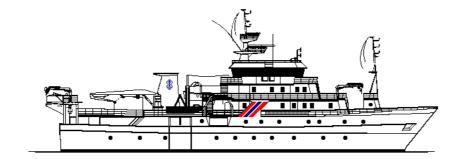
BCLME Project: LMR/NANSEN/02/05 Cruise reports "Dr. Fridtjof Nansen"



# **BCLME SURVEY NO. 2 2005**

# A TRANSBOUNDARY STUDY OF THE PELAGIC FISH STOCKS OF SOUTHERN ANGOLA AND NORTHERN NAMBIA

Cruise report No 2/2005

13 - 23 August 2005

by

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# Summary

The study has demonstrated that studied species are to large extents transboundary in the cold season and underpin recent reports of alarmingly low abundance levels of Cunene horse mackerel and sardine. Cunene horse mackerel was found as far south as Cape Frio (19°00' S), but the densities found south of the Angolan-Namibian border were too low to substantiate any kind of biomass estimation. The biomass of Cunene horse mackerel in Angola was 44 000 tons. Cape horse mackerel were found throughout the transboundary area. The biomass was 253 000 tons (64 %) in Angolan waters and 140 000 in Namibian waters (36 %), i.e. 393 000 tons in total.

Scattered individuals of sardine (pilchard) were found in some of the samples on both sides of the border during the high-density search grid for clupeids, but no aggregations of sardine were recorded, neither acoustically nor with the sampling gear (pelagic sample trawls). Any sizeable aggregation in the area would almost certainly have been discovered during such an intensive surveying exercise and it is therefore concluded that no sizeable aggregations of sardine were present in neither in Angola nor the transboundary area at the time of the survey. Other clupeid species (round herring and anchovy) were only found in scattered, low-density aggregations insufficient to produce any estimates of abundance.

All target species were found in small size groups. Cunene horse mackerel was generally less than 25 cm, and for Cape Horse mackerel 80% of the fish were less than 15 cm total length. The little that was found of the various clupeids was generally, small size groups.

The main recommendations are:

- 1 The survey should be repeated at the same of the year in order to establish whether the observed pattern is persistent over time and to monitor development trends in the transboundary area over time, if any.
- 2 The investigation should also be conducted in the warm season. The distribution pattern of all species under investigation here will likely be quite different in the alternate season. Horse mackerel distributions over the transboundary area generally follow the position of the Angolan-Benguelan front (ABF), i.e. both species have more southern distribution in the warm season. This will, in turn lead to expectations of more Cunene horse mackerel in Namibian waters and less Cape horse mackerel in Angolan waters during summer.

3 The two countries involved should consider cooperating on continuing to monitor the transboundary area and to coordinate management of the fish resources there; all stocks under study here are to some extent transboundary and most stocks are in low abundance. Only fish smaller than 25 cm were found throughout the transboundary area.

# Acknowledgements

A special thank goes to the officers and crew on the R/V 'Dr Fridtjof Nansen' for their efforts and good cooperation at sea.

# List of Abbreviations

Parameter	Name	Units
ρ <sub>i</sub>	Estimated number of fish in length group i	
ABF	Angola-Benguela Front	
ADCP	Acoustic Doppler Current Profiler	
As	Horizontal area of stratum s	[m <sup>2</sup> ]
BT	Bottom Trawl (demersal)	
C <sub>F</sub>	Correction Factor	
CTD	Conductivity, Temperature and Density	
CF	Condition Factor	
CV	Coefficient of Variance	
DO	Dissolved Oxygen	[ml I⁻¹]
Li	Length group i	[cm]
LT	Local Time (= UTC + 1 hour)	
n.mi	Nautical miles = 1852 m	
PT	Pelagic Trawl	
S	Salinity	
SA	Area backscattering coefficient	[m² n.mi⁻²]
SSS	Sea Surface Salinity	
SST	Sea Surface Temperature	[°C]
Sv	10 log(s <sub>v</sub> )	[dB re 1 m⁻¹]
Т	Temperature	[°C]
t <sub>i,j</sub>	Proportion of species j sampled in length group i	
TS	Target Strength	[dB re 1 m <sup>2</sup> ]
Ui	Proportion of fish sampled in length group i	
UTC	Greenwich Middle Time (earlier GMT)	

#### 1 Introduction

This transboundary pelagic survey is a dedicated research survey covering the pelagic fish resources and hydrographical conditions in the region ranging from southern Angola to northern Namibia. The main focus of the work was to assess the biomass of all commercially important pelagic fish stocks in the transboundary region, with emphasis on pilchard and horse mackerel stocks within the survey area. The overall ship time of ten days available were integrated into the yearly pelagic survey of Angola by the 'R/V Dr Fridtjof Nansen' in order to be able to continue the coverage carried out as part of the Angolan effort and in this way utilize the ship time optimally.

The overall transboundary area was defined from Ponta Albina near Tombua in the north (15°50' S) southwards to the Cape Frio upwelling cell (19°00' S). This definition is based primarily on evident geographical delimiters (points) that divide the coastal area into natural ecological zones. The northern boundary represents the northernmost extreme of the Tiger Bank, where the continental shelf narrows in to virtually nothing. The southern boundary represents a natural biological boundary in Namibian waters due to the presence of the massive upwelling cell near Cape Frio. The definition of the transboundary area applied is expected to be wide enough to cover the likely distribution area of fish migrating from Namibia into Angolan waters and vice verse, at both warm and cold seasons.

There has been reported a decline in both abundance and mean size in all main commercial pelagic species, particularly for sardine and horse mackerel both in Angola and Namibia. The zone across the Angolan-Namibian border is particularly important as this area hosts co-occurring population of carangids, i.e. Cape horse mackerel *Trachurus trachurus capensis* and Cunene horse mackerel *Trachurus trecae*, as well as clupeids, including sardine (Pilchard) *Sardinops ocellatus*, round herring (Redeye) *Etrumeus whiteheadi* and anchovy *Engraulis encrasicolus*. There is special concern about the situation in the transboundary area since most of these stocks are believed to be in low abundance, in particular the sardine and the Cunene horse mackerel, while there at the same is an intensive fisheries going on in the border area. All of these populations are, to a lesser or greater extents, distributed across the border and there is known to be considerable movements between seasons and years.

The main purpose of this survey is to map the distribution and estimate the abundance of the most commercially important pelagic species across the Namibian-Angolan transboundary area during the cold season. The study will complement the pelagic survey in Angola by

extending the survey grid into Namibian waters, using the same sampling resolution terms of acoustic transect lines, fish sampling (pelagic and demersal trawling) and hydrographical mapping as in Angolan waters. A high-resolution survey grid was designed, targeting inshore aggregations of clupeids, particularly sardine. The results are expected to provide a snapshot of the relative distribution of the most important species across the border area in the cold season, and will also provide important information about the abundance and biological state of these species in the area. When assessed together with the results from the pelagic survey in Angola, the results will provide a complete coverage of the Cunene horse mackerel, including the proportion of the stock present in Namibian waters at the time of the pelagic survey in Angola, if any. For sardine, the results will not cover the entire distribution area, but will indicate total biomass in Angolan waters and in Namibian waters south to 19°00' S.

#### 1.1 Objectives

The main objectives of the survey were the following:

- To estimate the abundance and to map the distribution of the main commercially important pelagic fish species, with special emphasis on the two horse mackerel Cunene horse mackerel *Trachurus trecae* and Cape horse mackerel *Trachurus capensis*, sardine "Pilchard" *Sardinops ocellatus* and other small pelagic species, including anchovy *Engraulis encrasicolus* and round herring *Etrumeus whiteheadi*.
- To study the biological state of the main species, including length frequencies, length-weight relationships and reproductive stages.
- To collect depth-stratified samples of zooplankton in order to determine zooplankton vertical distribution and abundance.
- To map the meteorological and hydrographical conditions in the survey area by means of continuous recordings of weather data (Sea-surface temperature SST, Sea-surface salinity SSS, wind speed and-direction, CTD-casts (Temperature, Salinity and Oxygen), stratified current measurements (Acoustic Doppler Current Profiler ADCP).

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 On-the-job training of local participants on the main survey routines, including using the biological database NAN-SIS, scrutinizing acoustical data (BEI) and producing acoustical biomass estimates. A one-day training course in theoretical and applied acoustics will be given aboard during the survey.

### 1.2 Participation

The following scientific staff participated in the survey:

# From INIP, Angola:

Filomena VAZ-VELHO (Angolan Team Leader), Pedro TCHIPALANGA, Manuel DOMINGOS, Miguel ANDRÉ, Pedro PANZO, Vanaquissa JONICO, José DA SILVA and Esteves ALFONSO.

# From NatMIRC, Swakopmund:

Martha UUMATI (Namibian Team Leader) and Helvi MUPUPA.

# From Lüderitz Marine Research:

Jean-Paul ROUX and Benedict DUNDEE.

### From IMR, Norway:

Bjørn Erik AXELSEN (Cruise Leader), Diana ZAERA, Tore MØRK and Jan Frode WILHELMSEN.

# 1.3 Survey schedule

A full transceiver calibration was carried out prior to the survey in Baía dos Elephantes on 5<sup>th</sup> August. The sampling trawls used included the smallest pelagic sample trawl (10 m vertical opening), the mid-sized pelagic sample trawl (12 m) fitted with a remote operated codend multisampler and the demersal sample trawl (5 m). All acoustic transducers (18, 38, 120 and 200 kHz) were operated continuously throughout the survey.

The vessel completed the pelagic survey in Angola and reached the Angolan-Namibian border at the Cunene River (17°15' S) on the 13<sup>th</sup> of August. Extending the survey grid into Namibian waters, the same general survey design was followed, i.e. equally spaced transect lines (6 nautical miles (n.mi) apart) perpendicular to the coastline (isobaths). The acoustic transects generally covered a depth range of 20-500 meters. However, some of the lines

had to be abrupt at 30-35 m due to steeply inclining bottom near the shore in some areas. The lines in the border area were extended offshore to about 2 000 m in order to check for possible offshore horse mackerel aggregations. Hydrographical sections were carried out at Pta. Albina, Baía dos Tigres and Cunene River (17°15' S) standard sections, and on every full degree latitude line up to 19°00' S. The transboundary area southwards to 19°00' S was completed on 18 August.

A high-resolution survey grid was designed in order to target inshore aggregations of pelagic fish, particularly focusing on sardine, but also the other clupeids. In order to cover the transboundary area with the highest possible density, a triangular survey design with a spacing of 4-5 n.mi was chosen. The transfer steaming back to Tombua took about 12 hours. During this survey, only potential clupeid aggregations were sampled, but all targets that resembled clupeids were trawled in order to check the species composition. The second coverage was completed (19°00 S) on the 22 August. The ship then steamed to Walvis Bay and docked 23 August.

#### 1.4 Survey effort

Figure 1(a and b) shows the cruise tracks with fishing and hydrographical stations in the survey area. For this transboundary study, data from southern Angola (15°00'-17°15' S) obtained during the previous survey (the pelagic resource survey in Angola 16 July-13 August 2005) are included. The study area for the present survey, defined as 16°00' - 19°00' S), covers the full overlapping zone of all target species, cut off at natural geographical delimiters (Ponta Albina near Tombua in the north and the upwelling cell south of Cape Frio). Table 1 gives a summary of the sampling effort throughout the survey. However, note that samples obtained during the pelagic survey in Angola are reported as well.

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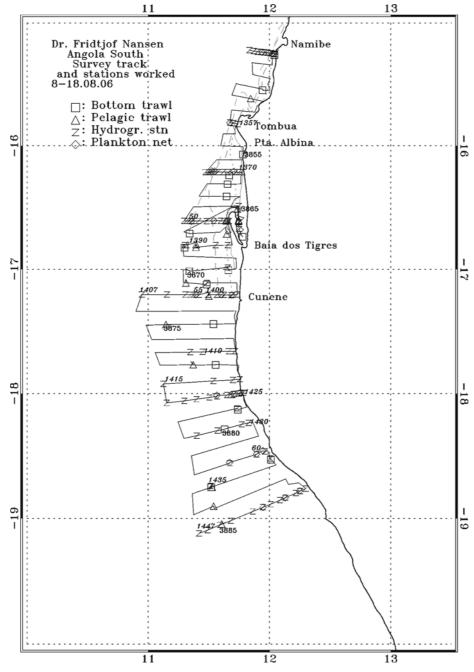


Figure 1a. Course track with fishing, plankton and hydrographic stations. Depth contours at 20, 50, 100, 200 and 500 m.

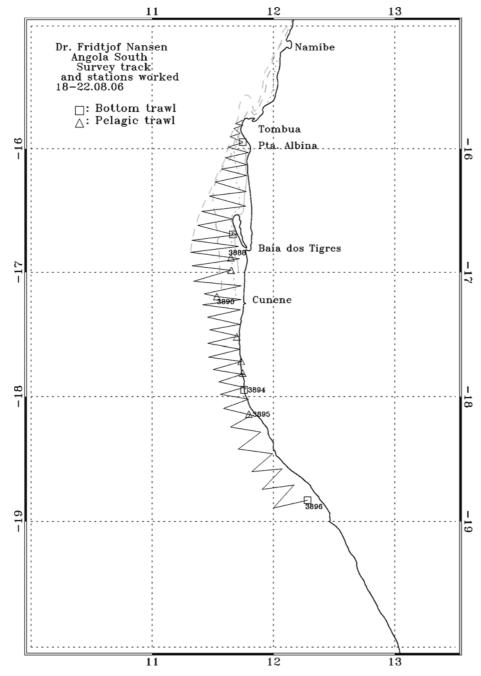


Figure 1b. Course track with fishing stations. Depth contours at 20, 50, 100, 200 and 500 m.

**Table 1.** Summary of survey effort, including number of demersal (BT) and pelagic (PT) trawl hauls, CTDcasts, Multinet stations (2-5 zooplankton samples per station) and distance surveyed (log in n.mi).

Area	BT	PT	Total	CTD	Multinet	Log
			trawls	casts	stations	(n.mi)
Angola South	12	11	23	62	13	915
(16°00'S - 17°15' S)						
Namibia North	8	11	19	39	9	1 296
(17°15'S -19°00' S)						
Total	20	22	42	102	22	2 211

### 2 Materials and methods

During the Angolan pelagic survey the vessel has carried out continuous coverage from Congo (Pointe Noire) through Cabinda to the Angolan-Namibian border at Cunene. During the transboundary survey this coverage was extended southwards to Cape Frio in north of Namibia. The overall transboundary area was defined from Ponta Albina near Tombua in the north (15°50' S) southwards to the Cape Frio upwelling cell (19°00' S). This definition is based primarily on evident geographical delimiters (points) that divide the coastal area into natural ecological zones. The northern boundary represents the northernmost extreme of the Tiger Bank, where the continental shelf narrows in to virtually nothing. The southern boundary represents a natural biological boundary in Namibian waters due to the presence of the massive upwelling cell near Cape Frio. The definition area of fish migrating from Namibia into Angolan waters and vice verse, at both warm and cold seasons. The transboundary area was covered twice, using two survey grids. The 1<sup>st</sup> grid was an extension of the Angolan survey up to Cape Frio and the 2<sup>nd</sup> grid a high-density inshore coverage targeting clupeids.

#### Survey grid 1:

The survey design of equidistant pseudo-parallel transects (6 nautical miles apart) perpendicular to the coastline (isobaths) applied in Angola was also followed in the extension into Namibian waters (Fig 1a). The acoustic transects generally covered a depth range of 20-500 meters. However, some of the lines had to be abrupt at 30-35 m due to the

steeply inclining bottom near the shoreline in some areas. The transect lines in the border area were extended to the 2 000 m isobaths in order to check for possible offshore aggregations of horse mackerel. This strategy ensured that the Namibian component of the transboundary area was covered in a way that was comparable to the data already collected in Angola. This way, distribution maps and biomass estimates could be drawn across the border area.

#### Survey grid 2:

The 2<sup>nd</sup> coverage was an intensive, inshore oriented coverage covering the entire transboundary area. The ship steamed northwards in order to start surveying from Tombua, hence reducing the time for transfer steaming to Walvis Bay towards the end of the survey. The main focus of this coverage was to search the study area for possible fish aggregations that were missed by grid 1. This pertains particularly to the near depleted sardine stocks that were not found at all neither during the Angola pelagic survey nor transboundary grid 1. The survey grid consisted of triangular transect spaced 4-5 n.mi (Fig 1b). The lines covered from inshore at about 20 m to the 300 m isobath. While the main focus was on acoustic searching for sardine an other schools, trawling intensity was reduced to only include potential clupeid schools. All observed candidates were, however, sampled using the pelagic trawls. No biomass estimates or distribution maps were produced on the basis of the data from the second coverage.

#### 2.1 Acoustical sampling

The acoustic recordings were conducted using two Simrad EK 500 echosounders (Bodholt *et al.* 1989) running keel mounted transducers at nominal operating frequencies of 18, 38, 120 (EK500 1) and 200 kHz (EK500 2). All the transceivers were calibrated shortly prior to the survey, in Baía dos Elephantes on the 5<sup>th</sup> of August. Acoustic data were logged and processed using the Sun-Unix based Bergen Echo Integrator (BEI) (Knudsen 1996) version 2000. The technical specifications, operational settings of the echosounders and calibration parameters used during the survey are given in Annex IV.

The acoustic data were scrutinized using the post-processing module of the BEI software. Scatterers were displayed at 38 kHz, standardized to 5 n.mi echograms with 1 000 pings (horizontal) by 500 bins (vertical). The mean 5 n.mi area backscattering coefficients  $s_A$  (m<sup>2</sup>/n.mi<sup>2</sup>) were allocated to a predefined set of acoustic target groups by an experienced team of operators on the basis of scrutiny of characteristic echogram features in conjunction with information about the species- and size compositions as derived from the trawl catches. Definitions of the acoustic target groups are given in Table 2.

**Table 2.** Allocation of acoustic backscattering coefficients to acoustic target groups and theirdefinitions. Note that for horse mackerel, big-eye grunt and pilchard all encounteredspecies are listed, while only examples are listed for the remaining groups.

Acoustic group	Taxonomical group	Species
Horse mackerel	Trachurucan	T. trecae
Horse mackerel	<i>Trachurus</i> sp.	T. t. capensis
Sardinella	Sardinella sp.	S. aurita
		S. maderensis
Pilchard	Sardinops	Sardinops ocellatus
Big-eye grunt	•	Brachydeuterus auritus
Pelagic species 1	Clupeiformes <sub>1</sub>	llisha africana
0		Engraulis encrasicolus
		Etrumeus whiteheadi
Pelagic species 2	Carangidae <sub>2</sub>	Selene dorsalis
5 1	5 2	Chloroscombrus chrysurus
		Decapterus rhonchus
		Seriola carpenteri
	Scombridae	Auxis thazard
		Sarda sarda
		Scomber japonicus
	Sphyraenidae	Sphyraena guachancho
		Trichiurus lepturus
	Others	Lepidopus caudatus
Other demersal species	Sparidae <sub>3</sub>	Dentex angolensis
	- p	D. macrophthalmus
		D. congoensis
		D. canariensis
		D. barnardi
		Pagellus bellottii
		Sparus caeruleostictus
		S. pagrus africanus
	Other taxii	Saurida brasiliensis
		Arioma bondi
		Pomadasys incisus
		Galeoides decadactylus
		Merluccius spp.
Mesopelagic species	Myctophidae <sub>3</sub>	Diaphus dumerili
	Other mesopelagic fish	Trachinocephalus myops
Plankton	Copepoda	Calanus sp.
	Euphausiacea	Meganyctiphanes sp.
	Chaetognatha	mogary oupriarioù op.
	Other plankton	

1: other than Sardinops sp.; 2: other than Trachurus sp.; 3: main species group.

Estimation of biomass and CV

The following target strength (TS) to length relationship was used to convert mean area backscattering coefficient  $s_A$  (m<sup>2</sup>/n.mi<sup>2</sup>) at 38 kHz to number of fish:

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

(1)

$$C_{\rm F} = \frac{10^{7.2}}{4\pi} \cdot L^{-2} \tag{2}$$

where  $C_F$  is the conversion factor from acoustic density to fish biomass and L is the mean total fish length. This target strength function was originally established for North Sea herring, but has later been attributed to clupeids in general (Foote *et al.* 1986, Foote 1987). No specific target strength relations presently are available for the species at hand, and equation (2) has therefore been applied consequently for all targeted species in this time series, following the established practice in Namibia. All estimates should consequently be considered as relative indices of abundance. The biomass was calculated by multiplying the number of fish by the expected length at weight, as estimated by regression of the log-length (total) against total weight.

The boundaries of encountered fish aggregations (post strata) were determined by means of contouring within the inner and outer zero-value limits of the transect lines. The strata contours were digitised using a CalBoard III digitising board / Atlas Draw v. 2.03 PC based software. Distribution plots and aerial calculations on the strata were carried out using IDL 5.6 for MS Windows. Sub-stratification was used to isolate areas of similar densities, using the following pre-defined, standard categories: 1:  $s_A = 0.300$ ; 2:  $s_A = 300.1000$ ; 3:  $s_A = 1000.3000$ ; 4:  $s_A > 3000$ . Mean 5-n.mi integrator values ( $s_A$ ) computed along the transect lines were re-averaged for each stratum. The overall length frequency distributions within strata were estimated by weighting the sample-distributions with the nearest valid 5 n.mi integrator value, or the average of two adjacent values. The total number of fish in each length group was estimated as:

$$\rho_{i} = \frac{\langle s_{A} \rangle t_{i,j} \cdot u_{i}}{\sum_{i} \frac{u_{i}}{C_{Fi}}} \cdot A_{s} = \frac{10^{7.2} \cdot t_{i,j} \cdot u_{i} \cdot \langle s_{A} \rangle \cdot A_{s}}{4\pi \sum_{i} u_{i} \cdot (L_{i} + 0.5)^{2}}$$
(3)

where:

$\rho_i$	=	estimated number of fish in length group i
<\$ <sub>A</sub> >	=	mean recorded area backscattering coefficient (m²/n.mi²)
t <sub>i,j</sub>	=	proportion of species j sampled in length group i

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or

Ui	=	proportion of fish sampled in length group i
$A_{s}$	=	horizontal area of stratum s
$C_{\text{Fi}}$	=	conversion factor for length group i
Li	=	length group i (nearest full cm below total length)
L <sub>i</sub> +0.5	. =	mean length in L <sub>i</sub> .

#### 2.2 Trawl sampling procedures

A brief description and illustrations of the sampling trawls are provided in Annex IV. All trawl catches were sampled for species composition by weights and numbers. Records of catch rates are given in Annex II. Other species (mostly of commercial value) were collected and identified to species level and length measurements were taken Annex III.

#### **Biological sampling**

Samples of the main target species *Trachurus capensis*, *Trachurus trecae* and *Sardinops ocellatus* were collected and measured for length and weight. Total length and body weight were determined to the nearest 1 cm and 1 g below, respectively. Sex and reproductive stages were determined by means of macroscopic examination, scoring each fish according to the five-point classification scale first proposed by Holden and Raitt (1974) (Angolan species) and the seven-point classification according to Tom Hecht (Namibian species). For the condition factor, which is the index of the length to weight proportion giving an idea on the body condition of the fish, the length-weight relationship of target species was determined from the regression analysis of length and weight for all stations sampled.

CF = observed weight /expected weight\*100

Expected weight =  $a^*L^{b}$ ,

#### Zooplankton sampling

The zooplankton communities were sampled along the hydrographical sections at fixed, predefined depths of 200, 100 and 50 m, following the sampling routine used during the prior Angola survey. The depth ranges sampled were 0-25 m, 25-50 m, 50-75 m, 75-100 m, and 100-200 m. The sampling was conducted by means of Hydrobios Multinet, enabling up to five depth-specific samples in one deployment. Each net (405  $\mu$ m) was fitted with a flowmeter for estimation of sample volume. A Scanmar depth sensor gave real-time information of the depth. Nets were opened and closed remotely from the bridge of the vessel.

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#### 2.3 Meteorological and hydrographical sampling

Wind direction and speed, air temperature, global radiation and sea surface temperature (5 m depth) were recorded using the Aanderaa weather station. Values averaged over 10 min intervals were logged continuously. The weather station data were logged continuously throughout the survey. The results presented in this report are based on a standard output from the logging system, i.e. one nautical mile averages along the ship's track.

A Seabird 911+ CTD probe was used to obtain vertical profiles of the temperature, salinity and oxygen. Real time logging was carried out using the PC based Seabird Seasave software. CTD casts were conducted along the cruise track in transects at CTD lines with 60 NM distance and on every 2nd transect at 200 and 50 m depth. The casts were stopped a few meters above the bottom.

A new SBE 21 Seacat Thermosalinograph was installed during the survey of the eastern Gulf of Guinea in 2004. Initial temperature comparisons between the CTD at 5 m and the thermosalinograph showed temperatures 0.25 - 0.3°C warmer for the thermosalinograph because of heating in the pipes, but this has been corrected by addition of another temperature sensor mounted on the water inlet.

The ship-born Acoustic Doppler Current Profiler (ADCP) was running continuously during the survey. The ADCP has significant interference on the 120 and 200 kHz echosounder data, and this was tried counteracted by changing the ping synchronisation routine (trig pulse from EK500 I), but this cannot be done without installing an external trigger unit, which will be done at a later stage.

### 3 Results

#### Coverage 1

In this coverage *T. trecae* was found only in the Angolan waters (Fig. 2). The distribution was patchy and in low densities (1 to  $S_A 300 \text{ m}^2 \setminus n.\text{mi}^2$ ), on the inshore. Densities in the range of 300-1000 were found in the Namibe area and inside Baia dos Tigres. The biomass of *T. trecae* was estimated to 44 000 tonnes, all of which was located in Angola. From this figure, 80 % of was comprised of individuals smaller than 25 cm.

Cape horse mackerel were found continuously from south of Pta. Albina in Angola to south of Cape Frio in Namibia (Fig. 3). Highest concentrations ( $S_A > 10~000~m^2~n.mi^{-2}$ ) were recorded outside of Baia dos Tigres on the inshore and at about 100 m bottom depth. The concentration appeared to decrease southwards with two areas with intermediate densities north and south of the 18° S line. The total biomass estimate of Cape horse mackerel was estimated to be 393 000 tonnes, 253 000 tonnes of which were recorded in Angola and 140 000 in Namibia. From the total biomass 80 % consisted of fish less than 15 cm total length.

The total length of Cape horse mackerel in the transboundary area ranged from 5 to 22 cm. The length frequency distributions of the sampled fish are shown in Fig. 4. The length frequency distribution of *T. trecae* in Angola (Fig. 4a) shows two well-defined cohorts with peaks at 9 and 21 cm in total length. The length distributions of *T. capensis* in the transboundary area showed, however, a mono-modal distribution with a peak around 15 cm total length in Angola (Fig. 4b), and a less clear pattern with peaks around 10, 17 and 22 cm in Namibia (Fig. 4c). Length-weight relationships are given in Annex III.

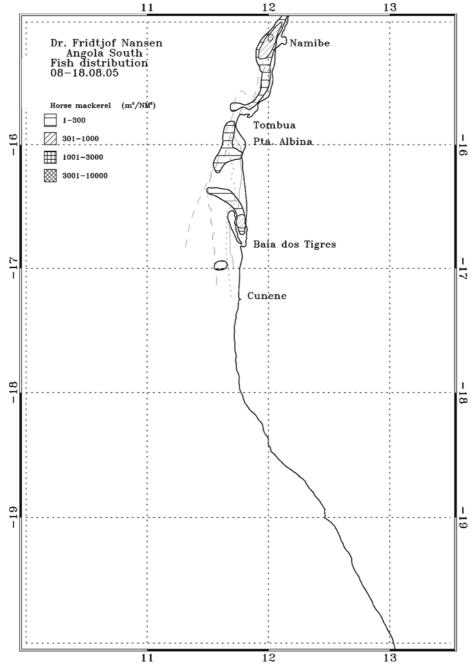
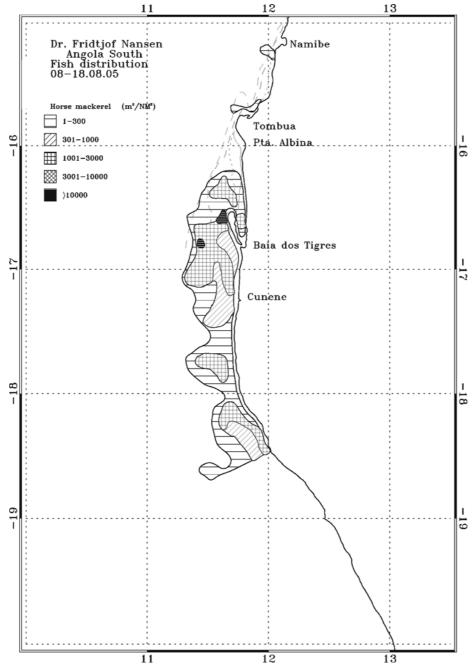
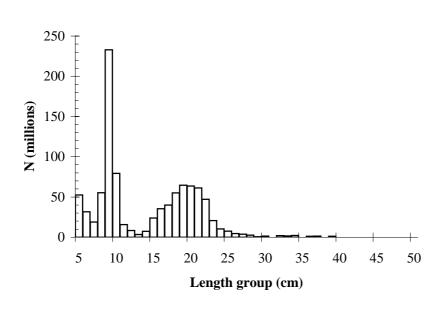
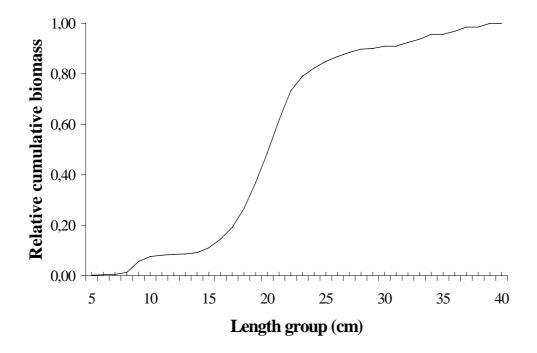


Figure 2. Distribution of *T.trecae* in the Angola-Namibian transboundary area. Depth contours at 20, 50, 100, 200 and 500 m.

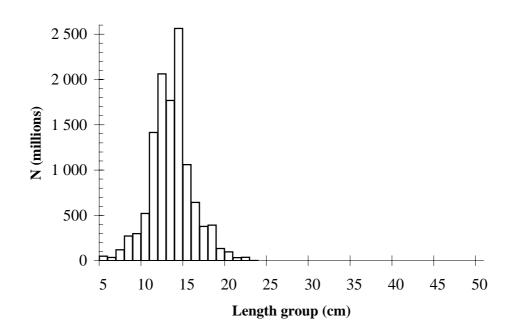


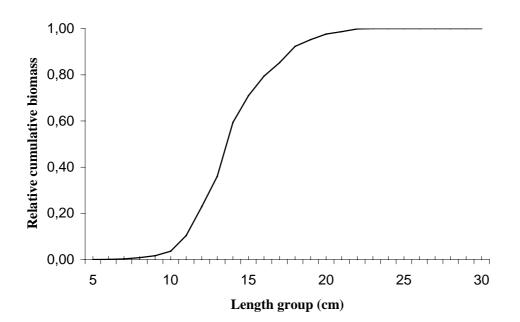
**Figure 3.** Distribution of *T.capensis* in the Angola-Namibian transboundary area. Depth contours at 20, 50, 100, 200 and 500 m.



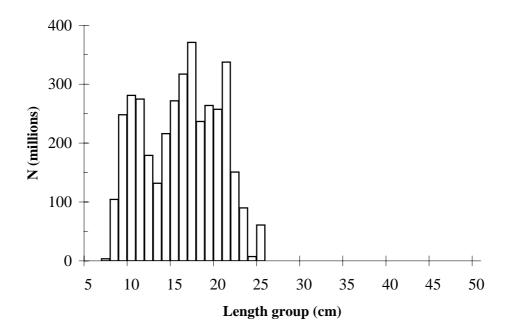


20





b)



**Figure 4.** Length frequencies of *T. trecae* sampled in Angola (a) and *T. capensis* sampled in Angola (b) and Namibia (c).

c)

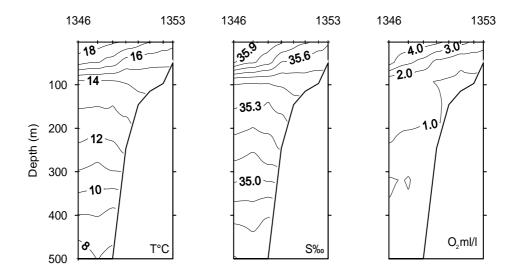
#### Coverage 2

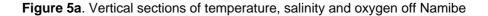
Also during the second coverage, the two horse mackerel dominated the biomass of pelagic fish in the transboundary area, as expected showing a similar distribution pattern to the first coverage. Cunene horse mackerel was, however, found in small quantities on four trawl stations around Cape Frio. The trawl catches prove that Cunene horse mackerel were present in this area, while the trawl catch rates were, however, too low (0,08 to 31.20 kg/hour, Annex II) to substantiate any kind of biomass estimation.

Sardine was found in very low densities inshore in some of the trawl samples obtain during this coverage. In the northern area scattered individuals were found in Baia dos Tigres (catch rate of 0,67 kg/hr) and near the Cunene River (catch rate 0,46 kg/hr). In the southern area sardine was recorded in two of the stations at about 18°S (catch rates of 2,3 and 0,17 kg/hr, respectively). Length-weight relationship of sampled sardine is given in Annex III. Scattered individuals of anchovy and round herring were also found in some of the trawl samples.

#### 4 Oceanographic Conditions

**Sections off Namibe** (Fig. 5a). This section exhibits highest surface temperatures and salinities with evident tropical water mass stratification indicated by isolines. The inshore surface elevation of isolines over a steep and narrow shelf region points to some weak upwelling process in shallow depths (up to 100m) close to the coast.





*Pta. Albina* (Fig. 5b) is separated from Namibe by approximately one degree of latitude. Though both sections exhibit a high level of stratification through the water mass at depth, there is a sharp decrease in both surface temperature and salinities from Namibe (T =18°C, S = 35.9 psu) to Pta. Albina (T =15°C, S = 35.5 psu). This most likely marks the transition in stratification dynamics from tropical to subtropical water masses.

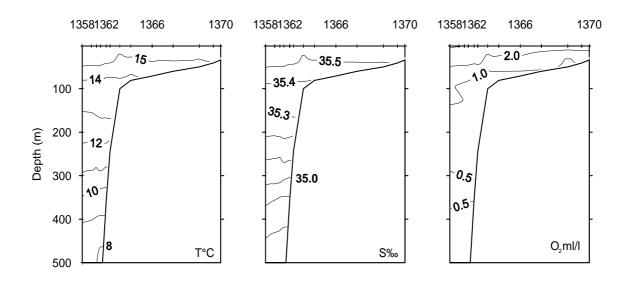


Figure 5b. Vertical sections of temperature, salinity and oxygen off Pta. Albina

**Section off Baia dos Tigres** (Fig. 5c): Relatively quiescent conditions prevailed near Baia dos Tigres, and the parameters in this area showed similar water mass stratification at depth as found off Pta. Albina. There were indications of very weak coastal upwelling close inshore, as evidenced by elevated isolines (T, S, 0<sub>2</sub>) at depths above 100m.

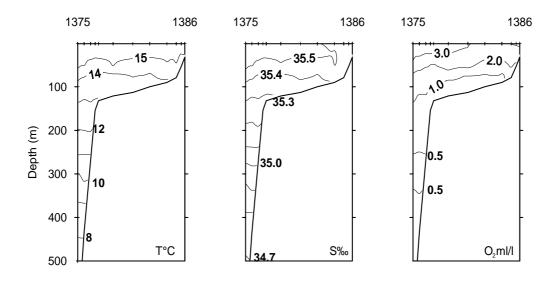


Figure 5c. Vertical sections of temperature, salinity and oxygen off Baía dos Tigres.

**Section off Cunene River** (Fig. 5d): Off the shelf edge the elevated isolines in the temperature; salinity and oxygen profiles indicate the presence of an open ocean upwelling process. The strong shoreward tilt of the isolines points towards the existence of an equator ward undercurrent. There was no detectable impact from the river outflow on the properties of the measured hydrographical parameters near the river mouth. This may be due to the seasonal reduction in the river outflow. A similar oxygen minimum of 0.5 ml/l is found at depths below 250 m off the shelf in regions off Pta. Albina, Baia dos Tigres and Cunene River.

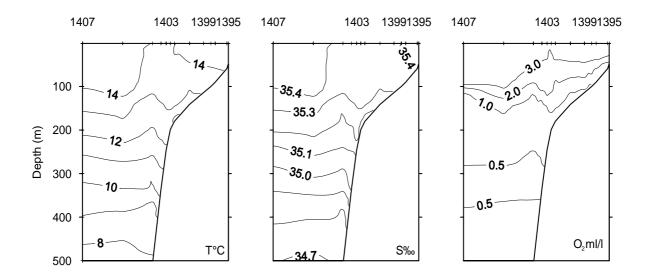


Figure 5d. Vertical sections of temperature, salinity and oxygen off Cunene River.

**Section off Cape Frio** (Fig. 5e): All the isolines clearly demonstrate a typical coastal upwelling regime off Cape Frio, with the uplift of isolines near the coast indicating the intrusion of cooler, less saline and low oxygen water from the subsurface onto the shelf.

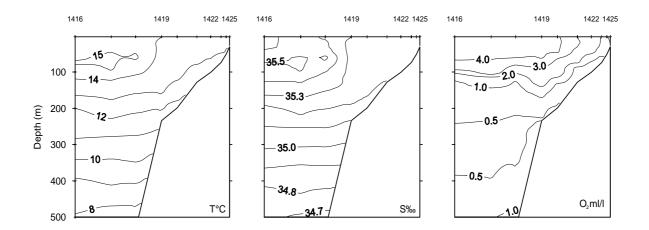


Figure 5e. Vertical sections of temperature, salinity and oxygen off Cape Frio.

**Section off 19°S** (Fig. 5f): The hydrographical conditions here are similar to those at Cape Frio, also indicating coastal upwelling. There was a decrease observed in sea temperature of 1°C and in the salinity of 0.2psu,from Cape Frio to 19°S, demonstrating typical progression into the Benguela proper.

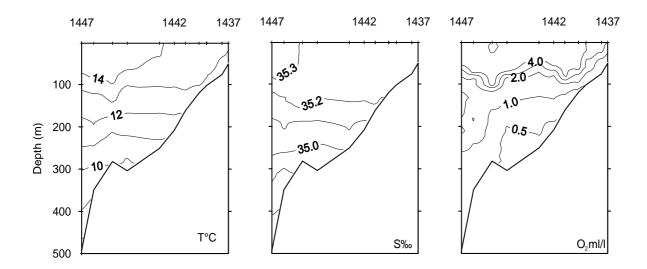


Figure 5f. Vertical sections of temperature, salinity and oxygen off 19°S

Fig. 6 shows the sea surface temperature (SST °C) (a) and sea surface salinity (SSS) (b) recorded at 5 m depth in the transboundary area recorded using the thermosalinograph.

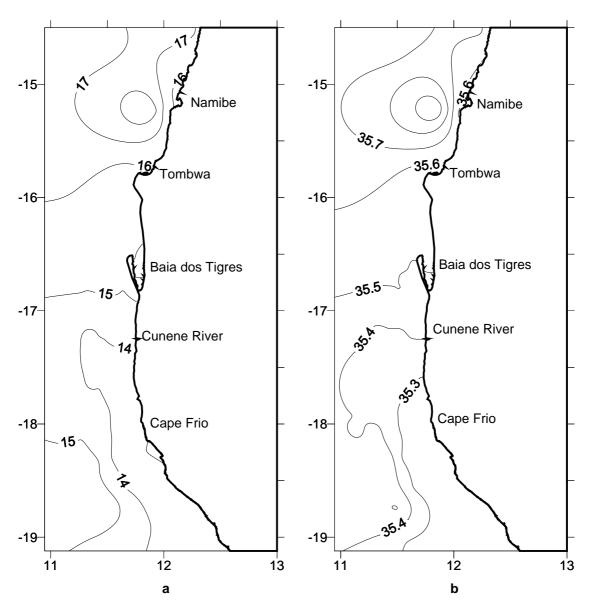


Figure 6. Sea surface temperature (SST °C) (a) and sea surface salinity (SSS) (b) recorded in the transboundary area using the thermosalinograph.

# 5 Conclusion and recommendations

The results clearly show the transboundary nature of the fish resources studied. The results also strongly support the recent reports of alarmingly low abundance levels of Cunene horse mackerel and sardine.

The main conclusions from the survey can be summarized as:

- Cunene horse mackerel was found as far south as Cape Frio (19°00' S), but the densities found south of the Angolan-Namibian border were too low to substantiate any kind of biomass estimation. The biomass of Cunene horse mackerel in Angola was 44 000 tons.
- Cape horse mackerel were found in significant amounts throughout the transboundary area. The biomass was 253 000 tons (64 %) in Angolan waters and 140 000 in Namibian waters (36 %), *i.e.* 393 000 tons in total.
- 3) Scattered individuals of sardine (pilchard) were found in some of the samples on both sides of the border during the high-density search grid for clupeids, but no aggregations of sardine were recorded, neither acoustically nor with the sampling gear (pelagic sample trawls). Any sizeable aggregation in this area would almost certainly have been discovered during such an intensive surveying exercise and it is therefore concluded that no sizeable aggregations of sardine were present in Angola or the transboundary area at the time of the survey.
- 4) Other clupeid species (round herring and anchovy) were only found in scattered, lowdensity aggregations insufficient to produce any estimates of abundance.
- 5) All target species found were small in size. Both horse mackerel species were less than 25 cm, and the little that was found of various clupeids were generally of small size groups.

The main recommendations are:

- 1) The survey should be repeated at the same time of the year in order to establish whether the observed pattern is persistent over time and to monitor development trends in the transboundary area over time, if any.
- 2) The investigation should also be conducted in the warm season. The distribution pattern of all species under investigation here will likely be quite different in the alternate season. Horse mackerel distributions over the transboundary area generally

follow the position of the Angolan-Benguelan front (ABF), i.e. both species have more southern distribution in the warm season. This will, in turn lead to expectations of more Cunene horse mackerel in Namibian waters and less Cape horse mackerel in Angolan waters during summer.

3) The two countries involved should consider cooperating on continuing to monitor the transboundary area and to coordinate management of the fish resources there; all stocks under study here are to some extent transboundary and most stocks are in low abundance. Only fish smaller than 25 cm were found throughout the transboundary area and Cape horse mackerel were predominantly less than 15 cm.

#### 6 References

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- KNUDSEN, H. P. 1996 The Bergen Echo Integrator.

# Annex I Records of fishing stations

DATE: 9/ 8/05 GEAR	TYPE: BT No:1	PH 14 POS:		1604
Start stop duration TIME :13:11:20 13:21:14 10 (π	in) Burbose	code :	Long E	1147
LOG :3920.48 3921.00 0.51	Area coo	de :	1	
LOG :3920.48 3921.00 0.51 FDEPTH: 26 25 BDEPTH: 26 25	GearCond Validity	y code:		
	it: 140 m Spe			
Sorted: 238 Kg Total catc	h: 2975.97	CATO	CH/HOUR: 178	55.82
SPECIES	CATCH/H	HOUR	% OF TOT. C	SAMP
Trachurus trecae	weight r 9954.00 7524.00	numbers	55 75	8196
JELLYFISH	7524.00	118200	55.75 42.14	0190
Atractoscion aequidens Dicologoglossa cuneata	203.22 116.22	1428 5730	1.14	
Rhinobatos albomaculatus	26.22	78 528	0.15	
Trichiurus lepturus Umbrina canariensis	14.22 9.00	300	0.08	
Sardinops ocellatus Raja miraletus	6.72 2.22	300 150 78	0.04	
Total	17855.82	70	100.01	
Iotal	17055.02		100.01	
		DI	ROJECT STATIO	NT • 2056
DATE: 9/ 8/05 GEAR start stop duration	TYPE: OT No:1	14 POSI	ITION:Lat S	1614
TIME :22:34:26 22:41:44 7 (m	nin) Purpose	code:	1	1140
LOG :3964.82 3965.17 0.34 FDEPTH: 60 60	Area coo GearCond		1	
FDEPTH: 60 60 BDEPTH: 60 60 Towing dir: 355ø Wire ou	Validity	y code:	kn*10	
Sorted: 65 Kg Total cate				27.40
SPECIES	weight r	numbers	% OF TOT. C	
Trachurus capensis, juvenile Dentex macrophthalmus Juv.	15365.57	850114	97.08	8197
Dentex macrophthalmus Juv. Sepia orbignyana	346.89 92.83	29803 1714	2.19	8198
Serranus accraensis Trigla lyra	7.37	489	0.05	
Dicologoglossa cuneata	7.37	249	0.05	
Total	15827.40		100.01	
start stop duration TIME :01:53:56 02:03:40 10 (m LOG :3986.45 3986.91 0.46 FDEPTH: 73 70 BDEPTH: 73 70	in) Purpose Area coo GearCond Validity	code: de : d.code: v.code:	Long E 1 1	1619
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start stop duration TIME :01:53:56 02:03:40 10 (m LOG :3986.45 3986.91 0.46 FDEPTH: 73 70 BDEPTH: 73 70 Towing dir: 900 Wire ou Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Juv. Dicologoglossa cuneata Mustelus mustelus Merluccius polli, juveniles Sepia orbignyana Atractoscion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR Start stop duration TIME :05:47:00 05:54:06 7 (m LOG :4020.00 4020.33 0.32 FDEPTH: 79 80 BDEFTH: 79 80	<pre>h h h h h h h h h h h h h h h h h h h</pre>	14 POS: code: de : i.code: y code: w code: y code: 1239972 28548 12360 240 8400 240 8400 240 360 240 360 240 120 14 PI 14 POS: code: de : i.code: y code: de : i.code: y code: y code	TTION:Lat S Long E 1 1 kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.18 0.55 0.18 0.77 0.04 	1619 1139 38.00 SAMP 8200 N:3858 1625 1139
start stop duration TIME :01:53:56 02:03:40 10 (m ILOG :33866.45 3986.91 0.46 PDEPTH: 73 70 BDEPTH: 73 70 Towing dir: 90s Wire ou Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Juv. Dicologoglosa cuneata Mustelus mustelus Merluccius polli, juveniles Sepia orbignyana Atractoscion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR start stop duration TIME :05:47:00 05:54:06 7 (m LOG s4020.00 05:54:00 0;54	A hara coc GearConc Validity 245 m Spe ch: 4123.00 CATCH/F weight r 23832.00 1 23832.00 1 23832.00 1 2373.60 162.00 162.00 162.00 162.00 162.00 162.00 162.00 162.00 162.00 162.00 162.00 162.00 24738.00 TYPE: BT No:1 A hin Purpose Area coc GearConc Validity xt: 245 m Spe ch: 253.70	14 POS: code: de : 1.code: y code: w code: total to	TTION:Lat S Long E 1 1 kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.55 0.18 0.14 0.09 0.07 0.04 	1619 1139 38.00 SAMP 8200 8200 8200 8200 8200 8200 8200 820
start stop duration TIME :01:53:56 02:03:40 10 (m LOG :3986.45 3986.91 0.46 PDEPTH: 73 70 Towing dir: 90ø Wire ou Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Juv. Dicologoglosa cumenta Mustelus mustelus Merluccius polli, juveniles Sepia orbignyana Atractoacion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR start stop duration TIME :05:47:00 05:54:06 7 (m LOG :4020:00 05:54:06 7 (m LOG :400:00 05:54:00 0;	Area con GearConc Validity Validity Validity 245 m Spe cht 4123.00 CATCH/H weight r 23832.00 1 273.60 162.0	14 POS: code: 1.code: 1.code: y code: w code: 285480 240 8400 240 360 240 120 7680 360 240 120 14 POS: code: ie: i.code: y code: ie: 28548 240 840 240 240 240 240 240 240 240 2	TTION:Lat S Long E 1 1 kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.18 0.14 0.09 0.07 0.04 	1619 1139 38.00 SAMP 8199 8200 N: 3858 1625 1139 74.57 SAMP 8202
start stop duration TIME :01:53:56 02:03:40 10 (n FDEPTH: 73 70 BDEFTH: 73 70 SOTED: 900 Wire ou Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Juv. Dicologoglossa cuneata Mustelus mustelus Merluccius polli, juveniles Sepia orbignyana Atractoscion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR total DATE:10/ 8/05 GEAR Start stop duration TIME :05:47:00 05:54:06 7 (n LOG :4020.00 4020.33 0.32 FDEFTH: 79 80 BDEFTH: 79 80 BDEFTH: 79 80 Sorted: 51 Kg Total cato SPECIES Trachurus capensis, juvenile Trachurus capensis	A TYPE: ET No:1 Area coc GearConc Validity validity t: 245 m Spe th: 4123.00 CATCH/F weight r 23832.00 1 273.60 126.80 162.00 136.80 44.40 34.80 22.60 136.80 12.60 136.80 12.00 14.40 34.80 24738.00 24738.00 TYPE: ET No:1 Area coc GearConc Validity t: 245 m Spe Area coc GearConc Validity t: 253.70 CATCH/F weight r 1661.89 235.71 253.71	14 POS: code: i.code: i.code: y code: w code: 28548 12360 240 360 240 360 240 360 240 120 14 POS: code: ie : 1.code: y code: ie : 1.code: 2007 2	TTION:Lat S Long E Long E L kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.18 0.14 0.09 0.09 0.07 0.04 	1619 1139 38.00 SAMP 8199 8200 N: 3858 1625 1139 74.57 SAMP 8202
start stop duration TIME :01:53:56 02:03:40 10 (m PDEPTH: 73 70 BDEPTH: 73 70 Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Pentex macrophthalmus Juv. Dicologoglossa cuneata Mustelus mustelus Merlucclus polli, juveniles Sepia orbignyana Atractoscion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR start stop duration TIME :05:47:00 05:54:06 7 (m LOG :4020:00 4020.33 0.32 PDETH: 79 80 BDEPTH: 79 80 BDEPTH: 79 80 Sorted: 51 Kg Total cato SPECIES Trachurus capensis, juvenile Trachurus trecae Merlucclus capensis Dentex macrophtalmus Monolene microstoma	<pre>h h h h h h h h h h h h h h h h h h h</pre>	14 POS: code: de : i.code: y code: w code: y code: 1239972 28548 12360 240 8400 2400 8400 2400 8400 2400 8400 2400 8400 2400 8400 2400 240 8400 2	TTION:Lat S Long E Long E 1 kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.55 0.18 0.09 0.07 0.04 	1619 1139 38.00 SAMP 8200 N:3858 1625 1139 74.57 74.57 8202 8203
start stop duration TIME :01:53:56 02:03:40 10 (m LOG :3986.45 3986.91 0.46 PDEPTH: 73 70 BDEPTH: 73 70 Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Juv. Dicologoglosa cuneata Mustelus mustelus Merluccius polli, juveniles Sepia orbignyana Atractoacion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR start stop duration TLME :05:47:00 05:54:06 7 (m LOG :4020.00 4020.33 0.32 PDEPTH: 79 80 BDEPTH: 79 80 DDETH: 79 80 Sorted: 51 Kg Total cato SPECIES Trachurus capensis, juvenile Trachurus capensis Dentex marophthalmus Monolene microstoma Calappa sp. GOBIIDAE	<pre>h h h h h h h h h h h h h h h h h h h</pre>	14 POS: code: de : i.code: y code: w code: y code: 1239972 28548 12360 240 8400 2400 8400 2400 8400 2400 2400 8400 2400 2400 2400 2400 240 240 2	TTION:Lat S Long E Long E 1 kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.55 0.18 0.07 0.04 	1619 1139 38.00 SAMP 8200 N: 3858 1625 1139 74.57 SAMP 8202 8203
start stop duration TIME :01:53:56 02:03:40 10 (m TLOG :33966.45 3986.91 0.46 PPEPTH: 73 70 BDEPTH: 73 70 Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Juv. Dicologolosa cumeata Mustelus mustelus Merluccius polli, juveniles Sepia orbignyana Atractoscion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR start stop duration TIME :05:47:00 05:54:06 7 (m LOG :4020.00 4020.33 0.32 PDEPTH: 79 80 DDEPTH: 79 80 DDEPTH: 79 80 Sorted: 51 Kg Total cato SPECIES Trachurus trecae Merluccius capensis, juvenile Trachurus trecae Merluccius capensis, juvenile Trachurus trecae Merluccius capensis Dentex macrophthalmus Konolene microstoma Calappa sp. GOBIIDAE Chelidonichthys capensis	<pre>h h h h h h h h h h h h h h h h h h h</pre>	14 POS: code: de i.code: y code: w code: y code: 28548 12360 240 360 240 360 240 360 240 120 14 POS: code: de i.code: de j.code: de j.code: d	TTION:Lat S Long E 1 1 kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.18 0.14 0.09 0.07 0.04 	1619 1139 38.00 SAMP 8200 N: 3858 1625 1139 74.57 SAMP 8202 8203
start stop duration TIME :01:53:56 02:03:40 10 (m LOG :3986.45 3986.91 0.46 PDEPTH: 73 70 BDEPTH: 73 70 Sorted: 206 Kg Total cato SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Juv. Dicologoglosa cuneata Mustelus mustelus Merluccius polli, juveniles Sepia orbignyana Atractoacion aequidens Diaphus dumerili Trachurus trecae Chelidonichthys capensis Serranus accraensis Total DATE:10/ 8/05 GEAR start stop duration TLME :05:47:00 05:54:06 7 (m LOG :4020.00 4020.33 0.32 PDEPTH: 79 80 BDEPTH: 79 80 DDETH: 79 80 Sorted: 51 Kg Total cato SPECIES Trachurus capensis, juvenile Trachurus capensis Dentex marophthalmus Monolene microstoma Calappa sp. GOBIIDAE	<pre>h h h h h h h h h h h h h h h h h h h</pre>	14 POS: code: de : i.code: y code: w code: y code: 1239972 28548 12360 240 8400 2400 8400 2400 8400 2400 2400 8400 2400 2400 2400 2400 240 240 2	TTION:Lat S Long E Long E 1 kn*10 CH/HOUR: 247 % OF TOT. C 96.34 1.11 0.82 0.65 0.55 0.18 0.07 0.04 	1619 1139 38.00 SAMP 8200 N: 3858 1625 1139 74.57 SAMP 8202 8203

	PROJECT STATIC	N:3859
DATE:10/ 8/05 GEAR Start stop duration	YPE: BT No:14 POSITION:Lat S	1644
TIME : 14:21:49 14:33:07 11 (m	n) Purpose code: 1	114/
LOG :4067.93 4068.55 0.60 FDEPTH: 15 16 BDEPTH: 15 16	Area code : 1 GearCond.code:	
BDEPTH: 15 16 Towing dir: 322ø Wire out	Validity code: : 100 m Speed: 30 kn*10	
		44.05
Sorted. 148 kg - Total Calci	: 888.24 CATCH/HOUR: 48	44.95
SPECIES	CATCH/HOUR % OF TOT. C	SAMP
MISCELLANEOUS	weight numbers 3471.05 71.64	
Trachurus trecae, juvenile Dicologoglossa cuneata	968.73 16331 19.99 110.62 4615 2.28	8204
Arius parkii	79.85 164 1.65	
Callorhinchus capensis Trichiurus lepturus	69.05 2520 1.43	
Atractoscion aequidens Sepia orbignyana	49.09 753 1.01 17.67 229 0.36	
Umbrina canariensis	17.67 229 0.36 2.29 164 0.05	
Total	4844.93 99.99	
	PROJECT STATIC	
DATE:10/ 8/05 GEAR start stop duration	YPE: PT No: 7 POSITION:Lat S Long E	
TIME :17:52:55 18:12:41 20 (m	n) Purpose code: 1	
LOG :4086.28 4087.46 1.17 FDEPTH: 10 10 BDEPTH: 24 25	GearCond.code:	
BDEPTH: 24 25 Towing dir: 357ø Wire out	Validity code: : 140 m Speed: 34 kn*10	
Sorted: Kg Total catch	: 25.36 CATCH/HOUR:	76.08
SPECIES	CATCH/HOUR % OF TOT. C	SAMP
JELLYFISH	weight numbers 71.10 723 93.45 2.01 258 2.64	
Trachurus capensis, juvenile Engraulis encrasicolus	1.83 219 2.41	8205
Trachurus trecae, juvenile	1.14 168 1.50	8206
Total	76.08 100.00	
DATE:27/ 7/03 GEAR 7	PROJECT STATIC YPE: PT No: 7 POSITION:Lat S	818
start stop duration TIME :07:05:14 07:16:30 11 (m	n) Purpose code: 1	1318
LOG :4910.08 4910.52 0.14 FDEPTH: 0 0	Area code : 1 GearCond.code:	
FDEPTH: 0 0 BDEPTH: 24 24 Towing dir: 155ø Wire out	Validity code: 1	
		44 55
Softed: 30 kg Total Catch	: 356.50 CATCH/HOUR: 19	44.55
SPECIES	CATCH/HOUR % OF TOT. C	SAMP
Trachurus capensis, juvenile	weight numbers 1577.45 248236 81.12	8208
JELLYFISH		
	208.36 3327 10.72 158.73 9000 8.16	8209
Etrumeus whiteheadi	158.73 9000 8.16	8209
	208.36         3327         10.72           158.73         9000         8.16           1944.54         100.00	8209
Etrumeus whiteheadi Total	158.73 9000 8.16 1944.54 100.00 PROJECT STATIO	N:3862
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : start stop duration	158.73 9000 8.16 1944.54 100.00 PROJECT STATIC YPE: PT No: 1 POSITION:Lat S Long E	N:3862 1643
Etrumeus whiteheadi Total DATE:11/8/05 GEAR start stop duration TIME :08:08:08 08:15:36 7 (m. LOG :4170.75 4171.21 0.45	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1         POSITION:Lat S           n)         Purpose code: 1           Area code: 1         1	N:3862 1643
Etrumeus whiteheadi Total DATE:11/8/05 GEAR start stop duration TIME :08:08:08 08:15:36 7 (m. LOG :4170.75 4171.21 0.45	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1         POSITION:Lat S           n)         Purpose code: 1           Area code: 1         1	N:3862 1643
Etrumeus whiteheadi Total DATE:11/8/05 GEAR start stop duration TIME :08:08:08 08:15:36 7 (m:	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1         POSITION:Lat S           n)         Purpose code: 1           Area code: 1         1	N:3862 1643
Etrumeus whiteheadi Total DATE:11/8/05 GEAR Start stop duration TIME :08:08:08:15:36 7 (m: LOG :4170.75 4171.21 0.45 FDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1         POSITION:Lat S           n)         Purpose code: 1           Area code: 1         1	N:3862 1643 1139
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR Start stop duration TIME :08:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           Long E           n) Purpose code: 1           GearCond.code: 1           GearCond.code:           'Jalidity code:           'Jalidity code:           'Jalidity code:           'Janity CATCH/HOUR:	N:3862 1643 1139 69.11
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR 2 Start stop duration 108:08:08 08:15:36 7 (mm LOG :4170.75 4171.21 0.45 FDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES	158.73     9000     8.16       1944.54     100.00       PROJECT STATIC       YPE: PT No: 1 POSITION:Lat S       Long E       n) Purpose code: 1       Area code       Validity code:       130 m Speed: 34 kn*10       : 719.73       CATCH/HOUR:       6 oF TOT. C	N:3862 1643 1139 69.11 SAMP
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR Start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 PDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi	158.73         9000         8.16           1944.54         100.00           PROJECT STATIO           YPE: PT No: 1 POSITION:Lat S           Long E           n) Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           'Jalidity code:           : 719.73           CATCH/HOUR           S721.26           667449           92.74           318.69           11786	N:3862 1643 1139 69.11
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR start stop duration TIME :08:08:08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           Inn Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           : 130 m Speed: 34 kn*10           : 719.73           CATCH/HOUR % OF TOT. C           weight numbers           5721.26           667449           92.74	N:3862 1643 1139 69.11 SAMP 8210
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR Start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 PDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi	158.73         9000         8.16           1944.54         100.00           PROJECT STATIO           YPE: PT No: 1 POSITION:Lat S           Long E           n) Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           'Jalidity code:           : 719.73           CATCH/HOUR           S721.26           667449           92.74           318.69           11786	N:3862 1643 1139 69.11 SAMP 8210
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR S start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 FDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           In Purpose code: 1           Area code           GearCond.code:           Validity code:           130 m Speed: 34 kn*10           : 719.73         CATCH/HOUR: 61           CATCH/HOUR         % OF TOT. C           weight numbers         5721.26         667449         92.74           318.69         11786         5.17         129.17         2.09           6169.12         100.00         100.00         100.00	N:3862 1643 1139 69.11 SAMP 8210 8211
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR 5 start stop duration TIME :08:08:08 08:15:36 7 (m; LOG :4170.75 4171.21 0.45 FPDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           n)         Purpose code: 1           Area code         :1           GearCond.code:         Validity code:           '130 m Speed: 34 kn*10         :           :         719.73         CATCH/HOUR: 61           CATCH/HOUR % OF TOT. C         weight numbers           5721.26         667449         92.74           318.69         11786         5.17           129.17         2.09	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR Start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 PDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR start stop duration TIME :11:12:30 (1):22:32 (0 (m)	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           In Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           130 m Speed: 34 kn*10           : 719.73         CATCH/HOUR: 61           CATCH/HOUR % OF TOT. C           weight numbers           5721.26         667449           92.74           318.69         11786           318.69         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           LONG E           n) Purpose code: 1	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR Start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 PDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR start stop duration TIME :11:12:30 (1):22:32 (0 (m)	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           Long E           n) Purpose code: 1           Area code           GearCond.code:           Validity code:           '130 m Speed: 34 kn*10           : 719.73           CATCH/HOUR % OF TOT. C           weight numbers           5721.26           667449           92.74           318.69           11786           5.17           129.17           2.09           6169.12           100.00           PROJECT STATIC           YPE: BT No:15           POSITION:Lat S           Long E	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR 5 start stop duration TIME :03:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR 5 start stop duration TIME :11:12:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S         Long E           n) Purpose code: 1         Area code : 1         GearCond.code:           Validity code:         :130 m Speed: 34 kn*10         :           : 719.73         CATCH/HOUR: 61         617           CATCH/HOUR % OF TOT. C         weight numbers         5721.26           5721.26         667449         92.74           318.69         11786         5.17           129.17         2.09	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR ( Start stop duration TIME :08:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR ( start stop duration TIME :11:22:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 HOM TOWING dir: 360ø Wire out	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           OgearCond.code:         1           Area code         1           GearCond.code:         1           Validity code:         130 m Speed: 34 km*10           :         719.73         CATCH/HOUR:           CATCH/HOUR         © F TOT. C           weight numbers         5721.26           667449         92.74           318.69         11786           5.17         129.17           129.17         2.09           6169.12         100.00           PROJECT STATIC           YPPOSE code:         1           Area code         1           GearCond.code:         100.00	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643 1121
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR ( Start stop duration TIME :08:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR ( start stop duration TIME :11:22:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 HOM TOWING dir: 360ø Wire out	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S         Long E           n) Purpose code: 1         Area code : 1         GearCond.code:           Validity code:         :130 m Speed: 34 kn*10         :           : 719.73         CATCH/HOUR: 61         617           CATCH/HOUR % OF TOT. C         weight numbers         5721.26           5721.26         667449         92.74           318.69         11786         5.17           129.17         2.09	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643 1121
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR ( Start stop duration TIME :08:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR ( start stop duration TIME :11:22:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 HOM TOWING dir: 360ø Wire out	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           Long E           Area code : 1           Area code : 1           GearCond.code:           Validity code:           130 m Speed: 34 kn*10           : 719.73         CATCH/HOUR: 61           CATCH/HOUR         © F TOT. C           weight numbers         5721.26           667449         92.74           318.69         11786           129.17         2.09           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           n) Purpose code: 1         GearCond.code:           Validity code:         :           validity code:         :           validity code:         :           : 2495.36         CATCH/HOUR: 149           CATCH/HOUR         % OF TOT. C	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643 1121 72.16
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR Start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 FDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR Start stop duration TIME :11:22:30 11:22:32 10 (m: LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 EDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           In Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           130 m Speed: 34 km*10           : 719.73         CATCH/HOUR & OF TOT. C           weight numbers           5721.26         667449           92.74           318.69         11786           5121.21         2.09           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           Long E           n) Purpose code: 1           GearCond.code:           Validity code:           : 400 m Speed: 35 km*10           : 2495.36         CATCH/HOUR: 149           CATCH/HOUR         % OF TOT. C           weight         numbers           CATCH/HOUR         % OF TOT. C           weight         numbers	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR Start stop duration TIME :08:08:08 08:15:36 7 (m: FDEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR Start stop duration TIME :11:12:30 11:22:32 10 (m: LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile DATE: 199 Kg Total catch	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           Long E           n) Purpose code: 1           Area code         :1           GearCond.code:         Validity code:           'Validity code:         :           '19.73         CATCH/HOUR:           CATCH/HOUR         & OF TOT. C           weight numbers         5.17           '129.17         2.09           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           Inorg E         1           Area code: 1           GearCond.code:           Validity code:           '400 m Speed: 35 kn*10           : 2495.36         CATCH/HOUR: 149           CATCH/HOUR         % OF TOT. C           weight numbers         14148.00 548802 94.50           '14148.00 548802 94.50         315.00 2250 2.10           165.00 2250 2.10         165.00 2250	N:3862 1643 1139 69.11 SAMP 8210 8211 N:3863 1643 1121 72.16 SAMP
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : start stop duration TIME :08:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR : Start stop duration TIME :11:12:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile Dentex macrophthalmus	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           In Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           130 m Speed: 34 kn*10           : 719.73         CATCH/HOUR: 61           CATCH/HOUR         % OF TOT. C           weight numbers         5721.26           667449         92.74           318.69         11786           512.12         667449           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           Long E         n) Purpose code: 1           Area code : 1         GearCond.code:           Validity code:         : 400 m Speed: 35 kn*10           : 2495.36         CATCH/HOUR: 149           CATCH/HOUR % OF TOT. C         weight numbers           14148.00         548802         94.50           315.00         2250         2.10           165.00         2928         1.00           66.78         300         0.45	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR : start stop duration TIME :11:12:30 11:22:32 10 (m: LOG :4196.18 4196.68 0.50 FPEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 SORted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Etrumeus whiteheadi Zeus faber Perothrissus belloci	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           area code : 1           Area code : 1           GearCond.code:           Validity code:           : 130 m Speed: 34 kn*10           : 719.73           : CATCH/HOUR % OF TOT. C           weight numbers           5721.26           667449           92.74           318.69           129.17           2.09           6169.12           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           Long E           n) Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           : 400 m Speed: 35 kn*10           : 2495.36         CATCH/HOUR * 0F TOT. C           weight numbers           14148.00         548802           94.50           315.00         2250           2.10         165.00           165.00         228           3.50         2.26           3.43.50         150           3.54.78	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : start stop duration TIME :08:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR : TIME :11:12:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile Dentex macrophtalmus Etrumeus whiteheadi Zeus faber Pterothrissus belloci Merluccius polli Zenopsis conchifer Soorpaen normani	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           area code : 1           Area code : 1           GearCond.code:           Validity code:           : 130 m Speed: 34 kn*10           : 719.73           : CATCH/HOUR % OF TOT. C           weight numbers           5721.26           667449           92.74           318.69           129.17           2.09           6169.12           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           Long E           n) Purpose code: 1           Area code : 1           GearCond.code:           Validity code:           : 400 m Speed: 35 kn*10           : 2495.36         CATCH/HOUR * 0F TOT. C           weight numbers           14148.00         548802           94.50           315.00         2250           2.10         165.00           165.00         228           3.50         2.26           3.43.50         150           3.54.78	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 PDEPTH: 60 62 Towing dir: 340s Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR : start stop duration TIME :11:22:30 11:22:32 10 (m: LOG :4196.18 4196.68 0.50 PDEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile Detrumeus whiteheadi Zeug faber Pterothrissus belloci Merluccius polli Zenopsis conchifer Scorpaen normani Mustelus mustelus	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           0         0.00           YPE: PT No: 1 POSITION:Lat S           108.73           GearCond.code:           Validity code:           130 m Speed: 34 km*10           : 719.73         CATCH/HOUR:           CATCH/HOUR         © F TOT. C           weight numbers           5721.26         667449           92.74           316.69         11786           5.17           129.17         2.09           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           sn) Purpose code: 1           Area code         :1           GearCond.code: Validity code:           : 400 m Speed: 35 km*10           : 2495.36         CATCH/HOUR: 149           CATCH/HOUR % OF TOT. C           weight numbers           14148.00         548802           94.50         315.00         228           14148.00         548802         34.50           165.78         300         0.45 </td <td>N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212</td>	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : Start stop duration TIME :03:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR : Start stop duration TIME :11:12:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 DEPTH: 140 140 DEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile Percohurus capensis, juvenile Pentex macrophtalmus Etrumeus whiteheadi Zeus faber Pterothrissus belloci Merluccius polli Zenopsis conchifer Scorpaena normani Mustelus	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           Long E           n) Purpose code: 1         Area code           Area code         1           GearCond.code:         Validity code:           130 m Speed: 34 kn*10         120.73           CATCH/HOUR % OF TOT. C           weight numbers         5721.26           667449         92.74           318.69         11786           129.17         2.09           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           n) Purpose code: 1         CATCH/HOUR % OF TOT. C           gearCond.code:         Long E           validity code:         : 400 m Speed: 35 kn*10           : 2495.36         CATCH/HOUR % OF TOT. C           weight numbers         14148.00           14148.00         548802         94.50           1315.00         2250         2.10           165.00         228         1.01           66.78         300         0.45           54.78         528         0.37           43.50         150	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : start stop duration TIME :03:08:08 08:15:36 7 (m LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340ø Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR : start stop duration TIME :11:12:30 11:22:32 10 (m LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 BDEPTH: 140 140 BDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile Pentex macrophthalmus Etrumeus whiteheadi Zeus faber Pterothrissus belloci Merluccius polli Zenopsis conchifer Scorpaena normani Mustelus mustelus Trigla lyra Squalus megalops	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S           0         0.00           YPE: PT No: 1 POSITION:Lat S           108.73           GearCond.code:           Validity code:           130 m Speed: 34 km*10           : 719.73         CATCH/HOUR:           CATCH/HOUR         © F TOT. C           weight numbers           5721.26         667449           92.74           316.69         11786           5.17           129.17         2.09           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           sn) Purpose code: 1           Area code         :1           GearCond.code: Validity code:           : 400 m Speed: 35 km*10           : 2495.36         CATCH/HOUR: 149           CATCH/HOUR % OF TOT. C           weight numbers           14148.00         548802           94.50         315.00         228           14148.00         548802         34.50           165.78         300         0.45 </td <td>N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212</td>	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR: start stop duration TIME :08:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340s Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR: start stop duration TIME :11:12:30 11:22:32 10 (m: LOG :4196.18 4196.68 0.50 FPEFTH: 140 140 DDEPTH: 140 140 DDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile Dentex macrophtalmus Etrumeus whiteheadi Zeus faber Pterothrisus belloci Merluccius polli Zenopsis conchifer Scorpaena normani Mustelus mustelus Mustelus mustelus Mustelus mustelus	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           Long E           n) Purpose code: 1         Area code           Area code         1           GearCond.code:         Validity code:           130 m Speed: 34 kn*10         120.73           CATCH/HOUR % OF TOT. C           weight numbers         5721.26           667449         92.74           318.69         11786           129.17         2.09           6169.12         100.00           PROJECT STATIC           YPE: BT No:15 POSITION:Lat S           n) Purpose code: 1         CATCH/HOUR % OF TOT. C           gearCond.code:         Long E           validity code:         : 400 m Speed: 35 kn*10           : 2495.36         CATCH/HOUR % OF TOT. C           weight numbers         14148.00           14148.00         548802         94.50           1315.00         2250         2.10           165.00         228         1.01           66.78         300         0.45           54.78         528         0.37           43.50         150	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212
Etrumeus whiteheadi Total DATE:11/ 8/05 GEAR : Start stop duration TIME :03:08:08 08:15:36 7 (m: LOG :4170.75 4171.21 0.45 FPEPTH: 30 30 BDEPTH: 60 62 Towing dir: 340g Wire out Sorted: 65 Kg Total catch SPECIES Trachurus capensis, juvenile Etrumeus whiteheadi JELLYFISH Total DATE:17/ 9/10 GEAR : Start stop duration TIME :11:12:30 11:22:32 10 (m: LOG :4196.18 4196.68 0.50 FDEPTH: 140 140 DDEPTH: 140 140 DDEPTH: 140 140 Sorted: 199 Kg Total catch SPECIES Trachurus capensis, juvenile DETE:15 Trachurus capensis, juvenile DETE: Trachurus capensis, juvenile Detrumeus whiteheadi Zeus faber Pterothrisus belloci Merluccius polli Zenopsis conchifer Scorpaena normani Mustelus mustelus Trigla lyra Squalus megalops Sepia orbingyana Monolene microstoma	158.73         9000         8.16           1944.54         100.00           PROJECT STATIC           YPE: PT No: 1 POSITION:Lat S         Long E           1 Area code : 1         GearCond.code:         Validity code:           130 m Speed: 34 kn*10         :         719.73           : 719.73         CATCH/HOUR % OF TOT. C         weight numbers           : 719.73         CATCH/HOUR % OF TOT. C         weight numbers           : 719.73         CATCH/HOUR % OF TOT. C         Weight numbers           : 719.73         CATCH/HOUR % OF TOT. C         Weight numbers           : 719.73         CATCH/HOUR % OF TOT. C         Long E           : 719.73         CATCH/HOUR % OF TOT. C         Long E           : 719.73         CATCH/HOUR % OF TOT. C         Weight numbers           : 400 m Speed: 35 kn*10         :         2495.36           : 2495.36         CATCH/HOUR % OF TOT. C         Weight numbers           : 4148.00         548802         94.50           : 315.00         2250         2.10           : 165.00         228         0.37           : 43.50         150         0.29           : 43.50         150         0.29           : 445.0         54.78	N: 3862 1643 1139 69.11 SAMP 8210 8211 N: 3863 1643 1121 72.16 SAMP 8212

D300-11/ 0/05	PI	ROJECT STATION: 3864
DATE:11/ 8/05 GEAR TY start stop duration	PE: PT No: 7 POS.	ITION:Lat S 1636 Long E 1145
TIME :16:44:15 17:19:01 35 (Min LOG :4249.17 4251.58 2.40 FDEPTH: 1 1 BDEPTH: 25 24	Area code : GearCond code:	1
BDEPTH: 25 24 Towing dir: 358ø Wire out:	Validity code: 150 m Speed: 40	kn*10
Sorted: 62 Kg Total catch:		
SPECIES	CATCH/HOUR weight numbers	
J E L L Y F I S H Trachurus capensis, juvenile	106.97 1565	99.69
Trachurus trecae, juvenile	0.24 45 0.09 9	
Total	107.30	99.99
		ROJECT STATION:3865
DATE:11/ 8/05 GEAR TY start stop duration	DD. DD N 4 DOO	ITION:Lat S 1631 Long E 1144
TIME :18:04:09 18:26:37 22 (min	) Purpose code:	1
LOG :4254.73 4256.19 1.36 FDEPTH: 1 1 BDEPTH: 29 52	GearCond.code: Validity code:	-
Towing dir: 335ø Wire out:	150 m Speed: 40	kn*10
Sorted: 36 Kg Total catch:	431.28 CAT	CH/HOUR: 1176.22
SPECIES	CATCH/HOUR	% OF TOT. C SAMP
Trachurus trecae, juvenile J E L L Y F I S H	weight numbers 416.29 54251 333.16 4582	35 39 8217
Trachurus capensis, juvenile	332.51 41793	28.27 8216
Etrumeus whiteheadi Engraulis encrasicolus	89.35 4876 4.91 785	7 60 8218
	1176.22	100.00
DATE:11/ 8/05 GEAR TY start stop duration		ROJECT STATION:3866 ITION:Lat S 1649
TIME :23:39:17 23:59:21 20 (min	) Purpose code:	Long E 1124
LOG :4298.47 4299.54 1.07 FDEPTH: 100 100 BDEPTH: 128 127	Area code : GearCond.code:	1
BDEPTH: 128 127 Towing dir: 360ø Wire out:	Validity code: m Speed:	kn*10
Sorted: 19 Kg Total catch:	18.62 CAT	CH/HOUR: 55.86
SPECIES	CATCH/HOUR	% OF TOT. C SAMP
	weight numbers 29.46 1782	52.74 8220
Trachurus capensis, juvenile Etrumeus whiteheadi Chelidonichthys capensis	13.38 321	23.95 8221 17.62
Trigla lyra	9.84 9 3.24 33	5.80
Total	55.92	100.11
DATE:12/ 8/05 GEAR TY		ROJECT STATION: 3867
DATE:12/ 8/05 GEAR TY start stop duration TIME :00:04:59 00:24:38 20 (min		ITION:Lat S 1648 Long E 1124
LOG :4299.81 4300.93 1.11	Area code : GearCond.code:	1
FDEPTH: 50 50 BDEPTH: 128 128 Towing dir: 360ø Wire out:	Validity code:	kn*10
Sorted: Kg Total catch:		
SPECIES		% OF TOT. C SAMP
Centrolophus niger Pteroscion peli	weight numbers 0.90 3 0.03 36	96.77 3.23
Total	0.93	100.00
DATE:12/ 8/05 GEAR TY start stop duration	PE: BT No:15 POS	ROJECT STATION:3868 ITION:Lat S 1650 Long E 1118
TIME :02:09:43 02:37:03 27 (min LOG :4311.71 4313.11 1.38	) Purpose code: Area code :	1
FDEPTH: 353 362 BDEPTH: 353 362	GearCond.code: Validity code:	-
Towing dir: 360ø Wire out:		kn*10
Sorted: 32 Kg Total catch:	1617.50 CAT	CH/HOUR: 3594.44
SPECIES	CATCH/HOUR	% OF TOT. C SAMP
Merluccius capensis	weight numbers 1355.56 2556	37.71 8222
Scorpaena normani Nematocarcinus africanus	1184.44 164000 238.89 184556	32.95 6.65
Pterothrissus belloci Aristeus varidens	234.44 1333	6.52
Hoplostethus cadenati Gadella imberbis	125.56 5556 102.22 1889	2.84
Chlorophthalmus atlanticus Dentex macrophthalmus	76.67 2222 35.56 111	2.13 0.99
MARME03	23.33 667	0.65
Total	3594.45	99.99

DATE:12/ 8/05 GEAR TV start stop duration TIME :08:11:58 08:30:29 19 (min LOG :4357.04 4357.97 0.49 FDEPTH: 57 57 BDEPTH: 57 57 Towing dir: 350ø Wire out:	) Purpose Area co GearCon Validit	code: de : d.code: y code:	1 1	E 1140
Sorted: 65 Kg Total catch:	293.67	CAT	CH/HOUR:	927.38
SPECIES			% OF TOT.	C SAMP
JELLYFISH	weight 371.46 250.67	numbers 60	40.0	
Trachurus trecae, juvenile Engraulis encrasicolus	100 05	6666	11 7	
	98.05	12322	10.5	7
Maja squinado	91.52 5.12	6041 512	9.8 0.5	
Atractoscion aequidens Frichiurus lepturus	98.05 91.52 5.12 1.26 0.41	16 28	0.1	4
	927.34		99.9	_
			ROJECT STA	
DATE:12/ 8/05 GEAR TY start stop duration	PE: BT No:		ITION:Lat	
TIME :11:25:36 11:34:19 9 (min	) Purpose	code:	1	
LOG :4380.46 4380.90 0.44 FDEPTH: 159 158 BDEPTH: 159 158	Area co GearCon	de : d.code:	Ţ	
BDEPTH: 159 158 Towing dir: 360ø Wire out:	Validit 515 m Sp	y code: eed: 30	kn*10	
Sorted: 95 Kg Total catch:				9049.60
SPECIES	CATCH/	HOUR	% OF TOT.	C SAMP
Frachurus capensis, juvenile	weight 5931.60 2074.40	numbers 207733	65.5	5 8226
Dentex macrophthalmus	2074.40 266.93	14300	22.9	5 8226 2 8227 5 8228
Scorpaena normani	241.13	2193	2.9	6
J E L L Y F I S H Dentex angolensis	239.27 112.47	14300 1713 2193 8007 193	2.6	
Cynoglossus capensis Pterothrissus belloci	97.20 20.00	12300	1.0	7
Zeus faber Jmbrina canariensis	20.00 18.07	287 93	0.2	2
Dicologoglossa cuneata	10.47	2480	0.1	2
Trigla lyra Bothus podas africanus	9.53 7.60	287 193	0.1	
Chlorophthalmus atlanticus	0.93		0.0	1
Total	9049.60		99.9	9
Discrete         Openation         Openation           TIME         :13:28:12         13:58:19         30         (min           LOG         :4395.29         4397.05         1.75         FDEPTH:         200         200           BDEPTH:         200         200         Towing dir:         360#         Wire out:	) Purpose Area co GearCon Validit	de : d.code: y code:	1	
	600 m Sp	eed: 40		
Sorted: 134 Kg Total catch:			CH/HOUR:	267.08
SPECIES	133.54 CATCH/	CAT	CH/HOUR: % OF TOT.	C SAMP
SPECIES	133.54 CATCH/	CAT	CH/HOUR: % OF TOT.	C SAMP
SPECIES J E L L Y F I S H Trachurus capensis, juvenile	133.54 CATCH/ weight 146.96 120.12	CAT	CH/HOUR: % OF TOT. 55.0 44.9	C SAMF 2 8 8229 
SPECIES J E L L Y F I S H Trachurus capensis, juvenile	133.54 CATCH/	CAT	CH/HOUR: % OF TOT.	C SAMF 2 8 8229 
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Fotal	133.54 CATCH/ weight 146.96 120.12	CATO HOUR numbers 3010 2458 Pl	CH/HOUR: % OF TOT. 55.0 44.9 100.0 ROJECT STAN ITION:Lat	C SAMP 2 8 8229 0 TION:3872 S 1707
SPECIES J E L L Y F I S H Frachurus capensis, juvenile Total — DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No:	CAT HOUR numbers 3010 2458 PI 15 POS: code:	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAN ITION:Lat Long	C SAMP 2 8 8229 0 TION:3872 S 1707
SPECIES J E L L Y F I S H frachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No:	CAT HOUR numbers 3010 2458 PI 15 POS: code:	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAN ITION:Lat Long	C SAMP 2 8 8229 0 TION:3872 S 1707
DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FDEPTH: 129 127 BDEPTH: 129 127	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: PE: BT No: ) Purpose Area co GearCon Validit	CAT HOUR numbers 3010 2458 PI 15 POS: code: de : d.code: y code:	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STA ITION:Lat Long 1 1	C SAMP 2 8 8229 0 TION:3872 S 1707
SPECIES / E L L Y F I S H Trachurus capensis, juvenile 	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: .) Purpose Area co GearCon Validit 325 m Sp	CATG HOUR numbers 3010 2458 PI 15 POS: code: de : d.code: y code: eed: 30	2H/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STA TTION:Lat Long 1 kn*10	C SAMP 2 8 8229 0 TION:3872 S 1707
SPECIES J E L L Y F I S H frachurus capensis, juvenile rotal DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES	133.54 CATCH/ Weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/	CAT HOUR numbers 3010 2458 15 POS: code: de : d. code: y code: eed: 30 CAT HOUR	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAI ITION:Lat Long 1 kn*10 CH/HOUR: \$ OF TOT.	C SAME 2 8 8229 0 TION:3872 S 1707 E 1129 4712.40
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total — DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 3600 Wire out: Sorted: 132 Kg Total catch: SPECIES Srachurus capensis, juvenile	133.54 CATCH/ Weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m \$785.40 CATCH/	CAT HOUR numbers 3010 2458 PI 15 POS: code: de : d.code: y code: eed: 30 CAT HOUR	2H/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAT I kn*10 CH/HOUR: \$ OF TOT.	C SAMP 2 8 8229 0 TION:3872 S 1707 E 1129 4712.40 C SAMP 0 8230
SPECIES J E L L Y F I S H Frachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FDEPTH: 129 127 BDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Frachurus capensis, juvenile Dentex macrophthalmus	133.54 CATCH/ Weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m \$785.40 CATCH/	CAT HOUR numbers 3010 2458 PI 15 POS: code: de : d.code: y code: eed: 30 CAT HOUR	2H/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAT I kn*10 CH/HOUR: \$ OF TOT.	C SAMF 2 8 8 229 0 TION: 3872 5 1707 E 1129 4712.40 C SAMF 0 8230 9 8231
SPECIES J E L L Y F I S H Frachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FDEFTH: 129 127 BDEFTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Frachurus capensis, juvenile Dentex macrophthalmus Merluccius capensis Synagrops microlepis	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 285.92 231.12 34.20	CATC HOUR numbers 3010 2458 15 POS: code: de : de : d.code: de. d.code: d.code	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STATA Long 1 kn*10 CH/HOUR: \$ OF TOT. 85.0 85.1 4.9 0.7	C SAMP 2 8 8 22 7 10 10 10 10 10 10 10 2 10 10 2 10 10 2 3 10 2 3 10 2 3 10 2 3 3 3 3 3 3 3 3 3 3 3 3 3
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 PDETH: 129 127 BDETH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Frachurus capensis, juvenile Pentex macrophthalmus Merluccius capensis Synagrops microlepis Trigla lyra Eus faber	133.54 weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 385.92 231.12 34.20 2.21.124	CAT( HOUR numbers 3010 2458 15 POS: de : de : ed: 30 CAT( HOUR numbers 176484 2988 1404 5220 108	CH/HOUR: * OF TOT. 55.0 44.9 100.0 ROJECT STATITION:Lat Long 1 kn*10 CH/HOUR: * OF TOT. 85.0 8.1 4.9 0.7 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	C SAME 2 8 8 8 2 9 1710N:3872 5 170N:3872 170N:3872 170N:1872 170N 2 170N:3872 170N 2 170N:3872 170N 2 170N:3872 170N 2 170N:3872 2 170N:375 170N:375 170N:375 170N:375 170N:375 170N:375 1 1 1 1 1 1 1 1 1 1 1 1 1
SPECIES JELLYFISH frachurus capensis, juvenile DATE:12/8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FPDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Frachurus capensis, juvenile Dentex macrophthalmus terluccius capensis Synagrops microlepis frigla lyra Bus faber Baurida brasiliensis	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 385.92 231.12 34.20 21.24	CAT( HOUR numbers 3010 2458 15 POS: de : de : ed: 30 CAT( HOUR numbers 176484 2988 1404 5220 108	CH/HOUR: * OF TOT. 55.0 44.9 100.0 ROJECT STATITION:Lat Long 1 kn*10 CH/HOUR: * OF TOT. 85.0 8.1 4.9 0.7 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	C SAMP 2 8 8 8 2 9 1710N:3872 5 170N 2 2 170N 2 170N 2 170N 2 2 2 2 2 2 2 2 2 2 2 2 2
SPECIES VELLYFISH Trachurus capensis, juvenile DATE:12/8/05 GEAR TY start stop duration TIME :16:06:34 (16:16:11) (min LOG :4413.55 4414.08 0.54 PDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Trachurus capensis, juvenile Pentex macrophthalmus terluccius capensis Synagrops microlepis Trigla lyra Guss faber Jaurida brasiliensis	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon validit 325 m Sp 785.40 CATCH/ weight 4005.35 4005.35 4005.35 231.12 345.92 231.12 345.92 21.12 345.94 21.12 345.95 21.12 345.95 35.	CAT( HOUR numbers 3010 2458 15 POS: de : de : ed: 30 CAT( HOUR numbers 176484 2988 1404 5220 108	CH/HOUR: * OF TOT. 55.0 44.9 100.0 ROJECT STAY ITION:Lat Long 1 kn*10 CH/HOUR: * OF TOT. 85.0 8.1 4.9 0.7 0.4 0.3 	C SAMP 2 8 8 8 2 9 1710N:3872 5 170N 2 2 170N 2 170N 2 170N 2 2 2 2 2 2 2 2 2 2 2 2 2
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 PDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Merluccius capensis Synagrops microlepis Trigla lyra Zeus faber Saurida brasiliensis Total DDTE:13/ 8/05 GENE TO	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon validit 325 m Sp 785.40 CATCH/ weight 4005.35 4005.35 231.22 34.20 21.24 19.08 15.48 4712.40	CAT( HOUR numbers 3010 2458 15 POS: de : d.code: d.code: d.code: d.code: d.code: 176484 2988 1404 520 540	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAT Long 1 kn*10 CH/HOUR: \$ OF TOT. 85.0 8.1 4.9 0.7 0.4 0.3 100.0 ROJECT STAT	C SAME 2 8 8229 0 TION:3872 S 1707 E 1129 4712.40 C SAME 0 8230 9 8231 0 8232 0 8232 0 3 5 1 1 1 1 1 1 1 1 1 1 1 1 1
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Frachurus capensis, juvenile Dentex macrophthalmus Merluccius capensis Synagrops microlepis Trigia lyra Zeus faber Saurida brasiliensis Total DATE:13/ 8/05 GEAR TY start stop duration TIME :23:52:20 00:22:22 30 (min	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 385.92 231.12 34.20 21.24 9.08 15.48 4712.40 PE: PT No: ) Purpose	CAT HOUR numbers 3010 2458 15 POS: code: de : de : eed: 30 CAT HOUR numbers 176484 2988 1404 5220 108 72 540 108 72 540	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAT TTION:Lat Long 1 kn*10 CH/HOUR: \$ OF TOT. 85.0 4.9 0.7 0.4 4.9 1 1 ROJECT STAT 1 2 ROJECT STAT 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	C SAME 2 8 8229 0 TION:3872 S 1707 E 1129 4712.40 C SAME 0 8230 9 8231 0 8232 0 8232 0 3 5 1 1 1 1 1 1 1 1 1 1 1 1 1
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 PDEPTH: 129 127 BDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Frachurus capensis, juvenile Dentex macrophthalmus Merluccius capensis Synagrops microlepis Trigla lyra Zeus faber Saurida brasiliensis Total DATE:13/ 8/05 GEAR TY start stop duration TIME :23:52:20 00:22:22 30 (min LOG :: 4455.03 4456.84 1.81	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 385.92 231.12 34.20 21.24 19.08 15.48 4712.40 PE: PT No: ) Purpose Area co Reaction of the second of th	CAT( HOUR numbers 3010 2458 15 POS: de : d.code: d.cod	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAT TTION:Lat Long 1 kn*10 CH/HOUR: \$ OF TOT. 85.0 4.9 0.7 0.4 4.9 1 1 ROJECT STAT 1 2 ROJECT STAT 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	C SAME 2 8 8229 0 TION:3872 S 1707 E 1129 4712.40 C SAME 0 8230 9 8231 0 8232 0 8232 0 3 5 1 1 1 1 1 1 1 1 1 1 1 1 1
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Prachurus capensis, juvenile Dentex macrophthalmus Merluccius capensis Synagrops microlepis Trigla Jyra Zeus faber Saurida brasiliensis Total DATE:13/ 8/05 GEAR TY start stop duration TIME :23:52:20 00:22:22 30 (min LOG :4455.03 4456.84 1.81 FDEPTH: 100 100 BDEPTH: 100 135	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 335.92 231.12 34.20 21.24 19.08 15.48 4712.40 PE: PT No: ) Purpose Area co GearCon Validit 4712.40	CAT( HOUR numbers 3010 2458 15 POS: de : d.code: d.code: y code: ded: 176484 2298 1404 5200 108 72 540 PI 1 POS: code: de : de: 1 POS: code: de : de: 1 POS: code: de: 1 POS: code: de: 1 POS: code: de: 1 POS: code: de: 1 POS: code: 1 POS: code: 2 POS POS POS POS POS POS POS POS POS POS	CH/HOUR: * OF TOT. 55.0 44.9 100.0 ROJECT STATITION:Lat Long 1 kn*10 CH/HOUR: * OF TOT. 85.0 81.1 4.9 0.4 0.4 0.4 0.4 0.3 100.0 ROJECT STATITION:Lat Long 1 1 1	C SAME 2 8 8229 0 TION:3872 S 1707 E 1129 4712.40 C SAME 0 8230 9 8231 0 8232 0 8232 0 3 5 1 1 1 1 1 1 1 1 1 1 1 1 1
SPECIES J E L L Y F I S H frachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 PDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: Species frachurus capensis, juvenile Dentex macrophthalmus Merluccius capensis Synagrops microlepis frigla lyra Zeus faber Saurida brasiliensis Total DATE:13/ 8/05 GEAR TY start stop duration TIME :23:52:20 00:22:22 30 (min LOG : 4455.03 4456 84 1.81	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon validit 325 m Sp 785.40 CATCH/ weight 4005.35 4005.35 231.12 34.20 21.12 34.20 21.24 19.08 15.48 4712.40 PE: PT No: ) Purpose Area co GearCon validit 405.35 407.24 405.35 407.24 407.35 407.24 407.35 407.24 407.35 407.24 407.35 407.24 407.35 407.24 407.35 407.24 407	CAT( HOUR numbers 3010 2458 15 POS: code: d.code: y code: eed: 30 CAT( HOUR numbers 176484 12988 1404 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540 74 74 74 74 74 74 74 74 74 74	CH/HOUR: * OF TOT. 55.0 44.9 100.0 ROJECT STAT ITION:Lat CH/HOUR: * OF TOT. 85.0 8.1 4.9 0.4 0.4 0.3 100.0 ROJECT STAT ITION:Lat Long 1 kn*10 ROJECT STAT Long 1 kn + 10 ROJECT STAT LONG 1 ROJECT STAT ROJECT	C SAME 2 8 8 8 2 1 2 5 1 1 2 1 1 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2
SPECIES JELLYFISH Trachurus capensis, juvenile Total DATE:12/8/05 GEAR TY gtart stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 FPDEFTH: 129 127 BDEFTH: 129 127 BDEFTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Trachurus capensis, juvenile Dentex macrophthalmus derluccius capensis Synagrops microlepis Trigla Jyra Zeus faber Saurida brasiliensis Total DATE:13/8/05 GEAR TY start stop duration TIME :23:52:20 00:22:22 30 (min LOG :4455.03 4456.84 1.81 FDEFTH: 100 100 BDEFTH: 140 135 Towing dir: 360ø Wire out: Sorted: Kg Total catch:	133.54 CATCH/ weight: 146.96 120.12 267.08 PE: BT No: ) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 385.92 231.12 34.20 21.24 19.08 15.48 4712.40 PE: PT No: ) Purpose Area co GearCon Validit 19.08 15.48 4712.40 PE: PT No: 160.78 CATCH/	CAT( HOUR numbers 3010 2458 15 POS: code: de : d.code: eed: 30 CAT( HOUR numbers 176484 2988 14048 2988 176484 5220 108 72 540 108 72 540 108 72 540 108 72 540 108 72 540	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAI TITONILAL kn*10 CH/HOUR: \$ OF TOT. 85.0 81.1 4.7 0.4 0.7 0.4 0.3 100.0 ROJECT STAN 100.0 ROJECT STAN 100.0 ROJECT STAN 100.0 ROJECT STAN 100.0 ROJECT STAN 100.0 ROJECT STAN 85.0 8.1 100.0 ROJECT STAN 85.0 8.1 100.0 85.0 8.1 100.0 85.0 8.1 100.0 85.0 8.1 100.0 85.0 8.1 100.0 85.0 8.1 100.0 85	C SAME 2 8 8225 0 TION:3877 E 1125 4712.40 C SAME 0 8230 0 8232 0 8232 5 0 7 TION:3873 S 1713 E 1130 33 2 1715 S 1713 S 171
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration TIME :16:06:34 16:16:13 10 (min LOG :4413.55 4414.08 0.54 PDEPTH: 129 127 BDEPTH: 129 127 BDEPTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Prachurus capensis, juvenile Dentex macrophthalmus Merluccius capensis Synagrops microlepis Trigla lyra Zeus faber Saurida brasiliensis Total DATE:13/ 8/05 GEAR TY start stop duration TIME :23:52:20 00:22:22 30 (min LOG :4455.03 4456.84 1.81 PDEPTH: 100 100 BDEPTH: 100 100 BDEPTH: 140 135 Towing dir: 360ø Wire out: Sorted: Kg Total catch: SPECIES	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: )) Purpose Area co GearCon Validit 325 m Sp 785.40 CATCH/ weight 4005.36 231.12 34.20 21.12 34.20 21.24 19.08 15.48 4712.40 PE: PT No: )) Purpose Area co GearCon Validit 300 m Sp 160.78 CATCH/ weight	CAT( HOUR numbers 3010 2458 15 POS: code: de : eed: 30 CAT( HOUR numbers 176484 2298 1404 5220 10 872 540 1 POS: code: de : de : 4.code: 2540 1 POS: code: de : 4.code: 4.code: 1 POS: code: de : 4.code: 2540 1 POS: code: de : 4.code: 4.cod	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAT ITION:Lat Long 1 kn*10 CH/HOUR: \$ OF TOT. 85.0 85.1 85.1 85.1 1 kn*10 CH/HOUR: 1 1 kn*10 ROJECT STAT Long 1 1 kn*10 ROJECT STAT Long 1 1 kn*10 ROJECT STAT Long 1 1 kn*10 ROJECT STAT Kn*10 CH/HOUR: 8 OF TOT. ROJECT STAT Long 1 1 kn*10 CH/HOUR: 8 OF TOT. ROJECT STAT CH/HOUR: 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT.	C SAMP 2 8 8 22 7 10N:3872 5 170N:3873 4712.40 C SAMP 0 8230 0 8230 0 8231 0 8232 5 0 3 5 1713 E 1130 321.56 C SAMF
SPECIES J E L L Y F I S H Trachurus capensis, juvenile Total DATE:12/ 8/05 GEAR TY start stop duration LOG :4413.55 4414.08 0.54 FDEPTH: 129 127 BDETTH: 129 127 Towing dir: 360ø Wire out: Sorted: 132 Kg Total catch: SPECIES Trachurus capensis, juvenile Dentex macrophthalmus Marluccius capensis Synagrops microlepis Trigla lyra Zeus faber Saurida brasiliensis Total DATE:13/ 8/05 GEAR TY start stop duration TIME :23:52:20 00:22:22 30 (min LOG :4455.03 4456.84 1.81 PDEPTH: 100 100 BDEPTH: 100 100 BDEFTH: 140 135 Towing dir: 360ø Wire out: Sorted: Kg Total catch: SPECIES J E L L Y F I S H Trachurus capensis, juvenile	133.54 CATCH/ weight 146.96 120.12 267.08 PE: BT No: )) Purpose Area co GearCon validit 325 m Sp 785.40 CATCH/ weight 4005.36 335.92 231.12 34.20 21.24 19.08 15.48 4712.40 PE: PT No: )) Purpose Area co GearCon validit 15.48 CATCH/ weight 300 m Sp 160.78 CATCH/ weight	CAT HOUR numbers 3010 2458 15 POS: code: eed: 30 CAT HOUR numbers 176484 2988 1404 2988 15220 108 722 540 108 72 540 1 POS: code: de: de: de: de: for for for for for for for for for for	CH/HOUR: \$ OF TOT. 55.0 44.9 100.0 ROJECT STAT ITION:Lat Long 1 kn*10 CH/HOUR: \$ OF TOT. 85.0 85.1 85.1 85.1 1 kn*10 CH/HOUR: 1 1 kn*10 ROJECT STAT Long 1 1 kn*10 ROJECT STAT Long 1 1 kn*10 ROJECT STAT Long 1 1 kn*10 ROJECT STAT Kn*10 CH/HOUR: 8 OF TOT. ROJECT STAT Long 1 1 kn*10 CH/HOUR: 8 OF TOT. ROJECT STAT CH/HOUR: 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT. 8 OF TOT.	C SAME 2 8 8 2 1 1 2 8 8 2 1 2 1 2 1 2 1 2 1 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2

# BCLME Project:LMR/NANSEN/02/05

100.00

321.56

Total

DATE:13/ 8/05 GEAR T start stop duration	YPE: BT No:		Long H	1132
TIME :15:26:38 15:27:48 1 (min LOG :4568.73 4568.74 0.01	n) Purpose Area co	code: 1 de : 5		
FDEPTH: 147 147 BDEPTH: 147 147	GearCon	d.code:		
BDEPTH: 147 147 Towing dir: 360ø Wire out	Validit : m Sp	y code: eed: kı	n*10	
Sorted: 183 Kg Total catch				32.80
ECIES	weight	numbers	OF TOT. C	SAME
quorea aequorea xysaora hysoscella	7597.80 2700.60	90960 9480	68.87 24.48	
achurus capensis, juvenile	717.60	19740	6.50	8234
rluccius capensis ntex macrophthalmus	717.60 15.00 1.80	120 60	0.14 0.02	
	11032.80		100.01	
LAI	11032.80		100.01	
DATE:13/ 8/05 GEAR T start stop duration TIME :18:51:37 19:36:14 45 (mi)	YPE: PT No:	1 POSITI	JECT STATIO ION:Lat S Long F	3 1727
LOG :4598.22 4600.99 2.76	Area co	de : 5		
FDEPTH: 200 100 BDEPTH: 1058 841	GearCon Validit			
Towing dir: 90ø Wire out			n*10	
Sorted: 7 Kg Total catch	: 7.02	CATCH,	/HOUR:	9.36
ECIES	CATCH/	HOUR %	OF TOT. C	SAMI
EPOCEPHALIDAE	weight 3.68	numbers 392	39.32	
LOPHORIDAE	1.57	996	16.77	
nostoma elongatum ACHICHTHYIDAE	0.84	996 75 3	8.97 8.55	
SCELLANEOUS	0.76	100	8.12	
CTOPHIDAE michthys scolopaceus	U.32 0.32	120 84 101 1 4	3.42 3.42	
gyropelecus affinis hedophilus huttoni	0.28	101	2.99	
TOPOTEUTHIDAE	0.21	1 4		
achurus capensis RISTIIDAE	0.12	1	1.28 0.75	
THYLAGIDAE	0.05	11	0.75	
COTEUTHIDAE plostethus cadenati	0.05	4	0.53	
LANOCETIDAE	0.03	7	0.32	
MASTREPHIDAE RALEPIDIDAE	0.01	3	0.11 0.11	
lex coindetii	0.01	5	0.11	
lex coindetil egmaceros atlanticus — tal —	0.01 0.01 9.34	4 1 3 11 4 1 7 3 1 5 3	0.11 0.11  99.78	
egmaceros atlanticus — tal — DATE:14/ 8/05 GEAR T	ype: pt No:	PRO 1 POSIT	JECT STATIC	5 1746
egmaceros atlanticus —	YPE: PT No: n) Purpose Area co GearCon Validit	PRO 1 POSIT: code: 1 de : 5 d.code: y code:	JECT STATIC ION:Lat S Long F	5 1746
egmaceros atlanticus tal	YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp	PRO 1 POSITI code: 1 de : 5 d.code: y code: eed: 40 kn	JECT STATIC ION:Lat S Long F n*10	3 1746 3 1122
egmaceros atlanticus tal — DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (mi LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 200 29 TOEPTH: 309 391 Towing dir: 3330 Wire out Sorted: 7 Kg Total catch	YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78	PROJ 1 POSIT: code: 1 de :5 d.code: y code: y code: eed: 40 kn CATCH,	JECT STATIC ION:Lat S Long F n*10 /HOUR:	1746 1122
egmaceros atlanticus tal — DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (mi) LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 200 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES	YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight	PRO. 1 POSIT: code: 1 de : 5 d.code: y code: eed: 40 kn CATCH, HOUR %	JECT STATIC ION:Lat S Long F n*10 /HOUR: OF TOT. C	1746 1122
egmaceros atlanticus tal	YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65	PROC 1 POSIT: code: 1 de : 5 d.code: y code: eed: 40 kr CATCH, HOUR %	JECT STATIC ION:Lat S Long F n*10 /HOUR: OF TOT. C 32.00	1746 1122
egmaceros atlanticus tal	YPE: PT No: n) Purpose Area co GearCon Validit 800 m Sp : 6.78 CATCH/ weight 4.65 3.75	PRO: 1 POSIT: code: 1 de : 5 d.code: y code: weed: 40 kK CATCH, HOUR \$ 1umbers 58 4 1513	JECT STATIG ION:Lat S Long F n*10 /HOUR: OF TOT. C 32.00 25.81 17.55	5 1746 5 1122 14.53 SAME
egmaceros atlanticus tal — DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (mi) LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 200 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES	YPE: PT No: n) Purpose Area co GearCon Validit : 600 m Sp : 6.78 CATCH/ weight 4.65 3.75	PRO. 1 POSIT: code: 1 de : 5 d.code: y code: y code: 40 kr CATCH, HOUR % 1 numbers 58 4	JECT STATIC LONY Lat S Long F n*10 /HOUR: OF TOT. C 32.00 25.81	1746 1122
egmaceros atlanticus tal	YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 2.55 1.67 1.03 0.51	PRO. 1 POSIT: code: 1 de : 5 d. code: y code: eed: 40 kn CATCH, HOUR % 1 10 8 4 1513 21 75 58	JECT STATIC ION:Lat S Long F h*10 /HOUR: 0F TOT. C 32.00 25.81 17.75 11.49 7.09 3.51	5 1746 5 1122 14.53 SAME
egmaceros atlanticus tal	YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 2.55 1.67 1.03 0.51 0.36	PRO. 1 POSIT: code: 1 de : 5 d. code: y code: eed: 40 kr CATCH, HOUR % 10 15 15 15 15 15 13 13 13	JECT STATIC ION:Lat S Long F n*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.44	5 1746 5 1122 14.53 SAME
egmaceros atlanticus tal	YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 2.55 1.67 1.03 0.51	PRO. 1 POSIT: code: 1 de : 5 d. code: y code: eed: 40 kr CATCH, HOUR % 10 15 15 15 15 15 13 13 13	JECT STATIC ION:Lat S Long F h*10 /HOUR: 0F TOT. C 32.00 25.81 17.75 11.49 7.09 3.51	5 1746 5 1122 14.53 SAME
egmaceros atlanticus tal DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. crOPHIDAE achurus capensis RALEPIDIDE rrella blackfordi michthys scolopaceus	YPE: PT No: n) Purpose Area co GearCon Validit 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 1.67 1.03 0.51 0.36 14.52	PRO: 1 POSIT: code: 1 de : 5 d.code: y code: w cArcH, HOUR % 1000 1513 21 75 58 133 PRO: PRO:	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 99.93	<ul> <li>1744</li> <li>1122</li> <li>114.53</li> <li>SAME</li> <li>8235</li> <li>8235</li> </ul>
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T Start stop duration TIME :09:53:12 10:21:29 28 (mi) LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 200 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE achipterus ap. CTOPHIDAE Trella blachfordi michthys acolopaceus tal — —	YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No:	PRO: 1 POSIT: code: 1 de : 5 d.code: y code: cATCH, HOUR % 100 15 PRO: 15 P	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 99.93	<ul> <li>1744</li> <li>1122</li> <li>114.53</li> <li>SAME</li> <li>8235</li> <li>8235</li> </ul>
egmaceros atlanticus tal	YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose	PRO: 1 POSIT: code: 1 de: 5 d.code: 5 d.code: 4 v code: 4 HOUR % Numbers 4 1513 21 75 58 133 133 PRO: 15 POSIT: code: 1 de: 5 de: 5 15 POSIT: code: 1 de: 5 28 28 28 28 28 28 28 28 28 28	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 99.93	<ul> <li>1744</li> <li>1122</li> <li>114.53</li> <li>SAME</li> <li>8235</li> <li>8235</li> </ul>
parte:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. CTOPHIDAE achipterus capensis RALEPIDIDAE tralla blackfordi michthys scolopaceus tal	YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose Area co GearCon Validit	PRO: 1 POSIT: code: 1 de: 5 d.code: y code: eed: 40 kn CATCH, HOUR % numbers 4 1513 21 75 58 133 PRO: 15 POSIT: code: 1 de: 5 d.code: 9 133 PRO: 15 POSIT: code: 5 d.code: 9 10 code: 9	JECT STATIC ION:Lat S Long F n*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 	<ul> <li>1744</li> <li>1122</li> <li>114.53</li> <li>SAME</li> <li>8235</li> <li>8235</li> </ul>
egmaceros atlanticus tal	YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp	PRO: POSIT: code: 1 de: 5 d. code: eed: 40 kn CATCH, HOUR % numbers 4 1513 21 75 58 133 133 PRO: 15 POSIT: code: 1 de: 5 d. code: y code: 9 15 POSIT: code: 1 de: 5 d. code: 9 10 10 10 10 10 10 10 10 10 10	JECT STATIC ION:Lat S Long F n*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 99.93 JECT STATIC ION:Lat S Long F	<pre>3 1746 3 1746 3 1122 3 1122 3 1122 3 1122 3 1122 8 235 8 217 8 217</pre>
egmaceros atlanticus tal	<pre>YPE: PT No: Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp : 170.63</pre>	PRO: 1 POSIT: code: 1 de. 5 d.code: 5 d.code: CATCH, HOUR % 158 133 PRO: 15 POSIT: code: 1 de. 5 d.code: 2 de. 5 d.code: 4 CATCH, PRO: 15 POSIT: code: 1 de. 5 58 133 PRO: 15 POSIT: code: 1 code: 4 CATCH, CATCH	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.55 11.49 7.51 2.48 99.93 JECT STATIC ION:Lat S Long F	<pre>3 1746 3 1746 8 1122 14.53 SAME 8235 8235 8235 8235 8235 8235 8235 8235</pre>
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T Start stop duration TIME :09:5312 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. CTOPHIDAE achipterus sp. CTOPHIDAE achipterus app. CTOPHIDAE achipterus app. CTOPHIDAE achirus capensis RALEPIDIDAE Trella blackfordi michthys scolopaceus tal — DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 EDEPTH: 165 167 ED	<pre>YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp : 170.63</pre>	PRO: 1 POSIT: code: 1 de : 5 d.code: 5 d.code: 40 kK CATCH, HOUR % 1513 21 75 58 133 1513 21 75 58 133 PRO: 15 POSIT: code: 1 de : 5 d.code: 1 de : 5 d.code: 1 code: 1 58 133 PRO: 15 POSIT: code: 1 CATCH, HOUR % 10 KK 10 KKK 10 KKK 10 KKK 10 KKK 10 KKK 10 KKKK 10 KKKKKK	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 99.93 JECT STATIC ION:Lat S Long F h*10 /HOUR: 25 0F TOT. C	<pre>3 1746 3 1746 8 1122 14.53 SAME 8235 8235 8235 8235 8235 8235 8235 8235</pre>
egmaceros atlanticus tal DATE:14/ 8/05 GEAR T Start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 200 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. CTOPHIDAE achipterus sp. CTOPHIDAE rrella blackfordi michthys scolopaceus tal DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 BDEPTH: 165 167 Sorted: 57 Kg Total catch	<pre>YPE: PT No:</pre>	PRO: 1 POSIT: code: 1 de : 5 d.code: 5 d.code: 7 code: 40 kK 1513 21 75 58 133 21 75 58 133 133 PRO: 15 POSIT: code: 1 de : 5 d.code: 1 de : 5 d.code: 1 code: 1 58 133 21 75 58 133 PRO: 15 POSIT: code: 1 code: 1 21 75 58 133 PRO: 15 POSIT: code: 1 code: 1 21 75 58 133 PRO: 15 POSIT: code: 1 code: 1 21 75 58 133 PRO: 15 POSIT: code: 1 code: 2 code: 1 code: 2 code: 1 code: 2 code:	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.55 11.49 7.51 2.48 99.93 JECT STATIC ION:Lat S Long F	17464 174653 SAMI 8235 8235 8235 8235 8235 8235 8235 8235
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. CTOPHIDAE COPHIDAE RALEPIDIDAE rella blackfordi michthys scolopaceus tal  DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 DDEPTH: 165 167 TOwing dir: 360ø Wire out Sorted: 57 Kg Total catch ECIES E L L Y F I S H achurus capensis F L L Y F I S H achurus capensis	<pre>YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp : 170.63 CATCH/ weight 1083.15 1083.15 1083.15</pre>	PRO: 1 POSIT: code: 1 de : 5 d.code: y code: CATCH, HOUR % Numbers 58 4 1513 21 75 58 133 PRO: 15 POSIT: code: 1 de : 5 d.code: 1 de : 5 d.code: 1 de : 5 CATCH, HOUR % ICATCH, HOUR % ICATCH, CA	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 99.93 JECT STATIC ION:Lat S Long F h*10 /HOUR: 25 0F TOT. C 42.32 42.32 7.64	<pre>3 1744% 3 1744% 2 1122 14.53 SAME 8235 8235 0N:3877 5 1744 2 1133 5559.45 SAME 8236</pre>
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333s Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achurus capensis RALEPIDIDAE tal  DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 Towing dir: 360s Wire out Sorted: 57 Kg Total catch ECIES E L L Y F I S H achurus capensis tal Towing dir: 360s Wire out Sorted: 57 Kg Total catch ECIES E L L Y F I S H achurus capensis rluccius capensis rjuacius capensis rjuacota c	<pre>YPE: PT No: n) Purpose Area co GearCon Validit : 0.10 : 6.78 CATCH/ weight 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp : 170.63 CATCH/ weight 1083.15 1083.15 1083.15 1083.15 1083.15</pre>	PRO: 1 POSIT: code: 1 de : 5 d.code: y code: CATCH, HOUR % 14 1513 21 75 58 133 PRO: 15 POSIT: code: 1 de : 5 d.code: 1 de : 5 d.code: 1 de : 5 d.code: 1 de : 5 CATCH, HOUR % Numbers 27000 795 225 58	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.01 17.55 11.49 7.09 3.51 2.48 99.93 JECT STATIC ION:Lat S Long F h*10 /HOUR: 25 0F TOT. C 42.32 42.32 7.64 3.69 2.41	<pre>3 1744% 3 1744% 2 1122 14.53 SAME 8235 8235 0N:3877 5 1744 2 1133 5559.45 SAME 8236</pre>
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T Start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. CTOPHIDAE achurus capensis RALEPIDIDAE tal  DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 BDEPTH: 165 167 BDEPTH: 165 167 BDEPTH: 165 167 BDEPTH: 165 167 Sorted: 57 Kg Total catch ECIES E L L Y F I S H achurus capensis rluccius capensis	<pre>YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp : 170.63 CATCH/ weight 1083.15 1093.15 1095.60 94.50 61.65 22.05</pre>	PRO: 1 POSIT: code: 1 de: 5 d. code: y code: eed: 40 kn CATCH, HOUR % 1513 21 75 58 133 PRO: 15 POSIT: code: 1 de: 5 d. code: y code: solution CATCH, HOUR % CATCH, HOUR % 133 PRO: 15 POSIT: code: 1 de: 5 d. code: 37305 27000 795 225 58	JECT STATIC ION:Lat S Long F a*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.09 3.51 2.48 99.93 HECT STATIC ION:Lat S Long F 0.55 0F TOT. C 42.32 42.32 7.64 3.51 0F TOT. C	<pre>3 1744% 3 1744% 2 1122 14.53 SAME 8235 8235 0N:3877 5 1744 2 1133 5559.45 SAME 8236</pre>
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 PDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. CTOPHIDAE achurus capensis RALEPIDIDAE tal  DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 BDEPTH: 165 167 Towing dir: 360ø Wire out Sorted: 57 Kg Total catch ECIES E L L Y F I S H achurus capensis rJsaota Stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 BDEPTH: 165 167 Towing dir: 360ø Wire out Sorted: 57 Kg Total catch ECIES	<pre>YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp : 170.63 CATCH/ weight 1083.15 1083.</pre>	PRO: POSIT: code: 1 de: 5 d. code: eed: 40 kn CATCH, HOUR % 1513 21 75 58 133 PRO: 15 POSIT: code: 1 de: 5 d. code: y code: 50 133 PRO: 15 POSIT: code: 1 de: 5 37305 225 5625 720 540 540 540 540 540 540 540 54	JECT STATIC ION:Lat S Long F a*10 /HOUR: OF TOT. C 32.00 25.81 17.55 1.7.55 1.7.55 1.7.59 3.51 2.48 99.93 JECT STATIC ION:Lat S Long F 0F TOT. C 42.32 42.32 7.64 3.69 2.41 0.69 2.41 0.69 2.41 0.69 2.41	<pre>3 1744% 3 1744% 2 1122 14.53 SAME 8235 8235 0N:3877 5 1744 2 1133 5559.45 SAME 8236</pre>
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T Start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 FDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achirgtorus sp. CTOPHIDAE achirgtorus apensis RALEPIDIDAE Trella blackfordi michthys scolopaceus tal  DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEFTH: 165 167 BDEPTH: 165 167 BDEPTH: 165 167 EDEPTH: 15 H achurus capensis rluccius balloci	<pre>YPE: PT No: n) Purpose Area co GearCon validit : 800 m Sp : 6.78 CATCH/ weight 4.65 3.75 2.55 1.67 1.03 0.51 0.36 </pre>	PRO: 1 POSIT: code: 1 de : 5 d.code: 5 d.code: code: y code: code: 15 15 15 13 21 75 58 133 27 20 68 15 16 27 20 68 27 20 27 20 58 58 27 20 27 20 58 58 27 20 58 27 20 58 58 27 20 58 58 27 20 58 58 27 20 58 58 27 20 58 58 58 27 20 58 58 58 58 27 20 58 58 58 58 58 58 58 58 58 58	JECT STATIC ION:Lat S Long F h*10 /HOUR: OF TOT. C 32.00 25.81 17.55 11.49 7.59 3.51 2.48 	<pre>3 1744% 3 1744% 2 1122 14.53 SAME 8235 8235 0N:3877 5 1744 2 1133 5559.45 SAME 8236</pre>
egmaceros atlanticus tal  DATE:14/ 8/05 GEAR T start stop duration TIME :09:53:12 10:21:29 28 (min LOG :4732.37 4734.27 1.90 PDEPTH: 200 225 BDEPTH: 309 391 Towing dir: 333ø Wire out Sorted: 7 Kg Total catch ECIES E L L Y F I S H achipterus sp. CTOPHIDAE achurus capensis RALEPIDIDAE tal  DATE:14/ 8/05 GEAR T start stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 BDEPTH: 165 167 Towing dir: 360ø Wire out Sorted: 57 Kg Total catch ECIES E L L Y F I S H achurus capensis rJsaota Stop duration TIME :12:37:41 12:41:50 4 (min LOG :4750.69 4750.92 0.22 FDEPTH: 165 167 BDEPTH: 165 167 Towing dir: 360ø Wire out Sorted: 57 Kg Total catch ECIES	<pre>YPE: PT No: n) Purpose Area co GearCon Validit : 800 m Sp : 6.78 CATCH/ weight 4.65 2.55 1.67 1.03 0.51 0.36 14.52 YPE: BT No: n) Purpose Area co GearCon Validit : 510 m Sp : 170.63 CATCH/ weight 1083.15 1083.</pre>	PRO: POSIT: code: 1 de: 5 d. code: eed: 40 kn CATCH, HOUR % 1513 21 75 58 133 PRO: 15 POSIT: code: 1 de: 5 d. code: y code: 50 133 PRO: 15 POSIT: code: 1 de: 5 37305 225 5625 720 540 540 540 540 540 540 540 54	JECT STATIC ION:Lat S Long F a*10 /HOUR: OF TOT. C 32.00 25.81 17.55 1.7.55 1.7.55 1.7.59 3.51 2.48 99.93 JECT STATIC ION:Lat S Long F 0F TOT. C 42.32 42.32 7.64 3.69 2.41 0.69 2.41 0.69 2.41 0.69 2.41	<pre>3 1744% 3 1744% 2 1122 14.53 SAME 8235 8235 0N:3877 5 1744 2 1133 5559.45 SAME 8236</pre>

PROJECT STATION: 3878 GEAR TYPE: PT No: 1 POSITION:Lat DATE:15/ 8/05 I:Lat S 1800 Long E 1141 
 DATE:15/8/05
 GEAR TYPE: PT No: 1
 POSIT:

 start
 stop
 duration
 nuration

 TIME
 :03:49:11
 03:53:40
 4
 (min)
 Purpose code: 1

 LOG
 :4854.30
 4854.58
 0.28
 Area code: 5
 5

 PDEPTH:
 90
 90
 GearCond.code:
 6
 BDEPTH:
 117
 118
 Validity code:
 Towing dir: 340ø Wire out: 270 m Speed: 45 kn\*10 Sorted: 97 Kg Total catch: 97.05 CATCH/HOUR: 1455.75 CATCH/HOUR SPECIES % OF TOT. C SAMP weight numbers 1072.20 11235 Chrysaora hysoscella Trachurus capensis, juvenile Aequorea aequorea Merluccius capensis Sufflogobius bibarbatus 73.65 296.40 73.80 8.85 2.85 15300 20.36 8238 1605 5.07 0.61 1005 15 30 45 0.20 1.65 PARALEPIDIDAE 0.11 1455.75 100.00 Total PROJECT STATION: 3879 DATE:15/ 8/05 GEAR TYPE: BT No:15 POSITION:13879 start stop duration Long E 1144 TIME :08:13:58 08:18:16 4 (min) Purpose code: 1 LOG :4877.66 4877.88 0.22 Area code : 5 FDEFTH: 98 99 GearCond.code: BDEFTH: 98 99 Validity code: Towing dir: 333ø Wire out: 300 m Speed: 30 kn\*10 Sorted: 66 Kg Total catch: 232.61 CATCH/HOUR: 3489.15 CATCH/HOUR % OF TOT. C SAMP weight numbers 1644.30 81855 47.13 8239 990.15 4260 28.38 86.10 735 2.47 8240 30.40 9320 0.87 18.90 375 0.54 6.30 1845 0.18 SPECIES Trachurus capensis Chrysaora hysoscella Merluccius capensis Aequorea aequorea Pterothrissus belloci Sufflogobius bibarbatus 2776.15 79.57 Total 
 PROJECT STATION:3880

 DATE:15/ 8/05
 GEAR TYPE: BT No:15 POSITION:Lat S 1817

 start stop duration
 Long E 1138

 TIME :16:11:00 16:13:55 3 (min) Purpose code: 1
 LOG :4937.92 4938.08 0.16

 LOG :4937.92 4938.08 0.16
 Area code : 5

 FDEPTH: 156 157
 GearCond.code:

 BDEPTH: 156 157
 Validity code:

 Towing dir: 350ø Wire out: 490 m Speed: 30 kn\*10
 Sorted: 175 Kg Total catch: 350.08 CATCH/HOUR: 7001.60 CATCH/HOUR % OF TOT. C SAMP SPECIES weight numbers 43.99 3080.00 1732.00 76200 8200 Aequorea aequorea Chrysaora hysoscella Trachurus capensis Merluccius capensis 24.74 1526.40 421.60 177.20 30.40 31220 21.80 8241 2160 6.02 8242 Dentex macrophthalmus 1640 2.53 0.43 8243 Synagrops microlepis 9320 Sufflogobius bibarbatus Pterothrissus belloci 28.00 5.60 11080 0.40 280 0.08 0.40 280 0.01 Calappa rubroguttata 7001.60 100.00 Total PROJECT STATION: 3881 
 DATE:16/ 8/05
 GEAR TYPE: BT No:15
 POSITION:La

 start
 stop
 duration
 Lc

 TIME
 :09:34:01
 6 (min)
 Purpose code: 1

 LOG
 :5050.53
 5050.78
 0.25
 Area code
 5

 FDEPTH:
 44
 46
 GearCond.code:
 BDEPTH:
 44
 46
 Validity code:

 Towing dir:
 333ø
 Wire out:
 150 m
 Speed: 30 kn\*10
 DATE:16/ 8/05 GEAR TYPE: BT No:15 POSITION:Lat Long E 1201 Sorted: 60 Kg Total catch: 182.58 CATCH/HOUR: 1825.80 CATCH/HOUR % OF TOT. C SAMP SPECTES CATCH/HOUR weight numbers 1160.40 127830 591.60 5130 52.50 2400 18.60 30 2.10 60 0.60 20 63.56 32.40 2.88 1.02 0.12 0.03 Trachurus capensis, juvenile Chrysaora hysoscella Dicologoglossa cuneata Chelidonichthys gabonensis 8244 Calappa sp. Pterothrissus belloci \_\_\_\_ 100.01 1825.80 Total 
 PROJECT STATION:3882

 DATE:16/8/05
 GEAR TYPE: BT No:15 POSITION:Lat S 1845

 start stop duration
 Long E 1131

 TIME 13:54:51 14:05:12 10 (min) Purpose code: 1
 LOG :5089.74 5090.29 0.54

 Area code : 1
 FDEPTH: 257 257

 GEPTH: 257 257
 Validity code:

 EDEPTH: 257 257
 Validity code:

 Towing dir: 345ø
 Wire out: 767 m Speed: 30 kn\*10
 Sorted: 56 Kg Total catch: 588.85 CATCH/HOUR: 3533.10 CATCH/HOUR % OF TOT. C weight numbers 2502.36 8316 70.83 509.04 2646 14.41 281.58 2772 SPECIES SAMP Merluccius capensis 8245 Dentex macrophthalmus 8246 Pterothrissus belloci 7.97 1.59 3342 Chlorophthalmus atlanticus 56.04 PORTUNIDAE Helicolenus dactylopterus 40.32 37.80 2712 1.14 2394 1.07 Synagrops microlepis Schedophilus pemarco Galeus polli Sufflogobius bibarbatus 34.80 24.54 4476 0.98 66 0.69 318 18.90 17.64 0.53 5922 0.50

Lophius vomerinus

Total

#### 100.00 BCLME Project:LMR/NANSEN/02/05

192

0.29

10.08

3533.10

		PRC	JECT STATIO	N:3883
DATE:16/ 8/05 GEAR TY start stop duration	PE: PT No: 1	POSII	Long E	1132
TIME :15:39:39 16:00:51 21 (min LOG :5097.46 5098.80 1.33	Area code	: 5		
FDEPTH: 250 240 BDEPTH: 255 254	GearCond.c Validity c	code:		
Towing dir: 345ø Wire out:				
Sorted: 24 Kg Total catch:	23.85	CATCH	I/HOUR:	68.14
SPECIES	CATCH/HOU	JR {	OF TOT. C	SAMP
MYCTOPHIDAE	weight num 51.11 2	25174	75.01	
Aequorea aequorea Chrysaora hysoscella	14.29 2.31	326 14	3.39	
Dentex macrophthalmus	0.43	3	0.63	
Total	68.14		100.00	
DATE:16/ 8/05 GEAR TY	PE: PT No: 1			1854
Start stop duration TIME :20:53:31 21:12:00 18 (min	) Purpose co	de: 1	Long E	1132
LOG :5135.67 5136.87 1.20 FDEPTH: 250 30 BDEPTH: 271 271	Area code GearCond.c	code:		
BDEPTH: 271 271 Towing dir: 170ø Wire out:	Validity of 150 m Speed	code: 1: 40 k	:n*10	
Sorted: 75 Kg Total catch:	75.20	CATCH	I/HOUR: 2	50.67
SPECIES	weight num	nbers	OF TOT. C	SAMP
MYCTOPHIDAE Brama brama	weight num 220.80 21 16.00 13.60 0.27	13	88.08 6.38	
Chrysaora hysoscella PARALEPIDIDAE	0.27	80 93	5.43 0.11	
Total	250.67		100.00	
			JECT STATIO	
start stop duration	PE: PT No: 1		Long E	
TIME :11:36:53 12:06:21 29 (min				
LOG :5236.31 5238.11 1.79 FDEPTH: 150 140 BDEPTH: 282 286	Area code GearCond.c	code:		
BDEPTH: 282 286 Towing dir: 64ø Wire out:	Validity o 450 m Speed	code: 1: 35 k	n*10	
Sorted: 35 Kg Total catch:	69.32	CATCH	I/HOUR: 1	43.42
SPECIES	and whether and and	· l= = =	OF TOT. C	SAMP
Aequorea aequorea MYCTOPHIDAE	106.10 31.12 2	3103 24894	73.98 21.70	
MYCTOPHIDAE Chrysaora hysoscella	106.10 31.12 2 6.21	3103 24894 21		
MYCTOPHIDAE Chrysaora hysoscella	106.10 31.12 2 6.21 143.43	3103 24894 21	73.98 21.70 4.33 100.01	
MYCTOPHIDAE Chrysaora hysoscella	106.10 31.12 2 6.21		100.01	
MYCTOPHIDAE Chrysaora hysoscella Total	106.10 31.12 2 6.21 143.43	PRC	JOO.01 DJECT STATIO TION:Lat S	1557
MYCTOPHIDAE Chrysaora hysoscella — Total — DATE:18/ 8/05 GEAR TYJ start stop duration	106.10 31.12 2 6.21 143.43	PRC POSIT	JOO.01 DJECT STATIO	1557
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYJ start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FDEFTH: 21 22	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c	PRC POSIT ode: 1 : 1 code:	JOO.01 DJECT STATIO	1557
MYCTOPHIDAE Chrysaora hysoscella — Total — DATE:18/ 8/05 GEAR TYJ start stop duration	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c	PRC POSIT ode: 1 : 1 code: code:	100.01 DJECT STATIO 'ION:Lat S Long E	1557
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI Start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FDEPTH: 21 22 BDEPTH: 21 22	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed	PRO POSIT ode: 1 code: code: d: 32 k	100.01 DJECT STATIO CION:Lat S Long E	1557 1145
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYJ start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285ø Wire out: Sorted: 32 Kg Total catch:	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27	PRC POSIT ode: 1 code: code: 1: 32 k CATCH		1557 1145 72.70
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI Start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FDEPTH: 21 22 DEPTH: 21 22 Towing dir: 285ø Wire out: Sorted: 32 Kg Total catch: SPECIES	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num	PRC POSIT ode: 1 code: code: i: 32 k CATCH IR %	100.01 DJECT STATIO VION:Lat S Long E 	1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYJ start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285ø Wire out: Sorted: 32 Kg Total catch:	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60	PRC POSIT ode: 1 code: code: i: 32 k CATCH IR %		1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285s Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90	PRC POSIT ode: 1 : 1 code: code: code: d: 32 k CATCH JR % hbers 03170 110	IOO.OI DJECT STATIO 'ION:Lat S Long E       	1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PEPETH: 21 22 BDEPTH: 21 22 Towing dir: 285s Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speec 347.27 CATCH/HOU weight num 282.40 20 83.60 53.90 15.40 9.90	PRC POSIT ode: 1 code: 1 code: i: 32 k CATCH JR % hbers J3170 110 110 440 220		1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285s Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose coc Area code GearCond.c Validity c 100 m Speec 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70	PRC POSIT ode: 1 code: code: 1: 32 k CATCE JR % hbers 03170 110 110 440 220 330		1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI Start stop duration TIME :12:38:08 12:43:50 6 (min LGG :5478.45 5478.77 0.30 FDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285æ Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speec 347.27 CATCH/HOU weight num 282.40 20 83.60 53.90 15.40 9.90	PRC POSIT ode: 1 code: 1 code: i: 32 k CATCH JR % hbers J3170 110 110 440 220		1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285æ Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Dubrina canariensis Dentex barnardi Pomadays incisus Trichiurus lepturus Galeus polli	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60	PRC POSIT odde: 1 code: 1 code: 4 code: 4 l: 32 k CATCE JR 4 hbers 03170 110 110 440 220 330 330 310		1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285s Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40	PRC POSIT odde: 1 code: 1 code: 4 code: 4 l: 32 k CATCE JR 4 hbers 03170 110 110 440 220 330 330 310		1557 1145 72.70 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285s Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40	PRC POSIT POSIT 1 1 1 10de: code: 1: 32 k hbers 03170 110 110 220 330 330 110 110		1557 1145 72.70 SAMP 8247
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FPEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285ø Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40	PRC POSIT ode: 1 :0de: code: carce carce 1 : 32 k der sole: 330 110 110 110 110 110 110		1557 1145 72.70 SAMP 8247 8247 N:3887 1642
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 2852 Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 02: d6:50 21 (min	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code Gearcond. c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc	PRC POSTI 1 1 :0de: 1 :0de: 1 :0de: 1 :0de: 1 :0de: 1		1557 1145 72.70 SAMP 8247 8247 N:3887 1642
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MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285s Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 83.60 53.90 15.40 9.90 83.60 53.90 15.40 9.90 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 83.60 53.90 15.40 9.90 6.60 4.40 3472.70	PRC POSIT i 1 i 2 i 2 i 32 k CATCE CATCE CATCE 440 220 110 110 POSIT 100 i 1 10 POSIT i 32 k 440 220 POSIT 100 i 1 100 i 1 i 1 i 1 i 1 i 1 i 1 i 1 i 1		1557 1145 72.70 SAMP 8247 8247 N:3887 1642
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 2850 Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FDEPTH: 37 40	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 8.80 7.70 6.60 4.40 3472.70	PRC POSIT i 1 i 2 i 2 i 2 i 2 i 2 i 2 i 2 i 2		1557 1145 72.70 SAMP 8247 8247 N:3887 1642
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI Start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 2858 Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TUME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FDEPTH: 37 40 BDEPTH: 37 40 DEDETH: 37 40 Towing dir: 3499 Wire out: Sorted: 27 Kg Total catch:	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 22 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 140 m Speed 162.66	PRC POSTI : 1 : 1 : 20de: : 32 k dubers 33170 110 110 110 110 110 110 110 110 110		1557 1145 72.70 SAMP 8247 8247 N:3887 1642 1140
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI Start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285ø Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FDEPTH: 37 40 BDEPTH: 37 40 Towing dir: 349ø Wire out: Sorted: 27 Kg Total catch:	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 22 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 162.66 CATCH/HOU weight num	PRC POSIT i 1 i 2 i 2 i 32 k CATCH I 3 2 CATCH I 3 2 I 3 2 I 3 2 K I 3 2 I 3 2 K I 3 2 I 3 2 K I 3 2 I 3 2 K I 3 2 I 3 2 I 3 2 I 3 2 K I 3 2 I 3 2 I 3 2 K I 3 2 I 10 I		1557 1145 72.70 SAMP 8247 8247 8247 1642 1140 64.74 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FPEPTH: 21 22 BDEPTH: 21 22 Towing dir: 2859 Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FDEPTH: 37 40 BDEPTH: 37 40 BDEPTH: 37 40 SPECIES Trachurus trecae SPECIES Trachurus trecae	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 22 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 162.66 CATCH/HOU weight num 242.06 180.00	PRC POSTI : 1 : 1 : 1 : 20de: : 32 k dubers 33170 110 110 110 220 330 110 110 110 110 110 110 110 110 11		1557 1145 72.70 SAMP 8247 8247 8247 1642 1140 64.74 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI Start stop duration TIME s12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FPEPTH: 21 22 BDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 2850 Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FPEPTH: 37 40 BDEPTH: 37 40 Towing dir: 349e Wire out: Sorted: 27 Kg Total catch: SPECIES Trachurus trecae JELLYFISH Umbrina canariensis Khinobatos rhinobatos	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 162.66 CATCH/HOU weight num 242.06 180.00 9.43 8.40	PRC POSTI : 1 : 20de: : 32 k CATCH R % CATCH ILO 440 220 330 110 110 110 PRC POSTI : 30 k CATCH CATCH CATCH CATCH CATCH PRC CATCH C		1557 1145 72.70 SAMP 8247 8247 8247 1642 1140 64.74 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME s12:38:05 6 (min LOG :5478.45 5478.77 0.30 FPEPTH: 21 22 BDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 2850 Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FPEPTH: 37 40 BDEPTH: 37 40 Towing dir: 349e Wire out: Sorted: 27 Kg Total catch: SPECIES Trachurus trecae JELLYFISH Umbrina canariensis Fhinobatos rhinobatos Sepia officinalis hierredda Engraulis encrasicolus	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 162.66 CATCH/HOU weight num 242.06 162.66	PRC POSTI de: 1 : 1 : 1 : 2 : 32 k CATCH R % CATCH R % CATCH PRC PRC PRC PRC PRC PRC PRC PRC		1557 1145 72.70 SAMP 8247 8247 8247 1642 1140 64.74 SAMP
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME :12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 FPEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285ø Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:00 9:46:50 21 (min LOG :5685.13 5686.18 1.05 FPEPTH: 37 40 BDEFTH: 37 40 BDEFTH: 37 40 Towing dir: 349ø Wire out: Sorted: 27 Kg Total catch: SPECIES Trachurus trecae JELLYFISH Umbrina canariensis Rhinobatos rhinobatos Sepia officinalis hierredda Engraulis encrasicolus Raja miraletus Loligo vulgaris	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 162.66 CATCH/HOU weight num 242.06 180.00 9.43 8.40 7.54 5.31 4.63 4.29	PRC POSIT de: 1 : 1 : 1 : 0de: : 32 k CATCH R % CATCH R % in 0 110 110 110 110 110 PRC PRC PRC PRC PRC PRC PRC PRC		1557 1145 72.70 SAMP 8247 8247 N: 3887 1642 1140 64.74 SAMP 8248 8251
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME s12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 2858 Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Umbrina canariensis Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FDEPTH: 37 40 BDEPTH: 37 40 BDEPTH: 37 40 SPECIES Trachurus trecae JELLYPISH Umbrina canariensis Rhinobatos rhinobatos Sepia officinalis hierredda Engraulis encrasicolus Raja miraletus	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 20 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 162.66 CATCH/HOU weight num 242.06 180.00 9.43 8.40 7.54 5.31 4.63 4.29	PRC POSTI i 12 i 20de: i 32 k CATCH R % CATCH R % CATCH I10 110 110 110 110 110 PRC POSTI i 330 110 110 PRC POSTI i 1 i 1 i 1 i 2 PRC i 330 i 2 i 2 i 2 i 2 i 2 i 2 i 2 i 2		1557 1145 72.70 SAMP 8247 8247 1642 1140 64.74 SAMP 8248
MYCTOPHIDAE Chrysaora hysoscella Total DATE:18/ 8/05 GEAR TYI start stop duration TIME s12:38:08 12:43:50 6 (min LOG :5478.45 5478.77 0.30 PDEPTH: 21 22 BDEPTH: 21 22 BDEPTH: 21 22 Towing dir: 285s Wire out: Sorted: 32 Kg Total catch: SPECIES Trachurus trecae, juvenile Arius parkii Mustelus mustelus Dentex barnardi Pomadasys incisus Trichiurus lepturus Galeus polli Dicologoglossa cuneata Total DATE:19/ 8/05 GEAR TYI start stop duration TIME :09:26:02 09:46:50 21 (min LOG :5685.13 5686.18 1.05 FDEPTH: 37 40 DDEPTH: 37 40 DDEPTH: 37 40 SPECIES Trachurus trecae SPECIES Trachurus trecae SPECIES	106.10 31.12 2 6.21 143.43 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 100 m Speed 347.27 CATCH/HOU weight num 3282.40 22 83.60 53.90 15.40 9.90 8.80 7.70 6.60 4.40 3472.70 PE: BT No:15 ) Purpose cc Area code GearCond.c Validity c 140 m Speed 162.66 CATCH/HOU weight num 242.06 180.00 9.43 8.40 7.54 5.31 4.63 4.29 2.06	PRC POSTI 1 1 1 20de: 1 21 20de: 1 220 330 3100 110 110 110 110 110 110 110 1		1557 1145 72.70 SAMP 8247 8247 1642 1140 64.74 SAMP 8248 8251 8250

PROJECT STATION:3888 GEAR TYPE: PT No: 1 POSITION:Lat S 1653 aration Long E 1139 
 PROC

 start
 stop
 GEAR TYPE: PT No: 1 POSITI

 start
 stop
 duration

 TIME :19:35:22 19:53:27 18 (min)
 Purpose code: 1

 LOG :5779.28 5780.56 1.28
 Area code : 1

 FDEPTH:
 30
 GearCond.code:

 BDEPTH:
 56
 70
 Validity order
 : 56 70 Validity code: Towing dir: 260ø Wire out: 170 m Speed: 40 kn\*10 Sorted: 75 Kg Total catch: 75.49 CATCH/HOUR: 251.63 SPECIES CATCH/HOUR % OF TOT. C SAMP weight 138.53 82.33 17.13 7.43 numbers Chrysaora hysoscella Engraulis encrasicolus 670 55.05 19080 32.72 8252 Aequorea aequorea Trachurus capensis, juvenile Etrumeus whiteheadi 133 6.81 8253 430 5 53 307 2.20 8255 Sardinops ocellatus 0.67 57 0.27 8254 251.62 100.00 Total PROJECT STATION: 3889 PROJECT STATION.5005 GEAR TYPE: PT No: 1 POSITION:Lat S 1659 iration Long E 1139 DATE:20/ 8/05 DATE:20/8/05 GEAR TYPE: PT No: 1 POSITION:La start stop duration Lo TIME :01:10:37 01:26:07 16 (min) Purpose code: 1 LOG :5830.54 5831.66 0.15 Area code : 1 FDEPTH: 15 14 GearCond.code: BDEPTH: 60 70 Validity code: Towing dir: 276ø Wire out: 100 m Speed: 45 kn\*10 Sorted: 37 Kg Total catch: 73.60 CATCH/HOUR: 276.00 CATCH/HOUR % OF TOT. C SAMP weight numbers 207.90 18975 75.33 8257 34.58 473 12.53 33.08 428 11.99 0.45 98 0.16 8256 SPECIES Engraulis encrasicolus Aequorea aequorea Chrysaora hysoscella Trachurus capensis 100.01 Total 276.01 
 PROJECT STATION:3890

 DATE:20/ 8/05
 GEAR TYPE: PT No: 1 POSITION:Lat S 1712

 start stop duration
 Long E 1132

 TIME :09:05:31 09:22:26 17 (min) Purpose code: 1

 LOG :5909.11 5910.18 1.07
 Area code : 1

 FDEPTH: 50 50
 GearCond.code:

 BDEPTH: 120
 129
 Validity code:

 Towing dir: 290ø
 Wire out: 200 m Speed: 40 kn\*10
 Sorted: 48 Kg Total catch: 47.50 CATCH/HOUR: 167.65 CATCH/HOUR % OF TOT. C SAMP weight numbers 109.91 198 65.56 56.89 646 77.57 SPECIES Aequorea aequorea Etrumeus whiteheadi Sardinops ocellatus Trachurus capensis, juvenile 0.46 11 49 0.27 8260 0.39 0.23 8258 167.65 99.99 Total PROJECT STATION: 3891 
 DATE:20/8/05
 GEAR TYPE: PT No:1
 PROJ

 start
 stop
 duration

 THE:21:00:25
 21:19:32
 19
 purpose code: 1

 LOG
 :6026.07
 6027.42
 1.34
 Area code: 1

 FDEPTH:
 0
 30
 GearCond.code:
 1

 DEDEPTH:
 59
 82
 Validity code:
 1
 GEAR TYPE: PT No: 1 POSITION:Lat I:Lat S 1731 Long E 1142 Towing dir: 260ø Wire out: 160 m Speed: 40 kn\*10 Sorted: 33 Kg Total catch: 33.19 CATCH/HOUR: 104.81 SPECTES 68.93 13.77 12.83 4.46 TELLYETSH JELLYFISH Etrumeus whiteheadi Trachurus capensis, juvenile Trachurus trecae, juvenile 13.45 1427 1197 8261 8262 104 80 99 99 Total PROJECT STATION: 3892 
 DATE:21/8/05
 GEAR TYPE: PT No:1
 PROJECT STATION:3892

 start
 stop
 duration
 Long
 E
 1144

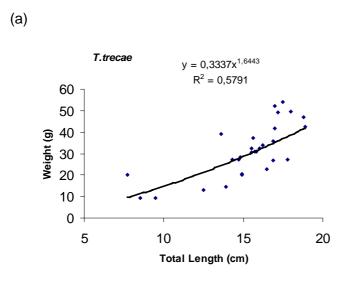
 TIME
 :03:21:03
 03:21:20
 9 (min)
 Purpose code: 1
 LOG
 :6089.23
 6089.83
 0.61
 Area code
 :1

 FDEPTH:
 15
 15
 GearCond.code:
 EDEPTH:
 44
 55
 Validity code:
 Towing dir:
 274ø
 Wire out:
 100 m
 Speed: 45 kn\*10
 Sorted: 38 Kg Total catch: 115.11 CATCH/HOUR: 767.40 CATCH/HOUR % OF TOT. C SPECIES SAMP weight numbers 531.60 42000 69.27 8266 Etrumeus whiteheadi Chrysaora hysoscella Sardinops ocellatus Trachurus capensis, juvenile 189.60 33.20 13.00 24.71 4.33 1.69 2640 8264 2260 2680 8265 767.40 100.00 Total

DATE:21/ 8/05 GEAR TY	PE: PT No:	PR POST	OJECT STA TION:Lat	ATION	1:3893
DATE:21/ 8/05 GEAR TY start stop duration	PE: PT No: 3		Long	j E	1145
TIME :06:41:22 06:41:36 6 (mir LOG :6124.46 6124.95 0.48	Area code	code: e :	1 5		
FDEPTH: 20 20 BDEPTH: 41 39	GearCond				
Towing dir: 160ø Wire out:	Validity 120 m Spee	ed: 40	kn*10		
Sorted: 77 Kg Total catch:	459 59	CATC	H/HOUR:	459	5 90
bortea: ,, kg fotar catch.	100.00	ciire		155	5.50
SPECIES	CATCH/H0	JUR	% OF TOT.	С	SAMP
Chryssors bysoscells	weight nu	umbers	57 3	24	
Chrysaora hysoscella Etrumeus whiteheadi	882.00	60570	19.1	.9	8273
Trachurus capensis, juvenile Engraulis encrasicolus	746.40 I 298.80	128220	16.2	24 50	8275 8274
Ingraulis encrasicolus Trachurus trecae, juvenile Sardinons ocellatus	31.20	7620	0.6	58	8271
Sardinops ocellatus	CATCH/H0 weight nu 2635.20 882.00 746.40 298.80 31.20 2.30	80	0.0		8272
Total	4595.90		16.2 6.5 0.6 0.0	00	
		PR	OJECT STA	ATION	1:3894
DATE:21/ 8/05 GEAR TY start stop duration TIME :11:29:29 11:50:51 21 (mir LOG :6157.05 6158.23 1.17 FDEPTH: 55 56 BDEPTH: 55 56	PE: BT No:15	5 POSI	TION:Lat	S	1757
TIME :11:29:29 11:50:51 21 (mir	1) Purpose d	code:	1	, 15	1145
LOG :6157.05 6158.23 1.17 FDEPTH: 55 56	Area code GearCond	e : .code:	5		
BDEPTH: 55 56	Validity	code:	+10		
Towing dir: 355ø Wire out:	140 m Spee	ea: 40	kn*10		
Sorted: 33 Kg Total catch:	65.42	CATC	H/HOUR:	18	6.91
SPECIES	CATCH/H0	OUR	S OF TOT.	С	SAMP
Trachurus capensis, juvenile	weight nu 79.66	umbers 15320	42.6	52	8276
Trachurus capensis, juvenile Chrysaora hysoscella Aeguorea aeguorea	60.46	994	32.3	35	
Aequorea aequorea Etrumeus whiteheadi	37.31 8.57	920 829	19.9	96 59	8278
Trachurus trecae, juvenile Sardinops ocellatus	earch/ht weight nu 79.66 60.46 37.31 8.57 0.74 0.17	194	0.4	10	8278 8277 8279
sarumops ocerratus	0.17	5			02/9
Total	186.91		100.0	)1	
			OJECT ST#		
DATE:21/ 8/05 GEAR TY start stop duration	PE: PT No: 3		TION:Lat	S	1808
start stop duration TIME :17:50:52 18:07:11 16 (mir	<ol> <li>Purpose (</li> </ol>	l POSI	TION:Lat Long	S	1808
TIME :17:50:52 18:07:11 16 (mir	<ol> <li>Purpose (</li> </ol>	l POSI	TION:Lat Long	S	1808
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51	<ol> <li>Purpose of Area code GearCond Validity</li> </ol>	l POSI code: e : .code: code:	TION:Lat Long 1 5	S	1808
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FPEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out:	<ul> <li>Purpose of Area code GearCond Validity</li> <li>120 m Spee</li> </ul>	1 POSI code: code: code: code: ed: 40	TION:Lat Long 1 5 kn*10	J E	1808 1148
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51	<ul> <li>Purpose of Area code GearCond Validity</li> <li>120 m Spee</li> </ul>	1 POSI code: code: code: code: ed: 40	TION:Lat Long 1 5 kn*10	J E	1808 1148
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch:	a) Purpose of Area code GearCond Validity 120 m Spee 68.65	l POSI code: code: code: ed: 40 CATC	TION:Lat Long 1 5 kn*10 H/HOUR:	S E 25	1808 1148
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch:	a) Purpose of Area code GearCond Validity 120 m Spee 68.65	l POSI code: code: code: ed: 40 CATC	TION:Lat Long 1 5 kn*10 H/HOUR:	S E 25	1808 1148
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H	a) Purpose of Area code GearCond Validity 120 m Spee 68.65	l POSI code: code: code: ed: 40 CATC	TION:Lat Long 1 5 kn*10 H/HOUR:	S E 25	1808 1148
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H	a) Purpose of Area code GearCond Validity 120 m Spee 68.65	1 POSI code: code: code: ed: 40 CATC DUR imbers 3540 11014 1778	TION:Lat Long 1 5 kn*10 H/HOUR: % OF TOT. 62.6 26.5 6.5	S E 25	1808 1148
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H	i) Purpose of Area cod GearCond. Validity 120 m Speed 68.65 CATCH/HG weight nu 161.25 69.30 16.88 7.73 1.46	l POSI code: e : .code: code: ed: 40 CATC DUR 1004 11014 1778 8	TION:Lat Long 5 kn*10 H/HOUR: % OF TOT. 62.6 6.5 3.0 0.5	S E 25 . C 54 . 25 . 6 . 00 . 7	1808 1148 57.44 SAMP 8267 8268
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H Trachurus capensis, juvenile Etrumeus whiteheadi Chelidonichthys capensis Callorhinchus capensis Engraulis encrasicolus	(1) Purpose of Area cod GearCond Validity 120 m Spec 68.65 CATCH/HC weight m 161.25 69.30 16.88 7.73 1.46 0.75	1 POSI code:	TION:Lat Long 5 5 kn*10 H/HOUR: % OF TOT. 62.6 26.5 6.5 3.0 0.5	S E 25 . C 54 . 25 . 6 . 00 . 7	1808 1148 57.44 SAMP 8267 8268
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H Trachurus capensis, juvenile Etrumeus whiteheadi Chelidonichthys capensis Engraulis encrasicolus Trachurus trecae, juvenile	i) Purpose of Area cod GearCond Validity 120 m Spec 68.65 CATCH/HC weight m 161.25 69.30 16.88 7.73 1.46 0.75 0.08	l POSI code: e : .code: code: ed: 40 CATC DUR 1004 11014 1778 8	TION:Lat Long 5 kn*10 H/HOUR: % OF TOT. 62.6 6.5: 3.0 0.2 0.2 0.2	S 3 E 25 . C 54 22 56 56 29 33 	1808 1148
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H Trachurus capensis, juvenile Etrumeus whiteheadi Chelidonichthys capensis Callorhinchus capensis Engraulis encrasicolus	(1) Purpose of Area cod GearCond Validity 120 m Spec 68.65 CATCH/HC weight m 161.25 69.30 16.88 7.73 1.46 0.75	1 POSI code:	TION:Lat Long 5 5 kn*10 H/HOUR: % OF TOT. 62.6 26.5 6.5 3.0 0.5	S 3 E 25 . C 54 22 56 56 29 33 	1808 1148 57.44 SAMP 8267 8268
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H Trachurus capensis, juvenile Etrumeus whiteheadi Chelidonichthys capensis Engraulis encrasicolus Trachurus trecae, juvenile	i) Purpose of Area cod GearCond Validity 120 m Spec 68.65 CATCH/HC weight m 161.25 69.30 16.88 7.73 1.46 0.75 0.08	1 POSI code:	TION:Lat Long 5 kn*10 H/HOUR: % OF TOT. 62.6 6.5: 3.0 0.2 0.2 0.2	S 3 E 25 . C 54 22 56 56 29 33 	1808 1148 57.44 SAMP 8267 8268
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H Trachurus capensis, juvenile Etrumeus whiteheadi Chelidonichthys capensis Callorhinchus capensis Callorhinchus capensis Trachurus trecae, juvenile Total	Purpose of Area cod GearCond Validity 120 m Spec 68.65 CATCH/HK weight nu 161.25 69.30 16.88 7.73 1.46 0.75 0.08 257.45	l POSI code: e.code: code: ed: 40 CATC DUR imbers 3540 11014 1778 8 4 75 11	TION:Lat Long 5 kn*10 H/HOUR: % OF TOT. 62.6 26.5 3.6 0.2 0.2 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0	S E E 25 25 56 56 29 30 30 30 29 30 30 20 30 30 30 30 30 30 30 30 30 30 30 30 30	1808 1148 57.44 SAMP 8267 8268 8269 8270
TIME :17:50:52 18:07:11 16 (mir LOG :6215.43 6216.49 1.04 FDEPTH: 20 20 BDEPTH: 52 51 Towing dir: 165ø Wire out: Sorted: 33 Kg Total catch: SPECIES J E L L Y F I S H Trachurus capensis, juvenile Etrumeus whiteheadi Chelidonichthys capensis Engraulis encrasicolus Trachurus trecae, juvenile Total — —	i) Purpose of Area cod GearCond Validity 120 m Spec 68.65 CATCH/HC weight m 161.25 69.30 16.88 7.73 1.46 0.75 0.08	l POSI code: e.code: code: ed: 40 CATC DUR imbers 3540 11014 1778 8 4 75 11	TION:Lat Long 5 kn*10 H/HOUR: \$ OF TOT. 62.6 6.5 6.5 0.2 0.2 0.2 0.0 00JECT ST# TION:Lat	S E E 25 . C . C . C . C . C . C . C . C C 	1808 1148 57.44 SAMP 8267 8268 8269 8270
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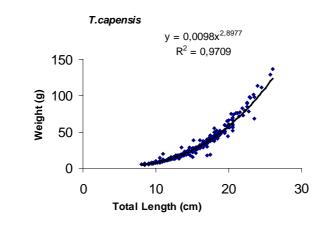
# Annex II Catch rates

Station	Depth (m)	T.trecae	T.capensis	Sardinops	Anchovy	Round herring	Others	Total
3855	26	9 954,00		6,72			7 895,10	7 901,82
3856	60		15 365,57				461,83	15 827,40
3857	72	18,00	23 832,00			888,00	24 720,00	
3858	80	235,71	1 861,89			77,14	1 939,03	
3859	16	968,73				3 876,20	3 876,20	
3860	10	1,14	2,01		1,83	3	71,10	74,94
3861	15		1 577,45			158,73	208,36	1 944,54
3862	30		5 721,26			318,69	129,17	6 169,12
3863	140		14 148,00			165,00	659,16	14 972,16
3864	1	0,09	0,24				106,97	107,21
3865	1	416,29	332,51		4,91	89,35	333,16	759,93
3866	100		29,46			13,38	13,08	55,92
3867	50						0,93	0,93
3868	358						3 594,45	3 594,45
3869	57	250,67	91,52		108,85	5	476,30	676,67
3870	159		5 931,60				3 118,00	9 049,60
3871	200		120,12				146,96	267,08
3872	128		4 005,36				707,04	4 712,40
3873	100		26,36				295,20	321,56
3874	147		717,60				10 315,20	11 032,80
3875	150		0,12				9,22	9,34
3876	213		1,67				12,85	14,52
3877	166		1 083,15				1 476,30	2 559,45
3878	90		296,40				1 159,35	1 455,75
3879	99		1 644,30				1 131,85	2 776,15
3880	157		1 526,40				5 475,20	7 001,60
3881	45		1 160,40				665,40	1 825,80
3882	257						3 533,10	3 533,10
3883	245						68,14	68,14
3884	140						250,67	250,67
3885	145						143,43	143,43
3886	22	3 282,40					190,30	190,30
3887	39	242,06	2,06	1,03	5,31		214,29	222,69
3888	30		7,43	0,67	82,33	5,53	155,66	251,62
3889	15		0,45		207,90	)	67,66	276,01
3890	50		0,39	0,46		56,89	109,91	167,65
3891	30	4,67	13,45			14,43	72,25	100,13
3892	15		13,00	33,20		531,60	189,60	767,40
3893	20	31,20	746,00	2,30	298,80	882,00	2 635,20	4 564,30
3894	56	0,74	79,66	0,17		8,57	97,77	186,17
3895	20	0,08	69,30		0,75	5 16,88	170,44	257,37
3896	65		740,51				478,90	1 219,41
Mean	90,93	366,80	1 932,09	1,06	16,92	2 53,83	1 230,50	3 234,40
STDEV		1 604,08	4 805,41	5,20	58,26	6 164,15	2 211,10	5 212,53
% Catch		11,34	59,74	0,03	0,52	2 1,66	38,04	



Annex III Length weight relationships, gonad maturity and Length distribution

(b)



(c)



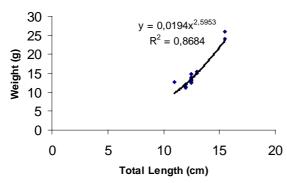


Figure 1.-Length-Weight relationship of *T. trecae* (a), *T. capensis* (b) and *S. ocellatus* (c).

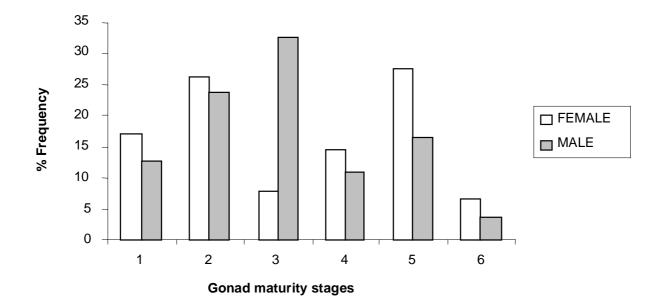


Figure 2.- Gonad maturity stages by sex of *T. capensis*.

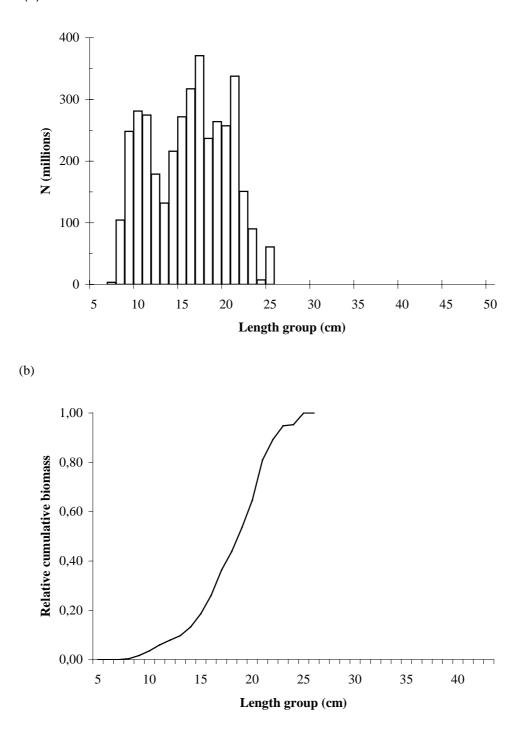


Figure 3.- Overall length distribution in numbers (a) ) and relative cumulative biomass (b) of *T. capensis* in Namibia.

(a)

# Annex IV Instruments and fishing gear

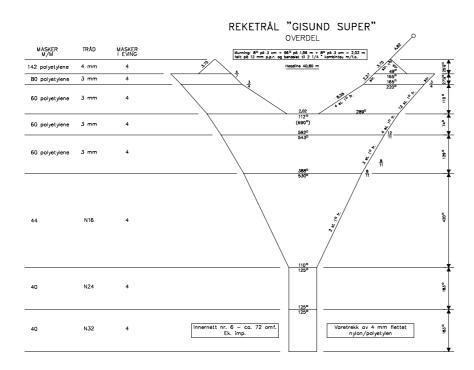
The Simrad EK-500, 38 kHz echo scientific sounder was used during the survey for fish abundance estimation, in addition data from the 18 kHz, 120 kHz and the 200 kHz transducers were logged for possible future multi frequency target estimation. The Bergen Echo Integrator system (BEI) logging the echogram 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 38 kHz were as follows:

Transceiver-1 menu	Transducer depth Absorption coeff.	5.5 m 10 dB/km
Pulse length mediu	im (1ms) Bandwidth Max power 2-way beam angle SV transducer gain TS transducer gain Angle sensitivity 3 dB beamwidth along 3 dB beamwidth athw. Alongship offset Athwardship offset	27.19 dB 27.22 dB 21.9 .6.9°
Display menu	Echogram Bottom range Bottom range start TVG Sv colour min TS Colour minimum	1 10 m 9 m 20 log R -67 dB -60 dB
<b>Printer- menu</b> 0 - 500m	Range TVG Sv colour min	0 - 50, 0 - 100, 0 - 150, 0 - 250 or 20 log R -60 dB
Bottom detection menu	Minimum level	-40 dB

A calibration experiment using a standard copper sphere was performed in Baía dos Elephantes, Angola 5<sup>th</sup> August 2005. These settings used during the survey.

# **Fishing gear**

The vessel has two different sized "Åkrahamn" pelagic trawls and one "Gisund super" bottom trawl. For all trawls, the Tyborøn, 7.8m<sup>2</sup> (1670 kg) trawl doors were used.



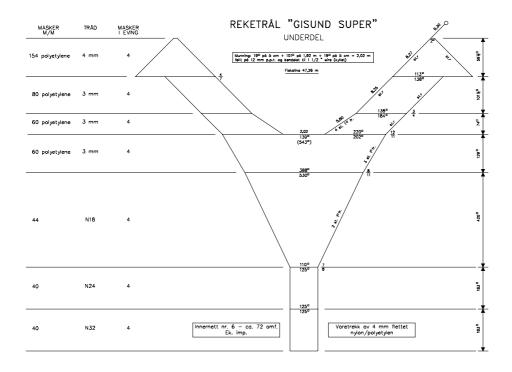


Figure 1 Design of the trawl used.

# ANNEX V Seabirds and Marine Mammals distribution and patterns of abundance

(Contribution to the 'Top Predador' BCLME Project LMR/EAF/03/02)

Participants from 28 July 2005:

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# AIMS

- 1. Make an inventory of seabird and marine mammal species present in the survey area
- 2. Estimate relative density of the different seabird species along the transect lines
- 3. Analyse patterns of distribution and abundance in relation to oceanographic features and fish distribution
- 4. Training on bird identification at sea and seabird survey methods
- 5. Record additional visual information on surface oceanographic features (slicks, water discoloration, flotsam lines) and fish (presence of pelagic sharks, surface aggregations of pelagic fish).

# METHODS

Counts of seabirds were made during daylight hours from the top-deck of the vessel, which offers excellent viewing conditions. The viewing height above sea level, measured in Luanda harbour, was 14.96 m at mid-deck.

When possible, standard "10-minute-counts" of the birds present around the vessel were effected while the vessel was steaming at constant speed and heading. During each count period, all birds detected were counted, discriminating between birds seen actively following the vessel (within an arc of 60° aft), birds flying and birds sitting or feeding. During the counts, scans with binoculars were effected at least once every two minutes to detect inconspicuous species. Care was taken to count individual birds only once particularly for species prone to follow or circle the vessel and not to conduct 10 minute counts soon after a station or a trawl which have attracted birds to the vessel. This method was chosen in order to record all species

seen including the scarce and rare species. The results of this method give a species-specific index of abundance rather than absolute densities.

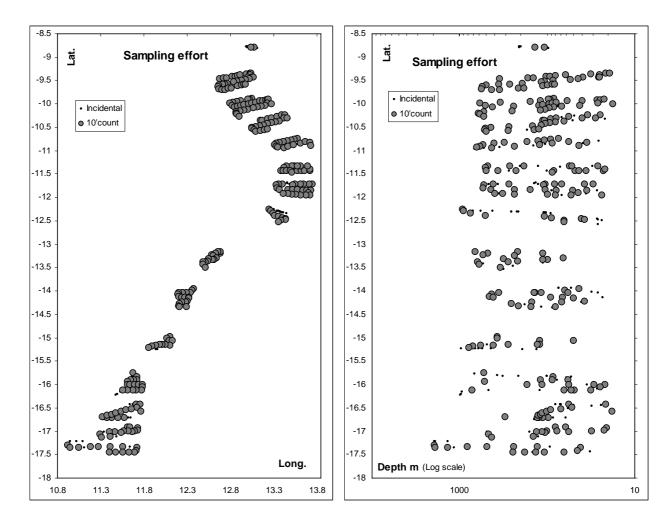
Additional "incidental observations" were made, between counts when scarce or unusual species were observed and while the vessel was on station or during trawling when standardized quantification of abundance was not possible. The time and duration of each observation and count was recorded with watches synchronized to the vessel's in order to match them with the data recorded by the electronic log and weather station (position, speed, depth, heading, sea temperature etc.) as well as environmental and biological parameters recorded during the survey. Additional information on the age classes of some species was noted (albatrosses, gannets, gulls).

Sightings of Cape fur seals were recorded following the same format. Each cetacean sighting was recorded in a way similar to the 'incidental sightings' of uncommon bird species above. A measure of effort was obtained by recording the periods of continuous observations (and relating them to the vessel route) to be modified by estimated sea state and visibility.

Fish schools visible at the surface were recorded following an estimated relative four-point scale: small (a few to  $100 \text{ m}^2$ ), medium (between  $100 \text{ and } 250 \text{ m}^2$ ) large (between 250 and 500 m<sup>2</sup>) and very large (> 500 m<sup>2</sup>). Pelagic shark sightings were also recorded. Additional visual information as flotsam lines, slicks, water discoloration etc. was also logged in the same format as well as photographically documented.

#### RESULTS

A total of 266 "10-minute counts" were effected between 28 July and 16 August. In addition, 130 incidental observations were logged, including 12 during Multinet sampling, 23 during CTD stations, and 18 during trawling. The summary of the distribution of the observations is given in Fig 1.



**Figure 1.** Distribution of the sampling effort (10 min counts and incidental observations on the left and Latitude-Depth plot (log scale) on the right.

# **Species accounts**

The list species and numbers identified during the survey are given in Table 1 for birds and seals.

Table 1: Seabird species and numbers of individuals identified during the 10' observation periods and in total (including incidental sightings). The overall percentage of occurrence (% FO) in the 10-minute count periods (N=266) and Cape fur seal numbers are also given. \*Several tens of thousands of Cape cormorant roosting and feeding in Baia dos Tigres excluded.

Species		Bird numbers		10' count
		All records	10 min counts	FO %
Thalassarche melanophris	Black-browed albatross	4	2	0.75
Thalassarche chlororhynchos	Yellow-nosed albatross	231	127	14.66
Thalassarche chrysostoma	Grey-headed albatross	1	1	0.38
Daption capense	Pintado petrel	8	5	1.88
Procellaria aequinoctialis	White-chinned petrel	2296	1396	36.84
Puffinus gravis	Great shearwater	1	0	0.00
Puffinus griseus	Sooty shearwater	30	10	3.76
Puffinus puffinus	Manx shearwater	7	3	1.13
Pterodroma mollis	Soft-plumaged petrel	2	1	0.38
Oceanites oceanicus	Wilson's storm-petrel	1930	1567	55.26
Phalacrocorax capensis*	Cape cormorant	889	648	4.51
Phalacrocorax lucidus	White-breasted cormorant	31	26	0.75
Morus capensis	Cape gannet	6299	5106	74.81
Stercorarius sp.	jaegger sp.	2	2	0.38
Stercorarius pomarinus	Pomarine jaeger	2	1	0.38
Stercorarius parasiticus	Arctic jaeger	1	0	0.00
Catharacta antarctica	Subantarctic skua	77	36	8.27
Xema sabini	Sabine's gull	4	1	0.38
Larus dominicanus vetula	Kelp gull	992	400	23.68
Larus cirrocephalus	Grey-headed gull	16	9	1.13
Sterna hirundo/paradisaea	Common/Arctic tern	194	110	18.42
Sterna maxima	Royal tern	2	1	0.38
Sterna sandvicensis	Sandwich tern	8	3	0.75
Chlidonias niger	Black tern	5	5	1.88
Arctocephalus pusillus	Cape fur seal	417	255	28.57

#### Diomedeidae, Albatrosses:

Three species of albatrosses were encountered, all migrants from the southern ocean. The Atlantic Yellow-nosed albatross *T. chlororhynchos* breeds at Gough Island and Tristan da Cunha group. They were absent in the north of the survey area, a few sightings of *T. chlororhynchos* were made in deep water between 12°13'S and 13°25'S but the species became regular only south of 15°S in water deeper than 100m and was absent in shallow water (< 50 m). Most individuals seen at close range were immature and juvenile birds, but the proportion of adults increased with latitude. The Black-browed albatross was very scarce, seen only four times (all juveniles) in the extreme south of the survey area (south of 17°S) and the Shy albatross (*Thalassarche cauta*) recorded in previous surveys in the same area was not sighted during this survey.

The Grey-headed albatross (*Thalassache chrysostoma*) was seen once at 16°07'S in about 50 m of water. This latitude probably constitutes the northernmost limit of the normal winter range of this species.

#### Procellariidae, Petrels and Shearwaters:

Out of six species of this group sighted during the survey, the Manx shearwater (*Puffinus puffinus*) is a northern hemisphere migrant; the Great shearwater (*Puffinus gravis*) is endemic to the Tristan and Gough group of Islands in the south Atlantic. The other species are migrants from the sub-Antarctic region of the southern ocean.

The Pintado petrel (*Daption capense*) was very scarce and present only in the south, with 7 sightings (of 8 birds in total) all south of  $16^{\circ}26$ 'S.

Only 7 sightings (of single birds) were made of the Manx shearwater (*P. puffinus*), four between  $12^{\circ}15$ 'S and  $15^{\circ}09$ 'S off the shelf in water deeper than 400m. The others sightings were all south of  $16^{\circ}$ S.

Only one sighting of Great shearwater (*P. gravis*) was made, the first one in Angolan waters during the last four surveys. The sighting was of a single bird at 12°19'S over mid shelf (108m depth).

The Sooty shearwater (*Puffinus griseus*), migrant from the sub-Antarctic, was uncommon on the outer shelf and beyond the shelf break becoming more widespread over the shelf south of 16°S south. There was, however, a noticeable cluster of sightings (10 out of 24) in deep water (9 sightings between 500m and 920m) between 12°13'S and 12°23'S.

The White-chinned petrel (*Procellaria aequinoctialis*) was one of the most abundant and widespread species encountered. It was found at low densities and mostly offshore (outer-shelf and shelf break) north of 13°S. South of 15°S this species is found regularly also inshore and in higher densities at depth greater than 100m and to the south.

The Soft-plumaged petrel (*Pterodroma mollis*) was seen for the first time during these surveys, only in the extreme south of the survey area (17°20'S) and in very deep water (the two sightings were in 1915 m and 1154 m respectively). This species is not normally seen on the shelf.

#### Hydrobatidae, Storm-petrels:

Only one species of this group was recorded: the Wilson's storm petrel (*Oceanites oceanicus*), a migrant from the southern ocean. This species was widespread and abundant but with marked variations in densities. It was most abundant at the shelf break and offshore between 10°50'S and 12°30'S, and south of 15°00'S, while far less common between 12°30 and 15°00'S. This species is mainly a zooplankton surface-feeder and its association with frontal zones and surface slicks is an indication of areas of zooplankton concentration at the surface. The observed distribution pattern is remarkably similar to that found during previous surveys, an indication that the zones of zooplankton availability at the surface are stable in space from year to year.

#### Sulidae, Gannets:

The Cape gannet, *Morus capensis*, proved to be the most abundant and widespread seabird during the survey, present in nearly 75% of the observations. The proportion of young birds accounted for nearly half the total (3.3% of subadults, 27.5% of immatures and 14.2% of juveniles out of 1346 aged birds) and this is consistent with observations made during previous cruises. This proves that Angolan waters are an important feeding and wintering area for all age classes and might be a key area for the survival of young birds of this vulnerable southern African endemic species. North of 10°30'S and between 12°30' and 14°30'S densities were low. The highest densities were observed in two clusters, one on the inner shelf (water shallower than 50 m) between 10°30'S and 11°30'S as well as on the outer shelf south of 15°S.

#### Phalacrocoracidae, Cormorants:

Only two cormorant species were recorded during the survey, and only in coastal waters. The White-breasted cormorant (*Phalacrocorax [carbo] lucidus*) is suspected to breed at several locations in the southern region from 13°15 to Baia dos Tigres. The Cape cormorant (*P. capensis*), an endemic species from the Benguela Current region, was observed only in the south (from about 14°13'S) and becoming abundant around Baia dos Tigres. This species breeds and roosts in large numbers at Baia dos Tigres and feeding aggregations counting tens of thousand birds were observed in the bay as during previous years.

A third species, the Reed cormorant, (*Phalacrocorax africanus*), more associated with fresh inland waters, was observed in Luanda bay but not included in the survey.

#### Pelecanidae; Pelicans:

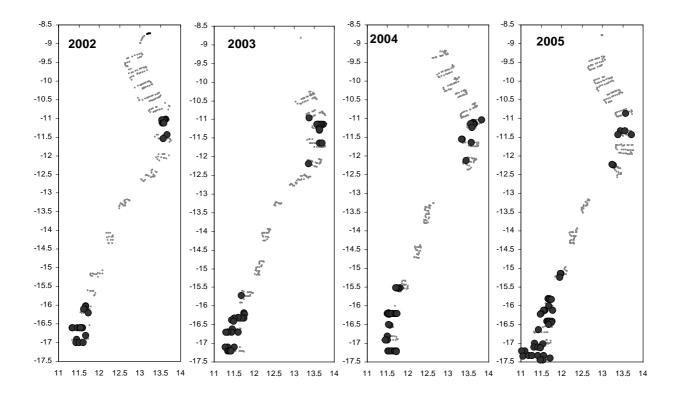
The Great-white pelican (*Pelecanus onocrotalus*) was not seen at sea during this survey, but several birds were seen onshore on the southeastern part of the Island at Baia dos Tigres and this species probably breeds there. During previous surveys the species has been seen in the same area as well as off several estuaries.

#### Stercoraridae, Skuas and Jaegers:

Two species of Jaegers (*Stercorarius*) were recorded in extremely low numbers, the Pomarine jaeger (*S. pomarinus*) and the Arctic jaeger (*S. parasiticus*), with 2 and 1 record of single individuals respectively. One additional record of two jaegers, which could not be identified to species level, refers to probably *St. parasiticus* or possibly to *S. longicaudus*. All three species have been recorded in previous surveys and the low number of observations during the present survey is probably due to the seasonality of migration of these northern hemisphere migrants. The bulk of the palaearctic migrants is expected to pass through the region in September to October.

The Subantarctic skua, *Catharacta antarctica* on the other hand, a visitor from the southern ocean, was slightly more frequent than in previous surveys (48 sightings of 77 individuals). The geographical distribution was remarkably similar to the previous surveys: this species has a discontinuous distribution in Angolan waters at this time of the year. South of 16°S, as further south in Namibian waters, the Subantarctic skua is fairly common over the shelf. It is scarce but regular between 15°S and 16°S and absent further north. This corresponds to the known northernmost distribution of the species in the Southeast Atlantic. However a small isolated area

about 350km further north, centered around the northern edge of the Quicombo Bank (around 11°20'S) has been the site of a small cluster of observations of this species during all previous surveys. This year seven sightings of single individuals were made between 10°52'S and 12°13'S. Figure 2 illustrates this unusual distribution pattern observed in the past 4 surveys.



**Figure 2.** Geographical distribution (Latitudes and Longitudes in decimal degrees) of the subantarctic skua, *Catharacta antarctica*, during the past four surveys illustrating the discontinuous distribution of this species in Angolan waters.

#### Laridae, Gulls:

The Grey-headed gull (*Larus cirrocephalus*), is a resident associated with coastal and inland waters as well as along the coast in the vicinity of estuaries. It was sighted on 5 occasions in shallow water (24 to 53m), around 12°29'S in the vicinity of a river mouth and in the Baia dos Tigres area between 16°07'S and 16°29'S.

The Kelp gull (*L. dominicanus vetula*), is an endemic subspecies from Southern Africa and the Benguela system was widespread throughout the survey area. Kelp gulls were scarce in the north, becoming regular from 11°30'S and abundant particularly inshore south of 16°S.

The Sabine's gull (*Xema sabini*), a northern hemisphere migrant, was sighted only 3 times with a total of 4 individuals at 13°20'S, 16°07'S and 17°06'S. This low abundance is probably due to the early date of the survey as this species' southward migration through the area is peaking in September-October.

### Sternidae, Terns:

Four of the five tern species recorded, are palearctic migrants (*Sterna hirundo, S. paradisaea, S. sandvicensis, and Chlidonias niger*). *S. hirundo* was widespread throughout the area but in much lower numbers than in some of the previous surveys; again probably the effect of an earlier date on the abundance of palearctic migrants. *C. niger* was very scarce with only 5 sightings of single individuals. August must correspond to the extreme beginning of the migration through this area (more than 300 individuals were sighted in September 2002).

The Royal tern (*Sterna maxima*) is a tropical species breeding in West Africa and dispersing to southern Angola in summer. During the survey it was sighted only twice at 14°19'S and 15°08'S. This low occurrence contrasts with previous surveys when the species was regularly seen north of 13°S.

#### Marine mammals:

#### Cape fur seal: Arctocephalus pusillus:

Fur seals were distributed fairly uniformly in small numbers in the entire study area but were more frequent over the inner shelf (depth < 150 m). Higher densities were found south of  $15^{\circ}$ S and particularly near Baia dos Tigres which harbours a fairly large non-breeding colony.

#### **Cetaceans:**

The summary of the cetacean sightings made during this part of the survey is given in Table 2 and Fig 3.

The sightings of Killer whales (*Orcinus orca*) confirm the presence of this species in Angolan waters. They have been observed in two previous surveys (2002 and 2003), which were the first confirmed records for this area.

The presence of Dusky dolphins (*Lagenorhynchus obscurus*) on the shelf in the area of Baia dos Tigres is also a confirmation that the previous sightings of this species in the same region during the last two surveys and represents the northern limit of their normal range in the Southeast Atlantic. This species is probably the most common small odontocete on the shelf of the Benguela upwelling ecosystem from South Africa and Namibia. Its extended distribution in southern Angola south of the Benguela-Angola Front is not surprising, however had not been documented before.

The lack of observation of dolphins of the genera *Delphinus* and *Stenella* was surprising during this survey, and possibly a consequence of the anomalously cold conditions prevalent in the region at the time of this survey.

#### **Turtles:**

Only one sighting of one single unidentified marine turtle was made during this survey in (40m of water at 10°18'S, 13°25'E). This is in sharp contrast with previous surveys when turtle sightings were regular particularly Olive Ridley (*Lepidochelis olivacea*) turtles in approximately the same area, between 10° 23'S and 11°08'S.

# Patterns of abundance:

On a broad scale and according to seabird and marine mammal distribution observed during the previous surveys, southern Angolan waters can be divided in 4 distinct zones (the latitudinal limits given below are approximate and the description of the patterns only for late winter and spring).

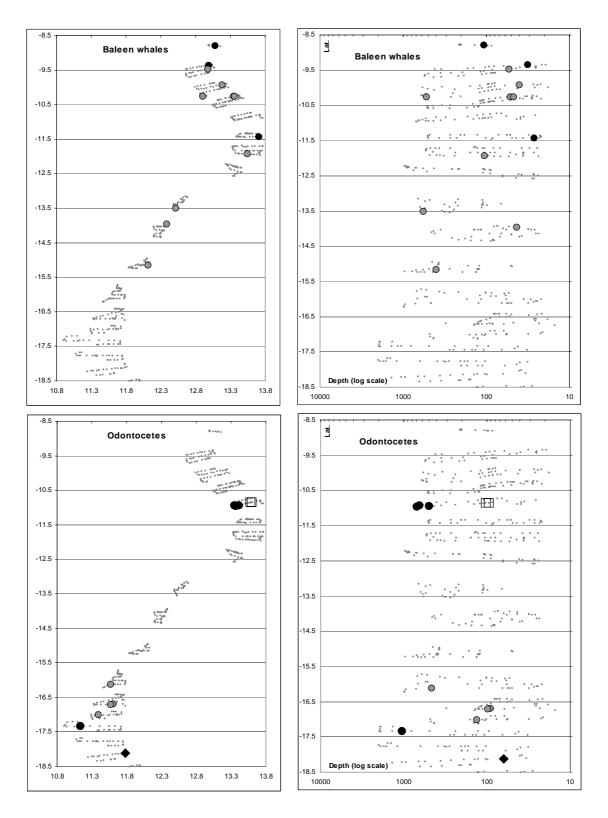
# a) 9°30'S to 12°30'S

This area is characterized at this time of the year by:

- Presence of the Sooty shearwater *P. griseus* at low densities in deep water
- Presence of White-chinned petrel at low density over the outer shelf and beyond
- Absence of Albatrosses, Cape Petrel, Cape cormorant
- Low densities of the Cape fur seal A. pusillus, on the shelf,
- Presence of Bryde's whale, Balaenoptera edeni.

In the southern half of this zone, a small area stands out at around  $11^{\circ}10'S - 11^{\circ}15'S$  (the northwestern edge of the Quicombo bank). In this area seabird densities are generally higher than either north or south of it. This is particularly the case for Cape gannets and Wilson's storm petrels. This indicates a high availability of zooplankton near the surface as well as higher availability of pelagic fish characteristics of a divergent frontal zone, or local upwelling. This interpretation is supported by the

negative sea temperature anomaly extending offshore observed in this area year after year. In addition the sightings of flotsam lines offshore in this area (contrasting with flotsam being seen inshore further north or south) seems to indicate a surface offshore transport located there. Also associated with this feature is the unexpected presence of the Subantarctic skua (*C. antarctica*) noted during the previous 3 surveys as well as during this one (Fig X2). This species is otherwise found only south of the Angola-BenguelaFront.



**Figure 3**. Humpback (grey circles) and Bryde's whale (black circles) distribution (Top) and Pilot whale (black circles), Orca (open squares), Dusky dolphin (grey circles) and Bottlenose dolphin (black diamond) distribution (Bottom).

# b) 12°30'S to 14°30'S

# This area is noticeable because of the general low densities of all seabird species and is characterized by

- Lowest density of the four most abundant and widespread species, Wilson's Storm petrel, White-chinned petrel, Kelp gull and Cape Gannet
- Absence of Balaenoptera edeni and Turtles
- Absence of Cape fur seal to 14°S, and very low abundance to 14°30'S

# c) 14°30'S to 16°00'S

This area seems to constitute a transition zone with the appearance at low density of some species more common further south such as Yellow-nosed albatross *Thalassarche chlororhynchos*, Cape cormorant *Phalacrocorax capensis* and Pintado petrel *Daption capense* and a slight increase in fur seal abundance.

# d) South of 16°00'S

South of 16°S, the avifauna changes dramatically and is marked by a large increase in density of many subantarctic species (Yellow-nosed albatross, Pintado petrel, Sooty shearwater, Subantarctic skua, White-chinned petrel) as well as Benguela current region endemics (Cape gannet, Cape cormorant, Kelp gull). The density of Cape fur seal increases dramatically as well at around 16°S.

New sub-Antarctic species, more common in Namibian waters at this time of the year, appear in this area (Black-browed albatross, Shy albatross) and marine mammals characteristic to the Benguela upwelling region are also present (Heaviside's dolphin inshore, Dusky dolphin on the shelf).

Species	Number	Date	Local time	Log	Depth	SST	Lat (dec ')	Long (dec ')	Remarks
Balaenoptera edeni	1	28-Jul-05	15:56	1951	108	19.1	-8.792	13.074	
Balaenoptera sp.	2	29-Jul-05	8:44	2092.3	32	19.4	-9.352	12.986	B.sp probable B. Edeni
Megaptera novaeangliae	1	29-Jul-05	11:02	2115	54	19.3	-9.475	12.977	Small size (sub adult)
Megaptera novaeangliae	1	30-Jul-05	11:40	2326.5	40	19.5	-9.923	13.177	Breaching
Unid.	2	30-Jul-05	15:18	2358	85	20	-10.062	13.115	Large baleen whale too far for ID
Megaptera novaeangliae	1	30-Jul-05	17:27	2381.2	529	22.1	-10.267	12.906	2 nm south
Megaptera novaeangliae	1	30-Jul-05	17:46	2384	265	22.1	-10.251	12.947	Possibly same individual as above
Megaptera novaeangliae	2	31-Jul-05	9:56	2497	52	19.5	-10.259	13.349	2 adults 10 m apart sounding in synchrony
Megaptera novaeangliae	2	31-Jul-05	10:08	2497.8	47	19.4	-10.252	13.358	2 adults possibly same individuals as above
Globicephala sp.	6-10	1-Aug-05	9:41	2698.2	650	20.1	-10.930	13.348	Associated with 8 <i>Tursiops</i>
Tursiops truncatus	8	1-Aug-05	9:41	2698.2	650	20.1	-10.930	13.348	Associated with Globicephala
Globicephala sp.	9	1-Aug-05	9:52	2700	696	19.7	-10.955	13.363	2 tight groups (4 and 5 indiv.) 200 m apart
Globicephala sp.	13-20	1-Aug-05	10:47	2703	495	19.4	-10.940	13.407	
Orcinus orca	4	1-Aug-05	13:30	2717	103	18.9	-10.853	13.580	2 ad females, 1 large male, 1 young
Orcinus orca	2	1-Aug-05	13:43	2718	95	19.2	-10.844	13.595	2 medium size (ad Females?) 1' South of previous group
Balaenoptera edeni	1	2-Aug-05	13:04	2919	27	18.1	-11.432	13.704	About 300 m
Megaptera novaeangliae	1	3-Aug-05	16:52	3128	105	19.9	-11.931	13.545	
Megaptera novaeangliae	4	6-Aug-05	17:24	3450	580	17.8	-13.506	12.515	4 large adults in a tight group
Megaptera novaeangliae	1	7-Aug-05	8:24	3538.9	43	17.1	-13.951	12.379	
Megaptera novaeangliae	1	8-Aug-05	10:30	3725.2	404	16.6	-15.156	12.110	Breaching
Lagenorhynchus obscurus	6	9-Aug-05	16:03	3937	468	15.9	-16.113	11.568	Minimum count
Lagenorhynchus obscurus	15-20	11-Aug-05	10:00	4177	91	15.3	-16.691	11.601	15 to 20 duskies
Lagenorhynchus obscurus	30-50	11-Aug-05	10:08	4179	98	15.2	-16.700	11.570	In 2 groups 100 m apart
Lagenorhynchus obscurus	24	12-Aug-05	11:40	4375	132	14.3	-17.003	11.396	One group
Globicephala sp.	12	13-Aug-05	10:47	4516	1058	14.4	-17.336	11.133	At least 1 very small young

# Table 2. Summary of cetacean sightings.

#### **Conservation aspects:**

A number of seabirds present in Angolan waters in winter and spring are susceptible to by catch by long line fisheries (as well as direct catch from small crafts). These include particularly all species of albatrosses, and some petrels and shearwaters as well as the Cape gannet. By catch by long-line fisheries in the southern hemisphere has impacted widely on many species of seabirds and, despite major international efforts to limit the problem, is threatening the survival of several species of albatrosses and petrels. In Namibia, the Cape gannet continuing population decline and the deterioration of its conservation status (the population declined by half in the past decade) has been attributed to trophic factors (and particularly the decline in the sardine stock) as well as increased by catch by long-line fisheries, which have developed in Namibia since the early 1990s.

The sightings during the 2002 survey of small vessels using floating lines to catch seabirds in the southern part of the area (and targeting both White-chinned petrels and Cape gannets, together with the realization of the importance of Angolan waters for all age classes of gannets at this time of the year causes some concern. A high incidence of Cape gannets sighted in southern Angola during the 2003 and 2004 surveys (particularly around Tombua) with remnants of lines and hooks in their beaks attests to the reality of this potential threat which might be impacting negatively on the threatened Namibian gannet population.

The results gathered during the four surveys have shown that southern Angola is a key area for wintering gannets and particularly important for young birds. The Cape gannet is an endemic to the region with only six breeding sites worldwide, including three in Namibia. The Namibian population has declined drastically in the past decade and the recruitment of young birds seems to be insufficient to sustain the population. Given the importance of southern Angola to young gannets revealed by the last four surveys it seems important that Angola be included and involved together with Namibia and South Africa in a joint conservation effort regarding these seabirds.

The following figures give examples of distribution of the main species using all records (presence absence) and of the highest densities of the most common and widespread species, using the 10-minute counts only. These data are plotted against geographical coordinates as well as in latitude-depth (on a log scale) plots to visualize the distribution patterns on and off the shelf.

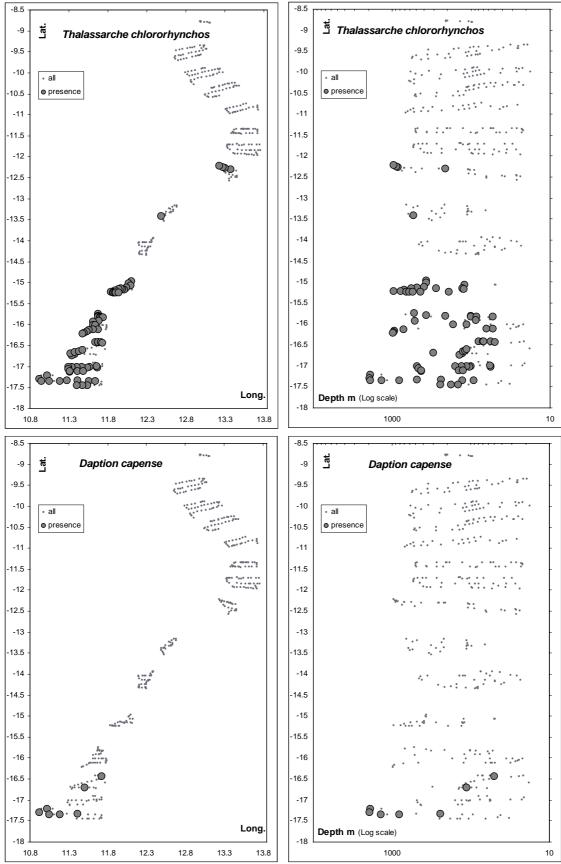


Figure 4. Distribution of the Yellownosed albatross (top) and the Pintado petrel (bottom).

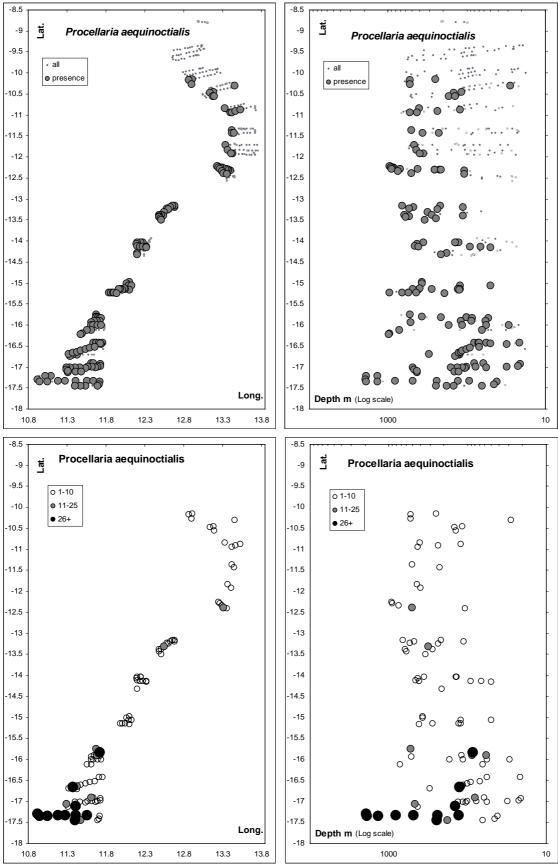


Figure 5. Distribution and patterns of abundance of the White-chinned petrel.

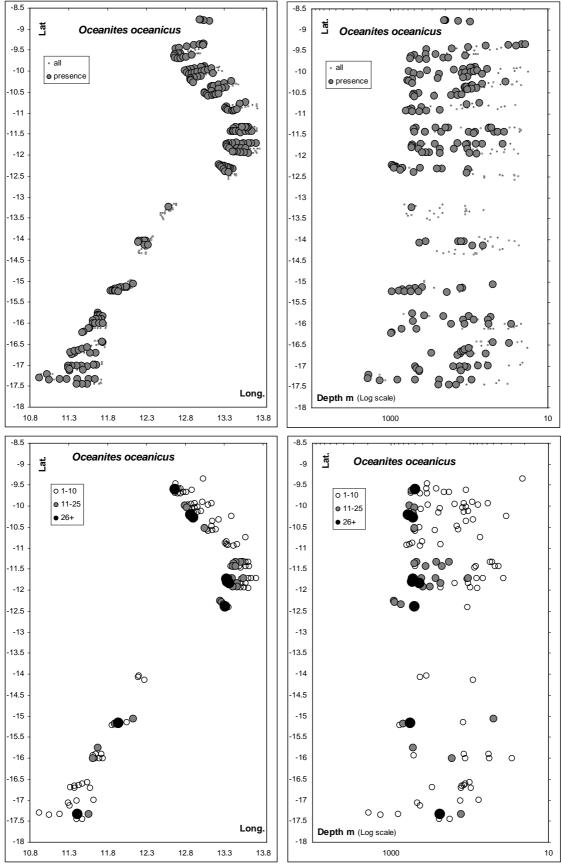


Figure 6. Distribution and patterns of abundance of the Wilson's storm-petrel.

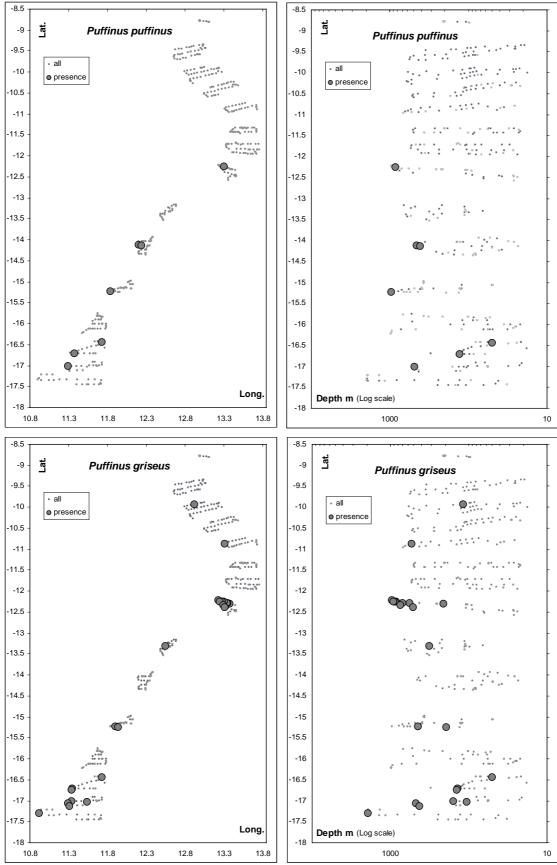


Figure 7. Distribution of the Manx shearwater (top) and the Sooty shearwater (bottom).

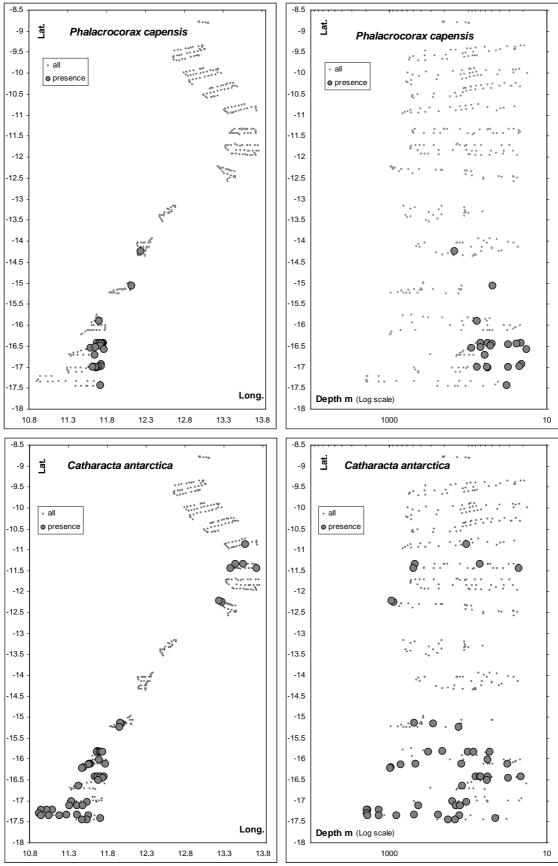


Figure 8. Distribution of the Cape cormorant (top) and the Subantarctic skua (bottom).

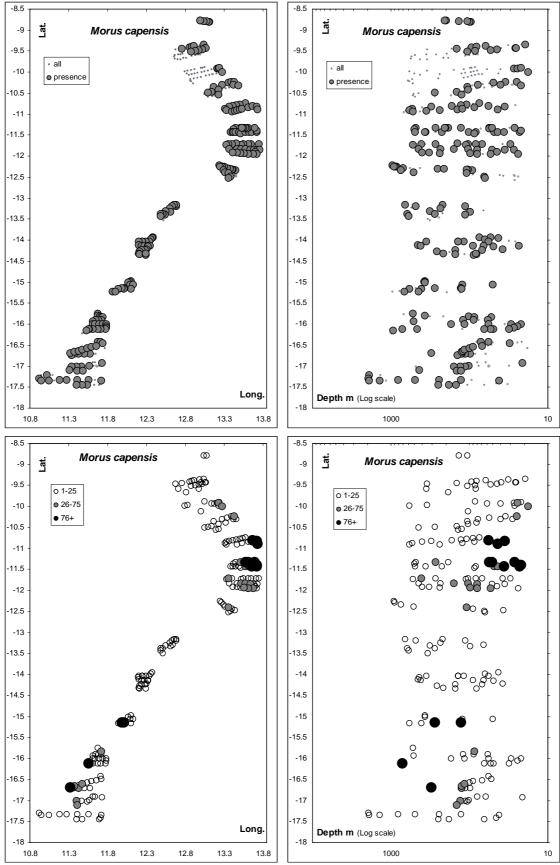


Figure 9. Distribution and patterns of abundance of the Cape gannet.

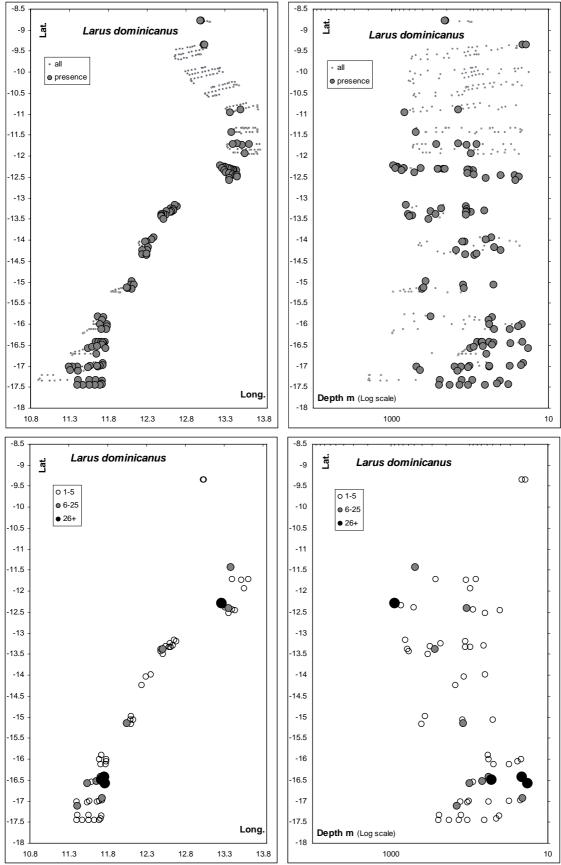


Figure 10. Distribution and patterns of abundance of the Kelp gull.

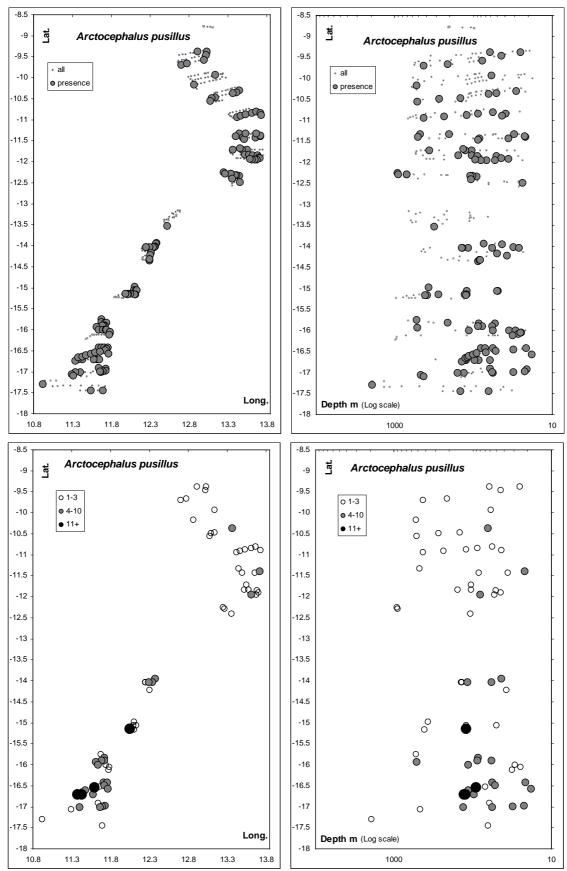


Figure 11. Distribution and patterns of abundance of the Cape fur seal.