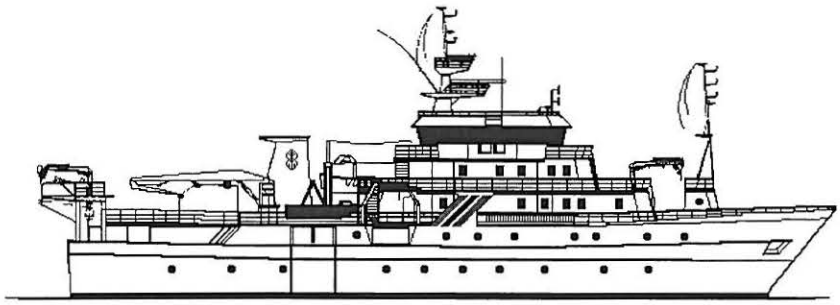

SURVEYS OF THE FISH RESOURCES OF THE WESTERN GULF OF GUINEA
(Benin, Togo, Ghana & Côte d'Ivoire)

Survey of the pelagic and demersal resources
16 July - 9 August 2002

Centre de Recherches Océanologiques
Abidjan
Côte d'Ivoire

Marine Fisheries Research Division
Tema
Ghana

Direction des Pêches
Cotonou
Benin

Centre Béninois de Recherche Scientifique et Technique
Cotonou
Benin

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
Benin, Togo, Ghana and Côte d'Ivoire	19 April – 06 May 1999
Benin, Togo, Ghana and Côte d'Ivoire	29 August-17 September 2000

CRUISE REPORTS "DR. FRIDTJOF NANSEN"

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

Survey of the pelagic and demersal resources

16 July – 9 August 2002

by

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Bergen, 2002

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CHAPTER 1 INTRODUCTION

Following a request from the Government of Ghana, later supported by the Governments of Benin, Togo and Côte d'Ivoire and channelled through FAO. It was agreed to conduct a survey in the western Gulf of Guinea covering the waters of the above four countries as part of the Nansen Programme. This was a follow-up of similar surveys conducted 19 April-6 May 1999 and 29 August-17 September 2000. 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 the 16 July 2002 where representatives from Côte d'Ivoire, Ghana, Togo, Benin 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 by a swept-area trawl programme
- 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

Ghana made the following additional requests: to study the distribution and estimate the biomass of scallops (*Chlamys purpuratus* and *Pecten jacobeus*), to spend more time on the acoustic survey due to the upwelling season and to consolidate the observations on deep water resources. Benin and Togo requested denser coverage of bottom trawl stations and collection of water samples for analysis of phosphate (pollution). Benin also wanted some samples for analyses of phytoplankton, while Côte d'Ivoire requested increase in bottom trawl stations between 51 and 100 m. The vessel was, however, not equipped for phytoplankton sampling and was unable to fulfil this request.

1.2 Participation

Direction des Pêches, Cotonou, Bénin:
Amélie Gbaguidi
Centre Béninois de Recherche Scientifique et Technique, Cotonou, Bénin:
Zacharie Sohou

Direction de l'Elevage et de la Pêche, Lome, Togo:
Kokou Vidzraku Agbokousse (15.7-21.7)
Samponguili Gambe

Marine Fisheries Research Division, Tema, Ghana:
Samuel N. K. Quaatey
Kofi Debrah Mireku
Felix Odai
Jones Tetteh
Comfort Yeboah

Centre de Recherches Océanologiques, Abidjan, Côte d'Ivoire:
Doumini Boubéri
Joanny Tapé

Institute of Marine Research, Bergen, Norway:
Oddgeir Alvheim, Thor Egil Johansson, Ingve Fjellstad, Sigbjørn Mehl (cruise leader)

1.3 Narrative

The vessel left Tema (Ghana) in the evening of 16 July and steamed eastwards to the western part of Benin where the survey started in the morning of 17 July. The shelf was surveyed during daytime (0600 to 1800) by parallel course tracks about 20 NM (nautical miles) apart. In Benin and Togo the inter-transect distance was 10 NM, allowing for 6 transects in Benin 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 with mid-water trawl was carried out during dark hours. Random blind trawl hauls were made close to the surface, mainly at the inner shelf, with a pelagic or bottom trawl equipped with large floats. Off Cape Three Points, the smallest pelagic trawl was destroyed and the rest

of the pelagic trawling in shallow waters was done with 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 surface down to the bottom or 500 m depths. Water samples for phosphate analyses were taken on 2-3 CTD-stations from various depths in depth strata 0-30 m, 31-50 m, 51-100 m, 101-300 m and 301-500 m in each country. Zooplankton samples were taken with 1.0 and 1.2 m diameter ICITA nets in step oblique hauls at 30-60m depth, but both nets were torn and only 4 samples were taken.

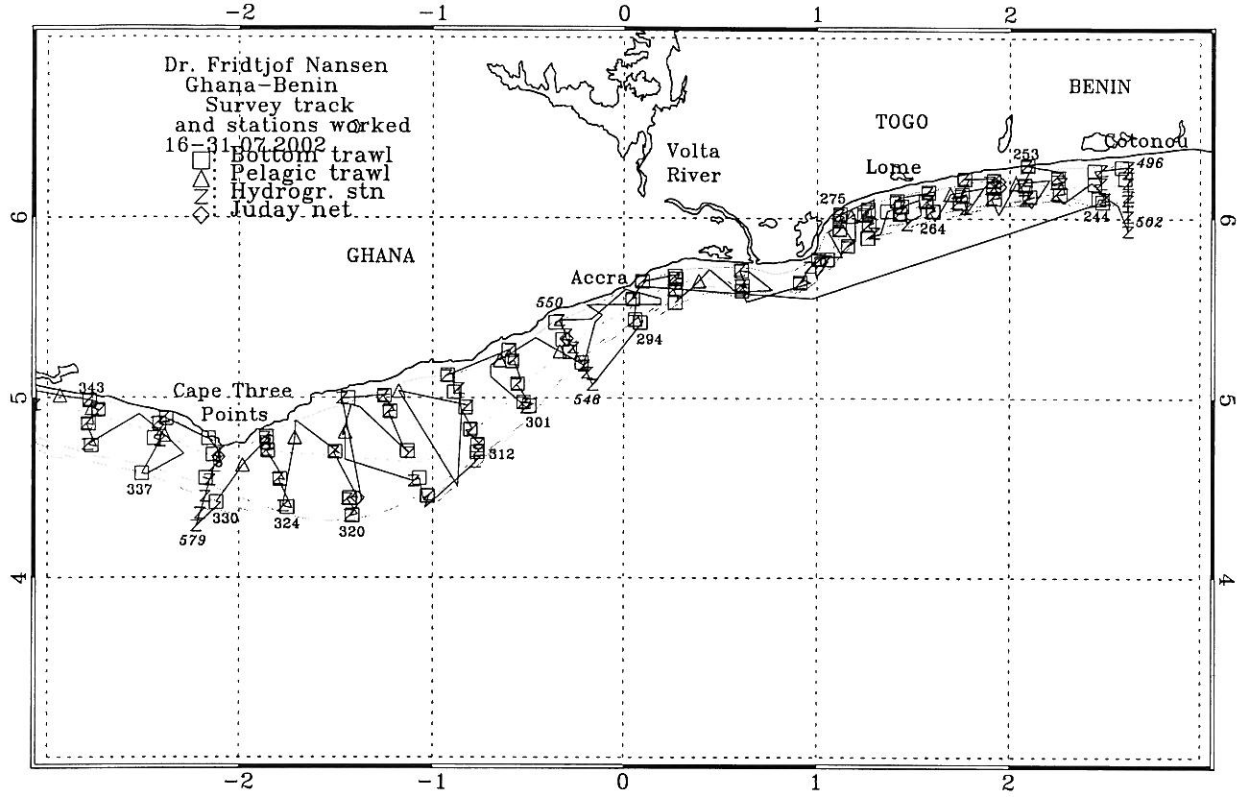
The shelf off Benin was covered from 17 to 19 July. One hydrographic transect was made off Cotonou. The Togo area was surveyed from 20 to 21 July. At noon on 21 July one of the participants from Togo was sent ashore in Lomé due to seasickness. The shelf off Ghana was surveyed from 21 to 31 July and two hydrographic transects were made, off Accra and Cape Three Points. In the morning of 24 July, a short stop was made at Tema for an urgent dentist visit. Côte d'Ivoire shelf area was covered from 1 to 7 August with two hydrographic transects, off Grand Jacques on the central part and a second off Grand Bérébi in the west. The main part of the survey was completed in the evening of 7 August and the vessel arrived in Tema at noon on 9 August.

1.4 Survey effort

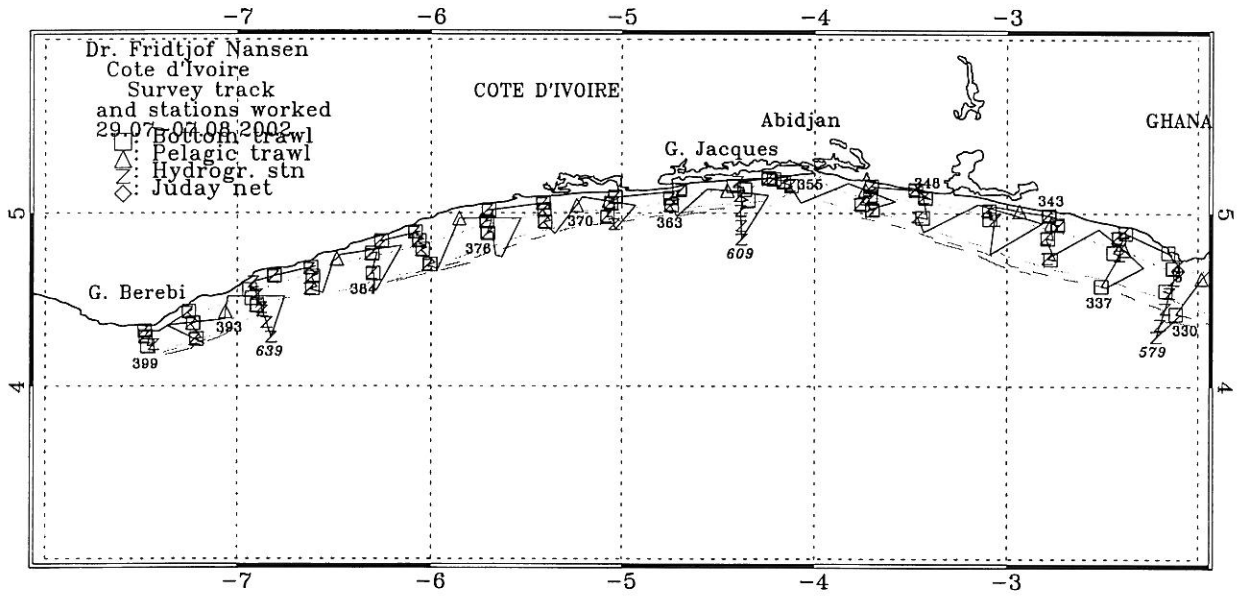
Figure 1.1 shows the cruise tracks with trawl, hydrographic and plankton stations. Table 1.1 summarises the survey effort in each sector.

Table 1.1 Number of hydrographic (CTD), water (W), 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	W	P	PT	BT	0-30 m	31-50m	51-100 m	surveyed
Benin	25	13	1	2	18	6	6	5	335
Area (NM^2)						387	134	244	
Togo	11	10	-	1	10	3	3	3	160
Area (NM^2)						149	78	100	
Ghana	65	13	3	11	61	16	19	19	1 500
Area (NM^2)						1 412	2 064	2 751	
Côte D'Ivoire	52	12	-	7	46	11	14	21	965
Area (NM^2)						563	701	1 619	
Total	153	48	4	21	135	36	42	48	2 960
Area (NM^2)						2 511	2 977	4 714	



a) Benin-Ghana



b) Ghana-Côte d'Ivoire

Figure 1.1 Course track with fishing and hydrographic stations for a) Benin-Ghana and b) Ghana-Côte d'Ivoire. 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

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. Two Niskin bottles were triggered in stable water to collect samples for calibration of the salinity and oxygen sensors. The samples were analysed for salinity using a Guildline Portasal salinometer, and the oxygen content was determined using the Winkler method.

For oxygen, 14 samples out of 14 from the Accra transect were accepted for the calibration. A linear regression gave the following formula for correcting the oxygen values:

$$O_2 = O_{2ctd} * 1.0282 + 0.0055$$

For the salinity calibration, 8 samples out of 14 from the Accra transect and 8 samples out of 12 from the Grand Bérébi transect were accepted. The average differences between the salinometer and CTD values were very small, 0.0048 and 0.0003 for the two transect respectively, and the CTD values were accepted.

Current speed and direction measurements (ADCP)

A ship-born Acoustic Doppler Current Profiler (ADCP) from RD Instruments was activated at every CTD station with bottom depth greater than 30 m. The ADCP was set to ping every 8 seconds, the depth cell was chosen to 8 m and the number of cells to 50. As a routine the data were averaged over 300 seconds for analyses onboard. Both the raw and averaged data were stored on files. The data were analysed by the PC software UMS (Underway Mapping System). Only 3 out of 4 beams were functioning, and the results are therefore less reliable and should be treated accordingly.

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, for anchovy to the nearest 0.5 cm. The carapace length was measured to the nearest 1 mm 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) 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:

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

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

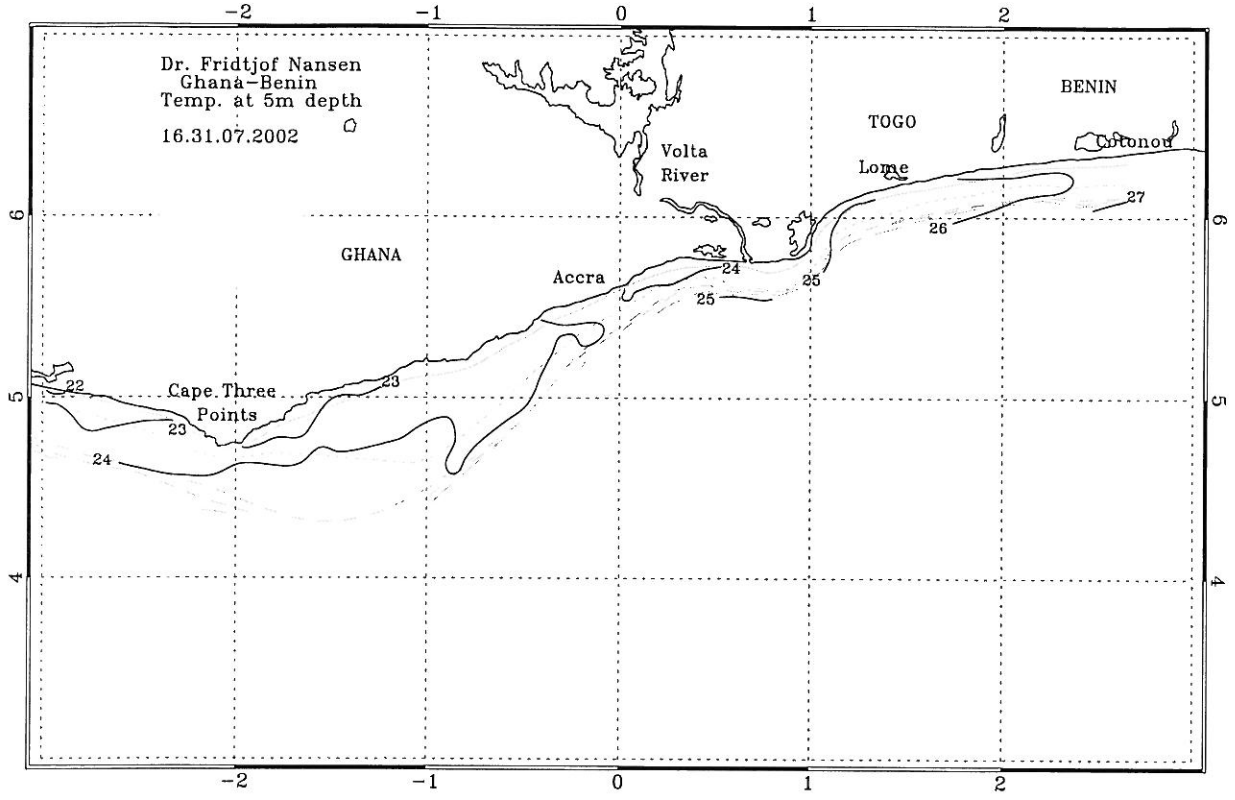
The surface layer temperature was continuously recorded during the cruise. Figures 2.1a and b show the horizontal distribution of sea surface temperature (SST) for the Benin-Ghana and the western Ghana-Côte d'Ivoire areas respectively. The lowest temperature of 21° C was recorded east of Grand Bérébi on the western side of Côte d'Ivoire. The surface temperatures showed a gradual increase from west to east of the survey area reaching a value of 26-27° C off Togo-Benin. Coastal temperatures were lower than in offshore areas, which is expected at this time of the year when a seasonal coastal upwelling occurs in the survey area. This pattern of surface temperature distribution is in agreement with previous observations on the differential intensity of the coastal upwelling along the western Gulf of Guinea coast (Pezennec and Bard, 1992; Koranteng and Pezennec, 1998).

The salinity contours (Figures 2.2a and b) show less clear patterns. This may be due to the upwelling season. The surface salinity ranged between 34.2 psu and 35.6 psu in the whole survey area. In general the salinity was lowest around the river estuaries and in some offshore areas.

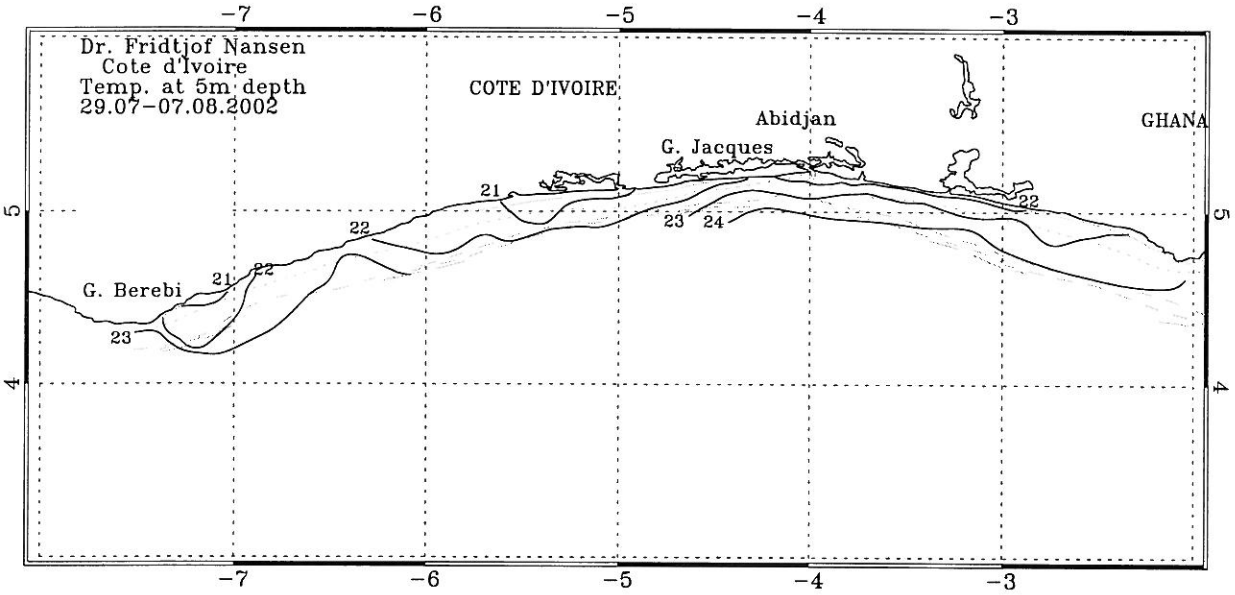
Vertical sections

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, which is known to be comparatively weak at this time of the year, was found between 20 and 50 m depth. Except for the Accra transect, a relatively flat structure was observed in most sections with no clear signs of vertical water displacement and upwelling. The thermocline was shallowest in the western part of the survey area.

Temperature ranged from 22° C (off Grand Bérébi) and 27° C (off Contonou) at the surface to 8° at 500 m depth. Salinity ranged from 34.8 psu (off Contonou and Cape Three Points) and 35.6 psu (off Accra) at the surface to 34.8 psu at 500m depth. Dissolved oxygen values ranged between 2 ml/l at the bottom and 5 ml/l at the surface. There was no sign of low bottom oxygen content on the shelf.

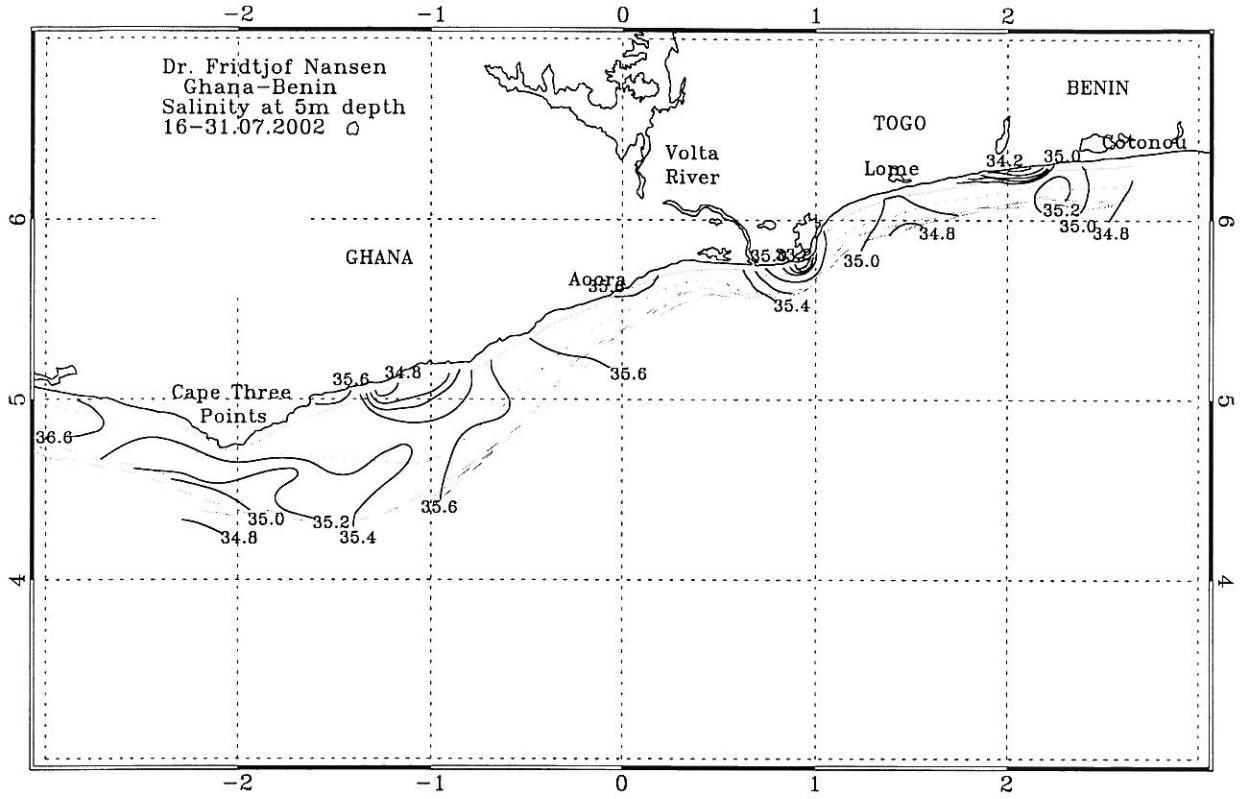


a) Benin-Ghana

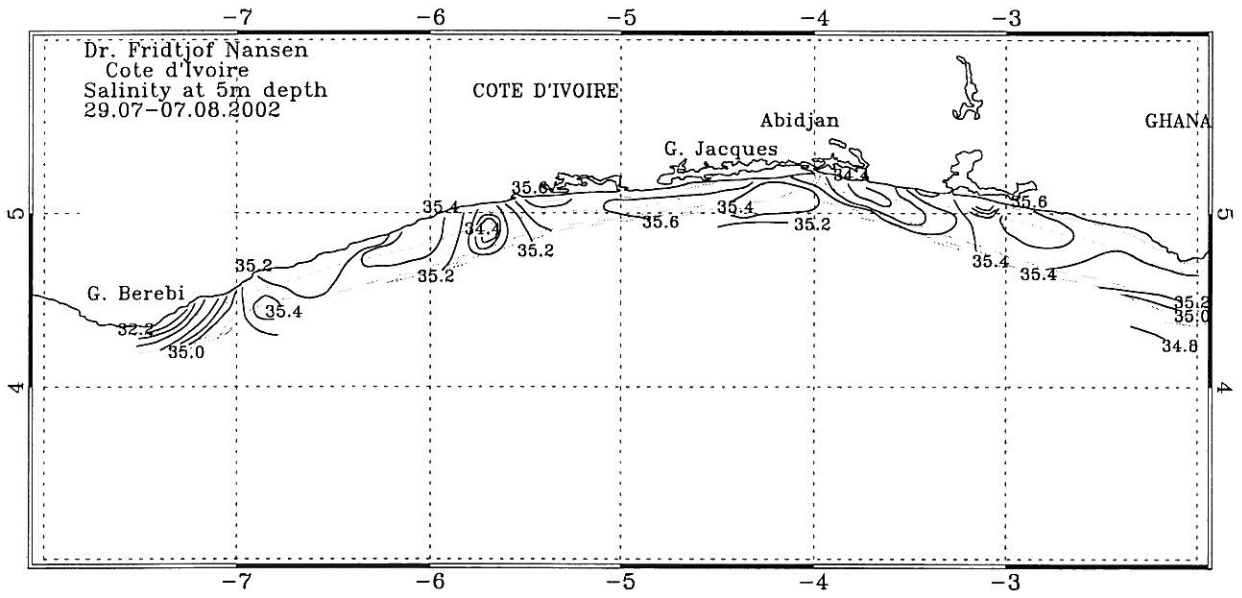


b) Ghana-Côte d'Ivoire

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

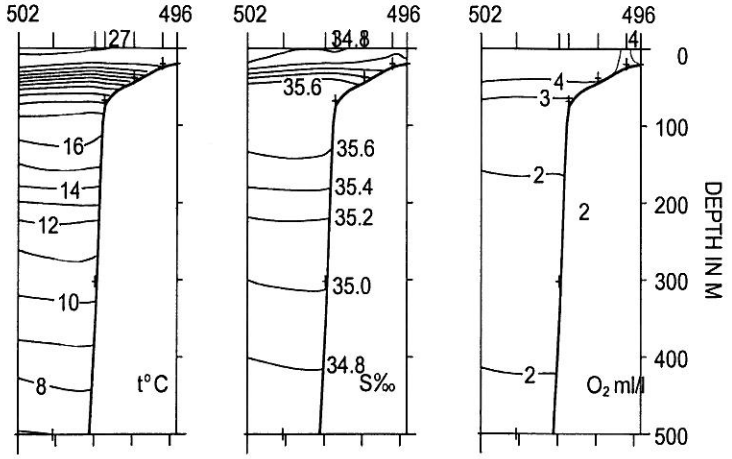


a) Benin-Ghana

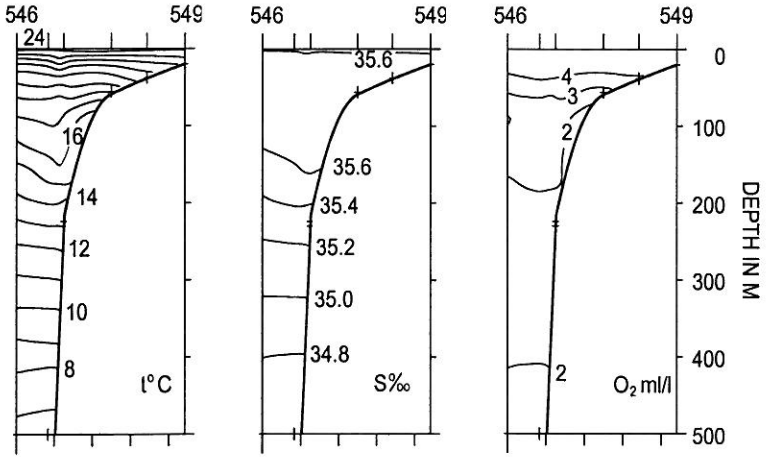


b) Ghana-Côte d'Ivoire

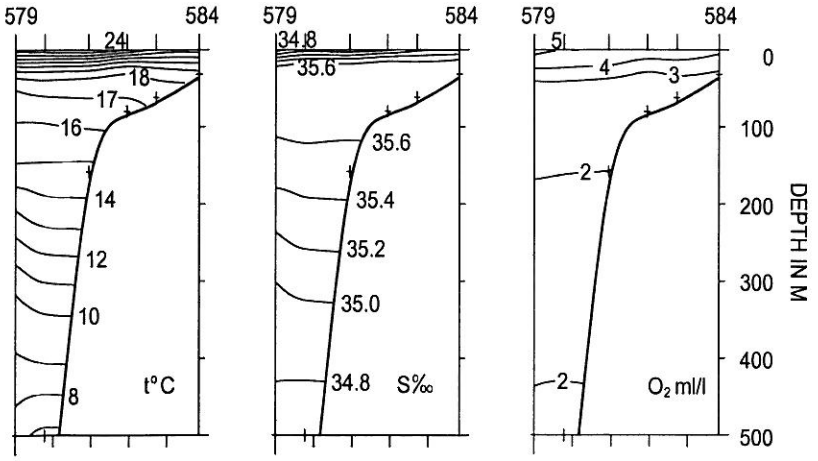
Figure 2.2 Horizontal distribution of salinity (5 m depth) at a) Benin-Ghana and b) Ghana-Côte d'Ivoire. Depth contours as in Fig. 1.



a) Cotonou – 17.07.2002

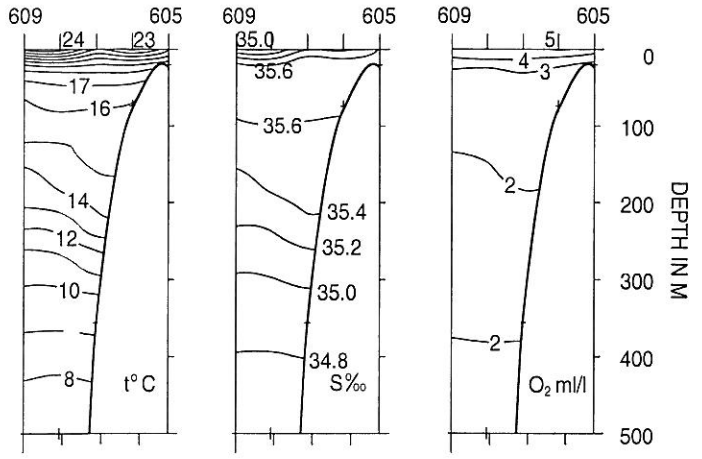


b) Accra – 23-24.07.2002

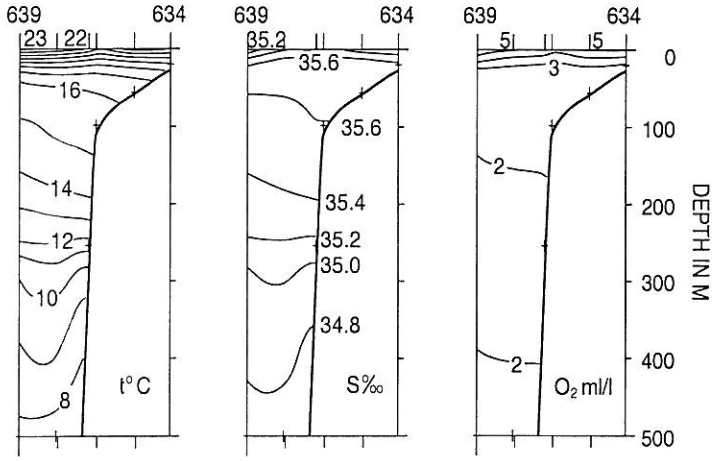


c) Cape Three Points – 30.07.2002

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



d) Grand Jacques – 02.08.2002



e) Grand Bérébi – 06.08.2002

Figure 2.3 Continued

Water sample analyses

The results of the water sample analyses for possible pollution are presented in Annex VIII.

ADCP current measurements

Due to problems with the Acoustic Doppler Current Profiler, the measurements were not reliable and are not analysed further.

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

Figures 4.1-4.3 show the distribution of the main groups of pelagic fish, i.e. sardinellas, anchovies and other fish (mainly carangids) defined as category PEL 2, 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 Benin

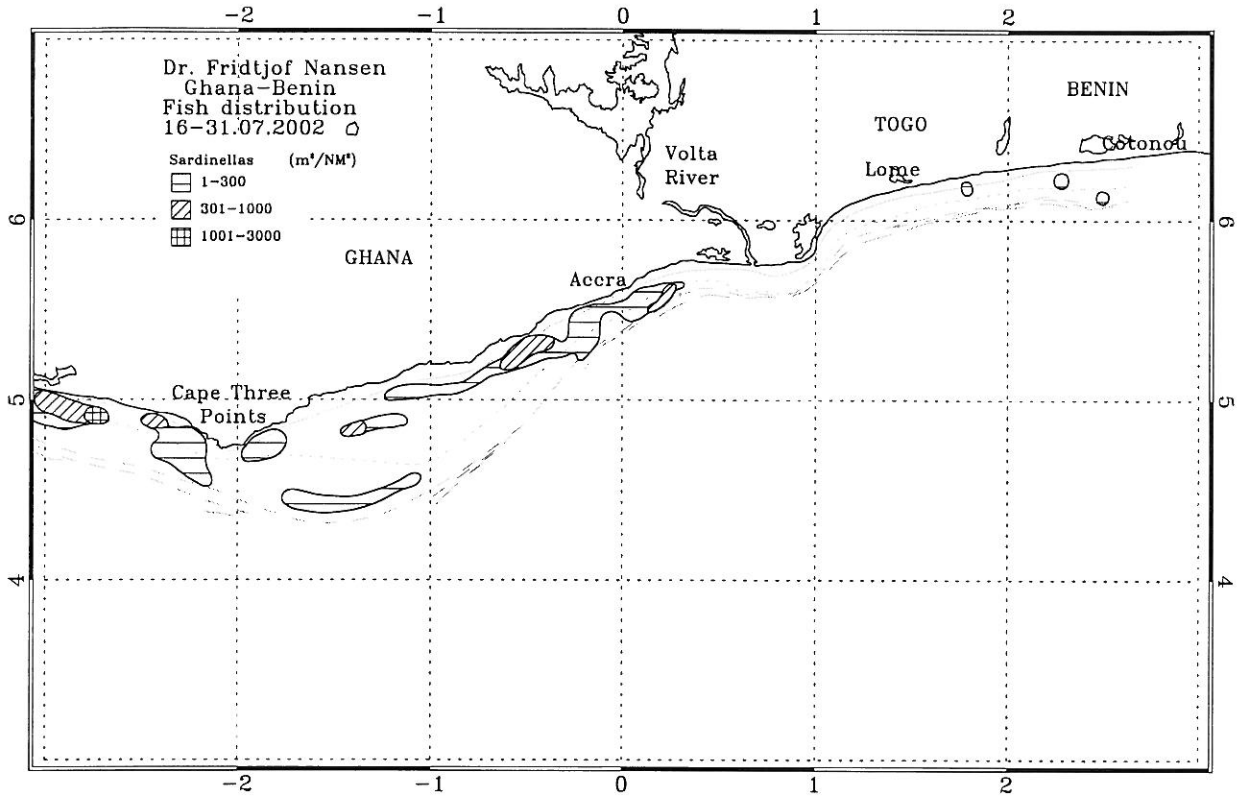
Clupeids

Sardinella maderensis were caught in small quantities in about half of the bottom trawl hauls in Benin waters, while *S. aurita* only was found on a few stations. *S. maderensis* (8-26 cm) was caught only on the inner shelf, while *S. aurita* was found mainly on the outer shelf (fish of sizes 9-16 cm). Juvenile *S. maderensis* (6-12 cm) was also caught in two pelagic blind trawl hauls close to the surface on the inner shelf. The acoustic registration of pelagic fish by the echo sounder was very scattered. A few low-medium density fish schools were mainly attributed to sardinella (Fig. 4.1a). No pelagic trawl hauls could be made to establish the species composition and length distribution of these schools and the bottom trawl hauls with highest occurrence of sardinella were applied for the acoustic abundance estimation. An estimated condition factor of 0.8 was used in the calculations. The biomass of the two sardinella species together was estimated to be about 1 500 tonnes, of which more than 90% was *S. aurita.*

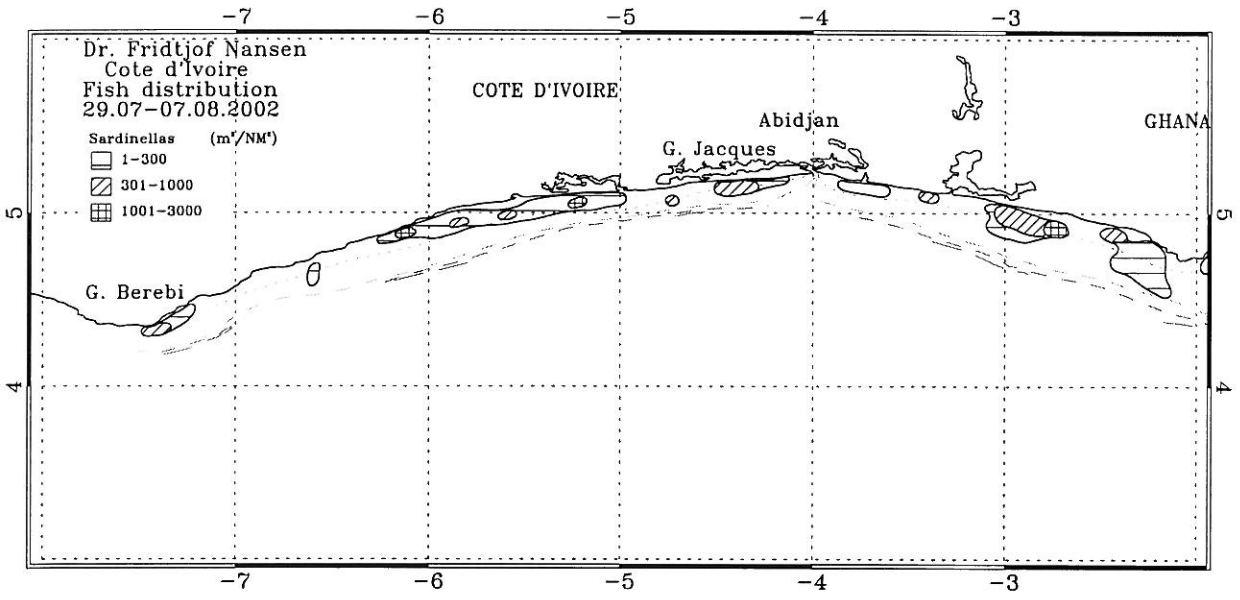
Ilisha africana (4-18 cm) was caught in some of the bottom-trawl hauls and in one of the pelagic blind trawl hauls in the inner shelf area. One low-density school was allocated to the PEL1 group, but no estimate of abundance was made.

Anchovy

Small quantities of juvenile *Engraulis encrasicolus* (3.5-6.0 cm) was caught in two pelagic blind trawl hauls on the inner shelf. No schools of *E. encrasicolus* were recorded and no estimate of abundance was made.



a) Benin-Ghana



b) Ghana-Côte d'Ivoire

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

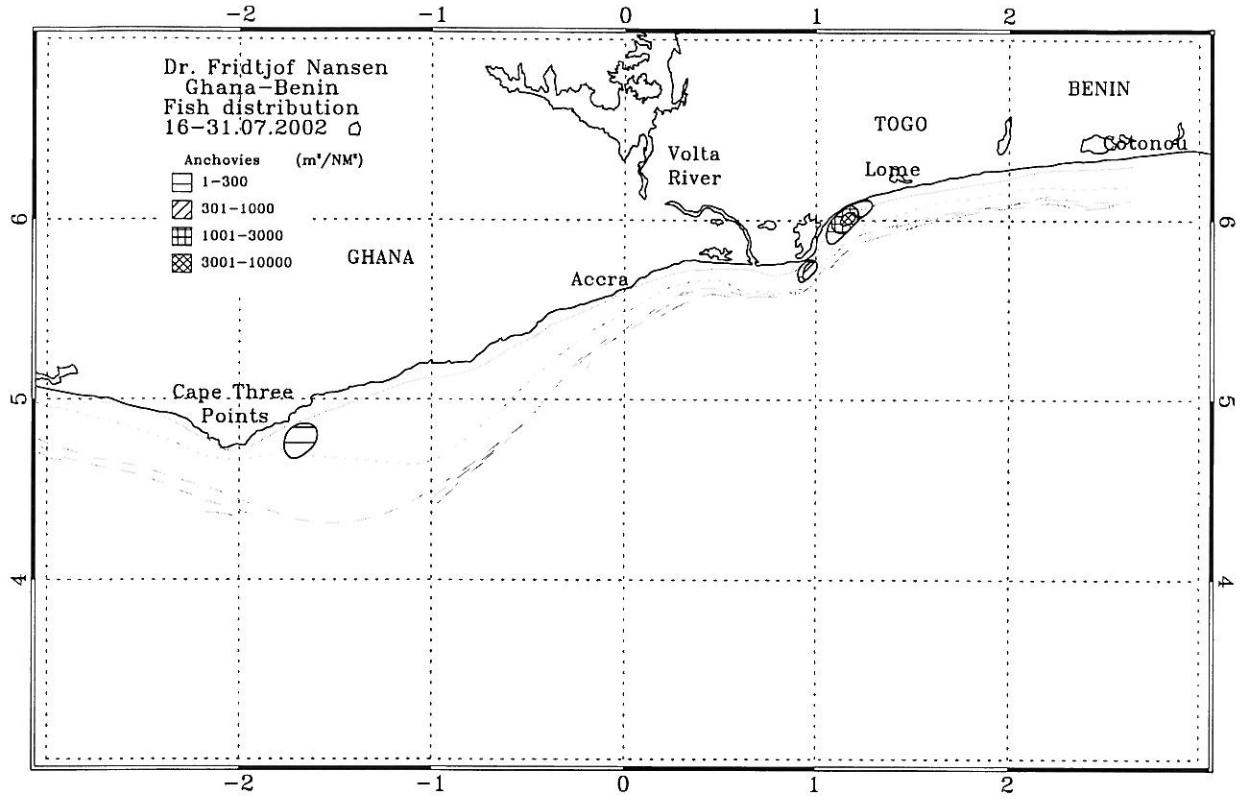
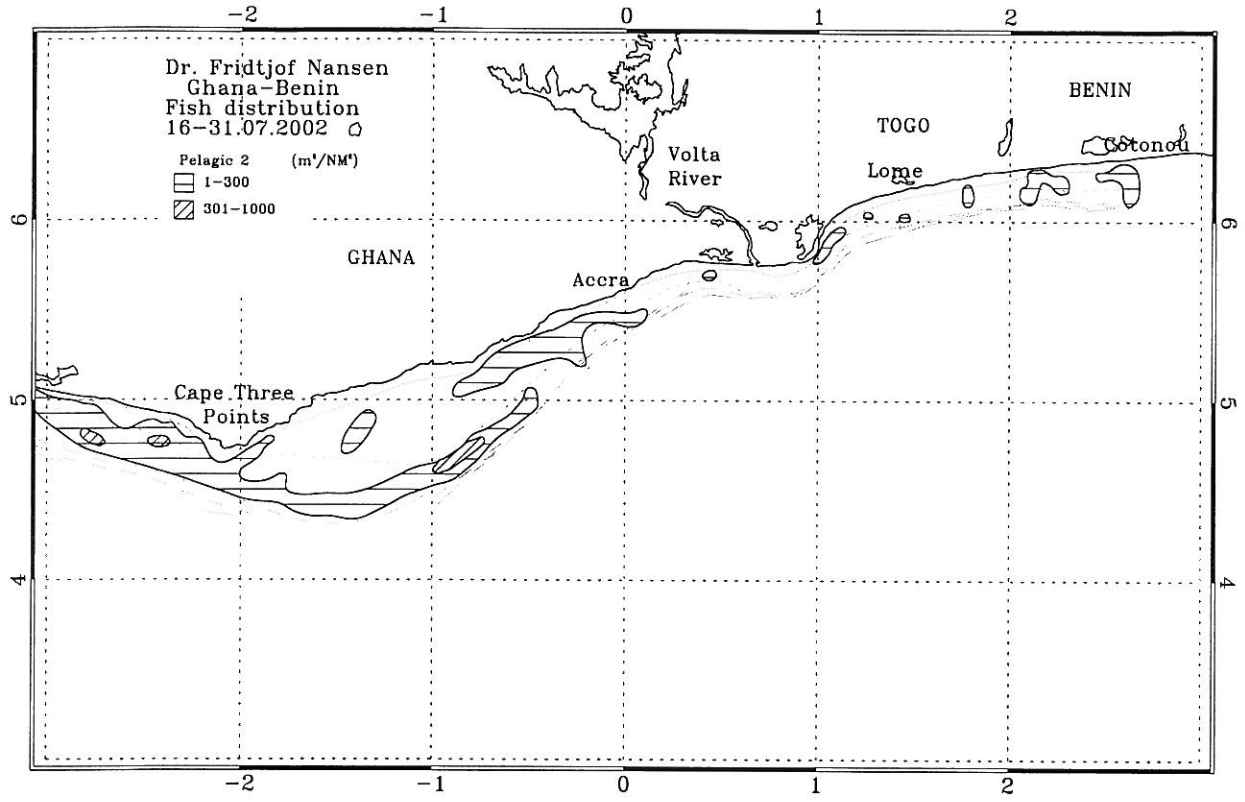


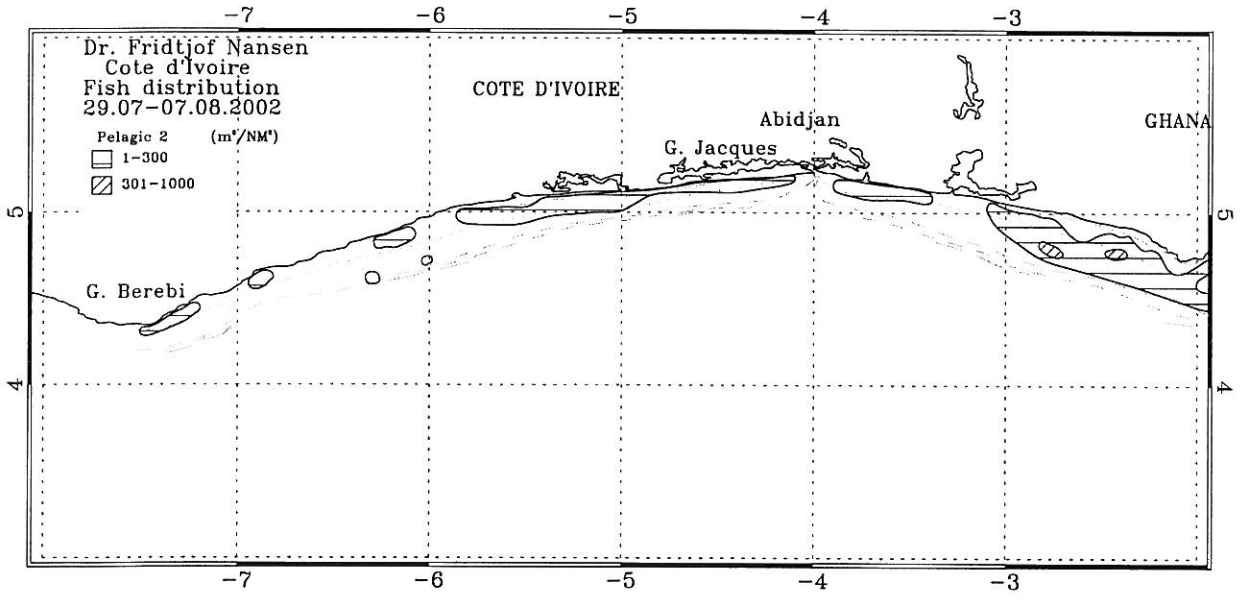
Figure 4.2 Distribution of anchovy (*Engraulis encrasicolus*) off a) Benin-Ghana. Depth contours as in Fig.1.

PEL 2 (carangids, scombrids, barracudas and hairtail)

This group consisted mainly of carangids with *Chloroscombrus chrysurus*, *Selene dorsalis*, *Selar crumenophthalmus* and *Alectis alexandrinus* as the most abundant species in the bottom trawl hauls. While *C. chrysurus* only was caught on the inner shelf, the three others also were caught in a few hauls on outer parts of the shelf. The carangid *Decapterus punctatus* was also quite common, mainly on the outer shelf, while *Trachurus trecae* was caught at only one station. The scombrid *Scomberomorus tritor* was caught in more than half of the bottom trawl hauls. 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 at some of the stations on the inner shelf. In the blind pelagic trawl hauls some *S. crumenophthalmus* (11-28 cm), *D. punctatus* (11-22 cm) and *S. tritor* (33-70 cm) were found, as well as *Sphyraena* spp. (22-130 cm). Some scattered schools, all of low density, were attributed to this group. The distribution of PEL 2 as allocated from the acoustic data is shown in Fig. 4.3a. Based on a pooled length distribution of the most common carangids and scombrids (4-42 cm, average of 18 cm), mainly from the bottom trawl hauls where they had the highest abundance, and an estimated condition factor of 0.9, the biomass of this group was estimated to be 2 600 tonnes.



a) Benin-Ghana



b) Ghana-Côte d'Ivoire

Figure 4.3 Distribution of PEL 2 (Carangids, scombrids, barracudas and hairtail) off a) Benin-Ghana and b) Ghana-Côte d'Ivoire. Depth contours as in Fig.1.

4.2 Togo

Clupeids

Sardinella aurita (8-21 cm) was caught in small quantities in the bottom trawl mainly at the outer shelf. A few juvenile *S. maderensis* (10-12 cm) and *S. aurita* (8-21 cm) were caught in a pelagic blind trawl haul close to the surface on the middle part of the shelf. No schools of sardinella were recorded and no estimate of abundance was made.

Anchovy

A few *Engraulis encrasicolus* (6-7 cm) were caught in a pelagic blind trawl haul close to the surface on the middle part of the shelf. No schools were recorded and no estimate of abundance was made.

Ilisha africana was not caught in Togo.

PEL 2 (carangids, scombrids, barracudas and hairtail)

Carangids and associated species were caught in the bottom trawl over the entire shelf. Catches of this group consisted mainly of carangids. *Decapterus punctatus* was most abundant and occurred over the whole shelf, while *Alectis alexandrinus* and *Selene dorsalis* were only found at the inner shelf area. *D. punctatus* (8-20 cm) was also caught in a pelagic blind trawl haul. Scombrids (*Scomberomorus tritor*) were caught in about half of the bottom trawl hauls over the whole shelf and in a pelagic blind trawl haul (36-65 cm). The barracudas, *Sphyraena guachancho, S. sphyraena* and *S. afra* (28-85 cm), were caught in a few hauls at the inner shelf and in a pelagic blind trawl haul. No hairtails were caught in this region. Only scattered layers and a couple of small low density schools were recorded by the acoustic registration (Fig. 4.3a). Based on a length distribution of *D. punctatus* (12-18 cm, mean of 14 cm) and an estimated condition factor of 0.9, the biomass of this group was estimated to be 100 tonnes.

4.3 Ghana

Clupeids

Sardinellas were caught at more than half of the bottom trawl hauls. *Sardinella aurita* (9-26 cm) was found over the entire shelf area and *S. maderensis* (5-27 cm) on the inner shelf. Sardinellas were also caught in pelagic blind trawl hauls at the inner shelf. Several small and some larger schools of medium density and a few of high density were allocated to sardinellas (Fig. 4.1a and b). The highest concentrations were recorded between Cape Three Points and the Ghana-Côte d'Ivoire border. Here, some larger *S. maderensis* (17-27 cm) were caught in pelagic trawl hauls during daytime. The total biomass of sardinellas was estimated

to be about 65 000 tonnes, applying added length distributions from both bottom and pelagic trawl hauls and a measured condition factor of 0.84. The two sardinella species contributed about 50% each to the estimate, with just slightly more of *S. maderensis*. In the acoustic estimate sardinellas of 11-13 cm and 18-20 cm were most abundant (Fig. 4.4).

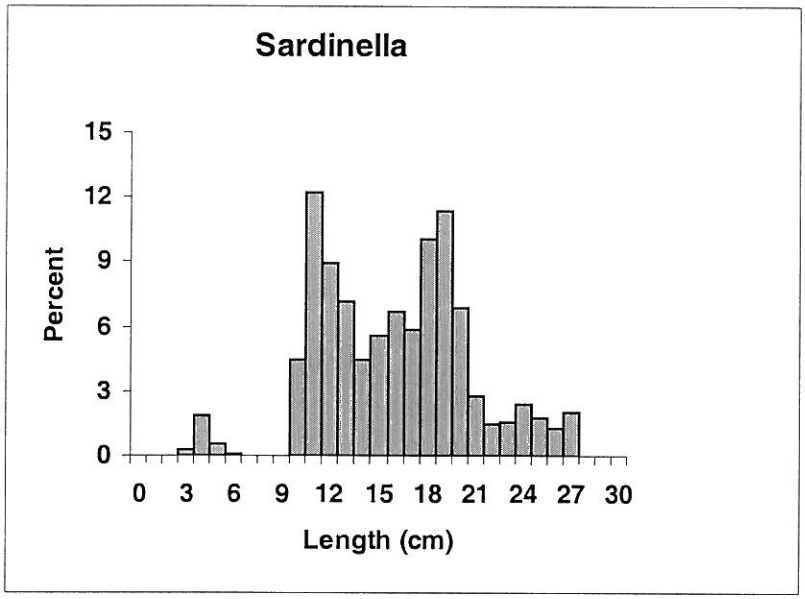


Figure 4.4 Length distribution of *Sardinella* spp. in Ghana, estimated acoustically.

Ilisha africana was caught in a few bottom trawl haul in shallow waters (30-50 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

Three schools of *Engraulis encrasicolus* were recorded in shallow waters, the largest and densest near the Ghana-Togo border (Fig. 4.2). Catches of anchovy (3.5-8.5 cm) were obtained both with pelagic trawl and in a few bottom trawl hauls in the areas of acoustic registrations. The biomass of anchovy was estimated to be about 8 000 tonnes, applying added length distributions from both bottom and pelagic trawl hauls and estimated condition factors of 0.7-0.8.

PEL 2 (carangids, scombrids, barracudas and hairtail)

As in Benin and Togo waters, this group consisted mainly of carangids. *Trachurus trecae* was the most abundant in the bottom trawl catches in the outer shelf area. *Chloroscombrus chrysurus, Selene dorsalis and Decapterus punctatus* were also common in the bottom trawl hauls at the shallow part of the shelf. The carangids were also caught in all pelagic blind trawl hauls. Most of the carangids were juveniles (14-23 cm). *Scomber japonicus* was the most abundant scombrid in the bottom trawl hauls, but *Scomberomorus tritor was* also quite

common. The barracudas, *Sphyraena guachancho*, *S. sphyraena* and *S. afra,* were found in less than half of the bottom trawl hauls but in most of the pelagic blind trawl hauls, mainly at the inner shelf. The hairtail *Trichiurus lepturus* was caught at some stations in both bottom trawl and pelagic blind trawl hauls. Small schools of PEL 2 species were detected at most of the shelf, both the inner and outer part (Fig. 4.3a and b). The schools were mainly of low-medium density. No direct pelagic trawl hauls were made on these schools. The biomass of PEL 2 was estimated to be approximately 52 000 tonnes, applying added length distributions of the most common carangids (*T. trecae, D. punctatus* and *C. chrysurus*) and *S. japonicus* from both bottom and pelagic trawl hauls and a measured condition factor of 0.97 (*T. trecae*).

4.4 Côte d'Ivoire

Clupeids

Sardinellas were recorded along the whole coast of Côte d'Ivoire, with highest concentrations in shallow waters at Grand Jacques (Fig. 4.1b). Both *Sardinella aurita* (9-29 cm) and *S. maderensis* (9-29 cm) occurred frequently in the bottom trawl catches, and were also caught in the pelagic trawl hauls. *S. maderensis* was most abundant and dominated on the inner shelf, while only *S. aurita* was found in low-medium densities on the outer shelf. The total biomass was estimated to about 34 000 tonnes, applying added length distributions from both bottom and pelagic trawl hauls and a measured condition factor of 0.9. *S. maderensis* contributed about 80% to the acoustic estimate. Most of the sardinellas found on the shelf off Côte d'Ivoire were juvenile (Fig. 4.5)

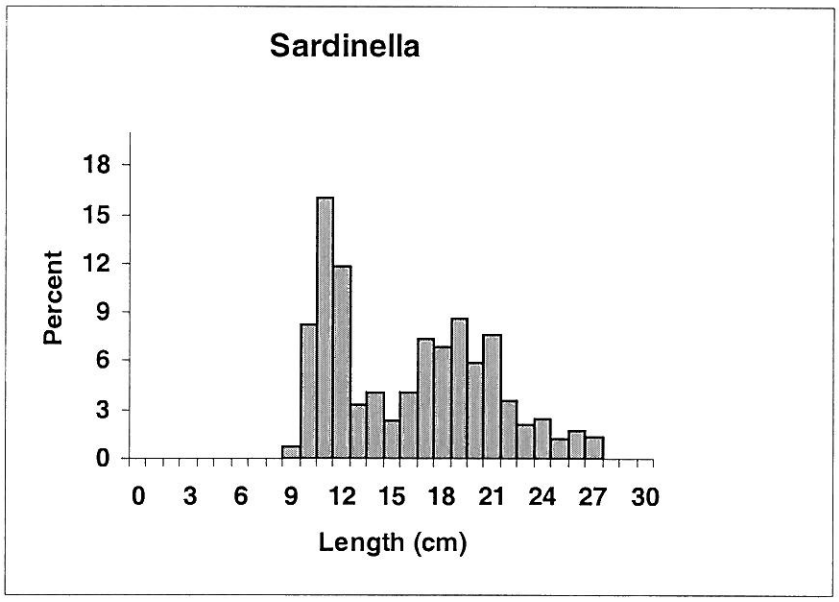


Figure 4.5. Length distribution of *Sardinella* spp. in Côte d'Ivoire, estimated acoustically.

Ilisha africana was frequently taken in bottom and pelagic blind 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

No anchovy (*Engraulis encrasicolus*) was caught, neither in the bottom trawl nor in pelagic blind trawl hauls, and no schools were recorded.

PEL 2 (carangids, scombrids, barracudas and hairtail)

Like in Benin, Togo and Ghana the species category PEL 2 consisted mostly of carangids. Juvenile *Trachurus trecae* (12-13 cm) was the dominant species in bottom trawl catches at the outer shelf. It was also caught at the inner shelf, both in the bottom trawl and in pelagic blind trawl hauls. Other carangids such as *Chloroscombrus chrysurus*, *Decapterus rhonchus* and *Selene dorsalis* also occurred in lower densities, mainly at the inner shelf. *Scomber japonicus* was the most abundant scombrid in the bottom trawl hauls, but *Scomberomorus tritor was* also caught at a few stations, both at low catch rates. Barracudas, dominated by *Sphyraena guachancho*, were common in bottom trawl hauls and pelagic blind trawl hauls, mainly at the inner shelf. Next to the carangids, hairtail was the most abundant pelagic group in bottom trawl hauls in the area. *Trichiurus lepturus* was found at most of the bottom trawl stations on both the inner and outer shelf. It was also common in pelagic blind trawl hauls.

Low to medium density schools of PEL 2 species were found along the whole coastline, mainly on the inner shelf (Fig. 4.3b). Applying added length distributions of the most common carangids (*T. trecae, D. punctatus* and *C. chrysurus*) and *S. japonicus* from both bottom and pelagic trawl hauls and a measured condition factor of 0.98 (*T. trecae*), the biomass of PEL 2 was estimated to about 10 500 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) and 2000 (Torstensen *et al.* 2000), are presented in Table 4.1. Benin and Togo sectors have in earlier years been covered as one area, due to the narrow coastline of Togo. During the two last surveys the effort has been increased, and in the present survey a design was made to have three transects in Togo and six in Benin. 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. In the eastern areas few schools of low densities were registrated as the fish occurred mainly in dispersed distribution. 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 day-time it was 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.

The 2000 biomass estimates for the sardinellas-anchovy group were much higher than in the other years. This was mainly seen in the biomass estimated for the western part of Côte d'Ivoire, and may be an effect of a stronger residual upwelling in this area. In Ghana the biomass of these combined species has varied less over the years, but seems to have increased somewhat in later years. The biomass of PEL 2 has also been less variable, especially in Ghana. The 2002 estimate for Côte d'Ivoire is among the lowest in the time series, but this may be due to low availability for acoustic registration. The swept area biomass estimate shows an opposite trend, and probably the carangids, mainly juvenile *Trachurus trecae*, have been too close to the bottom for proper acoustic registration, both in 2000 and 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 Benin-Togo in 1981, 1989, 1999, 2000 and 2002.

a) Sardinellas and anchovies (PEL 1)

Survey Year	Survey period	Côte d'Ivoire	Ghana	Benin-Togo	Benin	Togo	Total
1981	June	39 000	40 000	*			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	29.8 – 15. 9	111 000	56 500		1 700	6 500	175 700
2002	16.7 – 12.8	34 000	73 000		1 500	-	108 500

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

Survey Year	Survey period	Côte d'Ivoire	Ghana	Benin – Togo	Benin	Togo	Total
1981	June	2 000	10 000	*			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	29.8 – 15. 9	18 000	61 000		1 500	2 500	83 000
2002	16.7 – 12.8	10 500	52 000		2 600	100	65 200

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

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 Benin

17 swept-area trawl stations were made on the shelf off Benin. One additional haul was taken at 131-187 m depth. Due to a steep slope and rough bottom it was difficult to trawl in the deeper areas. Tables 5.1a 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 56%. The demersal group was the second most important, contributing 21% to the catches, followed by the "other" group (18%). Cephalopods had much lower catch rates, while shrimps were found at only two stations. No sharks were caught. On the outer shelf the demersal group was the most important with 58% of the average catch rate. The pelagic group made up 17% of the catches, "other" fish 5% and cephalopods 18%. *Sepia officinalis hierredda* was the dominant cephalopod. On the outer shelf, sharks were caught at some stations, but with low catch rates. Shrimps were not caught in this zone.

Table 5.1 Benin. 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. SE = standard error.

a) Inner shelf, 0-50 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
245	44	20.2	74.8	1.9	6.2	0.0	5.7	108.8
246	20	0.9	26.1	0.1	0.0	0.0	1.1	28.3
247	20	48.1	109.1	0.0	0.0	0.0	70.5	227.7
248	32	10.4	157.8	0.0	0.0	0.0	4.2	172.4
251	38	44.4	92.6	0.0	3.1	0.0	13.0	153.1
252	27	0.0	66.3	0.0	5.7	0.0	2.5	74.5
253	17	101.0	212.1	0.0	0.0	0.0	110.0	423.2
254	47	68.3	99.7	0.0	3.0	0.0	14.8	185.8
258	32	80.0	9.7	0.0	6.0	0.0	81.2	176.9
259	23	31.2	13.1	0.0	50.7	0.0	34.9	129.9
260	19	62.8	315.6	0.0	1.7	0.0	108.1	488.2
261	45	55.0	211.4	0.0	46.2	0.0	7.3	319.9
Mean	30	43.5	115.7	0.2	10.2	0.0	37.8	207.4
SE		9.2	26.8	0.2	5.2	0.0	12.3	39.8
% Catch		21.0	55.8	0.1	4.9	0.0	18.2	

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopod	Sharks	Other	Total
244	81	159.9	107.8	0.0	76.1	0.0	18.2	362.0
250	69	11.3	5.9	0.0	10.7	3.9	2.1	33.9
255	84	245.8	7.1	0.0	18.8	1.2	5.4	278.4
257	65	23.9	3.9	0.0	15.1	0.0	4.7	47.6
262	62	21.4	8.4	0.0	22.1	10.2	11.6	73.6
Mean	72	92.5	26.6	0.0	28.6	3.1	8.4	159.1
SE		47.1	20.3	0.0	12.0	1.9	2.9	67.4
% Catch		58.1	16.7	0.0	18.0	1.9	5.3	

Catch rates of the most important pelagic families, caught by bottom trawl in the swept-area survey, are presented in Tables 5.2a and b. Carangids were the dominant species group on both the inner and outer shelf, with highest average catch rate (68 kg/h) on the former. Of the carangids *Selene dorsalis, Selar crumenophthalmus, Alectis alexandrinus* and *Chloroscombrus chrysurus* occurred most frequently. Barracudas (Sphyraenidae) were the second most important group on the inner shelf with a mean catch rate of 25 kg/h, but were only caught in low numbers on the outer shelf. Clupeids were much less abundant than in 2000, and were mainly found on the inner shelf. *Sardinella maderensis* and *Ilisha africana* were the two most frequently occurring clupeids. Hairtails were only caught on the inner shelf. Some scombrids (*Scomberomorus tritor*) were found on both the inner and outer shelf.

Table 5.2 Benin. 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
245	44	2.1	6.4	1.6	50.3	14.3	34.0	108.7
246	20	0.0	15.1	5.4	2.4	3.3	2.2	28.3
247	20	5.9	28.0	10.6	18.2	46.4	118.6	227.7
248	32	0.6	78.3	27.1	0.4	51.3	14.6	172.4
251	38	1.9	65.5	1.1	0.9	23.2	60.5	153.1
252	27	0.0	65.1	0.0	0.0	1.2	8.2	74.5
253	17	38.8	73.6	0.0	27.9	71.8	211.1	423.2
254	47	0.4	80.1	0.0	0.0	19.2	86.1	185.8
258	32	0.5	2.6	6.6	0.0	0.0	166.8	176.5
259	23	0.0	8.4	2.4	0.0	2.3	116.8	129.9
260	19	43.5	179.6	24.3	0.0	68.2	172.6	488.2
261	45	0.6	210.2	0.0	0.0	0.6	108.5	319.9
Mean	30	7.9	67.7	6.6	8.3	25.2	91.7	207.4
SE		4.5	19.3	2.8	4.6	7.9	20.1	39.8
% Catch		3.8	32.7	3.2	4.0	12.1	44.2	

b) Outer shelf, 51-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
244	81	3.4	104.3	0.0	0.0	0.0	254.2	362.0
250	69	0.1	5.8	0.0	0.0	0.0	28.0	33.9
255	84	0.0	4.2	0.0	0.0	2.9	271.3	278.4
257	65	0.0	0.0	3.9	0.0	0.0	43.7	47.6
262	62	0.0	3.5	4.4	0.0	0.4	65.3	73.6
Mean	72	0.7	23.6	1.7	0.0	0.7	132.5	159.1
SE		0.7	20.2	1.0	0.0	0.6	53.6	67.4
% Catch		0.4	14.8	1.0	0.0	0.4	83.3	

Tables 5.3a and b show catch rates of the most commercially important demersal species on the shelf down to depths of 100 m, grouped as seabreams (Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *Brachydeuterus auritus*) and croakers (Sciaenidae). All groups had low catch rates on the inner shelf. Seabreams and croakers were most abundant with mean catch rates of about 10 kg/h. Seabreams dominated on the outer shelf with an average catch rate of 75 kg/h or 47% of the total average catch rate. The most commonly occurring species were *Pagrus caeruleostictus, Pagellus bellottii* and *Dentex canariensis.* Croakers, grunts and snappers were not found on the outer shelf, while groupers (*Epinephelus aeneus*) occurred in low numbers.

Table 5.3 Benin. 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 (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
245	44	0.0	0.0	0.0	0.0	0.0	108.7	108.7
246	20	0.0	0.0	0.0	0.0	0.0	28.3	28.3
247	20	0.0	6.6	0.0	0.3	40.7	180.1	227.7
248	32	5.6	0.0	0.0	0.0	1.6	165.2	172.4
251	38	3.9	0.0	1.3	6.3	0.0	141.7	153.1
252	27	0.0	0.0	0.0	0.0	0.0	74.5	74.5
253	17	0.0	0.0	0.0	12.2	64.1	346.9	423.2
254	47	29.3	0.0	5.0	0.0	0.5	151.0	185.8
258	32	56.9	6.8	0.0	0.0	0.0	112.8	176.5
259	23	12.1	9.5	0.0	0.0	0.0	108.3	129.9
260	19	2.2	0.0	0.0	1.5	22.3	462.2	488.2
261	45	2.4	0.0	0.0	0.0	0.0	317.5	319.9
Mean	30	9.4	1.9	0.5	1.7	10.8	183.1	207.3
SE		5.0	1.0	0.4	1.1	6.1	36.7	39.8
% Catch		4.5	0.9	0.3	0.8	5.2	88.3	

b) Outer shelf, 51-100 m

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
244	81	118.3	0.0	0.0	0.0	0.0	243.6	362.0
250	69	8.5	0.0	2.8	0.0	0.0	22.6	33.9
255	84	214.5	0.0	0.0	0.0	0.0	63.8	278.4
257	65	23.9	0.0	0.0	0.0	0.0	23.7	47.6
262	62	10.5	0.0	10.7	0.0	0.0	52.4	73.6
Mean	72	75.2	0.0	2.7	0.0	0.0	81.2	159.1
SE		40.3	0.0	2.1	0.0	0.0	41.4	67.4
% Catch		47.2	0.0	1.7	0.0	0.0	51.1	

Annex IV gives the swept-area estimates of mean densities (t/NM^2) based on the 17 random bottom trawl stations on the shelf of Benin. Of the demersal species, *Pseudotolithus senegalensis* and *Galeoides decadactylus* had the highest mean density in the shallowest zone (≤30 m), *B. auritus* in the 31-50 m zone, while *Dentex congoensis* had the highest density in the 51-100 m zone. *D. congoensis, Sepia officinalis hierredda* and *B. auritus* had the highest overall mean densities. This is similar to what was found in 2000.

Table 5.4 presents swept-area biomass estimates for valuable demersal groups and other groups that occurred in sizeable quantities. Estimated total biomass of valuable demersal groups was about 1 200 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 5.4. Benin. 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	31	71	632	734	48	1 420
Grunts	31	4	0	35	0	84
Croakers	263	1	0	265	32	497
Groupers	0	4	22	26	0	60
Snappers	35	4	0	39	0	80
Sum dem. val.	**360**	**84**	**654**	**1 098**	**386**	**1 810**
Bigeye grunt	135	102	0	237	64	410
Carangids	793	320	193	1 306	443	2 170
Barracudas	402	78	5	485	186	784

5.2 Togo

Nine swept-area trawl stations were made on the shelf off Togo. One deep-water bottom trawl was taken at 208-214 m. Tables 5.5a and b present catch rates by main groups for the inner and outer shelf. On the inner shelf the demersal group dominated with a relative contribution of 39%, while pelagic fish made up 16% of the catch. The group "other" species had a relative contribution of 31%. The mean catch of Cephalopods made up 13% of the total catch at the inner shelf and *Sepia officinalis hierredda* was the dominant species. No shrimps or sharks were caught. On the outer shelf the demersal and pelagic groups made about the same part of the total catch, 30 and 27%, respectively, while cephalopods contributed 17% and "other" 26%. No shrimps and sharks were caught in this zone either.

Table 5.5 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
265	40	28.7	23.3	0.0	32.8	0.0	19.0	103.8
266	22	7.6	10.5	0.0	29.2	0.0	5.3	52.5
267	25	384.2	18.2	0.0	74.7	0.0	220.6	697.7
268	43	49.7	24.3	0.0	9.5	0.0	3.5	87.0
273	35	2.5	95.0	0.0	20.0	0.0	21.5	139.0
274	25	39.0	38.8	0.0	5.4	0.0	140.8	224.0
Mean	32	85.3	35.0	0.0	28.6	0.0	68.4	217.3
SE		60.2	12.6	0.0	10.2	0.0	37.1	99.0
% Catch		39.2	16.1	0.0	13.2	0.0	31.5	

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
264	64	38.9	0.0	0.0	2.8	0.0	24.0	65.7
269	52	11.3	50.7	0.0	26.0	0.0	11.5	99.5
272	51	12.3	3.8	0.0	6.2	0.0	16.9	39.2
Mean	56	20.8	18.2	0.0	11.7	0.0	17.5	68.2
SE		9.0	16.3	0.0	7.2	0.0	3.6	17.4
% Catch		30.6	26.7	0.0	17.1	0.0	25.6	

Catch rates of the most important pelagic families, caught by bottom trawl in the swept-area survey, are presented in Tables 5.6a and b. Carangids were the dominant species group on both the inner and outer shelf, with highest average catch rate (25 kg/h) on the former. *Decapterus punctatus* occurred most frequently, followed by *Alectis alexandrinus*. Clupeids were mainly found on the outer shelf where they were the second most important pelagic group, represented only by *Sardinella aurita*. Barracudas were the second most important pelagic group on the inner shelf, but were scarce on the outer shelf. Scombrids (*Scomberomorus tritor*) occurred both on the inner and outer shelf, while no hairtails were caught.

Table 5.6 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
265	40	0.0	21.6	1.7	0.0	0.0	80.5	103.8
266	22	0.0	0.0	10.5	0.0	0.0	42.1	52.5
267	25	0.0	1.0	0.0	0.0	17.2	679.5	697.7
268	43	0.2	23.8	0.0	0.0	0.3	62.7	87.0
273	35	0.0	94.5	0.0	0.0	0.5	44.0	139.0
274	25	0.0	8.9	0.0	0.0	29.9	185.2	224.0
Mean	32	0.0	25.0	2.0	0.0	8.0	182.3	217.3
SE		0.0	14.5	1.7	0.0	5.2	101.8	99.0
% Catch		0.0	11.5	0.9	0.0	3.7	83.9	

b) Outer shelf, 51-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
264	64	0.0	0.0	0.0	0.0	0.0	65.7	65.7
269	52	19.9	28.9	1.9	0.0	0.0	48.8	99.5
272	51	0.0	0.2	2.8	0.0	0.8	35.4	39.2
Mean	56	6.6	9.7	1.6	0.0	0.3	50.0	68.2
SE		6.6	9.6	0.8	0.0	0.3	8.8	17.4
% Catch		9.7	14.2	2.3	0.0	0.4	73.3	

Tables 5.7a and b present catch rates of the most commercially important demersal species on the shelf down to depths of 100 m, grouped as seabreams (Sparidae except *Boops boops*), snappers (Lutjanidae), groupers (Serranidae), grunts (Haemulidae except *Brachydeuterus auritus*) and croakers (Sciaenidae). The seabreams dominated both the inner and outer parts of the shelf. *Dentex canariensis, Pagrus caeruleostictus* and *Pagellus bellottii* were the most common sparids. Snappers were the second most important family on the inner shelf due to one large catch of *Lutjanus dentatus* (112 kg/h), but were not encountered on outer parts. Groupers and grunts were caught in low numbers on both parts of the shelf, while no croakers were found in the Togo sector.

Table 5.7 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 (51-100 m).

a) Inner shelf, 0-50 m

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
265	40	23.5	0.0	3.5	0.5	0.0	76.3	103.8
266	22	5.6	0.0	0.0	0.0	0.0	46.9	52.5
267	25	37.2	111.7	0.0	6.6	0.0	542.1	697.7
268	43	47.7	0.0	1.1	0.0	0.0	38.2	87.0
273	35	2.5	0.0	0.0	0.0	0.0	136.5	139.0
274	25	17.7	10.5	0.0	0.0	0.0	195.9	224.0
Mean	32	22.4	20.4	0.8	1.2	0.0	172.6	217.3
SE		7.2	18.4	0.6	1.1	0.0	77.8	99.0
% Catch		10.3	9.4	0.4	0.5	0.0	79.4	

b) Outer shelf, 51-100 m

Station	Depth	Seabream	Snappers	Groupers	Grunts	Croakers	Other	Total
264	64	26.2	0.0	0.0	12.6	0.0	27.0	65.7
269	52	11.3	0.0	0.0	0.0	0.0	88.2	99.5
272	51	7.5	0.0	4.8	0.0	0.0	26.9	39.2
Mean	56	15.0	0.0	1.6	4.2	0.0	47.4	68.2
SE		5.7	0.0	1.6	4.2	0.0	20.4	17.4
% Catch		22.0	0.0	2.4	6.1	0.0	69.5	

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 *Acanthurus monroviae* had the highest mean density in the shallowest zone (≤30 m) and *Sepia officinalis hierredda* in the 31-50 m and 51-100 m zone. *L. atlanticus, S. officinalis hierredda* and *A. monroviae* had the highest overall mean densities.

Table 5.8 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 500 tonnes. Seabreams and snappers made up most of this, with about equal shares. It should, however, be noted that the snapper estimate is based on one large catch. The highest biomasses were estimated in the shallowest zone, but the seabreams had rather even density distribution over the three zones. The estimated biomasses of grunts and groupers were low, and no croakers were found. Of the pelagic and semi-pelagic groups, carangids had the highest estimated biomass. The bigeye grunt was not represented in the catches.

Table 5.8 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	100	64	51	215	95	335
Grunts	10	1	14	25	0	60
Croakers	0	0	0	0	0	0
Groupers	0	4	5	9	0	20
Snappers	198	0	0	198	0	576
Sum dem.val.	**308**	**69**	**70**	**447**	**0**	909
Bigeye grunt	0	0	0	0	0	0
Carangids	16	122	33	171	0	315
Barracudas	77	1	1	79	0	165

5.3 Ghana

A total of 54 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 5.9 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 52%. The pelagic group contributed 35% to the total followed by the "other" group, which had a relative contribution of 10%. Cephalopods made up about 2% of the catch, while shrimps and sharks were scarce. On the outer shelf the pelagic group dominated the catches, contributing 64% to the total. The demersal group had a relative contribution of 24% and "other" about 10%. Cephalopods and sharks were scarce, and 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 pelagic and "other" groups were about two times higher on the outer shelf than on the inner shelf, while for the demersal group they were similar. The average catch rate of the demersal group was just above 200 kg/h both on the

inner and outer shelf. The pelagic and "other " group had catch rates of 548 kg/h and 82 kg/h on the outer shelf, compared to 153 kg/h and 43 kg/h on the inner shelf.

Table 5.9 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
275	20	0.0	43.6	0.0	19.2	0.0	1.2	64.0
276	25	0.5	91.4	0.0	0.0	0.0	0.0	91.9
277	40	11.5	38.3	0.0	3.8	0.0	0.9	54.5
280	49	35.7	21.1	0.0	0.7	0.0	2.6	60.1
281	35	16.8	28.2	0.0	6.4	0.0	1.7	53.1
282	20	3.6	26.1	0.0	0.0	0.0	0.1	29.8
284	38	208.1	29.1	0.0	5.4	0.0	1.9	244.4
285	26	130.6	73.1	0.0	0.2	0.0	0.0	203.9
289	40	816.8	65.9	0.0	28.6	0.0	87.6	998.8
290	24	36.0	55.0	0.0	1.5	0.0	41.5	134.0
291	21	28.7	1.0	0.0	4.3	0.0	19.6	53.6
292	44	18.5	32.0	0.0	2.1	0.0	50.3	102.9
295	22	4.9	211.9	0.0	0.0	0.0	12.4	229.2
296	41	49.8	245.0	0.0	17.0	0.0	29.3	341.0
303	45	95.8	21.0	0.0	1.6	0.0	75.0	193.3
304	30	113.2	1 716.7	0.0	0.0	0.0	96.2	1 926.1
305	21	99.2	271.6	0.0	0.0	0.0	24.8	395.6
306	22	631.5	179.0	0.0	6.9	0.0	18.1	835.4
307	31	154.7	331.8	0.0	10.5	0.0	4.3	501.3
309	39	41.7	19.1	0.0	0.0	0.0	12.8	73.6
310	50	24.9	5.2	0.0	9.7	0.0	43.1	82.9
316	47	6.1	6.7	0.0	22.5	4.6	102.4	142.2
317	35	203.6	74.8	0.0	12.2	0.0	31.9	322.4
318	25	75.6	115.1	3.4	7.0	0.0	112.1	313.2
319	22	17.4	37.5	1.5	3.0	0.0	63.4	122.8
326	47	92.5	63.0	0.0	0.4	0.0	156.2	312.1
327	36	23.8	28.9	3.9	1.2	0.0	67.5	125.3
328	29	20.5	86.9	32.9	18.4	0.0	37.5	196.2
332	47	817.6	280.1	0.9	21.1	0.0	13.8	1 133.5
333	28	88.1	53.5	88.0	2.7	0.0	154.4	386.6
334	28	163.2	202.7	1.8	1.6	0.0	43.3	412.4
335	39	1 512.2	240.2	0.0	33.4	0.0	118.1	1 903.9
342	41	112.2	189.0	0.0	13.0	0.0	34.5	348.7
343	26	42.9	23.8	0.0	15.7	0.0	11.4	93.8
345	42	2 170.4	448.8	0.0	57.2	0.0	24.0	2 700.4
Mean	34	224.8	153.1	3.8	9.4	0.1	42.7	433.8
SE		77.8	49.6	2.7	2.1	0.1	7.5	103.1
% Catch		51.8	35.3	0.9	2.2	0.0	9.8	

Table 5.9 cont.

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
278	82	74.0	0.0	0.0	6.4	18.8	488.9	588.1
283	53	6.9	0.5	0.0	20.5	11.9	11.1	50.9
288	70	1 321.1	141.0	0.0	1.6	0.0	40.3	1 503.9
293	84	14.6	224.4	0.0	0.7	0.0	6.9	246.6
297	60	37.6	110.8	0.0	0.5	0.0	48.7	197.6
301	95	33.4	5.3	0.0	0.2	0.0	18.2	57.1
302	64	59.9	5.0	0.0	0.0	0.0	117.7	182.6
311	71	8.3	4.5	0.0	10.2	5.0	195.7	223.7
312	100	900.3	1.0	0.0	0.0	0.0	93.8	995.2
313	75	33.8	0.0	0.0	15.4	4.0	70.3	123.5
314	59	54.9	332.6	0.0	11.2	0.0	59.6	458.3
320	83	28.9	4.7	0.0	29.9	2.5	29.7	95.7
321	62	11.0	43.9	0.0	18.3	3.0	44.5	120.7
324	81	153.9	5.8	0.0	9.1	0.0	48.5	217.3
325	61	17.3	259.5	0.0	49.2	3.7	71.0	400.7
331	85	383.4	3 656.2	0.0	0.0	0.0	19.3	4 058.9
336	59	295.3	1 273.0	0.0	15.9	5.4	107.5	1 697.1
339	77	353.8	4 125.0	0.0	0.0	3.9	44.1	4 526.8
340	61	112.0	219.9	0.0	15.0	0.6	41.2	388.7
Mean	72.7	205.3	548.1	0.0	10.7	3.1	82.0	849.1
SE		79.6	278.9	0.0	2.9	1.1	24.9	298.8
% Catch		24.2	64.5	0.0	1.3	0.4	9.7	

Tables 5.10a and b show catch rates of the most important pelagic families caught in the bottom-trawl hauls. Carangids dominated both on the inner and outer shelves with catch rates of 107 kg/h and 387 kg/h, respectively. The most frequently occurring species of carangids were *Decapterus punctatus, Trachurus trecae*, *Chloroscombrus chrysurus* and *Selene dorsalis*. On the inner shelf, the second most important groups were Clupeids and Barracudas. They both had average catch rates of 16 kg/h. The Clupeids had the second highest catch rate on the outer shelf (86 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 Scombrids had low catch rates on the inner shelf (2.8 kg/h) but was the third largest group on the outer shelf where the average catch rate was around 73 kg/h, due to a couple of large catches. Hairtails (*Trichiurus lepturus*) were found in relatively low catch rates at some stations on the inner shelf but not on the outer. Barracudas were scarce on the outer shelf.

Table 5.10 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
275	20	34.6	1.8	3.0	0.0	4.2	20.4	64.0
276	25	47.5	33.2	3.6	0.0	7.1	0.5	91.9
277	40	7.1	24.1	1.3	0.0	5.8	16.2	54.5
280	49	0.0	8.6	5.2	0.0	7.3	39.0	60.1
281	35	0.0	13.9	0.0	0.0	14.2	25.0	53.1
282	20	6.8	9.0	7.8	0.0	2.5	3.7	29.8
284	38	0.3	15.1	0.0	0.0	13.7	215.4	244.4
285	26	2.4	23.7	3.9	3.0	40.1	130.8	203.9
289	40	0.0	65.9	0.0	0.0	0.0	933.0	998.8
290	24	0.3	54.7	0.0	0.0	0.0	79.0	134.0
291	21	0.0	0.2	0.8	0.0	0.0	52.6	53.6
292	44	14.6	17.4	0.0	0.0	0.0	70.9	102.9
295	22	0.6	200.4	0.9	0.5	9.5	17.3	229.2
296	41	3.5	213.5	28.0	0.0	0.0	96.0	341.0
303	45	0.0	21.0	0.0	0.0	0.0	172.3	193.3
304	30	83.4	1 617.9	6.2	0.0	9.2	209.4	1 926.1
305	21	2.8	175.0	0.0	0.0	93.8	124.0	395.6
306	22	11.2	106.5	3.9	0.0	57.3	656.5	835.4
307	31	131.6	196.0	3.8	0.0	0.4	169.5	501.3
309	39	0.0	15.6	0.0	0.0	3.5	54.5	73.6
310	50	0.0	2.7	2.5	0.0	0.0	77.7	82.9
316	47	0.0	0.0	6.7	0.0	0.0	135.5	142.2
317	35	10.4	47.7	0.0	0.3	16.4	247.6	322.4
318	25	24.4	36.8	3.2	27.0	23.7	198.1	313.2
319	22	19.5	2.7	0.0	15.3	0.0	85.3	122.8
326	47	7.4	0.9	0.0	30.6	24.2	249.1	312.1
327	36	14.8	8.0	0.3	3.3	2.5	96.5	125.3
328	29	28.7	5.7	4.5	46.0	2.1	109.3	196.2
332	47	7.5	242.8	0.0	14.9	14.9	853.4	1 133.5
333	28	1.7	6.3	0.0	45.5	0.0	333.1	386.6
334	28	11.0	14.2	0.0	176.2	1.2	209.7	412.4
335	39	96.7	21.8	10.7	0.0	111.0	1 663.6	1 903.9
342	41	6.9	182.1	0.0	0.0	0.0	159.7	348.7
343	26	0.0	23.8	0.0	0.0	0.0	70.0	93.8
345	42	3.2	330.0	3.2	0.0	112.4	2 251.6	2 700.4
Mean	34	16.5	106.8	2.8	10.4	16.5	280.8	433.8
SE		5.1	46.8	0.9	5.3	5.2	80.5	103.1
% Catch		3.8	24.6	0.7	2.4	3.8	64.7	

Table 5.10 cont.

b) Outer shelf, 51-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
278	82	0.0	0.0	0.0	0.0	0.0	588.1	588.1
283	53	0.0	0.1	0.4	0.0	0.0	50.4	50.9
288	70	24.7	91.1	5.2	0.0	20.0	1 362.9	1 503.9
293	84	0.9	222.2	1.3	0.0	0.0	22.2	246.6
297	60	2.9	107.9	0.0	0.0	0.0	86.8	197.6
301	95	0.0	5.3	0.0	0.0	0.0	51.8	57.1
302	64	2.7	1.5	0.8	0.0	0.0	177.6	182.6
311	71	0.0	4.5	0.0	0.0	0.0	219.2	223.7
312	100	0.0	1.0	0.0	0.0	0.0	994.2	995.2
313	75	0.0	0.0	0.0	0.0	0.0	123.5	123.5
314	59	32.4	299.5	0.7	0.0	0.0	125.7	458.3
320	83	0.0	4.7	0.0	0.0	0.0	91.0	95.7
321	62	23.8	17.4	2.7	0.0	0.0	76.8	120.7
324	81	0.7	5.1	0.0	0.0	0.0	211.5	217.3
325	61	104.5	154.9	0.1	0.0	0.0	141.2	400.7
331	85	1 134.0	2 124.6	397.6	0.0	0.0	402.7	4 058.9
336	59	49.4	1 202.9	16.1	0.0	4.6	424.1	1 697.1
339	77	270.6	2 890.8	963.6	0.0	0.0	401.8	4 526.8
340	61	0.9	219.0	0.0	0.0	0.0	168.8	388.7
Mean	73	86.7	387.0	73.1	0.0	1.3	301.1	849.1
SE		60.0	185.0	53.7	0.0	1.1	80.3	298.8
% Catch		10.2	45.6	8.6	0.0	0.2	35.5	

Catch rates of the most valuable demersal groups on the shelf are presented in Tables 5.11a and b. From these tables it can be seen that the seabreams had the highest catch rates both on the inner and outer shelf with average catch rates of 30 kg/h and 116 kg/h, respectively. The most common species of seabreams were *Pagellus bellottii*, *Dentex canariensis, D. gibbosus* and *Pagrus caeruleostictus. 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 10 kg/h followed by croakers (5 kg/h). Snappers and groupers were scarce. Croakers, snappers, groupers and grunts were all scarce on the outer shelf with average catch rates of 0.9-3.4 kg/h.

Annex IV gives the swept-area estimates of mean densities (t/NM^2) based on 54 random trawl stations on the shelf. Of the demersal species *Brachydeuterus auritus* had the highest densities in both of the two shallowest depth zones (≤30 m and 31-50 m) followed by *Parapenaeopsis atlantica* in the ≤30 m zone and *P. bellottii* in the 31-50 m zone. *Boops boops* had the highest mean density in the deepest depth zone (51-100 m) followed by *D. congoensis* and *Priacanthus arenatus*. *B. auritus* had the highest overall mean density, followed by *B. boops*. 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 present 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, and therefore no estimate of abundance was made. To obtain more reliable estimates, sampling with a grab is necessary.

Table 5.11 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
275	20	0.0	0.0	0.0	0.0	0.0	64.0	64.0
276	25	0.0	0.0	0.0	0.0	0.0	91.9	91.9
277	40	7.3	0.0	2.1	0.0	0.0	45.1	54.5
280	49	30.2	0.0	5.5	0.0	0.0	24.4	60.1
281	35	15.8	0.0	1.1	0.0	0.0	36.3	53.1
282	20	1.7	0.0	0.0	1.8	0.0	26.2	29.8
284	38	14.3	0.0	0.0	0.0	0.0	230.2	244.4
285	26	0.5	0.0	0.0	0.0	0.0	203.4	203.9
289	40	144.5	0.0	0.0	0.0	0.0	854.4	998.8
290	24	20.9	0.0	0.0	0.0	0.0	113.1	134.0
291	21	28.2	0.0	0.0	0.0	0.0	25.4	53.6
292	44	10.0	0.0	0.0	2.7	0.0	90.2	102.9
295	22	3.4	0.0	0.0	0.0	0.0	225.8	229.2
296	41	35.2	0.0	4.5	9.3	0.0	292.0	341.0
303	45	15.3	0.2	2.4	74.4	0.0	101.0	193.3
304	30	73.0	0.0	0.0	25.6	0.0	1 827.5	1 926.1
305	21	33.7	0.0	0.0	0.0	0.0	361.9	395.6
306	22	78.7	0.0	0.0	0.0	0.0	756.7	835.4
307	31	30.2	0.0	0.0	0.0	0.0	471.1	501.3
309	39	4.9	4.9	0.0	31.7	0.0	32.1	73.6
310	50	9.1	13.4	0.0	1.3	0.0	59.1	82.9
316	47	6.1	0.0	0.0	0.0	0.0	136.1	142.2
317	35	47.7	0.0	0.0	2.5	0.0	272.3	322.4
318	25	20.7	0.0	0.0	24.0	4.5	264.0	313.2
319	22	1.5	0.0	0.0	2.4	9.6	109.3	122.8
326	47	5.1	0.0	0.0	36.9	15.5	254.6	312.1
327	36	0.0	0.0	0.0	4.3	17.2	103.8	125.3
328	29	0.0	0.0	0.0	2.1	17.2	176.9	196.2
332	47	19.1	0.0	0.0	1.6	0.0	1 112.8	1 133.5
333	28	0.0	0.0	0.0	6.6	68.4	311.5	386.6
334	28	0.0	0.0	0.0	95.8	40.1	276.5	412.4
335	39	289.5	0.0	0.0	7.5	0.0	1 606.9	1 903.9
342	41	29.4	0.0	0.0	0.0	0.0	319.3	348.7
343	26	4.8	36.4	0.0	1.7	0.0	50.9	93.8
345	42	82.0	0.0	0.0	0.0	0.0	2 618.4	2 700.4
Mean	34	30.4	1.6	0.5	9.5	4.9	387.0	433.8
SE		9.2	1.1	0.2	3.6	2.3	97.3	103.1
% Catch		7.0	0.4	0.1	2.2	1.1	89.2	

Tab. 5.11 cont.

b) Outer shelf, 51-100 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
278	82	50.1	0.0	23.9	0.0	0.0	514.1	588.1
283	53	6.4	0.0	0.0	0.0	0.0	44.5	50.9
288	70	36.7	0.0	0.0	0.0	0.0	1 467.2	1 503.9
293	84	11.2	0.0	0.0	0.0	0.0	235.4	246.6
297	60	4.7	0.0	0.0	0.0	0.0	192.9	197.6
301	95	33.3	0.0	0.0	0.0	0.0	23.8	57.1
302	64	30.2	13.9	13.6	0.0	0.6	124.3	182.6
311	71	8.3	0.0	0.0	0.0	0.0	215.4	223.7
312	100	900.3	0.0	0.0	0.0	0.0	94.9	995.2
313	75	22.1	11.7	0.0	0.0	0.0	89.7	123.5
314	59	27.3	24.2	0.0	0.0	0.0	406.8	458.3
320	83	28.9	0.0	0.0	0.0	0.0	66.8	95.7
321	62	11.0	0.0	0.0	0.0	0.0	109.7	120.7
324	81	92.4	0.0	0.0	0.0	61.5	63.4	217.3
325	61	11.3	0.0	0.0	0.0	0.0	389.4	400.7
331	85	257.4	0.0	0.0	0.0	0.0	3 801.5	4 058.9
336	59	218.0	0.0	1.4	16.1	2.3	1 459.3	1 697.1
339	77	353.8	0.0	0.0	0.0	0.0	4 173.0	4 526.8
340	61	110.8	0.0	0.0	0.0	0.0	277.9	388.7
Mean	73	116.5	2.6	2.1	0.9	3.4	723.7	849.1
SE		49.0	1.5	1.4	0.9	3.2	281.2	298.8
% Catch		13.7	0.3	0.2	0.1	0.4	85.2	

Table 5.12 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 80%. The highest biomass of seabreams was found between depths of 51 and 100 m. Grunts had the second highest biomass with around 1 200 tonnes. Croakers had the third highest biomass followed by snappers and groupers. Of the pelagic and semi-pelagic groups, the bigeye grunt (*B. auritus*) had an estimated biomass of around 21 000 tonnes, carangids 45 000 tonnes and barracudas 2 000 tonnes.

Table 5.12 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	734	2 910	10 536	14 181	5 042	23 320
Grunts	466	619	83	1 168	330	2 005
Croakers	424	124	303	850	82	1 619
Groupers	0	62	193	254	0	525
Snappers	113	62	248	422	42	802
Sum dem.val.	**1 737**	**3 777**	**11 362**	**16 876**	**7 789**	**25 962**
Bigeye grunt	2 358	18 824	0	21 182	3 589	38 775
Carangids	6 156	5 284	33 892	45 332	11 814	78 851
Barracudas	692	1 197	110	1 999	768	3 230

5.4 Côte d'Ivoire

A total of 46 swept-area trawl hauls were made on the Ivorian shelf. Due to lack of suitable bottom, no trawl hauls were made in waters deeper than 100 m. Tables 5.13 a and b show catch rates by main groups for the inner (20-50 m) and outer (51-100 m) shelf. The demersal group had the highest average catch rate on the inner shelf with a relative contribution of 55%. The pelagic group was the second most important contributing 30% of the catches, followed by the group "other" (9%), cephalopods (2.7%) and sharks (2.1%). *Sepia officinalis hierredda* was the dominating cephalopod.

Table 5.13 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
348	41	53.0	34.0	1.5	13.1	20.5	24.4	146.5
349	25	78.6	247.9	1.8	9.3	0.0	108.1	445.6
350	25	268.2	331.3	1.4	17.0	0.0	33.6	651.5
351	45	115.4	193.7	0.0	9.8	0.0	13.2	332.2
357	33	38.4	9.9	0.1	14.7	42.4	24.3	129.8
358	24	513.9	117.5	0.2	28.4	0.0	24.9	684.9
359	37	581.9	35.4	0.0	13.3	0.0	31.2	661.8
364	40	104.8	34.3	4.4	23.3	24.4	16.2	207.4
365	23	93.2	169.0	25.1	17.2	0.0	31.2	335.7
366	26	60.3	32.1	9.0	8.9	16.4	28.7	155.3
367	36	339.1	188.4	0.0	0.0	37.0	12.7	577.2
372	40	867.1	992.7	0.0	8.0	11.6	16.6	1 896.0
373	25	85.1	61.7	5.4	22.0	33.8	32.1	240.1
374	21	57.9	90.9	8.1	11.5	0.0	14.9	183.3
375	45	62.7	24.8	2.4	13.1	33.7	26.7	163.4
380	40	72.2	60.6	0.1	22.6	0.0	5.2	160.6
381	23	63.9	35.9	34.2	27.2	0.0	37.2	198.4
382	28	231.7	215.1	9.9	10.2	0.0	79.5	546.5
383	45	207.7	13.6	3.2	11.4	0.0	10.9	246.8
388	35	151.0	79.1	7.7	5.1	0.0	71.4	314.3
389	29	159.5	129.4	3.1	3.4	0.0	46.7	342.1
390	44	644.3	106.6	5.4	10.2	0.0	70.0	836.5
396	44	216.3	87.6	0.0	7.8	0.0	174.6	486.2
397	28	140.5	97.6	2.6	3.7	0.0	55.9	300.2
398	40	1 042.0	59.8	0.8	0.0	13.0	26.2	1 141.8
Mean	34	250.0	138.0	5.1	12.5	9.3	40.6	455.4
SE		54.2	39.2	1.6	1.6	2.9	7.4	78.4
% Catch		54.9	30.3	1.1	2.7	2.1	8.9	

Except for a few stations, there were low catch rates of shrimps on this part of the shelf. The most abundant shrimp species were *Penaeus notialis* and *Parapenaeus longirostris. Penaeus mondon*, which has not been caught before, was found at two stations. This prawn is common in East Africa and may have spread due to aquaculture of this species. The pelagic group

dominated the catches on the outer shelf (66%), followed by the demersal group (28%). Cephalopods had lower catch rates than on the inner shelf while sharks had higher. Shrimps were scarce.

b) Outer shelf, 51-100 m

Station	Depth	Demersal	Pelagic	Shrimp	Cephalopods	Sharks	Other	Total
347	81	240.9	1.2	0.0	2.4	23.7	36.1	304.3
352	72	52.5	178.7	0.0	3.2	6.5	16.1	257.0
353	88	83.6	136.0	0.0	1.6	0.0	11.7	232.9
355	84	525.3	3 824.5	3.5	10.4	30.7	45.5	4 439.8
356	57	1 745.1	1 739.1	0.0	12.9	11.3	63.3	3 571.6
360	59	69.6	850.4	0.0	44.0	25.7	58.2	1 047.9
361	86	276.4	0.0	0.0	1.7	25.5	25.2	328.7
363	74	113.9	347.5	0.0	4.1	2.8	44.6	512.9
368	81	91.8	69.3	0.0	11.4	0.0	24.8	197.3
371	76	260.6	200.3	0.0	5.1	7.9	43.5	517.4
376	65	1 054.2	776.2	0.0	2.0	24.8	27.0	1 884.2
378	94	139.9	34.6	0.0	13.1	7.4	27.8	222.7
379	60	9.8	5.6	0.0	16.6	0.0	11.5	43.4
384	81	26.0	1 662.0	0.0	0.5	12.5	18.0	1 719.0
386	81	209.0	1 108.6	0.0	1.0	18.1	38.8	1 375.5
387	55	67.4	18.0	0.8	12.1	0.0	11.7	110.0
391	62	93.7	1 448.5	0.0	7.7	0.0	11.4	1 561.3
392	82	332.8	172.4	0.0	0.4	17.9	29.4	552.8
394	83	51.3	8.9	0.0	2.2	19.6	11.0	93.0
395	66	104.9	439.7	0.0	2.6	0.0	36.0	583.2
399	76	44.6	22.2	0.3	5.2	23.4	22.9	118.6
Mean	74	266.4	621.1	0.2	7.6	12.3	29.3	936.8
SE		89.8	203.6	0.2	2.1	2.3	3.4	256.3
% Catch		28.4	66.3	0.0	0.8	1.3	3.1	

Tables 5.14a and b show the catch rates of the most important pelagic families caught in the bottom trawl. The carangids were the dominant pelagic group on the inner shelf with an average catch rate of about 73 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 the hairtails (*Trichiurus lepturus*), which contributed 6% to the total. Clupeids came third, with an average catch rate of around 23 kg/h, constituting 5% of the catch. The clupeid species that occurred most frequently were *Sardinella aurita, S. maderensis* and *Ilisha africana.* Barracudas were less abundant and scombrids were scarce. Carangids also had the highest average catch rate on the outer shelf (592 kg/h or 63% of the catch), followed by hairtails (17 kg/h or 1.8%). The most frequently caught carangid on the outer shelf was *T. trecae,* which also had the highest catch rates of this group. Clupeids were less abundant than on the inner shelf and the dominating species was *S. aurita.* The catch rate of barracudas was also lower than on the inner shelf, while scombrids was somewhat more abundant here.

Table 5.14 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
348	41	3.6	28.9	0.0	1.1	0.4	112.5	146.5
349	25	54.3	175.0	2.2	13.5	2.9	197.8	445.6
350	25	51.6	146.4	2.7	78.0	52.6	320.2	651.5
351	45	68.7	125.0	0.0	0.0	0.0	138.4	332.2
357	33	0.2	3.5	0.0	6.2	0.0	119.8	129.8
358	24	2.0	78.0	0.0	37.5	0.0	567.4	684.9
359	37	0.5	31.0	0.0	1.1	2.8	626.4	661.8
364	40	0.8	14.6	0.0	17.4	1.5	173.1	207.4
365	23	4.8	86.3	0.0	74.7	3.3	166.7	335.7
366	26	10.0	1.9	0.0	20.1	0.0	123.2	155.3
367	36	10.2	11.7	0.0	21.0	145.5	388.8	577.2
372	40	5.8	942.6	2.2	2.9	39.2	903.3	1 896.0
373	25	15.2	11.6	0.0	27.3	7.6	178.5	240.1
374	21	59.7	11.4	0.0	16.8	3.0	92.4	183.3
375	45	0.4	2.2	0.0	22.2	0.0	138.6	163.4
380	40	1.7	6.6	0.5	44.3	7.6	100.0	160.6
381	23	3.1	4.2	0.0	28.0	0.5	162.5	198.4
382	28	140.7	15.3	0.0	19.5	39.6	331.4	546.5
383	45	0.9	5.4	0.0	5.9	1.5	233.1	246.8
388	35	43.5	10.5	0.0	13.0	12.1	235.2	314.3
389	29	51.6	7.2	0.0	64.4	6.2	212.7	342.1
390	44	25.2	18.0	0.0	61.2	2.2	729.9	836.5
396	44	6.1	1.1	0.0	79.4	0.9	398.7	486.2
397	28	13.2	23.6	0.0	59.8	0.9	202.7	300.2
398	40	4.7	54.1	0.0	0.0	0.9	1 082.0	1 141.8
Mean	34	23.1	72.7	0.3	28.6	13.3	317.4	455.4
SE		6.6	37.5	0.2	5.3	6.2	53.0	78.4
% Catch		5.1	16.0	0.1	6.3	2.9	69.7	

b) Outer shelf, 51-100 m

Station	Depth	Clupeids	Carangids	Scombrids	Hairtails	Barracudas	Other	Total
347	81	0.0	1.2	0.0	0.0	0.0	303.1	304.3
352	72	1.0	171.9	0.6	4.8	0.4	78.3	257.0
353	88	0.0	123.6	12.4	0.0	0.0	96.8	232.9
355	84	11.5	3 807.7	0.0	5.3	0.0	615.3	4 439.8
356	57	37.7	1 608.4	21.5	71.5	0.0	1 832.6	3 571.6
360	59	15.0	816.0	0.0	19.4	0.0	197.5	1 047.9
361	86	0.0	0.0	0.0	0.0	0.0	328.7	328.7
363	74	3.5	339.7	0.0	4.3	0.0	165.4	512.9
368	81	0.0	61.6	0.0	6.7	1.0	128.0	197.3
371	76	2.7	129.6	48.2	19.8	0.0	317.1	517.4
376	65	1.3	774.9	0.0	0.0	0.0	1 108.0	1 884.2
378	94	0.0	27.3	0.6	6.7	0.0	188.1	222.7
379	60	0.0	2.6	0.0	2.8	0.2	37.9	43.4
384	81	30.0	1 502.5	0.0	129.5	0.0	57.0	1 719.0
386	81	37.0	1 033.6	0.0	38.0	0.0	266.9	1 375.5
387	55	0.4	12.5	0.0	3.7	1.4	92.0	110.0
391	62	4.4	1 419.1	0.0	23.4	1.6	112.8	1 561.3
392	82	0.0	162.2	10.1	0.0	0.0	380.5	552.8
394	83	0.0	0.0	8.9	0.0	0.0	84.1	93.0
395	66	0.0	434.1	0.0	5.6	0.0	143.5	583.2
399	76	0.0	1.0	0.2	21.0	0.0	96.4	118.6
Mean	74	6.9	591.9	4.9	17.3	0.2	315.7	936.8
SE		2.7	199.6	2.5	6.7	0.1	92.4	256.3
% Catch		0.7	63.2	0.5	1.8	0.0	33.7	

Catch rates of the most valuable demersal groups on the shelf are presented in Tables 5.15a and b. The catch rates were in general low on the inner shelf. Croakers had the highest catch rate (31 kg/h), and a relative contribution to the total catch of 7%. *Pseudotolithus senegalensis* and *Pteroscion peli* were the most abundant croakers. Grunts (14 kg/h) were the second most important group, with *Pomadasys jubelini* and *P. incisus* as the most common species. Seabreams had low catch rates on the inner shelf (5.7 kg/h), and snappers and groupers were very scarce. On the outer shelf, seabreams dominated the valuable demersal species with a relative contribution of 10% and an average catch rate of 94 kg/h. *Dentex angolensis, Pagellus bellottii* and *D. canariensis* were the most frequently occurring seabreams. Croakers (3.5% and 33 kg/h) constituted the second most important group, *Umbrina canariensis* being the dominant species. Grunts were less abundant than on the inner shelf, while groupers (*Epinephelus aeneus*) were somewhat more common. Snappers occurred on only one station with a large catch of *Aspilus fuscus* (556 kg/h).

Table 5.15 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
348	41	17.8	0.0	0.0	26.8	1.0	100.9	146.5
349	25	6.3	0.0	0.0	22.0	18.4	398.9	445.6
350	25	0.0	0.0	0.0	4.1	24.7	622.7	651.5
351	45	6.5	0.0	0.0	1.7	0.0	324.0	332.2
357	33	4.5	0.0	0.0	0.0	31.5	93.9	129.8
358	24	5.0	0.0	0.8	0.0	3.9	675.2	684.9
359	37	33.1	0.0	0.0	2.8	0.0	625.9	661.8
364	40	5.7	0.0	2.9	12.3	6.2	180.3	207.4
365	23	0.0	0.0	0.0	26.6	51.5	257.6	335.7
366	26	0.0	0.0	0.0	8.4	25.0	121.9	155.3
367	36	1.0	0.0	0.0	3.8	22.1	550.3	577.2
372	40	7.9	0.0	0.0	0.8	0.0	1 887.3	1 896.0
373	25	1.1	6.1	0.0	19.7	23.4	189.8	240.1
374	21	0.0	0.0	0.0	9.9	35.7	137.7	183.3
375	45	7.4	0.0	3.5	14.2	1.0	137.3	163.4
380	40	7.7	0.0	0.0	0.0	2.3	150.7	160.6
381	23	0.0	0.0	0.0	18.2	42.2	138.0	198.4
382	28	0.0	0.0	0.0	102.1	124.2	320.2	546.5
383	45	9.2	0.0	0.0	0.0	9.9	227.7	246.8
388	35	7.7	0.0	0.2	29.8	25.7	251.0	314.3
389	29	0.0	0.0	0.0	10.0	127.9	204.2	342.1
390	44	21.1	0.0	0.0	11.2	10.8	793.4	836.5
396	44	0.0	0.0	0.0	16.4	62.1	407.7	486.2
397	28	0.0	0.0	1.5	9.1	101.9	187.8	300.2
398	40	0.0	0.0	0.0	0.0	29.6	1 112.2	1 141.8
Mean	34	5.7	0.2	0.4	14.0	31.2	403.9	455.4
SE		1.6	0.2	0.2	4.1	7.4	80.2	78.4
% Catch		1.3	0.1	0.1	3.1	6.9	88.7	

b) Outer shelf, 51-100 m

Station	Depth	Seabreams	Snappers	Groupers	Grunts	Croakers	Other	Total
347	81	223.9	0.0	0.0	0.0	0.0	80.4	304.3
352	72	43.6	0.0	0.0	0.0	0.0	213.4	257.0
353	88	50.1	0.0	0.0	0.0	1.6	181.3	232.9
355	84	142.0	0.0	0.0	19.6	278.3	3 999.9	4 439.8
356	57	583.0	0.0	1.6	8.7	0.7	2 977.7	3 571.6
360	59	47.2	0.0	1.3	0.0	0.4	999.0	1 047.9
361	86	171.4	0.0	0.0	0.0	89.6	67.8	328.7
363	74	59.8	0.0	0.0	0.0	26.1	427.0	512.9
368	81	53.1	0.0	0.0	0.0	0.0	144.2	197.3
371	76	58.5	0.0	0.0	0.0	10.8	448.1	517.4
376	65	145.7	584.7	26.8	2.7	0.0	1 124.3	1 884.2
378	94	83.7	0.0	0.0	0.0	27.9	111.1	222.7
379	60	1.3	0.0	0.0	0.0	0.0	42.1	43.4
384	81	18.5	0.0	0.0	0.0	0.0	1 700.5	1 719.0
386	81	50.6	0.0	38.1	0.0	83.9	1 202.9	1 375.5
387	55	3.0	0.0	0.5	0.0	0.0	106.5	110.0
391	62	8.8	0.0	0.0	0.0	0.9	1 551.6	1 561.3
392	82	128.0	0.0	22.5	0.0	147.7	254.7	552.8
394	83	43.7	0.0	0.0	0.0	2.5	46.8	93.0
395	66	54.3	0.0	23.0	7.7	3.1	495.2	583.2
399	76	8.6	0.0	0.0	0.0	10.0	100.0	118.6
Mean	74	94.2	27.8	5.4	1.8	32.6	775.0	936.8
SE		27.7	27.8	2.5	1.0	14.9	229.4	256.3
% Catch		10.1	3.0	0.6	0.2	3.5	82.7	

Appendix IV gives the swept-area estimates of mean densities (t/NM^2) based on 46 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 *Pseudotolithus senegalensis* in the shallowest depth zone and *Galeoides decadactylus* in the 31-50 m zone. *Boops boops* was the most abundant species in the 51-100 m depth zone followed by *D. angolensis, Umbrina canariensis* and *P. bellottii. B. auritus* had the highest all over mean density, followed by *B. boops, P. bellottii, D. angolensis* and *Umbrina canariensis.*

Table 5.16 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 11 000 tonnes of which seabreams made up almost 50%. The highest biomass of seabreams was found in the deepest zone. Croakers were most abundant in the shallowest depth zone and had the second highest biomass with about 3 000 tonnes. This was followed by snappers, grunts and groupers.

Of the pelagic and semi-pelagic species, carangids had the highest estimated biomass (about 36 000 tonnes). The bigeye grunt (*B. auritus*) followed with 8 500 tonnes and barracudas had an estimated biomass of 570 tonnes.

Table 5.16 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	23	217	5 067	5 307	2 319	8 295
Grunts	394	203	97	695	317	1 072
Croakers	991	336	1 781	3 108	1 383	4 834
Groupers	6	14	291	311	43	579
Snappers	11	0	1 554	1 566	0	4 672
Sum dem. val.	**1 424**	**771**	**8 791**	**10 987**	**6 016**	**15 958**
Bigeye grunt	1 560	6 793	178	8 530	4 157	12 903
Carangids	951	2 089	33 513	36 554	13 677	59 430
Barracudas	203	351	16	569	62	1 076

5.5 Review of results

Benin - Togo

Figs. 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 three 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 1999 and 2000 are, however, within the 95% confidence intervals of the 2000 estimates.

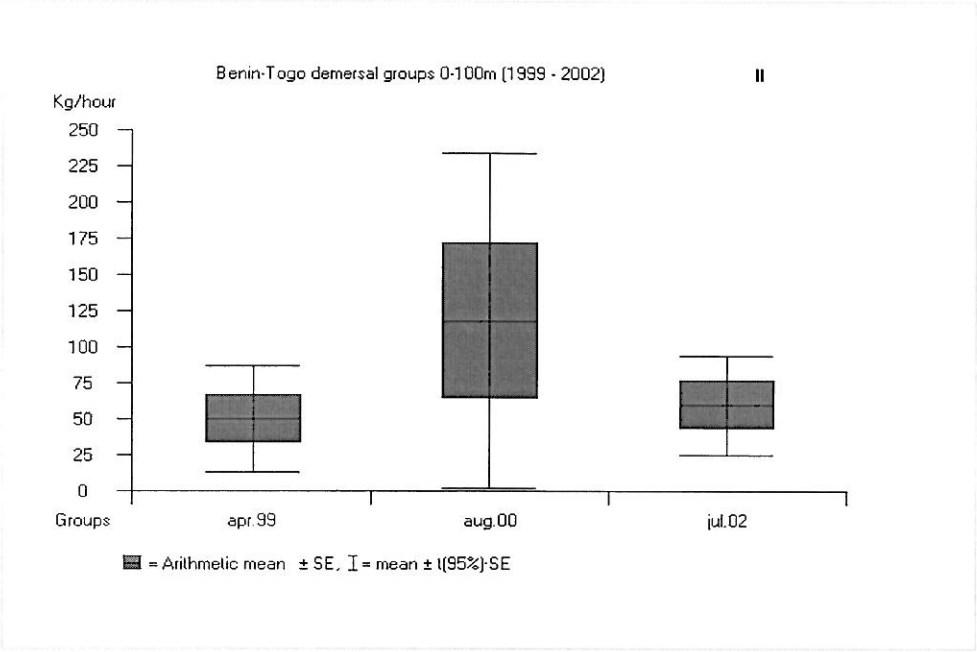


Figure 5.1 Mean catch rates of the main group "demersal" from 0 to100 m in Benin-Togo 1999-2002.

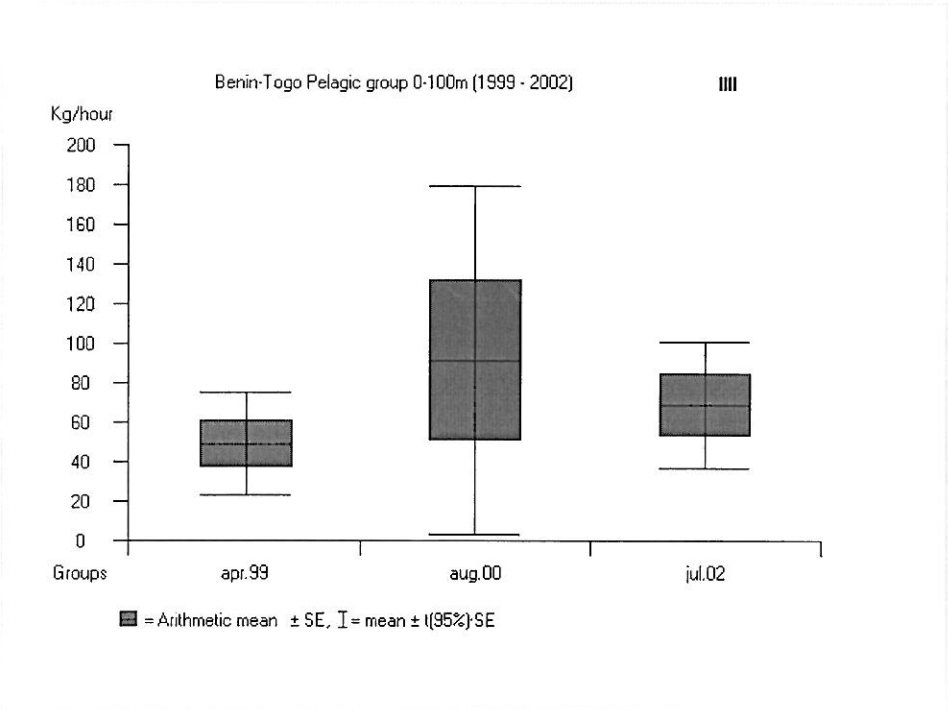


Figure 5.2 Mean catch rates of the main group "pelagic" from 0 to100 m in Benin-Togo 1999-2002.

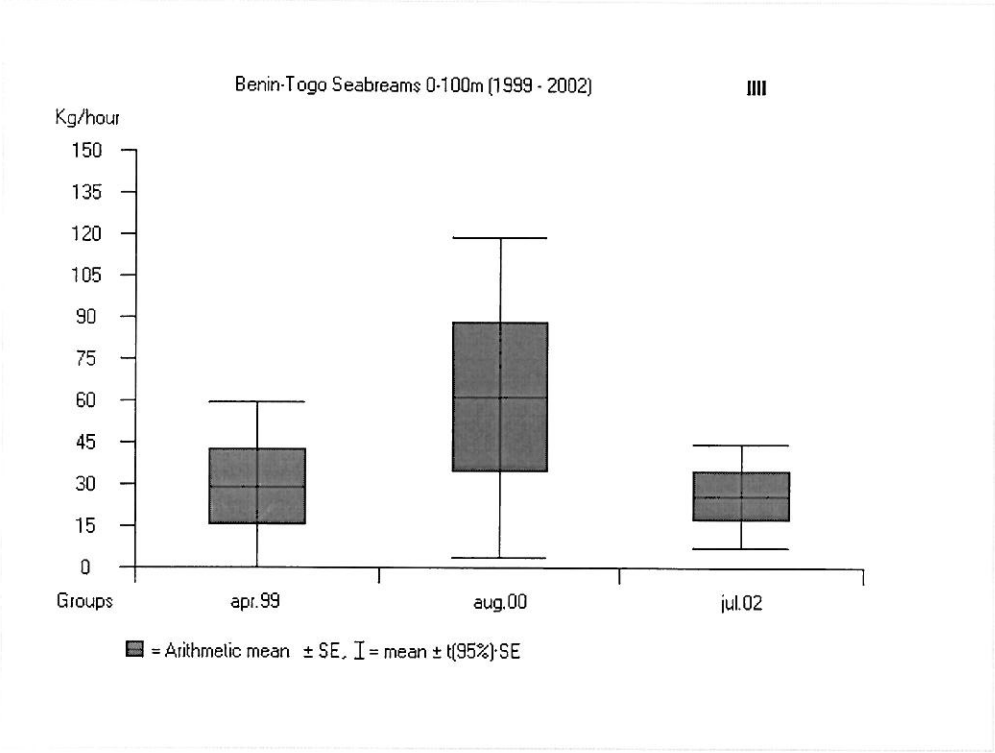


Figure 5.3 Mean catch rates of seabreams from 0 to100 m in Benin-Togo 1999-2002.

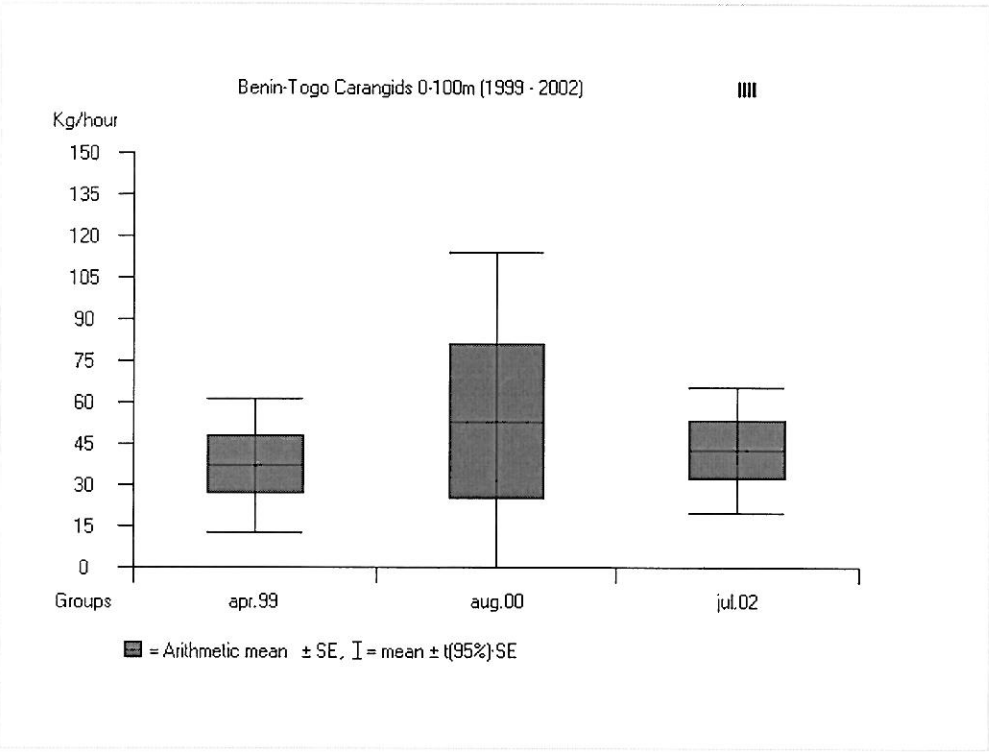


Figure 5.4 Mean catch rates of carangids from 0 to 100m in Benin-Togo 1999-2002.

Figures 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 1999 and 2000 estimates are quite similar, while in 2000 one large catch of *Dentex congoensis* in Togo (292 kg/h) and one of *Decapterus punctatus* in Benin (419 kg/h) gave high means and confidence intervals.

Table 5.17 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 Benin and Togo waters. Except from the high mean catch rate of seabreams (*D. congoensis*) in Togo in 2000, the results are quite similar, with few clear trends. The time series of biomass estimates (Table 5.18) show the same. The biomass of groupers show a decreasing trend, while snappers and barracudas seem to have increased in abundance, but also 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 three surveys were conducted in two different seasons. Whereas the 1999 survey was conducted during the thermocline season, the 2000 and this year's survey were conducted during different periods of the upwelling season.

Table 5.17 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 Benin and Togo for the Nansen-surveys in 1999, 2000 and 2002.

Group/species	Togo-Benin	Benin	Benin	Togo	Togo
	1999	2000	2002	2000	2002
Seabreams	28.6[1]	29.9	28.7	108.7	19.9
Grunts	0.9	3.5	1.2	0.0	2.2
Croakers	4.6	2.9	7.6	1.5	0
Groupers	10.3	2.3	1.2	4.1	1.0
Snappers	0.3	1.3	1.4	1.0	13.6
Sum dem. val.	**44.7**[1]	**39.9**	**40.0**	**115.3**	**36.7**
Bigeye grunt	5.5	10.1	12.1	0.6	0
Carangids	37.0	64.2	54.8	35.9	19.9
Barracudas	6.3	4.7	18.0	2.0	5.4

[1] Corrected

Table 5.18 Biomass estimates (tonnes) of valuable demersal species and some other groups from swept-area bottom-trawl hauls on the shelf (0-100 m) off Benin and Togo from the 1999, 2000 and 2002 survey. 1999 values are splitted proportional to the shelf area (in parenthesis in NM^2).

Group/Species	**Benin** (765)			**Togo** (327)		
	1999	**2000**	**2002**	**1999**	**2000**	**2002**
Seabreams	568	700[1]	734	255	1 102	215
Grunts	41	66[1]	35	18	5	25
Croakers	193	83	265	87	11	0
Groupers	215	59	26	97	33	9
Snappers	15	34	39	7	8	198
Sum dem. val.	**1 032**	**942**[1]	**1 098**	**464**	**1 159**	**447**
Bigeye grunt	118	222[1]	237	53	0	0
Carangids	788	1 490	1 306	354	339	171
Barracudas	170	102	485	76	25	79

[1] Corrected

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 three 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 outside the 95% confidence intervals of the two former.

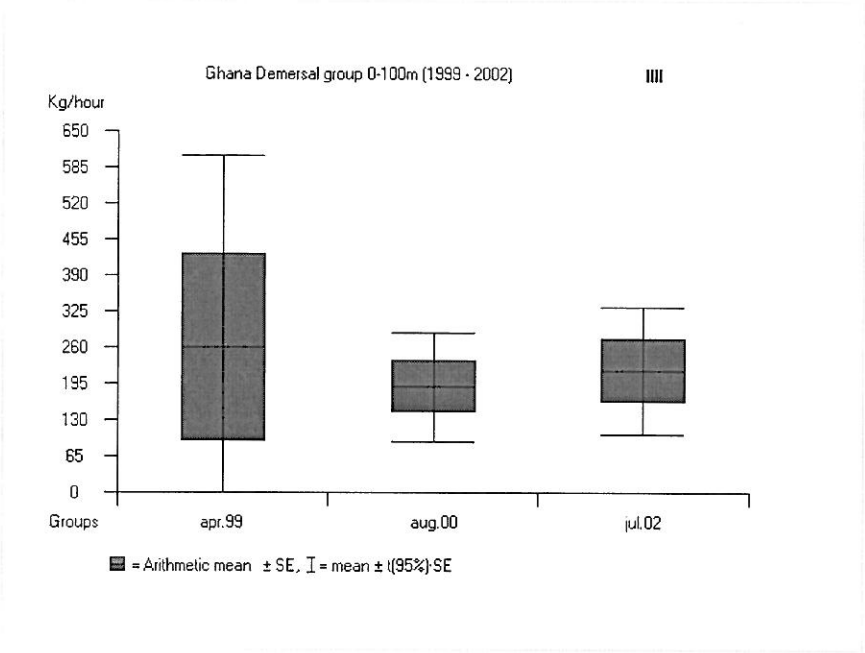


Figure 5.5 Mean catch rates of the main group "demersal" from 0 to100 m in Ghana 1999-2002.

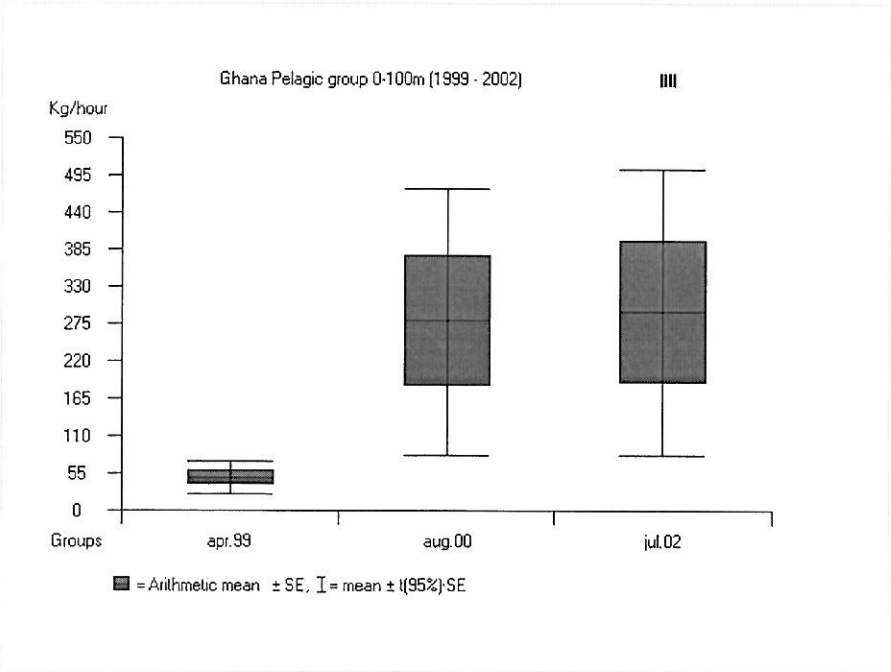


Figure 5.6 Mean catch rates of the main group "pelagic" from 0 to100 m in Ghana 1999-2002

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 and 2002 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 outside the 95% confidence intervals of the 2000 and 2002 estimates.

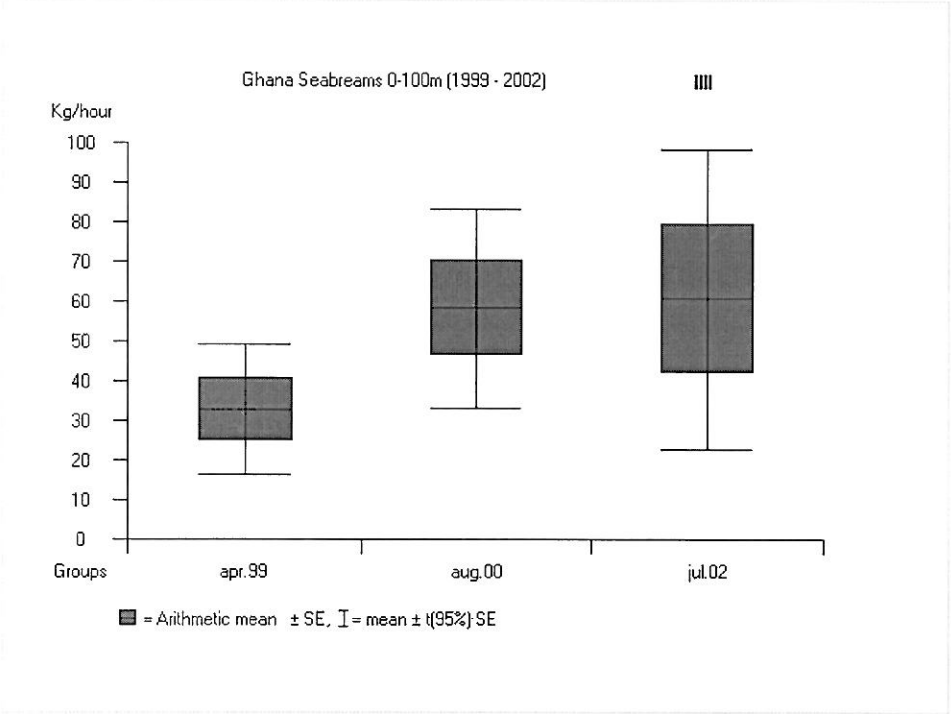


Figure 5.7 Mean catch rates of seabreams from 0 to100 m in Ghana 1999-2002

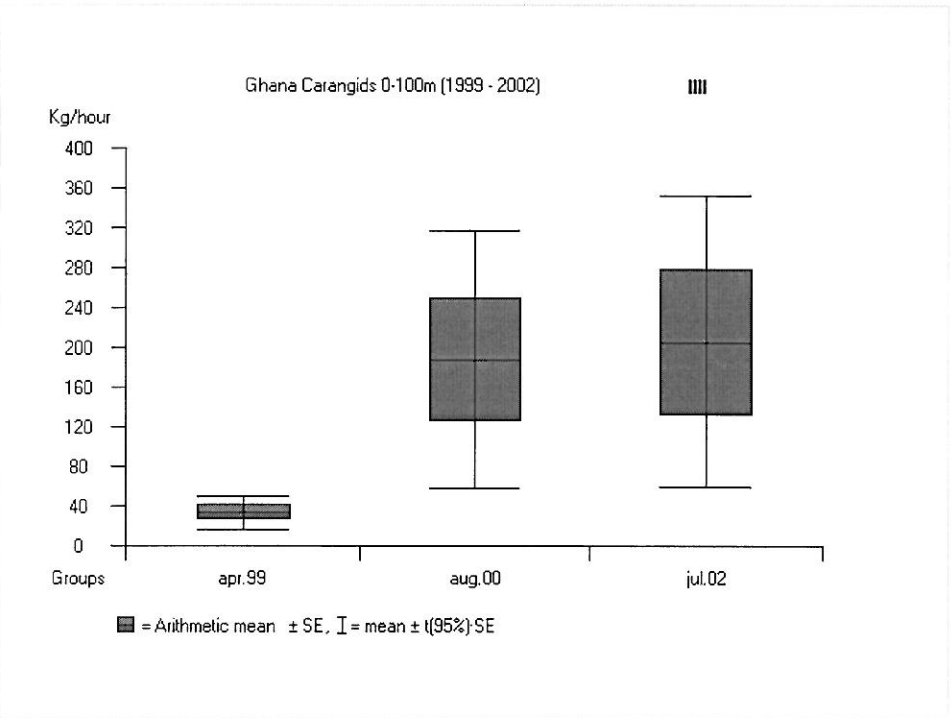


Figure 5.8 Mean catch rates of carangids from 0 to100 m in Ghana 1999-2002.

Table 5.19 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 two previous surveys in the Ghana waters. Most of the 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. Bigeye grunts had much higher catch rates and estimated biomass in 1999 due to one large catch. Carangids were more abundant in the two last years.

Table 5.19 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 and 2002 surveys.

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

[1] Corrected

Côte d'Ivoire

Figures 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 three 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 and not within the 95% confidence limits of the 2000 estimate. The pelagic fish also had the highest mean catch rate in 2000 and was outside the 95% confidence intervals of the 1999 estimate, which was the lowest.

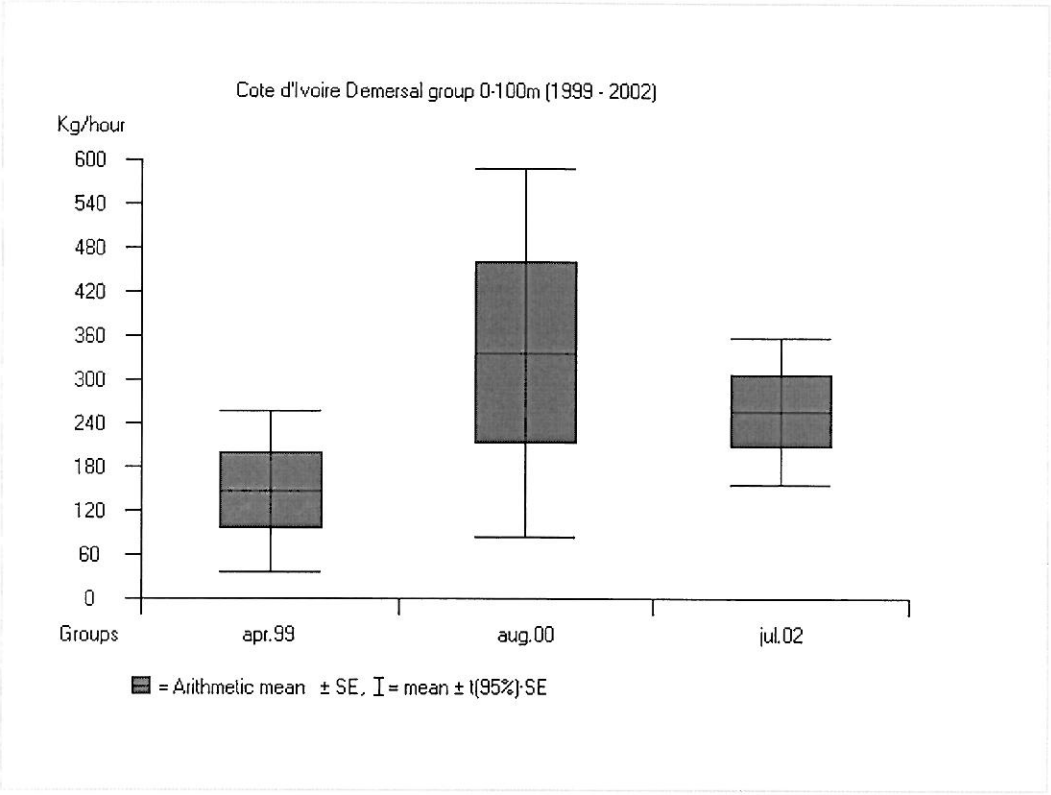


Figure 5.9 Mean catch rates of the main group "demersal" from 0 to100 m in Côte d'Ivoire 1999-2002.

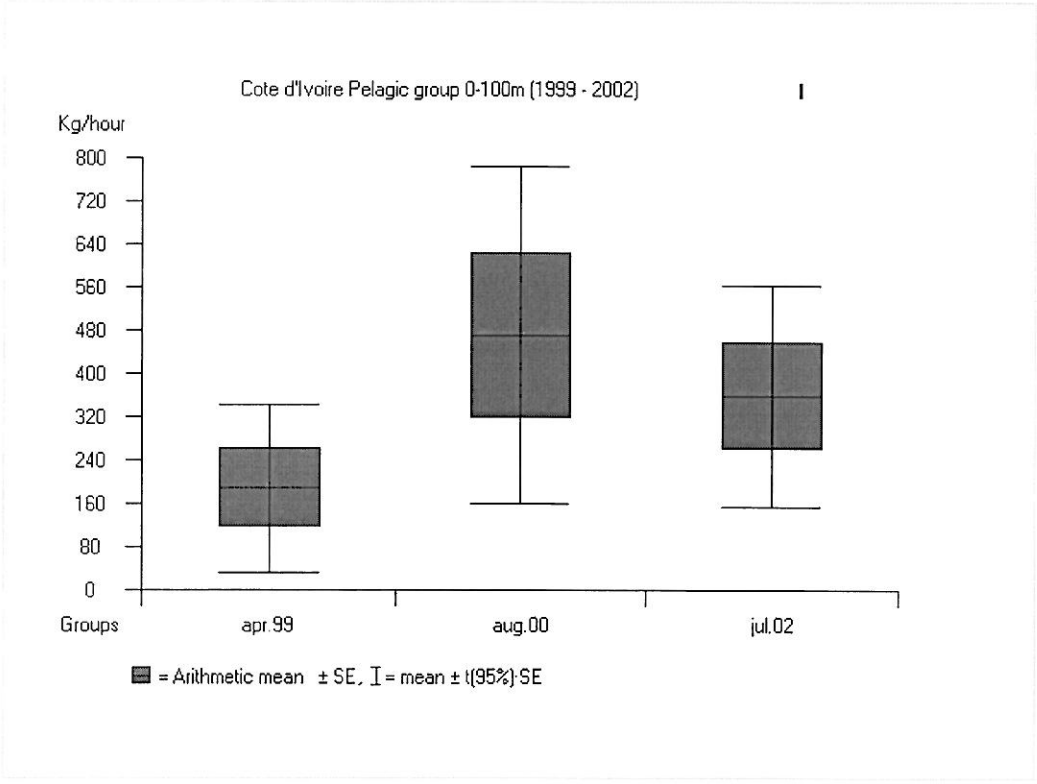


Figure 5.10 Mean catch rates of the main group "pelagic" from 0 to100 m in Côte d'Ivoire 1999-2002.

Figs. 5.11 and 5.12 show the mean catch rates of seabreams and carangids, the most abundant families in the "demersal" and "pelagic" groups. The 2000 and 2002 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 estimate was outside the 95% confidence intervals of both the 2000 and 2002 estimates.

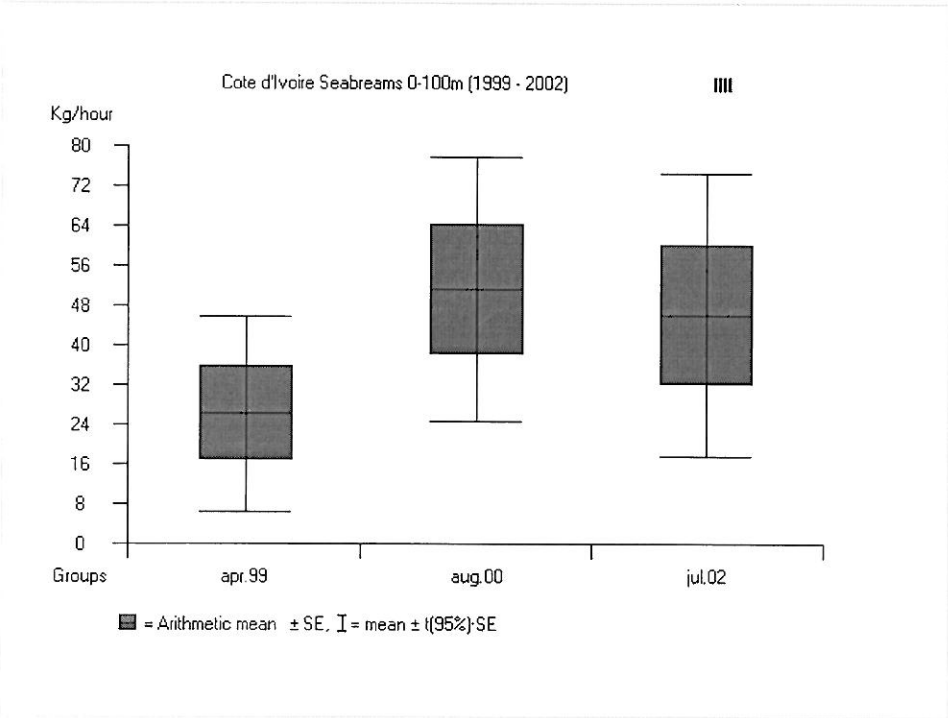


Figure 5.11 Mean catch rates of seabreams from 0 to100 m in Côte d'Ivoire 1999-2002.

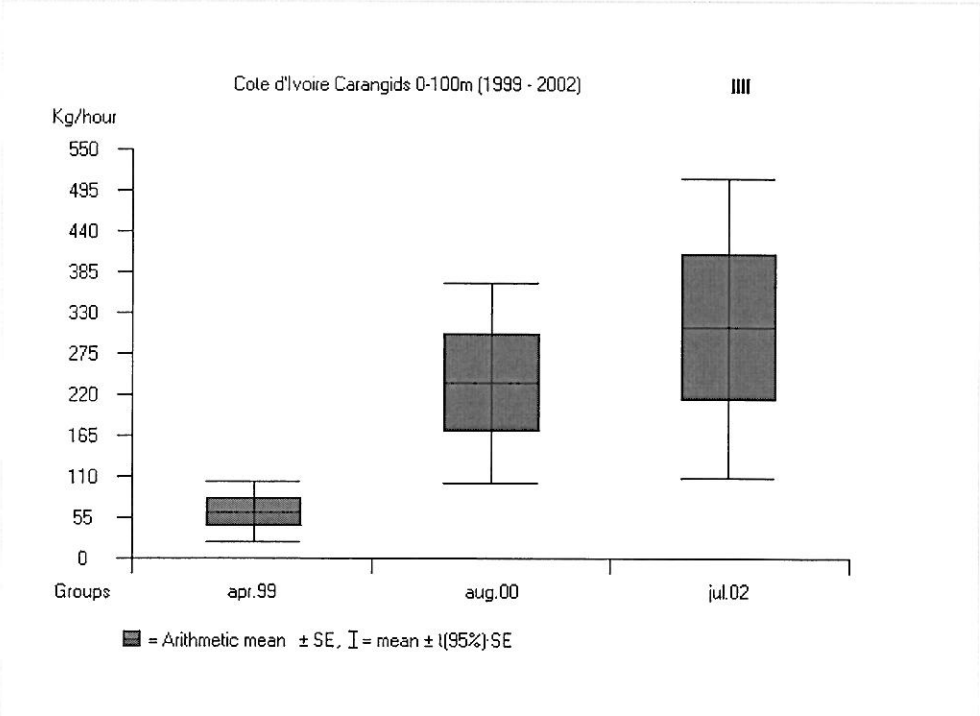


Figure 5.12 Mean catch rates of carangids from 0 to100 m in Côte d'Ivoire 1999-2002.

Table 5.20 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 two previous surveys in the Côte d'Ivoire waters. The valuable demersal species had highest average catch rates in 2000 and 2002. 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 trend. Bigeye grunt had much higher catch rates and estimated biomass in 2000 due to one large catch. Carangids were most abundant in 2002.

Table 5.20 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 and 2002 survey.

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

[1] Corrected

Gulf of Guinea

Table 5.21 summarises the swept-area biomass estimates from the three last surveys for the whole region. Most of the 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 estimate is about 75% of the 2000 one.

Among the other groups, the estimated biomasses of carangids were high and quite similar in 2000 and 2002, and much lower in 1999. For the bigeye grunt it was opposite, high estimates in 1999 and lower and more similar in the two last surveys. It should, however, be noted that the 1999 estimate of bigeye grunt is very much driven by one large catch. The estimated biomass of barracudas has also varied somewhat in the period, highest in 2002 and lowest in 2000.

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 Benin, Togo, Ghana and Côte d'Ivoire in April-May 1999, August-September 2000 and July-August 2002.

Group/Species	**Biomass** (tonnes)		
	1999	**2000**	**2002**
Seabreams	12 758[1]	21 814[1]	20 437
Grunts	1 907	6 135[1]	1 922
Croakers	1 346	3 871[1]	4 223
Groupers	1 174	2 296	600
Snappers	318	5 402[1]	2 225
Sum dem. val.	**17 503**[1]	**39 518**[1]	**29 407**
Bigeye grunt	80 398	23 587[1]	29 949
Carangids	13 480	75 252[1]	83 364
Barracudas	2 141	1 301[1]	3 133

[1] Corrected

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. Seven hauls were made as follows: 1 each off Benin 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			
Benin	249	06° 06'N	02° 29'E	131 – 187	245.3	*Pentheroscion mbizi* *Dentex congoensis* *Dentex angolensis*
Togo	271	05° 54'N	01° 16'E	208 – 214	1 204.5	*Centrophorus uyato* *Squatina oculata* *Dentex angolensis*
Ghana	287	05° 32'N	00° 16'W	331 – 337	519.1	*Centrophorus uyato* *Parasudis fraser-bruenneri* *Chlorophthalmus atlanticus*
	294	05° 25'N	00° 05'W	208 – 229	1 476.6	*Zenopsis conchifer* *Priacanthus arenatus* *Heptranchias perlo*
	298	05° 12'N	00° 13'W	107 – 131	546.7	*Arionmma bondi* *Trachurus trecae* *Boops boops*
	330	04° 25'N	02° 07'W	244 – 253	354.3	*Lophius vailanti* *Zenopsis conchifer* *Trigla lyra*
	337	04° 35'N	02° 31'W	251 – 252	288.7	*Zenopsis conchifer* *Dentex congoensis* *Squalus megalops*

Catch rates between 245 and 1 476 kg/h (average 662 kg/h) were obtained from the 7 hauls. The average catch rate amounted to a stock density of 22 t/NM^2 for all species combined. The corresponding figure for the area between 20 and 100 m was 15 t/NM^2, implying higher

catch rates on the upper continental slope than on the shelf. 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 at each station.

Table 6.2 Deep stations: catch rates (kg/h) of the most commercially valuable species and 'others' in the swept-area bottom trawl hauls, 101-400 m.

Station	Depth	Zeidae	Sparidae	Merluccidae	*Aristeus varidens*	*Parapenaeus longirostris*	Other	Total
249	159	4.5	78.0	0.0	3.0	1.4	158.4	245.3
271	211	8.5	27.9	0.0	4.5	1.9	1 161.7	1 204.5
287	334	0.0	0.0	3.9	15.0	4.4	495.8	519.1
294	219	920.0	27.6	0.0	0.0	0.0	529.0	1 476.6
298	119	24.9	71.2	0.0	0.0	0.0	450.6	546.7
330	249	48.6	1.1	23.6	9.3	0.2	271.5	354.3
337	252	123.2	21.2	17.0	0.2	0.6	126.5	288.7
Mean	220	161.4	32.4	6.4	4.6	1.2	456.2	662.2
SE		127.5	11.7	3.7	2.2	0.6	132.4	182.5
% Catch		24.4	4.9	1.0	0.7	0.2	68.9	

Dories (Zeidae) (mainly *Zenopsis conchifer*) was most abundant among the more commercially interesting groups with an average catch rate of 161 kg/h (Table 6.2). Seabreams also constituted an important group of species with an average catch rate of 32 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*) was the most abundant shrimp found in this depth range and the species occurred in 71% of the hauls and had a mean catch rate of 4.6 kg/h. Rose shrimp (*Parapenaeus longirostris*), which was most common in 2000, also occurred in 71% of the hauls but with a mean catch rate of only 1.2 kg/h. *Merluccius polli* (Benguela hake) also occurred in some of these hauls with an average catch rate of 6.4 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 density found in the 2000 survey is given. The most abundant species were *Centrophorus uyato* and *Zenopsis conchifer* (Table 6.2). In 2000 *Priacanthus arenatus* was most abundant due to one large catch, but came third in this survey Other species that occurred in over 50% of the hauls in some quantities were *Parasudis fraser-bruenneri, Chlorophthalmus atlanticus, Squatina oculata, D. angolensis* and *Trigla lyra.*

Table 6.3 Most abundant species in the deep hauls with common English names, percent incidence, mean density and mean density found in the 2000 survey.

Rank	Scientific Name	Common English Name	% incidence	Density 2002	Density 2000
1	*Centrophorus uyato*	Little gulper shark	43	5.53	-
2	*Zenopsis conchifer*	Silvery John dory	57	5.26	1.17
3	*Priacanthus arenatus*	Atlantic bigeye	86	2.04	12.37
4	*Parasudis fraser-bruenneri*	Greeneye	57	0.87	0.12
5	*Chlorophthalmus atlanticus*	Atlantic greeneye	71	0.75	2.56
6	*Ariomma bondi*	Silver-rag driftfish	29	0.75	0.29
7	*Trachurus trecae*	Horse mackerel	14	0.70	-
8	*Squatina oculata*	Smoothback angelshark	71	0.56	0.55
9	*Dentex angolensis*	Angola dentex	71	0.55	0.65
10	*Pentheroscion mbizi*	Blackmouth croaker	43	0.46	-
11	*Lophius vaillanti*	Shortspine African anglerfish	29	0.41	0.12
12	*Dentex congoensis*	Congo dentex	29	0.31	0.91
13	*Trigla lyra*	Piper gurnard	57	0.28	0.24
14	*Boops boops*	Bogue	14	0.22	-
15	*Merluccius polli*	Benguela hake	43	0.21	0.07

REFERENCES

Anon. 1989. Surveys of the small pelagic fish resources of Côte d'Ivoire and Ghana, 12-20 October 1989. NORAD/UNDP/FAO Programme. Reports of surveys with R/V Dr. Fridtjof Nansen. Institute of Marine Research, Bergen, November 1989. 14 pp.

Koranteng, K. A. and O. Pezennec (1998): Variability and Trends in Environmental Time Series along the Ivorian and Ghanaian Coasts, pp 167-177 *In* Global versus Local Changes in Upwelling Systems, edited by Durand M.-H., *et al.* ORSTOM Editions, Paris.

Marchal E. and J. Picaut 1977. Répartition et abondance évaluées par échointégration des poissons du plateau continental ivoiro-ghanéen en relation avec les upwellings locaux. *Journal Recherches Océanographiques* 2, 39 - 57.

Mehl, S., Alvheim, O., Koranteng, K. and M. Tandstad, 1999. Surveys of the fish resources of the western Gulf of Guinea (Benin, Togo, Ghana, Côte d'Ivoire). Survey of the pelagic and demersal resources 19 April-6 May 1999. NORAD – FAO/UNDP project GLO 92/013. Cruise reports Dr. Fridtjof Nansen, Institute of Marine Research, Bergen, Norway.

Pezennec O. and F.-X. Bard (1992). Importance écologique de la petite saison d'upwelling ivoiro-ghanéenne et changements dans la pêcherie de *Sardinella aurita*. *Aquatic Living Resources* 5, 249 - 259.

Strømme, T., Føyn, L. and G.S. Sætersdal, 1983. Survey of the offshore sub-surface community from Togo to Cameroon and of the shelf from Equatorial Guinea to the Congo Aug-Sep 1981. Reports on surveys with the Dr. Fridtjof Nansen, Institute of Marine Research, Bergen, Norway, 29 p.

Strømme T. 1984. Report on the R/V DR FRIDTJOF NANSEN fish resource survey off West Africa: Morocco to Ghana and Cape Verde Islands May 1981-March 1982. CECAF/ECAF Series 84/29, FAO, Rome.

Strømme T. 1992. NAN-SIS: Software for fishery survey data logging and analysis. User's manual. *FAO Computerized Information Series (Fisheries)*. No. 4. Rome, FAO. 1992. 103 p.

Torstensen, E., Alvheim, O., Koranteng, K. and M. Tandstad, 1999. Surveys of the fish resources of the western Gulf of Guinea (Benin, Togo, Ghana, Côte d'Ivoire). Survey of the pelagic and demersal resources 29 August - 17 September 2000. NORAD – FAO project GCP/INT730/NOR. Cruise reports Dr. Fridtjof Nansen, Institute of Marine Research, Bergen, Norway.

Williams F. 1968. Report on the Guinean Trawling Survey, Organisation of African Unity Scientific and Technical Research Commission (99).

Annex 1 Records of fishing stations

PROJECT STATION: 244

DATE:17/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 607
start stop duration Long E 228
TIME :10:51:50 11:20:23 29 (min) Purpose code: 3
LOG :5789.23 5790.67 1.43 Area code : 4
FDEPTH: 81 81 GearCond.code:
BDEPTH: 81 81 Validity code:
Towing dir: 90o Wire out: 250 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 174.95 CATCH/HOUR: 361.97

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Selar crumenophthalmus	83.88	453	23.17	662
Sepia officinalis hierredda	76.14	118	21.03	654
Dentex congoensis	74.48	2876	20.58	658
Boops boops	41.59	1792	11.49	656
Dentex angolensis	31.78	314	8.78	657
Decapterus punctatus	20.44	850	5.65	661
Zeus faber	15.83	8	4.37	655
Pagellus bellottii	10.92	145	3.02	659
Sardinella aurita	3.43	174	0.95	660
Fistularia petimba	1.03	8	0.28	
Dentex canariensis	0.83	2	0.23	
Raja miraletus	0.72	2	0.20	
Ariomma bondi	0.58	8	0.16	
Pagrus caeruleostictus	0.31	2	0.09	
Total	361.96		100.00	

PROJECT STATION: 245

DATE:17/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 612
start stop duration Long E 227
TIME :12:51:34 13:21:19 30 (min) Purpose code: 3
LOG :5800.41 5802.04 1.60 Area code : 4
FDEPTH: 44 43 GearCond.code:
BDEPTH: 44 43 Validity code:
Towing dir: 90o Wire out: 180 m Speed: 30 kn*10

Sorted: 54 Kg Total catch: 54.35 CATCH/HOUR: 108.70

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trichiurus lepturus	50.30	2348	46.27	672
Brachydeuterus auritus	20.20	922	18.58	669
Sphyraena guachancho	14.30	170	13.16	666
Sepia officinalis hierredda	6.20	304	5.70	
Selene dorsalis	6.10	174	5.61	665
Galeoides decadactylus	3.50	32	3.22	664
Penaeus notialis	1.90	84	1.75	663
Ilisha africana	1.70	70	1.56	668
Scomberomorus tritor	1.60	8	1.47	
Stromateus fiatola	1.00	2	0.92	
Priacanthus arenatus	1.00	10	0.92	
Sardinella maderensis	0.40	14	0.37	670
Chloroscombrus chrysurus	0.30	34	0.28	667
Psettodes belcheri	0.20	2	0.18	
Total	108.70		99.99	

PROJECT STATION: 246

DATE:17/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 616
start stop duration Long E 226
TIME :14:30:04 15:05:04 35 (min) Purpose code: 3
LOG :5809.57 5811.39 1.79 Area code : 4
FDEPTH: 20 19 GearCond.code:
BDEPTH: 20 19 Validity code:
Towing dir: 90o Wire out: 120 m Speed: 30 kn*10

Sorted: 17 Kg Total catch: 16.50 CATCH/HOUR: 28.29

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Alectis alexandrinus	11.57	14	40.90	679
Scomberomorus tritor	5.40	12	19.09	678
Sphyraena guachancho	3.26	46	11.52	677
Trichiurus lepturus	2.40	98	8.48	680
Trachinotus teraia	1.11	2	3.92	
Selene dorsalis	1.03	22	3.64	676
Brachydeuterus auritus	0.94	36	3.32	674
Uraspis helvola	0.86	2	3.04	
Chloroscombrus chrysurus	0.51	7	1.80	675
Drepane africana	0.43	2	1.52	
Galeoides decadactylus	0.43	3	1.52	
Priacanthus arenatus	0.26	2	0.92	
Penaeus notialis	0.09	2	0.32	673
Total	28.29		99.99	

PROJECT STATION: 247

DATE:17/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 617
start stop duration Long E 235
TIME :16:04:15 16:34:01 30 (min) Purpose code: 3
LOG :5818.33 5820.00 1.64 Area code : 4
FDEPTH: 20 20 GearCond.code:
BDEPTH: 20 20 Validity code:
Towing dir: 90o Wire out: 120 m Speed: 30 kn*10

Sorted: 114 Kg Total catch: 113.85 CATCH/HOUR: 227.70

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sphyraena guachancho	46.40	172	20.38	686
Elops lacerta	32.60	134	14.32	
Chloroscombrus chrysurus	27.20	518	11.95	688
Pseudotolithus senegalensis	21.60	98	9.49	684
Trichiurus lepturus	18.20	600	7.99	690
Polydactylus quadrifilis	18.20	2	7.99	681
Pteroscion peli	16.00	380	7.03	
Galeoides decadactylus	12.90	214	5.67	682
Scomberomorus tritor	10.60	34	4.66	685
Lutjanus goreensis	6.60	6	2.90	683
Ilisha africana	4.80	762	2.11	687
Drepane africana	3.70	52	1.62	
Acanthurus monroviae	2.20	4	0.97	
Pseudotolithus typus	2.10	6	0.92	
Sardinella maderensis	1.10	36	0.48	689
Pseudotolithus brachygnathus	1.00	2	0.44	
Selene dorsalis	0.80	10	0.35	
Lagocephalus laevigatus	0.50	2	0.22	
Lethrinus atlanticus	0.30	4	0.13	
Mugil bananensis	0.20	2	0.09	
Brachydeuterus auritus	0.20	4	0.09	
Pomadasys jubelini	0.20	2	0.09	
Pentanemus quinquarius	0.20	4	0.09	
Pomadasys rogeri	0.10	2	0.04	
Total	227.70		100.02	

PROJECT STATION: 248

DATE:17/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 613
start stop duration Long E 236
TIME :17:50:52 18:18:29 28 (min) Purpose code: 3
LOG :5827.45 5828.90 1.42 Area code : 4
FDEPTH: 33 31 GearCond.code:
BDEPTH: 33 31 Validity code:
Towing dir: 90o Wire out: 130 m Speed: 30 kn*10

Sorted: 80 Kg Total catch: 80.45 CATCH/HOUR: 172.39

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Alectis alexandrinus	51.54	54	29.90	694
Sphyraena guachancho	51.32	107	29.77	693
Scomberomorus tritor	27.11	56	15.73	697
Selene dorsalis	12.96	81	7.52	
Chloroscombrus chrysurus	10.39	146	6.03	692
Selar crumenophthalmus	3.43	26	1.99	691
Brachydeuterus auritus	3.21		1.86	
Pagrus caeruleostictus	2.46	9	1.43	696
Dentex canariensis	2.04	2	1.18	
Balistes capriscus	1.50	9	0.87	
Chaetodipterus goreensis	1.50	11	0.87	
Pseudotolithus senegalensis	1.39	4	0.81	
Pagellus bellottii	1.07	6	0.62	695
Albula vulpes	0.86	2	0.50	
Sardinella maderensis	0.64	4	0.37	
Trichiurus lepturus	0.43	6	0.25	
Galeoides decadactylus	0.32	6	0.19	
Pteroscion peli	0.21	2	0.12	
Total	172.38		100.01	

PROJECT STATION: 249

DATE:18/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 606
start stop duration Long E 229
TIME :23:46:36 00:06:18 20 (min) Purpose code: 3
LOG :5865.98 5866.97 0.97 Area code : 4
FDEPTH: 131 187 GearCond.code:
BDEPTH: 131 187 Validity code:
Towing dir: 90o Wire out: 380 m Speed: 30 kn*10

Sorted: 82 Kg Total catch: 81.76 CATCH/HOUR: 245.28

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Pentheroscion mbizi	77.70	756	31.68	
Dentex congoensis	42.00	900	17.12	698
Dentex angolensis	36.00	243	14.68	697
Lagocephalus laevigatus	24.45	75	9.97	
Torpedo marmorata	12.75	6	5.20	
Brotula barbata	10.05	12	4.10	
Priacanthus arenatus	10.05	483	4.10	699
Physiculus huloti	8.10	207	3.30	
Zeus faber	4.50	3	1.83	
Promethichthys prometheus	3.75	132	1.53	
Illex coindetii	3.60	27	1.47	
Aristeus varidens	3.00	207	1.22	
Lepidotrigla cadmani	3.00	36	1.22	
Sepia officinalis hierredda	2.85	6	1.16	
Parapenaeus longirostris	1.35	246	0.55	
Umbrina canariensis	1.20	3	0.49	
Hypoclydonia bella	0.45	9	0.18	
Psettodes belcheri	0.30	3	0.12	
Citharus linguatula	0.15	9	0.06	
Uranoscopus sp.	0.03	3	0.01	
Total	245.28		99.99	

PROJECT STATION: 250

DATE:18/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 608
start stop duration Long E 216
TIME :06:14:54 06:44:43 30 (min) Purpose code: 3
LOG :5899.60 5901.09 1.47 Area code : 4
FDEPTH: 70 68 GearCond.code:
BDEPTH: 70 68 Validity code:
Towing dir: 90ø Wire out: 220 m Speed: 30 kn*10

Sorted: 17 Kg Total catch: 16.95 CATCH/HOUR: 33.90

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	10.10	16	29.79	709
Dentex angolensis	5.70	54	16.81	703
Selar crumenophthalmus	4.00	20	11.80	702
Epinephelus aeneus	2.80	4	8.26	700
Squalus blainvillei	2.70	2	7.96	
Fistularia petimba	1.90	8	5.60	
Decapterus punctatus	1.80	78	5.31	708
Dentex congoensis	1.50	44	4.42	704
Squatina oculata	1.20	2	3.54	
Pagrus caeruleostictus	1.10	4	3.24	701
Alloteuthis africana	0.60	88	1.77	
Priacanthus arenatus	0.20	16	0.59	706
Pagellus bellottii	0.16	2	0.47	705
Sardinella aurita	0.10	8	0.29	707
Promethichthys prometheus	0.04	2	0.12	
Total	33.90		99.97	

PROJECT STATION: 251

DATE:18/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 612
start stop duration Long E 215
TIME :08:07:18 08:38:00 31 (min) Purpose code: 3
LOG :5909.65 5911.33 1.65 Area code : 4
FDEPTH: 38 38 GearCond.code:
BDEPTH: 38 38 Validity code:
Towing dir: 90ø Wire out: 130 m Speed: 30 kn*10

Sorted: 17 Kg Total catch: 79.10 CATCH/HOUR: 153.10

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	33.00	627	21.55	715
Chloroscombrus chrysurus	29.90	362	19.53	712
Selene dorsalis	28.55	114	18.65	718
Sphyraena guachaacho	21.10	186	13.78	717
Galeoides decadactylus	9.68	70	6.32	713
Pomadasys peroteti	6.29	6	4.11	711
Alectis alexandrinus	3.48	4	2.27	
Caranx hippos	3.48	6	2.27	
Ephippion guttifer	3.29	2	2.15	
Pagrus caeruleostictus	3.19	10	2.08	
Sepia officinalis hierredda	2.81	4	1.84	710
Sphyraena afra	2.13	2	1.39	
Sardinella maderensis	1.84	110	1.20	714
Epinephelus aeneus	1.26	2	0.82	
Scomberomorus tritor	1.06	6	0.69	
Trichiurus lepturus	0.87	31	0.57	716
Dentex canariensis	0.39	2	0.25	
Illex coindetii	0.29	2	0.19	
Pagellus bellottii	0.29	2	0.19	
Decapterus punctatus	0.10	8	0.07	
Ilisha africana	0.10	4	0.07	
Total	153.10		99.99	

PROJECT STATION: 252

DATE:18/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 614
start stop duration Long E 215
TIME :08:20:35 10:00:48 30 (min) Purpose code: 3
LOG :5917.27 5918.84 1.55 Area code : 4
FDEPTH: 27 26 GearCond.code:
BDEPTH: 27 26 Validity code:
Towing dir: 90ø Wire out: 120 m Speed: 30 kn*10

Sorted: 37 Kg Total catch: 37.25 CATCH/HOUR: 74.50

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Caranx senegallus	59.70	156	80.13	721
Sepia officinalis hierredda	5.70	4	7.65	719
Alectis alexandrinus	4.20	4	5.64	723
Ephippion guttifer	2.50	2	3.36	
Sphyraena guachancho	1.20	4	1.61	724
Caranx crysos	1.20	4	1.61	720
Total	74.50		100.00	

PROJECT STATION: 253

DATE:18/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 618
start stop duration Long E 206
TIME :11:48:25 12:19:43 31 (min) Purpose code: 3
LOG :5933.56 5935.16 1.58 Area code : 4
FDEPTH: 17 17 GearCond.code:
BDEPTH: 17 17 Validity code:
Towing dir: 90ø Wire out: 120 m Speed: 30 kn*10

Sorted: 46 Kg Total catch: 218.63 CATCH/HOUR: 423.15

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	60.58	1425	14.32	727
Sphyraena guachancho	55.35	554	13.08	728
Elops lacerta	47.03	192	11.11	
Ilisha africana	37.94	2530	8.97	726
Pseudotolithus typus	29.23	37	6.91	
Pseudotolithus senegalensis	28.26	165	6.68	
Trichiurus lepturus	27.87	1157	6.59	
Galeoides decadactylus	26.52	271	6.27	725
Drepane africana	25.26	182	5.97	
Brachydeuterus auritus	24.77	643	5.85	730
Sphyraena afra	16.45	8	3.89	
Pomadasys rogeri	12.19	17	2.88	
Dasyatis margarita	9.48	17	2.24	
Selene dorsalis	9.10	217	2.15	729
Pteroscion peli	6.58	209	1.56	
Caranx senegallus	3.93	25	0.93	
Polydactylus quadrifilis	1.74	35	0.41	
Sardinella maderensis	0.87	35	0.21	
Total	423.15		100.02	

PROJECT STATION: 254

DATE:18/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 611
start stop duration Long E 205
TIME :13:39:12 14:09:08 30 (min) Purpose code: 3
LOG :5945.75 5947.36 1.58 Area code : 4
FDEPTH: 45 49 GearCond.code:
BDEPTH: 45 49 Validity code:
Towing dir: 90ø Wire out: 160 m Speed: 30 kn*10

Sorted: 93 Kg Total catch: 92.90 CATCH/HOUR: 185.80

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Selene dorsalis	46.60	228	25.08	735
Brachydeuterus auritus	33.50	722	18.03	737
Alectis alexandrinus	19.20	22	10.33	736
Pagrus caeruleostictus	13.70	58	7.37	738
Pagellus bellottii	12.90	96	6.94	734
Sphyraena guachancho	12.10	98	6.51	731
Chloroscombrus chrysurus	11.90	150	6.40	733
Canthidermis maculatus	9.10	8	4.90	
Sphyraena afra	7.10	4	3.82	
Epinephelus aeneus	5.00	2	2.69	
Sepia officinalis hierredda	3.00	2	1.61	
Dentex canariensis	2.70	4	1.45	
Stromateus fiatola	2.70	4	1.45	
Selar crumenophthalmus	2.40	66	1.29	732
Psettodes belcheri	1.60	2	0.86	
Galeoides decadactylus	0.80	4	0.43	
Torpedo torpedo	0.60	2	0.32	
Pseudotolithus senegalensis	0.50	2	0.27	
Sardinella maderensis	0.40	6	0.22	
Total	185.80		99.97	

PROJECT STATION: 255

DATE:18/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 607
start stop duration Long E 206
TIME :15:52:23 16:22:00 30 (min) Purpose code: 3
LOG :5955.70 5957.14 1.42 Area code : 4
FDEPTH: 87 80 GearCond.code:
BDEPTH: 87 80 Validity code:
Towing dir: 90ø Wire out: 259 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 139.18 CATCH/HOUR: 278.36

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Dentex congoensis	189.00	3730	67.90	742
Boops boops	31.28	824	11.24	743
Dentex angolensis	24.00	188	8.62	740
Sepia officinalis hierredda	18.80	28	6.75	739
Sphyraena guachancho	2.90	4	1.04	
Aluterus punctata	2.70	2	0.97	
Selene dorsalis	2.00	10	0.72	
Trachurus trecae	1.80	14	0.65	
Ariomma bondi	1.80	22	0.65	
Pagellus bellottii	1.54	18	0.55	
Squatina oculata	1.20	2	0.43	742
Fistularia petimba	0.90	2	0.32	
Decapterus punctatus	0.40	4	0.14	
Chaetodon marcellae	0.04	2	0.01	741
Total	278.36		99.99	

PROJECT STATION: 256

DATE:18/ 7/02 GEAR TYPE: PT No: 4 POSITION:Lat N 612
start stop duration Long E 202
TIME :20:58:44 21:28:49 30 (min) Purpose code: 1
LOG :5988.88 5990.42 1.53 Area code : 4
FDEPTH: 0 0 GearCond.code:
BDEPTH: 31 47 Validity code:
Towing dir: 209ø Wire out: 124 m Speed: 30 kn*10

Sorted: 40 Kg Total catch: 40.15 CATCH/HOUR: 80.30

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Scomberomorus tritor	32.00	68	39.85	746
Selar crumenophthalmus	14.00	78	17.43	745
Sardinella maderensis	11.80	3146	14.69	747
Sphyraena guachancho	10.90	40	13.57	744
Engraulis encrasicolus	6.80	5666	8.47	748
Ariomma bondi	3.90	60	4.86	
Sphyraena sphyraena	0.50	2	0.62	
Scomber japonicus	0.40	4	0.50	
Total	80.30		99.99	

PROJECT STATION: 257

DATE:19/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 607
start stop duration Long E 155
TIME :06:06:50 06:37:39 31 (min) Purpose code: 3
LOG :6019.61 6021.26 1.63 Area code : 4
FDEPTH: 64 66 GearCond.code:
BDEPTH: 64 66 Validity code:
Towing dir: 64ø Wire out: 200 m Speed: 30 kn*10

Sorted: 17 Kg Total catch: 24.60 CATCH/HOUR: 47.61

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Dentex angolensis	21.29	159	44.72	751
Sepia officinalis hierredda	15.10	21	31.72	753
Fistularia petimba	4.74	31	9.96	749
Scomberomorus tritor	3.87	4	8.13	750
Pagellus bellottii	2.03	27	4.26	752
Dentex canariensis	0.58	2	1.22	
Total	47.61		100.01	

PROJECT STATION: 258

DATE:19/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 610

	start	stop	duration			Long E 155
TIME	:08:09:48	08:39:49	30 (min)	Purpose code:	3	
LOG	:6029.61	6031.16	1.54	Area code	: 4	
FDEPTH:	32	32		GearCond.code:		
BDEPTH:	32	32		Validity code:		

Towing dir: 80ø Wire out: 130 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 88.25 CATCH/HOUR: 176.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Acanthurus monroviae	56.60	78	32.07	762
Pagrus caeruleostictus	32.00	88	18.13	760
Dentex canariensis	24.50	46	13.88	761
Aluterus monoceros	21.60	24	12.24	
Lethrinus atlanticus	15.90	36	9.01	758
Scomberomorus tritor	6.60	12	3.74	757
Sepia officinalis hierredda	6.00	6	3.40	
Lutjanus fulgens	4.40	6	2.49	756
Lutjanus dentatus	2.40	2	1.36	755
Caranx hippos	2.10	2	1.19	754
Balistes punctatus	1.20	4	0.68	
Lagocephalus lagocephalus	1.20	4	0.68	
Fistularia petimba	0.60	2	0.34	
Selar crumenophthalmus	0.50	2	0.28	
Sardinella aurita	0.50	8	0.28	
Pagellus bellottii	0.40	4	0.23	759
Total	176.50		100.00	

PROJECT STATION: 259

DATE:19/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 613

	start	stop	duration			Long E 155
TIME	:10:00:03	10:00:25	30 (min)	Purpose code:	3	
LOG	:6039.50	6041.07	1.54	Area code	: 4	
FDEPTH:	23	23		GearCond.code:		
BDEPTH:	23	23		Validity code:		

Towing dir: 80ø Wire out: 120 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 64.97 CATCH/HOUR: 129.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	50.70	44	39.02	768
Acanthurus monroviae	19.80	24	15.24	
Lethrinus atlanticus	9.60	14	7.39	769
Lutjanus goreensis	9.50	8	7.31	764
Alectis alexandrinus	7.40	6	5.69	763
Dentex canariensis	7.30	14	5.62	766
Pagrus caeruleostictus	4.80	10	3.69	767
Balistes punctatus	4.60	10	3.54	
Balistes capriscus	3.00	4	2.31	
Scomberomorus tritor	2.40	6	1.85	
Ephippion guttifer	2.30	2	1.77	
Sphyraena afra	2.30	4	1.77	
Albula vulpes	1.60	2	1.23	
Fistularia petimba	1.50	6	1.15	
Lagocephalus laevigatus	1.30	2	1.00	
Caranx crysos	1.00	2	0.77	
Aluterus heudelotii	0.80	2	0.62	
Pseudupeneus prayensis	0.04	24	0.03	765
Total	129.94		100.00	

PROJECT STATION: 260

DATE:19/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 613

	start	stop	duration			Long E 146
TIME	:13:45:36	14:15:09	30 (min)	Purpose code:	3	
LOG	:6055.33	6056.82	1.48	Area code	: 4	
FDEPTH:	18	19		GearCond.code:		
BDEPTH:	18	19		Validity code:		

Towing dir: 80ø Wire out: 130 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 244.09 CATCH/HOUR: 488.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	164.20	3752	33.64	774
Drepane africana	53.20	234	10.90	
Brachydeuterus auritus	36.80	4048	7.54	770
Ilisha africana	34.50	12650	7.07	
Sphyraena guachancho	34.10	1412	6.99	771
Sphyraena afra	34.10	10	6.99	777
Galeoides decadactylus	32.60	428	6.68	772
Scomberomorus tritor	24.30	80	4.98	773
Pseudotolithus senegalensis	19.50	44	3.99	776
Sardinella maderensis	9.00	780	1.84	
Selene dorsalis	7.50	188	1.54	775
Balistes punctatus	7.00	8	1.43	
Acanthurus monroviae	6.80	6	1.39	
Elops lacerta	4.50	22	0.92	
Pteroscion peli	2.80	60	0.57	
Alectis alexandrinus	2.60	60	0.53	
Alectis alexandrinus	2.60	2	0.53	
Chaetodipterus goreensis	2.50	6	0.51	
Selar crumenophthalmus	1.88	188	0.39	
Sepia officinalis hierredda	1.70	2	0.35	
Pomadasys rogeri	1.50	8	0.31	
Pagrus caeruleostictus	1.12	8	0.23	
Psettodes belcheri	1.10	2	0.23	
Dentex canariensis	1.10	8	0.23	
Caranx senegallus	0.40	22	0.08	
Ephippion guttifer	0.40	2	0.08	
Caranx crysos	0.38	8	0.08	
Total	488.18		100.02	

PROJECT STATION: 261

DATE:19/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 608

	start	stop	duration			Long E 145
TIME	:15:25:18	15:55:32	30 (min)	Purpose code:	3	
LOG	:6065.66	6067.20	1.52	Area code	: 4	
FDEPTH:	46	43		GearCond.code:		
BDEPTH:	46	43		Validity code:		

Towing dir: 80ø Wire out: 170 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 159.95 CATCH/HOUR: 319.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	204.00	264	63.77	778
Brachydeuterus auritus	52.60	9782	16.44	782
Sepia officinalis hierredda	39.40	58	12.32	
Alloteuthis africana	6.80	128	2.13	
Ephippion guttifer	4.00	2	1.25	
Selar crumenophthalmus	3.60	116	1.13	779
Pagellus bellottii	2.40	40	0.75	781
Chloroscombrus chrysurus	2.00	20	0.63	
Balistes capriscus	1.00	2	0.31	
Dactylopterus volitans	0.90	2	0.28	
Sphyraena guachancho	0.60	24	0.19	
Decapterus punctatus	0.60	36	0.19	
Sardinella maderensis	0.60	36	0.19	780
Drepane africana	0.60	4	0.19	
Fistularia petimba	0.60	2	0.19	
Echeneis naucrates	0.20	4	0.06	
Total	319.90		100.02	

PROJECT STATION: 262

DATE:19/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 605

	start	stop	duration			Long E 145
TIME	:17:23:37	17:51:23	28 (min)	Purpose code:	3	
LOG	:6078.45	6079.81	1.34	Area code	: 4	
FDEPTH:	61	62		GearCond.code:		
BDEPTH:	61	62		Validity code:		

Towing dir: 90ø Wire out: 200 m Speed: 30 kn*10

Sorted: 34 Kg Total catch: 34.36 CATCH/HOUR: 73.63

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	22.07	28	29.97	788
Fistularia petimba	10.82	39	14.70	
Epinephelus aeneus	10.71	2	14.55	
Leptocharias smithii	5.68	2	7.71	
Squatina oculata	4.50	2	6.11	
Scomberomorus tritor	4.39	4	5.96	
Dentex congoensis	4.07	49	5.53	785
Pagrus caeruleostictus	3.11	15	4.22	786
Alectis alexandrinus	2.68	2	3.64	
Pagellus bellottii	2.04	28	2.77	783
Dentex canariensis	1.29	6	1.75	784
Selar crumenophthalmus	0.75	28	1.02	787
Priacanthus arenatus	0.75	4	1.02	
Sphyraena sphyraena	0.32	2	0.43	
Brachydeuterus auritus	0.21	11	0.29	
Decapterus punctatus	0.11	2	0.15	
Sphyraena guachancho	0.11	2	0.15	
Saurida brasiliensis	0.02	2	0.03	
Total	73.63		100.00	

PROJECT STATION: 263

DATE:19/ 7/02 GEAR TYPE: PT No: 6 POSITION:Lat N 608

	start	stop	duration			Long E 142
TIME	:21:41:21	22:11:31	30 (min)	Purpose code:	1	
LOG	:6107.22	6108.75	1.51	Area code	: 4	
FDEPTH:	0	0		GearCond.code:		
BDEPTH:	32	48		Validity code:		

Towing dir: 206ø Wire out: 140 m Speed: 30 kn*10

Sorted: 23 Kg Total catch: 36.85 CATCH/HOUR: 73.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena afra	18.30	2	24.83	789
Sardinella maderensis	12.60		17.10	
Engraulis encrasicolus	9.60		13.03	
Selar crumenophthalmus	9.20	130	12.48	790
Ariomma bondi	9.00	180	12.21	
Decapterus punctatus	5.20	160	7.06	791
Selar crumenophthalmus	2.40	150	3.26	
Scomberomorus tritor	1.80	4	2.44	
Ilisha africana	1.50	60	2.04	
MYCTOPHIDAE	1.20	390	1.63	
Lolliguncula mercatoris	0.90	690	1.22	
Alloteuthis africana	0.90	600	1.22	
Saurida brasiliensis	0.90	420	1.22	
Promethichthys prometheus	0.10	2	0.14	
Sphyraena guachancho	0.10	2	0.14	
Total	73.70		100.02	

PROJECT STATION: 264

DATE:20/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 602

	start	stop	duration			Long E 136
TIME	:06:07:00	06:23:02	16 (min)	Purpose code:	3	
LOG	:6132.14	6132.94	0.79	Area code	: 3	
FDEPTH:	64	63		GearCond.code:		
BDEPTH:	64	63		Validity code:		

Towing dir: 80ø Wire out: 200 m Speed: 30 kn*10

Sorted: 17 Kg Total catch: 17.52 CATCH/HOUR: 65.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagrus caeruleostictus	18.00	23	27.40	795
Aluterus punctata	12.75	11	19.41	
Pomadasys incisus	12.56	165	19.12	798
Fistularia petimba	10.88	34	16.56	
Dentex angolensis	4.88	23	7.43	793
Sepia officinalis hierredda	2.63	4	4.00	
Dentex canariensis	1.69	4	2.57	794
Pagellus bellottii	1.31	26	1.99	796
Pseudupeneus prayensis	0.38	11	0.58	792
Alloteuthis africana	0.19	101	0.29	
Boops boops	0.19	11	0.29	797
Dentex gibbosus	0.19	4	0.29	
Dentex congoensis	0.08	4	0.12	
Total	65.73		100.05	

PROJECT STATION: 265

DATE:20/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 606
start stop duration Long E 134
TIME :08:20:25 08:51:04 31 (min) Purpose code: 3
LOG :6142.77 6144.34 1.55 Area code : 3
FDEPTH: 39 41 GearCond.code:
BDEPTH: 39 41 Validity code:
Towing dir: 80ø Wire out: 140 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 53.61 CATCH/HOUR: 103.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	32.13	33	30.97	809
Alectis alexandrinus	19.16	23	18.47	804
Pagrus caeruleostictus	13.45	37	12.96	803
Dentex canariensis	7.26	19	7.00	802
Aluterus monoceros	5.61	4	5.41	
Aluterus heudelotii	5.32	8	5.13	
Balistes capriscus	5.03	8	4.85	808
Epinephelus aeneus	3.48	2	3.35	799
Pagellus bellottii	2.81	27	2.71	801
Selene dorsalis	2.42	8	2.33	806
Fistularia petimba	2.32	12	2.24	
Scomberomorus tritor	1.65	2	1.59	805
Lethrinus atlanticus	1.26	2	1.21	800
Alloteuthis africana	0.68	157	0.66	
Dactylopterus volitans	0.68	2	0.66	
Pomadasys incisus	0.48	4	0.46	807
Decapterus punctatus	0.02	2	0.02	
Total	103.76		100.02	

PROJECT STATION: 266

DATE:20/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 609
start stop duration Long E 135
TIME :09:49:37 10:20:48 31 (min) Purpose code: 3
LOG :6151.33 6152.92 1.56 Area code : 3
FDEPTH: 22 22 GearCond.code:
BDEPTH: 22 22 Validity code:
Towing dir: 80ø Wire out: 120 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 27.15 CATCH/HOUR: 52.55

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	29.03	21	55.24	810
Scomberomorus tritor	10.45	14	19.89	814
Dentex canariensis	5.61	17	10.68	811
Balistes punctatus	3.39	4	6.45	812
Lethrinus atlanticus	1.94	4	3.69	813
Aluterus heudelotii	1.16	2	2.21	
Dactylopterus volitans	0.77	2	1.47	
Alloteuthis africana	0.19	52	0.36	
Total	52.54		99.99	

PROJECT STATION: 267

DATE:20/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 606
start stop duration Long E 125
TIME :12:14:33 12:44:02 29 (min) Purpose code: 3
LOG :6168.02 6169.52 1.48 Area code : 3
FDEPTH: 24 25 GearCond.code:
BDEPTH: 24 25 Validity code:
Towing dir: 80ø Wire out: 130 m Speed: 30 kn*10

Sorted: 79 Kg Total catch: 337.21 CATCH/HOUR: 697.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lethrinus atlanticus	228.62	1181	32.77	817
Acanthurus monroviae	145.66	234	20.88	
Lutjanus dentatus	111.10	64	15.92	815
Sepia officinalis hierredda	74.69	60	10.71	816
Dasyatis margarita	48.62	2	6.97	
Dentex canariensis	27.31	72	3.91	818
Sphyraena afra	17.17	4	2.46	
Pagrus caeruleostictus	9.93	43	1.42	
Chaetodipterus goreensis	9.37	17	1.34	
Balistes punctatus	6.62	10	0.95	
Plectorhinchus macrolepis	6.62	2	0.95	
Aluterus punctata	4.41	10	0.63	
Bodianus speciosus	4.03	2	0.58	
Pseudupeneus prayensis	1.86	21	0.27	819
Decapterus punctatus	1.03	145	0.15	820
Lutjanus fulgens	0.62	6	0.09	821
Total	697.66		100.00	

PROJECT STATION: 268

DATE:20/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 604
start stop duration Long E 126
TIME :13:32:01 14:02:02 30 (min) Purpose code: 3
LOG :6174.27 6175.77 1.48 Area code : 3
FDEPTH: 43 43 GearCond.code:
BDEPTH: 43 43 Validity code:
Towing dir: 80ø Wire out: 150 m Speed: 30 kn*10

Sorted: 43 Kg Total catch: 43.50 CATCH/HOUR: 87.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	21.30	36	24.48	827
Pagrus caeruleostictus	21.00	86	24.14	822
Dentex canariensis	15.80	48	18.16	824
Sepia officinalis hierredda	7.70	10	8.85	
Pagrus africanus	6.40	10	7.36	825
Pagellus bellottii	4.50	54	5.17	823
Acanthurus monroviae	2.90	4	3.33	
Alloteuthis africana	1.80	468	2.07	
Decapterus punctatus	1.60	94	1.84	
Epinephelus aeneus	1.10	2	1.26	
Selene dorsalis	0.90	2	1.03	
Lethrinus atlanticus	0.80	2	0.92	
Lagocephalus laevigatus	0.30	2	0.34	
Sphyraena guachancho	0.30	2	0.34	
Eucinostomus melanopterus	0.20	4	0.23	
Sardinella aurita	0.20	28	0.23	826
Brachydeuterus auritus	0.10	2	0.11	
Pseudupeneus prayensis	0.10	4	0.11	
Total	87.00		99.97	

PROJECT STATION: 269

DATE:20/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 601
start stop duration Long E 126
TIME :15:48:50 16:18:29 30 (min) Purpose code: 3
LOG :6189.94 6191.43 1.47 Area code : 3
FDEPTH: 52 52 GearCond.code:
BDEPTH: 52 52 Validity code:
Towing dir: 80ø Wire out: 180 m Speed: 30 kn*10

Sorted: 49 Kg Total catch: 49.75 CATCH/HOUR: 99.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus punctatus	28.40	1038	28.54	829
Sepia officinalis hierredda	21.30	24	21.41	
Sardinella aurita	19.90	632	20.00	828
Balistes capriscus	8.00	10	8.04	832
Pagellus bellottii	5.10	68	5.13	831
Alloteuthis africana	4.70	1902	4.72	
Dentex canariensis	3.90	18	3.92	830
Fistularia petimba	2.80	10	2.81	
Pagrus caeruleostictus	2.30	18	2.31	833
Scomberomorus tritor	1.90	2	1.91	
Acanthurus monroviae	0.70	2	0.70	
Selar crumenophthalmus	0.50	6	0.50	
Total	99.50		99.99	

PROJECT STATION: 270

DATE:20/ 7/02 GEAR TYPE: PT No: 4 POSITION:Lat N 602
start stop duration Long E 122
TIME :21:07:53 21:38:36 31 (min) Purpose code: 1
LOG :6219.56 6221.21 1.64 Area code : 3
FDEPTH: 0 0 GearCond.code:
BDEPTH: 45 51 Validity code:
Towing dir: 45ø Wire out: 140 m Speed: 30 kn*10

Sorted: 14 Kg Total catch: 18.41 CATCH/HOUR: 35.63

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomberomorus tritor	7.94	12	22.28	834
Sepia officinalis hierredda	4.35	6	12.21	838
Ariomma bondi	3.48	77	9.77	
Saurida brasiliensis	2.81	2926	7.89	
Decapterus punctatus	2.03	83	5.70	835
Alloteuthis africana	1.94	1243	5.44	
Engraulis encrasicolus	1.94	1239	5.44	842
Selar crumenophthalmus	1.74	29	4.88	840
MYCTOPHIDAE	1.55	921	4.35	
Sardinella aurita	1.55	186	4.35	837
Dactylopterus volitans	1.45	6	4.07	
Aluterus heudelotii	1.06	2	2.98	
Pomadasys incisus	0.77	8	2.16	
Sphyraena sphyraena	0.48	2	1.35	
Sardinella maderensis	0.48	37	1.35	836
Sepia sp.	0.39	79	1.09	
Brachydeuterus auritus	0.39	321	1.09	
Pagellus bellottii	0.39	4	1.09	839
Priacanthus arenatus	0.39	2	1.09	
Sphyraena guachancho	0.19	2	0.53	
Boops boops	0.19	10	0.53	841
Brachydeuterus auritus	0.10	2	0.28	
SHRPE01	0.02	2	0.06	
Total	35.63		99.98	

PROJECT STATION: 271

DATE:20/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 554
start stop duration Long E 116
TIME :23:29:33 23:59:08 30 (min) Purpose code: 3
LOG :6235.11 6236.60 1.48 Area code : 3
FDEPTH: 208 214 GearCond.code:
BDEPTH: 208 214 Validity code:
Towing dir: 60ø Wire out: 570 m Speed: 30 kn*10

Sorted: 602 Kg Total catch: 602.24 CATCH/HOUR: 1204.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Centrophorus uyato	938.00	222	77.88	
Squatina oculata	99.20	32	8.24	
Dentex angolensis	27.90	122	2.32	843
Promethichthys prometheus	24.40	152	2.03	
Pentheroscion mbizi	16.70	78	1.39	
Ruvettus pretiosus	16.70	2	1.39	
Torpedo marmorata	14.00	14	1.16	
Sphoeroides pachgaster	13.00	36	1.08	
Zenopsis conchifer	8.50	10	0.71	
Lepidotrigla cadmani	8.30	132	0.69	
Trigla lyra	7.60	66	0.63	
Parasudis fraser-bruenneri	5.70	64	0.47	
Brotula barbata	5.50	8	0.46	
Neoharriotta pinnata	4.70	2	0.39	
Aristeus varidens	4.50	258	0.37	846
Umbrina canariensis	2.30	10	0.19	844
Parapenaeus longirostris	1.90	190	0.16	845
Trichiurus lepturus	1.20	14	0.10	
Illex coindetii	1.10	16	0.09	
Synagrops microlepis	0.90	52	0.07	
Peristedion cataphractum	0.70	18	0.06	
Priacanthus arenatus	0.50	2	0.04	
Todaropsis eblanae	0.50	2	0.04	
Gadella imberbis	0.20	2	0.02	
Antigonia capros	0.20	4	0.02	
Chlorophthalmus atlanticus	0.20	4	0.02	
Setarches guentheri	0.04	2		
Photichthys argenteus	0.04	2		
Total	1204.48		100.02	

PROJECT STATION: 272

DATE:21/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 558
start stop duration Long E 116
TIME :05:54:34 06:24:43 30 (min) Purpose code: 3
LOG :6258.25 6259.82 1.55 Area code : 3
FDEPTH: 51 51 GearCond.code:
BDEPTH: 51 51 Validity code:
Towing dir: 70º Wire out: 170 m Speed: 30 kn*10

Sorted: 20 Kg Total catch: 19.61 CATCH/HOUR: 39.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Balistes capriscus	15.30	18	39.01	851
Pagellus bellottii	4.90	70	12.49	847
Epinephelus aeneus	4.80	2	12.24	850
Alloteuthis africana	3.60	960	9.18	
Scomberomorus tritor	2.80	2	7.14	
Sepia officinalis hierredda	2.60	4	6.63	852
Pagrus caeruleostictus	1.60	16	4.08	848
Priacanthus arenatus	1.10	2	2.80	
Dentex canariensis	1.00	6	2.55	849
Sphyraena sphyraena	0.80	2	2.04	
Dactylopterus volitans	0.50	2	1.27	
Decapterus punctatus	0.20	4	0.51	
Sardinella aurita	0.02	2	0.05	
Total	39.22		99.99	

PROJECT STATION: 273

DATE:21/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 601
start stop duration Long E 115
TIME :08:13:16 08:43:44 30 (min) Purpose code: 3
LOG :6269.06 6270.60 1.50 Area code : 3
FDEPTH: 35 35 GearCond.code:
BDEPTH: 35 35 Validity code:
Towing dir: 72º Wire out: 130 m Speed: 30 kn*10

Sorted: 69 Kg Total catch: 69.50 CATCH/HOUR: 139.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Alectis alexandrinus	81.20	62	58.42	853
Sepia officinalis hierredda	20.00	24	14.39	858
Selene dorsalis	13.20	42	9.50	854
Dactylopterus volitans	10.60	34	7.63	
Aluterus heudelotii	5.70	18	4.10	
Balistes capriscus	5.00	10	3.60	857
Pagellus bellottii	1.70	26	1.22	855
Pagrus caeruleostictus	0.60	10	0.43	856
Sphyraena sphyraena	0.50	2	0.36	859
Pseudupeneus prayensis	0.20	2	0.14	
Dentex canariensis	0.20	2	0.14	
Decapterus punctatus	0.10	2	0.07	
Total	139.00		100.00	

PROJECT STATION: 274

DATE:21/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 603
start stop duration Long E 116
TIME :08:21:25 10:00:22 31 (min) Purpose code: 3
LOG :6274.70 6276.29 1.56 Area code : 3
FDEPTH: 24 25 GearCond.code:
BDEPTH: 24 25 Validity code:
Towing dir: 70º Wire out: 120 m Speed: 30 kn*10

Sorted: 115 Kg Total catch: 115.75 CATCH/HOUR: 224.03

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chaetodipterus goreensis	76.35	170	34.08	
Aluterus monoceros	33.68	35	15.03	
Sphyraena sphyraena	17.32	58	7.73	860
Dentex canariensis	15.29	43	6.82	871
Aluterus heudelotii	12.87	35	5.74	
Sphyraena afra	12.58	8	5.62	861
Balistes punctatus	11.42	14	5.10	863
Lethrinus atlanticus	10.84	23	4.84	864
Lutjanus goreensis	9.29	10	4.15	869
Alectis alexandrinus	8.13	31	3.63	868
Sepia officinalis hierredda	5.42	4	2.42	862
Pagrus caeruleostictus	2.42	15	1.08	866
Ephippion guttifer	2.42	2	1.08	
Dactylopterus volitans	1.26	4	0.56	
Lutjanus fulgens	1.16	2	0.52	870
Fistularia petimba	0.87	4	0.39	
Sparisoma rubripinne	0.77	2	0.34	
Decapterus punctatus	0.77	54	0.34	865
Pseudupeneus prayensis	0.58	8	0.26	867
Acanthostracion quadricornis	0.39	2	0.17	
Remora remora	0.10	2	0.04	
Sphoeroides marmoratus	0.10	2	0.04	
Total	224.03		99.98	

PROJECT STATION: 275

DATE:21/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 601
start stop duration Long E 107
TIME :11:40:32 11:40:39 10 (min) Purpose code: 3
LOG :6293.35 6293.84 0.48 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 20 20 Validity code:
Towing dir: 70º Wire out: 120 m Speed: 30 kn*10

Sorted: 10 Kg Total catch: 10.67 CATCH/HOUR: 64.02

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	34.20	55746	53.42	872
Sepia officinalis hierredda	19.20	12	29.99	
Sphyraena sphyraena	4.20	12	6.56	
Scomberomorus tritor	3.00	6	4.69	
Alectis alexandrinus	1.80	6	2.81	
Fistularia petimba	1.20	6	1.87	
Sardinella maderensis	0.42	108	0.66	873
Total	64.02		100.00	

PROJECT STATION: 276

DATE:21/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 559
start stop duration Long E 107
TIME :13:21:13 13:21:19 30 (min) Purpose code: 3
LOG :6298.38 6299.87 1.47 Area code : 2
FDEPTH: 25 24 GearCond.code:
BDEPTH: 25 24 Validity code:
Towing dir: 40º Wire out: 130 m Speed: 30 kn*10

Sorted: 45 Kg Total catch: 45.95 CATCH/HOUR: 91.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Engraulis encrasicolus	43.80	32996	47.66	874
Alectis alexandrinus	32.50	98	35.36	877
Sphyraena afra	7.10	6	7.73	
Sardinella maderensis	3.70	714	4.03	876
Scomberomorus tritor	3.60	2	3.92	
Chloroscombrus chrysurus	0.60	8	0.65	878
Brachydeuterus auritus	0.50	52	0.54	875
Decapterus punctatus	0.10	2	0.11	
Total	91.90		100.00	

PROJECT STATION: 277

DATE:21/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 556
start stop duration Long E 107
TIME :15:00:11 15:01:25 30 (min) Purpose code: 3
LOG :6306.46 6307.85 1.38 Area code : 2
FDEPTH: 40 39 GearCond.code:
BDEPTH: 40 39 Validity code:
Towing dir: 50º Wire out: 160 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 27.25 CATCH/HOUR: 54.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	13.40	36	24.59	883
Alectis alexandrinus	10.40	30	19.08	884
Sphyraena afra	5.80	6	10.64	
Pagrus caeruleostictus	4.70	24	8.62	880
Engraulis encrasicolus	4.30	2294	7.89	879
Sepia officinalis hierredda	3.60	2	6.61	
Sardinella maderensis	2.80	392	5.14	882
Epinephelus aeneus	2.10	4	3.85	
Dentex canariensis	2.10	8	3.85	885
Brachydeuterus auritus	2.10	504	3.85	881
Scomberomorus tritor	1.30	2	2.39	
Psettodes belcheri	0.90	2	1.65	
Pagellus bellottii	0.50	4	0.92	
Chloroscombrus chrysurus	0.30	4	0.55	
Alloteuthis africana	0.20	50	0.37	
Total	54.50		100.00	

PROJECT STATION: 278

DATE:21/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 551
start stop duration Long E 110
TIME :17:11:01 17:41:14 30 (min) Purpose code: 3
LOG :6318.63 6320.12 1.49 Area code : 2
FDEPTH: 81 82 GearCond.code:
BDEPTH: 81 82 Validity code:
Towing dir: 60º Wire out: 270 m Speed: 30 kn*10

Sorted: 85 Kg Total catch: 294.05 CATCH/HOUR: 588.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	438.00	39582	74.48	888
Dentex congoensis	43.00	1054	7.31	889
Fistularia petimba	41.10	84	6.99	
Epinephelus aeneus	23.90	4	4.06	
Squatina oculata	18.80	6	3.20	
Zeus faber	8.30	6	1.41	
Sepia officinalis hierredda	6.40	10	1.09	886
Dentex angolensis	5.00	120	0.85	890
Pagrus caeruleostictus	2.10	6	0.36	887
Ariomma bondi	1.50	30	0.26	
Total	588.10		100.01	

PROJECT STATION: 279

DATE:21/ 7/02 GEAR TYPE: PT No: 6 POSITION:Lat N 601
start stop duration Long E 111
TIME :20:39:43 21:00:00 20 (min) Purpose code: 1
LOG :6339.41 6340.53 1.11 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 26 24 Validity code:
Towing dir: 60º Wire out: 130 m Speed: 30 kn*10

Sorted: 253 Kg Total catch: 344.75 CATCH/HOUR: 1034.25

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	248.10	1068	23.99	899
Engraulis encrasicolus	186.00	137640	17.98	904
Sphyraena afra	131.70	69	12.73	898
Dentex canariensis	87.90	180	8.50	892
Sphyraena sphyraena	60.30	225	5.83	897
Brachydeuterus auritus	58.50	2340	5.66	903
Sphyraena guachancho	41.55	321	4.02	896
Sardinella maderensis	33.00	9600	3.19	905
Lutjanus goreensis	26.70	21	2.58	893
Lethrinus atlanticus	17.55	39	1.70	894
Dactylopterus volitans	17.40	54	1.68	
Scomberomorus tritor	15.75	21	1.52	901
Chloroscombrus chrysurus	15.30	177	1.48	900
Galeoides decadactylus	14.85	153	1.44	895
Caranx senegallus	11.10	12	1.07	
Stromateus fiatola	9.45	15	0.91	
Pagrus caeruleostictus	8.85	27	0.86	891
Alectis alexandrinus	8.25	39	0.80	
Sphyraena guachancho	7.50	750	0.73	
Eucinostomus melanopterus	6.75	90	0.65	
Sepia officinalis hierredda	5.70	6	0.55	
Fistularia petimba	4.50	18	0.44	
Caranx crysos	4.35	12	0.42	
Selar crumenophthalmus	2.70	9	0.26	
Sardinella maderensis	2.10	15	0.20	902
Fistularia tabacaria	2.10	3	0.20	
Acanthurus monroviae	1.80	3	0.17	
Scorpaena stephanica	1.50	3	0.15	
Chaetodipterus goreensis	1.20	3	0.12	
Acanthostracion quadricornis	1.05	6	0.10	
Elops lacerta	0.75	3	0.07	
Total	1034.25		100.00	

PROJECT STATION: 280

DATE:22/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 546
start stop duration Long E 103
TIME :05:56:51 06:26:27 30 (min) Purpose code: 3
LOG :6394.33 6395.72 1.39 Area code : 2
FDEPTH: 49 49 GearCond.code:
BDEPTH: 49 49 Validity code:
Towing dir: 30º Wire out: 170 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 30.05 CATCH/HOUR: 60.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pagrus caeruleostictus	19.80	56	32.95	909
Selene dorsalis	8.60	40	14.31	910
Dentex canariensis	7.70	12	12.81	908
Sphyraena guachancho	7.30	10	12.15	912
Epinephelus aeneus	5.50	4	9.15	906
Scomberomorus tritor	5.20	4	8.65	911
Pagellus bellottii	2.70	20	4.49	907
Fistularia petimba	2.10	8	3.49	
Sepia officinalis hierredda	0.70	2	1.16	
Priacanthus arenatus	0.40	2	0.67	
Lepidotrigla cadmani	0.10	2	0.17	
Total	60.10		100.00	

PROJECT STATION: 281

DATE:22/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 546
start stop duration Long E 100
TIME :08:09:36 08:40:56 31 (min) Purpose code: 3
LOG :6404.79 6406.35 1.55 Area code : 2
FDEPTH: 34 35 GearCond.code:
BDEPTH: 34 35 Validity code:
Towing dir: 20º Wire out: 130 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 27.45 CATCH/HOUR: 53.13

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena afra	14.23	4	26.78	913
Pagrus caeruleostictus	9.97	83	18.77	919
Sepia officinalis hierredda	6.39	6	12.03	922
Selar crumenophthalmus	5.71	19	10.75	915
Selene dorsalis	4.74	12	8.92	914
Pagellus bellottii	4.65	39	8.75	917
Alectis alexandrinus	3.48	4	6.55	916
Balistes capriscus	1.45	2	2.73	
Dentex canariensis	1.16	6	2.18	918
Epinephelus aeneus	1.06	2	2.00	920
Lagocephalus laevigatus	0.29	2	0.55	
Total	53.13		100.01	

PROJECT STATION: 282

DATE:22/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 539
start stop duration Long E 55
TIME :11:01:06 11:32:21 31 (min) Purpose code: 3
LOG :6422.12 6423.75 1.61 Area code : 2
FDEPTH: 20 19 GearCond.code:
BDEPTH: 20 19 Validity code:
Towing dir: 60º Wire out: 120 m Speed: 30 kn*10

Sorted: 15 Kg Total catch: 15.40 CATCH/HOUR: 29.81

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Scomberomorus tritor	7.84	31	26.30	928
Engraulis encrasicolus	6.77	11892	22.71	924
Alectis alexandrinus	5.23	21	17.54	923
Sphyraena afra	2.52	2	8.45	927
Trachinotus maxillosus	2.42	2	8.12	922
Pomadasys rogeri	1.84	2	6.17	926
Pagrus caeruleostictus	1.74	4	5.84	925
Selene dorsalis	1.06	4	3.56	
Caranx crysos	0.29	2	0.97	
Eucinostomus melanopterus	0.10	2	0.34	
Total	29.81		100.00	

PROJECT STATION: 283

DATE:22/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 536
start stop duration Long E 37
TIME :14:45:15 15:15:21 30 (min) Purpose code: 3
LOG :6453.70 6455.26 1.55 Area code : 2
FDEPTH: 50 55 GearCond.code:
BDEPTH: 50 55 Validity code:
Towing dir: 120º Wire out: 170 m Speed: 30 kn*10

Sorted: 25 Kg Total catch: 25.43 CATCH/HOUR: 50.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	20.50	26	40.31	933
Squatina oculata	11.90	2	23.40	
Fistularia petimba	8.90	52	17.50	
Pagellus bellottii	2.90	56	5.70	928
Pagrus caeruleostictus	2.80	22	5.51	930
Balistes capriscus	2.20	4	4.33	932
Dentex gibbosus	0.70	2	1.38	929
Boops boops	0.50	10	0.98	934
Scomberomorus tritor	0.40	2	0.79	931
Decapterus punctatus	0.06	2	0.12	
Total	50.86		100.02	

PROJECT STATION: 284

DATE:22/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 537
start stop duration Long E 37
TIME :16:03:41 16:33:01 29 (min) Purpose code: 3
LOG :6460.08 6461.60 1.53 Area code : 2
FDEPTH: 38 37 GearCond.code:
BDEPTH: 38 37 Validity code:
Towing dir: 120º Wire out: 150 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 118.15 CATCH/HOUR: 244.45

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	193.24	5959	79.05	936
Alectis alexandrinus	14.90	6	6.10	937
Sphyraena guachancho	13.66	21	5.59	938
Pagellus bellottii	9.21	89	3.77	935
Sepia officinalis hierredda	5.38	4	2.20	939
Pagrus caeruleostictus	5.07	19	2.07	934
Psettodes belcheri	1.24	2	0.51	
Boops boops	0.62	17	0.25	
Fistularia petimba	0.41	2	0.17	
Sardinella maderensis	0.31	14	0.13	
Pseudupeneus prayensis	0.10	2	0.04	
Priacanthus arenatus	0.10	2	0.04	
Decapterus punctatus	0.10	4	0.04	
Trachurus trecae	0.10	2	0.04	
Total	244.44		100.00	

PROJECT STATION: 285

DATE:22/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 543
start stop duration Long E 36
TIME :17:40:23 18:10:50 30 (min) Purpose code: 3
LOG :6470.38 6471.89 1.52 Area code : 2
FDEPTH: 26 25 GearCond.code:
BDEPTH: 26 25 Validity code:
Towing dir: 110º Wire out: 130 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 101.95 CATCH/HOUR: 203.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	79.10	18360	38.79	942
Brachydeuterus auritus	51.00	5246	25.01	945
Sphyraena guachancho	28.70	2742	14.08	944
Chloroscombrus chrysurus	18.60	276	9.12	943
Sphyraena guachancho	11.40	26	5.59	940
Scomberomorus tritor	3.90	2	1.91	
Selene dorsalis	3.20	28	1.57	
Trichiurus lepturus	3.00	600	1.47	
Sardinella maderensis	2.40	30	1.18	941
Alectis alexandrinus	1.40	28	0.69	
Pagellus bellottii	0.50	4	0.25	
Selar crumenophthalmus	0.40	28	0.20	
Lolliguncula mercatoris	0.20	240	0.10	
Decapterus punctatus	0.10	8	0.05	
Total	203.90		100.01	

PROJECT STATION: 286

DATE:22/ 7/02 GEAR TYPE: PT No: 6 POSITION:Lat N 540
start stop duration Long E 24
TIME :22:35:16 22:44:42 9 (min) Purpose code: 1
LOG :6509.81 6510.22 0.41 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 50 51 Validity code:
Towing dir: 217º Wire out: m Speed: kn*10

Sorted: 20 Kg Total catch: 20.20 CATCH/HOUR: 134.67

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	37.33	707	27.72	949
Acanthocybium solandri	33.33	7	24.75	946
Sardinella aurita	31.00	727	23.02	947
Decapterus punctatus	18.67	727	13.86	948
Selar crumenophthalmus	8.00	27	5.94	
Trichiurus lepturus	2.67	20	1.98	
Sphyraena sphyraena	1.33	7	0.99	
Ariomma bondi	1.00	13	0.74	
Sardinella maderensis	0.67	7	0.50	
Priacanthus arenatus	0.33	7	0.25	
Trachurus trecae	0.33	13	0.25	
Total	134.66		100.00	

PROJECT STATION: 287

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 532
start stop duration Long E 16
TIME :00:00:12 00:00:42 27 (min) Purpose code: 3
LOG :6524.29 6525.60 1.30 Area code : 2
FDEPTH: 331 337 GearCond.code:
BDEPTH: 331 337 Validity code:
Towing dir: 50º Wire out:1000 m Speed: 30 kn*10

Sorted: 121 Kg Total catch: 233.60 CATCH/HOUR: 519.11

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Centrophorus uyato	186.67	62	35.96	
Parasudis fraser-bruenneri	134.44	8067	25.90	
Chlorophthalmus atlanticus	134.44	1793	25.90	
Neoharriotta pinnata	18.67	7	3.60	
Aristeus varidens	14.44	611	2.78	950
Malacocephalus occidentalis	13.33	44	2.57	
Parapenaeus longirostris	4.44	211	0.86	952
Merluccius polli	3.89	11	0.75	
Trigla lyra	2.78	11	0.54	
Laemonema laureysi	1.67	11	0.32	
Deania profundorum	1.67	2	0.32	
Aristeus varidens	0.56	233	0.11	951
Ophisurus serpens	0.56	11	0.11	
Chascanopsetta lugubris	0.56	11	0.11	
Priacanthus arenatus	0.56	22	0.11	
Gadella imberbis	0.22	11	0.04	
Setarches guentheri	0.22	11	0.04	
Total	519.12		100.02	

PROJECT STATION: 288

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 536
start stop duration Long E 16
TIME :06:01:35 06:31:22 30 (min) Purpose code: 3
LOG :6539.83 6541.29 1.46 Area code : 2
FDEPTH: 69 70 GearCond.code:
BDEPTH: 69 70 Validity code:
Towing dir: 80º Wire out: 220 m Speed: 30 kn*10

Sorted: 75 Kg Total catch: 751.97 CATCH/HOUR: 1503.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Boops boops	1284.40	26628	85.40	954
Trachurus trecae	91.00	1694	6.05	958
Sardinella aurita	24.70	442	1.64	957
Sphyraena guachancho	19.00	22	1.26	953
Priacanthus arenatus	16.90	598	1.12	
Fistularia petimba	16.20	78	1.08	
Dentex angolensis	15.60	130	1.04	955
Pagrus caeruleostictus	10.40	78	0.69	
Dentex congoensis	10.40	286	0.69	956
Scomber japonicus	5.20	52	0.35	
Pseudupeneus prayensis	5.20	52	0.35	
Alloteuthis africana	1.56	598	0.10	
Sphyraena sphyraena	1.00	2	0.07	
Zeus faber	0.80	2	0.05	
Saurida brasiliensis	0.78	146	0.05	
Lagocephalus laevigatus	0.40	2	0.03	
Dentex gibbosus	0.30	2	0.02	
Decapterus punctatus	0.10	26	0.01	
Total	1503.94		100.00	

PROJECT STATION: 289

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 540
start stop duration Long E 16
TIME :08:03:11 08:33:37 30 (min) Purpose code: 3
LOG :6549.02 6550.58 1.54 Area code : 2
FDEPTH: 39 40 GearCond.code:
BDEPTH: 39 40 Validity code:
Towing dir: 85ø Wire out: 160 m Speed: 30 kn*10

Sorted: 79 Kg Total catch: 499.39 CATCH/HOUR: 998.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	449.62	10278	45.02	967
Boops boops	222.70	4900	22.30	964
Pagellus bellottii	136.84	3208	13.70	968
Fistularia petimba	62.90	442	6.30	
Sepia officinalis hierredda	27.70	46	2.77	959
Chloroscombrus chrysurus	19.56	306	1.96	963
Decapterus rhonchus	17.40	30	1.74	961
Pseudupeneus prayensis	16.16	220	1.62	966
Caranx crysos	11.90	34	1.19	962
Decapterus punctatus	11.90	408	1.19	960
Priacanthus arenatus	8.50	238	0.85	
Pagrus caeruleostictus	7.64	102	0.76	965
Selene dorsalis	5.10	34	0.51	
Alloteuthis africana	0.86	272	0.09	
Lampadena sp.	0.06	2	0.01	
Total	998.84		100.01	

PROJECT STATION: 290

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 541
start stop duration Long E 16
TIME :09:27:47 09:57:34 30 (min) Purpose code: 3
LOG :6555.34 6556.91 1.56 Area code : 2
FDEPTH: 25 22 GearCond.code:
BDEPTH: 25 22 Validity code:
Towing dir: 70ø Wire out: 130 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 67.00 CATCH/HOUR: 134.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus punctatus	54.70	13264	40.82	970
Dentex canariensis	19.00	62	14.18	971
Fistularia petimba	17.60	30	13.13	
Lethrinus atlanticus	14.80	502	11.04	969
Acanthurus monroviae	5.50	12	4.10	
Bodianus speciosus	4.40	2	3.28	
Aluterus heudelotii	3.70	4	2.76	
Aluterus monoceros	2.80	6	2.09	
Balistes punctatus	2.50	6	1.87	
Fistularia tabacaria	2.50	2	1.87	
Pagrus caeruleostictus	1.90	22	1.42	974
Sepia officinalis hierredda	1.50	2	1.12	
Pseudupeneus prayensis	1.40	26	1.04	973
Scarus hoefleri	0.70	2	0.52	
Acanthostracion quadricornis	0.40	2	0.30	
Sardinella aurita	0.30	16	0.22	972
Boops boops	0.30	8	0.22	
Total	134.00		99.98	

PROJECT STATION: 291

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 539
start stop duration Long E 6
TIME :11:40:39 12:10:46 30 (min) Purpose code: 3
LOG :6570.81 6572.38 1.55 Area code : 2
FDEPTH: 21 21 GearCond.code:
BDEPTH: 21 21 Validity code:
Towing dir: 70ø Wire out: 120 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 26.80 CATCH/HOUR: 53.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex canariensis	21.00	84	39.18	976
Pseudupeneus prayensis	7.80	134	14.55	977
Pagrus caeruleostictus	7.20	84	13.43	975
Aluterus heudelotii	6.20	12	11.57	
Sepia officinalis hierredda	4.30	4	8.02	978
Fistularia petimba	3.60	16	6.72	
Ephippion guttifer	1.90	2	3.54	
Scomberomorus tritor	0.80	2	1.49	
Lethrinus atlanticus	0.50	4	0.93	
Decapterus punctatus	0.20	2	0.37	
Priacanthus arenatus	0.10	2	0.19	
Total	53.60		99.99	

PROJECT STATION: 292

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 533
start stop duration Long E 3
TIME :13:24:58 13:55:00 30 (min) Purpose code: 3
LOG :6582.19 6583.59 1.39 Area code : 2
FDEPTH: 43 44 GearCond.code:
BDEPTH: 43 44 Validity code:
Towing dir: 65ø Wire out: 150 m Speed: 30 kn*10

Sorted: 55 Kg Total catch: 51.45 CATCH/HOUR: 102.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Fistularia petimba	42.60	192	41.40	
Sardinella aurita	14.60	322	14.19	986
Pagellus bellottii	7.90	180	7.68	980
Decapterus punctatus	7.60	238	7.39	982
Trachurus trecae	6.10	90	5.93	981
Brachydeuterus auritus	2.90	56	2.82	983
Boops boops	2.90	82	2.82	987
Pomadasys incisus	2.70	22	2.62	984
Chloroscombrus chrysurus	2.40	32	2.33	988
Ephippion guttifer	2.30	2	2.24	
Trigla lyra	2.10	6	2.04	
Pagrus caeruleostictus	2.10	20	2.04	979
Pseudupeneus prayensis	1.40	22	1.36	985
Alloteuthis africana	1.10	484	1.07	
Sepia officinalis hierredda	1.00	2	0.97	989
Decapterus punctatus	1.00	2	0.97	
Dactylopterus volitans	0.80	2	0.78	
Priacanthus arenatus	0.60	16	0.58	
Lagocephalus laevigatus	0.50	2	0.49	
Seriola dumerili	0.30	2	0.29	
Total	102.90		100.01	

PROJECT STATION: 293

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 526
start stop duration Long E 4
TIME :15:20:25 15:50:08 30 (min) Purpose code: 3
LOG :6594.19 6595.68 1.47 Area code : 2
FDEPTH: 85 82 GearCond.code:
BDEPTH: 85 82 Validity code:
Towing dir: 50ø Wire out: 270 m Speed: 30 kn*10

Sorted: 123 Kg Total catch: 123.32 CATCH/HOUR: 246.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	222.10	2696	90.05	989
Fistularia petimba	5.30	22	2.15	
Dentex angolensis	5.30	68	2.15	990
Dentex gibbosus	4.70	6	1.91	991
Boops boops	3.40	68	1.38	
Torpedo torpedo	1.50	2	0.61	
Scomber japonicus	1.30	12	0.53	993
Sardinella aurita	0.90	14	0.36	994
Dentex congoensis	0.80	44	0.32	992
Alloteuthis africana	0.70	284	0.28	
Pagrus caeruleostictus	0.40	4	0.16	
Trigla lyra	0.10	2	0.04	
Decapterus punctatus	0.10	6	0.04	
Priacanthus arenatus	0.02	2	0.01	
Pagellus bellottii	0.02	4	0.01	
Total	246.64		100.00	

PROJECT STATION: 294

DATE:23/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 525
start stop duration Long E 5
TIME :16:51:17 17:21:08 30 (min) Purpose code: 3
LOG :6602.14 6603.63 1.49 Area code : 2
FDEPTH: 208 229 GearCond.code:
BDEPTH: 208 229 Validity code:
Towing dir: 70ø Wire out: 660 m Speed: 30 kn*10

Sorted: 117 Kg Total catch: 738.30 CATCH/HOUR: 1476.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenopsis conchifer	920.00	1168	62.31	997
Priacanthus arenatus	410.00	32800	27.77	998
Heptranchias perlo	33.60	34	2.28	
Dentex angolensis	27.60	84	1.87	996
Antigonia capros	17.00	340	1.15	
Ariomma bondi	12.00	320	0.81	
Mustelus mustelus	9.40	2	0.64	
Pterothrissus belloci	8.00	60	0.54	
Raja straeleni	7.40	8	0.50	
Squatina oculata	4.90	12	0.33	
Umbrina canariensis	4.80	18	0.33	995
Hypoclydonia bella	4.00	540	0.27	
Aulopus cadenati	4.00	20	0.27	
Trichiurus lepturus	3.30	2	0.22	
Chlorophthalmus atlanticus	3.00	300	0.20	
Squalus megalops	2.60	2	0.18	
Synagrops microlepis	2.00	160	0.14	
Citharus linguatula	1.60	20	0.11	
Lagocephalus laevigatus	0.90	4	0.06	
Pentheroscion mbizi	0.50	2	0.03	
Total	1476.60		100.01	

PROJECT STATION: 295

DATE:24/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 525
start stop duration Long W 21
TIME :13:04:55 13:34:28 30 (min) Purpose code: 3
LOG :6721.38 6722.76 1.36 Area code : 2
FDEPTH: 22 21 GearCond.code:
BDEPTH: 22 21 Validity code:
Towing dir: 62ø Wire out: 120 m Speed: 30 kn*10

Sorted: 114 Kg Total catch: 114.61 CATCH/HOUR: 229.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	174.90	1286	76.30	999
Selene dorsalis	10.70	34	4.67	1001
Decapterus punctatus	10.10	638	4.41	1000
Bodianus speciosus	7.50	4	3.27	
Sphyraena sphyraena	6.00	36	2.62	1005
Caranx crysos	4.60	22	2.01	1002
Sphyraena guachancho	3.50	6	1.53	1004
Drepane africana	2.10	6	0.92	
Dentex canariensis	1.70	2	0.74	
Pagrus caeruleostictus	1.70	4	0.74	
Brachydeuterus auritus	1.50	384	0.65	1006
Chaetodipterus goreensis	1.00	6	0.44	
Scomberomorus tritor	0.90	4	0.39	
Scarus hoefleri	0.60	2	0.26	
Sardinella maderensis	0.60	4	0.26	1003
Trichiurus lepturus	0.50	58	0.22	
Scorpaena stephanica	0.50	2	0.22	
Acanthurus monroviae	0.40	2	0.17	
Chaetodon robustus	0.20	4	0.09	
Eucinostomus melanopterus	0.10	2	0.04	
Alectis alexandrinus	0.10	2	0.04	
Selar crumenophthalmus	0.02	2	0.01	
Total	229.22		100.00	

PROJECT STATION: 296

DATE:24/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 520
start stop duration Long E 19
TIME :14:46:09 15:16:03 30 (min) Purpose code: 3
LOG :6731.63 6733.08 1.44 Area code : 2
FDEPTH: 41 40 GearCond.code:
BDEPTH: 41 40 Validity code:
Towing dir: 42ø Wire out: 150 m Speed: 30 kn*10

Sorted: 65 Kg Total catch: 170.52 CATCH/HOUR: 341.04

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	135.00	2612	39.58	1008
Decapterus punctatus	67.50	2446	19.79	1007
Scomber japonicus	28.00	120	8.21	1012
Pagellus bellottii	25.24	364	7.40	1011
Sepia officinalis hierredda	12.00	10	3.52	1015
Fistularia petimba	11.50	120	3.37	
Dentex canariensis	10.00	100	2.93	
Pomadasys incisus	9.26	64	2.72	1013
Pseudupeneus prayensis	7.72	90	2.26	1010
Priacanthus arenatus	7.50	140	2.20	
Caranx crysos	7.00	10	2.05	
Octopus vulgaris	5.00	6	1.47	
Epinephelus aeneus	4.50	6	1.32	
Chloroscombrus chrysurus	4.00	40	1.17	1009
Sardinella aurita	3.50	86	1.03	1014
Lagocephalus laevigatus	1.50	6	0.44	
Balistes capriscus	1.00	6	0.29	
Boops boops	0.76	30	0.22	
Aluterus heudelotii	0.06	6	0.02	
Total	341.04		99.99	

PROJECT STATION: 297

DATE:24/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 515
start stop duration Long E 17
TIME :16:51:41 17:21:03 29 (min) Purpose code: 3
LOG :6741.50 6743.01 1.51 Area code : 2
FDEPTH: 60 59 GearCond.code:
BDEPTH: 60 59 Validity code:
Towing dir: 40ø Wire out: 200 m Speed: 30 kn*10

Sorted: 95 Kg Total catch: 95.49 CATCH/HOUR: 197.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	107.17	1974	54.24	1015
Fistularia petimba	43.24	103	21.89	
Boops boops	32.90	877	16.65	1016
Sardinella aurita	2.90	60	1.47	1017
Zeus faber	2.38	4	1.20	
Dentex gibbosus	2.07	14	1.05	1022
Torpedo torpedo	1.55	2	0.78	
Dentex canariensis	1.55	8	0.78	1020
Decapterus punctatus	0.72	27	0.36	1018
Dentex congoensis	0.62	41	0.31	1021
Alloteuthis africana	0.52	321	0.26	
Lagocephalus laevigatus	0.52	2	0.26	
Pseudupeneus prayensis	0.52	4	0.26	
Priacanthus arenatus	0.21	4	0.11	
Lepidotrigla carolae	0.21	10	0.11	
Dentex angolensis	0.21	2	0.11	
Pagellus bellottii	0.21	6	0.11	1019
Lepidotrigla cadmani	0.08	2	0.04	
Total	197.58		99.99	

PROJECT STATION: 298

DATE:24/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 512
start stop duration Long W 13
TIME :18:29:51 18:59:03 29 (min) Purpose code: 3
LOG :6750.60 6752.09 1.47 Area code : 2
FDEPTH: 107 131 GearCond.code:
BDEPTH: 107 131 Validity code:
Towing dir: 45ø Wire out: 320 m Speed: 30 kn*10

Sorted: 89 Kg Total catch: 264.25 CATCH/HOUR: 546.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ariomma bondi	148.03	2723	27.08	
Trachurus trecae	148.03	2026	27.08	1029
Boops boops	46.97	1148	8.59	1027
Scomber japonicus	29.79	364	5.45	1030
Sardinella aurita	29.38	447	5.37	1028
Zeus faber	24.93	33	4.56	1023
Dentex congoensis	22.76	447	4.16	1026
Fistularia petimba	22.45	39	4.11	
Lagocephalus laevigatus	16.76	74	3.07	
Umbrina canariensis	14.69	68	2.69	1024
Promethichthys prometheus	12.62	103	2.31	
Illex coindetii	5.17	10	0.95	
Priacanthus arenatus	4.76	31	0.87	1025
Torpedo torpedo	4.66	6	0.85	
Mustelus mustelus	4.45	2	0.81	
Squatina oculata	3.62	2	0.66	
Chelidonichthys gabonensis	1.86	19	0.34	
Spicara alta	1.86	130	0.34	
Pagellus bellottii	0.93	37	0.17	
Dentex gibbosus	0.52	2	0.10	
Sepia officinalis hierredda	0.41	10	0.07	
Lepidotrigla cadmani	0.41	10	0.07	
Lepidotrigla carolae	0.41	48	0.07	
Dicologoglossa hexophthalma	0.31	10	0.06	
Antigonia capros	0.21	10	0.04	
Trachinus collignoni	0.21	10	0.04	
Microchirus boscanion	0.21	37	0.04	
Raja miraletus	0.21	2	0.04	
Arnoglossus imperialis	0.10	19	0.02	
Total	546.72		100.01	

PROJECT STATION: 299

DATE:24/ 7/02 GEAR TYPE: PT No: 6 POSITION:Lat N 516
start stop duration Long W 20
TIME :21:00:40 21:30:11 30 (min) Purpose code: 1
LOG :6765.74 6767.40 1.66 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 48 42 Validity code:
Towing dir: 300ø Wire out: 142 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 51.83 CATCH/HOUR: 103.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	70.80	1250	68.30	1031
Trachurus trecae	12.20	218	11.77	1033
Decapterus punctatus	10.10	262	9.74	1035
Scomber japonicus	6.10	48	5.88	1034
Sardinella maderensis	2.60	20	2.51	1032
Lagocephalus laevigatus	1.40	6	1.35	
Selar crumenophthalmus	0.40	2	0.39	
Scomberomorus tritor	0.06	2	0.06	
Total	103.66		100.00	

PROJECT STATION: 300

DATE:25/ 7/02 GEAR TYPE: PT No: 7 POSITION:Lat N 513
start stop duration Long W 39
TIME :23:54:19 00:24:07 30 (min) Purpose code: 1
LOG :6790.13 6791.63 1.48 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 25 23 Validity code:
Towing dir: 36ø Wire out: 130 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 291.85 CATCH/HOUR: 583.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	251.10	6620	43.02	1036
Chloroscombrus chrysurus	243.90	3190	41.79	1037
Sardinella maderensis	70.20	846	12.03	1039
Sardinella aurita	16.20	162	2.78	1038
Sphyraena afra	1.40	2	0.24	1040
Decapterus punctatus	0.72	54	0.12	1041
Total	583.52		99.98	

PROJECT STATION: 301

DATE:25/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 457
start stop duration Long W 30
TIME :06:10:38 06:40:49 30 (min) Purpose code: 3
LOG :6830.52 6831.99 1.46 Area code : 2
FDEPTH: 95 95 GearCond.code:
BDEPTH: 95 95 Validity code:
Towing dir: 60ø Wire out: 280 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 28.55 CATCH/HOUR: 57.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	31.00	266	54.29	1042
Fistularia petimba	14.70	72	25.74	
Trachurus trecae	5.10	66	8.93	1044
Dentex gibbosus	2.20	2	3.85	1043
Sphoeroides pachgaster	1.60	4	2.80	
Lepidotrigla cadmani	1.20	18	2.10	
Uranoscopus albesca	0.70	2	1.23	
Alloteuthis africana	0.20	66	0.35	
Chloroscombrus chrysurus	0.20	2	0.35	
Boops boops	0.10	2	0.18	
Dentex congoensis	0.10	2	0.18	
Total	57.10		100.00	

PROJECT STATION: 302

DATE:25/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 458
start stop duration Long W 31
TIME :08:05:31 08:35:47 30 (min) Purpose code: 3
LOG :6838.88 6840.41 1.51 Area code : 2
FDEPTH: 62 65 GearCond.code:
BDEPTH: 62 65 Validity code:
Towing dir: 50ø Wire out: 200 m Speed: 30 kn*10

Sorted: 91 Kg Total catch: 91.30 CATCH/HOUR: 182.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chromis sp.	96.00	1262	52.57	
Dentex gibbosus	14.40	38	7.89	1046
Epinephelus aeneus	13.60	6	7.45	1052
Fistularia petimba	9.40	30	5.15	
Lutjanus fulgens	8.70	12	4.76	1050
Dentex canariensis	8.70	18	4.76	1045
Pagrus caeruleostictus	5.80	36	3.18	1047
Zeus faber	5.70	6	3.12	1056
Apsilus fuscus	5.20	28	2.85	1051
Pseudupeneus prayensis	4.80	64	2.63	1053
Sardinella aurita	2.70	66	1.48	1054
Boops boops	1.60	68	0.88	1049
Dactylopterus volitans	1.50	6	0.82	
Decapterus punctatus	1.50	56	0.82	1055
Pagellus bellottii	1.30	40	0.71	1048
Scomber japonicus	0.80	8	0.44	
Umbrina canariensis	0.60	2	0.33	
Anthias anthias	0.30	10	0.16	
Total	182.60		100.00	

PROJECT STATION: 303

DATE:25/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 505
start stop duration Long W 33
TIME :09:56:09 10:26:58 31 (min) Purpose code: 3
LOG :6850.40 6851.96 1.56 Area code : 2
FDEPTH: 44 46 GearCond.code:
BDEPTH: 44 46 Validity code:
Towing dir: 50ø Wire out: 160 m Speed: 30 kn*10

Sorted: 99 Kg Total catch: 99.88 CATCH/HOUR: 193.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys incisus	74.42	598	38.50	1063
Fistularia petimba	36.10	234	18.67	
Caranx crysos	20.90	79	10.81	1064
Pseudupeneus prayensis	15.10	155	7.81	1062
Dentex canariensis	10.45	35	5.41	1057
Chromis sp.	8.90	116	4.60	
Lagocephalus laevigatus	8.32	6	4.30	1066
Bodianus speciosus	3.97	2	2.05	
Pagrus caeruleostictus	2.81	21	1.45	1058
Epinephelus aeneus	2.42	2	1.25	1067
Lethrinus atlanticus	1.84	6	0.95	1065
Boops boops	1.61	157	0.83	1061
Sepia officinalis hierredda	1.55	2	0.80	
Acanthurus monroviae	1.55	2	0.80	
Dentex gibbosus	1.16	4	0.60	1060
Priacanthus arenatus	0.87	4	0.45	
Pagellus bellottii	0.87	10	0.45	1059
Apsilus fuscus	0.19	2	0.10	
Aluterus heudelotii	0.10	2	0.05	
Balistes capriscus	0.10	2	0.05	
Decapterus punctatus	0.10	2	0.05	
Total	193.33		99.98	

PROJECT STATION: 304

DATE:25/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 512

start	stop	duration			Long W 35
TIME :12:12:46	12:42:09	29 (min)	Purpose code:	3	
LOG :6865.66	6867.36	1.69	Area code :	2	
FDEPTH: 29	29		GearCond.code:		
BDEPTH: 29	29		Validity code:		

Towing dir: 240ø Wire out: 120 m Speed: 30 kn*10

Sorted: 68 Kg Total catch: 930.65 CATCH/HOUR: 1925.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	1572.10	25308	81.65	1068
Sardinella aurita	48.41	807	2.51	1078
Pagellus bellottii	45.72	619	2.37	1073
Sardinella maderensis	34.97	430	1.82	1079
Pseudupeneus prayensis	32.28	377	1.68	1077
Caranx crysos	25.66	31	1.33	1070
Pomadasys incisus	25.55	350	1.33	1076
Psettodes belcheri	20.17	27	1.05	
Acanthurus monroviae	20.17	54	1.05	
Lethrinus atlanticus	14.59	39	0.76	1075
Dentex canariensis	10.76	215	0.56	1072
Sphyraena sphyraena	9.21	14	0.48	1080
Selar crumenophthalmus	8.48	29	0.44	1069
Pagrus caeruleostictus	8.07	161	0.42	1074
Scarus hoefleri	6.72	27	0.35	
Trachurus trecae	6.72	81	0.35	
Scomberomorus tritor	6.21	2	0.32	
Dentex canariensis	5.79	19	0.30	1082
Decapterus rhonchus	4.97	8	0.26	1071
Fistularia petimba	4.66	2	0.24	
Balistes punctatus	4.45	8	0.23	1081
Fistularia petimba	4.03	27	0.21	
Torpedo torpedo	3.72	2	0.19	
Pagrus caeruleostictus	2.69	4	0.14	1083
Total	1926.10		100.04	

PROJECT STATION: 305

DATE:25/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 516

start	stop	duration			Long W 36
TIME :13:43:05	14:13:06	30 (min)	Purpose code:	3	
LOG :6874.85	6876.57	1.72	Area code :	2	
FDEPTH: 21	21		GearCond.code:		
BDEPTH: 21	21		Validity code:		

Towing dir: 248ø Wire out: 120 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 197.82 CATCH/HOUR: 395.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	146.30	2730	36.98	1082
Brachydeuterus auritus	65.44	1440	16.54	1089
Sphyraena guachancho	51.80	84	13.09	1090
Sphyraena sphyraena	42.00	140	10.62	1091
Dentex canariensis	28.84	84	7.29	1086
Selene dorsalis	24.50	112	6.19	1087
Balistes punctatus	9.10	20	2.30	
Acanthurus monroviae	7.34	14	1.86	
Fistularia petimba	5.60	20	1.42	
Pagrus caeruleostictus	4.90	34	1.24	1085
Aluterus heudelotii	2.80	8	0.71	
Sardinella maderensis	2.10	92	0.53	1088
Decapterus punctatus	2.10	84	0.53	1083
Trachurus trecae	1.76	34	0.44	1084
Sardinella aurita	0.70	14	0.18	
Alectis alexandrinus	0.36	8	0.09	
Total	395.64		100.01	

PROJECT STATION: 306

DATE:25/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 508

start	stop	duration			Long W 55
TIME :16:20:53	16:51:19	30 (min)	Purpose code:	3	
LOG :6897.29	6898.82	1.53	Area code :	2	
FDEPTH: 22	22		GearCond.code:		
BDEPTH: 22	22		Validity code:		

Towing dir: 70ø Wire out: 120 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 417.72 CATCH/HOUR: 835.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	552.76	28426	66.16	1094
Chloroscombrus chrysurus	90.00	1866	10.77	1092
Pagellus bellottii	54.74	674	6.55	1098
Sphyraena guachancho	54.00	374	6.46	1101
Pagrus caeruleostictus	17.26	210	2.07	1095
Lagocephalus laevigatus	15.00	12	1.80	
Sardinella maderensis	10.50	344	1.26	1097
Alectis alexandrinus	8.26	90	0.99	1093
Sepia officinalis hierredda	6.90	6	0.83	1102
Dentex canariensis	6.74	104	0.81	1099
Selene dorsalis	6.00	90	0.72	1096
Scomberomorus tritor	3.90	4	0.47	
Sphyraena sphyraena	3.30	8	0.40	
Decapterus punctatus	2.26	90	0.27	1100
Pseudupeneus prayensis	1.50	16	0.18	
Fistularia petimba	0.84	2	0.10	
Galeoides decadactylus	0.74	16	0.09	
Sardinella aurita	0.74	16	0.09	
Total	835.44		100.02	

PROJECT STATION: 307

DATE:25/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 502

start	stop	duration			Long W 53
TIME :17:48:50	18:18:52	30 (min)	Purpose code:	3	
LOG :6907.04	6908.54	1.49	Area code :	2	
FDEPTH: 31	31		GearCond.code:		
BDEPTH: 31	31		Validity code:		

Towing dir: 50ø Wire out: 120 m Speed: 30 kn*10

Sorted: 57 Kg Total catch: 250.64 CATCH/HOUR: 501.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus punctatus	189.00	5292	37.70	1109
Sardinella aurita	131.60	2786	26.25	1108
Brachydeuterus auritus	123.20	3248	24.58	1110
Pagellus bellottii	26.50	250	5.29	1104
Sepia officinalis hierredda	10.50	4	2.09	1103
Decapterus rhonchus	4.20	42	0.84	
Scomberomorus tritor	3.80	2	0.76	
Pagrus caeruleostictus	3.40	30	0.68	1105
Trachurus trecae	2.10	28	0.42	
Pseudupeneus prayensis	1.80	20	0.36	1107
Lethrinus atlanticus	1.30	4	0.26	1106
Fistularia petimba	1.30	4	0.26	
Chloroscombrus chrysurus	0.70	14	0.14	
Lagocephalus laevigatus	0.60	2	0.12	
Sphyraena sphyraena	0.40	2	0.08	
Balistes capriscus	0.30	2	0.06	
Dentex canariensis	0.30	2	0.06	
Chlamys purpuratus	0.28	28	0.06	
Total	501.28		100.01	

PROJECT STATION: 308

DATE:26/ 7/02 GEAR TYPE: PT No: 7 POSITION:Lat N 502

start	stop	duration			Long W 110
TIME :01:42:12	02:12:02	30 (min)	Purpose code:	1	
LOG :6980.91	6982.47	1.57	Area code :	2	
FDEPTH: 5	5		GearCond.code:		
BDEPTH: 25	27		Validity code:		

Towing dir: 107ø Wire out: 120 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 35.43 CATCH/HOUR: 70.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena guachancho	57.30	1058	80.86	1111
Brachydeuterus auritus	5.60	274	7.90	1117
Chloroscombrus chrysurus	3.90	56	5.50	1114
Sardinella maderensis	1.30	90	1.83	1113
Trichiurus lepturus	1.00	8	1.41	
Elops lacerta	0.50	2	0.71	
Decapterus punctatus	0.50	18	0.71	1115
Fistularia petimba	0.40	2	0.56	
Sepia officinalis hierredda	0.10	10	0.14	1116
Selene dorsalis	0.10	2	0.14	
Sardinella aurita	0.10	6	0.14	
Engraulis encrasicolus	0.06	84	0.08	1112
Total	70.86		99.98	

PROJECT STATION: 309

DATE:26/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 457

start	stop	duration			Long W 50
TIME :06:03:46	06:33:48	30 (min)	Purpose code:	3	
LOG :7008.10	7009.69	1.58	Area code :	2	
FDEPTH: 39	38		GearCond.code:		
BDEPTH: 39	38		Validity code:		

Towing dir: 40ø Wire out: 140 m Speed: 30 kn*10

Sorted: 37 Kg Total catch: 36.82 CATCH/HOUR: 73.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Pomadasys incisus	31.70	226	43.05	1122
Fistularia petimba	10.80	58	14.67	
Caranx crysos	9.90	24	13.44	1124
Selar crumenophthalmus	5.70	16	7.74	1123
Pagellus bellottii	3.80	52	5.16	1119
Apsilus fuscus	3.30	6	4.48	1121
Sphyraena sphyraena	3.00	52	4.07	1125
Lutjanus fulgens	1.60	6	2.17	1118
Pagrus caeruleostictus	1.10	16	1.49	1120
Priacanthus arenatus	0.90	2	1.22	
Sphyraena guachancho	0.50	2	0.68	
Lagocephalus laevigatus	0.40	2	0.54	
Stephanolepis hispidus	0.40	2	0.54	
Pseudupeneus prayensis	0.30	4	0.41	
Brachydeuterus auritus	0.20	10	0.27	
Decapterus punctatus	0.04	2	0.05	
Total	73.64		99.98	

PROJECT STATION: 310

DATE:26/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 449

start	stop	duration			Long W 48
TIME :08:17:21	08:47:23	30 (min)	Purpose code:	3	
LOG :7019.91	7021.48	1.56	Area code :	2	
FDEPTH: 49	49		GearCond.code:		
BDEPTH: 49	49		Validity code:		

Towing dir: 259ø Wire out: 190 m Speed: 30 kn*10

Sorted: 41 Kg Total catch: 41.45 CATCH/HOUR: 82.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	12.90	50	15.56	1136
Lagocephalus laevigatus	10.80	10	13.03	
Lutjanus fulgens	10.40	6	12.55	1126
Fistularia petimba	10.30	68	12.42	
Sepia officinalis hierredda	8.30	6	10.01	1135
Dentex gibbosus	6.50	20	7.84	1129
Acanthurus monroviae	4.40	8	5.31	
Pseudupeneus prayensis	3.10	18	3.74	1134
Apsilus fuscus	3.00	6	3.62	1127
Scomberomorus tritor	2.50	2	3.02	
Pagrus caeruleostictus	2.10	12	2.53	1133
Caranx crysos	1.60	2	1.93	
Alloteuthis africana	1.40	1008	1.69	
Dactylopterus volitans	1.30	4	1.57	
Pomadasys incisus	1.30	10	1.57	1137
Lethrinus atlanticus	0.80	2	0.97	
Selar crumenophthalmus	0.60	2	0.72	
Pagellus bellottii	0.50	6	0.60	1130
Decapterus rhonchus	0.40	4	0.48	1131
Stephanolepis hispidus	0.30	2	0.36	
Boops boops	0.30	58	0.36	1128
Decapterus punctatus	0.10	6	0.12	1132
Total	82.90		100.00	

PROJECT STATION: 311

DATE:26/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 44
start stop duration Long W 46
TIME :10:12:37 10:42:41 30 (min) Purpose code: 3
LOG :7032.26 7033.86 1.58 Area code : 2
FDEPTH: 73 68 GearCond.code:
BDEPTH: 73 68 Validity code:
Towing dir: 230º Wire out: 230 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 111.87 CATCH/HOUR: 223.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Priacanthus arenatus	147.70	8862	66.01	1139
Chromis sp.	27.30	412	12.20	1138
Fistularia petimba	13.40	52	5.99	
Sepia officinalis hierredda	10.20	8	4.56	1146
Mustelus mustelus	5.00	2	2.23	
Decapterus punctatus	4.54	112	2.03	1144
Zeus faber	3.80	8	1.70	
Dentex canariensis	3.60	8	1.61	1142
Dentex gibbosus	2.80	4	1.25	1141
Dactylopterus volitans	1.80	8	0.80	
Pseudupeneus prayensis	1.70	18	0.76	1145
Pagrus caeruleostictus	1.70	10	0.76	1143
Pagellus bellottii	0.20	4	0.09	1140
Total	223.74		99.99	

PROJECT STATION: 312

DATE:26/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 442
start stop duration Long W 46
TIME :11:55:25 12:25:03 30 (min) Purpose code: 3
LOG :7040.77 7042.24 1.47 Area code : 2
FDEPTH: 99 99 GearCond.code:
BDEPTH: 99 99 Validity code:
Towing dir: 50º Wire out: 300 m Speed: 30 kn*10

Sorted: 146 Kg Total catch: 497.59 CATCH/HOUR: 995.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	766.02	12176	76.97	1147
Dentex angolensis	109.14	748	10.97	1148
Priacanthus arenatus	75.82	3914	7.62	1150
Dentex canariensis	19.04	28	1.91	1149
Zeus faber	6.46	28	0.65	
Trigla lyra	4.42	62	0.44	
Pagrus caeruleostictus	3.40	6	0.34	
Fistularia petimba	3.06	20	0.31	
Dentex gibbosus	2.72	20	0.27	
Lagocephalus laevigatus	1.70	6	0.17	
Dactylopterus volitans	1.70	6	0.17	
Decapterus punctatus	1.02	28	0.10	1151
Chromis cadenati	0.68	6	0.07	
Total	995.18		99.99	

PROJECT STATION: 313

DATE:26/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 427
start stop duration Long W 102
TIME :16:05:30 16:35:53 30 (min) Purpose code: 3
LOG :7074.11 7075.72 1.60 Area code : 2
FDEPTH: 72 78 GearCond.code:
BDEPTH: 72 78 Validity code:
Towing dir: 240º Wire out: 240 m Speed: 30 kn*10

Sorted: 61 Kg Total catch: 61.75 CATCH/HOUR: 123.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Fistularia petimba	26.90	76	21.78	
Chromis sp.	24.40	222	19.76	1156
Sepia officinalis hierredda	15.20	14	12.31	1157
Lutjanus fulgens	9.60	18	7.77	1155
Dentex gibbosus	9.20	14	7.45	1153
Dentex canariensis	8.20	14	6.64	1152
Dactylopterus volitans	7.30	36	5.91	
Pagrus caeruleostictus	4.70	16	3.81	1154
Mustelus mustelus	4.00	2	3.24	
Torpedo torpedo	2.60	2	2.11	
Zeus faber	2.60	2	2.11	
Scorpaena angolensis	2.40	2	1.94	
Acanthurus monroviae	2.40	4	1.94	
Apsilus fuscus	2.10	6	1.70	
Priacanthus arenatus	0.70	2	0.57	
Pseudupeneus prayensis	0.60	4	0.49	
Alloteuthis africana	0.20	104	0.16	
Lagocephalus laevigatus	0.20	2	0.16	
Trigla lyra	0.10	2	0.08	1
Anthias anthias	0.10	2	0.08	
Total	123.50		100.01	

PROJECT STATION: 314

DATE:26/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 433
start stop duration Long W 104
TIME :17:46:13 18:17:06 31 (min) Purpose code: 3
LOG :7085.85 7087.39 1.54 Area code : 2
FDEPTH: 58 59 GearCond.code:
BDEPTH: 58 59 Validity code:
Towing dir: 245º Wire out: 200 m Speed: 30 kn*10

Sorted: 94 Kg Total catch: 236.35 CATCH/HOUR: 457.45

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Decapterus punctatus	299.03	3737	65.37	1158
Sardinella aurita	32.42	513	7.09	1166
Dactylopterus volitans	25.94	112	5.67	
Pagrus caeruleostictus	21.29	74	4.65	1162
Lutjanus fulgens	21.29	45	4.65	1159
Acanthurus monroviae	9.87	14	2.16	
Fistularia petimba	8.90	56	1.95	
Pseudupeneus prayensis	6.29	43	1.38	1164
Sepia officinalis hierredda	5.90	6	1.29	1157
Alloteuthis africana	5.32	4684	1.16	
Boops boops	3.39	581	0.74	1167
Chromis cadenati	3.39	39	0.74	
Zeus faber	3.29	10	0.72	
Apsilus fuscus	2.90	48	0.63	
Pagellus bellottii	2.52	15	0.55	1163
Dentex canariensis	2.32	6	0.51	1160
Dentex gibbosus	1.16	4	0.25	1161
Priacanthus arenatus	0.97	4	0.21	
Scomber japonicus	0.68	4	0.15	1165
Lagocephalus laevigatus	0.68	2	0.15	
Decapterus rhonchus	0.48	2	0.10	
Chelidonichthys capensis	0.29	4	0.06	
Total	458.32		100.18	

PROJECT STATION: 315

DATE:26/ 7/02 GEAR TYPE: PT No: 6 POSITION:Lat N 449
start stop duration Long W 127
TIME :23:25:07 23:54:31 29 (min) Purpose code: 1
LOG :7124.00 7125.71 1.60 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 38 39 Validity code:
Towing dir: 195º Wire out: 135 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 478.50 CATCH/HOUR: 990.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	322.76	4248	32.60	1168
Brachydeuterus auritus	318.10	21689	32.13	1169
Sardinella aurita	229.66	6070	23.20	1170
Sardinella maderensis	99.31	6054	10.03	1171
Trachurus trecae	10.86	652	1.10	1172
Sphyraena guachancho	6.21	93	0.63	
Decapterus punctatus	3.10	186	0.31	
Total	990.00		100.00	

PROJECT STATION: 316

DATE:27/ 7/02 GEAR TYPE: BT No:14 POSITION:Lat N 442
start stop duration Long W 108
TIME :06:21:35 06:52:22 31 (min) Purpose code: 3
LOG :7166.27 7167.86 1.58 Area code : 2
FDEPTH: 47 47 GearCond.code:
BDEPTH: 47 47 Validity code:
Towing dir: 316º Wire out: 190 m Speed: 30 kn*10

Sorted: 72 Kg Total catch: 73.46 CATCH/HOUR: 142.18

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Fistularia petimba	69.68	399	49.01	
Octopus vulgaris	14.71	8	10.35	
Sepia officinalis hierredda	7.55	6	5.31	1173
Scomberomorus tritor	6.68	8	4.70	1174
Sea urchins (strong spines)	6.19	155	4.35	
Mustelus mustelus	4.55	2	3.20	
Pagrus caeruleostictus	3.87	19	2.72	1178
Syacium micrurum	3.19	77	2.24	
Pseudupeneus prayensis	3.10	25	2.18	1177
Torpedo torpedo	3.10	4	2.18	
Balistes capriscus	3.10	12	2.18	1176
Raja miraletus	3.10	6	2.18	
Pagellus bellottii	2.23	12	1.57	1179
Conger conger	1.94	4	1.36	
Stephanolepis hispidus	1.84	12	1.29	
Zeus faber	1.65	6	1.16	1175
Dactylopterus volitans	1.35	8	0.95	
Lagocephalus laevigatus	1.16	4	0.82	
Chelidonichthys gabonensis	1.16	15	0.82	
Aluterus monoceros	0.77	2	0.54	
Grammoplites gruveli	0.68	23	0.48	
Arnoglossus imperialis	0.29	27	0.20	
Sepia orbignyana	0.19	19	0.13	
Bothus podas africanus	0.10	2	0.07	
Microchirus boscanion	0.02	2	0.01	
Total	142.20		100.00	

PROJECT STATION: 317

DATE:27/ 7/02 GEAR TYPE: BT No:14 POSITION:Lat N 455
start stop duration Long W 113
TIME :08:44:39 09:12:45 28 (min) Purpose code: 3
LOG :7182.83 7184.27 1.44 Area code : 2
FDEPTH: 35 35 GearCond.code:
BDEPTH: 35 35 Validity code:
Towing dir: 90º Wire out: 140 m Speed: 30 kn*10

Sorted: 77 Kg Total catch: 150.46 CATCH/HOUR: 322.41

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	153.43	5074	47.59	1193
Pagellus bellottii	29.36	411	9.11	1186
Chloroscombrus chrysurus	24.00	506	7.44	1190
Sphyraena sphyraena	15.86	174	4.92	1185
Sepia officinalis hierredda	12.21	11	3.79	1192
Pagrus caeruleostictus	11.04	77	3.42	1180
Sardinella maderensis	10.29	549	3.19	1189
Pseudupeneus prayensis	9.00	99	2.79	1182
Dentex canariensis	7.29	24	2.26	1181
Selar crumenophthalmus	6.21	32	1.93	1183
Trachinus armatus	6.00	26	1.86	
Caranx crysos	5.79	32	1.80	1187
Selene dorsalis	5.57	94	1.73	1188
Decapterus rhonchus	5.57	94	1.73	
Galeoides decadactylus	4.29	60	1.33	1191
Dasyatis pastinaca	3.43	2	1.06	
Uranoscopus polli	2.89	9	0.90	
Stromateus fiatola	2.68	4	0.83	
Pomadasys incisus	2.46	19	0.76	1184
Raja miraletus	0.96	2	0.30	
Eucinostomus melanopterus	0.86	9	0.27	
Trachinocephalus myops	0.86	13	0.27	
Alectis alexandrinus	0.54	2	0.17	
Sphyraena guachancho	0.54	4	0.17	
Grammoplites gruveli	0.43	26	0.13	
Trachinocephalus myops	0.43	17	0.13	
Trichiurus lepturus	0.32	2	0.10	
Sardinella aurita	0.11	2	0.03	
Lysiosquilla hoevenii	0.02	2	0.01	
Total	322.44		100.02	

PROJECT STATION: 318

DATE:27/ 7/02 GEAR TYPE: BT No:14 POSITION:Lat N 501

	start	stop	duration			Long W 115
TIME	:10:34:24	11:05:23	31 (min)	Purpose code:	3	
LOG	:7193.81	7195.39	1.56	Area code :	2	
FDEPTH:	25	25		GearCond.code:		
BDEPTH:	25	25		Validity code:		

Towing dir: 84º Wire out: 120 m Speed: 30 kn*10

Sorted: 20 Kg Total catch: 161.83 CATCH/HOUR: 313.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chlamys purpuratus	54.19	9105	17.30	
Chloroscombrus chrysurus	28.45	946	9.08	1246
Brachydeuterus auritus	26.42	772	8.43	1248
Trichiurus lepturus	25.06	528	8.00	
Sphyraena sphyraena	23.71	664	7.57	1245
Pomadasys incisus	22.35	135	7.14	1198
Pagrus caeruleostictus	20.32	379	6.49	1194
Ilisha africana	14.23	854	4.54	1195
Portunus validus	14.23	54	4.54	
Sardinella maderensis	9.48	583	3.03	1243
Sepia officinalis hierredda	6.97	25	2.23	1199
Eucinostomus melanopterus	6.10	176	1.95	
Uranoscopus polli	6.10	122	1.95	
Elops lacerta	4.84	14	1.55	
Galeoides decadactylus	4.74	54	1.51	1196
Pseudupeneus prayensis	4.74	81	1.51	1244
Selene dorsalis	4.06	122	1.30	1247
Caranx crysos	4.06	27	1.30	
Torpedo marmorata	3.77	4	1.20	
Stromateus fiatola	3.68	10	1.17	
Pseudotolithus senegalensis	3.29	8	1.05	
Scomberomorus tritor	3.19	19	1.02	1197
Albula vulpes	2.71	14	0.87	
Cymbium sp.	2.61	2	0.83	
Trichiurus lepturus	1.94	10	0.62	
Torpedo torpedo	1.74	2	0.56	
Pomadasys incisus	1.65	8	0.53	
Cynoglossus canariensis	1.45	6	0.46	
Penaeus kerathurus	1.35	27	0.43	
Penaeus notialis	1.35	14	0.43	
Pseudotolithus brachygnathus	1.16	2	0.37	
Sardinella aurita	0.68	27	0.22	
Parapenaeopsis atlantica	0.68	14	0.22	
Halobatrachus didactylus	0.68	27	0.22	
Pagellus bellottii	0.41	285	0.13	
Galeoides decadactylus	0.39	2	0.12	
Alectis alexandrinus	0.27	14	0.09	
Cynoglossus monodi	0.14	14	0.04	
Bothus podas africanus	0.02	2	0.01	
Total	313.21		100.01	

PROJECT STATION: 319

DATE:27/ 7/02 GEAR TYPE: BT No:14 POSITION:Lat N 500

	start	stop	duration			Long W 126
TIME	:12:34:23	13:04:31	30 (min)	Purpose code:	3	
LOG	:7208.93	7210.47	1.51	Area code :	2	
FDEPTH:	22	22		GearCond.code:		
BDEPTH:	22	22		Validity code:		

Towing dir: 264º Wire out: 120 m Speed: 30 kn*10

Sorted: 14 Kg Total catch: 61.41 CATCH/HOUR: 122.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Polydactylus quadrifilis	38.40	4	31.27	
Ilisha africana	19.50	1378	15.88	1204
Trichiurus lepturus	15.30	390	12.46	
Galeoides decadactylus	9.30	48	7.57	1202
Pseudotolithus senegalensis	6.30	6	5.13	
Elops lacerta	6.00	22	4.89	
Brachydeuterus auritus	3.90	546	3.18	1203
Pteroscion peli	3.30	168	2.69	
Sepia officinalis hierredda	3.00	30	2.44	1200
Chlamys purpuratus	2.40	666	1.95	
Chloroscombrus chrysurus	2.40	84	1.95	1201
Drepane africana	2.40	48	1.95	
Pomadasys rogeri	2.10	6	1.71	
Ephippion guttifer	1.50	6	1.22	
Calappa rubroguttata	1.50	6	1.22	
Parapenaeopsis atlantica	1.50	162	1.22	
Pagrus caeruleostictus	1.50	30	1.22	
Chaetodipterus goreensis	0.60	6	0.49	
Squilla aculata calmani	0.30	6	0.24	
Trachinocephalus myops	0.30	6	0.24	
Selene dorsalis	0.30	6	0.24	
Uranoscopus polli	0.30	6	0.24	
Scorpaena angolensis	0.30	6	0.24	
Pomadasys incisus	0.30	6	0.24	
Scyllarides herklotsii	0.12	6	0.10	
Total	122.82		99.98	

PROJECT STATION: 320

DATE:28/ 7/02 GEAR TYPE: BT No:14 POSITION:Lat N 421

	start	stop	duration			Long W 125
TIME	:12:32:42	13:02:21	30 (min)	Purpose code:	3	
LOG	:7273.36	7275.01	1.64	Area code :	2	
FDEPTH:	85	80		GearCond.code:		
BDEPTH:	85	80		Validity code:		

Towing dir: 76º Wire out: 280 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 47.86 CATCH/HOUR: 95.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sepia officinalis hierredda	29.90	144	31.24	1210
Dentex gibbosus	12.80	34	13.37	1206
Ephippion guttifer	9.40	36	9.82	
Pagrus caeruleostictus	8.80	28	9.19	1207
Fistularia petimba	6.90	36	7.21	
Raja miraletus	6.30	14	6.58	
Dactylopterus volitans	5.00	22	5.22	
Decapterus rhonchus	4.70	38	4.91	1209
Dentex canariensis	4.50	12	4.70	1205
Pagellus bellottii	2.80	76	2.93	1208
Squatina oculata	2.50	2	2.61	
Pseudupeneus prayensis	0.90	12	0.94	
Grammoplites gruveli	0.80	22	0.84	
Priacanthus arenatus	0.30	8	0.31	
Batrachoides didactylus *	0.10	2	0.10	
Cynoglossus monodi	0.02	6	0.02	
Total	95.72		99.99	

PROJECT STATION: 321

DATE:28/ 7/02 GEAR TYPE: BT No:14 POSITION:Lat N 426

	start	stop	duration			Long W 126
TIME	:14:18:39	14:48:13	30 (min)	Purpose code:	3	
LOG	:7284.49	7285.97	1.48	Area code :	2	
FDEPTH:	62	61		GearCond.code:		
BDEPTH:	62	61		Validity code:		

Towing dir: 74º Wire out: 200 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 60.35 CATCH/HOUR: 120.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella aurita	23.80	416	19.72	1211
Sepia officinalis hierredda	18.30	50	15.16	1218
Decapterus punctatus	14.80	376	12.26	1213
Pseudupeneus prayensis	13.70		11.35	
Sea urchins (strong spines)	4.90	284	4.06	
Dactylopterus volitans	4.90	36	4.06	
Ephippion guttifer	4.80	10	3.98	
Pagrus caeruleostictus	4.10	16	3.40	1215
Raja miraletus	3.80	10	3.15	
Dentex gibbosus	3.60	16	2.98	1214
Pagellus bellottii	3.30	60	2.73	1216
Squalus blainvillei	3.00	6	2.49	
Scomber japonicus	2.70	20	2.24	1217
Zeus faber	2.60	10	2.15	
Decapterus rhonchus	2.60	18	2.15	1212
Lepidotrigla cadmani	2.50	34	2.07	
Priacanthus arenatus	2.00	24	1.66	
Torpedo torpedo	1.60	2	1.33	
Syacium micrurum	1.40	80	1.16	
Trigla lyra	1.00	40	0.83	
Fistularia petimba	0.50	4	0.41	
Grammoplites gruveli	0.40	14	0.33	
Trachinocephalus myops	0.20	2	0.17	
Sphoeroides marmoratus	0.10	2	0.08	
Bothus podas africanus	0.10	2	0.08	
Total	120.70		100.00	

PROJECT STATION: 322

DATE:28/ 7/02 GEAR TYPE: BT No:14 POSITION:Lat N 442

	start	stop	duration			Long W 130
TIME	:17:36:08	17:44:04	8 (min)	Purpose code:	3	
LOG	:7308.03	7308.21	0.14	Area code :	2	
FDEPTH:	47	48		GearCond.code:	5	
BDEPTH:	47	48		Validity code:	9	

Towing dir: 70º Wire out: 160 m Speed: 30 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 323

DATE:29/ 7/02 GEAR TYPE: PT No: 6 POSITION:Lat N 447

	start	stop	duration			Long W 143
TIME	:00:18:41	00:48:15	30 (min)	Purpose code:	1	
LOG	:7337.70	7339.52	1.72	Area code :	2	
FDEPTH:	0	0		GearCond.code:	8	
BDEPTH:	37	39		Validity code:	1	

Towing dir: 180º Wire out: 140 m Speed: 40 kn*10

Sorted: 188 Kg Total catch: 188.35 CATCH/HOUR: 376.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sphyraena guachancho	81.00	292	21.50	1229
Engraulis encrasicolus	76.70	25858	20.36	1219
Pomadasys rogeri	61.30	60	16.27	1227
Lutjanus fulgens	31.00	66	8.23	1232
Pseudotolithus brachygnathus	13.20	2	3.50	
Selene dorsalis	11.80	26	3.13	1230
Galeoides decadactylus	10.50	34	2.79	1231
Pomadasys incisus	9.80	180	2.60	1226
Lethrinus atlanticus	7.70	24	2.04	1224
Pagellus bellottii	7.60	112	2.02	1223
Acanthurus monroviae	7.40	8	1.96	
Pagrus caeruleostictus	7.20	34	1.91	1233
Drepane africana	6.30	18	1.67	
Elops lacerta	5.60	14	1.49	
Brachydeuterus auritus	5.00	420	1.33	1222
Trichiurus lepturus	4.60	24	1.22	
Torpedo torpedo	4.20	6	1.11	
Pagrus africanus	3.70	4	0.98	
Dentex canariensis	3.60	14	0.96	1225
Scomber japonicus	3.30	4	0.88	
Stromateus fiatola	3.30	4	0.88	
Sepia officinalis hierredda	3.20	28	0.85	1220
Cephalopholis taeniops	2.20	2	0.58	
Ilisha africana	1.10	54	0.29	1221
Apsilus fuscus	0.90	2	0.24	
Pseudupeneus prayensis	0.90	6	0.24	
Pseudotolithus senegalensis	0.70	2	0.19	
Syacium micrurum	0.60	6	0.16	
Alectis alexandrinus	0.50	2	0.13	
Uranoscopus polli	0.40	2	0.11	
Acanthostrascion guineensis	0.40	2	0.11	
DIODONTIDAE	0.30	2	0.08	
Dactylopterus volitans	0.20	2	0.05	
Stephanolepis hispidus	0.20	6	0.05	
Pteroscion peli	0.10	2	0.03	
Chaetodon sp.	0.10	2	0.03	
Boops boops	0.10	4	0.03	
Total	376.70		100.00	

PROJECT STATION: 324

DATE:29/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 423

	start	stop	duration			Long W 145
TIME	:06:27:13	06:57:20	30	(min)	Purpose code: 3	
LOG	:7369.59	7371.11	1.51		Area code : 2	
FDEPTH:	80	81			GearCond.code:	
BDEPTH:	80	81			Validity code:	

Towing dir: 103º Wire out: 240 m Speed: 30 kn*10

Sorted: 109 Kg Total catch: 108.65 CATCH/HOUR: 217.30

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Umbrina canariensis	61.50	238	28.30	1234
Dentex canariensis	46.50	78	21.40	1236
Dentex gibbosus	33.90	124	15.60	1235
Dasyatis marmorata	17.30	4	7.96	
Fistularia petimba	9.70	28	4.46	
Pagrus caeruleostictus	9.00	22	4.14	1237
Sepia officinalis hierredda	8.80	24	4.05	1240
Pseudupeneus prayensis	5.80	64	2.67	1239
Decapterus rhonchus	5.10	44	2.35	1242
Torpedo torpedo	4.80	10	2.21	
Dactylopterus volitans	3.90	18	1.79	
Pagellus bellottii	3.00	58	1.38	1238
Zeus faber	2.00	2	0.92	
Priacanthus arenatus	1.50	4	0.69	
Sargocentron hastatus	1.30	8	0.60	
Mystriophis rostellatus	0.70	2	0.32	
Sardinella aurita	0.70	10	0.32	1241
Sphoeroides pachgaster	0.40	2	0.18	
Anthias anthias	0.40	12	0.18	
Alloteuthis africana	0.30	86	0.14	
Citharus linguatula	0.30	6	0.14	
Sea urchins (strong spines)	0.20	4	0.09	
Arnoglossus imperialis	0.10	4	0.05	
Chaetodon marcellae	0.10	2	0.05	
Total	217.30		99.99	

PROJECT STATION: 325

DATE:29/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 433

	start	stop	duration			Long W 147
TIME	:08:47:35	09:17:42	30	(min)	Purpose code: 3	
LOG	:7384.57	7386.11	1.53		Area code : 2	
FDEPTH:	61	60			GearCond.code:	
BDEPTH:	61	60			Validity code:	

Towing dir: 105º Wire out: 200 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 200.35 CATCH/HOUR: 400.70

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Decapterus punctatus	124.50	5554	31.07	1252
Sardinella aurita	104.50	3970	26.08	1254
Sepia officinalis hierredda	39.20	58	9.78	1251
Alectis alexandrinus	26.40	8	6.59	1249
Fistularia petimba	23.00	86	5.74	
Dactylopterus volitans	13.50	50	3.37	
Alloteuthis africana	7.50	5174	1.87	
Pseudupeneus prayensis	7.00	80	1.75	1257
Boops boops	6.00	260	1.50	1256
Trigla lyra	4.50	280	1.12	
Chromis sp.	4.50	110	1.12	1255
Dentex canariensis	4.40	8	1.10	1250
Decapterus rhonchus	4.00	120	1.00	1253
Squalus blainvillei	3.70	4	0.92	
Priacanthus arenatus	3.50	30	0.87	
Zeus faber	3.50	4	0.87	
Pagellus bellottii	3.00	100	0.75	1258
Chilomycterus spinosus mauret.	2.00	10	0.50	
Octopus vulgaris	2.00	4	0.50	
Ephippion guttifer	2.00	4	0.50	
Coris julis	1.50	10	0.37	
Dentex gibbosus	1.50	10	0.37	
Sea urchins (strong spines)	1.50	180	0.37	
Chaetodipterus goreensis	1.50	10	0.37	
Dentex gibbosus	1.40	2	0.35	
Dentex canariensis	1.00	10	0.25	
Anthias anthias	1.00	20	0.25	
Raja miraletus	1.00	2	0.25	
Sepia officinalis hierredda	0.50	30	0.12	
Grammoplites gruveli	0.50	20	0.12	
Syacium micrurum	0.50	70	0.12	
Scomber japonicus	0.10	10	0.02	
Total	400.70		99.96	

PROJECT STATION: 326

DATE:29/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 442

	start	stop	duration			Long W 151
TIME	:11:13:35	11:46:08	33	(min)	Purpose code: 3	
LOG	:7401.46	7403.14	1.67		Area code . 2	
FDEPTH:	47	46			GearCond.code:	
BDEPTH:	47	46			Validity code:	

Towing dir: 80º Wire out: 180 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 171.64 CATCH/HOUR: 312.07

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Galeoides decadactylus	86.55	289	27.73	1262
Brachydeuterus auritus	35.00	1705	11.22	1263
Pomadasys jubelini	32.24	29	10.33	1259
Trichlurus lepturus	30.55	665	9.79	
Sphyraena guachancho	24.18	236	7.75	1265
Cynoponticus ferox	20.45	2	6.55	
Raja miraletus	12.73	64	4.08	
Pseudotolithus senegalensis	12.09	25	3.87	1261
Dasyatis marmorata	10.60	4	3.40	
Stromateus fiatola	10.18	16	3.26	
Sardinella maderensis	5.73	327	1.84	1264
Pomadasys incisus	4.67	67	1.50	1260
Torpedo torpedo	3.40	67	1.09	
Ephippion guttifer	2.91	4	0.93	
Grammoplites gruveli	2.55	111	0.82	
Cynoglossus canariensis	2.55	16	0.82	
Umbrina canariensis	2.33	9	0.75	
Pagrus caeruleostictus	2.33	13	0.75	
Muraena helena	2.13	4	0.68	
Fistularia petimba	1.69	13	0.54	
Pagellus bellottii	1.69	22	0.54	
Ilisha africana	1.49	60	0.48	1266
Pteroscion peli	1.05	93	0.34	
Dentex gibbosus	1.05	13	0.34	
Selene dorsalis	0.85	4	0.27	
Syacium micrurum	0.42	22	0.13	
Sepia officinalis hierredda	0.42	16	0.13	
Sardinella aurita	0.22	4	0.07	
Syacium micrurum	0.04	7	0.01	
Total	312.09		100.01	

PROJECT STATION: 327

DATE:29/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 445

	start	stop	duration			Long W 151
TIME	:13:28:43	13:58:04	29	(min)	Purpose code: 3	
LOG	:7410.39	7411.93	1.53		Area code : 2	
FDEPTH:	36	36			GearCond.code:	
BDEPTH:	36	36			Validity code:	

Towing dir: 63º Wire out: 130 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 60.58 CATCH/HOUR: 125.34

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Galeoides decadactylus	25.66	89	20.47	1271
Elops lacerta	21.10	43	16.83	
Pteroscion peli	8.69	319	6.93	
Ilisha africana	8.59	499	6.85	1274
Pseudotolithus senegalensis	8.48	89	6.77	1270
Sardinella maderensis	6.21	364	4.95	1275
Raja miraletus	5.17	12	4.12	
Selene dorsalis	5.07	17	4.04	1276
Pisodonophis semicinctus	4.14	2	3.30	
Trichiurus lepturus	3.31		2.64	
Stromateus fiatola	3.31	6	2.64	
Parapenaeopsis atlantica	3.00	519	2.39	
Pomadasys jubelini	2.79	4	2.23	
Chloroscombrus chrysurus	2.59	33	2.07	1272
Sphyraena guachancho	2.48	17	1.98	1268
Brachydeuterus auritus	2.28	81	1.82	1273
Torpedo torpedo	1.97	27	1.57	
Drepane africana	1.76	19	1.40	
Pomadasys incisus	1.55	25	1.24	1267
Sepia officinalis hierredda	1.24	8	0.99	1269
Ephippion guttifer	1.14	2	0.91	
Batrachoides didactylus *	1.03	10	0.82	
Cynoponticus ferox	1.03	2	0.82	
Penaeus notialis	0.93	25	0.74	
Cynoglossus canariensis	0.72	12	0.57	
Eucinostomus melanopterus	0.31	2	0.25	
Alectis alexandrinus	0.31	6	0.25	
Scomberomorus tritor	0.31	2	0.25	
Lagocephalus laevigatus	0.10	2	0.08	
Scyllarides herklotsii	0.06	8	0.05	
Total	125.33		99.97	

PROJECT STATION: 328

DATE:29/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 447

	start	stop	duration			Long W 151
TIME	:15:24:57	15:54:46	30	(min)	Purpose code: 3	
LOG	:7417.47	7419.00	1.53		Area code : 2	
FDEPTH:	29	28			GearCond.code:	
BDEPTH:	29	28			Validity code:	

Towing dir: 66º Wire out: 120 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 98.10 CATCH/HOUR: 196.20

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trichiurus lepturus	39.30	728	20.03	
Ilisha africana	19.98	8658	10.18	
Parapenaeopsis atlantica	19.98	27306	10.18	
Sepia officinalis hierredda	13.32	3330	6.79	
Parapenaeopsis atlantica	11.40	1792	5.81	
Eucinostomus melanopterus	10.80	480	5.50	
Pseudotolithus senegalensis	10.50	120	5.35	1277
Galeoides decadactylus	10.20	36	5.20	1279
Elops lacerta	9.90	24	5.05	
Ilisha africana	8.70	770	4.43	1280
Pteroscion peli	6.66	1332	3.39	
Trichiurus lepturus	6.66	1332	3.39	
Sepia officinalis hierredda	5.10	18	2.60	
Chloroscombrus chrysurus	4.80	78	2.45	1278
Scomberomorus tritor	4.50	18	2.29	
Cynoponticus ferox	3.60	18	1.83	
Sphyraena guachancho	2.10	24	1.07	
Pomadasys jubelini	2.10	30	1.07	
G A S T R O P O D S	1.50	30	0.76	
Penaeus notialis	1.50	48	0.76	
Brachydeuterus auritus	1.20	66	0.61	1281
Calappa rubroguttata	0.90	6	0.46	
Selene dorsalis	0.90	36	0.46	1282
Batrachoides didactylus *	0.30	6	0.15	
Lagocephalus laevigatus	0.30	6	0.15	
Total	196.20		99.96	

PROJECT STATION: 329

DATE:29/ 7/02 GEAR TYPE: PT No: 5 POSITION:Lat N 437

	start	stop	duration			Long W 159
TIME	:20:45:30	21:14:44	29	(min)	Purpose code: 1	
LOG	:7440.76	7442.48	1.85		Area code : 2	
FDEPTH:	0	0			GearCond.code:	
BDEPTH:	62	66			Validity code:	

Towing dir: 220º Wire out: 130 m Speed: kn*10

Sorted: 63 Kg Total catch: 62.72 CATCH/HOUR: 129.77

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Priacanthus arenatus	96.00	4992	73.98	1283
Trachurus trecae	11.90	397	9.17	1286
Sepia officinalis hierredda	4.86	10	3.75	1292
Scomber japonicus	4.34	85	3.34	1289
Sardinella aurita	3.52	62	2.71	1284
Decapterus rhonchus	3.31	35	2.55	1288
Sphyraena guachancho	1.03	17	0.79	1290
Trichiurus lepturus	1.03	4	0.79	
Alloteuthis africana	0.93	559	0.72	
Sardinella maderensis	0.83	21	0.64	1285
Saurida brasiliensis	0.72	199	0.55	
Decapterus punctatus	0.41	21	0.32	1287
Brachydeuterus auritus	0.31	79	0.24	
Echeneis naucrates	0.31	4	0.24	
Boops boops	0.21	19	0.16	1291
Bregmaceros sp.	0.04	48	0.03	
Total	129.75		99.98	

PROJECT STATION: 330

DATE:29/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 425
start stop duration Long W 207
TIME :23:28:36 23:58:06 30 (min) Purpose code: 3
LOG :7461.55 7463.05 1.49 Area code : 2
FDEPTH: 253 244 GearCond.code:
BDEPTH: 253 244 Validity code:
Towing dir: 105ø Wire out: 750 m Speed: 30 kn*10

Sorted: 155 Kg Total catch: 177.16 CATCH/HOUR: 354.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lophius vaillanti	76.00	16	21.45	1295
Zenopsis conchifer	48.60	36	13.72	1293
Trigla lyra	29.80	108	8.41	1298
Parasudis fraser-bruenneri	24.20	820	6.83	
Merluccius polli	23.60	40	6.66	1294
Ijimaia loppei	20.00	8	5.64	
Centrophorus uyato	17.00	4	4.80	
Squalus megalops	14.80	8	4.18	
Chlorophthalmus atlanticus	13.80	414	3.89	
Illex coindetii	11.20	96	3.16	
Chascanopsetta lugubris	9.40	78	2.65	
Aristeus varidens	9.30	444	2.62	1299
Brotula barbata	8.50	6	2.40	1297
Peristedion cataphractum	7.20	188	2.03	
Bembrops greyi	6.90	66	1.95	
Aulopus cadenati	6.60	34	1.86	
Lophiodes kempi	5.50	12	1.55	1296
Lepidotrigla cadmani	4.80	54	1.35	
Raja straeleni	2.30	2	0.65	
Etmopterus spinax	2.00	18	0.56	
Argentina sphyraena	1.60	42	0.45	
MYCTOPHIDAE	1.60	30	0.45	
Malacocephalus occidentalis	1.50	24	0.42	
Dentex angolensis	1.10	2	0.31	
Coelorinchus coelorhincus	1.00	32	0.28	
Pontinus accraensis	0.90	10	0.25	
Hypoclydonia bella	0.90	12	0.25	
Synagrops microlepis	0.80	42	0.23	
Cynoponticus ferox	0.60	12	0.17	
Galeus polli	0.60	6	0.17	
Sphoeroides pachgaster	0.50	2	0.14	
Gadella imberbis	0.40	14	0.11	
Squatina oculata	0.30	2	0.08	
Parapenaeus longirostris	0.24	22	0.07	
Syacium micrurum	0.16	28	0.05	
Photichthys argenteus	0.16	12	0.05	
Priacanthus arenatus	0.16	10	0.05	
Nemichthys scolopaceus	0.10	4	0.03	
Promethichthys prometheus	0.06	4	0.02	
Solenocera africana	0.06	6	0.02	
Microchirus wittei	0.04	4	0.01	
APOGONIDAE	0.04	4	0.01	
Zenion longipinnis	0.00	4		
Total	354.32		99.98	

PROJECT STATION: 331

DATE:30/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 433
start stop duration Long W 210
TIME :06:22:51 06:52:12 29 (min) Purpose code: 3
LOG :7498.58 7500.11 1.53 Area code : 2
FDEPTH: 84 85 GearCond.code:
BDEPTH: 84 85 Validity code:
Towing dir: 120ø Wire out: 240 m Speed: 30 kn*10

Sorted: 45 Kg Total catch: 1961.80 CATCH/HOUR: 4058.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	2124.62	94223	52.34	1305
Sardinella aurita	1134.00	59317	27.94	1304
Scomber japonicus	397.55	6387	9.79	1306
Dentex angolensis	130.34	1217	3.21	1301
Boops boops	104.28	3519	2.57	1307
Dentex congoensis	85.86	2290	2.12	1302
Dentex gibbosus	35.79	130	0.88	1303
Brotula barbata	21.72	23	0.54	
Priacanthus arenatus	13.03	521	0.32	
Pagellus bellottii	5.38	130	0.13	1300
Zeus faber	5.38	2	0.13	
Scorpaena angolensis	0.93	2	0.02	
Total	4058.88		99.99	

PROJECT STATION: 332

DATE:30/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 441
start stop duration Long W 208
TIME :09:17:46 09:46:46 29 (min) Purpose code: 3
LOG :7514.36 7515.81 1.44 Area code : 2
FDEPTH: 45 48 GearCond.code:
BDEPTH: 45 48 Validity code:
Towing dir: 120ø Wire out: 160 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 547.84 CATCH/HOUR: 1133.46

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	796.97	33472	70.31	1308
Chloroscombrus chrysurus	203.90	1771	17.99	1312
Selene dorsalis	38.17	223	3.37	1311
Sepia officinalis hierredda	21.10	31	1.86	1315
Pagellus bellottii	16.76	223	1.48	1310
Trichiurus lepturus	14.90	317	1.31	
Sphyraena guachancho	14.90	149	1.31	1313
Sardinella maderensis	7.45	372	0.66	1309
Lepidotrigla cadmani	2.79	37	0.25	
Grammoplites gruveli	2.79	74	0.25	
Perulibatrachus elminensis	2.61	19	0.23	
Priacanthus arenatus	1.86	37	0.16	
Pagellus bellottii	1.76	4	0.16	1314
Raja miraletus	1.66	6	0.15	
Fistularia petimba	1.66	4	0.15	
Pomadasys rogeri	1.55	2	0.14	
Parapenaeopsis atlantica	0.93	149	0.08	
Decapterus rhonchus	0.74	19	0.07	
Pagrus caeruleostictus	0.56	19	0.05	
Torpedo torpedo	0.41	2	0.04	
Total	1133.47		100.02	

PROJECT STATION: 333

DATE:30/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 446
start stop duration Long W 209
TIME :11:51:32 12:22:34 31 (min) Purpose code: 3
LOG :7527.14 7528.69 1.50 Area code : 2
FDEPTH: 27 29 GearCond.code:
BDEPTH: 27 29 Validity code:
Towing dir: 106ø Wire out: 120 m Speed: 30 kn*10

Sorted: 55 Kg Total catch: 199.73 CATCH/HOUR: 386.57

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Cynoponticus ferox	103.55	70	26.79	
Parapenaeopsis atlantica	86.61	58030	22.40	
Trichiurus lepturus	45.48	850	11.77	
Pseudotolithus senegalensis	29.75	432	7.70	1317
Pteroscion peli	28.78	838	7.44	
Dasyatis margarita	24.19	23	6.26	
Brachydeuterus auritus	13.06	275	3.38	1316
Pseudotolithus senegalensis	9.87	2	2.55	
Galeoides decadactylus	6.77	10	1.75	1322
Drepane africana	4.84	19	1.25	1323
Pomadasys jubelini	3.97	2	1.03	1321
Cynoglossus senegalensis	3.87	10	1.00	
Selene dorsalis	3.39	15	0.88	
Chloroscombrus chrysurus	2.90	14	0.75	
Pomadasys jubelini	2.65	14	0.69	1320
Sepia officinalis hierredda	2.65	54	0.69	1319
Batrachoides didactylus *	2.42	10	0.63	
Raja miraletus	2.17	6	0.56	
Lagocephalus laevigatus	1.94	52	0.50	
Callinectes pallidus	1.70	48	0.44	
Ilisha africana	1.68	339	0.43	1318
Torpedo nobiliana	1.45	6	0.38	
Penaeus monodon	1.26	12	0.33	
Portunus validus	0.97	6	0.25	
Pisodonophis semicinctus	0.29	2	0.08	
Scyllarides herklotsii	0.25	10	0.06	
Penaeus notialis	0.10	2	0.03	
Total	386.56		100.02	

PROJECT STATION: 334

DATE:30/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 453
start stop duration Long W 223
TIME :14:39:28 15:10:52 31 (min) Purpose code: 3
LOG :7548.05 7549.56 1.50 Area code : 2
FDEPTH: 27 29 GearCond.code:
BDEPTH: 27 29 Validity code:
Towing dir: 120ø Wire out: 120 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 213.05 CATCH/HOUR: 412.35

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	176.23	5580	42.74	
Pomadasys rogeri	95.81	223	23.24	1324
Brachydeuterus auritus	27.29	757	6.62	1327
Pseudotolithus brachygnathus	21.48	2	5.21	
Galeoides decadactylus	17.13	52	4.15	1326
Dasyatis margarita	13.06	23	3.17	
Pteroscion peli	10.16	412	2.46	
Ilisha africana	9.00	2400	2.18	1328
Pseudotolithus senegalensis	8.42	145	2.04	1325
Chloroscombrus chrysurus	7.26	75	1.76	1331
Selene dorsalis	6.97	35	1.69	1329
Stromateus fiatola	4.94	12	1.20	
Cynoglossus senegalensis	4.06	12	0.98	
Raja miraletus	3.48	6	0.84	
Sardinella maderensis	2.03	75	0.49	1330
Penaeus notialis	1.65	14	0.40	1334
Sphyraena guachancho	1.16	6	0.28	
Sepia officinalis hierredda	1.16	41	0.28	1332
Pisodonophis semicinctus	0.48	2	0.12	
Octopus vulgaris	0.39	2	0.09	
Pythonichthys microphthalmus	0.10	2	0.02	
Parapenaeopsis atlantica	0.10	12	0.02	1333
Total	412.36		99.98	

PROJECT STATION: 335

DATE:30/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 451
start stop duration Long W 225
TIME :16:25:38 16:55:06 29 (min) Purpose code: 3
LOG :7556.57 7558.03 1.45 Area code : 2
FDEPTH: 39 38 GearCond.code:
BDEPTH: 39 38 Validity code:
Towing dir: 100ø Wire out: 140 m Speed: 30 kn*10

Sorted: 145 Kg Total catch: 920.21 CATCH/HOUR: 1903.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	1215.00	78975	63.82	1343
Pagellus bellottii	289.51	3399	15.21	1341
Sphyraena guachancho	111.00	1204	5.83	1336
Galeoides decadactylus	105.00	1866	5.52	1337
Sardinella maderensis	96.74	4632	5.08	1342
Sepia officinalis hierredda	33.41	48	1.75	1335
Scomberomorus tritor	10.66	3	0.56	
Selene dorsalis	10.55	180	0.55	1339
Pomadasys incisus	7.51	106	0.39	1340
Raja miraletus	6.74	14	0.35	
Chloroscombrus chrysurus	5.28	91	0.28	1338
Trachurus trecae	3.74	106	0.20	
Pseudupeneus prayensis	2.28	14	0.12	
Selar crumenophthalmus	2.26	14	0.12	
Fistularia petimba	1.97	14	0.10	
Trigla lyra	0.74	14	0.04	
Lagocephalus laevigatus	0.74	14	0.04	
Priacanthus arenatus	0.60	14	0.03	
Boops boops	0.14	14	0.01	
Total	1903.87		100.00	

PROJECT STATION: 336

DATE:30/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 446
start stop duration Long W 227
TIME :18:01:08 18:31:22 30 (min) Purpose code: 3
LOG :7567.02 7568.59 1.57 Area code : 2
FDEPTH: 58 60 GearCond.code:
BDEPTH: 58 60 Validity code:
Towing dir: 110ø Wire out: 180 m Speed: 30 kn*10

Sorted: 154 Kg Total catch: 848.55 CATCH/HOUR: 1697.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1198.30	23966	70.61	1352
Dentex canariensis	62.80	104	3.70	1347
Priacanthus arenatus	57.50	2034	3.39	1359
Boops boops	57.50	3874	3.39	1355
Pagrus caeruleostictus	53.80	148	3.17	1344
Sardinella aurita	49.40	828	2.91	1353
Pagellus bellottii	47.20	1132	2.78	1358
Pseudupeneus prayensis	19.60	230	1.15	1356
Dentex gibbosus	18.90	2	1.11	1345
Pomadasys incisus	16.10	208	0.95	1361
Scomber japonicus	16.10	208	0.95	1360
Sepia officinalis hierredda	15.90	22	0.94	1351
Fistularia petimba	11.60	70	0.68	
Dentex gibbosus	10.40	70	0.61	1357
Dentex gibbosus	10.30	20	0.61	1346
Pagrus caeruleostictus	8.00	46	0.47	1362
Zeus faber	7.00	24	0.41	
Lepidotrigla carolae	6.90	368	0.41	
Mustelus mustelus	5.40	2	0.32	
Sphyraena sphyraena	4.60	24	0.27	
Decapterus punctatus	4.60	300	0.27	1354
Dentex canariensis	3.50	24	0.21	
Lepidotrigla cadmani	2.30	46	0.14	
Umbrina canariensis	2.30	6	0.14	1348
Epinephelus aeneus	1.40	2	0.08	1349
Microchirus frechkopi	1.20	24	0.07	
Dentex congoensis	1.20	24	0.07	
Pagrus africanus	1.00	2	0.06	
Pagellus bellottii	0.90	6	0.05	1350
Arnoglossus imperialis	0.70	70	0.04	
Grammoplites gruveli	0.70	46	0.04	
Total	1697.10		100.00	

PROJECT STATION: 337

DATE:30/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 435
start stop duration Long W 231
TIME :20:49:57 21:19:12 29 (min) Purpose code: 3
LOG :7585.82 7587.31 1.47 Area code : 2
FDEPTH: 251 252 GearCond.code:
BDEPTH: 251 252 Validity code:
Towing dir: 112ø Wire out: 710 m Speed: 30 kn*10

Sorted: 120 Kg Total catch: 139.52 CATCH/HOUR: 288.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Zenopsis conchifer	123.10	130	42.65	1363
Dentex angolensis	21.21	41	7.35	1364
Squalus megalops	19.66	17	6.81	
Trigla lyra	17.79	66	6.16	1369
Merluccius polli	16.97	39	5.88	1366
Galeus polli	13.86	163	4.80	
Parasudis fraser-bruenneri	12.00	654	4.16	
Peristedion cataphractum	10.76	341	3.73	
Lophius vaillanti	9.10	2	3.15	1365
Squatina oculata	9.10	29	3.15	
Illex coindetii	6.62	62	2.29	
Lepidotrigla cadmani	5.59	50	1.94	
Raja straeleni	4.66	4	1.61	
Bembrops heterurus	3.10	29	1.07	
Lophiodes kempi	2.48	6	0.86	
Coelorinchus coelorhincus	2.28	74	0.79	
Chascanopsetta lugubris	2.28	4	0.79	
Sphoeroides pachgaster	1.45	4	0.50	
Malacocephalus occidentalis	1.45	17	0.50	
Unidentified fish	0.83	207	0.29	
Shrimps, small, non comm.	0.83		0.29	
Parapenaeus longirostris	0.62	48	0.21	1367
Chlorophthalmus atlanticus	0.41	91	0.14	
Promethichthys prometheus	0.41	4	0.14	
ARGENTINIDAE	0.41	170	0.14	
Calappa rubroguttata	0.21	4	0.07	
Photichthys argenteus	0.21	12	0.07	
Uranoscopus polli	0.21	4	0.07	
Laemonema laureysi	0.21	4	0.07	
Aristeus varidens	0.21	8	0.07	1368
Scorpaena normani	0.21	4	0.07	
Monolene microstoma	0.17	17	0.06	
Dicologoglossa cuneata	0.17	4	0.06	
Cyttopsis roseus	0.08	4	0.03	
Antigonia capros	0.04	4	0.01	
Total	288.69		99.98	

PROJECT STATION: 338

DATE:31/ 7/02 GEAR TYPE: PT No: 4 POSITION:Lat N 447
start stop duration Long W 223
TIME :00:30:48 00:47:07 16 (min) Purpose code: 1
LOG :7612.58 7613.64 1.05 Area code : 2
FDEPTH: 5 5 GearCond.code:
BDEPTH: 52 54 Validity code:
Towing dir: 135ø Wire out: 140 m Speed: 40 kn*10

Sorted: 94 Kg Total catch: 93.55 CATCH/HOUR: 350.81

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	158.25	1774	45.11	1371
Brachydeuterus auritus	70.69	1508	20.15	1373
Chloroscombrus chrysurus	55.50	998	15.82	1375
Trachurus trecae	19.50	439	5.56	1377
Sphyraena guachancho	18.19	184	5.19	1376
Scomber japonicus	10.88	71	3.10	1374
Sardinella aurita	10.13	109	2.89	1370
Selene dorsalis	4.31	49	1.23	1372
Sepia officinalis hierredda	3.19	4	0.91	
Saurida brasiliensis	0.19	41	0.05	
Total	350.83		100.01	

PROJECT STATION: 339

DATE:31/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 444
start stop duration Long W 246
TIME :06:21:35 06:51:13 30 (min) Purpose code: 3
LOG :7651.05 7652.64 1.59 Area code : 2
FDEPTH: 77 77 GearCond.code:
BDEPTH: 77 77 Validity code:
Towing dir: 110ø Wire out: 240 m Speed: 30 kn*10

Sorted: 48 Kg Total catch: 2263.41 CATCH/HOUR: 4526.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	2890.80	77094	63.86	1384
Scomber japonicus	963.60	12322	21.29	1385
Sardinella aurita	270.60	7524	5.98	1386
Dentex congoensis	195.40	5092	4.32	1379
Dentex canariensis	89.80	264	1.98	1380
Dentex gibbosus	40.92	132	0.90	1381
Fistularia petimba	27.72	52	0.61	
Pagellus bellottii	19.80	448	0.44	1382
Pseudupeneus prayensis	7.92	106	0.17	1383
Dentex angolensis	7.92	238	0.17	1378
Priacanthus arenatus	6.60	106	0.15	
Mustelus mustelus	3.90	2	0.09	
Lepidotrigla cadmani	1.32	26	0.03	
Anthias anthias	0.52	26	0.01	
Total	4526.82		100.00	

PROJECT STATION: 340

DATE:31/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 451
start stop duration Long W 247
TIME :08:27:20 08:57:15 30 (min) Purpose code: 3
LOG :7664.19 7665.77 1.56 Area code : 2
FDEPTH: 61 61 GearCond.code:
BDEPTH: 61 61 Validity code:
Towing dir: 100ø Wire out: 190 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 194.37 CATCH/HOUR: 388.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	219.00	5840	56.34	1395
Pagellus bellottii	106.50	2494	27.40	1390
Pseudupeneus prayensis	16.80	204	4.32	1392
Fistularia petimba	12.00	66	3.09	
Sepia officinalis hierredda	11.50	18	2.96	1387
Lepidotrigla carolae	3.00	186	0.77	
Alloteuthis africana	2.90	1608	0.75	
Zeus faber	2.70	6	0.69	
Lepidotrigla cadmani	2.40	72	0.62	
Dentex gibbosus	2.40	24	0.62	1388
Priacanthus arenatus	2.10	78	0.54	1391
Dactylopterus volitans	1.20	12	0.31	
Boops boops	1.20	36	0.31	1394
Sardinella aurita	0.90	24	0.23	1393
Pagrus caeruleostictus	0.90	6	0.23	
Illex coindetii	0.60	6	0.15	
Mustelus mustelus	0.60	42	0.15	
Dentex angolensis	0.60	36	0.15	1389
Grammoplites gruveli	0.30	6	0.08	
Microchirus frechkopi	0.30	6	0.08	
Dentex canariensis	0.30	6	0.08	
Stephanolepis hispidus	0.24	6	0.06	
Arnoglossus imperialis	0.18	42	0.05	
Dentex congoensis	0.12	6	0.03	
Total	388.74		100.01	

PROJECT STATION: 341

DATE:31/ 7/02 GEAR TYPE: PT No: 4 POSITION:Lat N 457
start stop duration Long W 246
TIME :10:13:28 10:44:47 31 (min) Purpose code: 1
LOG :7675.63 7677.40 1.75 Area code : 2
FDEPTH: 0 0 GearCond.code:
BDEPTH: 41 40 Validity code:
Towing dir: 105ø Wire out: 135 m Speed: 32 kn*10

Sorted: 3 Kg Total catch: 3.10 CATCH/HOUR: 6.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	5.32	81	88.67	1397
Sepia officinalis hierredda	0.68	46	11.33	1398
Total	6.00		100.00	

PROJECT STATION: 342

DATE:31/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 456
start stop duration Long W 244
TIME :11:18:58 11:48:56 30 (min) Purpose code: 3
LOG :7679.02 7680.54 1.51 Area code : 2
FDEPTH: 41 40 GearCond.code:
BDEPTH: 41 40 Validity code:
Towing dir: 285ø Wire out: 160 m Speed: 30 kn*10

Sorted: 55 Kg Total catch: 174.34 CATCH/HOUR: 348.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	176.10	4064	50.50	1400
Brachydeuterus auritus	82.50	3232	23.66	1405
Pagellus bellottii	22.20	348	6.37	1406
Pseudupeneus prayensis	14.70	96	4.22	1404
Sepia officinalis hierredda	13.00	18	3.73	1408
Dentex canariensis	6.60	48	1.89	1407
Cymbium sp.	5.50	4	1.58	
Chloroscombrus chrysurus	5.40	78	1.55	1399
Sardinella aurita	4.50	102	1.29	1402
Dactylopterus volitans	2.40	12	0.69	
Sardinella maderensis	2.40	108	0.69	1403
Raja miraletus	2.10	6	0.60	
Fistularia petimba	2.10	12	0.60	
Trachinocephalus myops	1.80	6	0.52	
Arnoglossus imperialis	1.50	72	0.43	
Stephanolepis hispidus	1.20	18	0.34	
Balistes capriscus	1.20	12	0.34	
Priacanthus arenatus	1.20	6	0.34	
Lepidotrigla cadmani	0.60	12	0.17	
Pagrus caeruleostictus	0.60	6	0.17	
Decapterus punctatus	0.60	30	0.17	1401
Boops boops	0.30	6	0.09	
Grammoplites gruveli	0.18	6	0.05	
Total	348.68		99.99	

PROJECT STATION: 343

DATE:31/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 459
start stop duration Long W 247
TIME :12:49:45 13:19:22 30 (min) Purpose code: 3
LOG :7687.28 7688.76 1.48 Area code : 2
FDEPTH: 26 26 GearCond.code:
BDEPTH: 26 26 Validity code:
Towing dir: 100ø Wire out: 120 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 46.92 CATCH/HOUR: 93.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lutjanus dentatus	31.40	4	33.46	
Selene dorsalis	20.80	68	22.17	1412
Sepia officinalis hierredda	15.70	12	16.73	1413
Balistes punctatus	7.80	16	8.31	1411
Lutjanus goreensis	3.50	2	3.73	
Pagrus africanus	3.40	2	3.62	
Chaetodipterus goreensis	1.70	2	1.81	
Pomadasys jubelini	1.70	2	1.81	
Decapterus punctatus	1.50	178	1.60	
Lutjanus fulgens	1.50	4	1.60	
Pseudupeneus prayensis	1.40	8	1.49	1409
Alectis alexandrinus	1.10	4	1.17	
Dentex canariensis	0.70	12	0.75	1410
Pagellus bellottii	0.70	4	0.75	
Chloroscombrus chrysurus	0.40	4	0.43	
Chaetodon hoefleri	0.30	6	0.32	
Fistularia petimba	0.20	2	0.21	
Brachydeuterus auritus	0.04	6	0.04	
Total	93.84		100.00	

PROJECT STATION: 344

DATE:31/ 7/02 GEAR TYPE: PT No: 7 POSITION:Lat N 501
start stop duration Long W 256
TIME :15:03:13 15:21:30 18 (min) Purpose code: 1
LOG :7703.08 7704.13 1.05 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 29 29 Validity code:
Towing dir: 100ø Wire out: 130 m Speed: 40 kn*10

Sorted: 8 Kg Total catch: 8.65 CATCH/HOUR: 28.83

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	11.33	80	39.30	1414
Chloroscombrus chrysurus	9.50	100	32.95	1415
Plectorhinchus macrolepis	7.83	3	27.16	
Sepia officinalis hierredda	0.10	13	0.35	
Decapterus punctatus	0.07	10	0.24	
Total	28.83		100.00	

PROJECT STATION: 345

DATE:31/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 501
start stop duration Long W 305
TIME :17:05:56 17:20:44 15 (min) Purpose code: 3
LOG :7718.90 7719.62 0.72 Area code : 2
FDEPTH: 42 41 GearCond.code:
BDEPTH: 42 41 Validity code:
Towing dir: 100ø Wire out: 140 m Speed: 30 kn*10

Sorted: 140 Kg Total catch: 675.10 CATCH/HOUR: 2700.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	2076.80	36040	76.91	1417
Chloroscombrus chrysurus	160.80	1972	5.95	1418
Trachurus trecae	153.20	2212	5.67	1420
Sphyraena guachancho	112.40	892	4.16	1422
Pagellus bellottii	82.00	2220	3.04	1421
Sepia officinalis hierredda	55.20	60	2.04	1416
Pseudupeneus prayensis	12.60	212	0.47	1424
Boops boops	11.60	168	0.43	1423
Selene dorsalis	8.40	84	0.31	1425
Priacanthus arenatus	8.40	232	0.31	1419
Decapterus rhonchus	7.40	84	0.27	1426
Sardinella aurita	3.20	64	0.12	
Sarda sarda	3.20	4	0.12	
Sepia officinalis hierredda	1.00	20	0.04	
Illex coindetii	1.00	44	0.04	
Grammoplites gruveli	1.00	44	0.04	
Citharus linguatula	1.00	64	0.04	
Dactylopterus volitans	0.60	20	0.02	
Arnoglossus imperialis	0.40	40	0.01	
Decapterus punctatus	0.20	20	0.01	
Total	2700.40		100.00	

PROJECT STATION: 346

DATE:31/ 7/02 GEAR TYPE: BT No: 8 POSITION:Lat N 458
start stop duration Long W 305
TIME :18:03:36 18:22:59 19 (min) Purpose code: 3
LOG :7724.60 7725.59 0.99 Area code : 2
FDEPTH: 55 54 GearCond.code: 7
BDEPTH: 55 54 Validity code: 9
Towing dir: 100ø Wire out: 180 m Speed: 30 kn*10

Sorted: 75 Kg Total catch: 357.80 CATCH/HOUR: 1129.89

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1007.37	23959	89.16	1430
Sardinella aurita	74.21	1393	6.57	1431
Boops boops	16.58	300	1.47	1432
Scomber japonicus	9.47	95	0.84	1433
Illex coindetii	7.89	32	0.70	
Pagellus bellottii	5.37	120	0.48	1427
Pseudupeneus prayensis	3.63	38	0.32	1428
Fistularia petimba	2.84	13	0.25	
Lepidotrigla carolae	0.79	32	0.07	
Microchirus frechkopi	0.79	16	0.07	
Priacanthus arenatus	0.63	13	0.06	1429
Microchirus boscanion	0.32	16	0.03	
Total	1129.89		100.02	

PROJECT STATION: 347

DATE: 1/ 8/02 GEAR TYPE: BT No: 8 POSITION:Lat N 458
start stop duration Long W 326
TIME :06:25:27 06:55:36 30 (min) Purpose code: 3
LOG :7816.12 7817.67 1.53 Area code : 1
FDEPTH: 81 81 GearCond.code:
BDEPTH: 81 81 Validity code:
Towing dir: 81ø Wire out: 240 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 152.15 CATCH/HOUR: 304.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex congoensis	126.40	2022	41.54	1439
Dentex angolensis	59.20	530	19.45	1437
Lepidotrigla cadmani	19.60	248	6.44	
Brotula barbata	17.00	28	5.59	1436
Dentex canariensis	14.90	22	4.90	1434
Mustelus mustelus	12.20	4	4.01	
Squatina oculata	11.50	8	3.78	
Pagellus bellottii	11.20	216	3.68	1441
Dentex canariensis	8.80	32	2.89	1438
Branchiostegus semifasciatus	3.40	6	1.12	
Zeus faber	2.70	2	0.89	
Raja miraletus	2.70	8	0.89	
Dentex gibbosus	2.40	24	0.79	1440
Pseudupeneus prayensis	2.00	16	0.66	
Chilomycterus spinosus mauret.	1.60	8	0.53	
Octopus vulgaris	1.40	2	0.46	
Dactylopterus volitans	1.20	8	0.39	
Trachurus trecae	1.20	8	0.39	
Dentex gibbosus	1.00	2	0.33	1435
Sepia officinalis hierredda	0.80	16	0.26	
Chaetodon robustus	0.80	8	0.26	
Citharus linguatula	0.80	8	0.26	
Fistularia petimba	0.70	4	0.23	
Chaetodon marcellae	0.40	8	0.13	
Calappa pelii	0.24	8	0.08	
Illex coindetii	0.16	8	0.05	
Total	304.30		100.00	

PROJECT STATION: 348

DATE: 1/ 8/02 GEAR TYPE: BT No: 8 POSITION:Lat N 505
start stop duration Long W 325
TIME :08:32:00 09:02:24 30 (min) Purpose code: 3
LOG :7828.21 7829.79 1.56 Area code : 1
FDEPTH: 41 41 GearCond.code:
BDEPTH: 41 41 Validity code:
Towing dir: 110ø Wire out: 160 m Speed: 30 kn*10

Sorted: 68 Kg Total catch: 73.14 CATCH/HOUR: 146.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Selene dorsalis	25.60	116	17.50	1448
Pomadasys jubelini	24.70	48	16.89	1450
Mustelus mustelus	17.40	14	11.89	
Ephippion guttifer	13.90	4	9.50	
Sepia officinalis hierredda	13.10	12	8.96	1442
Pagrus caeruleostictus	9.90	22	6.77	1444
Brachydeuterus auritus	6.80	738	4.65	1452
Pagellus bellottii	6.60	44	4.51	1445
Raja miraletus	4.90	12	3.35	
Sardinella maderensis	3.60	208	2.46	1453
Squatina oculata	3.10	2	2.12	
Pomadasys peroteti	2.10	8	1.44	1451
Chloroscombrus chrysurus	1.70	16	1.16	1447
Scorpaena angolensis	1.50	2	1.03	
Penaeus notialis	1.50	52	1.03	1446
Dentex canariensis	1.30	4	0.89	1443
Alectis alexandrinus	1.20	4	0.82	
Trichiurus lepturus	1.10	8	0.75	
Dactylopterus volitans	1.00	4	0.68	
Umbrina canariensis	1.00	2	0.68	
Citharus linguatula	0.80	56	0.55	
Syacium micrurum	0.80	24	0.55	
Brachydeuterus auritus	0.60	6	0.41	
Arnoglossus imperialis	0.40	96	0.27	
Grammoplites gruveli	0.40	24	0.27	
Lepidotrigla cadmani	0.40	8	0.27	
Decapterus rhonchus	0.40	4	0.27	
Sphyraena guachancho	0.20	8	0.14	1449
Pseudupeneus prayensis	0.20	2	0.14	
Bothus podas africanus	0.08	8	0.05	
Total	146.28		100.00	

PROJECT STATION: 349

DATE: 1/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 508
start stop duration Long W 328
TIME :10:11:54 10:41:01 29 (min) Purpose code: 3
LOG :7838.17 7839.65 1.46 Area code : 1
FDEPTH: 24 25 GearCond.code:
BDEPTH: 24 25 Validity code:
Towing dir: 100º Wire out: 120 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 215.40 CATCH/HOUR: 445.66

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	159.31	3583	35.75	1466
Polydactylus quadrifilis	52.97	2	11.89	1457
Ilisha africana	47.59	4690	10.68	1467
Brachydeuterus auritus	27.93	617	6.27	1464
Pomadasys jubelini	22.03	33	4.94	1461
Eucinostomus melanopterus	17.07	703	3.83	
Selene dorsalis	13.45	310	3.02	1465
Trichiurus lepturus	12.93	859	2.90	
Pseudotolithus senegalensis	11.69	43	2.62	1471
Sepia officinalis hierredda	9.31	10	2.09	
Galeoides decadactylus	8.79	166	1.97	1463
Sardinella maderensis	6.72	538	1.51	1469
Pseudotolithus senegalensis	6.72	166	1.51	1468
Drepane africana	4.14	93	0.93	
Cynoponticus ferox	4.03	2	0.90	
Dentex canariensis	4.03	14	0.90	1454
Galeoides decadactylus	3.93	14	0.88	1456
Lethrinus atlanticus	3.93	8	0.88	1455
Raja miraletus	3.31	8	0.74	
Drepane africana	2.90	4	0.65	
Stromateus fiatola	2.69	6	0.60	
Polydactylus quadrifilis	2.59	62	0.58	1462
Pagrus caeruleostictus	2.28	4	0.51	1460
Trachinotus maxillosus	2.28	2	0.51	
Scomberomorus tritor	2.17	6	0.49	1458
Penaeus notialis	1.76	116	0.39	1470
Sphyraena guachancho	1.55	10	0.35	
Balistes punctatus	1.34	2	0.30	
Sphyraena guachancho	1.34	6	0.30	1459
Dasyatis margarita	1.24	2	0.28	
Pseudupeneus prayensis	1.14	4	0.26	
Chaetodon hoefleri	1.03	4	0.23	
Cynoglossus senegalensis	0.62	2	0.14	
Trichiurus lepturus	0.52	2	0.12	
Callinectes pallidus	0.21	8	0.05	
Pytonichthys macrurus	0.10	2	0.02	
Total	445.64		99.99	

PROJECT STATION: 350

DATE: 1/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 509
start stop duration Long W 342
TIME :12:41:28 13:11:55 30 (min) Purpose code: 3
LOG :7856.75 7858.25 1.50 Area code : 1
FDEPTH: 25 25 GearCond.code:
BDEPTH: 25 25 Validity code:
Towing dir: 100º Wire out: 120 m Speed: 30 kn*10

Sorted: 46 Kg Total catch: 328.77 CATCH/HOUR: 657.54

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	239.40	7494	36.41	1473
Chloroscombrus chrysurus	81.00	1836	12.32	1474
Trichiurus lepturus	78.00	1510	11.86	1
Selene dorsalis	65.40	1700	9.95	1472
Sphyraena guachancho	52.60	192	8.00	1478
Ilisha africana	42.60	3176	6.48	1476
Pseudotolithus senegalensis	24.70	72	3.76	1479
Eucinostomus melanopterus	24.00	900	3.65	1
Sepia officinalis hierredda	17.00	20	2.59	1480
Sardinella maderensis	15.00	492	2.28	1475
Galeoides decadactylus	4.80	108	0.73	1477
Pomadasys jubelini	4.10	4	0.62	1481
Stromateus fiatola	3.60	10	0.55	
Scomberomorus tritor	2.70	14	0.41	1482
Parapenaeopsis atlantica	1.20	96	0.18	
Trachinocephalus myops	0.60	12	0.09	
Drepane africana	0.60	12	0.09	
Penaeus notialis	0.24	12	0.04	
Total	657.54		100.01	

PROJECT STATION: 351

DATE: 1/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 506
start stop duration Long W 344
TIME :14:17:00 14:47:00 30 (min) Purpose code: 3
LOG :7865.70 7867.30 1.60 Area code : 1
FDEPTH: 45 44 GearCond.code:
BDEPTH: 45 44 Validity code:
Towing dir: 280º Wire out: 140 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 166.09 CATCH/HOUR: 332.18

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	125.00	5416	37.63	1485
Brachydeuterus auritus	94.74	8052	28.52	1484
Sardinella aurita	68.74	1216	20.69	1483
Boops boops	12.50	866	3.76	1486
Sepia officinalis hierredda	9.60	10	2.89	1489
Balistes capriscus	5.50	4	1.66	
Pagellus bellottii	5.00	70	1.51	1487
Cymbium sp	3.40	4	1.02	
Pseudupeneus prayensis	3.00	40	0.90	1488
Pomadasys jubelini	1.70	4	0.51	
Pagrus caeruleostictus	1.30	6	0.39	
Dactylopterus volitans	0.74	4	0.22	
Calappa rubroguttata	0.30	2	0.09	
Eucinostomus melanopterus	0.26	4	0.08	
Illex coindetii	0.20	2	0.06	
Dentex canariensis	0.20	2	0.06	
Total	332.18		99.99	

PROJECT STATION: 352

DATE: 1/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 503
start stop duration Long W 345
TIME :15:55:50 16:26:18 30 (min) Purpose code: 3
LOG :7873.80 7875.29 1.49 Area code : 1
FDEPTH: 72 72 GearCond.code:
BDEPTH: 72 72 Validity code:
Towing dir: 100º Wire out: 240 m Speed: 30 kn*10

Sorted: 128 Kg Total catch: 128.50 CATCH/HOUR: 257.00

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	171.90	8308	66.89	1493
Dentex angolensis	42.40	454	16.50	1490
Brotula barbata	7.40	8	2.88	
Mustelus mustelus	5.60	2	2.18	
Fistularia petimba	5.00	54	1.95	
Trichiurus lepturus	4.80	4	1.87	1498
Priacanthus arenatus	2.70	46	1.05	1494
Pseudupeneus prayensis	2.50	18	0.97	1495
Illex coindetii	2.40	270	0.93	
Branchiostegus semifasciatus	1.70	4	0.66	
Lepidotrigla cadmani	1.70	46	0.66	
Boops boops	1.50	68	0.58	1491
Sardinella aurita	1.00	22	0.39	1497
Squatina oculata	0.90	2	0.35	
Dentex congoensis	0.80	24	0.31	1492
Dactylopterus volitans	0.70	2	0.27	
Chilomycterus spinosus mauret.	0.70	4	0.27	
Scomber japonicus	0.60	6	0.23	
Citharus linguatula	0.60	12	0.23	
Octopus vulgaris	0.40	2	0.16	
Pagellus bellottii	0.40	12	0.16	1496
Sphyraena guachancho	0.40	2	0.16	
Grammoplites gruveli	0.40	10	0.16	
Sepia officinalis hierredda	0.40	2	0.16	
Syacium micrurum	0.10	14	0.04	
Total	257.00		100.01	

PROJECT STATION: 353

DATE: 1/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 501
start stop duration Long W 342
TIME :17:33:47 18:02:43 29 (min) Purpose code: 3
LOG :7882.33 7883.74 1.40 Area code : 1
FDEPTH: 87 88 GearCond.code:
BDEPTH: 87 88 Validity code:
Towing dir: 280º Wire out: 270 m Speed: 30 kn*10

Sorted: 64 Kg Total catch: 112.55 CATCH/HOUR: 232.86

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	123.62	5193	53.09	1503
Dentex angolensis	40.76	468	17.50	1499
Boops boops	28.76	1078	12.35	1505
Scomber japonicus	12.41	99	5.33	1504
Dentex congoensis	8.38	197	3.60	1500
Zeus faber	4.86	4	2.09	
Brotula barbata	3.21	6	1.38	1501
Fistularia petimba	1.76	8	0.76	
Illex coindetii	1.55	124	0.67	
Sphoeroides pachgaster	1.45	6	0.62	
Uranoscopus polli	1.34	6	0.58	
Umbrina canariensis	1.03	6	0.44	1502
Priacanthus arenatus	1.03	6	0.44	
Dentex gibbosus	0.72	2	0.31	
Cubiceps sp.	0.52	17	0.22	
Pentheroscion mbizi	0.52	4	0.22	
Citharus linguatula	0.41	6	0.18	
Pseudupeneus prayensis	0.21	2	0.09	
Pagellus bellottii	0.19	6	0.08	
Microchirus frechkopi	0.08	2	0.03	
Arnoglossus imperialis	0.04	4	0.02	
Total	232.85		100.00	

PROJECT STATION: 354

DATE: 1/ 8/02 GEAR TYPE: PT No: 7 POSITION: Lat N 508
start stop duration Long W 344
TIME :22:42:21 23:12:00 30 (min) Purpose code: 1
LOG :7917.08 7918.57 1.46 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 32 34 Validity code:
Towing dir: 115º Wire out: 136 m Speed: 30 kn*10

Sorted: 21 Kg Total catch: 21.15 CATCH/HOUR: 42.30

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	21.20	268	50.12	1506
Alectis alexandrinus	7.30	22	17.26	1511
Sardinella maderensis	6.00	310	14.18	1508
Scomberomorus tritor	2.10	8	4.96	1512
Brachydeuterus auritus	2.10	42	4.96	1510
Sardinella maderensis	1.90	8	4.49	1509
Trichiurus lepturus	0.90	6	2.13	
Selene dorsalis	0.30	4	0.71	
Ilisha africana	0.30	14	0.71	1507
Decapterus rhonchus	0.20	2	0.47	
Total	42.30		99.99	

PROJECT STATION: 355

DATE: 2/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 509
start stop duration Long W 407
TIME :06:21:43 06:34:43 13 (min) Purpose code: 3
LOG :7959.69 7960.33 0.64 Area code : 1
FDEPTH: 81 87 GearCond.code:
BDEPTH: 81 87 Validity code:
Towing dir: 80ø Wire out: 240 m Speed: 30 kn*10

Sorted: 152 Kg Total catch: 961.96 CATCH/HOUR: 4439.82

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	3807.69	198000	85.76	1522
Umbrina canariensis	264.46	665	5.96	1513
Dentex canariensis	77.08	97	1.74	1515
Boops boops	51.92	1500	1.17	1523
Dentex angolensis	48.00	332	1.08	1514
Brotula barbata	33.46	46	0.75	1519
Plectorhinchus macrolepis	19.62	5	0.44	1521
Squatina oculata	18.46	9	0.42	
Uranoscopus polli	14.77	65	0.33	
Pentheroscion mbizi	13.85	74	0.31	1518
Mustelus mustelus	12.23	5	0.28	
Sardinella aurita	11.54	577	0.26	1524
Illex coindetii	10.38	115	0.23	
Pagellus bellottii	8.31	134	0.19	1517
Zeus faber	7.62	28	0.17	1520
Dentex congoensis	6.69	78	0.15	1516
Torpedo torpedo	5.77	5	0.13	
Trichiurus lepturus	5.31	14	0.12	
Grammoplites gruveli	3.46	115	0.08	
Sphoeroides marmoratus	3.46	115	0.08	
Parapenaeus longirostris	3.46	923	0.08	
Dicologoglossa cuneata	2.31	23	0.05	
Fistularia petimba	2.08	5	0.05	
Pagrus caeruleostictus	1.62	5	0.04	
Chaetodon hoefleri	1.38	5	0.03	
Saurida brasiliensis	1.15	462	0.03	
Arnoglossus imperialis	1.15	115	0.03	
Lepidotrigla cadmani	1.15	5	0.03	
Branchiostegus semifasciatus	1.15	5	0.03	
Dentex gibbosus	0.28	5	0.01	
Total	4439.81		100.03	

PROJECT STATION: 356

DATE: 2/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 511
start stop duration Long W 410
TIME :08:19:37 08:48:55 29 (min) Purpose code: 3
LOG :7969.91 7971.38 1.47 Area code : 1
FDEPTH: 57 57 GearCond.code:
BDEPTH: 57 57 Validity code:
Towing dir: 74ø Wire out: 180 m Speed: 30 kn*10

Sorted: 183 Kg Total catch: 1721.09 CATCH/HOUR: 3560.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1608.41	66517	45.17	1533
Boops boops	1151.17	39540	32.33	1534
Pagellus bellottii	394.76	5423	11.09	1530
Dentex canariensis	132.21	234	3.71	1525
Trichiurus lepturus	71.48	79	2.01	
Pagrus caeruleostictus	39.62	118	1.11	1527
Pseudupeneus prayensis	29.05	323	0.82	1531
Sardinella aurita	26.90	1183	0.76	1535
Scomber japonicus	21.52	108	0.60	
Pagrus caeruleostictus	13.99	194	0.39	1532
Balistes capriscus	11.79	21	0.33	
Sepia officinalis hierredda	9.72	10	0.27	1529
Dactylopterus volitans	7.55	43	0.21	
Pomadasys jubelini	7.03	10	0.20	1528
Mustelus mustelus	6.31	4	0.18	
Sphoeroides marmoratus	5.38	108	0.15	
Citharus linguatula	5.38	108	0.15	
Squatina oculata	4.97	2	0.14	
Sepia officinalis hierredda	3.21	21	0.09	
Dentex gibbosus	2.38	6	0.07	1526
Dicologoglossa hexophthalma	2.15	108	0.06	
Torpedo torpedo	1.97	4	0.06	
Plectorhinchus mediterraneus	1.66	2	0.05	
Epinephelus aeneus	1.55	2	0.04	
Umbrina canariensis	0.72	2	0.02	
Total	3560.88		100.01	

PROJECT STATION: 357

DATE: 2/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 512
start stop duration Long W 413
TIME :10:33:42 11:02:46 29 (min) Purpose code: 3
LOG :7978.55 7980.07 1.50 Area code : 1
FDEPTH: 33 33 GearCond.code:
BDEPTH: 33 33 Validity code:
Towing dir: 75ø Wire out: 140 m Speed: 30 kn*10

Sorted: 63 Kg Total catch: 62.71 CATCH/HOUR: 129.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Mustelus mustelus	42.41	10	32.69	
Argyrosomus hololepidotus	27.31	2	21.05	
Sepia officinalis hierredda	14.69	14	11.32	1543
Pseudupeneus prayensis	8.17	68	6.30	1537
Trichiurus lepturus	6.21	14	4.79	
Trachinocephalus myops	5.17	37	3.98	
Pseudotolithus senegalensis	4.14	2	3.19	
Pagellus bellottii	3.83	33	2.95	1540
Torpedo torpedo	3.31	4	2.55	
Priacanthus arenatus	3.00	33	2.31	1542
Trachurus trecae	2.59	62	2.00	1539
Boops boops	2.28	31	1.76	1541
Branchiostegus semifasciatus	1.55	23	1.19	
Aluterus heudelotii	1.24	8	0.96	
Dactylopterus volitans	0.62	2	0.48	
Chloroscombrus chrysurus	0.62	4	0.48	
Dentex canariensis	0.62	8	0.48	1538
Galeoides decadactylus	0.41	6	0.32	
Cynoglossus senegalensis	0.31		0.24	
Decapterus rhonchus	0.31	4	0.24	
Lepidotrigla cadmani	0.21	2	0.16	
Eucinostomus melanopterus	0.21	2	0.16	
Brachydeuterus auritus	0.21	21	0.16	1536
Sardinella aurita	0.21	6	0.16	
Penaeus notialis	0.06	4	0.05	
Bothus podas africanus	0.06	6	0.05	
Total	129.75		100.02	

PROJECT STATION: 358

DATE: 2/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 512
start stop duration Long W 414
TIME :11:56:06 12:26:03 30 (min) Purpose code: 3
LOG :7985.41 7986.89 1.47 Area code : 1
FDEPTH: 23 25 GearCond.code:
BDEPTH: 23 25 Validity code:
Towing dir: 75ø Wire out: 120 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 342.45 CATCH/HOUR: 684.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	497.50	19258	72.64	1544
Trachurus trecae	39.00	590	5.69	1546
Trichiurus lepturus	37.50	204	5.48	
Sepia officinalis hierredda	28.40	20	4.15	1551
Decapterus rhonchus	28.00	460	4.09	1545
Chloroscombrus chrysurus	11.00	110	1.61	1549
Galeoides decadactylus	8.00	160	1.17	1547
Boops boops	6.00	70	0.88	1548
Lagocephalus laevigatus	6.00	20	0.88	
Stromateus fiatola	3.80	4	0.55	
Pagellus bellottii	3.10	30	0.45	1552
Pseudotolithus senegalensis	3.10	4	0.45	
Priacanthus arenatus	3.00	60	0.44	
Pseudupeneus prayensis	2.40	22	0.35	1553
Dentex canariensis	1.90	16	0.28	1550
Sardinella aurita	1.50	30	0.22	
Dactylopterus volitans	1.20	4	0.18	
Epinephelus aeneus	0.80	2	0.12	
Lethrinus atlanticus	0.70	2	0.10	
Umbrina canariensis	0.50	2	0.07	
Trachinocephalus myops	0.50	20	0.07	
Sardinella maderensis	0.50	30	0.07	
Pteroscion peli	0.30	10	0.04	
Penaeus kerathurus	0.20	20	0.03	
Total	684.90		100.01	

PROJECT STATION: 359

DATE: 2/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 509
start stop duration Long W 425
TIME :14:14:31 14:44:45 30 (min) Purpose code: 3
LOG :8002.54 8004.03 1.48 Area code : 1
FDEPTH: 37 37 GearCond.code:
BDEPTH: 37 37 Validity code:
Towing dir: 178ø Wire out: 130 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 330.90 CATCH/HOUR: 661.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	545.00	58392	82.35	1554
Trachurus trecae	30.00	1264	4.53	1555
Pagellus bellottii	29.20	300	4.41	1559
Dactylopterus volitans	13.40	36	2.02	
Sepia officinalis hierredda	13.30	18	2.01	1560
Galeoides decadactylus	6.50	110	0.98	1562
Dentex canariensis	3.90	8	0.59	1557
Sphyraena guachancho	2.00	20	0.30	
Cynoglossus senegalensis	2.00	10	0.30	
Chilomycterus spinosus mauret.	2.00	10	0.30	
Pseudupeneus prayensis	1.90	18	0.29	1558
Pomadasys jubelini	1.70	6	0.26	
Balistes capriscus	1.50	10	0.23	
Uranoscopus polli	1.30	2	0.20	
Pomadasys incisus	1.10	12	0.17	1561
Trichiurus lepturus	1.10	8	0.17	
Boops boops	1.00	80	0.15	1556
Chloroscombrus chrysurus	1.00	20	0.15	
Torpedo torpedo	0.80	2	0.12	
Sphyraena guachancho	0.80	4	0.12	
Fistularia petimba	0.50	2	0.08	
Sardinella aurita	0.50	10	0.08	
Grammoplites gruveli	0.50	10	0.08	
Priacanthus arenatus	0.50	20	0.08	
Syacium micrurum	0.20	10	0.03	
Arnoglossus imperialis	0.10	10	0.02	
Total	661.80		100.02	

PROJECT STATION: 360

DATE: 2/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 508
start stop duration Long W 422
TIME :15:33:27 16:03:10 30 (min) Purpose code: 3
LOG :8009.70 8011.25 1.53 Area code : 1
FDEPTH: 59 59 GearCond.code:
BDEPTH: 59 59 Validity code:
Towing dir: 260ø Wire out: 180 m Speed: 30 kn*10

Sorted: 62 Kg Total catch: 523.95 CATCH/HOUR: 1047.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	816.00	40320	77.87	1562
Pagellus bellottii	47.24	690	4.51	1563
Sepia officinalis hierredda	44.00	42	4.20	1567
Priacanthus arenatus	30.74	960	2.93	1564
Boops boops	19.50	420	1.86	1566
Trichiurus lepturus	19.40	24	1.85	
Squatina oculata	16.20	6	1.55	
Sardinella aurita	15.00	254	1.43	1565
Mustelus mustelus	9.50	2	0.91	
Dactylopterus volitans	9.20	40	0.88	
Fistularia petimba	9.20	32	0.88	
Raja miraletus	3.80	6	0.36	
Grammoplites gruveli	2.24	60	0.21	
Pseudupeneus prayensis	1.50	14	0.14	
Epinephelus aeneus	1.30	2	0.12	
Brotula barbata	1.20	4	0.11	
Zeus faber	1.20	2	0.11	
Umbrina canariensis	0.40	2	0.04	
Citharus linguatula	0.14	14	0.01	
Arnoglossus imperialis	0.14	30	0.01	
Total	1047.90		99.98	

PROJECT STATION: 361

DATE: 2/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 505
start stop duration Long W 421
TIME :17:22:25 17:52:32 30 (min) Purpose code: 3
LOG :8020.00 8021.58 1.58 Area code : 1
FDEPTH: 85 86 GearCond.code:
BDEPTH: 85 86 Validity code:
Towing dir: 260º Wire out: 270 m Speed: 30 kn*10

Sorted: 94 Kg Total catch: 164.37 CATCH/HOUR: 328.74

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	147.60	1180	44.90	1572
Umbrina canariensis	89.60	452	27.26	1571
Mustelus mustelus	25.50	4	7.76	
Brotula barbata	15.40	20	4.68	1569
Branchiostegus semifasciatus	13.90	20	4.23	1568
Dentex canariensis	13.10	14	3.98	1570
Dentex congoensis	9.20	140	2.80	1573
Lepidotrigla cadmani	5.00	64	1.52	
Zeus faber	3.30	4	1.00	
Sepia officinalis hierredda	1.50	2	0.46	
Fistularia petimba	1.08	18	0.33	
Pagrus caeruleostictus	1.00	2	0.30	
Raja miraletus	1.00	2	0.30	
Pseudupeneus prayensis	0.50	4	0.15	
Pagellus bellottii	0.46	18	0.14	1574
Illex coindetii	0.20	10	0.06	
Citharus linguatula	0.20	4	0.06	
Chaetodon marcellae	0.20	4	0.06	
Total	328.74		99.99	

PROJECT STATION: 362

DATE: 3/ 8/02 GEAR TYPE: PT No: 4 POSITION: Lat N 508
start stop duration Long W 427
TIME :00:10:55 00:31:31 21 (min) Purpose code: 1
LOG :8068.91 8070.07 1.15 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 55 58 Validity code:
Towing dir: 96º Wire out: 140 m Speed: 35 kn*10

Sorted: 110 Kg Total catch: 406.65 CATCH/HOUR: 1161.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Sardinella maderensis	557.86	4894	48.01	1578
Sardinella aurita	465.00	5917	40.02	1579
Alectis alexandrinus	51.00	26	4.39	1576
Sphyraena guachancho	33.29	11	2.87	1575
Scomber japonicus	29.29	186	2.52	1580
Trichiurus lepturus	11.43	23	0.98	
Sepia officinalis hierredda	7.57	6	0.65	1577
Trachurus trecae	5.71	214	0.49	1581
Decapterus punctatus	0.71	14	0.06	
Total	1161.86		99.99	

PROJECT STATION: 363

DATE: 3/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 503
start stop duration Long W 445
TIME :06:23:11 06:53:28 30 (min) Purpose code: 3
LOG :8104.12 8105.64 1.51 Area code : 1
FDEPTH: 73 75 GearCond.code:
BDEPTH: 73 75 Validity code:
Towing dir: 80º Wire out: 220 m Speed: 30 kn*10

Sorted: 76 Kg Total catch: 256.45 CATCH/HOUR: 512.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	331.80	15002	64.69	1589
Dentex angolensis	47.60	616	9.28	1590
Brotula barbata	23.80	48	4.64	1582
Umbrina canariensis	13.30	54	2.59	1584
Lepidotrigla cadmani	9.80	98	1.91	
Fistularia petimba	8.10	40	1.58	
Decapterus rhonchus	7.90	8	1.54	1588
Branchiostegus semifasciatus	7.60	12	1.48	
Uranoscopus polli	7.20	22	1.40	
Pentheroscion mbizi	5.80	28	1.13	1583
Zeus faber	5.00	12	0.97	1587
Pentheroscion mbizi	4.90	42	0.96	
Pagellus bellottii	4.90	84	0.96	1591
Trichiurus lepturus	4.30	4	0.84	
Boops boops	4.20	98	0.82	
Sardinella aurita	3.50	70	0.68	
Alloteuthis africana	2.80	700	0.55	
Dentex gibbosus	2.80	14	0.55	
Squatina oculata	2.80		0.55	
Pagrus caeruleostictus	2.10	14	0.41	
Umbrina canariensis	2.10	14	0.41	
Priacanthus arenatus	2.10	28	0.41	
Scorpaena angolensis	2.00	2	0.39	
Dentex canariensis	1.50	4	0.29	1586
Citharus linguatula	1.40	14	0.27	
Saurida brasiliensis	1.40	308	0.27	
Sepia officinalis hierredda	1.30	2	0.25	
Dentex angolensis	0.90	4	0.18	1585
Total	512.90		100.00	

PROJECT STATION: 364

DATE: 3/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 505
start stop duration Long W 445
TIME :08:12:00 08:42:07 30 (min) Purpose code: 3
LOG :8111.21 8112.76 1.55 Area code : 1
FDEPTH: 40 40 GearCond.code:
BDEPTH: 40 40 Validity code:
Towing dir: 80º Wire out: 160 m Speed: 30 kn*10

Sorted: 104 Kg Total catch: 103.71 CATCH/HOUR: 207.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	77.70	1880	37.46	1599
Mustelus mustelus	24.40	10	11.76	
Sepia officinalis hierredda	23.00	24	11.09	1600
Trichiurus lepturus	17.40	106	8.39	
Pomadasys rogeri	10.30	58	4.97	1602
Decapterus rhonchus	8.60	134	4.15	1594
Pagellus bellottii	5.50	38	2.65	1593
Pseudotolithus senegalensis	5.20	10	2.51	1603
Galeoides decadactylus	4.40	96	2.12	1595
Penaeus notialis	4.30	220	2.07	1592
Torpedo torpedo	3.00	14	1.45	
Epinephelus aeneus	2.90	12	1.40	
Chloroscombrus chrysurus	2.50	32	1.21	1596
Trachurus trecae	2.50	56	1.21	1601
Pomadasys jubelini	2.00	2	0.96	
Lepidotrigla cadmani	1.50	14	0.72	
Sphyraena guachancho	1.50	14	0.72	
Perulibatrachus rossignoli	1.40	4	0.67	
Fistularia petimba	1.10	6	0.53	
Citharus linguatula	1.10	16	0.53	
Pseudupeneus prayensis	1.00	8	0.48	1604
Selene dorsalis	1.00	14	0.48	1597
Sardinella maderensis	0.80	16	0.39	1598
Acanthurus monroviae	0.70	2	0.34	
Pteroscion peli	0.70	32	0.34	
Cynoglossus senegalensis	0.50	4	0.24	
Eucinostomus melanopterus	0.40	6	0.19	
Alloteuthis africana	0.34	220	0.16	
Grammoplites gruveli	0.30	14	0.14	
Priacanthus arenatus	0.30	4	0.14	
Umbrina canariensis	0.30	2	0.14	
Dentex angolensis	0.20	2	0.10	
Antennarius sp.	0.20	2	0.10	
Penaeus kerathurus	0.10	4	0.05	
Squilla mantis	0.10	2	0.05	
Microchirus frechkopi	0.10	6	0.05	
Bothus podas africanus	0.08	2	0.04	
Total	207.42		100.00	

PROJECT STATION: 365

DATE: 3/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 508
start stop duration Long W 442
TIME :09:34:58 10:04:06 29 (min) Purpose code: 3
LOG :8118.13 8119.70 1.56 Area code : 1
FDEPTH: 22 23 GearCond.code:
BDEPTH: 22 23 Validity code:
Towing dir: 257º Wire out: 120 m Speed: 30 kn*10

Sorted: 60 Kg Total catch: 162.27 CATCH/HOUR: 335.73

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Chloroscombrus chrysurus	84.21	1846	25.08	1612
Trichiurus lepturus	74.69	598	22.25	
Parapenaeus longirostris	23.38	4442	6.96	1611
Pomadasys jubelini	22.55	50	6.72	1605
Pteroscion peli	21.93	1535	6.53	
Sepia officinalis hierredda	17.17	17	5.11	1608
Cynoponticus ferox	17.07	2	5.08	
Brachydeuterus auritus	15.10	292	4.50	1613
Pseudotolithus senegalensis	14.90	205	4.44	1614
Pseudotolithus senegalensis	14.69	14	4.38	1610
Pisodonophis semicinctus	6.41	10	1.91	
Ilisha africana	3.52	54	1.05	1615
Sphyraena guachancho	3.31	21	0.99	
Pomadasys peroteti	2.79	8	0.83	1606
Raja miraletus	2.38	4	0.71	
Selene dorsalis	2.07	4	0.62	
Pentanemus quinquarius	1.66	17	0.49	
Penaeus notialis	1.55	39	0.46	1607
Cynoglossus senegalensis	1.34	14	0.40	
Cynoglossus senegalensis	1.24	12	0.37	
Pomadasys peroteti	1.03	12	0.31	
Stromateus fiatola	1.03	4	0.31	1609
Sardinella maderensis	0.83	17	0.25	
Sardinella aurita	0.41	4	0.12	
Penaeus monodon	0.21	2	0.06	
Pomadasys jubelini	0.21	4	0.06	
Squilla acuelata calmani	0.04	4	0.01	
Total	335.72		100.00	

PROJECT STATION: 366

DATE: 3/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 506
start stop duration Long W 502
TIME :12:15:20 12:45:00 30 (min) Purpose code: 3
LOG :8139.76 8141.28 1.52 Area code : 1
FDEPTH: 26 26 GearCond.code:
BDEPTH: 26 26 Validity code:
Towing dir: 87º Wire out: 120 m Speed: 30 kn*10

Sorted: 40 Kg Total catch: 77.65 CATCH/HOUR: 155.30

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	26.84	560	17.28	1622
Trichiurus lepturus	20.10	200	12.94	
Mustelus mustelus	16.40	12	10.56	
Pteroscion peli	15.14	1036	9.75	
Galeoides decadactylus	11.70	162	7.53	1618
Pseudotolithus senegalensis	9.90	48	6.37	1621
Ilisha africana	9.44	1446	6.08	1620
Sepia officinalis hierredda	8.90	20	5.73	1689
Penaeus notialis	7.94	498	5.11	1616
Cynoponticus ferox	6.40	8	4.12	
Pomadasys jubelini	5.40	20	3.48	1619
Pomadasys rogeri	3.00	18	1.93	1623
Echelus myrus	2.70	2	1.74	
Stromateus fiatola	2.10	6	1.35	
Drepane africana	1.34	12	0.86	
Chloroscombrus chrysurus	1.04	18	0.67	1624
Penaeus kerathurus	1.04	32	0.67	1617
Callinectes pallidus	1.04	18	0.67	
Pisodonophis semicinctus	1.00	2	0.64	
Selene dorsalis	0.90	40	0.58	1683
Sardinella maderensis	0.60	6	0.39	
Antennarius sp.	0.60	6	0.39	
Eucinostomus melanopterus	0.60	6	0.39	
Uranoscopus polli	0.30	6	0.19	
Trachinocephalus myops	0.30	6	0.19	
Pentanemus quinquarius	0.30	12	0.19	
Scyllarides herklotsii	0.14	6	0.09	
BATPRO2	0.14	6	0.09	
Total	155.30		99.98	

PROJECT STATION: 367

DATE: 3/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 503
start stop duration Long W 503
TIME :13:37:24 14:07:21 30 (min) Purpose code: 3
LOG :8147.00 8148.54 1.54 Area code : 1
FDEPTH: 36 35 GearCond.code:
BDEPTH: 36 35 Validity code:
Towing dir: 90º Wire out: 130 m Speed: 30 kn*10

Sorted: 53 Kg Total catch: 288.58 CATCH/HOUR: 577.16

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	312.20	8250	54.09	1628
Sphyraena guachancho	145.50	430	25.21	1625
Mustelus mustelus	37.00	14	6.41	
Trichiurus lepturus	21.00	266	3.64	
Pteroscion peli	12.60	370	2.18	
Ilisha africana	9.80	202	1.70	1690
Pseudotolithus senegalensis	7.00	10	1.21	1627
Stromateus fiatola	5.90	8	1.02	
Selar crumenophthalmus	5.00	18	0.87	1626
Pomadasys incisus	3.14	14	0.54	
Drepane africana	2.46	6	0.43	
Pseudotolithus senegalensis	2.46	34	0.43	1629
Drepane africana	2.20	8	0.38	
Selene dorsalis	2.10	20	0.36	1632
Decapterus rhonchus	2.10	28	0.36	
Galeoides decadactylus	2.10	28	0.36	1630
Trachurus trecae	1.74	28	0.30	1631
Pagellus bellottii	1.00	4	0.17	
Pomadasys rogeri	0.70	6	0.12	
Chloroscombrus chrysurus	0.70	6	0.12	
Sardinella maderensis	0.36	6	0.06	
Decapterus rhonchus	0.10	2	0.02	
Total	577.16		99.98	

PROJECT STATION: 368

DATE: 3/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 459
start stop duration Long W 505
TIME :15:18:38 15:48:29 30 (min) Purpose code: 3
LOG :8157.22 8158.62 1.41 Area code : 1
FDEPTH: 81 81 GearCond.code:
BDEPTH: 81 81 Validity code:
Towing dir: 90º Wire out: 240 m Speed: 30 kn*10

Sorted: 98 Kg Total catch: 98.67 CATCH/HOUR: 197.34

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	61.60	1506	31.22	1639
Dentex angolensis	48.00	584	24.32	1638
Brotula barbata	31.00	56	15.71	
Zeus faber	8.00	26	4.05	
Octopus vulgaris	8.00	8	4.05	
Boops boops	7.70	246	3.90	1635
Priacanthus arenatus	7.30	110	3.70	1636
Trichiurus lepturus	6.70	12	3.40	
Uranoscopus cadenati	3.40	10	1.72	
Illex coindetii	2.90	316	1.47	
Dentex gibbosus	2.70	10	1.37	1633
Pagellus bellottii	2.40	22	1.22	1634
Scorpaena scrofa	2.20	4	1.11	
Saurida brasiliensis	1.30	396	0.66	
Sphyraena guachancho	1.00	4	0.51	
Lepidotrigla cadmani	1.00	12	0.51	
Dicologoglossa cuneata	0.80	8	0.41	
Pontinus accraensis	0.50	2	0.25	
Sepia officinalis hierredda	0.50	26	0.25	1637
Citharus linguatula	0.10	2	0.05	
Grammoplites gruveli	0.10	2	0.05	
Dicologoglossa hexophthalma	0.10	2	0.05	
Arnoglossus imperialis	0.04	4	0.02	
Total	197.34		100.00	

PROJECT STATION: 369

DATE: 3/ 8/02 GEAR TYPE: PT No: 7 POSITION: Lat N 504
start stop duration Long W 504
TIME :21:28:08 21:56:14 28 (min) Purpose code: 1
LOG :8186.95 8188.46 1.50 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 32 31 Validity code:
Towing dir: 280º Wire out: 138 m Speed: 32 kn*10

Sorted: 42 Kg Total catch: 41.85 CATCH/HOUR: 89.68

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	37.82	889	42.17	1647
Sardinella maderensis	21.54	253	24.02	1643
Trachurus trecae	7.18	86	8.01	1645
Sphyraena guachancho	4.93	9	5.50	1644
Stromateus fiatola	3.64	6	4.06	
Trichiurus lepturus	3.43	32	3.82	
Sepia officinalis hierredda	2.57	4	2.87	1648
Penaeus notialis	1.61	41	1.80	1640
Ilisha africana	1.50	32	1.67	1642
Chloroscombrus chrysurus	1.18	19	1.32	1641
Pteroscion peli	0.96	39	1.07	
Decapterus rhonchus	0.86	17	0.96	1646
Selar crumenophthalmus	0.86	4	0.96	
Sepiella ornata	0.54	66	0.60	
Scomberomorus tritor	0.54	2	0.60	
Sphyraena sphyraena	0.43	2	0.48	
Galeoides decadactylus	0.11	2	0.12	
Total	89.70		100.03	

PROJECT STATION: 370

DATE: 3/ 8/02 GEAR TYPE: PT No: 7 POSITION: Lat N 503
start stop duration Long W 514
TIME :23:20:29 23:49:58 29 (min) Purpose code: 1
LOG :8200.03 8201.67 1.62 Area code : 1
FDEPTH: 10 10 GearCond.code:
BDEPTH: 39 30 Validity code:
Towing dir: 34º Wire out: 137 m Speed: 32 kn*10

Sorted: 63 Kg Total catch: 125.00 CATCH/HOUR: 258.62

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	99.93	2086	38.64	1653
Sardinella maderensis	53.38	819	20.64	1649
Trachurus trecae	34.14	439	13.20	1656
Chloroscombrus chrysurus	20.07	317	7.76	1651
Trichiurus lepturus	14.90	91	5.76	
Sardinella aurita	14.69	161	5.68	1650
Scomber japonicus	12.00	66	4.64	1652
Sphyraena guachancho	4.55	21	1.76	1655
Ilisha africana	2.48	54	0.96	1654
Sepia officinalis hierredda	2.28	4	0.88	
Selene dorsalis	0.21	4	0.08	
Total	258.63		100.00	

PROJECT STATION: 371

DATE: 4/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 457
start stop duration Long W 524
TIME :06:22:00 06:52:17 30 (min) Purpose code: 3
LOG :8232.79 8234.37 1.58 Area code : 1
FDEPTH: 75 77 GearCond.code:
BDEPTH: 75 77 Validity code:
Towing dir: 80º Wire out: 240 m Speed: 30 kn*10

Sorted: 73 Kg Total catch: 258.69 CATCH/HOUR: 517.38

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Boops boops	161.10	2050	31.14	1665
Trachurus trecae	129.60	4396	25.05	1658
Scomber japonicus	48.20	306	9.32	1659
Dentex angolensis	32.40	450	6.26	1664
Pagellus bellottii	25.20	342	4.87	1663
Brotula barbata	20.30	64	3.92	1662
Zeus faber	11.70	46	2.26	1660
Trichiurus lepturus	11.20	14	2.16	
Umbrina canariensis	10.80	64	2.09	1661
Brotula barbata	9.90	12	1.91	1657
Priacanthus arenatus	9.00	172	1.74	1666
Trichiurus lepturus	8.60	82	1.66	
Mustelus mustelus	7.90	2	1.53	
Branchiostegus semifasciatus	7.20	18	1.39	
Fistularia petimba	4.10	10	0.79	
Saurida brasiliensis	4.00	614	0.77	
Alloteuthis africana	3.20	480	0.62	
Sardinella aurita	2.70	28	0.52	
Zeus faber	2.50	2	0.48	
Citharus linguatula	2.30	82	0.44	
Sepia officinalis hierredda	1.90	2	0.37	
Branchiostegus semifasciatus	1.00	2	0.19	
Lepidotrigla carolae	0.90	18	0.17	
Dentex gibbosus	0.90	2	0.17	
Dicologoglossa hexophthalma	0.50	10	0.10	
Microchirus frechkopi	0.18	36	0.03	
Arnoglossus imperialis	0.10	10	0.02	
Total	517.38		99.97	

PROJECT STATION: 372

DATE: 4/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 501
start stop duration Long W 525
TIME :08:16:18 08:46:27 30 (min) Purpose code: 3
LOG :8242.17 8243.68 1.50 Area code : 1
FDEPTH: 40 40 GearCond.code:
BDEPTH: 40 40 Validity code:
Towing dir: 85ø Wire out: 160 m Speed: 30 kn*10

Sorted: 77 Kg Total catch: 945.10 CATCH/HOUR: 1890.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	858.40	39486	45.41	1667
Chloroscombrus chrysurus	757.00	12232	40.05	1670
Trachurus trecae	163.80	2784	8.67	1668
Sphyraena guachancho	33.40	202	1.77	1673
Selene dorsalis	11.60	262	0.61	1672
Mustelus mustelus	11.60	8	0.61	
Pseudupeneus prayensis	10.20	88	0.54	1671
Octopus vulgaris	8.00	10	0.42	
Pagellus bellottii	7.20	116	0.38	1669
Sphyraena sphyraena	5.80	30	0.31	
Decapterus rhonchus	4.40	58	0.23	
Sardinella aurita	4.40	58	0.23	
Trichiurus lepturus	2.90	30	0.15	
Chelidonichthys gabonensis	2.90	30	0.15	
Scomberomorus tritor	2.20	4	0.12	
Raja miraletus	1.80	4	0.10	
Galeoides decadactylus	1.40	30	0.07	
Sardinella maderensis	1.40	58	0.07	
Pomadasys peroteti	0.80	2	0.04	
Pagellus bellottii	0.70	2	0.04	
Monochirus hispidus	0.30	30	0.02	
Total	1890.20		99.99	

PROJECT STATION: 373

DATE: 4/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 503
start stop duration Long W 525
TIME :09:40:52 10:09:42 29 (min) Purpose code: 3
LOG :8249.31 8250.80 1.48 Area code : 1
FDEPTH: 25 25 GearCond.code:
BDEPTH: 25 25 Validity code:
Towing dir: 84ø Wire out: 120 m Speed: 30 kn*10

Sorted: 114 Kg Total catch: 116.06 CATCH/HOUR: 240.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Mustelus mustelus	33.83	12	14.09	
Brachydeuterus auritus	30.93	3958	12.88	1688
Trichiurus lepturus	27.31	265	11.37	
Sepia officinalis hierredda	22.03	19	9.17	1687
Pomadasys jubelini	18.41	50	7.67	1678
Pteroscion peli	17.79	401	7.41	1686
Ilisha africana	10.03	1303	4.18	1681
Galeoides decadactylus	9.37	126	3.90	1682
Sphyraena guachancho	7.55	46	3.14	1675
Stromateus fiatola	6.83	14	2.84	1680
Selene dorsalis	6.21	145	2.59	1685
Lutjanus dentatus	6.10	2	2.54	
Pseudotolithus senegalensis	5.59	23	2.33	1677
Penaeus notialis	5.38	968	2.24	1674
Chloroscombrus chrysurus	5.17	163	2.15	1684
Sardinella maderensis	5.07	112	2.11	1676
Lethrinus atlanticus	3.93	10	1.64	1679
Lagocephalus laevigatus	3.72	6	1.55	
Cynoponticus ferox	2.59	2	1.08	
Raja sp.	2.38	6	0.99	
Pisodonophis semicinctus	1.76	6	0.73	
Uranoscopus polli	1.55	8	0.65	
Branchiostegus semifasciatus	1.30	6	0.54	
Pomadasys incisus	1.24	6	0.52	
Dentex canariensis	1.14	2	0.47	
Trachinus lineolatus	0.93	12	0.39	
Dasyatis marmorata	0.72	6	0.30	
Drepane africana	0.31	2	0.13	
Pseudupeneus prayensis	0.31	2	0.13	
Cynoglossus senegalensis	0.21	2	0.09	
Trachurus trecae	0.21	4	0.09	
Bothus podas africanus	0.10	6	0.04	
Sardinella aurita	0.10	2	0.04	
Total	240.10		99.99	

PROJECT STATION: 374

DATE: 4/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 501
start stop duration Long W 542
TIME :12:25:18 12:55:00 30 (min) Purpose code: 3
LOG :8271.76 8273.30 1.54 Area code : 1
FDEPTH: 21 21 GearCond.code:
BDEPTH: 21 21 Validity code:
Towing dir: 85ø Wire out: 120 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 91.64 CATCH/HOUR: 183.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ilisha africana	58.80	12348	32.08	1693
Pseudotolithus senegalensis	29.10	114	15.88	1696
Trichiurus lepturus	16.80	240	9.17	
Brachydeuterus auritus	12.30	330	6.71	1697
Sepia officinalis hierredda	11.50	28	6.27	1691
Parapenaeus longirostris	8.10	2268	4.42	1700
Galeoides decadactylus	7.80	90	4.26	1692
Chloroscombrus chrysurus	7.20	276	3.93	1699
Pomadasys jubelini	6.90	36	3.76	1694
Pteroscion peli	6.60	264	3.60	
Callinectes pallidus	3.30	12	1.80	
Sphyraena guachancho	3.00	24	1.64	
Pomadasys rogeri	3.00	18	1.64	1695
Caranx hippos	2.40	6	1.31	
Selene dorsalis	1.80	72	0.98	1701
Stromateus fiatola	1.50	6	0.82	
Pentanemus quinquarius	1.50	102	0.82	
Sardinella maderensis	0.90	78	0.49	1698
Drepane africana	0.60	12	0.33	
Cynoglossus senegalensis	0.18	6	0.10	
Total	183.28		100.01	

PROJECT STATION: 375

DATE: 4/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 457
start stop duration Long W 543
TIME :13:59:33 14:29:25 30 (min) Purpose code: 3
LOG :8281.13 8282.67 1.55 Area code : 1
FDEPTH: 45 45 GearCond.code:
BDEPTH: 45 45 Validity code:
Towing dir: 75ø Wire out: 140 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 81.71 CATCH/HOUR: 163.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	36.60	1610	22.40	1710
Mustelus mustelus	33.70	34	20.62	
Trichiurus lepturus	22.20	292	13.58	
Balistes capriscus	14.80	32	9.06	1706
Sepia officinalis hierredda	12.90	8	7.89	1702
Pomadasys incisus	9.60	72	5.87	1704
Pagellus bellottii	6.80	60	4.16	1703
Raja miraletus	5.20	12	3.18	
Pomadasys rogeri	4.60	16	2.81	1705
Epinephelus aeneus	3.30	2	2.02	
Penaeus notialis	2.40	12	1.47	
Galeoides decadactylus	2.20	28	1.35	1707
Stromateus fiatola	2.20		1.35	
Selene dorsalis	1.40	16	0.86	1708
Grammoplites gruveli	1.40	48	0.86	
Umbrina canariensis	1.00	4	0.61	
Lepidotrigla cadmani	0.80	4	0.49	
Dentex canariensis	0.60	4	0.37	
Trachurus trecae	0.60	8	0.37	
Sardinella maderensis	0.40	16	0.24	1709
Illex coindetii	0.20	4	0.12	
Serranus accraensis	0.20	12	0.12	
Chloroscombrus chrysurus	0.20	4	0.12	
Arnoglossus imperialis	0.08	20	0.05	
Microchirus frechkopi	0.04	4	0.02	
Total	163.42		99.99	

PROJECT STATION: 376

DATE: 4/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 453
start stop duration Long W 542
TIME :15:31:08 16:01:00 30 (min) Purpose code: 3
LOG :8290.18 8291.63 1.45 Area code : 1
FDEPTH: 65 65 GearCond.code:
BDEPTH: 65 65 Validity code:
Towing dir: 75ø Wire out: 200 m Speed: 30 kn*10

Sorted: 64 Kg Total catch: 942.11 CATCH/HOUR: 1884.22

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	774.90	211806	41.13	1719
Apsilus fuscus	556.20	1022	29.52	1718
Boops boops	294.30	6494	15.62	1717
Pagellus bellottii	62.10	918	3.30	1716
Dentex canariensis	58.20	78	3.09	1712
Lutjanus fulgens	28.50	50	1.51	1711
Mustelus mustelus	24.80	8	1.32	
Epinephelus aeneus	24.30	4	1.29	
Pseudupeneus prayensis	12.14	54	0.64	
Dentex angolensis	10.80	296	0.57	1720
Priacanthus arenatus	8.10	54	0.43	
Dentex gibbosus	5.50	12	0.29	1713
Fistularia petimba	5.40	80	0.29	
Pagrus caeruleostictus	3.70	10	0.20	1715
Pomadasys incisus	2.70	26	0.14	
Pagellus bellottii	2.60	10	0.14	1714
Epinephelus costae	2.50	2	0.13	
Pagrus africanus	2.20	4	0.12	1720
Octopus vulgaris	2.00	4	0.11	
Sardinella aurita	1.34	54	0.07	
Anthias anthias	1.34	80	0.07	
Dentex angolensis	0.60	4	0.03	
Total	1884.22		100.01	

PROJECT STATION: 377

DATE: 4/ 8/02 GEAR TYPE: PT No: 7 POSITION: Lat N 458
start stop duration Long W 551
TIME :23:09:05 23:39:03 30 (min) Purpose code: 1
LOG :8341.22 8342.86 1.63 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 23 27 Validity code:
Towing dir: 204ø Wire out: 135 m Speed: 32 kn*10

Sorted: 87 Kg Total catch: 87.32 CATCH/HOUR: 174.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	70.30	1746	40.25	1721
Chloroscombrus chrysurus	54.70	714	31.32	1724
Sardinella maderensis	31.60	790	18.09	1722
Ilisha africana	10.70	328	6.13	1727
Sardinella aurita	2.30	12	1.32	1723
Sphyraena guachancho	1.60	12	0.92	1726
Trichiurus lepturus	0.90	8	0.52	
Caranx crysos	0.70	4	0.40	
Sphyraena sphyraena	0.60	2	0.34	
Illex coindetii	0.60	104	0.34	
Selene dorsalis	0.40	8	0.23	1725
Trachurus trecae	0.20	2	0.11	
Grammoplites gruveli	0.04	2	0.02	
Total	174.64		99.99	

PROJECT STATION: 378

DATE: 5/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 442
start stop duration Long W 600
TIME :06:24:15 06:54:48 31 (min) Purpose code: 3
LOG :8374.04 8375.61 1.57 Area code : 1
FDEPTH: 94 94 GearCond.code:
BDEPTH: 94 94 Validity code:
Towing dir: 70ø Wire out: 280 m Speed: 30 kn*10

Sorted: 56 Kg Total catch: 115.06 CATCH/HOUR: 222.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Dentex angolensis	73.74	577	33.11	1731
Umbrina canariensis	27.87	192	12.51	1733
Trachurus trecae	27.29	645	12.25	1730
Brotula barbata	23.13	23	10.39	1729
Loligo vulgaris	13.06	1045	5.86	
Priacanthus arenatus	8.71	348	3.91	1732
Mustelus mustelus	7.35	2	3.30	
Zeus faber	6.97	23	3.13	1728
Trichiurus lepturus	6.68	6	3.00	
Dentex canariensis	5.23	12	2.35	1736
Boops boops	5.23	81	2.35	1735
Scorpaena angolensis	4.06	6	1.82	
Sphoeroides pachgaster	2.61	6	1.17	
Dentex canariensis	2.42	2	1.09	
Pagellus bellottii	2.32	35	1.04	1734
Raja miraletus	1.84	4	0.83	
Fistularia petimba	1.74	12	0.78	
Lepidotrigla cadmani	1.16	6	0.52	
Citharus linguatula	0.58	6	0.26	
Scomber japonicus	0.58	6	0.26	
Arnoglossus imperialis	0.06	6	0.03	
Cepola macrophthalma	0.06	6	0.03	
Total	222.69		99.99	

PROJECT STATION: 379

DATE: 5/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 447
start stop duration Long W 603
TIME :08:20:39 08:49:58 29 (min) Purpose code: 3
LOG :8385.08 8386.56 1.47 Area code : 1
FDEPTH: 60 59 GearCond.code:
BDEPTH: 60 59 Validity code:
Towing dir: 70ø Wire out: 200 m Speed: 30 kn*10

Sorted: 21 Kg Total catch: 21.00 CATCH/HOUR: 43.45

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Octopus vulgaris	10.34	19	23.80	
Brotula barbata	7.86	14	18.09	1741
Alloteuthis africana	6.21		14.29	
Fistularia petimba	5.69	21	13.10	
Trichiurus lepturus	2.79	21	6.42	
Priacanthus arenatus	2.28	89	5.25	1739
Caranx crysos	2.07	2	4.76	
Dentex angolensis	1.34	12	3.08	1740
Pseudupeneus prayensis	1.24	12	2.85	1737
Branchiostegus semifasciatus	1.03	2	2.37	
Raja miraletus	0.93	2	2.14	
Boops boops	0.62	12	1.43	1738
Stephanolepis hispidus	0.31	2	0.71	
Trachurus trecae	0.31	6	0.71	1742
Decapterus rhonchus	0.21	2	0.48	
Sphyraena sphyraena	0.21	2	0.48	
J E L L Y F I S H	0.00			
Total	43.44		99.96	

PROJECT STATION: 380

DATE: 5/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 450
start stop duration Long W 604
TIME :09:52:21 10:21:46 29 (min) Purpose code: 3
LOG :8393.00 8394.52 1.51 Area code : 1
FDEPTH: 40 40 GearCond.code:
BDEPTH: 40 40 Validity code:
Towing dir: 80ø Wire out: 160 m Speed: 30 kn*10

Sorted: 15 Kg Total catch: 78.03 CATCH/HOUR: 161.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	62.07	5121	38.45	1745
Trichiurus lepturus	44.28	439	27.43	
Octopus vulgaris	10.34	17	6.40	
Sepia officinalis hierredda	9.31	8	5.77	1743
Pagellus bellottii	7.66	56	4.74	1744
Sphyraena guachancho	6.62	83	4.10	1748
Chloroscombrus chrysurus	4.97	33	3.08	1746
Sardinella maderensis	2.48	116	1.54	1747
Stromateus fiatola	2.38	8	1.47	1749
Sepia officinalis hierredda	1.66	17	1.03	
Pseudotolithus senegalensis	1.34	2	0.83	
Alloteuthis africana	1.24	364	0.77	
Torpedo torpedo	1.03	4	0.64	
Sphyraena guachancho	0.93	2	0.58	
Decapterus rhonchus	0.83	8	0.51	
Trachurus trecae	0.83	8	0.51	
Umbrina canariensis	0.83	2	0.51	
Scomber japonicus	0.52	2	0.32	
Citharus linguatula	0.41	8	0.25	
Grammoplites gruveli	0.41	8	0.25	
Lepidotrigla cadmani	0.41	4	0.25	
Branchiostegus semifasciatus	0.17	58	0.11	
Galeoides decadactylus	0.17	8	0.11	
Boops boops	0.17	8	0.11	
Pseudupeneus prayensis	0.10	2	0.06	
Penaeus notialis	0.10	2	0.06	
Priacanthus arenatus	0.10	2	0.06	
Pteroscion peli	0.08	8	0.05	
Total	161.44		99.99	

PROJECT STATION: 381

DATE: 5/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 453
start stop duration Long W 605
TIME :11:18:40 11:47:55 29 (min) Purpose code: 3
LOG :8401.09 8402.59 1.49 Area code : 1
FDEPTH: 23 23 GearCond.code:
BDEPTH: 23 23 Validity code:
Towing dir: 85ø Wire out: 120 m Speed: 30 kn*10

Sorted: 96 Kg Total catch: 95.90 CATCH/HOUR: 198.41

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trichiurus lepturus	28.03	213	14.13	
Sepia officinalis hierredda	27.21	43	13.71	1759
Pteroscion peli	26.48	778	13.35	
Pseudotolithus senegalensis	15.72	134	7.92	1758
Parapenaeus longirostris	15.41	8632	7.77	
Parapenaeus longirostris	15.00	1800	7.56	
Pomadasys jubelini	9.21	23	4.64	1754
Portunus validus	7.24	29	3.65	
Pisodonophis semicinctus	6.72	17	3.39	
Pomadasys incisus	5.90	27	2.97	1753
Galeoides decadactylus	4.45	99	2.24	1756
Drepane africana	3.93	8	1.98	
Penaeus kerathurus	3.83	93	1.93	
Brachydeuterus auritus	3.52	64	1.77	1757
Stromateus fiatola	3.10	10	1.56	
Pomadasys rogeri	3.10	14	1.56	1755
Raja miraletus	3.00	6	1.51	
Chloroscombrus chrysurus	2.79	62	1.41	1750
Ilisha africana	2.69	281	1.36	1751
Dasyatis marmorata	2.59	10	1.31	
Selene dorsalis	1.45	46	0.73	1752
Torpedo nobiliana	1.45	2	0.73	
Callinectes pallidus	1.03	2	0.52	
Torpedo torpedo	1.03	2	0.52	
Albula vulpes	0.72	2	0.36	
Pentanemus quinquarius	0.72	19	0.36	
Sphyraena guachancho	0.52	8	0.26	
Cynoglossus senegalensis	0.41	8	0.21	
Chilomycterus spinosus mauret.	0.31	2	0.16	
Sardinella aurita	0.31	2	0.16	
Pseudupeneus prayensis	0.21	2	0.11	
Sardinella maderensis	0.10	2	0.05	
Rhinobatos albomaculatus	0.10	2	0.05	
Cynoponticus ferox	0.10	2	0.05	
Squilla mantis	0.04	2	0.02	
Total	198.42		100.01	

PROJECT STATION: 382

DATE: 5/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 450
start stop duration Long W 615
TIME :13:27:39 13:56:53 29 (min) Purpose code: 3
LOG :8417.28 8418.71 1.43 Area code : 1
FDEPTH: 28 28 GearCond.code:
BDEPTH: 28 28 Validity code:
Towing dir: 75ø Wire out: 120 m Speed: 30 kn*10

Sorted: 26 Kg Total catch: 264.15 CATCH/HOUR: 546.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Ilisha africana	126.21	8414	23.09	1766
Pseudotolithus senegalensis	91.66	159	16.77	1769
Pomadasys jubelini	87.21	246	15.96	1760
Sphyraena guachancho	35.48	74	6.49	1765
Cynoponticus ferox	23.69	41	4.33	
Galeoides decadactylus	21.72	87	3.97	1763
Trichiurus lepturus	19.45	695	3.56	
Sardinella maderensis	14.48	997	2.65	1770
Pseudotolithus typus	12.72	2	2.33	
Pteroscion peli	11.17	265	2.04	
Sepia officinalis hierredda	10.24	14	1.87	1764
Pomadasys rogeri	10.03	43	1.84	1761
Parapenaeus longirostris	9.93	1192	1.82	
Drepane africana	9.72	17	1.78	
Pseudotolithus senegalensis	8.69	217	1.59	1773
Selene dorsalis	7.86	257	1.44	1772
Chloroscombrus chrysurus	7.45	480	1.36	1768
Portunus validus	7.34	23	1.34	
Stromateus fiatola	6.21	8	1.14	
Pentanemus quinquarius	3.72	132	0.68	
Pisodonophis semicinctus	3.41	12	0.62	
Brachydeuterus auritus	3.31	108	0.61	1771
Pomadasys incisus	3.21	14	0.59	1762
Stromateus fiatola	2.48	8	0.45	
Sphyraena sphyraena	2.48	6	0.45	
Arius heudeloti	2.07	2	0.38	
Sphyraena guachancho	1.66	25	0.30	
Pomadasys peroteti	1.66	17	0.30	
Cynoglossus senegalensis	1.24	8	0.23	
Total	546.50		99.98	

PROJECT STATION: 383

DATE: 5/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 446
start stop duration Long W 618
TIME :15:31:43 16:02:22 31 (min) Purpose code: 3
LOG :8428.17 8429.72 1.56 Area code : 1
FDEPTH: 45 45 GearCond.code:
BDEPTH: 45 45 Validity code:
Towing dir: 75º Wire out: 140 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 127.51 CATCH/HOUR: 246.79

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	186.68	6720	75.64	1780
Pagellus bellottii	9.19	79	3.72	1774
Sepia officinalis hierredda	7.55	8	3.06	1779
Pseudotolithus senegalensis	5.90	15	2.39	1778
Trichiurus lepturus	5.90	79	2.39	
Raja miraletus	5.42	14	2.20	
Octopus vulgaris	3.87	6	1.57	
Umbrina canariensis	3.68	12	1.49	
Penaeus notialis	3.19	116	1.29	
Trachurus trecae	3.19	41	1.29	1776
Selene dorsalis	2.23	14	0.90	1775
Brotula barbata	1.74	21	0.71	
Perulibatrachus rossignoli	1.45	8	0.59	
Sphyraena guachancho	1.45	8	0.59	
Galeoides decadactylus	1.26	14	0.51	1777
Torpedo torpedo	1.06	2	0.43	
Cynoglossus senegalensis	0.87	4	0.35	
Ilisha africana	0.68	10	0.28	
Pteroscion peli	0.29	12	0.12	
Arnoglossus imperialis	0.23	10	0.09	
Sardinella aurita	0.19	6	0.08	
Grammoplites gruveli	0.19	15	0.08	
Boops boops	0.19	2	0.08	
Cynoglossus canariensis	0.15	2	0.06	
Syacium micrurum	0.10	2	0.04	
Squilla cadenati	0.06	4	0.02	
Antennarius sp.	0.04	2	0.02	
Citharus linguatula	0.02	2	0.01	
J E L L Y F I S H	0.00			
Total	246.77		100.00	

PROJECT STATION: 384

DATE: 5/ 8/02 GEAR TYPE: BT No: 8 POSITION: Lat N 439
start stop duration Long W 618
TIME :17:22:34 17:28:28 6 (min) Purpose code: 3
LOG :8439.82 8440.05 0.22 Area code : 1
FDEPTH: 82 80 GearCond.code: 8
BDEPTH: 82 80 Validity code: 1
Towing dir: 90º Wire out: 240 m Speed: 30 kn*10

Sorted: 50 Kg Total catch: 171.90 CATCH/HOUR: 1719.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1500.00	69130	87.26	1784
Trichiurus lepturus	129.50	190	7.53	
Sardinella aurita	30.00	1550	1.75	1785
Dentex angolensis	18.00	150	1.05	1781
Squatina oculata	12.50	10	0.73	
Fistularia petimba	12.00	80	0.70	
Brotula barbata	7.50	20	0.44	1783
Zeus faber	5.00	20	0.29	1782
Selene dorsalis	2.50	10	0.15	
Lepidotrigla cadmani	1.00	10	0.06	
Illex coindetii	0.50	10	0.03	
Pagellus bellottii	0.50	10	0.03	
Total	1719.00		100.02	

PROJECT STATION: 385

DATE: 6/ 8/02 GEAR TYPE: PT No: 7 POSITION: Lat N 444
start stop duration Long W 629
TIME :23:33:24 00:03:37 30 (min) Purpose code: 1
LOG :8489.89 8491.49 1.59 Area code : 1
FDEPTH: 0 10 GearCond.code:
BDEPTH: 37 39 Validity code:
Towing dir: 235º Wire out: 140 m Speed: 30 kn*10

Sorted: Kg Total catch: CATCH/HOUR.

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
J E L L Y F I S H	0.00			

PROJECT STATION: 386

DATE: 6/ 8/02 GEAR TYPE: BT No: 14 POSITION: Lat N 434
start stop duration Long W 637
TIME :06:25:51 06:55:25 30 (min) Purpose code: 3
LOG :8517.30 8518.81 1.50 Area code : 1
FDEPTH: 81 81 GearCond.code:
BDEPTH: 81 81 Validity code:
Towing dir: 65º Wire out: 240 m Speed: 30 kn*10

Sorted: 130 Kg Total catch: 687.75 CATCH/HOUR: 1375.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus trecae	1033.60	55126	75.14	1798
Umbrina canariensis	81.70	324	5.94	1796
Trichiurus lepturus	38.00	52	2.76	
Sardinella aurita	37.00	892	2.69	1791
Epinephelus aeneus	36.20	4	2.63	1786
Pagellus bellottii	24.70	362	1.80	1797
Boops boops	20.00	494	1.45	1792
Squatina oculata	15.70	4	1.14	
Dentex canariensis	10.50	12	0.76	1788
Brotula barbata	9.50	76	0.69	1794
Dentex angolensis	8.60	210	0.63	1795
Brotula barbata	6.90	8	0.50	1787
Prlacanthus arenatus	6.60	152	0.48	1793
Dentex angolensis	6.20	68	0.45	1790
Zeus faber	5.70	20	0.41	
Lophiodes kempi	5.70	20	0.41	
Scorpaena angolensis	5.70	6	0.41	
Citharus linguatula	3.80	152	0.28	
Grammoplites gruveli	2.80	40	0.20	
Lepidotrigla cadmani	2.80	38	0.20	
Scyliorhinus cervigoni	2.40	2	0.17	
Umbrina canariensis	2.20	4	0.16	
Serranus africana	1.90	76	0.14	
Illex coindetii	1.00	58	0.07	
Saurida brasiliensis	1.00	190	0.07	
Pseudupeneus prayensis	1.00	6	0.07	1789
Raja miraletus	0.90	4	0.07	
Priacanthus arenatus	0.80	2	0.06	
Fistularia petimba	0.70	4	0.05	
Pagellus bellottii	0.60	4	0.04	
Branchiostegus semifasciatus	0.60	2	0.04	
Chaetodon hoefleri	0.50	2	0.04	
Arnoglossus imperialis	0.20	40	0.01	
Total	1375.50		99.96	

PROJECT STATION: 387

DATE: 6/ 8/02 GEAR TYPE: BT No: 14 POSITION: Lat N 438
start stop duration Long W 637
TIME :08:20:43 08:50:28 30 (min) Purpose code: 3
LOG :8526.26 8527.80 1.54 Area code : 1
FDEPTH: 55 55 GearCond.code:
BDEPTH: 55 55 Validity code:
Towing dir: 63º Wire out: 190 m Speed: 30 kn*10

Sorted: 55 Kg Total catch: 54.97 CATCH/HOUR: 109.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	40.40	5028	36.75	1799
Brotula barbata	19.50		17.74	
Trachurus trecae	10.80	638	9.82	1805
Octopus vulgaris	9.00	12	8.19	
Ephippion guttifer	6.30	2	5.73	
Boops boops	4.00	220	3.64	1804
Trichiurus lepturus	3.70	180	3.37	
Pagellus bellottii	2.40	38	2.18	1802
Sepia officinalis hierredda	2.00	2	1.82	
Torpedo torpedo	1.60	2	1.46	
Selene dorsalis	1.60	4	1.46	1801
Sphyraena guachancho	1.40	8	1.27	1807
Citharus linguatula	1.10	30	1.00	
Illex coindetii	1.00	140	0.91	
Parapenaeus longirostris	0.80	80	0.73	1806
Dentex angolensis	0.60	8	0.55	1800
Chelidonichthys gabonensis	0.50	4	0.45	
Priacanthus arenatus	0.50	22	0.45	1803
Epinephelus aeneus	0.50	2	0.45	
Pegusa lascaris	0.40	2	0.36	
Saurida brasiliensis	0.40	60	0.36	
Grammoplites gruveli	0.30	2	0.27	
Sardinella aurita	0.30	6	0.27	
GOBIIDAE	0.20	68	0.18	
Fistularia petimba	0.20	2	0.18	
Scyllarides herklotsii	0.10	20	0.09	
Sepia sp.	0.10	12	0.09	
Sardinella maderensis	0.10	6	0.09	
Decapterus punctatus	0.10	2	0.09	
Arnoglossus imperialis	0.04	4	0.04	
Microchirus frechkopi	0.02	2	0.02	
Total	109.96		100.01	

PROJECT STATION: 388

DATE: 6/ 8/02 GEAR TYPE: BT No: 14 POSITION: Lat N 441
start stop duration Long W 637
TIME :09:55:53 10:24:44 29 (min) Purpose code: 3
LOG :8534.39 8535.88 1.48 Area code : 1
FDEPTH: 35 35 GearCond.code:
BDEPTH: 35 35 Validity code:
Towing dir: 70º Wire out: 140 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 151.91 CATCH/HOUR: 314.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	87.72	7519	27.91	1814
Galeoides decadactylus	25.24	614	8.03	1819
Ilisha africana	25.24	1556	8.03	1817
Sardinella maderensis	18.21	1179	5.79	1820
Pomadasys jubelini	17.69	19	5.63	1812
Trichiurus lepturus	12.41	281	3.95	
Pseudotolithus senegalensis	12.41	41	3.95	1810
Ephippion guttifer	11.79	6	3.75	
Pteroscion peli	11.59	650	3.69	1818
Selene dorsalis	9.52	215	3.03	1816
Torpedo torpedo	9.10	50	2.90	
Pomadasys peroteti	7.86	25	2.50	1813
Penaeus notialis	7.66	184	2.44	1809
Sphyraena guachancho	7.03	182	2.24	1821
Pagellus bellottii	7.03	50	2.24	1815
Torpedo torpedo	5.17	25	1.64	
Sepia officinalis hierredda	3.93	6	1.25	1808
Pomadasys incisus	3.72	66	1.18	1822
Dasyatis margarita	3.52	2	1.12	
Panulirus regius	3.10	2	0.99	
Eucinostomus melanopterus	2.48	50	0.79	
Grammoplites gruveli	2.48	124	0.79	
Sphyraena guachancho	2.48	6	0.79	1811
Perulibatrachus elminensis	2.07	17	0.66	
Raja miraletus	2.07	8	0.66	
Sphyraena sphyraena	2.07	8	0.66	
Scyllarides herklotsii	1.66	17	0.53	
Pseudotolithus senegalensis	1.66	33	0.53	1824
Galeoides decadactylus	1.55	8	0.49	1823
Sepia officinalis hierredda	0.83	58	0.26	
Trachurus trecae	0.83	8	0.26	
Pagellus bellottii	0.62	2	0.20	
Trichiurus lepturus	0.62	2	0.20	
Pomadasys incisus	0.52	2	0.17	
Cynoglossus canariensis	0.52	2	0.17	
Sphyraena sphyraena	0.52	2	0.17	
Raja miraletus	0.41	2	0.13	
Illex coindetii	0.33	91	0.10	
Cynoglossus senegalensis	0.25	8	0.08	
Epinephelus aeneus	0.21	2	0.07	
Chloroscombrus chrysurus	0.17	8	0.05	
Total	314.29		100.02	

PROJECT STATION: 389

DATE: 6/ 8/02 GEAR TYPE: BT No:14 POSITION: Lat N 438
start stop duration Long W 648
TIME :12:24:20 12:54:21 30 (min) Purpose code: 3
LOG :8551.94 8553.44 1.49 Area code : 1
FDEPTH: 29 28 GearCond.code:
BDEPTH: 29 28 Validity code:
Towing dir: 73ø Wire out: 120 m Speed: 30 kn*10

Sorted: 296 Kg Total catch: 171.04 CATCH/HOUR: 342.08

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Pseudotolithus senegalensis	66.90	284	19.56	1826
Trichiurus lepturus	64.40	1030	18.83	
Ilisha africana	50.40	8820	14.73	1836
Pteroscion peli	48.80	1774	14.27	
Brachydeuterus auritus	21.60	448	6.31	1832
Cynoponticus ferox	14.80	18	4.33	
Galeoides decadactylus	12.50	54	3.65	1825
Pseudotolithus senegalensis	11.20	264	3.27	1833
Pomadasys incisus	7.60	36	2.22	1829
Stromateus fiatola	6.40	18	1.87	1830
Sphyraena guachancho	6.20	12	1.81	1827
Selene dorsalis	5.60	232	1.64	1834
Dasyatis marmorata	4.10	8	1.20	
Sepia officinalis hierredda	3.40	8	0.99	1831
Parapenaeus longirostris	2.80	320	0.82	
Pomadasys jubelini	2.40	2	0.70	1828
Cynoglossus senegalensis	1.80	8	0.53	
Chloroscombrus chrysurus	1.60	24	0.47	
Panulirus regius	1.50	8	0.44	
Pisodonophis semicinctus	1.50	6	0.44	
Raja miraletus	1.30	2	0.38	
Sardinella maderensis	1.20	80	0.35	1835
Umbrina canariensis	1.00	4	0.29	
Drepane africana	0.80	16	0.23	
Torpedo torpedo	0.80	2	0.23	
Cynoglossus senegalensis	0.40	8	0.12	
Galeoides decadactylus	0.32	12	0.09	
Penaeus notialis	0.30	4	0.09	
Muraena helena	0.30	2	0.09	
Pentanemus quinquarius	0.16	8	0.05	
Total	342.08		100.00	

PROJECT STATION: 390

DATE: 6/ 8/02 GEAR TYPE: BT No:14 POSITION: Lat N 433
start stop duration Long W 656
TIME :14:41:34 15:11:31 30 (min) Purpose code: 3
LOG :8568.16 8569.62 1.45 Area code : 1
FDEPTH: 44 43 GearCond.code:
BDEPTH: 44 43 Validity code:
Towing dir: 65ø Wire out: 140 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 418.25 CATCH/HOUR: 836.50

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	598.80	20322	71.58	1838
Trichiurus lepturus	61.20	1128	7.32	
Perulibatrachus rossignoli	21.60	144	2.58	
Pagellus bellottii	21.10	210	2.52	1837
Raja miraletus	17.10	48	2.04	
Ilisha africana	16.80	504	2.01	1841
Dasyatis marmorata	13.10	4	1.57	
Selene dorsalis	10.80	216	1.29	1839
Sepia officinalis hierredda	10.20	10	1.22	1844
Sardinella maderensis	8.40	552	1.00	1840
Pseudotolithus senegalensis	8.40	22	1.00	1846
Pomadasys incisus	7.20	96	0.86	
Trachurus trecae	7.20	144	0.86	1842
Galeoides decadactylus	6.20	30	0.74	1843
Penaeus notialis	5.40	160	0.65	
Ephippion guttifer	4.10	4	0.49	
Pomadasys jubelini	3.20	2	0.38	
Torpedo torpedo	2.80	12	0.33	
Brotula barbata	2.40	48	0.29	
Grammoplites gruveli	2.40	96	0.29	
Galeoides decadactylus	2.40	48	0.29	
Sphyraena guachancho	2.20	6	0.26	1845
Pteroscion peli	1.20	72	0.14	
Umbrina canariensis	1.20	4	0.14	
Pomadasys incisus	0.80	4	0.10	
Lagocephalus laevigatus	0.30	2	0.04	
Total	836.50		99.99	

PROJECT STATION: 391

DATE: 6/ 8/02 GEAR TYPE: BT No:14 POSITION: Lat N 430
start stop duration Long W 655
TIME :16:18:46 16:48:28 30 (min) Purpose code: 3
LOG :8576.15 8577.64 1.48 Area code : 1
FDEPTH: 62 62 GearCond.code:
BDEPTH: 62 62 Validity code:
Towing dir: 73ø Wire out: 190 m Speed: 30 kn*10

Sorted: 662 Kg Total catch: 780.66 CATCH/HOUR: 1561.32

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	1403.60	74110	89.90	1851
Brotula barbata	40.00	78	2.56	
Brachydeuterus auritus	26.40	4118	1.69	1854
Trichiurus lepturus	23.40	76	1.50	
Boops boops	17.60	792	1.13	1852
Selene dorsalis	15.50	62	0.99	1849
Sepia officinalis hierredda	7.70	10	0.49	1850
Dentex angolensis	7.00	48	0.45	1846
Raja miraletus	4.70	8	0.30	
Sardinella aurita	4.40	176	0.28	1855
Priacanthus arenatus	4.40	198	0.28	1853
Pagellus bellottii	1.80	26	0.12	1847
Sphyraena guachancho	1.60	8	0.10	1848
Zeus faber	1.40	4	0.09	
Citharus linguatula	0.92	12	0.06	
Umbrina canariensis	0.50	2	0.03	
Pteroscion peli	0.40	2	0.03	
Total	1561.32		100.00	

PROJECT STATION: 392

DATE: 6/ 8/02 GEAR TYPE: BT No:14 POSITION: Lat N 428
start stop duration Long W 654
TIME :17:38:35 18:07:45 29 (min) Purpose code: 3
LOG :8583.28 8584.69 1.40 Area code : 1
FDEPTH: 82 81 GearCond.code:
BDEPTH: 82 81 Validity code:
Towing dir: 65ø Wire out: 240 m Speed: 30 kn*10

Sorted: 116 Kg Total catch: 267.20 CATCH/HOUR: 552.83

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	162.21	6372	29.34	1862
Umbrina canariensis	147.72	755	26.72	1861
Dentex angolensis	47.79	484	8.64	1863
Dentex canariensis	41.90	41	7.58	1859
Pagellus bellottii	29.38	364	5.31	1865
Brotula barbata	27.41	31	4.96	1857
Epinephelus aeneus	22.45	2	4.06	1856
Squatina oculata	17.90	6	3.24	
Scomber japonicus	10.14	87	1.83	1866
Brotula barbata	6.52	37	1.18	1867
Dentex congoensis	6.52	66	1.18	1864
Branchiostegus semifasciatus	5.38	14	0.97	
Lepidotrigla cadmani	3.93	43	0.71	
Zeus faber	3.62	14	0.65	
Chaetodon hoefleri	3.62	14	0.65	
Scorpaena angolensis	2.90	23	0.52	
Pseudupeneus prayensis	2.48	14	0.45	
Uranoscopus polli	1.45	8	0.26	
Sargocentron hastatus	1.45	8	0.26	
Priacanthus arenatus	1.45	14	0.26	
Raja miraletus	1.34	4	0.24	
Dentex gibbosus	1.24	4	0.22	1860
Dentex angolensis	1.14	4	0.21	1858
Saurida brasiliensis	1.03	252	0.19	
Boops boops	0.72	14	0.13	
Citharus linguatula	0.72	14	0.13	
Illex coindetii	0.41	29	0.07	
Total	552.82		99.96	

PROJECT STATION: 393

DATE: 7/ 8/02 GEAR TYPE: PT No: 7 POSITION: Lat N 426
start stop duration Long W 704
TIME :00:20:16 00:36:37 16 (min) Purpose code: 1
LOG :8635.67 8636.55 0.88 Area code : 1
FDEPTH: 0 0 GearCond.code:
BDEPTH: 73 76 Validity code:
Towing dir: 190ø Wire out: 120 m Speed: 34 kn*10

Sorted: 1 Kg Total catch: 1.35 CATCH/HOUR: 5.06

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	2.63	146	51.98	1868
Trichiurus lepturus	2.25	4	44.47	
Saurida brasiliensis	0.19	83	3.75	
Total	5.07		100.20	

PROJECT STATION: 394

DATE: 7/ 8/02 GEAR TYPE: BT No:14 POSITION: Lat N 416
start stop duration Long W 713
TIME :06:29:20 06:59:05 30 (min) Purpose code: 3
LOG :8679.21 8680.75 1.50 Area code : 1
FDEPTH: 83 82 GearCond.code:
BDEPTH: 83 82 Validity code:
Towing dir: 65ø Wire out: 240 m Speed: 30 kn*10

Sorted: 47 Kg Total catch: 46.52 CATCH/HOUR: 93.04

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Pagellus bellottii	27.50	344	29.56	1874
Mustelus mustelus	19.60	4	21.07	
Dentex canariensis	10.10	12	10.86	1871
Scomber japonicus	6.20	52	6.66	1875
Priacanthus arenatus	4.80	46	5.16	1876
Boops boops	4.80	192	5.16	1869
Dentex congoensis	4.40	88	4.73	1872
Raja miraletus	3.30	8	3.55	
Sarda sarda	2.70	2	2.90	
Umbrina canariensis	2.50	10	2.69	1873
Zeus faber	2.10	10	2.26	1877
Illex coindetii	1.50	88	1.61	
Dentex angolensis	1.00	40	1.07	1870
Sepia officinalis hierredda	0.70	6	0.75	1878
Dentex gibbosus	0.70	2	0.75	
Brotula barbata	0.30	2	0.32	
Dactylopterus volitans	0.30	4	0.32	
Arnoglossus imperialis	0.24	36	0.26	
Saurida brasiliensis	0.10	4	0.11	
Grammoplites gruveli	0.10	2	0.11	
Citharus linguatula	0.04	2	0.04	
Lepidotrigla carolae	0.04	2	0.04	
Serranus africana	0.02	2	0.02	
Total	93.04		100.00	

PROJECT STATION: 395

DATE: 7/ 8/02 GEAR TYPE: BT No:14 POSITION:Lat N 422
start stop duration Long W 714
TIME :10:44:41 11:14:06 29 (min) Purpose code: 3
LOG :8694.34 8695.80 1.46 Area code : 1
FDEPTH: 67 65 GearCond.code:
BDEPTH: 67 65 Validity code:
Towing dir: 75º Wire out: 200 m Speed: 30 kn*10

Sorted: 66 Kg Total catch: 281.88 CATCH/HOUR: 583.20

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus trecae	434.07	24070	74.43	1885
Epinephelus aeneus	22.97	4	3.94	1880
Pagellus bellottii	17.01	159	2.92	1884
Brotula barbata	15.83		2.71	
Dentex angolensis	13.03	72	2.23	1882
Dentex canariensis	12.21	25	2.09	1883
Fistularia petimba	6.31	25	1.08	
Dentex angolensis	6.17	58	1.06	
Pomadasys incisus	5.79	29	0.99	
Trichiurus lepturus	5.59	6	0.96	
Priacanthus arenatus	3.97	35	0.68	
Pagellus bellottii	3.72	27	0.64	1881
Pseudupeneus prayensis	3.62	21	0.62	
Rhinobatos albomaculatus	3.31	2	0.57	
Umbrina canariensis	3.10	6	0.53	
Torpedo torpedo	2.48	2	0.43	
Raja miraletus	2.28	4	0.39	
Chilomycterus spinosus mauret	2.17	6	0.37	
Alloteuthis africana	2.17		0.37	
Saurida brasiliensis	2.17	434	0.37	
Pagrus caeruleostictus	2.17	4	0.37	1879
Zeus faber	2.07	6	0.35	
Scorpaena angolensis	2.07	2	0.35	
Pomadasys incisus	1.86	8	0.32	
Priacanthus arenatus	1.24	6	0.21	
Brotula barbata	1.08	6	0.19	
Chaetodon hoefleri	1.08	6	0.19	
Grammoplites gruveli	1.08	14	0.19	
Branchiostegus semifasciatus	0.93	2	0.16	
Chaetodon marcellae	0.72	14	0.12	
Dactylopterus volitans	0.52	2	0.09	
Sepia officinalis hierredda	0.41	2	0.07	
Total	583.20		99.99	

PROJECT STATION: 396

DATE: 7/ 8/02 GEAR TYPE: BT No:14 POSITION:Lat N 426
start stop duration Long W 715
TIME :12:20:19 12:46:50 27 (min) Purpose code: 3
LOG :8703.68 8705.03 1.34 Area code : 1
FDEPTH: 42 45 GearCond.code:
BDEPTH: 42 45 Validity code:
Towing dir: 60º Wire out: 140 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 218.80 CATCH/HOUR: 486.22

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	137.78	5511	28.34	1892
Galeoides decadactylus	112.11	251	23.06	1890
Trichiurus lepturus	79.44	1022	16.34	
Pteroscion peli	39.44	1211	8.11	
Pseudotolithus senegalensis	22.67	91	4.66	1889
Pomadasys jubelini	16.44	11	3.38	1891
Priacanthus arenatus	15.56	344	3.20	1888
Raja miraletus	13.33	24	2.74	
Cynoponticus ferox	10.00	9	2.06	
Sepia officinalis hierredda	7.78	11	1.60	
Portunus validus	7.22	11	1.48	
Ilisha africana	6.11	656	1.26	1887
Dasyatis margarita	5.44	7	1.12	
Grammoplites gruveli	3.89	178	0.80	
Cynoglossus canariensis	2.56	7	0.53	
Stromateus fiatola	2.11	2	0.43	
Trachurus trecae	1.11	67	0.23	
Torpedo torpedo	1.11	7	0.23	
Sphyraena guachancho	0.89	2	0.18	
Pisodonophis semicinctus	0.67	2	0.14	
Dicologoglossa hexophthalma	0.56	22	0.12	
Total	486.22		100.01	

PROJECT STATION: 397

DATE: 7/ 8/02 GEAR TYPE: BT No:14 POSITION:Lat N 419
start stop duration Long W 729
TIME :14:58:53 15:28:12 29 (min) Purpose code: 3
LOG :8724.07 8725.48 1.40 Area code : 1
FDEPTH: 28 28 GearCond.code:
BDEPTH: 28 28 Validity code:
Towing dir: 90º Wire out: 130 m Speed: 30 kn*10

Sorted: 145 Kg Total catch: 145.10 CATCH/HOUR: 300.21

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Pseudotolithus senegalensis	93.52	523	31.15	1893
Trichiurus lepturus	59.79	1233	19.92	
Galeoides decadactylus	35.69	130	11.89	1895
Brachydeuterus auritus	28.03	581	9.34	1894
Selene dorsalis	22.97	317	7.65	1896
Ilisha africana	13.03	617	4.34	1899
Pomadasys jubelini	9.10	17	3.03	1897
Pteroscion peli	8.38	197	2.79	
Cynoponticus ferox	5.17	8	1.72	
Dasyatis margarita	5.07	10	1.69	
Sepia officinalis hierredda	3.72	21	1.24	1900
Drepane africana	3.31	10	1.10	
Dasyatis pastinaca	3.31	2	1.10	
Parapenaeus longirostris	2.59	391	0.86	
Epinephelus aeneus	1.45	2	0.48	
Cynoglossus senegalensis	1.14	10	0.38	
Sphyraena guachancho	0.93	10	0.31	1898
Pisodonophis semicinctus	0.83	2	0.28	
Cynoglossus browni	0.62	8	0.21	
Portunus validus	0.52	4	0.17	
Chloroscombrus chrysurus	0.52	8	0.17	
Pentanemus quinquarius	0.21	2	0.07	
Sardinella maderensis	0.21	12	0.07	
Trachurus trecae	0.10	4	0.03	
Total	300.21		99.99	

PROJECT STATION: 398

DATE: 7/ 8/02 GEAR TYPE: BT No:14 POSITION:Lat N 417
start stop duration Long W 729
TIME :16:16:26 16:46:18 30 (min) Purpose code: 3
LOG :8730.40 8731.83 1.43 Area code : 1
FDEPTH: 40 40 GearCond.code:
BDEPTH: 40 40 Validity code:
Towing dir: 70º Wire out: 140 m Speed: 30 kn*10

Sorted: 58 Kg Total catch: 570.92 CATCH/HOUR: 1141.84

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brachydeuterus auritus	1009.80	97872	88.44	1902
Trachurus trecae	54.14	2828	4.74	1903
Pteroscion peli	19.00	760	1.66	
Mustelus mustelus	13.00	10	1.14	
Pseudotolithus senegalensis	10.60	92	0.93	1901
Cynoponticus ferox	5.00	4	0.44	
Priacanthus arenatus	4.74	152	0.42	1905
Ilisha africana	4.74	304	0.42	1906
Galeoides decadactylus	4.74	246	0.42	1904
Ephippion guttifer	2.90	2	0.25	
Arius heudeloti	2.60	2	0.23	
Raja miraletus	2.50	8	0.22	
Portunus validus	2.00	4	0.18	
Mystriophis rostellatus	2.00	2	0.18	
Cynoglossus senegalensis	1.20	2	0.11	
Sphyraena guachancho	0.94	18	0.08	
Grammoplites gruveli	0.94	38	0.08	
Penaeus notialis	0.80	20	0.07	
Remora remora	0.20	2	0.02	
Total	1141.84		100.03	

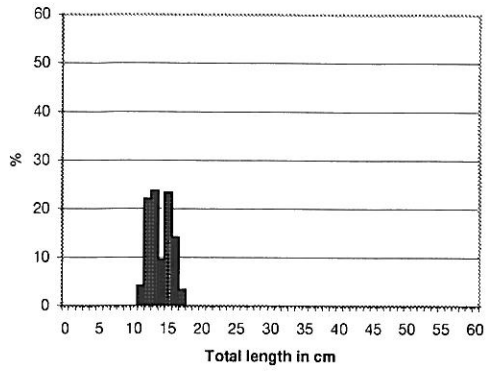
PROJECT STATION: 399

DATE: 7/ 8/02 GEAR TYPE: BT No:14 POSITION:Lat N 414
start stop duration Long W 728
TIME :17:40:24 18:10:42 30 (min) Purpose code: 3
LOG :8738.74 8740.28 1.53 Area code : 1
FDEPTH: 75 76 GearCond.code:
BDEPTH: 75 76 Validity code:
Towing dir: 70º Wire out: 230 m Speed: 30 kn*10

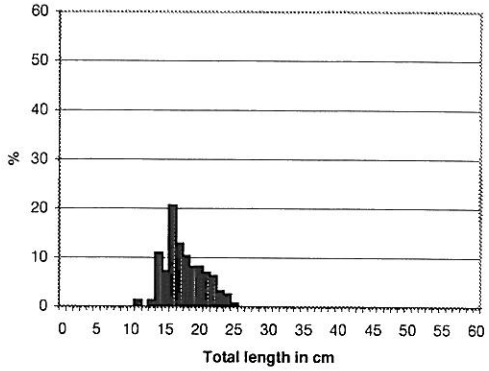
Sorted: 59 Kg Total catch: 59.28 CATCH/HOUR: 118.56

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Brotula barbata	25.50	62	21.51	1906
Trichiurus lepturus	21.00	40	17.71	
Squatina oculata	21.00	8	17.71	
Pentheroscion mbizi	9.60	72	8.10	1914
Uranoscopus polli	9.20	34	7.76	
Dentex angolensis	7.50	88	6.33	1907
Priacanthus arenatus	5.90	200	4.98	1915
Sepia officinalis hierredda	5.20	70	4.39	1913
Citharus linguatula	2.60	38	2.19	
Mustelus mustelus	2.40	2	2.02	
Lepidotrigla cadmani	2.10	22	1.77	
Raja miraletus	1.20	2	1.01	
Pagellus bellottii	1.10	14	0.93	1908
Trachurus trecae	1.00	54	0.84	1911
Saurida brasiliensis	0.80	144	0.67	
Pegusa lascaris	0.70	4	0.59	
Boops boops	0.50	22	0.42	1910
Umbrina canariensis	0.40	2	0.34	
Parapenaeus longirostris	0.30	32	0.25	1912
Grammoplites gruveli	0.20	6	0.17	
Scomber japonicus	0.20	2	0.17	
Sphoeroides marmoratus	0.10	6	0.08	
Squilla mantis	0.06	2	0.05	
J E L L Y F I S H	0.00			
Total	118.56		99.99	

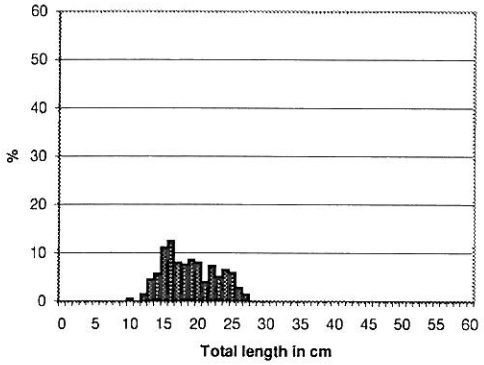
Annex II Length distributions of main species



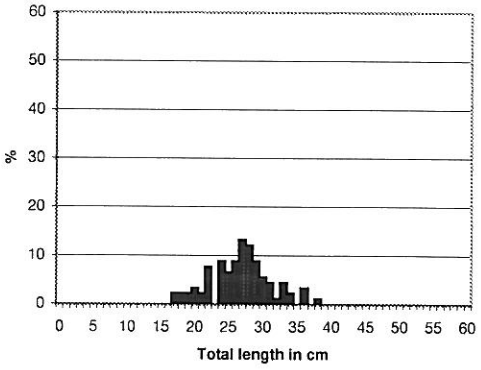
Boops boops Benin
Mean length = 14.3 cm N = 96



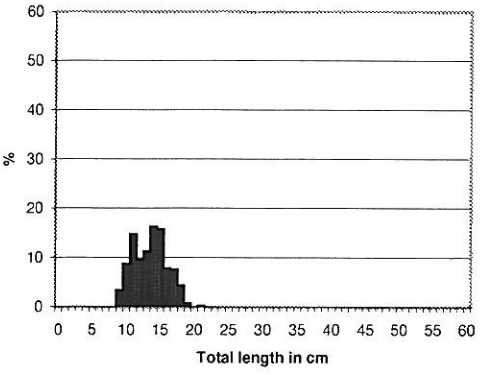
Pagellus bellottii Benin
Mean length = 18.2 cm N = 112



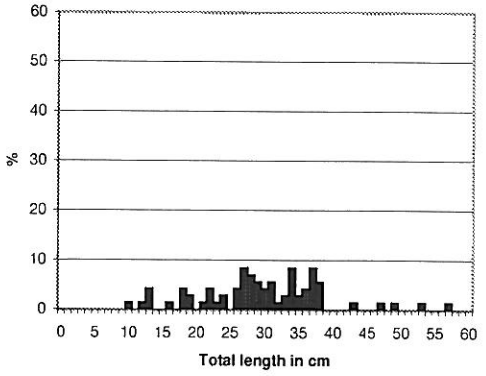
Dentex angolensis Benin
Mean length = 19.3 cm N = 158



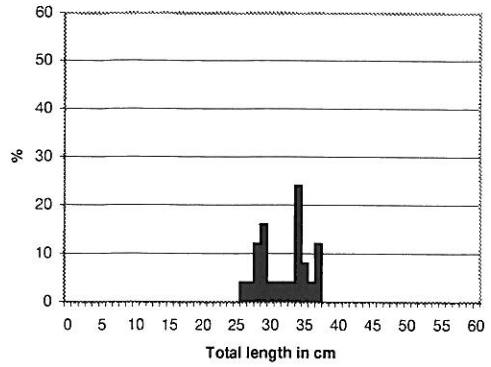
Pagrus caeruleostictus Benin
Mean length = 27.2 cm N = 91



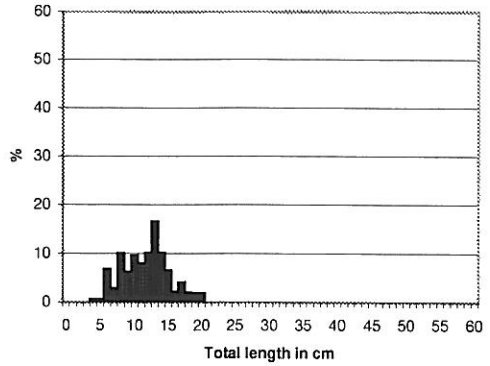
Dentex congoensis Benin
Mean length = 14.0 cm N = 238



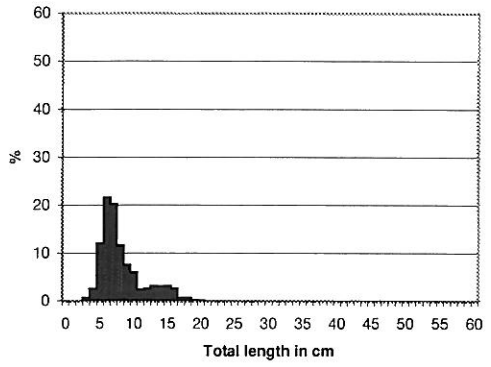
Pseudotolithus senegalensis Benin
Mean length = 33.2 cm N = 72



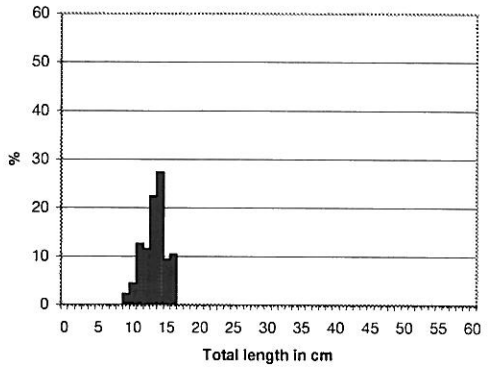
Lethrinus atlanticus Benin
Mean length = 32.5 cm N = 25



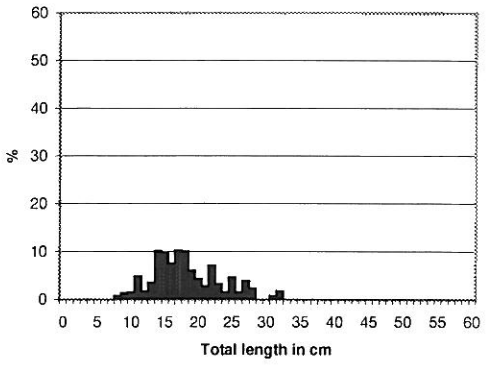
Ilisha africana Benin
Mean length = 12.3 cm N = 194



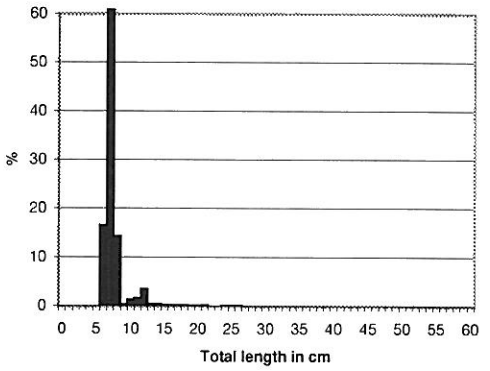
Brachydeuterus auritus Benin
Mean length = 8.6 cm N = 344



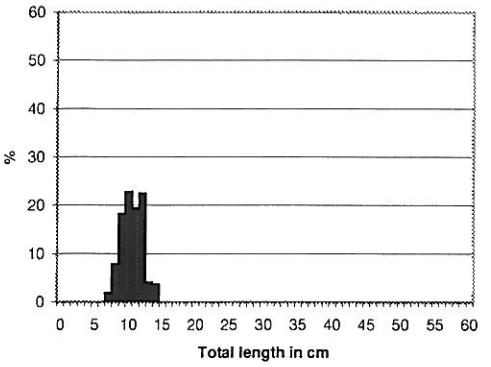
Sardinella aurita Benin
Mean length = 13.7 cm N = 46



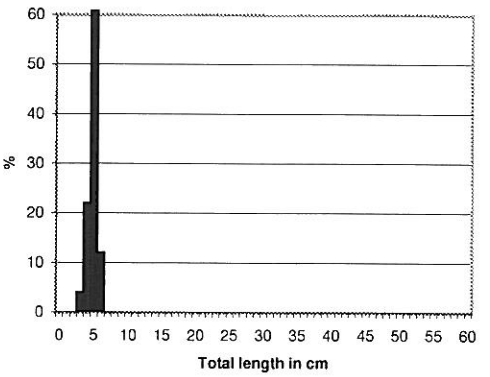
Galeoides decadactylus Benin
Mean length = 18.7 cm N = 178



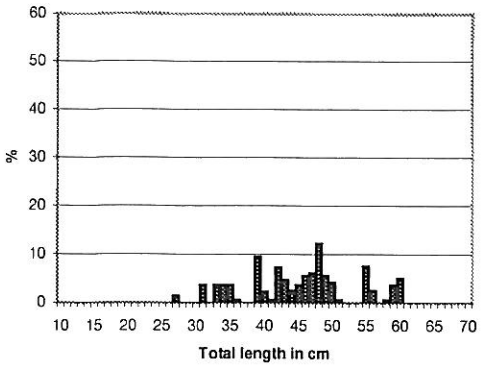
Sardinella maderensis Benin
Mean length = 7.9 cm N = 131



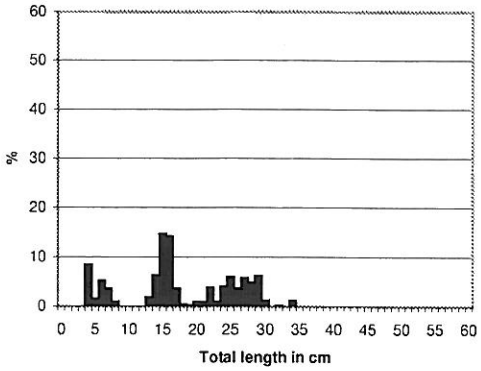
Priacanthus arenatus Benin
Mean length = 11.0 cm N = 61



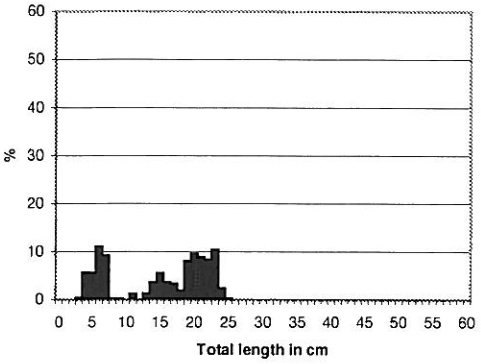
Engraulis encrasicolus Benin
Mean length = 5.3 cm N = 50



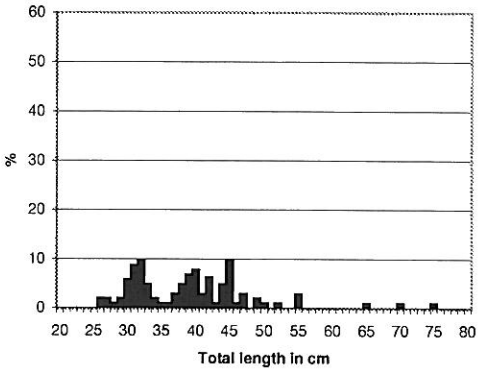
Alectis alexandrinus Benin
Mean length = 45.8 cm N = 54



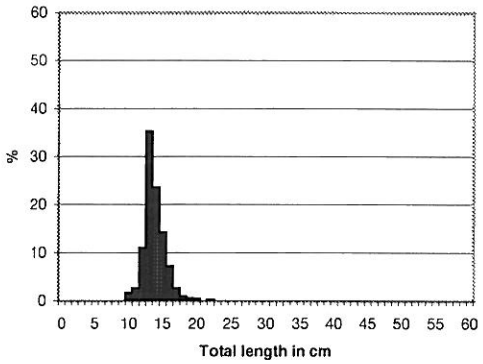
Selene dorsalis Benin
Mean length = 18.1 cm N = 180



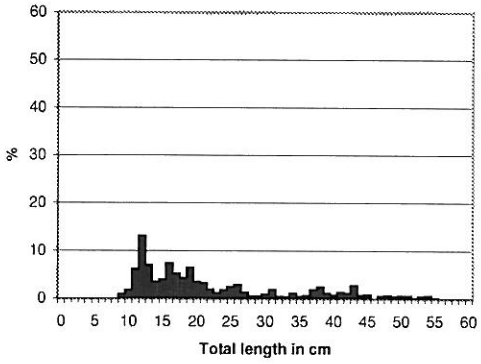
Chloroscombrus chrysurus Benin
Mean length = 15.6 cm N = 284



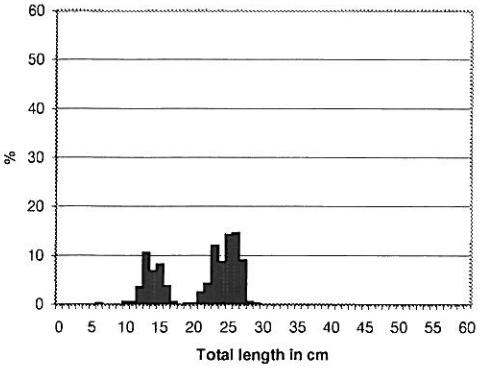
Scomberomorus tritor Benin
Mean length = 39.5 cm N = 104



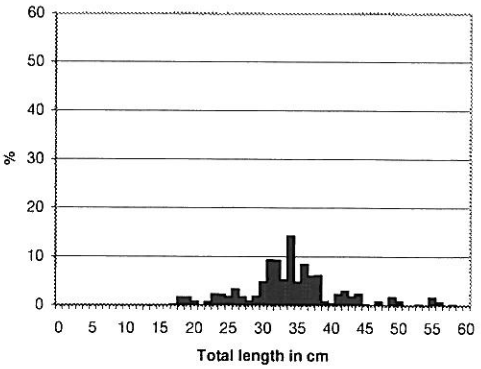
Decapterus punctatus Benin
Mean length = 14.3 cm N = 178



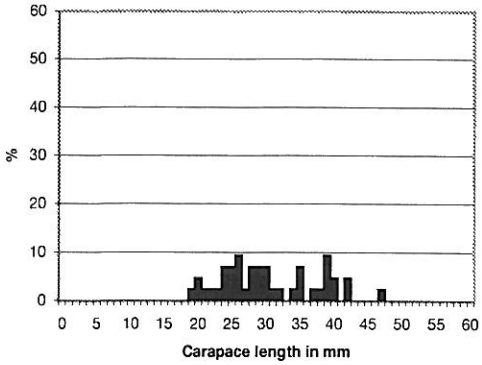
Sphyraena guachancho Benin
Mean length = 22.1 cm N = 240



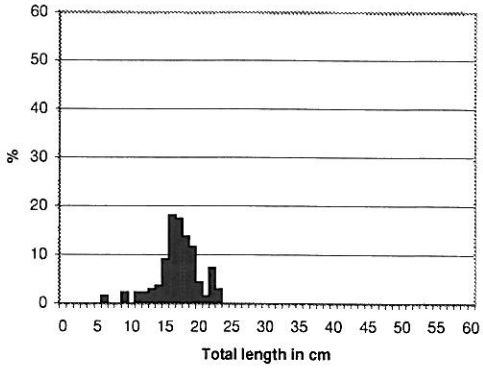
Selar crumenophthalmus Benin
Mean length = 21.5 cm N = 226



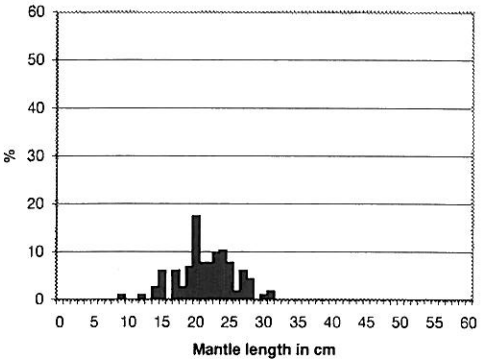
Trichiurus lepturus Benin
Mean length = 34.4 cm N = 156



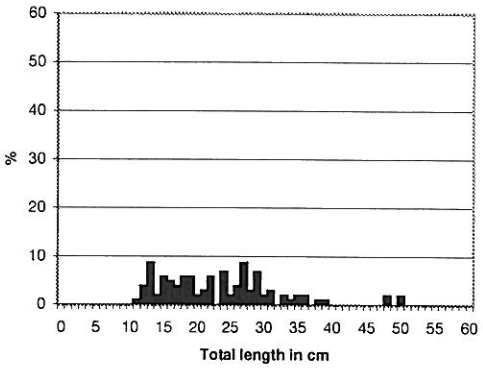
Penaeus notialis Benin
Mean length = 30.9 mm N = 43



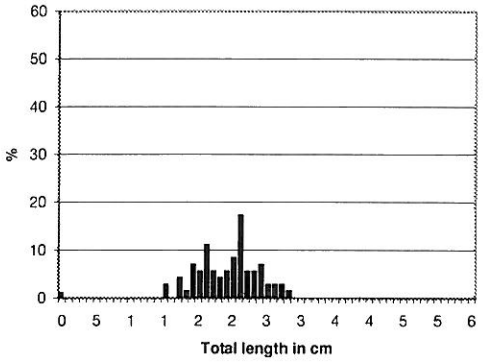
Pagellus bellottii Togo
Mean length = 17.4 cm N = 132



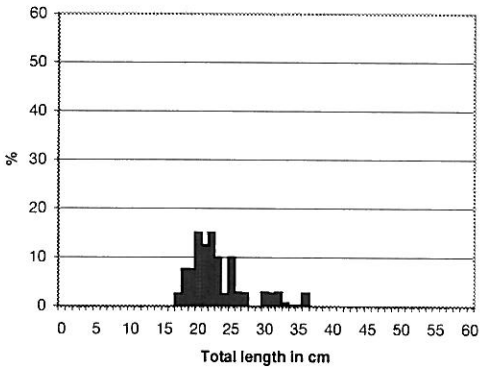
Sepia officinalis Benin
Mean length = 22.0 cm N = 117



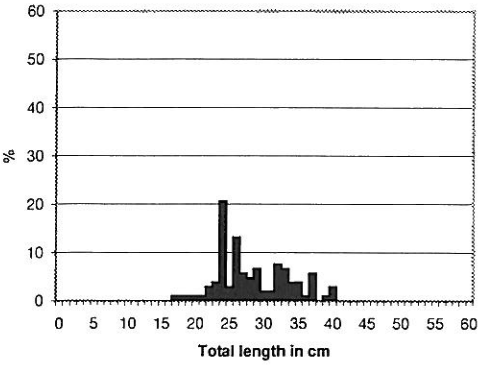
Pagrus caeruleostictus Togo
Mean length = 23.8 cm N = 98



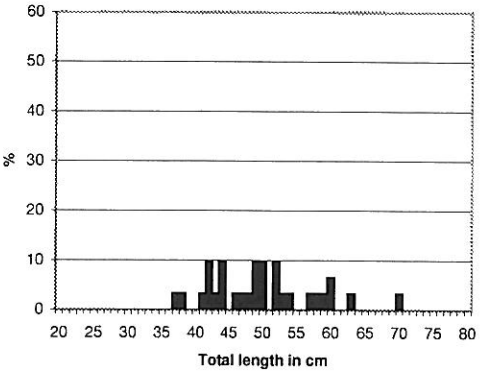
Dentex angolensis Togo
Mean length = 24.7 cm N = 67



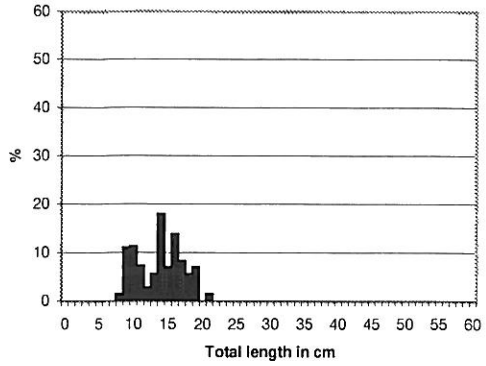
Lethrinus atlanticus Togo
Mean length = 23.4 cm N = 54



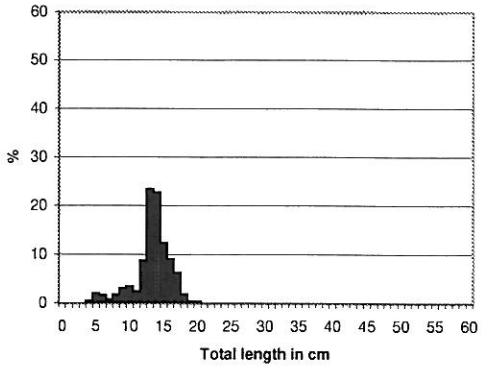
Dentex canariensis Togo
Mean length = 28.8 cm N = 82



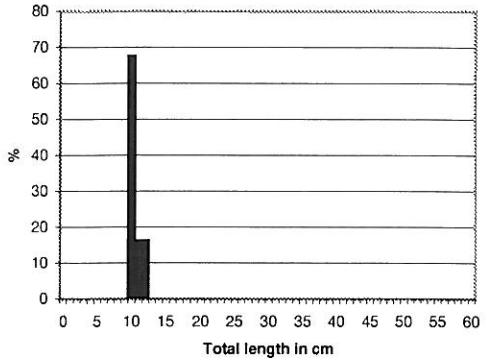
Lutjanus dentatus Togo
Mean length = 50.3 cm N = 31



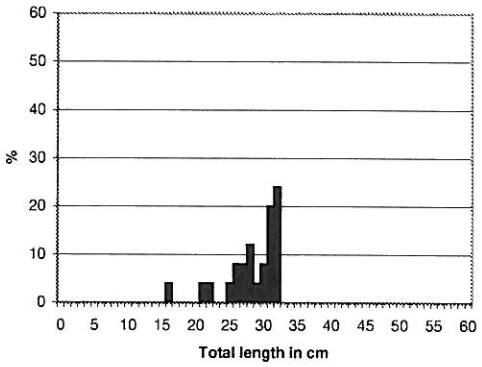
Sardinella aurita Togo
Mean length = 14.4 cm N = 98



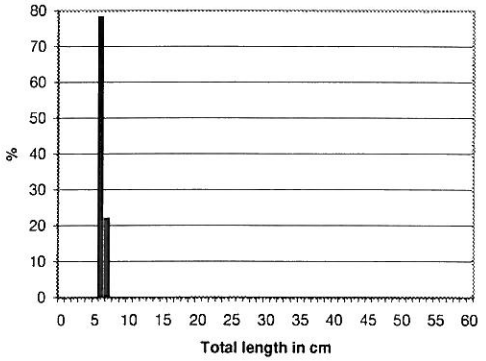
Decapterus punctatus Togo
Mean length = 13.8 cm N = 152



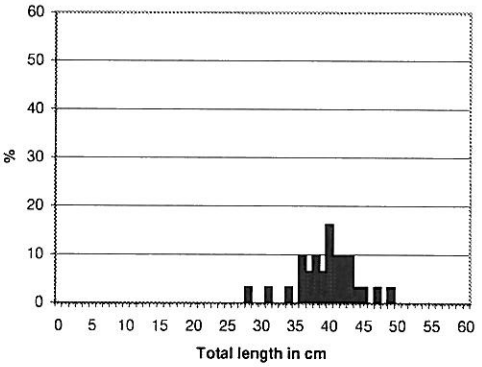
Sardinella maderensis Togo
Mean length = 11.0 cm N = 19



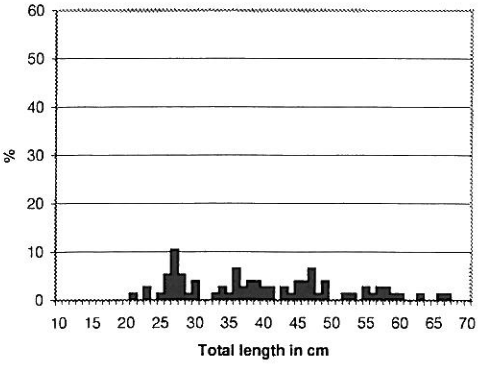
Selene dorsalis Togo
Mean length = 28.9 cm N = 25



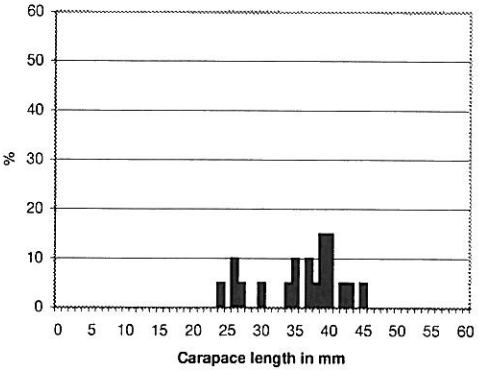
Engraulis encrasicolus Togo
Mean length = 6.7 cm N = 32



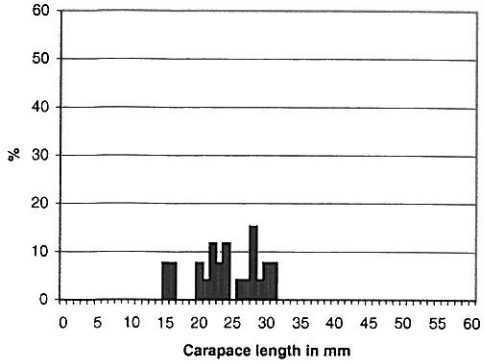
Sphyraena sphyraena Togo
Mean length = 40.2 cm N = 31



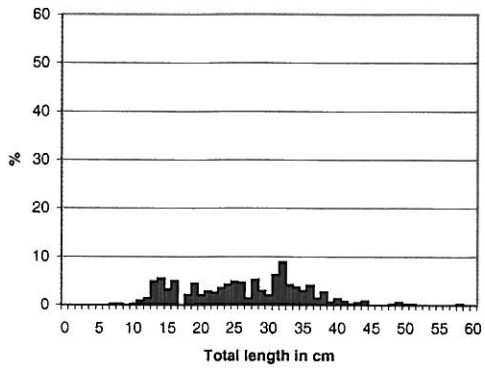
Alectis alexandrinus Togo
Mean length = 40.4 cm N = 77



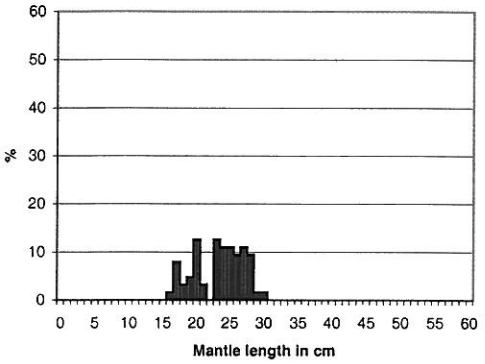
Aristeus varidens Togo
Mean length = 36.3 mm N = 20



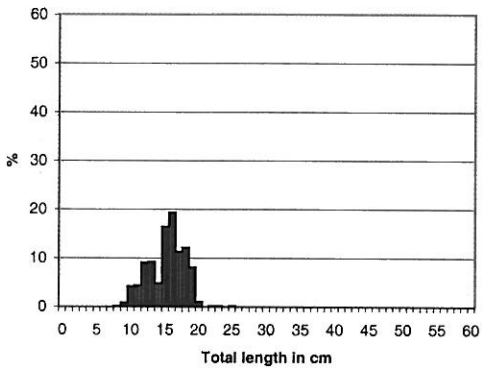
Parapenaeus longirostris Togo
Mean length = 24.5 mm N = 26



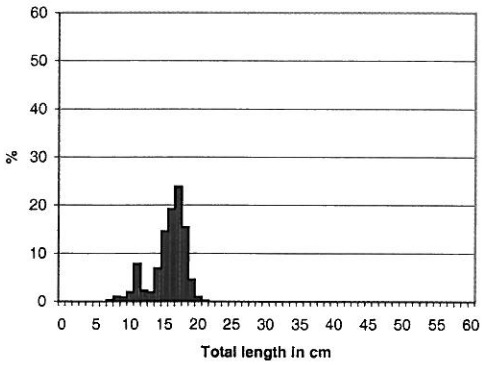
Dentex canariensis Ghana
Mean length = 26.6 cm N = 335



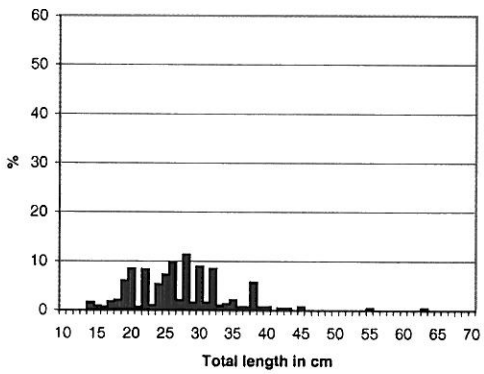
Sepia officinalis Togo
Mean length = 23.9 cm N = 64



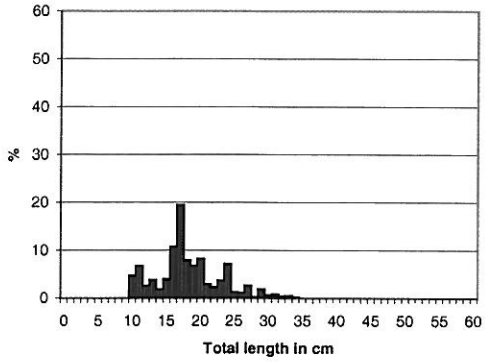
Dentex congoensis Ghana
Mean length = 15.7 cm N = 264



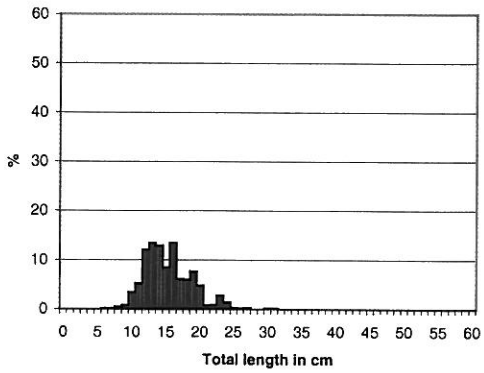
Boops boops Ghana
Mean length = 16.2 cm N = 597



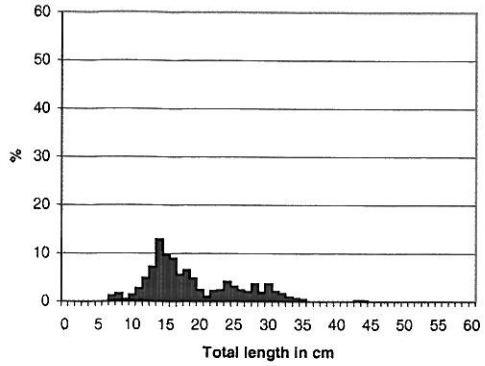
Dentex gibbosus Ghana
Mean length = 27.5 cm N = 133



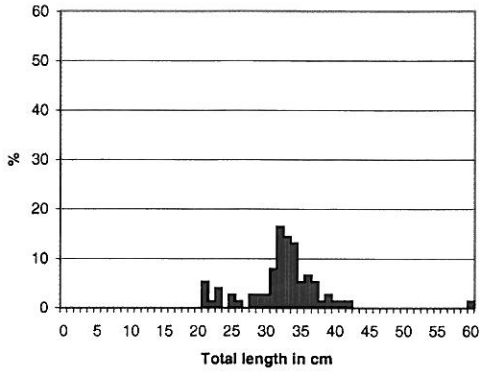
Dentex angolensis Ghana
Mean length = 18.6 cm N = 229



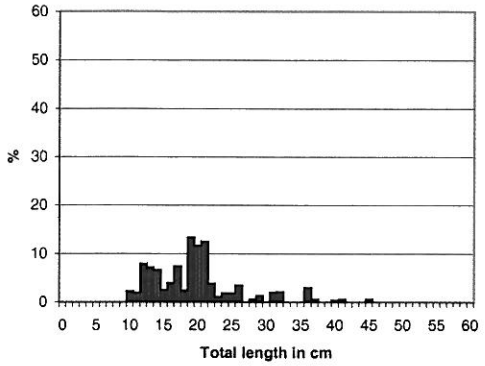
Pagellus bellottii Ghana
Mean length = 15.8 cm N = 817



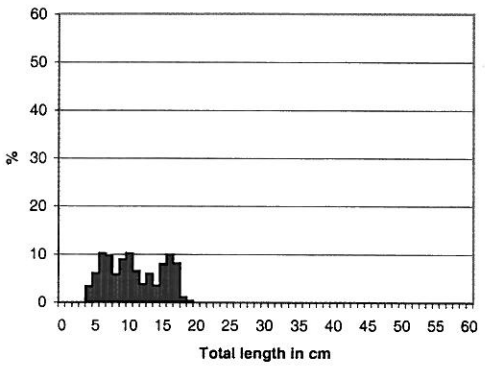
Pagrus caeruleostictus Ghana
Mean length = 19.2 cm N = 521



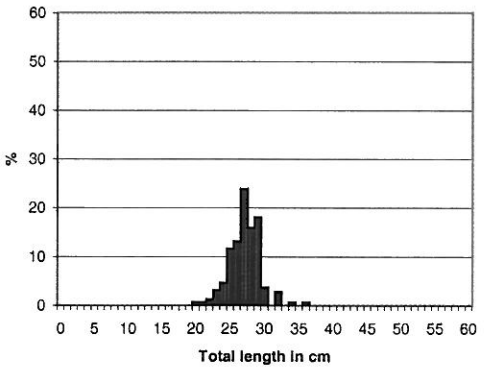
Lutjanus fulgens Ghana
Mean length = 32.9 cm N = 77



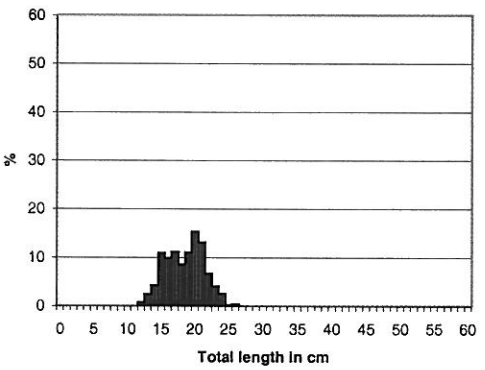
Pseudotolithus senegalensis Ghana
Mean length = 19.9 cm N = 123



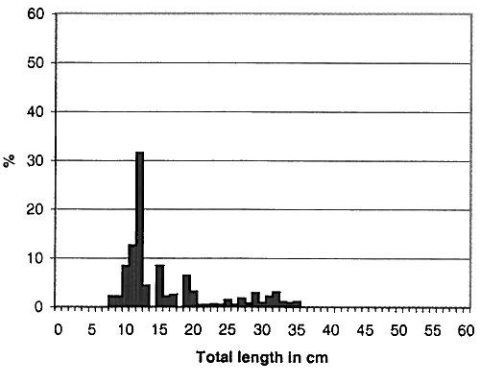
Brachydeuterus auritus Ghana
Mean length = 11.2 cm N = 1459



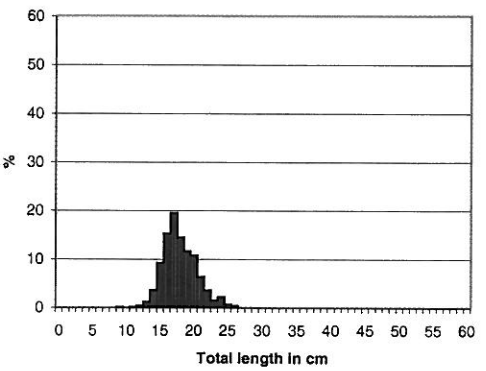
Umbrina canariensis Ghana
Mean length = 27.6 cm N = 72



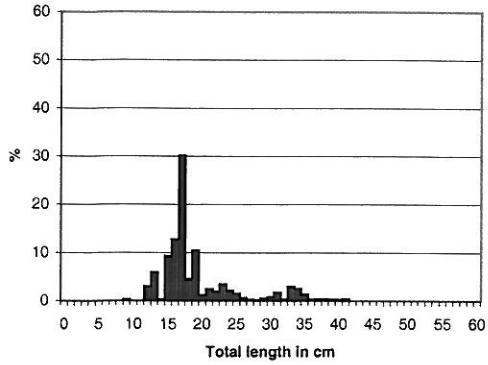
Pomadasys incisus Ghana
Mean length = 19.0 cm N = 212



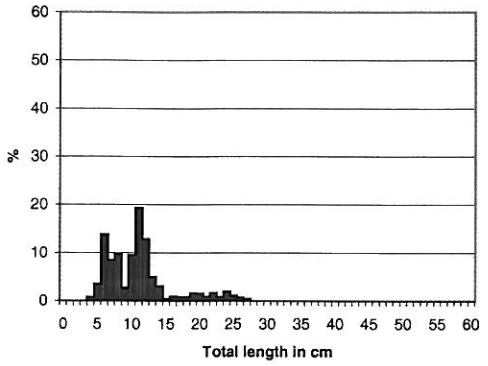
Lethrinus atlanticus Ghana
Mean length = 16.2 cm N = 88



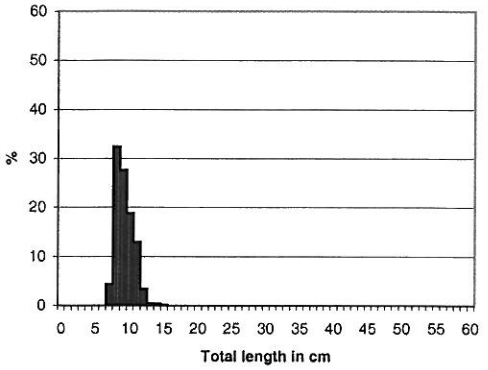
Pseudupeneus prayensis Ghana
Mean length = 18.4 cm N = 493



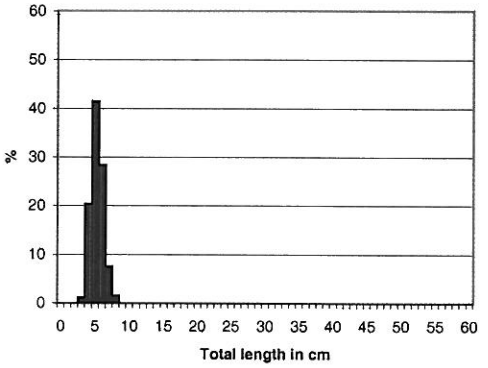
Galeoides decadactylus Ghana
Mean length = 19.6 cm N = 117



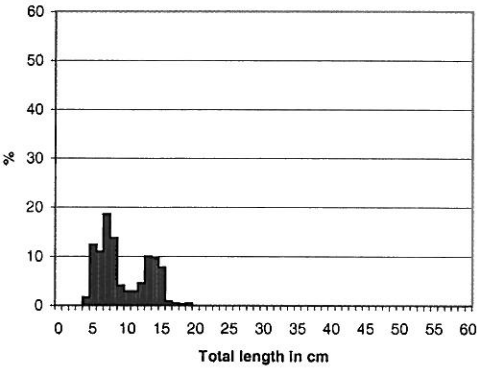
Sardinella maderensis Ghana
Mean length = 11.4 cm N = 869



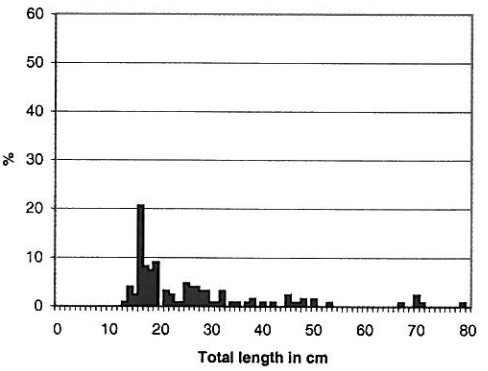
Priacanthus arenatus Ghana
Mean length = 9.7 cm N = 455



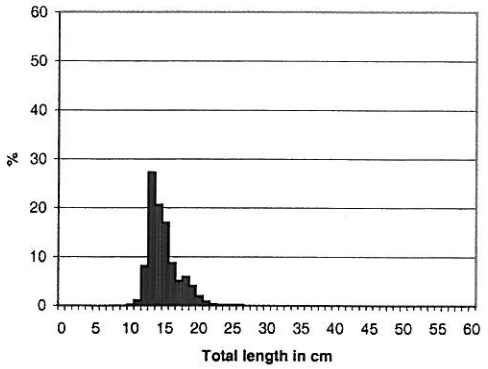
Engraulis encrasicolus Ghana
Mean length = 5.8 cm N = 708



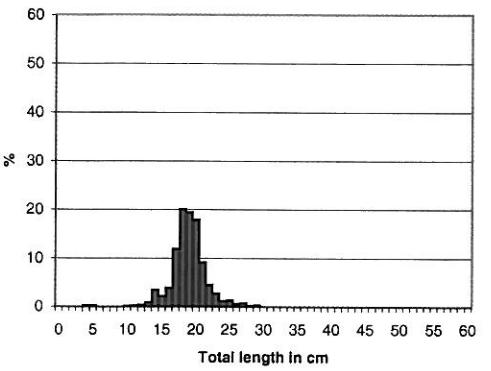
Ilisha africana Ghana
Mean length = 9.8 cm N = 402



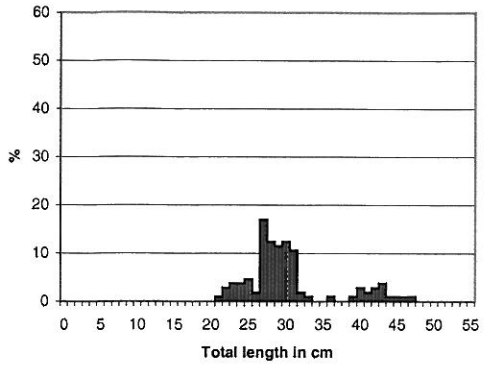
Alectis alexandrinus Ghana
Mean length = 26.2 cm N = 90



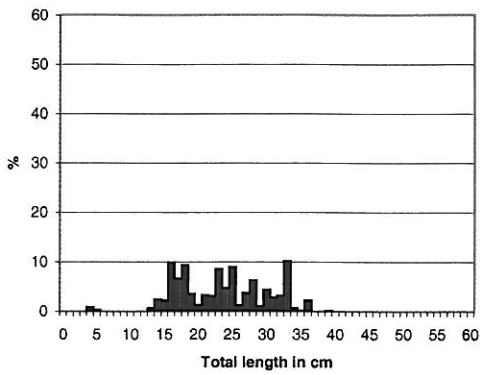
Sardinella aurita Ghana
Mean length = 15.2 cm N = 834



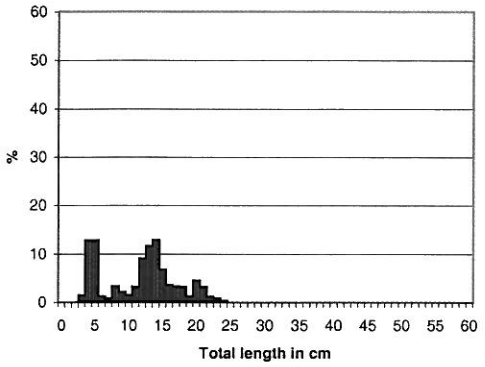
Chloroscombrus chrysurus Ghana
Mean length = 19.4 cm N = 600



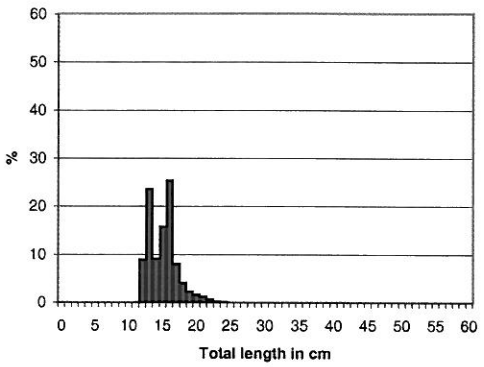
Caranx chrysos Ghana
Mean length = 30.7 cm N = 96



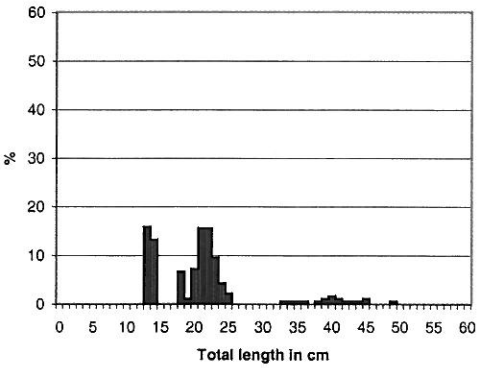
Selene dorsalis Ghana
Mean length = 24.0 cm N = 209



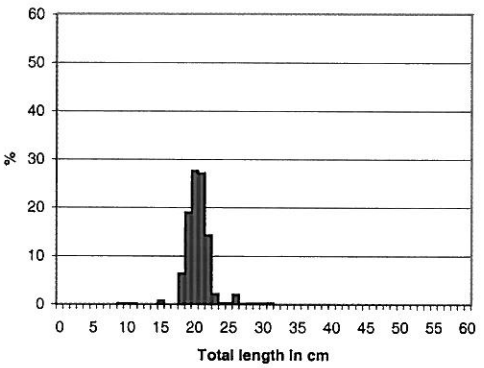
Decapterus punctatus Ghana
Mean length = 12.1 cm N = 813



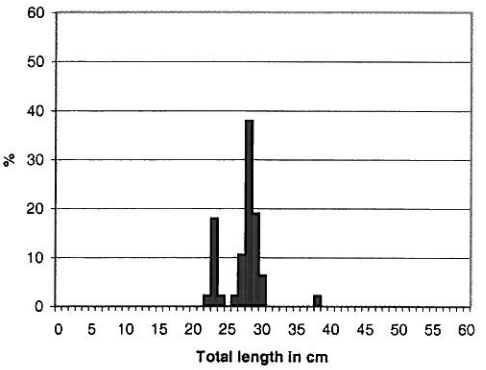
Trachurus trecae Ghana
Mean length = 15.5 cm N = 700



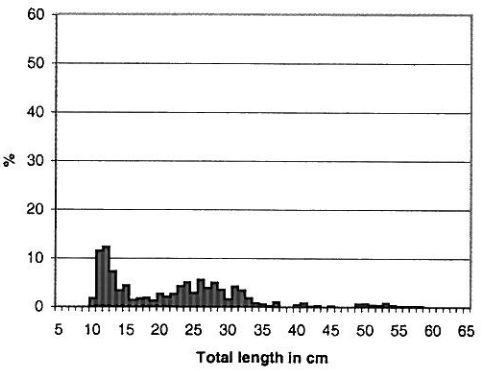
Decapterus rhonchus Ghana
Mean length = 21.4 cm N = 104



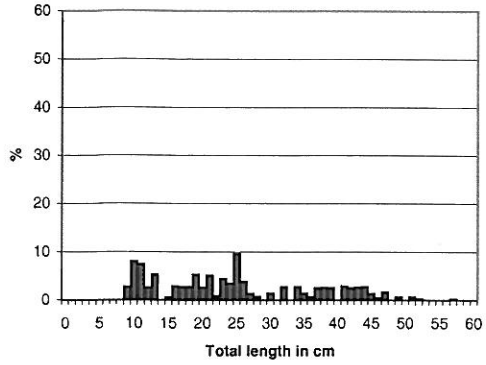
Scomber japonicus Ghana
Mean length = 20.9 cm N = 268



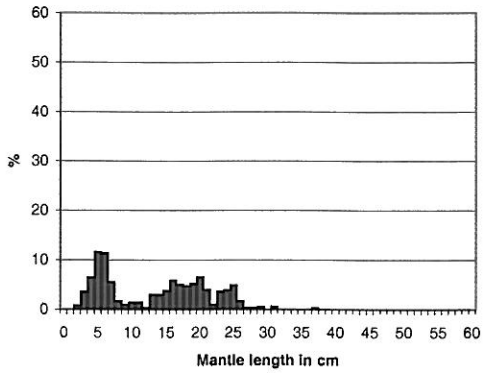
Selar crumenophthalmus Ghana
Mean length = 27.8 cm N = 47



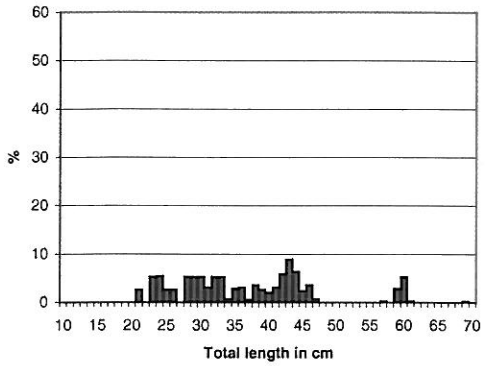
Sphyraena guachancho Ghana
Mean length = 22.0 cm N = 290



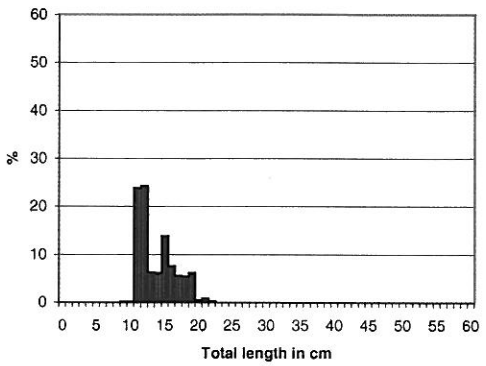
Sphyraena sphyraena Ghana
Mean length = 25.0 cm N = 127



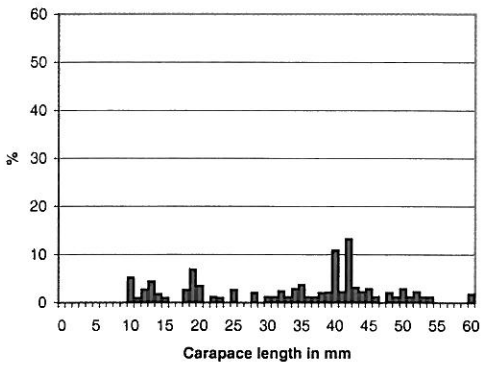
Sepia officinalis Ghana
Mean length = 14.0 cm N = 348



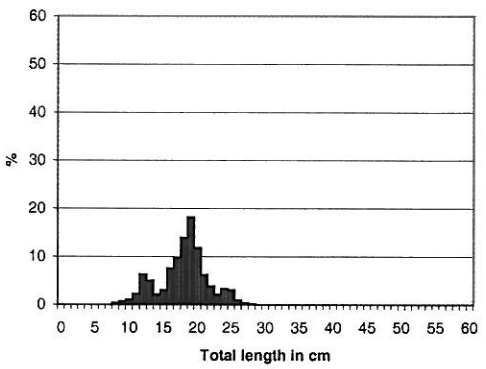
Zenopsis conchifer Ghana
Mean length = 38.0 cm N = 74



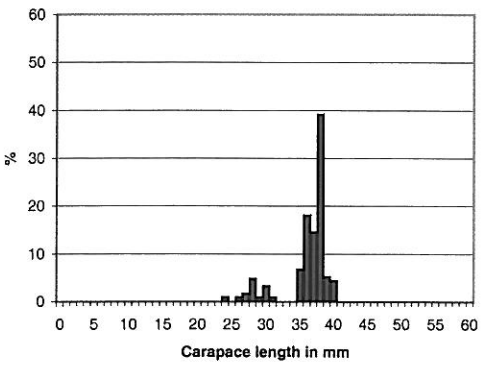
Boops boops Côte d'Ivoire
Mean length = 14.3 cm N = 538



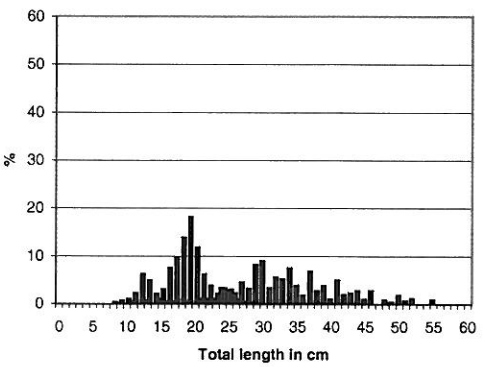
Aristeus varidens Ghana
Mean length = 33.8 mm N = 113



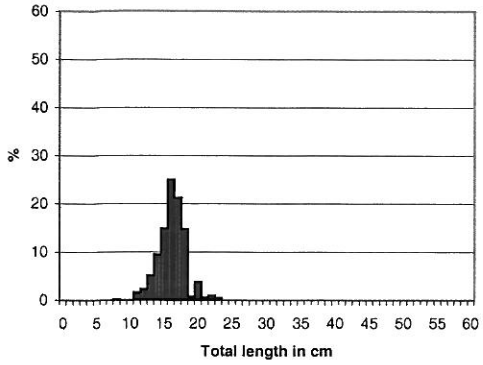
Dentex angolensis Côte d'Ivoire
Mean length = 18.5 cm N = 545



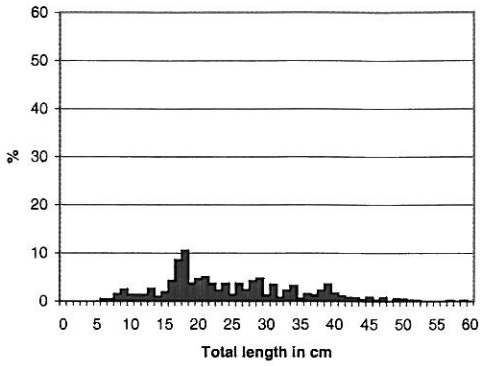
Parapenaeus longirostris Ghana
Mean length = 36.7 mm N = 42



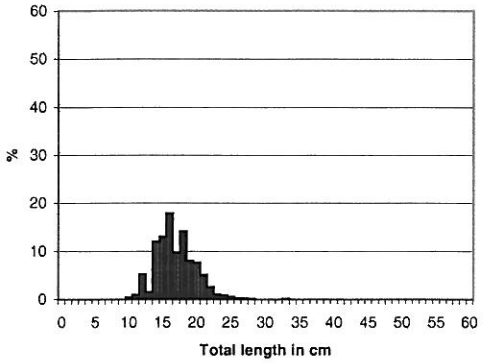
Dentex canariensis Côte d'Ivoire
Mean length = 34.3 cm N = 204



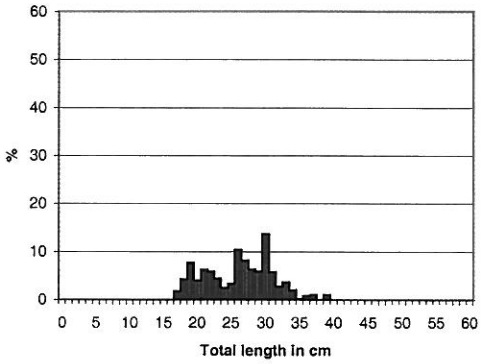
Dentex congoensis Côte d'Ivoire
Mean length = 16.1 cm N = 188



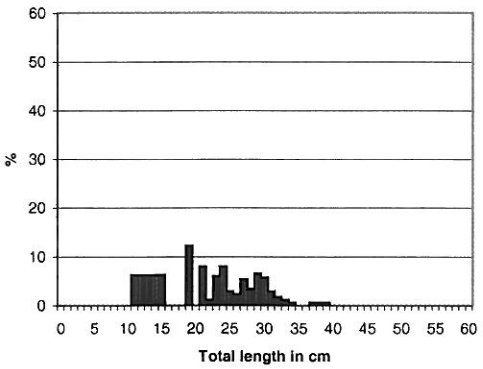
Pseudotolithus senegalensis Côte d'Ivoire
Mean length = 24.6 cm N = 450



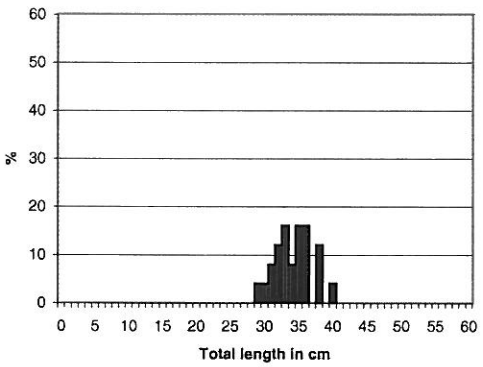
Pagellus bellottii Côte d'Ivoire
Mean length = 17.4 cm N = 657



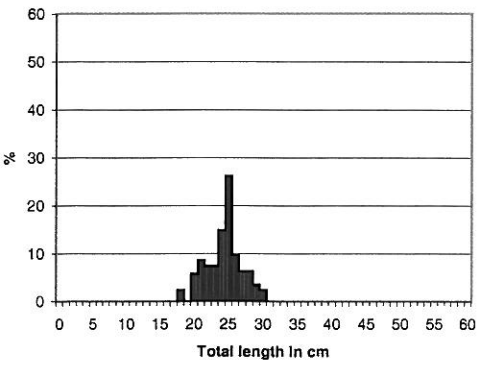
Umbrina canariensis Côte d'Ivoire
Mean length = 26.6 cm N = 181



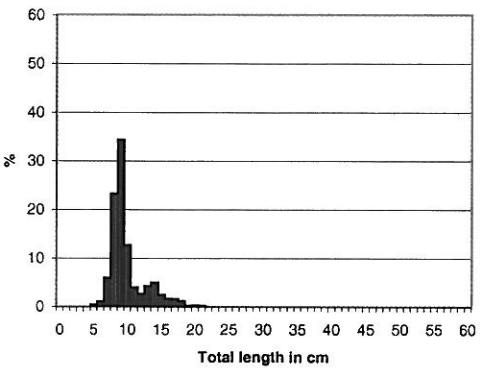
Pagrus caeruleostictus Côte d'Ivoire
Mean length = 21.9 cm N = 86



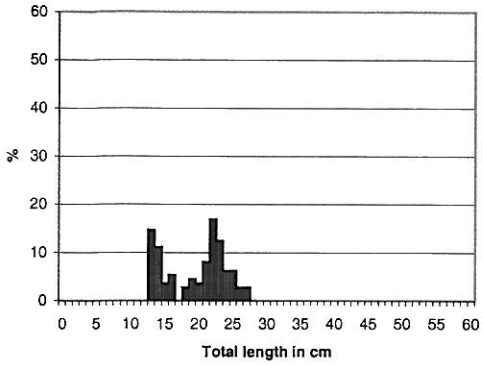
Lutjanus fulgens Côte d'Ivoire
Mean length = 34.7 cm N = 25



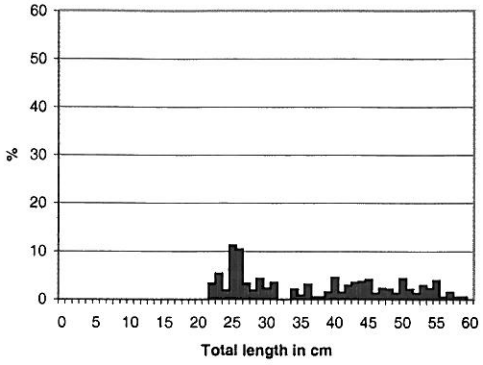
Pentheroscion mbizi Côte d'Ivoire
Mean length = 24.9 cm N = 49



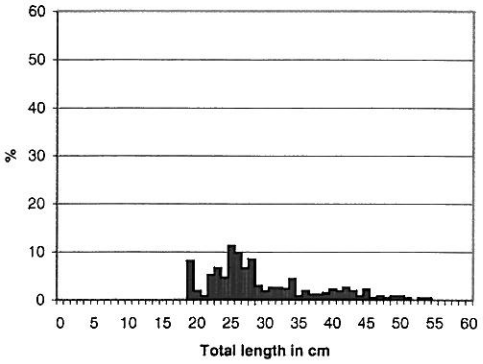
Brachydeuterus auritus Côte d'Ivoire
Mean length = 10.3 cm N = 1416



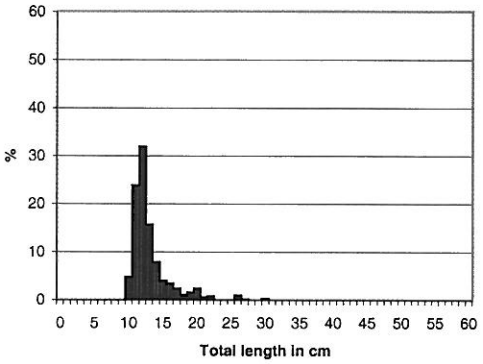
Pomadasys incisus Côte d'Ivoire
Mean length = 20.0 cm N = 70



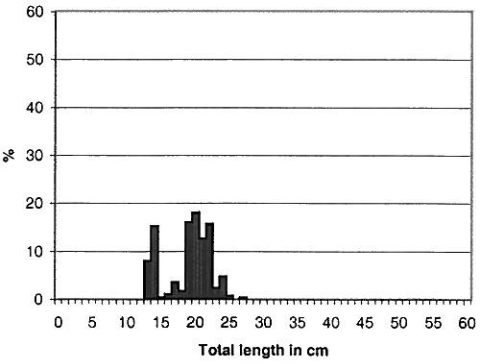
Brotula barbata Côte d'Ivoire
Mean length = 37.2 cm N = 154



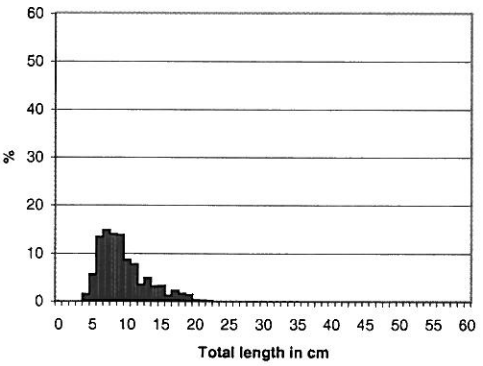
Pomadasys jubelini Côte d'Ivoire
Mean length = 29.8 cm N = 166



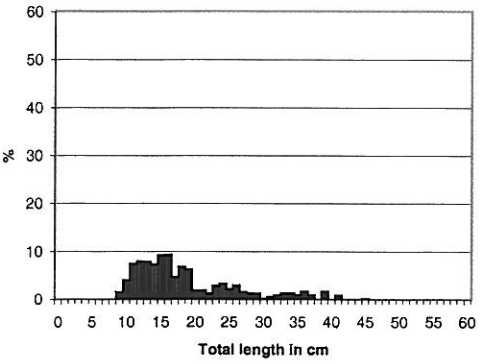
Priacanthus arenatus Côte d'Ivoire
Mean length = 13.5 cm N = 327



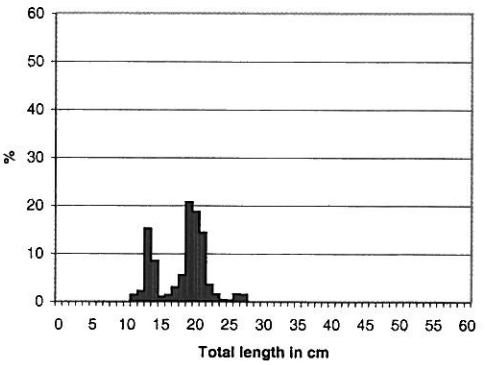
Pseudupeneus prayensis Côte d'Ivoire
Mean length = 19.4 cm N = 101



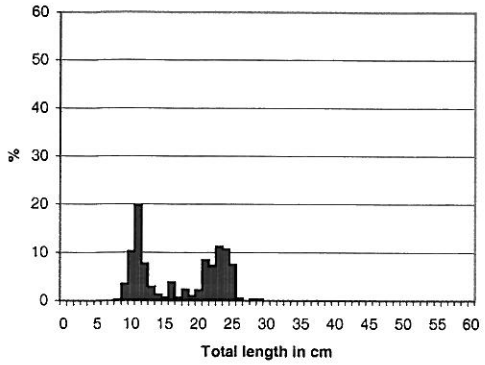
Ilisha africana Côte d'Ivoire
Mean length = 9.8 cm N = 858



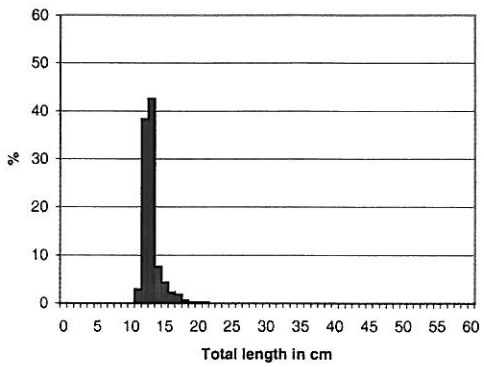
Galeoides decadactylus Côte d'Ivoire
Mean length = 18.8 cm N = 394



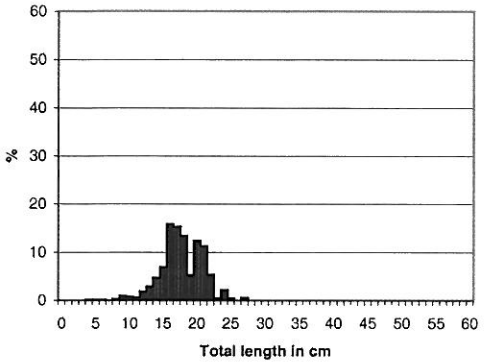
Sardinella aurita Côte d'Ivoire
Mean length = 18.6 cm N = 241



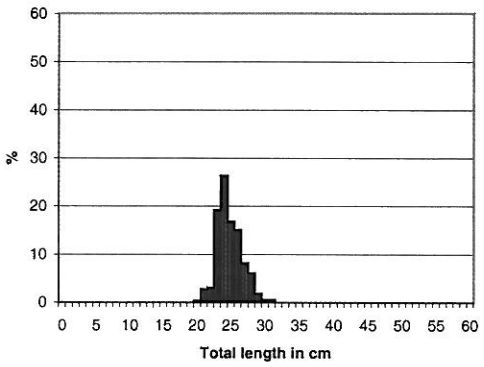
Sardinella maderensis Côte d'Ivoire
Mean length = 17.6 cm N = 497



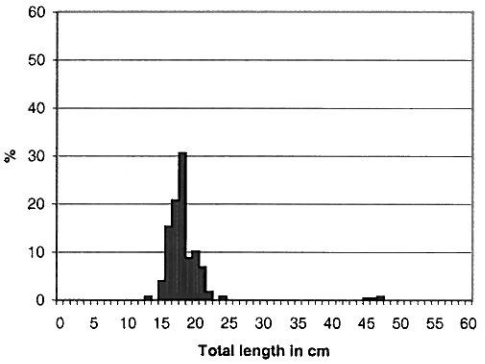
Trachurus trecae Côte d'Ivoire
Mean length = 13.4 cm N = 1369



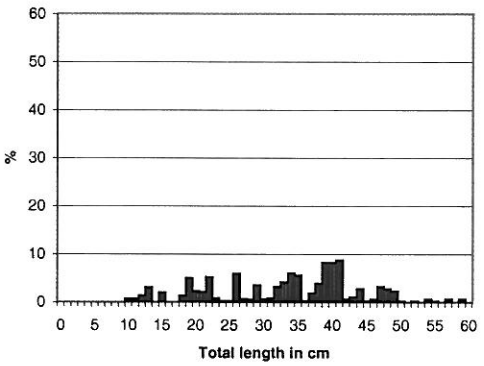
Chloroscombrus chrysurus Côte d'Ivoire
Mean length = 18.2 cm N = 464



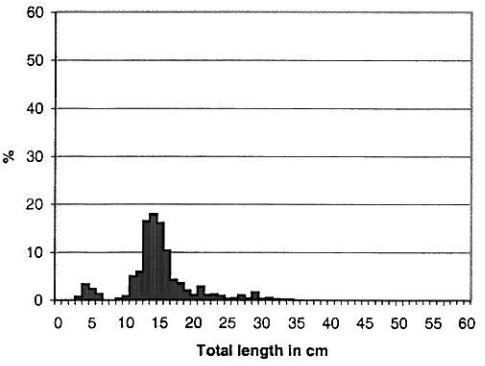
Scomber japonicus Côte d'Ivoire
Mean length = 25.3 cm N = 120



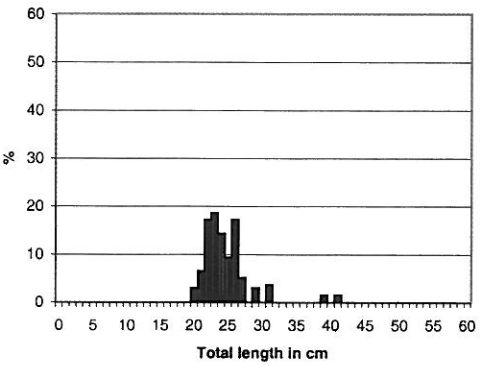
Decapterus rhonchus Côte d'Ivoire
Mean length = 18.8 cm N = 125



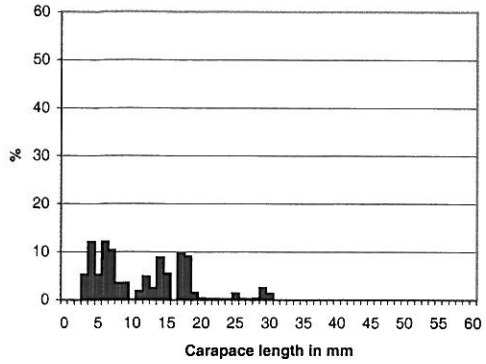
Sphyraena guachancho Côte d'Ivoire
Mean length = 33.8 cm N = 147



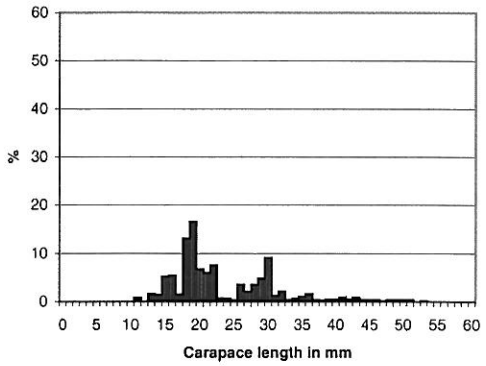
Selene dorsalis Côte d'Ivoire
Mean length = 15.2 cm N = 328



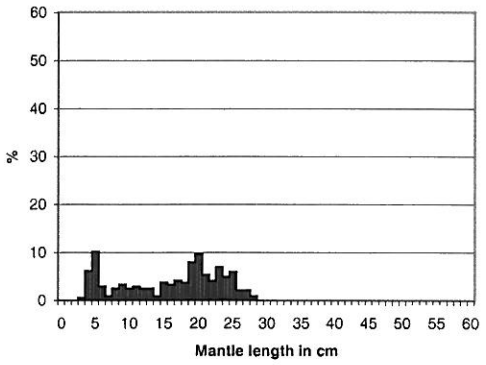
Zeus faber Côte d'Ivoire
Mean length = 25.1 cm N = 36



Parapenaeus longirostris Côte d'Ivoire
Mean length = 11.6 mm N = 497



Penaeus notialis Côte d'Ivoire
Mean length = 23.6 mm N = 250



Sepia officinalis Côte d'Ivoire
Mean length = 16.5 cm N = 248

Annex III Families/genera in swept area estimates

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

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

Pelagic:
Canangidae, 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:
Canangidae

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 244 TO STATION 263

Benin 2002

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
Alectis alexandrinus	8	1	1				53	0.60	0.16	1.52	0.02	
Chloroscombrus chrysurus	7	1	1				53	0.59	1.40	0.29		
Dentex congoensis	2	1	1				24	0.55			1.87	
Sepia officinalis hierredda	10	3					76	0.51	0.32	0.31	0.97	
Sphyraena guachancho	8	4					71	0.46	0.75	0.53	0.02	
Brachydeuterus auritus	6	4					59	0.39	0.35	0.76		
Selene dorsalis	8	1					53	0.22	0.10	0.50	0.01	
Selar crumenophthalmus	7	1					47	0.20	0.01	0.05	0.60	
Trichiurus lepturus	5	1					35	0.19	0.26	0.27		
Scomberomorus tritor	10						59	0.17	0.23	0.20	0.06	
Galeoides decadactylus	7	1					47	0.17	0.40	0.08		
Dentex angolensis	3	1					24	0.16			0.56	
Elops lacerta	2	1					18	0.16	0.45			
Drepane africana	4	1					29	0.16	0.46			
Acanthurus monroviae	3	1					24	0.16	0.16	0.31		
Boops boops		2					12	0.15			0.50	
Ilisha africana	3	2					29	0.15	0.43	0.01		
Pseudotolithus senegalensis	5						29	0.14	0.37	0.01		
Sphyraena afra	4	1					29	0.12	0.29	0.05		
Pagrus caeruleostictus	8	1					53	0.12	0.03	0.28	0.03	
Caranx senegallus	2	1					18	0.12	0.35			
Dentex canariensis	9						53	0.08	0.05	0.16	0.02	
Pagellus bellottii	10						59	0.07		0.09	0.11	
Pseudotolithus typus	2						12	0.06	0.17			
Pteroscion peli	4						18	0.05	0.13			
Lethrinus atlanticus	3						18	0.05	0.05	0.09		
Decapterus punctatus	6						35	0.05			0.15	
Penaeus notialis	2						12			0.01		
Other fish								0.54	0.58	0.50	0.53	
Sum all species								6.39	7.50	6.02	5.45	
Sum Snappers								0.05	0.09	0.03		
Sum Groupers								0.04		0.03	0.09	
Sum Grunts								0.43	0.43	0.79		
Sum Croakers								0.25	0.68	0.01		
Sum Seabreams								1.13	0.08	0.53	3.09	
Sum Sharks								0.03			0.11	
Sum Rays								0.02	0.05		0.01	
Sum Squids								0.52	0.32	0.35	0.97	
Sum Carangids								1.80	2.05	2.39	0.79	
Sum Barracuda								0.58	1.04	0.58	0.02	
0.01												
Number of stations included in analysis, total and by depth strata								17	6	6	5	

SWEPT AREA ANALYSIS FROM STATION 264 TO STATION 274

Togo 2002

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
Lethrinus atlanticus	4		1				56	0.88	2.63	0.02		
Sepia officinalis hierredda	7	2					100	0.72	1.19	0.67	0.30	
Acanthurus monroviae	2		1				33	0.54	1.59	0.03	0.01	
Alectis alexandrinus	3	1					44	0.48	0.09	1.36		
Lutjanus dentatus			1				11	0.40	1.21			
Chaetodipterus goreensis	1	1					22	0.32	0.95			
Dentex canariensis	9						89	0.29	0.53	0.26	0.07	
Pagrus caeruleostictus	8						89	0.26	0.14	0.39	0.25	
Dasyatis margarita		1					11	0.18	0.53			
Aluterus monoceros	1	1					22	0.15	0.37	0.06		
Decapterus punctatus	7						78	0.12	0.02	0.02	0.32	
Balistes capriscus	4						44	0.12		0.11	0.26	
Sphyraena afra	2						22	0.11	0.33			
Aluterus heudelotii	4						44	0.09	0.16	0.12		
Pagellus bellottii	6						56	0.08		0.10	0.13	
Sardinella aurita	3						33	0.08			0.23	
Balistes punctatus	3						33	0.08	0.24			
Sphyraena sphyraena	3						33	0.07	0.19	0.01	0.01	
Scomberomorus tritor	4						44	0.06	0.12	0.02	0.05	
Aluterus punctata	2						22	0.06	0.05		0.14	
Fistularia petimba	4						44	0.06	0.01	0.03	0.15	
Selene dorsalis	3						33	0.06		0.18		
Pomadasys incisus	2						22	0.05		0.01	0.14	
Dactylopterus volitans	5						56	0.05	0.02	0.13	0.01	
Other fish								0.21	0.30	0.15	0.22	
Sum all species								5.52	10.67	3.67	2.29	
Sum Snappers								0.44	1.33			
Sum Groupers								0.03		0.05	0.05	
Sum Grunts								0.07	0.07	0.01	0.14	
Sum Croakers												
Sum Seabreams								0.67	0.67	0.82	0.51	
Sum Sharks												
Sum Rays								0.18	0.53			
Sum Squids								0.76	1.19	0.70	0.39	
Sum Carangids								0.66	0.11	1.56	0.33	
Sum Barracuda								0.18	0.52	0.01	0.01	
Number of stations included in analysis, total and by depth strata								9	3	3	3	

SWEPT AREA ANALYSIS FROM STATION 275 TO STATION 346

Ghana 2002

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
Trachurus trecae	7		7			3	31	4.33	0.02	0.86	11.45	
Brachydeuterus auritus	12	5	3	3		2	44	3.71	1.67	9.12		
Chloroscombrus chrysurus	18	1	4			1	44	1.39	3.80	0.77		
Sardinella aurita	17	3	3			1	44	1.10	0.09	0.28	2.75	
Boops boops	16	2	2			1	39	1.09		0.41	2.67	
Scomber japonicus	8			1		1	19	0.83		0.05	2.30	
Dentex congoensis	6	2	1	1			19	0.68			1.94	
Pagellus bellottii	32	4	3				69	0.59	0.20	1.17	0.34	
Priacanthus arenatus	25	2	1	1			54	0.50		0.08	1.33	
Decapterus punctatus	25	2	2	1			54	0.50	0.15	0.50	0.79	
Fistularia petimba	34	6					72	0.35	0.07	0.45	0.48	
Sepia officinalis hierredda	39	3					72	0.30	0.17	0.39	0.31	
Sphyraena guachancho	13	2	2				30	0.28	0.30	0.51	0.03	
Dentex canariensis	27	3					50	0.24	0.18	0.08	0.43	
Trichiurus lepturus	9	3	1				20	0.23	0.67	0.09		
Dentex angolensis	6	1	2				17	0.19			0.53	
Pagrus caeruleostictus	39	1					70	0.17	0.13	0.14	0.23	
Galeoides decadactylus	9	1	1				19	0.17	0.10	0.38		
Pseudupeneus prayensis	32						59	0.14	0.09	0.15	0.16	
Dentex gibbosus	21	3					39	0.13		0.02	0.36	
Pomadasys incisus	12	2					24	0.12	0.10	0.24	0.03	
Sardinella maderensis	16		1				31	0.12	0.13	0.23		
Selene dorsalis	20	1					39	0.11	0.17	0.18		
Chromis sp.	4		1				9	0.10		0.02	0.26	
Parapenaeopsis atlantica	7	1					13	0.08	0.26	0.01		
Cynoponticus ferox	3		1				6	0.08	0.23	0.04		
Sphyraena sphyraena	10	1					20	0.07	0.17	0.03	0.01	
Alectis alexandrinus	14	1					28	0.07	0.11	0.05	0.05	
Pseudotolithus senegalensis	7	1					13	0.06	0.15	0.04		
Pomadasys rogeri	3		1				7	0.06	0.21			
Engraulis encrasicolus	2	2					7	0.06	0.18	0.01		
Dactylopterus volitans	15						28	0.05		0.01	0.12	
Ilisha africana	8						13	0.05	0.15	0.02		
Caranx crysos	10						19	0.05	0.07	0.10		
Penaeus monodon	1						2					
Penaeus kerathurus	1						2					
Penaeus notialis	5						9		0.01			
Other fish								0.89	1.30	0.79	0.80	
Sum all species								18.89	10.88	17.22	27.37	
Sum Snappers								0.06	0.08	0.03	0.09	
Sum Groupers								0.03		0.03	0.07	
Sum Grunts								3.92	2.00	9.42	0.03	
Sum Croakers								0.15	0.30	0.06	0.11	
Sum Seabreams								3.09	0.52	1.82	6.50	
Sum Sharks								0.03		0.01	0.10	
Sum Rays								0.09	0.11	0.11	0.07	
Sum Squids								0.32	0.17	0.43	0.34	
Sum Carangids								6.51	4.36	2.56	12.32	
Sum Barracuda								0.37	0.49	0.58	0.04	
0.01												
Number of stations included in analysis, total and by depth strata								54	16	19	19	

SWEPT AREA ANALYSIS FROM STATION 347 TO STATION 399

Côte d'Ivoire 2002

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
Trachurus trecae	16	4	6	4	4	1	76	9.74	0.12	0.93	20.66	
Brachydeuterus auritus	12	7	3	5	1		59	3.66	2.77	9.69	0.11	
Boops boops	19	1	1	1	1		50	1.29	0.02	0.04	2.80	
Trichiurus lepturus	30	10	1				83	0.81	1.32	0.65	0.65	
Chloroscombrus chrysurus	16	2	1	1			43	0.81	1.07	1.83		
Pagellus bellottii	34	3		1			72	0.57	0.01	0.26	1.06	
Dentex angolensis	15	9	1				43	0.49			1.07	
Umbrina canariensis	20	2	2				48	0.48	0.01	0.02	1.04	
Apsilus fuscus				1			2	0.42			0.91	
Pseudotolithus senegalensis	23	1	2				43	0.36	1.24	0.20		
Ilisha africana	11	4	1				35	0.31	1.10	0.15		
Dentex canariensis	17	3	1				41	0.29	0.02	0.02	0.62	
Sepia officinalis hierredda	37	1					76	0.26	0.48	0.30	0.12	
Mustelus mustelus	16	4					43	0.26	0.15	0.42	0.21	
Brotula barbata	22	3					46	0.26		0.01	0.57	
Sphyraena guachancho	25	3	1				52	0.23	0.35	0.48	0.01	
Galeoides decadactylus	24	1	1				48	0.22	0.39	0.41		
Pomadasys jubelini	18	1					39	0.19	0.57	0.16	0.01	
Pteroscion peli	16	2					39	0.17	0.47	0.20		
Sardinella aurita	16	4					43	0.16	0.01	0.17	0.25	
Selene dorsalis	20	1					46	0.16	0.39	0.17	0.03	
Dentex congoensis	6		1				15	0.12			0.25	
Squatina oculata	11						24	0.09		0.01	0.20	
Epinephelus aeneus	11	1					26	0.09	0.01	0.02	0.18	
Priacanthus arenatus	24	1					50	0.09	0.01	0.06	0.16	
Scomber japonicus	8	1					20	0.07			0.16	
Zeus faber	16						33	0.06			0.12	
Pagrus caeruleostictus	9	1					20	0.06	0.01	0.03	0.10	
Parapenaeus longirostris	10						20	0.06	0.23		0.01	
Raja miraletus	24						50	0.06	0.03	0.13	0.04	
Cynoponticus ferox	10						22	0.06	0.22	0.04		
Pseudupeneus prayensis	22						48	0.06	0.01	0.06	0.09	
Fistularia petimba	17						37	0.05			0.11	
Sardinella maderensis	20						43	0.05	0.12	0.08		
Penaeus notialis	15						33	0.03	0.05	0.06		
Penaeus monodon	1						2					
Penaeus kerathurus	4						9		0.02			
Parapenaeopsis atlantica	1						2					
Other fish								0.90	1.19	0.88	0.79	
Sum all species								22.99	12.39	17.48	32.33	
Sum Snappers								0.44	0.02		0.96	
Sum Groupers								0.09	0.01	0.02	0.18	
Sum Grunts								3.94	3.47	9.98	0.17	
Sum Croakers								1.07	1.76	0.48	1.10	
Sum Seabreams								2.84	0.06	0.35	5.93	
Sum Sharks								0.35	0.15	0.43	0.41	
Sum Rays								0.12	0.10	0.24	0.07	
Sum Squids								0.34	0.48	0.35	0.25	
Sum Carangids								10.75	1.69	2.98	20.70	
Sum Barracuda								0.24	0.36	0.50	0.01	
0.06												
Number of stations included in analysis, total and by depth strata								46	11	14	21	

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

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

where s_i^2 is from equation (3).

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

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

where $\text{var}(\bar{y}_{st})$ 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)

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

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)

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

where

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

$\bar{x}_i$ and $s^2_{x,i}$ 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 $f = s^2_{x,i}/2$ 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

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

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)

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

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

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

where

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

c_i and 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

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

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 optionally 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 the density (t/NM^2), i.e. that the swept area is constant per hour
Equation numbers (1) and (2) refers to Annex 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)=
20-50	**387**	6	0.08	1.83	0.04	0.146	0.021	0.001
50-100	**134**	6	0.53	1.54	0.09	0.816	0.666	0.003
100-200	**244**	5	2.59	1.20	0.83	3.108	9.660	0.197
Total	5561						Var(strat-mean)=	0.20
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 not submerged 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 08.09.2001. 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)
Bandwith	wide
Max Power	2000 Watt
2-way beam angle	-21.0 dB
Sv Transducer gain	27.01 dB
TS Transducer gain	27.26 dB
Angle sensitivity	21.9
3 dB beamwidth	7.1 ° alongship
	6.9 ° athwardship
Alongship offset	-0.07 °
Athwardship effect	0.03 °

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	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 two different sized "Åkrahamn" pelagic trawls and one "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 Results of water samples analysis

BENIN

PHOSPHATE ANALYSIS SHEET - NANSEN SURVEY (15TH JUL. - 12TH AUG. 2002)

	Date	Station	Depth (M)	Lat.	Long.	Bottle No.	Time (UTC)	PO_4^{2-} (mg/l)	F^- (mg/l)	Br^- (mg/l)	SO_4^{2-} (mg/l)
1	17/07/02	0493	63	06 06,64 N	002 29,53 E	FN 1	11:49:27	-	1.8	50.9	2607
2	17/07/02	0494	40	06 11,82 N	002 28,67 E	FN 2	13:40:00	-	< 0.01	48.8	2610
3	17/07/02	0496	15	06 17,25 N	002 37,21 E	FN 3	16:51:23	-	< 0.01	50.8	2637
4	18/07/02	0506	15	06 17,49 N	002 05,08 E	FN 4	11:36:55	-	< 0.01	48.4	2557
5	18/07/02	0507	35	06 11,07 N	002 03,88 E	FN 5	13:25:52	-	< 0.01	50.7	2647
6	18/07/02	0508	80	06 07,10N	002 05,47 E	FN 6	14:55:29	-	< 0.01	52.5	2675
7	18/07/02	0509	150	06 05,97N	002 04,72 E	FN 7	17:13:15	-	< 0.01	52.4	2667
8	18/07/02	0509	322	06 05,97N	002 04,72 E	FN 8	17:13:15	-	< 0.01	51.8	2624
9	19/07/02	0512	18	06 12,22 N	001 53,98 E	FN 9	10:40:48	-	< 0.01	51.7	2621
10	19/07/02	0515	55	06 05,17 N	001 43,58 E	FN 10	17:04:28	-	< 0.01	51.9	2601
11	19/07/02	0517	254	06 03,33 N	001 46,43 E	FN 11	18:52:14	-	< 0.01	52.7	2656

TOGO

PHOSPHATE ANALYSIS SHEET - NANSEN SURVEY (15TH JUL. - 12TH AUG. 2002)

	Date	Station	Depth (M)	Lat.	Long.	Bottle No.	Time (UTC)	PO_4^{2-} (mg/l)	F^- (mg/l)	Br^- (mg/l)	SO_4^{2-} (mg/l)
1	20/07/02	0520	7	06 08,51 N	001 34,32 E	FN 12	09:37:41	-	< 0.01	52.3	2623
2	20/07/02	0520	17	06 08,51 N	001 34,32 E	FN 13	09:37:41	-	< 0.01	53.3	2698
3	20/07/02	0521	20	06 05,56 N	001 24,33 E	FN 14	12:01:52	-	< 0.01	53.0	2578
4	20/07/02	0522	40	06 03,73 N	001 25,75 E	FN 15	13:19:05	-	< 0.01	53.3	2689
5	20/07/02	0523	45	06 01,28 N	001 25,20 E	FN 16	15:34:43	-	< 0.01	53.7	2673
6	20/07/02	0524	95	05 57,79N	001 28,04 E	FN 20	17:19:35	-	< 0.01	53.6	2672
7	20/07/02	0524	190	05 57,79N	001 28,04 E	FN 19	17:19:35	-	< 0.01	53.7	2670
8	20/07/02	0524	250	05 57,79N	001 28,04 E	FN 17	17:19:35	-	< 0.01	50.9	2580
9	20/07/02	0524	350	05 57,79 N	001 28,04 E	FN 18	17:19:35	-	< 0.01	51.3	2570
10	21/07/02	0527	32	06 00,86 N	001 14,45 E	FN 21	07:23:41	-	< 0.01	50.7	2615

GHANA

PHOSPHATE ANALYSIS SHEET - NANSEN SURVEY (15TH JUL. - 12TH AUG. 2002)

	Date	Station	Depth (M)	Lat.	Long.	Bottle No.	Time (UTC)	PO_4^{2-} (mg/l)	F^- (mg/l)	Br^- (mg/l)	SO_4^{2-} (mg/l)
1	22/07/02	0534	31	05 46,01 N	001 00,59 E	FN 22	07:26:33	-	< 0.01	53.9	2676
2	22/07/02	0535	18	05 43,51 N	000 57,76 E	FN 23	09:31:53	-	< 0.01	56.0	2403
3	23/07/02	0545	82	05 25,70 N	000 03,07 E	FN 24	15:05:19	-	< 0.01	51.7	2653
4	24/07/02	0552	225	05 10,80 N	000 12,53 W	FN 25	19:51:43	-	< 0.01	48.1	2535
5	26/07/02	0561	48	04 49,54 N	000 47,57 W	FN 26	08:04:45	-	< 0.01	47.9	2562
6	26/07/02	0562	67	04 44,68 N	000 45,40 W	FN 27	09:58:05	-	< 0.01	49.8	2649
7	26/07/02	0564	208	04 38,30 N	000 46,94 W	FN 28	13:12:35	-	< 0.01	20.1	1375
8	26/07/02	0564	350	04 38,30 N	000 46,94 W	FN 29	13:15:06	-	< 0.01	42.7	2427
9	26/07/02	0566	23	04 32,12 N	001 05,83 W	FN 30	18:49:04	-	< 0.01	54.5	2662
10	27/07/02	0569	15	05 00,59 N	001 15,52 W	FN 31	10:22:44	-	< 0.01	46.6	2843
11	29/07/02	0577	24	04 44,60 N	001 51,84 W	FN 32	12:33:02	-	< 0.01	43.6	2535
12	30/07/02	0579	291	04 17,12 N	002 13,51 W	FN 33	01:28:06	-	< 0.01	42.8	2478
13	30/07/02	0579	494	04 17,12 N	002 13,51 W	FN 34	01:31:02	-	< 0.01	47.2	2770

COTE D'IVOIRE

PHOSPHATE ANALYSIS SHEET - NANSEN SURVEY (15TH JUL. - 12TH AUG. 2002)

	Date	Station	Depth (M)	Lat.	Long.	Bottle No.	Time (UTC)	PO_4^{2-} (mg/l)	F^- (mg/l)	Br^- (mg/l)	SO_4^{2-} (mg/l)
1	01/08/02	0595	35	05 05,53 N	003 26,12 W	FN 35	08:17:41	-	< 0.01	47.6	2588
2	01/08/02	0596	22	05 08,19 N	003 28,85 W	FN 36	10:00:37	-	< 0.01	51.4	2908
3	01/08/02	0599	70	05 03,04 N	003 45,93 W	FN 37	15:31:26	-	< 0.01	47.6	2679
4	02/08/02	0607	250	05 00,68 N	004 23,21 W	FN 38	18:35:38	-	< 0.01	50.8	2533
5	02/08/02	0608	401	04 55,45 N	004 22,97 W	FN 39	19:27:26	-	< 0.01	43.6	2519
6	03/08/02	0611	29	05 05,08 N	004 45,38 W	FN 40	08:00:36	-	< 0.01	46.3	2521
7	03/08/02	0612	13	05 08,23 N	004 41,42 W	FN 41	09:24:34	-	< 0.01	46.2	2685
8	03/08/02	0615	78	04 58,57 N	005 05,14 W	FN 42	15:06:12	-	< 0.01	47.9	2619
9	03/08/02	0616	233	04 55,88 N	005 02,52 W	FN 43	16:25:57	-	< 0.01	46.3	2572
10	03/08/02	0616	402	04 55,88 N	005 02,52 W	FN 44	16:28:41	-	< 0.01	45.8	2597
11	06/08/03	0632	15	04 40,59 N	006 37,92 W	FN 45	09:42:50	-	< 0.01	51.6	2833
12	06/08/04	0632	33	04 40,59 N	006 37,92 W	FN 46	09:43:11	-	< 0.01	65.6	3770