	
Trigla lyra	0.17	6	0.20	
Pagrus caeruleostictus	0.12	2	0.14	
Boops boops	0.10	4	0.12	
Pseudupeneus prayensis	0.08	2	0.09	
Citharus linguatula	0.08	2	0.09	
Syacium micrurum	0.02	2	0.02	
Total	84.78		99.99	

PROJECT STATION: 530

DATE: 5/ 6/04 GEAR TYPE: PT No: 7 POSITION:Lat N 608
start stop duration Long E 141
TIME :21:53:47 22:23:00 29 (min) Purpose code: 1
LOG :7473.56 7475.11 1.54 Area code : 4
FDEPTH: 0 0 GearCond.code:
BDEPTH: 32 45 Validity code:
Towing dir: 212ø Wire out: 100 m Speed:320 kn*10

Sorted: 9 Kg Total catch: 9.28 CATCH/HOUR: 19.20

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	8.21	8214	42.76	2523
Sardinella maderensis	4.22	2026	21.98	2524
Sphyraena sphyraena	2.50	8	13.02	
Scomberomorus tritor	1.74	2	9.06	
Raja miraletus	1.01	2	5.26	
Fistularia petimba	0.91	2	4.74	
Selar crumenophthalmus	0.50	10	2.60	
Ilisha africana	0.10	2	0.52	
Total	19.19		99.94	

PROJECT STATION: 531

DATE: 6/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 602
start stop duration Long E 134
TIME :06:24:01 06:54:04 30 (min) Purpose code: 3
LOG :7494.22 7495.77 1.52 Area code : 3
FDEPTH: 67 68 GearCond.code:
BDEPTH: 67 68 Validity code:
Towing dir: 80ø Wire out: 240 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 58.40 CATCH/HOUR: 116.80

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sardinella aurita	24.30	606	20.80	2525
Dentex angolensis	24.00	228	20.55	2526
Fistularia petimba	16.20	88	13.87	
Decapterus punctatus	15.98	304	13.68	2527
Sepia officinalis hierredda	11.30	26	9.67	
Selar crumenophthalmus	9.70	46	8.30	2528
Priacanthus arenatus	5.12	78	4.38	2529
Squatina oculata	2.82	4	2.41	
Pagellus bellottii	1.58	18	1.35	
Dentex congoensis	1.34	42	1.15	2530
Sphyraena sphyraena	1.18	4	1.01	
Pagrus caeruleostictus	1.12	8	0.96	
Alloteuthis africana	1.04	358	0.89	
Scomber japonicus	0.40	4	0.34	
Trachurus trecae	0.24	2	0.21	
Pseudupeneus prayensis	0.22	4	0.19	
Lepidotrigla carolae	0.14	2	0.12	
Boops boops	0.12	4	0.10	
Total	116.80		99.98	

PROJECT STATION: 532

DATE: 6/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 606
start stop duration Long E 136
TIME :09:04:50 09:35:00 30 (min) Purpose code: 3
LOG :7503.32 7504.76 1.43 Area code : 3
FDEPTH: 41 41 GearCond.code:
BDEPTH: 41 41 Validity code:
Towing dir: 250ø Wire out: 140 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 79.71 CATCH/HOUR: 159.42

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	43.20	804	27.10	2532
Trichiurus lepturus	28.32	1172	17.76	
Selene dorsalis	21.84	120	13.70	2534
Sepia officinalis hierredda	15.80	50	9.91	2531
Pagellus bellottii	9.56	80	6.00	2533
Pomadasys incisus	4.20	40	2.63	
Raja miraletus	4.12	8	2.58	
Syacium micrurum	3.76	72	2.36	
Pomadasys peroteti	3.44	4	2.16	
Balistes capriscus	2.88	8	1.81	
Cynoponticus ferox	2.44	2	1.53	
Psettodes belcheri	2.02	2	1.27	
Chilomycterus spinosus mauret.	2.00	4	1.25	
Epinephelus aeneus	2.00	6	1.25	
Alloteuthis africana	1.96	592	1.23	
Pagrus caeruleostictus	1.78	12	1.12	
Dactylopterus volitans	1.76	8	1.10	
Stromateus fiatola	1.40	2	0.88	
Fistularia petimba	1.12	8	0.70	
Aluterus monoceros	1.12	4	0.70	
Priacanthus arenatus	1.00	4	0.63	
Acanthurus monroviae	0.74	2	0.46	
Cynoglossus senegalensis	0.70	2	0.44	
Torpedo torpedo	0.68	4	0.43	
Pisodonophis semicinctus	0.62	2	0.39	
Dicologoglossa hexophthalma	0.40	4	0.25	
Decapterus punctatus	0.32	4	0.20	
Grammoplites gruveli	0.08	4	0.05	
Monochirus hispidus	0.08	4	0.05	
Calappa rubroguttata	0.08	4	0.05	
Total	159.42		99.99	

PROJECT STATION: 533

DATE: 6/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 609
start stop duration Long E 136
TIME :10:33:34 11:03:59 30 (min) Purpose code: 3
LOG :7510.18 7511.63 1.43 Area code : 3
FDEPTH: 22 21 GearCond.code:
BDEPTH: 22 21 Validity code:
Towing dir: 260ø Wire out: 120 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 83.03 CATCH/HOUR: 166.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	25.80	448	15.54	2538
Engraulis encrasicolus	24.28	30956	14.62	2535
Sphyraena-juveniles	14.64	354	8.82	2540
Galeoides decadactylus	13.68	196	8.24	2543
Lethrinus atlanticus	12.22	26	7.36	
Chloroscombrus chrysurus	11.20	422	6.74	2536
Selene dorsalis	6.48	104	3.90	2539
Pomadasys jubelini	6.12	6	3.69	
Dasyatis margarita	5.90	8	3.55	
Ilisha africana	5.40	1766	3.25	2541
Drepane africana	4.88	28	2.94	
Elops lacerta	4.12	16	2.48	
Pseudotolithus senegalensis	3.50	10	2.11	
Sphyraena guachancho	3.46	18	2.08	
Alectis alexandrinus	2.92	76	1.76	2537
Pagrus caeruleostictus	2.64	8	1.59	
Trichiurus lepturus	1.76	104	1.06	
Pteroscion peli	1.56	44	0.94	
Sepia officinalis hierredda	1.54	6	0.93	
Caranx hippos	1.48	8	0.89	
Trachinocephalus myops	1.48	48	0.89	
Aluterus heudelotii	1.28	4	0.77	
Stephanolepis hispidus	1.00	4	0.60	
Caranx crysos	1.00	4	0.60	
Dactylopterus volitans	0.92	2	0.55	
Sphyraena sphyraena	0.86	4	0.52	
Dentex canariensis	0.84	4	0.51	
Raja miraletus	0.76	2	0.46	
Ephippion guttifer	0.76	2	0.46	
Pseudupeneus prayensis	0.60	8	0.36	
Scomberomorus tritor	0.52	4	0.31	
Bothus podas africanus	0.48	16	0.29	
Pomadasys incisus	0.44	4	0.26	
Sardinella maderensis - Juv.	0.40	220	0.24	2542
Dicologoglossa hexophthalma	0.28	4	0.17	
Scorpaena scrofa	0.26	2	0.16	
Decapterus punctatus	0.24	4	0.14	
Sphoeroides marmoratus	0.20	4	0.12	
Pisodonophis semicinctus	0.08	2	0.05	
Chlamys purpuratus	0.08	4	0.05	
Total	166.06		100.00	

PROJECT STATION: 534

DATE: 6/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 606
start stop duration Long E 126
TIME :12:23:11 12:53:12 30 (min) Purpose code: 3
LOG :7520.80 7522.31 1.49 Area code : 3
FDEPTH: 24 24 GearCond.code:
BDEPTH: 24 24 Validity code:
Towing dir: 260ø Wire out: 120 m Speed: 30 kn*10

Sorted: 101 Kg Total catch: 100.55 CATCH/HOUR: 201.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	43.50	92	21.63	2544
Lutjanus goreensis	35.00	34	17.40	2545
Dentex canariensis	28.90	60	14.37	2548
Lethrinus atlanticus	26.20	104	13.03	2547
Chaetodipterus goreensis	16.40	2	8.16	
Pagrus caeruleostictus	15.50	48	7.71	2546
Scomberomorus tritor	4.70	10	2.34	
Engraulis encrasicolus	3.18	2458	1.58	2549
Sepia officinalis hierredda	2.66	2	1.32	
Acanthurus monroviae	2.64	6	1.31	
Sphyraena afra	2.24	2	1.11	
Chloroscombrus chrysurus	2.14	20	1.06	
Aluterus heudelotii	1.80	6	0.90	
Ephippion guttifer	1.76	2	0.88	
Caranx hippos	1.76	2	0.88	
Bodianus speciosus	1.36	2	0.68	
Albula vulpes	1.30	2	0.65	
Lutjanus fulgens	1.26	14	0.63	
Dasyatis margarita	1.10	2	0.55	
Elops lacerta	1.02	2	0.51	
Balistes punctatus	0.92	2	0.46	
Selene dorsalis	0.88	6	0.44	
Uranoscopus polli	0.68	2	0.34	
Drepane africana	0.66	4	0.33	
Acanthostracion quadricornis	0.60	2	0.30	
Galeoides decadactylus	0.60	6	0.30	
Sardinella maderensis - Juv.	0.46	302	0.23	2550
Stephanolepis hispidus	0.44	2	0.22	
Decapterus punctatus	0.42	2	0.21	
Trachinocephalus myops	0.40	4	0.20	
Brachydeuterus auritus	0.34	4	0.17	
Bothus podas africanus	0.22	6	0.11	
Sardinella maderensis	0.04	2	0.02	
Total	201.08		100.03	

PROJECT STATION: 535

DATE: 6/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 604
start stop duration Long E 126
TIME :13:35:17 14:05:16 30 (min) Purpose code: 3
LOG :7525.76 7527.35 1.57 Area code : 3
FDEPTH: 43 42 GearCond.code:
BDEPTH: 43 42 Validity code:
Towing dir: 76ø Wire out: 170 m Speed: 30 kn*10

Sorted: 105 Kg Total catch: 105.47 CATCH/HOUR: 210.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	74.60	342	35.37	2552
Trichiurus lepturus	58.50	1258	27.73	
Brachydeuterus auritus	17.80	300	8.44	2556
Pagellus bellottii	16.80	188	7.96	2554
Pagrus caeruleostictus	14.08	78	6.67	2551
Sphyraena guachancho	6.06	24	2.87	
Pomadasys peroteti	4.50	6	2.13	
Lutjanus goreensis	4.50	4	2.13	
Sepia officinalis hierredda	3.18	8	1.51	
Raja miraletus	1.76	4	0.83	
Aluterus monoceros	1.20	2	0.57	
Torpedo torpedo	1.06	2	0.50	
Dactylopterus volitans	0.94	4	0.45	
Selar crumenophthalmus	0.92	4	0.44	
Decapterus punctatus	0.80	236	0.38	2553
Chaetodipterus goreensis	0.74	2	0.35	
Balistes capriscus	0.68	2	0.32	
Syacium micrurum	0.66	18	0.31	
Sardinella aurita - Juveniles	0.44	82	0.21	2555
Pseudupeneus prayensis	0.36	6	0.17	
Alloteuthis africana	0.36	122	0.17	
Dentex canariensis	0.34	2	0.16	
Chelidonichthys gabonensis	0.32	4	0.15	
Pomadasys incisus	0.14	2	0.07	
Eucinostomus melanopterus	0.10	2	0.05	
Engraulis encrasicolus	0.08	46	0.04	
Anthias anthias	0.02	2	0.01	
Total	210.94		99.99	

PROJECT STATION: 536

DATE: 6/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 602
start stop duration Long E 127
TIME :14:53:27 15:24:35 31 (min) Purpose code: 3
LOG :7531.41 7533.00 1.58 Area code : 3
FDEPTH: 53 53 GearCond.code:
BDEPTH: 53 53 Validity code:
Towing dir: 256ø Wire out: 185 m Speed: 30 kn*10

Sorted: 71 Kg Total catch: 71.38 CATCH/HOUR: 138.15

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	66.77	108	48.33	2557
Pagrus caeruleostictus	18.10	232	13.10	2559
Pagellus bellottii	15.39	145	11.14	2558
Fistularia petimba	13.94	103	10.09	
Squatina oculata	8.81	2	6.38	
Alloteuthis africana	5.83	2286	4.22	
Priacanthus arenatus	2.01	23	1.45	
Sphyraena sphyraena	1.99	8	1.44	
Pseudupeneus prayensis	1.61	25	1.17	
Balistes capriscus	1.06	2	0.77	
Raja miraletus	0.70	2	0.51	
Dentex canariensis	0.50	2	0.36	
Selene dorsalis	0.35	2	0.25	
Sphyraena guachancho	0.35	2	0.25	
Brachydeuterus auritus	0.29	4	0.21	
Decapterus punctatus	0.25	6	0.18	
Dentex gibbosus	0.19	2	0.14	
Trigla lyra	0.02	2	0.01	
Total	138.16		100.00	

PROJECT STATION: 537

DATE: 6/ 6/04 GEAR TYPE: PT No: 7 POSITION:Lat N 602
start stop duration Long E 122
TIME :22:11:32 22:41:02 30 (min) Purpose code: 1
LOG :7560.97 7562.29 1.30 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 45 50 Validity code:
Towing dir: 200ø Wire out: 120 m Speed: 30 kn*10

Sorted: 2 Kg Total catch: 1.92 CATCH/HOUR: 3.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ariomma bondi	1.70	28	44.27	
Todaropsis eblanae	1.08	4	28.13	
Selar crumenophthalmus	0.80	6	20.83	
Sardinella maderensis	0.26	28	6.77	
Total	3.84		100.00	

PROJECT STATION: 538

DATE: 7/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 554

	start	stop	duration			Long E 116
TIME	:00:36:47	01:06:34	30	(min)	Purpose code:	3
LOG	:7575.07	7576.59	1.50		Area code :	3
FDEPTH:	201	255			GearCond.code:	
BDEPTH:	201	255			Validity code:	

Towing dir: 50ø Wire out: 605 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 97.72 CATCH/HOUR: 195.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Promethichthys prometheus	63.40	488	32.44	
Squatina oculata	39.00	34	19.95	
Dentex angolensis	15.70	50	8.03	2560
Brotula barbata	14.30	22	7.32	
Illex coindetii	9.64	60	4.93	
Centrophorus squamosus	5.90	4	3.02	
Aristeus varidens	5.36	324	2.74	
Chlorophthalmus atlanticus	5.12	24	2.62	
Chelidonichthys gabonensis	4.12	56	2.11	
Zenion hololepis	3.92	220	2.01	
Torpedo marmorata	3.88	4	1.99	
Pentheroscion mbizi	3.36	16	1.72	
Pterothrissus belloci	3.20	20	1.64	
Umbrina canariensis	3.20	10	1.64	
Uranoscopus cadenati	2.56	20	1.31	
MYCTOPHIDAE	2.00	320	1.02	
Zenopsis conchifer	2.00	4	1.02	
Hoplostethus cadenati	1.56	676	0.80	
Scorpaena scrofa	1.04	4	0.53	
Antigonia capros	1.00	60	0.51	
Peristedion cataphractum	1.00	32	0.51	
Aulopus cadenati	0.96	264	0.49	
Parapenaeus longirostris	0.72	176	0.37	
Spicara alta	0.62	4	0.32	
Decapterus punctatus	0.60	8	0.31	
Priacanthus arenatus	0.48	4	0.25	
Trichiurus lepturus	0.40	4	0.20	
Erythrocles monodi	0.20	4	0.10	
Gephyroberyx darwini	0.20	4	0.10	
Total	195.44		100.00	

PROJECT STATION: 540

DATE: 7/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 602

	start	stop	duration			Long E 117
TIME	:08:01:41	08:31:28	30	(min)	Purpose code:	3
LOG	:7597.71	7599.17	1.44		Area code :	3
FDEPTH:	36	35			GearCond.code:	
BDEPTH:	36	35			Validity code:	

Towing dir: 250ø Wire out: 150 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 27.52 CATCH/HOUR: 55.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	23.60	80	42.88	2566
Balistes capriscus	8.38	12	15.23	
Sphyraena afra	4.42	4	8.03	
Dentex canariensis	4.30	6	7.81	
Pagellus bellottii	2.20	20	4.00	
Selar crumenophthalmus	1.80	14	3.27	
Aluterus monoceros	1.68	2	3.05	
Priacanthus arenatus	1.26	12	2.29	
Pseudupeneus prayensis	1.18	14	2.14	
Torpedo torpedo	0.96	2	1.74	
Sphyraena sphyraena	0.94	4	1.71	
Decapterus punctatus	0.88	30	1.60	
Brachydeuterus auritus	0.82	22	1.49	
Sepia officinalis hierredda	0.74	2	1.34	
Syacium micrurum	0.46	2	0.84	
Alloteuthis africana	0.38	96	0.69	
Stephanolepis hispidus	0.36	2	0.65	
Fistularia petimba	0.24	4	0.44	
Trichiurus lepturus	0.22	6	0.40	
Pagrus caeruleostictus	0.18	4	0.33	
Lagocephalus laevigatus	0.04	2	0.07	
Total	55.04		100.00	

PROJECT STATION: 539

DATE: 7/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 558

	start	stop	duration			Long E 117
TIME	:06:19:14	06:49:13	30	(min)	Purpose code:	3
LOG	:7591.26	7592.80	1.53		Area code :	3
FDEPTH:	52	52			GearCond.code:	
BDEPTH:	52	52			Validity code:	

Towing dir: 50ø Wire out: 200 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 65.98 CATCH/HOUR: 131.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	52.60	136	39.86	2565
Pagellus bellottii	38.70	450	29.33	2562
Pagrus caeruleostictus	8.46	114	6.41	2563
Decapterus punctatus	7.00	238	5.30	2564
Fistularia petimba	6.28	56	4.76	
Alloteuthis africana	4.78	2060	3.62	
Priacanthus arenatus	4.54	96	3.44	2561
Epinephelus aeneus	4.06	4	3.08	
Balistes punctatus	2.64	4	2.00	
Pseudupeneus prayensis	1.40	24	1.06	
Syacium micrurum	0.58	2	0.44	
Dactylopterus volitans	0.52	2	0.39	
Chilomycterus spinosus mauret.	0.32	2	0.24	
Sphoeroides marmoratus	0.08	2	0.06	
Total	131.96		99.99	

PROJECT STATION: 541

DATE: 7/ 6/04 GEAR TYPE: BT No: 8 POSITION:Lat N 602

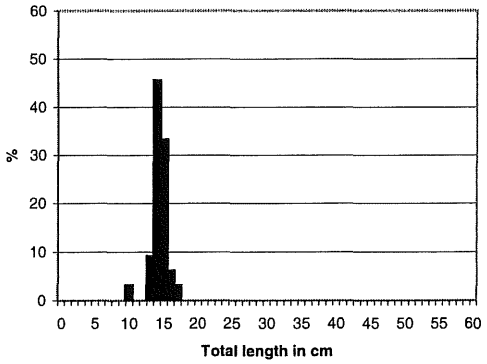
	start	stop	duration			Long E 116
TIME	:09:22:27	09:52:12	30	(min)	Purpose code:	3
LOG	:7602.68	7604.14	1.45		Area code :	3
FDEPTH:	28	28			GearCond.code:	
BDEPTH:	28	28			Validity code:	

Towing dir: 250ø Wire out: 140 m Speed: 30 kn*10

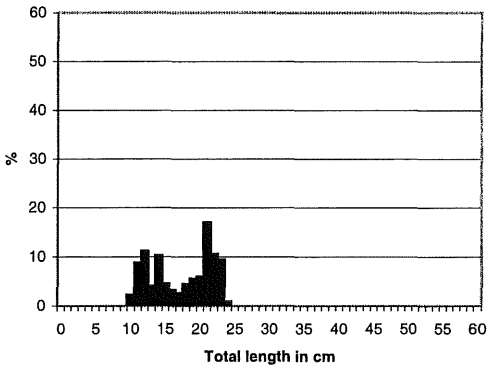
Sorted: 15 Kg Total catch: 14.91 CATCH/HOUR: 29.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Aluterus monoceros	9.80	10	32.86	
Balistes capriscus	7.88	12	26.43	
Sphyraena afra	3.48	4	11.67	
Chlamys purpuratus	2.96	184	9.93	
Sepia officinalis hierredda	1.76	2	5.90	
Aluterus heudelotii	1.18	4	3.96	
Fistularia petimba	0.90	8	3.02	
Dactylopterus volitans	0.84	2	2.82	
Lagocephalus laevigatus	0.46	2	1.54	
Pagellus bellottii	0.32	2	1.07	
Pagrus caeruleostictus	0.16	2	0.54	
Decapterus punctatus	0.08	2	0.27	
Total	29.82		100.01	

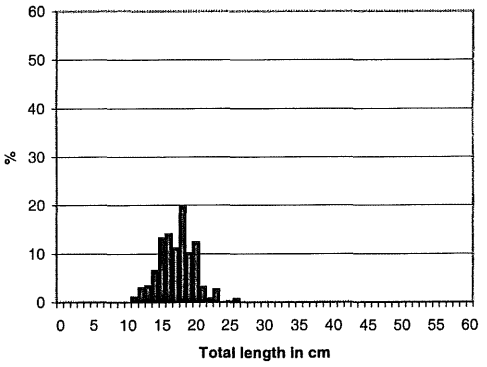
Annex II Length distributions of main species



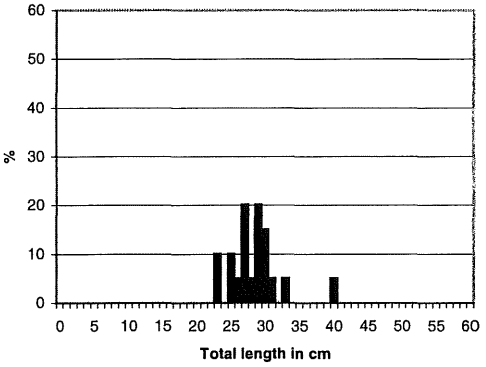
Boops boops Benin
Mean length = 14.8 cm N = 33



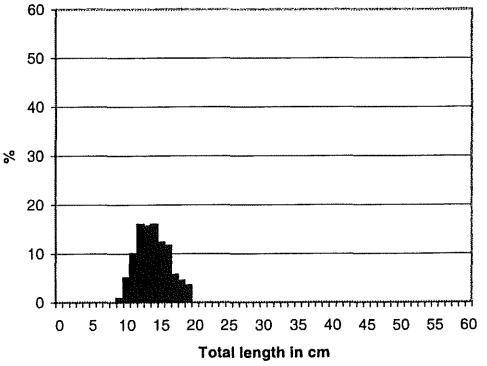
Pagellus bellottii Benin
Mean length = 17.8 cm N = 167



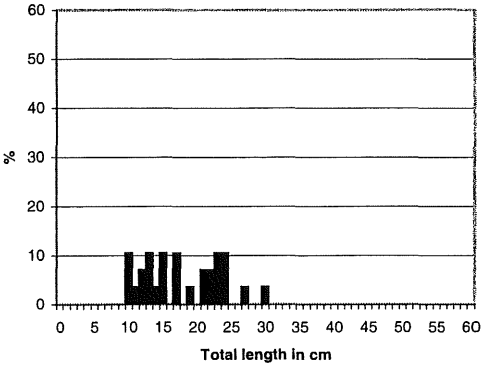
Dentex angolensis Benin
Mean length = 17.7 cm N = 163



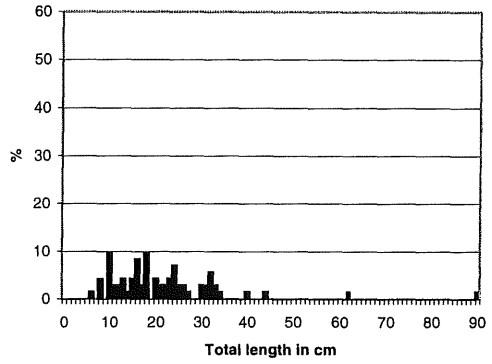
Pagrus caeruleostictus Benin
Mean length = 28.9 cm N = 20



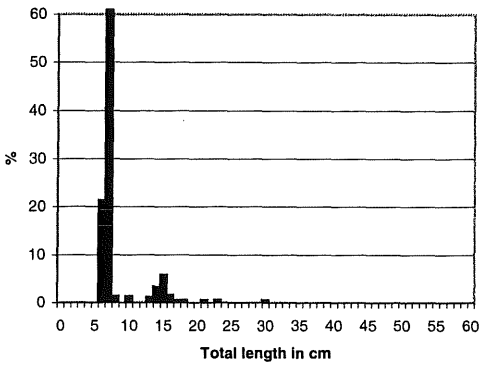
Dentex congoensis Benin
Mean length = 14.4 cm N = 168



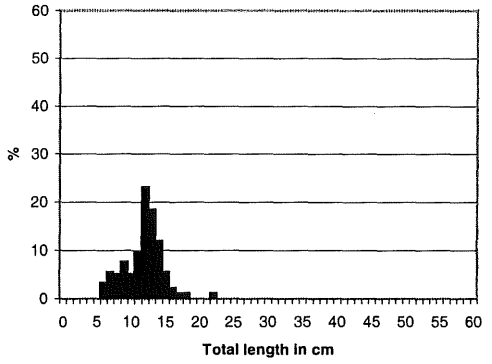
Pseudotolithus senegalensis Benin
Mean length = 18.3 cm N = 29



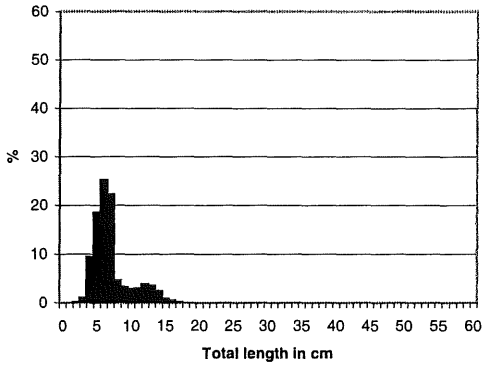
Pseudotolithus typus Benin
Mean length = 22.0 cm N = 72



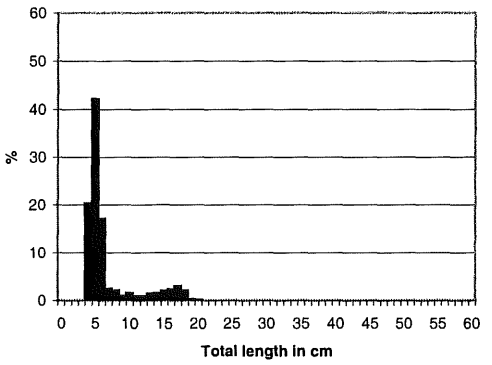
Priacanthus arenatus Benin
Mean length = 8.6 cm N = 92



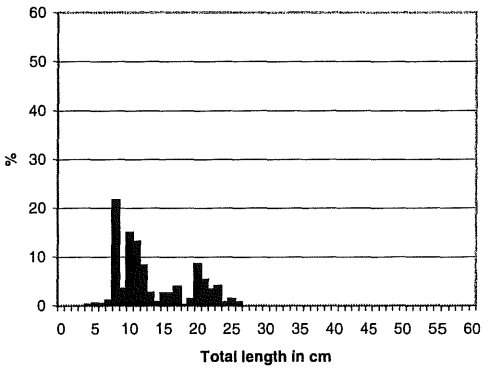
Lutjanus fulgens Benin
Mean length = 12.3 cm N = 108



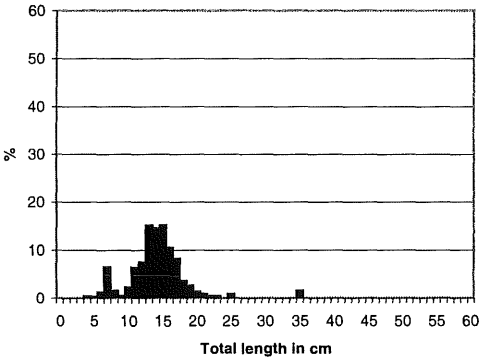
Ilisha africana Benin
Mean length = 7.5 cm N = 419



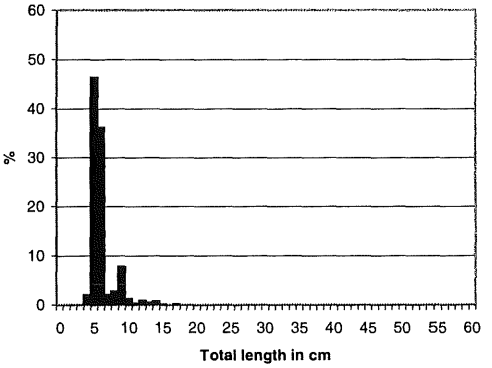
Brachydeuterus auritus Benin
Mean length = 7.1 cm N = 661



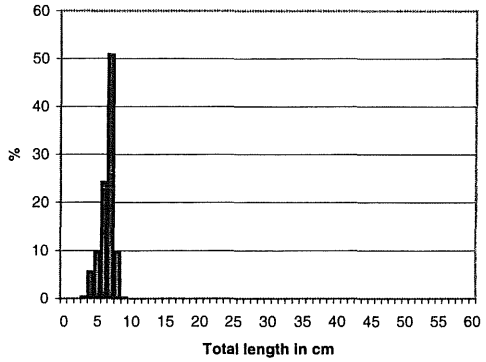
Sardinella aurita Benin
Mean length = 13.8 cm N = 465



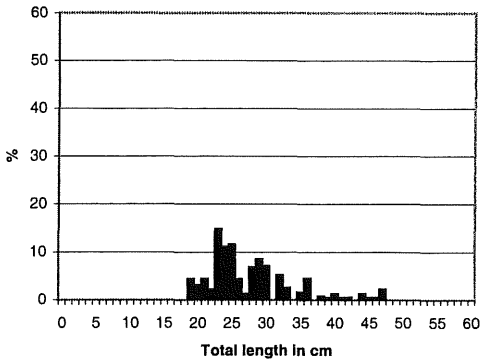
Galeoides decadctylus Benin
Mean length = 14.7 cm N = 191



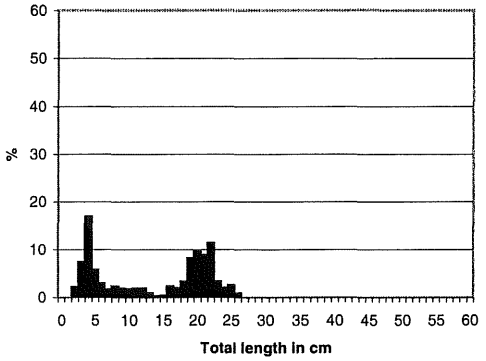
Sardinella maderensis Benin
Mean length = 6.5 cm N = 305



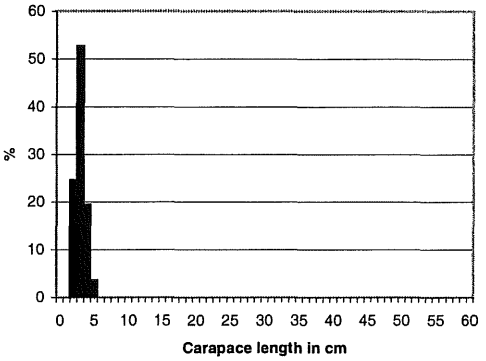
Engraulis encrasicolus Benin
Mean length = 7.0 cm N = 607



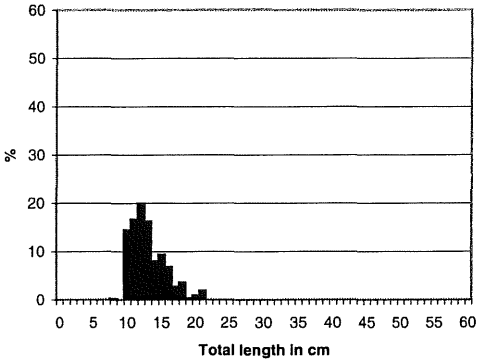
Sphyraena guachancho Benin
Mean length = 28.0 cm N = 75



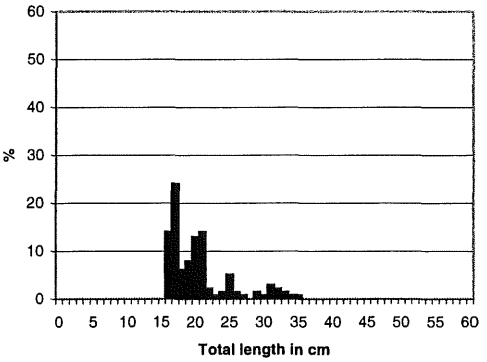
Chloroscombrus chrysurus Benin
Mean length = 14.1 cm N = 325



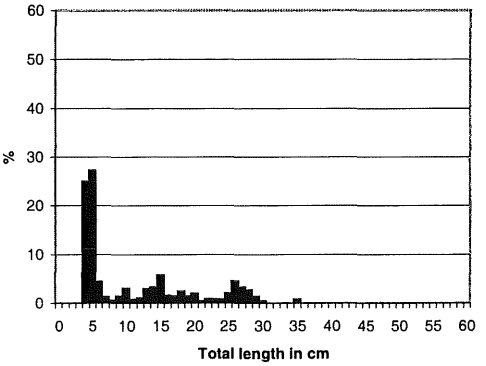
Penaeus notialis Benin
Mean length = 3.5 mm N = 57



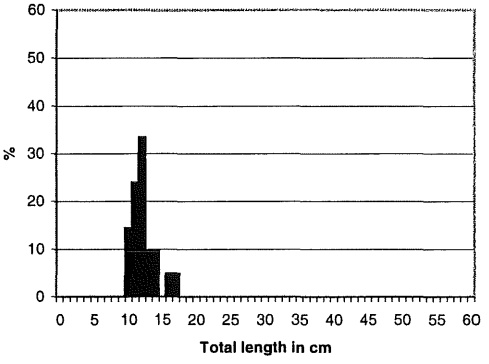
Decapterus punctatus Benin
Mean length = 13.5 cm N = 288



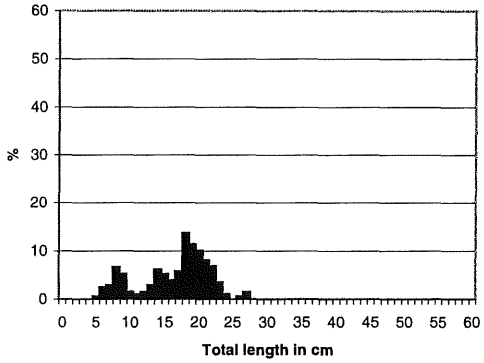
Dentex angolensis Togo
Mean length = 20.8 cm N = 66



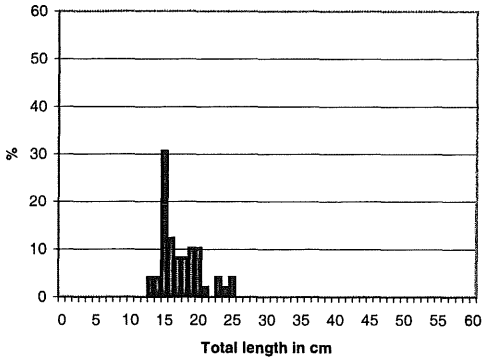
Selene dorsalis Benin
Mean length = 11.4 cm N = 421



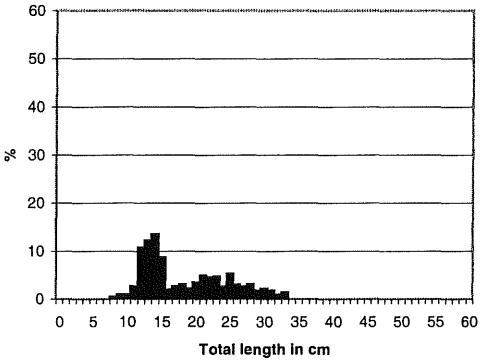
Dentex congoensis Togo
Mean length = 28.8 cm N = 82



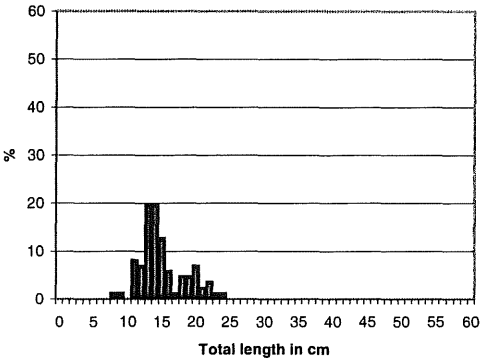
Pagellus bellottii Togo
Mean length = 17.0 cm N = 157



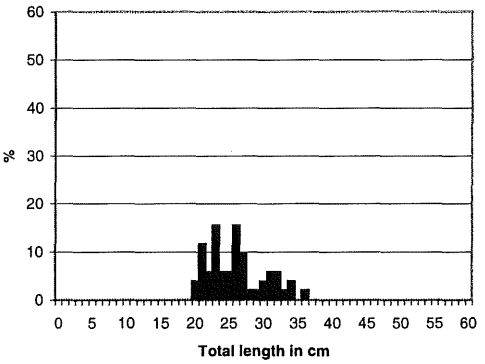
Galeoides decadactylus Togo
Mean length = 17.9 cm N = 49



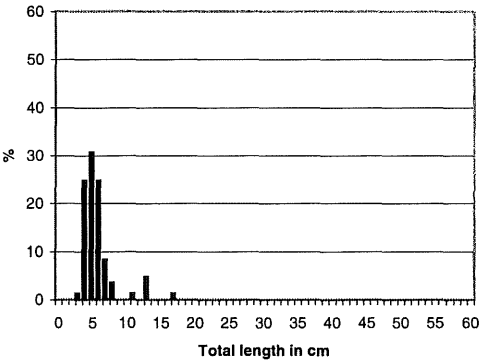
Pagrus caeruleostictus Togo
Mean length = 18.9 cm N = 168



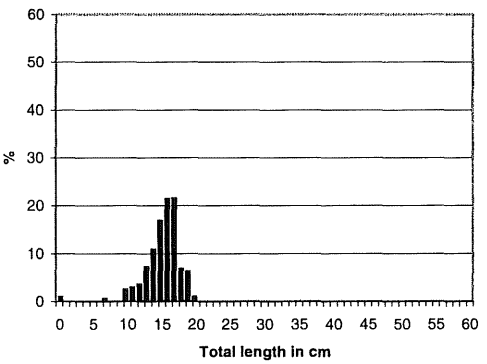
Priacanthus arenatus Togo
Mean length = 15.6 cm N = 87



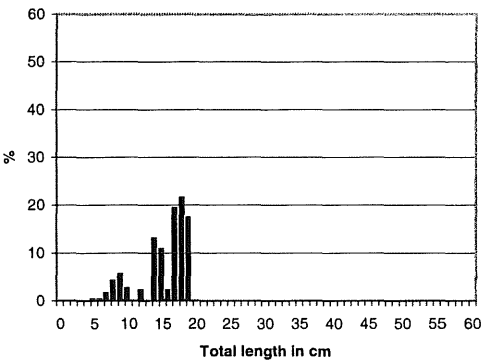
Lethrinus atlanticus Togo
Mean length = 26.4 cm N = 52



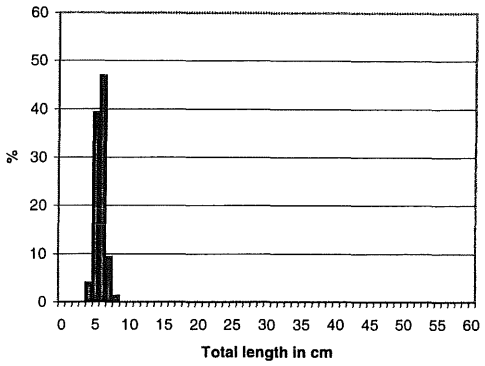
Ilisha africana Togo
Mean length = 6.3 cm N = 85



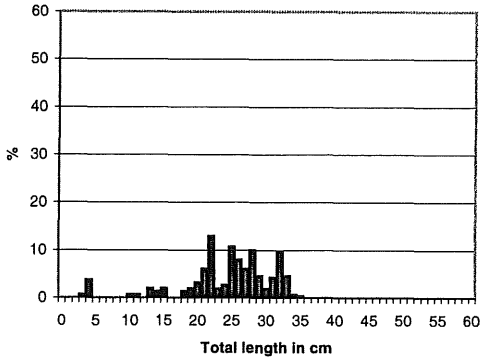
Brachydeuterus auritus Togo
Mean length = 16.0 cm N = 120



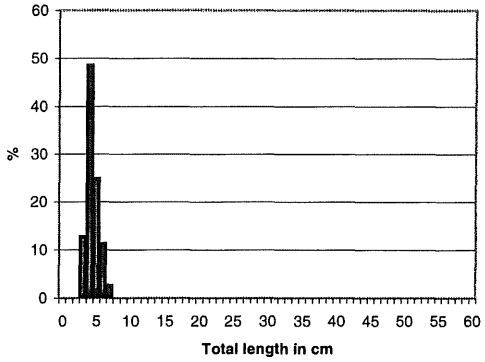
Sardinella aurita Togo
Mean length = 16.1 cm N = 82



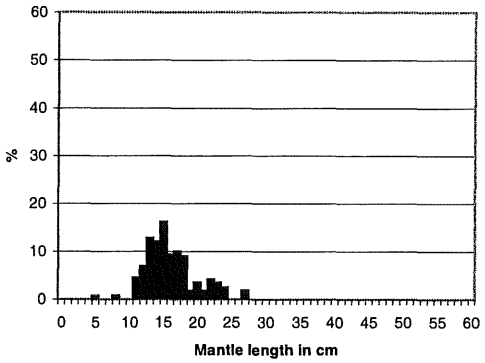
Sardinella maderensis Togo
Mean length = 6.2 cm N = 206



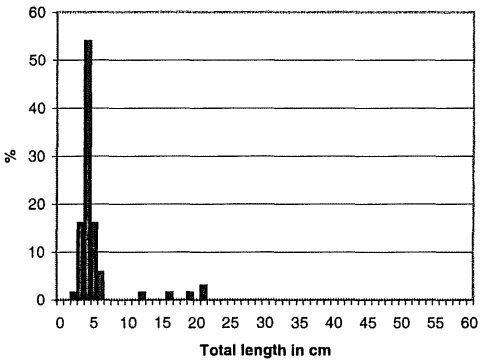
Selene dorsalis Togo
Mean length = 25.0 mm N = 126



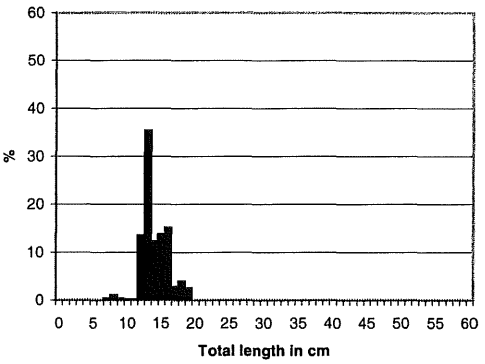
Engraulis encrasicolus Togo
Mean length = 4.9 cm N = 187



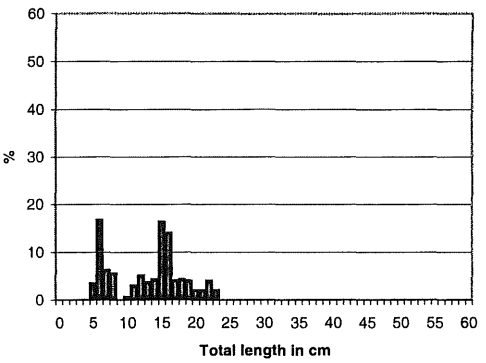
Sepia officinalis Togo
Mean length = 16.5 cm N = 71



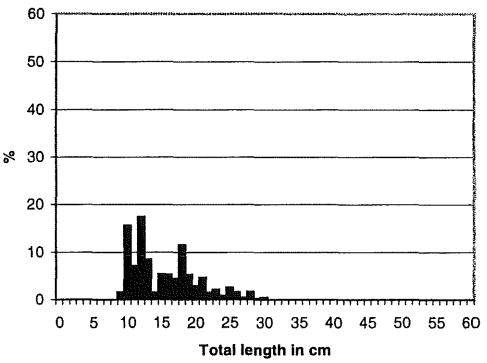
Chloroscombrus chrysurus Togo
Mean length = 5.6 cm N = 69



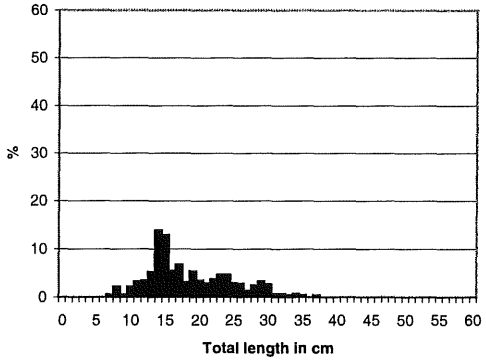
Boops boops Ghana
Mean length = 14.6 cm N = 373



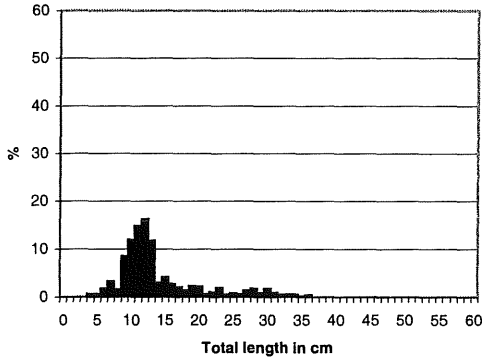
Decapterus punctatus Togo
Mean length = 13.5 mm N = 215



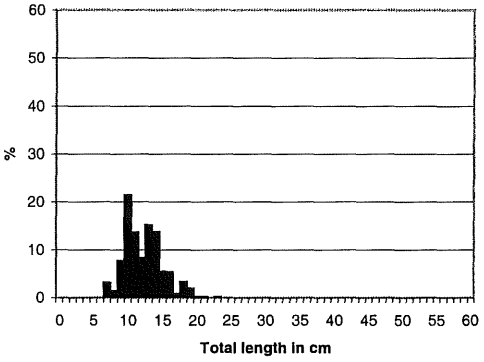
Dentex angolensis Ghana
Mean length = 15.8 cm N = 213



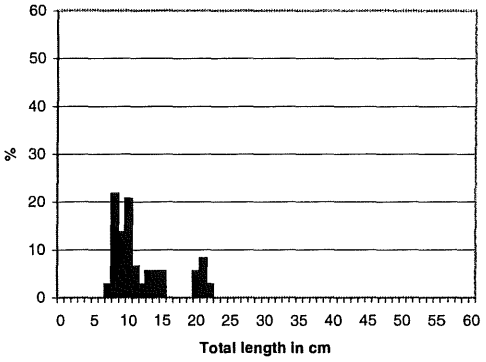
Dentex canariensis Ghana
Mean length = 24.8 cm N = 169



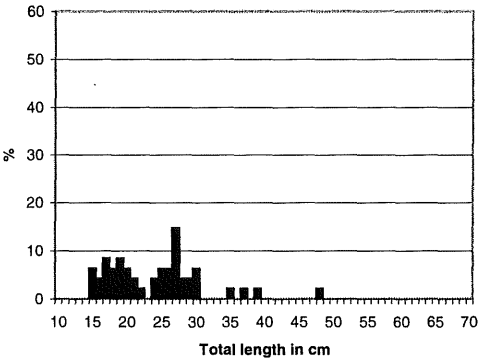
Pagrus caeruleostictus Ghana
Mean length = 14.3 cm N = 363



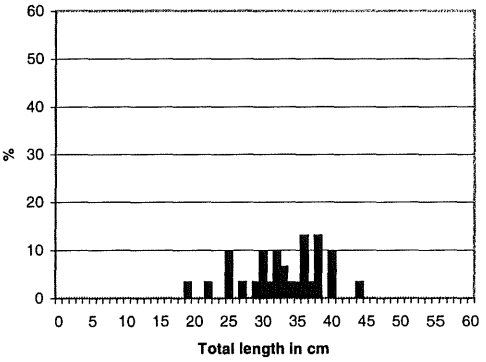
Dentex congoensis Ghana
Mean length = 12.7 cm N = 505



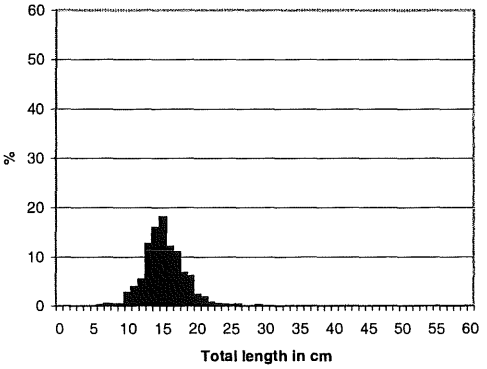
Lutjanus fulgens Ghana
Mean length = 17.4 cm N = 64



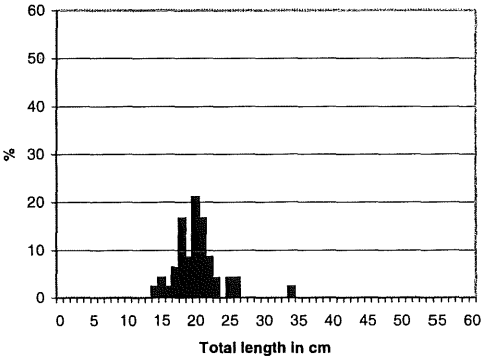
Dentex gibbosus Ghana
Mean length = 24.5 cm N = 48



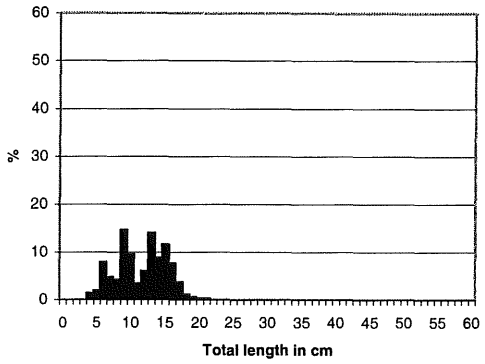
Pseudotolithus senegalensis Ghana
Mean length = 38.4 cm N = 31



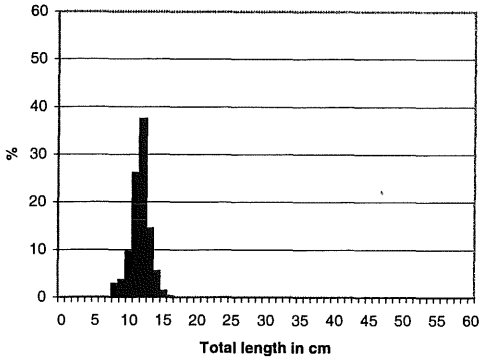
Pagellus bellottii Ghana
Mean length = 15.7 cm N = 920



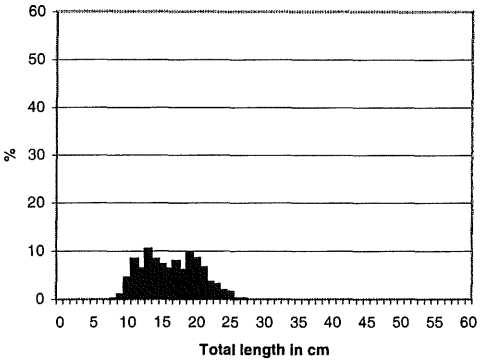
Lethrinus atlanticus Ghana
Mean length = 20.7 cm N = 48



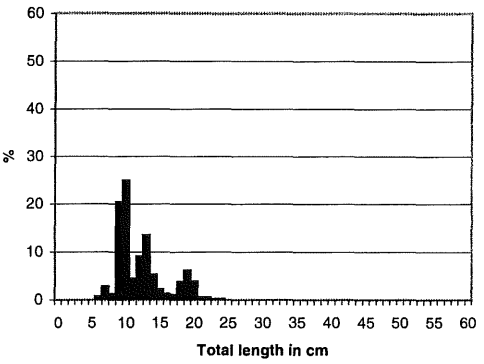
Brachydeuterus auritus Ghana
Mean length = 12.0 cm N = 1130



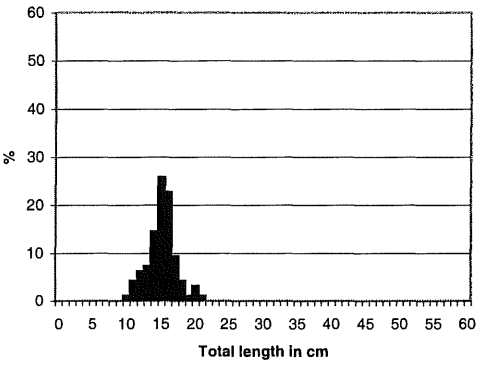
Ilisha africana Ghana
Mean length = 12.1 cm N = 161



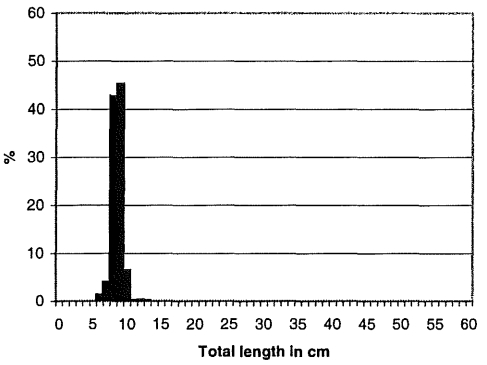
Pseudupeneus prayensis Ghana
Mean length = 16.8 cm N = 607



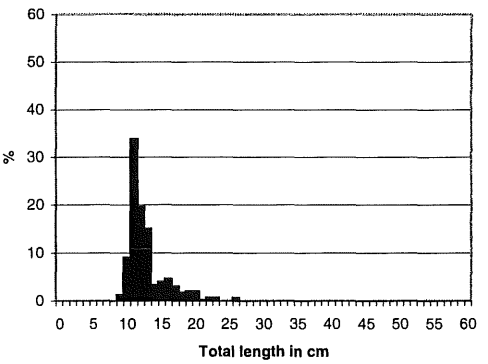
Sardinella aurita Ghana
Mean length = 12.6 cm N = 1031



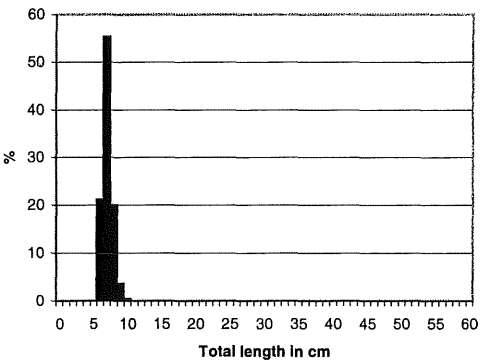
Galeoides decadactylus Ghana
Mean length = 15.6 cm N = 97



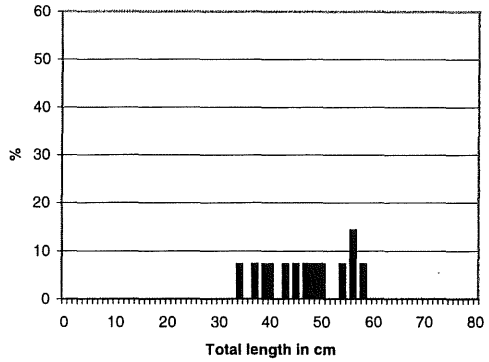
Sardinella maderensis Ghana
Mean length = 9.0 cm N = 97



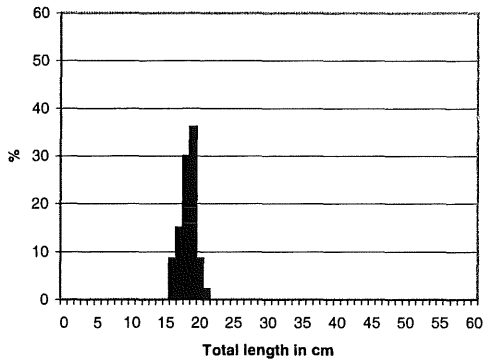
Priacanthus arenatus Ghana
Mean length = 13.2 cm N = 177



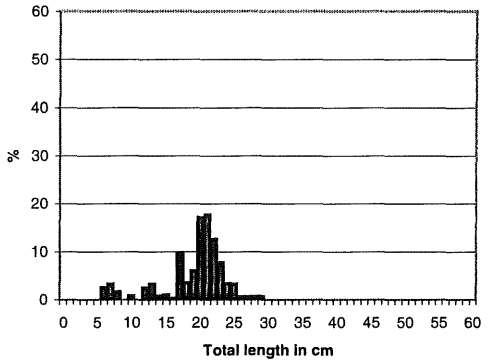
Engraulis encrasicolus Ghana
Mean length = 7.6 cm N = 774



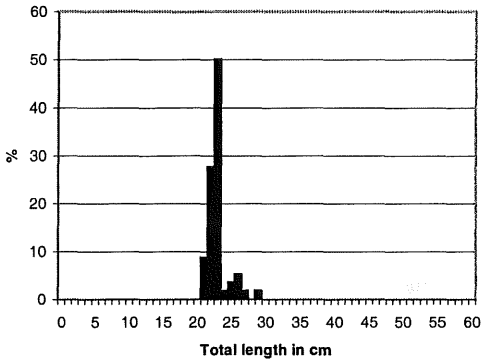
Alectis alexandrinus Ghana
Mean length = 47.4 cm N = 14



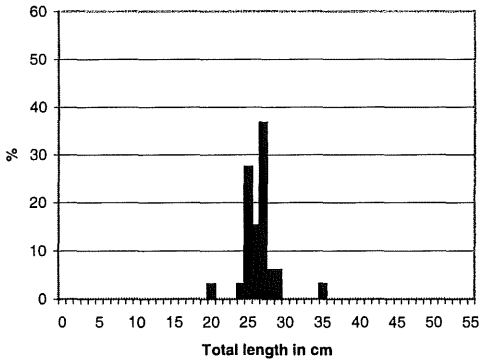
Decapterus rhonchus Ghana
Mean length = 18.8 cm N = 47



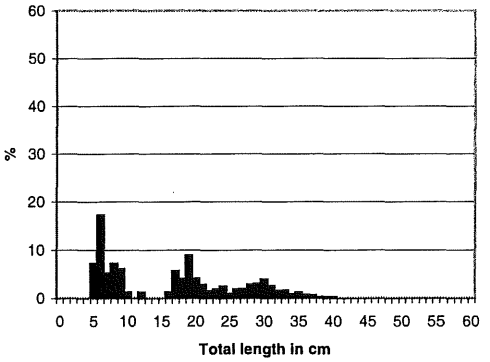
Chloroscombrus chrysurus Ghana
Mean length = 19.7 cm N = 177



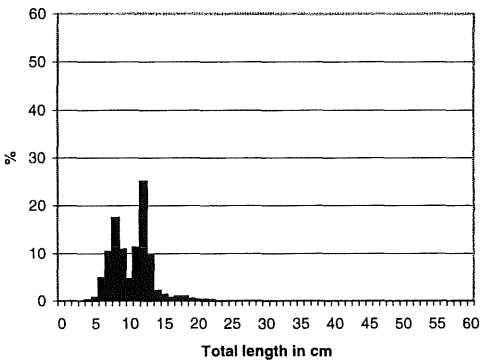
Selar crumenophthalmus Ghana
Mean length = 23.5 cm N = 58



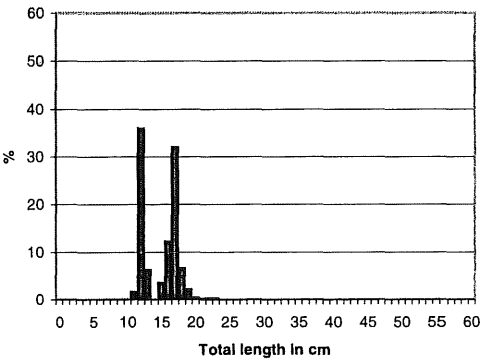
Caranx chrysos Ghana
Mean length = 26.9 cm N = 33



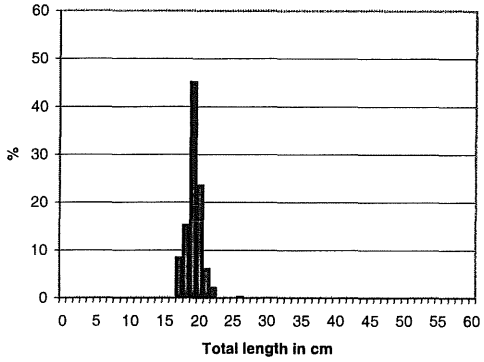
Selene dorsalis Ghana
Mean length = 16.9 cm N = 283



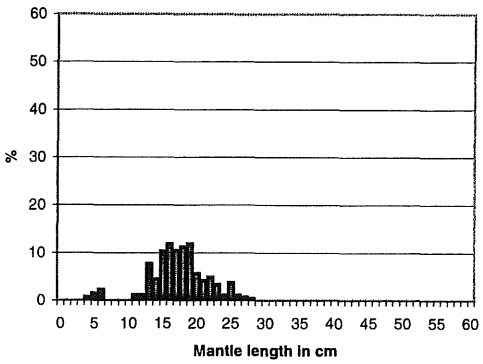
Decapterus punctatus Ghana
Mean length = 10.8 cm N = 1260



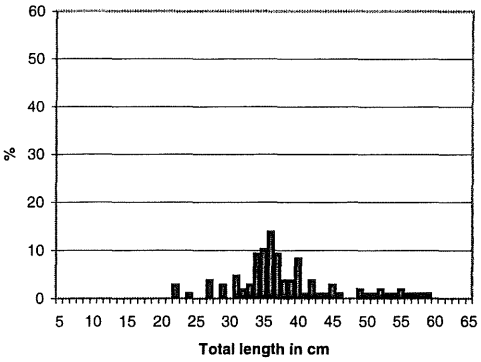
Trachurus trecae Ghana
Mean length = 15.3 cm N = 133



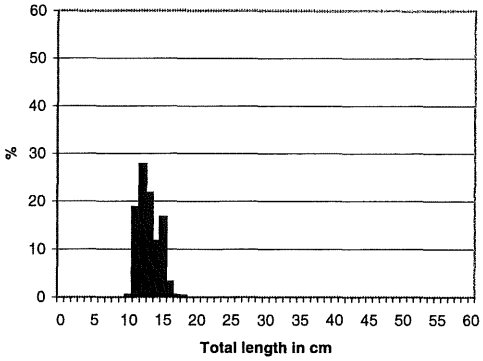
Scomber japonicus Ghana
Mean length = 19.6 cm N = 145



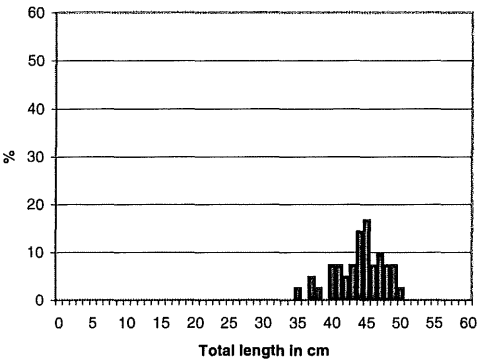
Sepia officinalis Ghana
Mean length = 17.8 cm N = 170



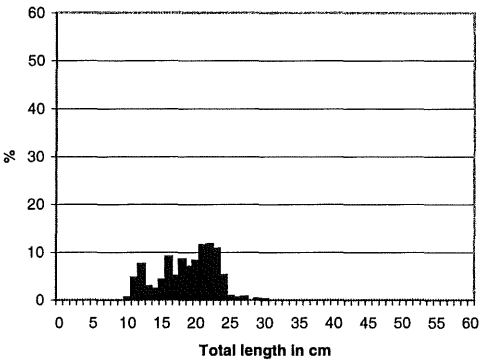
Sphyraena guachancho Ghana
Mean length = 38.4 cm N = 73



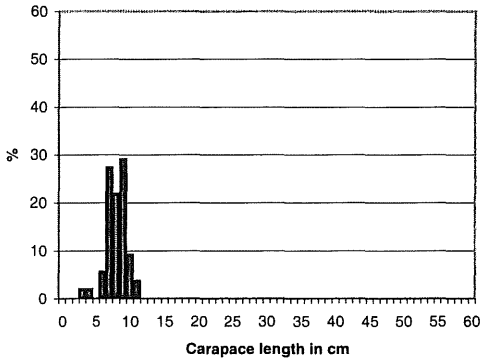
Boops boops Côte d'Ivoire
Mean length = 13.4 cm N = 169



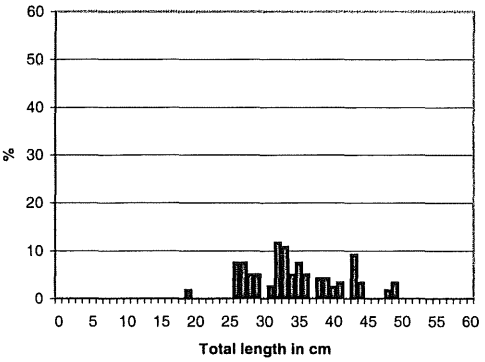
Sphyraena sphyraena Ghana
Mean length = 44.5 cm N = 42



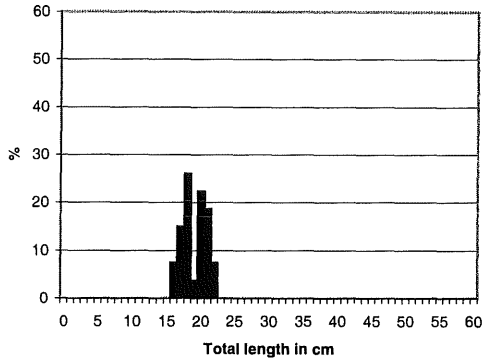
Dentex angolensis Côte d'Ivoire
Mean length = 19.2 cm N = 270



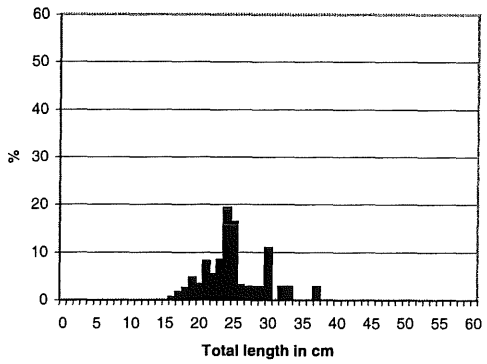
Plesiopenaeus edwardsianus Ghana
Mean length = 85.3 mm N = 55



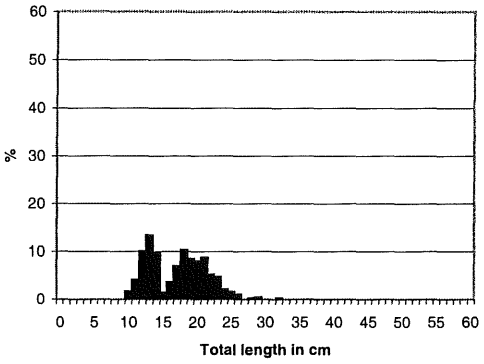
Dentex canariensis Côte d'Ivoire
Mean length = 35.0 cm N = 39



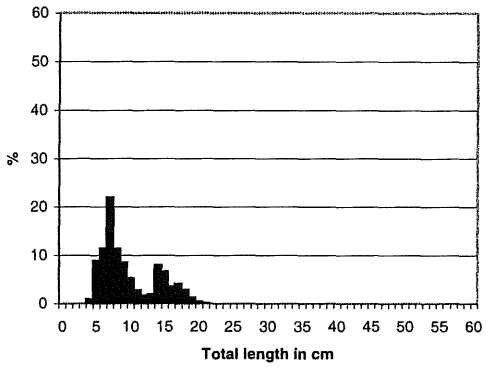
Dentex congoensis Côte d'Ivoire
Mean length = 19.5 cm N = 27



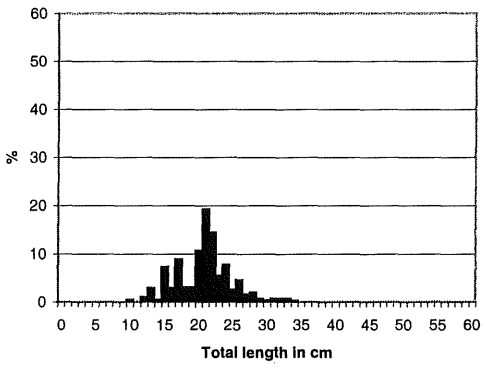
Umbrina canariensis Côte d'Ivoire
Mean length = 25.1 cm N = 63



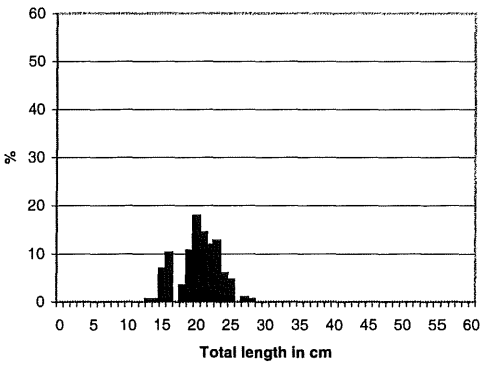
Pagellus bellottii Côte d'Ivoire
Mean length = 17.6 cm N = 605



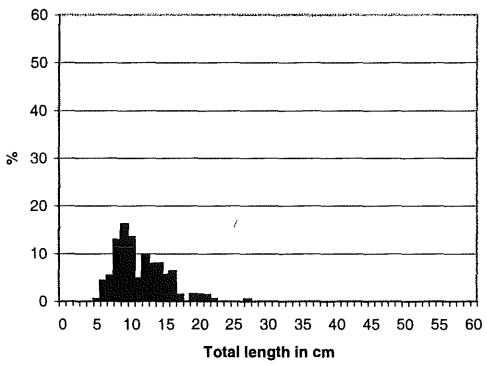
Brachydeuterus auritus Côte d'Ivoire
Mean length = 10.2 cm N = 1829



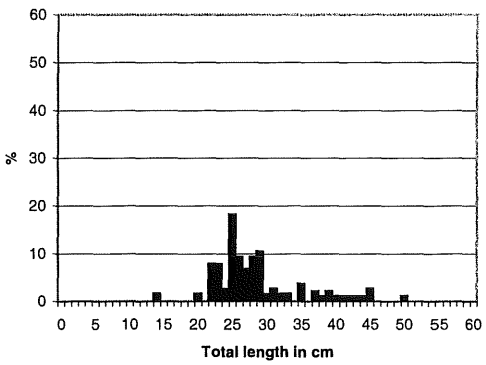
Pseudotolithus senegalensis Côte d'Ivoire
Mean length = 21.2 cm N = 109



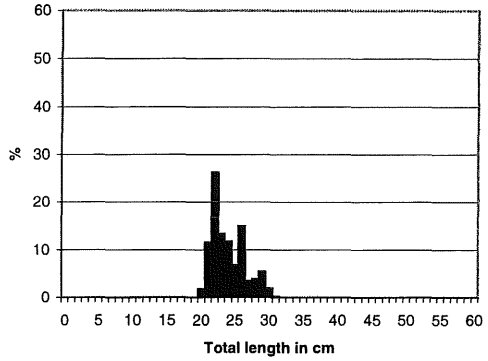
Pomadasys incisus Côte d'Ivoire
Mean length = 20.9 cm N = 55



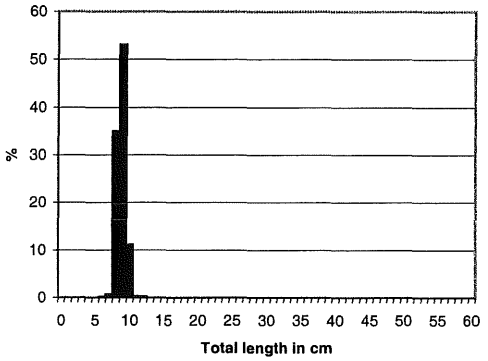
Pteroscion peli Côte d'Ivoire
Mean length = 11.8 cm N = 346



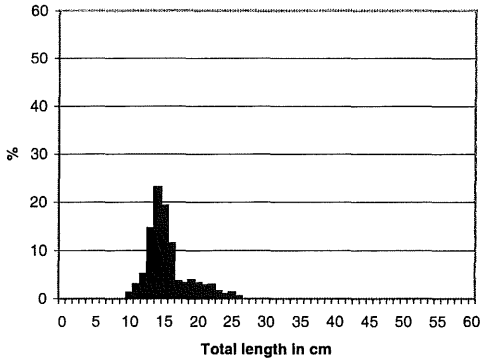
Pomadasys jubelini Côte d'Ivoire
Mean length = 28.9 cm N = 55



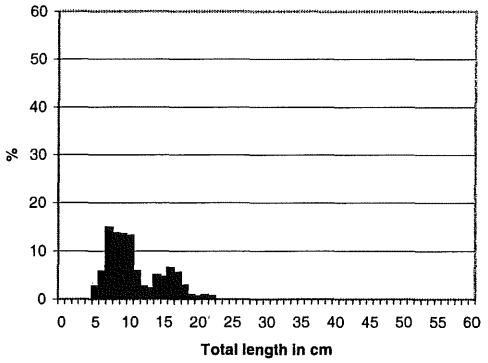
Pomadasys peroteti Côte d'Ivoire
Mean length = 24.4 cm N = 81



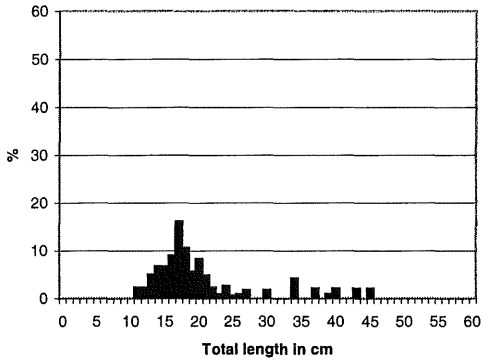
Priacanthus arenatus Côte d'Ivoire
Mean length = 9.3 cm N = 555



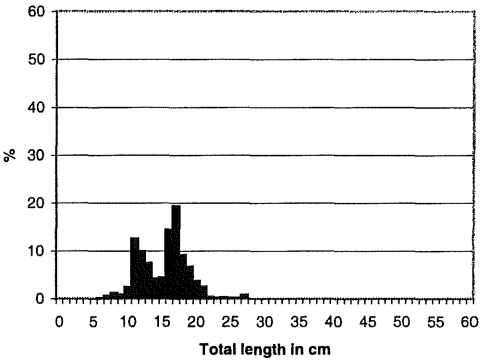
Pseudupeneus prayensis Côte d'Ivoire
Mean length = 16.0 cm N = 333



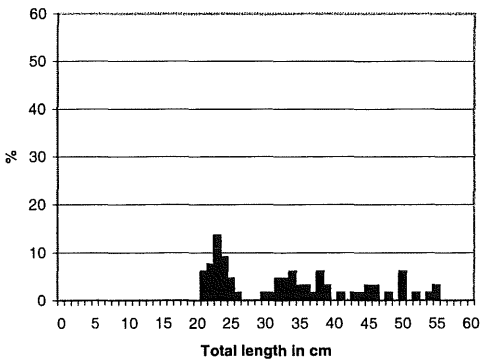
Ilisha africana Côte d'Ivoire
Mean length = 11.1 cm N = 414



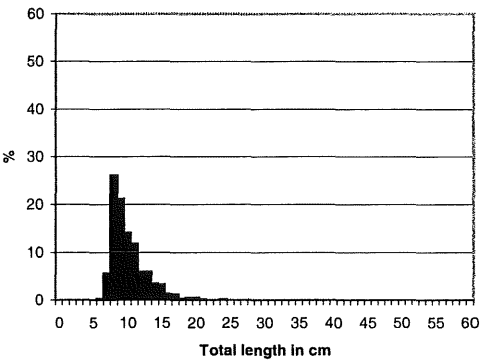
Galeoides decadactylus Côte d'Ivoire
Mean length = 21.0 cm N = 84



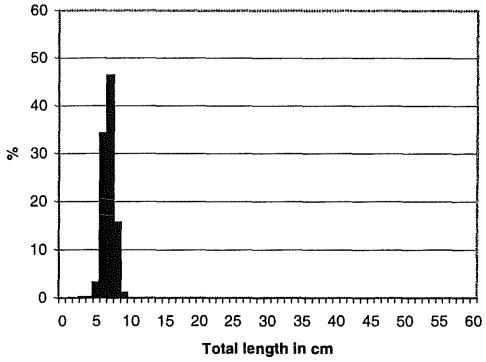
Sardinella aurita Côte d'Ivoire
Mean length = 15.8 cm N = 1274



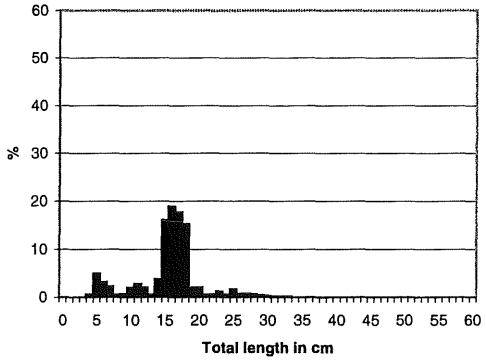
Brotula barbata Côte d'Ivoire
Mean length = 33.7 cm N = 67



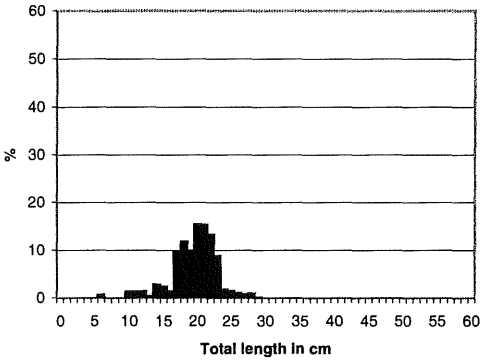
Sardinella maderensis Côte d'Ivoire
Mean length = 10.6 cm N = 1468



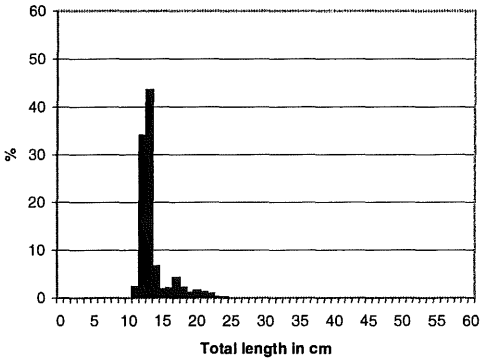
Engraulis encrasicolus Côte d'Ivoire
Mean length = 7.3 cm N = 629



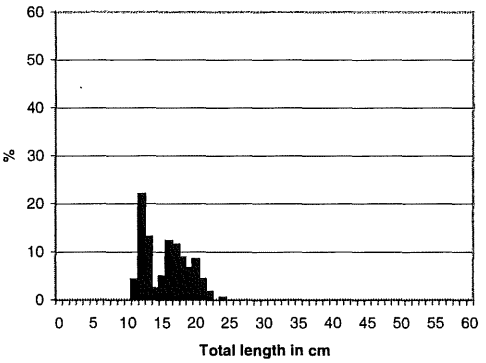
Selene dorsalis Côte d'Ivoire
Mean length = 16.0 cm N = 951



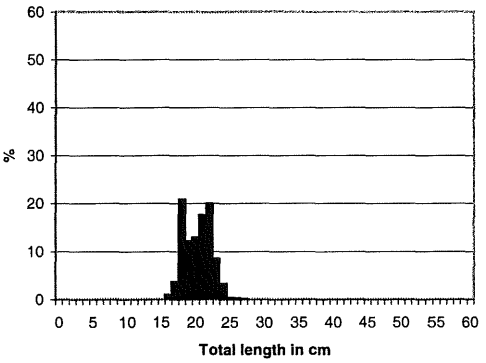
Chloroscombrus chrysurus Côte d'Ivoire
Mean length = 20.1 cm N = 274



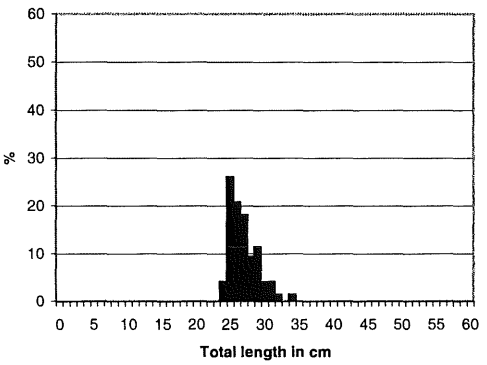
Trachurus trecae Côte d'Ivoire
Mean length = 13.9 cm N = 823



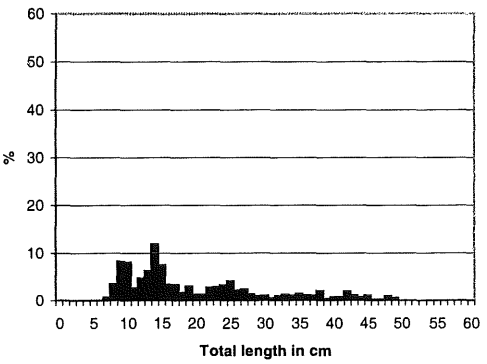
Decapterus punctatus Côte d'Ivoire
Mean length = 16.1 cm N = 424



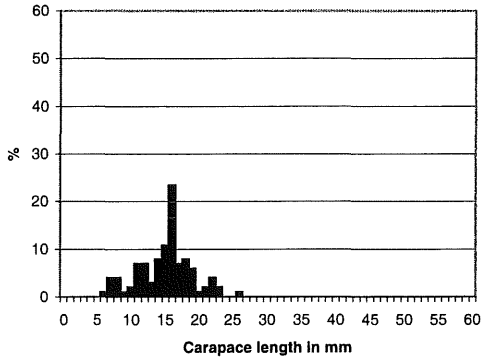
Scomber japonicus Côte d'Ivoire
Mean length = 20.2 cm N = 350



Decapterus rhonchus Côte d'Ivoire
Mean length = 32.4 cm N = 73



Sphyraena guachancho Côte d'Ivoire
Mean length = 19.9 cm N = 521



Sepia officinalis Côte d'Ivoire
Mean length = 15.6 cm N = 88

Annex III Families/genera in catch analysis and swept area estimates

1) Main groups in swept-area bottom trawl hauls:

Demersal: Sciaenidae, Sparidae, Haemulidae, Ariidae, Serranidae, Lutjanidae, Merluccidae, Ophididae, Lethrinidae

Pelagic:
Carangidae, Scombridae, Sphyraenidae, Trichiuridae, Clupeidae, Engraulididae

Shrimp:
Shrimps

Cephalopods:
Cephalopods

Sharks:
Sharks

2) Main pelagic families in swept-area bottom trawl hauls:

Clupeids:
Clupeidae, Engraulididae

Carangids:
Carangidae

Scombrids:
Scombridae

Hairtails:
Trichiuridae

Barracudas:
Sphyraenidae

3) Commercially important demersal species grouped by families in swept-area bottom trawl hauls:

Seabream: *Dentex* spp., *Diplodus* spp., *Lithognathus* spp., *Pagellus* spp., *Pagrus* spp., *Sparus* spp.

Snappers:
Lutjanidae

Groupers:
Serranidae

Grunts:
Plectorhynchus spp., *Pomadasys* spp.

Croakers:
Sciaenidae

Annex IV Swept-area biomass estimates

SWEPT AREA ANALYSIS FROM STATION 400 TO STATION 454

Cote d'Ivoire 2004

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 30m	30- 50m	50-100m	100-100m
Brachydeuterus auritus	12	5	9	4			71	3.51	1.64	5.71	3.05	
Trachurus trecae	10	2	3	1	1		40	1.66	0.01	0.04	3.83	
Pagellus bellottii	17	3	5	1			62	1.30	0.03	0.78	2.44	
Brachydeuterus auritus Juv.	2	1		2			12	0.93	0.31	2.74		
Selene dorsalis	19	6	3				64	0.85	0.59	2.06	0.13	
Sardinella aurita	22	5	3				71	0.69	0.11	0.05	1.50	
Engraulis encrasicolus	6		1	1			19	0.48	1.78	0.05		
Sardinella maderensis	15	5	2				52	0.43	1.34	0.22	0.02	
Chloroscombrus chrysurus	15	5	1				48	0.42	1.18	0.36		
J E L L Y F I S H				1			2	0.40	1.51			
Sphyraena guachancho	25	3	1				55	0.38	0.39	0.75	0.10	
Pomadasys peroteti	12			1			31	0.36	0.09	1.07		
Decapterus punctatus	7	5	1				31	0.36	0.21	0.08	0.66	
Dentex angolensis	12	1	1				33	0.30			0.70	
Scomber japonicus	9	1	1				26	0.22			0.52	
Sardinella maderensis - Juv.		1	1				5	0.22	0.17	0.57		
Trichiurus lepturus	17	3					48	0.20	0.27	0.40	0.02	
Pseudupeneus prayensis	19	4					55	0.20	0.09	0.15	0.30	
Dentex canariensis	9		1				24	0.17		0.01	0.37	
Boops boops	13	2					36	0.17			0.39	
Umbrina canariensis	10		1				26	0.17		0.03	0.39	
Pseudotolithus senegalensis	14	2					31	0.17	0.27	0.19	0.10	
Galeoides decadactylus	22	1					45	0.17	0.31	0.29		
Priacanthus arenatus	14		1				36	0.16		0.01	0.36	
Ilisha africana	7	3					24	0.14	0.53	0.01		
Sepia officinalis hierredda	22						52	0.12	0.01	0.07	0.22	
Pteroscion peli	11	2					31	0.12	0.25	0.18		
Raja miraletus	21		1				52	0.12	0.03	0.28	0.05	
Dentex congoensis	3		1				10	0.10			0.23	
Sphyraena sphyraena	9	1					24	0.09		0.19	0.06	
Epinephelus aeneus	12	1					31	0.09	0.03	0.14	0.09	
Pomadasys jubelini	12	1					29	0.08	0.19	0.11		
Polydactylus quadrifilis	1	2					7	0.08	0.31			
Pomadasys incisus	9	1					24	0.07	0.06	0.05	0.10	
Brotula barbata	12						26	0.07		0.03	0.15	
Trigla lyra	11						26	0.06			0.13	
Pegusa lascaris	4	1					12	0.05		0.04	0.09	
Grammoplites gruveli	14						33	0.05		0.07	0.05	
Cynoglossus senegalensis	3	1					10	0.05		0.15		
Penaeus notialis	10						24	0.02	0.02	0.06		
Parapenaeopsis atlantica	5						12	0.01	0.03			
Penaeus kerathurus	3						7		0.01			
Other fish								1.05	1.01	0.96	1.15	
Sum all species								16.29	12.78	17.90	17.20	
Sum Snappers												
Sum Groupers								0.09	0.03	0.15	0.09	
Sum Grunts								4.95	2.29	9.68	3.15	
Sum Croakers								0.49	0.53	0.40	0.56	
Sum Seabreams								2.10	0.03	0.82	4.25	
Sum Sharks								0.03		0.03	0.05	
Sum Rays								0.13	0.06	0.30	0.05	
Sum Squids								0.20	0.02	0.16	0.33	
Sum												
Number of stations included in analysis, total and by depth strata								42	11	13	18	

SWEPT AREA ANALYSIS FROM STATION 455 TO STATION 509

Ghana 2004

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 30m	30- 50m	50-100m	100-100m
Brachydeuterus auritus	11	1	7	2			49	1.85	0.73	2.62	1.96	
Pagellus bellottii	18	10	4	1			77	1.28	0.02	1.03	2.46	
Engraulis encrasicolus	3	1	2	1			16	0.82	0.65	1.82		
Sardinella aurita	15	4	1	1			49	0.59	0.02	0.36	1.24	
Boops boops	12		2	1			35	0.52		0.01	1.38	
Chlamys purpuratus	1	2		1			9	0.52	1.78	0.06		
Dentex congoensis	8			1			21	0.44			1.17	
Brachydeuterus auritus Juv.	2	3	2				16	0.38	0.93	0.35		
Decapterus punctatus	19	5	1				58	0.38	0.03	0.19	0.82	
Pseudupeneus prayensis	28		2				67	0.36	0.09	0.42	0.51	
Sepia officinalis hierredda	26	2	1				67	0.30	0.02	0.24	0.57	
Fistularia petimba	28	2					70	0.28	0.01	0.20	0.55	
Trachurus trecae	7		1				19	0.21		0.03	0.55	
Chromis cadenati	1	1	1				7	0.20			0.52	
Pagrus caeruleostictus	34						70	0.17	0.13	0.22	0.15	
Dentex angolensis	7	3					21	0.16			0.43	
Priacanthus arenatus	20		1				47	0.16		0.05	0.37	
Ilisha africana	2		1				7	0.16	0.56			
Selene dorsalis	14	2					37	0.16	0.22	0.27		
Dentex canariensis	30						67	0.15	0.13	0.11	0.20	
Elops lacerta	2	3					12	0.14	0.33	0.14		
Sphyraena-juveniles	6	2					19	0.12	0.36	0.06		
Dentex gibbosus	12	1					28	0.12			0.31	
Sphyraena guachancho	17	1					40	0.11	0.12	0.13	0.07	
Chloroscombrus chrysurus	17	2					42	0.11	0.11	0.22	0.01	
Alectis alexandrinus	13	1					33	0.11	0.09	0.24		
Lepidotrigla cadmani	6	2					19	0.09			0.24	
Galeoides decadactylus	7	1					19	0.09	0.26	0.04		
Caranx crysos	6	1					16	0.08	0.01	0.07	0.15	
Squatina oculata	4	1					12	0.07			0.20	
Sardinella maderensis	5	1					14	0.07	0.24			
Lagocephalus laevigatus	12	1					30	0.06	0.04	0.13	0.01	
Drepane africana	3	1					9	0.06	0.18	0.03		
Penaeus notialis	4						9		0.01			
Parapenaeopsis atlantica	2						5		0.01			
Other fish								0.88	0.82	0.87	1.16	
Sum all species								11.20	7.90	9.91	15.03	
Sum Snappers								0.03	0.01	0.01	0.06	
Sum Groupers								0.03		0.08	0.02	
Sum Grunts								2.28	1.73	3.08	1.96	
Sum Croakers								0.06	0.11	0.01	0.04	
Sum Seabreams								2.84	0.28	1.37	6.10	
Sum Sharks								0.11			0.30	
Sum Rays								0.04	0.01	0.04	0.08	
Sum Squids								0.37	0.06	0.32	0.67	
Sum												
Number of stations included in analysis, total and by depth strata								43	12	15	16	

SWEPT AREA ANALYSIS FROM STATION 510 TO STATION 529

Benin 2004

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nmř	Mean densities by bottom depth strata t/nmř - 30m	30- 50m	50-100m	100-100m
Sardinella aurita	4		1	1			32	1.27			3.45	
Brachydeuterus auritus	6	4	1				58	0.71	0.37	1.88		
Engraulis encrasicolus	2		1				16	0.41	0.06	1.24		
Dentex congoensis		3					16	0.32			0.88	
Dentex angolensis	3	3					32	0.27			0.72	
Decapterus punctatus	10	1	1				63	0.26	0.02		0.70	
Selene dorsalis	11	1					63	0.24	0.09	0.67		
Sphyraena guachancho	12	1					63	0.21	0.51	0.16	0.01	
Pagellus bellottii	9	1					53	0.20		0.40	0.21	
Sepia officinalis hierredda	16						84	0.19	0.06	0.29	0.23	
Trichiurus lepturus	12	1					58	0.18	0.20	0.34	0.01	
Fistularia petimba	10						47	0.13		0.05	0.29	
Sphyraena-juveniles	4	1					26	0.12	0.25	0.11	0.03	
Sardinella aurita - Juveniles	2	1					16	0.12	0.01	0.38		
Chloroscombrus chrysurus	9						47	0.12	0.29	0.08		
Galeoides decadactylus	8	1					47	0.11	0.29	0.08		
Pagrus caeruleostictus	13						68	0.10	0.19	0.07	0.06	
Dentex canariensis	4	1					26	0.09	0.03	0.26	0.01	
Pseudotolithus typus	7						37	0.09	0.25	0.03	0.01	
Ephippion guttifer	6	1					37	0.08	0.24			
Alloteuthis africana	7						37	0.08			0.21	
Carcharhinus sp.		1					5	0.08		0.25		
Pomadasys incisus	1	1					11	0.08		0.25		
Priacanthus arenatus	8						42	0.06		0.01	0.15	
Ilisha africana	6						32	0.06	0.12	0.08		
Sepia juveniles	3						16	0.05	0.02		0.11	
Epinephelus aeneus	7						37	0.05		0.07	0.09	
Polydactylus quadrifilis	2						11	0.05	0.17			
Penaeus notialis	4						21	0.04		0.14		
Sicyonia galeata	1						5					
Penaeus kerathurus	3						16		0.01			
Parapenaeus longirostris	2						11					
Parapenaeopsis atlantica	2						11		0.01			
Plesionika martia	1						5				0.01	
Other fish								0.89	1.02	0.96	0.79	
Sum all species								6.66	4.21	7.80	7.97	
Sum Snappers								0.05	0.06	0.11	0.01	
Sum Groupers								0.05		0.07	0.09	
Sum Grunts								0.83	0.42	2.16	0.03	
Sum Croakers								0.18	0.38	0.04	0.14	
Sum Seabreams								1.02	0.22	0.74	1.99	
Sum Sharks								0.13		0.31	0.09	
Sum Rays								0.08	0.13	0.12	0.02	
Sum Squids								0.33	0.08	0.31	0.57	
Sum												
Number of stations included in analysis, total and by depth strata								19	6	6	7	

SWEPT AREA ANALYSIS FROM STATION 531 TO STATION 541

Togo 2004

SPECIES NAME	SAMPLE DISTRIB. BY CATCH CLASSES Lower limits, Kg/nm >0	10	30	100	300	1000	% incidence	Mean dens. t/nm²	Mean densities by bottom depth strata t/nm² - 30m	30- 50m	50-100m	100-100m
Sepia officinalis hierredda	7	2					100	0.57	0.07	0.23	1.43	
Selene dorsalis	5	1					67	0.47	0.09	1.32		
Brachydeuterus auritus	5	1					67	0.34	0.30	0.70		
Trichiurus lepturus	3	1					44	0.33	0.02	0.95		
Pagellus bellottii	6	1					78	0.31		0.32	0.61	
Pagrus caeruleostictus	9						100	0.23	0.21	0.17	0.30	
Alectis alexandrinus	1	1					22	0.17	0.52			
Lutjanus goreensis	1	1					11	0.15	0.39	0.05		
Lethrinus atlanticus	2						22	0.15	0.44			
Fistularia petimba	6						67	0.14	0.01	0.02	0.40	
Dentex canariensis	5						56	0.13	0.33	0.05	0.01	
Engraulis encrasicolus	3						33	0.11	0.32			
Decapterus punctatus	9						100	0.10	0.01	0.02	0.25	
Dentex angolensis	1							0.09			0.26	
Sardinella aurita	1						11	0.09			0.27	
Balistes capriscus	5						56	0.08	0.09	0.14	0.01	
Sphyraena-juveniles	1						11	0.06	0.17			
Galeoides decadactylus	2						22	0.06	0.17			
Chaetodipterus goreensis	2						22	0.06	0.18	0.01		
Alloteuthis africana	6						67	0.05		0.03	0.13	
Priacanthus arenatus	5						56	0.05		0.03	0.13	
Aluterus monoceros	4						44	0.05	0.11	0.05		
Selar crumenophthalmus	3						33	0.05		0.03	0.11	
Chloroscombrus chrysurus	2						22	0.05	0.16			
Other fish								0.63	0.97	0.63	0.33	
Sum all species								4.52	4.56	4.75	4.24	
Sum Snappers								0.16	0.40	0.05		
Sum Groupers								0.02		0.02	0.04	
Sum Grunts								0.41	0.38	0.84		
Sum Croakers								0.02	0.06			
Sum Seabreams								0.77	0.54	0.54	1.20	
Sum Sharks								0.04			0.13	
Sum Rays								0.07	0.09	0.10	0.01	
Sum Squids								0.62	0.07	0.26	1.56	
Sum												
Number of stations included in analysis, total and by depth strata								9	3	3	3	

Annex V

1. Stratified mean density and confidence intervals

The stratified estimator of mean density in the entire area is calculated as (Cochran, 1977; eq. 5.1, p. 91)

$$\bar{y}_{st} = \sum_{i=1}^{L} W_i \bar{y}_i , \tag{1}$$

where

L is the number of strata,

$W_i = \dfrac{area_i}{total\ area}$ is the proportion of the survey area in the i^{th} stratum,

$\bar{y}_i = \dfrac{\sum_{k=1}^{n_i} y_{i,k}}{n_i}$ is the average catch in the i^{th} stratum

n_i is the number of tows in the i^{th} stratum, and

$y_{i,k}$ is the catch by the k^{th} tow in stratum i (normalized to either kg/hour

or t/nmi^2 $= \dfrac{y_{ik}}{area\ swept_{ik}}$ for biomass estimates).

The estimated variance of the stratified mean, $\bar{y}_{st}$, is

$$\mathrm{var}(\bar{y}_{st}) = \sum_{i=1}^{L} W_i^2 \frac{s_i^2}{n_i} , \tag{2}$$

where

$$s_i^2 = \frac{\sum_{k=1}^{n_i} (y_{i,k} - \bar{y}_i)^2}{n_i - 1} . \tag{3}$$

When $\bar{y}_{st}$ is estimated in t/nmi^2 then an estimate of the total biomass in the area is calculated by

$$B = \bar{y}_{st} \cdot total\ area \tag{4}$$

2. Precision of the estimates of mean density

2.1. Estimates based on the sample mean

The estimate of the standard error for each stratum mean is given by

$$se(\overline{y}_i) = \sqrt{\frac{s_i^2}{n_i}}, \tag{5}$$

where s_i^2 is from equation (3).

The standard error of the stratified mean ($\overline{y}_{st}$, equation 1), i.e. the square root of the variance of $\overline{y}_{st}$, is calculated as

$$se(\overline{y}_{st}) = \sqrt{\text{var}(\overline{y}_{st})}, \tag{6}$$

where $\text{var}(\overline{y}_{st})$ is defined by equation (2).

If the sample size is "large" enough, then the Central Limit Theorem states that each time a survey is conducted there is a 95% chance that the true mean lies in the interval (see Cochran, 1977, pp. 39-44)

$$\overline{y}_{st} \pm t_{(n-1)} se(\overline{y}_{st}), \tag{7}$$

where t is from Students t-table with (n-1) degrees of freedom and $\alpha = 0.025$.

2.2. Estimates of the mean based on lognormal theory - The Pennington estimator

Since abundance data from marine surveys usually have a large variance (much higher than the mean) and are highly skewed to the right, the sample sizes are typically not large enough so that equation (2) is a valid 95% confidence interval. In fact, the confidence associated with the interval given by equation (7) is usually much lower than 95% (McConnaughey and Conquest, 1992; Conquest *et al.*, 1996; Pennington, 1996). A major problem to the degree of skewness is due to the high proportion of zero tows often observed. Development of confidence intervals is complicated by the asymmetric distribution, and the occurrence of zero catches confounds an effective normalization transformation. Logarithmic transformation will

stabilize the variance but data will still not be normally distributed and interpretation of re-transformed means is difficult (Pennington and Grosslein 1978).

One way to generate more precise estimates of the mean and more accurate confidence statements for skewed marine data is to base the estimators on the lognormal Delta distribution (Pennington, 1983, 1996; Conquest *et al.*, 1996), in which catches are divided into zero and non-zero units, followed by transformation of the non-zero values to natural logarithms. When it is found that the transformed non-zero data are approximated by a lognormal distribution (*i.e.* the logged values are normally distributed), then a more efficient estimator of mean density, c_i, within each stratum is given by (Pennington, 1983, 1996)

$$c_i = \frac{m_i}{n_i}\exp(\bar{x}_i)G_{m_i}(s_{x,i}^2/2), \tag{8}$$

where

m_i is the number of sample values greater than 0 in stratum i,

$\bar{x}_i$ and $s_{x,i}^2$ are the mean and variance, respectively, of the log transformed values of catches greater than 0, and

$G_m(f)$ is an infinite series function of m and f [for example, $m = m_i$ and $f = s_{x,i}^2/2$ in equation (8)] which is used to correct for bias in re-transformation from log to arithmetic scale and is defined by

$$G_m(f) = 1 + \frac{m-1}{m}f + \sum_{j=2}^{\infty}\frac{(m-1)^{2j-1}f^j}{m^j(m+1)(m+3)\cdots(m+2j-3)j!} \tag{9}$$

The variance of c_i is given by

$$\mathrm{var}(c_i) = \frac{m_i}{n_i}\exp(2\bar{x}_i)\left\{\frac{m_i}{n_i}G_{m_i}^2\left(s_{x,i}^2/2\right) - \frac{(m_i-1)}{(n_i-1)}G_{m_i}\left(\frac{m_i-2}{m_i-1}s_{x,i}^2\right)\right\} \tag{10}$$

2.3. The modified Pennington estimator

In contrast to estimates based on the sample mean (equation 1 and 2), which are highly sensitive to a single or a few isolated high catch rates that may account for more than 50% of the total catch, Pennington's estimator (equations 8 and 10) is sensitive to low catch rates which contribute little to the total catch, but when log-transformed may give large negative values resulting in a distribution skewed to the left. In such a case a more precise estimator of mean density within each stratum, $\hat{\mu}_i$, is given by (modified from Pennington, 1983, 1996)

$$\hat{\mu}_i = \frac{(n_i - m_i)}{n_i}\bar{y}_i' + \frac{m_i}{n_i}\exp(\bar{x}_i)G_{m_i}(s_{x,i}^2/2), \quad (11)$$

where

m_i is the number of sample values greater than a defined 'cut-level' (rather than 0 as in equation 8) in stratum i,

$\bar{y}_i'$ denotes the arithmetic mean of the non-transformed values less than the cut-level, and

$\bar{x}_i$ and $s_{x,i}^2$ are the mean and variance, respectively, of the logged values of catches greater than the cut-level.

The variance of $\hat{\mu}_i$ is given by

$$\mathrm{var}(\hat{\mu}_i) = \mathrm{var}(c_i) + \left(\frac{n_i - m_i - 1}{n_i(n_i-1)}\right)s_i'^2 + \left(\frac{m_i(n_i-m_i)}{n_i^2(n_i-1)}\right)\bar{y}_i'^2 - 2\left(\frac{n_i - m_i}{n_i(n_i-1)}\right)\bar{y}_i' \times c_i, \quad (12)$$

where

$s_i'^2$ is the variance of the values less than the cut-level (equation 3), and

c_i and $\mathrm{var}(c_i)$ are equations (8) and (10) with m_i bigger than the cut-level.

There is no single objective criterion upon which to define a cut-level bigger than zero. Basically the logged Delta distribution should be viewed (e.g. in GRAFER) in order to determine if it is skewed to the left and/or contains isolated small catches. As a 'rule of thumb' (Pennington pers. com.) the cut-level should be set $= (2\bar{x}_i - x_{\max})$, where $\bar{x}_i$ and $x_{\max}$ are the mean and the largest value, respectively, of the log transformed values of catches greater than 0.

2.4. Stratified mean and confidence interval based on lognormal theory

The stratified estimate of mean density (denoted by $\hat{\mu}_{st}$) in the entire area is calculated by replacing $\bar{y}_i$ with $\hat{\mu}_i$ for each stratum in equation (1). The standard error of $\hat{\mu}_{st}$ is obtained by substituting var($\hat{\mu}_i$) for s_i^2 / n_i (which equals var($\bar{y}_i$)) in equation (2) and then

$$se(\hat{\mu}_{st}) = \sqrt{var(\hat{\mu}_{st})} \tag{13}$$

Sometimes the $\hat{\mu}_{st}$-estimator is higher than the one based on the sample mean. This is because, given the sample sizes typical for marine surveys, the sample mean tends to underestimate the true mean most of the time for these highly skewed distributions (Pennington, 1983, 1996; Conquest *et al.*, 1996).

An approximate 95% confidence interval for $\hat{\mu}_{st}$ is given by

$$\hat{\mu}_{st} \pm t_{(n-1)} se(\hat{\mu}_{st}) \tag{14}$$

Annex VI Excel sheet used for calculations of biomass and confidence intervals

Made 23/3 1999 by Jeppe Kolding This example is the biomass of seabreams in Benin 2002

This sheet is used to calculate stratified mean density, total biomass, and 95% confidence limits on the total biomass.
Inputs are only required in the yellow fields and optinally the t-value can be set. NOTE that the Station field MUST be 1 even if there is no catch
Density (t/nm^2) is from NAN-SIS and Coefficient of variation (CV) is from GRAFER using the same depth intervals
The underlying assumption is that the CV from the catch (kg/hour) is equal for for the density (t/nm^2), i.a. that the swept area is constant per hour
Equation numbers (1) and (2) refers to Appendix in report

		Input from NANSIS			GRAFER			
Depth (m)	Area	No Stations	Density (t/nm^2)	CV (kg/hour)	Equation(1)=	SD	Est. Variance	Equation (2)=
20-30	**387**	6	0.08	1.83	0.04	0.146	0.021	0.001
31-50	**134**	6	0.53	1.54	0.09	0.816	0.666	0.003
51-100	**244**	5	2.59	1.20	0.83	3.108	9.660	0.197
Total	5561						Var(strat-mean)=	

t- value = 2

Stratified mean = 0.96 SE(strat-mean)= 0.45

95% Confidence limits:

Total biomass=	734	48	1420

Annex VII Instruments and fishing gear used

Echo sounder

The SIMRAD EK500/38 kHz scientific sounder was used during the survey for fish abundance estimation. The lowering keel was submerged a few times during the survey. The Bergen Echo Integrator system (BEI) was used to scrutinise the acoustic records. System calibration experiment using a standard copper sphere was performed 08.11.2003. The settings of 38 kHz echo sounder were as follows:

Tranceiver-1 menu (38 kHz, mounted in lowering keel)

Transducer depth	5.5 m (lowering keel not submerged)
Absorption coeff.	10 dB/km
Pulse length	medium (1 ms)
Bandwidth	wide
Max Power	2000 Watt
2-way beam angle	-21.0 dB
Sv Transducer gain	26.98 dB
TS Transducer gain	27.15 dB
Angle sensitivity	21.9
3 dB beamwidth	6.8 ° alongship
	6.7 ° athwardship
Alongship offset	-0.07 °
Athwardship effect	0.07 °

Display menu

Echogram	1 (38 kHz)
Bottom range	15 m
Bottom range start	10 m
Sv colour min	-67 dB

Printer menu

Echogram	1 (38 kHz)
Range	50 m, 100 m, 250 m, 500 m
Range start	0
Bottom range	12 m
Bottom range start	10 m
TVG	20 log R
Sv Colour min	- 60 dB

Bottom detection menu Minimum level -50 dB

Fishing gear

The vessel has "Harstad" and "Åkrahamn" pelagic trawls and "Gisund super bottom trawl".

The bottom trawl has a headline of 31 m, footrope 47 m and 20 mm meshsize in the codend with an innernet of 10 mm meshsize. The estimated opening is 6 m (observed 5.7) and distance between wings during towing about 18 m. The sweeps are 40 m long. The trawl is equipped with a 12" rubber bobbins gear. The doors are of "Thyborøn" combi type, 7.81 m^2, 1670 kg, their distance while trawling about 45 - 55 m in average, depending on the depth (least distance at low depths). This distance can be kept constant (about 50 m) at all depths by the use of a 9.5 m strap between the wires at 130 m distance from the doors, normally applied at depths greater than 80 m. On the present survey, however, the strap was not applied because most of the trawl hauls were made in shallower waters.

The SCANMAR system was used on all trawl hauls. This equipment consists of sensors, a hydrophone, a receiver, a display unit and a battery charger. Communication between sensors and ship is based on acoustic transmission. The doors are fitted with sensors to provide information on their distance and a height sensor is fitted to the bottom trawl to measure the trawl opening and provide information on clearance and bottom contact.

The pelagic trawl can be equipped with a trawleye that provides information on the trawl opening and the distance of the footrope to the bottom.

Annex VIII CTD-stations in hydrographic transects

Grand Berebi	Lat	Lon	Depth (m)
1	04°36.020'N	006°55.250'W	25
2	04°31.370'N	006°54.000'W	56
3	04°26.920'N	006°52.560'W	106
4	04°25.830'N	006°52.310'W	241
5	04°21.890'N	006°50.850'W	1396
6	04°16.800'N	006°49.480'W	> 2000

Grand Jacques	Lat	Lon	Depth
1	05°10.810'N	004°24.060'W	24
2	05°05.750'N	004°23.560'W	79
3	05°00.680'N	004°23.210'W	409
4	04°55.450'N	004°22.970'W	1938
5	04°50.850'N	004°22.980'W	1702

Cape Three Points	Lat	Lon	Depth
1	04°42.130'N	002°06.190'W	35
2	04°36.940'N	002°07.670'W	68
3	04°32.490'N	002°08.950'W	84
4	04°27.080'N	002°10.580'W	209
5	04°21.520'N	002°12.230'W	659
6	04°17.120'N	002°13.510'W	949

Accra	Lat	Lon	Depth
1	05°25.880'N	000°20.460'W	21
2	05°20.990'N	000°18.040'W	39
3	05°16.700'N	000°15.870'W	59
4	05°10.780'N	000°12.500'W	278
5	05°08.540'N	000°11.530'W	769
6	05°04.340'N	000°09.800'W	1612

Cotonou	Lat	Lon	Depth
1	06°17.250'N	002°37.210'E	21
2	06°15.000'N	002°37.010'E	25
3	06°11.820'N	002°36.970'E	43
4	06°06.100'N	002°36.900'E	322
5	06°00.710'N	002°36.970'E	1390
6	05°55.780'N	002°36.950'E	1808