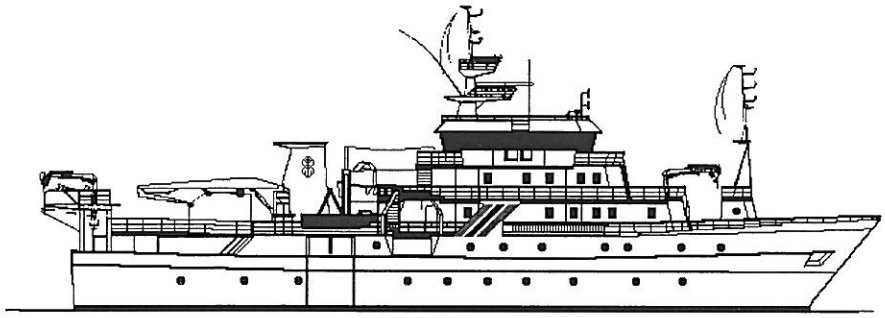

# SURVEY OF THE PELAGIC FISH RESOURCES OFF NORTH WEST AFRICA

## Part I

## SENEGAL - THE GAMBIA

**29 October - 7 November 2002**

Centre de Recherches Océanographiques de Dakar-Thiaroye
Dakar, Senegal

Institute of Marine Research
Bergen, Norway

Department of Fisheries
Banjul, The Gambia

CRUISE REPORTS 'DR FRIDTJOF NANSEN'

# SURVEY OF THE PELAGIC FISH RESOURCES OFF NORTH WEST AFRICA

## Part I

## SENEGAL - THE GAMBIA

**29 October - 7 November 2002**

by

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**Institute of Marine Research**
**Bergen, 2003**

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# CHAPTER 1 INTRODUCTION

## 1.1 Objective of the cruise

The general objectives were to estimate the biomass and to map the distribution of small pelagic fish stocks off NW Africa (Morocco, Mauritania, Senegal and the Gambia) by hydro-acoustic methods and describe the hydrographic conditions there over a period of 50 days, in October-November 2002. For Senegal and the Gambia the agreed objectives were:

- To map the distribution and estimate the biomass for the main small pelagic fish using hydro-acoustic methods. The species of interest were: sardinella *Sardinella aurita*, *Sardinella maderensis*, horse mackerel *Trachurus trachurus* and *T. trecae*, false scad *Caranx rhonchus*, and anchovy *Engraulis encrasicolus*.
- To identify and describe the size distribution of the target fish populations by midwater and bottom trawl sampling and process the catches by recording weight and number by species.
- To sample standard hydrographical transects for temperature, salinity and oxygen at about 13°35'N and 14°50'N.

The time allocated for this part of the survey, off Senegal and the Gambia, was 9 days.

## 1.2 Participation

Members of the scientific teams were:

Centre de Recherches Océanographiques de Dakar-Thiaroye, Senegal:
Abdoulaye SARRE, Mor SYLLA, Ibrahima SOW and Abdourahmane SAMBE

Department of Fisheries, the Gambia:
Solomon TAMOH and Juldah JALLOW,

Institut Mauritanien de Recherches Océanographiques et des Pêches, Mauritania:
AHMEDOU Ould Mohamed El Moustapha

Institut National de Recherche Halieutique, Casablanca, Morocco
Hassan MOUSTAHFID

Institute of Marine Research, Norway:
Reidar TORESEN, Magne OLSEN, Thor Egil JOHANSSON and
Jarle WANGENSTEN

## 1.3 Narrative

The course tracks with the fishing and hydrographical stations are shown in Figure 1.

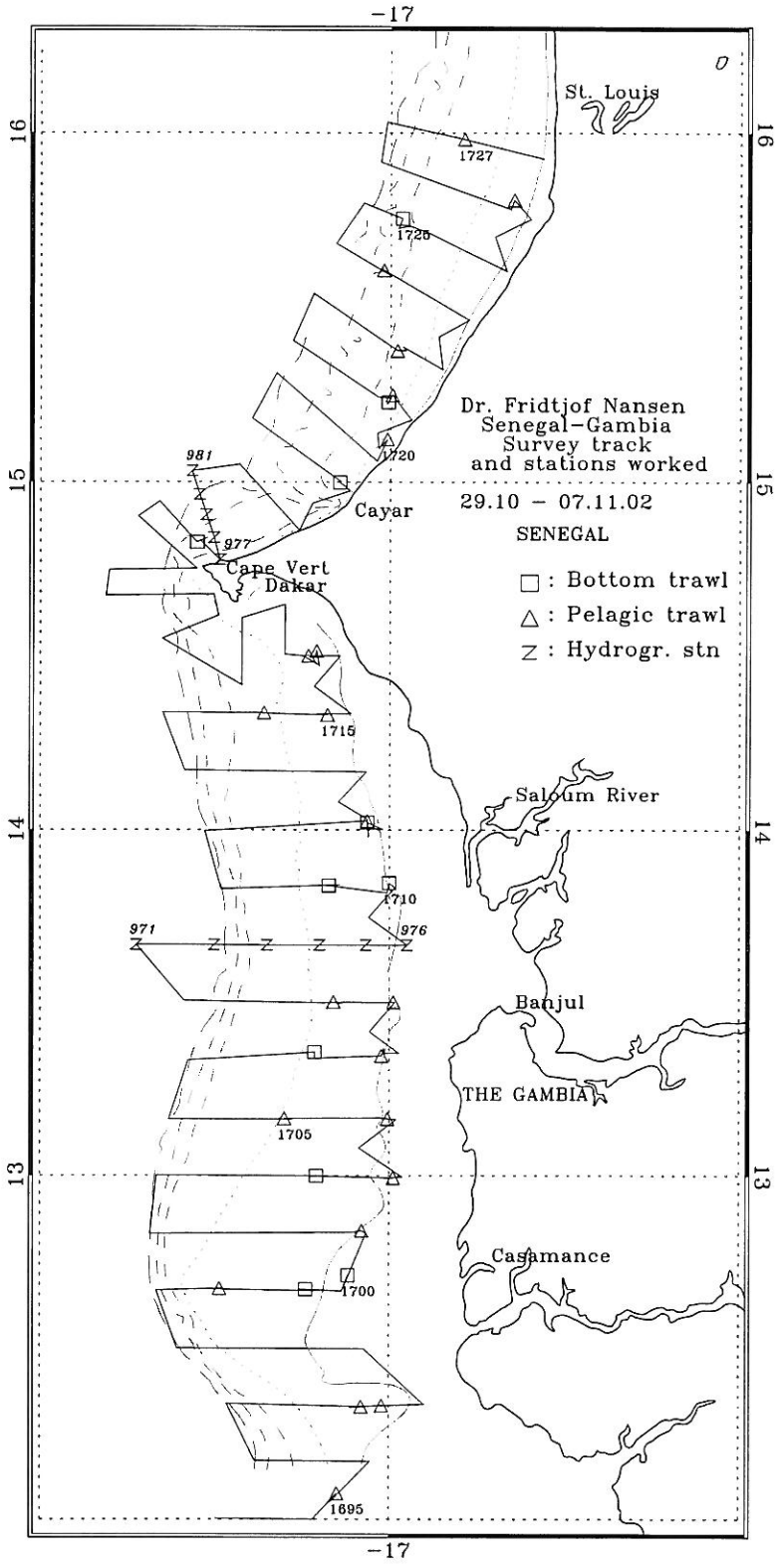



Figure 1. Course tracks with fishing and hydrographic stations; Casamance to St. Louis.

The survey started off Casamance on October 30 with systematic parallel course tracks spaced about 10 NM (nautical miles) apart. To cover the whole distribution area of pelagic fish, the shelf was covered from the 15 m isobath and offshore to the 500 m isobath. Trawling was done irregularly, either to identify echo registrations or to check 'blindly' if fish were mixed with the plankton in the upper layers of the water column. In the latter case, pelagic trawl with floats was often used. A smaller pelagic trawl or the bottom trawl with floats was used for sampling the pelagic fish in very shallow waters (depth less than 25 m). The shelf was covered north to St. Louis. The survey was finished in Dakar November 7.

The hydrographic profile off the Gambia was carried out on 2nd November and that off Cape Vert on 4th July.

### 1.4 Methods

*Environmental Data*

Surface temperature and meteorological data from a weather station were logged automatically and recorded with position and bottom depth every nautical mile sailed.

Hydrographic profiles were collected with a Seabird 911+ CTD probe. Temperature, salinity, oxygen and pressure (depth) were logged by the Seabird Software. From these data series, records were selected from standard depths and presented in figures.

*Biological sampling*

Biological sampling of the fish was carried out using trawls. A pelagic trawl with floats was often used. A smaller pelagic trawl or the bottom trawl with floats was used for sampling the pelagic fish in very shallow waters (depth less than 25 m). Annex II gives a description of the instruments and the fishing gear used. All catches were sampled for composition by weight and numbers of each species caught. Species identification was based on the FAO Species Guides. Length frequency distributions, by total fish length in cm, of the selected target species were taken in all the stations where they were present. Individual weight measurements were taken regularly to estimate the condition factor in the length-weight relationship:

$$\overline{w} = \frac{cond}{100} \cdot L^3$$

The specific condition factors obtained from the samples and applied for this survey were: 0.96 for sardinellas and horse mackerels.

For the estimation of the biomass of carangids and associated species, an overall average length of 23 cm and a condition factor of 0.88 (to calculate the mean length of this length group) were applied.

All data on fishing stations and fish length sampling were made available to the participants on diskettes.

The complete records of fishing stations are shown in Annex I.

The following target groups were used for Senegal:

1. Sardinellas (flat sardinella *Sardinella maderensis* and round sardinella *S. aurita*),
2. Horse mackerels (Cunene horse mackerel *Trachurus trecae*, round scad *Decapterus punctatus*, and false scad *Caranx rhonchus*),
3. Other pelagic carangids and associated species (Atlantic bumper *Chloroscombrus chrysurus*, African lookdown *Selene dorsalis*, chub mackerel *Scomber japonicus*, largehead hairtail, *Trichiurus lepturus*, and barracudas *Sphyraena* spp.),
4. Other demersal species (such as bigeye grunt *Brachydeuterus auritus*, Sparidae and Haemulidae),
5. Other clupeids such as West African ilisha *Ilisha africana*.

*Acoustic sampling*

A SIMRAD EK500 Echosounder was used with the settings as shown in Annex II. The Bergen Integrator (BEI) was used for analysis and allocation of the integrated $s_A$-values to the individual specified target groups by 5 NM intervals. The allocation of values to target groups was based on a combination of a visual scrutiny of the behaviour pattern as deduced from echo diagrams, the BEI analysis, and the catch compositions.

In cases where the target category of fish contains more than one species (sardinellas and horse mackerels), the mean $s_A$-value allocated to the category is divided between the species in the same ratio as their contribution to the mean back scattering strength in the length frequency samples.

The following target strength (TS) function was applied to convert $s_A$-values (mean integrator value for a given species or group of species in a specified area) to number of fish:

$$TS = 20 \log L - 72 \text{ dB}$$

Which can be converted (see Toresen *et al.* 1998 for details) to the area form (scattering cross sections of acoustic targets):

$$C_{Fi} = 1.26 \cdot 10^6 \cdot L^{-2}$$

where L is total length in 1 cm length group $i$ and $C_{Fi}$ ($m^{-2}$) is the reciprocal back scattering strength, or so-called fish conversion factor. In order to split and convert the allocated $s_A$-values ($m^2/NM^2$) to fish densities (numbers per length group per $NM^2$), the following formula was used:

$$\rho_i = s_A \cdot \frac{p_i}{\sum_{i=1}^{n} \frac{p_i}{C_{F_i}}}$$

where

$\rho_i$ = density of fish in length group $i$

$s_A$ = mean integrator value

$p_i$ = proportion of fish in length group $I$

$\sum_{i=1}^{n} \frac{p_i}{C_{Fi}}$ = the relative back scattering cross section ($m^2$) of the length frequency sample of the target species, and

$C_{fi}$ = reciprocal back scattering cross section ($\sigma_{bs}^{-1}$) of a fish in length group $i$

The integrator outputs were split in fish groups using a combination of behaviour pattern as deduced from echo diagrams, the BEI analysis and catch composition as described below. The following groups were used for Senegal: 1) sardinellas, 2) horse mackerels, 3) carangids and associated species and 4) demersal fish.

The above equations show that the conversion from $s_A$-values to number of fish is dependent on the length composition of the fish. It is therefore important to get representative length distributions from the stock in the whole distribution area.

When the size classes (of e.g. young fish and older fish) are well mixed, the various length distributions can be pooled together with equal importance. Otherwise, when the size classes are segregated, the total distribution area has to be post-stratified, according to the length distributions, and separate estimates are made for the regions containing fish with equal size.

For a region representing a distribution of a target-specie, the following basic data are needed for the estimation of abundance; 1) the average $s_A$-value for the region, 2) the surface (usually square nautical miles, $NM^2$), and 3) a representative length distribution of the fish in the region. If the targeted fish is a mixture of more than one species, for example sardinellas, a representative distribution of the two, within the region, as shown in the trawl catches, are used. A length distribution representing the number of the two species for each catch will have to be calculated. Thereafter, these distributions have to be normalized to a unit number (usually 100) so they are equally weighted.

A systematic approach to a) divide the $s_A$-value between species in a category of fish (e.g. *Sardinella aurita* and *S. maderensis*) and b) produce pooled length distributions of a target species for use in the above equation and c) calculate the biomass estimates for a region, is obtained through the following procedure:

- The samples of the species in the category (e.g. sardinellas) are respectively pooled together with equal importance (normalized).

- The mean back scattering strength ($\rho/s_A$) of each length frequency distribution of the target species is calculated and summed. This is automatically done in the Excel spread-sheet made available for acoustic abundance estimation onboard RV 'Dr. Fridtjof Nansen', provided the data are punched in this sheet.

- The mean $s_A$-value allocated to the category of fish in the region is divided between the species in the same ratio as their relative contribution to the mean back scattering strength of the length groups in the sample representing the region (also automatically done in the Excel spread-sheet given that the $s_A$-value for the region is punched into the sheet).

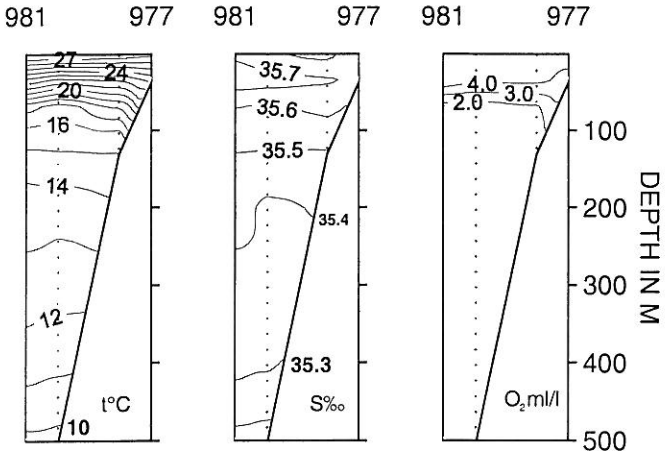
- The pooled length distribution is used, together with the mean $s_A$-value, to calculate the density (numbers per square NM) by length groups and species, using the above formula. The total number by length group in the area is obtained by multiplying each number by the area. (This is done in the Excel spreadsheet, given that the area of the region is punched into the sheet).

- The numbers are converted to biomass using the estimated weight at length. (Done in the Excel sheet if the condition factor is punched).

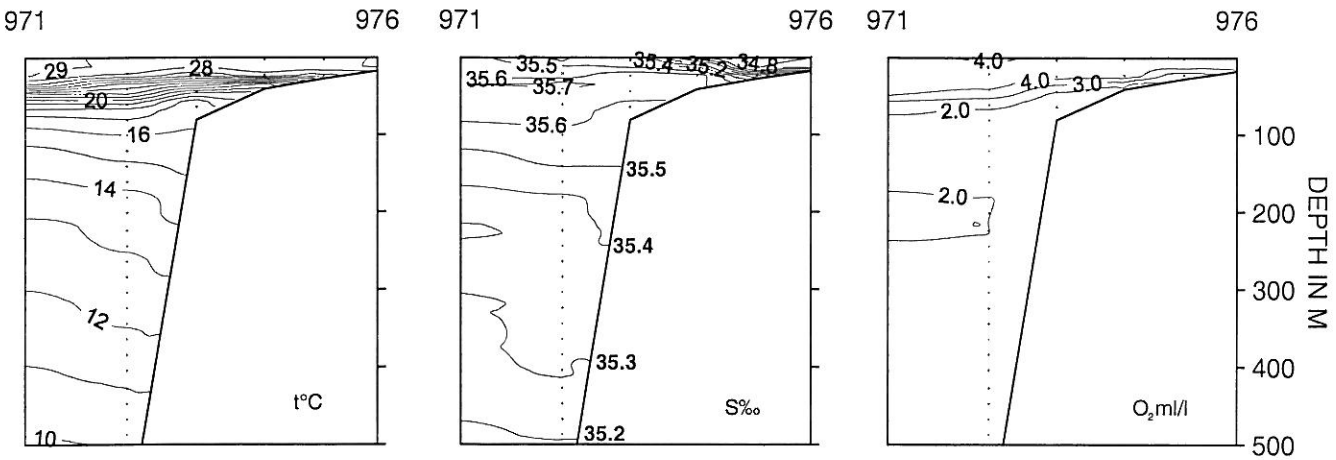
# CHAPTER 2 SURVEY RESULTS

## 2.1 Hydrography

Figure 2 shows the distribution of temperature, salinity and oxygen in the two profiles and Figure 3 the sea surface temperature at 5 m of depth.




**CAPE VERT 02.07 2002**




**THE GAMBIA - WEST 04.07 2002**

Figure 2. Hydrographic profiles with distribution of temperature, salinity and oxygen.

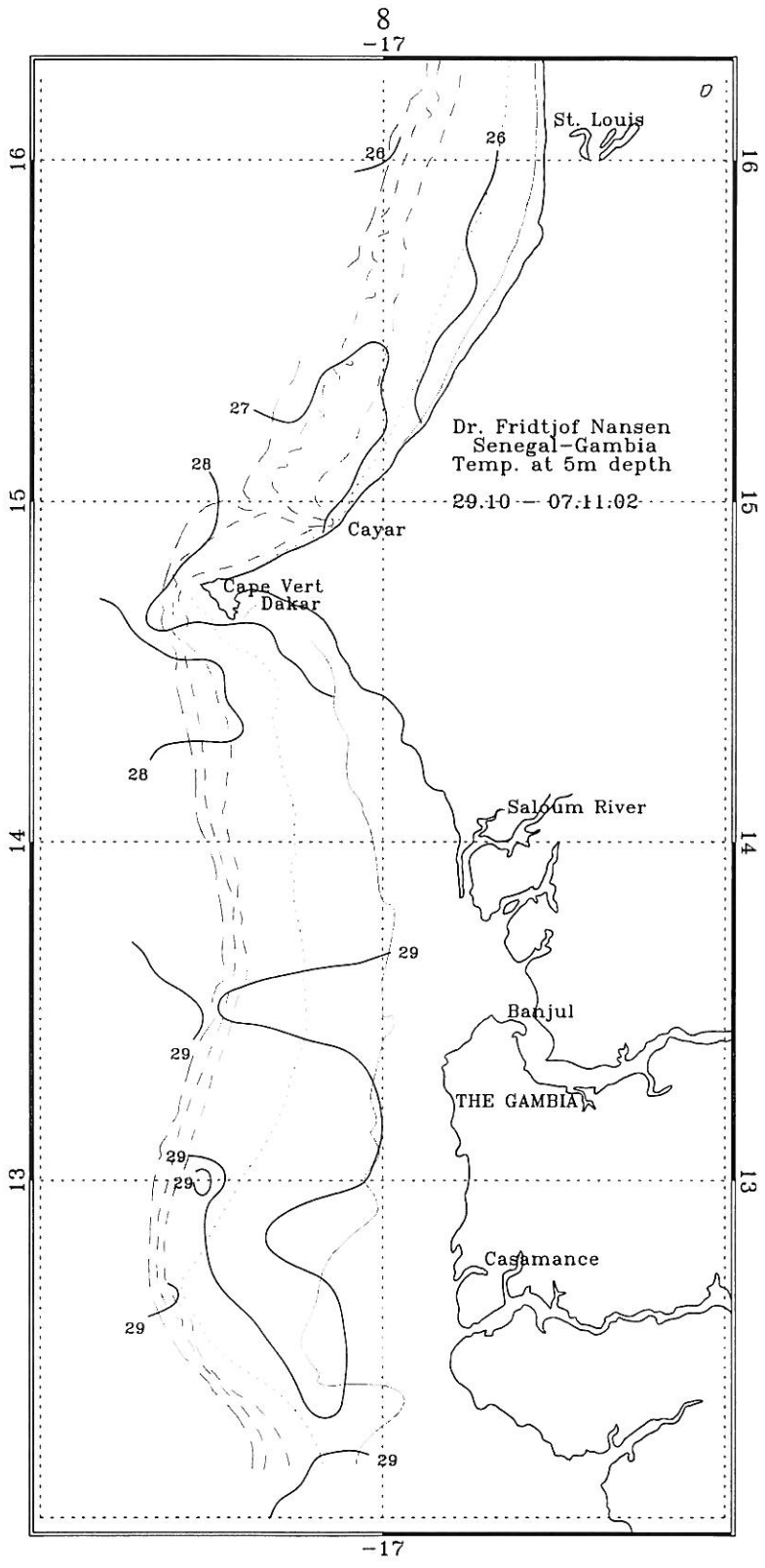



Figure 3. Sea surface temperature; Casamance to St. Louis.

The distribution of surface temperature and the profile the Gambia-west show that there was a stable surface layer with a temperature of 29 °C over the whole shelf south of Banjul. North of Cape Vert there was a decreasing trend of temperature from 28 °C to 26 °C close to the shore.

No indication of the front between the temperate northern waters and the tropical waters from south was observed in northern part during this survey.

The overall temperature regime this year was about 1 degree lower than was observed last year in same period.

## 2.2 The Casamance shelf

Figures 4, 5 and 6 show the distributions of the main groups of pelagic fish by contoured acoustic densities for the whole shelf of Senegal and the Gambia.

Off the Casamance coast, there was a continuous distribution of sardinella of medium and high density covering most of the shelf, Figure 4. The samples from this aggregation were predominantly *Sardinella maderensis.* The modal size was 23 cm (total length). The stock length compositions by numbers and weight are found in Annex IV. The total biomass of sardinellas in the area was estimated at 490 thousand tonnes, Table 1.

False scad *Caranx rhonchus* were found in a small area in the inner part of the shelf (Figure 5). This rather low concentration was estimated at 9 thousand tonnes, and the fish had modal lengths of 14, 19 and 26 cm. A rather low concentration of what was believed to be Atlantic horse mackerel was found at the outer part of the shelf, but since no trawling was carried out there, no estimate of the abundance could be made.

Other pelagic fish were found over most of the shelf, see Figure 6. The trawl samples indicated that these consisted of bumper, lookdown, barracudas, two-colour jack and hairtails, with the bumper as the dominating species. The estimated biomass of this group of fish was 114 thousand tonnes.

Table 1. Casamance. Biomass estimates of pelagic fish, thousand tonnes.

| Flat sardinella | Round sardinella | Horse mackerels | Carangids etc |
|---|---|---|---|
| 428 | 62 | 9 | 114 |

## 2.3 The Gambian shelf

The school area of sardinella found at the southern boarder between the Gambia and Senegal continued northwards into the Gambian zone (Figure 4). A rather high density concentration was recorded at the northern boarder of the Gambia, some 20 NM west of Banjul. The samples showed a 55% dominance of round sardinella *Sardinella aurita*. The pooled length composition of the round sardinella had a mode of 24 cm, while for the flat sardinella the modal lengths were 18, 20, and 23 cm, Annex IV.

Table 2 shows that the biomass estimates of the sardinellas amounted to 204 thousand tonnes, of which 92 thousand tonnes were flat sardinella.

In this area, two concentrations of horse mackerels were found, one near the outer edge of the shelf, which was not verified by trawl samples, and the other one at the inner part of the shelf which was found to be false scad *Caranx rhonchus,* Figure 5. However, the densities were very low and the biomass of the false scad was estimated at 3 thousand tonnes only.

Carangids and associated species were found widely distributed over the inner shelf, Figure 6. Catches of this group consisted mainly of bumper, African lookdown and barracudas. The biomass was estimated at 35 thousand tonnes.

Table 2. The Gambia. Biomass estimates of pelagic fish, thousand tonnes.

| Flat sardinella | Round sardinella | Horse mackerels | Carangids etc. |
|---|---|---|---|
| 92 | 112 | 3 | 35 |

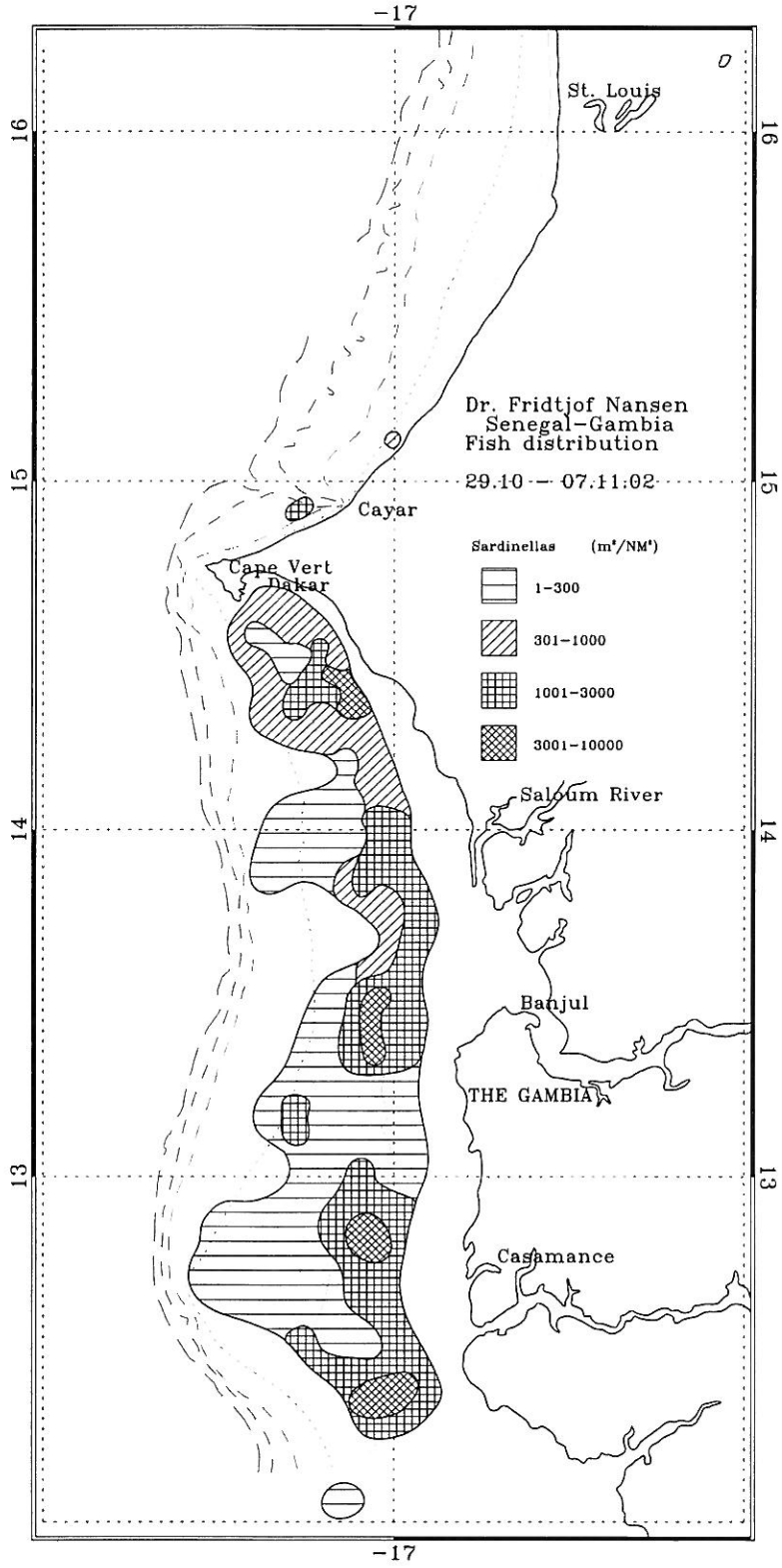



Figure 4. Distribution of sardinellas; Casamance to St. Louis.

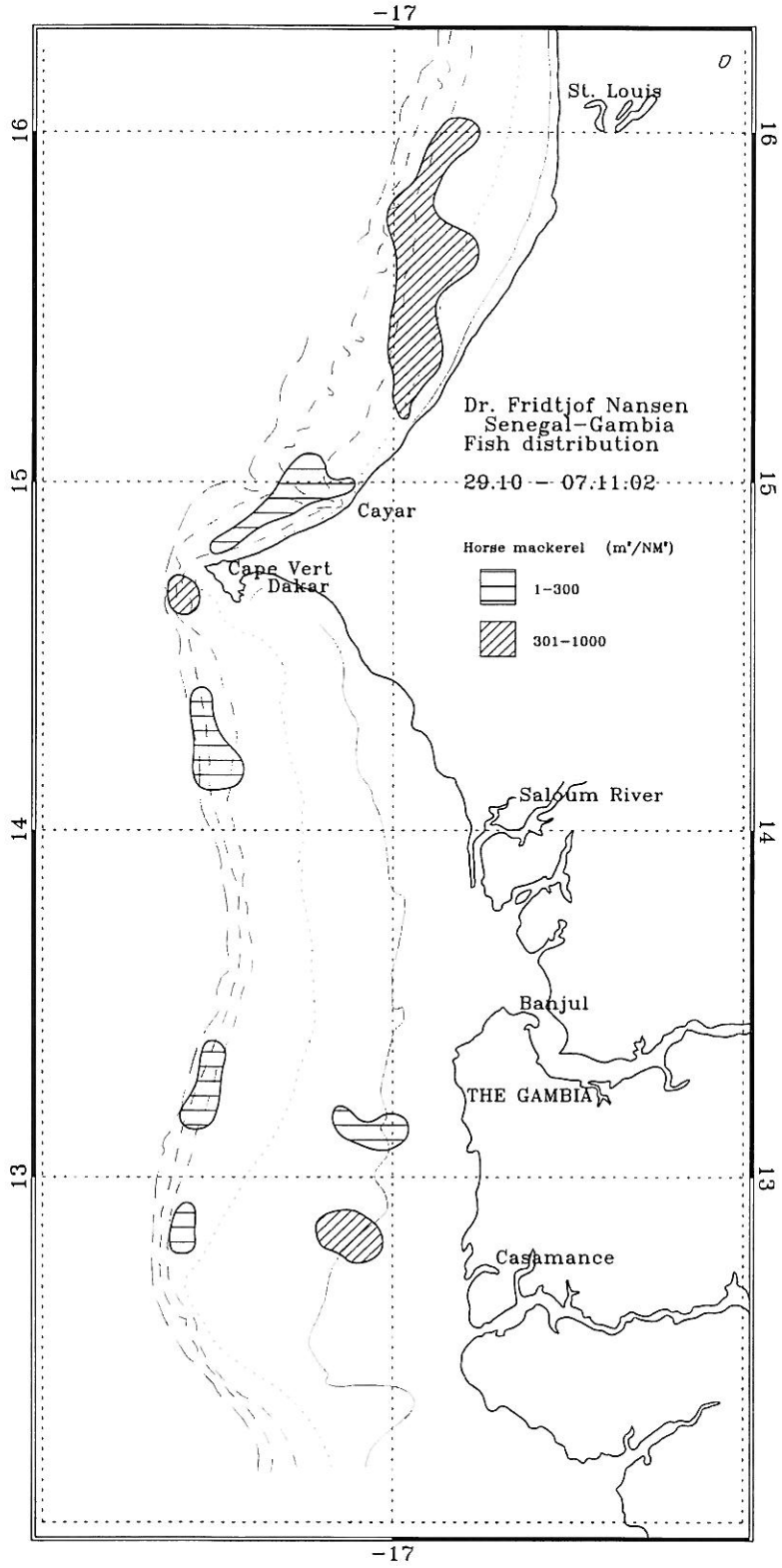



Figure 5. Horse mackerels; Casamance to St. Louis.

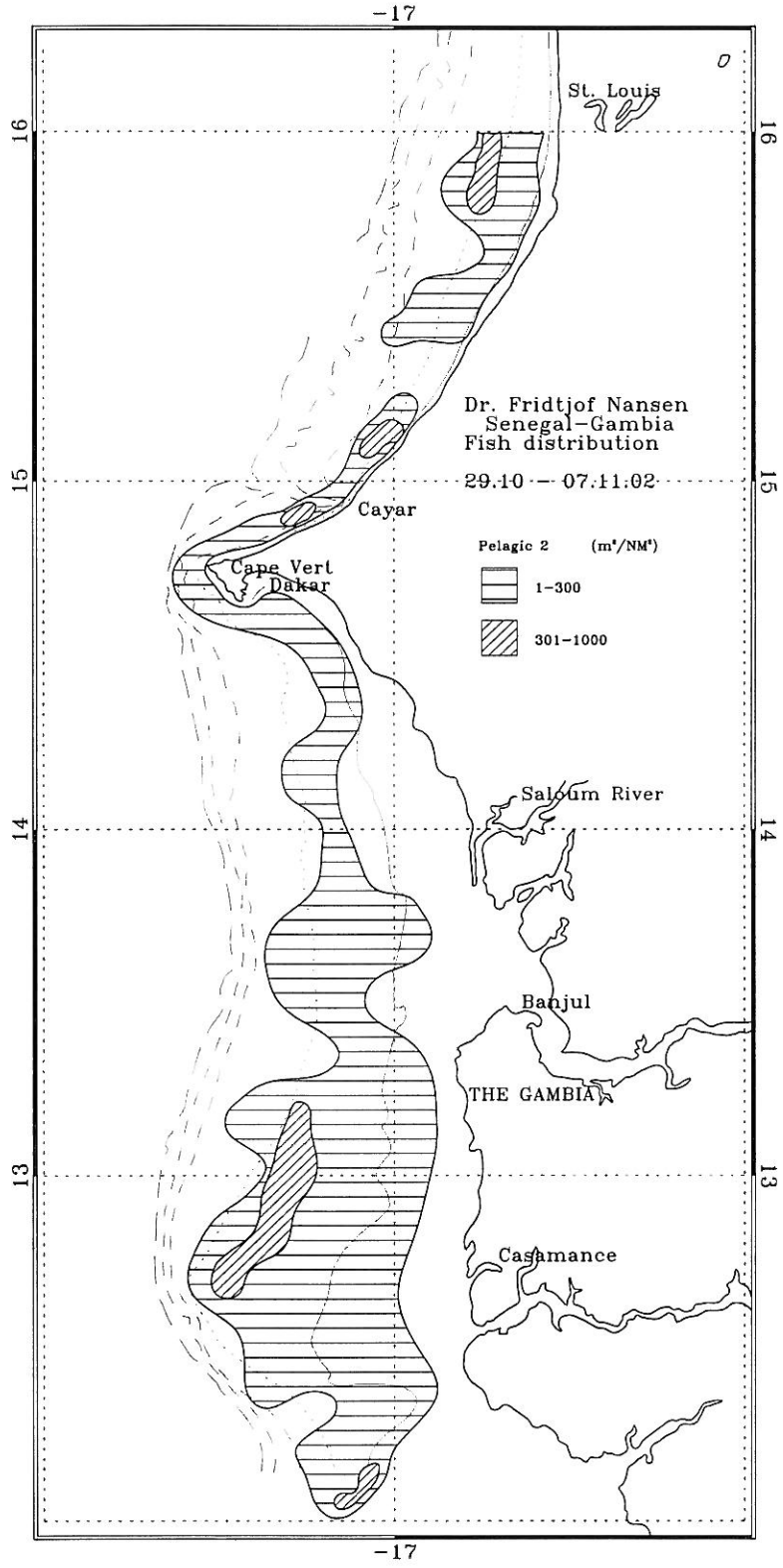



Figure 6. Carangids and associated species; Casamance to St. Louis

## 2.4 The Gambian border - Cape Vert

The concentrations of sardinellas found farther south continued northwards to the bay of Dakar, Figure 4. Medium and high densities were found in all this area. Table 3 shows the biomass estimates for the two sardinella species that summed up to 220 thousand tonnes. Flat sardinella dominated the estimated biomass in the area by 78%.

Pooled length compositions of samples showed that the flat sardinella had a modal length of 24 cm while the round sardinella had a modal length of 23 cm, see Annex III.

The horse mackerels in this area were distribution along the outer part of the shelf, between the outlet of the Saloum River and Dakar, Figure 5. The concentrations were very scattered, and no trawling, hence no samples were taken of the fish. Therefore, no estimate of these concentrations could be made.

The carangids and associated pelagic fish were distributed as a continuous belt over the inner part of the shelf, but at rather low densities, Figure 6. Again, bumper was caught in most of the trawl samples. The biomass of the carangids and associated pelagic fish was estimated at about 19 thousand tonnes, Table 3.

Table 3. The Gambia border to Cape Vert. Biomass estimates of pelagic fish, thousand tonnes.

| Flat sardinella | Round sardinella | Horse mackerels | Carangids etc. |
|---|---|---|---|
| 172 | 48 | 0 | 19 |

## 2.5 Cape Vert - St. Louis

Almost no sardinella were found in this area. Only two very small inshore concentrations were found, but they were not verified as sardinellas. Therefore, no estimates were carried for sardinellas in the areas north of Cape Vert.

Horse mackerel were found in two medium to low density areas, one just north of Cape Vert, and the other one some 50 NM south of St. Louis and northwards to the boarder, Figure 5. The total biomass was estimated at 50 thousand tonnes, and the catches show that only Cunene horse mackerel were found. The modal lengths were 13 and 26 cm.

Carangids and associated pelagic fish were found in two areas, one as a continuation of the concentrations from south of Cape Vert, and the other one starting some 30 NM south of St. Louis reaching northwards to the border, Figure 6. The catches consisted also here of bumper, African lookdown and hairtails. The biomass estimate was 28 thousand tonnes.

Table 4. Cape Vert to St. Louis. Biomass estimates of pelagic fish, thousand tonnes.

| Flat sardinella | Round sardinella | Horse mackerels | Carangids etc. |
|---|---|---|---|
| 0 | 0 | 50 | 28 |

# CHAPTER 3 OVERVIEW AND SUMMARY OF RESULTS

The survey was conducted successfully in the period October 29 to November 7 with a course track of about 1 600 NM and 33 fishing stations.

The hydrographical data showed a stable surface layer for the whole shelf in the south, but with declining surface temperatures towards the coast from about Dakar northwards.

Sardinellas were found in one main area, off Casamance to Cape Vert, Figure 4. High densities were found off Casamance and west of Banjul. Round sardinella dominated in the waters of the Gambia, while in other areas flat sardinella dominated.

Horse mackerels were nearly absent from the area south of Cape Vert. Only two very small concentrations of false scad *Caranx rhonchus* were verified. North of Cape Vert two somewhat larger concentrations of Cunene horse mackerel *Trachurus trecae* were found consisting of young and juvenile fish, Figure 5.

Other carangids and associated species were distributed over most of the shelf at rather low densities, Figure 6. The catches of this group consisted of bumper, barracudas and hairtails.

An overview of the acoustic estimates of biomass of the main groups of pelagic fish is shown in Table 5. The total biomass of sardinellas was thus 914 thousand tonnes, horse mackerels 62 thousand tonnes and of carangids and associated species 196 thousand tonnes.

Table 5. Summary of biomass estimates of pelagic fish, Senegal and the Gambia, thousand tonnes.

| | Flat sardinella | Round sardinella | Horse mackerels | Carangids etc. |
|---|---|---|---|---|
| St. Louis-Cape Vert | 0 | 0 | 50 | 28 |
| Cape Vert-the Gambia | 172 | 48 | 0 | 19 |
| the Gambia | 92 | 112 | 3 | 35 |
| Casamance | 428 | 62 | 9 | 114 |
| Total | 692 | 222 | 62 | 196 |

Table 6 lists biomass estimates of sardinellas and carangids (including the horse mackerels) and associated species from the 'Dr. Fridtjof Nansen' surveys of this shelf region. Large-scale latitudinal movements of pelagic fish between Morocco and Guinea Bissau are well known, and in the summer the sardinellas should be concentrated in Senegal for spawning. Compared

with the October/November survey last year, the estimate of 914 thousand tonnes of sardinellas from the current survey is high. The carangid estimate of 258 thousand tonnes is low compared to recent estimates of this group of fish.

Table 6. Biomass estimates from previous 'Dr Fridtjof Nansen' surveys of the Senegal-the Gambia shelf, thousand tonnes.

| Survey: | Sardinellas | Carangids etc.* |
|---|---|---|
| AprMay-81 | 210 | 570 |
| Sept -81 | 360 | ** |
| FebMar-82 | 40 | 90 |
| NovDec-86 | 330 | 170 |
| FebMar-92 | 1 530 | 690 |
| NovDec-95 | 760 | 220 |
| NovDec-96 | 230 | 530 |
| NovDec-97 | 300 | 250 |
| NovDec-98 | 390 | 340 |
| NovDec-99 | 1 390 | 470 |
| NovDec-00 | 300 | 540 |
| JunJul-01 | 410 | 230 |
| NovDec-01 | 430 | 480 |
| JunJul-02 | 600 | 430 |
| NovDec-02 | 910 | 260 |

* Horse mackerels and other carangids
** Not available

## References

Toresen, R., Gjøsæter, H., and Barros, P. 1998. The acoustic method as used in the abundance estimation of capelin (*Mallotus villosus* Müller) and herring (*Clupea harengus* Linné) in the Barents Sea. Fisheries Research 34 (1998) 27-37.

# Annex I Records of fishing stations

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1695
DATE:30/10/02 GEAR TYPE: PT No: 3 POSITION:Lat N 1205
start stop duration Long W 1709
TIME :13:06:57 13:27:46 21 (min) Purpose code: 1
LOG : 933.86 935.30 1.43 Area code : 4
FDEPTH: 20 20 GearCond.code:
BDEPTH: 40 47 Validity code:
Towing dir: 225ø Wire out: 150 m Speed: 42 kn*10

Sorted: Kg Total catch: 64.74 CATCH/HOUR: 184.97

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sphyraena guachancho | 141.00 | 311 | 76.23 | |
| Sardinella maderensis | 14.57 | 131 | 7.88 | 2853 |
| Rhizoprionodon acutus | 8.57 | 3 | 4.63 | |
| Sardinella aurita | 8.31 | 60 | 4.49 | 2852 |
| Chloroscombrus chrysurus | 8.03 | 91 | 4.34 | 2854 |
| Sphyrna lewini | 4.29 | 3 | 2.32 | |
| Echeneis naucrates | 0.20 | 3 | 0.11 | |
| Total | 184.97 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1696
DATE:30/10/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1220
start stop duration Long W 1705
TIME :19:57:45 20:26:58 29 (min) Purpose code: 1
LOG :1001.17 1003.14 1.97 Area code : 4
FDEPTH: 10 10 GearCond.code:
BDEPTH: 28 28 Validity code:
Towing dir: 270ø Wire out: 110 m Speed: 40 kn*10

Sorted: 69 Kg Total catch: 1455.59 CATCH/HOUR: 3011.57

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Brachydeuterus auritus | 2297.11 | 19552 | 76.28 | |
| Sphyraena guachancho | 129.21 | 317 | 4.29 | |
| Sphyraena guachancho | 93.41 | 261 | 3.10 | |
| Pomadasys peroteti | 71.26 | 87 | 2.37 | |
| Ilisha africana | 69.52 | 6155 | 2.31 | |
| Stromateus fiatola | 62.57 | 87 | 2.08 | |
| Arius parkii | 62.57 | 130 | 2.08 | |
| Chloroscombrus chrysurus | 55.18 | 739 | 1.83 | |
| Sardinella aurita | 36.93 | 217 | 1.23 | |
| Galeoides decadactylus | 23.46 | 217 | 0.78 | |
| Penaeus notialis | 22.59 | 7003 | 0.75 | |
| Pteroscion peli | 22.16 | 348 | 0.74 | |
| Selene dorsalis | 21.72 | 391 | 0.72 | |
| Parapenaeus longirostris | 19.12 | 1043 | 0.63 | |
| Sardinella maderensis | 16.94 | 130 | 0.56 | |
| Eucinostomus melanopterus | 5.65 | 43 | 0.19 | |
| Portunus validus | 1.30 | 43 | 0.04 | |
| Trichiurus lepturus | 0.87 | 261 | 0.03 | |
| Total | 3011.57 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1697
DATE:30/10/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1220
start stop duration Long W 1701
TIME :21:39:48 21:49:50 10 (min) Purpose code: 1
LOG :1011.86 1012.55 0.66 Area code : 4
FDEPTH: 5 5 GearCond.code:
BDEPTH: 25 19 Validity code:
Towing dir: 270ø Wire out: 120 m Speed: 41 kn*10

Sorted: 32 Kg Total catch: 1802.08 CATCH/HOUR: 10812.48

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 10164.00 | 107184 | 94.00 | 2856 |
| Chloroscombrus chrysurus | 510.72 | 14448 | 4.72 | |
| Sardinella aurita | 33.60 | 336 | 0.31 | |
| Selene dorsalis | 20.16 | 336 | 0.19 | |
| Trichiurus lepturus | 20.16 | 336 | 0.19 | |
| Total | 10748.64 | | 99.41 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1698
DATE:31/10/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1240
start stop duration Long W 1729
TIME :06:06:38 06:21:30 15 (min) Purpose code: 1
LOG :1093.83 1094.88 1.05 Area code : 4
FDEPTH: 15 15 GearCond.code:
BDEPTH: 42 39 Validity code:
Towing dir: 270ø Wire out: 95 m Speed: 41 kn*10

Sorted: 71 Kg Total catch: 156.97 CATCH/HOUR: 627.88

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 209.00 | 1640 | 33.29 | 2857 |
| Brachydeuterus auritus | 82.20 | 700 | 13.09 | |
| Chloroscombrus chrysurus | 80.00 | 540 | 12.74 | |
| Arius parkii | 57.08 | 80 | 9.09 | |
| Selene dorsalis | 54.40 | 340 | 8.66 | |
| Sphyraena guachancho | 36.20 | 60 | 5.77 | |
| Galeoides decadactylus | 32.84 | 56 | 5.23 | |
| Trichiurus lepturus | 28.24 | 68 | 4.50 | |
| Caranx crysos | 9.28 | 8 | 1.48 | |
| Sphyrna lewini | 7.64 | 4 | 1.22 | |
| Caranx rhonchus | 7.28 | 20 | 1.16 | |
| Alectis alexandrinus | 6.04 | 8 | 0.96 | |
| Albula vulpes | 4.24 | 8 | 0.68 | |
| Pomadasys rogeri | 3.92 | 8 | 0.62 | |
| Pomadasys incisus | 3.84 | 12 | 0.61 | |
| Sardinella aurita | 2.80 | 20 | 0.45 | |
| Sepia officinalis hierredda | 2.24 | 4 | 0.36 | |
| Echeneis naucrates | 0.64 | 4 | 0.10 | |
| Total | 627.88 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1699
DATE:31/10/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1240
start stop duration Long W 1714
TIME :08:46:36 09:07:29 21 (min) Purpose code: 1
LOG :1115.30 1116.36 1.05 Area code : 4
FDEPTH: 23 24 GearCond.code:
BDEPTH: 23 24 Validity code:
Towing dir: 270ø Wire out: 130 m Speed: 30 kn*10

Sorted: 27 Kg Total catch: 220.23 CATCH/HOUR: 629.23

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Ilisha africana | 168.00 | 4920 | 26.70 | |
| Trichiurus lepturus | 134.00 | 523 | 21.30 | |
| Galeoides decadactylus | 100.29 | 600 | 15.94 | |
| Brachydeuterus auritus | 49.20 | 2434 | 7.82 | |
| Chloroscombrus chrysurus | 44.57 | 651 | 7.08 | |
| Selene dorsalis | 33.09 | 686 | 5.26 | |
| Arius parkii | 32.06 | 257 | 5.10 | |
| Sphyraena guachancho | 13.89 | 34 | 2.21 | |
| Rhizoprionodon acutus | 12.86 | 17 | 2.04 | |
| Pseudotolithus senegalensis | 12.29 | 34 | 1.95 | |
| Alectis alexandrinus | 6.51 | 69 | 1.03 | |
| Pteroscion peli | 4.63 | 51 | 0.74 | |
| Scomberomorus tritor | 4.43 | 11 | 0.70 | |
| Pseudotolithus typus | 4.26 | 14 | 0.68 | |
| Pomadasys peroteti | 2.40 | 17 | 0.38 | |
| Dasyatis margarita | 1.43 | 3 | 0.23 | |
| Trachinotus ovatus | 1.09 | 6 | 0.17 | |
| Argyrosomus regius | 0.86 | 3 | 0.14 | |
| Albula vulpes | 0.77 | 3 | 0.12 | |
| Sardinella maderensis | 0.69 | 17 | 0.11 | |
| Drepane africana | 0.66 | 3 | 0.10 | |
| Sardinella aurita | 0.60 | 3 | 0.10 | |
| Penaeus notialis | 0.34 | 69 | 0.05 | |
| Sphyraena sphyraena | 0.34 | 17 | 0.05 | |
| Diplodus bellottii | 0.26 | 17 | 0.04 | |
| Total | 629.52 | | 100.04 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1700
DATE:31/10/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1243
start stop duration Long W 1707
TIME :10:39:21 11:09:45 30 (min) Purpose code: 1
LOG :1129.03 1130.66 1.63 Area code : 4
FDEPTH: 18 17 GearCond.code:
BDEPTH: 18 17 Validity code:
Towing dir: 202ø Wire out: 140 m Speed: 32 kn*10

Sorted: 59 Kg Total catch: 448.27 CATCH/HOUR: 896.54

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Chloroscombrus chrysurus | 399.00 | 9106 | 44.50 | |
| Trichiurus lepturus | 198.74 | 570 | 22.17 | |
| Brachydeuterus auritus | 141.00 | 2924 | 15.73 | |
| Galeoides decadactylus | 70.50 | 390 | 7.86 | |
| Sardinella maderensis | 31.66 | 270 | 3.53 | |
| Selene dorsalis | 12.00 | 196 | 1.34 | |
| Elops lacerta | 12.00 | 30 | 1.34 | |
| Pomadasys jubelini | 6.00 | 16 | 0.67 | |
| Caranx rhonchus | 5.70 | 16 | 0.64 | |
| Sphyraena guachancho | 4.64 | 16 | 0.52 | |
| Arius parkii | 4.50 | 16 | 0.50 | |
| Caranx hippos | 4.06 | 16 | 0.45 | |
| Alectis alexandrinus | 3.74 | 46 | 0.42 | |
| Mugil capurrii | 3.00 | 16 | 0.33 | |
| Total | 896.54 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1701
DATE:31/10/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1250
start stop duration Long W 1705
TIME :12:40:03 13:03:47 24 (min) Purpose code: 1
LOG :1141.95 1143.45 1.43 Area code : 4
FDEPTH: 10 10 GearCond.code:
BDEPTH: 18 19 Validity code:
Towing dir: 270º Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 30.13 CATCH/HOUR: 75.33

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 60.13 | 720 | 79.82 | 2859 |
| Caranx rhonchus | 7.58 | 23 | 10.06 | |
| Sardinella aurita | 7.53 | 55 | 10.00 | 2858 |
| Chloroscombrus chrysurus | 0.10 | 3 | 0.13 | |
| Total | 75.34 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1702
DATE:31/10/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1300
start stop duration Long W 1713
TIME :20:00:18 20:20:33 20 (min) Purpose code:
LOG :1216.78 1217.95 1.16 Area code :
FDEPTH: 33 34 GearCond.code: 1
BDEPTH: 33 34 Validity code: 1
Towing dir: 270º Wire out: 100 m Speed: 35 kn*10

Sorted: 56 Kg Total catch: 850.20 CATCH/HOUR: 2550.60

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Brachydeuterus auritus | 1428.75 | 1191 | 56.02 | |
| Chloroscombrus chrysurus | 614.25 | 654 | 24.08 | |
| Sardinella maderensis | 382.50 | 4995 | 15.00 | 2860 |
| Sardinella aurita | 32.40 | 360 | 1.27 | |
| Eucinostomus melanopterus | 30.60 | 225 | 1.20 | |
| Galeoides decadactylus | 27.00 | 225 | 1.06 | |
| Pomadasys jubelini | 19.80 | 90 | 0.78 | |
| Sepia officinalis hierredda | 10.35 | 45 | 0.41 | |
| Selene dorsalis | 4.05 | 90 | 0.16 | |
| Penaeus notialis | 0.90 | 45 | 0.04 | |
| Total | 2550.60 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1703
DATE:31/10/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1300
start stop duration Long W 1659
TIME :22:30:26 22:51:39 21 (min) Purpose code: 1
LOG :1234.78 1236.15 1.33 Area code : 4
FDEPTH: 10 10 GearCond.code:
BDEPTH: 19 19 Validity code:
Towing dir: 270º Wire out: 130 m Speed: 36 kn*10

Sorted: 35 Kg Total catch: 201.23 CATCH/HOUR: 574.94

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 464.57 | 5729 | 80.80 | 2861 |
| Brachydeuterus auritus | 65.14 | 789 | 11.33 | |
| Chloroscombrus chrysurus | 25.71 | 429 | 4.47 | |
| Sardinella aurita | 6.00 | 34 | 1.04 | |
| Trichiurus lepturus | 5.29 | 9 | 0.92 | |
| Alectis alexandrinus | 4.80 | 34 | 0.83 | |
| Caranx crysos | 3.43 | 17 | 0.60 | |
| Sepia bertheloti | 1.03 | 17 | 0.18 | |
| Caranx rhonchus | 0.69 | 17 | 0.12 | |
| Total | 576.66 | | 100.29 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1704
DATE: 1/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1310
start stop duration Long W 1700
TIME :01:23:18 01:43:10 20 (min) Purpose code: 1
LOG :1259.40 1260.56 1.13 Area code : 5
FDEPTH: 10 10 GearCond.code:
BDEPTH: 18 20 Validity code:
Towing dir: 270º Wire out: 150 m Speed: 35 kn*10

Sorted: 30 Kg Total catch: 90.39 CATCH/HOUR: 271.17

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Brachydeuterus auritus | 110.70 | 1458 | 40.82 | |
| Caranx rhonchus | 73.80 | 792 | 27.22 | 2863 |
| Chloroscombrus chrysurus | 25.38 | 639 | 9.36 | |
| Trichiurus lepturus | 20.25 | 72 | 7.47 | |
| Sardinella maderensis | 18.09 | 234 | 6.67 | 2862 |
| 'Calappa baby' | 14.40 | 351 | 5.31 | |
| Selene dorsalis | 3.24 | 54 | 1.19 | |
| Sardinella aurita | 2.25 | 18 | 0.83 | |
| Eucinostomus melanopterus | 0.90 | 9 | 0.33 | |
| Sphyraena guachancho | 0.90 | 3 | 0.33 | |
| Decapterus punctatus | 0.63 | 36 | 0.23 | |
| Ilisha africana | 0.63 | 9 | 0.23 | |
| Total | 271.17 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1705
DATE: 1/11/02 GEAR TYPE: PT No: 3 POSITION:Lat N 1310
start stop duration Long W 1718
TIME :04:32:04 04:40:28 8 (min) Purpose code: 1
LOG :1286.09 1286.75 0.64 Area code : 5
FDEPTH: 10 30 GearCond.code:
BDEPTH: 49 48 Validity code:
Towing dir: 90º Wire out: 150 m Speed: 45 kn*10

Sorted: 66 Kg Total catch: 368.13 CATCH/HOUR: 2760.98

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 1897.50 | 15885 | 68.73 | 2864 |
| Sardinella maderensis | 360.00 | 4043 | 13.04 | 2865 |
| Chloroscombrus chrysurus | 217.50 | 1815 | 7.88 | |
| Trachurus trecae | 75.00 | 705 | 2.72 | |
| Brachydeuterus auritus | 67.50 | 705 | 2.44 | |
| Caranx rhonchus | 60.00 | 623 | 2.17 | |
| Selene dorsalis | 30.00 | 293 | 1.09 | |
| Scomber japonicus | 30.00 | 248 | 1.09 | |
| Decapterus punctatus | 15.00 | 705 | 0.54 | |
| Arius latiscutatus | 8.48 | 8 | 0.31 | |
| Total | 2760.98 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1706
DATE: 1/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1321
start stop duration Long W 1713
TIME :10:35:41 10:54:22 19 (min) Purpose code: 1
LOG :1344.70 1345.79 1.08 Area code : 5
FDEPTH: 43 43 GearCond.code:
BDEPTH: 43 43 Validity code:
Towing dir: 180º Wire out: 170 m Speed: 35 kn*10

Sorted: 70 Kg Total catch: 3509.00 CATCH/HOUR: 11081.05

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Chloroscombrus chrysurus | 7856.84 | 105632 | 70.90 | |
| Sardinella aurita | 2842.11 | 23211 | 25.65 | 2866 |
| Selene dorsalis | 113.68 | 947 | 1.03 | |
| Caranx rhonchus | 85.26 | 474 | 0.77 | |
| Sardinella maderensis | 72.63 | 789 | 0.66 | |
| Pomadasys incisus | 25.26 | 158 | 0.23 | |
| Pseudupeneus prayensis | 25.26 | 474 | 0.23 | |
| Priacanthus arenatus | 25.26 | 158 | 0.23 | |
| Nicholsina usta | 18.95 | 158 | 0.17 | |
| Decapterus punctatus | 9.47 | 474 | 0.09 | |
| Pagellus bellottii | 6.32 | 158 | 0.06 | |
| Total | 11081.04 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1707
DATE: 1/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1321
start stop duration Long W 1701
TIME :14:57:54 15:16:31 19 (min) Purpose code: 1
LOG :1360.00 1361.30 1.27 Area code : 5
FDEPTH: 10 10 GearCond.code:
BDEPTH: 20 20 Validity code:
Towing dir: ø Wire out: 150 m Speed:350 kn*10

Sorted: 36 Kg Total catch: 288.40 CATCH/HOUR: 910.74

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 833.68 | 13213 | 91.54 | 2567 |
| Sardinella aurita | 77.05 | 505 | 8.46 | 2568 |
| Total | 910.73 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1708
DATE: 1/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1330
start stop duration Long W 1659
TIME :17:18:49 17:36:03 17 (min) Purpose code:
LOG :1379.86 1380.97 1.07 Area code :
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 19 20 Validity code: 1
Towing dir: 270º Wire out: 150 m Speed: 35 kn*10

Sorted: 33 Kg Total catch: 100.95 CATCH/HOUR: 356.29

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 254.12 | 3102 | 71.32 | 2870 |
| Sardinella aurita | 100.16 | 720 | 28.11 | 2869 |
| Trachinotus ovatus | 2.01 | 11 | 0.56 | |
| Total | 356.29 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1709
DATE: 1/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1330
start stop duration Long W 1710
TIME :19:00:26 19:18:05 18 (min) Purpose code: 1
LOG :1391.86 1393.03 1.16 Area code : 5
FDEPTH: 15 20 GearCond.code:
BDEPTH: 40 38 Validity code:
Towing dir: 90º Wire out: 100 m Speed: 39 kn*10

Sorted: 36 Kg Total catch: 3617.00 CATCH/HOUR: 12056.67

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 7016.67 | 46333 | 58.20 | 2871 |
| Sardinella maderensis | 3606.67 | 47667 | 29.91 | 2872 |
| Chloroscombrus chrysurus | 896.67 | 13333 | 7.44 | |
| Brachydeuterus auritus | 316.67 | 4667 | 2.63 | |
| Pomadasys incisus | 153.33 | 667 | 1.27 | |
| Selene dorsalis | 66.67 | 667 | 0.55 | |
| Total | 12056.68 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1710
DATE: 2/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1351
start stop duration Long W 1700
TIME :07:32:46 08:02:41 30 (min) Purpose code: 1
LOG :1499.06 1500.80 1.74 Area code : 4
FDEPTH: 19 21 GearCond.code:
BDEPTH: 19 21 Validity code:
Towing dir: 190ø Wire out: 140 m Speed: 35 kn*10

Sorted: 31 Kg Total catch: 93.74 CATCH/HOUR: 187.48

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Chloroscombrus chrysurus | 65.40 | 1746 | 34.88 | |
| Pseudupeneus prayensis | 37.20 | 708 | 19.84 | |
| Sardinella maderensis | 12.30 | 108 | 6.56 | |
| Aluterus sp. | 11.94 | 24 | 6.37 | |
| Caranx rhonchus | 9.36 | 156 | 4.99 | |
| Dentex gibbosus | 9.12 | 78 | 4.86 | |
| Bracnydeuterus auritus | 6.48 | 72 | 3.46 | |
| Sepia officinalis hierredda | 6.12 | 12 | 3.26 | |
| Sphyraena guachancho | 5.40 | 12 | 2.88 | |
| Pagrus caeruleostictus | 4.50 | 12 | 2.40 | |
| Alectis alexandrinus | 3.78 | 12 | 2.02 | |
| Sepia bertheloti | 3.30 | 18 | 1.76 | |
| Acanthurus monroviae | 2.70 | 6 | 1.44 | |
| Epinephelus aeneus | 2.24 | 2 | 1.19 | |
| Fistularia petimba | 1.50 | 12 | 0.80 | |
| Echeneis naucrates | 1.38 | 6 | 0.74 | |
| Nicholsina usta | 1.08 | 6 | 0.58 | |
| Chaetodon hoefleri | 0.96 | 6 | 0.51 | |
| Ephippion guttifer | 0.68 | 2 | 0.36 | |
| Albula vulpes | 0.46 | 2 | 0.25 | |
| Pagellus bellottii | 0.42 | 12 | 0.22 | |
| Mugil cephalus | 0.42 | 6 | 0.22 | |
| Balistes capriscus | 0.30 | 6 | 0.16 | |
| Sphoeroides marmoratus | 0.18 | 6 | 0.10 | |
| Selene dorsalis | 0.14 | 2 | 0.07 | |
| Decapterus punctatus | 0.12 | 6 | 0.06 | |
| Total | 187.48 | | 99.98 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1711
DATE: 2/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1350
start stop duration Long W 1711
TIME :09:42:21 10:14:59 33 (min) Purpose code: 1
LOG :1513.89 1515.76 1.48 Area code : 4
FDEPTH: 35 34 GearCond.code:
BDEPTH: 35 34 Validity code:
Towing dir: 90ø Wire out: 140 m Speed: 35 kn*10

Sorted: 5 Kg Total catch: 5.42 CATCH/HOUR: 9.85

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Rhizoprionodon acutus | 9.36 | 2 | 95.03 | |
| Pagellus bellottii | 0.25 | 2 | 2.54 | |
| Echeneis naucrates | 0.24 | 2 | 2.44 | |
| Total | 9.85 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1712
DATE: 2/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1402
start stop duration Long W 1704
TIME :16:14:20 16:32:29 18 (min) Purpose code: 1
LOG :1576.18 1577.46 1.27 Area code : 4
FDEPTH: 10 10 GearCond.code:
BDEPTH: 21 22 Validity code:
Towing dir: 180ø Wire out: 150 m Speed: 37 kn*10

Sorted: Kg Total catch: 6.67 CATCH/HOUR: 22.23

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 21.67 | 177 | 97.48 | 2873 |
| Trachinotus ovatus | 0.57 | 3 | 2.56 | |
| Total | 22.24 | | 100.04 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1713
DATE: 2/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1401
start stop duration Long W 1704
TIME :17:41:20 18:13:38 32 (min) Purpose code:
LOG :1585.66 1587.94 2.25 Area code :
FDEPTH: 24 25 GearCond.code: 1
BDEPTH: 24 25 Validity code: 1
Towing dir: 180ø Wire out: 130 m Speed: 42 kn*10

Sorted: 25 Kg Total catch: 25.00 CATCH/HOUR: 46.88

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 27.00 | 212 | 57.59 | 2874 |
| Pomadasys incisus | 6.00 | 58 | 12.80 | |
| Sparus caeruleostictus * | 5.08 | 19 | 10.84 | |
| Priacanthus arenatus | 4.05 | 15 | 8.64 | |
| Pseudupeneus prayensis | 1.13 | 9 | 2.41 | |
| Dentex gibbosus | 0.81 | 4 | 1.73 | |
| Caranx rhonchus | 0.79 | 6 | 1.69 | |
| Balistes punctatus | 0.73 | 2 | 1.56 | |
| Chloroscombrus chrysurus | 0.68 | 8 | 1.45 | |
| Fistularia petimba | 0.39 | 2 | 0.83 | |
| Selene dorsalis | 0.23 | 2 | 0.49 | |
| Total | 46.89 | | 100.03 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1714
DATE: 3/11/02 GEAR TYPE: PT No: 3 POSITION:Lat N 1420
start stop duration Long W 1722
TIME :02:51:19 03:05:59 15 (min) Purpose code: 1
LOG :1664.90 1665.89 0.98 Area code : 4
FDEPTH: 25 25 GearCond.code:
BDEPTH: 54 63 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 40 kn*10

Sorted: 36 Kg Total catch: 208.71 CATCH/HOUR: 834.84

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 483.60 | 3660 | 57.93 | 2775 |
| Scomber japonicus | 325.20 | 4020 | 38.95 | 2776 |
| Decapterus punctatus | 16.80 | 360 | 2.01 | |
| Trachurus trecae | 6.60 | 60 | 0.79 | |
| Sphyraena guachancho | 2.64 | 8 | 0.32 | |
| Total | 834.84 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1715
DATE: 3/11/02 GEAR TYPE: PT No: 6 POSITION:Lat N 1420
start stop duration Long W 1711
TIME :05:21:49 05:41:58 20 (min) Purpose code:
LOG :1680.33 1681.57 1.23 Area code : 4
FDEPTH: 10 10 GearCond.code: 1
BDEPTH: 30 32 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 40 kn*10

Sorted: 70 Kg Total catch: 145.13 CATCH/HOUR: 435.39

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Chloroscombrus chrysurus | 260.19 | 2766 | 59.76 | |
| Sardinella maderensis | 49.20 | 309 | 11.30 | 2877 |
| Pagellus bellottii | 28.41 | 159 | 6.53 | |
| Pomadasys incisus | 21.51 | 210 | 4.94 | |
| Caranx rhonchus | 19.77 | 249 | 4.54 | 2878 |
| Eucinostomus melanopterus | 14.97 | 156 | 3.44 | |
| Decapterus punctatus | 14.37 | 573 | 3.30 | |
| Arius heudeloti | 6.15 | 6 | 1.41 | |
| Rhizoprionodon acutus | 3.18 | 3 | 0.73 | |
| Brachydeuterus auritus | 3.15 | 27 | 0.72 | |
| Pseudupeneus prayensis | 3.03 | 42 | 0.70 | |
| Selene dorsalis | 2.34 | 42 | 0.54 | |
| Lithognathus mormyrus | 2.22 | 6 | 0.51 | |
| Boops boops | 1.20 | 102 | 0.28 | |
| Sparus caeruleostictus * | 1.14 | 6 | 0.26 | |
| Dactylopterus volitans | 1.14 | 6 | 0.26 | |
| Microchirus ocellatus | 0.87 | 15 | 0.20 | |
| Trachinocephalus myops | 0.72 | 6 | 0.17 | |
| Dicologoglossa sp. | 0.72 | 6 | 0.17 | |
| Trachinus draco | 0.54 | 6 | 0.12 | |
| Spondyliosoma cantharus | 0.39 | 6 | 0.09 | |
| Acanthurus monroviae | 0.06 | 6 | 0.01 | |
| Sphoeroides marmoratus | 0.06 | 6 | 0.01 | |
| Total | 435.33 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1716
DATE: 3/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1430
start stop duration Long W 1714
TIME :08:47:02 09:02:05 15 (min) Purpose code: 1
LOG :1710.08 1711.16 1.07 Area code : 4
FDEPTH: 10 15 GearCond.code:
BDEPTH: 34 33 Validity code:
Towing dir: 90ø Wire out: 100 m Speed: 42 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 | | | |
| Total | | | | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1717
DATE: 3/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1431
start stop duration Long W 1713
TIME :10:11:20 10:44:30 33 (min) Purpose code: 1
LOG :1719.45 1721.96 2.48 Area code : 4
FDEPTH: 15 15 GearCond.code:
BDEPTH: 31 31 Validity code:
Towing dir: 180ø Wire out: 105 m Speed: 45 kn*10

Sorted: 34 Kg Total catch: 118.24 CATCH/HOUR: 214.98

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 190.27 | 1896 | 88.51 | 2879 |
| Sphyraena guachancho | 23.49 | 135 | 10.93 | |
| Chloroscombrus chrysurus | 1.22 | 45 | 0.57 | |
| Total | 214.98 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1718
DATE: 4/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1450
start stop duration Long W 1733
TIME :23:53:53 00:20:59 27 (min) Purpose code: 1
LOG :1854.20 1855.60 1.40 Area code : 4
FDEPTH: 135 138 GearCond.code:
BDEPTH: 135 138 Validity code:
Towing dir: 55ø Wire out: 350 m Speed: 30 kn*10

Sorted: 28 Kg Total catch: 310.09 CATCH/HOUR: 689.09

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Antigonia capros | 282.33 | 4082 | 40.97 | |
| Chelidonichthys lastoviza | 100.22 | 1124 | 14.54 | |
| Apogon sp. | 66.49 | 5476 | 9.65 | |
| Pterothrissus belloci | 44.00 | 1344 | 6.39 | |
| Merluccius senegalensis | 42.04 | 1516 | 6.10 | |
| Pontinus accraensis | 37.16 | 416 | 5.39 | |
| Peristedion cataphractum | 21.76 | 391 | 3.16 | |
| Scorpaena stephanica | 20.53 | 24 | 2.98 | |
| Trachinocephalus myops | 20.04 | 122 | 2.91 | |
| Syacium micrurum | 17.84 | 49 | 2.59 | |
| MYCTOPHIDAE | 15.16 | 5378 | 2.20 | |
| ANGUILLIFORMES | 13.20 | 709 | 1.92 | |
| Glyphus marsupialis | 3.18 | 1198 | 0.46 | |
| Todarodes sagittatus | 2.69 | 98 | 0.39 | |
| Illex coindetii | 1.22 | 24 | 0.18 | |
| Arnoglossus imperialis | 0.98 | 49 | 0.14 | |
| Dentex macrophthalmus | 0.02 | 2 | | |
| Total | 688.86 | | 99.97 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1719
DATE: 4/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1500
start stop duration Long W 1709
TIME :08:28:58 08:32:24 3 (min) Purpose code: 1
LOG :1919.73 1919.92 0.11 Area code : 4
FDEPTH: 81 82 GearCond.code:
BDEPTH: 81 82 Validity code:
Towing dir: 25ø Wire out: 250 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 184.96 CATCH/HOUR: 3699.20

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 2664.00 | 168840 | 72.02 | 2880 |
| Trachurus trecae | 804.00 | 7920 | 21.73 | 2881 |
| Pseudupeneus prayensis | 114.00 | 1200 | 3.08 | |
| Boops boops | 40.80 | 720 | 1.10 | |
| Raja miraletus | 18.80 | 20 | 0.51 | |
| Zeus faber | 15.60 | 120 | 0.42 | |
| Fistularia petimba | 9.80 | 60 | 0.26 | |
| Peristedion cataphractum | 8.40 | 240 | 0.23 | |
| Pagellus bellottii | 8.40 | 120 | 0.23 | |
| Illex coindetii | 6.80 | 60 | 0.18 | |
| Scomber japonicus | 6.00 | 120 | 0.16 | |
| Priacanthus arenatus | 2.40 | 120 | 0.06 | |
| Total | 3699.00 | | 99.98 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1720
DATE: 4/11/02 GEAR TYPE: PT No: 3 POSITION:Lat N 1507
start stop duration Long W 1701
TIME :14:24:07 14:34:56 11 (min) Purpose code: 1
LOG :1977.10 1977.90 0.79 Area code : 4
FDEPTH: 20 20 GearCond.code:
BDEPTH: 38 40 Validity code:
Towing dir: 227ø Wire out: 140 m Speed: 45 kn*10

Sorted: 8 Kg Total catch: 85.51 CATCH/HOUR: 466.42

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Chloroscombrus chrysurus | 219.38 | 2258 | 47.03 | |
| Trachinotus ovatus | 105.55 | 540 | 22.63 | |
| Pomadasys peroteti | 66.82 | 273 | 14.33 | |
| Brachydeuterus auritus | 50.73 | 453 | 10.88 | |
| Sphyraena guachancho | 11.62 | 44 | 2.49 | |
| Sardinella maderensis | 6.11 | 44 | 1.31 | |
| Stromateus fiatola | 3.65 | 5 | 0.78 | |
| Selene dorsalis | 2.56 | 305 | 0.55 | |
| Total | 466.42 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1721
DATE: 4/11/02 GEAR TYPE: PT No: 3 POSITION:Lat N 1515
start stop duration Long W 1700
TIME :16:56:03 17:23:33 28 (min) Purpose code: 1
LOG :1999.49 2001.30 1.67 Area code : 1
FDEPTH: 50 50 GearCond.code: 1
BDEPTH: 73 76 Validity code: 1
Towing dir: 211ø Wire out: 230 m Speed:450 kn*10

Sorted: 76 Kg Total catch: 76.22 CATCH/HOUR: 163.33

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae | 158.04 | 857 | 96.76 | 2882 |
| Caranx rhonchus | 3.54 | 17 | 2.17 | |
| Brachydeuterus auritus | 1.76 | 13 | 1.08 | |
| Total | 163.34 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1722
DATE: 4/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1514
start stop duration Long W 1700
TIME :17:56:47 18:11:32 15 (min) Purpose code: 1
LOG :2003.05 2003.89 0.81 Area code : 4
FDEPTH: 75 75 GearCond.code:
BDEPTH: 75 75 Validity code:
Towing dir: 22ø Wire out: 250 m Speed: 35 kn*10

Sorted: 31 Kg Total catch: 443.80 CATCH/HOUR: 1775.20

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae | 1260.00 | 10360 | 70.98 | |
| Brachydeuterus auritus | 436.80 | 3080 | 24.61 | |
| Boops boops | 43.12 | 336 | 2.43 | |
| Caranx rhonchus | 20.72 | 112 | 1.17 | |
| Illex coindetii | 7.28 | 56 | 0.41 | |
| Trichiurus lepturus | 7.28 | 168 | 0.41 | |
| Total | 1775.20 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1723
DATE: 5/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1523
start stop duration Long W 1659
TIME :23:47:42 00:19:08 31 (min) Purpose code: 1
LOG :2054.90 2056.99 1.39 Area code : 4
FDEPTH: 25 25 GearCond.code:
BDEPTH: 91 78 Validity code:
Towing dir: 150ø Wire out: 150 m Speed:450 kn*10

Sorted: 27 Kg Total catch: 194.14 CATCH/HOUR: 375.75

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae | 263.23 | 17294 | 70.05 | |
| Brachydeuterus auritus | 88.84 | 674 | 23.64 | |
| Caranx rhonchus | 6.50 | 23 | 1.73 | |
| Trichiurus lepturus | 5.81 | 128 | 1.55 | |
| Scomber japonicus | 3.60 | 23 | 0.96 | |
| Aulopus cadenati | 3.37 | 662 | 0.90 | |
| Sphyraena guachancho | 1.51 | 35 | 0.40 | |
| Selene dorsalis | 1.05 | 23 | 0.28 | |
| Lagocephalus laevigatus | 0.81 | 12 | 0.22 | |
| Boops boops | 0.46 | 46 | 0.12 | |
| Alloteuthis africana | 0.35 | 174 | 0.09 | |
| Synagrops microlepis | 0.23 | 12 | 0.06 | |
| Total | 375.76 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1724
DATE: 5/11/02 GEAR TYPE: PT No: 6 POSITION:Lat N 1536
start stop duration Long W 1701
TIME :04:28:18 04:47:35 19 (min) Purpose code: 1
LOG :2096.35 2097.62 1.26 Area code : 4
FDEPTH: 10 10 GearCond.code:
BDEPTH: 181 120 Validity code:
Towing dir: 130ø Wire out: 150 m Speed: 43 kn*10

Sorted: 34 Kg Total catch: 652.85 CATCH/HOUR: 2061.63

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 1190.53 | 13080 | 57.75 | 2883 |
| Trachurus trecae | 862.11 | 32700 | 41.82 | 2884 |
| Ariomma bondi | 9.00 | 300 | 0.44 | |
| Total | 2061.64 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1725
DATE: 5/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1545
start stop duration Long W 1658
TIME :08:46:43 09:20:33 34 (min) Purpose code:
LOG :2132.88 2134.65 1.76 Area code : 4
FDEPTH: 111 108 GearCond.code: 1
BDEPTH: 111 108 Validity code:
Towing dir: 210ø Wire out: 390 m Speed: 32 kn*10

Sorted: 33 Kg Total catch: 830.96 CATCH/HOUR: 1466.40

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 1443.53 | 83074 | 98.44 | 2885 |
| Zeus faber | 12.35 | 132 | 0.84 | |
| Dentex macrophthalmus | 8.82 | 88 | 0.60 | |
| Merluccius senegalensis | 1.57 | 7 | 0.11 | |
| Illex coindetii | 0.12 | 2 | 0.01 | |
| Total | 1466.39 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1726
DATE: 5/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1548
start stop duration Long W 1639
TIME :14:05:17 14:31:01 26 (min) Purpose code: 1
LOG :2180.00 2181.73 1.70 Area code : 4
FDEPTH: 10 10 GearCond.code:
BDEPTH: 27 28 Validity code:
Towing dir: 204ø Wire out: 140 m Speed: 45 kn*10

Sorted: Kg Total catch: 0.32 CATCH/HOUR: 0.74

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachinotus ovatus | 0.74 | 2 | 100.00 | |
| Total | 0.74 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1727
DATE: 5/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1559
start stop duration Long W 1647
TIME :19:24:20 19:54:30 30 (min) Purpose code: 1
LOG :2228.30 2230.17 1.86 Area code : 4
FDEPTH: 50 40 GearCond.code:
BDEPTH: 85 92 Validity code:
Towing dir: 280ø Wire out: 200 m Speed: 38 kn*10

Sorted: 28 Kg Total catch: 199.86 CATCH/HOUR: 399.72

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Brachydeuterus auritus | 386.68 | 2746 | 96.74 | |
| Trachurus trecae | 8.68 | 728 | 2.17 | |
| Caranx rhonchus | 1.64 | 4 | 0.41 | |
| Scomber japonicus | 1.18 | 10 | 0.30 | |
| Boops boops | 0.70 | 70 | 0.18 | |
| Saurida brasiliensis | 0.56 | 126 | 0.14 | |
| Priacanthus arenatus | 0.28 | 14 | 0.07 | |
| Total | 399.72 | | 100.01 | |

# Annex II Instruments and fishing gear used

The Simrad EK-500, 38kHz echo scientific sounder was used during the survey for fish abundance estimation. The Bergen Echo Integrator system (BEI) logging the echogram raw data from the sounder, was used to scrutinize the acoustic records, and to allocate integrator data to fish species. All raw data were stored to tape, and a backup of the database of scrutinized data. The details of the settings of the 38kHz were as follows:

| | | |
|---|---|---|
| **Transceiver-1 menu** | Transducer depth | 5.5 m |
| | Absorption coeff. | 10 dB/km |
| | Pulse length | medium (1ms) |
| | Bandwidth | wide |
| | Max power | 2000 Watt |
| | 2-way beam angle | -21.0 dB |
| | SV transducer gain | 27.18 dB |
| | TS transducer gain | 27.26 dB |
| | Angle sensitivity | 21.9 |
| | 3 dB beamwidth along. | 6.9° |
| | 3 dB beamwidth athw. | 6.9° |
| | Alongship offset | 0.00° |
| | Athwardship offset | -0.12° |
| **Display menu** | Echogram | 1 |
| | Bottom range | 10 m |
| | Bottom range start | 9 m |
| | TVG | 20 log R |
| | Sv colour min | -67 dB |
| | TS Colour minimum | -60 dB |
| **Printer- menu** | Range | 0-50, 0-100, 0-150, 0-250 or 0-500m |
| | TVG | 20 log R |
| | Sv colour min | -60 dB |
| **Bottom detection menu** | Minimum level | -40 dB |

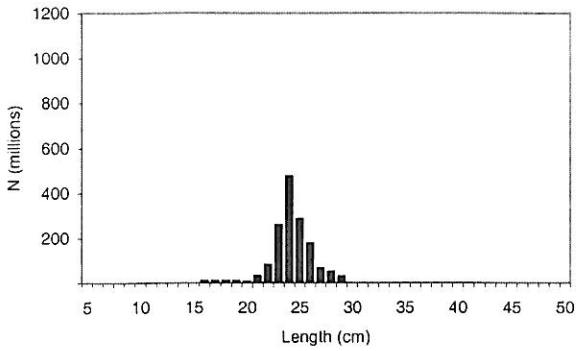
A calibration experiment using a standard copper sphere was performed in Baía dos Elefantos, Angola 7 September 2002.

**Fishing gear**

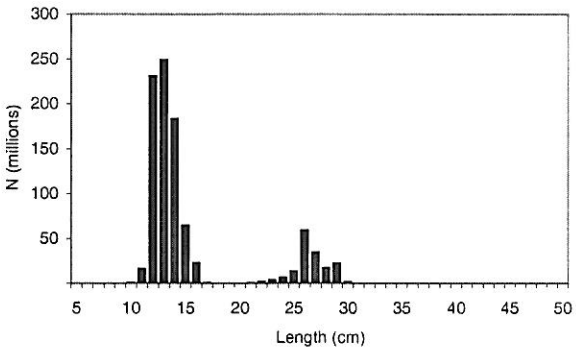
The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super" bottom trawl. For all trawls, the Tyborøn, 7.8m² (1670 kg) trawl doors were used.

# Annex III Pooled length distributions by species

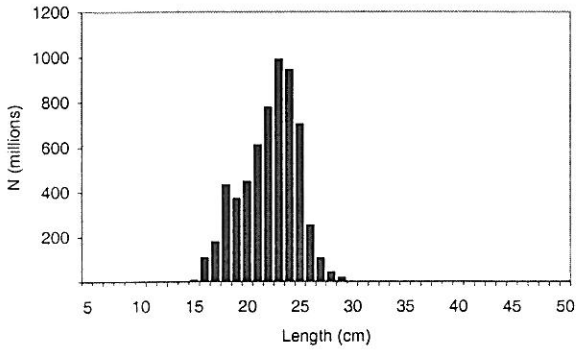
*Sardinella aurita,* Casamance-Cape Vert



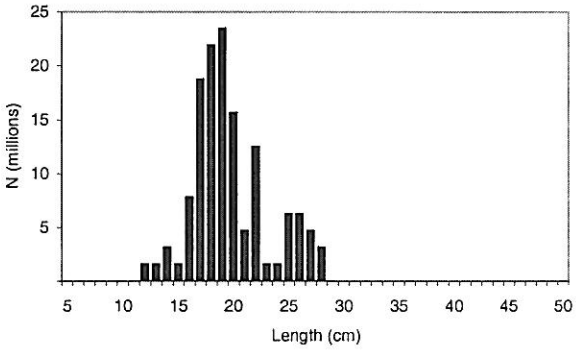

*Trachurus trecae,* Cape Vert-St. Louis




*Sardinella maderensis,* Casam.-Cape Vert




*Caranx rhonchus,* Casamance-Cape Vert



# Annex IV Estimates of numbers and weight by length

## Senegal and the Gambia, October-November 2002

*Sardinella aurita*

| | N (thousands) | | | | | Biomass (tonnes) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length cm | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL |
| 15 | | | | | | | | | | |
| 16 | | | | 8 473 | 8 473 | | | | 365 | 365 |
| 17 | | | | 8 473 | 8 473 | | | | 436 | 436 |
| 18 | | | | 8 473 | 8 473 | | | | 515 | 515 |
| 19 | | | | 8 473 | 8 473 | | | | 603 | 603 |
| 20 | | | 5 678 | | 5 678 | | | 470 | | 470 |
| 21 | | | 23 621 | 8 473 | 32 094 | | | 2 254 | 808 | 3 062 |
| 22 | | 11 009 | 41 590 | 27 406 | 80 005 | | 1 204 | 4 548 | 2 997 | 8 749 |
| 23 | | 60 550 | 131 777 | 65 271 | 257 598 | | 7 544 | 16 418 | 8 132 | 32 094 |
| 24 | | 143 118 | 284 735 | 46 339 | 474 191 | | 20 205 | 40 199 | 6 542 | 66 946 |
| 25 | | 104 586 | 159 665 | 20 918 | 285 169 | | 16 648 | 25 416 | 3 330 | 45 394 |
| 26 | | 11 009 | 69 061 | 96 649 | 176 719 | | 1 967 | 12 338 | 17 267 | 31 571 |
| 27 | | | 27 389 | 37 865 | 65 254 | | | 5 468 | 7 560 | 13 028 |
| 28 | | | 12 870 | 37 865 | 50 735 | | | 2 860 | 8 415 | 11 275 |
| 29 | | | 7 994 | 20 918 | 28 912 | | | 1 970 | 5 155 | 7 126 |
| 30 | | | | | | | | | | |
| TOTAL | | 330 272 | 764 380 | 395 599 | 1 490 251 | | 47 568 | 111 940 | 62 125 | 221 633 |

*Sardinella maderensis*

| | N (thousands) | | | | | Biomass (tonnes) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length cm | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL |
| 14 | | | | | | | | | | |
| 15 | | | 4 798 | | 4 798 | | | 172 | | 172 |
| 16 | | 11 196 | 65 028 | 28 855 | 105 079 | | 483 | 2 804 | 1 244 | 4 531 |
| 17 | | 8 397 | 76 358 | 90 459 | 175 214 | | 432 | 3 929 | 4 654 | 9 015 |
| 18 | | 36 386 | 176 967 | 217 102 | 430 455 | | 2 212 | 10 757 | 13 196 | 26 165 |
| 19 | | 21 174 | 134 025 | 215 106 | 370 305 | | 1 507 | 9 540 | 15 312 | 26 359 |
| 20 | | 53 910 | 178 393 | 214 074 | 446 377 | | 4 459 | 14 754 | 17 705 | 36 918 |
| 21 | | 99 410 | 130 980 | 377 728 | 608 118 | | 9 485 | 12 497 | 36 038 | 58 020 |
| 22 | | 146 795 | 96 979 | 532 467 | 776 241 | | 16 052 | 10 605 | 58 225 | 84 882 |
| 23 | | 251 214 | 109 057 | 627 901 | 988 173 | | 31 298 | 13 587 | 78 229 | 123 114 |
| 24 | | 341 589 | 51 939 | 548 835 | 942 363 | | 48 225 | 7 333 | 77 484 | 133 042 |
| 25 | | 288 792 | 24 808 | 387 001 | 700 601 | | 45 970 | 3 949 | 61 603 | 111 522 |
| 26 | | 38 905 | 8 579 | 201 980 | 249 464 | | 6 950 | 1 533 | 36 084 | 44 567 |
| 27 | | 23 321 | 1 101 | 78 495 | 102 917 | | 4 656 | 220 | 15 672 | 20 547 |
| 28 | | | | 40 300 | 40 300 | | | | 8 956 | 8 956 |
| 29 | | | | 16 120 | 16 120 | | | | 3 973 | 3 973 |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| TOTAL | | 1 321 089 | 1 059 013 | 3 576 424 | 5 956 526 | | 171 729 | 91 678 | 428 376 | 691 783 |

## Annex IV Continued

### Senegal and the Gambia, October-November 2002

*Trachurus trecae*

| | N (thousands) | | | | | Biomass (tonnes) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length cm | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | 218 | | | | 218 | 2 | | | | 2 |
| 11 | 16 231 | | | | 16 231 | 237 | | | | 237 |
| 12 | 230 917 | | | | 230 917 | 4 330 | | | | 4 330 |
| 13 | 248 609 | | | | 248 609 | 5 872 | | | | 5 872 |
| 14 | 183 259 | | | | 183 259 | 5 363 | | | | 5 363 |
| 15 | 64 539 | | | | 64 539 | 2 307 | | | | 2 307 |
| 16 | 22 455 | | | | 22 455 | 968 | | | | 968 |
| 17 | 218 | | | | 218 | 11 | | | | 11 |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | 218 | | | | 218 | 21 | | | | 21 |
| 22 | 1 958 | | | | 1 958 | 214 | | | | 214 |
| 23 | 3 698 | | | | 3 698 | 461 | | | | 461 |
| 24 | 6 434 | | | | 6 434 | 908 | | | | 908 |
| 25 | 13 242 | | | | 13 242 | 2 108 | | | | 2 108 |
| 26 | 59 094 | | | | 59 094 | 10 557 | | | | 10 557 |
| 27 | 34 350 | | | | 34 350 | 6 858 | | | | 6 858 |
| 28 | 17 066 | | | | 17 066 | 3 793 | | | | 3 793 |
| 29 | 22 382 | | | | 22 382 | 5 516 | | | | 5 516 |
| 30 | 1 492 | | | | 1 492 | 406 | | | | 406 |
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| TOTAL | 926 380 | | | | 926 380 | 49 934 | | | | 49 934 |

## Annex IV Continued

### Senegal and the Gambia, October-November 2002

*Caranx rhonchus*

| | N (thousands) | | | | | Biomass (tonnes) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Length cm | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL | St. Louis-C. Vert | C. Vert-Gambia | The Gambia | Casa-mance | TOTAL |
| 11 | | | | | | | | | | |
| 12 | | | 391 | 1 173 | 1 564 | | | 7 | 22 | 29 |
| 13 | | | 391 | 1 173 | 1 564 | | | 9 | 28 | 37 |
| 14 | | | 783 | 2 345 | 3 128 | | | 23 | 69 | 92 |
| 15 | | | 391 | 1 173 | 1 564 | | | 14 | 42 | 56 |
| 16 | | | 1 957 | 5 864 | 7 821 | | | 84 | 253 | 337 |
| 17 | | | 4 698 | 14 073 | 18 770 | | | 242 | 724 | 966 |
| 18 | | | 5 480 | 16 418 | 21 899 | | | 333 | 998 | 1 331 |
| 19 | | | 5 872 | 17 591 | 23 463 | | | 418 | 1 252 | 1 670 |
| 20 | | | 3 915 | 11 727 | 15 642 | | | 324 | 970 | 1 294 |
| 21 | | | 1 174 | 3 518 | 4 693 | | | 112 | 336 | 448 |
| 22 | | | 3 132 | 9 382 | 12 513 | | | 342 | 1 026 | 1 368 |
| 23 | | | 391 | 1 173 | 1 564 | | | 49 | 146 | 195 |
| 24 | | | 391 | 1 173 | 1 564 | | | 55 | 166 | 221 |
| 25 | | | 1 566 | 4 691 | 6 257 | | | 249 | 747 | 996 |
| 26 | | | 1 566 | 4 691 | 6 257 | | | 280 | 838 | 1 118 |
| 27 | | | 1 174 | 3 518 | 4 693 | | | 234 | 702 | 937 |
| 28 | | | 783 | 2 345 | 3 128 | | | 174 | 521 | 695 |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| TOTAL | | | 34 057 | 102 027 | 136 084 | | | 2 950 | 8 839 | 11 789 |

# Annex V Regional estimates

## Sardine (*Sardina pilchardus* )

## MOROCCO - MAURITANIA, November-December 2002

| Length | C.Juby-C.Cantin | | C.Bojador-C.Juby | | C.Blanc-C.Bojador | | C.Timiris-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | 35 | 10 | | | | | | | 35 | 10 |
| 8 | 4 719 | 937 | | | | | | | 4 719 | 937 |
| 9 | 9 779 | 1 391 | | | | | | | 9 779 | 1 391 |
| 10 | 16 218 | 1 708 | 537 | 57 | | | | | 16 754 | 1 765 |
| 11 | 67 584 | 5 419 | 862 | 69 | | | | | 68 446 | 5 488 |
| 12 | 128 759 | 8 040 | 376 | 23 | 1 372 | 86 | 1 867 | 110 | 130 507 | 8 149 |
| 13 | 95 286 | 4 723 | 644 | 32 | 9 035 | 448 | 2 337 | 113 | 104 965 | 5 203 |
| 14 | 69 580 | 2 783 | 276 | 11 | 54 250 | 2 170 | 4 829 | 191 | 124 106 | 4 965 |
| 15 | 58 449 | 1 914 | 1 092 | 36 | 63 904 | 2 093 | 72 201 | 2 346 | 123 445 | 4 043 |
| 16 | 69 726 | 1 893 | 807 | 22 | 128 245 | 3 482 | 255 578 | 6 943 | 198 779 | 5 396 |
| 17 | 100 801 | 2 294 | 9 600 | 218 | 242 882 | 5 527 | 189 288 | 4 375 | 353 283 | 8 039 |
| 18 | 97 093 | 1 870 | 28 479 | 549 | 245 821 | 4 735 | 116 431 | 2 285 | 371 393 | 7 153 |
| 19 | 77 274 | 1 271 | 31 639 | 520 | 143 787 | 2 365 | 26 146 | 438 | 252 700 | 4 156 |
| 20 | 47 347 | 670 | 13 699 | 194 | 187 401 | 2 653 | | | 248 447 | 3 517 |
| 21 | 24 813 | 304 | 12 506 | 153 | 516 933 | 6 343 | | | 554 253 | 6 801 |
| 22 | 6 295 | 67 | 20 209 | 216 | 583 310 | 6 245 | | | 609 815 | 6 529 |
| 23 | 11 476 | 108 | 45 810 | 430 | 889 432 | 8 358 | | | 946 718 | 8 896 |
| 24 | 9 358 | 78 | 42 483 | 352 | 952 894 | 7 902 | | | 1 004 735 | 8 332 |
| 25 | 1 833 | 13 | 10 194 | 75 | 451 330 | 3 319 | | | 463 357 | 3 408 |
| 26 | | | | | 104 605 | 685 | | | 104 605 | 685 |
| 27 | | | | | 3 891 | 23 | | | 3 891 | 23 |
| 28 | 2 559 | 13 | | | 1 050 | 6 | | | 3 609 | 19 |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| Total | 898 983 | 35 508 | 219 213 | 2 959 | 4 580 145 | 56 438 | 668 677 | 16 802 | 6 367 018 | 111 706 |

**Round sardinella (*Sardinella aurita* )**

**SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002**

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | 0,7 | | 0,7 | | 16 | | 16 |
| 14 | | 1,4 | | 1,4 | | 40 | | 40 |
| 15 | | 0,7 | | 0,7 | | 24 | | 24 |
| 16 | 8,5 | 2,0 | | 10,5 | 365 | 87 | | 452 |
| 17 | 8,5 | 10,1 | | 18,5 | 436 | 518 | | 954 |
| 18 | 8,5 | 12,8 | | 21,2 | 515 | 776 | | 1 291 |
| 19 | 8,5 | 104,6 | | 113,0 | 603 | 7 442 | | 8 046 |
| 20 | 5,7 | 115,3 | 40,0 | 161,0 | 470 | 9 536 | 3 238 | 13 243 |
| 21 | 32,1 | 33,9 | 193,4 | 259,4 | 3 062 | 3 232 | 18 066 | 24 360 |
| 22 | 80,0 | 36,8 | 1 070,4 | 1 187,2 | 8 749 | 4 029 | 114 609 | 127 386 |
| 23 | 257,6 | 55,6 | 1 094,4 | 1 407,6 | 32 094 | 6 928 | 133 509 | 172 530 |
| 24 | 474,2 | 39,2 | 1 220,4 | 1 733,8 | 66 946 | 5 535 | 168 702 | 241 183 |
| 25 | 285,2 | 24,7 | 998,6 | 1 308,4 | 45 394 | 3 932 | 155 643 | 204 969 |
| 26 | 176,7 | 16,9 | 505,0 | 698,6 | 31 571 | 3 017 | 88 335 | 122 923 |
| 27 | 65,3 | 5,9 | 224,9 | 296,1 | 13 028 | 1 184 | 43 971 | 58 183 |
| 28 | 50,7 | 10,1 | 150,4 | 211,2 | 11 275 | 2 236 | 32 727 | 46 237 |
| 29 | 28,9 | 13,4 | 150,3 | 192,6 | 7 126 | 3 312 | 36 268 | 46 705 |
| 30 | | 30,3 | 138,4 | 168,8 | | 8 260 | 36 919 | 45 179 |
| 31 | | 22,0 | 45,6 | 67,6 | | 6 613 | 13 389 | 20 002 |
| 32 | | 21,0 | 65,4 | 86,4 | | 6 931 | 21 092 | 28 023 |
| 33 | | 10,8 | 35,6 | 46,4 | | 3 911 | 12 584 | 16 496 |
| 34 | | 7,7 | 172,2 | 179,9 | | 3 041 | 66 466 | 69 507 |
| 35 | | 8,5 | 138,4 | 146,8 | | 3 642 | 58 183 | 61 824 |
| 36 | | 2,3 | 183,9 | 186,2 | | 1 072 | 84 069 | 85 141 |
| 37 | | 0,8 | 53,1 | 53,9 | | 387 | 26 323 | 26 711 |
| 38 | | | 23,5 | 23,5 | | | 12 613 | 12 613 |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 1 490,3 | 587,5 | 6 503,8 | 8 581,5 | 221 633 | 85 699 | 1 126 706 | 1 434 038 |

**Flat sardinella (*Sardinella maderensis* )**

**SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002**

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | 1,3 | | 1,3 | | 3 | | 3 |
| 7 | | 1,3 | | 1,3 | | 5 | | 5 |
| 8 | | 14,9 | | 14,9 | | 88 | | 88 |
| 9 | | 29,6 | | 29,6 | | 244 | | 244 |
| 10 | | 99,4 | | 99,4 | | 1 105 | | 1 105 |
| 11 | | 54,5 | | 54,5 | | 795 | | 795 |
| 12 | | 32,6 | | 32,6 | | 611 | | 611 |
| 13 | | 9,8 | | 9,8 | | 233 | | 233 |
| 14 | | 3,1 | | 3,1 | | 89 | | 89 |
| 15 | 4,8 | 0,3 | | 5,1 | 172 | 9 | | 181 |
| 16 | 105,1 | 0,3 | | 105,3 | 4 531 | 11 | | 4 542 |
| 17 | 175,2 | | | 175,2 | 9 015 | | | 9 015 |
| 18 | 430,5 | | | 430,5 | 26 165 | | | 26 165 |
| 19 | 370,3 | 0,1 | | 370,4 | 26 359 | 10 | | 26 370 |
| 20 | 446,4 | 4,3 | | 450,6 | 36 918 | 352 | | 37 269 |
| 21 | 608,1 | 33,3 | | 641,4 | 58 020 | 3 173 | | 61 192 |
| 22 | 776,2 | 71,3 | | 847,5 | 84 882 | 7 794 | | 92 676 |
| 23 | 988,2 | 60,9 | | 1 049,1 | 123 114 | 7 592 | | 130 706 |
| 24 | 942,4 | 69,2 | 23,5 | 1 035,1 | 133 042 | 9 771 | 3 359 | 146 172 |
| 25 | 700,6 | 97,4 | 53,7 | 851,7 | 111 522 | 15 505 | 8 631 | 135 658 |
| 26 | 249,5 | 103,0 | 34,6 | 387,1 | 44 567 | 18 408 | 6 243 | 69 218 |
| 27 | 102,9 | 116,0 | 79,6 | 298,5 | 20 547 | 23 154 | 16 058 | 59 759 |
| 28 | 40,3 | 115,4 | 30,3 | 186,1 | 8 956 | 25 656 | 6 807 | 41 419 |
| 29 | 16,1 | 74,3 | 32,7 | 123,1 | 3 973 | 18 301 | 8 144 | 30 418 |
| 30 | | 80,3 | 26,0 | 106,3 | | 21 868 | 7 167 | 29 035 |
| 31 | | 64,0 | 2,2 | 66,2 | | 19 206 | 663 | 19 869 |
| 32 | | 55,0 | 4,4 | 59,4 | | 18 140 | 1 456 | 19 596 |
| 33 | | 54,9 | | 54,9 | | 19 816 | | 19 816 |
| 34 | | 40,7 | | 40,7 | | 16 051 | | 16 051 |
| 35 | | 17,1 | | 17,1 | | 7 355 | | 7 355 |
| 36 | | 5,0 | | 5,0 | | 2 348 | | 2 348 |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 5 956,5 | 1 309,4 | 287,0 | 7 552,9 | 691 783 | 237 695 | 58 527 | 988 005 |

## Anchovy (*Engraulis encrasicolus* )

## MOROCCO, November-December 2002

| Length | C.Juby-C.Cantin | | C.Blanc-C.Juby | | Total | |
|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | 30 | 13,0 | | | 30 | 13,0 |
| 8 | 589 | 177,7 | | | 589 | 177,7 |
| 9 | 3 459 | 747,2 | | | 3 459 | 747,2 |
| 10 | 6 434 | 1 029,3 | | | 6 434 | 1 029,3 |
| 11 | 4 348 | 529,4 | 9 | 1,1 | 4 357 | 530,6 |
| 12 | 5 202 | 493,3 | 611 | 57,9 | 5 813 | 551,2 |
| 13 | 9 300 | 700,0 | 377 | 28,4 | 9 677 | 728,4 |
| 14 | 4 414 | 268,1 | 19 | 1,1 | 4 433 | 269,3 |
| 15 | 880 | 43,8 | | | 880 | 43,8 |
| 16 | 19 | 0,8 | | | 19 | 0,8 |
| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | | | | | | |
| Total | 34 677 | 4 002,6 | 1 016 | 88,6 | 35 693 | 4 091,2 |

## Atlantic horse mackerel (*Trachurus trachurus* )

## MOROCCO - MAURITANIA, November-December 2002

| Length | C.Juby-C.Cantin | | C.Blanc-C.Juby | | St.Louis-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | 613 | 48,0 | | | 613 | 48,0 |
| 12 | | | 1 716 | 104,6 | | | 1 716 | 104,6 |
| 13 | | | 4 726 | 228,6 | | | 4 726 | 228,6 |
| 14 | | | 20 199 | 788,7 | | | 20 199 | 788,7 |
| 15 | | | 45 477 | 1 453,8 | | | 45 477 | 1 453,8 |
| 16 | | | 35 852 | 950,1 | | | 35 852 | 950,1 |
| 17 | | | 15 777 | 350,4 | | | 15 777 | 350,4 |
| 18 | | | 6 612 | 124,3 | | | 6 612 | 124,3 |
| 19 | | | 2 772 | 44,5 | | | 2 772 | 44,5 |
| 20 | | | 680 | 9,4 | | | 680 | 9,4 |
| 21 | | | 1 120 | 13,4 | | | 1 120 | 13,4 |
| 22 | | | 2 944 | 30,8 | | | 2 944 | 30,8 |
| 23 | | | 5 642 | 51,8 | | | 5 642 | 51,8 |
| 24 | | | 8 179 | 66,2 | | | 8 179 | 66,2 |
| 25 | | | 3 156 | 22,7 | | | 3 156 | 22,7 |
| 26 | | | 7 286 | 46,6 | | | 7 286 | 46,6 |
| 27 | | | 15 846 | 90,7 | | | 15 846 | 90,7 |
| 28 | | | 19 452 | 100,0 | | | 19 452 | 100,0 |
| 29 | | | 10 272 | 47,6 | | | 10 272 | 47,6 |
| 30 | | | 2 506 | 10,5 | | | 2 506 | 10,5 |
| 31 | | | 1 593 | 6,1 | | | 1 593 | 6,1 |
| 32 | | | | | | | | |
| 33 | | | 958 | 3,0 | | | 958 | 3,0 |
| 34 | | | 1 047 | 3,0 | | | 1 047 | 3,0 |
| 35 | | | | | 4 215 | 9,8 | 4 215 | 9,8 |
| 36 | | | | | 1 527 | 3,3 | 1 527 | 3,3 |
| 37 | | | | | 4 252 | 8,4 | 4 252 | 8,4 |
| 38 | | | | | 8 427 | 15,4 | 8 427 | 15,4 |
| 39 | | | | | 20 137 | 34,0 | 20 137 | 34,0 |
| 40 | | | | | 19 619 | 30,8 | 19 619 | 30,8 |
| 41 | | | | | 3 518 | 5,1 | 3 518 | 5,1 |
| 42 | | | | | 4 822 | 6,5 | 4 822 | 6,5 |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | | | 214 425 | 4 595 | 66 516 | 113,3 | 280 941 | 4 708 |

## Cunene horse mackerel (*Trachurus trecae* )

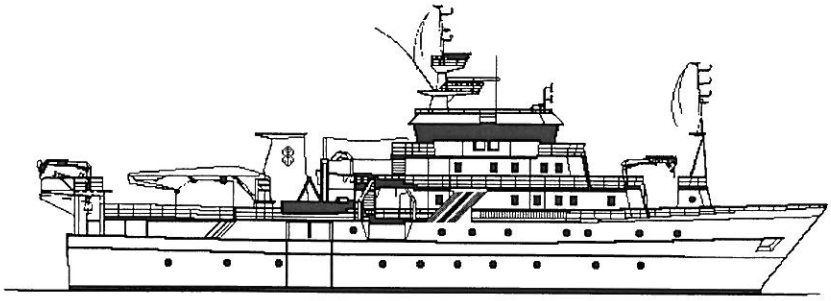
## SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | 17,1 | | 17,1 | | 69 | | 69 |
| 8 | | 627,6 | | 627,6 | | 3 700 | | 3 700 |
| 9 | | 2 589,2 | | 2 589,2 | | 21 312 | | 21 312 |
| 10 | 0,2 | 1 693,3 | 862,2 | 2 555,7 | 2 | 18 818 | 8 384 | 27 204 |
| 11 | 16,2 | 1 641,3 | 4 417,7 | 6 075,3 | 237 | 23 964 | 56 438 | 80 639 |
| 12 | 230,9 | 1 138,6 | 5 036,2 | 6 405,7 | 4 330 | 21 348 | 82 625 | 108 303 |
| 13 | 248,6 | 481,2 | 4 772,1 | 5 501,9 | 5 872 | 11 366 | 98 626 | 115 864 |
| 14 | 183,3 | 33,2 | 1 246,9 | 1 463,4 | 5 363 | 971 | 31 932 | 38 266 |
| 15 | 64,5 | 15,8 | 189,6 | 269,9 | 2 307 | 564 | 5 931 | 8 803 |
| 16 | 22,5 | 1,0 | 78,7 | 102,2 | 968 | 41 | 2 971 | 3 981 |
| 17 | 0,2 | | 82,0 | 82,2 | 11 | | 3 690 | 3 701 |
| 18 | | | 22,2 | 22,2 | | | 1 182 | 1 182 |
| 19 | | | 43,8 | 43,8 | | | 2 726 | 2 726 |
| 20 | | | | | | | | |
| 21 | 0,2 | | 0,7 | 0,9 | 21 | | 59 | 80 |
| 22 | 2,0 | | | 2,0 | 214 | | | 214 |
| 23 | 3,7 | | | 3,7 | 461 | | | 461 |
| 24 | 6,4 | | | 6,4 | 908 | | | 908 |
| 25 | 13,2 | | 26,7 | 39,9 | 2 108 | | 3 714 | 5 822 |
| 26 | 59,1 | | 127,3 | 186,4 | 10 557 | | 19 899 | 30 456 |
| 27 | 34,3 | | 82,1 | 116,5 | 6 858 | | 14 345 | 21 202 |
| 28 | 17,1 | | 55,4 | 72,5 | 3 793 | | 10 782 | 14 575 |
| 29 | 22,4 | | | 22,4 | 5 516 | | | 5 516 |
| 30 | 1,5 | | | 1,5 | 406 | | | 406 |
| 31 | | | 26,0 | 26,0 | | | 6 815 | 6 815 |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | 2,5 | | 2,5 | | 1 452 | | 1 452 |
| 40 | | 7,4 | | 7,4 | | 4 694 | | 4 694 |
| 41 | | 9,8 | | 9,8 | | 6 734 | | 6 734 |
| 42 | | 24,5 | | 24,5 | | 18 082 | | 18 082 |
| 43 | | 24,5 | | 24,5 | | 19 388 | | 19 388 |
| 44 | | 14,7 | | 14,7 | | 12 454 | | 12 454 |
| 45 | | 9,8 | | 9,8 | | 8 875 | | 8 875 |
| 46 | | 2,5 | | 2,5 | | 2 368 | | 2 368 |
| 47 | | 2,5 | | 2,5 | | 2 524 | | 2 524 |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 926,4 | 8 336,3 | 17 069,6 | 26 332,3 | 49 934 | 178 723 | 350 119 | 578 776 |

## Chub mackerel (*Scomber japonicus* )

## MOROCCO - MAURITANIA, November-December 2002

| Length | C.Juby-C.Cantin | | C.Blanc-C.Juby | | St. Louis-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | 148 | 4,7 | | | 148 | 4,7 |
| 16 | | | 359 | 9,5 | | | 359 | 9,5 |
| 17 | | | 2 968 | 65,9 | | | 2 968 | 65,9 |
| 18 | 81 | 1,5 | 10 860 | 204,2 | | | 10 941 | 205,7 |
| 19 | 1 420 | 22,8 | 14 622 | 234,8 | | | 16 042 | 257,6 |
| 20 | 3 875 | 53,5 | 13 348 | 184,4 | | | 17 222 | 238,0 |
| 21 | 3 708 | 44,4 | 12 680 | 151,9 | | | 16 388 | 196,3 |
| 22 | 2 285 | 23,9 | 11 872 | 124,1 | | | 14 157 | 148,0 |
| 23 | 1 659 | 15,2 | 14 218 | 130,4 | | | 15 876 | 145,6 |
| 24 | 789 | 6,4 | 12 858 | 104,1 | | | 13 647 | 110,5 |
| 25 | 446 | 3,2 | 5 735 | 41,2 | | | 6 181 | 44,4 |
| 26 | 457 | 2,9 | 9 776 | 62,5 | | | 10 232 | 65,5 |
| 27 | 521 | 3,0 | 20 002 | 114,5 | | | 20 522 | 117,5 |
| 28 | 686 | 3,5 | 28 369 | 145,9 | | | 29 056 | 149,4 |
| 29 | 1 188 | 5,5 | 34 650 | 160,7 | | | 35 838 | 166,2 |
| 30 | 950 | 4,0 | 25 200 | 105,7 | | | 26 149 | 109,7 |
| 31 | 820 | 3,1 | 13 081 | 49,8 | | | 13 902 | 52,9 |
| 32 | 326 | 1,1 | 8 988 | 31,2 | | | 9 314 | 32,3 |
| 33 | 141 | 0,4 | 7 066 | 22,4 | | | 7 208 | 22,8 |
| 34 | 377 | 1,1 | 6 252 | 18,1 | | | 6 629 | 19,2 |
| 35 | 56 | 0,1 | 3 453 | 9,2 | | | 3 509 | 9,3 |
| 36 | 61 | 0,1 | 2 217 | 5,4 | | | 2 278 | 5,6 |
| 37 | | | 2 759 | 6,2 | | | 2 759 | 6,2 |
| 38 | | | 8 861 | 18,5 | | | 8 861 | 18,5 |
| 39 | | | | | | | | |
| 40 | | | 1 673 | 3,0 | | | 1 673 | 3,0 |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| Total | 19 846 | 196,0 | 272 014 | 2 008,4 | | | 291 860 | 2 204,4 |



# SURVEY OF THE PELAGIC FISH RESOURCES OFF NORTH WEST AFRICA

## Part II

## MAURITANIA

**9 - 18 November 2002**

Institut Mauritanien de Recherches Océanographiques et des Pêches
Nouadhibou, Mauritania

Institute of Marine Research
Bergen, Norway

CRUISE REPORTS 'DR FRIDTJOF NANSEN'

# SURVEY OF THE PELAGIC FISH RESOURCES NORTH WEST AFRICA

## Part II

## MAURITANIA

**09 - 18 November 2002**

by

**Reidar Toresen***

**Ahmedou O/El Moustapha****

**Hassan Moustahfid*****

and

**Magne Olsen***

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** Institut Mauritanien de Recherches Océanographiques et des Pêches
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*** Institut National de Recherche Halieutique
Casablanca, Morocco

**Institute of Marine Research**
**Bergen, 2003**

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# CHAPTER 1 INTRODUCTION

## 1.1 Objective of the cruise

The general objectives were to estimate the biomass and to map the distribution of small pelagic fish stocks off NW Africa (Morocco, Mauritania, Senegal and The Gambia) by hydro-acoustic methods and describe the hydrographic conditions there over a period of 50 days, in November-December 2002. For Mauritania the agreed objectives were:

- To map the distribution and estimate the biomass of the main small pelagic fish using hydroacoustic methods. The species of interest are: sardine *Sardina pilchardus*, sardinellas *Sardinella aurita* and *S. maderensis*, horse mackerels *Trachurus trachurus* and *T. trecae*, false scad *Caranx rhonchus* and anchovy *Engraulis encrasicolus*.

- To identify and describe the size distribution of the target fish populations by midwater and bottom trawl sampling and process the catches by recording weight and number by species.

- To sample standard hydrographical transects for temperature, salinity and oxygen at about 16°40' N, 18°00' N, 19°00' N, and off Cape Blanc.

The time allocated for this part of the survey, off Mauritania, was 10 days.

## 1.2 Participation

Members of the scientific teams were:

Institut Mauritanien de Recherches Océanographiques et des Pêches, Mauritania:
M'bodje Oumar BOCAR, Beyah Ould MEISSE, Ahmedou O/El MOUSTAPHA and Ball Abou CIRÉ

Centre de Recherches Océanographiques de Dakar-Thiaroy, Senegal:
Mor SYLLA

Department of Fisheries, The Gambia:
Juldeh JALLOW

Institut National de Recherche Halieutique, Casablanca, Morocco
Hassan MOUSTAHFID

Institute of Marine Research, Norway:
Reidar TORESEN, Magne OLSEN, Thor Egil JOHANSEN and Jarle WANGENSTEN

## 1.3 Narrative

The course tracks with fishing stations are shown in Figure 1.

After embarking of scientists from Mauritania, Senegal and The Gambia, the survey of the Mauritanian shelf started on November the 9, at the border between Mauritania and Senegal, with systematic parallel course tracks spaced about 10 NM (nautical miles) apart. To cover the whole distribution area of pelagic fish, the shelf was covered from the 15 m isobath and offshore to the 500 m isobath. Trawling was done irregularly, either to identify echo registrations or to check 'blindly' if fish were mixed with the plankton in the upper layers of the water column. In the latter case, pelagic trawl with floats was often used. A smaller pelagic trawl or the bottom trawl with floats was used for sampling the pelagic fish in very shallow waters (depth less than 25 m). The shelf was covered northwards to Cape Blanc before a call was made in Nouadhibou on November 18, to let participants from Senegal, The Gambia and Mauritania disembark and scientists from Morocco come onboard.

The hydrographic profile at 16°40' N was sampled on 10 November, at 18°00' N on 13 at 19°00' N on 14 and off Cape Blanc on the 17 November.

The survey was terminated in Nouadhibou on 18 November.

## 1.4 Methods

*Environmental Data*
Surface temperature and meteorological data from a weather station were logged automatically and recorded with position and bottom depth every nautical mile sailed.

Hydrographic profiles were collected with a CTD sonde and temperature, salinity, and pressure (depth) were logged by the Seabird Software. From these data series, records were selected from standard depths and presented in figures.

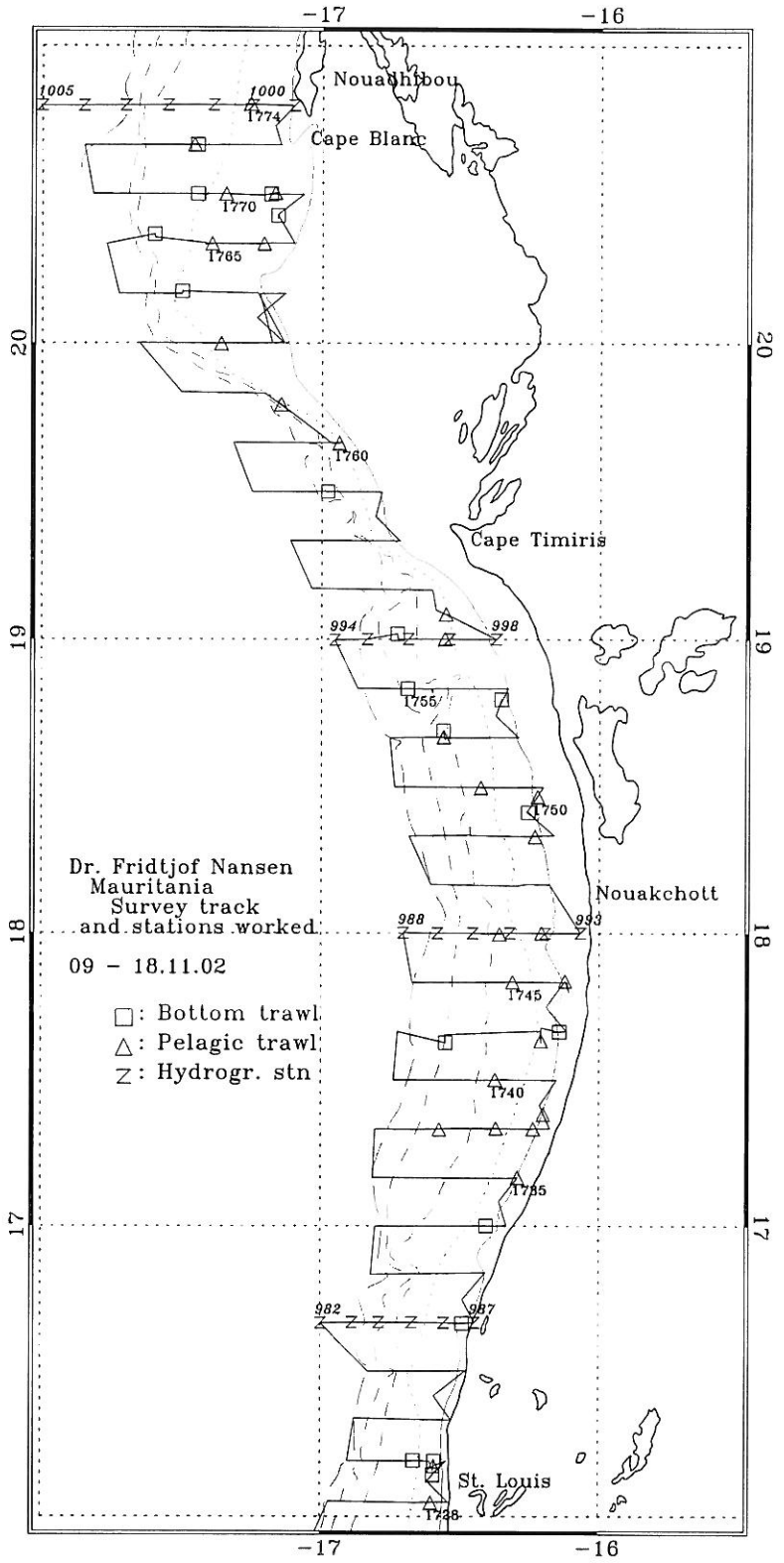



Figure 1. Course track and fishing and hydrographic stations

*Biological sampling*

Biological sampling of the fish was carried out using trawls. A pelagic trawl with floats was often used. A smaller pelagic trawl or the bottom trawl with floats was used for sampling the pelagic fish in very shallow waters (depth less than 25 m). Annex II gives a description of the instruments and the fishing gear used. All catches were sampled for composition by weight and numbers of each species caught. Species identification was based on the FAO Species Guides. Length frequency distributions, by total fish length in cm, of the selected target species were taken in all the stations where they were present. Individual weight measurements were taken regularly to estimate the condition factor in the length-weight relationship:

$$\overline{w} = \frac{cond}{100} \cdot L^3$$

The specific condition factors obtained from the samples and applied for this survey were: 0.96 for sardinellas and horse mackerels, 0.82 for sardine and 0.54 for anchovy.

For the estimation of the biomass of carangids and associated species, an overall average length of 23 cm and a condition factor of 0.88 (to calculate the mean length of this length group) were applied.

All data on fishing stations and fish length sampling were made available to the participants on diskettes.

The complete records of fishing stations are shown in Annex I.

The following target groups were used for Mauritania:

1) Sardinellas (flat sardinella *Sardinella maderensis* and round sardinella *S. aurita*),
2) Sardine (*Sardina pilchardus*),
3) Horse mackerels (Atlantic horse mackerel *Trachurus trachurus,* Cunene horse mackerel *Trachurus trecae* and false scad *Decapterus rhonchus*),
4) Chub mackerel *Scomber japonicus*
5) Other pelagic carangids and associated species (Atlantic bumper *Chloroscombrus chrysurus*, African lookdown *Selene dorsalis*, largehead hairtail *Trichiurus lepturus* and barracudas *Sphyraena* spp.),
6) Other demersal species (such as bigeye grunt *Brachydeuterus auritus*, Sparidae and Haemulidae),
7) Other clupeids such as West African ilisha *Ilisha africana.*

*Acoustic sampling*

A SIMRAD EK500 Echo-sounder was used with the settings as shown in Annex II. The Bergen Integrator (BEI) was used for analysis and allocation of the integrated $s_A$-values to the individual specified target groups by 5 NM intervals. The allocation of values to target groups were based on a combination of a visual scrutiny of the behaviour pattern as deduced from echo diagrams, the BEI analysis and the catch compositions.

In cases where the target category of fish contains more than one species (sardinellas and horse mackerels), the mean $s_A$-value allocated to the category is divided between the species in the same ratio as their contribution to the mean back scattering strength in the length frequency samples.

The following target strength (TS) function was applied to convert $s_A$-values (mean integrator value for a given species or group of species in a specified area) to number of fish:

$$TS = 20 \log L - 72 \, dB$$

Which can be converted (see Toresen *et al.* 1998 for details) to the area form (scattering cross sections of acoustic targets):

$$C_{Fi} = 1.26 \cdot 10^6 \cdot L^{-2}$$

where L is total length in 1 cm length group $i$ and $C_{Fi}$ ($m^{-2}$) is the reciprocal back scattering strength, or so-called fish conversion factor.

In order to split and convert the allocated $s_A$-values ($m^2/NM^2$) to fish densities (numbers per length group per $NM^2$), the following formula was used:

$$\rho_i = s_A \cdot \frac{p_i}{\sum_{i=1}^{n} \frac{p_i}{C_{F_i}}}$$

where

$\rho_i$ = density of fish in length group $i$

$s_A$ = mean integrator value

$p_i$ = proportion of fish in length group $i$

$\sum_{i=1}^{n} \frac{p_i}{C_{Fi}}$ = the relative back scattering cross section ($m^2$) of the length frequency sample of the target species, and

$C_{fi}$ = reciprocal back scattering cross section ($\sigma_{bs}^{-1}$) of a fish in length group $i$.

The integrator outputs were split in fish groups using a combination of behaviour pattern as deduced from echo diagrams, the BEI analysis and catch composition as described below. The following groups were used for Mauritania: 1) sardinellas, 2) sardine, 3) horse mackerels, 4) carangids and associated species and 5) demersal fish.

The above equations show that the conversion from $s_A$-values to number of fish is dependent on the length composition of the fish. It is therefore important to get representative length distributions from the stock in the whole distribution area.

When the size classes (of e.g. young fish and older fish) are well mixed, the various length distributions can be pooled together with equal importance. Otherwise, when the size classes are segregated, the total distribution area has to be post-stratified, according to the length distributions, and separate estimates are made for the regions containing fish with equal size.

A systematic approach to a) divide the $s_A$-value between species in a category of fish (e.g. *Sardinella aurita* and *S. maderensis*) and b) produce pooled length distributions of a target species for use in the above equation and c) calculate the biomass estimates for a region, is obtained through the following procedure:

- The samples of the species in the category (e.g. sardinellas) are respectively pooled together with equal importance (normalized). A sample of 60 flat sardinella in one sample will have equal importance to 30 fish in another sample and not the double weight in accordance with the number of fish in the sample.

- The mean back scattering strength ($\rho/s_A$) of each length frequency distribution of the target species is calculated and summed. This is automatically done if the length distributions are punched into an Excel spreadsheet prepared for the estimation of the abundance of fish (made available onboard 'Dr. Fridtjof Nansen').

- The mean $s_A$-value allocated to the category of fish in the region is divided between the species in the same ratio as their relative contribution to the mean back scattering strength of the length groups in the sample (also automatically done in the Excel spread-sheet given that the $s_A$-value for the region is punched into the sheet).

- The pooled length distribution is used, together with the mean $s_A$-value, to calculate the density (numbers per square NM) by length groups and species, using the above formula. The total number by length group in the area is obtained by multiplying each number by the area. (This is done in the Excel spreadsheet, given that the area of the region is punched into the sheet).

- The numbers are converted to biomass using the estimated weight at length. (Done in the Excel sheet if the condition factor is punched).

# CHAPTER 2 SURVEY RESULTS

## 2.1 Weather conditions and hydrography

*Wind conditions*

Distribution of wind speed and direction recorded along the survey track is presented in Figure 2. In the north, the Cape Blanc area, a strong northerly wind with average speed of 20 m/s was registered. Further south the wind speed dropped below 10 m/s and the wind direction became variable, except the Cape Timiris area.

*Hydrography*

Figure 3 shows the distribution of sea surface temperature along the survey track. The temperature was lower this year than in previous years, and the front between the south-flowing Canary Current and the north-flowing tropical water was found in the area off Cape Timiris. The general pattern south of Cape Timiris was a temperature of 24-25 °C offshore, decreasing to 22-23 °C inshore.

North of Cape Timiris to Cape Blanc, the distribution of sea surface temperature is affected by the persistence of the upwelling waters from the north with temperatures below 19 °C off Cape Blanc.

Figure 4 shows the distribution of temperature, salinity and oxygen in the four profiles.

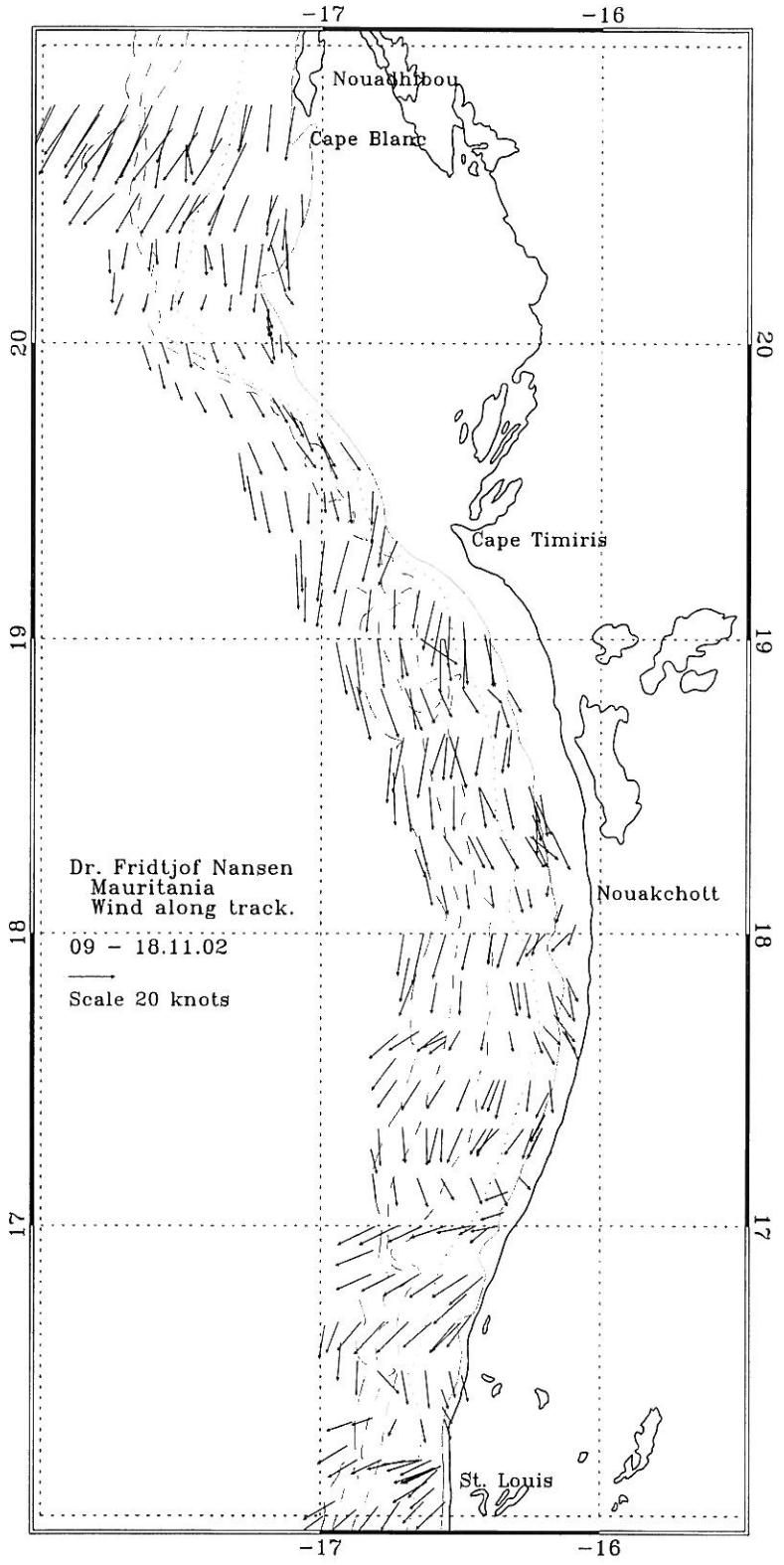



Figure 2. Wind conditions along the survey track.

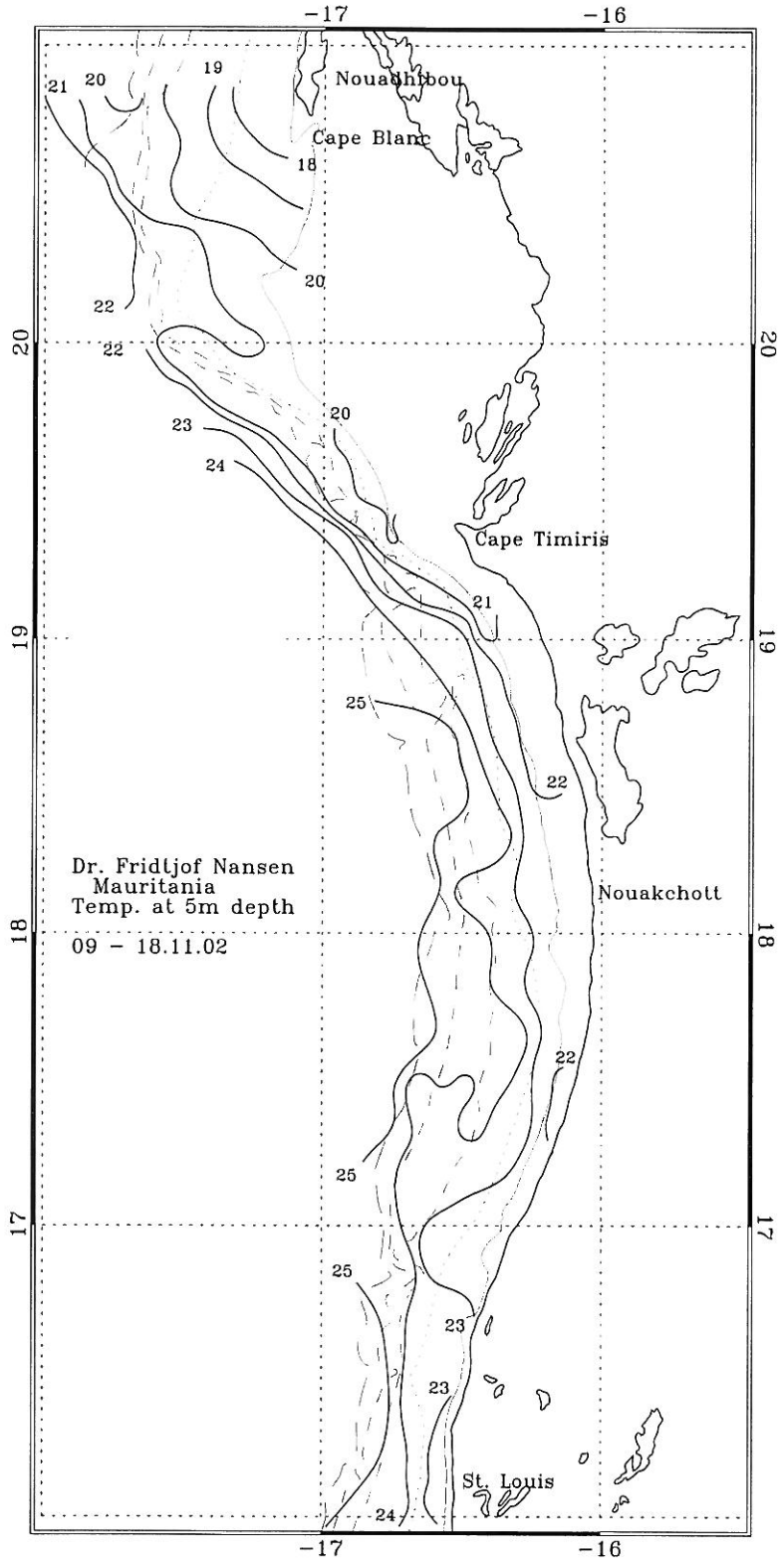
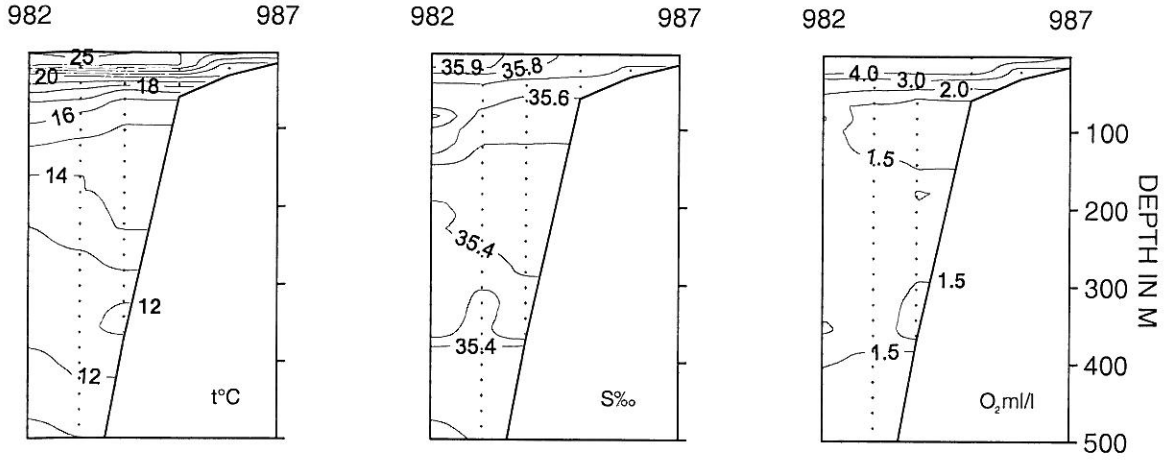
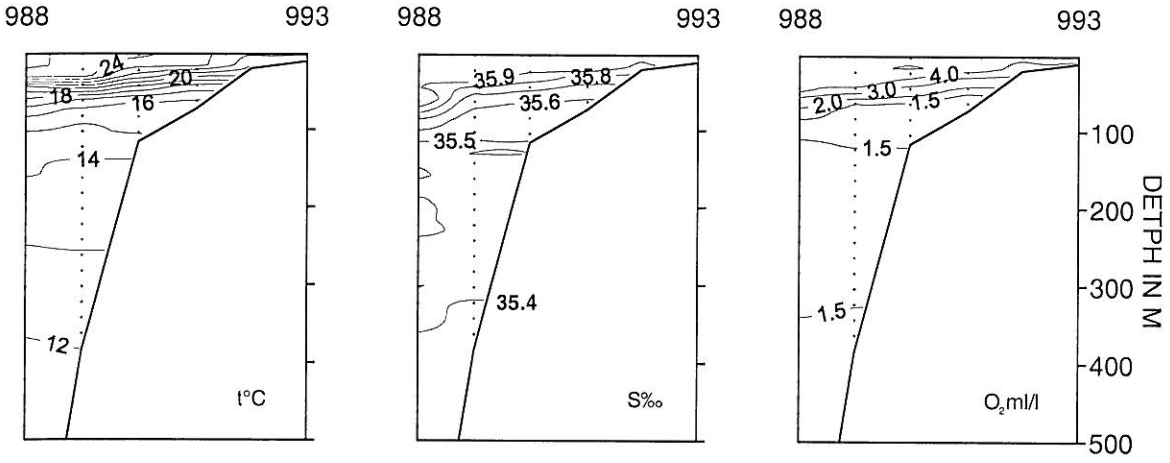


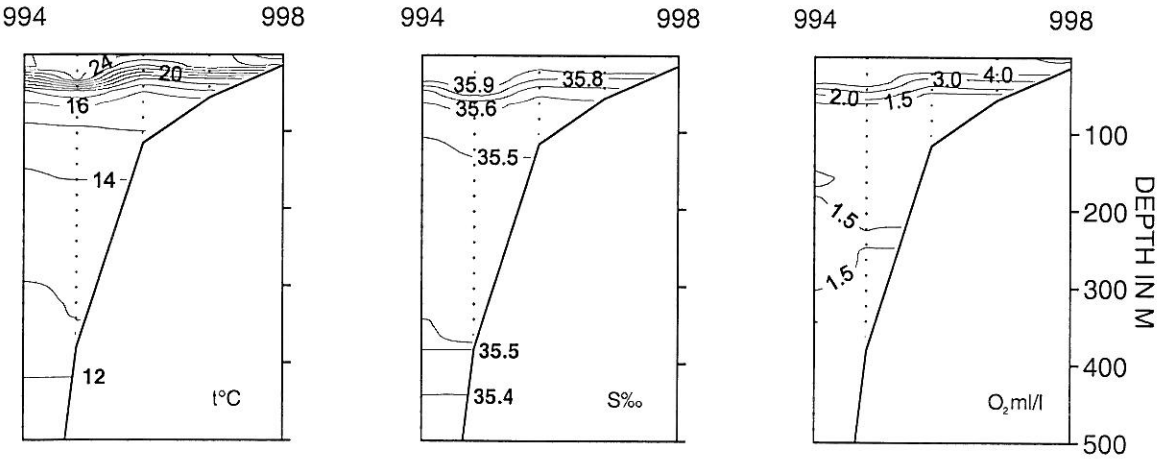

Figure 3. Sea surface temperature.




16 40 N – 10-11.11.2002




18 00 N – 13.11.2002




19 00 N – 14.11.2002

Figure 4. Hydrographic profiles with distribution of temperature, salinity and oxygen

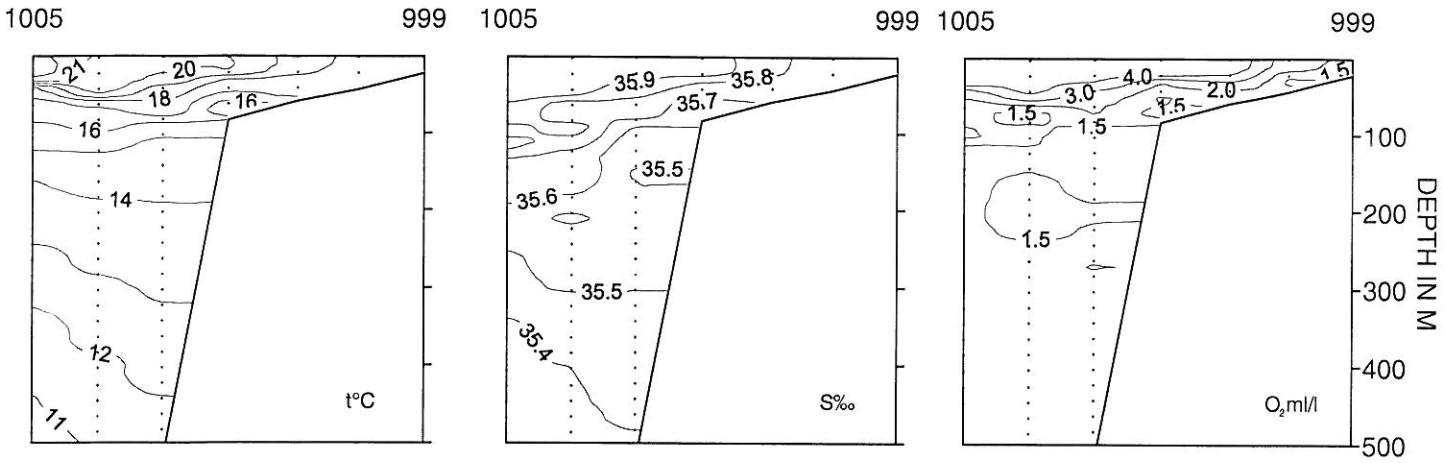



Figure 4. continued.

## 2.2 Pelagic fish on the shelf from St. Louis to Cape Timiris

Figures 5 shows the distribution of sardinellas on the shelf of Mauritania.

Sardinellas were found over the inner shelf in a nearly continuous belt along the coast from about 16°00' N to about 18°40' N, see Figure 5. In an area some 30-40 NM south of Nouakchott, denser concentrations were found. A denser school area was also located off St. Louis.

The samples showed sardinellas of varying size, the round sardinella south of Cape Timiris with modal lengths of 23 and 30 cm, while the flat sardinella had modal lengths of 10, 22 and 27 cm. The size compositions of the estimates are shown in Annex III, and the stock length composition by numbers and weight in Annex IV. The total biomass of sardinellas in the area was estimated at 270 thousand tonnes (Table 1), of which flat sardinella dominated by 67%.

Table 1. Biomass estimates (thousand tonnes) of pelagic fish, St. Louis to CapeTimiris.

| Flat sardinella | Round sardinella | Horse mackerels | Other Carangids etc. |
|---|---|---|---|
| 208 | 62 | 168 | 90 |

The distribution of horse mackerels is shown in Figure 6. Horse mackerels occurred in three main concentrations, two smaller in south and a larger one between 17°00' N and Cape Timiris. The most dense concentrations in the main aggregations were found at about 18°30' N. The main aggregations of larger horse mackerels (Atlantic horse mackerel and Cunene horse mackerel)

were found at the edge of the shelf, and at daytime the fish were found close to the bottom at depths around 50-120 m. Younger individuals were found in the inner parts of the shelf. The total biomass was estimated at 168 thousand tonnes of which Atlantic horse mackerel made up 22%, Cunene horse mackerel 30% and false scad 50% of the total.

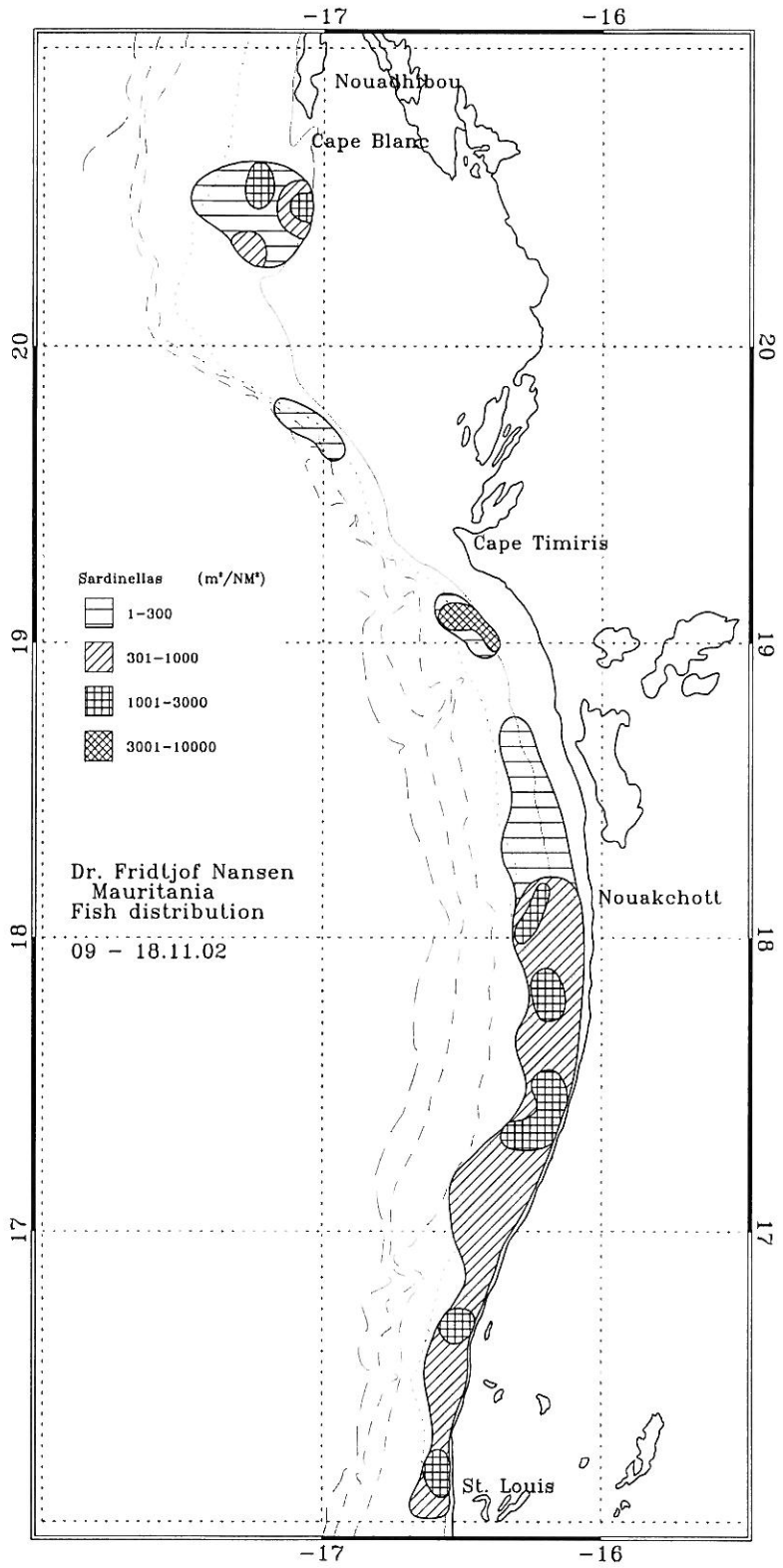



Figure 5. Distribution of sardinellas.

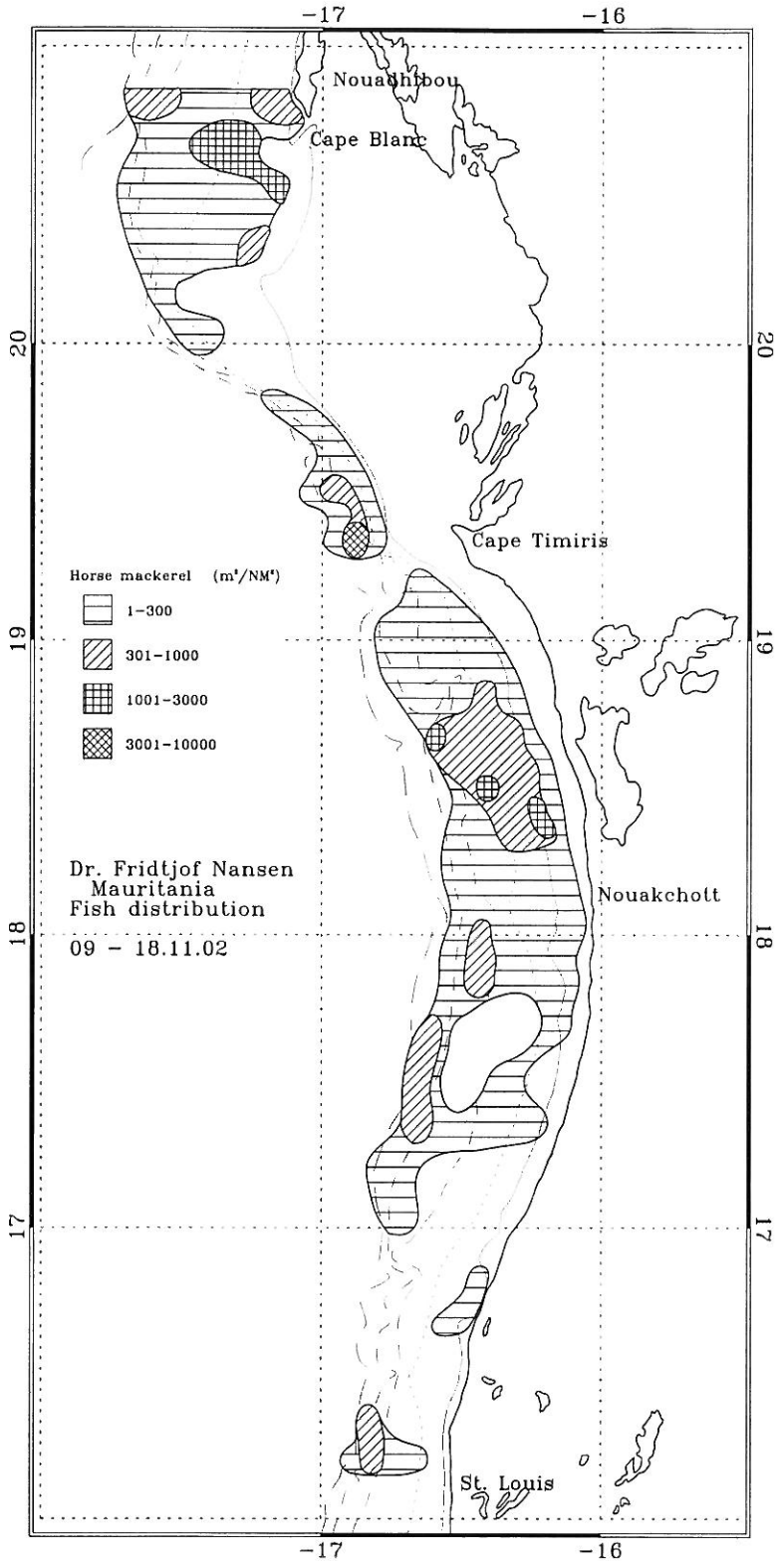



Figure 6. Distribution of horse mackerels.

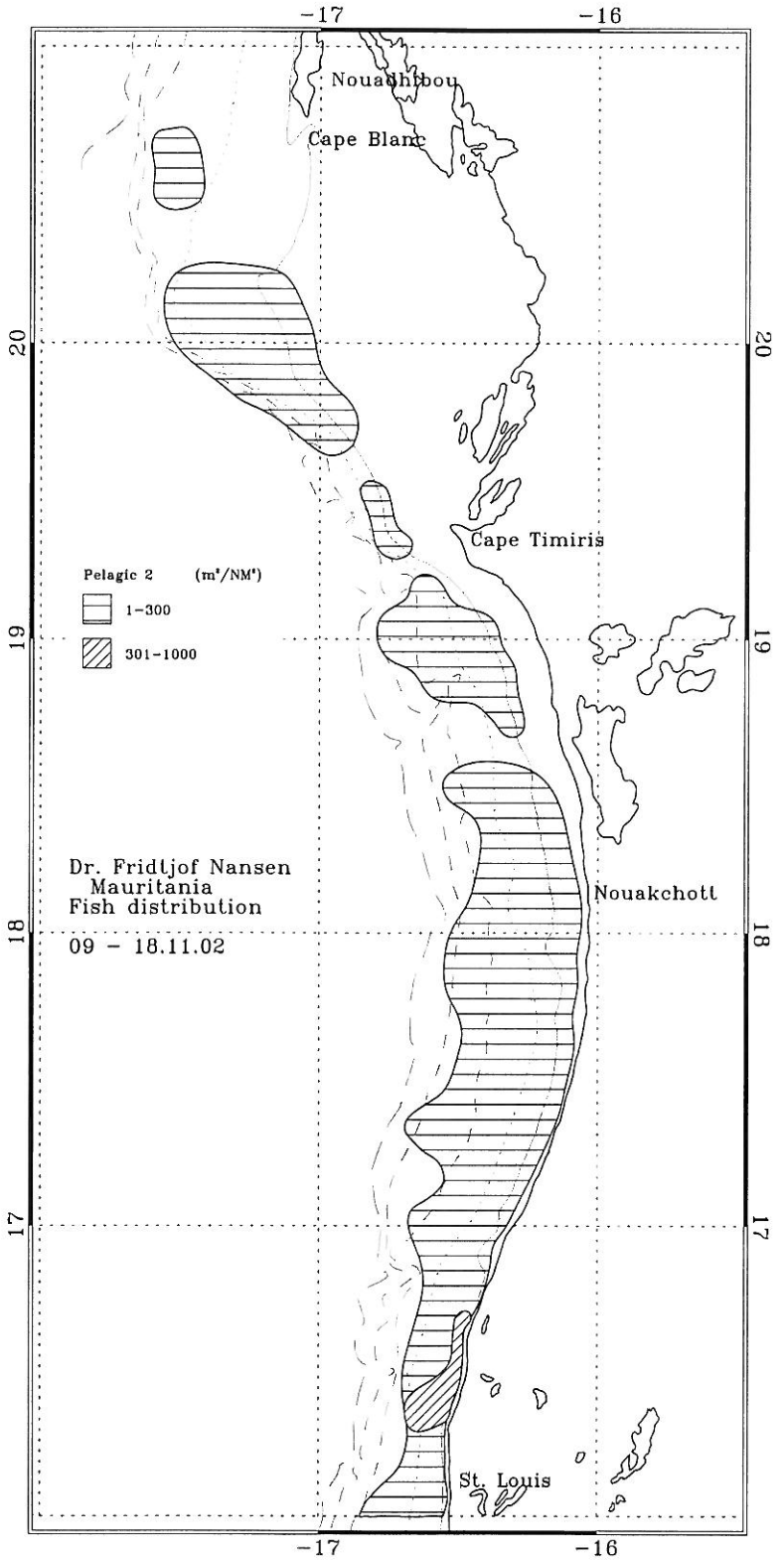



Figure 7. Distribution of carangids and associated species.

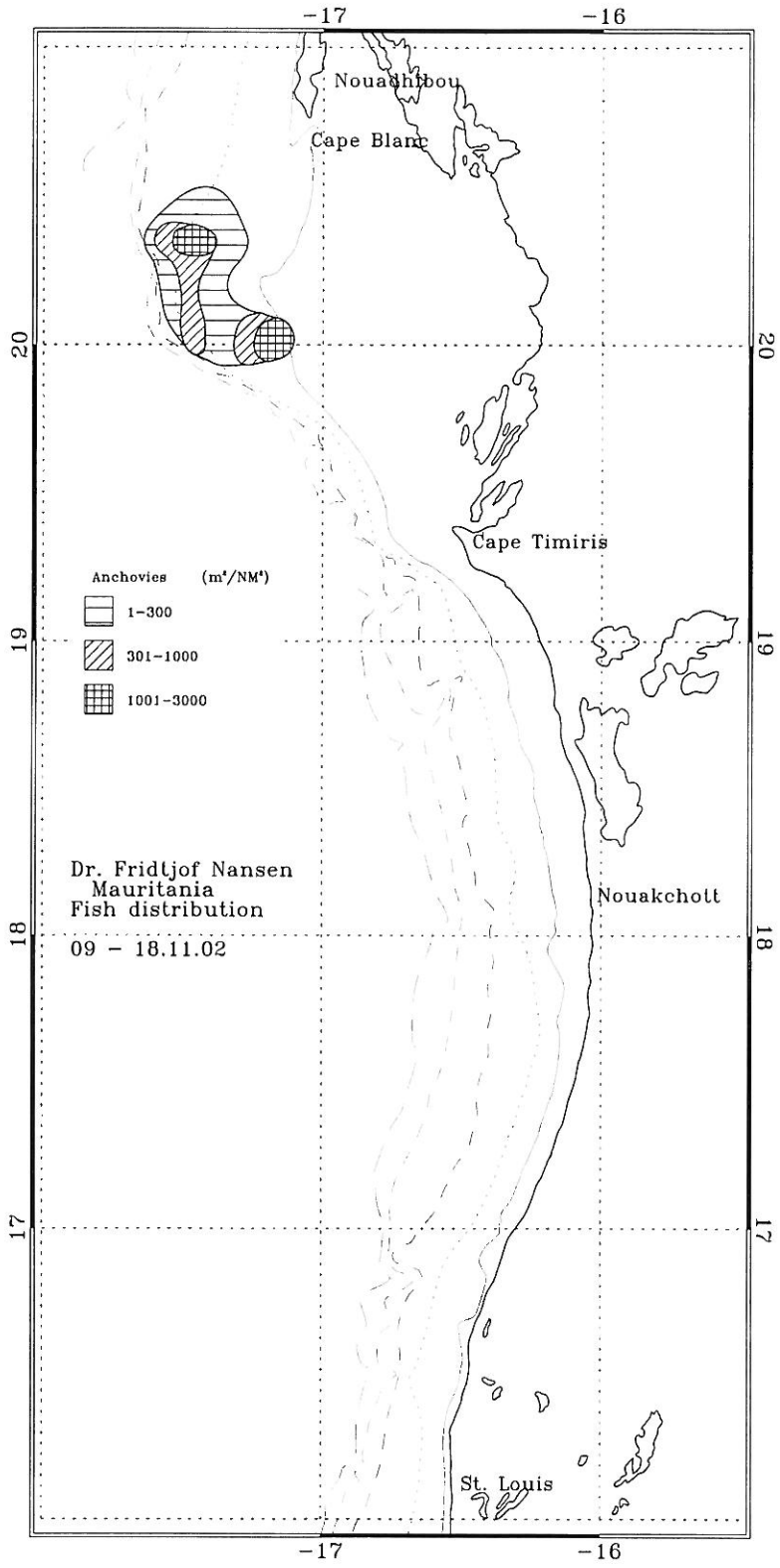



Figure 8. Distribution of anchovy.

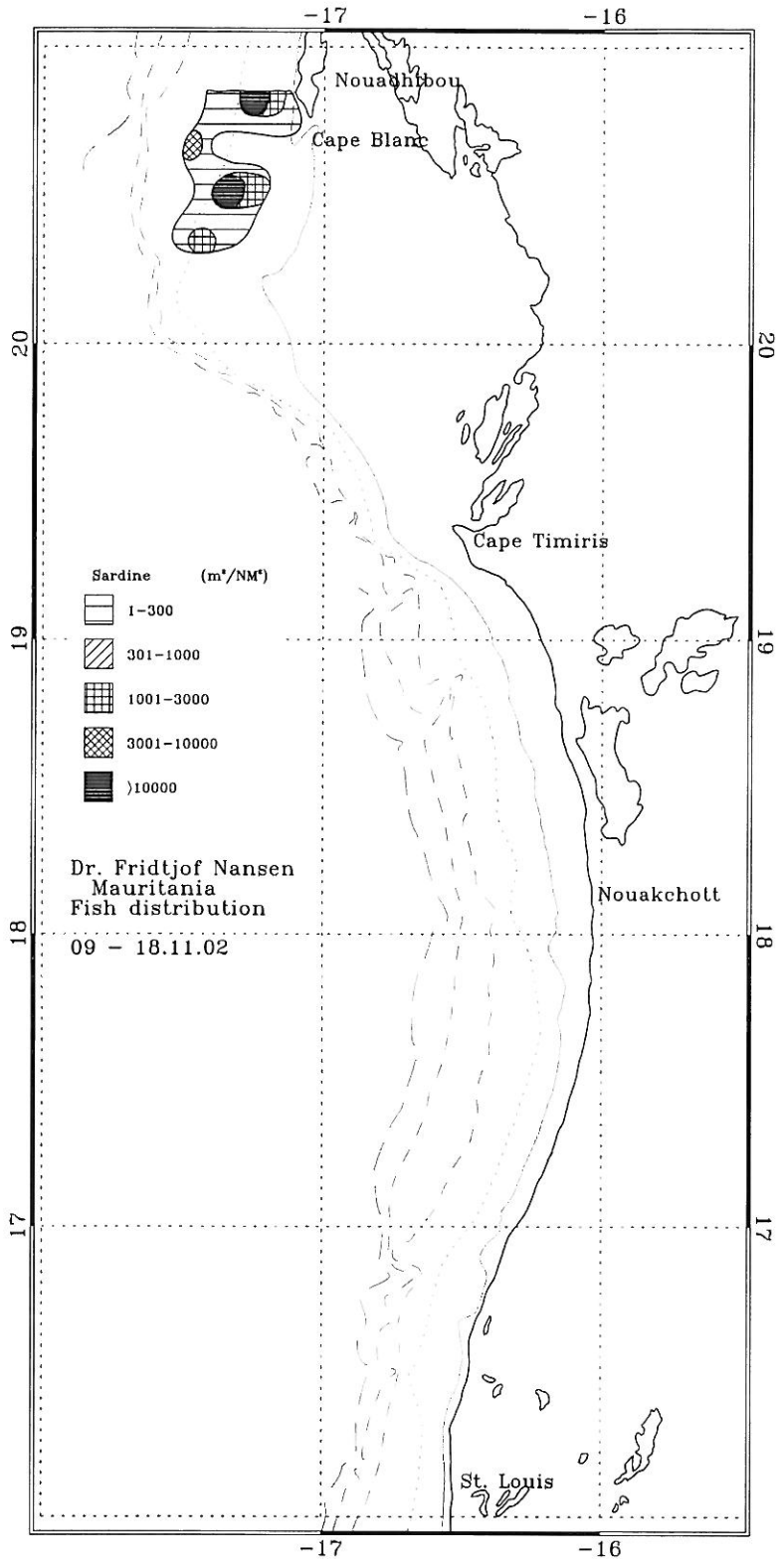



Figure 9. Distribution of sardine.

Two modal lengths were observed in the total length distribution of *Caranx ronchus*, namely 13 and 24 cm. The size compositions of the three horse mackerel species are shown in Annex III and the stock length composition by numbers and weight in Annex IV.

Figure 7 shows the distribution of the other carangids and associated species, which took the form of a continuous belt of various densities on the entire shelf, except for a small area some 20 NM south of Nouakchott, were no carangids were found. The total biomass was estimated at 90 thousand tonnes. The samples from the distributional areas consisted of bumper, West African Spanish mackerel, Atlantic bonito, pompano with small amounts of barracudas.

### 2.3 Pelagic fish on the shelf from Cape Timiris to Cape Blanc

Aggregations of juvenile fish are often found in the area between Cape Timiris and Cape Blanc, and this year, sardinella, horse mackerels, pilchard and anchovy were present.

However, the estimate of small fish in the area must be regarded as uncertain and low because the area, Banc d'Arguin cannot be covered by the vessel. It is believed that a lot of juvenile fish is distributed there.

Both round and flat sardinella were found in an aggregation of schools between 20°00' N and 20°25' N, Figure 5. The concentrations were not very dense and the total estimate was thus, only some 52 thousand tonnes, Table 2, of which flat sardinella dominated by 56%. The modal lengths of the flat sardinella were 12, 21, 25 cm and 33 cm. It is believed that the coverage of sardinella in this area is not complete as there may be fish in the shallow waters of Banc d'Arguin. The length distribution of the sardinellas and the estimated stock abundance at length, are presented in Annex III and IV.

Horse mackerel were recorded in an area between 20°00' N and 20°25' N, Figure 6. The aggregations consisted of both *Trachurus trecae,* and *T. trachurus*. The horse mackerels were estimated at 127 thousand and 29 thousand tonnes respectively, Table 2. The modal length of *Trachurus trachurus* was 39 cm, while the medium size of the *T. trecae*, where 9 and 43 cm.

Some anchovy were present in the catches on the northern part of the shelf, off Cape Blanc. And a few anchovy schools could be identified on the echograms. The distribution of the anchovy is shown in Figure 8. These were estimated at a biomass 34 thousand tonnes.

Off Cape Blanc, a rather dense school area of pilchard was detected, and estimated at 669 thousand tonnes. The distribution of the pilchard is shown in Figure 9.

The length distribution of anchovy and pilchard and the estimates by length groups are in Annex III and IV.

The carangids and associated species were found in two main concentrations, one from Cape Timiris and some 30 NM northwards along the shelf, and the other, on the shelf from about 20°00'N to about 20°40'N (Figure 7). The concentrations were estimated at 22 thousand tonnes. The catches of this group consisted mainly of *Trichiurus lepturus*, *Scomberomorus tritor*, and bluefish *Pomatomus saltatrix*.

Table 2. Biomass estimates (thousand tonnes) of pelagic fish, CapeTimiris – Cape Blanc.

| Flat sardinella | Round sardinella | Horse mackerels | Other Carangids etc |
|---|---|---|---|
| 29 | 23 | 156 | 22 |

# CHAPTER 3 OVERVIEW AND SUMMARY OF RESULTS

The survey was conducted successfully in the period 9 to 18 November with a course track of 1400 NM and 46 fishing stations, Figure 1.

The hydrographical data show that the temperature is higher than the long-term mean.

Mainly adult sardinella were found between St. Louis and Cape Timiris, Figure 5. Horse mackerels were found in low densities over large parts of the shelf, and the largest concentrations were found south of Cape Timiris, Figure 6. Carangids (not including horse mackerel) and associated species occurred in low densities all along the shelf, with patches of high-density areas, Figure 7.

The total biomass of sardinella was estimated at 322 thousand tonnes (73% flat and 27% round sardinella), that of horse mackerels at 324 thousand tonnes and that of the carangids and associated species at 112 thousand tonnes, see Table 3.

Table 3 Summary of biomass estimates (thousand tonnes) of pelagic fish, Mauritania.

| | Flat sardinella | Round sardinella | Horse mackerel | Carangids etc. |
|---|---|---|---|---|
| St. Louis-Cape Timiris | 208 | 62 | 168 | 90 |
| Cape Timiris-Cape Blanc | 29 | 23 | 156 | 22 |
| Total | 237 | 85 | 324 | 112 |

Table 4 lists biomass estimates of sardinella and carangids and associated species from previous 'Dr Fridtjof Nansen' surveys of this shelf region. Compared earlier November-December surveys the estimate of 324 thousand tonnes of sardinella from the current survey is the low. The carangid estimate (including horse mackerels) of 436 thousand tonnes is also low when comparing with the available time series.

Table 4 Biomass estimates from 'Dr Fridtjof Nansen' surveys of the Mauritanian shelf, thousand tonnes.

| Survey: | Sardinellas | Carangids etc. |
|---|---|---|
| AprMay-81 | 20 | 370 |
| Sept -81 | 75 | * |
| FebMar -82 | 50 | 470 |
| NovDec-86 | 300 | 540 |
| FebMar-92 | 1970 | 190 |
| NovDec-95 | 1780 | 190 |
| NovDec-96 | 1400 | 400 |
| NovDec-97 | 1200 | 660 |
| NovDec-98 | 1130 | 280 |
| NovDec-99 | 740 | 560 |
| NovDec-00 | 930 | 1 040 |
| JunJul -01 | 570 | 670 |
| NovDec-01 | 230 | 370 |
| JunJul-02 | 930 | 1 130 |
| NovDec-02 | 320 | 440 |

* Not available

## References:

Toresen, R., Gjøsæter, H., and Barros P. 1998. The acoustic method as used in the abundance estimation of capelin (*Mallotus villosus* Müller) and herring (*Clupea harengus* Linné) in the Barents Sea. Fisheries Research 34 (1998) 27-37.

# Annex I Records of fishing stations

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1728
DATE:10/11/02 GEAR TYPE: PT No: 4 POSITION:Lat N 1603
start stop duration Long W 1636
TIME :03:34:49 03:56:10 21 (min) Purpose code: 1
LOG :2555.27 2556.61 1.31 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 31 39 Validity code:
Towing dir: 270ø Wire out: 160 m Speed: 40 kn*10

Sorted: 64 Kg Total catch: 1478.00 CATCH/HOUR: 4222.86

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Brachydeuterus auritus | 2796.43 | 118094 | 66.22 | |
| Sardinella maderensis | 1038.23 | 8294 | 24.59 | 2886 |
| Galeoides decadactylus | 96.43 | 194 | 2.28 | |
| Pomadasys rogeri | 64.29 | 66 | 1.52 | |
| Chloroscombrus chrysurus | 64.29 | 66 | 1.52 | |
| Trachurus trecae | 63.66 | 3471 | 1.51 | 2887 |
| Trichiurus lepturus | 32.14 | 257 | 0.76 | |
| Selene dorsalis | 27.00 | 1286 | 0.64 | |
| Sardinella aurita | 18.66 | 66 | 0.44 | |
| Diplodus bellottii | 17.37 | 66 | 0.41 | |
| Penaeus notialis | 5.63 | 294 | 0.13 | |
| Total | 4224.13 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1729
DATE:10/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1609
start stop duration Long W 1635
TIME :06:09:02 06:38:18 29 (min) Purpose code: 1
LOG :2574.88 2576.68 1.79 Area code : 3
FDEPTH: 32 38 GearCond.code:
BDEPTH: 32 38 Validity code:
Towing dir: 220ø Wire out: 160 m Speed: 30 kn*10

Sorted: 13 Kg Total catch: 97.84 CATCH/HOUR: 202.43

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Arius parkii | 62.38 | 182 | 30.82 | |
| Brachydeuterus auritus | 20.30 | 2774 | 10.03 | |
| Drepane africana | 16.14 | 8 | 7.97 | |
| Penaeus notialis | 15.27 | 161 | 7.54 | |
| Trachurus trecae | 10.55 | 807 | 5.21 | 2888 |
| Sardinella maderensis | 8.69 | 118 | 4.29 | 2889 |
| Syacium micrurum | 7.63 | 211 | 3.77 | |
| Pomadasys jubelini | 7.57 | 12 | 3.74 | |
| Galeoides decadactylus | 6.70 | 267 | 3.31 | |
| Trichiurus lepturus | 6.14 | 56 | 3.03 | |
| Pagellus bellottii | 5.77 | 31 | 2.85 | |
| Dasyatis marmorata | 5.59 | 2 | 2.76 | |
| Conger conger | 4.34 | 6 | 2.14 | |
| Caranx rhonchus | 3.72 | 4 | 1.84 | |
| GOBIIDAE | 3.66 | 310 | 1.81 | |
| Raja miraletus | 3.62 | 6 | 1.79 | |
| Zeus faber | 2.73 | 19 | 1.35 | |
| Pomadasys incisus | 2.48 | 12 | 1.23 | |
| Sphyraena barracuda | 2.36 | 19 | 1.17 | |
| Octopus vulgaris | 1.74 | 2 | 0.86 | |
| Chloroscombrus chrysurus | 1.10 | 8 | 0.54 | |
| Pseudotolithus senegalensis | 1.01 | 4 | 0.50 | |
| Selene dorsalis | 0.87 | 19 | 0.43 | |
| Trachinotus ovatus | 0.43 | 2 | 0.21 | |
| Chilomycterus spinosus mauret. | 0.43 | 2 | 0.21 | |
| Ilisha africana | 0.37 | 2 | 0.18 | |
| Cynoglossus canariensis | 0.33 | 2 | 0.16 | |
| Fistularia petimba | 0.23 | 2 | 0.11 | |
| Pterothrissus belloci | 0.12 | 6 | 0.06 | |
| Epinephelus aeneus | 0.12 | 2 | 0.06 | |
| Total | 202.39 | | 99.97 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1730
DATE:10/11/02 GEAR TYPE: PT No: 3 POSITION:Lat N 1610
start stop duration Long W 1635
TIME :08:32:40 08:33:58 1 (min) Purpose code: 1
LOG :2592.40 2592.46 0.09 Area code : 3
FDEPTH: 20 20 GearCond.code: 8
BDEPTH: 30 30 Validity code: 3
Towing dir: ø Wire out: 130 m Speed: 30 kn*10

Sorted: 14 Kg Total catch: 54.63 CATCH/HOUR: 3277.80

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Drepane africana | 1512.00 | 2220 | 46.13 | |
| Brachydeuterus auritus | 802.80 | 4800 | 24.49 | |
| Trichiurus lepturus | 492.00 | 3120 | 15.01 | |
| Raja miraletus | 103.20 | 120 | 3.15 | |
| Sepia officinalis hierredda | 98.40 | 120 | 3.00 | |
| Caranx rhonchus | 54.00 | 120 | 1.65 | |
| Ilisha africana | 45.60 | 480 | 1.39 | |
| Trachurus trecae | 31.20 | 1920 | 0.95 | |
| Selene dorsalis | 28.80 | 720 | 0.88 | |
| Galeoides decadactylus | 27.60 | 1320 | 0.84 | |
| Zeus faber | 18.00 | 120 | 0.55 | |
| Torpedo torpedo | 15.00 | 300 | 0.46 | |
| Argyrosomus regius | 13.20 | 120 | 0.40 | |
| Syacium micrurum | 12.00 | 840 | 0.37 | |
| Fistularia petimba | 8.40 | 240 | 0.26 | |
| Sepia bertheloti | 8.40 | 120 | 0.26 | |
| Cynoglossus canariensis | 7.20 | 120 | 0.22 | |
| Total | 3277.80 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1731
DATE:10/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1611
start stop duration Long W 1635
TIME :09:15:48 09:38:43 23 (min) Purpose code: 1
LOG :2595.33 2597.16 1.83 Area code : 3
FDEPTH: 29 31 GearCond.code:
BDEPTH: 29 31 Validity code:
Towing dir: 180ø Wire out: 70 m Speed: 45 kn*10

Sorted: Kg Total catch: 4.67 CATCH/HOUR: 12.18

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Arius parkii | 11.58 | 29 | 95.07 | |
| Fistularia petimba | 0.31 | 5 | 2.55 | |
| Sardinella maderensis | 0.21 | 3 | 1.72 | |
| Trachurus trecae | 0.08 | 5 | 0.66 | |
| Total | 12.18 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1732
DATE:10/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1612
start stop duration Long W 1640
TIME :10:53:09 11:21:37 28 (min) Purpose code: 1
LOG :2605.95 2607.63 1.66 Area code : 3
FDEPTH: 58 48 GearCond.code:
BDEPTH: 58 48 Validity code:
Towing dir: 90ø Wire out: 200 m Speed: 34 kn*10

Sorted: 50 Kg Total catch: 50.13 CATCH/HOUR: 107.42

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Brachydeuterus auritus | 29.46 | 180 | 27.43 | |
| Selene dorsalis | 26.04 | 139 | 24.24 | |
| Trichiurus lepturus | 15.84 | 244 | 14.75 | |
| Arius parkii | 9.32 | 17 | 8.68 | |
| Pomadasys incisus | 6.06 | 39 | 5.64 | |
| Umbrina canariensis | 5.59 | 45 | 5.20 | |
| Caranx rhonchus | 4.91 | 13 | 4.57 | |
| Trachurus trecae, juvenile | 2.61 | 216 | 2.43 | 2890 |
| Pagellus bellottii | 1.89 | 15 | 1.76 | |
| Trachurus trecae | 1.33 | 6 | 1.24 | |
| Scyllarides herklotsii | 1.29 | 2 | 1.20 | |
| Zeus faber | 0.94 | 9 | 0.88 | |
| Scorpaena scrofa | 0.64 | 6 | 0.60 | |
| Dentex angolensis | 0.45 | 11 | 0.42 | |
| Boops boops | 0.41 | 36 | 0.38 | |
| Scomber japonicus | 0.21 | 2 | 0.20 | |
| Fistularia petimba | 0.17 | 2 | 0.16 | |
| Brotula barbata | 0.15 | 2 | 0.14 | |
| Alloteuthis africana | 0.09 | 45 | 0.08 | |
| Decapterus punctatus | 0.02 | 2 | 0.02 | |
| Total | 107.42 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1733
DATE:11/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1640
start stop duration Long W 1629
TIME :01:41:47 02:01:38 20 (min) Purpose code: 1
LOG :2734.64 2735.73 1.09 Area code : 3
FDEPTH: 18 20 GearCond.code:
BDEPTH: 18 20 Validity code:
Towing dir: 270ø Wire out: 100 m Speed: 32 kn*10

Sorted: 57 Kg Total catch: 484.00 CATCH/HOUR: 1452.00

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 264.00 | 1530 | 18.18 | 2891 |
| Pomadasys rogeri | 162.00 | 1149 | 11.16 | |
| Galeoides decadactylus | 159.00 | 1506 | 10.95 | |
| Rhizoprionodon acutus | 135.00 | 129 | 9.30 | |
| Brachydeuterus auritus | 111.00 | 1326 | 7.64 | |
| Caranx rhonchus | 108.00 | 1047 | 7.44 | 2892 |
| Ilisha africana | 75.00 | 894 | 5.17 | |
| Sparus caeruleostictus * | 75.00 | 255 | 5.17 | |
| Pomadasys incisus | 69.00 | 918 | 4.75 | |
| Stephanolepis hispidus | 63.00 | 102 | 4.34 | |
| Arius heudeloti | 54.00 | 255 | 3.72 | |
| Pagellus bellottii | 39.00 | 306 | 2.69 | |
| Selene dorsalis | 27.00 | 1479 | 1.86 | |
| Sepia officinalis hierredda | 21.00 | 27 | 1.45 | |
| Lithognathus mormyrus | 21.00 | 51 | 1.45 | |
| Alectis alexandrinus | 21.00 | 78 | 1.45 | |
| Trichiurus lepturus | 15.00 | 78 | 1.03 | |
| Raja miraletus | 6.00 | 27 | 0.41 | |
| Pseudotolithus senegalensis | 6.00 | 27 | 0.41 | |
| Loligo vulgaris | 6.00 | 27 | 0.41 | |
| Eucinostomus melanopterus | 6.00 | 51 | 0.41 | |
| Trachinocephalus myops | 3.00 | 27 | 0.21 | |
| Chloroscombrus chrysurus | 3.00 | 27 | 0.21 | |
| Argyrosomus regius | 3.00 | 27 | 0.21 | |
| Total | 1452.00 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1734
DATE:11/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1700
start stop duration Long W 1624
TIME :10:43:11 11:12:01 29 (min) Purpose code: 1
LOG :2814.65 2816.61 1.95 Area code : 3
FDEPTH: 25 35 GearCond.code:
BDEPTH: 25 35 Validity code:
Towing dir: 270ø Wire out: 100 m Speed: 38 kn*10

Sorted: Kg Total catch: 25.54 CATCH/HOUR: 52.84

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis - Juv. | 19.34 | 1461 | 36.60 | 2893 |
| Chloroscombrus chrysurus | 11.38 | 64 | 21.54 | |
| Trachinotus ovatus | 7.12 | 31 | 13.47 | |
| Sardinella maderensis | 5.52 | 23 | 10.45 | 2895 |
| Alectis alexandrinus | 3.25 | 6 | 6.15 | |
| Campogramma glaycos | 2.42 | 6 | 4.58 | |
| Caranx senegallus | 1.92 | 2 | 3.63 | |
| Sardinella aurita | 1.88 | 6 | 3.56 | 2894 |
| Total | 52.83 | | 99.98 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1735
DATE:11/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1710
start stop duration Long W 1617
TIME :13:41:08 14:11:10 30 (min) Purpose code: 1
LOG :2837.09 2839.20 2.10 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 20 28 Validity code:
Towing dir: 270ø Wire out: 170 m Speed: 40 kn*10

Sorted: Kg Total catch: 43.44 CATCH/HOUR: 86.88

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 42.70 | 164 | 49.15 | 2896 |
| Chloroscombrus chrysurus | 25.80 | 220 | 29.70 | |
| Sphyraena guachancho | 4.80 | 14 | 5.52 | |
| Trichiurus lepturus | 4.30 | 12 | 4.95 | |
| Alectis alexandrinus | 3.60 | 10 | 4.14 | |
| Trachinotus ovatus | 3.40 | 16 | 3.91 | |
| Campogramma glaycos | 1.32 | 4 | 1.52 | |
| Selene dorsalis | 0.76 | 2 | 0.87 | |
| Brachydeuterus auritus | 0.20 | 8 | 0.23 | |
| Total | 86.88 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1736
DATE:11/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1720
start stop duration Long W 1634
TIME :19:49:02 20:18:51 30 (min) Purpose code: 1
LOG :2893.44 2895.29 1.84 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 130 153 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 36 kn*10

Sorted: 32 Kg Total catch: 124.81 CATCH/HOUR: 249.62

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 174.00 | 11340 | 69.71 | 2897 |
| Trichiurus lepturus | 44.00 | 76 | 17.63 | |
| Synagrops microlepis | 18.00 | 2700 | 7.21 | |
| Euthynnus alletteratus | 6.70 | 6 | 2.68 | |
| Trachinotus ovatus | 4.04 | 12 | 1.62 | |
| MYCTOPHIDAE | 2.88 | 900 | 1.15 | |
| Total | 249.62 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1737
DATE:11/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1720
start stop duration Long W 1622
TIME :22:23:34 22:56:10 33 (min) Purpose code: 1
LOG :2912.03 2914.13 2.08 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 62 71 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 38 kn*10

Sorted: 30 Kg Total catch: 98.71 CATCH/HOUR: 179.47

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 112.64 | 8249 | 62.76 | 2899 |
| Trichiurus lepturus | 34.64 | 300 | 19.30 | |
| Priacanthus arenatus | 9.38 | 600 | 5.23 | |
| Scomber japonicus | 8.42 | 75 | 4.69 | 2898 |
| Engraulis encrasicolus | 8.13 | 1055 | 4.53 | 2900 |
| Torpedo torpedo | 1.82 | 2 | 1.01 | |
| Saurida brasiliensis | 1.36 | 180 | 0.76 | |
| Caranx rhonchus | 1.36 | 4 | 0.76 | |
| Sepia officinalis hierredda | 1.20 | 5 | 0.67 | |
| Boops boops | 0.22 | 16 | 0.12 | |
| Lagocephalus lagocephalus | 0.18 | 2 | 0.10 | |
| Sepia orbignyana | 0.09 | 2 | 0.05 | |
| Sepiella ornata | 0.04 | 2 | 0.02 | |
| Total | 179.48 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1738
DATE:12/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1720
start stop duration Long W 1614
TIME :00:57:04 01:17:11 20 (min) Purpose code: 1
LOG :2927.70 2929.05 1.34 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 22 31 Validity code:
Towing dir: 270ø Wire out: 40 m Speed:160 kn*10

Sorted: 33 Kg Total catch: 131.75 CATCH/HOUR: 395.25

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Chloroscombrus chrysurus | 187.08 | 1716 | 47.33 | |
| Sardinella maderensis | 61.80 | 264 | 15.64 | |
| Brachydeuterus auritus | 52.92 | 660 | 13.39 | |
| Brachydeuterus auritus Juv. | 21.12 | 1116 | 5.34 | |
| Sphyrna lewini | 16.44 | 12 | 4.16 | |
| Mugil cephalus | 10.32 | 12 | 2.61 | |
| Caranx rhonchus | 9.36 | 144 | 2.37 | |
| Arius heudeloti | 8.28 | 12 | 2.09 | |
| Penaeus notialis | 4.47 | 168 | 1.13 | |
| Pomadasys rogeri | 4.20 | 12 | 1.06 | |
| Trichiurus lepturus | 4.08 | 108 | 1.03 | |
| Selene dorsalis | 3.48 | 96 | 0.88 | |
| Ilisha africana | 3.36 | 24 | 0.85 | |
| Galeoides decadactylus | 2.28 | 84 | 0.58 | |
| Trachinotus ovatus | 1.92 | 12 | 0.49 | |
| Dactylopterus volitans | 1.32 | 12 | 0.33 | |
| Sardinella maderensis - Juv. | 1.32 | 72 | 0.33 | |
| Engraulis encrasicolus | 0.48 | 204 | 0.12 | |
| Sepia bertheloti | 0.48 | 12 | 0.12 | |
| Sphyraena guachancho | 0.36 | 12 | 0.09 | |
| Penaeus kerathurus | 0.18 | 12 | 0.05 | |
| Total | 395.25 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1739
DATE:12/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1723
start stop duration Long W 1612
TIME :02:41:30 02:59:52 18 (min) Purpose code: 1
LOG :2939.32 2940.69 1.37 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 19 18 Validity code:
Towing dir: 150ø Wire out: 45 m Speed:160 kn*10

Sorted: 30 Kg Total catch: 194.17 CATCH/HOUR: 647.23

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella maderensis | 298.00 | 1400 | 46.04 | 2901 |
| Brachydeuterus auritus | 153.00 | 1540 | 23.64 | |
| Mugil cephalus | 38.33 | 40 | 5.92 | |
| Galeoides decadactylus | 35.80 | 380 | 5.53 | |
| Chloroscombrus chrysurus | 26.00 | 180 | 4.02 | |
| Stromateus fiatola | 23.40 | 20 | 3.62 | |
| Diplodus bellottii | 15.20 | 20 | 2.35 | |
| Sphyraena guachancho | 12.70 | 13 | 1.96 | |
| Sarpa salpa | 11.40 | 20 | 1.76 | |
| Pomadasys rogeri | 9.40 | 20 | 1.45 | |
| Caranx rhonchus | 8.80 | 60 | 1.36 | |
| Trichiurus lepturus | 5.60 | 40 | 0.87 | |
| Brachydeuterus auritus Juv. | 3.80 | 520 | 0.59 | |
| Ilisha africana | 3.00 | 20 | 0.46 | |
| Penaeus notialis | 1.60 | 80 | 0.25 | |
| Selene dorsalis | 0.60 | 20 | 0.09 | |
| Penaeus kerathurus | 0.40 | 20 | 0.06 | |
| Sphoeroides spengleri | 0.20 | 20 | 0.03 | |
| Total | 647.23 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1740
DATE:12/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1730
start stop duration Long W 1622
TIME :06:09:57 06:38:36 29 (min) Purpose code: 1
LOG :2967.37 2969.19 1.81 Area code : 3
FDEPTH: 25 25 GearCond.code:
BDEPTH: 78 67 Validity code:
Towing dir: 90ø Wire out: 100 m Speed: 37 kn*10

Sorted: 3 Kg Total catch: 28.59 CATCH/HOUR: 59.15

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trichiurus lepturus | 28.86 | 213 | 48.79 | |
| Trachurus trecae, juvenile | 28.24 | 2537 | 47.74 | 2902 |
| Scomber japonicus | 1.97 | 17 | 3.33 | 2903 |
| Saurida brasiliensis | 0.06 | 4 | 0.10 | |
| Engraulis encrasicolus | 0.02 | 4 | 0.03 | |
| Total | 59.15 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1741
DATE:12/11/02 GEAR TYPE: BT No: POSITION:Lat N 1738
start stop duration Long W 1633
TIME :11:51:48 12:21:35 30 (min) Purpose code: 1
LOG :3022.66 3024.31 1.65 Area code : 3
FDEPTH: 190 196 GearCond.code:
BDEPTH: 190 196 Validity code:
Towing dir: 360ø Wire out: 580 m Speed: 31 kn*10

Sorted: 36 Kg Total catch: 985.96 CATCH/HOUR: 1971.92

| SPECIES | CATCH/HOUR weight | CATCH/HOUR numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Synagrops microlepis | 747.90 | 66906 | 37.93 | |
| Merluccius senegalensis | 366.66 | 4968 | 18.59 | |
| Trichiurus lepturus | 318.60 | 432 | 16.16 | |
| Helicolenus dactylopterus | 196.02 | 1782 | 9.94 | |
| Pterothrissus belloci | 90.72 | 1566 | 4.60 | |
| Zenopsis conchifer | 89.10 | 378 | 4.52 | |
| Scorpaena scrofa | 42.66 | 54 | 2.16 | |
| Dasyatis marmorata | 40.50 | 54 | 2.05 | |
| Dentex macrophthalmus | 33.48 | 108 | 1.70 | |
| Trachurus trachurus | 29.00 | 50 | 1.47 | 2904 |
| Chlorophthalmus atlanticus | 8.10 | 540 | 0.41 | |
| Pontinus accraensis | 5.94 | 54 | 0.30 | |
| Parapenaeus longirostris | 2.16 | 270 | 0.11 | |
| Gephyroberyx darwini | 1.08 | 108 | 0.05 | |
| Total | 1971.92 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1742
DATE:12/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 1738
start stop duration Long W 1612
TIME :15:10:18 16:01:00 51 (min) Purpose code: 1
LOG :3048.17 3051.57 3.40 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 39 40 Validity code:
Towing dir: 360º Wire out: 160 m Speed: 40 kn*10

Sorted: 38 Kg Total catch: 79.00 CATCH/HOUR: 92.94

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sphyrna zygaena | 31.41 | 14 | 33.80 | |
| Sardinella aurita | 29.36 | 236 | 31.59 | 2905 |
| Sardinella maderensis | 11.12 | 55 | 11.96 | 2906 |
| Caranx rhonchus | 6.67 | 18 | 7.18 | |
| Loligo vulgaris | 3.68 | 7 | 3.96 | |
| Trachinotus ovatus | 3.39 | 14 | 3.65 | |
| Lagocephalus laevigatus | 1.62 | 11 | 1.74 | |
| Selene dorsalis | 1.48 | 7 | 1.59 | |
| Trachurus trecae, juvenile | 1.06 | 88 | 1.14 | |
| Campogramma glaycos | 0.92 | 4 | 0.99 | |
| Chloroscombrus chrysurus | 0.85 | 4 | 0.91 | |
| Sphyraena guachancho | 0.67 | 4 | 0.72 | |
| Trichiurus lepturus | 0.64 | 4 | 0.69 | |
| Sepia officinalis hierredda | 0.07 | 11 | 0.08 | |
| Total | 92.94 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1743
DATE:12/11/02 GEAR TYPE: BT No: POSITION:Lat N 1740
start stop duration Long W 1608
TIME :17:07:10 17:27:10 20 (min) Purpose code: 1
LOG :3058.84 3059.94 1.10 Area code : 3
FDEPTH: 18 25 GearCond.code:
BDEPTH: 18 25 Validity code:
Towing dir: 270º Wire out: 120 m Speed: 31 kn*10

Sorted: 56 Kg Total catch: 405.33 CATCH/HOUR: 1215.99

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Plectorhinchus mediterraneus | 374.85 | 714 | 30.83 | |
| Galeoides decadactylus | 115.50 | 525 | 9.50 | |
| Pomadasys incisus | 95.13 | 840 | 7.82 | |
| Alectis alexandrinus | 64.35 | 42 | 5.29 | |
| Diplodus vulgaris | 63.84 | 126 | 5.25 | |
| Drepane africana | 56.70 | 63 | 4.66 | |
| Sparus caeruleostictus * | 51.66 | 168 | 4.25 | |
| Pomadasys jubelini | 42.00 | 105 | 3.45 | |
| Diplodus puntazzo | 41.16 | 63 | 3.38 | |
| Brachydeuterus auritus | 40.32 | 525 | 3.32 | |
| Rhinoptera marginata | 38.10 | 9 | 3.13 | |
| Caranx rhonchus | 37.38 | 672 | 3.07 | 2907 |
| Pteroscion peli | 32.97 | 231 | 2.71 | |
| Balistes capriscus | 18.27 | 21 | 1.50 | |
| Rhizoprionodon acutus | 17.22 | 21 | 1.42 | |
| Parapristipoma octolineatum | 16.80 | 63 | 1.38 | |
| Mugil cephalus | 16.80 | 21 | 1.38 | |
| Pomatomus saltatrix | 15.54 | 21 | 1.28 | |
| Chloroscombrus chrysurus | 15.33 | 84 | 1.26 | |
| Sparus auriga * | 10.71 | 42 | 0.88 | |
| Umbrina canariensis | 10.71 | 42 | 0.88 | |
| Arius parkii | 9.45 | 21 | 0.78 | |
| Pagellus bellottii | 6.72 | 42 | 0.55 | |
| Diplodus bellottii | 3.57 | 168 | 0.29 | |
| Chaetodon hoefleri | 3.36 | 21 | 0.28 | |
| Pterothrissus belloci | 2.31 | 42 | 0.19 | |
| Pseudupeneus prayensis | 2.10 | 21 | 0.17 | |
| Sardinella maderensis | 2.10 | 63 | 0.17 | |
| Trachurus trecae | 1.68 | 21 | 0.14 | |
| Trichiurus lepturus | 0.84 | 21 | 0.07 | |
| Onychoteuthis banksi | 0.21 | 84 | 0.02 | |
| Selene dorsalis | 0.21 | 42 | 0.02 | |
| Total | 1207.89 | | 99.32 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1744
DATE:12/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1750
start stop duration Long W 1607
TIME :19:45:25 20:13:12 28 (min) Purpose code: 1
LOG :3078.83 3080.81 1.97 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 16 15 Validity code:
Towing dir: 170º Wire out: 75 m Speed: 42 kn*10

Sorted: 30 Kg Total catch: 1103.53 CATCH/HOUR: 2364.71

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Brachydeuterus auritus | 960.43 | 18746 | 40.62 | |
| Sardinella maderensis | 458.23 | 2914 | 19.38 | 2909 |
| Mugil cephalus | 195.94 | 154 | 8.29 | |
| Lagocephalus laevigatus | 185.91 | 231 | 7.86 | |
| Caranx rhonchus | 118.03 | 1003 | 4.99 | 2908 |
| Sardinella aurita | 72.51 | 231 | 3.07 | |
| Pomadasys rogeri | 67.89 | 77 | 2.87 | |
| Galeoides decadactylus | 63.26 | 1466 | 2.68 | |
| Sepia bertheloti | 61.71 | 154 | 2.61 | |
| Chloroscombrus chrysurus | 43.20 | 386 | 1.83 | |
| Pomadasys peroteti | 28.54 | 154 | 1.21 | |
| Pagellus bellottii | 24.69 | 154 | 1.04 | |
| Pomadasys jubelini | 23.14 | 154 | 0.98 | |
| Alectis alexandrinus | 23.14 | 77 | 0.98 | |
| Sphyraena guachancho | 22.37 | 77 | 0.95 | |
| Trichiurus lepturus | 6.17 | 154 | 0.26 | |
| Selene dorsalis | 6.17 | 231 | 0.26 | |
| Leptocharias smithii | 2.59 | 2 | 0.11 | |
| Penaeus notialis | 0.77 | 309 | 0.03 | |
| Total | 2364.69 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1745
DATE:12/11/02 GEAR TYPE: PT No: 4 POSITION:Lat N 1750
start stop duration Long W 1618
TIME :22:14:09 22:43:57 30 (min) Purpose code: 1
LOG :3097.37 3099.11 1.71 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 74 66 Validity code:
Towing dir: 90º Wire out: 150 m Speed: 34 kn*10

Sorted: 33 Kg Total catch: 740.96 CATCH/HOUR: 1481.92

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae | 1333.20 | 111848 | 89.96 | 2910 |
| Trichiurus lepturus | 132.00 | 176 | 8.91 | |
| Arius parkii | 5.00 | 2 | 0.34 | |
| Campogramma glaycos | 1.74 | 2 | 0.12 | |
| Scomber japonicus | 0.78 | 6 | 0.05 | |
| Total | 1472.72 | | 99.38 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1746
DATE:13/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 1800
start stop duration Long W 1621
TIME :05:42:24 06:11:35 29 (min) Purpose code: 1
LOG :3156.21 3158.06 1.83 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 82 92 Validity code:
Towing dir: 270º Wire out: 160 m Speed: 35 kn*10

Sorted: 33 Kg Total catch: 488.75 CATCH/HOUR: 1011.21

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae | 971.79 | 60741 | 96.10 | 2911 |
| Euthynnus alletteratus | 26.05 | 21 | 2.58 | |
| Campogramma glaycos | 6.21 | 8 | 0.61 | |
| Mugil capurrii | 5.69 | 4 | 0.56 | |
| Total | 1009.74 | | 99.85 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1747
DATE:13/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1800
start stop duration Long W 1612
TIME :08:14:08 08:45:15 31 (min) Purpose code: 1
LOG :3172.34 3174.42 2.05 Area code : 3
FDEPTH: 10 15 GearCond.code:
BDEPTH: 23 28 Validity code:
Towing dir: 270º Wire out: 100 m Speed: 40 kn*10

Sorted: 70 Kg Total catch: 492.38 CATCH/HOUR: 952.99

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 737.03 | 4241 | 77.34 | 2913 |
| Sardinella maderensis | 113.54 | 555 | 11.91 | 2912 |
| Caranx rhonchus | 62.73 | 406 | 6.58 | 2914 |
| Chloroscombrus chrysurus | 30.89 | 257 | 3.24 | |
| Stromateus fiatola | 4.74 | 14 | 0.50 | |
| Trachinotus ovatus | 4.06 | 14 | 0.43 | |
| Total | 952.99 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1748
DATE:13/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1820
start stop duration Long W 1614
TIME :18:29:31 19:09:24 40 (min) Purpose code: 1
LOG :3266.83 3269.53 2.68 Area code : 3
FDEPTH: 15 15 GearCond.code:
BDEPTH: 23 31 Validity code:
Towing dir: 270º Wire out: 100 m Speed: 41 kn*10

Sorted: 32 Kg Total catch: 165.36 CATCH/HOUR: 248.04

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Caranx rhonchus | 183.00 | 1238 | 73.78 | 2915 |
| Sardinella aurita | 48.45 | 180 | 19.53 | 2916 |
| Chloroscombrus chrysurus | 6.00 | 24 | 2.42 | |
| Lagocephalus lagocephalus | 2.99 | 2 | 1.21 | |
| Alectis alexandrinus | 2.25 | 8 | 0.91 | |
| Sphyraena sphyraena | 1.26 | 5 | 0.51 | |
| Scomber japonicus | 0.99 | 6 | 0.40 | |
| Trachurus trecae | 0.75 | 15 | 0.30 | |
| Rhizoprionodon acutus | 0.65 | 2 | 0.26 | |
| Campogramma glaycos | 0.63 | 2 | 0.25 | |
| Loligo vulgaris | 0.51 | 2 | 0.21 | |
| Pagellus bellottii | 0.41 | 2 | 0.17 | |
| Penaeus notialis | 0.17 | 3 | 0.07 | |
| Total | 248.06 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1749
DATE:13/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1825
start stop duration Long W 1615
TIME :21:18:20 21:44:04 26 (min) Purpose code: 1
LOG :3287.14 3288.93 1.78 Area code : 3
FDEPTH: 24 21 GearCond.code:
BDEPTH: 24 21 Validity code:
Towing dir: 130ø Wire out: 100 m Speed: 40 kn*10

Sorted: 24 Kg Total catch: 126.36 CATCH/HOUR: 291.60

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Caranx rhonchus | 57.69 | 450 | 19.78 | 2917 |
| Galeoides decadactylus | 48.58 | 473 | 16.66 | |
| Pagellus bellottii | 35.42 | 323 | 12.15 | |
| Trichiurus lepturus | 29.77 | 81 | 10.21 | |
| Pomadasys incisus | 16.04 | 150 | 5.50 | |
| Arius parkii | 15.92 | 21 | 5.46 | |
| Penaeus kerathurus | 15.46 | 1546 | 5.30 | |
| Rhizoprionodon acutus | 11.88 | 21 | 4.07 | |
| Brachydeuterus auritus | 11.31 | 81 | 3.88 | |
| Stromateus fiatola | 8.86 | 14 | 3.04 | |
| Argyrosomus regius | 8.31 | 23 | 2.85 | |
| Lithognathus mormyrus | 5.38 | 14 | 1.84 | |
| Loligo vulgaris | 3.95 | 12 | 1.35 | |
| Citharus linguatula | 3.69 | 23 | 1.27 | |
| Penaeus notialis | 2.88 | 127 | 0.99 | |
| Sparus caeruleostictus * | 2.77 | 35 | 0.95 | |
| Sepia officinalis hierredda | 2.05 | 7 | 0.70 | |
| Pseudotolithus senegalensis | 1.89 | 2 | 0.65 | |
| Dicologoglossa cuneata | 1.73 | 23 | 0.59 | |
| Spondyliosoma cantharus | 1.62 | 2 | 0.56 | |
| Trachinocephalus myops | 1.62 | 2 | 0.56 | |
| Lagocephalus laevigatus | 1.52 | 7 | 0.52 | |
| Sphyraena sphyraena | 1.52 | 5 | 0.52 | |
| Dentex canariensis | 1.04 | 12 | 0.36 | |
| Dactylopterus volitans | 0.69 | 12 | 0.24 | |
| Total | 291.59 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1750
DATE:13/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 1828
start stop duration Long W 1613
TIME :23:00:00 23:34:48 35 (min) Purpose code: 1
LOG :3297.89 3300.08 2.17 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 18 22 Validity code:
Towing dir: 230ø Wire out: 100 m Speed: 38 kn*10

Sorted: 31 Kg Total catch: 430.99 CATCH/HOUR: 738.84

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Caranx rhonchus | 416.74 | 3231 | 56.40 | 2918 |
| Sardinella maderensis | 146.86 | 557 | 19.88 | 2920 |
| Brachydeuterus auritus | 46.13 | 357 | 6.24 | |
| Pagellus bellottii | 32.31 | 713 | 4.37 | |
| Caranx rhonchus juv | 30.31 | 1114 | 4.10 | 2919 |
| Arius heudeloti | 15.67 | 19 | 2.12 | |
| Pomadasys incisus | 15.38 | 134 | 2.08 | |
| Trichiurus lepturus | 8.57 | 14 | 1.16 | |
| Stromateus fiatola | 5.33 | 7 | 0.72 | |
| Alectis alexandrinus | 3.43 | 2 | 0.46 | |
| Sparus caeruleostictus * | 2.42 | 7 | 0.33 | |
| Penaeus kerathurus | 2.23 | 312 | 0.30 | |
| Rhizoprionodon acutus | 2.21 | 2 | 0.30 | |
| Mustelus mustelus | 2.21 | 3 | 0.30 | |
| Boops boops | 2.01 | 89 | 0.27 | |
| Plectorhinchus mediterraneus | 1.95 | 3 | 0.26 | |
| Penaeus notialis | 1.78 | 45 | 0.24 | |
| Pomadasys jubelini | 1.17 | 2 | 0.16 | |
| Caranx senegallus | 0.82 | 2 | 0.11 | |
| Sepia officinalis hierredda | 0.77 | 2 | 0.10 | |
| Selene dorsalis | 0.53 | 2 | 0.07 | |
| Total | 738.83 | | 99.97 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1751
DATE:14/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 1830
start stop duration Long W 1625
TIME :01:56:51 02:11:23 15 (min) Purpose code: 1
LOG :3319.69 3320.60 0.91 Area code : 3
FDEPTH: 30 32 GearCond.code:
BDEPTH: 57 55 Validity code:
Towing dir: 90ø Wire out: 100 m Speed: 35 kn*10

Sorted: 30 Kg Total catch: 268.36 CATCH/HOUR: 1073.44

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 1072.80 | 78516 | 99.94 | 2921 |
| Penaeus notialis | 0.16 | 4 | 0.01 | |
| Total | 1072.96 | | 99.95 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1752
DATE:14/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1840
start stop duration Long W 1633
TIME :06:46:44 06:58:58 12 (min) Purpose code: 1
LOG :3364.49 3365.30 0.80 Area code : 3
FDEPTH: 25 30 GearCond.code:
BDEPTH: 119 138 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 35 kn*10

Sorted: Kg Total catch: 0.02 CATCH/HOUR: 0.10

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 0.10 | 5 | 100.00 | |
| Total | 0.10 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1753
DATE:14/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1841
start stop duration Long W 1633
TIME :08:29:02 08:56:03 27 (min) Purpose code: 1
LOG :3373.37 3375.07 1.69 Area code : 3
FDEPTH: 110 118 GearCond.code:
BDEPTH: 110 118 Validity code:
Towing dir: 180ø Wire out: 330 m Speed: 37 kn*10

Sorted: 32 Kg Total catch: 348.96 CATCH/HOUR: 775.47

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 656.67 | 63244 | 84.68 | 2924 |
| Engraulis encrasicolus | 54.44 | 7156 | 7.02 | 2922 |
| Zeus faber | 23.11 | 51 | 2.98 | |
| Trachurus trecae | 19.00 | 42 | 2.45 | 2923 |
| Arius parkii | 5.40 | 13 | 0.70 | |
| Merluccius senegalensis | 4.36 | 13 | 0.56 | |
| Caranx rhonchus | 3.80 | 29 | 0.49 | |
| Sardinella maderensis | 2.22 | 9 | 0.29 | |
| Illex coindetii | 2.02 | 47 | 0.26 | |
| Scomber japonicus | 1.69 | 16 | 0.22 | |
| Sphoeroides pachgaster | 1.18 | 2 | 0.15 | |
| Dentex angolensis | 1.02 | 4 | 0.13 | |
| Trichiurus lepturus | 0.36 | 7 | 0.05 | |
| Todaropsis eblanae | 0.20 | 16 | 0.03 | |
| Total | 775.47 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1754
DATE:14/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1848
start stop duration Long W 1621
TIME :12:00:13 12:25:27 25 (min) Purpose code: 1
LOG :3402.89 3404.53 1.63 Area code : 3
FDEPTH: 23 27 GearCond.code:
BDEPTH: 23 27 Validity code:
Towing dir: 200ø Wire out: 130 m Speed: 32 kn*10

Sorted: Kg Total catch: 29.18 CATCH/HOUR: 70.03

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Lagocephalus laevigatus | 18.24 | 12 | 26.05 | |
| Caranx rhonchus | 15.17 | 82 | 21.66 | 2925 |
| Diplodus puntazzo | 12.19 | 14 | 17.41 | |
| Campogramma glaycos | 10.61 | 26 | 15.15 | |
| Sparus caeruleostictus * | 4.03 | 10 | 5.75 | |
| Sepia officinalis hierredda | 3.67 | 5 | 5.24 | |
| Pomadasys rogeri | 1.92 | 2 | 2.74 | |
| Illex coindetii | 0.89 | 34 | 1.27 | |
| Loligo vulgaris | 0.74 | 2 | 1.06 | |
| Fistularia petimba | 0.74 | 19 | 1.06 | |
| Pagellus bellottii | 0.65 | 5 | 0.93 | |
| Chelidonichthys gabonensis | 0.48 | 5 | 0.69 | |
| Trachurus trecae | 0.41 | 2 | 0.59 | |
| Total | 69.74 | | 99.60 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1755
DATE:14/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1850
start stop duration Long W 1641
TIME :15:39:16 16:09:23 30 (min) Purpose code: 1
LOG :3433.71 3435.33 1.60 Area code : 3
FDEPTH: 176 148 GearCond.code:
BDEPTH: 176 148 Validity code:
Towing dir: 90ø Wire out: 600 m Speed: 31 kn*10

Sorted: 30 Kg Total catch: 278.81 CATCH/HOUR: 557.62

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Synagrops microlepis | 416.00 | 69328 | 74.60 | |
| Trichiurus lepturus | 33.92 | 44 | 6.08 | |
| Trachurus trachurus | 30.50 | 54 | 5.47 | 2926 |
| Merluccius polli | 28.48 | 288 | 5.11 | |
| Merluccius senegalensis | 21.12 | 64 | 3.79 | |
| Pterothrissus belloci | 5.44 | 128 | 0.98 | |
| Sphoeroides pachgaster | 3.84 | 16 | 0.69 | |
| Chlorophthalmus atlanticus | 3.84 | 608 | 0.69 | |
| Pontinus accraensis | 2.56 | 16 | 0.46 | |
| Octopus vulgaris | 2.34 | 2 | 0.42 | |
| Dactylopterus volitans | 1.52 | 4 | 0.27 | |
| Dentex angolensis | 1.48 | 2 | 0.27 | |
| Dentex macrophthalmus | 1.44 | 16 | 0.26 | |
| Zenopsis conchifer | 1.28 | 16 | 0.23 | |
| Umbrina canariensis | 1.28 | 6 | 0.23 | |
| Sepia officinalis hierredda | 0.64 | 16 | 0.11 | |
| Capros aper | 0.64 | 112 | 0.11 | |
| Illex coindetii | 0.50 | 8 | 0.09 | |
| Antigonia capros | 0.48 | 16 | 0.09 | |
| Synchiropus phaeton | 0.32 | 16 | 0.06 | |
| Total | 557.62 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1756
DATE:14/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1901
start stop duration Long W 1643
TIME :21:32:47 21:53:00 20 (min) Purpose code: 1
LOG :3477.10 3478.24 1.10 Area code : 3
FDEPTH: 134 133 GearCond.code:
BDEPTH: 134 133 Validity code:
Towing dir: 170º Wire out: 400 m Speed: 34 kn*10

Sorted: 20 Kg Total catch: 215.00 CATCH/HOUR: 645.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Pontinus kuhlii | 402.00 | 108 | 62.33 | |
| Trachurus trecae | 69.21 | 120 | 10.73 | 2927 |
| Merluccius senegalensis | 42.90 | 129 | 6.65 | |
| Synagrops microlepis | 29.46 | 5244 | 4.57 | |
| Dentex macrophthalmus | 26.22 | 300 | 4.07 | |
| Scorpaena normani | 19.26 | 402 | 2.99 | |
| Zeus faber | 9.06 | 36 | 1.40 | |
| Zenopsis conchifer | 7.98 | 66 | 1.24 | |
| Scorpaena elongata | 6.60 | 54 | 1.02 | |
| Scorpaena stephanica | 5.10 | 24 | 0.79 | |
| Umbrina canariensis | 3.69 | 6 | 0.57 | |
| Arnoglossus imperialis | 3.48 | 408 | 0.54 | |
| Trachurus trachurus | 2.91 | 6 | 0.45 | |
| Pterothrissus belloci | 2.70 | 18 | 0.42 | |
| Illex coindetii | 2.16 | 36 | 0.33 | |
| Trichiurus lepturus | 2.10 | 3 | 0.33 | |
| Brotula barbata | 1.44 | 3 | 0.22 | |
| Dactylopterus volitans | 1.23 | 24 | 0.19 | |
| Trachurus trachurus, juveniles | 1.08 | 78 | 0.17 | |
| Aulopus cadenati | 0.96 | 24 | 0.15 | |
| Solenocera africana | 0.84 | 474 | 0.13 | |
| Chelidonichthys gabonensis | 0.84 | 48 | 0.13 | |
| Serranus cabrilla | 0.84 | 12 | 0.13 | |
| Trachurus trecae, juvenile | 0.66 | 42 | 0.10 | |
| MYCTOPHIDAE | 0.66 | 240 | 0.10 | |
| PORTUNIDAE | 0.42 | 24 | 0.07 | |
| Antigonia capros | 0.36 | 48 | 0.06 | |
| GALATHEIDAE | 0.30 | 36 | 0.05 | |
| Monolene microstoma | 0.24 | 6 | 0.04 | |
| Sepia elegans | 0.18 | 6 | 0.03 | |
| Aulopus filamentosus | 0.12 | 6 | 0.02 | |
| Total | 645.00 | | 100.02 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1757
DATE:15/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1900
start stop duration Long W 1633
TIME :23:51:34 00:21:22 30 (min) Purpose code: 1
LOG :3490.98 3492.50 1.50 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 62 69 Validity code:
Towing dir: 270º Wire out: 150 m Speed: 35 kn*10

Sorted: Kg Total catch: 35.77 CATCH/HOUR: 71.54

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Campogramma glaycos | 43.70 | 68 | 61.08 | |
| Trichiurus lepturus | 24.50 | 130 | 34.25 | |
| Trachurus trecae, juvenile | 1.88 | 216 | 2.63 | 2928 |
| OCTOPODIDAE | 0.40 | 2 | 0.56 | |
| Saurida brasiliensis | 0.38 | 54 | 0.53 | |
| Engraulis encrasicolus | 0.32 | 34 | 0.45 | |
| Sphoeroides spengleri | 0.26 | 6 | 0.36 | |
| Ariomma bondi | 0.10 | 2 | 0.14 | |
| Total | 71.54 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1758
DATE:15/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 1905
start stop duration Long W 1633
TIME :03:49:27 04:10:39 21 (min) Purpose code: 1
LOG :3520.12 3521.73 1.60 Area code : 3
FDEPTH: 15 20 GearCond.code:
BDEPTH: 54 43 Validity code:
Towing dir: 115º Wire out: 100 m Speed: 45 kn*10

Sorted: 106 Kg Total catch: 100.61 CATCH/HOUR: 287.46

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trichiurus lepturus | 164.34 | 1011 | 57.17 | |
| Sardinella maderensis | 91.71 | 257 | 31.90 | 2929 |
| Sardinella aurita | 20.60 | 54 | 7.17 | 2930 |
| Caranx rhonchus | 7.54 | 23 | 2.62 | |
| Campogramma glaycos | 2.91 | 6 | 1.01 | |
| Trachurus trecae, juvenile | 0.34 | 9 | 0.12 | |
| Total | 287.44 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1759
DATE:15/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 1930
start stop duration Long W 1659
TIME :14:21:45 14:57:19 36 (min) Purpose code: 1
LOG :3614.92 3616.81 1.89 Area code : 3
FDEPTH: 101 101 GearCond.code:
BDEPTH: 101 101 Validity code:
Towing dir: 90º Wire out: 350 m Speed: 32 kn*10

Sorted: 28 Kg Total catch: 192.97 CATCH/HOUR: 321.62

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 199.00 | 16720 | 61.87 | 2931 |
| Zeus faber | 67.10 | 180 | 20.86 | |
| Trachurus trecae | 28.15 | 53 | 8.75 | 2932 |
| Pterothrissus belloci | 8.80 | 150 | 2.74 | |
| Trachurus trachurus | 7.93 | 25 | 2.47 | |
| Trichiurus lepturus | 3.27 | 5 | 1.02 | |
| Dentex maroccanus | 3.10 | 60 | 0.96 | |
| Scorpaena scrofa | 1.50 | 3 | 0.47 | |
| Octopus vulgaris | 1.18 | 2 | 0.37 | |
| Pagellus acarne | 0.58 | 2 | 0.18 | |
| Scomber japonicus | 0.50 | 10 | 0.16 | |
| Illex coindetii | 0.40 | 2 | 0.12 | |
| Arnoglossus imperialis | 0.10 | 20 | 0.03 | |
| Total | 321.61 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1760
DATE:15/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1940
start stop duration Long W 1656
TIME :20:33:26 21:01:35 28 (min) Purpose code: 1
LOG :3669.27 3670.88 1.60 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 48 64 Validity code:
Towing dir: 270º Wire out: 130 m Speed: 35 kn*10

Sorted: 92 Kg Total catch: 612.24 CATCH/HOUR: 1311.94

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 1114.29 | 119871 | 84.93 | 2934 |
| Sardinella maderensis | 134.57 | 403 | 10.26 | 2935 |
| Trichiurus lepturus | 42.86 | 643 | 3.27 | |
| Scomberomorus tritor | 11.46 | 2 | 0.87 | |
| Trachurus trecae | 5.21 | 11 | 0.40 | 2933 |
| Campogramma glaycos | 3.56 | 6 | 0.27 | |
| Total | 1311.95 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1761
DATE:15/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 1948
start stop duration Long W 1709
TIME :23:05:55 23:33:45 28 (min) Purpose code: 1
LOG :3686.50 3688.39 1.88 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 61 94 Validity code:
Towing dir: 130º Wire out: 130 m Speed: 40 kn*10

Sorted: 27 Kg Total catch: 440.30 CATCH/HOUR: 943.50

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trichiurus lepturus | 905.14 | 4251 | 95.93 | |
| Synagrops microlepis | 15.43 | 3120 | 1.64 | |
| Trachurus trecae, juvenile | 10.63 | 1063 | 1.13 | |
| MYCTOPHIDAE | 6.17 | 1577 | 0.65 | |
| Trachurus trecae | 2.23 | 4 | 0.24 | |
| Sardinella maderensis | 1.84 | 6 | 0.20 | |
| Ruvettus pretiosus | 1.39 | 2 | 0.15 | |
| Sardinella aurita | 0.66 | 2 | 0.07 | |
| Total | 943.49 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1762
DATE:16/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2000
start stop duration Long W 1722
TIME :05:25:59 05:45:51 20 (min) Purpose code: 1
LOG :3743.59 3744.84 1.25 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 43 46 Validity code:
Towing dir: 270º Wire out: 160 m Speed: 40 kn*10

Sorted: 36 Kg Total catch: 1551.55 CATCH/HOUR: 4654.65

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Engraulis encrasicolus | 4488.00 | 720000 | 96.42 | 2936 |
| Trachurus trecae, juvenile | 88.50 | 15900 | 1.90 | 2937 |
| Trichiurus lepturus | 73.50 | 2100 | 1.58 | |
| Sepia officinalis hierredda | 2.46 | 12 | 0.05 | |
| Caranx rhonchus | 1.68 | 6 | 0.04 | |
| Trachurus trecae | 0.51 | 3 | 0.01 | |
| Total | 4654.65 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1763
DATE:16/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2010
start stop duration Long W 1730
TIME :14:12:58 14:22:14 9 (min) Purpose code: 1
LOG :3821.64 3822.13 0.46 Area code : 3
FDEPTH: 46 45 GearCond.code:
BDEPTH: 46 45 Validity code:
Towing dir: 180º Wire out: 200 m Speed: 34 kn*10

Sorted: 40 Kg Total catch: 484.88 CATCH/HOUR: 3232.53

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Engraulis encrasicolus | 2824.00 | 465920 | 87.36 | 2939 |
| Trachurus trecae, juvenile | 192.00 | 31280 | 5.94 | 2938 |
| Pagellus bellottii | 94.40 | 1280 | 2.92 | |
| Trichiurus lepturus | 60.80 | 233 | 1.88 | |
| Gobioides sp | 40.00 | 4080 | 1.24 | |
| Chelidonichthys gabonensis | 6.13 | 53 | 0.19 | |
| Grammoplites gruveli | 5.60 | 80 | 0.17 | |
| Campogramma glaycos | 3.73 | 7 | 0.12 | |
| Dicologoglossa cuneata | 3.20 | 80 | 0.10 | |
| Microchirus boscanion | 1.60 | 80 | 0.05 | |
| Sepia officinalis hierredda | 0.67 | 7 | 0.02 | |
| Priacanthus arenatus | 0.20 | 7 | 0.01 | |
| Penaeus notialis | 0.20 | 7 | 0.01 | |
| Total | 3232.53 | | 100.01 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1764
DATE:16/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2022
start stop duration Long W 1736
TIME :18:17:26 18:28:24 11 (min) Purpose code: 1
LOG :3859.13 3859.77 0.64 Area code : 3
FDEPTH: 80 80 GearCond.code:
BDEPTH: 80 80 Validity code:
Towing dir: 180º Wire out: 300 m Speed: 34 kn*10

Sorted: 37 Kg Total catch: 761.83 CATCH/HOUR: 4155.44

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Engraulis encrasicolus | 2712.00 | 310473 | 65.26 | 2941 |
| Trachurus trecae, juvenile | 1053.82 | 137345 | 25.36 | 2940 |
| Cepola sp. | 115.64 | 1855 | 2.78 | |
| Scomber japonicus | 115.64 | 1418 | 2.78 | |
| GOBIIDAE | 77.45 | 5673 | 1.86 | |
| Helicolenus dactylopterus | 52.36 | 8073 | 1.26 | |
| Octopus vulgaris | 14.67 | 16 | 0.35 | |
| Sardina pilchardus | 12.00 | 436 | 0.29 | |
| Loligo vulgaris | 1.85 | 11 | 0.04 | |
| Total | 4155.43 | | 99.98 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1765
DATE:16/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2020
start stop duration Long W 1724
TIME :20:08:16 20:29:42 21 (min) Purpose code: 1
LOG :3873.40 3874.69 1.27 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 40 43 Validity code:
Towing dir: 270ø Wire out: 130 m Speed: 37 kn*10

Sorted: 38 Kg Total catch: 8709.60 CATCH/HOUR: 24884.57

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Engraulis encrasicolus | 12996.00 | 1603166 | 52.23 | 2943 |
| Sardina pilchardus | 10390.29 | 281417 | 41.75 | 2942 |
| Sarda sarda | 801.26 | 651 | 3.22 | |
| Trachurus trecae, juvenile | 482.06 | 54720 | 1.94 | 2944 |
| Caranx rhonchus | 214.97 | 651 | 0.86 | |
| Total | 24884.58 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1766
DATE:16/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2020
start stop duration Long W 1713
TIME :22:48:54 23:05:51 17 (min) Purpose code: 1
LOG :3891.44 3892.55 1.11 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 29 29 Validity code:
Towing dir: 270ø Wire out: 110 m Speed: 40 kn*10

Sorted: 34 Kg Total catch: 1058.93 CATCH/HOUR: 3737.40

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 3446.47 | 49976 | 92.22 | 2945 |
| Sardinella maderensis | 185.29 | 7412 | 4.96 | 2946 |
| Trachurus trecae, juvenile | 47.65 | 2647 | 1.27 | 2947 |
| Scomberomorus tritor | 27.71 | 11 | 0.74 | |
| Stromateus fiatola | 26.65 | 32 | 0.71 | |
| Arius parkii | 3.64 | 4 | 0.10 | |
| Total | 3737.41 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1767
DATE:17/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2026
start stop duration Long W 1710
TIME :01:23:56 01:24:12 (min) Purpose code: 1
LOG :3909.45 3909.47 0.02 Area code : 3
FDEPTH: 25 10 GearCond.code:
BDEPTH: 25 10 Validity code:
Towing dir: 160ø Wire out: 130 m Speed: 45 kn*10

Sorted: 30 Kg Total catch: 109.06 CATCH/HOUR: 6543.60

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 5805.00 | 69960 | 88.71 | 2949 |
| Scomberomorus tritor | 357.00 | 120 | 5.46 | |
| Sardinella aurita - Juveniles | 154.20 | 5700 | 2.36 | |
| Sardinella maderensis - Juv. | 108.00 | 11340 | 1.65 | 2948 |
| Campogramma glaycos | 84.00 | 120 | 1.28 | |
| Trachurus trecae | 35.40 | 2700 | 0.54 | |
| Total | 6543.60 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1768
DATE:17/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2030
start stop duration Long W 1711
TIME :03:37:37 03:46:57 9 (min) Purpose code: 1
LOG :3927.21 3927.68 0.44 Area code : 3
FDEPTH: 32 31 GearCond.code:
BDEPTH: 32 31 Validity code:
Towing dir: 90ø Wire out: 120 m Speed: 35 kn*10

Sorted: 29 Kg Total catch: 78.15 CATCH/HOUR: 521.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 163.33 | 1833 | 31.35 | 2950 |
| Trachurus trecae, juvenile | 145.87 | 9320 | 28.00 | 2951 |
| Pagellus bellottii | 130.53 | 3120 | 25.05 | |
| Lepidotrigla cadmani | 18.33 | 487 | 3.52 | |
| Trachinus draco | 12.33 | 433 | 2.37 | |
| Argyrosomus regius | 10.00 | 7 | 1.92 | |
| Sepia officinalis hierredda | 9.87 | 73 | 1.89 | |
| Uranoscopus cadenati | 4.93 | 7 | 0.95 | |
| Pomadasys incisus | 4.27 | 13 | 0.82 | |
| Dicologoglossa cuneata | 3.53 | 133 | 0.68 | |
| Octopus vulgaris | 3.20 | 7 | 0.61 | |
| Campogramma glaycos | 2.93 | 7 | 0.56 | |
| Sphyraena guachancho | 2.80 | 7 | 0.54 | |
| Penaeus notialis | 2.13 | 47 | 0.41 | |
| Cynoponticus ferox | 2.00 | 67 | 0.38 | |
| Sardinella maderensis - Juv. | 1.33 | 100 | 0.26 | |
| Microchirus boscanion | 1.00 | 87 | 0.19 | |
| Bothus podas africanus | 1.00 | 33 | 0.19 | |
| Plesionika martia | 0.53 | 100 | 0.10 | |
| Loligo vulgaris | 0.53 | 7 | 0.10 | |
| Solea sp. | 0.33 | 20 | 0.06 | |
| Solea hexophthalma * | 0.20 | 20 | 0.04 | |
| Total | 520.97 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1769
DATE:17/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2030
start stop duration Long W 1710
TIME :04:17:34 04:54:19 37 (min) Purpose code: 1
LOG :3929.21 3931.53 2.28 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 31 34 Validity code:
Towing dir: 240ø Wire out: 150 m Speed: 40 kn*10

Sorted: 30 Kg Total catch: 211.89 CATCH/HOUR: 343.61

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 136.62 | 1978 | 39.76 | 2952 |
| Trachurus trecae, juvenile | 99.32 | 6568 | 28.90 | 2953 |
| Scomberomorus tritor | 96.73 | 37 | 28.15 | |
| Campogramma glaycos | 4.05 | 8 | 1.18 | |
| Caranx rhonchus | 1.70 | 8 | 0.49 | |
| Sphyraena guachancho | 1.69 | 5 | 0.49 | |
| Sardinella maderensis - Juv. | 1.62 | 114 | 0.47 | |
| Stromateus fiatola | 1.62 | 3 | 0.47 | |
| Sardina pilchardus | 0.24 | 8 | 0.07 | |
| Total | 343.59 | | 99.98 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1770
DATE:17/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2030
start stop duration Long W 1721
TIME :06:03:07 06:21:38 19 (min) Purpose code: 1
LOG :3940.72 3941.81 1.08 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 42 42 Validity code:
Towing dir: 90ø Wire out: 120 m Speed: 36 kn*10

Sorted: 30 Kg Total catch: 156.00 CATCH/HOUR: 492.63

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 388.74 | 9758 | 78.91 | 2955 |
| Trachurus trecae, juvenile | 63.16 | 5416 | 12.82 | 2954 |
| Scomberomorus tritor | 11.37 | 6 | 2.31 | |
| Sardinella aurita | 7.89 | 111 | 1.60 | |
| Arius heudeloti | 7.42 | 6 | 1.51 | |
| Engraulis encrasicolus | 7.26 | 742 | 1.47 | 2956 |
| Caranx rhonchus | 6.47 | 32 | 1.31 | |
| Belone belone gracilis | 0.47 | 3 | 0.10 | |
| Total | 492.78 | | 100.03 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1771
DATE:17/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2030
start stop duration Long W 1727
TIME :08:05:26 08:33:22 28 (min) Purpose code: 1
LOG :3953.35 3955.03 1.67 Area code : 3
FDEPTH: 60 51 GearCond.code:
BDEPTH: 60 51 Validity code:
Towing dir: 90ø Wire out: 210 m Speed: 36 kn*10

Sorted: 33 Kg Total catch: 2796.00 CATCH/HOUR: 5991.43

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 3317.14 | 385157 | 55.36 | 2957 |
| Sardina pilchardus | 1482.86 | 43491 | 24.75 | 2959 |
| Engraulis encrasicolus | 801.43 | 73530 | 13.38 | 2960 |
| Sardinella aurita | 317.14 | 3317 | 5.29 | 2958 |
| Scomber japonicus | 72.86 | 184 | 1.22 | |
| Total | 5991.43 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1772
DATE:17/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2040
start stop duration Long W 1727
TIME :14:59:44 15:29:31 30 (min) Purpose code: 1
LOG :4013.24 4015.15 1.90 Area code : 3
FDEPTH: 10 10 GearCond.code:
BDEPTH: 62 66 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 1.47 CATCH/HOUR: 2.94

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Campogramma glaycos | 1.90 | 2 | 64.63 | |
| Echelus myrus | 1.04 | 2 | 35.37 | |
| Total | 2.94 | | 100.00 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1773
DATE:17/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2040
start stop duration Long W 1727
TIME :16:29:32 16:38:55 9 (min) Purpose code: 1
LOG :4021.51 4022.02 0.50 Area code : 3
FDEPTH: 63 62 GearCond.code:
BDEPTH: 63 62 Validity code:
Towing dir: 270ø Wire out: 220 m Speed: 31 kn*10

Sorted: 32 Kg Total catch: 3213.80 CATCH/HOUR: 21425.33

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 11400.00 | 272667 | 53.21 | 2961 |
| Trachurus trecae, juvenile | 9266.67 | 1053333 | 43.25 | 2962 |
| Engraulis encrasicolus | 560.00 | 59333 | 2.61 | |
| Scomber japonicus | 180.00 | 667 | 0.84 | |
| Priacanthus arenatus | 13.33 | 667 | 0.06 | |
| Octopus vulgaris | 5.33 | 667 | 0.02 | |
| Total | 21425.33 | | 99.99 | |

DR. FRIDTJOF NANSEN PROJECT:W3 PROJECT STATION:1774
DATE:17/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2048
start stop duration Long W 1715
TIME :21:11:15 21:25:37 14 (min) Purpose code: 1
LOG :4061.77 4062.61 0.84 Area code : 3
FDEPTH: 15 15 GearCond.code:
BDEPTH: 45 44 Validity code:
Towing dir: 90ø Wire out: 110 m Speed: 40 kn*10

Sorted: 30 Kg Total catch: 185.10 CATCH/HOUR: 793.29

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 745.71 | 16843 | 94.00 | 2964 |
| Trachurus trecae, juvenile | 38.57 | 3549 | 4.86 | 2963 |
| Scomber japonicus | 7.71 | 129 | 0.97 | |
| Engraulis encrasicolus | 1.29 | 103 | 0.16 | |
| Total | 793.28 | | 99.99 | |

# Annex II Instruments and fishing gear used

The Simrad EK-500, 38kHz echo scientific sounder was used during the survey for fish abundance estimation. The Bergen Echo Integrator system (BEI) logging the echogram raw data from the sounder, was used to scrutinize the acoustic records, and to allocate integrator data to fish species. All raw data were stored to tape, and a backup of the database of scrutinized data, stored. The details of the settings of the 38kHz were as follows:

| | | |
|---|---|---|
| **Transceiver-1 menu** | Transducer depth | 5.5 m |
| | Absorption coeff. | 10 dB/km |
| | Pulse length | medium (1ms) |
| | Bandwidth | wide |
| | Max power | 2000 Watt |
| | 2-way beam angle | -21.0 dB |
| | SV transducer gain | 27.18 dB |
| | TS transducer gain | 27.26 dB |
| | Angle sensitivity | 21.9 |
| | 3 dB beamwidth along. | 6.9° |
| | 3 dB beamwidth athw. | 6.9° |
| | Alongship offset | 0.00° |
| | Athwardship offset | -0.12° |
| **Display menu** | Echogram | 1 |
| | Bottom range | 10 m |
| | Bottom range start | 9 m |
| | TVG | 20 log R |
| | Sv colour min | -67 dB |
| | TS Colour minimum | -60 dB |
| **Printer- menu** | Range | 0-50, 0-100, 0-150, 0-250 or 0-500m |
| | TVG | 20 log R |
| | Sv colour min | -60 dB |
| **Bottom detection menu** | Minimum level | -40 dB |

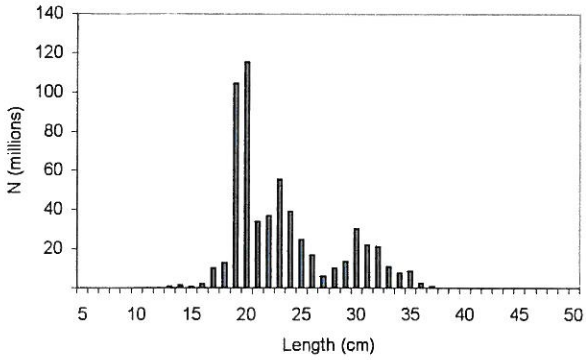
A calibration experiment using a standard copper sphere was performed in Baía dos Elefantos, Angola 7 September 2002.

**Fishing gear**

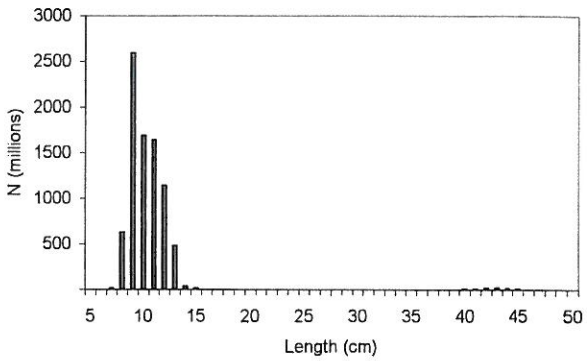
The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super" bottom trawl. For all trawls, the Tyborøn, 7.8m² (1670 kg) trawl doors were used.

# Annex III Pooled length distributions by species

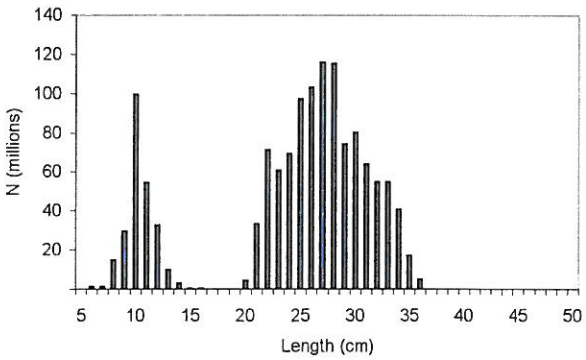
***Sardinella aurita***



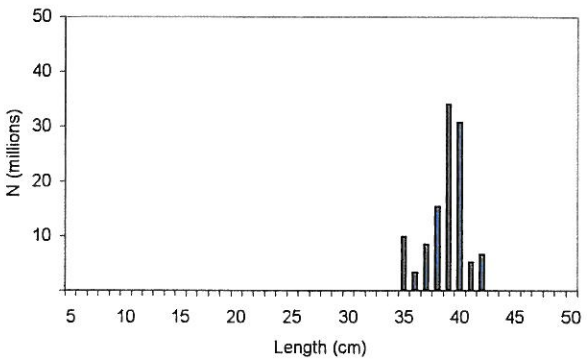

***Trachurus trecae***



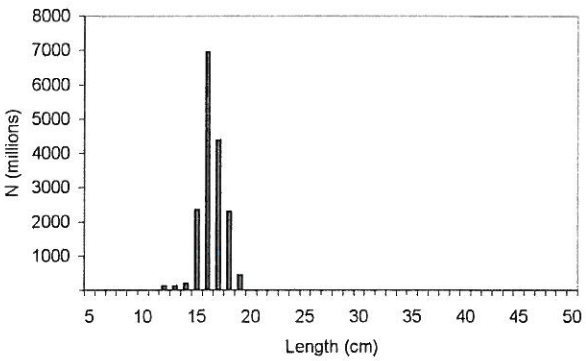

***Sardinella maderensis***



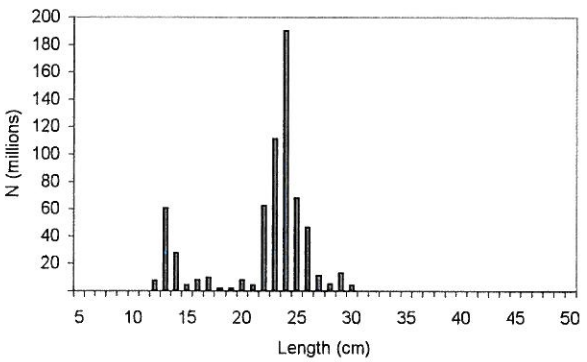

***Trachurus trachurus***



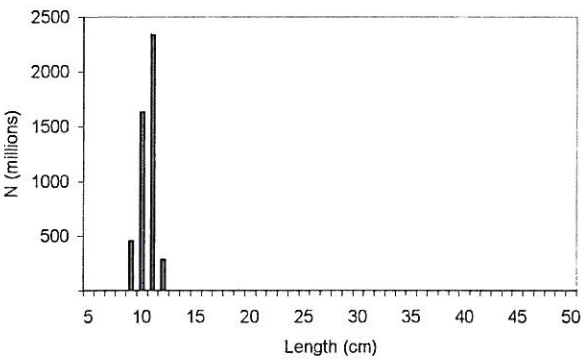

***Sardina pilchardus***




***Caranx rhonchus***




***Engraulis encrasicolus***



# Annex IV Estimates of numbers and weight by length

Mauritania, November 2002

*Sardinella aurita*

| | N (thousands) | | | Biomass (tonnes) | | |
|---|---|---|---|---|---|---|
| Length cm | St.Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL | St.Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| 13 | | 682 | 682 | | 16 | 16 |
| 14 | | 1 365 | 1 365 | | 40 | 40 |
| 15 | | 682 | 682 | | 24 | 24 |
| 16 | | 2 009 | 2 009 | | 87 | 87 |
| 17 | | 10 072 | 10 072 | | 518 | 518 |
| 18 | | 12 764 | 12 764 | | 776 | 776 |
| 19 | 1 276 | 103 277 | 104 553 | 91 | 7 352 | 7 442 |
| 20 | 3 377 | 111 921 | 115 298 | 279 | 9 256 | 9 536 |
| 21 | 6 755 | 27 120 | 33 874 | 644 | 2 587 | 3 232 |
| 22 | 21 844 | 15 000 | 36 844 | 2 389 | 1 640 | 4 029 |
| 23 | 51 269 | 4 335 | 55 604 | 6 388 | 540 | 6 928 |
| 24 | 36 034 | 3 172 | 39 206 | 5 087 | 448 | 5 535 |
| 25 | 24 699 | | 24 699 | 3 932 | | 3 932 |
| 26 | 16 888 | | 16 888 | 3 017 | | 3 017 |
| 27 | 5 929 | | 5 929 | 1 184 | | 1 184 |
| 28 | 10 060 | | 10 060 | 2 236 | | 2 236 |
| 29 | 13 437 | | 13 437 | 3 312 | | 3 312 |
| 30 | 30 326 | | 30 326 | 8 260 | | 8 260 |
| 31 | 22 039 | | 22 039 | 6 613 | | 6 613 |
| 32 | 21 031 | | 21 031 | 6 931 | | 6 931 |
| 33 | 10 837 | | 10 837 | 3 911 | | 3 911 |
| 34 | 7 714 | | 7 714 | 3 041 | | 3 041 |
| 35 | 8 479 | | 8 479 | 3 642 | | 3 642 |
| 36 | 2 295 | | 2 295 | 1 072 | | 1 072 |
| 37 | 765 | | 765 | 387 | | 387 |
| 38 | | | | | | |
| 39 | | | | | | |
| TOTAL | 295 055 | 292 399 | 587 454 | 62 414 | 23 285 | 85 699 |

## Annex IV Continued

Mauritania, November 2002

*Sardinella maderensis*

| | N (thousands) | | | Biomass (tonnes) | | |
|---|---|---|---|---|---|---|
| Length cm | St. Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL | St. Louis-Cape Timiris | Cape Timiris Cape Blanc | TOTAL |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | 1 303 | | 1 303 | 3 | | 3 |
| 7 | 1 303 | | 1 303 | 5 | | 5 |
| 8 | 14 678 | 254 | 14 932 | 87 | 1 | 88 |
| 9 | 29 388 | 254 | 29 642 | 242 | 2 | 244 |
| 10 | 98 145 | 1 271 | 99 416 | 1 091 | 14 | 1 105 |
| 11 | 54 226 | 254 | 54 480 | 792 | 4 | 795 |
| 12 | 27 765 | 4 830 | 32 594 | 521 | 91 | 611 |
| 13 | 9 339 | 508 | 9 848 | 221 | 12 | 233 |
| 14 | | 3 050 | 3 050 | | 89 | 89 |
| 15 | | 254 | 254 | | 9 | 9 |
| 16 | | 254 | 254 | | 11 | 11 |
| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | 145 | 145 | | 10 | 10 |
| 20 | 2 949 | 1 301 | 4 250 | 244 | 108 | 352 |
| 21 | 31 951 | 1 301 | 33 253 | 3 048 | 124 | 3 173 |
| 22 | 70 842 | 434 | 71 275 | 7 747 | 47 | 7 794 |
| 23 | 60 359 | 578 | 60 938 | 7 520 | 72 | 7 592 |
| 24 | 67 186 | 2 024 | 69 210 | 9 485 | 286 | 9 771 |
| 25 | 95 092 | 2 313 | 97 405 | 15 137 | 368 | 15 505 |
| 26 | 101 447 | 1 590 | 103 038 | 18 124 | 284 | 18 408 |
| 27 | 115 538 | 434 | 115 972 | 23 067 | 87 | 23 154 |
| 28 | 115 448 | | 115 448 | 25 656 | | 25 656 |
| 29 | 74 258 | | 74 258 | 18 301 | | 18 301 |
| 30 | 77 838 | 2 449 | 80 287 | 21 201 | 667 | 21 868 |
| 31 | 59 112 | 4 898 | 64 009 | 17 737 | 1 470 | 19 206 |
| 32 | 37 902 | 17 142 | 55 043 | 12 490 | 5 649 | 18 140 |
| 33 | 25 519 | 29 386 | 54 905 | 9 210 | 10 606 | 19 816 |
| 34 | 26 025 | 14 693 | 40 717 | 10 259 | 5 792 | 16 051 |
| 35 | 10 594 | 6 530 | 17 124 | 4 550 | 2 805 | 7 355 |
| 36 | 1 766 | 3 265 | 5 031 | 824 | 1 524 | 2 348 |
| 37 | | | | | | |
| 38 | | | | | | |
| 39 | | | | | | |
| 40 | | | | | | |
| TOTAL | 1 209 972 | 99 413 | 1 309 385 | 207 563 | 28 608 | 237 695 |

## Annex IV continued

Mauritania, November 2002

*Trachurus trachurus*

| | N (thousands) | | | Biomass (tonnes) | | |
|---|---|---|---|---|---|---|
| Length cm | St. Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL | St. Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL |
| 30 | | | | | | |
| 31 | | | | | | |
| 32 | | | | | | |
| 33 | | | | | | |
| 34 | | | | | | |
| 35 | 3 850 | 5 964 | 9 814 | 1 654 | 2 561 | 4 215 |
| 36 | 1 283 | 1 988 | 3 271 | 599 | 928 | 1 527 |
| 37 | 4 423 | 3 976 | 8 399 | 2 239 | 2 013 | 4 252 |
| 38 | 9 418 | 5 964 | 15 382 | 5 159 | 3 267 | 8 427 |
| 39 | 20 119 | 13 916 | 34 035 | 11 903 | 8 233 | 20 137 |
| 40 | 18 836 | 11 928 | 30 764 | 12 012 | 7 607 | 19 619 |
| 41 | 3 139 | 1 988 | 5 127 | 2 154 | 1 364 | 3 518 |
| 42 | 2 567 | 3 976 | 6 543 | 1 892 | 2 930 | 4 822 |
| 43 | | | | | | |
| 44 | | | | | | |
| 45 | | | | | | |
| 46 | | | | | | |
| TOTAL | 63 636 | 49 699 | 113 335 | 37 613 | 28 904 | 66 516 |

## Annex IV continued

Mauritania, November 2002

*Trachurus trecae*

| | N (thousands) | | | Biomass (tonnes) | | |
|---|---|---|---|---|---|---|
| Length cm | St. Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL | St. Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | 8 678 | 8 387 | 17 065 | 35 | 34 | 69 |
| 8 | 57 192 | 570 385 | 627 577 | 337 | 3 363 | 3 700 |
| 9 | 340 099 | 2 249 139 | 2 589 238 | 2 799 | 18 512 | 21 312 |
| 10 | 606 629 | 1 086 661 | 1 693 290 | 6 742 | 12 076 | 18 818 |
| 11 | 479 022 | 1 162 279 | 1 641 301 | 6 994 | 16 970 | 23 964 |
| 12 | 150 850 | 987 707 | 1 138 557 | 2 828 | 18 520 | 21 348 |
| 13 | 51 600 | 429 604 | 481 204 | 1 219 | 10 147 | 11 366 |
| 14 | 12 239 | 20 928 | 33 168 | 358 | 613 | 971 |
| 15 | 2 108 | 13 674 | 15 782 | 75 | 489 | 564 |
| 16 | 957 | | 957 | 41 | | 41 |
| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | | | | | | |
| 21 | | | | | | |
| 22 | | | | | | |
| 23 | | | | | | |
| 24 | | | | | | |
| 25 | | | | | | |
| 26 | | | | | | |
| 27 | | | | | | |
| 28 | | | | | | |
| 29 | | | | | | |
| 30 | | | | | | |
| 31 | | | | | | |
| 32 | | | | | | |
| 33 | | | | | | |
| 34 | | | | | | |
| 35 | | | | | | |
| 36 | | | | | | |
| 37 | | | | | | |
| 38 | | | | | | |
| 39 | 963 | 1 491 | 2 454 | 570 | 882 | 1 452 |
| 40 | 2 888 | 4 473 | 7 361 | 1 842 | 2 853 | 4 694 |
| 41 | 3 850 | 5 964 | 9 814 | 2 642 | 4 092 | 6 734 |
| 42 | 9 626 | 14 910 | 24 536 | 7 094 | 10 988 | 18 082 |
| 43 | 9 626 | 14 910 | 24 536 | 7 607 | 11 782 | 19 388 |
| 44 | 5 776 | 8 946 | 14 722 | 4 886 | 7 568 | 12 454 |
| 45 | 3 850 | 5 964 | 9 814 | 3 482 | 5 393 | 8 875 |
| 46 | 963 | 1 491 | 2 454 | 929 | 1 439 | 2 368 |
| 47 | 963 | 1 491 | 2 454 | 990 | 1 534 | 2 524 |
| 48 | | | | | | |
| 49 | | | | | | |
| 50 | | | | | | |
| TOTAL | 1 747 877 | 6 588 404 | 8 336 282 | 51 470 | 127 253 | 178 723 |

## Annex IV continued

Mauritania, November 2002

*Carnax rhonchus*

| | N (thousands) | | | Biomass (tonnes) | | |
|---|---|---|---|---|---|---|
| Length cm | St. Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL | St. Louis-Cape Timiris | Cape Timiris-Cape Blanc | TOTAL |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | 7 741 | | 7 741 | 145 | | 145 |
| 13 | 60 494 | | 60 494 | 1 429 | | 1 429 |
| 14 | 27 532 | | 27 532 | 806 | | 806 |
| 15 | 4 321 | | 4 321 | 154 | | 154 |
| 16 | 7 865 | | 7 865 | 339 | | 339 |
| 17 | 9 815 | | 9 815 | 505 | | 505 |
| 18 | 1 950 | | 1 950 | 119 | | 119 |
| 19 | 2 015 | | 2 015 | 143 | | 143 |
| 20 | 7 800 | | 7 800 | 645 | | 645 |
| 21 | 4 321 | | 4 321 | 412 | | 412 |
| 22 | 62 549 | | 62 549 | 6 840 | | 6 840 |
| 23 | 111 448 | | 111 448 | 13 885 | | 13 885 |
| 24 | 190 104 | | 190 104 | 26 839 | | 26 839 |
| 25 | 68 216 | | 68 216 | 10 859 | | 10 859 |
| 26 | 46 530 | | 46 530 | 8 313 | | 8 313 |
| 27 | 11 255 | | 11 255 | 2 247 | | 2 247 |
| 28 | 5 151 | | 5 151 | 1 145 | | 1 145 |
| 29 | 13 205 | | 13 205 | 3 254 | | 3 254 |
| 30 | 4 030 | | 4 030 | 1 098 | | 1 098 |
| 31 | | | | | | |
| TOTAL | 646 342 | | 646 342 | 79 176 | | 79 176 |

# Annex V Regional estimates

**Sardine (*Sardina pilchardus* )**

**MOROCCO - MAURITANIA, November-December 2002**

| Length | C.Juby-C.Cantin | | C.Bojador-C.Juby | | C.Blanc-C.Bojador | | C.Timiris-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | 35 | 10 | | | | | | | 35 | 10 |
| 8 | 4 719 | 937 | | | | | | | 4 719 | 937 |
| 9 | 9 779 | 1 391 | | | | | | | 9 779 | 1 391 |
| 10 | 16 218 | 1 708 | 537 | 57 | | | | | 16 754 | 1 765 |
| 11 | 67 584 | 5 419 | 862 | 69 | | | | | 68 446 | 5 488 |
| 12 | 128 759 | 8 040 | 376 | 23 | 1 372 | 86 | 1 867 | 110 | 130 507 | 8 149 |
| 13 | 95 286 | 4 723 | 644 | 32 | 9 035 | 448 | 2 337 | 113 | 104 965 | 5 203 |
| 14 | 69 580 | 2 783 | 276 | 11 | 54 250 | 2 170 | 4 829 | 191 | 124 106 | 4 965 |
| 15 | 58 449 | 1 914 | 1 092 | 36 | 63 904 | 2 093 | 72 201 | 2 346 | 123 445 | 4 043 |
| 16 | 69 726 | 1 893 | 807 | 22 | 128 245 | 3 482 | 255 578 | 6 943 | 198 779 | 5 396 |
| 17 | 100 801 | 2 294 | 9 600 | 218 | 242 882 | 5 527 | 189 288 | 4 375 | 353 283 | 8 039 |
| 18 | 97 093 | 1 870 | 28 479 | 549 | 245 821 | 4 735 | 116 431 | 2 285 | 371 393 | 7 153 |
| 19 | 77 274 | 1 271 | 31 639 | 520 | 143 787 | 2 365 | 26 146 | 438 | 252 700 | 4 156 |
| 20 | 47 347 | 670 | 13 699 | 194 | 187 401 | 2 653 | | | 248 447 | 3 517 |
| 21 | 24 813 | 304 | 12 506 | 153 | 516 933 | 6 343 | | | 554 253 | 6 801 |
| 22 | 6 295 | 67 | 20 209 | 216 | 583 310 | 6 245 | | | 609 815 | 6 529 |
| 23 | 11 476 | 108 | 45 810 | 430 | 889 432 | 8 358 | | | 946 718 | 8 896 |
| 24 | 9 358 | 78 | 42 483 | 352 | 952 894 | 7 902 | | | 1 004 735 | 8 332 |
| 25 | 1 833 | 13 | 10 194 | 75 | 451 330 | 3 319 | | | 463 357 | 3 408 |
| 26 | | | | | 104 605 | 685 | | | 104 605 | 685 |
| 27 | | | | | 3 891 | 23 | | | 3 891 | 23 |
| 28 | 2 559 | 13 | | | 1 050 | 6 | | | 3 609 | 19 |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| Total | 898 983 | 35 508 | 219 213 | 2 959 | 4 580 145 | 56 438 | 668 677 | 16 802 | 6 367 018 | 111 706 |

## Round sardinella (*Sardinella aurita* )

## SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | 0,7 | | 0,7 | | 16 | | 16 |
| 14 | | 1,4 | | 1,4 | | 40 | | 40 |
| 15 | | 0,7 | | 0,7 | | 24 | | 24 |
| 16 | 8,5 | 2,0 | | 10,5 | 365 | 87 | | 452 |
| 17 | 8,5 | 10,1 | | 18,5 | 436 | 518 | | 954 |
| 18 | 8,5 | 12,8 | | 21,2 | 515 | 776 | | 1 291 |
| 19 | 8,5 | 104,6 | | 113,0 | 603 | 7 442 | | 8 046 |
| 20 | 5,7 | 115,3 | 40,0 | 161,0 | 470 | 9 536 | 3 238 | 13 243 |
| 21 | 32,1 | 33,9 | 193,4 | 259,4 | 3 062 | 3 232 | 18 066 | 24 360 |
| 22 | 80,0 | 36,8 | 1 070,4 | 1 187,2 | 8 749 | 4 029 | 114 609 | 127 386 |
| 23 | 257,6 | 55,6 | 1 094,4 | 1 407,6 | 32 094 | 6 928 | 133 509 | 172 530 |
| 24 | 474,2 | 39,2 | 1 220,4 | 1 733,8 | 66 946 | 5 535 | 168 702 | 241 183 |
| 25 | 285,2 | 24,7 | 998,6 | 1 308,4 | 45 394 | 3 932 | 155 643 | 204 969 |
| 26 | 176,7 | 16,9 | 505,0 | 698,6 | 31 571 | 3 017 | 88 335 | 122 923 |
| 27 | 65,3 | 5,9 | 224,9 | 296,1 | 13 028 | 1 184 | 43 971 | 58 183 |
| 28 | 50,7 | 10,1 | 150,4 | 211,2 | 11 275 | 2 236 | 32 727 | 46 237 |
| 29 | 28,9 | 13,4 | 150,3 | 192,6 | 7 126 | 3 312 | 36 268 | 46 705 |
| 30 | | 30,3 | 138,4 | 168,8 | | 8 260 | 36 919 | 45 179 |
| 31 | | 22,0 | 45,6 | 67,6 | | 6 613 | 13 389 | 20 002 |
| 32 | | 21,0 | 65,4 | 86,4 | | 6 931 | 21 092 | 28 023 |
| 33 | | 10,8 | 35,6 | 46,4 | | 3 911 | 12 584 | 16 496 |
| 34 | | 7,7 | 172,2 | 179,9 | | 3 041 | 66 466 | 69 507 |
| 35 | | 8,5 | 138,4 | 146,8 | | 3 642 | 58 183 | 61 824 |
| 36 | | 2,3 | 183,9 | 186,2 | | 1 072 | 84 069 | 85 141 |
| 37 | | 0,8 | 53,1 | 53,9 | | 387 | 26 323 | 26 711 |
| 38 | | | 23,5 | 23,5 | | | 12 613 | 12 613 |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 1 490,3 | 587,5 | 6 503,8 | 8 581,5 | 221 633 | 85 699 | 1 126 706 | 1 434 038 |

## Flat sardinella (*Sardinella maderensis* )

## SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | 1,3 | | 1,3 | | 3 | | 3 |
| 7 | | 1,3 | | 1,3 | | 5 | | 5 |
| 8 | | 14,9 | | 14,9 | | 88 | | 88 |
| 9 | | 29,6 | | 29,6 | | 244 | | 244 |
| 10 | | 99,4 | | 99,4 | | 1 105 | | 1 105 |
| 11 | | 54,5 | | 54,5 | | 795 | | 795 |
| 12 | | 32,6 | | 32,6 | | 611 | | 611 |
| 13 | | 9,8 | | 9,8 | | 233 | | 233 |
| 14 | | 3,1 | | 3,1 | | 89 | | 89 |
| 15 | 4,8 | 0,3 | | 5,1 | 172 | 9 | | 181 |
| 16 | 105,1 | 0,3 | | 105,3 | 4 531 | 11 | | 4 542 |
| 17 | 175,2 | | | 175,2 | 9 015 | | | 9 015 |
| 18 | 430,5 | | | 430,5 | 26 165 | | | 26 165 |
| 19 | 370,3 | 0,1 | | 370,4 | 26 359 | 10 | | 26 370 |
| 20 | 446,4 | 4,3 | | 450,6 | 36 918 | 352 | | 37 269 |
| 21 | 608,1 | 33,3 | | 641,4 | 58 020 | 3 173 | | 61 192 |
| 22 | 776,2 | 71,3 | | 847,5 | 84 882 | 7 794 | | 92 676 |
| 23 | 988,2 | 60,9 | | 1 049,1 | 123 114 | 7 592 | | 130 706 |
| 24 | 942,4 | 69,2 | 23,5 | 1 035,1 | 133 042 | 9 771 | 3 359 | 146 172 |
| 25 | 700,6 | 97,4 | 53,7 | 851,7 | 111 522 | 15 505 | 8 631 | 135 658 |
| 26 | 249,5 | 103,0 | 34,6 | 387,1 | 44 567 | 18 408 | 6 243 | 69 218 |
| 27 | 102,9 | 116,0 | 79,6 | 298,5 | 20 547 | 23 154 | 16 058 | 59 759 |
| 28 | 40,3 | 115,4 | 30,3 | 186,1 | 8 956 | 25 656 | 6 807 | 41 419 |
| 29 | 16,1 | 74,3 | 32,7 | 123,1 | 3 973 | 18 301 | 8 144 | 30 418 |
| 30 | | 80,3 | 26,0 | 106,3 | | 21 868 | 7 167 | 29 035 |
| 31 | | 64,0 | 2,2 | 66,2 | | 19 206 | 663 | 19 869 |
| 32 | | 55,0 | 4,4 | 59,4 | | 18 140 | 1 456 | 19 596 |
| 33 | | 54,9 | | 54,9 | | 19 816 | | 19 816 |
| 34 | | 40,7 | | 40,7 | | 16 051 | | 16 051 |
| 35 | | 17,1 | | 17,1 | | 7 355 | | 7 355 |
| 36 | | 5,0 | | 5,0 | | 2 348 | | 2 348 |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 5 956,5 | 1 309,4 | 287,0 | 7 552,9 | 691 783 | 237 695 | 58 527 | 988 005 |

## Anchovy (*Engraulis encrasicolus*)

## MOROCCO, November-December 2002

| Length cm | C.Juby-C.Cantin | | C.Blanc-C.Juby | | Total | |
|---|---|---|---|---|---|---|
| | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | 30 | 13,0 | | | 30 | 13,0 |
| 8 | 589 | 177,7 | | | 589 | 177,7 |
| 9 | 3 459 | 747,2 | | | 3 459 | 747,2 |
| 10 | 6 434 | 1 029,3 | | | 6 434 | 1 029,3 |
| 11 | 4 348 | 529,4 | 9 | 1,1 | 4 357 | 530,6 |
| 12 | 5 202 | 493,3 | 611 | 57,9 | 5 813 | 551,2 |
| 13 | 9 300 | 700,0 | 377 | 28,4 | 9 677 | 728,4 |
| 14 | 4 414 | 268,1 | 19 | 1,1 | 4 433 | 269,3 |
| 15 | 880 | 43,8 | | | 880 | 43,8 |
| 16 | 19 | 0,8 | | | 19 | 0,8 |
| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | | | | | | |
| Total | 34 677 | 4 002,6 | 1 016 | 88,6 | 35 693 | 4 091,2 |

## Atlantic horse mackerel (*Trachurus trachurus* )

## MOROCCO - MAURITANIA, November-December 2002

| Length | C.Juby-C.Cantin | | C.Blanc-C.Juby | | St.Louis-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | 613 | 48,0 | | | 613 | 48,0 |
| 12 | | | 1 716 | 104,6 | | | 1 716 | 104,6 |
| 13 | | | 4 726 | 228,6 | | | 4 726 | 228,6 |
| 14 | | | 20 199 | 788,7 | | | 20 199 | 788,7 |
| 15 | | | 45 477 | 1 453,8 | | | 45 477 | 1 453,8 |
| 16 | | | 35 852 | 950,1 | | | 35 852 | 950,1 |
| 17 | | | 15 777 | 350,4 | | | 15 777 | 350,4 |
| 18 | | | 6 612 | 124,3 | | | 6 612 | 124,3 |
| 19 | | | 2 772 | 44,5 | | | 2 772 | 44,5 |
| 20 | | | 680 | 9,4 | | | 680 | 9,4 |
| 21 | | | 1 120 | 13,4 | | | 1 120 | 13,4 |
| 22 | | | 2 944 | 30,8 | | | 2 944 | 30,8 |
| 23 | | | 5 642 | 51,8 | | | 5 642 | 51,8 |
| 24 | | | 8 179 | 66,2 | | | 8 179 | 66,2 |
| 25 | | | 3 156 | 22,7 | | | 3 156 | 22,7 |
| 26 | | | 7 286 | 46,6 | | | 7 286 | 46,6 |
| 27 | | | 15 846 | 90,7 | | | 15 846 | 90,7 |
| 28 | | | 19 452 | 100,0 | | | 19 452 | 100,0 |
| 29 | | | 10 272 | 47,6 | | | 10 272 | 47,6 |
| 30 | | | 2 506 | 10,5 | | | 2 506 | 10,5 |
| 31 | | | 1 593 | 6,1 | | | 1 593 | 6,1 |
| 32 | | | | | | | | |
| 33 | | | 958 | 3,0 | | | 958 | 3,0 |
| 34 | | | 1 047 | 3,0 | | | 1 047 | 3,0 |
| 35 | | | | | 4 215 | 9,8 | 4 215 | 9,8 |
| 36 | | | | | 1 527 | 3,3 | 1 527 | 3,3 |
| 37 | | | | | 4 252 | 8,4 | 4 252 | 8,4 |
| 38 | | | | | 8 427 | 15,4 | 8 427 | 15,4 |
| 39 | | | | | 20 137 | 34,0 | 20 137 | 34,0 |
| 40 | | | | | 19 619 | 30,8 | 19 619 | 30,8 |
| 41 | | | | | 3 518 | 5,1 | 3 518 | 5,1 |
| 42 | | | | | 4 822 | 6,5 | 4 822 | 6,5 |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | | | 214 425 | 4 595 | 66 516 | 113,3 | 280 941 | 4 708 |

## Cunene horse mackerel (*Trachurus trecae* )

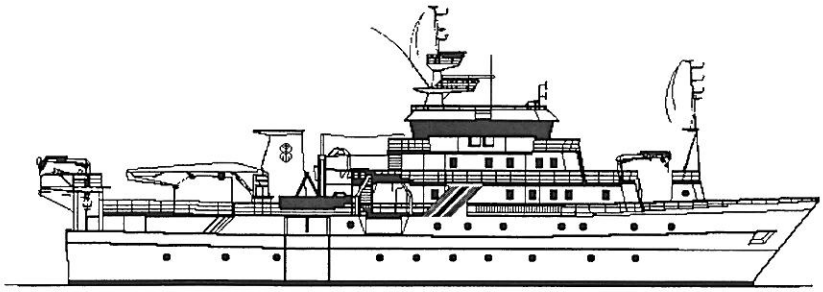
## SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | 17,1 | | 17,1 | | 69 | | 69 |
| 8 | | 627,6 | | 627,6 | | 3 700 | | 3 700 |
| 9 | | 2 589,2 | | 2 589,2 | | 21 312 | | 21 312 |
| 10 | 0,2 | 1 693,3 | 862,2 | 2 555,7 | 2 | 18 818 | 8 384 | 27 204 |
| 11 | 16,2 | 1 641,3 | 4 417,7 | 6 075,3 | 237 | 23 964 | 56 438 | 80 639 |
| 12 | 230,9 | 1 138,6 | 5 036,2 | 6 405,7 | 4 330 | 21 348 | 82 625 | 108 303 |
| 13 | 248,6 | 481,2 | 4 772,1 | 5 501,9 | 5 872 | 11 366 | 98 626 | 115 864 |
| 14 | 183,3 | 33,2 | 1 246,9 | 1 463,4 | 5 363 | 971 | 31 932 | 38 266 |
| 15 | 64,5 | 15,8 | 189,6 | 269,9 | 2 307 | 564 | 5 931 | 8 803 |
| 16 | 22,5 | 1,0 | 78,7 | 102,2 | 968 | 41 | 2 971 | 3 981 |
| 17 | 0,2 | | 82,0 | 82,2 | 11 | | 3 690 | 3 701 |
| 18 | | | 22,2 | 22,2 | | | 1 182 | 1 182 |
| 19 | | | 43,8 | 43,8 | | | 2 726 | 2 726 |
| 20 | | | | | | | | |
| 21 | 0,2 | | 0,7 | 0,9 | 21 | | 59 | 80 |
| 22 | 2,0 | | | 2,0 | 214 | | | 214 |
| 23 | 3,7 | | | 3,7 | 461 | | | 461 |
| 24 | 6,4 | | | 6,4 | 908 | | | 908 |
| 25 | 13,2 | | 26,7 | 39,9 | 2 108 | | 3 714 | 5 822 |
| 26 | 59,1 | | 127,3 | 186,4 | 10 557 | | 19 899 | 30 456 |
| 27 | 34,3 | | 82,1 | 116,5 | 6 858 | | 14 345 | 21 202 |
| 28 | 17,1 | | 55,4 | 72,5 | 3 793 | | 10 782 | 14 575 |
| 29 | 22,4 | | | 22,4 | 5 516 | | | 5 516 |
| 30 | 1,5 | | | 1,5 | 406 | | | 406 |
| 31 | | | 26,0 | 26,0 | | | 6 815 | 6 815 |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | 2,5 | | 2,5 | | 1 452 | | 1 452 |
| 40 | | 7,4 | | 7,4 | | 4 694 | | 4 694 |
| 41 | | 9,8 | | 9,8 | | 6 734 | | 6 734 |
| 42 | | 24,5 | | 24,5 | | 18 082 | | 18 082 |
| 43 | | 24,5 | | 24,5 | | 19 388 | | 19 388 |
| 44 | | 14,7 | | 14,7 | | 12 454 | | 12 454 |
| 45 | | 9,8 | | 9,8 | | 8 875 | | 8 875 |
| 46 | | 2,5 | | 2,5 | | 2 368 | | 2 368 |
| 47 | | 2,5 | | 2,5 | | 2 524 | | 2 524 |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 926,4 | 8 336,3 | 17 069,6 | 26 332,3 | 49 934 | 178 723 | 350 119 | 578 776 |

## Chub mackerel (*Scomber japonicus* )

## MOROCCO - MAURITANIA, November-December 2002

| Length | C.Juby-C.Cantin | | C.Blanc-C.Juby | | St. Louis-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | 148 | 4,7 | | | 148 | 4,7 |
| 16 | | | 359 | 9,5 | | | 359 | 9,5 |
| 17 | | | 2 968 | 65,9 | | | 2 968 | 65,9 |
| 18 | 81 | 1,5 | 10 860 | 204,2 | | | 10 941 | 205,7 |
| 19 | 1 420 | 22,8 | 14 622 | 234,8 | | | 16 042 | 257,6 |
| 20 | 3 875 | 53,5 | 13 348 | 184,4 | | | 17 222 | 238,0 |
| 21 | 3 708 | 44,4 | 12 680 | 151,9 | | | 16 388 | 196,3 |
| 22 | 2 285 | 23,9 | 11 872 | 124,1 | | | 14 157 | 148,0 |
| 23 | 1 659 | 15,2 | 14 218 | 130,4 | | | 15 876 | 145,6 |
| 24 | 789 | 6,4 | 12 858 | 104,1 | | | 13 647 | 110,5 |
| 25 | 446 | 3,2 | 5 735 | 41,2 | | | 6 181 | 44,4 |
| 26 | 457 | 2,9 | 9 776 | 62,5 | | | 10 232 | 65,5 |
| 27 | 521 | 3,0 | 20 002 | 114,5 | | | 20 522 | 117,5 |
| 28 | 686 | 3,5 | 28 369 | 145,9 | | | 29 056 | 149,4 |
| 29 | 1 188 | 5,5 | 34 650 | 160,7 | | | 35 838 | 166,2 |
| 30 | 950 | 4,0 | 25 200 | 105,7 | | | 26 149 | 109,7 |
| 31 | 820 | 3,1 | 13 081 | 49,8 | | | 13 902 | 52,9 |
| 32 | 326 | 1,1 | 8 988 | 31,2 | | | 9 314 | 32,3 |
| 33 | 141 | 0,4 | 7 066 | 22,4 | | | 7 208 | 22,8 |
| 34 | 377 | 1,1 | 6 252 | 18,1 | | | 6 629 | 19,2 |
| 35 | 56 | 0,1 | 3 453 | 9,2 | | | 3 509 | 9,3 |
| 36 | 61 | 0,1 | 2 217 | 5,4 | | | 2 278 | 5,6 |
| 37 | | | 2 759 | 6,2 | | | 2 759 | 6,2 |
| 38 | | | 8 861 | 18,5 | | | 8 861 | 18,5 |
| 39 | | | | | | | | |
| 40 | | | 1 673 | 3,0 | | | 1 673 | 3,0 |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| Total | 19 846 | 196,0 | 272 014 | 2 008,4 | | | 291 860 | 2 204,4 |



# SURVEY OF THE PELAGIC FISH RESOURCES OFF NORTH WEST AFRICA

## Part III

## MOROCCO

**19 November - 19 December 2002**

Institut National de Recherche Halieutique
Casablanca, Maroc

Institute of Marine Research
Bergen, Norway

CRUISE REPORT "DR FRIDTJOF NANSEN"

# SURVEY OF THE PELAGIC FISH RESOURCES NORTH WEST AFRICA

## Part III

## MOROCCO

**19 November - 19 December 2002**

by

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# CHAPTER 1 INTRODUCTION

## 1.1 Survey objectives

The specific objectives for the survey in Morocco were, as for the previous surveys:

- To map the distribution and estimate the biomass of the main small pelagic fish species using hydroacoustic methods. The species of interest were: sardine *Sardina pilchardus*, sardinellas *Sardinella aurita*, *S. maderensis*, chub mackerel *Scomber japonicus*, horse mackerel *Trachurus trachurus*, *T. trecae*, and anchovy *Engraulis encrasicolus*.
- To identify acoustic targets by midwater and bottom trawl sampling and process the catches by recording weight and number by species. For the target species, length frequencies are taken to describe the size distribution.
- To collect otoliths of sardine and read these during the survey.
- To sample standard hydrographical transects for temperature, salinity and oxygen off Cape Blanc, Dakhla, Cape Bojador, Cape Juby, Cape Dra and Cape Ghir.

The time allocated for this part of the survey was 28 working days.

## 1.2 Participation

Members of the scientific teams were:

Institut National de Recherche Halieutique, Morocco:

Hassan MOUSTAHFID (team leader), Hicham GOURICH, Mohamed ARAABAB, Lahcen ABOUABDELLAH and Ahmed YOUSSOUFI

Institut Mauritanien de Recherches Océanographiques et des Pêches, Mauritania:

Ball Abou SIRRE DIOP

From Haiphong, Vietnam:

NGUYEN Ba Thong, NGUYEN Phi Toan

Institute of Marine Research, Norway (IMR):

Tore STRØMME (cruise leader), Marek OSTROWSKI (3-19 Dec.), Oddgeir ALVHEIM, Thor Egil JOHANSSON and Jarle WANGENSTEN

### 1.3 Narrative

Figure 1 shows the cruise track and the stations worked during the survey. The vessel departed from Nouadhibou on November 19, starting the sampling work off Cape Blanc. The survey proceeded northwards with an acoustic sampling grid with a transect distance 10 NM (nautical miles) apart, covering the shelf and slope down until about 200 m bottom depth. The sampling continued northwards to Laayoune where the survey was interrupted with a call at Las Palmas 2-4 December for refuelling and change of crew. The survey resumed off Laayoune on the morning of 5 December. Northwards from Cape Juby the inner shelf between Cape Juby and 30°N was covered with a zigzag pattern, while the outer shelf was covered with a more open grid, (Figure1b). Due to absence of fishing vessels in the region it was possible to survey the inshore areas during nighttimes when registrations were more scattered compared to the day. From Sidi Ifni the survey proceeded northwards with a survey track perpendicular to the coast, transecting the whole shelf. The northern limit of the survey, off Safi, was reached late 14 December. The vessel called on Casablanca on 15 December for a meeting with representatives from INRH, Casablanca and for disembarking local scientists. The vessel arrived on Las Palmas 18 December.

Standard hydrographical sections were sampled at Cape Blanc, Cape Barbas, off Dakhla, at Cape Bojador, Cape Juby, Cape Dra, and Cape Ghir.

Except for one day of rough weather in the vicinity of Cape Ghir, when it was not possible to do trawl sampling, the weather was favourable and put no constraints on the sampling work.

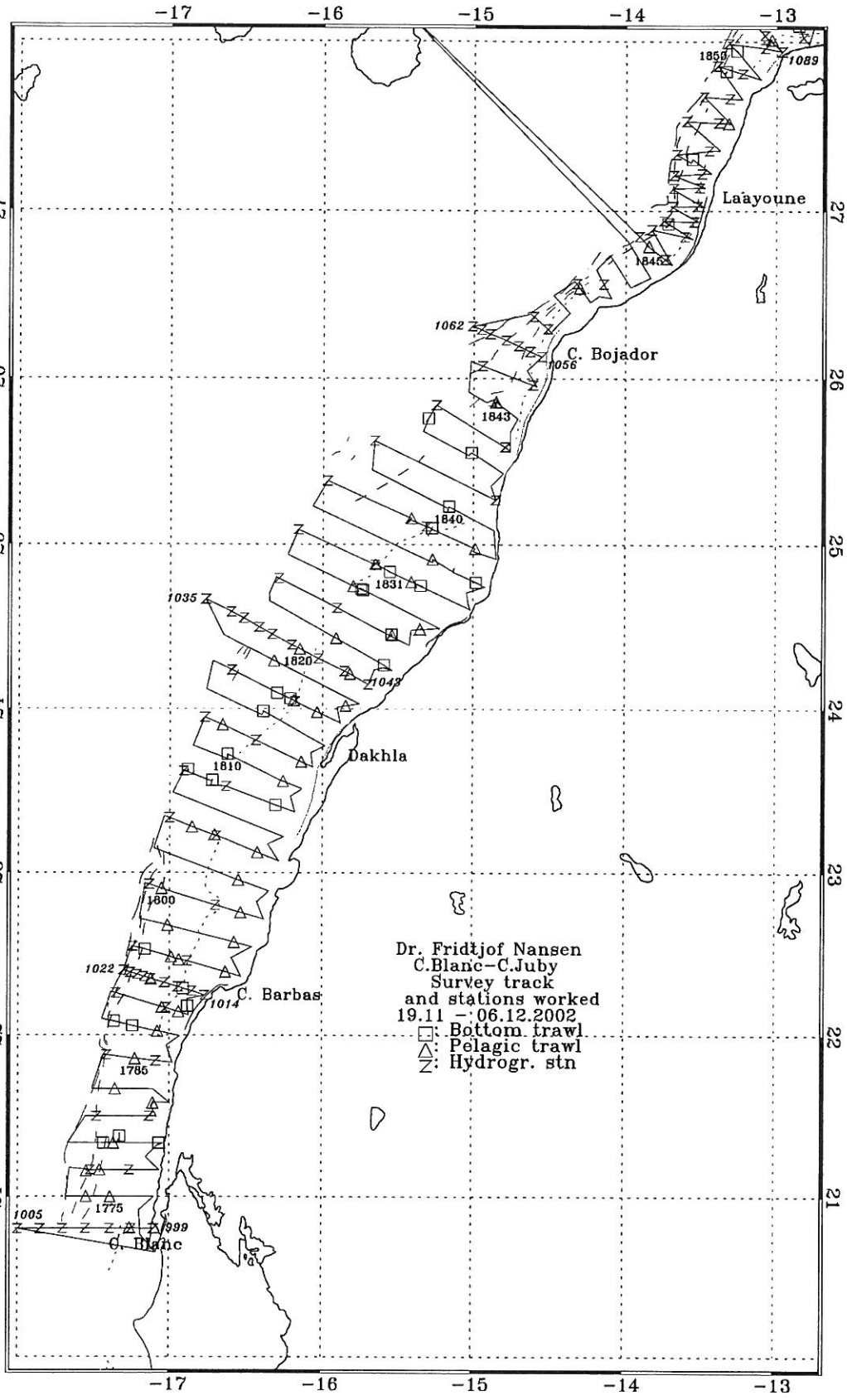



Figure 1a. Course track with fishing and hydrographic stations, Cape Blanc to Cape Juby. Depth contours at 20 m, 50 m, 100 m, 200 m and 500 m are indicated.

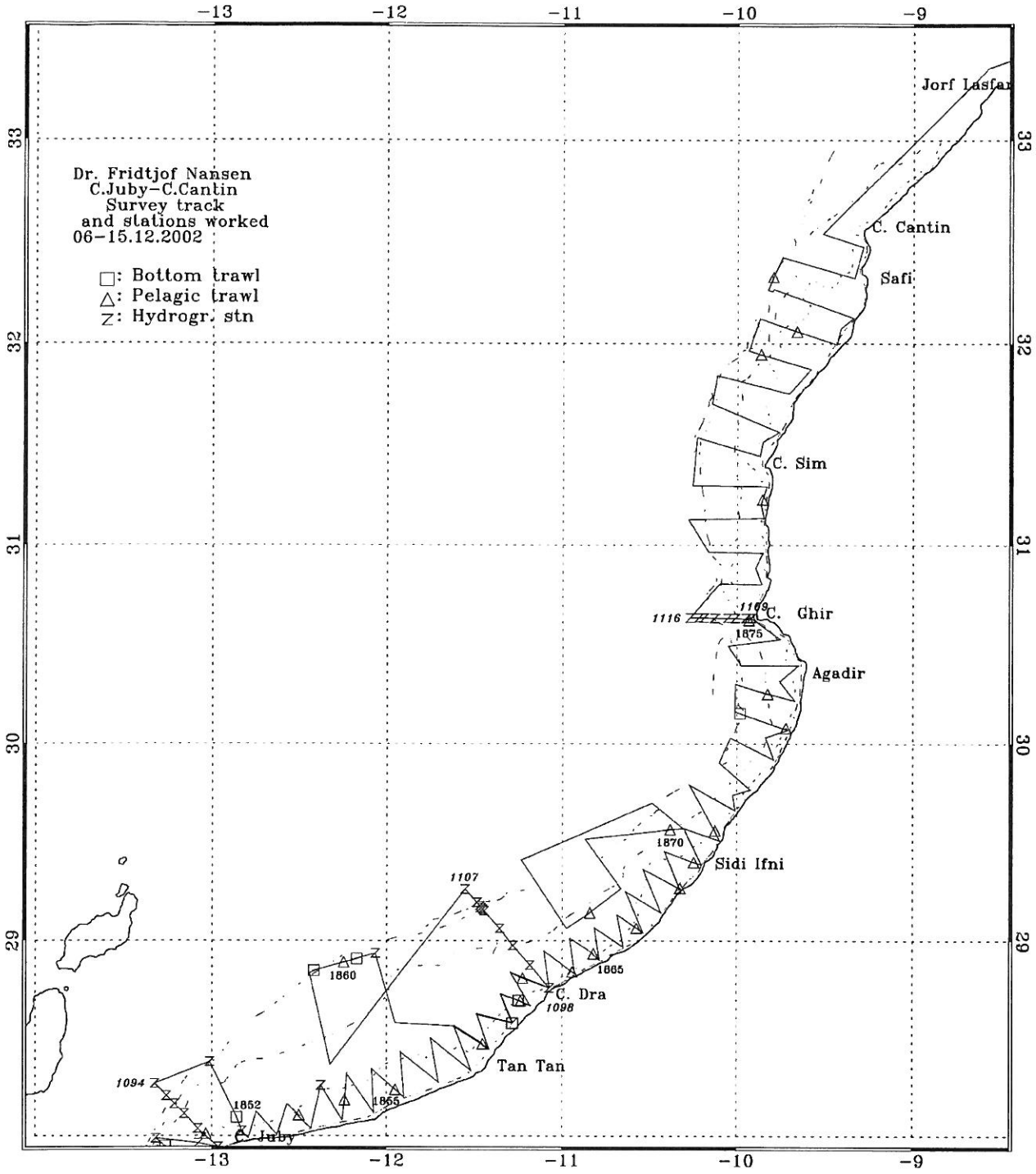



Figure 1b. Course track with fishing and hydrographic stations, Cape Juby to Cape Cantin. Depth contours as in Fig. 1a.

## 1.4 Methods

The cruise followed the standard methods established for the regional surveys:

*Environmental Data*

Meteorological observations including wind direction and speed, air temperature, solar radiation and sea surface temperature (SST) were automatically logged and recorded with position and bottom depth every nautical mile sailed using an Aanderaa meteorological station. CTD-stations were recorded at the standard hydrographic transects. A Seabird 911+ CTD probe was used to obtain vertical profiles of temperature, salinity and oxygen. Real time plotting and logging was done using the customised Seabird Seasave software installed on a PC. The profiles were in general taken down to a few meters above the bottom. In deep stations, however, data logging was interrupted at 500 m. Niskin bottles were triggered for water samples, one near the surface and one near the bottom, in order to calibrate the oxygen and salinity sensors. The water samples were analysed for dissolved oxygen using the Winkler method, and for salinity using a Guildline Portasal salinometer mod. 8410.

*Biological Sampling*

Biological sampling of the fish was carried out using trawls. A pelagic trawl with floats was often used. A smaller pelagic trawl or the bottom trawl with floats was used for sampling the pelagic fish in very shallow waters (depth less than 25 m). Annex II gives a description of the instruments and the fishing gear used. All catches were sampled for composition by weight and numbers of each species caught. Species identification was based on the FAO Species Guides. Length frequency distributions, by total fish length in cm, of the selected target species were taken in all the stations where they were present. The complete records of fishing stations are shown in Annex I. Sardine otoliths were collected and preserved for later reading ashore. Some readings of the otoliths were carried out during the survey.

The following target groups were used for Morocco:

1) Sardine (European pilchard *Sardina pilchardus*),
2) Sardinellas (flat sardinella *Sardinella maderensis* and round sardinella *S. aurita*),
3) Anchovy (European anchovy *Engraulis encrasicolus*),
4) Horse mackerels (Atlantic horse mackerel *Trachurus trachurus,* Cunene horse mackerel *T. trecae* and also including false scad *Decapterus rhonchus*),
5) Mackerels (chub mackerel *Scomber japonicus)*
6) Other pelagic scombrids, carangids and associated species (such as *Auxis* sp., *Caranx* sp. and largehead hairtail *Trichiurus lepturus*), BEI group PEL2
7) Other demersal species (such as Sparidae, Haemulidae and Merluccidae).

*Acoustic Sampling*

A SIMRAD EK500 Echosounder 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) to the individual specified target groups, usually by 5 NM intervals. Where bottom detection was poor and where fish schools were located very close to the bottom, the bottom echo was sealed off from the fish registrations by manual contouring. The splitting and allocation of the integrator outputs ($s_A$-values) was based on a combination of a visual scrutiny of species characteristics as deduced from echo diagrams, the BEI analysis, and the catch compositions.

In cases where the target category of fish contains more than one species (sardinellas and horse mackerels), the mean $s_A$-value allocated to the category is divided between the species in the same ratio as their relative contribution to the mean back scattering strength in the length frequency samples.

The following target strength (TS) function was applied to convert allocated $s_A$-values (average integrator value, or area back scattering coefficient for a given species or group of species in a specified area) to number of fish:

$$TS = 20 \log L - 72 \text{ dB} \quad (1)$$

which can be converted (see Toresen *et al.* 1998 for details) to the area form (scattering cross sections of acoustic targets):

$$C_{Fi} = 1.26 \cdot 10^6 \cdot L_i^{-2} \quad (2)$$

where $L_i$ is total length in 1 cm length group $i$ and $C_{Fi}$ ($m^{-2}$) is the reciprocal back scattering cross section, or so-called fish conversion factor. In order to split and convert the allocated $s_A$-values ($m^2$/$NM^2$) to fish densities (numbers per length group per $NM^2$), the following formula was used:

$$\rho_i = s_A \cdot \frac{p_i}{\sum_{i=1}^{n} \frac{p_i}{C_{Fi}}} \quad (3)$$

where $\rho_i$ = density (n/$NM^2$) of fish in length group $i$

$s_A$ = mean integrator value ($m^2$/$NM^2$)

$p_i$ = proportion of fish in length group $i$

$\sum_{i=1}^{n} \frac{p_i}{C_{Fi}}$ = the relative back scattering cross section ($m^2$) of the length frequency sample of the target species, and

$C_{Fi}$ = reciprocal back scattering cross section ($\sigma_{bs}^{-1}$) of a fish in length group $i$

For TS= 20log L- be 72 the formula can further simplified into:

$$\rho_i = 1261217 \cdot \frac{\bar{s}_A \, n_i}{\sum_{i=\min}^{\max} n_i l_i^2} \qquad (4)$$

where $s_A$ = mean integrator value of a species within an aggregation area, in $m^2/NM^2$

$n_i$ = frequency count of length group $i$ in a pooled representative sample from the distribution area.

$l_i$ = mid length of fish in length group $i$.

The constant 1261217 incorporates the offset constant -72 in equation (1). For other TS relationships the equation constant becomes as in box. The table is presented to facilitate a recalculation in case more accurate TS measurements are provided in the future:

| TS constant | Equation constant |
|---|---|
| -74 | 1998895 |
| -73 | 1587779 |
| -72 | 1261217 |
| -71 | 1001821 |
| -70 | 795774 |
| -69 | 632106 |
| -68 | 502099 |

Using equation (4), the pooled length distribution is used together with the mean $s_A$-value to calculate the density by length groups for each observed area with fish aggregations. The total number, by length groups, in an area is obtained by multiplying the densities with the distribution area. Areas were calculated on the maps by using a digital planimeter (Tamaya Planix 7).

The number of fish was converted to biomass by length group using the estimated weight at length from the length-weight relationship:

$$\overline{w} = \frac{cond}{100} * L^3 \qquad (3)$$

The specific condition factors obtained from the samples and applied for this survey were: 0.82 for sardine, 0.94 for *S. aurita*, 0.97 for *S. maderensis*, 0.54 for *Engraulis encrasicolus* and 0.84 for horse mackerel and chub mackerel.

Finally the total biomass estimate is obtained by summing the biomass by length group and areas within each sector of the survey.

Equations (1), (2) and (3) show that the conversion from $s_A$-value to number of fish is dependent on the length composition of the fish. In general there are many problems associated with getting representative length distributions when the various size classes mix with varying proportions between neighbouring stations. When the size classes are well and homogenously mixed in an area, the various length distributions are pooled together with equal importance. In areas where fish size-groups are well segregated, separate estimates are made for each group. Otherwise, when the size distribution varies from sample to sample, a weighting factor is applied that takes into account the density at the location. In most cases, the mean acoustic density at the location of the sample is the most representative index of this fish density.

For the estimation of the biomass of target group 3) carangids and associated species, an overall average length of 23 cm and a condition factor of 0.88 (to calculate mean weight of this length group) were applied.

A systematic approach to a) produce pooled length distributions of a target species for use in the above equation and b) calculate the biomass estimates for a region, are obtained through the following procedure:

- Each trawl station gets an integrator value as a density index for the sampling site.
- Representative length distributions are selected from all the collected samples of a fish aggregation.
- The mean back scattering strength of a fish in each of these length frequency distributions is calculated.
- The selected length distributions are then pooled using the ratio between the allocated $s_A$-value and the mean back scattering strength as the weighting factor. (If the size distribution is geographically uniform the three steps mentioned above can be skipped and the samples are pooled together with equal importance.)
- The pooled length distribution is used together with the mean $s_A$-value to calculate the biomass in numbers by length groups, for each area in the map, using formula (4) above. Numbers are converted to weight using the condition factor of the species. This can be calculated from the length samples where the total weight of the sample is recorded, or from individual biological samples.
- Biomass is calculated as the product of the density and the area of the aggregation, and finally the area-related biomass values in a region are summed together.

The necessary calculations are done in spreadsheets after the scientist has completed the two first steps in the above list manually.

All data on fishing stations and fish length sampling were made available to the participants from the local research institutes on diskettes.

# CHAPTER 2 SURVEY RESULTS

## 2.1 Hydrographic conditions

*Wind conditions*

Strong winds persisted during the entire survey period. The calmer wind conditions were recorded on three occasions, each of which lasted less than two days. Distributions of winds observed during the survey in the southern and northern regions are depicted in Figures 2a and 2b, respectively.

Between Cape Blanc and Cape Barbas (Figure 2a), the survey encountered a northerly wind with average speed 9 m/s. The wind speed dropped by half for two days between Cape Barbas and Dakhla (Figure 2a). To the north of Dakhla, the wind picked up again reaching 11 m/s. The wind direction turned more from northeast and followed the local coastline. In the Laayoune region, calmer conditions had returned with the 5-6 m/s wind directed from the north. Near Cape Juby, the northerly wind increased to 9 m/s hit the coastline exposed to the wind from the north. The strong wind persisted until the survey approached Cape Dra, but its direction turned gradually towards northeast.

To the north of Cape Dra, the survey entered a zone of calmer wind conditions, which persisted until the vessel reached Agadir. The wind speed in this region was decreasing gradually from 7 m/s to below 5 m/s as the ship sailed north.

Approaching Cape Ghir, on December 12, the survey was hit by a very strong southeasterly to easterly gale having the average speed well over 15 m/s. After passing Cape Ghir, the strong wind continued to blow but its direction veered more towards the southerly and southwesterly sectors. While the similar spells of southerly winds, have been observed in the previous surveys done in December, this year's event appeared to be exceptionally strong and long-lasting.

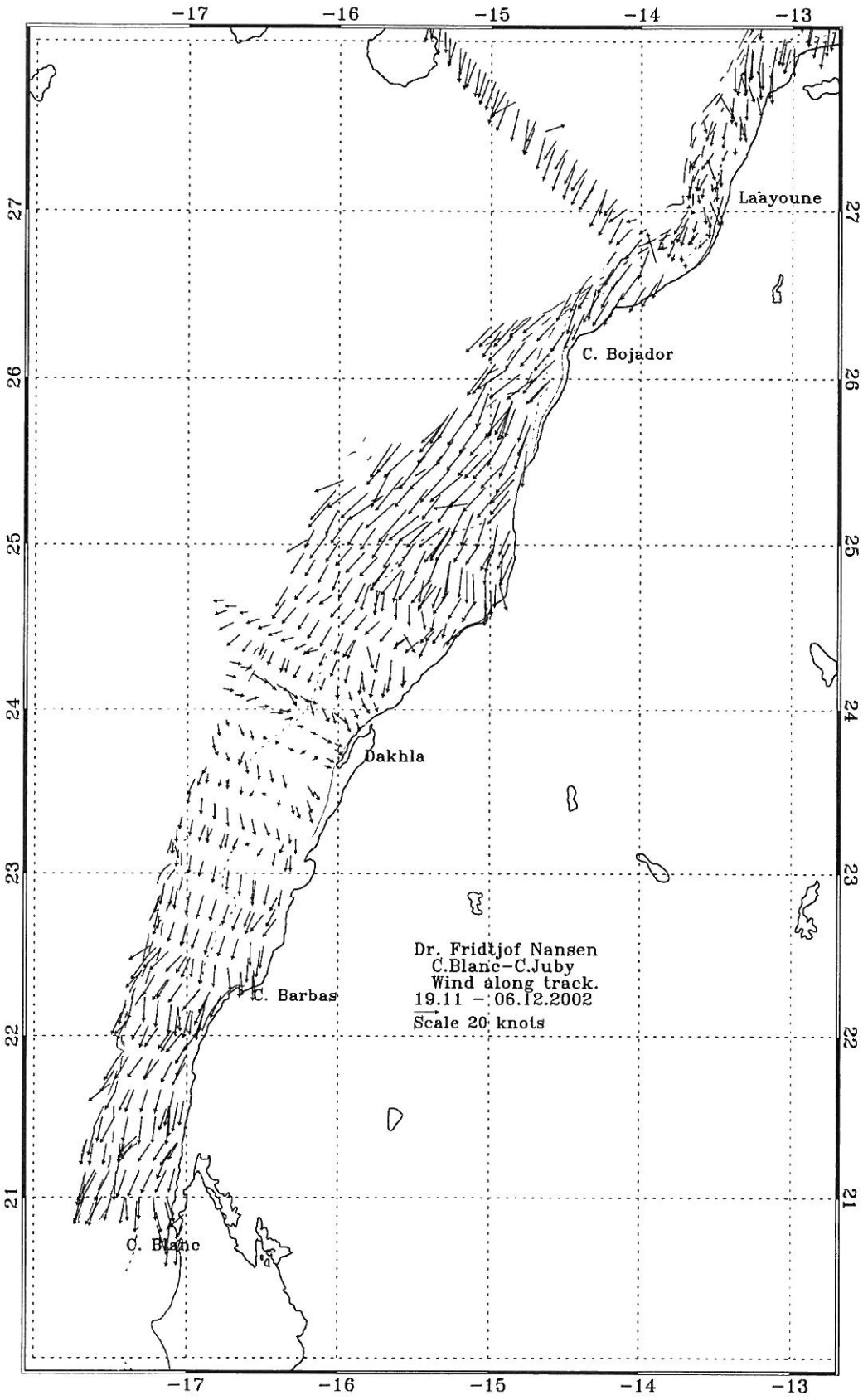



Figure 2a. Wind conditions along the survey, Cape Blanc to Cape Juby. Depth contours as in Fig. 1a.

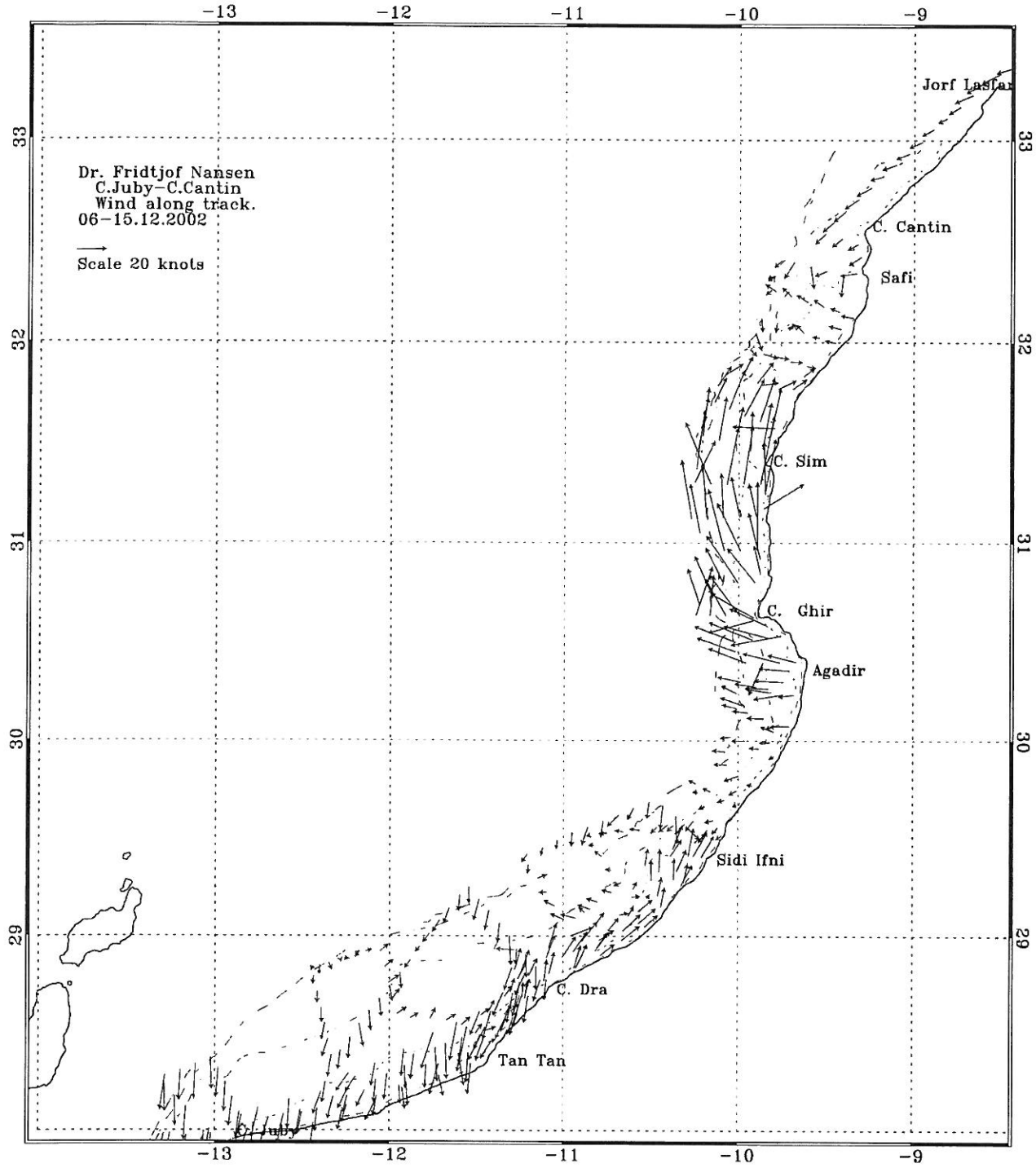



Figure 2b. Wind conditions along the survey, Cape Juby to Cape Cantin. Depth contours as in Fig. 1a.

*Sea surface temperature*

The sea surface temperature observed in the southern region (Figure 3a) can be divided into four distinct zones:

(1) Distribution between Cape Blanc and Cape Barbas was characterized by a pronounced shoreward decrease in temperature. The temperature exceeded 21 °C offshore, while inshore it was less 17 °C.
(2) Distribution between Cape Barbas and Dakhla was characterized by the decreasing cross-shelf gradient. Just south of Dakhla the uniform sea surface temperature of 19 °C extended across the entire shelf. (Note that it coincided with the region of wind relaxation in Figure 2a)
(3) Between Dakhla and Cape Bojador the cross-shelf temperature gradients increased again. A large pool of warm water >21°C located just the south of Cape Bojador was a dominant offshore feature in this region. This pool manifests a filament of the Canary Current, which at this location is at its closest to the African continent.
(4) Between Cape Bojador and Cape Juby the strong cross-shelf temperature gradient persisted. The warm water >20 °C was present offshore while the cold water <18 °C was entrapped inshore along this section of the coast.

The sea surface temperature distribution Figure 3a reveals the presence of four active upwelling cells in the south, characterized by the inshore temperatures <17 °C. These were: Cape Blanc, Garnet (24°50N), Cape Bojador and Laayoune.

The sea surface distribution in the northern region (Figure 3b) revealed less pronounced variability across the shelf than that observed in the south. The warmest water, 18.5 °C occurred between Tan-Tan and Cape Ghir and it was observed during the period of the low wind intensity. The only low temperature cell observed in Figure 3b during the strong, upwelling favourable wind event was at Cape Dra. The large pool of low temperature water, seen in the northern extremity of the survey area in Figure 3b, cannot be attributed to the upwelling because it coincided with a strong southerly gale, which on the northern hemisphere prevents its formation. In this case, the surface water was cooled down because the strong wind and waves mixed it locally with the cold subsurface water masses from below. This process is known as vertical mixing and, as opposed to upwelling, is not significant the concentration of small pelagic fish along the shelf.

*Hydrographic sections*

Distribution of temperature, salinity and oxygen along the vertical sections collected during the survey is depicted in Figures 4. These sections help us to resolve the status of upwelling along the coast and, in the southern region, to determine extent of the intrusions from South Atlantic into the fishing grounds on the Dakhla shelf.

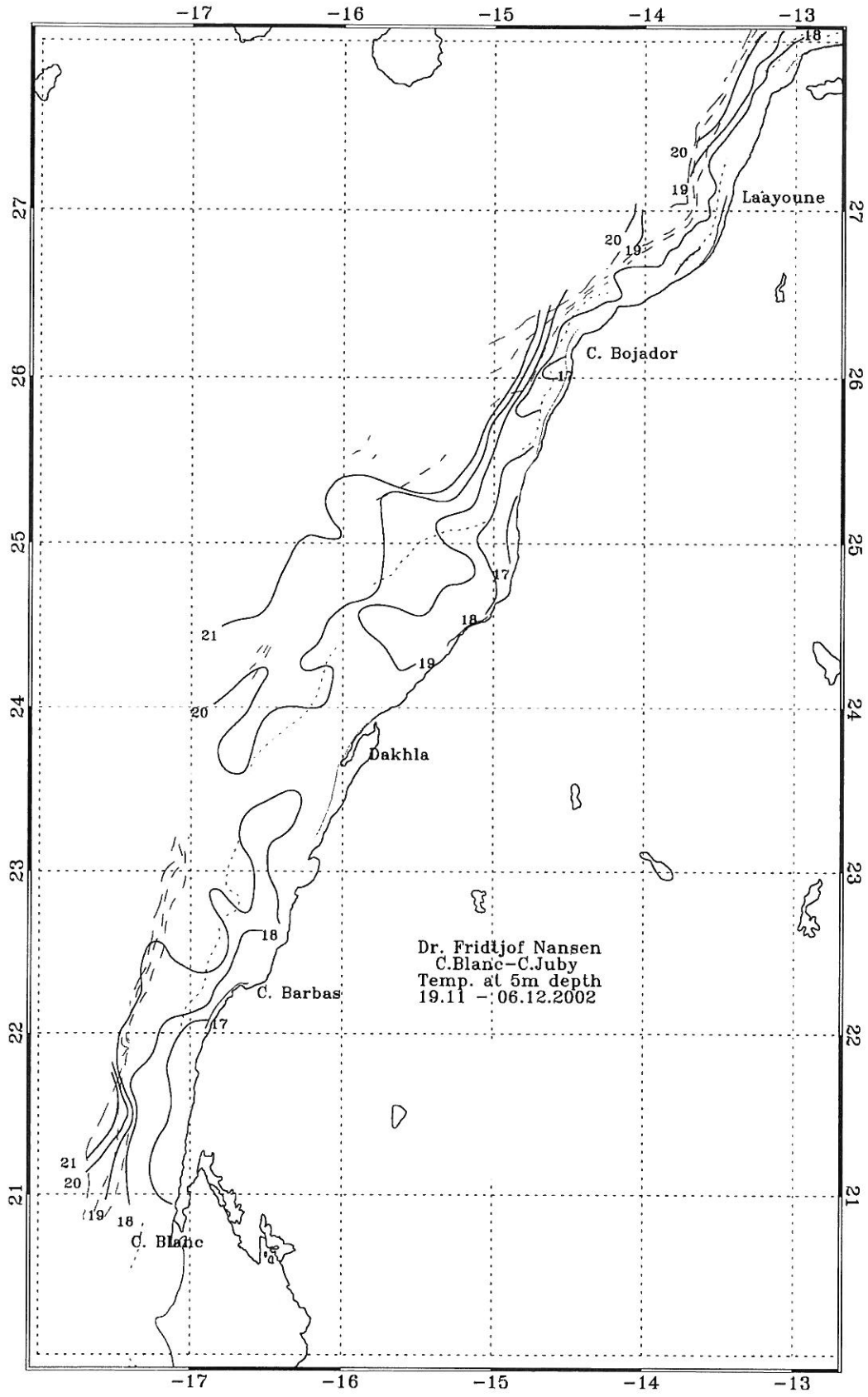



Figure 3a Sea surface temperature (at 5 m depth), Cape Blanc to Cape Juby. Depth contours as in Fig. 1a.

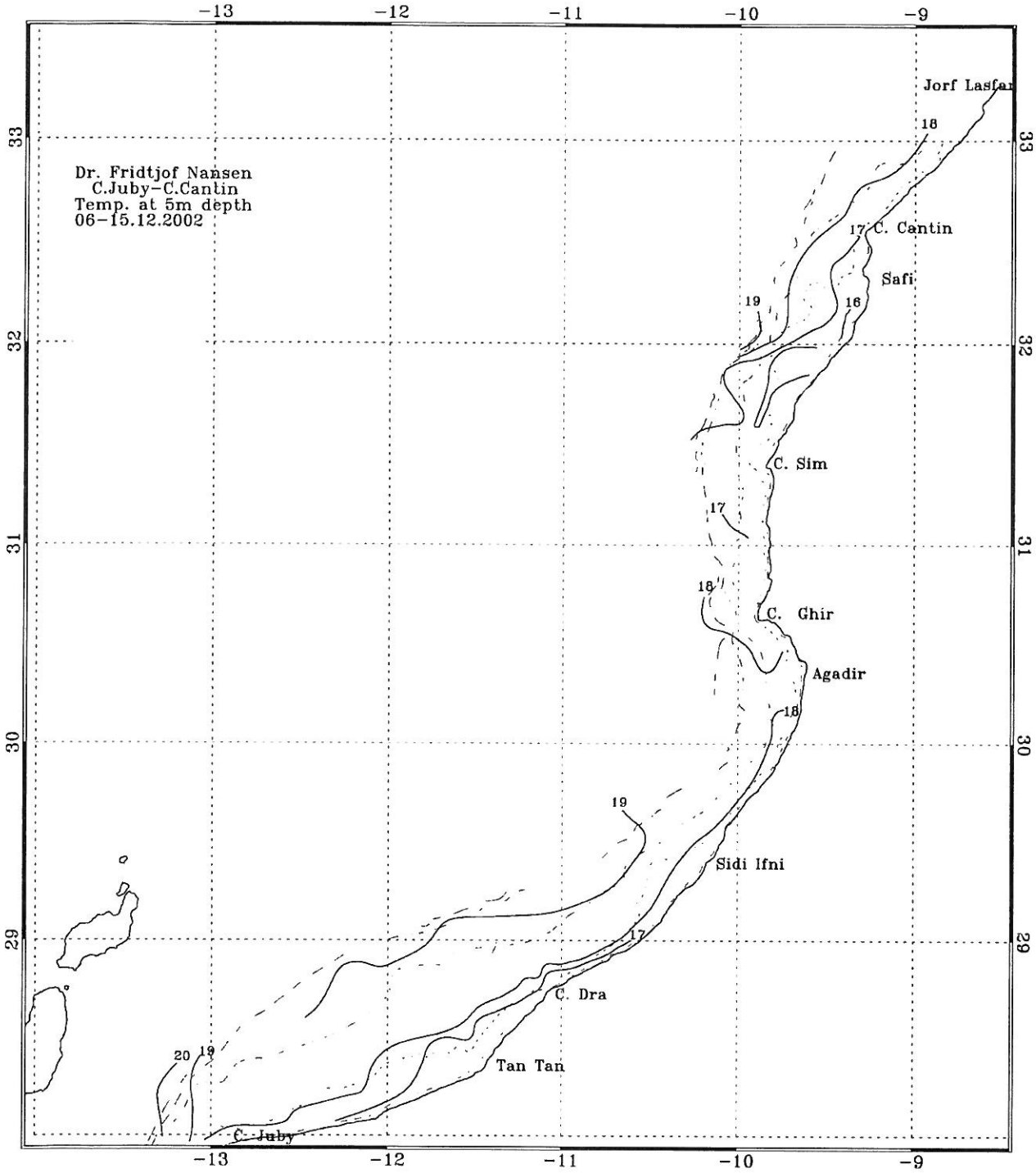



Figure 3b. Sea surface temperature (at 5 m depth), Cape Juby to Cape Cantin. Depth contours as in Fig. 1a.

The upwelling favourable conditions in the northern hemisphere occur were the northerly winds blow parallel to straight coastline along the eastern continent boundaries. According the wind field maps (Figure 2), in the survey area these conditions were met along the following transects: Cape Blanc, (Figure 4a), Cape Barbas (Figure 4b), Cape Bojador (Figure 4d), Cape Juby (Figure 4e) and Cape Dra (Figure 4f). In all these locations, the effect of the ongoing upwelling is

clearly manifested by means of the shoreward uplift of the subsurface isolines, in particular from the temperature distributions. The temperature of the uplifted, inshore water is between 16-17 °C and shows a little variation with latitude. On the other hand, the inshore salinity and oxygen concentrations in the aforementioned sections display a great variability with geographical location.

Upwelling was not observed along the two sections: off Dakhla (Figure 4c) and Cape Ghir (Figure 4g) but for vastly different reasons. The measurements off Dakhla were made during a period of calm conditions, indicating that the data may have captured a phase of upwelling relaxation. The observation off Cape Ghir was made during the strong easterly to south-easterly wind, which due its direction had prevented upwelling. Instead, a strong turbulence in the surface layer, associated with the storm, developed a 50 m thick mixed layer with uniform distribution of seawater properties across the section.

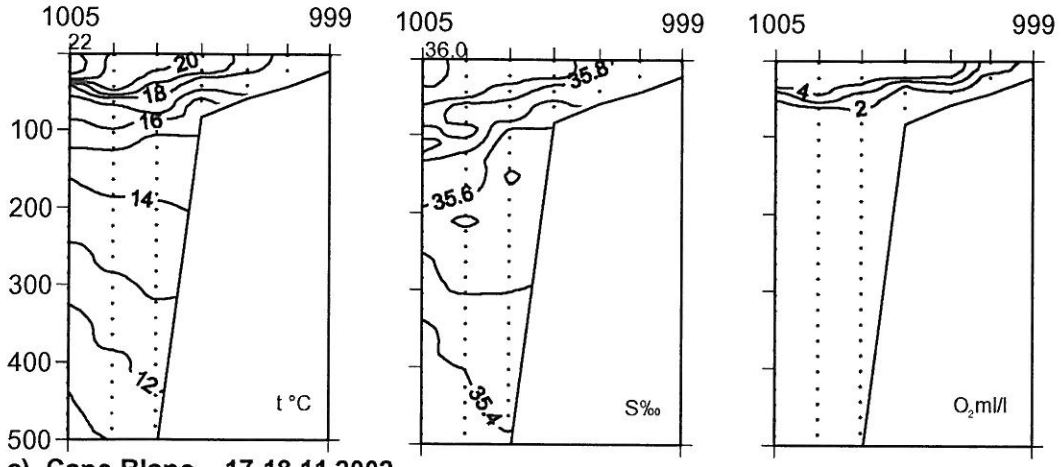
The intrusion of South Atlantic water masses into the Dakhla shelf is well manifested in the salinity and oxygen distributions (Figure 4). It is less visible in the distributions of temperature, because the temperature difference between the South Atlantic intrusions and the North Atlantic water resident on the Dakhla self is small.

The Cape Blanc section (Figure 4a) displays oxygen and salinity levels typical for the tropical Atlantic. Near the surface salinity is 35.8. At 30 m depth, a shallow pycnocline separates the surface layer from the underlying layer of South Atlantic Central Water (SACW), characterized by salinity 35.7 and dissolved oxygen $O_2$<2 ml/l. The SACW is also visible inshore, where it has been transported by upwelling.

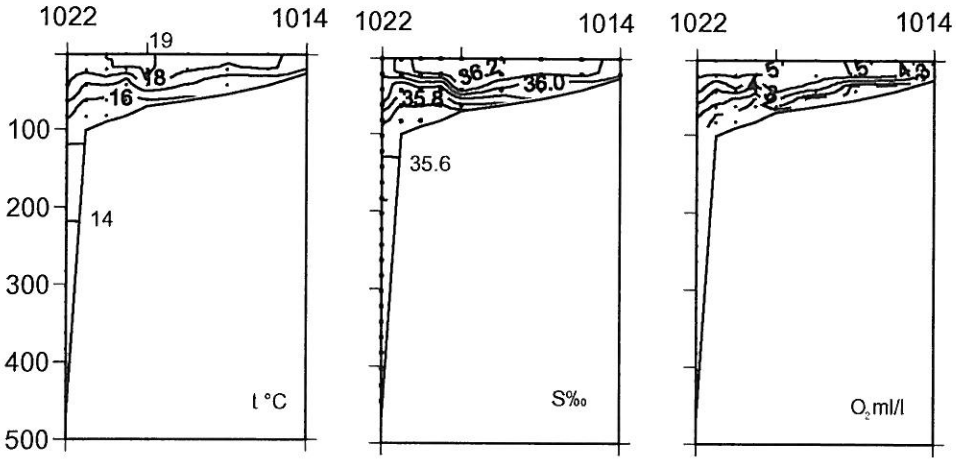
The Cape Barbas (Figure 4b) marks the transition zone between the South and North Atlantic domain. The subsurface SACW (S 37.7, $O_2$<2 ml/l) is still seen near the seabed and in the upwelling region inshore, but the bulk of the surface layer is now formed by the high salinity (S >36.1) and rich in oxygen ($O_2$>5 ml/l) waters of the North Atlantic origin.

Off Dakhla (Figure 4c) the low salinity and oxygen signature of the SACW disappears from the shelf area, but it is still present in the subsurface core offshore, which culminates at station 1037 below depth 150 m where it probably forms a subsurface pole ward current flowing along the Dakhla shelf.

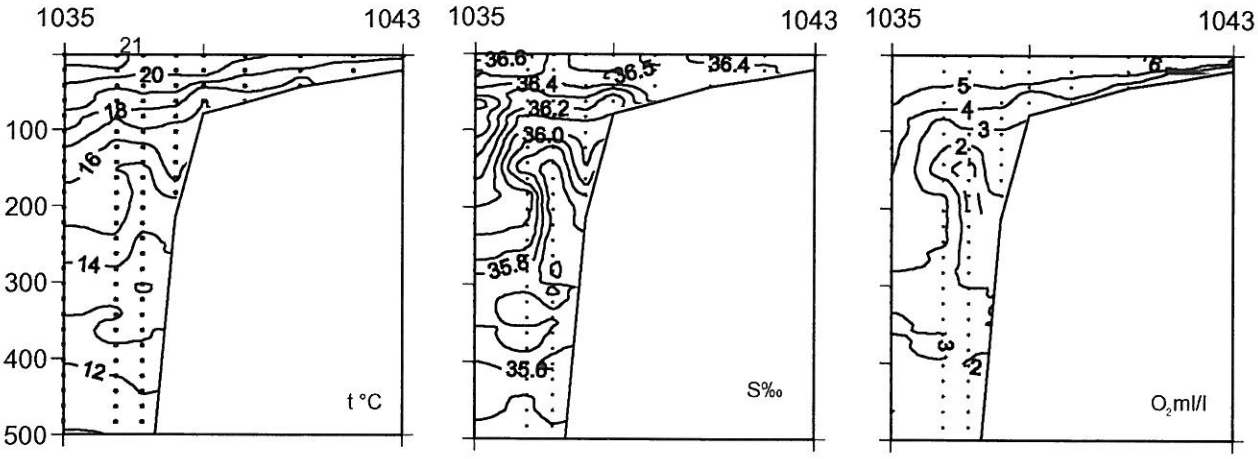
Off Cape Bojador (Figure 4d) the SACW vanishes from the picture entirely. The subsurface water masses, as well as those brought inshore by upwelling, are characterized entirely by the North Atlantic ranges: salinity > 35.2 and oxygen > 4 ml/l.




a) Cape Blanc – 17-18.11.2002

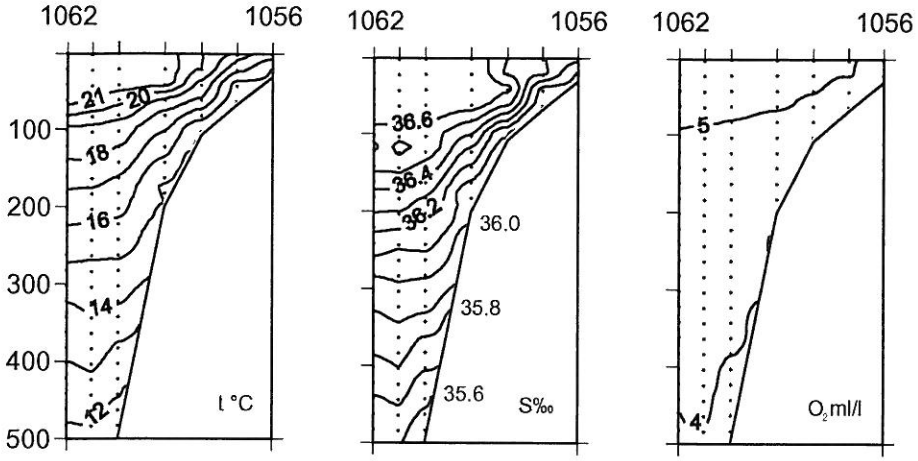



b) Cape Barbas – 22.11.2002

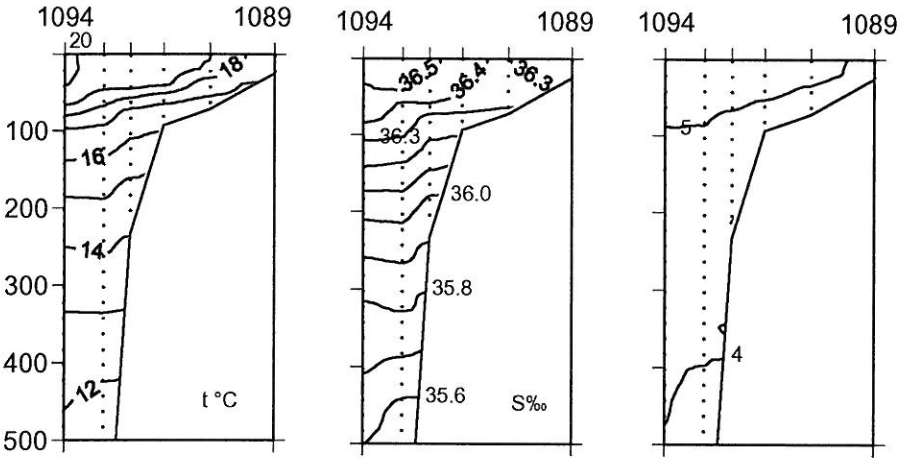



c) Dakhla – 26.11.2002

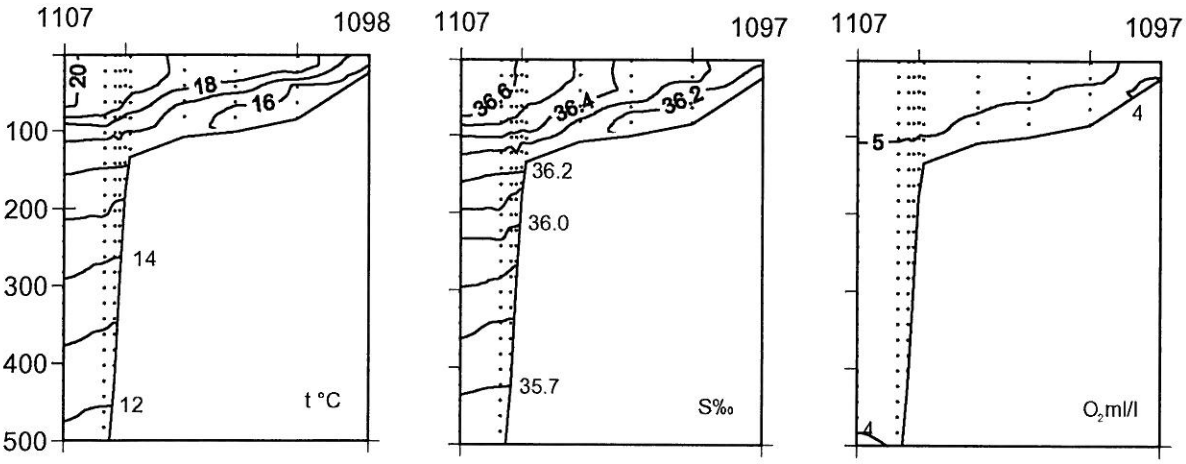
Figure 4. Hydrographic sections with distribution of temperature, salinity and oxygen.




**d) Cape Bojador – 01.12.2002**

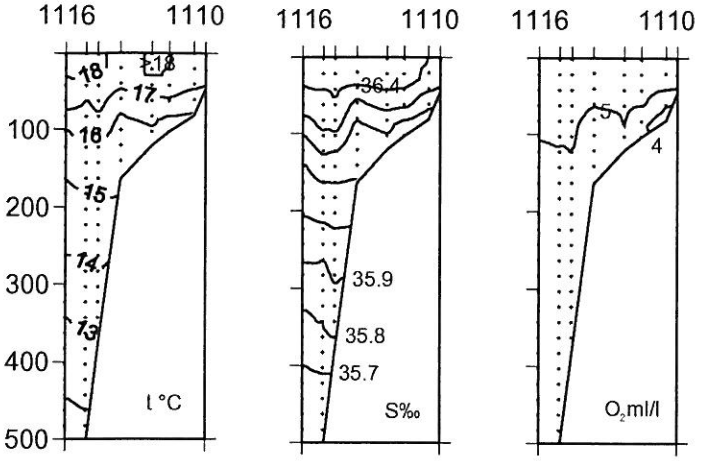



**e) Cape Juby – 06.12.2002**




**f) Cape Dra – 08.12.2002**

Figure 4. (continued)




**g) Cape Ghir – 13.12.2002**

Figure 4. (continued)

To determine the exact position of the front, we conducted two alongshore sections, following the 50 m and 200 m isobaths. The results are depicted in Figure 5. Inside the shelf, the front appears to be located in vicinity of the Cape Barbas section. At the shelf break, the colder and less saline South Atlantic water, advancing from the south, sinks below the warmer and more saline waters of the North Atlantic origin (Figure 5b). The core this water continues than to advance northwards along the slope. At station 1048, the South Atlantic water disappears from the station grid.

*Summary of findings*

(1) This year's December survey was characterized by stronger than usual wind conditions. Northerly and northeasterly winds persisted in the south until Cape Dra, while the unusually strong southerly gale was encountered to the north of Cape Agadir.

(2) The strong southerly gale caused a significant cooling of surface waters along the coast to the north of Agadir, which was not associated to upwelling.

(3) Upwelling cells were mostly observed in the south. Only one strong upwelling cell identified in the northern region was at Cape Dra (28°43'N). This is the typical situation for December.

(4) Front between tropical waters of the South Atlantic and the temperate waters of North Atlantic was located in vicinity of Cape Barbas (22°14'N).

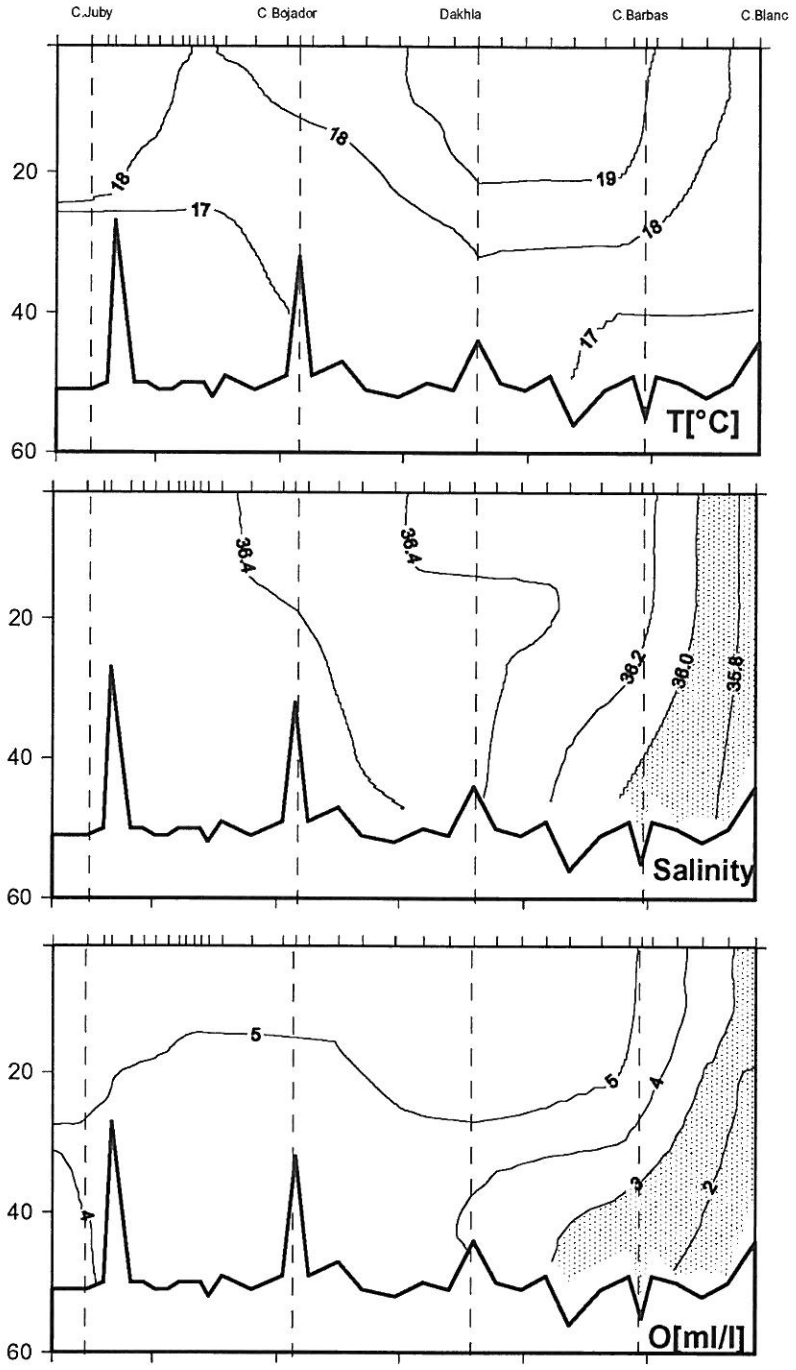



Figure 5a. Distribution of temperature, salinity and oxygen along 50 m isobath.

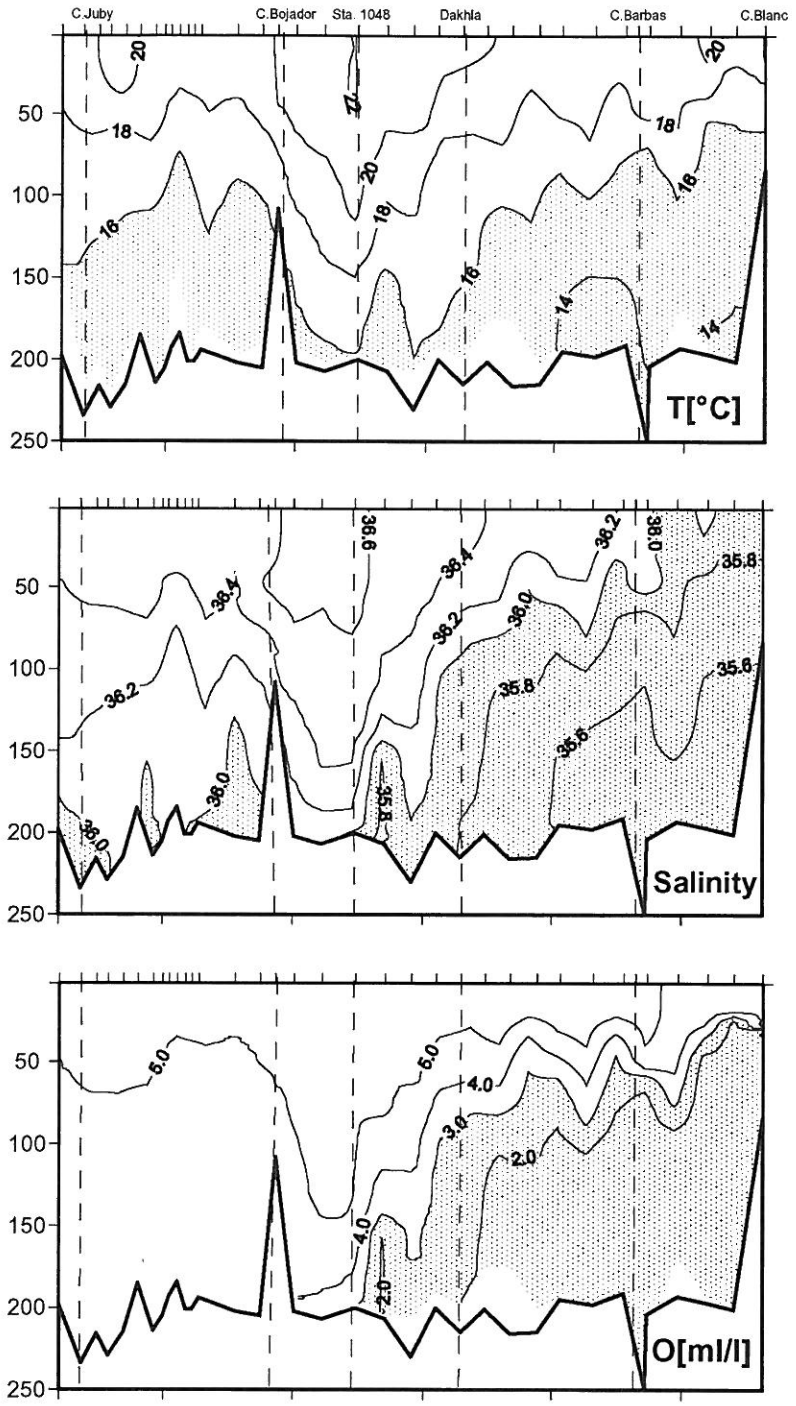



Figure 5b. Distribution of temperature, salinity and oxygen along 200 m isobath.

## 2.2 Distribution of pelagic fish on the shelf from Cape Blanc to Cape Juby.

Figures 5 to 9 show the distribution of the main groups of pelagic fish by contoured acoustic densities.

**Sardine**, *Sardina pilchardus*, was found almost without interruption between Cape Blanc and 25 °N, Figure 6. The dense aggregations between Cape Blanc and Cape Barbas consisted mainly of young fish, less than 19 cm. Further north, the aggregation between Cape Barbas and to north of Dakhla is mainly of adult year classes. The whole area has a better balance between young and old fish as compared to a year earlier, figure 10a. Between Cape Bojador and Cape Juby sardine was recorded in high abundance in several patches close to the shore. These aggregations consist of a mixture of young and old fish, figure 10b.

**Sardinellas** (Sar*dinella aurita* and *S. maderensis*) formed a major aggregation off Cape Barbas, but was common at lower densities between Cape Blanc and Dakhla, Figure 7. Generally the abundance is lower than in previous years.

**Horse mackerels** (*Trachurus trachurus* and *T. trecae*) were common between Cape Blanc and Cape Barbas, with high densities on the narrow shelf North of Cape Blanc, Figure 8. These aggregations were mainly from *T. trecae.* Further north, between Dakhla and Cape Bojador, the horse mackerel was found more mid-shelf and were mainly made up of *T. trachurus*. Horse mackerel were also recorded further north to Cape Bojador, but only at low densities, Figure 8.

**Chub mackerel** (*Scomber japonicus*) was more common than in previous surveys, but were mainly hit at lower densities, Figure 8. A few higher registrations were found off Dakhla.

**Anchovy** (*Engraulis encrasicolus*) were encountered at one event forming a single patch 30 NM north of Cape Blanc (no figure).

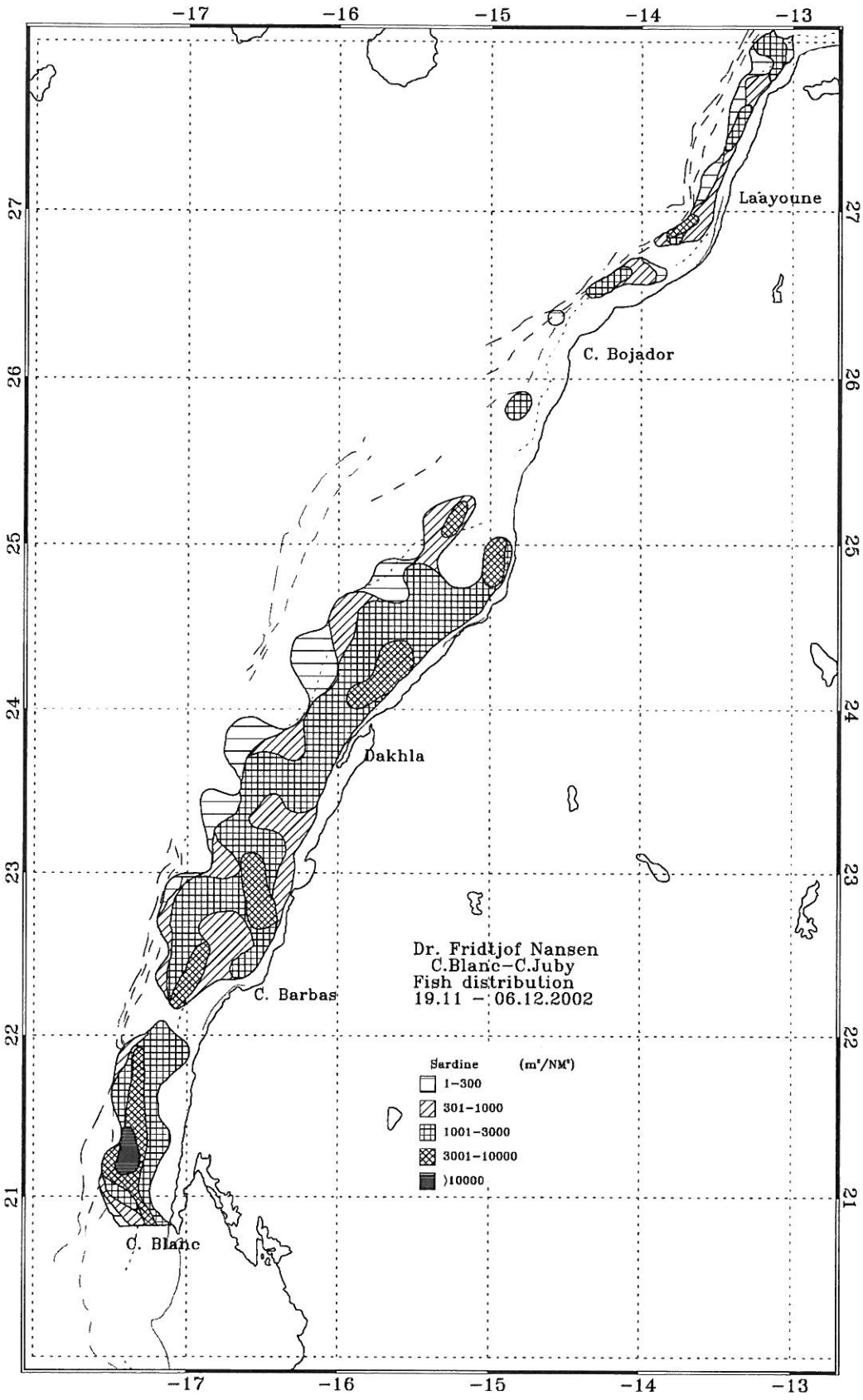



Figure 6. Distribution of sardine, Cape Blanc to Cape Juby. Depth contours as in Fig. 1a.

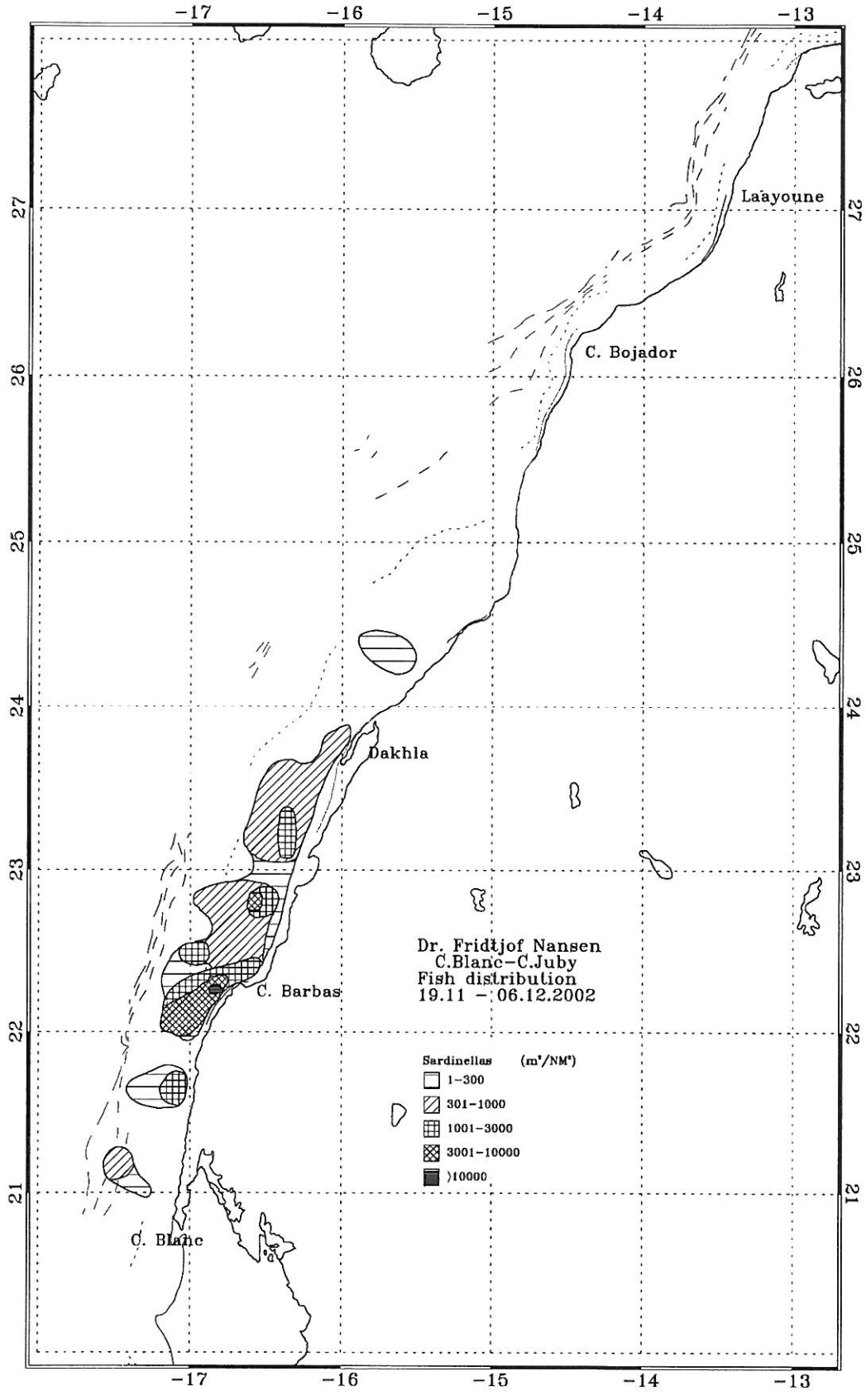



Figure 7. Distribution of sardinella, Cape Blanc to Cape Juby. Depth contours as in Fig. 1a.

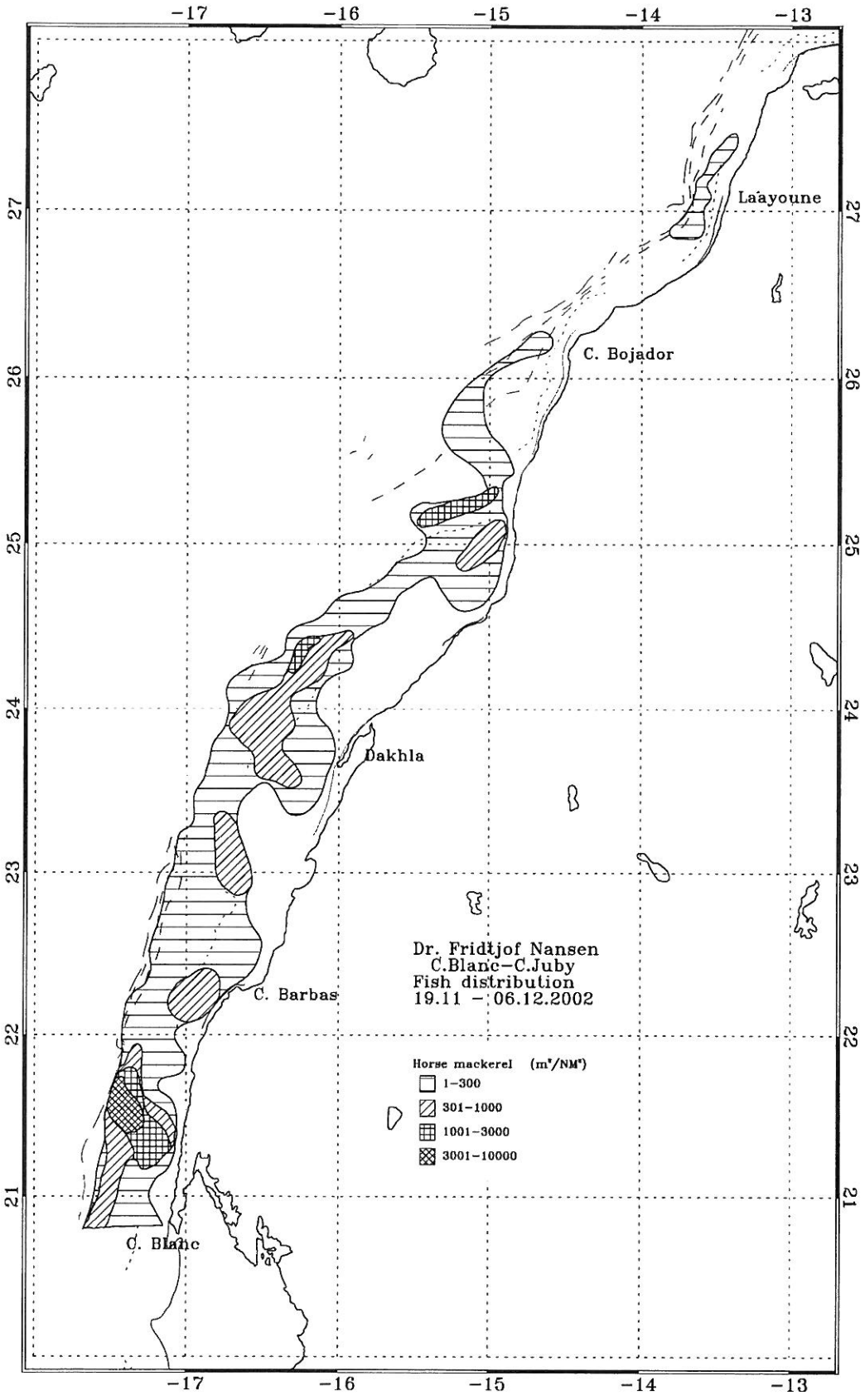



Figure 8. Distribution of horse mackerel, Cape Blanc to Cape Juby. Depth contours as in Fig. 1a.

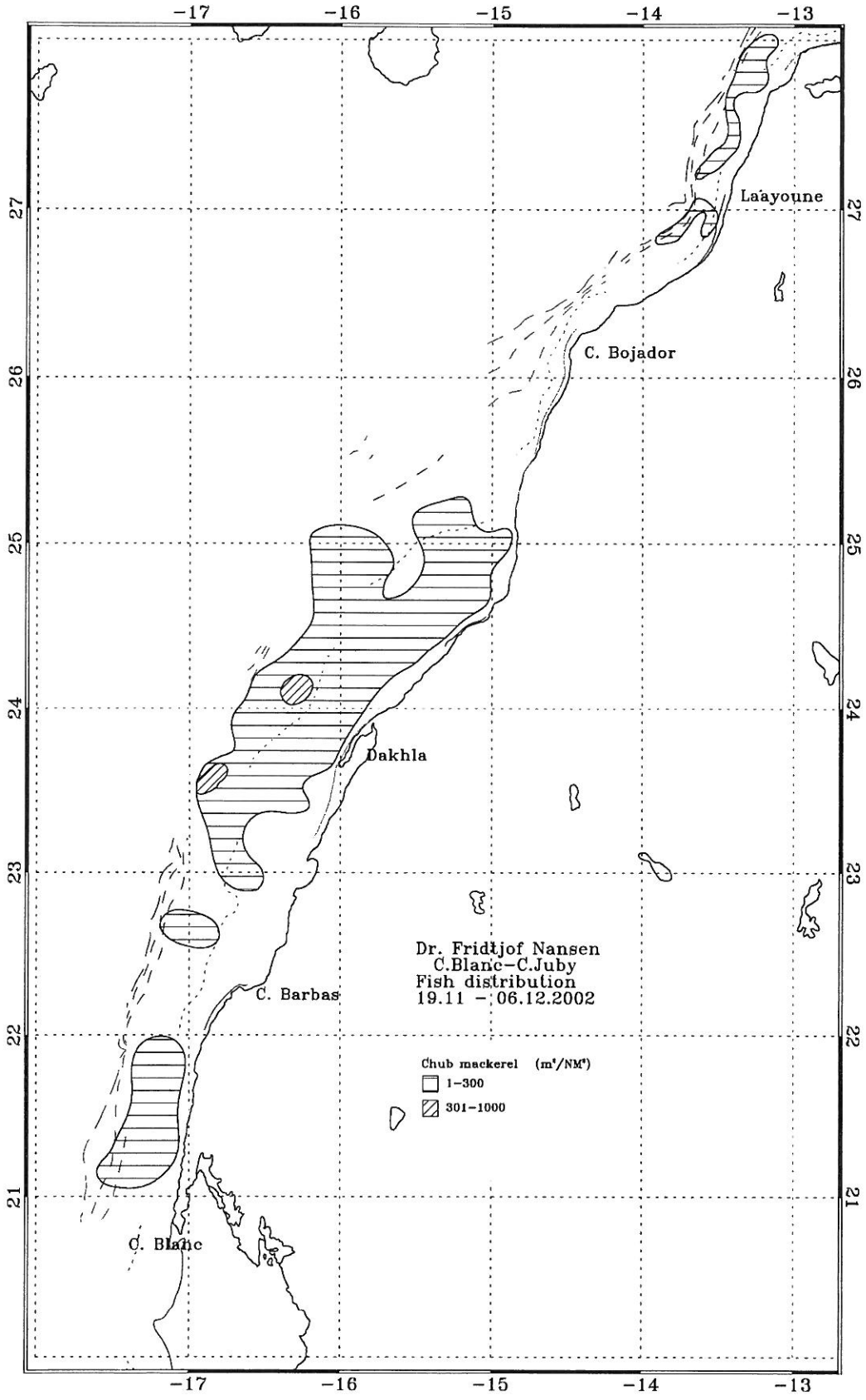
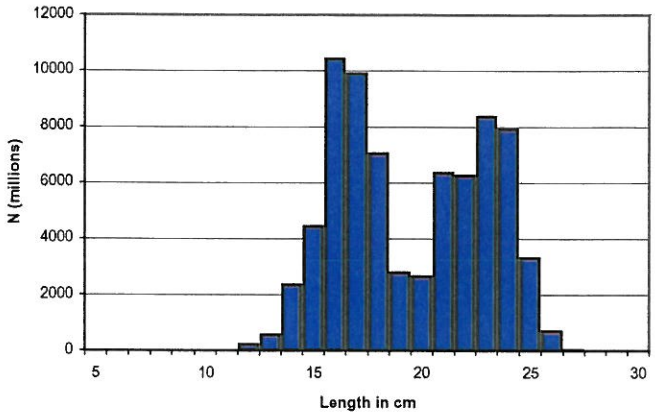



Figure 9. Distribution of chub mackerel, Cape Blanc to Cape Juby. Depth contours as in Fig. 1a.

a) Cape Timiris - Cape Bojador




b) Cape Bojador - Cape Juby

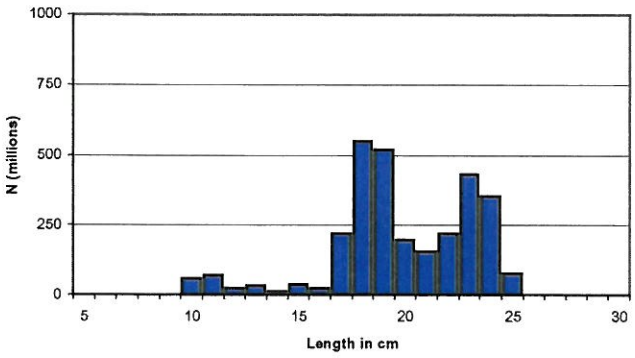



Figure 10. Length frequency distributions sardine Cape Timiris to Cape Juby.

## 2.3 Distribution of pelagic fish on the shelf from Cape Juby to Cape Cantin.

**Sardine** was common in the coastal area from Cape Juby to Cape Cantin, Figure 11. Several high-density patches were recorded: east of Cape Juby, between Cape Dra and Agadir, off Cape Ghir, off Cape Sim and off Safi. The aggregations consist mainly of two younger cohorts with modes around 12 and 17 cm, Figure 14.

**Anchovy** is more common than in recent years and notable concentrations were recorded east of Cape Dra and off Agadir, Figure 12. The anchovy seems to be on a rising trend in abundance.

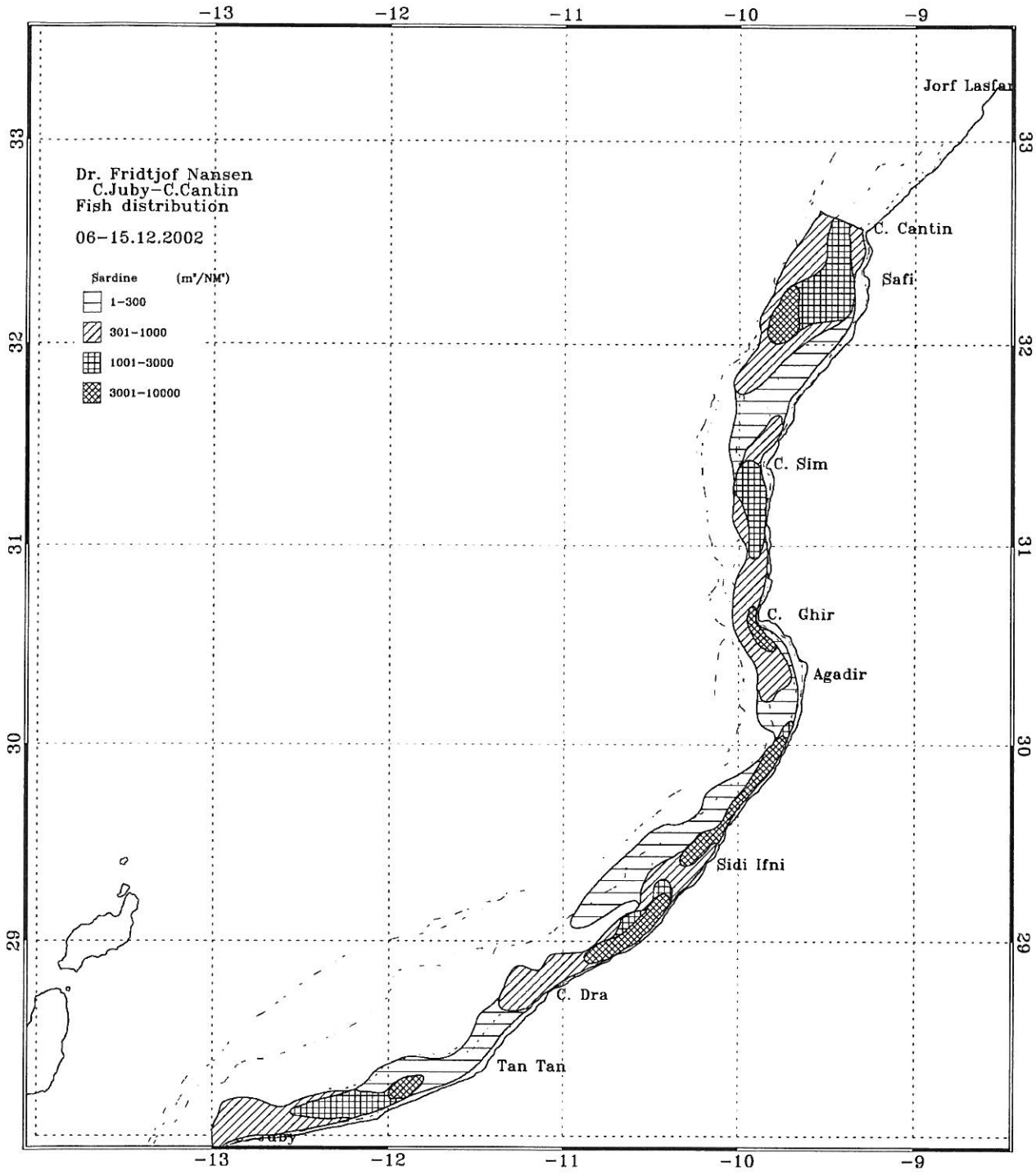



Figure 11. Distribution of sardine, Cape Juby to Cape Cantin. Depth contours as in Fig. 1a.

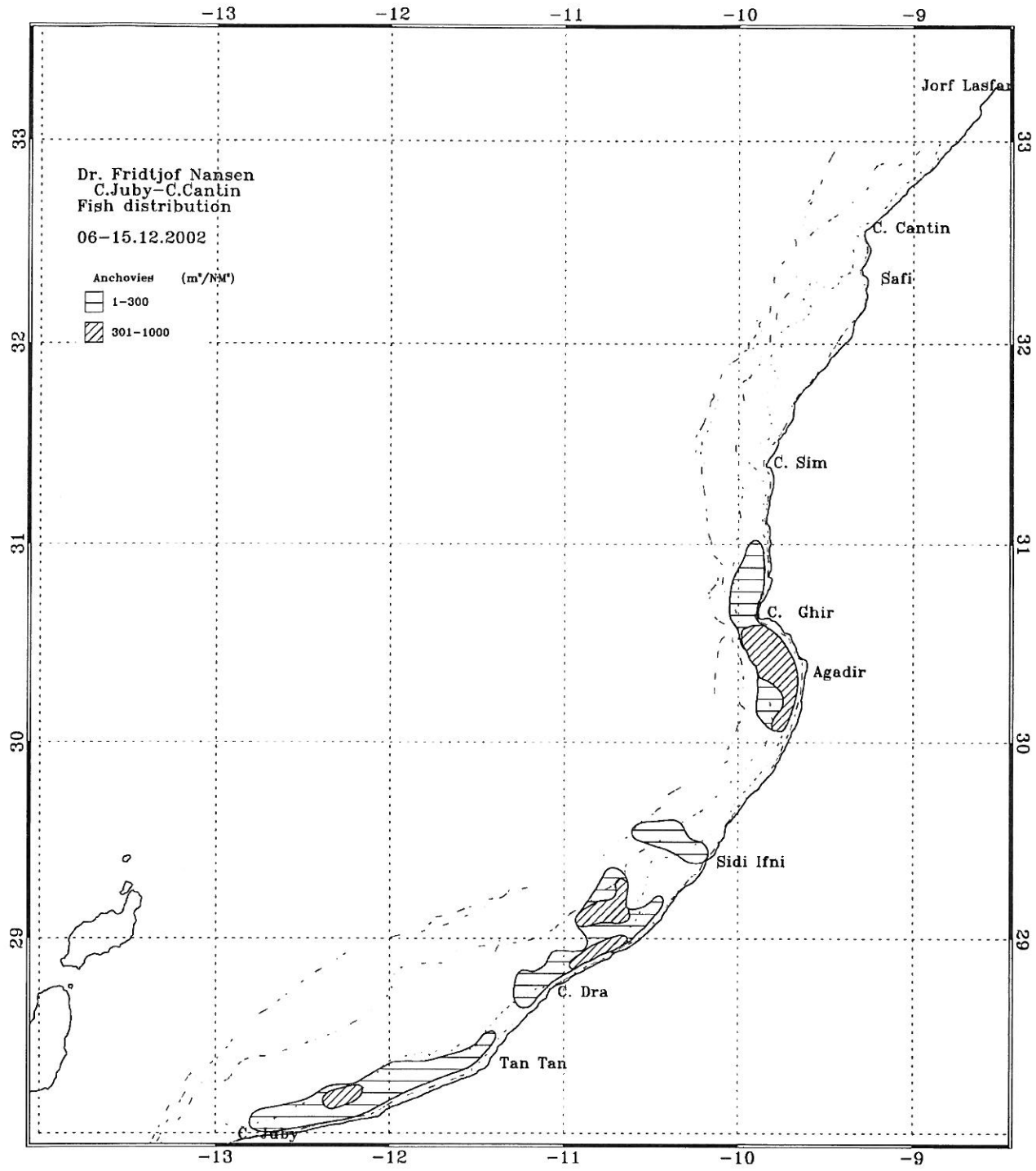



Figure 12. Distribution of anchovy, Cape Juby to Cape Cantin. Depth contours as in Fig. 1a.

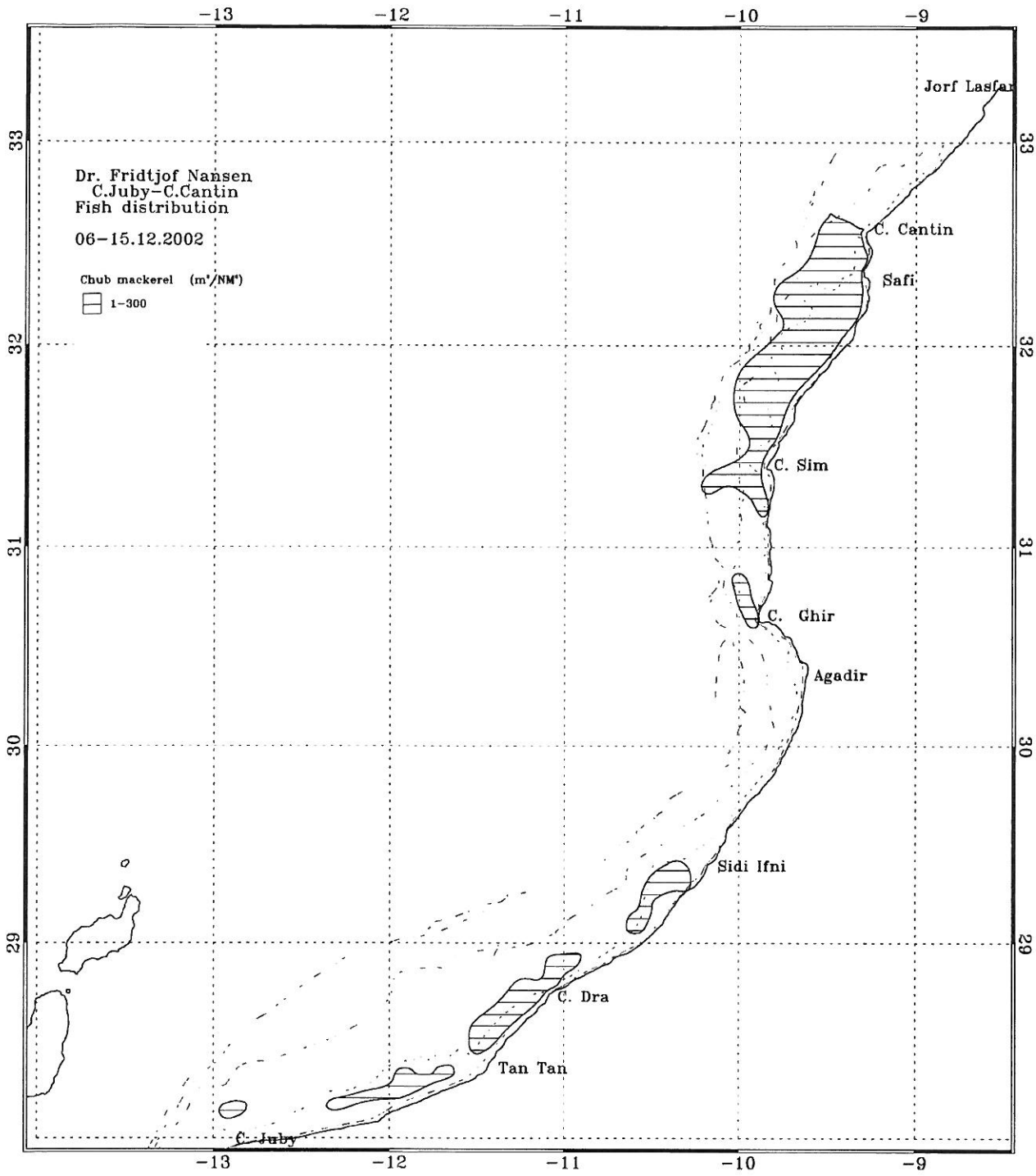



Figure 13. Distribution of chub mackerel, Cape Juby to Cape Cantin. Depth contours as in Fig. 1a.

Recordings of **horse mackerel** were very few while **chub mackerel** was more common, especially between Cape Sim and Cape Cantin, Figure 13. Densities were low.

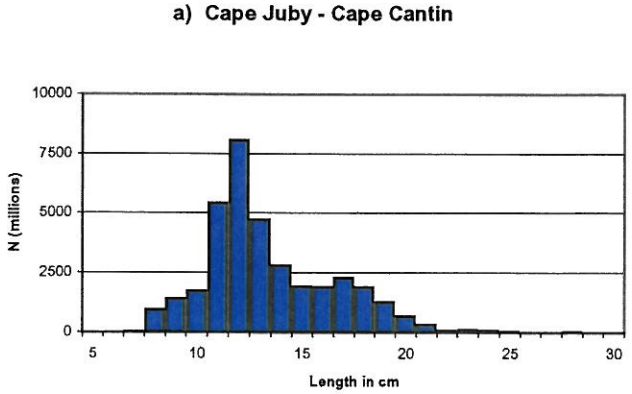



Figure 14. Length frequency distribution of sardine Cape Juby to Cape Cantin.

## 2.4 Biomass estimates

A summary on biomass estimates is given in Table 1 below. More detailed biomass estimates in number and weight by length groups are shown in Annex I.

*Cape Blanc – Cape Bojador*

The **sardine** was estimated to 4.6 million tonnes, 59% more than the 2.9 million estimated in June. However, if the sardine in Mauritania in June is included, the biomass of the southern stock is now 5.3 million tonnes, a considerable (40%) increase from the 3.8 million tonnes estimated then. The length distribution is earlier shown in Figure 9. The major share of the fish in terms of biomass consists of older fish, exclusively north of Cape Blanc. Compared with earlier years, the development in the "adult" part of the stock (i.e. fish >19cm) is:

| Survey | Thousand tonnes | Million fish |
|---|---|---|
| November-December 1996 | 4 600 | 47 400 |
| November-December 1997 | 240 | 2 900 |
| November-December 1998 | 340 | 3 400 |
| November-December 1999 | 1 000 | 11 500 |
| November-December 2000 | 1 260 | 13 200 |
| May-June 2001* | 1 975 | 22 500 |
| November-December 2001 | 3 200 | 32 000 |
| May-June 2002* | 2 100 | 21 400 |
| November-December 2002 | 3 700 | 35 500 |

* Including sardine in Mauritania

The strong increase in the adult stock during the last half year is mainly due to intrinsic growth in this population and less to recruitment of new year class into the adult stage, as can be seen from the only minor increase in number abundance in the above table. The young fish (<20cm), including the fish in Mauritanian waters, constitute about 38 billion fish, compared to 10 billion the previous year. As a rough recruitment index this signify a rather successful recruitment.

**Sardinella** was estimated to roughly 1.2 million tonnes of which 1.14 and 0.06 million are round and flat sardinella respectively. The main part of the fish is located between 22 °N and Dakhla and seems to constitute most of the regional stock of round sardinella, but only a fraction of the flat variety. In the preceding survey in Senegal and Mauritania 1.2 tonnes of sardinella were estimated south of Cape Blanc, see Annex I.

The two species of **horse mackerel** combined was estimated to 560 thousand tonnes, of which about roughly 210 thousand and 350 thousand were Atlantic and Cunene horse mackerel respectively. The Cunene horse mackerel forms a major part of the stock, distributed also south of Cape Blanc into Mauritania and Senegal, see Annex I.

*Cape Bojador – Cape Juby*

Estimated **sardine** in this region is 220 thousand tonnes, slightly less than the 270 thousand tonnes estimated in June this year. Compared with the November survey last year (2001) the biomass is down from about 330 thousand tonnes. In November 2000 the estimate was 600 thousand tonnes, and the sub-stock in this region seems therefore to be on a strong declining trend.

*Cape Juby – Cape Cantin*

The **sardine** is estimated to 900 thousand tonnes, similar to the 890 thousand estimated one year earlier, and 50% higher than the estimate in June this year. The abundance in numbers is rising, from 28 billion in 2001 to 36 billion in 2002. The biomass is mainly (93%) made up of young fish less than 19 cm length, Annex I.

**Anchovies** was estimated to only 35 thousand tonnes, a considerable increase from the 5000 estimated on year earlier. In May this year the estimate was 40 thousand and it seems like the anchovy is about to re-establish itself after its very low abundance in 2001.

Table 1 Morocco. Summary of biomass estimates of pelagic fish, thousand tonnes.

| Region | Sardines | Round sardinella | Flat sardinella | Atlantic horse mackerel | Cunene horse mackerel | Chub mackerel | Anchovy |
|---|---|---|---|---|---|---|---|
| Cape Blanc-Cape Bojador | 4 580 | 1 100 | 60 | 215 | 350 | 270 | 1 |
| Cape Bojador-Cape Juby | 220 | - | - | - | - | - | - |
| Cape Juby-Cape Cantin | 900 | - | - | - | - | 20 | 35 |
| Totals | 5 700 | 1 100 | 60 | 215 | 350 | 290 | 36 |

# CHAPTER 3 CONCLUDING REMARKS

This year's survey was characterized by more severe than usual weather conditions. Northerly and northeasterly winds persisted to the south of Cape Dra, while a strong southerly gale was encountered to north of Agadir. This gale caused a significant cooling of the surface waters near the coast. However, this decrease in the sea-surface temperature took place under the unfavourable wind direction and hence it was not related to the upwelling. The only true upwelling cell, featuring an uplift of cool and oxygen-poor subsurface water, was observed in the northern region off Cap Dra. In the southern region, the strong upwelling cell was encountered at a location at 25°N, (referred to as Garnet Head on the British Admiralty Charts).

The front between the tropical waters of South Atlantic and temperate waters of the North Atlantic origin was the major hydrographic feature observed during this survey. A high-resolution grid of CTD stations taken alongshore permitted us to determine its precise location at Cape Barbas.

Figure 15 gives a general overview on the major aggregations of pelagic fish with rounded biomass figures. The biomass estimates are also summarised in Table 1.

The **sardine** in the southern region has normal distribution pattern with the adults off Dakhla and the juveniles south of Cape Barbas. The biomass of sardine between Cape Blanc and Cape Bojador has increased from 3.5 million tonnes in November 2001 to 4.6 million during the last survey. 745 thousand tonnes of the present stock is juvenile fish. In addition 650 thousand tonnes of young fish is found in Mauritanian waters, just south of Cape Blanc. Sardine in the region Cape Bojador-Cape Juby is estimated to 220 thousands tonnes, roughly 30% less than one year earlier. Most of the fish is of adult size with lower growth potential, and growth in this sub-stock must come from influx from other areas or from new recruitment. Further north, the stock between Cape Juby and Cape Cantin is estimated to 900 thousands tonnes, very similar to the estimate in 2001. The stock is distributed in clusters along the entire region. Recruitment seems to be slightly above normal.

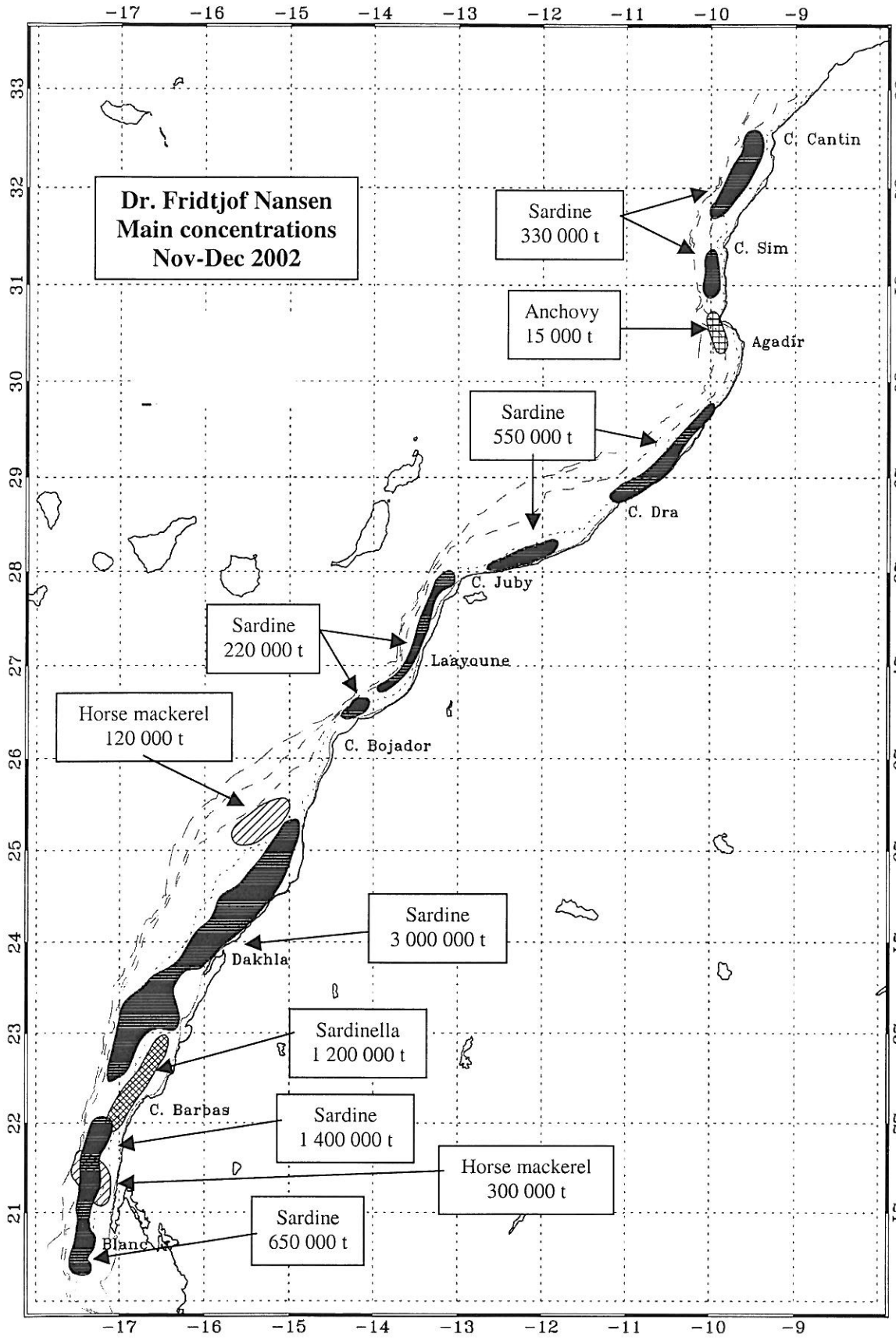



Figure 15. Map of the major pelagic fish concentrations with estimated abundance (tonnes), Cape Blanc to Cape Cantin.

**Sardinellas** were recorded between Cape Blanc and Dakhla during the survey. The biomass was estimated to 1.2 million tonnes, approximately 50% of the entire regional stock.

**Horse mackerel** was forming aggregations between Cape Blanc and Cape Barbas and was else found in scattered patches in the whole survey area. The combined estimate of the two species of horse mackerel is 565 thousand tonnes of which 350 thousand tonnes is Cunene horse mackerel south of Cape Barbas.

**Anchovy** were estimated to 35 thousand tonnes between Cape Juby and Cape Cantin, and seems to be on a recovering trend from its almost absence one year ago.

**Trends 1995-2002, sardine**

Figure 16 shows the biomass estimates of sardine compared with results from previous "Dr. Fridtjof Nansen" surveys. Figure 17 shows the biomass figures 1995-2002 by length classes. Both figures display that the stock between Cape Blanc and Cape Juby has now fully recovered from its sudden collapse in 1997. It is reasonable to include the recordings south of Cape Blanc as they belong to the same unit stock and most of the year stays north of Cape Blanc. In contrast to one year earlier the stock also has a high number of juveniles in the range 14-17 cm and must be considered as well balanced with several year-classes. In that respect, given the high number of juveniles, the stock has a further growth potential. However when relating to the whole time series (Figure 17), there is reason to assume that the standing stock size now approaches limits set by the ecosystem, and increased production could then be better stimulated by increased fishing, preferably on the older year-classes.

Small fish continue to dominate the central stock between Cape Juby and Safi. The level of the stock is about the same as observed in November 2001. Probably due to relative high fishing pressure, the central stock will continue to be dependent on steady good recruitment, as there is no buffer capacity from older year-classes.

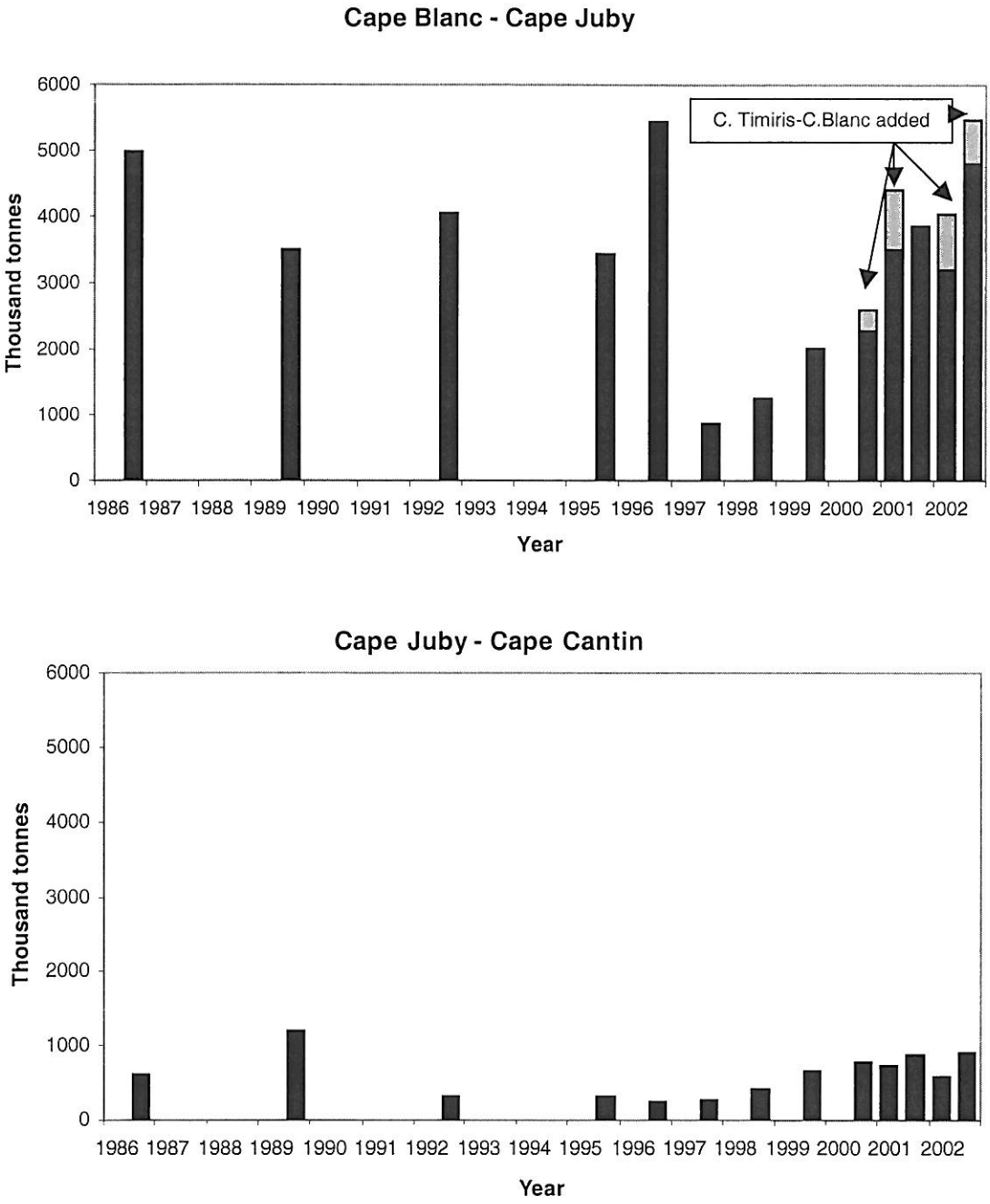



Figure 16. Sardine biomass estimates Cape Blanc-Cape Juby and Cape Juby-Cape Cantin, Dr. Fridtjof Nansen 1986-2002.

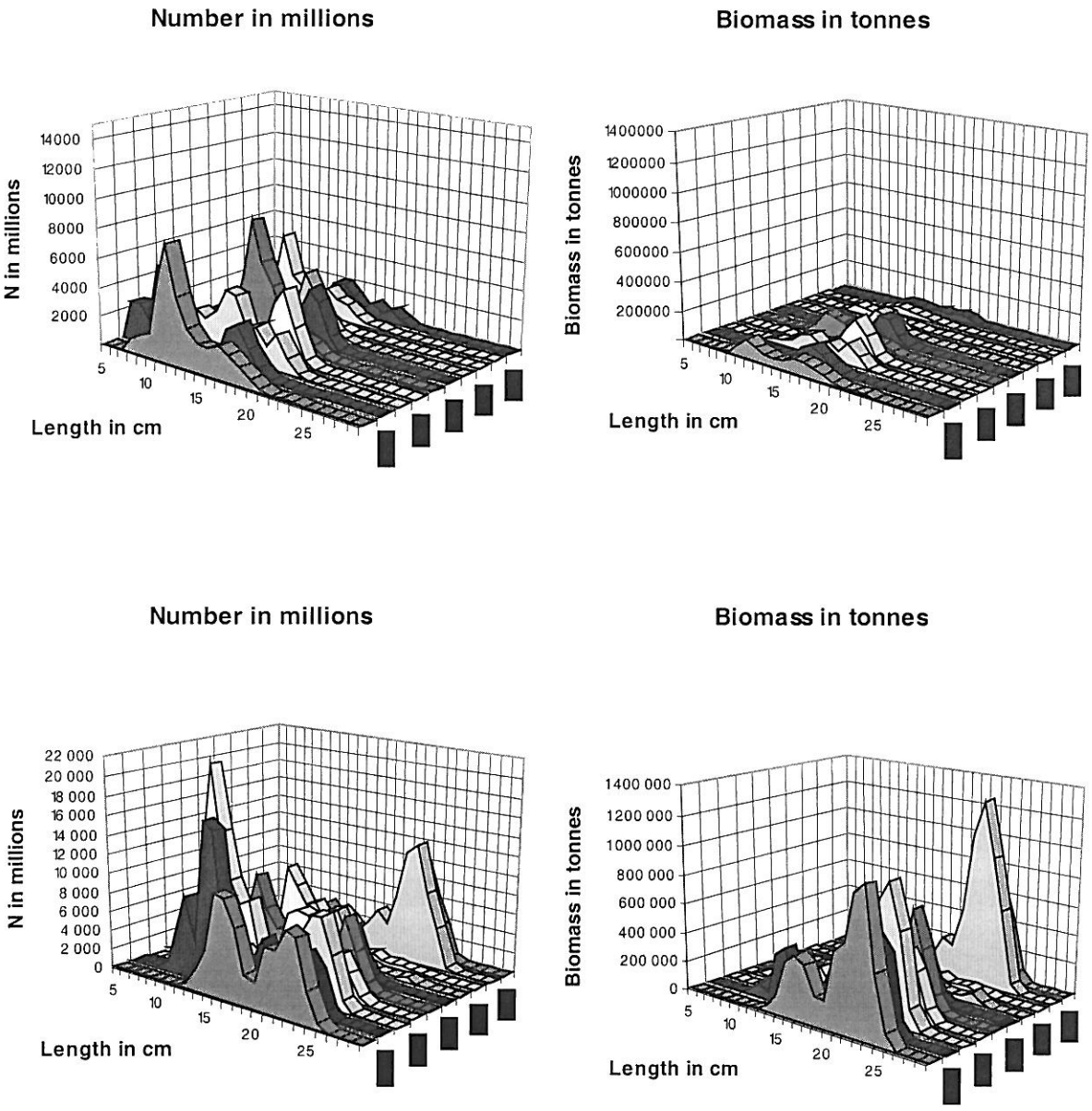



Figure 17. Numbers and biomass by length class, 1995-2002. Cape Juby - Cape Cantin (top) and Cape Blanc - Cape Juby (bottom).

## RESUME

La campagne a été conduite avec succès durant la période du 19 Novembre au 18 Décembre 2001, suivant un schéma de prospection acoustique de 4900 miles nautiques et 103 stations de pêche de contrôle. Les bancs de sardine, anchois, chinchards, ont été bien déterminés et délimités et leurs principales zones adéquatement échantillonnées. Les conditions climatiques n'ont pas cause de contrainte durant cette campagne.

Cette campagne de décembre a été caractérisée par des vents très forte que les conditions normales. Les vents Nord et Nord-Est persistent dans la région sud, alors qu'au nord d'Agadir des vents Sud très fort ont été enregistrés .

Les vents fort venus du sud ont cause un refroidissement signifiant des eaux de surface le long des cotes au nord d'Agadir, ceci n'est pas associe a l'effet des upwellings dans cette région.

L'upwelling a été plus prononce généralement dans la région sud. Une seule cellule d'upwelling a été identifiée dans la région nord au niveau de Cap Draa.

La zone frontale entre les eaux tropical de l'atlantique sud et les eaux temperes de l'atlantique nord a été localisée durant cette campagne au niveau de Cap Barbas (22°14' N).

La figure 15 représente une vision générale des majeures concentrations des poissons pélagiques, avec des valeurs de biomasses arrondies. Les estimations de biomasse sont également résumées dans la tableau 1.

La sardine dans de la zone sud, présente une distribution normale avec les sardines adultes au niveau de Dakhla et les juvéniles sud de Cap Barbas. La biomasse de sardine entre Cap Blanc et Cap Bojador a augmenté de 3.5 million de tonnes en Novembre 2001 à 4.6 million durant cette campagne, dont 745 000 tonnes sont des juvéniles. En plus 645 000 tonnes de jeunes sardine sont trouves en Mauritanie, juste au sud de Cap Blanc. La sardine dans la région Cap Boujdor-Cap Juby est estimée a 220 000 tonnes, environ 30 % moins que l'année dernière. La majorité de poissons dans cette région sont des adultes avec un potentiel de croissance faible, et la croissance dans ce stock doit venir d'autre régions adjacentes ou d'un nouveau recrutement.

Plus au nord, le stock entre Cap Juby et Cap Cantin est estimé à 900 000 tonnes, similaire a la biomasse estimée en 2001. Le stock est distribue d'une manière continue le long de cette région. Le recrutement semble légèrement en dessous de la normale.

Les sardinelles ont été détectés, durant cette campagne entre Cap Blanc et Dakhla. Leurs biomasses est estimée à 1.2 million de tonnes, presque 50 % de stock régional.

Les chinchards étaient regroupés en bancs entre Cape Blanc et Cap Barbas, ils étaient dispersés en petits agrégats sur toute la zone prospectée. L'estimation combinée de la biomasse des deux espèces était de 565 mille tonnes dont 350 000 tonnes de chinchard noir africain au sud du Cap Barbas .

L'anchois a été estimée a 35 000 tonnes entre Cap Juby et Cap Cantin, et semble trouve sa tendance après son absence une année auparavant.

**Tendances du stock sardinier pendant la période 1995-2002**

La figure 16 montre les estimations de la biomasse de la sardine, comparées avec les précédentes campagnes de N/R 'Dr. Fridtjof Nansen', les évaluations de la biomasse par classe de taille sont présentées sur la figure 17. Les deux figures montrent que le stock entre Cap Blanc et Cap Juby présente une remarquable reconstitution depuis sa chute drastique observée à la fin de 1997. Il est raisonnable d'inclure la sardine rencontrée au sud de Cap Blanc, il appartient au même stock sud, et la plus part de temps il reste au nord de Cap Blanc. En contraste avec une année auparavant le stock a un nombre plus élevé de juvéniles de taille 14-17 cm et doit être considérer en bonne équilibre avec les autres classe d'age. Par conséquent, avec ce grand nombre de juvéniles, le stock a un grand potentiel de croissance.

Cependant, en relation avec la séries (Figure 17), il est de raison d'assumer que la taille de stock s'approche de la limite fixe par l'écosystème, et pour augmenter la production, il est préférable d'augmentation la pêche sur les sardines adultes.

Les poissons de petites taille observés durant ces dernières années dominent le stock central entre Cap Juby et Safi. le niveau du stock est presque au même niveau qu'en Novembre 2001. probablement du a une forte pression de pêche, et Le stock central continuera d'être dépendant d'un bon recrutement stable, d'autant qu'il n'y a pas de capacité d'effet tampon à partir des classes d'ages supérieures.

# Annex I Biomass and number by length

**Sardine (*Sardina pilchardus* )**

**MOROCCO - MAURITANIA, November-December 2002**

| Length | C.Juby-C.Cantin | | C.Bojador-C.Juby | | C.Blanc-C.Bojador | | C.Timiris-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | 35 | 10 | | | | | | | 35 | 10 |
| 8 | 4 719 | 937 | | | | | | | 4 719 | 937 |
| 9 | 9 779 | 1 391 | | | | | | | 9 779 | 1 391 |
| 10 | 16 218 | 1 708 | 537 | 57 | | | | | 16 754 | 1 765 |
| 11 | 67 584 | 5 419 | 862 | 69 | | | | | 68 446 | 5 488 |
| 12 | 128 759 | 8 040 | 376 | 23 | 1 372 | 86 | 1 867 | 110 | 130 507 | 8 149 |
| 13 | 95 286 | 4 723 | 644 | 32 | 9 035 | 448 | 2 337 | 113 | 104 965 | 5 203 |
| 14 | 69 580 | 2 783 | 276 | 11 | 54 250 | 2 170 | 4 829 | 191 | 124 106 | 4 965 |
| 15 | 58 449 | 1 914 | 1 092 | 36 | 63 904 | 2 093 | 72 201 | 2 346 | 123 445 | 4 043 |
| 16 | 69 726 | 1 893 | 807 | 22 | 128 245 | 3 482 | 255 578 | 6 943 | 198 779 | 5 396 |
| 17 | 100 801 | 2 294 | 9 600 | 218 | 242 882 | 5 527 | 189 288 | 4 375 | 353 283 | 8 039 |
| 18 | 97 093 | 1 870 | 28 479 | 549 | 245 821 | 4 735 | 116 431 | 2 285 | 371 393 | 7 153 |
| 19 | 77 274 | 1 271 | 31 639 | 520 | 143 787 | 2 365 | 26 146 | 438 | 252 700 | 4 156 |
| 20 | 47 347 | 670 | 13 699 | 194 | 187 401 | 2 653 | | | 248 447 | 3 517 |
| 21 | 24 813 | 304 | 12 506 | 153 | 516 933 | 6 343 | | | 554 253 | 6 801 |
| 22 | 6 295 | 67 | 20 209 | 216 | 583 310 | 6 245 | | | 609 815 | 6 529 |
| 23 | 11 476 | 108 | 45 810 | 430 | 889 432 | 8 358 | | | 946 718 | 8 896 |
| 24 | 9 358 | 78 | 42 483 | 352 | 952 894 | 7 902 | | | 1 004 735 | 8 332 |
| 25 | 1 833 | 13 | 10 194 | 75 | 451 330 | 3 319 | | | 463 357 | 3 408 |
| 26 | | | | | 104 605 | 685 | | | 104 605 | 685 |
| 27 | | | | | 3 891 | 23 | | | 3 891 | 23 |
| 28 | 2 559 | 13 | | | 1 050 | 6 | | | 3 609 | 19 |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| Total | 898 983 | 35 508 | 219 213 | 2 959 | 4 580 145 | 56 438 | 668 677 | 16 802 | 6 367 018 | 111 706 |

## Round sardinella (*Sardinella aurita* )

## SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | 0,7 | | 0,7 | | 16 | | 16 |
| 14 | | 1,4 | | 1,4 | | 40 | | 40 |
| 15 | | 0,7 | | 0,7 | | 24 | | 24 |
| 16 | 8,5 | 2,0 | | 10,5 | 365 | 87 | | 452 |
| 17 | 8,5 | 10,1 | | 18,5 | 436 | 518 | | 954 |
| 18 | 8,5 | 12,8 | | 21,2 | 515 | 776 | | 1 291 |
| 19 | 8,5 | 104,6 | | 113,0 | 603 | 7 442 | | 8 046 |
| 20 | 5,7 | 115,3 | 40,0 | 161,0 | 470 | 9 536 | 3 238 | 13 243 |
| 21 | 32,1 | 33,9 | 193,4 | 259,4 | 3 062 | 3 232 | 18 066 | 24 360 |
| 22 | 80,0 | 36,8 | 1 070,4 | 1 187,2 | 8 749 | 4 029 | 114 609 | 127 386 |
| 23 | 257,6 | 55,6 | 1 094,4 | 1 407,6 | 32 094 | 6 928 | 133 509 | 172 530 |
| 24 | 474,2 | 39,2 | 1 220,4 | 1 733,8 | 66 946 | 5 535 | 168 702 | 241 183 |
| 25 | 285,2 | 24,7 | 998,6 | 1 308,4 | 45 394 | 3 932 | 155 643 | 204 969 |
| 26 | 176,7 | 16,9 | 505,0 | 698,6 | 31 571 | 3 017 | 88 335 | 122 923 |
| 27 | 65,3 | 5,9 | 224,9 | 296,1 | 13 028 | 1 184 | 43 971 | 58 183 |
| 28 | 50,7 | 10,1 | 150,4 | 211,2 | 11 275 | 2 236 | 32 727 | 46 237 |
| 29 | 28,9 | 13,4 | 150,3 | 192,6 | 7 126 | 3 312 | 36 268 | 46 705 |
| 30 | | 30,3 | 138,4 | 168,8 | | 8 260 | 36 919 | 45 179 |
| 31 | | 22,0 | 45,6 | 67,6 | | 6 613 | 13 389 | 20 002 |
| 32 | | 21,0 | 65,4 | 86,4 | | 6 931 | 21 092 | 28 023 |
| 33 | | 10,8 | 35,6 | 46,4 | | 3 911 | 12 584 | 16 496 |
| 34 | | 7,7 | 172,2 | 179,9 | | 3 041 | 66 466 | 69 507 |
| 35 | | 8,5 | 138,4 | 146,8 | | 3 642 | 58 183 | 61 824 |
| 36 | | 2,3 | 183,9 | 186,2 | | 1 072 | 84 069 | 85 141 |
| 37 | | 0,8 | 53,1 | 53,9 | | 387 | 26 323 | 26 711 |
| 38 | | | 23,5 | 23,5 | | | 12 613 | 12 613 |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 1 490,3 | 587,5 | 6 503,8 | 8 581,5 | 221 633 | 85 699 | 1 126 706 | 1 434 038 |

**Flat sardinella (*Sardinella maderensis* )**

**SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002**

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | 1,3 | | 1,3 | | 3 | | 3 |
| 7 | | 1,3 | | 1,3 | | 5 | | 5 |
| 8 | | 14,9 | | 14,9 | | 88 | | 88 |
| 9 | | 29,6 | | 29,6 | | 244 | | 244 |
| 10 | | 99,4 | | 99,4 | | 1 105 | | 1 105 |
| 11 | | 54,5 | | 54,5 | | 795 | | 795 |
| 12 | | 32,6 | | 32,6 | | 611 | | 611 |
| 13 | | 9,8 | | 9,8 | | 233 | | 233 |
| 14 | | 3,1 | | 3,1 | | 89 | | 89 |
| 15 | 4,8 | 0,3 | | 5,1 | 172 | 9 | | 181 |
| 16 | 105,1 | 0,3 | | 105,3 | 4 531 | 11 | | 4 542 |
| 17 | 175,2 | | | 175,2 | 9 015 | | | 9 015 |
| 18 | 430,5 | | | 430,5 | 26 165 | | | 26 165 |
| 19 | 370,3 | 0,1 | | 370,4 | 26 359 | 10 | | 26 370 |
| 20 | 446,4 | 4,3 | | 450,6 | 36 918 | 352 | | 37 269 |
| 21 | 608,1 | 33,3 | | 641,4 | 58 020 | 3 173 | | 61 192 |
| 22 | 776,2 | 71,3 | | 847,5 | 84 882 | 7 794 | | 92 676 |
| 23 | 988,2 | 60,9 | | 1 049,1 | 123 114 | 7 592 | | 130 706 |
| 24 | 942,4 | 69,2 | 23,5 | 1 035,1 | 133 042 | 9 771 | 3 359 | 146 172 |
| 25 | 700,6 | 97,4 | 53,7 | 851,7 | 111 522 | 15 505 | 8 631 | 135 658 |
| 26 | 249,5 | 103,0 | 34,6 | 387,1 | 44 567 | 18 408 | 6 243 | 69 218 |
| 27 | 102,9 | 116,0 | 79,6 | 298,5 | 20 547 | 23 154 | 16 058 | 59 759 |
| 28 | 40,3 | 115,4 | 30,3 | 186,1 | 8 956 | 25 656 | 6 807 | 41 419 |
| 29 | 16,1 | 74,3 | 32,7 | 123,1 | 3 973 | 18 301 | 8 144 | 30 418 |
| 30 | | 80,3 | 26,0 | 106,3 | | 21 868 | 7 167 | 29 035 |
| 31 | | 64,0 | 2,2 | 66,2 | | 19 206 | 663 | 19 869 |
| 32 | | 55,0 | 4,4 | 59,4 | | 18 140 | 1 456 | 19 596 |
| 33 | | 54,9 | | 54,9 | | 19 816 | | 19 816 |
| 34 | | 40,7 | | 40,7 | | 16 051 | | 16 051 |
| 35 | | 17,1 | | 17,1 | | 7 355 | | 7 355 |
| 36 | | 5,0 | | 5,0 | | 2 348 | | 2 348 |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 5 956,5 | 1 309,4 | 287,0 | 7 552,9 | 691 783 | 237 695 | 58 527 | 988 005 |

## Anchovy (*Engraulis encrasicolus*)

## MOROCCO, November-December 2002

| Length cm | C.Juby-C.Cantin | | C.Blanc-C.Juby | | Total | |
|---|---|---|---|---|---|---|
| | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | 30 | 13,0 | | | 30 | 13,0 |
| 8 | 589 | 177,7 | | | 589 | 177,7 |
| 9 | 3 459 | 747,2 | | | 3 459 | 747,2 |
| 10 | 6 434 | 1 029,3 | | | 6 434 | 1 029,3 |
| 11 | 4 348 | 529,4 | 9 | 1,1 | 4 357 | 530,6 |
| 12 | 5 202 | 493,3 | 611 | 57,9 | 5 813 | 551,2 |
| 13 | 9 300 | 700,0 | 377 | 28,4 | 9 677 | 728,4 |
| 14 | 4 414 | 268,1 | 19 | 1,1 | 4 433 | 269,3 |
| 15 | 880 | 43,8 | | | 880 | 43,8 |
| 16 | 19 | 0,8 | | | 19 | 0,8 |
| 17 | | | | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | | | | | | |
| Total | 34 677 | 4 002,6 | 1 016 | 88,6 | 35 693 | 4 091,2 |

## Atlantic horse mackerel (*Trachurus trachurus* )

## MOROCCO - MAURITANIA, November-December 2002

| Length | C.Juby-C.Cantin | | C.Blanc-C.Juby | | St.Louis-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | 613 | 48,0 | | | 613 | 48,0 |
| 12 | | | 1 716 | 104,6 | | | 1 716 | 104,6 |
| 13 | | | 4 726 | 228,6 | | | 4 726 | 228,6 |
| 14 | | | 20 199 | 788,7 | | | 20 199 | 788,7 |
| 15 | | | 45 477 | 1 453,8 | | | 45 477 | 1 453,8 |
| 16 | | | 35 852 | 950,1 | | | 35 852 | 950,1 |
| 17 | | | 15 777 | 350,4 | | | 15 777 | 350,4 |
| 18 | | | 6 612 | 124,3 | | | 6 612 | 124,3 |
| 19 | | | 2 772 | 44,5 | | | 2 772 | 44,5 |
| 20 | | | 680 | 9,4 | | | 680 | 9,4 |
| 21 | | | 1 120 | 13,4 | | | 1 120 | 13,4 |
| 22 | | | 2 944 | 30,8 | | | 2 944 | 30,8 |
| 23 | | | 5 642 | 51,8 | | | 5 642 | 51,8 |
| 24 | | | 8 179 | 66,2 | | | 8 179 | 66,2 |
| 25 | | | 3 156 | 22,7 | | | 3 156 | 22,7 |
| 26 | | | 7 286 | 46,6 | | | 7 286 | 46,6 |
| 27 | | | 15 846 | 90,7 | | | 15 846 | 90,7 |
| 28 | | | 19 452 | 100,0 | | | 19 452 | 100,0 |
| 29 | | | 10 272 | 47,6 | | | 10 272 | 47,6 |
| 30 | | | 2 506 | 10,5 | | | 2 506 | 10,5 |
| 31 | | | 1 593 | 6,1 | | | 1 593 | 6,1 |
| 32 | | | | | | | | |
| 33 | | | 958 | 3,0 | | | 958 | 3,0 |
| 34 | | | 1 047 | 3,0 | | | 1 047 | 3,0 |
| 35 | | | | | 4 215 | 9,8 | 4 215 | 9,8 |
| 36 | | | | | 1 527 | 3,3 | 1 527 | 3,3 |
| 37 | | | | | 4 252 | 8,4 | 4 252 | 8,4 |
| 38 | | | | | 8 427 | 15,4 | 8 427 | 15,4 |
| 39 | | | | | 20 137 | 34,0 | 20 137 | 34,0 |
| 40 | | | | | 19 619 | 30,8 | 19 619 | 30,8 |
| 41 | | | | | 3 518 | 5,1 | 3 518 | 5,1 |
| 42 | | | | | 4 822 | 6,5 | 4 822 | 6,5 |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | | | 214 425 | 4 595 | 66 516 | 113,3 | 280 941 | 4 708 |

## Cunene horse mackerel (*Trachurus trecae* )

## SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO, November-December 2002

| Length | Number in millions | | | | Biomass in tonnes | | | |
|---|---|---|---|---|---|---|---|---|
| cm | Senegal | Mauritania | Morocco | Total | Senegal | Mauritania | Morocco | Total |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | 17,1 | | 17,1 | | 69 | | 69 |
| 8 | | 627,6 | | 627,6 | | 3 700 | | 3 700 |
| 9 | | 2 589,2 | | 2 589,2 | | 21 312 | | 21 312 |
| 10 | 0,2 | 1 693,3 | 862,2 | 2 555,7 | 2 | 18 818 | 8 384 | 27 204 |
| 11 | 16,2 | 1 641,3 | 4 417,7 | 6 075,3 | 237 | 23 964 | 56 438 | 80 639 |
| 12 | 230,9 | 1 138,6 | 5 036,2 | 6 405,7 | 4 330 | 21 348 | 82 625 | 108 303 |
| 13 | 248,6 | 481,2 | 4 772,1 | 5 501,9 | 5 872 | 11 366 | 98 626 | 115 864 |
| 14 | 183,3 | 33,2 | 1 246,9 | 1 463,4 | 5 363 | 971 | 31 932 | 38 266 |
| 15 | 64,5 | 15,8 | 189,6 | 269,9 | 2 307 | 564 | 5 931 | 8 803 |
| 16 | 22,5 | 1,0 | 78,7 | 102,2 | 968 | 41 | 2 971 | 3 981 |
| 17 | 0,2 | | 82,0 | 82,2 | 11 | | 3 690 | 3 701 |
| 18 | | | 22,2 | 22,2 | | | 1 182 | 1 182 |
| 19 | | | 43,8 | 43,8 | | | 2 726 | 2 726 |
| 20 | | | | | | | | |
| 21 | 0,2 | | 0,7 | 0,9 | 21 | | 59 | 80 |
| 22 | 2,0 | | | 2,0 | 214 | | | 214 |
| 23 | 3,7 | | | 3,7 | 461 | | | 461 |
| 24 | 6,4 | | | 6,4 | 908 | | | 908 |
| 25 | 13,2 | | 26,7 | 39,9 | 2 108 | | 3 714 | 5 822 |
| 26 | 59,1 | | 127,3 | 186,4 | 10 557 | | 19 899 | 30 456 |
| 27 | 34,3 | | 82,1 | 116,5 | 6 858 | | 14 345 | 21 202 |
| 28 | 17,1 | | 55,4 | 72,5 | 3 793 | | 10 782 | 14 575 |
| 29 | 22,4 | | | 22,4 | 5 516 | | | 5 516 |
| 30 | 1,5 | | | 1,5 | 406 | | | 406 |
| 31 | | | 26,0 | 26,0 | | | 6 815 | 6 815 |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | 2,5 | | 2,5 | | 1 452 | | 1 452 |
| 40 | | 7,4 | | 7,4 | | 4 694 | | 4 694 |
| 41 | | 9,8 | | 9,8 | | 6 734 | | 6 734 |
| 42 | | 24,5 | | 24,5 | | 18 082 | | 18 082 |
| 43 | | 24,5 | | 24,5 | | 19 388 | | 19 388 |
| 44 | | 14,7 | | 14,7 | | 12 454 | | 12 454 |
| 45 | | 9,8 | | 9,8 | | 8 875 | | 8 875 |
| 46 | | 2,5 | | 2,5 | | 2 368 | | 2 368 |
| 47 | | 2,5 | | 2,5 | | 2 524 | | 2 524 |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| Total | 926,4 | 8 336,3 | 17 069,6 | 26 332,3 | 49 934 | 178 723 | 350 119 | 578 776 |

## Chub mackerel (*Scomber japonicus* )

## MOROCCO - MAURITANIA, November-December 2002

| Length | C.Juby-C.Cantin | | C.Blanc-C.Juby | | St. Louis-C.Blanc | | Total | |
|---|---|---|---|---|---|---|---|---|
| cm | tonnes | N millions | tonnes | N millions | tonnes | N millions | tonnes | N millions |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | 148 | 4,7 | | | 148 | 4,7 |
| 16 | | | 359 | 9,5 | | | 359 | 9,5 |
| 17 | | | 2 968 | 65,9 | | | 2 968 | 65,9 |
| 18 | 81 | 1,5 | 10 860 | 204,2 | | | 10 941 | 205,7 |
| 19 | 1 420 | 22,8 | 14 622 | 234,8 | | | 16 042 | 257,6 |
| 20 | 3 875 | 53,5 | 13 348 | 184,4 | | | 17 222 | 238,0 |
| 21 | 3 708 | 44,4 | 12 680 | 151,9 | | | 16 388 | 196,3 |
| 22 | 2 285 | 23,9 | 11 872 | 124,1 | | | 14 157 | 148,0 |
| 23 | 1 659 | 15,2 | 14 218 | 130,4 | | | 15 876 | 145,6 |
| 24 | 789 | 6,4 | 12 858 | 104,1 | | | 13 647 | 110,5 |
| 25 | 446 | 3,2 | 5 735 | 41,2 | | | 6 181 | 44,4 |
| 26 | 457 | 2,9 | 9 776 | 62,5 | | | 10 232 | 65,5 |
| 27 | 521 | 3,0 | 20 002 | 114,5 | | | 20 522 | 117,5 |
| 28 | 686 | 3,5 | 28 369 | 145,9 | | | 29 056 | 149,4 |
| 29 | 1 188 | 5,5 | 34 650 | 160,7 | | | 35 838 | 166,2 |
| 30 | 950 | 4,0 | 25 200 | 105,7 | | | 26 149 | 109,7 |
| 31 | 820 | 3,1 | 13 081 | 49,8 | | | 13 902 | 52,9 |
| 32 | 326 | 1,1 | 8 988 | 31,2 | | | 9 314 | 32,3 |
| 33 | 141 | 0,4 | 7 066 | 22,4 | | | 7 208 | 22,8 |
| 34 | 377 | 1,1 | 6 252 | 18,1 | | | 6 629 | 19,2 |
| 35 | 56 | 0,1 | 3 453 | 9,2 | | | 3 509 | 9,3 |
| 36 | 61 | 0,1 | 2 217 | 5,4 | | | 2 278 | 5,6 |
| 37 | | | 2 759 | 6,2 | | | 2 759 | 6,2 |
| 38 | | | 8 861 | 18,5 | | | 8 861 | 18,5 |
| 39 | | | | | | | | |
| 40 | | | 1 673 | 3,0 | | | 1 673 | 3,0 |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| Total | 19 846 | 196,0 | 272 014 | 2 008,4 | | | 291 860 | 2 204,4 |

# Annex II Records of fishing stations

PROJECT STATION:1775
DATE:19/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2100
start stop duration Long W 1723
TIME :17:46:59 18:16:10 29 (min) Purpose code: 1
LOG :4244.94 4246.79 1.84 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 64 66 Validity code:
Towing dir: 90ø Wire out: 160 m Speed: 38 kn*10

Sorted: 35 Kg Total catch: 9033.55 CATCH/HOUR: 18690.11

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 18690.11 | 409614 | 100.00 | 2965 |
| Total | 18690.11 | | 100.00 | |

PROJECT STATION:1776
DATE:19/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2100
start stop duration Long W 1733
TIME :20:39:29 20:53:38 14 (min) Purpose code: 1
LOG :4264.38 4265.33 0.94 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 106 105 Validity code:
Towing dir: 90ø Wire out: 150 m Speed: 39 kn*10

Sorted: 31 Kg Total catch: 157.93 CATCH/HOUR: 676.84

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 531.43 | 43179 | 78.52 | 2966 |
| Trichiurus lepturus | 125.14 | 197 | 18.49 | |
| Raja sp. | 17.14 | 4 | 2.53 | |
| Scomber japonicus | 2.01 | 13 | 0.30 | |
| Belone belone gracilis | 0.60 | 9 | 0.09 | |
| Sardina pilchardus | 0.51 | 4 | 0.08 | |
| Total | 676.83 | | 100.01 | |

PROJECT STATION:1777
DATE:20/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2110
start stop duration Long W 1733
TIME :00:27:09 00:37:10 30 (min) Purpose code: 1
LOG :4295.26 4297.26 2.00 Area code : 2
FDEPTH: 1 1 GearCond.code:
BDEPTH: 229 270 Validity code:
Towing dir: 270ø Wire out: 150 m Speed: 40 kn*10

Sorted: 31 Kg Total catch: 247.11 CATCH/HOUR: 494.22

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 314.30 | 3262 | 63.60 | 2967 |
| Trachurus trecae, juvenile | 126.00 | 5026 | 25.49 | 2968 |
| Isurus oxyrinchus | 49.20 | 2 | 9.96 | |
| Brama brama | 4.00 | 10 | 0.81 | |
| Lepidopus caudatus | 0.72 | 2 | 0.15 | |
| Total | 494.22 | | 100.01 | |

PROJECT STATION:1778
DATE:20/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2110
start stop duration Long W 1727
TIME :02:31:01 02:39:38 9 (min) Purpose code: 1
LOG :4308.11 4309.00 0.89 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 103 103 Validity code:
Towing dir: 270ø Wire out: 110 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 120.60 CATCH/HOUR: 804.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 583.33 | 4133 | 72.55 | 2970 |
| Trachurus trecae, juvenile | 105.47 | 8493 | 13.12 | 2969 |
| Trichiurus lepturus | 57.67 | 67 | 7.17 | |
| Sardinella maderensis | 33.87 | 120 | 4.21 | |
| Sardinella aurita | 13.07 | 93 | 1.63 | |
| Scomber japonicus | 7.47 | 47 | 0.93 | |
| Lepidopus caudatus | 3.13 | 7 | 0.39 | |
| Total | 804.01 | | 100.00 | |

PROJECT STATION:1779
DATE:20/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2120
start stop duration Long W 1704
TIME :07:08:05 07:19:28 11 (min) Purpose code: 1
LOG :4349.28 4350.04 0.76 Area code : 2
FDEPTH: 31 31 GearCond.code:
BDEPTH: 31 31 Validity code:
Towing dir: 180ø Wire out: 130 m Speed: 40 kn*10

Sorted: 34 Kg Total catch: 2383.50 CATCH/HOUR: 13000.91

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 6147.27 | 411982 | 47.28 | 2973 |
| Pomadasys incisus | 2119.09 | 17182 | 16.30 | |
| Diplodus bellottii | 1550.18 | 14509 | 11.92 | |
| Engraulis encrasicolus | 1008.00 | 85909 | 7.75 | 2972 |
| Scomber japonicus | 897.27 | 12218 | 6.90 | 2971 |
| Decapterus rhonchus | 511.64 | 3436 | 3.94 | |
| Diplodus vulgaris | 423.82 | 764 | 3.26 | |
| Diplodus puntazzo | 286.36 | 382 | 2.20 | |
| Loligo vulgaris | 57.27 | 2291 | 0.44 | |
| Total | 13000.90 | | 99.99 | |

PROJECT STATION:1780
DATE:20/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2123
start stop duration Long W 1720
TIME :10:04:25 10:16:35 12 (min) Purpose code: 1
LOG :4374.00 4374.85 0.84 Area code : 2
FDEPTH: 71 70 GearCond.code:
BDEPTH: 71 70 Validity code:
Towing dir: ø Wire out: 220 m Speed: 42 kn*10

Sorted: 3 Kg Total catch: 3.54 CATCH/HOUR: 17.70

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 15.95 | 95 | 90.11 | |
| Sardina pilchardus | 1.10 | 10 | 6.21 | |
| Sardinella aurita | 0.65 | 5 | 3.67 | |
| Total | 17.70 | | 99.99 | |

PROJECT STATION:1781
DATE:20/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2120
start stop duration Long W 1722
TIME :11:13:58 11:42:09 28 (min) Purpose code: 1
LOG :4381.45 4383.24 1.72 Area code : 2
FDEPTH: 20 30 GearCond.code:
BDEPTH: 79 69 Validity code:
Towing dir: 90ø Wire out: 130 m Speed: 40 kn*10

Sorted: 33 Kg Total catch: 6012.00 CATCH/HOUR: 12882.86

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 12651.43 | 84857 | 98.20 | 2974 |
| Scomber japonicus | 231.43 | 1157 | 1.80 | |
| Total | 12882.86 | | 100.00 | |

PROJECT STATION:1782
DATE:20/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2120
start stop duration Long W 1726
TIME :50:00:16 51:40:33 12 (min) Purpose code: 1
LOG :4391.75 4392.41 0.65 Area code : 2
FDEPTH: 102 98 GearCond.code:
BDEPTH: 102 98 Validity code:
Towing dir: 90ø Wire out: 340 m Speed: 31 kn*10

Sorted: 66 Kg Total catch: 1644.55 CATCH/HOUR: 8222.75

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 3368.75 | 241875 | 40.97 | 2976 |
| Sardina pilchardus | 2131.25 | 14875 | 25.92 | 2975 |
| Zenopsis conchifer | 943.75 | 4000 | 11.48 | |
| Trachurus trachurus | 493.75 | 3125 | 6.00 | 2978 |
| Trachurus trecae | 413.75 | 2625 | 5.03 | 2977 |
| Scomber japonicus | 322.50 | 2750 | 3.92 | |
| Merluccius senegalensis | 318.75 | 250 | 3.88 | |
| Pagellus acarne | 142.50 | 500 | 1.73 | |
| Dentex macrophthalmus | 42.50 | 500 | 0.52 | |
| Zeus faber | 30.25 | 65 | 0.37 | |
| Capros aper | 10.00 | 2000 | 0.12 | |
| Engraulis encrasicolus | 2.50 | 250 | 0.03 | |
| Loligo vulgaris | 1.50 | 5 | 0.02 | |
| Trichiurus lepturus | 1.00 | 5 | 0.01 | |
| Total | 8222.75 | | 100.00 | |

PROJECT STATION:1783
DATE:20/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2135
start stop duration Long W 1706
TIME :20:46:43 21:07:14 21 (min) Purpose code: 1
LOG :4456.39 4457.68 1.27 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 44 49 Validity code:
Towing dir: 235ø Wire out: 110 m Speed: 38 kn*10

Sorted: 35 Kg Total catch: 4995.00 CATCH/HOUR: 14271.43

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 13165.71 | 42377 | 92.25 | 2979 |
| Scomber japonicus | 525.71 | 2057 | 3.68 | |
| Trachurus trecae | 394.97 | 4114 | 2.77 | |
| Spondyliosoma cantharus | 77.14 | 411 | 0.54 | |
| Sardinella maderensis | 57.14 | 411 | 0.40 | |
| Sardina pilchardus | 48.57 | 411 | 0.34 | |
| Total | 14269.24 | | 99.98 | |

PROJECT STATION:1784
DATE:21/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2140
start stop duration Long W 1721
TIME :00:47:56 00:53:43 6 (min) Purpose code: 1
LOG :4490.82 4491.22 0.39 Area code : 2
FDEPTH: 15 20 GearCond.code:
BDEPTH: 96 94 Validity code:
Towing dir: 90ø Wire out: 100 m Speed: 40 kn*10

Sorted: 29 Kg Total catch: 4008.00 CATCH/HOUR: 40080.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 38780.00 | 535440 | 96.76 | 2980 |
| Sardinella aurita | 1150.00 | 9660 | 2.87 | |
| Trachurus trecae, juvenile | 150.00 | 9660 | 0.37 | |
| Total | 40080.00 | | 100.00 | |

PROJECT STATION:1785

DATE:21/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2151
start stop duration Long W 1714
TIME :05:13:45 05:21:22 8 (min) Purpose code: 1
LOG :4528.98 4529.55 0.56 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 65 64 Validity code:
Towing dir: 277ø Wire out: 100 m Speed: 40 kn*10

Sorted: 36 Kg Total catch: 4992.00 CATCH/HOUR: 37440.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 36742.50 | 281520 | 98.14 | 2981 |
| Scomber japonicus | 577.50 | 4140 | 1.54 | |
| Sardinella aurita | 112.50 | 1035 | 0.30 | |
| Trachurus trecae, juvenile | 7.50 | 1035 | 0.02 | |
| Total | 37440.00 | | 100.00 | |

PROJECT STATION:1786

DATE:21/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2202
start stop duration Long W 1705
TIME :09:53:33 10:03:51 10 (min) Purpose code: 1
LOG :4569.40 4570.00 0.57 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 52 51 Validity code:
Towing dir: 90ø Wire out: 110 m Speed: 38 kn*10

Sorted: 61 Kg Total catch: 615.00 CATCH/HOUR: 3690.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 2466.00 | 16212 | 66.83 | 2982 |
| Sardinella maderensis | 750.00 | 3432 | 20.33 | 2983 |
| Trichiurus lepturus | 474.00 | 666 | 12.85 | |
| Trachurus trecae | 1.08 | 6 | 0.03 | |
| Total | 3691.08 | | 100.04 | |

PROJECT STATION:1787

DATE:21/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2204
start stop duration Long W 1714
TIME :12:14:55 12:17:45 3 (min) Purpose code: 1
LOG :4584.61 4584.76 0.14 Area code : 2
FDEPTH: 68 68 GearCond.code:
BDEPTH: 68 68 Validity code:
Towing dir: 102ø Wire out: 250 m Speed: 30 kn*10

Sorted: 30 Kg Total catch: 371.70 CATCH/HOUR: 7434.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 7044.00 | 402480 | 94.75 | 2984 |
| Cepola macrophthalma | 180.00 | 1200 | 2.42 | |
| Loligo vulgaris | 126.00 | 860 | 1.69 | |
| Trachurus trachurus | 72.00 | 480 | 0.97 | |
| Sardina pilchardus | 9.60 | 240 | 0.13 | |
| Capros aper | 2.40 | 240 | 0.03 | |
| Total | 7434.00 | | 99.99 | |

PROJECT STATION:1788

DATE:21/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2205
start stop duration Long W 1722
TIME :13:36:29 13:41:49 5 (min) Purpose code: 1
LOG :4595.43 4595.70 0.26 Area code : 2
FDEPTH: 90 88 GearCond.code:
BDEPTH: 90 88 Validity code:
Towing dir: 102ø Wire out: 340 m Speed: 30 kn*10

Sorted: 31 Kg Total catch: 315.23 CATCH/HOUR: 3782.76

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 2544.00 | 180000 | 67.25 | 2985 |
| Sardina pilchardus | 1146.00 | 28200 | 30.30 | 2986 |
| Dentex macrophthalmus | 27.24 | 36 | 0.72 | |
| Zeus faber | 19.32 | 48 | 0.51 | |
| Loligo vulgaris | 18.96 | 192 | 0.50 | |
| Capros aper | 18.00 | 1680 | 0.48 | |
| Scomber scombrus | 4.08 | 12 | 0.11 | |
| Total | 3777.60 | | 99.87 | |

PROJECT STATION:1789

DATE:21/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2210
start stop duration Long W 1703
TIME :17:52:47 18:20:04 27 (min) Purpose code: 1
LOG :4633.35 4635.10 1.73 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 57 59 Validity code:
Towing dir: 287ø Wire out: 150 m Speed: 38 kn*10

Sorted: 64 Kg Total catch: 8037.50 CATCH/HOUR: 17861.11

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 12388.89 | 90153 | 69.36 | 2987 |
| Sardinella aurita | 5472.22 | 15556 | 30.64 | 2988 |
| Total | 17861.11 | | 100.00 | |

PROJECT STATION:1790

DATE:21/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2209
start stop duration Long W 1656
TIME :20:23:39 20:44:38 21 (min) Purpose code: 1
LOG :4647.62 4648.94 1.32 Area code : 2
FDEPTH: 15 15 GearCond.code:
BDEPTH: 42 42 Validity code:
Towing dir: 308ø Wire out: 110 m Speed: kn*10

Sorted: 33 Kg Total catch: 680.90 CATCH/HOUR: 1945.43

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 1448.00 | 7371 | 74.43 | 2989 |
| Sardinella maderensis | 400.57 | 2171 | 20.59 | 2990 |
| Trichiurus lepturus | 42.71 | 40 | 2.20 | |
| Trachurus trecae | 41.71 | 1829 | 2.14 | 2991 |
| Trachurus trachurus | 8.00 | 57 | 0.41 | |
| Torpedo torpedo | 4.43 | 3 | 0.23 | |
| Total | 1945.42 | | 100.00 | |

PROJECT STATION:1791

DATE:21/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2211
start stop duration Long W 1653
TIME :22:11:40 22:39:11 28 (min) Purpose code: 1
LOG :4660.67 4662.27 1.60 Area code : 2
FDEPTH: 37 32 GearCond.code:
BDEPTH: 37 32 Validity code:
Towing dir: 180ø Wire out: 160 m Speed: 34 kn*10

Sorted: 31 Kg Total catch: 123.66 CATCH/HOUR: 264.99

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Pomadasys incisus | 184.29 | 763 | 69.55 | |
| Pagellus bellottii | 23.06 | 146 | 8.70 | |
| Trachurus trecae | 15.69 | 771 | 5.92 | |
| Decapterus rhonchus | 10.37 | 43 | 3.91 | |
| Plectorhinchus mediterraneus | 5.14 | 26 | 1.94 | |
| Umbrina canariensis | 3.73 | 9 | 1.41 | |
| Pagrus caeruleostictus | 3.60 | 9 | 1.36 | |
| Merluccius senegalensis | 3.43 | 17 | 1.29 | |
| Diplodus vulgaris | 3.34 | 9 | 1.26 | |
| Sepia officinalis hierredda | 3.17 | 17 | 1.20 | |
| Dentex gibbosus | 2.83 | 9 | 1.07 | |
| Sardinella aurita | 2.31 | 17 | 0.87 | |
| Diplodus bellottii | 1.63 | 43 | 0.62 | |
| Sardinella maderensis | 1.11 | 9 | 0.42 | |
| Arnoglossus imperialis | 0.77 | 17 | 0.29 | |
| Spondyliosoma cantharus | 0.51 | 17 | 0.19 | |
| Total | 264.98 | | 100.00 | |

PROJECT STATION:1792

DATE:22/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2217
start stop duration Long W 1655
TIME :01:25:33 01:44:45 19 (min) Purpose code: 1
LOG :4684.03 4685.01 0.98 Area code : 2
FDEPTH: 50 47 GearCond.code:
BDEPTH: 50 47 Validity code:
Towing dir: 108ø Wire out: 200 m Speed: 30 kn*10

Sorted: 59 Kg Total catch: 179.42 CATCH/HOUR: 566.59

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Pomadasys incisus | 195.16 | 824 | 34.44 | |
| Pagellus bellottii | 152.53 | 587 | 26.92 | |
| Umbrina canariensis | 55.89 | 152 | 9.86 | |
| Trachurus trecae, juvenile | 36.76 | 2018 | 6.49 | 2992 |
| Sardinella aurita | 29.84 | 76 | 5.27 | |
| Trachurus trecae | 26.34 | 142 | 4.65 | |
| Sardinella maderensis | 13.74 | 66 | 2.43 | |
| Trachurus trachurus | 11.75 | 95 | 2.07 | |
| Pagrus caeruleostictus | 8.15 | 19 | 1.44 | |
| Halobatrachus didactylus | 8.05 | 19 | 1.42 | |
| Dentex gibbosus | 7.58 | 38 | 1.34 | |
| Dentex canariensis | 6.73 | 19 | 1.19 | |
| Decapterus rhonchus | 5.12 | 19 | 0.90 | |
| Argyrosomus regius | 4.48 | 3 | 0.79 | |
| Spondyliosoma cantharus | 2.37 | 9 | 0.42 | |
| Trichiurus lepturus | 1.52 | 3 | 0.27 | |
| Aspitrigla obscura | 0.47 | 19 | 0.08 | |
| Citharus linguatula | 0.28 | 9 | 0.05 | |
| Total | 566.76 | | 100.03 | |

PROJECT STATION:1793

DATE:22/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2221
start stop duration Long W 1707
TIME :03:49:12 03:52:54 4 (min) Purpose code: 1
LOG :4700.48 4700.72 0.23 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 71 70 Validity code:
Towing dir: 108ø Wire out: 120 m Speed: 40 kn*10

Sorted: 30 Kg Total catch: 2513.45 CATCH/HOUR: 37701.75

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 36847.50 | 291975 | 97.73 | 2993 |
| Sardinella aurita | 854.25 | 10200 | 2.27 | |
| Total | 37701.75 | | 100.00 | |

PROJECT STATION:1794

DATE:22/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2232
start stop duration Long W 1710
TIME :08:47:00 09:15:58 29 (min) Purpose code: 1
LOG :4731.45 4733.18 1.73 Area code : 2
FDEPTH: 90 107 GearCond.code:
BDEPTH: 90 107 Validity code:
Towing dir: 90ø Wire out: 300 m Speed: 35 kn*10

Sorted: 30 Kg Total catch: 603.92 CATCH/HOUR: 1249.49

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 535.86 | 23834 | 42.89 | 2997 |
| Scomber japonicus | 322.34 | 5214 | 25.80 | 2994 |
| Trachurus trachurus | 289.66 | 2979 | 23.18 | 2995 |
| Zenopsis conchifer | 47.17 | 166 | 3.78 | |
| Trachurus trachurus, juveniles | 37.24 | 1903 | 2.98 | 2996 |
| Zeus faber | 8.19 | 6 | 0.66 | |
| Capros aper | 4.55 | 248 | 0.36 | |
| Loligo vulgaris | 2.17 | 19 | 0.17 | |
| Spondyliosoma cantharus | 1.94 | 4 | 0.16 | |
| Dentex macrophthalmus | 0.25 | 2 | 0.02 | |
| Illex coindetii | 0.10 | 2 | 0.01 | |
| Total | 1249.47 | | 100.01 | |

PROJECT STATION:1795

DATE:22/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2229
start stop duration Long W 1659
TIME :11:12:23 11:48:25 36 (min) Purpose code: 1
LOG :4748.03 4750.15 2.12 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 61 57 Validity code:
Towing dir: 288ø Wire out: 110 m Speed: 35 kn*10

Sorted: Kg Total catch: 1.89 CATCH/HOUR: 3.15

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Zeus faber | 3.15 | 2 | 100.00 | |
| Total | 3.15 | | 100.00 | |

PROJECT STATION:1796

DATE:22/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2228

| | start | stop | duration | | | Long W 1656 |
|---|---|---|---|---|---|---|
| TIME | :12:56:32 | 13:16:22 | 20 | (min) | Purpose code: | 1 |
| LOG | :4757.93 | 4759.19 | 1.26 | | Area code : | 2 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 60 | 59 | | | Validity code: | |

Towing dir: 108ø Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 60.31 CATCH/HOUR: 180.93

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 93.45 | 660 | 51.65 | 2999 |
| Sardina pilchardus | 67.05 | 513 | 37.06 | 2998 |
| Sardinella maderensis | 15.96 | 63 | 8.82 | |
| Trichiurus lepturus | 4.47 | 9 | 2.47 | |
| Total | 180.93 | | 100.00 | |

PROJECT STATION:1797

DATE:22/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2223

| | start | stop | duration | | | Long W 1638 |
|---|---|---|---|---|---|---|
| TIME | :16:02:15 | 16:23:40 | 21 | (min) | Purpose code: | 1 |
| LOG | :4780.60 | 4781.96 | 1.36 | | Area code : | 2 |
| FDEPTH: | 1 | 1 | | | GearCond.code: | |
| BDEPTH: | 35 | 38 | | | Validity code: | |

Towing dir: 288ø Wire out: 160 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 1123.80 CATCH/HOUR: 3210.86

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1795.00 | 12400 | 55.90 | 3001 |
| Sardinella aurita | 1175.00 | 8200 | 36.59 | 3000 |
| Trachurus trecae | 141.00 | 1500 | 4.39 | |
| Trachurus trachurus | 64.00 | 500 | 1.99 | |
| Gymnura altavela | 31.57 | 3 | 0.98 | |
| Campogramma glaycos | 2.14 | 3 | 0.07 | |
| Diplodus puntazzo | 2.14 | 3 | 0.07 | |
| Total | 3210.85 | | 99.99 | |

PROJECT STATION:1798

DATE:22/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2234

| | start | stop | duration | | | Long W 1635 |
|---|---|---|---|---|---|---|
| TIME | :20:03:40 | 20:34:17 | 31 | (min) | Purpose code: | 1 |
| LOG | :4814.15 | 4816.15 | 1.99 | | Area code : | 2 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 35 | 43 | | | Validity code: | |

Towing dir: 284ø Wire out: 120 m Speed: 40 kn*10

Sorted: 30 Kg Total catch: 223.04 CATCH/HOUR: 431.69

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 245.23 | 1951 | 56.81 | 3003 |
| Sardinella aurita | 162.58 | 1409 | 37.66 | 3002 |
| Trichiurus lepturus | 7.45 | 10 | 1.73 | |
| Diplodus sargus * | 4.16 | 4 | 0.96 | |
| Scomber japonicus | 4.06 | 54 | 0.94 | |
| Trachurus trecae | 3.39 | 135 | 0.79 | |
| Loligo vulgaris | 2.52 | 17 | 0.58 | |
| Sepia officinalis hierredda | 1.74 | 4 | 0.40 | |
| Sepia orbignyana | 0.29 | 2 | 0.07 | |
| Trachurus trachurus | 0.27 | 14 | 0.06 | |
| Total | 431.69 | | 100.00 | |

PROJECT STATION:1799

DATE:22/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2241

| | start | stop | duration | | | Long W 1701 |
|---|---|---|---|---|---|---|
| TIME | :23:11:45 | 23:30:14 | 18 | (min) | Purpose code: | 1 |
| LOG | :4840.81 | 4842.00 | 1.19 | | Area code : | 2 |
| FDEPTH: | 15 | 15 | | | GearCond.code: | |
| BDEPTH: | 68 | 60 | | | Validity code: | |

Towing dir: 104ø Wire out: 150 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 105.33 CATCH/HOUR: 351.10

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 201.00 | 2040 | 57.25 | 3004 |
| Trachurus trecae, juvenile | 94.00 | 4720 | 26.77 | 3005 |
| Scomber japonicus | 54.50 | 1110 | 15.52 | 3006 |
| Sardinella aurita | 1.00 | 10 | 0.28 | |
| BELONIDAE | 0.60 | 10 | 0.17 | |
| Total | 351.10 | | 99.99 | |

PROJECT STATION:1800

DATE:23/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2254

| | start | stop | duration | | | Long W 1703 |
|---|---|---|---|---|---|---|
| TIME | :03:48:50 | 03:56:03 | 7 | (min) | Purpose code: | 1 |
| LOG | :4877.50 | 4877.98 | 0.47 | | Area code : | 2 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 100 | 104 | | | Validity code: | |

Towing dir: 288ø Wire out: 150 m Speed: 40 kn*10

Sorted: 31 Kg Total catch: 465.90 CATCH/HOUR: 3993.43

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae | 2070.00 | 113914 | 51.84 | 3007 |
| Sardina pilchardus | 1857.86 | 42300 | 46.52 | 3008 |
| Scomber japonicus | 65.57 | 1414 | 1.64 | |
| Total | 3993.43 | | 100.00 | |

PROJECT STATION:1801

DATE:23/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2245

| | start | stop | duration | | | Long W 1632 |
|---|---|---|---|---|---|---|
| TIME | :08:04:14 | 08:33:11 | 29 | (min) | Purpose code: | 1 |
| LOG | :4911.61 | 4913.48 | 1.84 | | Area code : | 2 |
| FDEPTH: | 15 | 15 | | | GearCond.code: | |
| BDEPTH: | 36 | 40 | | | Validity code: | |

Towing dir: 190ø Wire out: 120 m Speed: 40 kn*10

Sorted: 33 Kg Total catch: 101.05 CATCH/HOUR: 209.07

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 127.68 | 1080 | 61.07 | 3009 |
| Sardinella aurita | 81.31 | 763 | 38.89 | 3010 |
| Sepia officinalis hierredda | 0.08 | 2 | 0.04 | |
| Total | 209.07 | | 100.00 | |

PROJECT STATION:1802

DATE:23/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2257

| | start | stop | duration | | | Long W 1633 |
|---|---|---|---|---|---|---|
| TIME | :12:45:18 | 12:57:10 | 12 | (min) | Purpose code: | 1 |
| LOG | :4950.78 | 4951.57 | 0.78 | | Area code : | 2 |
| FDEPTH: | 15 | 20 | | | GearCond.code: | |
| BDEPTH: | 40 | 38 | | | Validity code: | |

Towing dir: 111ø Wire out: 100 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 2989.02 CATCH/HOUR: 14945.10

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 13671.00 | 143220 | 91.47 | 3011 |
| Scomber japonicus | 916.05 | 11625 | 6.13 | |
| Sardinella aurita | 181.35 | 2325 | 1.21 | |
| Trachurus trecae, juvenile | 176.70 | 7440 | 1.18 | |
| Total | 14945.10 | | 99.99 | |

PROJECT STATION:1803

DATE:23/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2317

| | start | stop | duration | | | Long W 1651 |
|---|---|---|---|---|---|---|
| TIME | :19:32:19 | 19:54:20 | 22 | (min) | Purpose code: | 1 |
| LOG | :5013.68 | 5014.99 | 1.31 | | Area code : | 2 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 67 | 69 | | | Validity code: | |

Towing dir: 113ø Wire out: 120 m Speed: 38 kn*10

Sorted: 30 Kg Total catch: 315.39 CATCH/HOUR: 860.15

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 422.73 | 9027 | 49.15 | 3012 |
| Trachurus trachurus, juveniles | 287.73 | 16064 | 33.45 | 3013 |
| Scomber japonicus | 110.45 | 1773 | 12.84 | 3014 |
| Auxis rochei | 33.00 | 38 | 3.84 | |
| Sardinella aurita | 5.73 | 55 | 0.67 | |
| Sepia orbignyana | 0.41 | 3 | 0.05 | |
| Loligo vulgaris | 0.11 | 3 | 0.01 | |
| Total | 860.16 | | 100.01 | |

PROJECT STATION:1804

DATE:23/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2314

| | start | stop | duration | | | Long W 1643 |
|---|---|---|---|---|---|---|
| TIME | :21:40:38 | 21:52:27 | 12 | (min) | Purpose code: | 1 |
| LOG | :5027.80 | 5028.52 | 0.70 | | Area code : | 2 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 56 | 56 | | | Validity code: | |

Towing dir: 300ø Wire out: 120 m Speed: 37 kn*10

Sorted: 34 Kg Total catch: 346.70 CATCH/HOUR: 1733.50

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1382.50 | 8150 | 79.75 | 3015 |
| Trachurus trecae, juvenile | 187.50 | 7460 | 10.82 | 3017 |
| Scomber japonicus | 163.50 | 2200 | 9.43 | 3016 |
| Total | 1733.50 | | 100.00 | |

PROJECT STATION:1805

DATE:24/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2307

| | start | stop | duration | | | Long W 1626 |
|---|---|---|---|---|---|---|
| TIME | :00:13:54 | 00:24:29 | 11 | (min) | Purpose code: | 1 |
| LOG | :5048.20 | 5048.92 | 0.72 | | Area code : | 2 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 28 | 27 | | | Validity code: | |

Towing dir: 113ø Wire out: 150 m Speed: 40 kn*10

Sorted: 36 Kg Total catch: 295.50 CATCH/HOUR: 1611.82

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 739.64 | 6720 | 45.89 | 3018 |
| Sardinella aurita | 669.82 | 6327 | 41.56 | 3019 |
| Decapterus rhonchus | 102.55 | 960 | 6.36 | |
| Diplodus vulgaris | 26.18 | 38 | 1.62 | |
| Trichiurus lepturus | 16.09 | 11 | 1.00 | |
| Diplodus sargus * | 13.91 | 11 | 0.86 | |
| Pagellus bellottii | 13.09 | 87 | 0.81 | |
| Sardinella maderensis | 10.91 | 44 | 0.68 | |
| Pomadasys incisus | 10.91 | 44 | 0.68 | |
| Diplodus bellottii | 8.73 | 131 | 0.54 | |
| Total | 1611.83 | | 100.00 | |

PROJECT STATION:1806

DATE:24/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2338
start stop duration Long W 1653
TIME :08:48:33 09:06:24 18 (min) Purpose code: 1
LOG :5130.09 5131.07 0.98 Area code : 2
FDEPTH: 115 113 GearCond.code:
BDEPTH: 115 113 Validity code:
Towing dir: 200ø Wire out: 320 m Speed: 33 kn*10

Sorted: 32 Kg Total catch: 138.25 CATCH/HOUR: 460.83

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 426.67 | 3807 | 92.59 | 3021 |
| Lepidopus caudatus | 19.83 | 17 | 4.30 | |
| Trachurus trecae | 5.50 | 33 | 1.19 | 3020 |
| Sphoeroides pachgaster | 4.67 | 7 | 1.01 | |
| Pagellus acarne | 3.17 | 10 | 0.69 | |
| Boops boops | 0.67 | 3 | 0.15 | |
| Illex coindetii | 0.33 | 3 | 0.07 | |
| Total | 460.84 | | 100.00 | |

PROJECT STATION:1807

DATE:24/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2334
start stop duration Long W 1643
TIME :10:40:52 11:11:23 31 (min) Purpose code: 1
LOG :5144.45 5146.37 1.93 Area code : 2
FDEPTH: 66 66 GearCond.code:
BDEPTH: 66 66 Validity code:
Towing dir: 205ø Wire out: 210 m Speed: 35 kn*10

Sorted: 33 Kg Total catch: 683.70 CATCH/HOUR: 1323.29

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 619.35 | 5528 | 46.80 | |
| Trachurus trachurus | 454.84 | 12157 | 34.37 | 3023 |
| Sardina pilchardus | 176.13 | 3523 | 13.31 | 3022 |
| Pagellus acarne | 26.32 | 116 | 1.99 | |
| Pagellus bellottii | 17.42 | 116 | 1.32 | |
| Zeus faber | 16.06 | 12 | 1.21 | |
| Loligo vulgaris | 10.06 | 48 | 0.76 | |
| Boops boops | 3.10 | 39 | 0.23 | |
| Total | 1323.28 | | 99.99 | |

PROJECT STATION:1808

DATE:24/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2325
start stop duration Long W 1619
TIME :14:13:22 14:27:06 14 (min) Purpose code: 1
LOG :5174.73 5175.42 0.67 Area code : 2
FDEPTH: 29 30 GearCond.code:
BDEPTH: 29 30 Validity code:
Towing dir: 289ø Wire out: 125 m Speed: 30 kn*10

Sorted: 33 Kg Total catch: 173.98 CATCH/HOUR: 745.63

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Diplodus bellottii | 431.79 | 4671 | 57.91 | |
| Pomadasys incisus | 192.86 | 1007 | 25.87 | |
| Argyrosomus regius | 24.00 | 21 | 3.22 | |
| Scomber japonicus | 17.14 | 193 | 2.30 | |
| Pagellus bellottii | 15.43 | 129 | 2.07 | |
| Sardina pilchardus | 15.00 | 129 | 2.01 | |
| Plectorhinchus mediterraneus | 10.29 | 9 | 1.38 | |
| Trachurus trecae | 9.86 | 236 | 1.32 | |
| Trachurus trachurus | 9.21 | 150 | 1.24 | |
| Aspitrigla obscura | 6.64 | 64 | 0.89 | |
| Loligo vulgaris | 5.19 | 21 | 0.70 | |
| Spondyliosoma cantharus | 3.86 | 64 | 0.52 | |
| Diplodus vulgaris | 1.80 | 4 | 0.24 | |
| Pseudupeneus prayensis | 1.50 | 21 | 0.20 | |
| Trachinus draco | 1.07 | 21 | 0.14 | |
| Total | 745.64 | | 100.01 | |

PROJECT STATION:1809

DATE:24/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2334
start stop duration Long W 1616
TIME :17:26:13 17:41:01 15 (min) Purpose code: 1
LOG :5202.85 5203.84 0.99 Area code : 2
FDEPTH: 1 1 GearCond.code:
BDEPTH: 31 33 Validity code:
Towing dir: 292ø Wire out: 150 m Speed: 40 kn*10

Sorted: 34 Kg Total catch: 512.94 CATCH/HOUR: 2051.76

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1284.00 | 10440 | 62.58 | 3024 |
| Trachurus trachurus | 310.20 | 10140 | 15.12 | 3025 |
| Pagellus bellottii | 243.00 | 1200 | 11.84 | |
| Sardinella aurita | 212.40 | 2100 | 10.35 | 3026 |
| Sphyraena sphyraena | 2.16 | 4 | 0.11 | |
| Total | 2051.76 | | 100.00 | |

PROJECT STATION:1810

DATE:24/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2343
start stop duration Long W 1637
TIME :20:26:38 20:55:51 29 (min) Purpose code: 1
LOG :5229.85 5231.58 1.72 Area code : 2
FDEPTH: 60 60 GearCond.code:
BDEPTH: 60 60 Validity code:
Towing dir: 180ø Wire out: 200 m Speed:350 kn*10

Sorted: 32 Kg Total catch: 981.00 CATCH/HOUR: 2029.66

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trachurus | 1505.17 | 38172 | 74.16 | 3027 |
| Pagellus bellottii | 87.52 | 621 | 4.31 | |
| Pagellus acarne | 79.45 | 372 | 3.91 | |
| Pomadasys incisus | 65.79 | 372 | 3.24 | |
| Diplodus vulgaris | 47.17 | 124 | 2.32 | |
| Spondyliosoma cantharus | 44.69 | 186 | 2.20 | |
| Plectorhinchus mediterraneus | 43.45 | 62 | 2.14 | |
| Aspitrigla obscura | 36.00 | 434 | 1.77 | |
| Dentex macrophthalmus | 31.66 | 248 | 1.56 | |
| Umbrina canariensis | 31.66 | 124 | 1.56 | |
| Boops boops | 21.10 | 310 | 1.04 | |
| Dentex canariensis | 19.86 | 62 | 0.98 | |
| Sardina pilchardus | 12.41 | 124 | 0.61 | |
| Scomber japonicus | 3.72 | 62 | 0.18 | |
| Total | 2029.65 | | 99.98 | |

PROJECT STATION:1811

DATE:25/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2354
start stop duration Long W 1639
TIME :00:45:00 00:53:22 8 (min) Purpose code: 1
LOG :5264.03 5264.58 0.54 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 69 67 Validity code:
Towing dir: 114ø Wire out: 120 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 989.52 CATCH/HOUR: 7421.40

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 3336.38 | 171675 | 44.96 | 3030 |
| Sardina pilchardus | 3150.38 | 69285 | 42.45 | 3028 |
| Scomber japonicus | 920.70 | 18833 | 12.41 | 3029 |
| Loligo vulgaris | 13.95 | 233 | 0.19 | |
| Total | 7421.41 | | 100.01 | |

PROJECT STATION:1812

DATE:25/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2341
start stop duration Long W 1608
TIME :04:21:36 04:25:49 4 (min) Purpose code: 1
LOG :5295.68 5295.95 0.26 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 31 31 Validity code:
Towing dir: 114ø Wire out: 150 m Speed: 40 kn*10

Sorted: 33 Kg Total catch: 99.78 CATCH/HOUR: 1496.70

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1381.50 | 11790 | 92.30 | 3031 |
| Scomber japonicus | 40.50 | 225 | 2.71 | |
| Sardinella aurita | 35.10 | 270 | 2.35 | |
| Trachurus trachurus, juveniles | 18.45 | 540 | 1.23 | |
| Trachurus trachurus | 10.80 | 90 | 0.72 | |
| Dentex macrophthalmus | 6.75 | 45 | 0.45 | |
| Trachurus trecae, juvenile | 3.60 | 90 | 0.24 | |
| Total | 1496.70 | | 100.00 | |

PROJECT STATION:1813

DATE:25/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2359
start stop duration Long W 1624
TIME :09:07:19 09:19:30 12 (min) Purpose code: 1
LOG :5340.12 5340.91 0.79 Area code : 2
FDEPTH: 62 62 GearCond.code:
BDEPTH: 62 62 Validity code:
Towing dir: 195ø Wire out: 180 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 660.37 CATCH/HOUR: 3301.85

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trachurus | 2970.00 | 92765 | 89.95 | 3032 |
| Pomadasys incisus | 112.00 | 600 | 3.39 | |
| Sardina pilchardus | 99.00 | 2500 | 3.00 | 3033 |
| Pagellus acarne | 62.00 | 200 | 1.88 | |
| Dentex canariensis | 26.85 | 80 | 0.81 | |
| Scomber japonicus | 8.00 | 200 | 0.24 | |
| Zeus faber | 6.50 | 5 | 0.20 | |
| Pagellus bellottii | 4.15 | 20 | 0.13 | |
| Boops boops | 3.45 | 55 | 0.10 | |
| Pagellus erythrinus | 3.40 | 5 | 0.10 | |
| Diplodus vulgaris | 2.95 | 10 | 0.09 | |
| Loligo vulgaris | 2.30 | 10 | 0.07 | |
| Spondyliosoma cantharus | 1.25 | 5 | 0.04 | |
| Total | 3301.85 | | 100.00 | |

PROJECT STATION:1814

DATE:25/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2406
start stop duration Long W 1618
TIME :15:59:17 16:29:14 30 (min) Purpose code: 1
LOG :5401.90 5403.60 1.68 Area code : 2
FDEPTH: 64 67 GearCond.code:
BDEPTH: 64 67 Validity code:
Towing dir: 296ø Wire out: 230 m Speed: 31 kn*10

Sorted: 36 Kg Total catch: 108.49 CATCH/HOUR: 216.98

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trachurus, juveniles | 136.50 | 4956 | 62.91 | 3034 |
| Pagellus acarne | 31.32 | 72 | 14.43 | |
| Zeus faber | 16.80 | 18 | 7.74 | |
| Pagellus bellottii | 13.38 | 72 | 6.17 | |
| Dentex canariensis | 4.32 | 18 | 1.99 | |
| Boops boops | 3.06 | 48 | 1.41 | |
| Pomadasys incisus | 2.64 | 12 | 1.22 | |
| Dentex maroccanus | 2.58 | 36 | 1.19 | |
| Loligo vulgaris | 1.88 | 16 | 0.87 | |
| Scomber japonicus | 1.80 | 48 | 0.83 | |
| Aspitrigla obscura | 0.54 | 12 | 0.25 | |
| Total | 214.82 | | 99.01 | |

PROJECT STATION:1815

DATE:25/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2403
start stop duration Long W 1611
TIME :17:50:37 18:03:31 13 (min) Purpose code: 1
LOG :5413.78 5414.64 0.84 Area code : 2
FDEPTH: 20 40 GearCond.code:
BDEPTH: 53 54 Validity code:
Towing dir: 296ø Wire out: 110 m Speed: 40 kn*10

Sorted: 2 Kg Total catch: 2.23 CATCH/HOUR: 10.29

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 10.29 | 69 | 100.00 | 3035 |
| Total | 10.29 | | 100.00 | |

PROJECT STATION:1816

DATE:25/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2404
start stop duration Long W 1613
TIME :18:38:39 19:06:15 28 (min) Purpose code: 1
LOG :5417.15 5418.83 1.66 Area code : 2
FDEPTH: 56 51 GearCond.code:
BDEPTH: 56 51 Validity code:
Towing dir: 116ø Wire out: 200 m Speed: 36 kn*10

Sorted: 31 Kg Total catch: 780.40 CATCH/HOUR: 1672.29

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Pomadasys incisus | 392.68 | 2518 | 23.48 | |
| Pagellus acarne | 356.25 | 1500 | 21.30 | |
| Diplodus vulgaris | 189.64 | 857 | 11.34 | |
| Pagellus bellottii | 164.46 | 1179 | 9.83 | |
| Trachurus trachurus | 135.00 | 1929 | 8.07 | 3036 |
| Plectorhinchus mediterraneus | 130.18 | 214 | 7.78 | |
| Dentex canariensis | 108.75 | 375 | 6.50 | |
| Loligo vulgaris | 69.64 | 214 | 4.16 | |
| Aspitrigla obscura | 45.00 | 696 | 2.69 | |
| Umbrina canariensis | 19.29 | 54 | 1.15 | |
| Trachinus vipera | 13.93 | 161 | 0.83 | |
| Boops boops | 12.32 | 107 | 0.74 | |
| Dentex macrophthalmus | 10.71 | 54 | 0.64 | |
| Sardina pilchardus | 10.18 | 161 | 0.61 | |
| Spondyliosoma cantharus | 8.04 | 54 | 0.48 | |
| Sepia officinalis hierredda | 4.07 | 2 | 0.24 | |
| Total | 1670.14 | | 99.84 | |

PROJECT STATION:1817

DATE:25/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2359
start stop duration Long W 1602
TIME :20:40:00 21:07:08 27 (min) Purpose code: 1
LOG :5429.63 5431.44 1.98 Area code : 2
FDEPTH: 15 15 GearCond.code:
BDEPTH: 35 33 Validity code:
Towing dir: 296ø Wire out: 120 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 806.00 CATCH/HOUR: 1791.11

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1661.11 | 21944 | 92.74 | 3037 |
| Scomber japonicus | 125.56 | 556 | 7.01 | 3038 |
| Trachurus trachurus | 4.44 | 111 | 0.25 | |
| Total | 1791.11 | | 100.00 | |

PROJECT STATION:1818

DATE:25/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2401
start stop duration Long W 1551
TIME :23:26:17 23:36:20 10 (min) Purpose code: 1
LOG :5452.84 5453.50 0.66 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 24 24 Validity code:
Towing dir: 81ø Wire out: 100 m Speed: 40 kn*10

Sorted: 37 Kg Total catch: 739.46 CATCH/HOUR: 4436.76

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 4338.00 | 43200 | 97.77 | 3039 |
| Scomber japonicus | 72.00 | 240 | 1.62 | |
| Trachurus trachurus | 20.40 | 240 | 0.46 | |
| Dentex canariensis | 1.56 | 6 | 0.04 | |
| Trachurus trecae, juvenile | 0.48 | 120 | 0.01 | |
| Total | 4432.44 | | 99.90 | |

PROJECT STATION:1819

DATE:26/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2418
start stop duration Long W 1619
TIME :03:57:38 04:04:29 7 (min) Purpose code: 1
LOG :5494.79 5495.20 0.40 Area code : 2
FDEPTH: 40 45 GearCond.code:
BDEPTH: 70 69 Validity code:
Towing dir: 120ø Wire out: 150 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 889.56 CATCH/HOUR: 7624.80

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trecae, juvenile | 6924.00 | 221760 | 90.81 | 3040 |
| Scomber japonicus | 367.20 | 5040 | 4.82 | |
| Sardina pilchardus | 316.80 | 9120 | 4.15 | |
| Boops boops | 16.80 | 240 | 0.22 | |
| Total | 7624.80 | | 100.00 | |

PROJECT STATION:1820

DATE:26/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2422
start stop duration Long W 1609
TIME :14:14:18 14:44:31 30 (min) Purpose code: 1
LOG :5575.77 5577.56 1.78 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 61 63 Validity code:
Towing dir: 298ø Wire out: m Speed: kn*10

Sorted: Kg Total catch: 0.08 CATCH/HOUR: 0.16

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Aspitrigla obscura | 0.10 | 2 | 62.50 | |
| Trachurus trachurus | 0.06 | 2 | 37.50 | |
| Total | 0.16 | | 100.00 | |

PROJECT STATION:1821

DATE:26/11/02 GEAR TYPE: PT No: 4 POSITION:Lat N 2413
start stop duration Long W 1549
TIME :17:47:28 18:03:55 16 (min) Purpose code: 1
LOG :5602.05 5603.14 1.08 Area code : 2
FDEPTH: 1 1 GearCond.code:
BDEPTH: 31 31 Validity code:
Towing dir: 298ø Wire out: 150 m Speed: 42 kn*10

Sorted: 38 Kg Total catch: 3057.60 CATCH/HOUR: 11466.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 10485.00 | 104850 | 91.44 | 3041 |
| Scomber japonicus | 981.00 | 4331 | 8.56 | 3042 |
| Total | 11466.00 | | 100.00 | |

PROJECT STATION:1822

DATE:26/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2416
start stop duration Long W 1535
TIME :21:08:00 21:14:36 6 (min) Purpose code: 1
LOG :5629.60 5631.30 1.70 Area code : 2
FDEPTH: 22 22 GearCond.code:
BDEPTH: 22 22 Validity code:
Towing dir: 300ø Wire out: 100 m Speed: 39 kn*10

Sorted: 33 Kg Total catch: 340.87 CATCH/HOUR: 3408.70

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 3340.00 | 30870 | 97.98 | 3043 |
| Scomber japonicus | 25.00 | 100 | 0.73 | |
| Sardinella aurita | 14.40 | 100 | 0.42 | |
| Raja undulata | 10.60 | 10 | 0.31 | |
| Trachurus trachurus | 10.00 | 300 | 0.29 | |
| Sardinella maderensis | 3.40 | 20 | 0.10 | |
| Diplodus bellottii | 2.80 | 30 | 0.08 | |
| Decapterus rhonchus | 2.50 | 20 | 0.07 | |
| Total | 3408.70 | | 99.98 | |

PROJECT STATION:1823

DATE:26/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2426
start stop duration Long W 1555
TIME :23:50:55 23:57:47 7 (min) Purpose code: 1
LOG :5653.08 5653.57 0.49 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 44 43 Validity code:
Towing dir: 120ø Wire out: 130 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 256.27 CATCH/HOUR: 2196.60

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1220.57 | 25029 | 55.57 | 3044 |
| Trachurus trecae, juvenile | 617.14 | 24411 | 28.10 | 3045 |
| Scomber japonicus | 259.20 | 2674 | 11.80 | 3046 |
| Pagellus bellottii | 69.94 | 343 | 3.18 | |
| Trachurus trachurus | 17.14 | 137 | 0.78 | |
| Pomadasys incisus | 9.60 | 69 | 0.44 | |
| Loligo vulgaris | 3.00 | 9 | 0.14 | |
| Total | 2196.59 | | 100.01 | |

PROJECT STATION:1824

DATE:27/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2427
start stop duration Long W 1532
TIME :09:20:40 09:27:18 7 (min) Purpose code: 1
LOG :5743.28 5743.77 0.48 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 27 27 Validity code:
Towing dir: 220ø Wire out: 100 m Speed: 34 kn*10

Sorted: 73 Kg Total catch: 73.00 CATCH/HOUR: 625.71

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 598.97 | 5957 | 95.73 | 3047 |
| Scomber japonicus | 26.74 | 111 | 4.27 | 3048 |
| Total | 625.71 | | 100.00 | |

PROJECT STATION:1825

DATE:27/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2427
start stop duration Long W 1532
TIME :10:02:41 10:16:51 14 (min) Purpose code: 1
LOG :5746.90 5747.88 0.97 Area code : 2
FDEPTH: 27 27 GearCond.code:
BDEPTH: 27 27 Validity code:
Towing dir: 220ø Wire out: 130 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 7320.26 CATCH/HOUR: 31372.54

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 29979.00 | 286200 | 95.56 | 3049 |
| Scomber japonicus | 693.00 | 2541 | 2.21 | 3050 |
| Diplodus bellottii | 657.00 | 8100 | 2.09 | |
| Trachurus trecae, juvenile | 36.00 | 900 | 0.11 | |
| Loligo vulgaris | 5.10 | 4 | 0.02 | |
| Spondyliosoma cantharus | 2.44 | 4 | 0.01 | |
| Total | 31372.54 | | 100.00 | |

PROJECT STATION:1826

DATE:27/11/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2429
start stop duration Long W 1521
TIME :12:46:29 13:05:52 19 (min) Purpose code: 1
LOG :5767.95 5769.35 1.38 Area code : 2
FDEPTH: 1 1 GearCond.code:
BDEPTH: 23 24 Validity code:
Towing dir: 265ø Wire out: 150 m Speed: 40 kn*10

Sorted: Kg Total catch: 16.08 CATCH/HOUR: 50.78

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 50.21 | 471 | 98.88 | 3051 |
| BELONIDAE | 0.35 | 3 | 0.69 | |
| Scomber japonicus | 0.22 | 3 | 0.43 | |
| Total | 50.78 | | 100.00 | |

PROJECT STATION:1827

DATE:27/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2444

| | start | stop | duration | | | Long W 1545 |
|---|---|---|---|---|---|---|
| TIME | :17:42:52 | 17:57:22 | 15 | (min) | Purpose code: | 1 |
| LOG | :5812.81 | 5813.53 | 0.71 | | Area code : | 2 |
| FDEPTH: | 46 | 45 | | | GearCond.code: | |
| BDEPTH: | 46 | 45 | | | Validity code: | |

Towing dir: 116ø Wire out: 200 m Speed: 30 kn*10

Sorted: Kg Total catch: 3.93 CATCH/HOUR: 15.72

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Dentex gibbosus | 6.68 | 4 | 42.49 | |
| Loligo vulgaris | 4.32 | 20 | 27.48 | |
| Spondyliosoma cantharus | 1.56 | 12 | 9.92 | |
| Trachinus vipera | 1.48 | 20 | 9.41 | |
| Scomber japonicus | 0.64 | 4 | 4.07 | |
| Dentex canariensis | 0.40 | 4 | 2.54 | |
| Trachurus trachurus, juveniles | 0.32 | 8 | 2.04 | |
| Pagellus bellottii | 0.32 | 4 | 2.04 | |
| Total | 15.72 | | 99.99 | |

PROJECT STATION:1828

DATE:27/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2443

| | start | stop | duration | | | Long W 1544 |
|---|---|---|---|---|---|---|
| TIME | :18:25:21 | 19:01:11 | 36 | (min) | Purpose code: | 1 |
| LOG | :5815.78 | 5816.56 | 0.76 | | Area code : | 2 |
| FDEPTH: | 45 | 44 | | | GearCond.code: | |
| BDEPTH: | 45 | 44 | | | Validity code: | |

Towing dir: 120ø Wire out: 200 m Speed: 38 kn*10

Sorted: Kg Total catch: 39.30 CATCH/HOUR: 65.50

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trachurus | 43.00 | 1232 | 65.65 | 3052 |
| Trichiurus lepturus | 10.17 | 5 | 15.53 | |
| Pagellus bellottii | 4.68 | 32 | 7.15 | |
| Pomadasys incisus | 2.47 | 15 | 3.77 | |
| Loligo vulgaris | 1.55 | 8 | 2.37 | |
| Spondyliosoma cantharus | 1.38 | 8 | 2.11 | |
| Trachinus vipera | 0.72 | 8 | 1.10 | |
| Aspitrigla obscura | 0.50 | 3 | 0.76 | |
| Dentex canariensis | 0.45 | 2 | 0.69 | |
| Pagellus acarne | 0.28 | 2 | 0.43 | |
| Mullus surmuletus | 0.18 | 2 | 0.27 | |
| Trigloporus lastoviza africanu | 0.12 | 2 | 0.18 | |
| Total | 65.50 | | 100.01 | |

PROJECT STATION:1829

DATE:27/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2445

| | start | stop | duration | | | Long W 1548 |
|---|---|---|---|---|---|---|
| TIME | :19:44:43 | 19:49:13 | 5 | (min) | Purpose code: | 1 |
| LOG | :5824.49 | 5824.80 | 0.30 | | Area code : | 2 |
| FDEPTH: | 30 | 30 | | | GearCond.code: | |
| BDEPTH: | 47 | 47 | | | Validity code: | |

Towing dir: 120ø Wire out: 120 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 1748.00 CATCH/HOUR: 20976.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 14730.00 | 265200 | 70.22 | 3054 |
| Sardina pilchardus | 5940.00 | 151800 | 28.32 | 3053 |
| Pagellus bellottii | 180.00 | 600 | 0.86 | |
| Trachurus trachurus | 126.00 | 4800 | 0.60 | |
| Total | 20976.00 | | 100.00 | |

PROJECT STATION:1830

DATE:28/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2453

| | start | stop | duration | | | Long W 1539 |
|---|---|---|---|---|---|---|
| TIME | :03:44:19 | 03:59:10 | 15 | (min) | Purpose code: | 1 |
| LOG | :5896.85 | 5897.87 | 1.00 | | Area code : | 2 |
| FDEPTH: | 20 | 25 | | | GearCond.code: | |
| BDEPTH: | 50 | 54 | | | Validity code: | |

Towing dir: 296ø Wire out: 110 m Speed: 40 kn*10

Sorted: 34 Kg Total catch: 277.80 CATCH/HOUR: 1111.20

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1059.20 | 14016 | 95.32 | 3055 |
| Scomber japonicus | 35.52 | 288 | 3.20 | |
| Trichiurus lepturus | 15.20 | 8 | 1.37 | |
| Pagellus bellottii | 1.28 | 8 | 0.12 | |
| Total | 1111.20 | | 100.01 | |

PROJECT STATION:1831

DATE:28/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2450

| | start | stop | duration | | | Long W 1533 |
|---|---|---|---|---|---|---|
| TIME | :05:20:34 | 05:35:20 | 15 | (min) | Purpose code: | 1 |
| LOG | :5907.60 | 5908.39 | 0.78 | | Area code : | 2 |
| FDEPTH: | 42 | 43 | | | GearCond.code: | |
| BDEPTH: | 42 | 43 | | | Validity code: | |

Towing dir: 296ø Wire out: 190 m Speed: 31 kn*10

Sorted: 32 Kg Total catch: 82.64 CATCH/HOUR: 330.56

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 159.20 | 1688 | 48.16 | 3056 |
| Trichiurus lepturus | 64.20 | 24 | 19.42 | |
| Trachurus trachurus | 56.88 | 1864 | 17.21 | 3057 |
| Pagellus bellottii | 16.80 | 112 | 5.08 | |
| Loligo vulgaris | 8.84 | 20 | 2.67 | |
| Spondyliosoma cantharus | 6.88 | 40 | 2.08 | |
| Octopus vulgaris | 3.20 | 4 | 0.97 | |
| Pomadasys incisus | 3.04 | 16 | 0.92 | |
| Trachinus vipera | 2.88 | 40 | 0.87 | |
| Scomber japonicus | 2.24 | 16 | 0.68 | |
| Dentex canariensis | 2.16 | 8 | 0.65 | |
| Aspitrigla obscura | 1.68 | 24 | 0.51 | |
| Pagellus acarne | 0.96 | 8 | 0.29 | |
| Mullus surmuletus | 0.88 | 8 | 0.27 | |
| Boops boops | 0.72 | 8 | 0.22 | |
| Total | 330.56 | | 100.00 | |

PROJECT STATION:1832

DATE:28/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2446

| | start | stop | duration | | | Long W 1524 |
|---|---|---|---|---|---|---|
| TIME | :07:19:09 | 07:48:30 | 29 | (min) | Purpose code: | 1 |
| LOG | :5921.84 | 5923.94 | 2.07 | | Area code : | 2 |
| FDEPTH: | 5 | 5 | | | GearCond.code: | |
| BDEPTH: | 36 | 36 | | | Validity code: | |

Towing dir: 300ø Wire out: 110 m Speed: 42 kn*10

Sorted: Kg Total catch: 0.62 CATCH/HOUR: 1.28

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardinella aurita | 0.74 | 2 | 57.81 | |
| Scomber japonicus | 0.54 | 2 | 42.19 | |
| Total | 1.28 | | 100.00 | |

PROJECT STATION:1833

DATE:28/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2445

| | start | stop | duration | | | Long W 1521 |
|---|---|---|---|---|---|---|
| TIME | :09:18:21 | 09:37:11 | 19 | (min) | Purpose code: | 1 |
| LOG | :5935.03 | 5936.19 | 1.16 | | Area code : | 2 |
| FDEPTH: | 34 | 34 | | | GearCond.code: | |
| BDEPTH: | 34 | 34 | | | Validity code: | |

Towing dir: 300ø Wire out: 160 m Speed: 35 kn*10

Sorted: 61 Kg Total catch: 61.90 CATCH/HOUR: 195.47

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 129.95 | 1443 | 66.48 | 3058 |
| Trachurus trachurus | 23.31 | 752 | 11.93 | 3060 |
| Scomber japonicus | 19.83 | 85 | 10.14 | 3059 |
| Dentex canariensis | 10.14 | 51 | 5.19 | |
| Spondyliosoma cantharus | 4.77 | 38 | 2.44 | |
| Pagellus bellottii | 4.52 | 38 | 2.31 | |
| Loligo vulgaris | 1.71 | 3 | 0.87 | |
| Trachinus vipera | 1.01 | 13 | 0.52 | |
| Aspitrigla obscura | 0.25 | 3 | 0.13 | |
| Total | 195.49 | | 100.01 | |

PROJECT STATION:1834

DATE:28/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2446

| | start | stop | duration | | | Long W 1459 |
|---|---|---|---|---|---|---|
| TIME | :13:57:25 | 14:17:20 | 20 | (min) | Purpose code: | 1 |
| LOG | :5977.94 | 5979.00 | 1.05 | | Area code : | 2 |
| FDEPTH: | 27 | 28 | | | GearCond.code: | |
| BDEPTH: | 27 | 28 | | | Validity code: | |

Towing dir: 115ø Wire out: 160 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 750.80 CATCH/HOUR: 2252.40

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Diplodus bellottii | 2092.50 | 23925 | 92.90 | |
| Argyrosomus regius | 72.90 | 9 | 3.24 | |
| Pomadasys incisus | 27.00 | 225 | 1.20 | |
| Diplodus vulgaris | 21.75 | 75 | 0.97 | |
| Trachurus trachurus | 13.50 | 225 | 0.60 | |
| Zeus faber | 8.25 | 3 | 0.37 | |
| Pagellus acarne | 4.50 | 75 | 0.20 | |
| Pagellus bellottii | 3.75 | 75 | 0.17 | |
| Loligo vulgaris | 3.66 | 9 | 0.16 | |
| Octopus vulgaris | 2.13 | 3 | 0.09 | |
| Lithognathus mormyrus | 1.26 | 3 | 0.06 | |
| Aspitrigla obscura | 1.20 | 9 | 0.05 | |
| Total | 2252.40 | | 100.01 | |

PROJECT STATION:1835

DATE:28/11/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2455

| | start | stop | duration | | | Long W 1516 |
|---|---|---|---|---|---|---|
| TIME | :17:29:59 | 17:41:30 | 12 | (min) | Purpose code: | 1 |
| LOG | :6006.72 | 6007.65 | 0.93 | | Area code : | 2 |
| FDEPTH: | 15 | 15 | | | GearCond.code: | |
| BDEPTH: | 39 | 37 | | | Validity code: | |

Towing dir: 180ø Wire out: 120 m Speed: 45 kn*10

Sorted: 31 Kg Total catch: 311.12 CATCH/HOUR: 1555.60

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 1422.50 | 6055 | 91.44 | 3061 |
| Spondyliosoma cantharus | 132.00 | 750 | 8.49 | |
| Boops boops | 1.10 | 5 | 0.07 | |
| Total | 1555.60 | | 100.00 | |

PROJECT STATION:1836

DATE:29/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2509

| | start | stop | duration | | | Long W 1525 |
|---|---|---|---|---|---|---|
| TIME | :05:53:59 | 06:01:30 | 8 | (min) | Purpose code: | 1 |
| LOG | :6107.76 | 6108.29 | 0.53 | | Area code : | 2 |
| FDEPTH: | 30 | 45 | | | GearCond.code: | |
| BDEPTH: | 68 | 69 | | | Validity code: | |

Towing dir: 240ø Wire out: 160 m Speed: 45 kn*10

Sorted: 30 Kg Total catch: 3015.70 CATCH/HOUR: 22617.75

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 11587.50 | 189000 | 51.23 | 3062 |
| Trachurus trachurus | 9450.00 | 293250 | 41.78 | 3063 |
| Diplodus vulgaris | 712.50 | 1500 | 3.15 | |
| Sardina pilchardus | 457.50 | 6750 | 2.02 | |
| Pagellus bellottii | 300.00 | 750 | 1.33 | |
| Trichiurus lepturus | 100.13 | 38 | 0.44 | |
| Sparus aurata | 10.13 | 8 | 0.04 | |
| Total | 22617.76 | | 99.99 | |

PROJECT STATION:1837

DATE:29/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2506
start stop duration Long W 1516
TIME :09:00:41 09:13:52 13 (min) Purpose code: 1
LOG :6125.51 6126.51 0.98 Area code : 2
FDEPTH: 49 49 GearCond.code:
BDEPTH: 49 49 Validity code:
Towing dir: 210º Wire out: 200 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 389.54 CATCH/HOUR: 1797.88

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1321.85 | 12923 | 73.52 | 3065 |
| Scomber japonicus | 180.00 | 2169 | 10.01 | 3064 |
| Loligo vulgaris | 175.43 | 415 | 9.76 | |
| Trachurus trachurus | 41.08 | 600 | 2.28 | |
| Merluccius senegalensis | 27.23 | 46 | 1.51 | |
| Pagellus acarne | 21.69 | 92 | 1.21 | |
| Diplodus vulgaris | 17.54 | 46 | 0.98 | |
| Trichiurus lepturus | 11.86 | 5 | 0.66 | |
| Aspitrigla obscura | 1.20 | 5 | 0.07 | |
| Total | 1797.88 | | 100.00 | |

PROJECT STATION:1838

DATE:29/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2506
start stop duration Long W 1516
TIME :10:05:56 10:34:50 29 (min) Purpose code: 1
LOG :6131.30 6133.45 2.14 Area code : 2
FDEPTH: 49 49 GearCond.code:
BDEPTH: 49 49 Validity code:
Towing dir: 210º Wire out: 200 m Speed: 44 kn*10

Sorted: 33 Kg Total catch: 353.22 CATCH/HOUR: 730.80

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 417.93 | 3910 | 57.19 | 3066 |
| Scomber japonicus | 144.41 | 1448 | 19.76 | 3067 |
| Trachurus trachurus | 78.00 | 2048 | 10.67 | 3068 |
| Loligo vulgaris | 41.17 | 112 | 5.63 | |
| Spondyliosoma cantharus | 15.93 | 62 | 2.18 | |
| Pomadasys incisus | 13.03 | 62 | 1.78 | |
| Boops boops | 8.07 | 103 | 1.10 | |
| Pagellus bellottii | 6.21 | 41 | 0.85 | |
| Diplodus vulgaris | 4.80 | 6 | 0.66 | |
| Aspitrigla obscura | 1.24 | 21 | 0.17 | |
| Total | 730.79 | | 99.99 | |

PROJECT STATION:1839

DATE:29/11/02 GEAR TYPE: PT No: 5 POSITION:Lat N 2459
start stop duration Long W 1459
TIME :13:44:32 14:02:42 18 (min) Purpose code: 1
LOG :6161.63 6162.94 1.27 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 38 37 Validity code:
Towing dir: 205º Wire out: 150 m Speed: 40 kn*10

Sorted: 32 Kg Total catch: 2242.60 CATCH/HOUR: 7475.33

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 7151.67 | 63933 | 95.67 | 3069 |
| Scomber japonicus | 263.67 | 1000 | 3.53 | 3070 |
| Total | 7415.34 | | 99.20 | |

PROJECT STATION:1840

DATE:29/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2514
start stop duration Long W 1510
TIME :18:41:19 18:59:11 18 (min) Purpose code: 1
LOG :6205.13 6206.47 1.34 Area code : 2
FDEPTH: 60 60 GearCond.code:
BDEPTH: 60 60 Validity code:
Towing dir: 200º Wire out: 200 m Speed: 43 kn*10

Sorted: 67 Kg Total catch: 1361.25 CATCH/HOUR: 4537.50

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1060.00 | 9667 | 23.36 | 3073 |
| Diplodus vulgaris | 859.33 | 2933 | 18.94 | |
| Boops boops | 621.33 | 8533 | 13.69 | |
| Trachurus trachurus | 597.33 | 12200 | 13.16 | 3072 |
| Spondyliosoma cantharus | 308.67 | 1733 | 6.80 | |
| Pagellus acarne | 260.00 | 1600 | 5.73 | |
| Scomber japonicus | 234.00 | 1267 | 5.16 | 3071 |
| Plectorhinchus mediterraneus | 144.00 | 267 | 3.17 | |
| Dentex canariensis | 116.67 | 467 | 2.57 | |
| Pagellus bellottii | 110.67 | 600 | 2.44 | |
| Pomadasys incisus | 104.00 | 667 | 2.29 | |
| Dentex maroccanus | 36.67 | 67 | 0.81 | |
| Dentex gibbosus | 30.67 | 67 | 0.68 | |
| Pagrus auriga | 17.83 | 17 | 0.39 | |
| Loligo vulgaris | 14.00 | 17 | 0.31 | |
| Dentex macrophthalmus | 13.33 | 67 | 0.29 | |
| Conger conger | 11.00 | 3 | 0.24 | |
| Total | 4539.50 | | 100.03 | |

PROJECT STATION:1841

DATE:30/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2533
start stop duration Long W 1501
TIME :08:54:30 09:14:40 20 (min) Purpose code: 1
LOG :6329.11 6330.50 1.38 Area code : 2
FDEPTH: 88 87 GearCond.code:
BDEPTH: 88 87 Validity code:
Towing dir: 230º Wire out: 300 m Speed: 37 kn*10

Sorted: 17 Kg Total catch: 17.32 CATCH/HOUR: 51.96

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Pagellus acarne | 34.83 | 189 | 67.03 | |
| Pagellus bellottii | 6.60 | 39 | 12.70 | |
| Spondyliosoma cantharus | 6.21 | 33 | 11.95 | |
| Merluccius merluccius | 2.28 | 3 | 4.39 | |
| Aspitrigla obscura | 1.68 | 27 | 3.23 | |
| Loligo vulgaris | 0.27 | 3 | 0.52 | |
| Total | 51.87 | | 99.82 | |

PROJECT STATION:1842

DATE:30/11/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2546
start stop duration Long W 1518
TIME :12:08:09 12:38:10 30 (min) Purpose code: 1
LOG :6357.37 6359.03 1.66 Area code : 2
FDEPTH: 190 185 GearCond.code:
BDEPTH: 190 185 Validity code:
Towing dir: 206º Wire out: 580 m Speed: 32 kn*10

Sorted: 27 Kg Total catch: 158.14 CATCH/HOUR: 316.28

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trachurus | 96.20 | 610 | 30.42 | 3074 |
| Dentex maroccanus | 74.00 | 1340 | 23.40 | |
| Dentex macrophthalmus | 55.00 | 770 | 17.39 | |
| Zeus faber | 30.90 | 34 | 9.77 | |
| Macrorhamphosus scolopax | 20.50 | 1450 | 6.48 | |
| Trichiurus lepturus | 16.00 | 50 | 5.06 | |
| Merluccius merluccius | 14.98 | 18 | 4.74 | |
| Capros aper | 3.50 | 80 | 1.11 | |
| Pagellus acarne | 2.50 | 10 | 0.79 | |
| Mullus surmuletus | 1.40 | 4 | 0.44 | |
| Illex coindetii | 1.00 | 180 | 0.32 | |
| Anthias anthias | 0.30 | 30 | 0.09 | |
| Total | 316.28 | | 100.01 | |

PROJECT STATION:1843

DATE:30/11/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2551
start stop duration Long W 1451
TIME :22:08:23 22:12:26 4 (min) Purpose code: 1
LOG :6431.46 6431.84 0.37 Area code : 2
FDEPTH: 30 30 GearCond.code:
BDEPTH: 95 95 Validity code:
Towing dir: 225º Wire out: 130 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 2936.75 CATCH/HOUR: 44051.25

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 44051.25 | 409275 | 100.00 | 3075 |
| Total | 44051.25 | | 100.00 | |

PROJECT STATION:1844

DATE: 1/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2632
start stop duration Long W 1418
TIME :19:18:06 19:21:41 4 (min) Purpose code: 1
LOG :6601.32 6601.59 0.26 Area code : 2
FDEPTH: 20 20 GearCond.code:
BDEPTH: 90 84 Validity code:
Towing dir: 135º Wire out: 120 m Speed: 40 kn*10

Sorted: 34 Kg Total catch: 1020.00 CATCH/HOUR: 15300.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 15300.00 | 135450 | 100.00 | 3076 |
| Total | 15300.00 | | 100.00 | |

PROJECT STATION:1845

DATE: 5/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2647
start stop duration Long W 1351
TIME :03:21:08 03:42:48 22 (min) Purpose code: 1
LOG :6906.32 6907.75 1.45 Area code : 2
FDEPTH: 50 50 GearCond.code:
BDEPTH: 76 82 Validity code:
Towing dir: 310º Wire out: 200 m Speed: 40 kn*10

Sorted: 34 Kg Total catch: 154.08 CATCH/HOUR: 420.22

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 313.64 | 2924 | 74.64 | 3077 |
| Spondyliosoma cantharus | 48.00 | 185 | 11.42 | |
| Zeus faber | 37.64 | 14 | 8.96 | |
| Scomber japonicus | 9.49 | 65 | 2.26 | |
| Diplodus sargus * | 7.96 | 5 | 1.89 | |
| Diplodus vulgaris | 1.64 | 11 | 0.39 | |
| Diplodus vulgaris | 1.42 | 3 | 0.34 | |
| Trachurus trachurus | 0.44 | 11 | 0.10 | |
| Total | 420.23 | | 100.00 | |

PROJECT STATION:1846

DATE: 5/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2655
start stop duration Long W 1343
TIME :09:59:10 10:18:07 19 (min) Purpose code: 1
LOG :6963.34 6964.56 1.20 Area code : 2
FDEPTH: 100 95 GearCond.code:
BDEPTH: 100 95 Validity code:
Towing dir: 120º Wire out: 300 m Speed: 37 kn*10

Sorted: 33 Kg Total catch: 163.26 CATCH/HOUR: 515.56

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trachurus | 275.53 | 5839 | 53.44 | 3079 |
| Sardina pilchardus | 97.42 | 1105 | 18.90 | 3078 |
| Scomber japonicus | 84.47 | 1089 | 16.38 | 3080 |
| Pagellus acarne | 35.53 | 142 | 6.89 | |
| Dentex macrophthalmus | 11.05 | 189 | 2.14 | |
| Boops boops | 7.11 | 95 | 1.38 | |
| Dentex maroccanus | 3.32 | 95 | 0.64 | |
| Loligo vulgaris | 0.98 | 9 | 0.19 | |
| Lepidopus caudatus | 0.16 | 3 | 0.03 | |
| Total | 515.57 | | 99.99 | |

PROJECT STATION:1847

DATE: 5/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2718
start stop duration Long W 1333
TIME :21:54:22 22:07:56 14 (min) Purpose code: 1
LOG :7069.76 7070.54 0.77 Area code : 2
FDEPTH: 73 73 GearCond.code:
BDEPTH: 73 73 Validity code:
Towing dir: 200º Wire out: 250 m Speed: 35 kn*10

Sorted: 33 Kg Total catch: 678.99 CATCH/HOUR: 2909.96

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Trachurus trachurus | 1684.29 | 33120 | 57.88 | 3082 |
| Scomber japonicus | 805.71 | 12857 | 27.69 | 3081 |
| Pagellus acarne | 378.86 | 2057 | 13.02 | |
| Boops boops | 26.57 | 343 | 0.91 | |
| Dentex maroccanus | 7.71 | 514 | 0.26 | |
| Octopus vulgaris | 6.81 | 9 | 0.23 | |
| Total | 2909.95 | | 99.99 | |

PROJECT STATION:1848

DATE: 6/12/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2731
start stop duration Long W 1319
TIME :04:46:44 04:56:23 10 (min) Purpose code: 1
LOG :7127.84 7128.57 0.72 Area code : 2
FDEPTH: 15 10 GearCond.code:
BDEPTH: 23 26 Validity code:
Towing dir: 273ø Wire out: 60 m Speed: 40 kn*10

Sorted: Kg Total catch: 39.90 CATCH/HOUR: 239.40

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 237.30 | 3468 | 99.12 | 3083 |
| Belone belone gracilis | 1.14 | 18 | 0.48 | |
| Liocarcinus sp | 0.96 | 168 | 0.40 | |
| Total | 239.40 | | 100.00 | |

PROJECT STATION:1849

DATE: 6/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2749
start stop duration Long W 1320
TIME :09:59:33 10:17:11 18 (min) Purpose code: 1
LOG :7174.52 7175.63 1.10 Area code : 2
FDEPTH: 87 90 GearCond.code:
BDEPTH: 87 90 Validity code:
Towing dir: 200ø Wire out: 300 m Speed: 36 kn*10

Sorted: 31 Kg Total catch: 91.18 CATCH/HOUR: 303.93

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 180.50 | 3440 | 59.39 | 3085 |
| Pagellus acarne | 66.20 | 420 | 21.78 | |
| Dentex macrophthalmus | 46.10 | 1110 | 15.17 | |
| Sardina pilchardus | 10.00 | 190 | 3.29 | 3084 |
| Loligo vulgaris | 0.43 | 3 | 0.14 | |
| Zeus faber | 0.40 | 10 | 0.13 | |
| Merluccius merluccius | 0.30 | 3 | 0.10 | |
| Total | 303.93 | | 100.00 | |

PROJECT STATION:1850

DATE: 6/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2757
start stop duration Long W 1316
TIME :14:35:28 14:51:51 16 (min) Purpose code: 1
LOG :7211.63 7212.53 0.88 Area code : 2
FDEPTH: 89 88 GearCond.code:
BDEPTH: 89 88 Validity code:
Towing dir: 141ø Wire out: 300 m Speed: 31 kn*10

Sorted: 30 Kg Total catch: 275.71 CATCH/HOUR: 1033.91

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 595.69 | 10226 | 57.62 | 3086 |
| Dentex macrophthalmus | 207.56 | 3476 | 20.08 | |
| Sardina pilchardus | 143.44 | 2498 | 13.87 | 3087 |
| Trachurus trachurus | 54.68 | 473 | 5.29 | 3087 |
| Pagellus acarne | 23.63 | 169 | 2.29 | |
| Zeus faber | 4.13 | 15 | 0.40 | |
| Total | 1029.13 | | 99.55 | |

PROJECT STATION:1851

DATE: 6/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2801
start stop duration Long W 1302
TIME :19:03:20 19:20:27 17 (min) Purpose code: 1
LOG :7248.99 7250.31 1.07 Area code : 2
FDEPTH: 25 25 GearCond.code:
BDEPTH: 49 41 Validity code:
Towing dir: 212ø Wire out: 130 m Speed: 40 kn*10

Sorted: Kg Total catch: 47.71 CATCH/HOUR: 168.39

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 93.88 | 2072 | 55.75 | 3088 |
| Engraulis encrasicolus | 73.06 | 8569 | 43.39 | 3089 |
| Alloteuthis subulata | 0.67 | 233 | 0.40 | |
| Belone belone gracilis | 0.53 | 11 | 0.31 | |
| Solenocera membranacea | 0.25 | 212 | 0.15 | |
| Total | 168.39 | | 100.00 | |

PROJECT STATION:1852

DATE: 7/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2806
start stop duration Long W 1252
TIME :03:33:18 03:48:27 15 (min) Purpose code: 1
LOG :7313.33 7314.15 0.81 Area code : 2
FDEPTH: 65 66 GearCond.code:
BDEPTH: 65 66 Validity code:
Towing dir: 340ø Wire out: 220 m Speed: 30 kn*10

Sorted: 32 Kg Total catch: 158.45 CATCH/HOUR: 633.80

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Pagellus acarne | 268.00 | 1380 | 42.28 | |
| Sardina pilchardus | 134.40 | 2200 | 21.21 | 3092 |
| Trachurus trachurus | 101.00 | 1960 | 15.94 | 3091 |
| Scomber japonicus | 59.60 | 960 | 9.40 | 3090 |
| Pagellus bellottii | 29.80 | 280 | 4.70 | |
| Dentex macrophthalmus | 10.00 | 120 | 1.58 | |
| Aspitrigla obscura | 6.80 | 260 | 1.07 | |
| Diplodus vulgaris | 5.00 | 20 | 0.79 | |
| Pomadasys incisus | 3.80 | 20 | 0.60 | |
| Trisopterus luscus | 3.40 | 80 | 0.54 | |
| Trachinus draco | 3.00 | 180 | 0.47 | |
| Pseudupeneus prayensis | 3.00 | 60 | 0.47 | |
| Spondyliosoma cantharus | 2.60 | 20 | 0.41 | |
| Raja straeleni | 1.40 | 4 | 0.22 | |
| Belone belone gracilis | 1.00 | 20 | 0.16 | |
| Dentex maroccanus | 1.00 | 20 | 0.16 | |
| Total | 633.80 | | 100.00 | |

PROJECT STATION:1853

DATE: 7/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2806
start stop duration Long W 1230
TIME :08:57:59 09:01:54 4 (min) Purpose code: 1
LOG :7359.06 7359.32 0.26 Area code : 2
FDEPTH: 15 15 GearCond.code:
BDEPTH: 44 45 Validity code:
Towing dir: 330ø Wire out: 110 m Speed: 40 kn*10

Sorted: 44 Kg Total catch: 517.05 CATCH/HOUR: 7755.75

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 7425.00 | 294075 | 95.74 | 3093 |
| Engraulis encrasicolus | 330.75 | 45450 | 4.26 | 3094 |
| Total | 7755.75 | | 100.00 | |

PROJECT STATION:1854

DATE: 7/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2811
start stop duration Long W 1214
TIME :13:59:23 14:21:03 22 (min) Purpose code: 1
LOG :7401.62 7403.09 1.46 Area code : 2
FDEPTH: 20 22 GearCond.code:
BDEPTH: 44 42 Validity code:
Towing dir: 180ø Wire out: 100 m Speed: 45 kn*10

Sorted: 33 Kg Total catch: 274.92 CATCH/HOUR: 749.78

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 624.00 | 35945 | 83.22 | 3095 |
| Engraulis encrasicolus | 99.93 | 8725 | 13.33 | 3096 |
| Scomber japonicus | 15.82 | 46 | 2.11 | |
| Trachinotus ovatus | 5.45 | 22 | 0.73 | |
| Pagellus acarne | 4.58 | 22 | 0.61 | |
| Total | 749.78 | | 100.00 | |

PROJECT STATION:1855

DATE: 7/12/02 GEAR TYPE: PT No: 4 POSITION:Lat N 2814
start stop duration Long W 1157
TIME :19:26:48 19:32:06 5 (min) Purpose code: 1
LOG :7452.70 7453.09 0.39 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 41 43 Validity code:
Towing dir: 320ø Wire out: 120 m Speed: 45 kn*10

Sorted: 36 Kg Total catch: 909.33 CATCH/HOUR: 10911.96

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 10680.00 | 349500 | 97.87 | 3097 |
| Scomber japonicus | 108.00 | 900 | 0.99 | |
| Engraulis encrasicolus | 78.00 | 13800 | 0.71 | 3098 |
| Pagellus acarne | 18.96 | 48 | 0.17 | |
| Alloteuthis subulata | 15.00 | 3900 | 0.14 | |
| Diplodus bellottii | 12.00 | 300 | 0.11 | |
| Total | 10911.96 | | 99.99 | |

PROJECT STATION:1856

DATE: 8/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2828
start stop duration Long W 1127
TIME :05:26:57 05:35:06 8 (min) Purpose code: 1
LOG :7547.65 7548.21 0.55 Area code : 2
FDEPTH: 20 15 GearCond.code:
BDEPTH: 39 37 Validity code:
Towing dir: 180ø Wire out: 100 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 1047.00 CATCH/HOUR: 7852.50

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 7537.50 | 220050 | 95.99 | 3099 |
| Engraulis encrasicolus | 90.00 | 11925 | 1.15 | 3100 |
| Trachurus trachurus | 90.00 | 2475 | 1.15 | |
| Scomber japonicus | 83.25 | 675 | 1.06 | |
| Diplodus bellottii | 36.00 | 675 | 0.46 | |
| Alloteuthis subulata | 15.75 | 4050 | 0.20 | |
| Total | 7852.50 | | 100.01 | |

PROJECT STATION:1857

DATE: 8/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2835
start stop duration Long W 1117
TIME :08:46:05 09:15:31 29 (min) Purpose code: 1
LOG :7578.48 7580.37 1.87 Area code : 2
FDEPTH: 23 25 GearCond.code:
BDEPTH: 23 25 Validity code:
Towing dir: 45ø Wire out: 110 m Speed: 37 kn*10

Sorted: 38 Kg Total catch: 77.15 CATCH/HOUR: 159.62

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Diplodus bellottii | 73.74 | 1444 | 46.20 | |
| Engraulis encrasicolus | 38.65 | 6974 | 24.21 | 3102 |
| Sardina pilchardus | 23.59 | 3890 | 14.78 | 3101 |
| Scomber japonicus | 11.01 | 124 | 6.90 | |
| Alloteuthis subulata | 3.81 | 848 | 2.39 | |
| Trachurus trachurus | 3.31 | 219 | 2.07 | |
| Parapenaeus longirostris | 2.23 | 894 | 1.40 | |
| Raja microocellata | 1.32 | 2 | 0.83 | |
| Merluccius senegalensis | 0.99 | 91 | 0.62 | |
| Loligo vulgaris | 0.91 | 50 | 0.57 | |
| Trisopterus luscus | 0.06 | 2 | 0.04 | |
| Total | 159.62 | | 100.01 | |

PROJECT STATION:1858

DATE: 8/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2842

| | start | stop | duration | | | Long W 1115 |
|---|---|---|---|---|---|---|
| TIME | :11:40:30 | 12:10:13 | 30 | (min) | Purpose code: | 1 |
| LOG | :7602.08 | 7603.85 | 1.75 | | Area code : | 1 |
| FDEPTH: | 48 | 62 | | | GearCond.code: | |
| BDEPTH: | 48 | 62 | | | Validity code: | |

Towing dir: 300ø Wire out: 200 m Speed: 30 kn*10

Sorted: 35 Kg Total catch: 872.74 CATCH/HOUR: 1745.48

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 782.50 | 26650 | 44.83 | 3103 |
| Trachurus trachurus, juveniles | 615.00 | 18350 | 35.23 | 3104 |
| Scomber japonicus | 143.00 | 1350 | 8.19 | 3105 |
| Pagellus acarne | 55.00 | 150 | 3.15 | |
| Pagellus bellottii | 45.50 | 100 | 2.61 | |
| Chelidonichthys lucerna | 44.00 | 300 | 2.52 | |
| Merluccius senegalensis | 37.50 | 50 | 2.15 | |
| Engraulis encrasicolus | 10.00 | 600 | 0.57 | |
| Diplodus puntazzo | 8.20 | 8 | 0.47 | |
| Diplodus bellottii | 3.00 | 50 | 0.17 | |
| Loligo vulgaris | 1.78 | 12 | 0.10 | |
| Total | 1745.48 | | 99.99 | |

PROJECT STATION:1859

DATE: 9/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2851

| | start | stop | duration | | | Long W 1225 |
|---|---|---|---|---|---|---|
| TIME | :08:38:49 | 09:08:25 | 30 | (min) | Purpose code: | 1 |
| LOG | :7784.78 | 7786.38 | 1.60 | | Area code : | 1 |
| FDEPTH: | 231 | 232 | | | GearCond.code: | |
| BDEPTH: | 231 | 232 | | | Validity code: | |

Towing dir: 255ø Wire out: 600 m Speed: 32 kn*10

Sorted: Kg Total catch: 14.28 CATCH/HOUR: 28.56

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Merluccius merluccius | 12.66 | 74 | 44.33 | |
| Dentex macrophthalmus | 8.44 | 106 | 29.55 | |
| Trachurus trachurus | 3.60 | 32 | 12.61 | 3106 |
| Macrorhamphosus scolopax | 3.28 | 286 | 11.48 | |
| Illex coindetii | 0.46 | 12 | 1.61 | |
| Capros aper | 0.10 | 18 | 0.35 | |
| Alloteuthis subulata | 0.02 | 2 | 0.07 | |
| Total | 28.56 | | 100.00 | |

PROJECT STATION:1860

DATE: 9/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2853

| | start | stop | duration | | | Long W 1215 |
|---|---|---|---|---|---|---|
| TIME | :10:50:47 | 11:21:02 | 30 | (min) | Purpose code: | 1 |
| LOG | :7799.96 | 7801.66 | 1.66 | | Area code : | 2 |
| FDEPTH: | 80 | 80 | | | GearCond.code: | |
| BDEPTH: | 119 | 123 | | | Validity code: | |

Towing dir: 254ø Wire out: 250 m Speed: 34 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 | | | |
| Total | | | | |

PROJECT STATION:1861

DATE: 9/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 2854

| | start | stop | duration | | | Long W 1210 |
|---|---|---|---|---|---|---|
| TIME | :12:32:28 | 13:02:14 | 30 | (min) | Purpose code: | 1 |
| LOG | :7810.58 | 7812.35 | 1.74 | | Area code : | 1 |
| FDEPTH: | 122 | 120 | | | GearCond.code: | |
| BDEPTH: | 122 | 120 | | | Validity code: | |

Towing dir: 254ø Wire out: 380 m Speed: 30 kn*10

Sorted: 46 Kg Total catch: 45.70 CATCH/HOUR: 91.40

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Mullus surmuletus | 24.70 | 132 | 27.02 | |
| Zeus faber | 24.40 | 18 | 26.70 | |
| Anthias anthias | 23.40 | 1508 | 25.60 | |
| Peristedion cataphractum | 4.56 | 14 | 4.99 | |
| Dentex gibbosus | 3.80 | 2 | 4.16 | |
| Raja sp. | 3.66 | 2 | 4.00 | |
| Umbrina canariensis | 2.20 | 6 | 2.41 | |
| Macrorhamphosus scolopax | 1.32 | 110 | 1.44 | |
| Scyliorhinus canicula | 1.20 | 2 | 1.31 | |
| Alloteuthis subulata | 0.94 | 218 | 1.03 | |
| Callanthias ruber | 0.54 | 16 | 0.59 | |
| Dentex macrophthalmus | 0.34 | 2 | 0.37 | |
| Loligo vulgaris | 0.26 | 2 | 0.28 | |
| Illex coindetii | 0.08 | 2 | 0.09 | |
| Total | 91.40 | | 99.99 | |

PROJECT STATION:1862

DATE: 9/12/02 GEAR TYPE: PT No: 4 POSITION:Lat N 2842

| | start | stop | duration | | | Long W 1114 |
|---|---|---|---|---|---|---|
| TIME | :23:14:35 | 23:25:56 | 11 | (min) | Purpose code: | 1 |
| LOG | :7913.36 | 7914.14 | 0.78 | | Area code : | 1 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 45 | 50 | | | Validity code: | |

Towing dir: 290ø Wire out: 120 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 351.80 CATCH/HOUR: 1918.91

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1797.27 | 132055 | 93.66 | 3107 |
| Scomber japonicus | 73.09 | 764 | 3.81 | |
| Trachurus trachurus | 43.64 | 1527 | 2.27 | |
| Engraulis encrasicolus | 3.27 | 709 | 0.17 | |
| Illex coindetii | 1.64 | 709 | 0.09 | |
| Total | 1918.91 | | 100.00 | |

PROJECT STATION:1863

DATE:10/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2849

| | start | stop | duration | | | Long W 1114 |
|---|---|---|---|---|---|---|
| TIME | :02:04:30 | 02:24:19 | 20 | (min) | Purpose code: | 1 |
| LOG | :7937.24 | 7938.61 | 1.37 | | Area code : | 1 |
| FDEPTH: | 15 | 15 | | | GearCond.code: | |
| BDEPTH: | 80 | 80 | | | Validity code: | |

Towing dir: 291ø Wire out: 90 m Speed: 40 kn*10

Sorted: 78 Kg Total catch: 1169.55 CATCH/HOUR: 3508.65

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Scomber japonicus | 3035.25 | 13050 | 86.51 | 3108 |
| Sardina pilchardus | 244.80 | 5670 | 6.98 | 3109 |
| Engraulis encrasicolus | 228.60 | 18090 | 6.52 | 3110 |
| Total | 3508.65 | | 100.01 | |

PROJECT STATION:1864

DATE:10/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2850

| | start | stop | duration | | | Long W 1057 |
|---|---|---|---|---|---|---|
| TIME | :06:16:03 | 06:21:13 | 5 | (min) | Purpose code: | 1 |
| LOG | :7974.41 | 7974.79 | 0.37 | | Area code : | 1 |
| FDEPTH: | 15 | 15 | | | GearCond.code: | |
| BDEPTH: | 49 | 53 | | | Validity code: | |

Towing dir: 300ø Wire out: 110 m Speed: 42 kn*10

Sorted: 33 Kg Total catch: 396.60 CATCH/HOUR: 4759.20

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 4737.60 | 572832 | 99.55 | 3111 |
| Trachurus trachurus | 21.60 | 720 | 0.45 | |
| Total | 4759.20 | | 100.00 | |

PROJECT STATION:1865

DATE:10/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2856

| | start | stop | duration | | | Long W 1049 |
|---|---|---|---|---|---|---|
| TIME | :09:35:42 | 09:41:15 | 6 | (min) | Purpose code: | 1 |
| LOG | :8003.99 | 8004.32 | 0.32 | | Area code : | 1 |
| FDEPTH: | 30 | 30 | | | GearCond.code: | |
| BDEPTH: | 55 | 55 | | | Validity code: | |

Towing dir: 240ø Wire out: 120 m Speed: 45 kn*10

Sorted: 39 Kg Total catch: 317.57 CATCH/HOUR: 3175.70

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 2544.00 | 122480 | 80.11 | 3112 |
| Engraulis encrasicolus | 600.00 | 108960 | 18.89 | 3113 |
| Lepidopus caudatus | 14.60 | 10 | 0.46 | |
| Trachurus trachurus | 7.90 | 10 | 0.25 | |
| MULLIDAE | 5.20 | 10 | 0.16 | |
| Trachinotus ovatus | 4.00 | 10 | 0.13 | |
| Total | 3175.70 | | 100.00 | |

PROJECT STATION:1866

DATE:10/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 2904

| | start | stop | duration | | | Long W 1034 |
|---|---|---|---|---|---|---|
| TIME | :14:17:24 | 14:23:28 | 6 | (min) | Purpose code: | 1 |
| LOG | :8048.05 | 8048.48 | 0.42 | | Area code : | 1 |
| FDEPTH: | 15 | 15 | | | GearCond.code: | |
| BDEPTH: | 40 | 42 | | | Validity code: | |

Towing dir: 306ø Wire out: 100 m Speed: 40 kn*10

Sorted: 38 Kg Total catch: 566.25 CATCH/HOUR: 5662.50

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 5617.50 | 519900 | 99.21 | 3114 |
| Scomber japonicus | 45.00 | 300 | 0.79 | |
| Total | 5662.50 | | 100.00 | |

PROJECT STATION:1867

DATE:10/12/02 GEAR TYPE: PT No: 7 POSITION:Lat N 2916

| | start | stop | duration | | | Long W 1019 |
|---|---|---|---|---|---|---|
| TIME | :20:29:41 | 20:39:06 | 9 | (min) | Purpose code: | 1 |
| LOG | :8108.60 | 8109.21 | 0.60 | | Area code : | 2 |
| FDEPTH: | 15 | 15 | | | GearCond.code: | |
| BDEPTH: | 27 | 25 | | | Validity code: | |

Towing dir: 230ø Wire out: 90 m Speed: 40 kn*10

Sorted: Kg Total catch: 17.83 CATCH/HOUR: 118.87

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 78.00 | 7147 | 65.62 | 3115 |
| Trachurus trachurus | 26.47 | 947 | 22.27 | 3116 |
| Scomber japonicus | 12.53 | 73 | 10.54 | 3117 |
| Loligo vulgaris | 1.33 | 27 | 1.12 | |
| Diplodus bellottii | 0.53 | 7 | 0.45 | |
| Total | 118.86 | | 100.00 | |

PROJECT STATION:1868

DATE:11/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2924

| | start | stop | duration | | | Long W 1015 |
|---|---|---|---|---|---|---|
| TIME | :23:56:18 | 00:03:54 | 8 | (min) | Purpose code: | 1 |
| LOG | :8136.95 | 8137.44 | 0.47 | | Area code : | 2 |
| FDEPTH: | 10 | 10 | | | GearCond.code: | |
| BDEPTH: | 38 | 42 | | | Validity code: | |

Towing dir: 290ø Wire out: 100 m Speed: 40 kn*10

Sorted: 37 Kg Total catch: 262.00 CATCH/HOUR: 1965.00

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 1924.13 | 171675 | 97.92 | 3118 |
| Engraulis encrasicolus | 11.03 | 1733 | 0.56 | 3119 |
| Diplodus puntazzo | 9.90 | 15 | 0.50 | |
| Diplodus bellottii | 8.40 | 263 | 0.43 | |
| Trachurus trachurus | 5.78 | 158 | 0.29 | |
| Pagellus acarne | 4.73 | 53 | 0.24 | |
| Scomber japonicus | 1.58 | 8 | 0.08 | |
| Total | 1965.55 | | 100.02 | |

PROJECT STATION:1869

DATE:11/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 2909
start stop duration Long W 1050
TIME :10:52:06 11:22:08 30 (min) Purpose code: 1
LOG :8245.51 8247.27 1.74 Area code : 2
FDEPTH: 60 60 GearCond.code:
BDEPTH: 95 93 Validity code:
Towing dir: 230ø Wire out: 180 m Speed: 35 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:1870

DATE:11/12/02 GEAR TYPE: PT No: 4 POSITION:Lat N 2934
start stop duration Long W 1023
TIME :19:31:53 20:07:08 35 (min) Purpose code: 1
LOG :8309.67 8311.70 2.01 Area code : 2
FDEPTH: 15 15 GearCond.code:
BDEPTH: 101 106 Validity code:
Towing dir: 260ø Wire out: 130 m Speed: 35 kn*10

Sorted: 35 Kg Total catch: 69.14 CATCH/HOUR: 118.53

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Engraulis encrasicolus | 86.06 | 4622 | 72.61 | 3121 |
| Sardina pilchardus | 32.06 | 761 | 27.05 | 3120 |
| Scomber japonicus | 0.14 | 3 | 0.12 | |
| Alloteuthis subulata | 0.14 | 69 | 0.12 | |
| Illex coindetii | 0.14 | 2 | 0.12 | |
| Total | 118.54 | | 100.02 | |

PROJECT STATION:1871

DATE:11/12/02 GEAR TYPE: PT No: 4 POSITION:Lat N 2934
start stop duration Long W 1007
TIME :23:39:16 23:56:04 17 (min) Purpose code: 1
LOG :8337.64 8338.70 1.06 Area code : 2
FDEPTH: 10 10 GearCond.code:
BDEPTH: 48 40 Validity code:
Towing dir: 160ø Wire out: 120 m Speed: 40 kn*10

Sorted: 37 Kg Total catch: 269.97 CATCH/HOUR: 952.84

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 921.53 | 71675 | 96.71 | 3122 |
| Trichiurus lepturus | 20.65 | 7 | 2.17 | |
| Diplodus puntazzo | 5.54 | 7 | 0.58 | |
| Loligo vulgaris | 2.82 | 4 | 0.30 | |
| Scomber japonicus | 2.29 | 28 | 0.24 | |
| Total | 952.83 | | 100.00 | |

PROJECT STATION:1872

DATE:12/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 3005
start stop duration Long W 943
TIME :09:43:07 09:49:47 7 (min) Purpose code: 1
LOG :8435.15 8435.55 0.41 Area code : 1
FDEPTH: 30 25 GearCond.code:
BDEPTH: 48 48 Validity code:
Towing dir: 200ø Wire out: 110 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 286.12 CATCH/HOUR: 2452.46

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Engraulis encrasicolus | 1680.00 | 231840 | 68.50 | 3124 |
| Sardina pilchardus | 728.57 | 46560 | 29.71 | 3123 |
| Trachurus trachurus | 34.54 | 34 | 1.41 | 3125 |
| Sarpa salpa | 6.51 | 17 | 0.27 | |
| Sardinella aurita | 2.83 | 9 | 0.12 | |
| Total | 2452.45 | | 100.01 | |

PROJECT STATION:1873

DATE:12/12/02 GEAR TYPE: BT No: 8 POSITION:Lat N 3009
start stop duration Long W 959
TIME :12:07:08 12:37:12 30 (min) Purpose code: 1
LOG :8456.44 8458.08 1.62 Area code : 1
FDEPTH: 214 255 GearCond.code:
BDEPTH: 214 255 Validity code:
Towing dir: 290ø Wire out: 650 m Speed: 30 kn*10

Sorted: Kg Total catch: 57.16 CATCH/HOUR: 114.32

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Lepidopus caudatus | 47.40 | 356 | 41.46 | |
| Merluccius merluccius | 43.90 | 1254 | 38.40 | |
| Illex coindetii | 13.16 | 240 | 11.51 | |
| Capros aper | 2.06 | 108 | 1.80 | |
| Helicolenus dactylopterus | 1.46 | 14 | 1.28 | |
| Zeus faber | 1.42 | 20 | 1.24 | |
| Macrorhamphosus scolopax | 1.36 | 78 | 1.19 | |
| Todaropsis eblanae | 1.34 | 48 | 1.17 | |
| Trachurus trachurus | 0.90 | 2 | 0.79 | |
| Loligo vulgaris | 0.86 | 2 | 0.75 | |
| Alloteuthis subulata | 0.42 | 182 | 0.37 | |
| Total | 114.28 | | 99.96 | |

PROJECT STATION:1874

DATE:12/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 3015
start stop duration Long W 950
TIME :15:03:35 15:25:46 22 (min) Purpose code: 1
LOG :8478.84 8480.29 1.45 Area code : 1
FDEPTH: 70 80 GearCond.code:
BDEPTH: 99 105 Validity code:
Towing dir: 280ø Wire out: 260 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 149.30 CATCH/HOUR: 407.18

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 343.64 | 13058 | 84.40 | 3126 |
| Engraulis encrasicolus | 43.64 | 2967 | 10.72 | 3127 |
| Lepidopus caudatus | 10.09 | 5 | 2.48 | |
| Scomber japonicus | 9.82 | 120 | 2.41 | 3128 |
| Total | 407.19 | | 100.01 | |

PROJECT STATION:1875

DATE:13/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 3037
start stop duration Long W 956
TIME :00:05:32 00:09:31 4 (min) Purpose code: 1
LOG :8563.22 8563.53 0.31 Area code : 1
FDEPTH: 40 40 GearCond.code:
BDEPTH: 71 77 Validity code:
Towing dir: 312ø Wire out: 150 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 957.15 CATCH/HOUR: 14357.25

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 13992.75 | 846855 | 97.46 | 3129 |
| Loligo vulgaris | 267.30 | 810 | 1.86 | |
| Engraulis encrasicolus | 52.65 | 5670 | 0.37 | |
| Scomber japonicus | 44.55 | 405 | 0.31 | |
| Total | 14357.25 | | 100.00 | |

PROJECT STATION:1876

DATE:13/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 3114
start stop duration Long W 951
TIME :13:19:53 13:34:32 15 (min) Purpose code: 1
LOG :8680.51 8681.83 1.31 Area code : 1
FDEPTH: 15 12 GearCond.code:
BDEPTH: 56 48 Validity code:
Towing dir: 19ø Wire out: 100 m Speed: 50 kn*10

Sorted: 31 Kg Total catch: 889.93 CATCH/HOUR: 3559.72

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 3196.80 | 200880 | 89.80 | 3130 |
| Scomber japonicus | 172.80 | 2044 | 4.85 | 3131 |
| Alopias vulpinus | 169.60 | 4 | 4.76 | |
| Sardinella aurita | 20.52 | 108 | 0.58 | |
| Total | 3559.72 | | 99.99 | |

PROJECT STATION:1877

DATE:14/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 3157
start stop duration Long W 952
TIME :04:59:21 05:02:25 3 (min) Purpose code: 1
LOG :8831.81 8832.03 0.21 Area code : 1
FDEPTH: 15 15 GearCond.code:
BDEPTH: 82 74 Validity code:
Towing dir: 106ø Wire out: 100 m Speed: 40 kn*10

Sorted: 36 Kg Total catch: 429.84 CATCH/HOUR: 8596.80

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 8436.00 | 550320 | 98.13 | 3132 |
| Scomber japonicus | 160.80 | 2580 | 1.87 | 3133 |
| Total | 8596.80 | | 100.00 | |

PROJECT STATION:1878

DATE:14/12/02 GEAR TYPE: PT No: 1 POSITION:Lat N 3204
start stop duration Long W 940
TIME :08:18:09 08:39:00 21 (min) Purpose code: 1
LOG :8861.48 8862.71 1.22 Area code : 1
FDEPTH: 15 15 GearCond.code:
BDEPTH: 52 51 Validity code:
Towing dir: 300ø Wire out: 100 m Speed: 40 kn*10

Sorted: 36 Kg Total catch: 254.59 CATCH/HOUR: 727.40

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 681.00 | 38060 | 93.62 | 3135 |
| Scomber japonicus | 46.40 | 540 | 6.38 | 3134 |
| Total | 727.40 | | 100.00 | |

PROJECT STATION:1879

DATE:14/12/02 GEAR TYPE: PT No: 2 POSITION:Lat N 3220
start stop duration Long W 948
TIME :16:15:00 16:31:48 17 (min) Purpose code: 1
LOG :8924.19 8925.07 0.87 Area code : 1
FDEPTH: 125 125 GearCond.code:
BDEPTH: 145 145 Validity code:
Towing dir: 208ø Wire out: 400 m Speed: 40 kn*10

Sorted: 34 Kg Total catch: 242.72 CATCH/HOUR: 856.66

| SPECIES | CATCH/HOUR weight | numbers | % OF TOT. C | SAMP |
|---|---|---|---|---|
| Sardina pilchardus | 634.94 | 11562 | 74.12 | 3136 |
| Scomber japonicus | 202.59 | 2965 | 23.65 | 3137 |
| Lepidopus caudatus | 18.35 | 14 | 2.14 | |
| Illex coindetii | 0.53 | 18 | 0.06 | |
| Trachurus trachurus | 0.25 | 4 | 0.03 | |
| Total | 856.66 | | 100.00 | |

# Annex III Instruments and fishing gear used

The Simrad EK-500, 38kHz echo scientific sounder was used during the survey for fish abundance estimation. The Bergen Echo Integrator system (BEI) logging the echogram raw data from the sounder, was used to scrutinize the acoustic records, and to allocate integrator data to fish species. All raw data were stored to tape, and a backup of the database of scrutinized data, stored. The details of the settings of the 38kHz were as follows:

| | | |
|---|---|---|
| **Transceiver-1 menu** | Transducer depth | 5.5 m |
| | Absorption coeff. | 10 dB/km |
| | Pulse length | medium (1ms) |
| | Bandwidth | wide |
| | Max power | 2000 Watt |
| | 2-way beam angle | -21.0 dB |
| | SV transducer gain | 27.18 dB |
| | TS transducer gain | 27.26 dB |
| | Angle sensitivity | 21.9 |
| | 3 dB beamwidth along. | 6.9° |
| | 3 dB beamwidth athw. | 6.9° |
| | Alongship offset | 0.00° |
| | Athwardship offset | -0.12° |
| **Display menu** | Echogram | 1 |
| | Bottom range | 10 m |
| | Bottom range start | 9 m |
| | TVG | 20 log R |
| | Sv colour min | -67 dB |
| | TS Colour minimum | -60 dB |
| **Printer- menu** | Range | 0-50, 0-100, 0-150, 0-250 or 0-500m |
| | TVG | 20 log R |
| | Sv colour min | -60 dB |
| **Bottom detection menu** | Minimum level | -40 dB |

A calibration experiment using a standard copper sphere was performed in Baía dos Elefantos, Angola 7 September 2002.

**Fishing gear**

The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super" bottom trawl. For all trawls, the Tyborøn, 7.8m² (1670 kg) trawl doors were used.