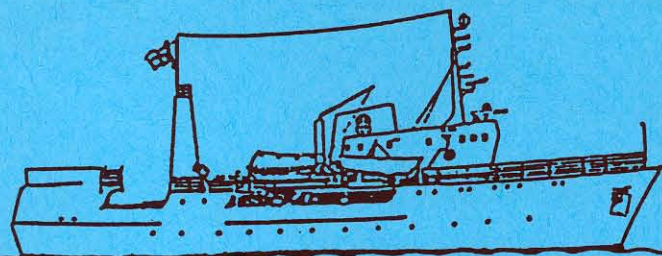


NORAD - FAO/UNDP GLO 82/001

CRUISE REPORTS "DR. FRIDTJOF NANSEN"



**SURVEYS OF THE FISH RESOURCES OF NAMIBIA**

**Preliminary Report Cruise No 2/91**

**Part I**

**Surveys of the hake stocks  
23 October-22 November 1991**

**and**

**Part II**

**Surveys of the pelagic stocks  
23 November-16 December 1991**

**Ministry of Fisheries  
& Marine Resources  
Swakopmund**

**Institute of Marine Research  
Bergen  
Norway**

The DR. FRIDTJOF NANSEN RESEARCH PROGRAMME is sponsored by the Norwegian Agency for Development Cooperation, NORAD, the Food and Agriculture Organization of the United Nations, FAO, and the United Nations Development Programme, UNDP. The programme in Namibia is being conducted and planned under agreements between UNDP, Namibian authorities and the Institute of Marine Research, Bergen, Norway. Its execution is the responsibility of the Institute of Marine Research in cooperation with the Ministry of Fisheries & Marine Resources of Namibia.

The programme has comprised the following previous surveys:

|        |      |                                |
|--------|------|--------------------------------|
| Survey | 1/90 | 25 January to 19 March 1990    |
| "      | 2/90 | 27 May to 20 June 1990         |
| "      | 3/90 | 11 September to 6 October 1990 |
| "      | 1/91 | 25 January to 23 March 1991    |

Reports were submitted after the completion of each survey. This cruise report describes the work and some of the findings of Survey 2 1991.

**PART I**

**SURVEYS OF THE HAKE STOCKS**

**23 October-22 November 1991**



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# **CHAPTER 1 INTRODUCTION**

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## **1.1 GENERAL OBJECTIVES**

Following an offer from NORAD extended through FAO and UNDP, an agreement was reached in Windhoek in January 1990 between the UNDP Resident Representative and Namibian authorities for the execution of a programme of surveys of the fish resources of the Namibian shelf with the R/V "DR. FRIDTJOF NANSEN". The Ministry of Fisheries and Marine Resources, Windhoek has since agreed with NORAD on an extension of this programme.

The purpose of the programme was defined as follows:

The main objectives are descriptions of the distribution, composition and abundance of the most important resources of fish. The small pelagic fish horse mackerel, pilchard and anchovy will be investigated by the acoustic integration method combined with sampling with mid-water and bottom trawls. A swept area trawl survey programme will be used for the demersal stocks. All catches will be sampled to species by weight and numbers and biological sampling will be made of the commercially important stocks.

Environmental studies will include recording of surface temperature on a continuous basis and occupation of hydrographic stations along fixed tracks.

Possible taxonomic problems will be studied by sampling and examination by experts in cooperation with FAO's Fisheries Department.

## **1.2 SPECIFIC OBJECTIVES OF SURVEY 2/91, PART I**

During the first part, 23 October to 22 November, the main objective is investigations of hakes and associated species and horse mackerel covering the whole shelf. The acoustic system will be used to observe horse mackerel and mid-water occurrence of the hakes. The survey design for the swept area trawl programme will be based on a semi-random distribution of hauls intended to cover the depth ranges of the two hake species and with a density of stations adapted to the expected fish densities. Biomass estimates of Cape hake will be based on post-stratification by density areas. Trawl selectivity experiments of hake will be made with a metal frame fish separator installed in the trawl. Observations of surface temperatures will be made on a continuous basis for a pilot study of comparison with satellite images.

## **1.3 PARTICIPATION**

The scientific staff from Namibia up to 12 November were:

Ekkehard Klingelhoefter, Moses Nghishongwa, Filamon Dausab, Henry Vrieslaar, Dennis Williams.

From 12 to 22 November:

Ekkehard Klingelhoefter, Leon McClusky, Ben Birisamub, Michael Evenson, David Gaseb and Benedictus Ushona.

The scientific staff from the Institute of Marine Research up to 22 November were:

G. Saetersdal, O. Alvheim, K. Korsbrekke, T. Haugland and T. Mørk.

#### 1.4 NARRATIVE

Figures 1a-c show the course tracks with the positions of the fishing and hydrographic stations. After departure from Walvis Bay on 23 October, work started near Orange River on 25 October following largely the course tracks and station grids used in the three previous surveys. The hydrographic section off Panther Head was worked on October 28. Coverage of the shelf up to St. Francis Bay, including the hydrographic profile off Hottentot Point, was completed by November 2 with a total of 52 successful swept area hauls. The coverage by depth ranges was adjusted to an increased density of deep water hake at 300-500 m of depth. Weather conditions in this southern area were in general not favourable. About 36 hours were lost in dodging a gale force 8 off Lüderitz.

The profile off Conception Bay was worked on November 5 and the swept area trawling programme continued northwards with lines of stations about every 20 nm taking care to locate both the inner and the outer limits of the distribution of the hakes. Juvenile Cape hake with modal lengths in the lower 20 cm range was encountered in high densities in shallow waters, 130-200 m from Conception Bay northwards. Because of many areas of soft bottom and occurrence of jellyfish in these shallow waters, fishing time had often to be limited to 10-20 min. Heavy by-catches of jellyfish occurred in most hauls in the depth range 130 to well over 200 m along the whole coast from about Conception Bay northwards to about Rocky Point.

The coverage of the swept area trawl programme was adjusted both for the high density of small sized hake in shallow waters and the relatively abundant fish found at depths down to 400 m. A hydrographic profile was worked off Cape Cross on 8 and 9 November. A series of trawl hauls to test the selectivity of a metal bar sorting grid installed in the extension piece of the trawl were made on 9 November. A call on Walvis Bay was made on November 10-12 to allow participation in the Annual Research Meeting in Swakopmund. Weather and sea conditions continued somewhat rough also in the central area, but did not cause disruption of the work.

When returning northwards the opportunity was used of adding some observations on the inner limit of the distribution of small sized hake from west of Walvis Bay northwards. The swept area programme was resumed north of Cape Cross on 13 November and continued northwards covering the depth range 200-450 m representing the inner and outer limit of hake distribution respectively. This coverage was successfully completed on 18 November off the Cunene River. 19 and 20 November were spent on selectivity trials with steaming southwards at night. The vessel reached Walvis Bay on 21 November. The weather conditions during the northern coverage were generally favourable.



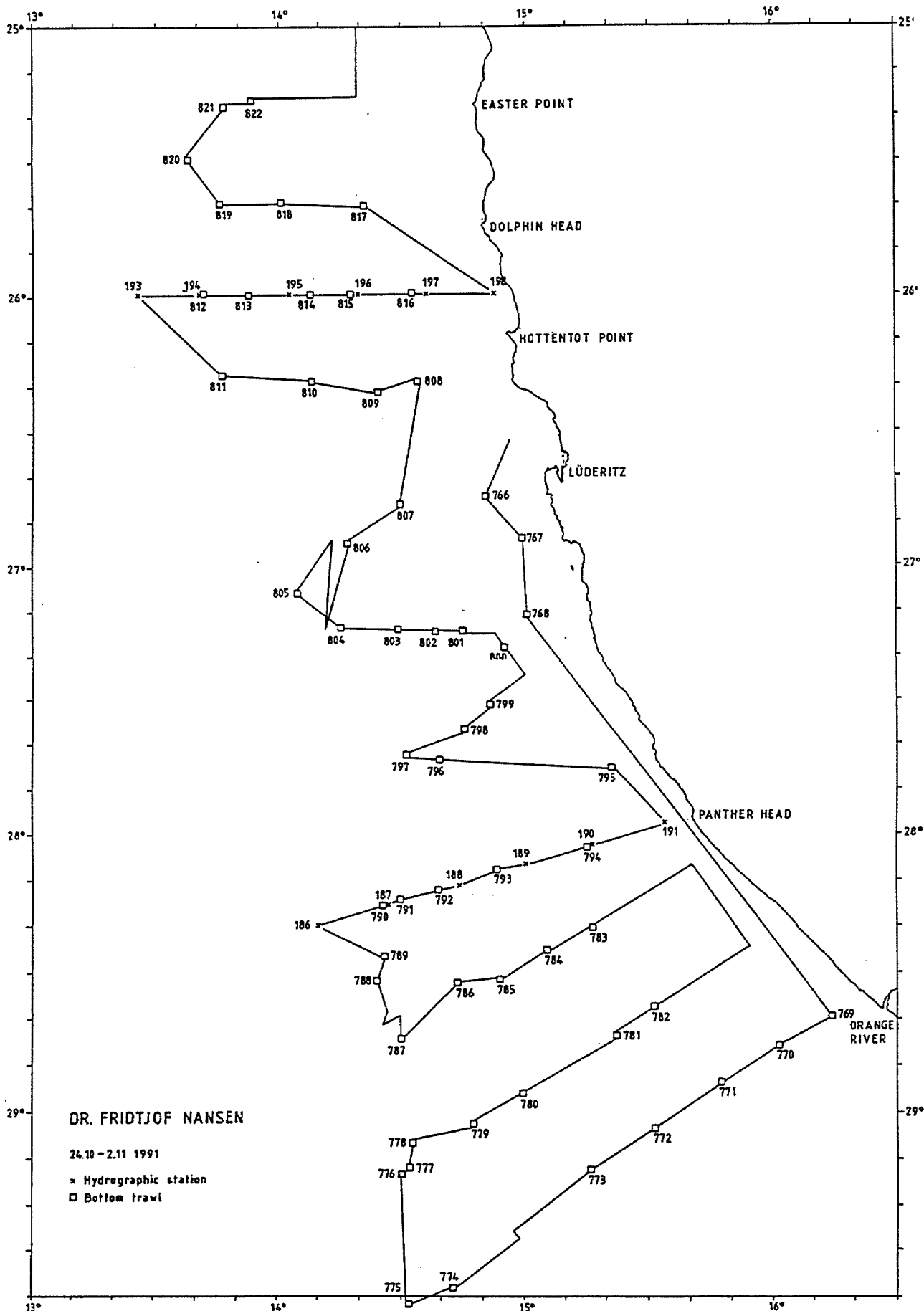


Figure 1a Orange River to St. Francis Bay. Course tracks, fishing stations and hydrographic profiles.

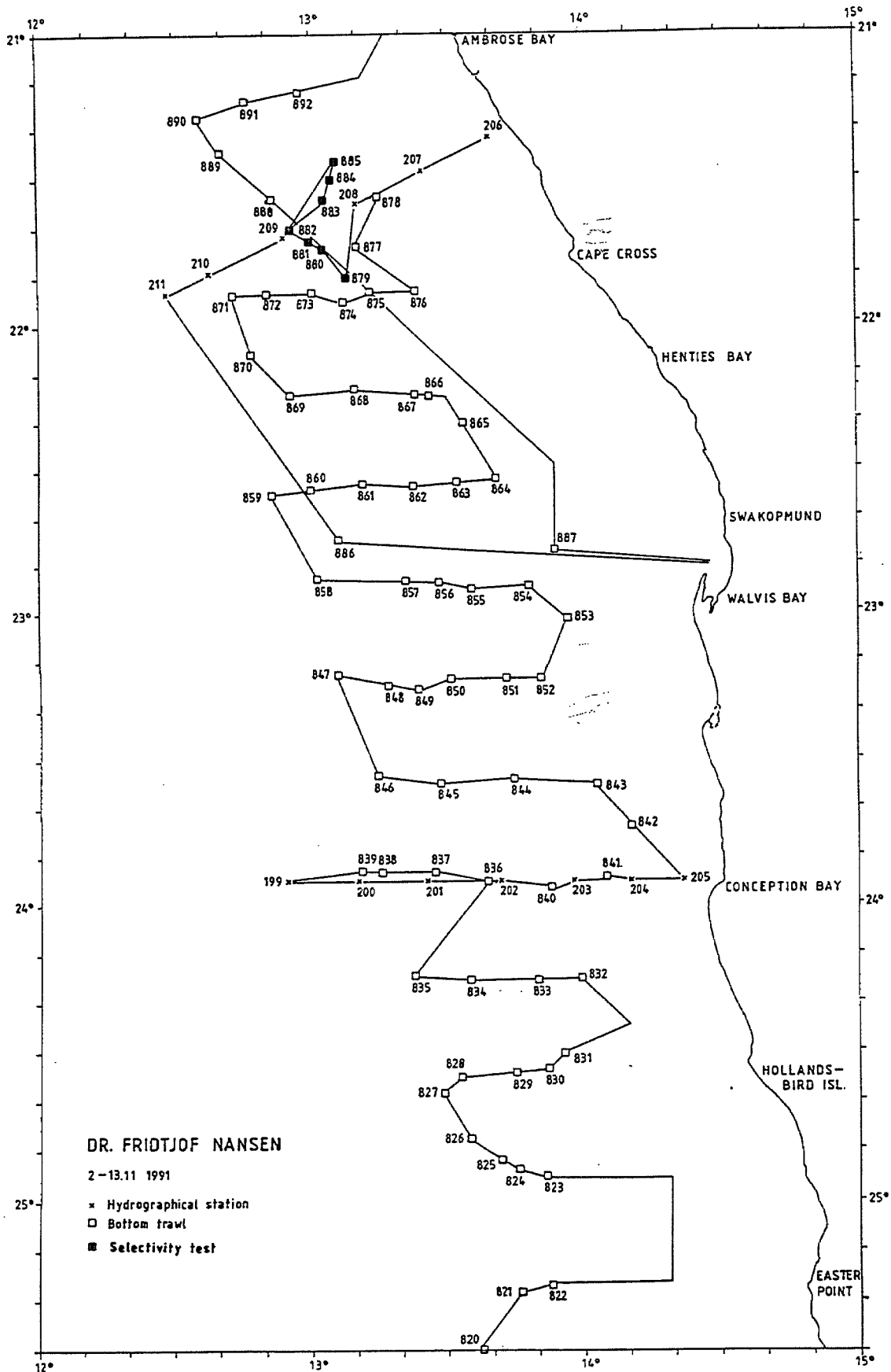


Figure 1b St. Francis Bay to Ambrose Bay. Course tracks, fishing stations and hydrographic profiles.

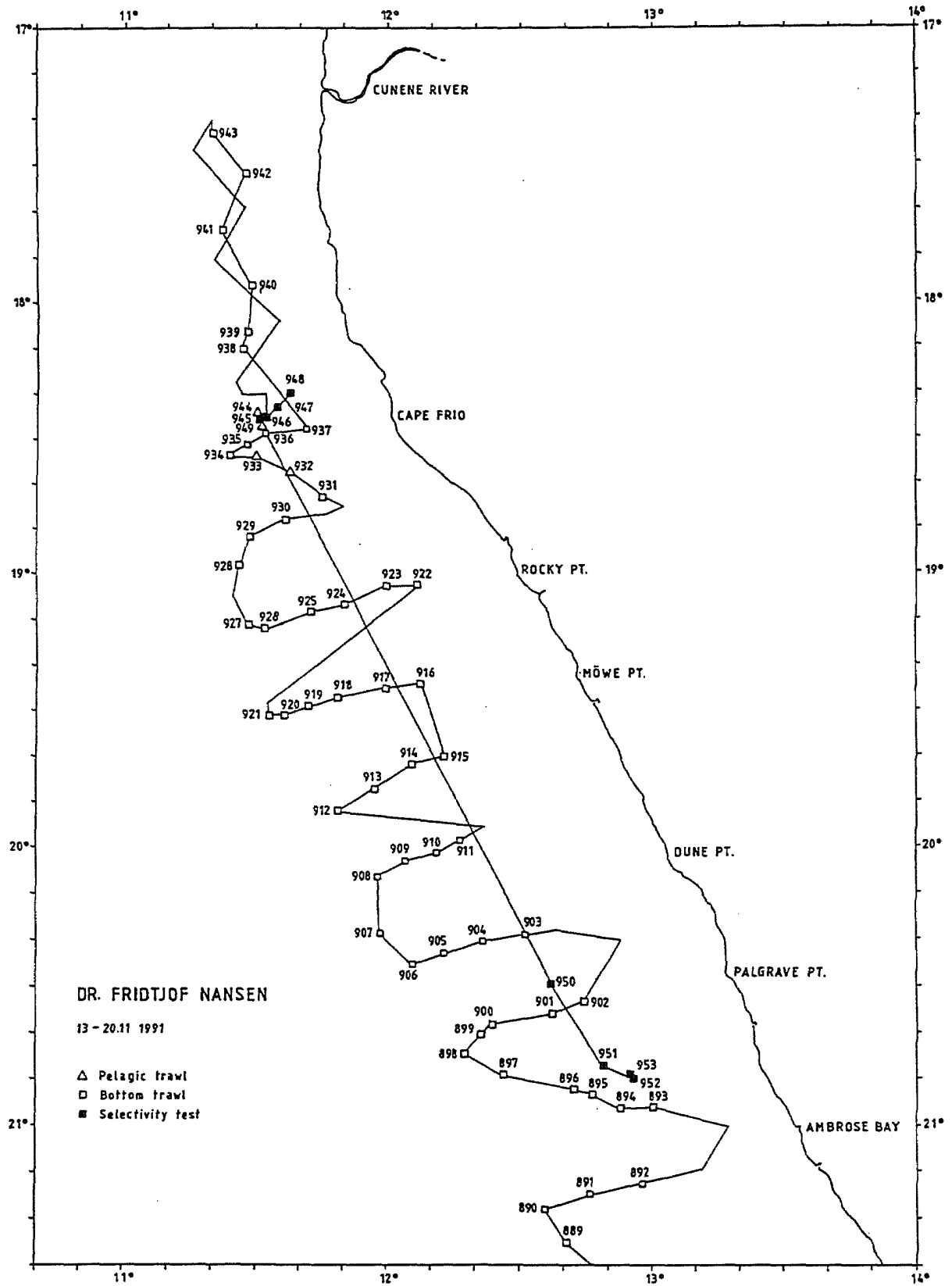


Figure 1c Ambrose Bay to Cunene River. Course tracks and fishing stations.

## CHAPTER 2 THE ENVIRONMENT

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### 2.1 THE SHELF AND THE SLOPE

The depths over the shelf and the slope and the quality of the bottom are incompletely described in the nautical charts available. Observations on depth from the five "DR. FRIDTJOF NANSEN" surveys have been used to prepare the bathymetric chart presented in Figure 2a-c. Echo sounding also provides some information on the type of bottom, whether it is smooth and even or uneven, whether it is rough and hard or soft. For assessing this, analysis of the second bottom echo is important and the quality of these data has been improved in the new EK 500 system. As shown by the charts rough and uneven bottom is found in many areas both inshore and offshore south of 25°S while soft bottom is frequent inside about 150 m of depth from Easter Point up towards Ambrose Bay. This represents the diatomaceous mud belt described in oceanographic literature and related to a zone of high primary production.

It is expected that these charts will be improved through further accumulation of information.

### 2.2 HYDROGRAPHY

Figures 3a-c show the sea temperature at 4 m of depth as observed with the ships thermograph and Figures 4a-c show the distribution of temperature, salinity and oxygen in the five hydrographic transects worked.

Strong winds prevailed during the coverage of the Orange River to St. Francis Bay shelf and both the chart of surface temperature distribution and the profiles show evidence of intensive upwelling. Conditions are similar to those found in September 1990.

Fairly intensive upwelling is also evident in the observations of surface temperature and profiles from the central area, St. Francis Bay to Ambrose Bay. This agrees with the conditions of continued prevailing southerly winds during the period of coverage.

The calmer conditions during the northern coverage are reflected in both sets of data. The profiles were occupied during part 2 of the survey, but in a period of continued calm weather.

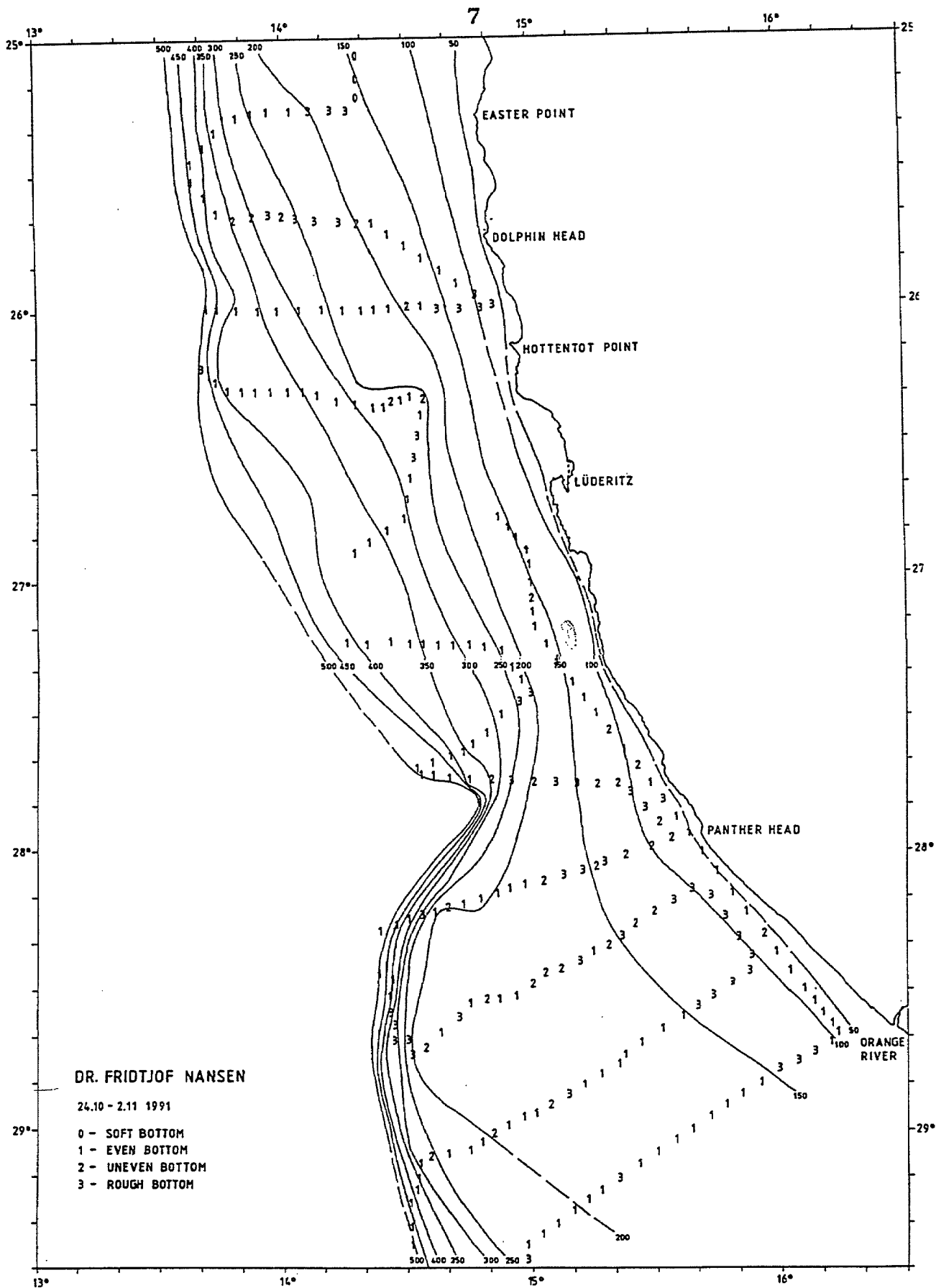


Figure 2a Orange River to St. Francis Bay. Bathymetric chart of the Namibian shelf based on echo sounding observations of "DR. FRIDTJOF NANSEN" surveys 1990-91 complemented with some data from Spanish fishing charts.

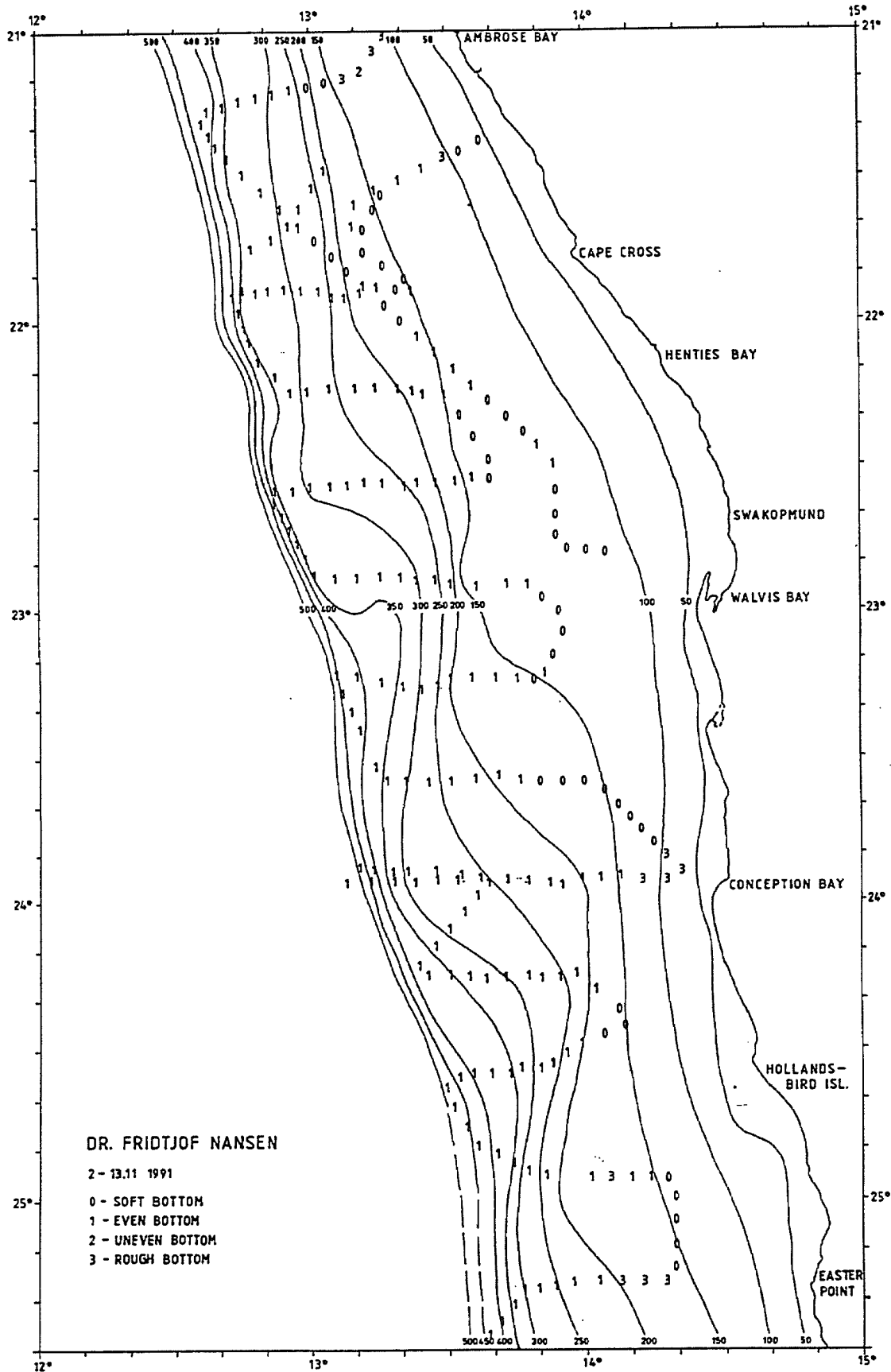


Figure 2b St. Francis Bay to Ambrose Bay. Bathymetric chart of the Namibian shelf based on echo sounding observations of "DR. FRIDTJOF NANSEN" surveys 1990-91.

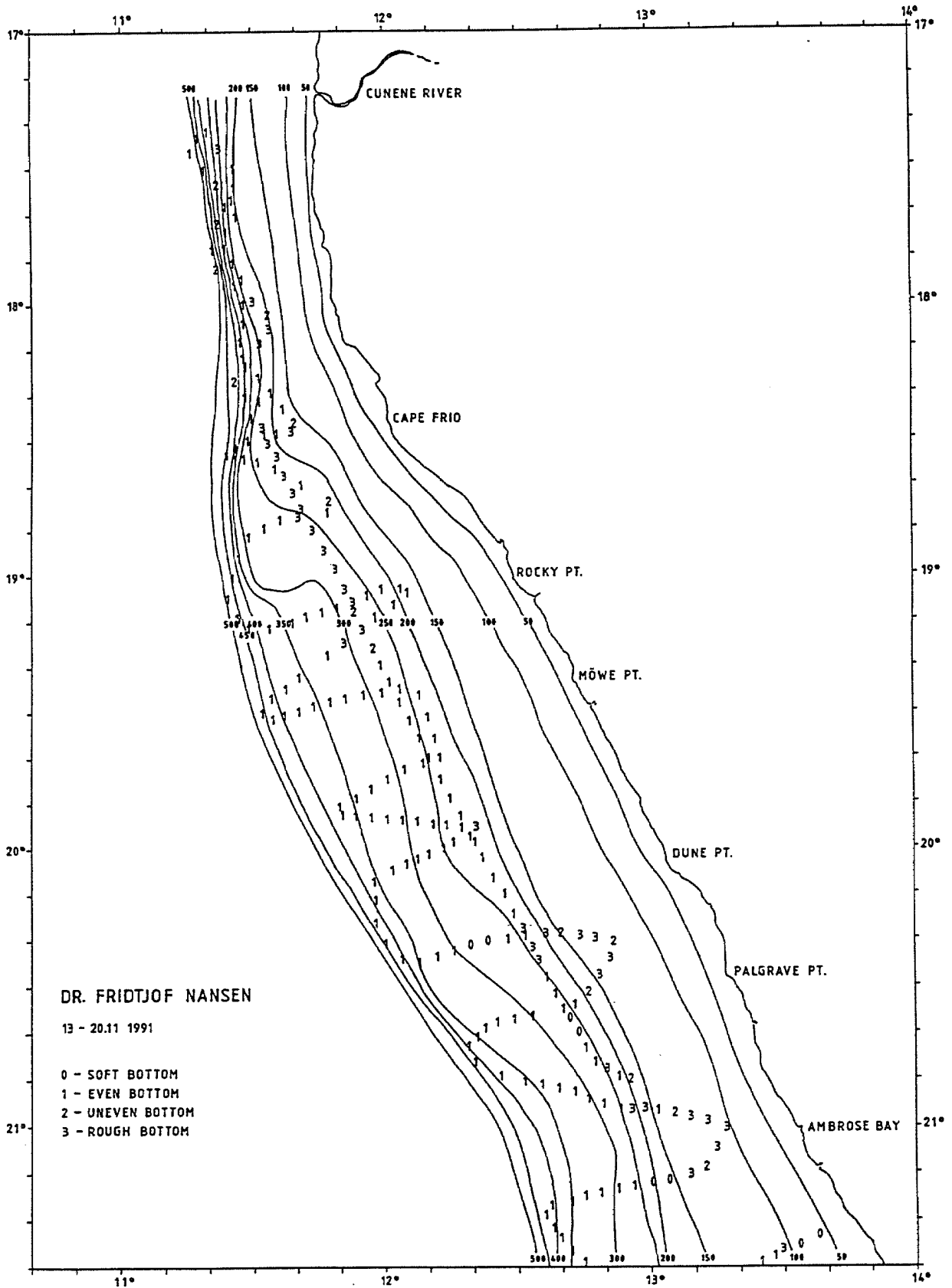


Figure 2c Ambrose Bay to Cunene River. Bathymetric chart of the Namibian shelf based on echo sounding observations of "DR. FRIDTJOF NANSEN" surveys 1990-91.

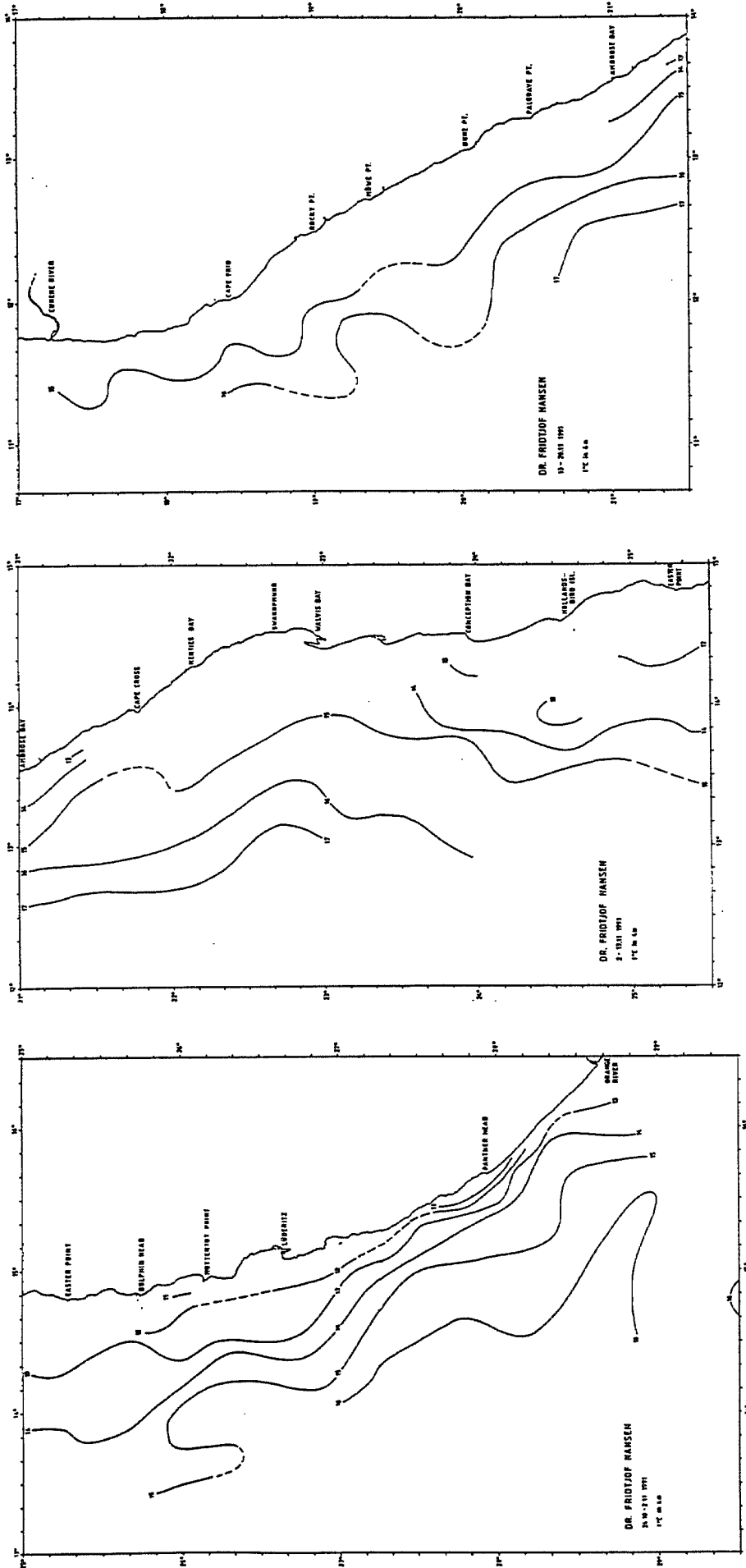


Figure 3a-c Distribution of sea temperature at 5 m of depth based on observations of the ships thermograph.



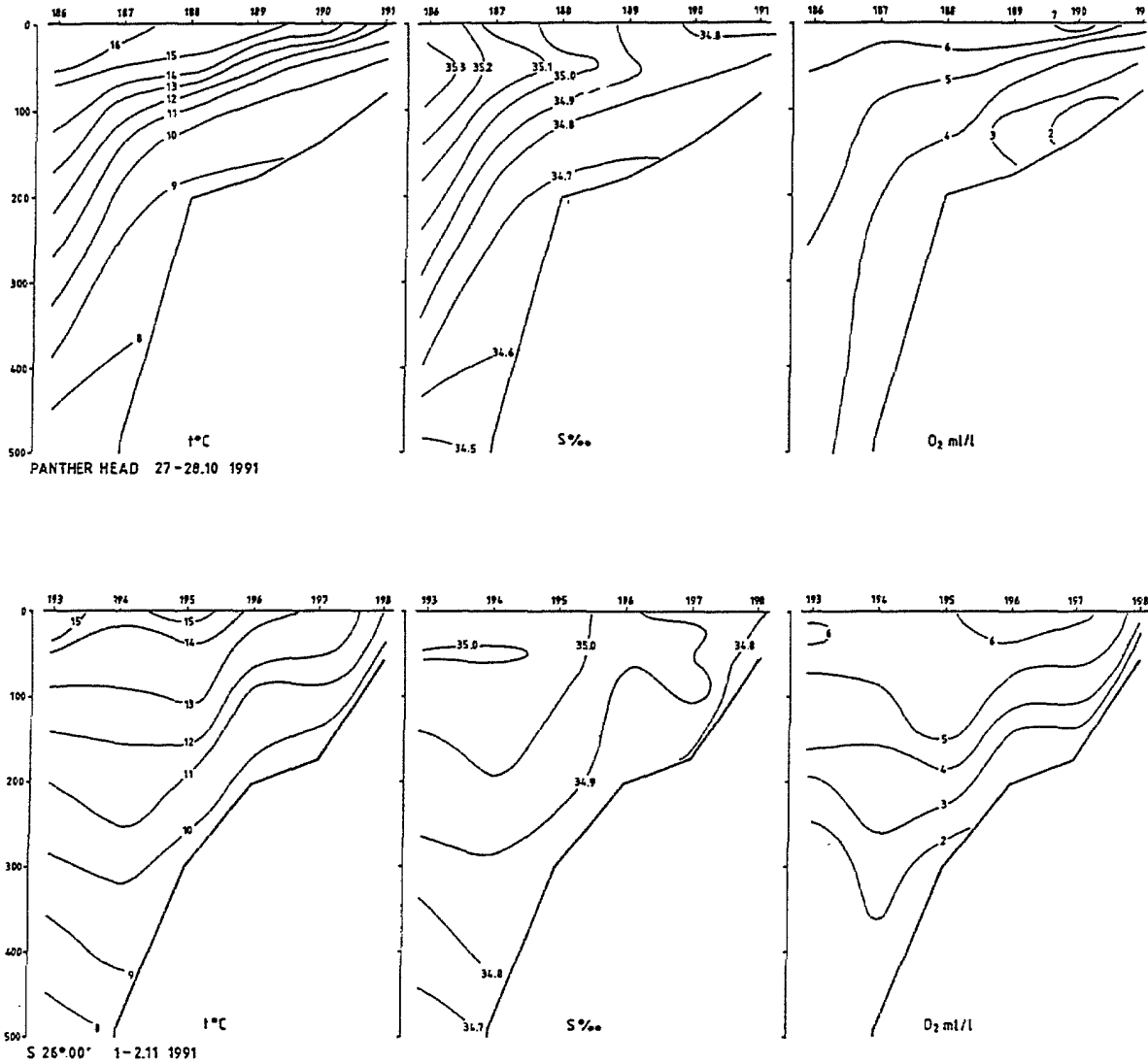


Figure 4a Orange River to St. Francis Bay. Temperature, salinity and oxygen in the standard profiles worked.

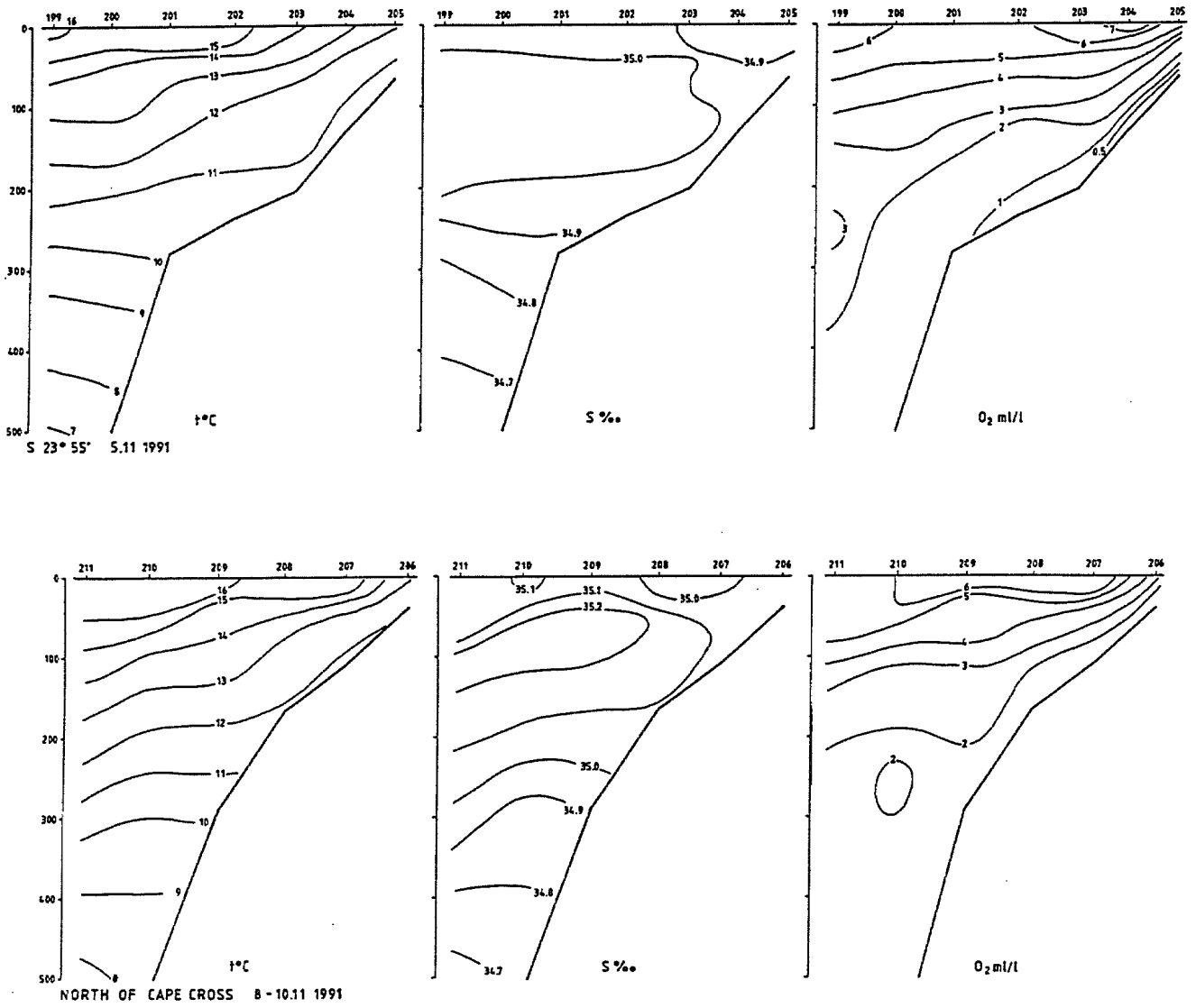


Figure 4b St. Francis Bay to Ambrose Bay. Temperature, salinity and oxygen in the standard profiles worked.

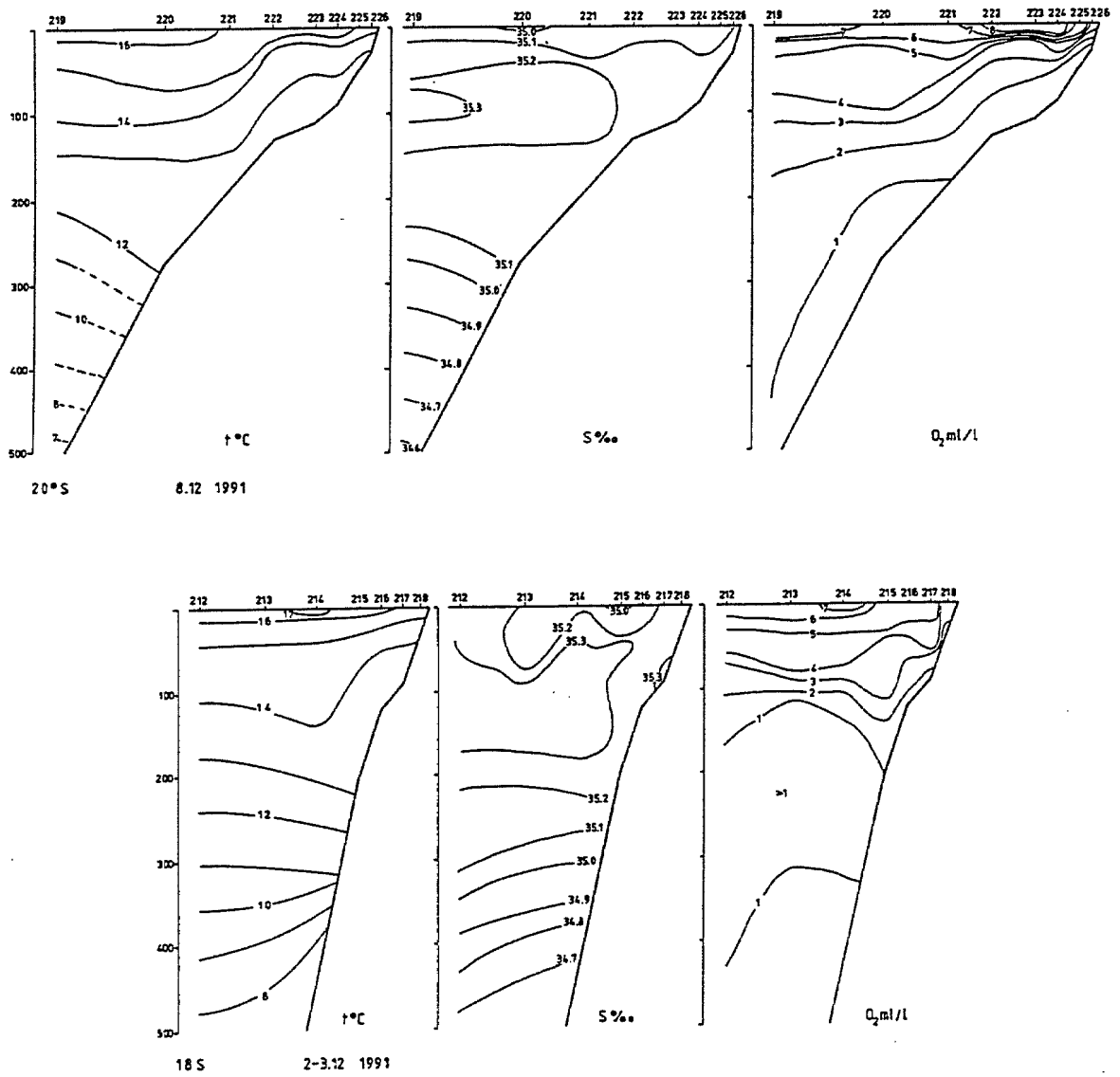


Figure 4c Ambrose Bay to Cunene River. Temperature, salinity and oxygen in the standard profiles worked.

## CHAPTER 3 RESULTS OF THE ACOUSTIC AND TRAWL SURVEYS

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### 3.1 DISCUSSION OF METHODS

A description of the fishing gear and the acoustic instruments and their state is shown in Annex I.

In the trawl survey programme all catches were sampled for composition in weight and numbers by species. The bottom trawl has a headline of 31 m (float line), footrope 47 m, estimated headline height 6 m and distance between wings during towing about 18 m. Observations on the geometry of this type of trawl were made during Survey 2/90 and are described in the corresponding report. A bobbins gear was used for protection in the southern region. For conversion of catch rates to fish densities the area between the wings is assumed to be the effective fishing area i.e.  $q$  is equal to 1.

The problem of mid-water occurrence of hake and the effect on the swept area assessments were discussed in the report of Survey 1/91. Fish occurring above the headline of the trawl, more than 5 m from the bottom must be assumed to cause an underestimate. The extent of this behaviour seems to have varied between the surveys. Mid-water occurrence during the night has always been observed although with varying frequency. Fishing has, however, been restricted to day time as much as possible, and mid-water occurrence during the day was first found as a problem for the assessment in the northern region during the September-October survey 1990 when abundant echo traces of hake were observed both day and night. Quantification was, however, difficult with the instrumentation then available, but the new SIMRAD EK 500 system which was taken into use in the first 1991 survey provided improved means of observing and measuring the densities of hake in mid-water. A correction for the bias in the swept area estimates was then introduced using the acoustic estimates of fish found more than 5 m from the bottom. The frequent presence of spurious recordings such as of myctophids, gobies, euphaucids and others often complicates the acoustic density estimates of hakes and prevents an ordinary acoustic biomass estimate of mid water hake in the area, but special attempts were made to separate and assess mid-water hake during trawling. A target strength used for cod was applied:  $TS = 20 \log l - 69.5$ .

During the January-February 1991 survey mid-water occurrence was common. Of the day time hauls about half was given an acoustic correction in the southern and central regions and about 2/3 in the northern region. Table 1 shows the observations and measurements of density of fish in mid-water during trawling in this survey. The extent of mid-water occurrence during daytime is seen to be very low in the south and centre and of significance only in the north. The mean acoustic densities are also low. Because of time pressure a higher proportion of the hauls were made at night, mostly in the evening and the acoustic density corrections are still of some importance.

| Table 1. Cape hake. Frequency of observations of hake in mid-water during trawling. No of trawl stations with swept area densities and no. of stations with observations of hake above 5 m from bottom with acoustic density estimate. Density tonnes/nm <sup>2</sup> . |      |       |
|---|------|-------|
| ORANGE RIVER -<br>ST. FRANCIS BAY   | DAY  | NIGHT |
| Trawl   |      |       |
| No. stations  | 30   | 6     |
| Mean density  | 8.0  | 7.2   |
| Acoustic obs.   |      |       |
| No. stations  | 1    | 2     |
| Mean density  | 2.0  | 2.0   |
| ST. FRANCIS BAY -<br>AMBROSE BAY  | DAY  | NIGHT |
| Trawl   |      |       |
| No. stations  | 39   | 20    |
| Mean density  | 30.9 | 15.5  |
| Acoustic obs.   |      |       |
| No. stations  | 0    | 16    |
| Mean density  |      | 14.7  |
| AMBROSE BAY -<br>CUNENE RIVER   | DAY  | NIGHT |
| Trawl   |      |       |
| No. stations  | 37   | 12    |
| Mean density  | 19.0 | 20.6  |
| Acoustic obs.   |      |       |
| No. stations  | 15   | 8     |
| Mean density  | 7.8  | 6.6   |

### 3.2 ORANGE RIVER TO ST FRANCIS BAY

#### Observation of pelagic fish

Figure 5 shows the distribution of the pelagic fish types 1 and 2. One should note that the course tracks are not adjusted to a study of the inshore pelagic fish, pilchard, anchovy and round herring and their recordings in this survey are only incidental. As previously, pelagic fish was only recorded in low densities in this southern area. The patch close to the shelf edge in the extreme south derives from schools identified as round herring, *Etrumeus whiteheadi*. Southern rover, *Emmelichthys nitidus* also occurred in a few of the catches here. Mid-water schools identified as Cape horse mackerel was only found in low densities in a few limited areas, but this species occurred frequently in the bottom trawl catches at intermediate depths, see Table 2. The horse mackerel in this southern area was large sized as shown in Annex II.

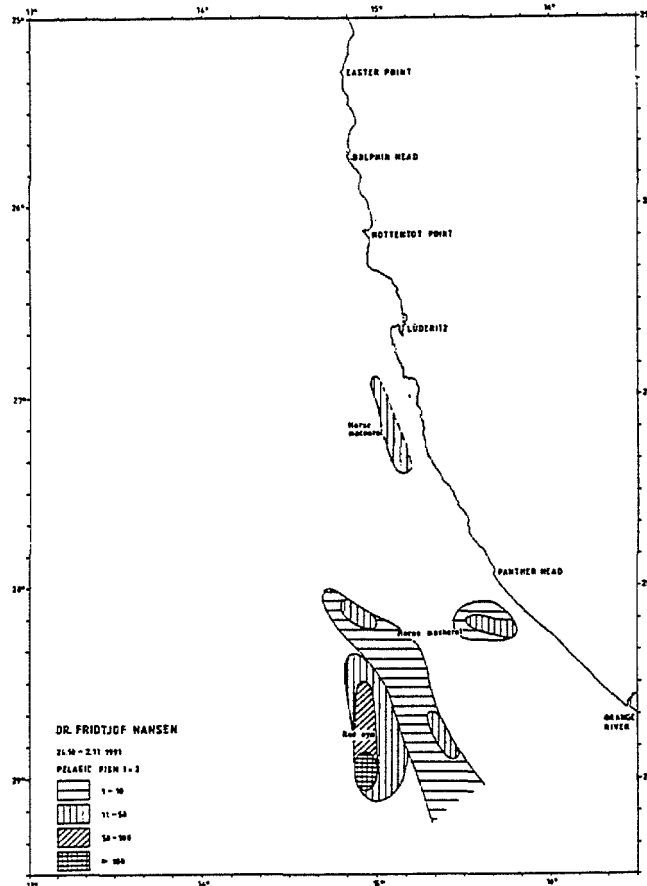


Figure 5 Orange River to St. Francis Bay. Distribution of pelagic fish in the area covered based on information from the echo integrator system.

Myctophids and gobies were recorded in abundance in schools and layers over nearly the whole shelf area. Myctophids usually aggregate outside and over the slope, but from the Orange River to Lüderitz this they are also abundant inside the shelf platform.

### Results of the trawl survey

The complete record of the fishing stations is shown in Annex III.

The catch compositions are shown in Table 2 which lists the catch rates standardized to kg/hour by main groups for the shelf and the slope separately. Compared with the previous surveys the mean catch rate for hake on the shelf is now significantly lower, but that for the slope hauls higher than previously. This will be discussed further below. Monk and kingklip show the highest abundance in the slope with catch rates up to 66 and 45 kg/hour respectively. Snoek appeared less frequently than previously, but squid with about the same abundance. The horse mackerel consisted as usual of large sized fish in this southern area and the catch rates were in the same range as in previous surveys.

Table 2 Orange River to St. Francis Bay. Catch rates by main groups in bottom trawl hauls standardized to kg/hour for the shelf and slope.

SHELF 50-259m

| ST.NO. | DEP. | Hakes  | Monk | Kingklip | Horse mck. | Squid | Other |
|--------|------|--------|------|----------|------------|-------|-------|
| 766    | 164  | 387.0  |      |          | 40.0       | 8.4   | 274.6 |
| 767    | 136  | 186.0  |      |          | 1870.0     |       | 468.0 |
| 768    | 161  | 143.0  |      |          | 129.4      | 0.8   | 81.0  |
| 769    | 77   | 3.2    |      |          |            |       | 93.2  |
| 770    | 125  |        |      |          |            |       |       |
| 771    | 169  | 82.6   |      | 1.2      | 1.2        | 47.0  | 16.2  |
| 772    | 177  | 65.2   |      |          | 88.4       | 10.4  | 153.2 |
| 773    | 182  | 68.0   |      | 0.5      | 104.4      | 35.0  | 99.8  |
| 779    | 211  | 125.6  | 6.4  |          | 219.6      | 4.6   | 117.4 |
| 780    | 174  | 132.4  |      |          | 74.8       | 5.8   | 404.4 |
| 781    | 179  | 183.6  |      | 1.2      | 5.0        | 15.6  | 20.8  |
| 782    | 175  | 54.4   |      |          | 15.0       | 62.6  | 35.8  |
| 783    | 161  | 45.3   |      |          | 7.2        | 12.6  | 62.7  |
| 784    | 169  | 111.6  |      |          | 114.0      | 5.4   | 101.2 |
| 785    | 177  | 69.0   |      |          | 42.0       | 3.0   | 274.6 |
| 786    | 194  | 56.6   | 10.2 | 2.4      |            | 7.2   | 92.8  |
| 787    | 212  |        |      |          |            |       |       |
| 792    | 199  | 308.9  |      |          | 9.6        | 1.2   | 34.2  |
| 793    | 191  | 63.0   | 6.4  |          | 265.2      | 2.4   | 35.0  |
| 794    | 142  | 66.0   |      | 0.4      | 34.0       | 10.0  | 644.9 |
| 795    | 121  | 72.5   |      |          | 0.3        | 2.5   | 52.5  |
| 800    | 201  | 92.2   |      |          | 167.2      | 17.2  | 268.0 |
| 808    | 259  |        |      |          |            |       |       |
| 815    | 220  | 550.0  | 2.6  |          | 8.8        | 11.0  | 14.4  |
| 816    | 177  | 376.0  |      |          |            |       | 36.0  |
| 817    | 188  | 331.2  |      |          |            |       | 134.2 |
| 822    | 237  | 1358.1 | 18.9 |          |            | 67.5  | 91.8  |
| MEAN   |      | 182.6  | 1.7  | 0.2      | 118.4      | 12.2  | 133.6 |

SLOPE 260-600m

| ST.NO. | DEP. | Hakes  | Monk | Kingklip | Horse mck. | Squid | Other  |
|--------|------|--------|------|----------|------------|-------|--------|
| 774    | 390  | 206.4  | 5.4  |          |            | 2.4   | 71.4   |
| 775    | 552  | 30.0   |      |          |            |       | 62.0   |
| 776    | 415  | 185.4  | 6.8  |          |            | 0.6   | 20.4   |
| 777    | 364  | 310.8  |      | 2.6      |            | 17.0  | 56.1   |
| 778    | 292  | 382.8  |      | 2.8      | 4.6        |       | 220.5  |
| 788    | 441  | 171.4  |      | 20.8     |            |       | 21.0   |
| 789    | 395  | 113.6  |      | 2.4      |            | 1.6   | 57.9   |
| 790    | 523  | 152.0  |      |          |            | 2.0   | 71.3   |
| 791    | 384  | 236.4  |      | 45.0     | 4.7        | 12.9  | 82.5   |
| 796    | 391  | 1213.3 | 15.3 |          |            |       | 24.0   |
| 797    | 493  | 316.4  |      |          |            | 3.8   | 168.2  |
| 798    | 337  | 669.6  |      | 3.0      | 17.0       | 18.2  | 56.0   |
| 799    | 307  | 522.0  |      | 1.6      | 2.7        | 16.2  | 71.1   |
| 801    | 276  | 0.8    |      |          |            | 1.2   | 24.8   |
| 802    | 309  | 677.8  | 9.6  |          | 157.8      | 38.0  | 48.8   |
| 803    | 361  | 892.5  |      | 1.0      | 25.2       | 98.8  | 143.5  |
| 804    | 408  | 728.0  |      |          |            | 15.6  | 53.2   |
| 805    | 453  | 137.4  |      |          |            |       | 43.9   |
| 806    | 363  | 646.1  |      | 2.4      | 19.5       | 11.7  | 53.3   |
| 807    | 301  | 234.0  |      | 16.6     | 5.6        | 15.2  | 72.6   |
| 809    | 290  | 405.9  |      |          | 2.1        | 2.1   | 49.1   |
| 810    | 328  | 520.8  |      |          |            |       | 222.6  |
| 811    | 391  | 555.1  |      |          |            | 55.9  | 122.8  |
| 813    | 360  | 361.4  | 66.0 |          | 21.4       |       | 192.6  |
| 814    | 270  | 482.2  | 42.8 |          | 34.0       |       | 3.4    |
| 818    | 264  | 742.6  | 16.4 |          | 8.2        | 20.2  | 51.8   |
| 819    | 352  | 468.0  | 51.2 | 46.2     |            | 13.8  | 160.2  |
| 820    | 459  | 208.4  |      |          |            |       | 8015.6 |
| 821    | 296  | 1652.5 | 22.4 |          | 17.9       | 21.8  | 137.0  |
| MEAN   |      | 456.0  | 8.1  | 5.0      | 11.1       | 12.7  | 357.9  |

The depth distribution of the two hake species based on the catch rates converted to densities are shown in Table 3. There is a considerable difference as compared to the findings of the previous three surveys. There is a shift of the highest density of Cape hake from the shallowest range to 250-350 m, a consequence of the present larger size of the fish. The deep water hake shows considerably increased densities at all depths.

|              | 100-250 m | 250-350 m | 350-450 m | 450-550 m |
|--------------|-----------|-----------|-----------|-----------|
| Cape hake    |           |           |           |           |
| Density      | 6.3       | 12.5      | 0.7       | 0.7       |
| Catch rate   | 190       | 375       | 20        | 20        |
| Deep w. hake |           |           |           |           |
| Density      | 0.3       | 8.9       | 14.0      | 4.9       |
| Catch rate   | 10        | 270       | 420       | 150       |
| No. of hauls | 24        | 10        | 13        | 5         |

The distribution of the Cape hake based on plots of densities by fishing stations is shown in Figure 6. The densities include the acoustic estimates of fish present above the 5 m bottom channel during trawling as discussed above. The Cape hake was only found in low densities south of Lüderitz, a picture similar to the distribution found in Survey 1/91 whereas patches of higher densities were found from Lüderitz southwards in both of the 1990 surveys.

Figure 7 shows the distribution of deep water hake. The higher densities between 26° and 28°S is a new finding not observed in the previous surveys.

Biomass estimates based on a post-stratification of the estimated densities, as shown in the figures of fish distribution, give 80 000 tonnes for the Cape hake and 82 000 tonnes for the deep water hake.

For the Cape hake this is a significant reduction compared with previous surveys. The size compositions of the Cape hake are shown in Annex II. The dominating cohort with a modal size of 25 cm (probably the 1989 yearclass) was only present in low abundance over the shelf. 3 years and older fish was found in some abundance on the slope in northern parts of the area.

The size composition of the deep water hake, see Annex II shows a dominance of fish in the 30 cm range, probably the 1988 yearclass. Reviewing the size compositions of this species from the previous surveys it seems likely that the present considerable increase of biomass has been brought about by an influx of fish, probably of the 1988 yearclass from south of the border.

Assuming a trawl mesh size of 110 mm and a selection factor of 3.3 the 50% retention length is about 36 cm. Using the total size compositions of all samples in this southern region weighted by the corresponding catch the fishable part of the Cape hake estimated as fish 36 cm and larger would be 53% by weight. The fishable part of the deep water hake is estimated at 50% by weight. This corresponds to a biomass of 42 000 tonnes for each of the stocks.



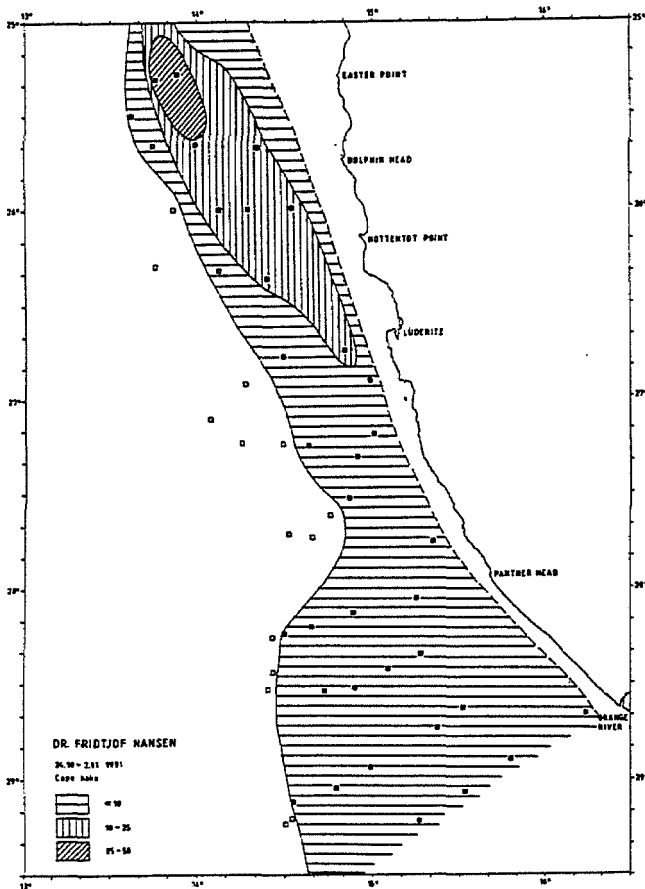


Figure 6 Orange River to St. Francis Bay.  
Distribution of Cape hake.

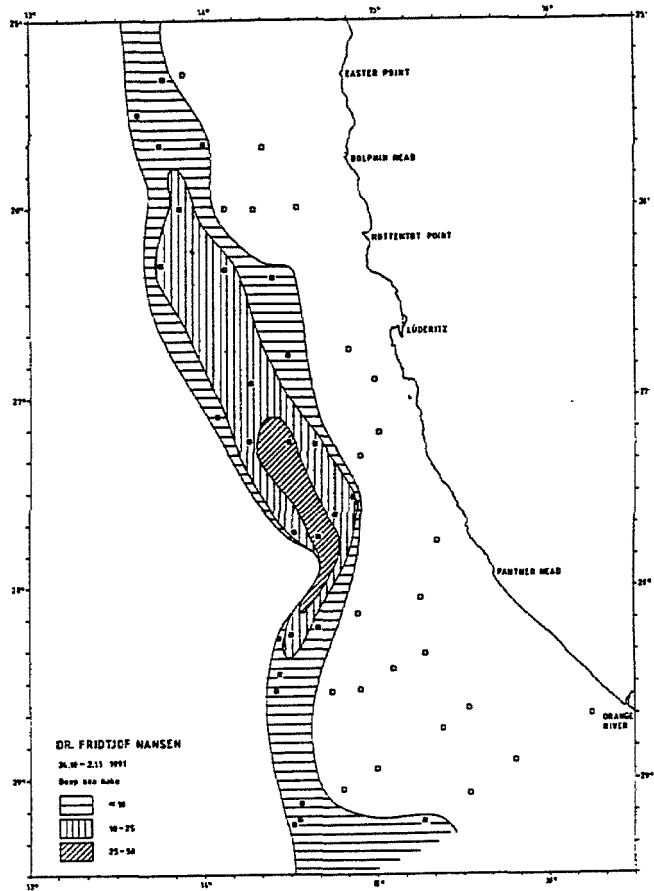


Figure 7 Orange River to St. Francis Bay.  
Distribution of deep water hake.

### 3.3 ST. FRANCIS BAY TO AMBROSE BAY

#### Observations of pelagic fish

The acoustic system did not show any appreciable concentrations of commercial pelagic fish in this part. One should note that the coverage did not include the inshore shelf area as this was to be the task of the second part of the survey programme. Extensive acoustic recordings were made of pelagic gobies and myctophids. Horse mackerel occurred commonly in the bottom trawl catches.

#### Results of the trawl survey

The catch compositions for the shelf and the slope are shown in Table 4 by main groups. For the hakes the mean catch rate in the slope is much higher than in any of the previous surveys. The catch rates for horse mackerel were lower than in recent surveys, but this could be a seasonal effect. The catch rates for squid were relatively high.

Table 4 St. Francis Bay to Ambrose Bay. Catch rates by main groups in bottom trawl hauls standardized to kg/hour for the shelf and slope.

| SHELF 50-259m |      |        |      |        |            |       |       |
|---------------|------|--------|------|--------|------------|-------|-------|
| ST.NO.        | DEP. | Hakes  | Monk | Dentex | Horse mck. | Squid | Other |
| 823           | 212  | 188.0  | 6.0  |        | 6.4        | 3.0   | 26.0  |
| 830           | 256  | 510.4  | 16.6 |        |            | 38.2  | 133.6 |
| 831           | 208  | 869.4  | 10.8 |        |            |       | 23.4  |
| 832           | 207  | 642.0  |      |        | 12.0       |       | 3.0   |
| 836           | 247  | 777.6  |      |        | 32.6       | 5.4   | 11.1  |
| 840           | 218  | 1246.0 | 7.0  |        |            |       | 70.0  |
| 841           | 163  | 1530.0 |      |        | 12.0       |       | 39.0  |
| 842           | 137  | 870.4  |      |        |            |       | 25.6  |
| 843           | 154  | 3461.5 |      |        |            |       |       |
| 844           | 176  | 345.6  |      |        | 147.0      | 3.3   | 42.3  |
| 845           | 232  | 334.0  |      |        | 7.6        | 0.4   | 36.0  |
| 850           | 196  | 242.0  |      |        | 56.0       | 6.4   | 15.2  |
| 851           | 156  | 439.2  |      |        | 1296.0     |       | 3.6   |
| 852           | 151  | 4276.8 |      |        |            |       |       |
| 853           | 136  | 2592.0 |      |        |            |       |       |
| 854           | 136  | 883.2  |      |        | 19.2       |       |       |
| 855           | 139  | 717.5  |      |        | 540.0      |       | 26.5  |
| 856           | 250  | 180.0  | 1.8  |        | 79.0       | 3.0   | 56.2  |
| 862           | 240  | 664.0  |      |        | 49.4       | 3.0   | 75.2  |
| 863           | 150  | 993.6  |      |        |            |       | 471.3 |
| 864           | 127  | 104.7  |      |        |            |       | 12.0  |
| 865           | 136  | 3000.0 |      |        | 3000.0     |       |       |
| 866           | 159  | 252.0  |      |        | 60.0       |       |       |
| 867           | 186  | 960.0  | 0.8  |        | 649.5      |       | 20.3  |
| 868           | 231  | 265.2  | 5.2  |        | 64.0       |       | 38.4  |
| 874           | 224  | 679.1  |      |        | 183.3      | 1.1   | 61.6  |
| 875           | 168  | 1386.2 |      |        | 7.6        |       | 54.6  |
| 876           | 148  | 1003.5 |      |        | 517.5      | 1.2   | 16.5  |
| 877           | 173  | 39.0   |      |        | 90.0       |       | 6.3   |
| 878           | 141  | 73.2   |      |        | 10.4       |       | 1.2   |
| 880           | 255  | 238.5  |      |        | 231.3      |       |       |
| 883           | 232  | 471.3  |      |        | 657.3      |       |       |
| 884           | 204  | 607.5  |      |        | 576.9      |       |       |
| 885           | 173  | 77.4   |      |        | 77.7       |       |       |
| 887           | 127  | 2097.2 |      |        | 300.0      |       |       |
| 892           | 241  | 227.8  |      |        | 8.2        |       |       |
| MEAN          |      | 923.5  | 1.3  |        | 241.4      | 1.8   | 35.3  |

| SLOPE 260-600m |      |        |      |        |            |       |        |
|----------------|------|--------|------|--------|------------|-------|--------|
| ST.NO.         | DEP. | Hakes  | Monk | Dentex | Horse mck. | Squid | Other  |
| 824            | 287  | 593.0  | 15.7 |        | 41.6       | 5.0   | 76.2   |
| 825            | 360  | 547.7  |      |        | 11.8       | 26.2  | 101.5  |
| 826            | 451  | 242.6  |      |        | 3.4        | 33.4  | 264.8  |
| 827            | 492  | 208.8  | 11.4 |        |            | 49.2  | 275.0  |
| 828            | 384  | 396.0  |      |        | 8.0        | 102.6 | 93.2   |
| 829            | 329  | 321.6  | 4.2  |        |            | 6.8   | 57.0   |
| 833            | 272  | 616.3  | 25.6 |        |            | 34.6  | 178.6  |
| 834            | 311  | 327.2  |      |        | 13.8       | 21.4  | 86.0   |
| 835            | 371  | 547.4  |      |        | 2.2        | 17.6  | 247.4  |
| 837            | 272  | 371.6  | 9.2  |        | 16.6       | 4.4   | 38.2   |
| 838            | 344  | 704.0  |      |        |            | 22.5  | 76.7   |
| 839            | 451  | 146.0  | 4.0  |        |            | 18.4  | 122.7  |
| 846            | 352  | 342.8  | 2.2  |        | 3.4        | 4.4   | 88.2   |
| 847            | 443  | 183.2  |      |        |            | 20.0  | 135.6  |
| 848            | 358  | 518.0  | 9.6  |        | 5.8        | 27.2  | 74.7   |
| 849            | 301  | 515.0  |      |        | 9.6        | 14.4  | 1412.2 |
| 857            | 324  | 198.2  |      |        | 38.0       | 1.6   | 39.0   |
| 858            | 340  | 422.2  | 4.0  |        |            | 2.8   | 116.4  |
| 859            | 407  | 327.3  |      |        |            | 3.3   | 226.0  |
| 860            | 290  | 4720.5 | 6.6  |        | 105.0      | 9.0   | 79.5   |
| 861            | 271  | 621.8  | 13.0 |        | 102.8      | 0.8   | 96.9   |
| 869            | 314  | 354.8  | 0.2  |        | 9.2        | 0.4   | 83.6   |
| 870            | 354  | 340.0  |      |        |            | 15.2  | 92.0   |
| 871            | 414  | 206.4  |      |        |            | 0.8   | 222.8  |
| 872            | 316  | 308.6  | 10.8 |        | 34.0       | 2.4   | 100.8  |
| 873            | 288  | 276.2  | 7.0  |        | 34.0       | 4.8   | 118.8  |
| 881            | 273  | 219.6  |      |        | 301.8      |       |        |
| 882            | 286  | 184.2  |      |        | 326.4      |       |        |
| 886            | 307  | 427.4  | 3.0  |        | 45.6       | 1.2   | 21.7   |
| 888            | 301  | 323.8  |      |        | 17.0       | 0.8   | 61.8   |
| 889            | 350  | 495.8  |      |        |            | 3.6   | 183.6  |
| 890            | 398  | 135.0  |      |        |            | 13.6  | 106.2  |
| 891            | 328  | 313.8  |      |        |            |       | 28.2   |
| MEAN           |      | 498.7  | 3.8  |        | 34.2       | 14.2  | 148.6  |

The depth distribution of the two hake species is shown in Table 5. The density in the shallow range, 100-250 m is at the same high level as in 1990, while that in the deeper ranges shows considerable increases over the corresponding previous observations. This will be further discussed under Chapter 5 below.

|              | 100-250m | 250-350m | 350-450m | 450-550m |
|--------------|----------|----------|----------|----------|
| Cape hake    |          |          |          |          |
| Density      | 33.3     | 19.5     | 6.3      | 1.0      |
| Catch rate   | 1 000    | 584      | 190      | 31       |
| Deep w. hake |          |          |          |          |
| Density      |          | 0.3      | 5.8      | 5.6      |
| Catch rate   |          | 9        | 173      | 167      |
| No. of hauls | 34       | 22       | 10       | 3        |

Figure 8 shows the distribution of Cape hake over this area. The belt of high density inshore from off Conception Bay to off Cape Cross represents mainly a new recruit class with a modal length of 20-22 cm, assumed to be the 1990 yearclass (see length compositions in Annex II). A similar high density area of juvenile fish inshore, was found in the 1990 surveys when the 1988 yearclass was recruited to the stock. High densities of fish were also located in more restricted spots in deeper waters representing fish of similar large size, 40-60 cm as found in the northern region. The proportion of the adult stock, fish of 36 cm and larger as estimated from the total length composition weighted by the catches is 46% by weight. The total size composition (see Annex II), 0-600 m demonstrates, however, the dominance by numbers of the recruit group in the 20-25 cm range.

A biomass estimate of the Cape hake based on post-stratified observations, as shown in Figure 8 and adjusted for fish present in mid-water, gives a total of 302 000 tonnes for this region of which 139 000 tonnes is adult and fishable.

The distribution of deep water hake is shown in Figure 9. As in previous surveys, the density of this species decreases rapidly northwards. The size composition is shown in Annex II. The biomass is estimated at 13 000 tonnes, a doubling of the level found in recent surveys.

### 3.4 AMBROSE BAY TO CUNENE RIVER

#### Observations on pelagic fish

Some acoustic recordings of horse mackerel were made in parts of the area, especially in the north. The swept area programme for hake proved, however, to be more demanding than anticipated, mainly because the higher densities now found in deeper waters necessitated more deep water and time consuming hauls. It was therefore decided to leave the main coverage of the horse mackerel to the second part of the survey. Heavy recordings of non commercial pelagic organisms, especially euphausiids and myctophids were made also in this area. Horse mackerel appeared in the bottom trawl catches.

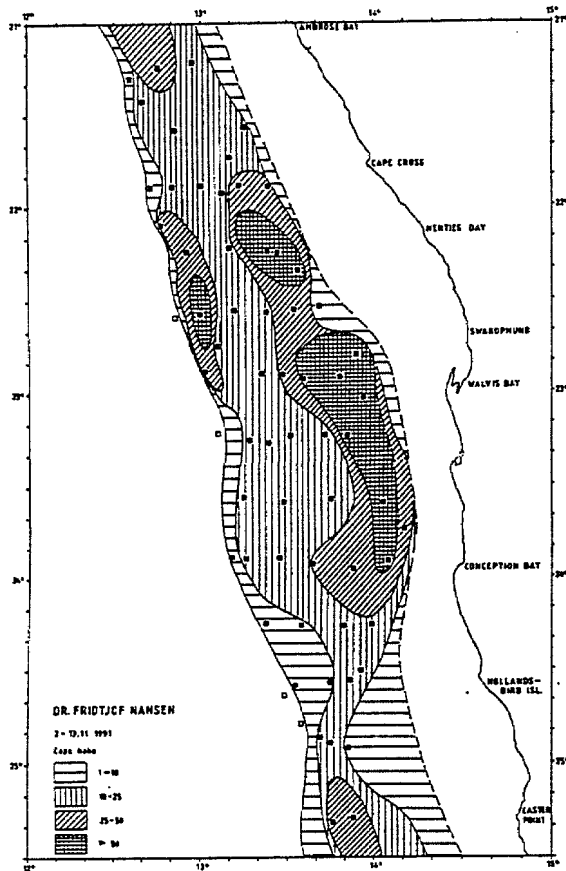


Figure 8 St. Francis to Ambrose Bay.  
Distribution of Cape hake.

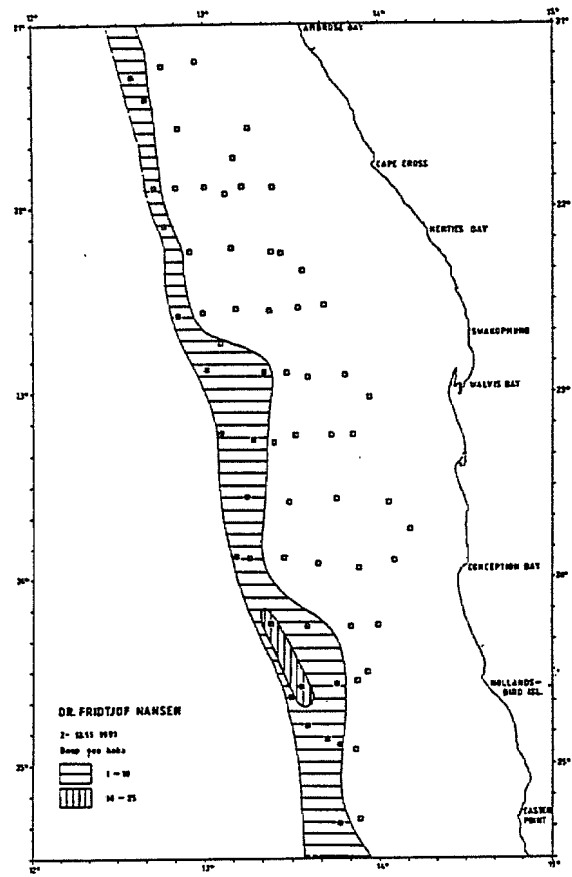


Figure 9 St. Francis Bay to Ambrose Bay.  
Distribution of deep water hake.

### Results of the trawl survey

Table 6 shows the catch rates by main groups for the shelf and the slope separately. The large-eye dentex is mainly found in the 150-250 m range, the monk in deeper waters. The by-catch of horse mackerel with a mean value of 138 kg/hour in the shallow range is very much lower than the means of 1.7, 1.2 and 2.8 tonnes/hour found in the previous surveys. The coverage in shallow waters was less in this last survey and there could also be a seasonal effect through lateral migrations.

Table 7 shows the depth distribution of the hakes. The Cape hake is found in highest densities in the 250-450 m range, a further shift towards greater depths compared with the last survey. Angola hake, *M. polli* appeared in small amounts in some catches.

Table 6 Ambrose Bay to Cunene River. Catch rates by main groups in bottom trawl hauls standardized to kg/hor for the shelf and slope.

| SHELF 50-259m |      |        |      |        |            |       |       |
|---------------|------|--------|------|--------|------------|-------|-------|
| ST.NO.        | DEP. | Hakes  | Monk | Dentex | Horse mck. | Squid | Other |
| 893           | 157  | 482.4  |      |        | 2.4        |       | 58.8  |
| 894           | 245  | 556.0  |      |        | 174.4      |       | 44.0  |
| 902           | 212  | 160.2  | 7.9  |        | 150.9      | 2.8   | 46.2  |
| 903           | 241  | 369.0  |      |        | 46.2       |       | 128.7 |
| 911           | 224  | 426.9  | 1.8  |        | 17.1       | 5.4   | 33.0  |
| 915           | 229  | 56.4   |      |        |            |       | 45.6  |
| 916           | 232  | 279.9  |      |        | 9.0        |       | 30.6  |
| 922           | 152  | 403.5  |      | 264.6  | 44.1       |       | 43.5  |
| 923           | 215  | 361.0  | 1.8  | 9.0    | 29.0       |       | 30.8  |
| 930           | 252  | 556.4  |      | 14.6   | 35.8       |       | 80.0  |
| 931           | 227  | 394.2  | 3.2  | 78.0   | 194.0      |       | 126.8 |
| 936           | 228  | 1210.2 |      | 143.8  | 1303.4     | 9.8   | 347.8 |
| 937           | 164  | 16.6   |      | 21.0   | 11.8       | 1.4   | 6.9   |
| 940           | 212  | 583.2  |      | 237.6  | 56.0       | 9.6   | 155.2 |
| 942           | 203  | 232.0  |      |        |            |       |       |
| MEAN          |      | 405.9  | 1.0  | 51.2   | 138.3      | 1.9   | 78.5  |

| SHELF 260-600m |      |        |      |        |            |       |        |
|----------------|------|--------|------|--------|------------|-------|--------|
| ST.NO.         | DEP. | Hakes  | Monk | Dentex | Horse mck. | Squid | Other  |
| 895            | 288  | 675.2  |      |        | 22.4       | 12.2  | 106.2  |
| 896            | 316  | 1024.0 |      |        | 8.0        |       | 140.0  |
| 897            | 362  | 1127.4 |      |        |            | 11.0  | 149.4  |
| 898            | 401  | 390.6  |      |        |            | 49.6  | 231.8  |
| 899            | 319  | 503.6  | 5.2  |        | 35.0       | 8.6   | 143.8  |
| 900            | 303  | 724.4  |      |        | 1.8        |       | 65.0   |
| 901            | 276  | 525.4  | 5.0  |        | 8.2        |       | 72.4   |
| 904            | 272  | 1063.0 |      |        | 30.0       |       | 80.0   |
| 905            | 300  | 886.4  |      |        | 15.2       |       | 25.6   |
| 906            | 352  | 507.0  |      |        |            | 35.8  | 201.4  |
| 907            | 452  | 119.2  |      |        |            |       | 1575.6 |
| 908            | 355  | 294.0  | 2.8  |        | 1.6        | 6.4   | 94.2   |
| 909            | 305  | 492.0  | 14.0 |        | 4.6        | 0.6   | 51.2   |
| 910            | 261  | 580.5  | 6.6  |        | 5.4        | 4.2   | 46.2   |
| 912            | 375  | 427.6  | 6.0  |        |            | 16.0  | 156.0  |
| 913            | 327  | 364.8  | 4.8  |        |            | 2.8   | 66.4   |
| 914            | 273  | 258.4  | 1.4  |        | 1.6        | 1.4   | 110.0  |
| 917            | 276  | 341.2  |      | 17.4   | 90.0       |       | 52.2   |
| 918            | 316  | 556.6  | 3.2  |        | 4.6        | 13.8  | 90.6   |
| 919            | 351  | 663.2  | 4.0  |        | 2.0        | 10.4  | 104.8  |
| 920            | 387  | 1508.8 |      |        |            |       | 368.4  |
| 921            | 453  | 112.6  |      |        |            | 28.0  | 237.8  |
| 924            | 288  | 489.0  |      | 27.4   | 44.2       |       | 134.8  |
| 925            | 318  | 329.8  |      |        | 25.2       |       | 204.8  |
| 926            | 346  | 1055.8 |      |        | 6.8        | 15.2  | 194.8  |
| 927            | 410  | 1140.0 |      |        |            | 18.0  | 446.0  |
| 928            | 398  | 307.2  |      |        |            | 11.2  | 148.0  |
| 929            | 301  | 1489.2 | 8.4  |        |            |       | 224.4  |
| 934            | 460  | 241.2  |      |        |            |       | 302.0  |
| 935            | 302  | 1015.2 |      | 1.6    | 12.0       | 1.6   | 128.8  |
| 938            | 433  | 430.0  |      | 3.4    |            | 4.0   | 608.4  |
| 939            | 343  | 1373.0 | 27.6 |        |            |       | 320.2  |
| 941            | 356  | 1386.7 | 58.3 |        |            | 7.7   | 531.1  |
| 943            | 353  | 1153.8 |      |        |            |       |        |
| MEAN           |      | 692.9  | 4.3  | 1.5    | 9.4        | 7.6   | 218.0  |

Table 7. Depth distribution of the two hake species Ambrose Bay to Cunene River. Mean densities: tonnes/nm<sup>2</sup> and mean catch rates, kg/hour.

|              | 100-250m | 250-350m | 350-450m | 450-550m |
|--------------|----------|----------|----------|----------|
| Cape hake    |          |          |          |          |
| Density      | 13.6     | 23.5     | 24.3     | 4.3      |
| Catch rate   | 408      | 706      | 730      | 128      |
| Deep w. hake |          |          |          |          |
| Density      |          |          | 1.0      | 1.0      |
| Catch rate   |          |          | 31       | 30       |
| No. of hauls | 14       | 20       | 12       | 3        |

Figure 10 shows the distribution of Cape hake in the region. The pattern is similar to that found previously, but the belt of high density is narrower and shifted offshore.

The size compositions are shown in Annex II. The size of the Cape hake has been consistently highest in this northern region in all surveys. From the total size composition, 0-600 m one can see that the juvenile fish at about 25 cm of length is an insignificant component and the main part is in the 40-60 cm range.

The total biomass of Cape hake in this region estimated from the post stratified data shown in Figure 10 and adjusted for fish in mid water is 140 000 tonnes, 96% of which is of fishable size (36 cm and larger).

Some observations were made of the maturity stages of female Cape hake in this region. A few fish south of Dune Point were found to be actually spawning, the majority were in post-spawning or early pre-spawning conditions. Similar observations from previous surveys indicate that this northern region is not a spawning area for the hake, but represents feeding grounds where gonads will be in resting stage. There has, however, so far been no coverage in the period from March to August and the planned April-May 1992 survey may provide important information on the spawning cycle and distributional characteristics of the Cape hake.

The extent of mid-water occurrence of hake during daytime was less than in the two last surveys, as discussed under 3.1 above. The variation in this behaviour could be related to the type of available food organisms for the hake, in this case perhaps the apparent reduced availability of horse mackerel.

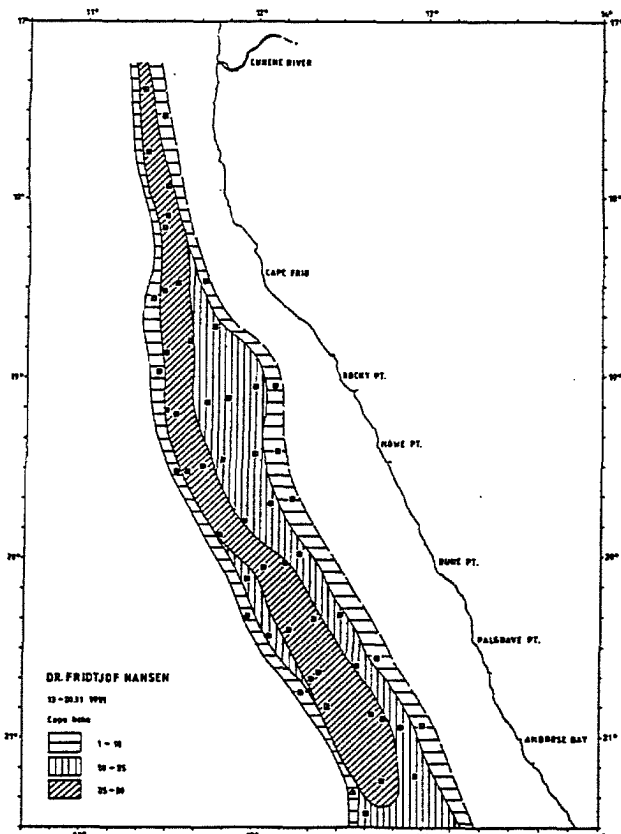


Figure 10 Ambrose Bay to Cunene River. Distribution of Cape hake.

## CHAPTER 4 EXPERIMENTS ON SORTING GRID ESCAPEMENT

The hake survey also included experiments with a sorting grid system Sort-X. This is a metal grid installed in the extension piece of the trawl which allows small sized fish to escape. The arrangement is shown in Figure 11.

This system has been tested on other species such as cod, and compared with ordinary cod-end mesh selection, sorting grids have tended to produce steeper selection curves and with maintained escapement also with heavy catches when cod end escapement is reduced due to closure of the diamond shaped meshes.

The trawl used in the experiments was the standard sampling trawl used by R/V "DR. FRIDTJOF NANSEN". The grid dimensions were 3 m x 2 m and the bar distance 45 mm. An additional fine meshed cover was fitted to catch the fish escaping through the sorting grid (not shown in Figure 11).

### Sort-X System - Fish Trawl

#### Attachment to the trawl

Principle sketch, sideview

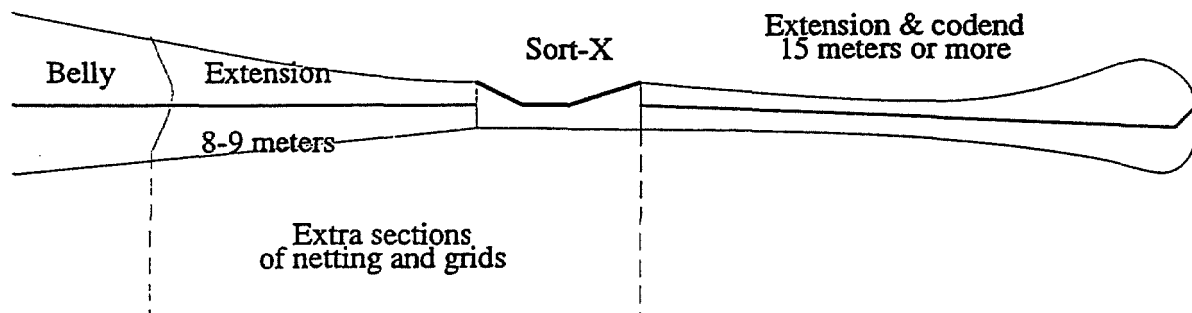


Figure 11 Principle sketch of the sorting grid system.

The sorting grid experiment consisted of a total of 14 hauls. In each haul the total catch was length measured both in the cod-end of the trawl and in the cover. The probability of a fish to enter the cod-end given that it enters the trawl is called the retention probability (the probability of not escaping through the grid). Within the range of fish densities observed during this experiment, the retention probabilities is assumed to be dependent on fish length and independent of catch size and the length distribution within the catch. Using this assumption it was important during the experiments to catch a significant number of fish for all length groups within the selectivity range. The length distributions of the total catch (14 hauls) are given in Figure 12.

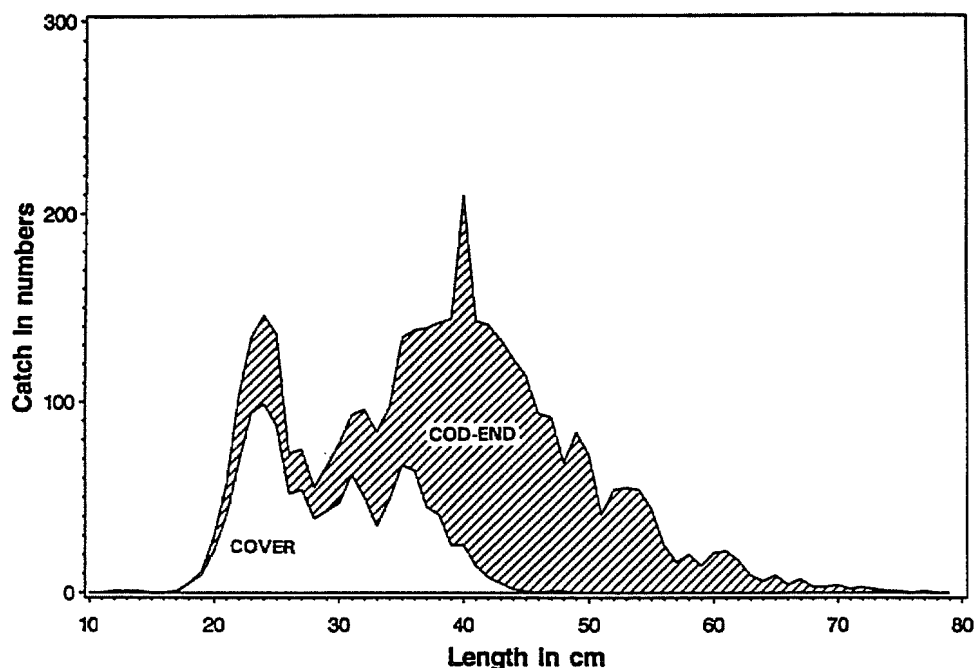


Figure 12 Length distributions of hake in the cover, the cod-end and total.

When comparing this result with previous and future experiments it is convenient to fit the data to a curve described with few parameters. When analyzing data from mesh selection experiments one usually models the retention probability as a function of 2 parameters (1).

$$(1) \quad R(L) = \frac{e^{\alpha + \beta \cdot L}}{1 + e^{\alpha + \beta \cdot L}}$$

This function is very close to zero for small lengths and increases asymptotically to 1. It is also symmetrical around the 50% retention point. As seen from figure i) there is some space below the sorting grid allowing a percentage of the fish to enter the cod-end independent of the fish length. These fish do not get into contact with the sorting grid. Instead of (1) one should expect that the retention probability being 1 for large fish decreases to a constant level (> zero) when the fish size decreases. One such curve could be of the form (2).



$$(2) \quad R(L) = \frac{e^{\alpha + \beta \cdot L} + k}{1 + e^{\alpha + \beta \cdot L}}$$

$k$  can be interpreted as the fraction of fish sliding directly below the grid without being in contact with the grid. The maximum likelihood estimates of the parameters are given below. A plot of observed vs predicted (fitted curve) retention probability is given in Figure 13).

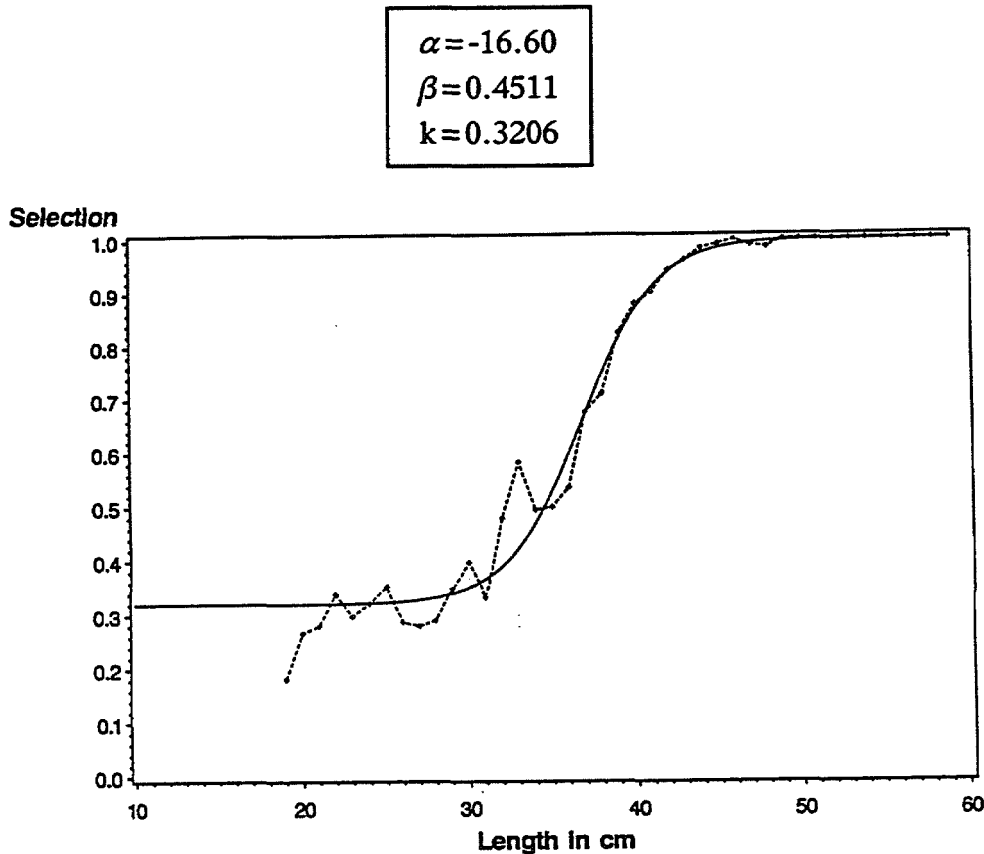


Figure 13 Observed and estimated selection curve.

## Conclusion

When discussing this selection curve two aspects should demand attention. The selection curve is steeper than typical mesh selection curves making the use of sorting grids more favourable.

$k$  equal to 0.32 (see above) indicates that 32% of the smaller fish is not sorted through the grid. The very high  $k$  parameter indicates either a very low "swimming ability" for hake or that the rigging of the grid and the trawl used in these experiments resulted in a too large space between the grid and the bottom of the trawl. In addition one should also bear in mind that the very low catch of fish below 20 cm gives an estimate of  $k$  with a relatively high uncertainty.

Further experiments with the sorting grid used on hake should be made. These should be designed to minimize the k through different variations of the rigging of the grid within the trawl. The experiments should be carried out with substantial catches from all length groups of hake.

Some of the catches contained horse mackerel and this species appeared to have a high escapement through the grid. There were however some problems in measuring the escapement since the actively swimming horse mackerel in some cases were found well forward in the cover net, in part over the grid where they would fall back into the cod-end. This would of course not happen in practical use of the grid.

#### Details on the estimation

The parameters in the functional model of the retention probability (2) was estimated by maximizing the log-likelihood function.

Assuming that the probability for a single fish to enter the cod-end follows a binomial distribution with  $p=R(L)$  the likelihood (or probability) to get the result given in Figure 12 could be given as

$$(3) \quad \prod_L R(L)^{N_1(L)} \cdot (1-R(L))^{N_2(L)}$$

and the log-likelihood would of course be

$$(4) \quad \sum_L N_1(L) \cdot \text{Log}(R(L)) + N_2(L) \cdot \text{Log}(1-R(L))$$

It is not straightforward to maximize this function, but using a mathematical package (Mathematica (R)) on a workstation, not much manpower is needed.

## CHAPTER 5 CONSIDERATIONS OF THE SURVEY RESULTS

### 5.1 THE HAKE STOCKS 1990-1991; ESTIMATES OF BIOMASS AND RECRUITMENT

(The information contained in this section of the report was presented at a ministerial meeting in Windhoek on 22 November 1991).

The present survey is the 4th in a series started in early 1990 and in each of which the distribution of the hake stocks over the whole Namibian shelf has been covered. Table 8 shows that the effort spent in these hake investigations has been considerable.

| Table 8 Effort in Namibian hake surveys 1990-1991. Number of swept area fishing stations, number of samples (mostly by sex) and number of length measurements in thousands. |              |                           |                        |                    |       |
|---|--------------|---------------------------|------------------------|--------------------|-------|
| Survey  |              | Orange R.-<br>St. Francis | St. Francis<br>Ambrose | Ambrose-<br>Cunene | Total |
| 1/1990  |              |                           |                        |                    |       |
| 25/1-10/3   | No. stations | 59                        | 73                     | 37                 | 169   |
|   | " samples    | 37                        | 73                     | 25                 | 114   |
|   | " measured   | 6.0                       | 10.7                   | 2.6                | 18.6  |
| 3/1990  |              |                           |                        |                    |       |
| 11/9-6/10   | No. stations | 44                        | 51                     | 34                 | 129   |
|   | " samples    | 68                        | 106                    | 77                 | 251   |
|   | " measured   | 9.3                       | 10.3                   | 5.6                | 25.2  |
| 1/1991  |              |                           |                        |                    |       |
| 25/1-28/2   | No. stations | 41                        | 77                     | 56                 | 174   |
|   | " samples    | 104                       | 170                    | 114                | 388   |
|   | " measured   | 6.8                       | 13.3                   | 6.9                | 27.0  |
| 2/1991  |              |                           |                        |                    |       |
| 23/10-21/11   | No. stations | 52                        | 69                     | 49                 | 170   |
|   | " samples    | 110                       | 132                    | 110                | 352   |
|   | " measured   | 7.1                       | 14.3                   | 9.6                | 31.0  |

The surveys give information on the distribution of the hakes by density. One finding is that there has been a change in the density distribution by depth over the survey period with increasing densities at greater depths as shown in Table 9. As the size of the hake is known to be depth dependent with larger sizes in deeper waters, this demonstrates an increasing amount of large sized hake, most clearly evident in the northern region, but in the last survey also demonstrated in the southern and central parts.

| Table 9 Depth distribution of the hake species.<br>Mean densities in tonnes/nm <sup>2</sup> . |          |          |          |          |
|---|----------|----------|----------|----------|
|   | 100-250m | 250-350m | 350-450m | 450-550m |
| <b>ORANGE RIVER - ST. FRANCIS BAY</b>   |          |          |          |          |
| Cape hake   |          |          |          |          |
| 1/90  | 21.9     | 4.4      |          |          |
| 3/90  | 11.5     | 6.1      | 0.1      |          |
| 1/91  | 11.3     | 8.8      | 0.9      |          |
| 2/91  | 6.3      | 12.5     | 0.7      | 0.7      |
| Deep water hake   |          |          |          |          |
| 1/90  |          | 1.4      | 5.0      | 1.2      |
| 3/90  | 0.1      | 6.3      | 1.2      | 0.4      |
| 1/91  |          | 4.4      | 6.0      | 1.1      |
| 2/91  | 0.3      | 8.9      | 14.9     | 4.9      |
| <b>ST. FRANCIS BAY - AMBROSE BAY</b>  |          |          |          |          |
| Cape hake   |          |          |          |          |
| 1/90  | 27.1     | 7.4      | 0.4      |          |
| 3/90  | 38.6     | 8.3      | 2.5      |          |
| 1/91  | 14.5     | 9.1      | 2.2      |          |
| 2/91  | 34.2     | 19.0     | 7.2      | 1.0      |
| Deep water hake   |          |          |          |          |
| 1/90  |          |          | 1.6      | 1.4      |
| 3/90  | 0.2      | 0.4      | 0.9      | 0.9      |
| 1/91  | 0.2      | 0.1      | 0.8      |          |
| 2/91  |          | 0.3      | 5.3      | 5.6      |
| <b>AMBROSE BAY - CUNENE</b>   |          |          |          |          |
| Cape hake   |          |          |          |          |
| 1/90  | 41.3     | 20.9     | 1.0      |          |
| 3/90  | 25.9     | 15.1     |          |          |
| 1/91  | 15.0     | 27.0     | 11.5     |          |
| 2/91  | 13.6     | 23.5     | 24.3     | 4.3      |

One of the most important types of information obtained is the estimates of biomass. Table 10 shows these by regions and the totals. The stock biomass represents fish of about 2 years (20 cm range) and older. The fishery exploits only fish about 3 years (30 cm range) and older with the mesh size now in use and estimates of the fishable parts of the total stock biomass in accordance with this are presented separately.

There may be a systematic error, a bias in the biomass estimates, but if so it seems likely that they are underestimates of the true figures. It is, however, the trends of changes in which we are especially interested and they appear in the data.

The stock was seriously overexploited in 1990 with a fishable biomass of only about 200 000 tonnes. The total stock was higher which was due to the very fortunate presence of a high abundance of juvenile fish deriving from a strong yearclass assumed to have been spawned in 1988. There is not much growth recorded in the stock during 1990 and this was probably due to the continued international fishing until April that year and some further fishing. This last survey shows, however, a clear growth of both the total and the fishable stock. By the

first quarter of 1992 the fishable stock will probably have exceeded 400 000 tonnes and the total stock will have reached 650-700 000 tonnes. So during 1991 we will have had an increase of about 100 000 tonnes of the fishable hakes and some 200 000 tonnes in total.

| Table 10 Summary of estimates of biomass of the two hake species by surveys and areas. Tonnes. |                 |                     |                 |                 |
|--|-----------------|---------------------|-----------------|-----------------|
|  | TOTAL BIOMASS   |                     |                 |                 |
|  | Feb-Mar<br>1990 | Sept-Oct<br>1990    | Jan-Feb<br>1991 | Oct-Nov<br>1991 |
| ORANGE R.-<br>ST. FRANCIS B.   |                 |                     |                 |                 |
| Cape hake  | 130 000         | 130 000             | 126 000         | 80 000          |
| Deep w. hake   | 22 000          | 25 000              | 31 000          | 83 000          |
| ST. FRANCIS B.-<br>AMBROSE B.  |                 |                     |                 |                 |
| Cape hake  | 180 000         | 219 000             | 150 000         | 302 000         |
| Deep w. hake   | 4 000           | 6 000               | 6 000           | 13 000          |
| AMBROSE B.-<br>CUNENE R.   |                 |                     |                 |                 |
| Cape hake  | 180 000         | 105 000<br>+ mid w. | 200 000         | 140 000         |
| Deep w. hake   |                 |                     |                 | 2 000           |
| TOTAL  | 516 000         |                     | 513 000         | 620 000         |
| TOTAL FISHABLE   | 220 000         |                     | 300 000         | 370 000         |

This evidence of a clear recovery of the hake stocks is confirmed by the more practical observations of catch rates. Table 11 show the mean catch rates and the catch distributions in the hauls in deeper waters, 275-400 m along the slope from off Walvis Bay to off Cunene. The large sized hake which is found at these depths was hardly available in early 1990, while high catches predominated in 1991. This also shows that the commercial fishery can now be economically conducted with high catch rates of large sized fish.

| Table 11 Mean catch rates in depth range 275-400 m from off Walvis Bay to off Cunene. Catch per hour with "DR. FRIDTJOF NANSEN" trawl of 31 m headline. Comparison of data from Feb.-March Survey 1990 and Oct.-Nov. Survey 1991. |         |        |         |        |      |      |
|---|---------|--------|---------|--------|------|------|
| 1990  |         |        |         |        |      |      |
| Mean rate: 131 kg/hr in 17 hauls  |         |        |         |        |      |      |
| Catch distribution (%):   |         |        |         |        |      |      |
|   | 0-30 kg | 30-100 | 100-300 | 300-1t | 1-3t | > 3t |
|   | 29      | 24     | 18      | 29     |      |      |
| 1991  |         |        |         |        |      |      |
| Mean rate: 751 kg/hr in 36 hauls  |         |        |         |        |      |      |
| Catch distribution (%):   |         |        |         |        |      |      |
|   | 0-30 kg | 30-100 | 100-300 | 300-1t | 1-3t | > 3t |
|   |         |        | 11      | 61     | 25   | 3    |

One can conclude then that the hakes are in clear recovery. There is, however, a need to ensure a further growth of the stocks. A sustained fishery of 300 000 tonnes annual catch, which is a rough estimate of the sustained long term yield of the Namibian hake stocks, needs a standing fishable biomass in excess of 1 million tonnes. How fast the continued growth will be, depends mainly on the amount of fish removed by the fishery and on the recruitment to the stock.

Recruitment to these types of stocks is a stochastic variable and can not be predicted except as a long term mean. It can, however, be measured at the stage of 1-2 year old fish. Measurement of recruit strength at the 10-15 cm size (1 year of age or less) when the juveniles are still aggregated in very dense mainly pelagic shoals has not been attempted in a systematic way, but should be developed through a special survey program. At a size of 20-25 cm ( 2 year old or somewhat less) the juveniles have settled on the bottom in the shallow parts of the shelf and these areas have been covered by the surveys. On the basis of the size compositions and biomass estimates for the regions, an estimate of the total population number of these cohorts can be made. Table 12 shows these estimates for yearclasses assumed to have been spawned in 1988, 1989 and 1990 based on the numerical abundance of the modal groups below 26-27 cm of length.

| Table 12 Estimates of strength of recent yearclasses of Cape hake. Cohort population numbers at about two years of age for the groups assumed to have been spawned in 1988, 1989 and 1990. Millions of fish. |       |      |       |
|--|-------|------|-------|
| Yearclass  | 1988  | 1989 | 1990  |
| Region south   | 980   | 100  | 160   |
| " centre   | 1 320 | 170  | 1 710 |
| " north  | 10    | 10   | 20    |
| Total  | 2 310 | 280  | 1 890 |

There is an 8 times difference between the poorest and the richest of these yearclasses which is a level not unusual in these types of fish. The 1988 brood was found in high abundance also in the southern region while the 1990 yearclass was largely restricted to the central region which is perhaps the main recruitment area.

Since no historic data are available on recruit abundance and resulting stock state, a simulation was made of the continued life history of a yearclass of 2 000 million fish at two years of age with reasonable parameters of growth and mortality. This indicated that it would yield a total catch over its life span of 300-400 000 tonnes. This level of recruitment is therefore considered to be good in the absolute sense.

## **5.2 BASIS FOR THE ESTABLISHMENT OF NON FISHING ZONES FOR THE PROTECTION OF JUVENILE AND YOUNG HAKE**

(The content of this section was submitted to the Ministry of fisheries and Marine Resources, Windhoek in December 1991).

The indirect adjustment of fishing mortality through limitation of fishing effort or total allowable catch, TAC as practised by Namibia, is a basic measure in the management of the hake resources. In addition, it is necessary to control the size of the fish caught. For the full and proper application of this management measure, an analysis should be made of the relationship between the lowest age of capture and the yield per recruit as well as the spawning biomass per recruit for the Namibian hake stocks. To enable such analysis improved estimates of various stock parameters are needed. In the meantime, however, one can provisionally simplify the problem by comparing the hake stocks with fish stocks of similar age and growth potentials. Such comparisons indicate that the minimum age of capture should not be less than three years for the hake stocks.

A minimum cod-end mesh size of 110 mm was introduced by ICSEAF and is being practised in the fishery. The nominal 50% selection length of an 110 mm mesh is about 35 cm corresponding roughly to the size of a three year old fish. In commercial fishing the escapement through cod end trawl meshes is, however, considerably lower than that estimated from the nominal selection curve, especially when catches are high. Since juvenile fish of 1 to 2 years of age in some years occur in very high density, they are in reality available to the fishery and the high catch rates that may be obtained will attract fishing. The objective of this analysis is to see to which extent fishing on the juveniles may be avoided through the establishment of zones prohibiting fishing in areas where the juveniles concentrate.

The data used derive from the four hake surveys during 1990 and 1991 described under 5.1 above.

### **Behaviour of juvenile hake**

Juvenile Cape hake first appears in the January-March surveys with a total length of between 10 and 15 cm at an age of approximately one year. At this stage they do not have a wide continuous distribution, but are instead for the most part found in restricted locations along the coast in dense patches at depths of 120-150 m with the main part of the shoals in mid-water.

A well-known phenomenon from the Namibian hake stocks (and similar fish stocks) is that fluctuating spawning success through varying conditions for the survival of larvae in the various years causes fluctuations in the abundance of the yearclasses. This was observed in the surveys. The 1-group in the January-March survey in 1990 (the 1989 yearclass) was only found scattered and in relatively low densities, while the same age group (the 1990 yearclass) appeared in several very densely packed areas in the January-February 1991 survey.

At the age of approximately 2 years with a size of 20-25 cm the juveniles were found over wide parts of the shelf in relatively shallow water, 200-130 m; sometimes in very high

density. The areas of high abundance of this juvenile group were especially extensive in the Central Region, St. Francis Bay to Ambrose Bay. The total abundance was high in the January-March survey 1990 (the 1988 yearclass) and in the October-November survey 1991 (the 1990 yearclass). It was low in the January-February survey 1991 (the 1989 yearclass). Estimates of the numerical abundance of these yearclasses as two year old are presented under 5.1 above. The resulting relative strengths of the 1989 and the 1990 yearclasses are consistent with the corresponding impression of these yearclasses as 1 years old.

Judging from the total size compositions of the hake found inside the 200-250 m isobath, the majority of the fish here was two years old, but mixed with some fish of larger size 25-35 cm, part of the three-year group. Large sized hake was not found in abundance in this depth range in any of the surveys. The juvenile and young fish thus occur separately and this is a distributional characteristic which is also of some importance for evaluating the effects of cannibalism in the hakes.

From the results of the surveys one may thus conclude that the Cape hake shows a clearly size-dependent distribution by bottom depth which should greatly facilitate a regulation of the fishery by fish size. A quantitative analysis of the depth distribution of the main components of the stock by surveys and regions is presented in the following section. For the purposes of this analysis fish up to 35 cm of length was defined as juveniles, while fish of 36 cm and more represent the adult stock. With this definition all one- and two years old will be included in the juvenile stock together with a substantial part of the three years old.

#### **Depth distribution of juvenile and adult hake**

The total distributions by density strata of the Cape hake observed in the four surveys are shown in Figure 14a-1, for the three regions: Southern Region-Orange River to St. Francis Bay; Central Region: St Francis Bay to Ambrose Bay, and Northern Region: Ambrose Bay to Cunene River. These data are based on the swept area estimates from the trawl stations. As fish size increased over this period mid water occurrence was observed also during the day. Compensations for this based on acoustic measurements have been included in the last two surveys, but in general this phenomenon will not have much effect on our conclusions concerning the distribution of juvenile hake. The isobaths for the 200 m and 250 m depths are shown in the maps as are the size distributions of the hake for the depth ranges 50-200 m, 201-600 m and 50-250 m, 251-600 m.

An inspection of the distribution charts in Figure 14a-1 shows that areas of high density of hake were found to be located inside the 200 m and the 250 m depth lines as a regular feature, especially in the Central Region. The areas were particularly extensive in Survey 1, January-March 1990 and Survey 4, October-November 1991.

From the size compositions one can see that in the Central Region a large part of the fish inside the 200 m and 250 m depth lines are juvenile, i.e. of size less than 36 cm. In the North Region these isobaths also distinguish between juvenile and adult fish in the two 1990 surveys, but not to the same extent in the two 1991 surveys. Here fish up to 45-50 cm are present inside these depths lines, in particular the 250 m line.



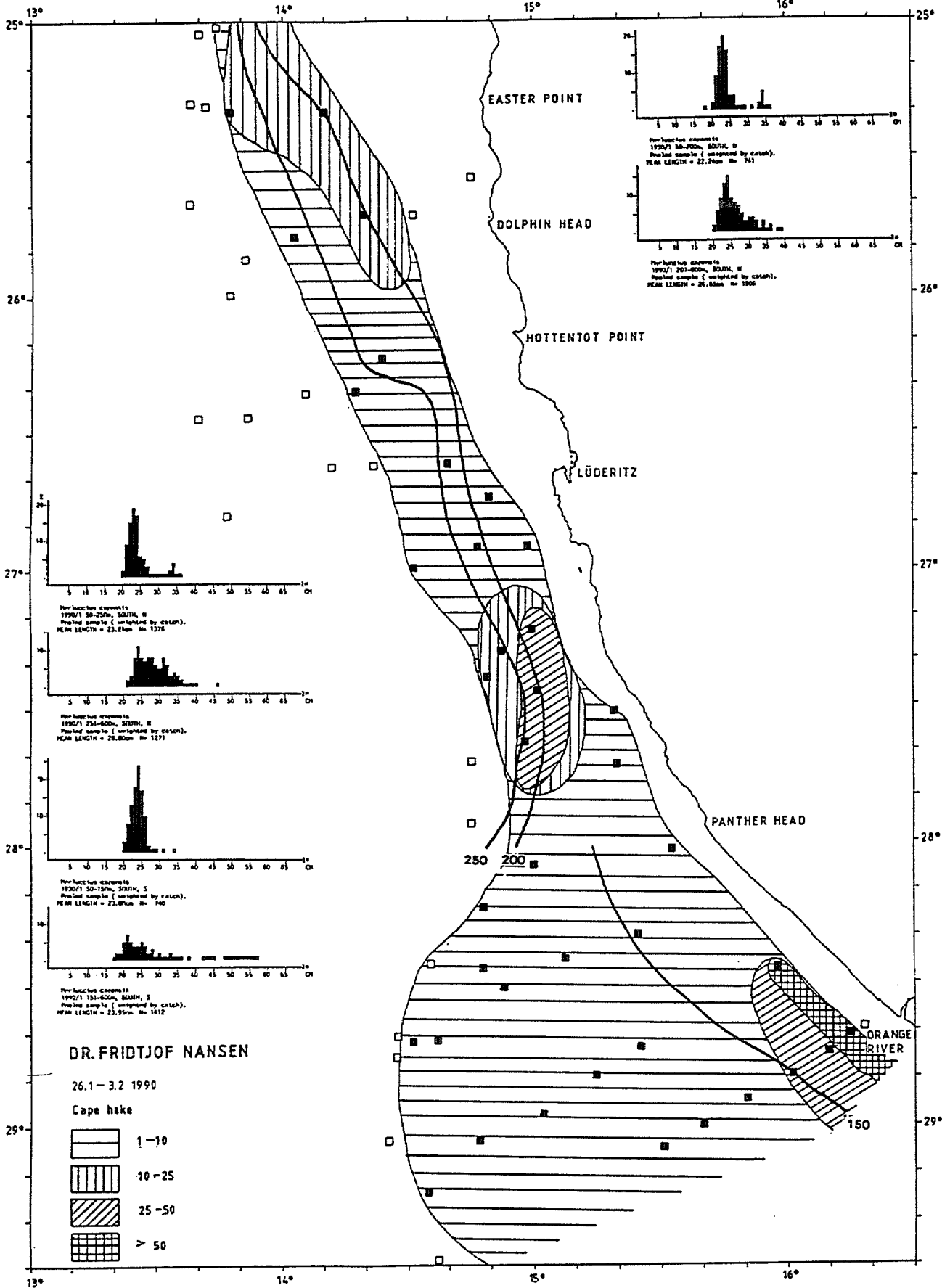


Figure 14a Distribution of Cape hake, Survey 1, Southern Region, tonnes/nm<sup>2</sup>.

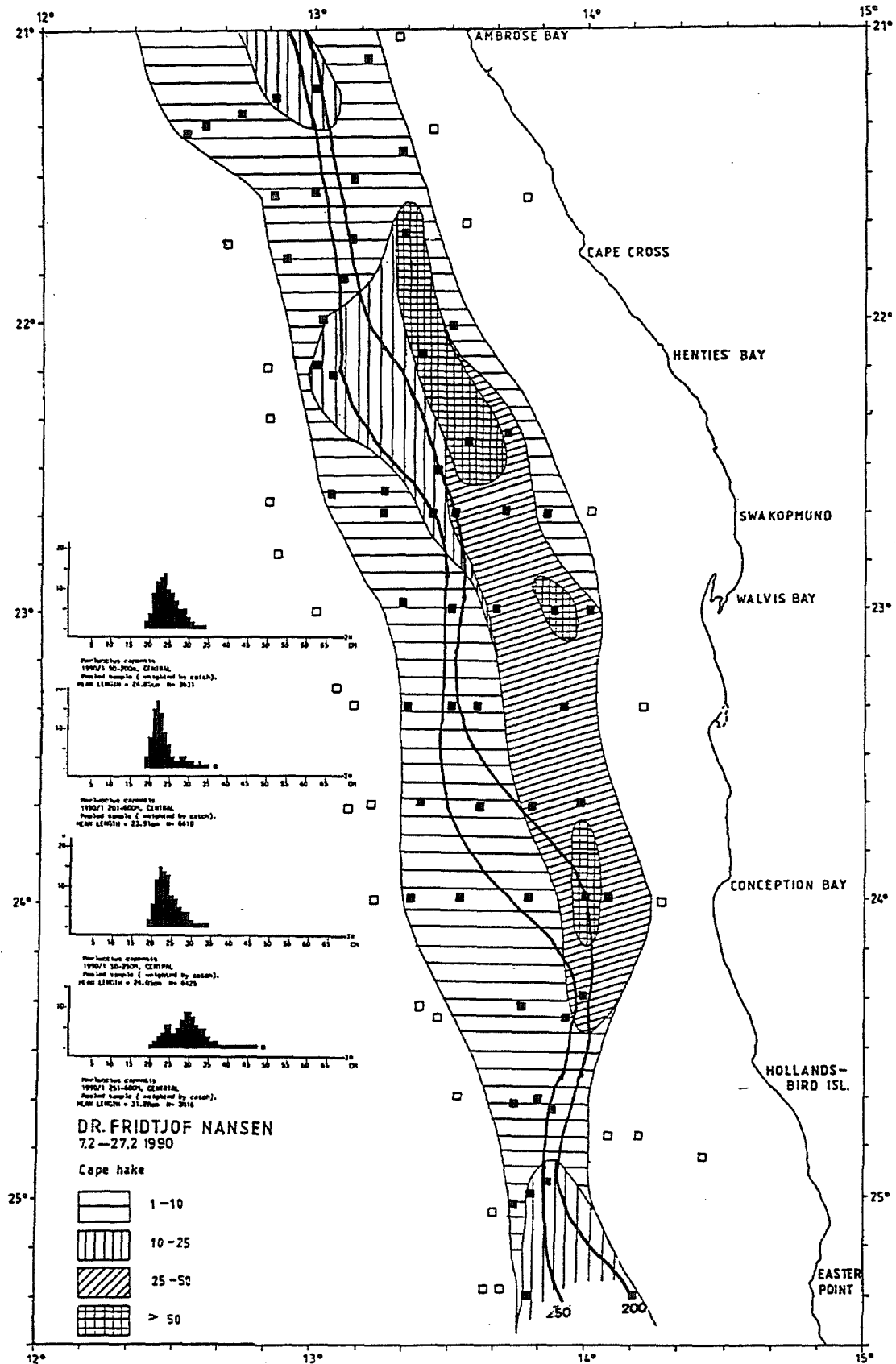


Figure 14b Distribution of Cape hake, Survey 1, Central Region, tonnes/nm<sup>2</sup>.

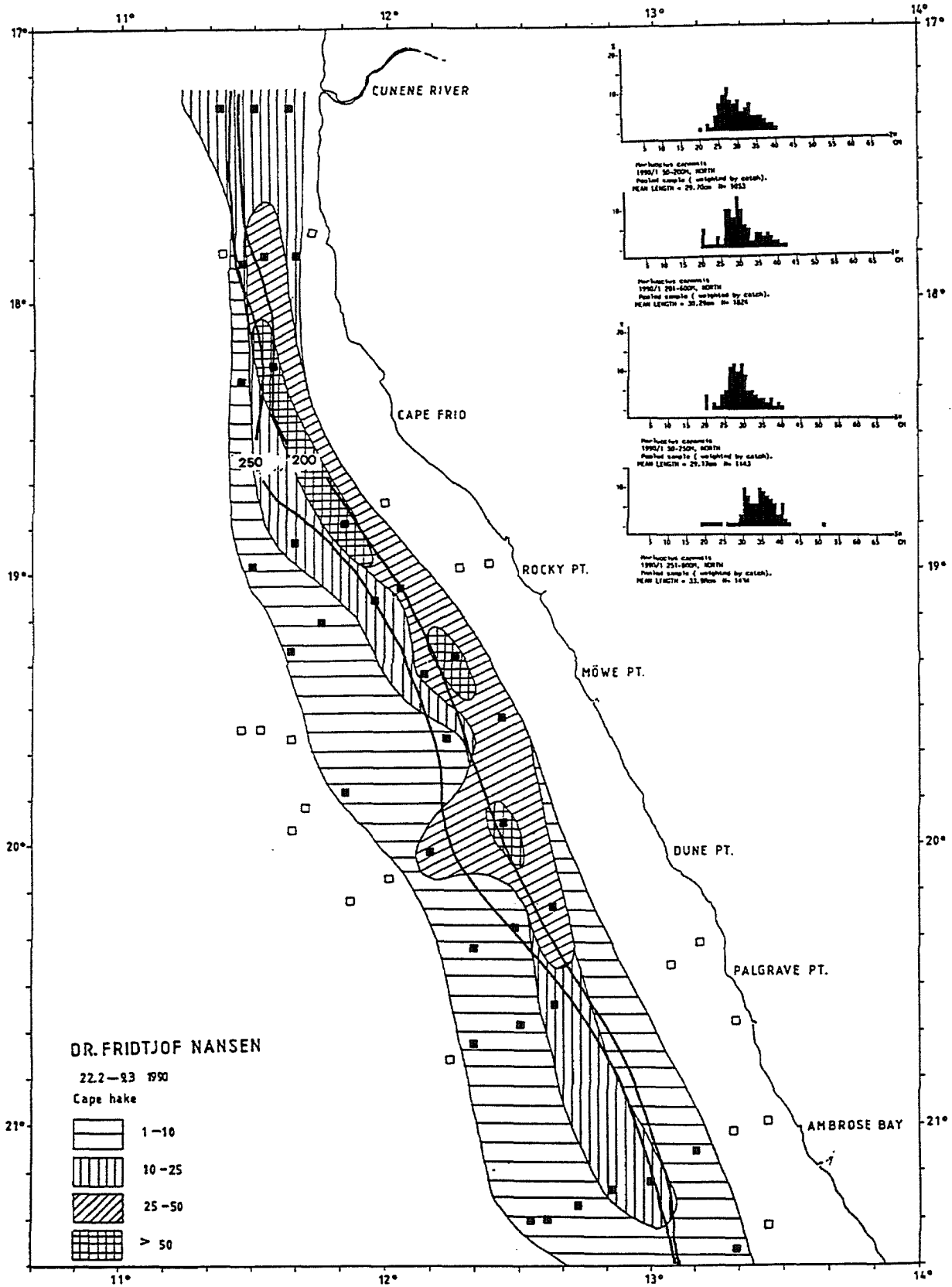


Figure 14c Distribution of Cape hake, Survey 1, Northern Region, tonnes/nm<sup>2</sup>.

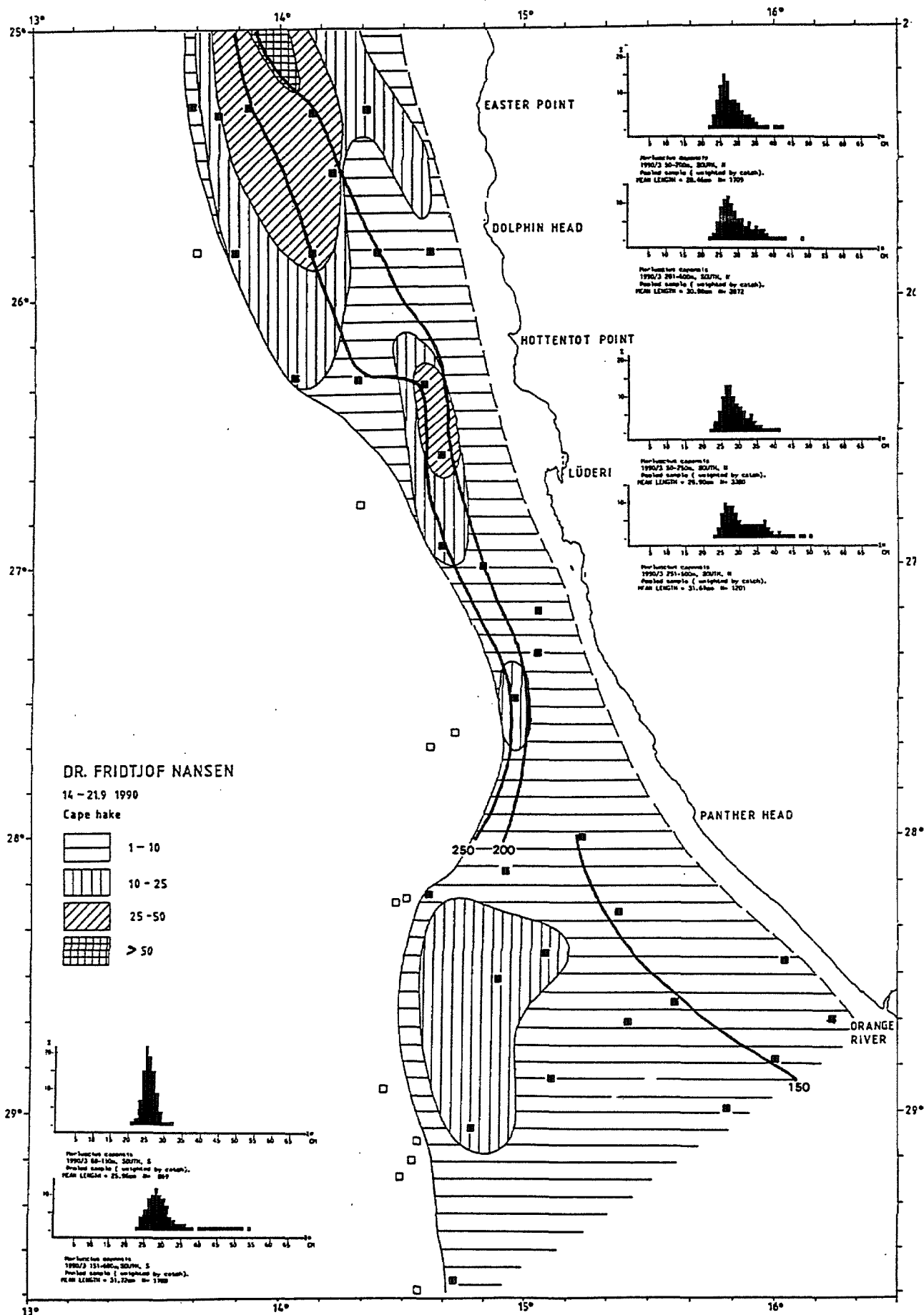


Figure 14d Distribution of Cape hake, Survey 2, Southern Region, tonnes/nm<sup>2</sup>.

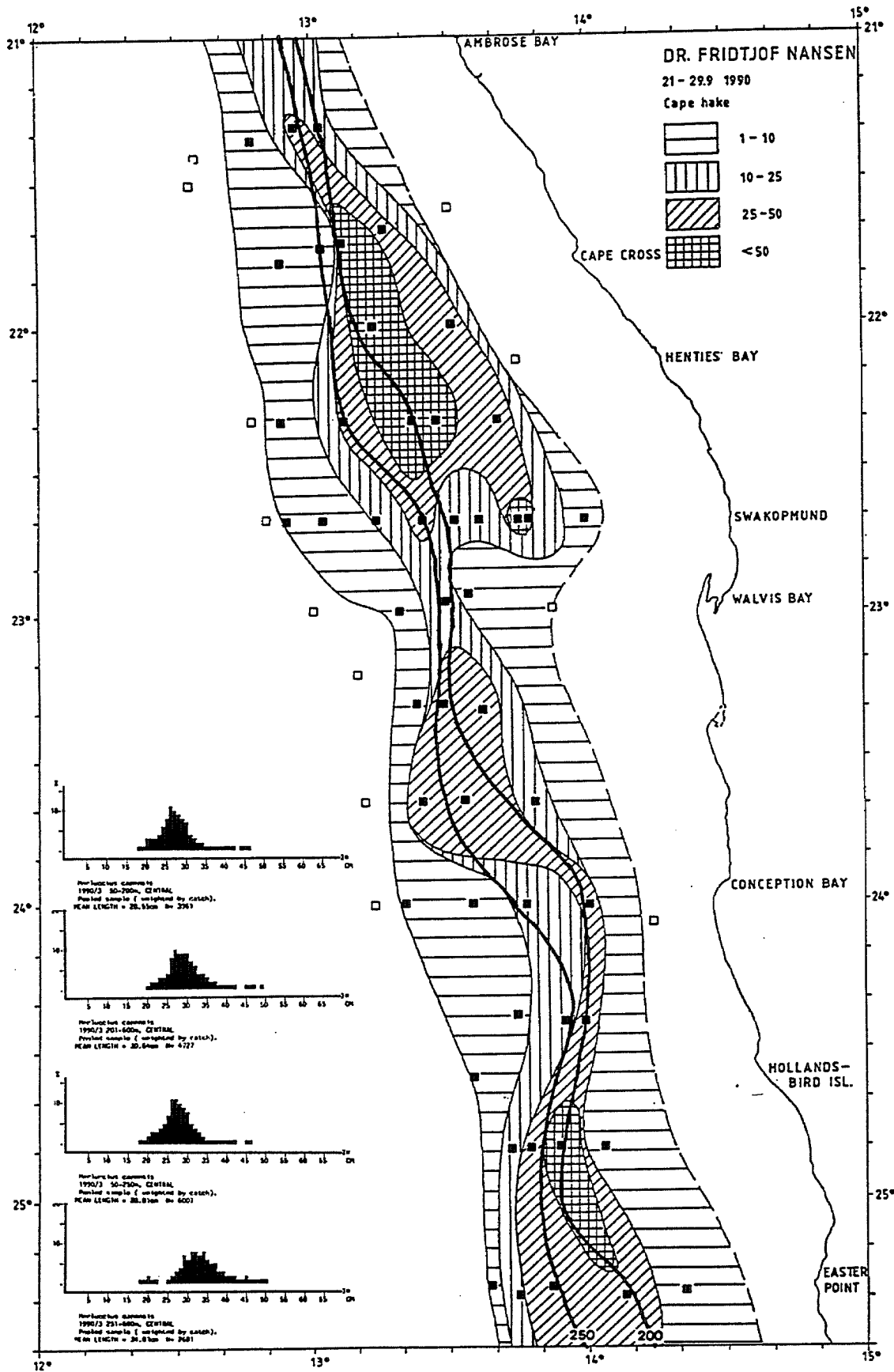


Figure 14e Distribution of Cape hake, Survey 2, Central Region, tonnes/nm<sup>2</sup>.

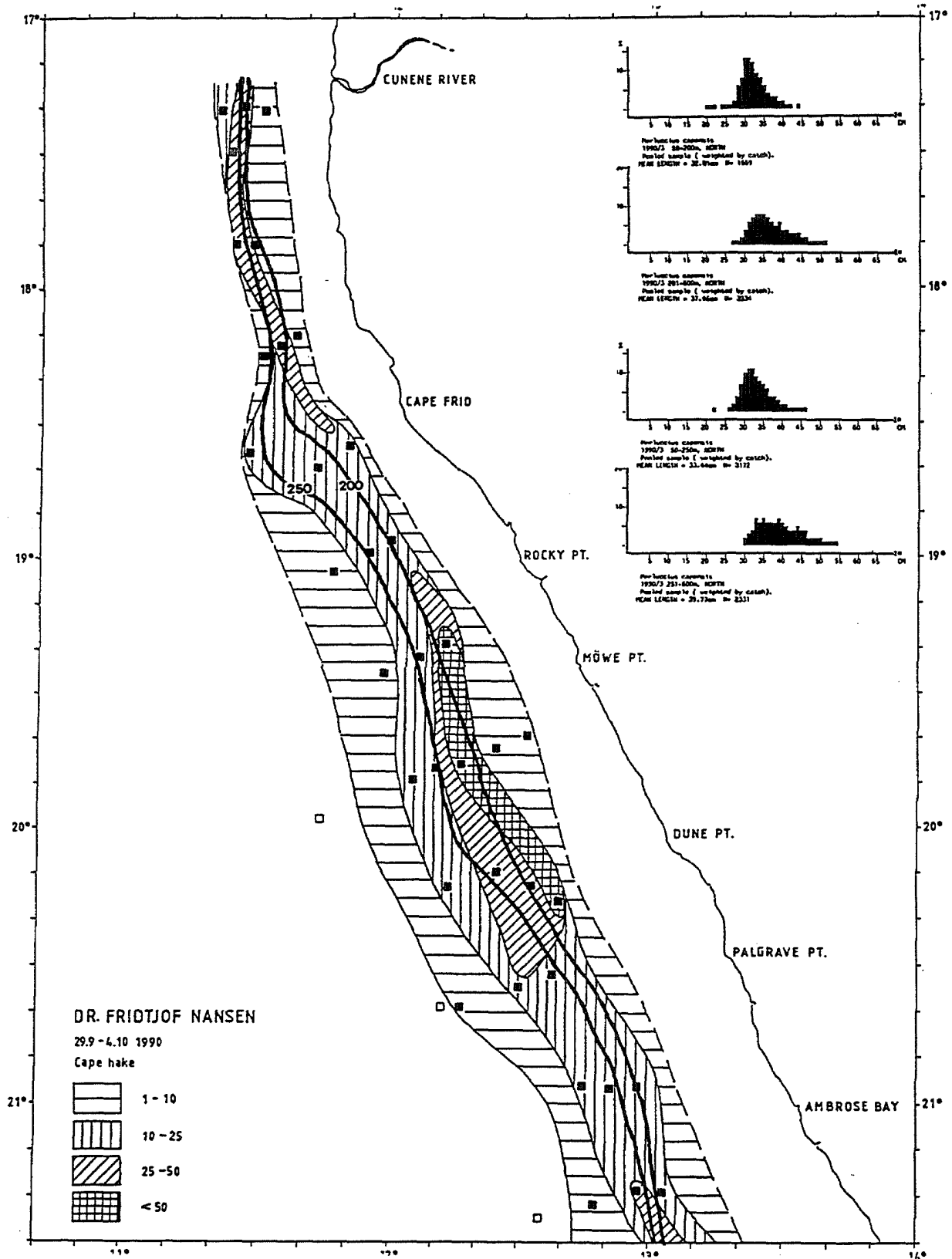


Figure 14f Distribution of Cape hake, Survey 2, Northern Region, tonnes/nm<sup>2</sup>.

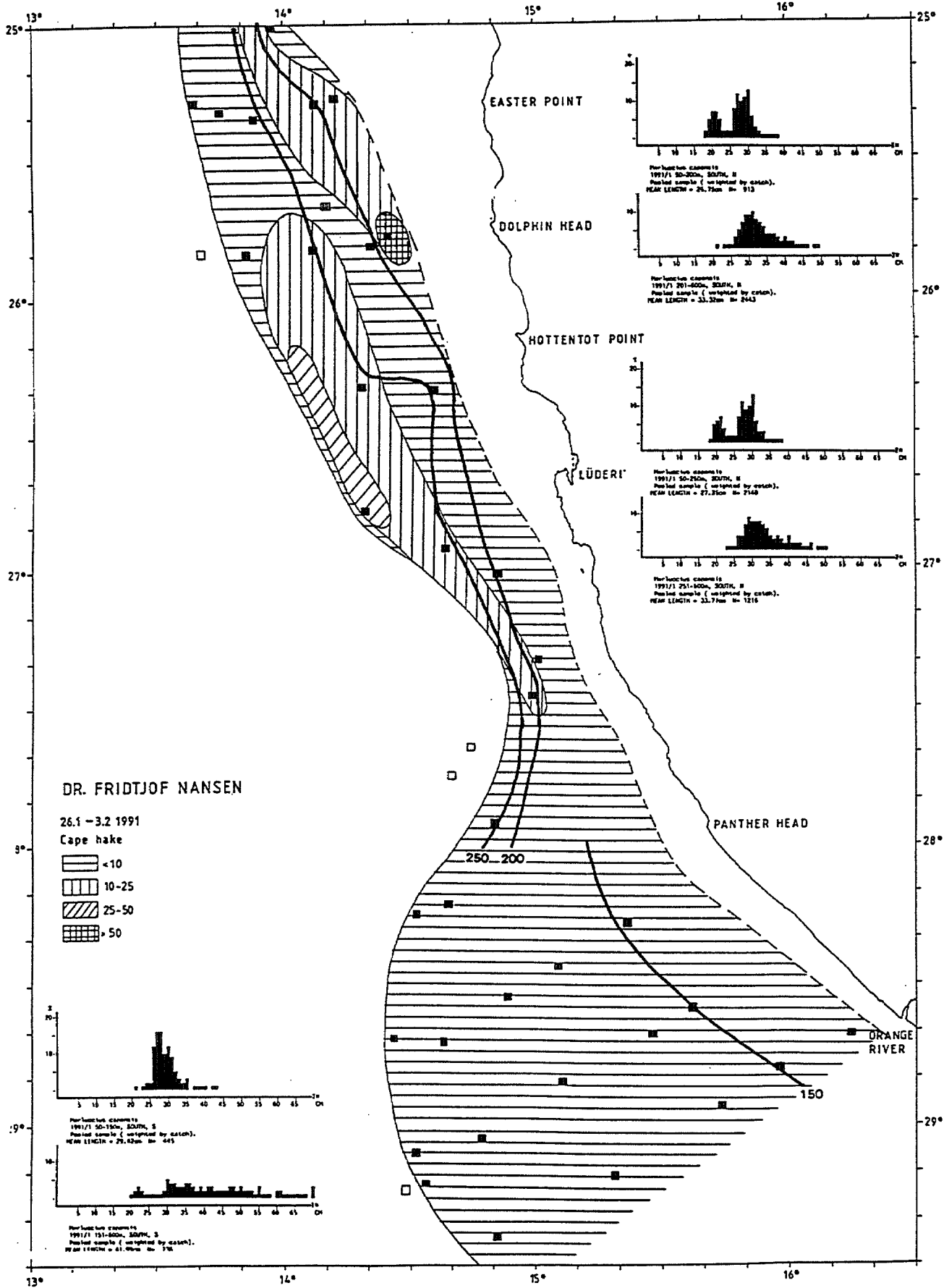


Figure 14g Distribution of Cape hake, Survey 3, Southern Region, tonnes/nm<sup>2</sup>.

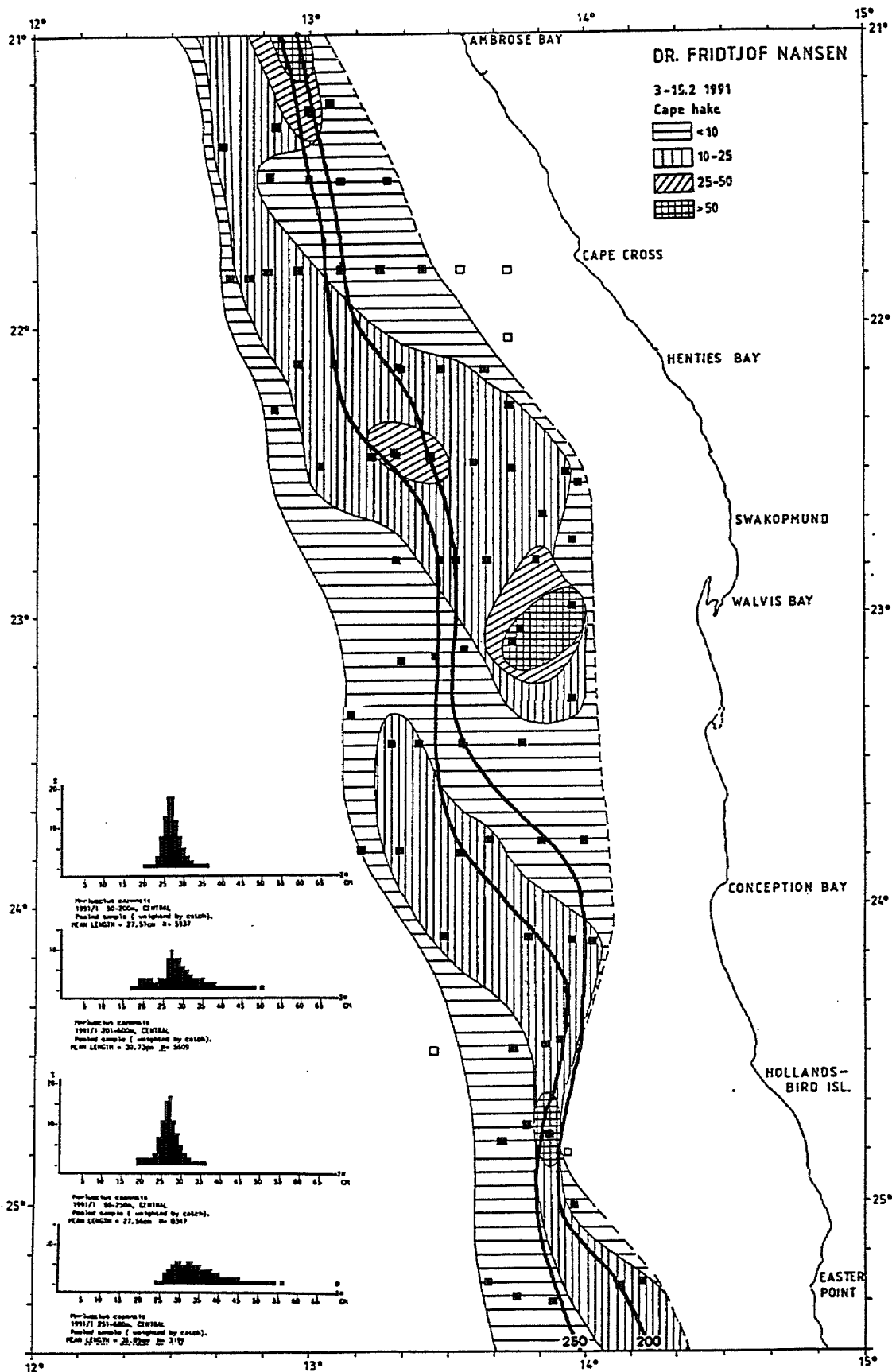


Figure 14h Distribution of Cape hake, Survey 3, Central Region, tonnes/nm<sup>2</sup>.



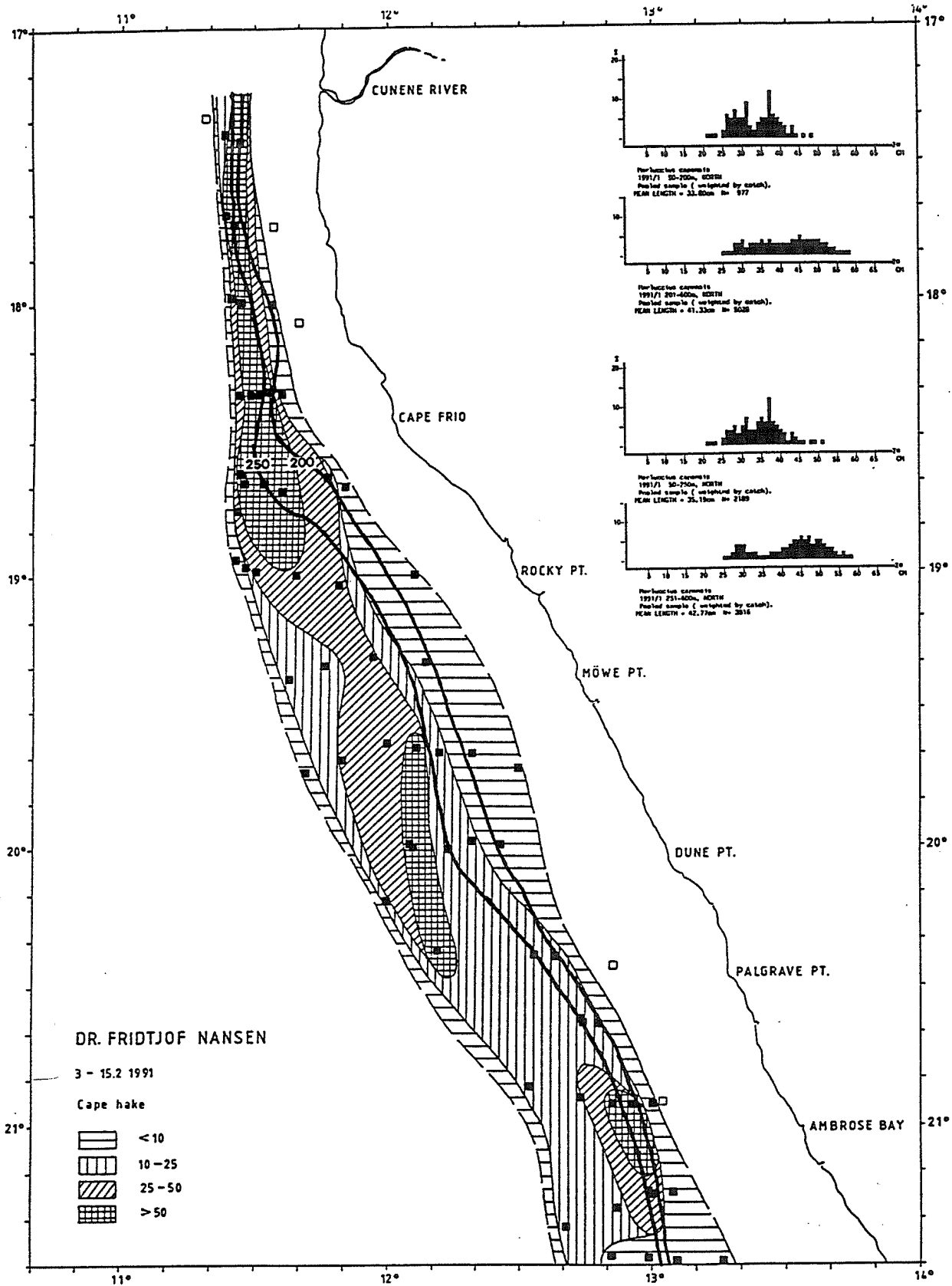


Figure 14i Distribution of Cape hake, Survey 3, Northern Region, tonnes/nm<sup>2</sup>.

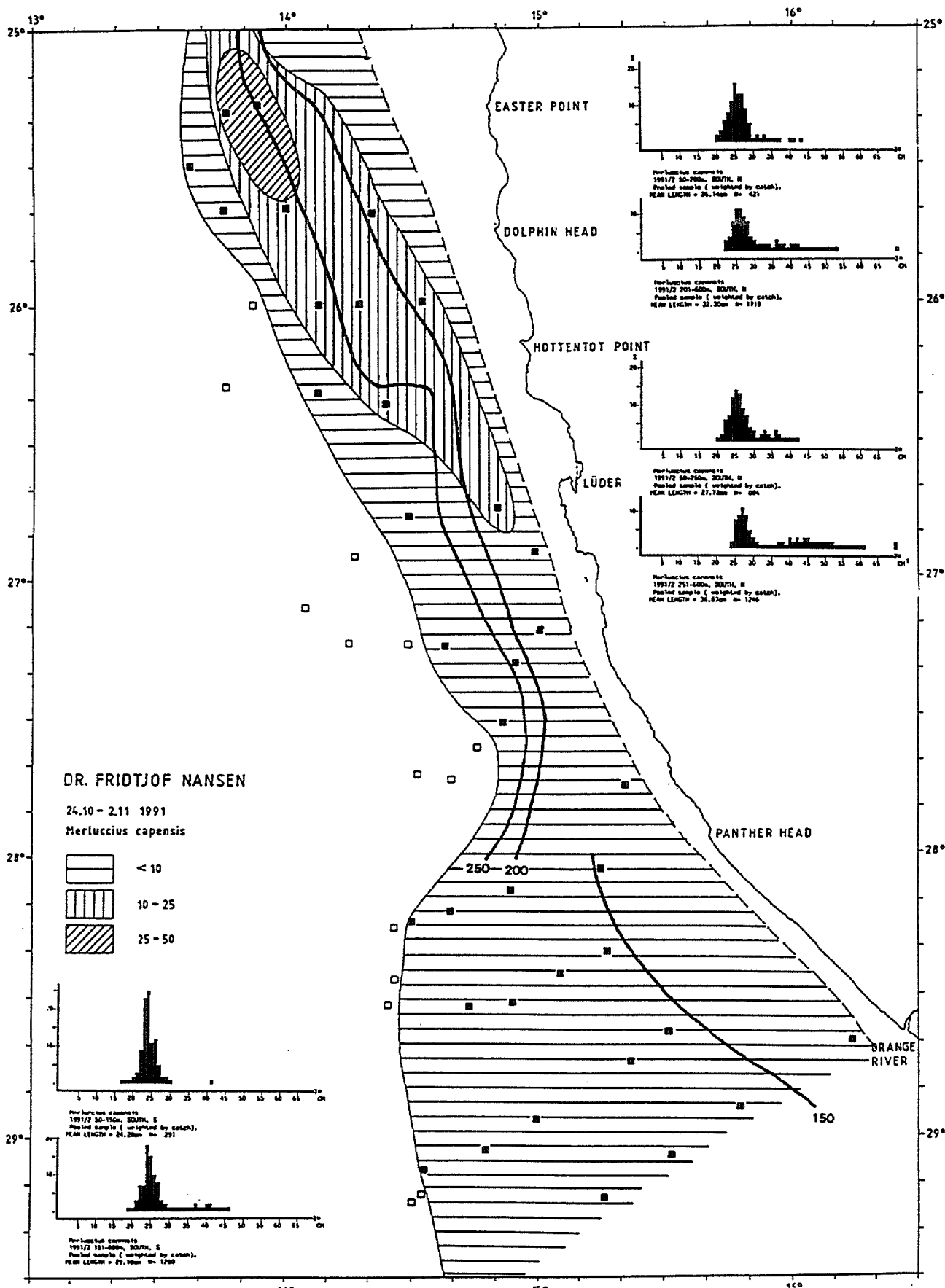


Figure 14j Distribution of Cape hake, Survey 4, Southern Region, tonnes/nm<sup>2</sup>.

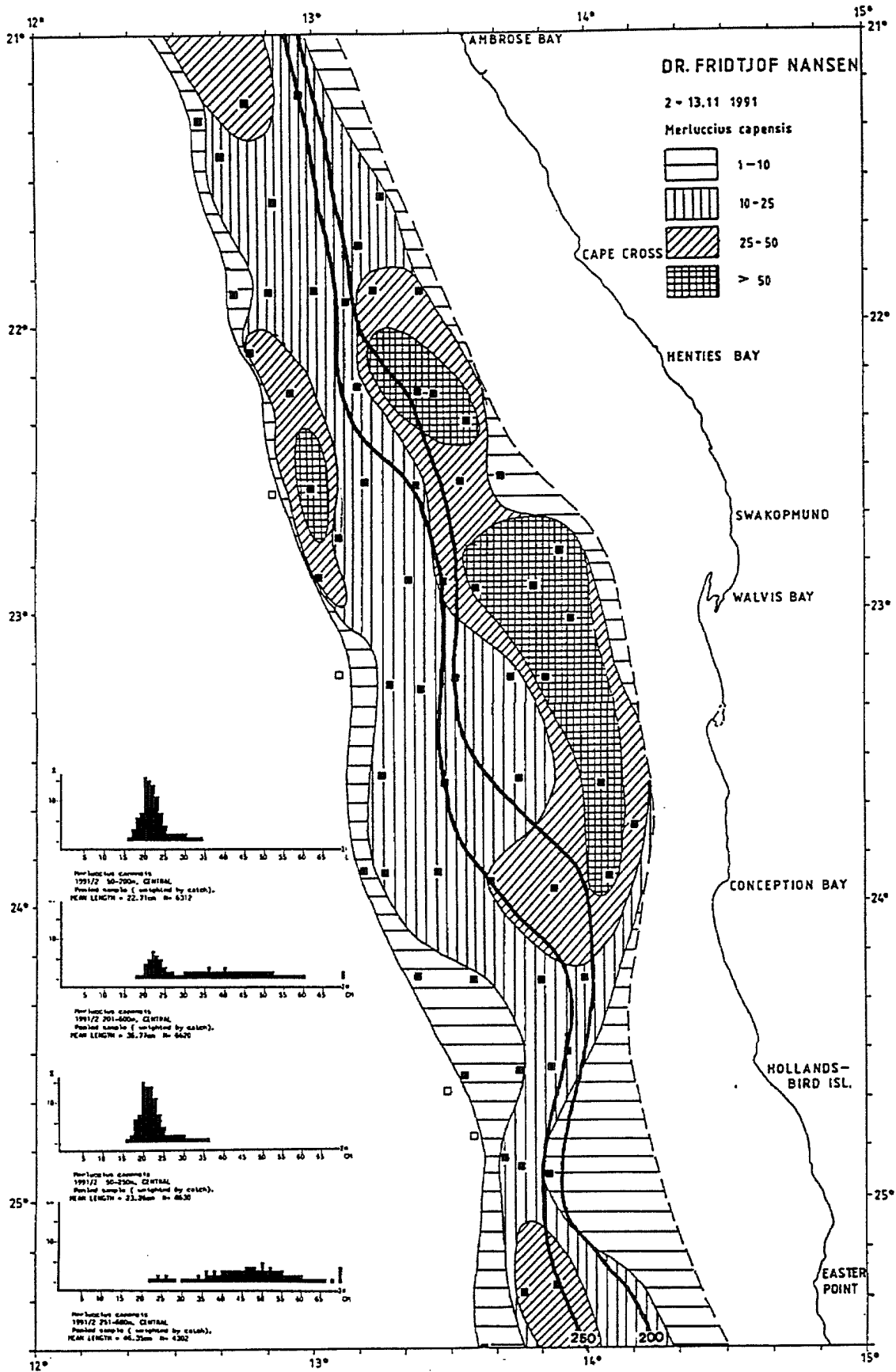


Figure 14k Distribution of Cape hake, Survey 4, Central Region, tonnes/nm<sup>2</sup>.

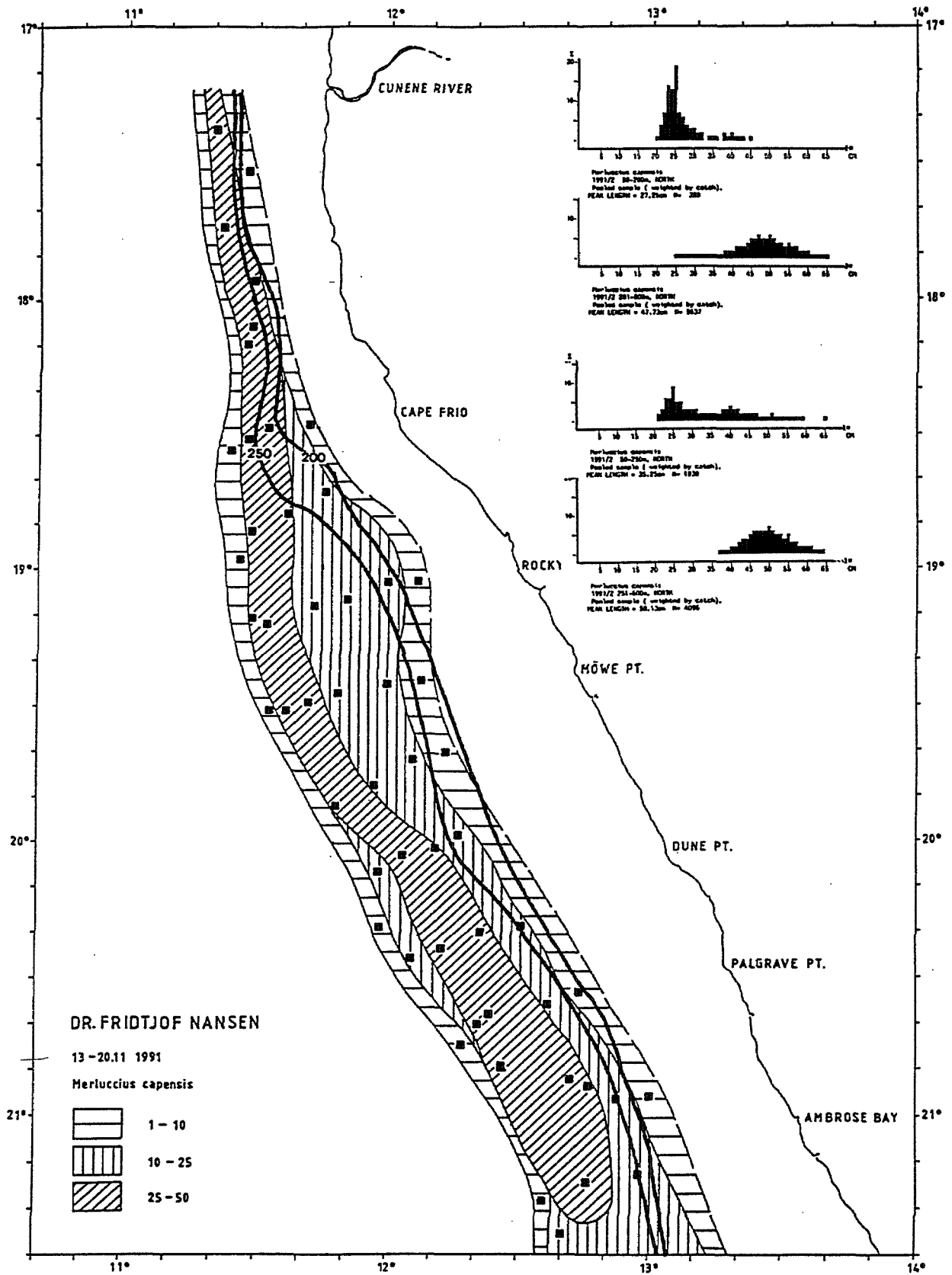


Figure 14| Distribution of Cape hake, Survey 4, Northern Region, tonnes/nm<sup>2</sup>.

In the South Region a special analysis must be made for the shelf south of 28°S, (Panther Head). Here there is a bank ridge near the shelf edge with depths of 160-170 m at a distance of 60-70 nm from the shore and this apparently creates special faunistic conditions. Thus at this distance from the shore large sized Cape hake was sometimes found to dominate at depths less than 200 m. For the purposes of this analysis it was therefore decided to use the 150 m depth line in order to distinguish between juvenile and adult hake south of 28°S.

The data shown in Figure 14a-1 has further formed the basis for estimates of the biomass of the juvenile and adult components of the stock found in the various depth ranges. Table 13 shows these biomass estimates by regions and surveys. The adult stock, i.e. fish of 36 cm and larger, had a very low abundance in the first survey, no doubt due to the preceding years of intensive fishing under the ICSEAF management regime. There is some increase of adult fish in Survey 2, but most of this is, as shown by the size compositions of Figure 14a-1, still younger fish in the size range up to 45 cm. Only the last survey demonstrates a change towards what is likely to be a more normal balance between the juvenile and adult components of the stock. It is therefore proposed that in the conclusions, the results from the last surveys and especially Survey 4 should be given special emphasis. Another general finding is that the Central Region tends to hold the largest part of the juvenile stock. This will then be the most critical area for avoidance of fishing on the juveniles. The North Region is dominated by adult fish except in Survey 1.

|                       | Total |      | Inside 200 m |      | Inside 250 m |      |
|-----------------------|-------|------|--------------|------|--------------|------|
|                       | Adult | Juv. | Adult        | Juv. | Adult        | Juv. |
| <b>NORTH REGION</b>   |       |      |              |      |              |      |
| Survey 1              | 43    | 132  | 24           | 79   | 31           | 121  |
| " 2                   | (61)  | 44   | (10)         | 24   | (31)         | 39   |
| " 3                   | 175   | 27   | 10           | 5    | 41           | 18   |
| " 4                   | 134   | 6    | 2            | 4    | 22           | 5    |
| <b>CENTRAL REGION</b> |       |      |              |      |              |      |
| Survey 1              | 14    | 171  | 6            | 137  | 6            | 162  |
| " 2                   | 77    | 142  | 41           | 82   | 55           | 127  |
| " 3                   | 64    | 86   | 9            | 45   | 14           | 64   |
| " 4                   | 139   | 163  | 22           | 144  | 42           | 160  |
| <b>SOUTH REGION</b>   |       |      |              |      |              |      |
| Survey 1              | 23    | 105  | 2            | 75   | 5            | 91   |
| " 2                   | 43    | 84   | 4            | 22   | 14           | 47   |
| " 3                   | 52    | 74   | 4            | 27   | 12           | 63   |
| " 4                   | 42    | 38   | 3            | 18   | 14           | 28   |

\* Inside 150 m south of 28°S

Table 14 shows the same data as Table 13, but in the form of percentage proportions of the biomass of the adult and juvenile stocks within the respective depth ranges. In the first two surveys a relatively high proportion of the adult stock, about 50 to 70% was found inside the 200 and 250 m lines in the North and Central Regions. As mentioned above, this was middle sized fish and the proportion is much smaller in the last two surveys. In most surveys the

larger part of the juvenile stock is found inside the 200 m line and about 70-90% inside 250 m.

|                       | Total        |      | Inside 200 m |      | Inside 250 m |      |
|-----------------------|--------------|------|--------------|------|--------------|------|
|                       | Adult        | Juv. | Adult        | Juv. | Adult        | Juv. |
|                       | 1 000 tonnes |      | %            |      | %            |      |
| <b>NORTH REGION</b>   |              |      |              |      |              |      |
| Survey 1              | 43           | 132  | 56           | 60   | 72           | 92   |
| " 2                   | (61)         | 44   | (16)         | 55   | (51)         | 89   |
| " 3                   | 175          | 27   | 6            | 19   | 23           | 67   |
| " 4                   | 134          | 6    | 2            | 67   | 16           | 83   |
| <b>CENTRAL REGION</b> |              |      |              |      |              |      |
| Survey 1              | 14           | 171  | 43           | 80   | 43           | 95   |
| " 2                   | 77           | 142  | 53           | 58   | 71           | 89   |
| " 3                   | 64           | 86   | 14           | 52   | 22           | 74   |
| " 4                   | 139          | 163  | 16           | 88   | 30           | 98   |
| <b>SOUTH REGION</b>   |              |      |              |      |              |      |
| Survey 1              | 23           | 105  | 9            | 71   | 22           | 87   |
| " 2                   | 43           | 84   | 9            | 26   | 33           | 56   |
| " 3                   | 52           | 74   | 8            | 36   | 23           | 85   |
| " 4                   | 42           | 38   | 7            | 47   | 33           | 74   |

\* Inside 150 m south of 28°S

The mean proportions weighted by the corresponding biomass will give the most representative relationships. These are as follows:

|                                | Inside 200 m |      | Inside 250 m |      |
|--------------------------------|--------------|------|--------------|------|
|                                | Adult        | Juv. | Adult        | Juv. |
| Mean, all regions, all surveys | 15%          | 62%  | 33%          | 87%  |
| Mean, all regions, Survey 4    | 9%           | 80%  | 25%          | 93%  |

It seems reasonable to conclude then that over the period of time covered by the surveys, more than 60% of the juvenile stock was distributed inside 200 m of depth and nearly 90% inside 250 m. With the more normal balance of the stock components existing at present these proportions are even higher, 80% and 93% respectively. Only small proportions of the adult stock, about 1/3 was found shallower than 250 m during the period and only 1/4 in the last survey.

### The deep water hake

This species has a clearly different distribution from that of the Cape hake both by depth and regions. The highest densities of the deep water hake was as shown in Table 9 under 5.1

above found between 250 and 450 m with hardly any catches in waters of less than 250 m of depth. The main part of the biomass was found in the South Region as shown in Table 10.

A considerable increase of biomass was observed in Survey 2/91. Size sampling showed that this was mainly fish from 30 to 45 cm of length whereas the composition of the smaller stocks of the previous surveys showed even smaller fish. No depth range with dominance of juvenile fish of deep water hake was found as for the Cape hake.

Some misidentification of deep water hake may have occurred in the earlier surveys, but at least in Survey 4 the species identification is thought to have been good. Juvenile deep water hake occurred in this survey in smaller amounts in six catches with a depth range from 180-390 m.

With our present knowledge of the depth distribution of this species fishery protection zones for juveniles does not seem to be a feasible regulation measure. The source of the rapid increase of the stock during 1991 is uncertain. Recruitment from the shelf south of Namibia may be the most likely explanation.

#### **The effect of closed zones on the fishery for kingklip and anglerfish**

These species occur as by-catches in the hake fishery. The kingklip is almost exclusively found in the Southern Region. An analysis shows that as a mean of all surveys the kingklip occurred in 17% of the catches in this region at depths less than 250 m with a mean catch of 0.5 kg/hour. The corresponding data for the hauls deeper than 250 m were 42% with a mean catch of 5.1 kg/hour.

The anglerfish has a wider distribution. An analysis of 48 catches from all regions of Survey 4 shows a depth distribution as follows:

|           | Mean catch | Incidence | Mean weight |
|-----------|------------|-----------|-------------|
| 100-200 m | 0.4 kg/hr  | 3         | 0.33 kg     |
| 200-300 m | 5.5 "      | 23        | 0.76 "      |
| 300-400 m | 4.7 "      | 19        | 1.43 "      |
| 400-500 m | 1.5 "      | 3         | 1.39 "      |

The main area of distribution is thus below 200 m and it seems likely that a 200-250 m limit would benefit the stock by protection of fish of smaller sizes.

#### **Conclusions**

The analysis shows that the Cape hake has a clearly size dependent depth distribution. 1-year old hake, 10-15 cm, appeared in restricted locations along the coast in dense patches at depths of 120-150 m with the main part of the shoals in mid water. Two year old fish in the 20 cm range was found over wider parts of the shelf, often concentrated over a depth range of 130-200 m, sometimes mixed with 3 years old in the 30 cm range with the high density aggregations then often extending out to 250 m depth.

For the purposes of the quantitative analysis, fish up to 35 cm of length was defined as juveniles, while 36 cm and more represents the adult stock. With this definition and using data from all four surveys one may conclude that more than 60% of the juvenile stock was distributed inside 200 m of depth and nearly 90% inside 250 m over the whole period from January 1990 to November 1991. With the more normal balance of adult and juvenile stock existing at present these proportions are about 80% and more than 90%. Only small proportions of the adult stock was found in shallower waters than 250 m, about 1/3 as an average for the whole period and 1/4 in the last survey.

For the deep water hake no similar concentration of juveniles over a limited depth range was found and one must conclude that with our present knowledge of the depth distribution of this species, it does not seem feasible to protect the juvenile stock by fishing bans. The size of this stock is at present only about 1/6 of that of the Cape hake.

An analysis of the by catch of kingklip and anglerfish in the trawl hauls shows that for both species the major catches are taken at depths greater than 250 m. A fishing ban to 250 m of depth may protect some small sized anglerfish.

Depth contours are not suitable for legislation, control and surveillance of limits of regulation zones. For this purpose lines defined by geographical coordinates should be established.



## ANNEX I INSTRUMENTS AND FISHING GEAR USED

### ACOUSTIC INSTRUMENTS

A SIMRAD scientific echo sounder, EK 500/38kHz, was used during the survey for estimation of fish density.

Based on a calibration experiment using a standard copper sphere in Baia dos Tigres on 26th November 1991, the following settings were used:

|                   |          |
|-------------------|----------|
| Absorption Coeff. | 10 dB/km |
| Pulse length      | Medium   |
| Bandwidth         | Wide     |
| Max. Power        | 2 000 W  |
| Angle sensitivity | 21.9     |
| 2-way Beam Angle  | -21.0 dB |
| Sv Transd. Gain   | 28.0 dB  |
| Ts Transd. Gain   | 28.0 dB  |
| 3 dB Beamwidth    | 6.9°     |
| Along-ship Offset | 0°       |
| Athwart-ship      | 0°       |

### HYDROGRAPHY

Temperature, salinity and oxygen were sampled at standard depths with Nansen bottles. Oxygen was measured with the Winkler method and salinity determined with an inductive salinometer.

### FISHING GEAR

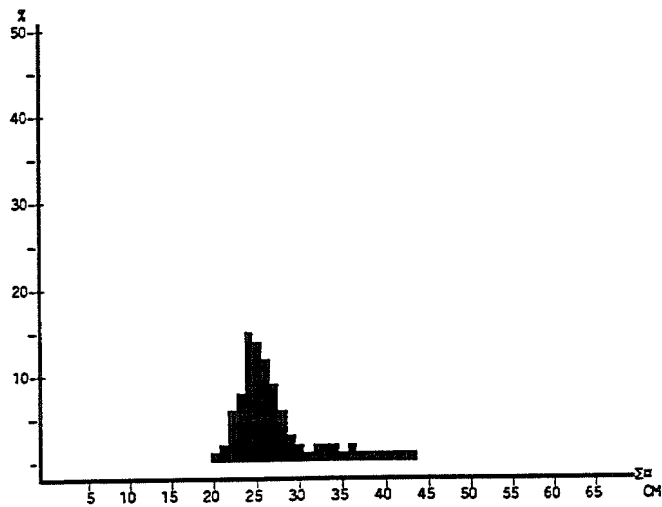
Bottom trawl: High opening shrimp and fish trawl with net headline 31m (floatline), foot-rope 47m, gear with 12 cm diameter roller disks, 40 m sweeps, estimated headline height 6m and distance between wings during towing 18-20m. This gear was also used for some of the mid-water trawls.

Pelagic trawl: Swedish type mid-water trawl with a vertical opening of 20-25m.

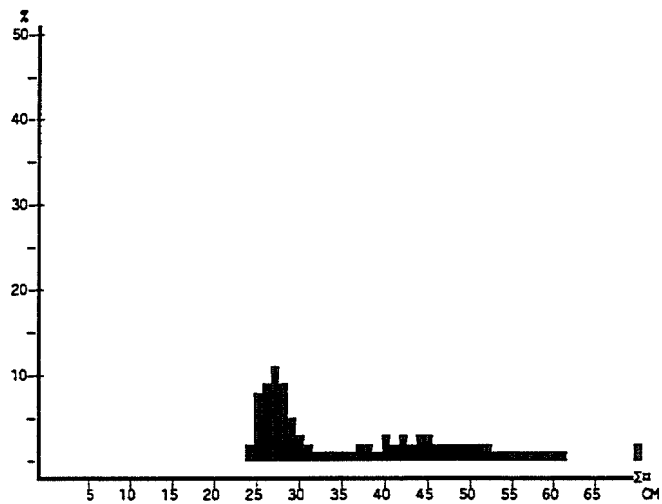
Cod-ends of trawls with fine meshed inner lining.



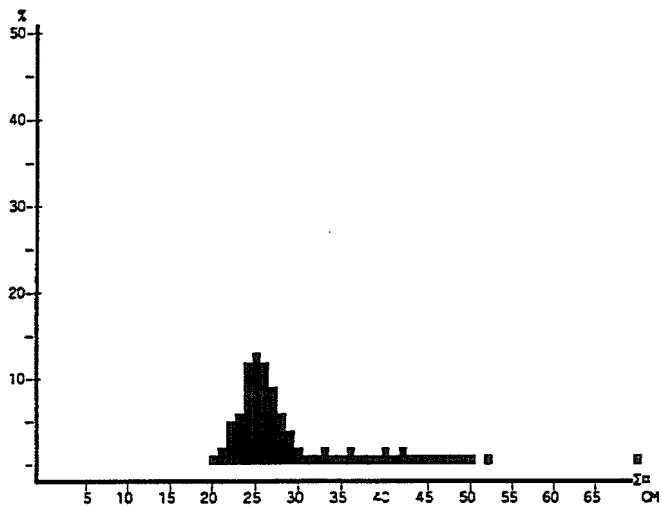
## ANNEX II SIZE COMPOSITIONS OF MAIN STOCKS



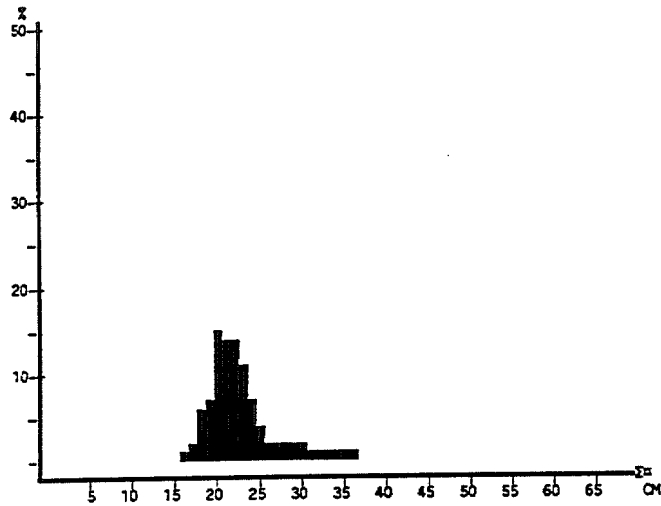
Merluccius capensis  
 SOUTH 2/91 50-259m  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 27.60cm N= 2333  
 NUMBER OF SUBSAMPLES : 41



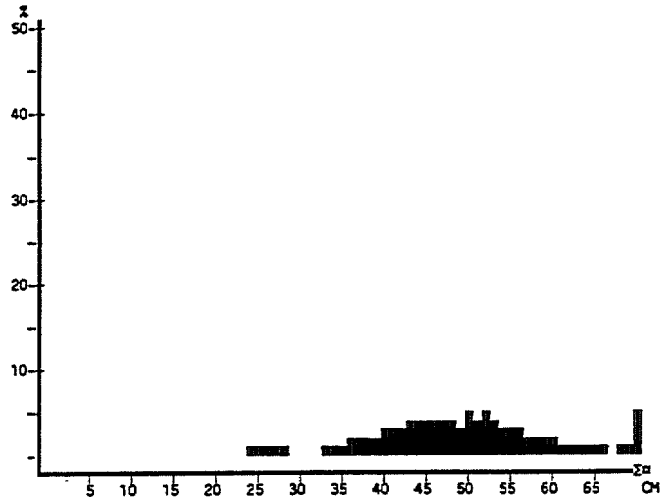
Merluccius capensis  
 SOUTH 2/91 260-600m  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 36.94cm N= 1298  
 NUMBER OF SUBSAMPLES : 20



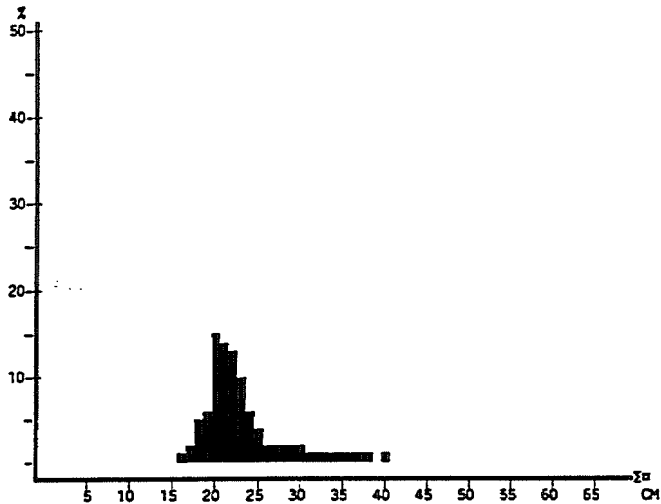
Merluccius capensis  
 SOUTH 2/91 TOTAL  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 30.01cm N= 3631  
 NUMBER OF SUBSAMPLES : 61



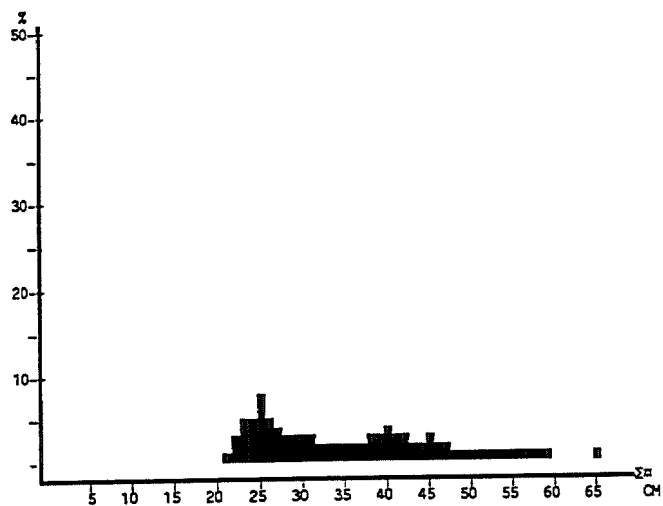
Merluccius capensis  
 CENTRAL 2/91 50-259m  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 23.33cm N= 8807  
 NUMBER OF SUBSAMPLES : 60



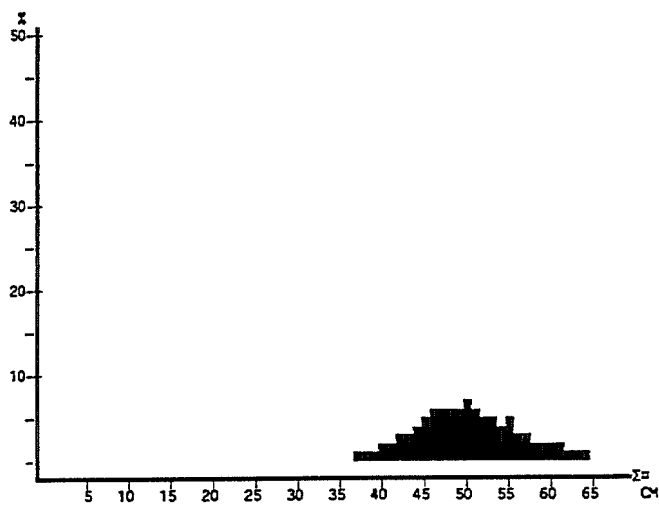
Merluccius capensis  
 CENTRAL 2/91 260-600m  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 48.90cm N= 3969  
 NUMBER OF SUBSAMPLES : 55



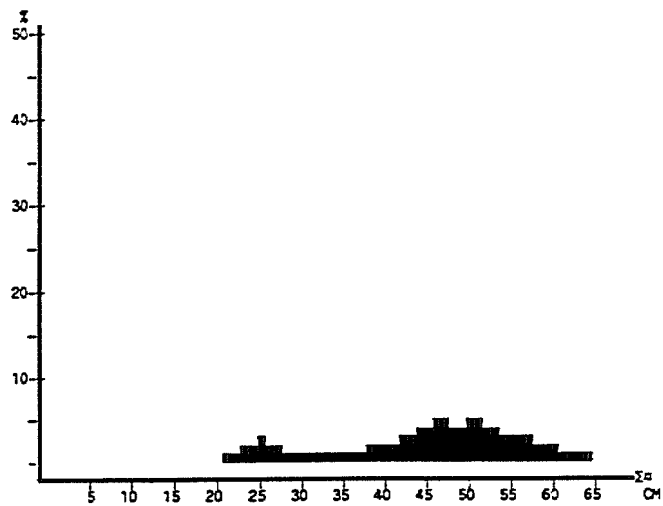
Merluccius capensis  
 CENTRAL 2/91 TOTAL  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 24.64cm N=12776  
 NUMBER OF SUBSAMPLES : 115



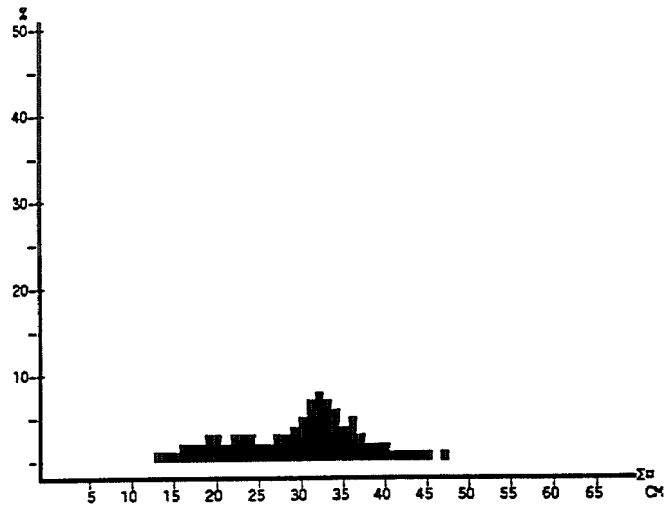
*Merluccius capensis*  
 NORTH 2/91 50-259m  
 Pooled sample (weighted by catch).  
 MEAN LENGTH = 35.86cm N= 2054  
 NUMBER OF SUBSAMPLES : 27



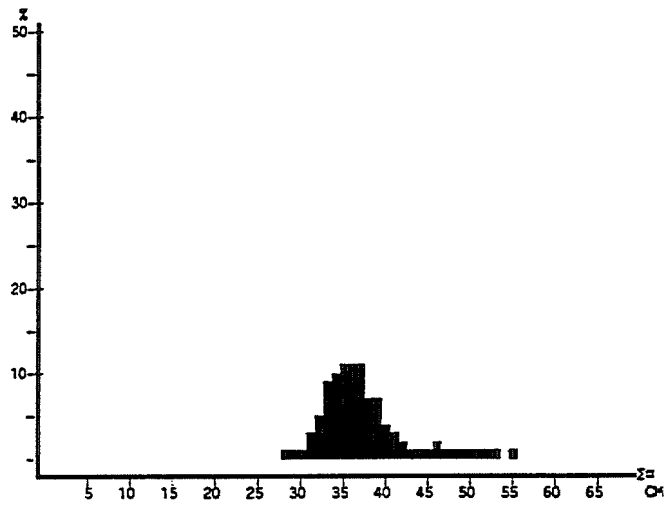
*Merluccius capensis*  
 NORTH 2/91 260-600m  
 Pooled sample (weighted by catch).  
 MEAN LENGTH = 50.16cm N= 3972  
 NUMBER OF SUBSAMPLES : 67



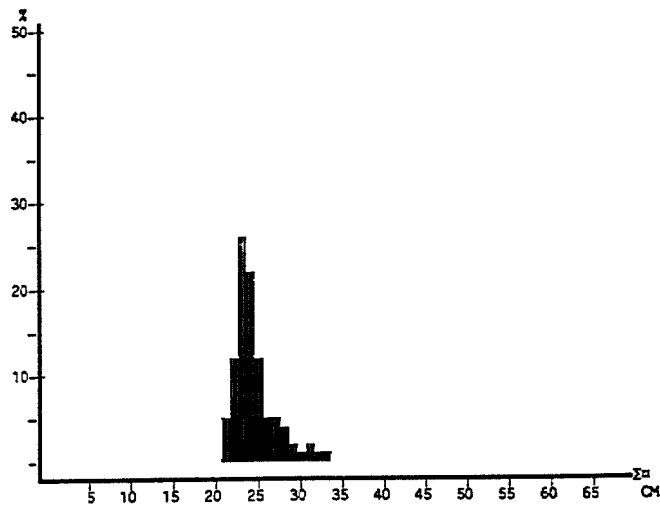
*Merluccius capensis*  
 NORTH 2/91 TOTAL  
 Pooled sample (weighted by catch).  
 MEAN LENGTH = 45.18cm N= 6026  
 NUMBER OF SUBSAMPLES : 94



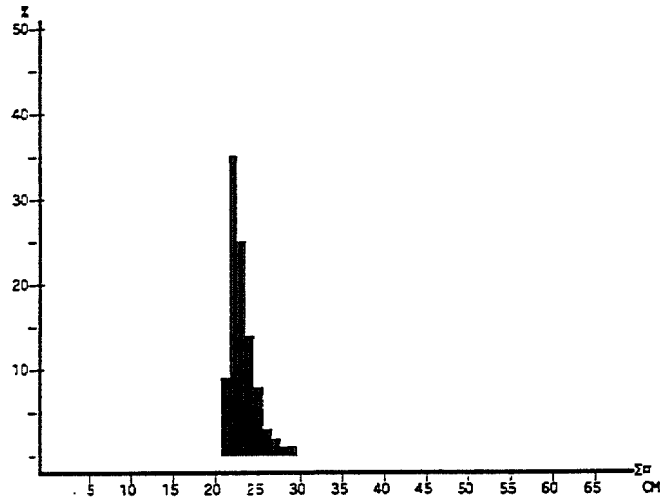
*Merluccius paradoxus*  
 SOUTH 2/91 TOTAL  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 30.02cm N= 3293  
 NUMBER OF SUBSAMPLES : 46



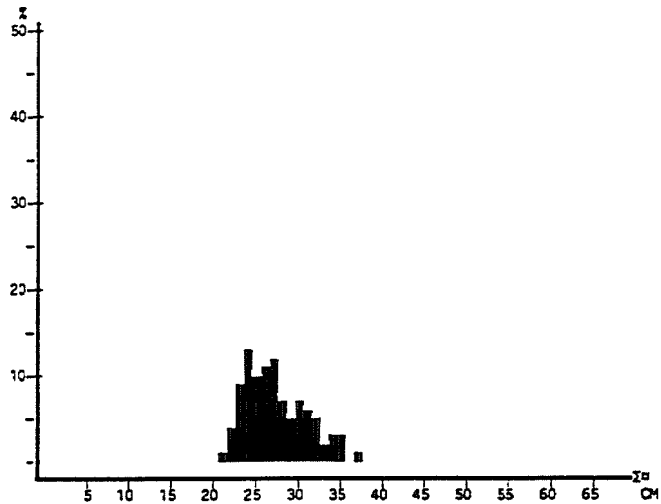
*Merluccius paradoxus*  
 CENTRAL 2/91 TOTAL  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 37.17cm N= 1290  
 NUMBER OF SUBSAMPLES : 31



Trachurus capensis  
 SOUTH 2/91 TOTAL  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 24.42cm N= 892  
 NUMBER OF SUBSAMPLES : 14



Trachurus capensis  
 CENTRAL 2/91 TOTAL  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 23.19cm N= 1994  
 NUMBER OF SUBSAMPLES : 24



Trachurus capensis  
 NORTH 2/91 TOTAL  
 Pooled sample ( weighted by catch).  
 MEAN LENGTH = 27.30cm N= 955  
 NUMBER OF SUBSAMPLES : 14





# ANNEX III RECORDS OF FISHING STATIONS

PROJECT STATION: 766  
 DATE: 24/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2645 Long E 1450  
 start stop duration  
 TIME :12:35:00 13:05:00 30 (min) Purpose code: 3  
 LOG :8083.30 8084.70 2.00 Area code : 1  
 FDEPTH: 164 164 GearCond.code:  
 BDEPTH: 164 164 Validity code:  
 Towing dir: 360 Wire out: 600 m Speed: 37 kn\*10  
 Sorted: 68 Kg Total catch: 355.00 CATCH/HOUR: 710.00

| SPECIES                  | CATCH/HOUR    |         | % OF TOT. C  | SAMP.NO. |
|--------------------------|---------------|---------|--------------|----------|
|                          | weight        | numbers |              |          |
| Merluccius capensis      | 387.00        | 3570    | 54.51        | 2        |
| MYCTOPHIDAE              | 215.00        |         | 30.28        |          |
| Trachurus capensis       | 40.00         | 190     | 5.63         | 1        |
| Chelidonichthys capensis | 34.00         | 90      | 4.79         |          |
| Callorhynchus capensis   | 21.60         | 12      | 3.04         |          |
| Todarodes sagittatus     | 8.40          | 16      | 1.18         |          |
| Sufflogobius bibarbatu   | 4.00          | 850     | 0.56         |          |
| <b>Total</b>             | <b>710.00</b> |         | <b>99.99</b> |          |

PROJECT STATION: 771  
 DATE: 25/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2853 Long E 1548  
 start stop duration  
 TIME :11:38:00 12:08:00 30 (min) Purpose code: 3  
 LOG :8280.10 8281.40 1.30 Area code : 1  
 FDEPTH: 169 169 GearCond.code:  
 BDEPTH: 169 169 Validity code:  
 Towing dir: 310 Wire out: 600 m Speed: 300 kn\*10  
 Sorted: 47 Kg Total catch: 74.10 CATCH/HOUR: 148.20

| SPECIES                        | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|--------------------------------|---------------|---------|---------------|----------|
|                                | weight        | numbers |               |          |
| Sepia australis                | 46.80         |         | 31.58         |          |
| Merluccius capensis, juveniles | 44.80         | 1632    | 30.23         | 12       |
| Merluccius capensis, female    | 34.60         | 82      | 23.35         | 11       |
| Paracallionymus costatus       | 8.80          | 740     | 5.94          |          |
| Chelidonichthys capensis       | 3.20          | 12      | 2.16          |          |
| Merluccius capensis, male      | 3.20          | 10      | 2.16          | 10       |
| Genypterus capensis            | 1.20          | 8       | 0.81          |          |
| Holohalaelurus regani          | 1.20          | 12      | 0.81          |          |
| Squilla aculeata calmani       | 1.20          | 88      | 0.81          |          |
| Trachurus capensis             | 1.20          | 8       | 0.81          |          |
| Cynoglossus zanzibarensis      | 0.80          | 16      | 0.54          |          |
| Coelorrinchus fasciatus        | 0.40          | 12      | 0.27          |          |
| Helicolenus dactylopterus      | 0.40          | 288     | 0.27          |          |
| Todaropsis eblanae             | 0.20          | 4       | 0.13          |          |
| Zeus capensis                  | 0.20          | 4       | 0.13          |          |
| Lepidopus caudatus             | 0.00          | 4       |               |          |
| Sufflogobius bibarbatu         | 0.00          | 4       |               |          |
| <b>Total</b>                   | <b>148.20</b> |         | <b>100.00</b> |          |

PROJECT STATION: 767  
 DATE: 24/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2654 Long E 1459  
 start stop duration  
 TIME :15:03:00 15:33:00 30 (min) Purpose code: 3  
 LOG :8101.10 8102.50 1.44 Area code : 1  
 FDEPTH: 137 134 GearCond.code:  
 BDEPTH: 137 134 Validity code:  
 Towing dir: 360 Wire out: 450 m Speed: 301 kn\*10  
 Sorted: 126 Kg Total catch: 1262.00 CATCH/HOUR: 2524.00

| SPECIES                  | CATCH/HOUR     |         | % OF TOT. C   | SAMP.NO. |
|--------------------------|----------------|---------|---------------|----------|
|                          | weight         | numbers |               |          |
| Trachurus capensis       | 1870.00        | 17300   | 74.09         | 3        |
| MYCTOPHIDAE              | 356.00         |         | 14.10         |          |
| Merluccius capensis      | 186.00         | 1780    | 7.37          | 4        |
| Chelidonichthys capensis | 90.00          | 340     | 3.57          |          |
| Thysites acun            | 16.00          | 80      | 0.63          |          |
| Sufflogobius bibarbatu   | 6.00           | 600     | 0.24          |          |
| <b>Total</b>             | <b>2524.00</b> |         | <b>100.00</b> |          |

PROJECT STATION: 772  
 DATE: 25/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2904 Long E 1532  
 start stop duration  
 TIME :14:25:00 14:55:00 30 (min) Purpose code: 3  
 LOG :8300.70 8302.20 1.44 Area code : 1  
 FDEPTH: 176 178 GearCond.code:  
 BDEPTH: 176 178 Validity code:  
 Towing dir: 320 Wire out: 650 m Speed: 280 kn\*10  
 Sorted: 77 Kg Total catch: 158.60 CATCH/HOUR: 317.20

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C  | SAMP.NO. |
|-----------------------------|---------------|---------|--------------|----------|
|                             | weight        | numbers |              |          |
| Emmelichthys nitidus        | 109.20        | 76      | 34.43        | 15       |
| Trachurus capensis          | 88.40         | 132     | 27.87        | 16       |
| Merluccius capensis, female | 56.00         | 110     | 17.65        | 14       |
| Paracallionymus costatus    | 13.40         | 1540    | 4.22         |          |
| Callorhynchus capensis      | 12.00         | 6       | 3.78         |          |
| Helicolenus dactylopterus   | 10.40         | 250     | 3.28         |          |
| Sepia australis             | 9.40          | 540     | 2.96         |          |
| Merluccius capensis, male   | 9.20          | 18      | 2.90         | 13       |
| Chelidonichthys capensis    | 2.60          | 10      | 0.82         |          |
| Etrumeus whiteheadi         | 2.00          | 42      | 0.63         |          |
| Holohalaelurus regani       | 2.00          | 20      | 0.63         |          |
| Cynoglossus zanzibarensis   | 1.60          | 52      | 0.50         |          |
| Todarodes sagittatus        | 1.00          | 20      | 0.32         |          |
| <b>Total</b>                | <b>317.20</b> |         | <b>99.99</b> |          |

PROJECT STATION: 768  
 DATE: 24/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2712 Long E 1500  
 start stop duration  
 TIME :18:18:00 18:48:00 30 (min) Purpose code: 3  
 LOG :8126.90 8128.10 1.30 Area code : 1  
 FDEPTH: 162 160 GearCond.code:  
 BDEPTH: 162 160 Validity code:  
 Towing dir: 360 Wire out: 600 m Speed: 280 kn\*10  
 Sorted: 177 Kg Total catch: 177.10 CATCH/HOUR: 354.20

| SPECIES                        | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|--------------------------------|---------------|---------|---------------|----------|
|                                | weight        | numbers |               |          |
| Trachurus capensis             | 129.40        | 980     | 36.53         | 5        |
| Merluccius capensis, female    | 72.20         | 510     | 20.38         | 6        |
| MYCTOPHIDAE                    | 63.60         |         | 17.96         |          |
| Merluccius capensis, male      | 55.40         | 488     | 15.64         | 7        |
| Chelidonichthys capensis       | 15.80         | 58      | 4.46          |          |
| Merluccius capensis, juveniles | 15.40         | 242     | 4.35          | 8        |
| Sufflogobius bibarbatu         | 1.00          | 174     | 0.28          |          |
| Todarodes sagittatus           | 0.80          | 2       | 0.23          |          |
| Lepidopus caudatus             | 0.60          | 8       | 0.17          |          |
| <b>Total</b>                   | <b>354.20</b> |         | <b>100.00</b> |          |

PROJECT STATION: 773  
 DATE: 25/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2913 Long E 1517  
 start stop duration  
 TIME :17:06:00 17:36:00 30 (min) Purpose code: 3  
 LOG :8321.20 8322.70 1.60 Area code : 1  
 FDEPTH: 183 180 GearCond.code:  
 BDEPTH: 183 180 Validity code:  
 Towing dir: 360 Wire out: 650 m Speed: 306 kn\*10  
 Sorted: 10 Kg Total catch: 153.85 CATCH/HOUR: 307.70

| SPECIES                      | CATCH/HOUR    |         | % OF TOT. C  | SAMP.NO. |
|------------------------------|---------------|---------|--------------|----------|
|                              | weight        | numbers |              |          |
| Trachurus capensis           | 104.40        | 442     | 33.93        | 17       |
| Merluccius capensis, female  | 46.00         | 94      | 14.95        | 19       |
| Sepia australis              | 33.00         |         | 10.72        |          |
| Helicolenus dactylopterus    | 19.00         | 160     | 6.17         |          |
| Chelidonichthys capensis     | 17.00         | 70      | 5.52         |          |
| Callorhynchus capensis       | 16.60         | 8       | 5.39         |          |
| Merluccius capensis, male    | 16.00         | 42      | 5.20         | 18       |
| Emmelichthys nitidus         | 9.20          | 18      | 2.99         |          |
| Holohalaelurus regani        | 8.30          | 20      | 2.60         |          |
| Mustelus palumbes            | 5.20          | 2       | 1.69         |          |
| Paracallionymus costatus     | 5.00          | 640     | 1.62         |          |
| Cynoglossus zanzibarensis    | 5.00          | 190     | 1.62         |          |
| Merluccius paradoxus, female | 5.00          | 38      | 1.62         | 21       |
| Squalus blainvilliei         | 4.80          | 6       | 1.56         |          |
| Torpedo nobiliana            | 3.00          | 10      | 0.97         |          |
| CALAPPIDAE                   | 3.00          | 12      | 0.97         |          |
| Loligo vulgaris              | 2.00          | 10      | 0.65         |          |
| Coelorrinchus fasciatus      | 2.00          | 20      | 0.65         |          |
| Zeus capensis                | 2.00          | 70      | 0.65         |          |
| Merluccius paradoxus, male   | 1.00          | 8       | 0.32         | 20       |
| Genypterus capensis          | 0.50          | 10      | 0.16         |          |
| Todaropsis eblanae           | 0.00          | 10      |              |          |
| Etrumeus whiteheadi          | 0.00          | 10      |              |          |
| <b>Total</b>                 | <b>307.70</b> |         | <b>99.95</b> |          |

PROJECT STATION: 769  
 DATE: 25/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2840 Long E 1614  
 start stop duration  
 TIME :07:05:00 07:35:00 30 (min) Purpose code: 3  
 LOG :8248.80 8250.10 1.30 Area code : 1  
 FDEPTH: 80 74 GearCond.code:  
 BDEPTH: 80 74 Validity code:  
 Towing dir: 320 Wire out: 300 m Speed: 260 kn\*10  
 Sorted: 24 Kg Total catch: 48.20 CATCH/HOUR: 96.40

| SPECIES                        | CATCH/HOUR   |         | % OF TOT. C   | SAMP.NO. |
|--------------------------------|--------------|---------|---------------|----------|
|                                | weight       | numbers |               |          |
| Sufflogobius bibarbatu         | 48.80        |         | 50.62         |          |
| Krill                          | 29.20        |         | 30.29         |          |
| Squilla aculeata calmani       | 15.20        |         | 15.77         |          |
| Merluccius capensis, juveniles | 2.40         | 504     | 2.49          | 9        |
| Merluccius capensis, female    | 0.80         | 4       | 0.83          |          |
| <b>Total</b>                   | <b>96.40</b> |         | <b>100.00</b> |          |

PROJECT STATION: 770  
 DATE: 25/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2846 Long E 1602  
 start stop duration  
 TIME :09:16:00 09:25:00 9 (min) Purpose code: 3  
 LOG :8265.10 8265.30 0.20 Area code : 1  
 FDEPTH: 125 125 GearCond.code: 8  
 BDEPTH: 125 125 Validity code: 9  
 Towing dir: 310 Wire out: 500 m Speed: 200 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES      | CATCH/HOUR  |         | % OF TOT. C | SAMP.NO. |
|--------------|-------------|---------|-------------|----------|
|              | weight      | numbers |             |          |
| <b>Total</b> | <b>0.00</b> |         |             |          |

PROJECT STATION: 774  
 DATE:25/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2939 Long E 1443  
 start stop duration  
 TIME :22:54:00 23:55:00 30 (min) Purpose code: 3  
 LOG :8372.80 8375.00 1.60 Area code : 1  
 FDEPTH: 394 386 GearCond.code:  
 BDEPTH: 394 386 Validity code:  
 Towing dir: 315 Wire out:1200 m Speed:320 kn\*10  
 Sorted: 43 Kg Total catch: 142.80 CATCH/HOUR: 285.60

| SPECIES                        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------------|------------|---------|-------------|----------|
|                                | weight     | numbers |             |          |
| Merluccius paradoxus, juvenile | 195.00     | 1686    | 68.28       | 22       |
| Raja straeleni                 | 33.60      | 8       | 11.76       |          |
| Coelorinchus fasciatus         | 14.40      | 148     | 5.04        |          |
| Holohalaelurus regani          | 9.40       | 46      | 3.29        |          |
| Merluccius capensis            | 8.80       | 4       | 3.08        |          |
| Zeus capensis                  | 8.60       | 24      | 3.01        |          |
| Lophius upsicephalus           | 5.40       | 16      | 1.89        |          |
| Helicolenus dactylopterus      | 4.60       | 70      | 1.61        |          |
| Merluccius paradoxus           | 2.60       | 4       | 0.91        |          |
| Todaropsis eblanae             | 2.40       | 8       | 0.84        |          |
| Nezumia sp.                    | 0.40       | 32      | 0.14        |          |
| Paracallionymus costatus       | 0.40       | 118     | 0.14        |          |
| Total                          | 285.60     |         | 99.99       |          |

PROJECT STATION: 775  
 DATE:26/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2943 Long E 1432  
 start stop duration  
 TIME :01:40:00 02:10:00 30 (min) Purpose code: 3  
 LOG :8388.80 8389.60 1.50 Area code : 1  
 FDEPTH: 540 563 GearCond.code:  
 BDEPTH: 540 563 Validity code:  
 Towing dir: 360 Wire out:1350 m Speed:290 kn\*10  
 Sorted: 18 Kg Total catch: 46.00 CATCH/HOUR: 92.00

| SPECIES                  | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------|------------|---------|-------------|----------|
|                          | weight     | numbers |             |          |
| Trachyrhinus scabrus     | 47.00      | 740     | 51.09       |          |
| Merluccius paradoxus     | 30.00      | 30      | 32.61       |          |
| Zeus capensis            | 5.00       | 6       | 5.43        |          |
| Aristeus varidens        | 2.60       |         | 2.83        |          |
| Photichthys argenteus    | 2.60       | 116     | 2.83        |          |
| Etmopterus lucifer       | 2.00       | 50      | 2.17        |          |
| Malacocephalus laevis    | 1.60       | 6       | 1.74        |          |
| Selachophidium guentheri | 0.60       | 40      | 0.65        |          |
| Coelorinchus fasciatus   | 0.60       | 20      | 0.65        |          |
| Total                    | 92.00      |         | 100.00      |          |

PROJECT STATION: 776  
 DATE:26/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2914 Long E 1430  
 start stop duration  
 TIME :05:30:00 06:00:00 30 (min) Purpose code: 3  
 LOG :8417.50 8418.90 1.50 Area code : 1  
 FDEPTH: 420 409 GearCond.code:  
 BDEPTH: 420 409 Validity code:  
 Towing dir: 360 Wire out:1250 m Speed:290 kn\*10  
 Sorted: 107 Kg Total catch: 106.60 CATCH/HOUR: 213.20

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 122.60     | 378     | 57.50       | 24       |
| Merluccius paradoxus, male   | 62.80      | 208     | 29.46       | 23       |
| Lophius upsicephalus         | 6.80       | 4       | 3.19        |          |
| Helicolenus dactylopterus    | 5.00       | 34      | 2.35        |          |
| Geryon maritae               | 4.80       | 178     | 2.25        |          |
| Etmopterus lucifer           | 4.00       | 90      | 1.88        |          |
| Holohalaelurus regani        | 2.80       | 32      | 1.31        |          |
| Malacocephalus laevis        | 2.20       | 16      | 1.03        |          |
| Coelorinchus fasciatus       | 0.80       | 16      | 0.38        |          |
| Sepia australis              | 0.60       | 26      | 0.28        |          |
| Trachyrhinus scabrus         | 0.40       | 18      | 0.19        |          |
| Notacanthus sexspinis        | 0.20       | 6       | 0.09        |          |
| Photichthys argenteus        | 0.20       | 24      | 0.09        |          |
| Total                        | 213.20     |         | 100.00      |          |

PROJECT STATION: 777  
 DATE:26/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2932 Long E 1432  
 start stop duration  
 TIME :06:52:00 07:22:00 30 (min) Purpose code: 3  
 LOG :8423.30 8424.70 1.60 Area code : 1  
 FDEPTH: 363 365 GearCond.code:  
 BDEPTH: 363 365 Validity code:  
 Towing dir: 340 Wire out:1050 m Speed:300 kn\*10  
 Sorted: 28 Kg Total catch: 193.25 CATCH/HOUR: 386.50

| SPECIES                        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------------|------------|---------|-------------|----------|
|                                | weight     | numbers |             |          |
| Merluccius paradoxus, female   | 163.80     | 868     | 42.38       | 26       |
| Merluccius paradoxus, male     | 93.80      | 490     | 24.27       | 25       |
| Merluccius paradoxus, juvenile | 53.20      | 1008    | 13.76       | 27       |
| Scyllorhinus capensis          | 23.80      | 28      | 6.16        |          |
| Octopus vulgaris               | 17.00      | 2       | 4.40        |          |
| Holohalaelurus regani          | 14.00      | 70      | 3.62        |          |
| Squalus blainvillei            | 13.40      | 14      | 3.47        |          |
| Coelorinchus fasciatus         | 2.80       | 154     | 0.72        |          |
| Genypterus capensis            | 2.60       | 2       | 0.67        |          |
| PORTUNIDAE                     | 1.40       | 238     | 0.36        |          |
| Trachyrhinus scabrus           | 0.70       | 14      | 0.18        |          |
| Total                          | 386.50     |         | 99.99       |          |

PROJECT STATION: 778  
 DATE:26/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2908 Long E 1432  
 start stop duration  
 TIME :08:35:00 09:05:00 30 (min) Purpose code: 3  
 LOG :8432.10 8433.50 1.50 Area code : 1  
 FDEPTH: 290 294 GearCond.code:  
 BDEPTH: 290 294 Validity code:  
 Towing dir: 330 Wire out: 900 m Speed:290 kn\*10  
 Sorted: 26 Kg Total catch: 305.35 CATCH/HOUR: 610.70

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius paradoxus        | 252.00     | 2142    | 41.26       | 30       |
| Zeus capensis               | 144.00     | 342     | 23.58       |          |
| Merluccius capensis, female | 106.20     | 68      | 17.39       | 29       |
| Merluccius capensis, male   | 24.60      | 16      | 4.03        | 28       |
| Holohalaelurus regani       | 23.40      | 72      | 3.83        |          |
| Coelorinchus fasciatus      | 19.80      | 396     | 3.24        |          |
| Cynoglossus zanzibarensis   | 10.80      | 216     | 1.77        |          |
| Apristurus saldanha         | 7.20       | 18      | 1.18        |          |
| Helicolenus dactylopterus   | 5.40       | 18      | 0.88        |          |
| Trachurus capensis          | 4.60       | 8       | 0.75        |          |
| Epigonus denticulatus       | 3.60       | 144     | 0.59        |          |
| Scyllorhinus capensis       | 3.60       | 18      | 0.59        |          |
| Genypterus capensis         | 2.80       | 2       | 0.46        |          |
| Lepidopus caudatus          | 1.80       | 18      | 0.29        |          |
| Malacocephalus laevis       | 0.90       | 18      | 0.15        |          |
| Paracallionymus costatus    | 0.00       | 36      |             |          |
| PORTUNIDAE                  | 0.00       | 18      |             |          |
| CALAPPIDAE                  | 0.00       | 18      |             |          |
| Emmelichthys nitidus        | 0.00       | 18      |             |          |
| Total                       | 610.70     |         | 99.99       |          |

PROJECT STATION: 779  
 DATE:26/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2903 Long E 1448  
 start stop duration  
 TIME :11:10:00 11:40:00 30 (min) Purpose code: 3  
 LOG :8451.20 8452.40 1.50 Area code : 1  
 FDEPTH: 209 213 GearCond.code:  
 BDEPTH: 209 213 Validity code:  
 Towing dir: 330 Wire out: 650 m Speed:310 kn\*10  
 Sorted: 101 Kg Total catch: 236.80 CATCH/HOUR: 473.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Trachurus capensis          | 219.60     | 612     | 46.37       | 31       |
| Merluccius capensis, female | 109.60     | 84      | 23.14       | 34       |
| Brama brama                 | 37.00      | 18      | 7.81        |          |
| Lepidopus caudatus          | 21.60      | 396     | 4.56        |          |
| Zeus capensis               | 20.80      | 46      | 4.29        |          |
| Thyrssites atun             | 17.20      | 10      | 3.63        |          |
| Merluccius capensis, male   | 16.00      | 12      | 3.38        | 33       |
| Etmopterus whiteheadi       | 12.60      | 144     | 2.66        | 32       |
| Lophius upsicephalus        | 6.40       | 10      | 1.35        |          |
| Todarodes sagittatus        | 4.60       | 10      | 0.97        |          |
| Helicolenus dactylopterus   | 4.60       | 64      | 0.97        |          |
| Holohalaelurus regani       | 3.60       | 10      | 0.76        |          |
| Total                       | 473.60     |         | 99.99       |          |

PROJECT STATION: 780  
 DATE:26/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2856 Long E 1500  
 start stop duration  
 TIME :13:42:00 14:12:00 30 (min) Purpose code: 3  
 LOG :8470.20 8471.50 1.50 Area code : 1  
 FDEPTH: 173 175 GearCond.code:  
 BDEPTH: 173 175 Validity code:  
 Towing dir: 250 Wire out: 550 m Speed:303 kn\*10  
 Sorted: 134 Kg Total catch: 308.70 CATCH/HOUR: 617.40

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Etmopterus whiteheadi       | 262.80     | 3478    | 42.57       | 36       |
| Merluccius capensis, female | 112.20     | 106     | 18.17       | 38       |
| Trachurus capensis          | 74.80      | 396     | 12.12       | 35       |
| Chelidonichthys capensis    | 46.00      | 118     | 7.45        |          |
| Galeorhinus galeus          | 35.00      | 2       | 5.67        |          |
| Merluccius capensis, male   | 20.20      | 22      | 3.27        | 37       |
| Thyrssites atun             | 18.00      | 18      | 2.92        |          |
| Callorhynchus capensis      | 18.00      | 10      | 2.92        |          |
| Zeus capensis               | 7.20       | 64      | 1.17        |          |
| Todaropsis eblanae          | 5.40       | 18      | 0.87        |          |
| Helicolenus dactylopterus   | 5.40       | 90      | 0.87        |          |
| Mustelus mustelus           | 4.60       | 10      | 0.75        |          |
| Paracallionymus costatus    | 4.60       | 280     | 0.75        |          |
| Lepidopus caudatus          | 1.80       | 36      | 0.29        |          |
| Cynoglossus zanzibarensis   | 1.00       | 10      | 0.16        |          |
| Sepia australis             | 0.40       | 10      | 0.06        |          |
| Total                       | 617.40     |         | 100.01      |          |

PROJECT STATION: 781  
 DATE:26/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2843 Long E 1523  
 start stop duration  
 TIME :17:10:00 17:40:00 30 (min) Purpose code: 3  
 LOG :8500.40 8502.10 1.46 Area code : 1  
 FDEPTH: 182 176 GearCond.code:  
 BDEPTH: 182 176 Validity code:  
 Towing dir: 260 Wire out: 600 m Speed:290 kn\*10  
 Sorted: 7 Kg Total catch: 113.10 CATCH/HOUR: 226.20

| SPECIES                        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------------|------------|---------|-------------|----------|
|                                | weight     | numbers |             |          |
| Merluccius capensis, female    | 123.80     | 232     | 54.73       | 40       |
| Merluccius capensis, male      | 43.00      | 76      | 19.01       | 39       |
| Merluccius capensis, juveniles | 16.80      | 840     | 7.43        | 41       |
| Octopus vulgaris               | 12.40      | 2       | 5.48        |          |
| Paracallionymus costatus       | 8.80       | 992     | 3.89        |          |
| Trachurus capensis             | 5.00       | 32      | 2.21        |          |
| Helicolenus dactylopterus      | 4.80       | 160     | 2.12        |          |
| NYCTOPHIDAE                    | 4.00       |         | 1.77        |          |
| Sepia australis                | 3.20       | 144     | 1.41        |          |
| Chelidonichthys capensis       | 2.40       | 8       | 1.06        |          |
| Genypterus capensis            | 1.20       | 2       | 0.53        |          |
| Cynoglossus zanzibarensis      | 0.80       | 16      | 0.35        |          |
| Lepidopus caudatus             | 0.00       | 8       |             |          |
| Total                          | 226.20     |         | 99.99       |          |

PROJECT STATION: 782  
 DATE: 26/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2838 Long E 1530  
 start stop duration  
 TIME :19:00:00 19:30:00 30 (min) Purpose code: 3  
 LOG :8512.80 8514.10 1.40 Area code : 1  
 FDEPTH: 177 172 GearCond.code: 1  
 BDEPTH: 177 172 Validity code:  
 Towing dir: 60 Wire out: 550 m Speed:280 kn\*10  
 Sorted: 23 Kg Total catch: 83.90 CATCH/HOUR: 167.80

| SPECIES                        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------------|------------|---------|-------------|----------|
|                                | weight     | numbers |             |          |
| Sepia australis                | 47.40      | 3124    | 28.25       |          |
| Merluccius capensis, juveniles | 45.00      |         | 26.82       |          |
| Octopus vulgaris               | 15.20      | 2       | 9.06        |          |
| Trachurus capensis             | 15.00      | 96      | 9.94        |          |
| Lepidopus caudatus             | 9.00       | 366     | 5.36        |          |
| Helicolenus dactylopterus      | 8.70       | 450     | 5.18        |          |
| Brama brama                    | 5.50       | 2       | 3.28        |          |
| Merluccius capensis, female    | 5.40       | 8       | 3.22        |          |
| Paracallionymus costatus       | 4.80       | 288     | 2.86        |          |
| Merluccius capensis, male      | 4.00       | 6       | 2.38        |          |
| Holohalaelurus regani          | 2.40       | 30      | 1.43        |          |
| Cynoglossus xanibarensis       | 1.50       | 54      | 0.89        |          |
| Coelorrhinchus fasciatus       | 1.50       | 12      | 0.89        |          |
| Chelidonichthys capensis       | 1.20       | 6       | 0.72        |          |
| Etrumeus whiteheadi            | 1.20       | 12      | 0.72        |          |
| Squilla aculeata calmani       | 0.00       | 6       |             |          |
| Sufflogobius bibarbatatus      | 0.00       | 12      |             |          |
| Todaropsis eblansea            | 0.00       | 6       |             |          |
| Total                          | 167.80     |         | 100.00      |          |

PROJECT STATION: 783  
 DATE: 26/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2821 Long E 1517  
 start stop duration  
 TIME :07:02:00 07:22:00 20 (min) Purpose code: 3  
 LOG :8588.30 8589.50 0.90 Area code : 1  
 FDEPTH: 162 160 GearCond.code: 5  
 BDEPTH: 162 160 Validity code:  
 Towing dir: 340 Wire out: 600 m Speed:280 kn\*10  
 Sorted: 43 Kg Total catch: 42.60 CATCH/HOUR: 127.80

| SPECIES                        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------------|------------|---------|-------------|----------|
|                                | weight     | numbers |             |          |
| MYCTOPHIDAE                    | 23.10      |         | 18.08       |          |
| Chelidonichthys capensis       | 22.80      | 93      | 17.84       |          |
| Merluccius capensis, female    | 22.80      | 93      | 17.84       | 43       |
| Merluccius capensis, juveniles | 15.60      | 723     | 12.21       | 44       |
| Sepia australis                | 12.60      | 609     | 9.86        |          |
| Trachurus capensis             | 7.20       | 54      | 5.63        | 45       |
| Merluccius capensis, male      | 6.90       | 30      | 5.40        | 42       |
| Lepidopus caudatus             | 6.00       | 222     | 4.69        |          |
| Cynoglossus xanibarensis       | 5.10       | 54      | 3.99        |          |
| Austroglossus microlepis       | 2.70       | 3       | 2.11        |          |
| Sufflogobius bibarbatatus      | 1.50       | 444     | 1.17        |          |
| Congiopodus spinifer           | 0.90       | 6       | 0.70        |          |
| Paracallionymus costatus       | 0.60       | 42      | 0.47        |          |
| CALAPPIDAE                     | 0.00       | 3       |             |          |
| Squilla aculeata calmani       | 0.00       | 6       |             |          |
| Zeus capensis                  | 0.00       | 9       |             |          |
| Todaropsis eblansea            | 0.00       | 3       |             |          |
| Solenocera africana            | 0.00       | 3       |             |          |
| Total                          | 127.80     |         | 99.99       |          |

PROJECT STATION: 784  
 DATE: 27/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2826 Long E 1506  
 start stop duration  
 TIME :08:58:00 09:23:00 25 (min) Purpose code: 3  
 LOG :8603.80 8605.00 1.30 Area code : 1  
 FDEPTH: 168 169 GearCond.code: 5  
 BDEPTH: 168 169 Validity code:  
 Towing dir: 350 Wire out: 600 m Speed:290 kn\*10  
 Sorted: 22 Kg Total catch: 138.45 CATCH/HOUR: 332.28

| SPECIES                        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------------|------------|---------|-------------|----------|
|                                | weight     | numbers |             |          |
| Trachurus capensis             | 114.00     | 912     | 34.31       | 49       |
| Merluccius capensis, juveniles | 66.00      |         | 19.86       | 48       |
| Merluccius capensis, female    | 32.88      | 50      | 9.90        | 47       |
| Chelidonichthys capensis       | 27.60      | 108     | 8.31        |          |
| Lepidopus caudatus             | 16.80      | 516     | 5.06        |          |
| Callorhinchus capensis         | 16.32      | 10      | 4.91        |          |
| Merluccius capensis, male      | 12.72      | 17      | 3.83        | 46       |
| Helicolenus dactylopterus      | 12.00      | 132     | 3.61        |          |
| Brama brama                    | 8.64       | 5       | 2.60        |          |
| Zeus capensis                  | 7.20       | 168     | 2.17        |          |
| Etrumeus whiteheadi            | 6.00       | 132     | 1.81        |          |
| Sepia australis                | 4.80       | 228     | 1.44        |          |
| Congiopodus spinifer           | 2.40       | 12      | 0.72        |          |
| Mustelus palumbus              | 2.16       | 2       | 0.65        |          |
| Austroglossus microlepis       | 0.96       | 2       | 0.29        |          |
| Paracallionymus costatus       | 0.60       | 72      | 0.18        |          |
| Todaropsis eblansea            | 0.60       | 36      | 0.18        |          |
| Cynoglossus xanibarensis       | 0.60       | 12      | 0.18        |          |
| CALAPPIDAE                     | 0.00       | 12      |             |          |
| PORTUNIDAE                     | 0.00       | 12      |             |          |
| Sufflogobius bibarbatatus      | 0.00       | 12      |             |          |
| Total                          | 332.28     |         | 100.01      |          |

PROJECT STATION: 785  
 DATE: 27/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2832 Long E 1554  
 start stop duration  
 TIME :11:00:00 11:30:00 30 (min) Purpose code: 3  
 LOG :8618.70 8620.20 1.50 Area code : 1  
 FDEPTH: 176 177 GearCond.code: 1  
 BDEPTH: 176 177 Validity code:  
 Towing dir: 350 Wire out: 600 m Speed:300 kn\*10  
 Sorted: 75 Kg Total catch: 194.30 CATCH/HOUR: 388.60

| SPECIES                        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------------|------------|---------|-------------|----------|
|                                | weight     | numbers |             |          |
| Lepidopus caudatus             | 112.60     |         | 28.98       |          |
| Etrumeus whiteheadi            | 60.00      | 1200    | 15.44       | 52       |
| Trachurus capensis             | 42.00      | 210     | 10.81       |          |
| Merluccius capensis, juveniles | 41.00      | 1730    | 10.55       | 53       |
| Galeorhinus galeus             | 35.00      |         | 9.01        |          |
| Squalus blainvillei            | 25.00      | 60      | 6.43        |          |
| Merluccius capensis, female    | 24.60      | 24      | 6.33        | 51       |
| Thyrasties atun                | 17.00      | 8       | 4.37        |          |
| Callorhinchus capensis         | 11.40      | 6       | 2.93        |          |
| Paracallionymus costatus       | 8.00       | 650     | 2.06        |          |
| Merluccius capensis, male      | 3.40       | 6       | 0.87        | 50       |
| Sepia australis                | 3.00       |         | 0.77        |          |
| Helicolenus dactylopterus      | 3.00       | 70      | 0.77        |          |
| Monolene microstoma            | 2.00       | 50      | 0.51        |          |
| Zeus capensis                  | 0.60       | 20      | 0.15        |          |
| Total                          | 388.60     |         | 99.98       |          |

PROJECT STATION: 786  
 DATE: 27/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2832 Long E 1443  
 start stop duration  
 TIME :13:17:00 13:47:00 30 (min) Purpose code: 3  
 LOG :8638.30 8636.80 1.40 Area code : 1  
 FDEPTH: 193 194 GearCond.code: 1  
 BDEPTH: 193 194 Validity code:  
 Towing dir: 80 Wire out: 650 m Speed:280 kn\*10  
 Sorted: 66 Kg Total catch: 84.60 CATCH/HOUR: 169.20

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 50.40      | 72      | 29.79       | 55       |
| Galeorhinus galeus          | 35.00      | 2       | 20.69       |          |
| Zeus capensis               | 21.60      | 210     | 12.77       |          |
| Lophius upsidephalus        | 10.20      | 10      | 6.03        |          |
| Chelidonichthys capensis    | 9.00       | 18      | 5.32        |          |
| Thyrasties atun             | 7.00       | 2       | 4.14        |          |
| Squalus blainvillei         | 6.60       | 12      | 3.90        |          |
| Merluccius capensis, male   | 6.20       | 12      | 3.66        | 54       |
| Sepia australis             | 6.00       | 252     | 3.55        |          |
| Holohalaelurus regani       | 6.00       | 24      | 3.55        |          |
| Callorhinchus capensis      | 3.40       | 2       | 2.01        |          |
| Cynoglossus xanibarensis    | 3.00       | 96      | 1.77        |          |
| Genypterus capensis         | 2.40       | 6       | 1.42        |          |
| Todarodes sagittatus        | 1.20       | 12      | 0.71        |          |
| Congiopodus spinifer        | 1.20       | 6       | 0.71        |          |
| Total                       | 169.20     |         | 100.02      |          |

PROJECT STATION: 787  
 DATE: 27/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2844 Long E 1430  
 start stop duration  
 TIME :16:10:00 16:13:00 3 (min) Purpose code: 3  
 LOG :8658.20 8658.30 0.10 Area code : 1  
 FDEPTH: 212 212 GearCond.code: 5  
 BDEPTH: 212 212 Validity code: 9  
 Towing dir: 360 Wire out: 650 m Speed:300 kn\*10  
 Sorted: Kg Total catch: 50.00 CATCH/HOUR: 1000.00

| SPECIES | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------|------------|---------|-------------|----------|
|         | weight     | numbers |             |          |
| Total   | 0.00       |         |             |          |

PROJECT STATION: 788  
 DATE: 27/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2844 Long E 1424  
 start stop duration  
 TIME :19:17:00 19:47:00 30 (min) Purpose code: 3  
 LOG :8681.10 8682.60 1.50 Area code : 1  
 FDEPTH: 451 430 GearCond.code: 1  
 BDEPTH: 451 430 Validity code:  
 Towing dir: 170 Wire out: 1300 m Speed:290 kn\*10  
 Sorted: 107 Kg Total catch: 106.60 CATCH/HOUR: 213.20

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 121.40     | 432     | 56.94       | 57       |
| Merluccius paradoxus, male   | 50.00      | 176     | 23.45       | 56       |
| Genypterus capensis          | 20.80      | 6       | 9.76        |          |
| Raja confundens              | 9.00       | 10      | 4.22        |          |
| Holohalaelurus regani        | 5.40       | 22      | 2.53        |          |
| Trachyrhinus scabrus         | 1.60       | 40      | 0.75        |          |
| Malacocephalus laevis        | 1.60       | 4       | 0.75        |          |
| Etmopterus pusillus          | 1.20       | 4       | 0.56        |          |
| Helicolenus dactylopterus    | 1.00       | 6       | 0.47        |          |
| Laemonema laureysi           | 0.80       | 10      | 0.38        |          |
| Photichthys argenteus        | 0.40       | 12      | 0.19        |          |
| PORTUNIDAE                   | 0.00       | 4       |             |          |
| Total                        | 213.20     |         | 100.00      |          |

PROJECT STATION: 789  
 DATE: 27/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2826 Long E 1427  
 start stop duration  
 TIME :21:22:00 21:52:00 30 (min) Purpose code: 3  
 LOG :8693.60 8695.20 1.50 Area code : 1  
 FDEPTH: 389 401 GearCond.code: 1  
 BDEPTH: 389 401 Validity code:  
 Towing dir: 175 Wire out: 1200 m Speed:280 kn\*10  
 Sorted: 88 Kg Total catch: 87.75 CATCH/HOUR: 175.50

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 79.60      | 302     | 45.36       | 59       |
| Merluccius paradoxus, male   | 34.00      | 152     | 19.37       | 58       |
| Helicolenus dactylopterus    | 16.00      | 356     | 9.12        |          |
| Holohalaelurus regani        | 11.40      | 28      | 6.50        |          |
| Raja confundens              | 9.60       | 10      | 5.47        |          |
| PORTUNIDAE                   | 6.40       | 318     | 3.65        |          |
| Helicolenus dactylopterus    | 4.00       | 12      | 2.28        |          |
| Scyllorhinus capensis        | 3.00       | 4       | 1.71        |          |
| Epigonus denticulatus        | 2.60       | 40      | 1.48        |          |
| Genypterus capensis          | 2.40       | 2       | 1.37        |          |
| Malacocephalus laevis        | 2.00       | 8       | 1.14        |          |
| Tripterygion gilchristi      | 1.40       | 118     | 0.80        |          |
| Galeus polli                 | 1.00       | 4       | 0.57        |          |
| Todarodes sagittatus         | 1.00       | 8       | 0.57        |          |
| Rossia sp.                   | 0.60       | 14      | 0.34        |          |
| Laemonema laureysi           | 0.20       | 6       | 0.11        |          |
| Nesimia micronychodon        | 0.20       | 16      | 0.11        |          |
| Hoplostethus mediterraneus   | 0.10       | 12      | 0.06        |          |
| Paracallionymus costatus     | 0.00       | 4       |             |          |
| Trachyrhinus scabrus         | 0.00       | 2       |             |          |
| Total                        | 175.50     |         | 100.01      |          |

PROJECT STATION: 790  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2817  
start stop duration Long E 1426  
TIME : 03:40:00 04:10:00 30 (min) Purpose code: 3  
LOG : 8732.60 8733.80 1.58 Area code : 1  
FDEPTH: 503 543 GearCond.code:  
BDEPTH: 503 543 Validity code:  
Towing dir: 20 Wire out: 1400 m Speed: 300 kn\*10  
Sorted: 11 Kg Total catch: 112.65 CATCH/HOUR: 225.30

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|------------------------------|----------------|-------------|-----------|
|                              | weight numbers |             |           |
| Merluccius paradoxus, female | 139.20         | 170         | 61.78     |
| Trachyrinus scabrus          | 40.50          | 628         | 17.98     |
| Centrophorus squamosus       | 16.20          | 2           | 7.19      |
| Merluccius paradoxus, male   | 12.80          | 28          | 5.68      |
| Etmopterus lucifer           | 6.50           | 226         | 2.89      |
| Raja confundens              | 3.60           | 2           | 1.60      |
| Selachophidium guentheri     | 2.50           | 30          | 1.11      |
| Todarodes sagittatus         | 2.00           | 6           | 0.89      |
| Notacanthus sexspinis        | 1.50           | 26          | 0.67      |
| Photichthys argenteus        | 0.50           | 26          | 0.22      |
| Total                        | 225.30         | 100.01      |           |

PROJECT STATION: 791  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2814  
start stop duration Long E 1430  
TIME : 05:38:00 06:06:00 28 (min) Purpose code: 3  
LOG : 8743.10 8744.20 1.30 Area code : 1  
FDEPTH: 363 405 GearCond.code: 5  
BDEPTH: 363 405 Validity code:  
Towing dir: 10 Wire out: 1050 m Speed: 290 kn\*10  
Sorted: 178 Kg Total catch: 178.00 CATCH/HOUR: 381.43

| SPECIES                        | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|--------------------------------|----------------|-------------|-----------|
|                                | weight numbers |             |           |
| Merluccius paradoxus, female   | 160.50         | 225         | 42.08     |
| Genypterus capensis            | 45.00          | 19          | 11.80     |
| Merluccius paradoxus, male     | 41.14          | 101         | 10.79     |
| Merluccius capensis, female    | 30.43          | 21          | 7.98      |
| Coelorinchus fasciatus         | 25.71          | 456         | 6.74      |
| Holchalcus regani              | 17.36          | 43          | 4.55      |
| PORTUNIDAE                     | 16.50          | 737         | 4.33      |
| Todarodes sagittatus           | 12.86          | 36          | 3.37      |
| Notacanthus sexspinis          | 6.43           | 154         | 1.69      |
| Etmopterus lucifer             | 5.36           | 193         | 1.41      |
| Trachurus capensis             | 4.71           | 39          | 1.23      |
| Raja confundens                | 4.29           | 6           | 1.12      |
| Merluccius paradoxus, juvenile | 4.29           | 39          | 1.12      |
| Scyllorhinus capensis          | 2.14           | 6           | 0.56      |
| Malacocephalus laevis          | 2.14           | 6           | 0.56      |
| Galeus polii                   | 1.07           | 4           | 0.28      |
| Tripterygius gilchristi        | 0.64           | 26          | 0.17      |
| Laemonema laureysi             | 0.21           | 4           | 0.06      |
| Epigonus denticulatus          | 0.21           | 4           | 0.06      |
| Trachyrinus scabrus            | 0.21           | 4           | 0.06      |
| Paracallionymus costatus       | 0.11           | 9           | 0.03      |
| Chelidonichthys capensis       | 0.11           | 2           | 0.03      |
| Nezumia micronychodon          | 0.00           | 2           |           |
| Squilla acuelata calmani       | 0.00           | 2           |           |
| Total                          | 381.42         | 100.02      |           |

PROJECT STATION: 792  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2812  
start stop duration Long E 1439  
TIME : 07:40:00 08:05:00 25 (min) Purpose code: 3  
LOG : 8756.50 8757.50 1.30 Area code : 1  
FDEPTH: 195 203 GearCond.code:  
BDEPTH: 195 203 Validity code:  
Towing dir: 15 Wire out: 650 m Speed: 300 kn\*10  
Sorted: 45 Kg Total catch: 147.75 CATCH/HOUR: 354.60

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|-----------------------------|----------------|-------------|-----------|
|                             | weight numbers |             |           |
| Merluccius paradoxus        | 235.20         | 5326        | 66.33     |
| Merluccius capensis, female | 55.68          | 101         | 15.70     |
| Merluccius capensis, male   | 18.00          | 36          | 5.08      |
| Chelidonichthys capensis    | 10.20          | 12          | 2.08      |
| Trachurus capensis          | 9.60           | 67          | 2.71      |
| Squalus blainvillei         | 6.00           | 12          | 1.69      |
| Thyraites atun              | 6.00           | 2           | 1.69      |
| Brama brama                 | 4.80           | 2           | 1.35      |
| Holchalcus regani           | 3.60           | 12          | 1.02      |
| Paracallionymus costatus    | 3.00           | 151         | 0.85      |
| Sepia australis             | 1.20           | 72          | 0.34      |
| MYCTOPHIDAE                 | 0.60           |             | 0.17      |
| Sufflogobius bibarbatu      | 0.00           | 7           |           |
| Lepidopus caudatus          | 0.00           | 7           |           |
| Total                       | 353.88         | 99.61       |           |

PROJECT STATION: 793  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2808  
start stop duration Long E 1453  
TIME : 10:33:00 11:03:00 30 (min) Purpose code: 3  
LOG : 8775.20 8776.20 1.60 Area code : 1  
FDEPTH: 190 192 GearCond.code:  
BDEPTH: 190 192 Validity code:  
Towing dir: 270 Wire out: 600 m Speed: 310 kn\*10  
Sorted: 64 Kg Total catch: 186.00 CATCH/HOUR: 372.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|-----------------------------|----------------|-------------|-----------|
|                             | weight numbers |             |           |
| Trachurus capensis          | 265.20         | 1728        | 71.29     |
| Merluccius capensis, female | 43.60          | 118         | 11.72     |
| Merluccius capensis, male   | 19.40          | 84          | 5.22      |
| Squalus blainvillei         | 9.60           | 24          | 2.58      |
| Raja straeleni              | 8.40           | 12          | 2.26      |
| Lophius upsicephalus        | 6.40           | 12          | 1.72      |
| Mustelus palumbes           | 6.20           | 2           | 1.67      |
| Sufflogobius bibarbatu      | 3.60           | 624         | 0.97      |
| Lepidopus caudatus          | 3.60           | 96          | 0.97      |
| Sepia australis             | 2.40           | 240         | 0.65      |
| Zeus capensis               | 2.40           | 36          | 0.65      |
| Austroglossus microlepis    | 1.20           | 2           | 0.32      |
| Total                       | 372.00         | 100.02      |           |

PROJECT STATION: 794  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2803  
start stop duration Long E 1516  
TIME : 14:19:00 14:46:00 27 (min) Purpose code: 3  
LOG : 8802.00 8803.10 1.26 Area code : 1  
FDEPTH: 142 142 GearCond.code: 5  
BDEPTH: 142 142 Validity code:  
Towing dir: 260 Wire out: 500 m Speed: 266 kn\*10  
Sorted: 99 Kg Total catch: 339.90 CATCH/HOUR: 755.33

| SPECIES                        | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|--------------------------------|----------------|-------------|-----------|
|                                | weight numbers |             |           |
| MYCTOPHIDAE                    | 616.00         |             | 81.55     |
| Merluccius capensis, male      | 46.44          | 278         | 6.15      |
| Trachurus capensis             | 34.00          | 351         | 4.50      |
| Chelidonichthys capensis       | 25.11          | 111         | 3.32      |
| Merluccius capensis, female    | 18.00          | 167         | 2.38      |
| Sepia australis                | 10.00          | 380         | 1.32      |
| Squilla acuelata calmani       | 3.11           | 160         | 0.41      |
| Merluccius capensis, juveniles | 1.56           | 38          | 0.21      |
| Genypterus capensis            | 0.44           | 11          | 0.06      |
| Congiopodus spinifer           | 0.44           | 11          | 0.06      |
| Sufflogobius bibarbatu         | 0.22           | 11          | 0.03      |
| Total                          | 755.32         | 99.99       |           |

PROJECT STATION: 795  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2744  
start stop duration Long E 1521  
TIME : 19:15:00 19:27:00 12 (min) Purpose code: 3  
LOG : 8841.40 8841.90 0.60 Area code : 1  
FDEPTH: 124 117 GearCond.code: 5  
BDEPTH: 124 117 Validity code:  
Towing dir: 120 Wire out: 400 m Speed: 290 kn\*10  
Sorted: 26 Kg Total catch: 25.55 CATCH/HOUR: 127.75

| SPECIES                  | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|--------------------------|----------------|-------------|-----------|
|                          | weight numbers |             |           |
| Merluccius capensis      | 72.50          | 850         | 56.75     |
| Sufflogobius bibarbatu   | 15.50          | 3185        | 12.13     |
| MYCTOPHIDAE              | 15.00          |             | 11.74     |
| Raja straeleni           | 13.00          | 5           | 10.18     |
| Callorhynchus capensis   | 6.00           | 5           | 4.70      |
| Chelidonichthys capensis | 3.00           | 15          | 2.35      |
| Sepia australis          | 2.50           | 95          | 1.96      |
| Trachurus capensis       | 0.25           | 5           | 0.20      |
| Squilla acuelata calmani | 0.00           | 15          |           |
| PORTUNIDAE               | 0.00           | 5           |           |
| CALAPPIDAE               | 0.00           | 10          |           |
| Total                    | 127.75         | 100.01      |           |

PROJECT STATION: 796  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2744  
start stop duration Long E 1440  
TIME : 23:30:00 23:48:00 18 (min) Purpose code: 3  
LOG : 8882.00 8882.80 0.90 Area code : 1  
FDEPTH: 392 390 GearCond.code: 5  
BDEPTH: 392 390 Validity code:  
Towing dir: 320 Wire out: 1200 m Speed: 270 kn\*10  
Sorted: 90 Kg Total catch: 375.80 CATCH/HOUR: 1252.67

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|------------------------------|----------------|-------------|-----------|
|                              | weight numbers |             |           |
| Merluccius paradoxus, female | 891.00         | 1917        | 71.13     |
| Merluccius paradoxus, male   | 322.33         | 763         | 25.73     |
| Lophius upsicephalus         | 15.33          | 13          | 1.22      |
| Coelorinchus fasciatus       | 14.00          | 237         | 1.12      |
| Trachyrinus scabrus          | 5.67           | 127         | 0.45      |
| Chelidonichthys capensis     | 2.00           | 13          | 0.16      |
| PORTUNIDAE                   | 1.33           | 49          | 0.11      |
| Helicolenus dactylopterus    | 0.67           | 27          | 0.05      |
| Paracallionymus costatus     | 0.33           | 27          | 0.03      |
| Total                        | 1252.66        | 100.00      |           |

PROJECT STATION: 797  
DATE: 29/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2743  
start stop duration Long E 1431  
TIME : 01:33:00 02:03:00 30 (min) Purpose code: 3  
LOG : 8894.60 8895.90 1.50 Area code : 1  
FDEPTH: 505 481 GearCond.code:  
BDEPTH: 505 481 Validity code:  
Towing dir: 350 Wire out: 1350 m Speed: 306 kn\*10  
Sorted: 77 Kg Total catch: 244.20 CATCH/HOUR: 488.40

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|------------------------------|----------------|-------------|-----------|
|                              | weight numbers |             |           |
| Merluccius paradoxus, female | 265.00         | 508         | 54.26     |
| Trachyrinus scabrus          | 128.80         | 1436        | 26.37     |
| Merluccius paradoxus, male   | 51.40          | 96          | 10.52     |
| Malacocephalus laevis        | 13.40          | 102         | 2.74      |
| RAJIDAE                      | 6.40           | 12          | 1.31      |
| Etmopterus lucifer           | 4.20           | 102         | 0.86      |
| Todarodes sagittatus         | 3.80           | 6           | 0.78      |
| Selachophidium guentheri     | 3.20           | 38          | 0.66      |
| Coelorinchus fasciatus       | 3.20           | 32          | 0.66      |
| Photichthys argenteus        | 3.20           | 172         | 0.66      |
| PORTUNIDAE                   | 2.60           | 26          | 0.53      |
| SQUALIDAE                    | 2.00           | 6           | 0.41      |
| Notacanthus sexspinis        | 0.60           | 12          | 0.12      |
| Helicolenus dactylopterus    | 0.60           | 6           | 0.12      |
| Total                        | 488.40         | 100.00      |           |

PROJECT STATION: 798  
DATE: 28/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2803  
start stop duration Long E 1453  
TIME : 10:33:00 11:03:00 30 (min) Purpose code: 3  
LOG : 8775.20 8776.20 1.60 Area code : 1  
FDEPTH: 190 192 GearCond.code:  
BDEPTH: 190 192 Validity code:  
Towing dir: 270 Wire out: 600 m Speed: 310 kn\*10  
Sorted: 64 Kg Total catch: 186.00 CATCH/HOUR: 372.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP. NO. |
|-----------------------------|----------------|-------------|-----------|
|                             | weight numbers |             |           |
| Trachurus capensis          | 265.20         | 1728        | 71.29     |
| Merluccius capensis, female | 43.60          | 118         | 11.72     |
| Merluccius capensis, male   | 19.40          | 84          | 5.22      |
| Squalus blainvillei         | 9.60           | 24          | 2.58      |
| Raja straeleni              | 8.40           | 12          | 2.26      |
| Lophius upsicephalus        | 6.40           | 12          | 1.72      |
| Mustelus palumbes           | 6.20           | 2           | 1.67      |
| Sufflogobius bibarbatu      | 3.60           | 624         | 0.97      |
| Lepidopus caudatus          | 3.60           | 96          | 0.97      |
| Sepia australis             | 2.40           | 240         | 0.65      |
| Zeus capensis               | 2.40           | 36          | 0.65      |
| Austroglossus microlepis    | 1.20           | 2           | 0.32      |
| Total                       | 372.00         | 100.02      |           |

PROJECT STATION: 798  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2738  
start stop duration Long E 1445  
TIME :06:25:00 06:55:00 30 (min) Purpose code: 3  
LOG :8915.50 8916.80 1.60 Area code : 1  
FDEPTH: 339 334 GearCond.code:  
BDEPTH: 339 334 Validity code:  
Towing dir: 360 Wire out:1050 m Speed:300 kn\*10  
Sorted: 58 Kg Total catch: 381.90 CATCH/HOUR: 763.80

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 400.80     | 2310    | 52.47       | 82       |
| Merluccius paradoxus, male   | 268.80     | 1250    | 35.19       | 81       |
| Todarodes sagittatus         | 18.20      | 26      | 2.38        |          |
| Trachurus capensis           | 17.00      | 92      | 2.23        |          |
| PORTUNIDAE                   | 16.90      | 794     | 2.21        |          |
| Coelorrinchus fasciatus      | 15.60      | 274     | 2.04        |          |
| Malacocephalus laevis        | 9.80       | 14      | 1.28        |          |
| Holohalaelurus regani        | 7.80       | 14      | 1.02        |          |
| Genypterus capensis          | 3.00       | 6       | 0.39        |          |
| Raja confundens              | 2.60       | 14      | 0.34        |          |
| Maurollicus muelleri         | 1.40       | 0       | 0.18        |          |
| Squilla aculeata calmani     | 1.30       | 144     | 0.17        |          |
| Helicolenus dactylopterus    | 0.60       | 26      | 0.08        |          |
| Total                        | 763.80     |         | 99.98       |          |

PROJECT STATION: 799  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2732  
start stop duration Long E 1451  
TIME :08:15:00 08:45:00 30 (min) Purpose code: 3  
LOG :8924.80 8926.10 1.50 Area code : 1  
FDEPTH: 304 310 GearCond.code:  
BDEPTH: 304 310 Validity code:  
Towing dir: 360 Wire out: 900 m Speed:310 kn\*10  
Sorted: 88 Kg Total catch: 306.80 CATCH/HOUR: 613.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius paradoxus        | 473.40     | 4112    | 77.15       | 85       |
| Merluccius capensis, female | 40.60      | 34      | 6.62        | 84       |
| Coelorrinchus fasciatus     | 27.90      | 460     | 4.55        |          |
| PORTUNIDAE                  | 16.20      | 522     | 2.64        |          |
| Todarodes sagittatus        | 16.20      | 28      | 2.64        |          |
| MYCTOPHIDAE                 | 9.90       |         | 1.61        |          |
| Holohalaelurus regani       | 9.00       | 18      | 1.47        |          |
| Merluccius capensis, male   | 8.00       | 8       | 1.30        | 83       |
| Squilla aculeata calmani    | 4.50       | 414     | 0.73        |          |
| Galeus polli                | 3.60       | 18      | 0.59        |          |
| Trachurus capensis          | 2.70       | 10      | 0.44        |          |
| Genypterus capensis         | 1.60       | 2       | 0.26        |          |
| CALAPPIDAE                  | 0.00       | 10      |             |          |
| Total                       | 613.60     |         | 100.00      |          |

PROJECT STATION: 800  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2718  
start stop duration Long E 1454  
TIME :11:08:00 11:38:00 30 (min) Purpose code: 3  
LOG :8947.80 8949.20 1.30 Area code : 1  
FDEPTH: 201 201 GearCond.code:  
BDEPTH: 201 201 Validity code:  
Towing dir: 160 Wire out: 600 m Speed:260 kn\*10  
Sorted: 77 Kg Total catch: 272.30 CATCH/HOUR: 544.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| MYCTOPHIDAE                 | 235.20     |         | 43.37       |          |
| Trachurus capensis          | 167.20     | 766     | 30.70       | 88       |
| Merluccius capensis, female | 60.00      | 466     | 11.02       | 87       |
| Merluccius capensis, male   | 32.20      | 286     | 5.21        | 86       |
| Todarodes sagittatus        | 17.20      | 30      | 3.16        |          |
| Callorhynchus capensis      | 12.40      | 6       | 2.28        |          |
| Sufflogobius bibarbatus     | 7.60       | 990     | 1.40        |          |
| Chelidonichthys capensis    | 6.80       | 16      | 1.25        |          |
| PORTUNIDAE                  | 4.60       | 76      | 0.84        |          |
| C R A B S                   | 0.40       | 16      | 0.07        |          |
| Total                       | 544.60     |         | 100.00      |          |

PROJECT STATION: 801  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2715  
start stop duration Long E 1445  
TIME :13:15:00 13:45:00 30 (min) Purpose code: 3  
LOG :8962.00 8963.30 1.51 Area code : 1  
FDEPTH: 276 276 GearCond.code: 6  
BDEPTH: 276 276 Validity code: 9  
Towing dir: 360 Wire out: 600 m Speed:293 kn\*10  
Sorted: 13 Kg Total catch: 13.40 CATCH/HOUR: 26.80

| SPECIES              | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|----------------------|------------|---------|-------------|----------|
|                      | weight     | numbers |             |          |
| MYCTOPHIDAE          | 24.80      |         | 92.54       |          |
| Todarodes sagittatus | 1.20       | 4       | 4.48        |          |
| Merluccius capensis  | 0.80       | 4       | 2.99        |          |
| Total                | 26.80      |         | 100.01      |          |

PROJECT STATION: 802  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2715  
start stop duration Long E 1458  
TIME :15:00:00 15:30:00 30 (min) Purpose code: 3  
LOG :8971.10 8972.60 1.43 Area code : 1  
FDEPTH: 310 308 GearCond.code:  
BDEPTH: 310 308 Validity code:  
Towing dir: 360 Wire out:1000 m Speed:300 kn\*10  
Sorted: 137 Kg Total catch: 466.00 CATCH/HOUR: 932.00

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius capensis, female  | 245.40     | 232     | 26.33       | 93       |
| Merluccius paradoxus, female | 226.40     | 912     | 24.29       | 90       |
| Trachurus capensis           | 157.80     | 734     | 16.93       | 94       |
| Merluccius paradoxus         | 83.00      | 1272    | 8.91        | 91       |
| Merluccius capensis, male    | 71.40      | 54      | 7.66        | 92       |
| Merluccius paradoxus, male   | 51.60      | 224     | 5.54        | 89       |
| Todarodes sagittatus         | 38.00      | 108     | 4.08        |          |
| PORTUNIDAE                   | 27.20      | 1136    | 2.92        |          |
| Coelorrinchus fasciatus      | 15.60      | 238     | 1.67        |          |
| Lophius upsicephalus         | 9.60       | 6       | 1.03        |          |
| Holohalaelurus regani        | 4.00       | 6       | 0.43        |          |
| Galeus polli                 | 2.00       | 20      | 0.21        |          |
| Total                        | 932.00     |         | 100.00      |          |

PROJECT STATION: 803  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2714  
start stop duration Long E 1429  
TIME :17:09:00 17:39:00 30 (min) Purpose code: 3  
LOG :8984.10 8985.60 1.50 Area code : 1  
FDEPTH: 361 360 GearCond.code:  
BDEPTH: 361 360 Validity code:  
Towing dir: 360 Wire out:1100 m Speed:295 kn\*10  
Sorted: 55 Kg Total catch: 580.50 CATCH/HOUR: 1161.00

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 556.50     | 2226    | 47.93       | 96       |
| Merluccius paradoxus, male   | 336.00     | 1282    | 28.94       | 95       |
| Todarodes sagittatus         | 98.80      | 190     | 8.51        |          |
| Coelorrinchus fasciatus      | 77.80      | 442     | 6.70        |          |
| PORTUNIDAE                   | 29.40      | 840     | 2.53        |          |
| Trachurus capensis           | 25.20      | 84      | 2.37        |          |
| Helicolenus dactylopterus    | 14.80      | 316     | 1.27        |          |
| Holohalaelurus regani        | 13.20      | 22      | 1.14        |          |
| Centrolophus niger           | 6.20       | 2       | 0.53        |          |
| Galeus polli                 | 2.10       | 42      | 0.18        |          |
| Genypterus capensis          | 1.00       | 2       | 0.09        |          |
| Total                        | 1161.00    |         | 99.99       |          |

PROJECT STATION: 804  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2714  
start stop duration Long E 1416  
TIME :19:20:00 19:50:00 30 (min) Purpose code: 3  
LOG :8997.30 8998.50 1.90 Area code : 1  
FDEPTH: 409 407 GearCond.code:  
BDEPTH: 409 407 Validity code:  
Towing dir: 340 Wire out:1200 m Speed:330 kn\*10  
Sorted: 61 Kg Total catch: 398.39 CATCH/HOUR: 796.78

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 439.40     | 1626    | 55.15       | 98       |
| Merluccius paradoxus, male   | 286.60     | 1196    | 36.22       | 97       |
| Coelorrinchus fasciatus      | 37.80      | 274     | 4.74        |          |
| Todarodes sagittatus         | 15.60      | 52      | 1.96        |          |
| Helicolenus dactylopterus    | 7.80       | 26      | 0.98        |          |
| PORTUNIDAE                   | 6.50       | 156     | 0.82        |          |
| S H R I M P S                | 0.52       | 274     | 0.07        |          |
| Selachophidium guentheri     | 0.28       | 14      | 0.04        |          |
| Malacocephalus laevis        | 0.28       | 14      | 0.04        |          |
| Total                        | 796.78     |         | 100.02      |          |

PROJECT STATION: 805  
DATE:29/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2707  
start stop duration Long E 1404  
TIME :22:05:00 22:35:00 30 (min) Purpose code: 3  
LOG :9009.20 9010.40 1.80 Area code : 1  
FDEPTH: 452 453 GearCond.code:  
BDEPTH: 452 453 Validity code:  
Towing dir: 320 Wire out:1350 m Speed:330 kn\*10  
Sorted: 91 Kg Total catch: 90.55 CATCH/HOUR: 181.10

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 117.40     | 260     | 64.83       | 100      |
| Centrolophus squamosus       | 24.00      | 2       | 13.25       |          |
| Merluccius paradoxus, male   | 20.00      | 54      | 11.04       | 99       |
| Helicolenus dactylopterus    | 6.00       | 16      | 3.31        |          |
| Lithodes ferox               | 3.00       | 4       | 1.66        |          |
| Deania profundorum           | 2.80       | 4       | 1.55        |          |
| Coelorrinchus fasciatus      | 2.60       | 36      | 1.44        |          |
| Etmopterus pusillus          | 2.00       | 4       | 1.10        |          |
| Photichthys argenteus        | 1.00       | 62      | 0.55        |          |
| Nesimia micronychodon        | 0.80       | 22      | 0.44        |          |
| Selachophidium guentheri     | 0.70       | 6       | 0.39        |          |
| Norcanthus saxipinis         | 0.20       | 6       | 0.22        |          |
| Etmopterus lucifer           | 0.20       | 2       | 0.11        |          |
| Tripteryophyllus gilchristi  | 0.20       | 6       | 0.11        |          |
| Etmopterus lucifer           | 0.20       | 2       | 0.11        |          |
| Total                        | 181.30     |         | 100.11      |          |

PROJECT STATION: 806  
DATE:31/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2656  
start stop duration Long E 1417  
TIME :08:15:00 08:45:00 30 (min) Purpose code: 3  
LOG :9104.90 9106.00 1.50 Area code : 1  
FDEPTH: 362 363 GearCond.code:  
BDEPTH: 362 363 Validity code:  
Towing dir: 360 Wire out:1100 m Speed:310 kn\*10  
Sorted: 56 Kg Total catch: 366.20 CATCH/HOUR: 732.40

| SPECIES                   | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------------|------------|---------|-------------|----------|
|                           | weight     | numbers |             |          |
| Merluccius paradoxus      | 646.10     | 2366    | 88.22       | 101      |
| PORTUNIDAE                | 37.70      | 910     | 5.15        |          |
| Trachurus capensis        | 19.50      | 92      | 2.66        |          |
| Todarodes sagittatus      | 11.70      | 26      | 1.60        |          |
| Helicolenus dactylopterus | 9.10       | 312     | 1.24        |          |
| S H R I M P S             | 5.20       |         | 0.71        |          |
| Genypterus capensis       | 2.40       | 2       | 0.33        |          |
| MYCTOPHIDAE               | 1.30       |         | 0.18        |          |
| Squilla aculeata calmani  | 0.00       | 14      |             |          |
| Total                     | 733.00     |         | 100.09      |          |

PROJECT STATION: 807  
DATE:31/10/91 GEAR TYPE: BT No:1 POSITION:Lat S 2647  
start stop duration Long E 1429  
TIME :11:32:00 12:02:00 30 (min) Purpose code: 3  
LOG :9122.10 9123.50 1.50 Area code : 1  
FDEPTH: 300 301 GearCond.code:  
BDEPTH: 300 301 Validity code:  
Towing dir: 10 Wire out: 900 m Speed:300 kn\*10  
Sorted: 85 Kg Total catch: 172.00 CATCH/HOUR: 344.00

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 155.20     | 328     | 45.12       | 104      |
| Merluccius capensis, female  | 64.00      | 60      | 18.60       | 103      |
| Coelorrinchus fasciatus      | 39.20      | 440     | 11.40       |          |
| Galeorhinus galeus           | 17.40      | 2       | 5.06        |          |
| Genypterus capensis          | 16.60      | 16      | 4.83        |          |
| Todarodes sagittatus         | 15.20      | 16      | 4.42        |          |
| Merluccius capensis, male    | 14.80      | 16      | 4.30        | 102      |
| PORTUNIDAE                   | 11.20      | 632     | 3.26        |          |
| Trachurus capensis           | 5.60       | 16      | 1.63        |          |
| Helicolenus dactylopterus    | 3.20       | 32      | 0.93        |          |
| Sufflogobius bibarbatus      | 1.60       | 432     | 0.47        |          |
| Total                        | 344.00     |         | 100.02      |          |

DATE: 31/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2620 Long E 1434  
 start stop duration  
 TIME : 15:50:00 16:20:00 30 (min) Purpose code: 3  
 LOG : 9152.30 9153.50 1.48 Area code : 1  
 FDEPTH: 259 258 GearCond.code: 8  
 BDEPTH: 259 258 Validity code: 9  
 Towing dir: 300 Wire out: 900 m Speed: 278 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES         | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------|----------------|-------------|----------|
|                 | weight numbers |             |          |
| N O C A T C H E | 0.00           |             |          |
| Total           |                |             |          |

PROJECT STATION: 809  
 DATE: 31/10/91 GEAR TYPE: BT No:1 POSITION: Lat S 2621 Long E 1423  
 start stop duration  
 TIME : 19:57:00 20:32:00 35 (min) Purpose code: 3  
 LOG : 9172.00 9173.70 1.60 Area code : 1  
 FDEPTH: 286 293 GearCond.code: 8  
 BDEPTH: 286 293 Validity code: 9  
 Towing dir: 170 Wire out: 900 m Speed: 270 kn\*10

Sorted: 107 Kg Total catch: 267.88 CATCH/HOUR: 459.22

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius capensis, female  | 158.57         | 288         | 34.53    |
| Merluccius paradoxus, female | 120.43         | 537         | 26.22    |
| Merluccius capensis, male    | 118.29         | 202         | 25.76    |
| Sufflogobius bibarbatatus    | 17.57          | 4440        | 3.83     |
| Coelorinchus fasciatus       | 15.43          | 245         | 3.36     |
| Squilla aculeata calmani     | 11.14          | 694         | 2.43     |
| Merluccius paradoxus, male   | 8.57           | 48          | 1.87     |
| PORTUNIDAE                   | 2.57           | 86          | 0.56     |
| Todarodes sagittatus         | 2.14           | 5           | 0.47     |
| Trachurus capensis           | 2.14           | 9           | 0.47     |
| Galeus polli                 | 1.29           | 39          | 0.28     |
| Lepidopus caudatus           | 1.03           | 5           | 0.22     |
| Mauriculus muelleri          | 0.05           | 48          | 0.01     |
| Total                        | 459.22         |             | 100.01   |

PROJECT STATION: 810  
 DATE: 1/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2620 Long E 1408  
 start stop duration  
 TIME : 00:15:00 00:45:00 30 (min) Purpose code: 3  
 LOG : 9192.70 9193.90 1.39 Area code : 1  
 FDEPTH: 329 327 GearCond.code: 8  
 BDEPTH: 329 327 Validity code: 9  
 Towing dir: 360 Wire out: 1050 m Speed: 288 kn\*10

Sorted: 53 Kg Total catch: 371.70 CATCH/HOUR: 743.40

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius paradoxus, female | 434.00         | 1260        | 58.38    |
| Coelorinchus fasciatus       | 140.00         | 2128        | 18.83    |
| Merluccius capensis          | 57.40          | 70          | 7.72     |
| PORTUNIDAE                   | 53.20          |             | 7.16     |
| Merluccius paradoxus, male   | 29.40          | 70          | 3.95     |
| Galeus polli                 | 14.00          | 364         | 1.88     |
| Helicolenus dactylopterus    | 12.60          | 336         | 1.69     |
| Sufflogobius bibarbatatus    | 2.80           | 840         | 0.38     |
| Total                        | 743.40         |             | 99.99    |

PROJECT STATION: 811  
 DATE: 1/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2618 Long E 1346  
 start stop duration  
 TIME : 07:00:00 07:30:00 30 (min) Purpose code: 3  
 LOG : 9222.00 9223.50 1.50 Area code : 1  
 FDEPTH: 390 392 GearCond.code: 8  
 BDEPTH: 390 392 Validity code: 9  
 Towing dir: 350 Wire out: 1200 m Speed: 300 kn\*10

Sorted: 56 Kg Total catch: 366.90 CATCH/HOUR: 733.80

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius paradoxus, female | 495.30         | 1222        | 67.50    |
| Coelorinchus fasciatus       | 68.90          | 1028        | 9.39     |
| Merluccius paradoxus, male   | 59.80          | 170         | 8.15     |
| Todarodes sagittatus         | 55.90          | 196         | 7.62     |
| Helicolenus dactylopterus    | 20.80          | 404         | 2.83     |
| PORTUNIDAE                   | 15.60          | 326         | 2.13     |
| Shrimps, small, non comm.    | 7.80           |             | 1.06     |
| Galeus polli                 | 5.20           | 40          | 0.71     |
| Selachophidium guentheri     | 3.90           | 92          | 0.53     |
| Photichthys argenteus        | 0.60           | 26          | 0.08     |
| MYCTOPHIDAE                  | 0.00           | 26          |          |
| Total                        | 733.80         |             | 100.00   |

PROJECT STATION: 812  
 DATE: 1/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2600 Long E 1341  
 start stop duration  
 TIME : 13:07:00 13:37:00 30 (min) Purpose code: 3  
 LOG : 9266.40 9268.10 1.43 Area code : 1  
 FDEPTH: 470 479 GearCond.code: 8  
 BDEPTH: 470 479 Validity code: 9  
 Towing dir: 360 Wire out: 1300 m Speed: 279 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------|----------------|-------------|----------|
|         | weight numbers |             |          |
| Total   |                |             |          |

PROJECT STATION: 813  
 DATE: 1/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2600 Long E 1351  
 start stop duration  
 TIME : 15:55:00 16:25:00 30 (min) Purpose code: 3  
 LOG : 9279.70 9281.40 1.43 Area code : 1  
 FDEPTH: 364 356 GearCond.code: 8  
 BDEPTH: 364 356 Validity code: 9  
 Towing dir: 88 Wire out: 1100 m Speed: 288 kn\*10

Sorted: 119 Kg Total catch: 320.70 CATCH/HOUR: 641.40

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius paradoxus, female | 325.40         | 908         | 50.73    |
| Helicolenus dactylopterus    | 98.60          | 948         | 15.37    |
| Lophius upsicephalus         | 66.00          | 14          | 10.29    |
| PORTUNIDAE                   | 50.00          | 1088        | 7.80     |
| Merluccius paradoxus, male   | 36.00          | 100         | 5.61     |
| Trachurus capensis           | 21.40          | 80          | 3.34     |
| Coelorinchus fasciatus       | 20.00          | 420         | 3.12     |
| Galeus polli                 | 17.40          | 306         | 2.71     |
| Selachophidium guentheri     | 3.40           | 100         | 0.53     |
| RAJIDAE                      | 2.60           | 26          | 0.41     |
| Squilla aculeata calmani     | 0.60           | 40          | 0.09     |
| Total                        | 641.40         |             | 100.00   |

PROJECT STATION: 814  
 DATE: 1/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2066 Long E 1407  
 start stop duration  
 TIME : 18:34:00 19:04:00 30 (min) Purpose code: 3  
 LOG : 9295.30 9296.80 1.40 Area code : 1  
 FDEPTH: 274 266 GearCond.code: 8  
 BDEPTH: 274 266 Validity code: 9  
 Towing dir: 90 Wire out: 850 m Speed: 280 kn\*10

Sorted: 281 Kg Total catch: 281.20 CATCH/HOUR: 562.40

| SPECIES                   | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------------|----------------|-------------|----------|
|                           | weight numbers |             |          |
| Merluccius capensis       | 482.20         | 850         | 85.74    |
| Lophius upsicephalus      | 42.80          | 16          | 7.61     |
| Trachurus capensis        | 34.00          | 76          | 6.05     |
| Helicolenus dactylopterus | 2.00           | 2           | 0.36     |
| Lepidopus caudatus        | 1.00           | 10          | 0.18     |
| Galeus polli              | 0.40           | 2           | 0.07     |
| Total                     | 562.40         |             | 100.01   |

PROJECT STATION: 815  
 DATE: 1/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2600 Long E 1418  
 start stop duration  
 TIME : 21:00:00 21:30:00 30 (min) Purpose code: 3  
 LOG : 9308.20 9309.50 1.40 Area code : 1  
 FDEPTH: 207 232 GearCond.code: 8  
 BDEPTH: 207 232 Validity code: 9  
 Towing dir: 270 Wire out: 600 m Speed: 290 kn\*10

Sorted: 35 Kg Total catch: 293.40 CATCH/HOUR: 586.80

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis         | 424.60         | 3124        | 72.36    |
| Merluccius capensis, female | 104.50         | 56          | 17.81    |
| Merluccius capensis, male   | 20.90          | 22          | 3.56     |
| Todarodes sagittatus        | 11.00          | 22          | 1.87     |
| Lepidopus caudatus          | 11.00          | 88          | 1.87     |
| Trachurus capensis          | 8.80           | 44          | 1.50     |
| Thyrssites atun             | 3.40           | 2           | 0.58     |
| Lophius upsicephalus        | 2.60           | 2           | 0.44     |
| Total                       | 586.80         |             | 99.99    |

PROJECT STATION: 816  
 DATE: 1/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2559 Long E 1433  
 start stop duration  
 TIME : 23:55:00 00:25:00 30 (min) Purpose code: 3  
 LOG : 9330.30 9331.80 1.59 Area code : 1  
 FDEPTH: 178 176 GearCond.code: 8  
 BDEPTH: 178 176 Validity code: 9  
 Towing dir: 270 Wire out: 550 m Speed: 303 kn\*10

Sorted: 52 Kg Total catch: 206.00 CATCH/HOUR: 412.00

| SPECIES                   | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------------|----------------|-------------|----------|
|                           | weight numbers |             |          |
| Merluccius capensis       | 376.00         | 3340        | 81.26    |
| MYCTOPHIDAE               | 24.00          |             | 5.83     |
| Sufflogobius bibarbatatus | 8.00           | 1336        | 1.94     |
| Chelidonichthys capensis  | 4.00           | 8           | 0.97     |
| Total                     | 412.00         |             | 100.00   |

PROJECT STATION: 817  
 DATE: 2/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2540 Long E 1420  
 start stop duration  
 TIME : 06:34:00 07:04:00 30 (min) Purpose code: 3  
 LOG : 9388.10 9389.50 1.40 Area code : 1  
 FDEPTH: 188 187 GearCond.code: 8  
 BDEPTH: 188 187 Validity code: 9  
 Towing dir: 150 Wire out: 600 m Speed: 290 kn\*10

Sorted: 37 Kg Total catch: 232.70 CATCH/HOUR: 465.40

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, male   | 239.40         | 1296        | 51.44    |
| Merluccius capensis, female | 91.80          | 360         | 19.72    |
| Sufflogobius bibarbatatus   | 77.40          | 7354        | 16.63    |
| Chelidonichthys capensis    | 23.40          | 18          | 5.03     |
| Hexanchus griseus           | 21.00          | 2           | 4.51     |
| Coelorinchus fasciatus      | 9.00           | 108         | 1.93     |
| Callorhynchus capensis      | 3.40           | 2           | 0.73     |
| Total                       | 465.40         |             | 99.99    |

DATE: 2/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2540 Long E 1400  
 start stop duration Purpose code: 3  
 TIME :09:20:00 09:50:00 30 (min) Area code : 1  
 LOG :9410.70 9412.00 1.50 GearCond.code: 1  
 FDEPTH: 265 262 Validity code:  
 BDEPTH: 265 262  
 Towing dir: 340 Wire out: 750 m Speed:300 kn\*10

Sorted: 121 Kg Total catch: 419.60 CATCH/HOUR: 839.20

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|-------------|----------|
| weight                      | numbers    |             |          |
| Merluccius capensis, female | 574.60     | 728         | 68.47    |
| Merluccius capensis, male   | 158.20     | 240         | 18.85    |
| Coelorinchus fasciatus      | 28.60      | 412         | 3.41     |
| Todarodes sagittatus        | 20.20      | 82          | 2.41     |
| Lophius upsicephalus        | 16.40      | 8           | 1.95     |
| Merluccius paradoxus        | 9.80       | 68          | 1.17     |
| Trachurus capensis          | 8.20       | 38          | 0.98     |
| Schedophilus huttoni        | 8.00       | 2           | 0.95     |
| Sufflogobius bibarbatatus   | 6.80       | 540         | 0.81     |
| PORTUNIDAE                  | 4.60       | 56          | 0.55     |
| Squilla acuelata calmani    | 2.20       | 90          | 0.26     |
| Krill                       | 1.60       |             | 0.19     |
| Mauroliscus muelleri        | 0.00       | 16          |          |
| Total                       | 839.20     |             | 100.00   |

DATE: 2/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2517 Long E 1353  
 start stop duration Purpose code: 3  
 TIME :19:05:00 19:35:00 30 (min) Area code : 1  
 LOG :9471.60 9472.90 1.40 GearCond.code: 1  
 FDEPTH: 233 241 Validity code:  
 BDEPTH: 233 241  
 Towing dir: 270 Wire out: 700 m Speed:280 kn\*10

Sorted: 57 Kg Total catch: 768.15 CATCH/HOUR: 1536.30

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|-------------|----------|
| weight                      | numbers    |             |          |
| Merluccius capensis, female | 1088.10    | 4402        | 70.83    |
| Merluccius capensis, male   | 270.00     | 1782        | 17.57    |
| Sufflogobius bibarbatatus   | 70.20      |             | 4.57     |
| Todarodes sagittatus        | 67.50      | 108         | 4.39     |
| Lophius upsicephalus        | 18.90      | 54          | 1.23     |
| Helicolenus dactylopterus   | 8.10       | 54          | 0.53     |
| Galeus polli                | 5.40       | 298         | 0.95     |
| Coelorinchus fasciatus      | 2.70       | 162         | 0.18     |
| PORTUNIDAE                  | 2.70       | 108         | 0.18     |
| Squilla acuelata calmani    | 2.70       | 108         | 0.18     |
| PORTUNIDAE                  | 0.00       | 54          |          |
| Total                       | 1536.30    |             | 100.01   |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2456 Long E 1352  
 start stop duration Purpose code: 3  
 TIME :06:28:00 06:58:00 30 (min) Area code : 2  
 LOG :9555.50 9557.00 1.60 GearCond.code: 2  
 FDEPTH: 207 216 Validity code:  
 BDEPTH: 207 216  
 Towing dir: 360 Wire out: 600 m Speed:300 kn\*10

Sorted: 48 Kg Total catch: 114.70 CATCH/HOUR: 229.40

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|-------------|----------|
| weight                      | numbers    |             |          |
| Merluccius capensis, female | 160.00     | 650         | 69.75    |
| Merluccius capensis, male   | 28.00      | 130         | 12.21    |
| Sufflogobius bibarbatatus   | 14.00      | 860         | 6.10     |
| Coelorinchus fasciatus      | 11.00      | 220         | 4.80     |
| Trachurus capensis          | 6.40       | 22          | 2.79     |
| Lophius upsicephalus        | 6.00       | 10          | 2.62     |
| Todarodes sagittatus        | 3.00       | 10          | 1.31     |
| PORTUNIDAE                  | 1.00       | 46          | 0.44     |
| Total                       | 229.40     |             | 100.02   |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2454 Long E 1346  
 start stop duration Purpose code: 3  
 TIME :07:57:00 08:27:00 30 (min) Area code : 2  
 LOG :9563.70 9565.00 1.40 GearCond.code: 2  
 FDEPTH: 287 287 Validity code:  
 BDEPTH: 287 287  
 Towing dir: 360 Wire out: 900 m Speed:280 kn\*10

Sorted: 144 Kg Total catch: 365.76 CATCH/HOUR: 731.52

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|-------------|----------|
| weight                      | numbers    |             |          |
| Merluccius capensis, female | 433.44     | 1086        | 59.25    |
| Merluccius capensis, male   | 136.64     | 398         | 18.68    |
| Trachurus capensis          | 41.60      | 86          | 5.69     |
| Helicolenus dactylopterus   | 29.68      | 846         | 4.06     |
| Coelorinchus fasciatus      | 24.00      | 358         | 3.29     |
| Merluccius paradoxus        | 22.96      | 124         | 3.14     |
| PORTUNIDAE                  | 16.24      | 314         | 2.22     |
| Lophius upsicephalus        | 15.68      | 22          | 2.14     |
| Galeus polli                | 6.16       | 246         | 0.84     |
| Todarodes sagittatus        | 5.04       | 16          | 0.69     |
| Total                       | 731.52     |             | 100.00   |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2453 Long E 1342  
 start stop duration Purpose code: 3  
 TIME :09:20:00 09:55:00 35 (min) Area code : 2  
 LOG :9570.20 9571.60 1.60 GearCond.code: 2  
 FDEPTH: 357 363 Validity code:  
 BDEPTH: 357 363  
 Towing dir: 10 Wire out:1050 m Speed:290 kn\*10

Sorted: 135 Kg Total catch: 400.90 CATCH/HOUR: 687.26

| SPECIES                      | CATCH/HOUR | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|-------------|----------|
| weight                       | numbers    |             |          |
| Merluccius capensis, female  | 357.43     | 273         | 52.01    |
| Merluccius paradoxus, female | 97.71      | 288         | 14.22    |
| Merluccius capensis, male    | 82.29      | 98          | 11.97    |
| Coelorinchus fasciatus       | 39.60      |             | 5.76     |
| Todarodes sagittatus         | 26.23      | 57          | 3.82     |
| Helicolenus dactylopterus    | 25.71      | 386         | 3.74     |
| Galeus polli                 | 12.34      | 226         | 1.80     |
| Trachurus capensis           | 11.83      | 26          | 1.72     |
| PORTUNIDAE                   | 10.29      | 329         | 1.50     |
| Merluccius paradoxus, male   | 10.29      | 26          | 1.50     |
| Squilla acuelata calmani     | 5.14       | 365         | 0.75     |
| Selachophidium guentheri     | 4.11       | 93          | 0.60     |
| Lithodes ferrox              | 2.23       | 2           | 0.32     |
| Ebinania costaeanae          | 2.06       | 10          | 0.30     |
| Total                        | 687.26     |             | 100.01   |

DATE: 2/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2531 Long E 1348  
 start stop duration Purpose code: 3  
 TIME :14:40:00 15:10:00 30 (min) Area code : 1  
 LOG :9443.60 9445.30 1.37 GearCond.code: 1  
 FDEPTH: 454 463 Validity code:  
 BDEPTH: 454 463  
 Towing dir: 360 Wire out:1300 m Speed:273 kn\*10

Sorted: 81 Kg Total catch: 4112.00 CATCH/HOUR: 8224.00

| SPECIES                      | CATCH/HOUR | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|-------------|----------|
| weight                       | numbers    |             |          |
| Hoplostethus mediterraneus   | 8000.00    | 228572      | 97.28    |
| Merluccius paradoxus, female | 105.00     | 204         | 1.28     |
| Merluccius capensis, female  | 77.80      | 60          | 0.95     |
| Merluccius capensis, male    | 16.60      | 10          | 0.20     |
| Neoharriotta pinnata         | 15.60      | 2           | 0.19     |
| Merluccius paradoxus, male   | 9.00       | 22          | 0.11     |
| Total                        | 8224.00    |             | 100.01   |

DATE: 2/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2519 Long E 1346  
 start stop duration Purpose code: 3  
 TIME :17:15:00 17:45:00 30 (min) Area code : 1  
 LOG :9460.00 9461.50 1.48 GearCond.code: 1  
 FDEPTH: 300 292 Validity code:  
 BDEPTH: 300 292  
 Towing dir: 360 Wire out:1000 m Speed:292 kn\*10

Sorted: 154 Kg Total catch: 925.76 CATCH/HOUR: 1851.52

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|-------------|----------|
| weight                      | numbers    |             |          |
| Merluccius capensis, female | 1080.32    | 3636        | 58.35    |
| Merluccius capensis, male   | 451.84     | 1690        | 24.40    |
| Merluccius paradoxus        | 120.32     | 768         | 6.50     |
| Coelorinchus fasciatus      | 66.56      | 960         | 3.59     |
| Helicolenus dactylopterus   | 30.72      | 780         | 1.66     |
| Lophius upsicephalus        | 22.40      | 14          | 1.21     |
| Todarodes sagittatus        | 21.76      | 64          | 1.18     |
| Trachurus capensis          | 17.92      | 26          | 0.97     |
| PORTUNIDAE                  | 14.08      | 396         | 0.76     |
| Raja confundens             | 8.96       | 12          | 0.48     |
| Galeus polli                | 8.96       | 422         | 0.48     |
| Sufflogobius bibarbatatus   | 3.84       |             | 0.21     |
| Notacanthus sexspinis       | 2.56       | 140         | 0.14     |
| Squilla acuelata calmani    | 1.28       | 76          | 0.07     |
| Total                       | 1851.52    |             | 100.00   |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2449 Long E 1335 PROJECT STATION: 826  
TIME :11:05:00 11:35:00 30 (min) Purpose code: 3  
LOG :9579.20 9580.70 1.50 Area code : 2  
FDEPTH: 452 449 GearCond.code:  
BDEPTH: 452 449 Validity code:  
Towing dir: 360 Wire out:1350 m Speed:300 kn\*10  
Sorted: 94 Kg Total catch: 272.10 CATCH/HOUR: 544.20

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 236.00     | 666     | 43.37       | 149      |
| Trachyrhinus scabrus         | 50.60      | 320     | 9.30        |          |
| Galeus polli                 | 38.60      | 306     | 7.09        |          |
| Todarodes sagittatus         | 33.40      | 120     | 6.14        |          |
| Deania calcea                | 33.40      | 46      | 6.14        |          |
| Etmopterus pusillus          | 33.20      | 4       | 6.10        |          |
| Coelorrhinus fasciatus       | 28.60      | 454     | 5.26        |          |
| Roplostethus mediterraneus   | 21.40      | 360     | 3.93        |          |
| Selachophidium guentheri     | 16.60      | 274     | 3.05        |          |
| RAJIDAE                      | 13.40      | 20      | 2.46        |          |
| Helicolenus dactylopterus    | 10.00      | 34      | 1.84        |          |
| Merluccius paradoxus, male   | 6.60       | 14      | 1.21        | 148      |
| Lithodes ferax               | 6.60       | 14      | 1.21        |          |
| Epigonus denticulatus        | 6.60       | 280     | 1.21        |          |
| Notacanthus sexspinis        | 5.40       | 6       | 0.99        |          |
| Trachurus capensis           | 3.40       | 6       | 0.62        |          |
| Ebinania costaecanarie       | 0.40       | 6       | 0.07        |          |
| Total                        | 544.20     |         | 99.99       |          |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2439 Long E 1329 PROJECT STATION: 827  
TIME :13:35:00 14:05:00 30 (min) Purpose code: 3  
LOG :9590.20 9591.50 1.53 Area code : 2  
FDEPTH: 490 493 GearCond.code:  
BDEPTH: 490 493 Validity code:  
Towing dir: 350 Wire out:1400 m Speed:298 kn\*10  
Sorted: 91 Kg Total catch: 272.20 CATCH/HOUR: 544.40

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 208.80     | 204     | 38.35       | 150      |
| Trachyrhinus scabrus         | 102.00     | 342     | 18.74       |          |
| Todarodes sagittatus         | 49.20      | 90      | 9.04        |          |
| Coelorrhinus fasciatus       | 39.60      | 570     | 7.27        |          |
| Deania calcea                | 28.20      | 24      | 5.18        |          |
| Parapenaeus longirostris     | 24.00      |         | 4.41        |          |
| RAJIDAE                      | 18.00      | 6       | 3.31        |          |
| Lithodes ferax               | 14.40      | 36      | 2.65        |          |
| Etmopterus pusillus          | 14.40      | 12      | 2.65        |          |
| Lophius upsiocephalus        | 11.40      | 6       | 2.09        |          |
| Galeus polli                 | 10.20      | 54      | 1.87        |          |
| Helicolenus dactylopterus    | 7.20       | 24      | 1.32        |          |
| Ebinania costaecanarie       | 6.60       |         | 1.21        |          |
| Selachophidium guentheri     | 6.00       | 102     | 1.10        |          |
| Epigonus denticulatus        | 3.00       | 84      | 0.55        |          |
| Photichthys argenteus        | 0.60       | 60      | 0.11        |          |
| Lampadena sp.                | 0.40       | 18      | 0.07        |          |
| Mullisia microlepis          | 0.40       | 6       | 0.07        |          |
| Total                        | 544.40     |         | 99.99       |          |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2436 Long E 1333 PROJECT STATION: 828  
TIME :15:20:00 15:50:00 30 (min) Purpose code: 3  
LOG :9597.50 9598.90 1.50 Area code : 2  
FDEPTH: 388 380 GearCond.code:  
BDEPTH: 388 380 Validity code:  
Towing dir: 350 Wire out:1200 m Speed:300 kn\*10  
Sorted: 90 Kg Total catch: 299.90 CATCH/HOUR: 599.80

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 301.40     | 874     | 50.25       | 154      |
| Todarodes sagittatus         | 102.60     | 260     | 17.11       |          |
| Merluccius capensis, female  | 66.60      | 66      | 11.10       | 152      |
| Helicolenus dactylopterus    | 32.60      | 346     | 5.44        |          |
| Epigonus denticulatus        | 20.60      | 800     | 3.43        |          |
| Merluccius paradoxus, male   | 18.60      | 54      | 3.10        | 153      |
| Galeus polli                 | 15.00      | 146     | 2.87        |          |
| Coelorrhinus fasciatus       | 12.00      | 234     | 2.00        |          |
| Merluccius capensis, male    | 9.40       | 14      | 1.57        | 151      |
| Trachurus capensis           | 8.00       | 20      | 1.33        |          |
| Selachophidium guentheri     | 7.40       | 106     | 1.23        |          |
| PORTUNIDAE                   | 2.60       | 86      | 0.43        |          |
| Bassanago albescens *        | 2.00       | 6       | 0.33        |          |
| Total                        | 599.80     |         | 99.99       |          |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2435 Long E 1345 PROJECT STATION: 829  
TIME :18:00:00 18:30:00 30 (min) Purpose code: 3  
LOG :9614.00 9615.40 1.70 Area code : 2  
FDEPTH: 326 331 GearCond.code:  
BDEPTH: 326 331 Validity code:  
Towing dir: 350 Wire out:1000 m Speed:310 kn\*10  
Sorted: 195 Kg Total catch: 194.80 CATCH/HOUR: 389.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 224.00     | 262     | 57.49       | 156      |
| Merluccius capensis, male   | 60.80      | 88      | 15.61       | 155      |
| Merluccius paradoxus        | 36.80      | 140     | 9.45        | 157      |
| Coelorrhinus fasciatus      | 34.00      | 612     | 8.73        |          |
| Helicolenus dactylopterus   | 7.20       | 150     | 1.85        |          |
| Todarodes sagittatus        | 6.80       | 12      | 1.75        |          |
| PORTUNIDAE                  | 6.40       | 174     | 1.64        |          |
| Galeus polli                | 4.80       | 120     | 1.23        |          |
| Lophius upsiocephalus       | 4.20       | 6       | 1.08        |          |
| Hyperoglyphe moselii        | 2.40       | 4       | 0.62        |          |
| Squilla aculeata calmani    | 1.80       | 84      | 0.46        |          |
| Epigonus denticulatus       | 0.20       | 10      | 0.05        |          |
| Chlorophthalmus atlanticus  | 0.10       | 4       | 0.03        |          |
| Ebinania costaecanarie      | 0.10       | 2       | 0.03        |          |
| Total                       | 389.60     |         | 100.02      |          |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2434 Long E 1352 PROJECT STATION: 830  
TIME :19:52:00 20:25:00 33 (min) Purpose code: 3  
LOG :9624.50 9625.70 1.70 Area code : 2  
FDEPTH: 251 260 GearCond.code:  
BDEPTH: 251 260 Validity code:  
Towing dir: 360 Wire out: 750 m Speed:310 kn\*10  
Sorted: 55 Kg Total catch: 384.30 CATCH/HOUR: 698.73

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 329.64     | 1476    | 47.18       | 159      |
| Merluccius capensis, male   | 180.73     | 878     | 25.87       | 158      |
| Sufflogobius bibarbatus     | 118.36     | 65295   | 16.94       |          |
| Todarodes sagittatus        | 38.18      | 51      | 5.46        |          |
| Lophius upsiocephalus       | 16.55      | 51      | 2.37        |          |
| Squilla aculeata calmani    | 11.45      | 560     | 1.64        |          |
| Coelorrhinus fasciatus      | 2.55       | 38      | 0.36        |          |
| PORTUNIDAE                  | 1.27       | 38      | 0.18        |          |
| Total                       | 698.73     |         | 100.00      |          |

DATE: 3/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2431 Long E 1356 PROJECT STATION: 831  
TIME :21:30:00 22:00:00 30 (min) Purpose code: 3  
LOG :9632.60 9633.70 1.60 Area code : 2  
FDEPTH: 205 211 GearCond.code:  
BDEPTH: 205 211 Validity code:  
Towing dir: 360 Wire out: 600 m Speed:300 kn\*10  
Sorted: 49 Kg Total catch: 451.80 CATCH/HOUR: 903.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 581.40     | 2124    | 64.34       | 161      |
| Merluccius capensis, male   | 288.00     | 1386    | 31.87       | 160      |
| Sufflogobius bibarbatus     | 14.40      | 1458    | 1.59        |          |
| Lophius upsiocephalus       | 10.80      | 18      | 1.20        |          |
| Coelorrhinus fasciatus      | 7.20       | 90      | 0.80        |          |
| Squilla aculeata calmani    | 1.80       | 54      | 0.20        |          |
| PORTUNIDAE                  | 0.00       | 18      |             |          |
| Total                       | 4603.60    |         | 100.00      |          |

DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2416 Long E 1400 PROJECT STATION: 832  
TIME :06:28:00 06:58:00 30 (min) Purpose code: 3  
LOG :9670.80 9672.20 1.30 Area code : 2  
FDEPTH: 204 209 GearCond.code:  
BDEPTH: 204 209 Validity code:  
Towing dir: 350 Wire out: 600 m Speed:250 kn\*10  
Sorted: 22 Kg Total catch: 328.50 CATCH/HOUR: 657.00

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 372.00     | 2880    | 56.62       | 163      |
| Merluccius capensis, male   | 270.00     | 2850    | 41.10       | 162      |
| Trachurus capensis          | 12.00      | 30      | 1.83        |          |
| Coelorrhinus fasciatus      | 3.00       | 60      | 0.46        |          |
| Squilla aculeata calmani    | 0.00       | 60      |             |          |
| Total                       | 657.00     |         | 100.01      |          |

DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2416 Long E 1350 PROJECT STATION: 833  
TIME :08:25:00 08:55:00 30 (min) Purpose code: 3  
LOG :9682.70 9684.20 1.40 Area code : 2  
FDEPTH: 272 271 GearCond.code:  
BDEPTH: 272 271 Validity code:  
Towing dir: 350 Wire out: 850 m Speed:280 kn\*10  
Sorted: 134 Kg Total catch: 427.52 CATCH/HOUR: 855.04

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 455.68     | 844     | 53.29       | 165      |
| Merluccius capensis, male   | 160.64     | 282     | 18.79       | 164      |
| MYCTOPHIDAE                 | 57.60      |         | 6.74        |          |
| Coelorrhinus fasciatus      | 4.08       |         | 5.39        |          |
| Todarodes sagittatus        | 34.56      | 64      | 4.04        |          |
| Sufflogobius bibarbatus     | 32.00      |         | 3.74        |          |
| Lophius upsiocephalus       | 25.60      | 32      | 2.99        |          |
| Galeus polli                | 19.20      | 358     | 2.25        |          |
| Helicolenus dactylopterus   | 16.00      | 480     | 1.87        |          |
| Squilla aculeata calmani    | 3.84       | 148     | 0.45        |          |
| Lepidopus caudatus          | 3.20       | 12      | 0.37        |          |
| PORTUNIDAE                  | 0.64       | 38      | 0.07        |          |
| Total                       | 855.04     |         | 99.99       |          |

DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2416 Long E 1335 PROJECT STATION: 834  
TIME :11:28:00 11:58:00 30 (min) Purpose code: 3  
LOG :9700.80 9702.40 1.60 Area code : 2  
FDEPTH: 313 308 GearCond.code:  
BDEPTH: 313 308 Validity code:  
Towing dir: 350 Wire out:1000 m Speed:320 kn\*10  
Sorted: 152 Kg Total catch: 224.20 CATCH/HOUR: 448.40

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius capensis, female  | 224.20     | 226     | 50.00       | 168      |
| Helicolenus dactylopterus    | 66.00      | 1714    | 14.72       |          |
| Merluccius capensis, male    | 60.60      | 84      | 13.51       | 167      |
| Merluccius paradoxus, female | 41.40      | 162     | 9.23        | 170      |
| Todarodes sagittatus         | 21.40      | 40      | 4.77        |          |
| Trachurus capensis           | 13.80      | 26      | 3.08        | 166      |
| MYCTOPHIDAE                  | 7.80       |         | 1.74        |          |
| Coelorrhinus fasciatus       | 5.40       | 90      | 1.20        |          |
| Galeus polli                 | 2.80       | 84      | 0.62        |          |
| Epigonus denticulatus        | 2.80       | 82      | 0.62        |          |
| PORTUNIDAE                   | 1.20       | 18      | 0.27        |          |
| Merluccius paradoxus, male   | 1.00       | 4       | 0.22        | 169      |
| Squilla aculeata calmani     | 0.00       | 4       |             |          |
| Total                        | 448.40     |         | 99.98       |          |



PROJECT STATION: 835  
 DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2415 Long E 1322  
 start stop duration  
 TIME :13:43:00 14:13:00 30 (min) Purpose code: 3  
 LOG :9715.70 9717.40 1.45 Area code : 2  
 FDEPTH: 373 368 GearCond.code:  
 BDEPTH: 373 368 Validity code:  
 Towing dir: 350 Wire out:1150 m Speed:285 kn\*10

Sorted: 116 Kg Total catch: 407.30 CATCH/HOOUR: 814.60

| SPECIES                      | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|-------------|---------|-------------|----------|
|                              | weight      | numbers |             |          |
| Merluccius paradoxus, female | 309.40      | 876     | 37.98       | 174      |
| Merluccius capensis, female  | 208.60      | 204     | 25.61       | 172      |
| Beryx splendens              | 187.60      | 630     | 23.03       |          |
| Helicolenus dactylopterus    | 19.00       | 190     | 2.33        |          |
| Todarodes sagittatus         | 17.60       | 36      | 2.16        |          |
| Merluccius paradoxus, male   | 15.40       | 42      | 1.89        | 173      |
| Merluccius capensis, male    | 14.00       | 22      | 1.72        | 171      |
| Schedophilus huttoni         | 12.60       | 8       | 1.55        |          |
| Coelorinchus fasciatus       | 12.00       | 182     | 1.47        |          |
| Galeus polli                 | 5.60        | 42      | 0.69        |          |
| Krill                        | 4.20        |         | 0.52        |          |
| MYCTOPHIDAE                  | 4.20        |         | 0.52        |          |
| Trachurus capensis           | 2.20        | 8       | 0.27        |          |
| Selachophidium guentheri     | 1.40        | 14      | 0.17        |          |
| PORTUNIDAE                   | 0.80        | 14      | 0.10        |          |
| Total                        | 814.60      |         | 100.01      |          |

PROJECT STATION: 836  
 DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2356 Long E 1338  
 start stop duration  
 TIME :16:53:00 17:23:00 30 (min) Purpose code: 3  
 LOG :9740.90 9742.30 1.50 Area code : 2  
 FDEPTH: 248 245 GearCond.code:  
 BDEPTH: 248 245 Validity code:  
 Towing dir: 350 Wire out: 900 m Speed:295 kn\*10

Sorted: 149 Kg Total catch: 413.35 CATCH/HOOUR: 826.70

| SPECIES                     | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|-------------|---------|-------------|----------|
|                             | weight      | numbers |             |          |
| Merluccius capensis, female | 558.00      | 1398    | 67.50       | 177      |
| Merluccius capensis, male   | 219.60      | 582     | 26.56       | 176      |
| Trachurus capensis          | 32.60       | 50      | 3.94        | 175      |
| Helicolenus dactylopterus   | 6.00        | 240     | 0.73        |          |
| Todarodes sagittatus        | 5.40        | 18      | 0.65        |          |
| Sufflogobius bibarbatu      | 1.80        | 192     | 0.22        |          |
| Lepidopus caudatus          | 1.20        | 6       | 0.15        |          |
| Coelorinchus fasciatus      | 1.20        | 36      | 0.15        |          |
| Chlorophthalmus atlanticus  | 0.60        | 30      | 0.07        |          |
| Maurollicus muelleri        | 0.30        |         | 0.04        |          |
| Galeus polli                | 0.00        | 12      |             |          |
| PORTUNIDAE                  | 0.00        | 6       |             |          |
| Total                       | 826.70      |         | 100.01      |          |

PROJECT STATION: 837  
 DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2354 Long E 1327  
 start stop duration  
 TIME :19:10:00 19:40:00 30 (min) Purpose code: 3  
 LOG :9753.40 9754.90 1.50 Area code : 2  
 FDEPTH: 272 272 GearCond.code:  
 BDEPTH: 272 272 Validity code:  
 Towing dir: 330 Wire out: 850 m Speed:290 kn\*10

Sorted: 115 Kg Total catch: 220.00 CATCH/HOOUR: 440.00

| SPECIES                     | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|-------------|---------|-------------|----------|
|                             | weight      | numbers |             |          |
| Merluccius capensis, female | 299.20      | 412     | 68.00       | 179      |
| Merluccius paradoxus, male  | 72.40       | 132     | 16.45       | 178      |
| Helicolenus dactylopterus   | 19.20       | 424     | 4.36        |          |
| Trachurus capensis          | 16.60       | 28      | 3.77        |          |
| Lophius upsicephalus        | 9.20        | 8       | 2.09        |          |
| Chlorophthalmus atlanticus  | 7.60        | 212     | 1.73        |          |
| Todarodes sagittatus        | 4.40        | 4       | 1.00        |          |
| Galeus polli                | 4.00        | 64      | 0.91        |          |
| Coelorinchus fasciatus      | 3.20        | 84      | 0.73        |          |
| Zenopsis conchifer          | 1.80        | 2       | 0.41        |          |
| Hyperoglyphe moselii        | 1.60        | 4       | 0.36        |          |
| Squilla aculeata calmani    | 0.80        | 44      | 0.18        |          |
| Sufflogobius bibarbatu      | 0.00        | 32      |             |          |
| PORTUNIDAE                  | 0.00        | 8       |             |          |
| Total                       | 440.00      |         | 99.99       |          |

PROJECT STATION: 838  
 DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2354 Long E 1314  
 start stop duration  
 TIME :21:30:00 22:00:00 30 (min) Purpose code: 3  
 LOG :9769.20 9770.30 1.60 Area code : 2  
 FDEPTH: 349 339 GearCond.code:  
 BDEPTH: 349 339 Validity code:  
 Towing dir: 360 Wire out:1050 m Speed:280 kn\*10

Sorted: 161 Kg Total catch: 401.60 CATCH/HOOUR: 803.20

| SPECIES                      | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|-------------|---------|-------------|----------|
|                              | weight      | numbers |             |          |
| Merluccius capensis, female  | 520.00      | 476     | 64.74       | 181      |
| Merluccius paradoxus, female | 102.50      | 326     | 12.76       | 183      |
| Merluccius capensis, male    | 77.50       | 86      | 9.65        | 180      |
| Helicolenus dactylopterus    | 38.00       | 376     | 4.73        |          |
| Todarodes sagittatus         | 22.50       | 50      | 2.80        |          |
| Etmopterus pusillus          | 18.50       | 56      | 2.30        |          |
| Coelorinchus fasciatus       | 11.50       | 210     | 1.43        |          |
| Galeus polli                 | 5.50        | 50      | 0.68        |          |
| Merluccius paradoxus, male   | 4.00        | 10      | 0.50        | 182      |
| Epigonus denticulatus        | 3.00        | 90      | 0.37        |          |
| Chlorophthalmus atlanticus   | 0.20        | 10      | 0.02        |          |
| Total                        | 803.20      |         | 99.98       |          |

PROJECT STATION: 839  
 DATE: 4/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2353 Long E 1311  
 start stop duration  
 TIME :23:08:00 23:38:00 30 (min) Purpose code: 3  
 LOG :9777.40 9778.60 1.50 Area code : 2  
 FDEPTH: 450 451 GearCond.code:  
 BDEPTH: 450 451 Validity code:  
 Towing dir: 350 Wire out:1350 m Speed:290 kn\*10

Sorted: Kg Total catch: 145.60 CATCH/HOOUR: 291.20

| SPECIES                      | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|-------------|---------|-------------|----------|
|                              | weight      | numbers |             |          |
| Merluccius paradoxus, female | 76.00       | 84      | 26.10       | 185      |
| Merluccius paradoxus, female | 52.00       | 108     | 17.86       | 187      |
| Trachyrhinus scabrus         | 34.00       | 166     | 11.68       |          |
| Centrophorus squamosus       | 27.80       | 4       | 9.55        |          |
| Todarodes sagittatus         | 18.40       | 48      | 6.32        |          |
| Merluccius capensis, male    | 16.00       | 20      | 5.49        | 184      |
| Helicolenus dactylopterus    | 13.40       | 36      | 4.60        |          |
| Hoplostethus mediterraneus   | 11.40       | 500     | 3.91        |          |
| RAJIDAE                      | 9.20        |         | 3.16        |          |
| Coelorinchus fasciatus       | 7.00        | 146     | 2.40        |          |
| Denia calca                  | 5.40        | 8       | 1.85        |          |
| Galeus polli                 | 4.00        | 34      | 1.37        |          |
| Lophius upsicephalus         | 4.00        | 6       | 1.37        |          |
| Etmopterus pusillus          | 3.20        | 8       | 1.10        |          |
| Deepwater fish mixture       | 2.20        |         | 0.76        |          |
| Merluccius paradoxus, male   | 2.00        | 2       | 0.69        | 186      |
| Selachophidium guentheri     | 1.80        | 32      | 0.62        |          |
| PANDALIDAE                   | 1.60        | 168     | 0.55        |          |
| Epigonus denticulatus        | 1.00        | 22      | 0.34        |          |
| PORTUNIDAE                   | 0.40        | 10      | 0.14        |          |
| CONGRIDAE                    | 0.20        | 2       | 0.07        |          |
| Notacanthus sexspinis        | 0.10        | 6       | 0.03        |          |
| Total                        | 291.10      |         | 99.96       |          |

PROJECT STATION: 840  
 DATE: 5/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2356 Long E 1353  
 start stop duration  
 TIME :09:14:00 09:44:00 30 (min) Purpose code: 3  
 LOG :9853.40 9854.60 1.50 Area code : 2  
 FDEPTH: 215 220 GearCond.code:  
 BDEPTH: 215 220 Validity code:  
 Towing dir: 180 Wire out: 700 m Speed:300 kn\*10

Sorted: 95 Kg Total catch: 661.50 CATCH/HOOUR: 1323.00

| SPECIES                     | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|-------------|---------|-------------|----------|
|                             | weight      | numbers |             |          |
| Merluccius capensis, male   | 785.40      | 3402    | 59.37       | 188      |
| Merluccius capensis, female | 460.60      | 1666    | 34.81       | 189      |
| Coelorinchus fasciatus      | 35.00       | 756     | 2.65        |          |
| Helicolenus dactylopterus   | 19.60       | 910     | 1.48        |          |
| Sufflogobius bibarbatu      | 14.00       | 924     | 1.06        |          |
| Lophius upsicephalus        | 7.00        | 14      | 0.53        |          |
| PORTUNIDAE                  | 1.40        | 42      | 0.11        |          |
| Total                       | 1323.00     |         | 100.01      |          |

PROJECT STATION: 841  
 DATE: 5/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2355 Long E 1305  
 start stop duration  
 TIME :11:48:00 12:08:00 20 (min) Purpose code: 3  
 LOG :9869.20 9870.10 1.00 Area code : 2  
 FDEPTH: 163 163 GearCond.code:  
 BDEPTH: 163 163 Validity code:  
 Towing dir: 180 Wire out: 600 m Speed:300 kn\*10

Sorted: 53 Kg Total catch: 527.00 CATCH/HOOUR: 1581.00

| SPECIES                     | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|-------------|---------|-------------|----------|
|                             | weight      | numbers |             |          |
| Merluccius capensis, female | 1065.00     | 7500    | 67.36       | 191      |
| Merluccius capensis, male   | 465.00      | 5940    | 29.41       | 190      |
| Chelidonichtys capensis     | 33.00       | 60      | 2.09        |          |
| Trachurus capensis          | 12.00       | 60      | 0.76        |          |
| Sufflogobius bibarbatu      | 6.00        | 600     | 0.38        |          |
| Total                       | 1581.00     |         | 100.00      |          |

PROJECT STATION: 842  
 DATE: 5/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2343 Long E 1410  
 start stop duration  
 TIME :16:48:00 17:03:00 15 (min) Purpose code: 3  
 LOG :9905.00 9905.80 0.76 Area code : 2  
 FDEPTH: 138 136 GearCond.code:  
 BDEPTH: 138 136 Validity code:  
 Towing dir: 140 Wire out: 650 m Speed:302 kn\*10

Sorted: 28 Kg Total catch: 224.00 CATCH/HOOUR: 896.00

| SPECIES                     | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|-------------|---------|-------------|----------|
|                             | weight      | numbers |             |          |
| Merluccius capensis, female | 473.60      | 5184    | 52.86       | 193      |
| Merluccius capensis, male   | 396.80      | 5088    | 44.29       | 192      |
| Sufflogobius bibarbatu      | 25.60       | 6656    | 2.86        |          |
| Total                       | 896.00      |         | 100.01      |          |

PROJECT STATION: 843  
 DATE: 5/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2336 Long E 1403  
 start stop duration  
 TIME :18:28:00 18:54:00 26 (min) Purpose code: 3  
 LOG :9917.70 9918.80 1.10 Area code : 2  
 FDEPTH: 153 155 GearCond.code:  
 BDEPTH: 153 155 Validity code:  
 Towing dir: 320 Wire out: 450 m Speed:260 kn\*10

Sorted: 26 Kg Total catch: 1500.00 CATCH/HOOUR: 3461.54

| SPECIES                     | CATCH/HOOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|-------------|---------|-------------|----------|
|                             | weight      | numbers |             |          |
| Merluccius capensis, female | 2190.00     | 19662   | 63.27       | 195      |
| Merluccius capensis, male   | 1271.54     | 15598   | 36.73       | 194      |
| Total                       | 3461.54     |         | 100.00      |          |

DATE: 5/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2335  
 start stop duration Long E 1345  
 TIME :21:49:00 22:09:00 20 (min) Purpose code: 3  
 LOG :9938.50 9939.50 1.00 Area code : 2  
 FDEPTH: 175 177 GearCond.code:  
 BDEPTH: 175 177 Validity code:  
 Towing dir: 270 Wire out: 500 m Speed:280 kn\*10  
 Sorted: 51 Kg Total catch: 179.40 CATCH/HOUR: 538.20

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2314  
 start stop duration Long E 1316  
 TIME :08:24:00 08:54:00 30 (min) Purpose code: 3  
 LOG : 7.50 8.70 1.50 Area code : 2  
 FDEPTH: 363 353 GearCond.code:  
 BDEPTH: 363 353 Validity code:  
 Towing dir: 104 Wire out:1250 m Speed:290 kn\*10  
 Sorted: 176 Kg Total catch: 317.60 CATCH/HOUR: 635.20

| SPECIES                        | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|--------------------------------|----------------|-------------|----------|
|                                | weight numbers |             |          |
| Merluccius capensis, female    | 210.00         | 756         | 39.02    |
| Trachurus capensis             | 147.00         | 1134        | 27.31    |
| Merluccius capensis, male      | 130.20         | 1860        | 24.19    |
| Sufflogobius bibarbat          | 15.90          | 1743        | 2.95     |
| Cheilodichthys capensis        | 10.50          | 12          | 1.95     |
| Coelorrinchus fasciatus        | 10.50          | 189         | 1.95     |
| Merluccius capensis, juveniles | 5.40           | 24          | 1.00     |
| Todarodes sagittatus           | 3.30           | 42          | 0.61     |
| Lepidopus caudatus             | 3.30           | 12          | 0.61     |
| PORTUNIDAE                     | 2.10           | 33          | 0.39     |
| Total                          | 538.20         | 99.98       |          |

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius capensis, female  | 325.60         | 330         | 51.26    |
| Merluccius paradoxus, female | 106.20         | 238         | 16.72    |
| Merluccius capensis, male    | 80.60          | 92          | 12.69    |
| Todarodes sagittatus         | 27.20          | 70          | 4.28     |
| MYCTOPHIDAE                  | 26.40          |             | 4.16     |
| Deania profundorum           | 14.60          | 22          | 2.30     |
| Galeus polli                 | 11.00          | 162         | 1.73     |
| Lophius upaicephalus         | 9.60           | 14          | 1.51     |
| Helicolenus dactylopterus    | 6.80           | 352         | 1.07     |
| Trachurus capensis           | 5.80           | 12          | 0.91     |
| Merluccius paradoxus, male   | 5.60           | 12          | 0.88     |
| Chlorophthalmus atlanticus   | 4.00           | 106         | 0.63     |
| Etmopterus pusillus          | 3.60           | 4           | 0.57     |
| RAJIDAE                      | 3.60           | 4           | 0.57     |
| Coelorrinchus fasciatus      | 3.00           | 34          | 0.47     |
| Epigonus denticulatus        | 0.80           | 12          | 0.13     |
| PENAEIDAE                    | 0.36           | 54          | 0.06     |
| Selachophidium quentheri     | 0.18           | 4           | 0.03     |
| Hoplostethus mediterraneus   | 0.18           | 4           | 0.03     |
| Nezumia micronychodon        | 0.18           | 8           | 0.03     |
| Total                        | 635.30         | 100.03      |          |

DATE: 5/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2335  
 start stop duration Long E 1329  
 TIME :23:47:00 00:17:00 30 (min) Purpose code: 3  
 LOG :9953.50 9954.80 1.42 Area code : 2  
 FDEPTH: 228 236 GearCond.code:  
 BDEPTH: 228 236 Validity code:  
 Towing dir: 270 Wire out: 700 m Speed:283 kn\*10  
 Sorted: 101 Kg Total catch: 189.00 CATCH/HOUR: 378.00

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2315  
 start stop duration Long E 1323  
 TIME :10:00:00 10:30:00 30 (min) Purpose code: 3  
 LOG : 15.40 16.90 1.50 Area code : 2  
 FDEPTH: 301 300 GearCond.code:  
 BDEPTH: 301 300 Validity code:  
 Towing dir: 180 Wire out: 900 m Speed:290 kn\*10  
 Sorted: 391 Kg Total catch: 975.60 CATCH/HOUR: 1951.20

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 268.80         | 532         | 71.11    |
| Merluccius capensis, male   | 65.20          | 206         | 17.25    |
| Lepidopus caudatus          | 12.60          | 802         | 3.33     |
| Trachurus capensis          | 7.60           | 22          | 2.01     |
| Chlorophthalmus atlanticus  | 6.40           | 266         | 1.69     |
| Helicolenus dactylopterus   | 6.40           | 352         | 1.69     |
| Coelorrinchus fasciatus     | 5.60           | 150         | 1.48     |
| Sufflogobius bibarbat       | 2.60           | 472         | 0.69     |
| Galeus polli                | 2.00           | 48          | 0.53     |
| Todarodes sagittatus        | 0.40           | 4           | 0.11     |
| PORTUNIDAE                  | 0.40           | 8           | 0.11     |
| Total                       | 378.00         | 100.00      |          |

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Schedophilus huttoni        | 1180.00        | 440         | 60.48    |
| Merluccius capensis, female | 345.00         | 388         | 17.53    |
| Merluccius capensis, male   | 172.00         | 284         | 8.87     |
| Centrolophus niger          | 85.20          | 32          | 4.37     |
| MYCTOPHIDAE                 | 80.00          |             | 4.10     |
| Chlorophthalmus atlanticus  | 28.00          | 832         | 1.44     |
| Todarodes sagittatus        | 14.40          | 36          | 0.74     |
| Trachipterus trachipterus   | 12.40          | 4           | 0.64     |
| Brama brama                 | 10.20          | 8           | 0.52     |
| Trachurus capensis          | 9.60           | 14          | 0.49     |
| Hyperoglyphe meselii        | 7.20           | 12          | 0.37     |
| Helicolenus dactylopterus   | 4.60           | 180         | 0.24     |
| Neopsis conchifer           | 3.00           | 2           | 0.15     |
| Coelorrinchus fasciatus     | 0.80           | 4           | 0.04     |
| Galeus polli                | 0.80           | 16          | 0.04     |
| Total                       | 1951.20        | 100.02      |          |

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2334  
 start stop duration Long E 1314  
 TIME :02:04:00 02:34:00 30 (min) Purpose code: 3  
 LOG :9969.70 9971.00 1.48 Area code : 2  
 FDEPTH: 350 353 GearCond.code:  
 BDEPTH: 350 353 Validity code:  
 Towing dir: 360 Wire out:1050 m Speed:276 kn\*10  
 Sorted: 221 Kg Total catch: 220.50 CATCH/HOUR: 441.00

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius capensis, female  | 240.00         | 194         | 54.42    |
| Merluccius paradoxus, female | 66.00          | 146         | 14.97    |
| Deania calcea                | 56.60          | 86          | 12.83    |
| Merluccius capensis, male    | 36.00          | 38          | 8.16     |
| Helicolenus dactylopterus    | 12.80          | 320         | 2.90     |
| Galeus polli                 | 7.20           | 82          | 1.63     |
| Todarodes sagittatus         | 4.40           | 12          | 1.00     |
| Trachurus capensis           | 3.40           | 8           | 0.77     |
| Chlorophthalmus atlanticus   | 3.00           | 82          | 0.68     |
| Etmopterus pusillus          | 2.80           | 6           | 0.63     |
| Coelorrinchus fasciatus      | 2.40           | 46          | 0.54     |
| Lophius upaicephalus         | 2.20           | 4           | 0.50     |
| Centropristis squamosus      | 2.00           | 2           | 0.45     |
| Merluccius paradoxus, male   | 0.80           | 2           | 0.18     |
| MYCTOPHIDAE                  | 0.60           |             | 0.14     |
| Epigonus denticulatus        | 0.40           | 22          | 0.09     |
| Selachophidium quentheri     | 0.20           | 6           | 0.05     |
| PORTUNIDAE                   | 0.20           | 12          | 0.05     |
| Total                        | 441.00         | 99.99       |          |

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2314  
 start stop duration Long E 1330  
 TIME :11:50:00 12:20:00 30 (min) Purpose code: 3  
 LOG : 27.30 28.60 1.40 Area code : 2  
 FDEPTH: 195 196 GearCond.code:  
 BDEPTH: 195 196 Validity code:  
 Towing dir: 350 Wire out: 600 m Speed:280 kn\*10  
 Sorted: 94 Kg Total catch: 159.80 CATCH/HOUR: 319.60

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, male   | 166.00         | 788         | 51.94    |
| Merluccius capensis, female | 76.00          | 372         | 23.78    |
| Trachurus capensis          | 56.00          | 288         | 17.52    |
| Lepidopus caudatus          | 12.40          | 100         | 3.88     |
| Todarodes sagittatus        | 6.40           | 20          | 2.00     |
| Coelorrinchus fasciatus     | 0.80           | 4           | 0.25     |
| Helicolenus dactylopterus   | 0.80           | 20          | 0.25     |
| Sufflogobius bibarbat       | 0.80           | 128         | 0.25     |
| Chlorophthalmus atlanticus  | 0.40           | 8           | 0.13     |
| Total                       | 319.60         | 100.00      |          |

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2313  
 start stop duration Long E 1306  
 TIME :06:32:00 07:02:00 30 (min) Purpose code: 3  
 LOG :9996.90 9998.00 1.50 Area code : 2  
 FDEPTH: 444 442 GearCond.code:  
 BDEPTH: 444 442 Validity code:  
 Towing dir: 345 Wire out:1350 m Speed:280 kn\*10  
 Sorted: 85 Kg Total catch: 169.40 CATCH/HOUR: 338.80

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2313  
 start stop duration Long E 1342  
 TIME :13:36:00 13:56:00 20 (min) Purpose code: 3  
 LOG : 38.50 39.60 0.96 Area code : 2  
 FDEPTH: 155 157 GearCond.code:  
 BDEPTH: 155 157 Validity code:  
 Towing dir: 105 Wire out: 600 m Speed:270 kn\*10  
 Sorted: 102 Kg Total catch: 578.60 CATCH/HOUR: 1738.80

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius paradoxus, female | 175.60         | 416         | 51.83    |
| Trachyrinus scabrus          | 62.40          | 256         | 18.42    |
| Helicolenus dactylopterus    | 29.20          | 120         | 8.62     |
| Todarodes sagittatus         | 20.00          | 60          | 5.90     |
| Nezumia micronychodon        | 16.00          | 352         | 4.72     |
| Deania profundorum           | 8.00           | 12          | 2.36     |
| Merluccius paradoxus, male   | 7.60           | 12          | 2.24     |
| Krill                        | 6.00           |             | 1.77     |
| Galeus polli                 | 4.00           | 32          | 1.18     |
| Etmopterus pusillus          | 3.60           | 8           | 1.06     |
| Epigonus denticulatus        | 2.80           | 96          | 0.83     |
| MYCTOPHIDAE                  | 2.00           |             | 0.59     |
| Coelorrinchus fasciatus      | 0.80           | 12          | 0.24     |
| Selachophidium quentheri     | 0.40           | 4           | 0.12     |
| Notacanthus sexspinis        | 0.20           | 8           | 0.06     |
| Chlorophthalmus atlanticus   | 0.20           | 12          | 0.06     |
| Hoplostethus cadonati        | 0.00           | 4           |          |
| Photichthys argenteus        | 0.00           | 8           |          |
| Total                        | 338.80         | 100.00      |          |

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Trachurus capensis          | 1296.00        | 10176       | 74.53    |
| Merluccius capensis, female | 277.20         | 1512        | 15.94    |
| Merluccius capensis, male   | 162.00         | 1566        | 9.32     |
| Thyrartes atun              | 3.60           | 6           | 0.21     |
| Total                       | 1738.80        | 100.00      |          |

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2313  
 start stop duration Long E 1351  
 TIME :15:23:00 15:43:00 20 (min) Purpose code: 3  
 LOG : 51.80 52.80 0.96 Area code : 2  
 FDEPTH: 152 149 GearCond.code:  
 BDEPTH: 152 149 Validity code:  
 Towing dir: 280 Wire out: 600 m Speed:279 kn\*10  
 Sorted: 59 Kg Total catch: 1425.60 CATCH/HOUR: 4276.80

DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2313  
 start stop duration Long E 1351  
 TIME :15:23:00 15:43:00 20 (min) Purpose code: 3  
 LOG : 51.80 52.80 0.96 Area code : 2  
 FDEPTH: 152 149 GearCond.code:  
 BDEPTH: 152 149 Validity code:  
 Towing dir: 280 Wire out: 600 m Speed:279 kn\*10  
 Sorted: 59 Kg Total catch: 1425.60 CATCH/HOUR: 4276.80

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 2498.40        | 17064       | 58.42    |
| Merluccius capensis, male   | 1778.40        | 20880       | 41.58    |
| Total                       | 4276.80        | 100.00      |          |

PROJECT STATION: 853  
 DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2302 Long E 1357  
 start stop duration Purpose code: 3  
 TIME :17:10:00 17:21:00 11 (min) Area code : 2  
 LOG : 65.10 65.60 0.50 GearCond.code: 3  
 FDEPTH: 136 136 Validity code:  
 BDEPTH: 136 136  
 Towing dir: 360 Wire out: 500 m Speed:280 kn\*10  
 Sorted: 26 Kg Total catch: 475.20 CATCH/HOUR: 2592.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 1541.45 21404  | 59.47       | 223      |
| Merluccius capensis, male   | 1050.55 15807  | 40.53       | 222      |
| Total                       | 2592.00        | 100.00      |          |

PROJECT STATION: 854  
 DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2255 Long E 1348  
 start stop duration Purpose code: 3  
 TIME :18:37:00 18:52:00 15 (min) Area code : 2  
 LOG : 76.20 76.80 0.70 GearCond.code: 3  
 FDEPTH: 136 135 Validity code:  
 BDEPTH: 136 135  
 Towing dir: 310 Wire out: 400 m Speed:290 kn\*10  
 Sorted: 28 Kg Total catch: 225.60 CATCH/HOUR: 902.40

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 364.80 4960    | 40.43       | 225      |
| Merluccius capensis, male   | 326.40 4960    | 36.17       | 224      |
| Merluccius capensis         | 192.00 384     | 21.28       |          |
| Trachurus capensis          | 19.20 128      | 2.13        |          |
| Total                       | 902.40         | 100.01      |          |

PROJECT STATION: 855  
 DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2255 Long E 1336  
 start stop duration Purpose code: 3  
 TIME :20:10:00 20:22:00 12 (min) Area code : 2  
 LOG : 87.60 88.10 0.60 GearCond.code: 3  
 FDEPTH: 139 138 Validity code:  
 BDEPTH: 139 138  
 Towing dir: 270 Wire out: 450 m Speed:290 kn\*10  
 Sorted: 77 Kg Total catch: 256.80 CATCH/HOUR: 1284.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Trachurus capensis          | 540.00 4345    | 42.06       | 228      |
| Merluccius capensis, female | 523.50 2150    | 40.77       | 227      |
| Merluccius capensis, male   | 194.00 1850    | 15.11       | 226      |
| Chelidonichthys capensis    | 21.50 50       | 1.67        |          |
| Lepidopus caudatus          | 5.00 5         | 0.39        |          |
| Total                       | 1284.00        | 100.00      |          |

PROJECT STATION: 856  
 DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2254 Long E 1328  
 start stop duration Purpose code: 3  
 TIME :21:21:00 21:51:00 30 (min) Area code : 2  
 LOG : 95.80 97.00 1.40 GearCond.code: 3  
 FDEPTH: 251 249 Validity code:  
 BDEPTH: 251 249  
 Towing dir: 270 Wire out: 750 m Speed:290 kn\*10  
 Sorted: 160 Kg Total catch: 160.00 CATCH/HOUR: 320.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 118.00 314     | 36.88       | 230      |
| Trachurus capensis          | 79.00 488      | 24.69       | 231      |
| Merluccius capensis, male   | 62.00 260      | 19.38       | 229      |
| Helicolenus dactylopterus   | 15.40 320      | 4.81        |          |
| Chlorophthalmus atlanticus  | 12.80 534      | 4.00        |          |
| Sufflogobius bibarbatatus   | 10.40 2146     | 3.25        |          |
| Coelorrhinchus fasciatus    | 9.00 212       | 2.81        |          |
| Lepidopus caudatus          | 8.00 32        | 2.50        |          |
| Todarodes sagittatus        | 3.00 24        | 0.94        |          |
| Lophius upsicephalus        | 1.80 2         | 0.56        |          |
| Galeus polli                | 0.60 10        | 0.19        |          |
| PORTUNIDAE                  | 0.00 4         |             |          |
| Total                       | 320.00         | 100.01      |          |

PROJECT STATION: 857  
 DATE: 6/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2254 Long E 1320  
 start stop duration Purpose code: 3  
 TIME :23:04:00 23:34:00 30 (min) Area code : 2  
 LOG : 106.40 107.50 1.50 GearCond.code: 3  
 FDEPTH: 326 321 Validity code:  
 BDEPTH: 326 321  
 Towing dir: 360 Wire out:1000 m Speed:290 kn\*10  
 Sorted: 138 Kg Total catch: 138.40 CATCH/HOUR: 276.80

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius capensis, female  | 126.80 146     | 45.81       | 235      |
| Merluccius capensis, male    | 58.80 90       | 21.24       | 234      |
| Trachurus capensis           | 38.00 208      | 13.73       | 232      |
| Helicolenus dactylopterus    | 18.80 1160     | 6.79        |          |
| Chlorophthalmus atlanticus   | 14.60 462      | 5.27        |          |
| Merluccius paradoxus, female | 12.60 42       | 4.55        | 233      |
| Coelorrhinchus fasciatus     | 3.20 62        | 1.16        |          |
| Galeus polli                 | 2.20 34        | 0.79        |          |
| Todarodes sagittatus         | 1.60 10        | 0.58        |          |
| Epigonus denticulatus        | 0.20 6         | 0.07        |          |
| Total                        | 276.80         | 99.99       |          |

PROJECT STATION: 858  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2233 Long E 1301  
 start stop duration Purpose code: 3  
 TIME :01:52:00 02:22:00 30 (min) Area code : 2  
 LOG : 127.30 128.80 1.56 GearCond.code: 3  
 FDEPTH: 341 339 Validity code:  
 BDEPTH: 341 339  
 Towing dir: 320 Wire out:1050 m Speed:305 kn\*10  
 Sorted: 129 Kg Total catch: 272.70 CATCH/HOUR: 545.40

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius capensis, female  | 324.00 414     | 59.41       | 238      |
| Merluccius capensis, male    | 61.20 82       | 11.22       | 237      |
| Helicolenus dactylopterus    | 49.60 1008     | 9.09        |          |
| Merluccius paradoxus, female | 37.00 108      | 6.78        | 236      |
| RAUIDAE                      | 21.20 2        | 3.89        |          |
| Chlorophthalmus atlanticus   | 14.40 428      | 2.64        |          |
| Coelorrhinchus fasciatus     | 11.80 238      | 2.16        |          |
| Galeus polli                 | 7.20 2         | 1.32        |          |
| Epigonus denticulatus        | 6.40 126       | 1.17        |          |
| Lophius upsicephalus         | 5.00 198       | 0.92        |          |
| Lophius upsicephalus         | 4.00 4         | 0.73        |          |
| Todarodes sagittatus         | 2.80 10        | 0.51        |          |
| MYCTOPHIDAE                  | 0.40 14        | 0.07        |          |
| Selachophidium guentheri     | 0.40 14        | 0.07        |          |
| Total                        | 545.40         | 99.98       |          |

PROJECT STATION: 859  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2236 Long E 1251  
 start stop duration Purpose code: 3  
 TIME :06:38:00 07:05:00 27 (min) Area code : 2  
 LOG : 155.30 156.50 1.20 GearCond.code: 5  
 FDEPTH: 397 417 Validity code:  
 BDEPTH: 397 417  
 Towing dir: 350 Wire out:1200 m Speed:270 kn\*10  
 Sorted: 84 Kg Total catch: 250.50 CATCH/HOUR: 556.67

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius paradoxus, female | 303.33 767     | 54.49       | 240      |
| Trachyrhinus acabrus         | 123.33 400     | 22.15       |          |
| Centrophorus granulosus      | 49.33 27       | 8.86        |          |
| Merluccius paradoxus, male   | 24.00 60       | 4.31        | 239      |
| Coelorrhinchus fasciatus     | 21.33 227      | 3.83        |          |
| Epigonus denticulatus        | 8.00 187       | 1.44        |          |
| Deania profundorum           | 5.33 7         | 0.96        |          |
| Helicolenus dactylopterus    | 5.33 7         | 0.96        |          |
| Merula micronychodon         | 4.67 87        | 0.84        |          |
| Galeus polli                 | 4.00 40        | 0.72        |          |
| Todarodes sagittatus         | 3.33 20        | 0.60        |          |
| Chlorophthalmus atlanticus   | 2.67 60        | 0.48        |          |
| Beryx splendens              | 2.00 7         | 0.36        |          |
| Lammonema laureysi           | 0.00 7         |             |          |
| Total                        | 556.65         | 100.00      |          |

PROJECT STATION: 860  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2233 Long E 1259  
 start stop duration Purpose code: 3  
 TIME :08:23:00 08:53:00 30 (min) Area code : 2  
 LOG : 166.20 167.30 1.50 GearCond.code: 3  
 FDEPTH: 291 289 Validity code:  
 BDEPTH: 291 289  
 Towing dir: 350 Wire out: 900 m Speed:290 kn\*10  
 Sorted: 331 Kg Total catch: 2460.30 CATCH/HOUR: 4920.60

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, male   | 2872.50 3076   | 58.38       | 241      |
| Merluccius capensis, female | 1848.00 946    | 37.56       | 242      |
| Trachurus capensis          | 105.00 300     | 2.13        |          |
| Chlorophthalmus atlanticus  | 46.50 1590     | 0.95        |          |
| Helicolenus dactylopterus   | 27.00 826      | 0.55        |          |
| Todarodes sagittatus        | 9.00 16        | 0.18        |          |
| Lophius upsicephalus        | 6.60 4         | 0.13        |          |
| Beryx splendens             | 4.50 16        | 0.09        |          |
| Galeus polli                | 1.50 30        | 0.03        |          |
| Total                       | 4920.60        | 100.00      |          |

PROJECT STATION: 861  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2233 Long E 1311  
 start stop duration Purpose code: 3  
 TIME :10:35:00 11:05:00 30 (min) Area code : 2  
 LOG : 181.30 182.80 1.50 GearCond.code: 3  
 FDEPTH: 273 268 Validity code:  
 BDEPTH: 273 268  
 Towing dir: 350 Wire out: 850 m Speed:300 kn\*10  
 Sorted: 418 Kg Total catch: 417.80 CATCH/HOUR: 835.60

| SPECIES                           | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------------|----------------|-------------|----------|
|                                   | weight numbers |             |          |
| Merluccius capensis, female       | 350.80 224     | 41.98       | 244      |
| Merluccius capensis, male         | 271.00 342     | 32.43       | 243      |
| Trachurus capensis                | 102.80 184     | 12.30       | 245      |
| Chlorophthalmus atlanticus        | 40.00 1564     | 4.79        |          |
| Brama brama                       | 34.00 26       | 4.07        |          |
| Lophius upsicephalus              | 13.00 12       | 1.56        |          |
| Helicolenus dactylopterus         | 6.60 238       | 0.79        |          |
| Galeus polli                      | 5.60 80        | 0.67        |          |
| Coelorrhinchus fasciatus          | 5.40 60        | 0.65        |          |
| Hyperolyphe noselii               | 5.20 10        | 0.62        |          |
| Todarodes sagittatus              | 0.80 18        | 0.10        |          |
| Coelorrhinchus coelorrinch. polli | 0.10 2         | 0.01        |          |
| Total                             | 835.30         | 99.97       |          |

PROJECT STATION: 862  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2234 Long E 1322  
 start stop duration  
 TIME :12:43:00 13:13:00 30 (min) Purpose code: 3  
 LOG : 195.30 196.80 1.43 Area code : 2  
 FDEPTH: 242 237 GearCond.code:  
 BDEPTH: 242 237 Validity code:  
 Towing dir: 10 Wire out: 900 m Speed:284 kn\*10  
 Sorted: 164 Kg Total catch: 395.80 CATCH/HOUR: 791.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 396.80     | 396     | 50.13       | 248      |
| Merluccius capensis, male   | 267.20     | 328     | 33.75       | 247      |
| Trachurus capensis          | 49.40      | 106     | 6.24        | 246      |
| Chlorophthalmus atlanticus  | 43.60      | 2366    | 5.51        |          |
| Lepidopus caudatus          | 13.40      | 82      | 2.45        |          |
| Coelorinchus fasciatus      | 5.40       | 72      | 0.68        |          |
| Galeus polli                | 3.00       | 58      | 0.38        |          |
| Todarodes sagittatus        | 3.00       | 112     | 0.38        |          |
| Helicolenus dactylopterus   | 2.40       | 262     | 0.30        |          |
| Sufflogobius bibarbatu      | 1.40       | 164     | 0.18        |          |
| Total                       | 791.60     |         | 100.00      |          |

PROJECT STATION: 863  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2233 Long E 1322  
 start stop duration  
 TIME :14:35:00 14:55:00 20 (min) Purpose code: 3  
 LOG : 207.40 208.30 0.90 Area code : 2  
 FDEPTH: 149 150 GearCond.code:  
 BDEPTH: 149 150 Validity code:  
 Towing dir: 360 Wire out: 650 m Speed:282 kn\*10  
 Sorted: 212 Kg Total catch: 488.30 CATCH/HOUR: 1464.90

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 603.00     | 6246    | 41.16       | 250      |
| Thyrsites atun              | 471.30     | 144     | 32.17       |          |
| Merluccius capensis, male   | 390.60     | 5706    | 26.66       | 249      |
| Total                       | 1464.90    |         | 99.99       |          |

PROJECT STATION: 864  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2232 Long E 1341  
 start stop duration  
 TIME :16:15:00 16:35:00 20 (min) Purpose code: 3  
 LOG : 218.80 219.80 1.00 Area code : 2  
 FDEPTH: 127 127 GearCond.code:  
 BDEPTH: 127 127 Validity code:  
 Towing dir: 360 Wire out: 550 m Speed:300 kn\*10  
 Sorted: 14 Kg Total catch: 38.90 CATCH/HOUR: 116.70

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 60.30      | 693     | 51.67       | 252      |
| Merluccius capensis, male   | 44.40      | 579     | 38.05       | 251      |
| Sufflogobius bibarbatu      | 12.00      |         | 10.28       |          |
| Total                       | 116.70     |         | 100.00      |          |

PROJECT STATION: 865  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2221 Long E 1334  
 start stop duration  
 TIME :18:00:00 18:20:00 20 (min) Purpose code: 3  
 LOG : 231.50 232.30 1.00 Area code : 2  
 FDEPTH: 135 137 GearCond.code:  
 BDEPTH: 135 137 Validity code:  
 Towing dir: 360 Wire out: 550 m Speed:310 kn\*10  
 Sorted: 100 Kg Total catch: 2000.00 CATCH/HOUR: 6000.00

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Trachurus capensis  | 3000.00    | 28713   | 50.00       | 254      |
| Merluccius capensis | 3000.00    | 49560   | 50.00       | 253      |
| Total               | 6000.00    |         | 100.00      |          |

PROJECT STATION: 866  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2215 Long E 1327  
 start stop duration  
 TIME :19:24:00 19:44:00 20 (min) Purpose code: 3  
 LOG : 240.20 241.20 1.00 Area code : 2  
 FDEPTH: 157 161 GearCond.code:  
 BDEPTH: 157 161 Validity code:  
 Towing dir: 273 Wire out: 450 m Speed:300 kn\*10  
 Sorted: 26 Kg Total catch: 104.00 CATCH/HOUR: 312.00

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Merluccius capensis | 252.00     | 2820    | 80.77       | 255      |
| Trachurus capensis  | 60.00      | 528     | 19.23       | 256      |
| Total               | 312.00     |         | 100.00      |          |

PROJECT STATION: 867  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2215 Long E 1322  
 start stop duration  
 TIME :20:36:00 21:06:00 30 (min) Purpose code: 3  
 LOG : 247.00 248.50 1.50 Area code : 2  
 FDEPTH: 191 181 GearCond.code:  
 BDEPTH: 191 181 Validity code:  
 Towing dir: 90 Wire out: 600 m Speed:280 kn\*10  
 Sorted: 109 Kg Total catch: 815.30 CATCH/HOUR: 1630.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, male   | 795.00     | 2146    | 48.76       | 257      |
| Trachurus capensis          | 649.50     |         | 39.83       | 259      |
| Merluccius capensis, female | 165.00     | 466     | 10.12       | 258      |
| Lepidopus caudatus          | 13.50      | 106     | 0.83        |          |
| Pterothrissus bellotti      | 3.00       | 16      | 0.18        |          |
| Coelorinchus fasciatus      | 3.00       | 76      | 0.18        |          |
| Sufflogobius bibarbatu      | 0.80       | 256     | 0.05        |          |
| Lophius upsicephalus        | 0.80       | 30      | 0.05        |          |
| PORTUNIDAE                  | 0.00       | 16      |             |          |
| Total                       | 1630.60    |         | 100.00      |          |

PROJECT STATION: 868  
 DATE: 7/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2214 Long E 1310  
 start stop duration  
 TIME :22:47:00 23:17:00 30 (min) Purpose code: 3  
 LOG : 262.10 263.40 1.60 Area code : 2  
 FDEPTH: 230 231 GearCond.code:  
 BDEPTH: 230 231 Validity code:  
 Towing dir: 345 Wire out: 700 m Speed:300 kn\*10  
 Sorted: 93 Kg Total catch: 186.40 CATCH/HOUR: 372.80

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, male   | 160.00     | 288     | 42.92       | 261      |
| Merluccius capensis, female | 105.20     | 128     | 28.22       | 262      |
| Trachurus capensis          | 64.00      | 412     | 17.17       | 260      |
| Lepidopus caudatus          | 10.80      | 48      | 2.90        |          |
| Pterothrissus bellotti      | 7.60       | 36      | 2.04        |          |
| Chlorophthalmus atlanticus  | 7.20       | 300     | 1.93        |          |
| Coelorinchus fasciatus      | 6.00       | 96      | 1.61        |          |
| Lophius upsicephalus        | 5.20       | 4       | 1.39        |          |
| Squalus megalops            | 2.80       | 8       | 0.75        |          |
| Galeus polli                | 2.40       | 28      | 0.64        |          |
| Helicolenus dactylopterus   | 1.20       | 36      | 0.32        |          |
| Sufflogobius bibarbatu      | 0.40       | 24      | 0.11        |          |
| Total                       | 372.80     |         | 100.00      |          |

PROJECT STATION: 869  
 DATE: 8/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2215 Long E 1255  
 start stop duration  
 TIME :00:59:00 01:29:00 30 (min) Purpose code: 3  
 LOG : 276.50 277.90 1.48 Area code : 2  
 FDEPTH: 309 319 GearCond.code:  
 BDEPTH: 309 319 Validity code:  
 Towing dir: 330 Wire out: 950 m Speed:304 kn\*10  
 Sorted: 224 Kg Total catch: 224.10 CATCH/HOUR: 448.20

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 259.40     | 222     | 57.88       | 264      |
| Merluccius capensis, male   | 95.40      | 136     | 21.29       | 263      |
| Helicolenus dactylopterus   | 38.80      | 1488    | 8.66        |          |
| Galeus polli                | 20.40      | 236     | 4.55        |          |
| Chlorophthalmus atlanticus  | 19.00      | 544     | 4.24        |          |
| Trachurus capensis          | 9.20       | 54      | 2.05        |          |
| Coelorinchus fasciatus      | 2.40       | 74      | 0.54        |          |
| Squalus megalops            | 2.20       | 4       | 0.49        |          |
| MYCTOPHIDAE                 | 0.40       |         | 0.09        |          |
| OMMASTREPHIDAE              | 0.40       | 6       | 0.09        |          |
| Lophius upsicephalus        | 0.20       | 2       | 0.04        |          |
| FORIUNIDAE                  | 0.20       |         | 0.04        |          |
| Epigonus denticulatus       | 0.20       | 4       | 0.04        |          |
| Total                       | 448.20     |         | 100.00      |          |

PROJECT STATION: 870  
 DATE: 8/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2207 Long E 1247  
 start stop duration  
 TIME :02:53:00 03:23:00 30 (min) Purpose code: 3  
 LOG : 288.10 289.70 1.57 Area code : 2  
 FDEPTH: 352 355 GearCond.code:  
 BDEPTH: 352 355 Validity code:  
 Towing dir: 360 Wire out:1050 m Speed:297 kn\*10  
 Sorted: 56 Kg Total catch: 223.60 CATCH/HOUR: 447.20

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius capensis, female  | 226.40     | 176     | 50.63       | 267      |
| Merluccius capensis, male    | 91.20      | 96      | 20.39       | 266      |
| Helicolenus dactylopterus    | 50.40      | 800     | 11.27       |          |
| Merluccius paradoxus, female | 22.40      | 64      | 5.01        | 265      |
| Chlorophthalmus atlanticus   | 21.60      | 640     | 4.83        |          |
| Todarodes sagittatus         | 15.20      | 32      | 3.40        |          |
| Galeus polli                 | 6.40       | 96      | 1.43        |          |
| Etmopterus pusillus          | 4.00       | 8       | 0.89        |          |
| Beryx splendens              | 3.20       | 8       | 0.72        |          |
| Epigonus denticulatus        | 3.20       | 88      | 0.72        |          |
| Coelorinchus fasciatus       | 2.40       | 40      | 0.54        |          |
| Selachophidium guentheri     | 0.80       | 8       | 0.18        |          |
| Total                        | 447.20     |         | 100.01      |          |

PROJECT STATION: 871  
 DATE: 8/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2254 Long E 1242  
 start stop duration  
 TIME :06:28:00 06:58:00 30 (min) Purpose code: 3  
 LOG : 308.70 310.10 1.60 Area code : 2  
 FDEPTH: 410 418 GearCond.code:  
 BDEPTH: 410 418 Validity code:  
 Towing dir: 350 Wire out:1200 m Speed:310 kn\*10  
 Sorted: 108 Kg Total catch: 215.00 CATCH/HOUR: 430.00

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius paradoxus, female | 100.00     | 164     | 23.26       | 270      |
| Merluccius capensis, female  | 76.00      | 72      | 17.67       | 269      |
| Trachyrinus scabrus          | 65.20      | 436     | 15.16       |          |
| Galeus polli                 | 42.00      |         | 9.77        |          |
| Helicolenus dactylopterus    | 41.60      | 136     | 9.67        |          |
| Merluccius capensis, male    | 30.40      | 32      | 7.07        | 268      |
| Aristeus varidens            | 18.00      |         | 4.19        |          |
| Shrimps, small, non comm.    | 14.00      |         | 3.26        |          |
| Nezumia micronychodon        | 12.40      | 284     | 2.88        |          |
| Chlorophthalmus atlanticus   | 7.20       | 88      | 1.67        |          |
| Deania profundorum           | 5.60       | 8       | 1.30        |          |
| Hoplostethus mediterraneus   | 5.20       | 232     | 1.21        |          |
| Etmopterus pusillus          | 4.40       | 12      | 1.02        |          |
| Yareella blackfordi          | 3.20       |         | 0.74        |          |
| MYCTOPHIDAE                  | 2.80       |         | 0.65        |          |
| Todarodes sagittatus         | 0.80       | 4       | 0.19        |          |
| Epigonus denticulatus        | 0.80       | 36      | 0.19        |          |
| Notacanthus sexspinis        | 0.40       | 24      | 0.09        |          |
| Total                        | 430.00     |         | 99.99       |          |

DATE: 8/11/91 PROJECT STATION: 872  
 GEAR TYPE: BT No:1 POSITION:Lat S 2154  
 start stop duration Long E 1350  
 TIME :08:32:00 09:02:00 30 (min) Purpose code: 3  
 LOG : 321.00 322.40 1.50 Area code : 2  
 FDEPTH: 318 314 GearCond.code:  
 BDEPTH: 318 314 Validity code:  
 Towing dir: 350 Wire out:1000 m Speed:290 kn\*10

Sorted: 191 Kg Total catch: 228.30 CATCH/HOUR: 456.60

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 193.60         | 214         | 273      |
| Merluccius capensis, male   | 115.00         | 154         | 272      |
| MYCTOPHIDAE                 | 37.60          |             | 8.23     |
| Trachurus capensis          | 34.00          | 112         | 7.45     |
| Chlorophthalmus atlanticus  | 28.00          | 1200        | 6.13     |
| Helicolenus dactylopterus   | 21.60          | 856         | 4.73     |
| Lophius upsicephalus        | 10.80          | 8           | 2.37     |
| Galeus polli                | 8.00           | 128         | 1.75     |
| Schedophilus huttoni        | 4.80           | 4           | 1.05     |
| Todarodes sagittatus        | 2.40           | 8           | 0.53     |
| Coelorinchus fasciatus      | 0.40           | 16          | 0.09     |
| Coelorinchus fasciatus      | 0.40           | 16          | 0.09     |
| Total                       | 456.60         | 100.01      |          |

DATE: 8/11/91 PROJECT STATION: 877  
 GEAR TYPE: BT No:1 POSITION:Lat S 2144  
 start stop duration Long E 1310  
 TIME :18:30:00 18:50:00 20 (min) Purpose code: 3  
 LOG : 384.20 384.90 1.10 Area code : 2  
 FDEPTH: 172 173 GearCond.code:  
 BDEPTH: 172 173 Validity code:  
 Towing dir: 340 Wire out: 550 m Speed:310 kn\*10

Sorted: 45 Kg Total catch: 45.10 CATCH/HOUR: 135.30

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Trachurus capensis          | 90.00          | 801         | 66.52    |
| Merluccius capensis, male   | 27.60          | 132         | 20.40    |
| Merluccius capensis, female | 11.40          | 54          | 8.43     |
| Scomber japonicus           | 6.30           | 3           | 4.66     |
| Total                       | 135.30         | 100.01      |          |

DATE: 8/11/91 PROJECT STATION: 878  
 GEAR TYPE: BT No:1 POSITION:Lat S 2134  
 start stop duration Long E 1315  
 TIME :20:08:00 20:38:00 30 (min) Purpose code: 3  
 LOG : 395.50 396.70 1.50 Area code : 2  
 FDEPTH: 142 139 GearCond.code:  
 BDEPTH: 142 139 Validity code:  
 Towing dir: 360 Wire out: 450 m Speed:300 kn\*10

Sorted: 42 Kg Total catch: 42.40 CATCH/HOUR: 84.80

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 49.60          | 274         | 58.49    |
| Merluccius capensis, male   | 23.60          | 294         | 27.83    |
| Trachurus capensis          | 10.40          | 82          | 12.26    |
| Pterothrissus belloci       | 1.20           | 6           | 1.42     |
| Total                       | 84.80          | 100.00      |          |

DATE: 8/11/91 PROJECT STATION: 873  
 GEAR TYPE: BT No:1 POSITION:Lat S 2154  
 start stop duration Long E 1300  
 TIME :10:45:00 11:15:00 30 (min) Purpose code: 3  
 LOG : 333.90 335.20 1.50 Area code : 2  
 FDEPTH: 287 287 GearCond.code:  
 BDEPTH: 288 287 Validity code:  
 Towing dir: 350 Wire out: 900 m Speed:290 kn\*10

Sorted: 198 Kg Total catch: 220.40 CATCH/HOUR: 440.80

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 198.60         | 202         | 45.05    |
| Merluccius capensis, male   | 77.60          | 114         | 17.60    |
| Chlorophthalmus atlanticus  | 59.20          | 1818        | 13.43    |
| Trachurus capensis          | 34.00          | 132         | 7.71     |
| Schedophilus huttoni        | 33.20          | 12          | 7.53     |
| MYCTOPHIDAE                 | 12.00          |             | 2.72     |
| Helicolenus dactylopterus   | 10.80          | 808         | 2.45     |
| Lophius upsicephalus        | 7.00           | 6           | 1.59     |
| Todarodes sagittatus        | 4.80           | 12          | 1.09     |
| Galeus polli                | 2.80           | 44          | 0.64     |
| Coelorinchus fasciatus      | 0.80           | 24          | 0.18     |
| Total                       | 440.80         | 99.99       |          |

DATE: 9/11/91 PROJECT STATION: 879  
 GEAR TYPE: BT No:1 POSITION:Lat S 2151  
 start stop duration Long E 1308  
 TIME :06:53:00 07:20:00 27 (min) Purpose code: 3  
 LOG : 475.50 476.70 1.20 Area code : 2  
 FDEPTH: 192 196 GearCond.code: 8  
 BDEPTH: 192 196 Validity code: 9  
 Towing dir: 350 Wire out: 600 m Speed:260 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------|----------------|-------------|----------|
|         | weight numbers |             |          |
| Total   |                |             |          |

DATE: 8/11/91 PROJECT STATION: 874  
 GEAR TYPE: BT No:1 POSITION:Lat S 2156  
 start stop duration Long E 1307  
 TIME :12:48:00 13:10:00 22 (min) Purpose code: 3  
 LOG : 345.90 347.00 1.11 Area code : 2  
 FDEPTH: 223 224 GearCond.code:  
 BDEPTH: 223 224 Validity code:  
 Towing dir: 360 Wire out:1050 m Speed:293 kn\*10

Sorted: 78 Kg Total catch: 339.20 CATCH/HOUR: 925.09

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 348.27         | 1489        | 37.65    |
| Merluccius capensis, male   | 330.82         | 2163        | 35.76    |
| Trachurus capensis          | 183.27         | 982         | 19.81    |
| Chlorophthalmus atlanticus  | 41.45          | 1925        | 4.48     |
| Pterothrissus belloci       | 8.18           | 35          | 0.88     |
| Helicolenus dactylopterus   | 6.00           | 188         | 0.65     |
| Sufflogobius bibarbatus     | 2.45           | 284         | 0.26     |
| Coelorinchus fasciatus      | 2.45           | 25          | 0.26     |
| Galeus polli                | 1.09           | 11          | 0.12     |
| Todarodes sagittatus        | 1.09           | 25          | 0.12     |
| Total                       | 925.07         | 99.99       |          |

DATE: 9/11/91 PROJECT STATION: 880  
 GEAR TYPE: BT No:1 POSITION:Lat S 2145  
 start stop duration Long E 1303  
 TIME :09:20:00 09:40:00 20 (min) Purpose code: 3  
 LOG : 484.50 485.50 1.00 Area code : 2  
 FDEPTH: 250 259 GearCond.code:  
 BDEPTH: 250 259 Validity code:  
 Towing dir: 345 Wire out: 750 m Speed:280 kn\*10

Sorted: 157 Kg Total catch: 156.60 CATCH/HOUR: 469.80

| SPECIES             | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------|----------------|-------------|----------|
|                     | weight numbers |             |          |
| Merluccius capensis | 238.50         | 444         | 50.77    |
| Trachurus capensis  | 231.30         | 1296        | 49.23    |
| Total               | 469.80         | 100.00      |          |

DATE: 8/11/91 PROJECT STATION: 875  
 GEAR TYPE: BT No:1 POSITION:Lat S 2154  
 start stop duration Long E 1313  
 TIME :14:16:00 14:46:00 30 (min) Purpose code: 3  
 LOG : 354.60 355.90 1.50 Area code : 2  
 FDEPTH: 168 168 GearCond.code:  
 BDEPTH: 168 168 Validity code:  
 Towing dir: 360 Wire out: 700 m Speed:297 kn\*10

Sorted: 115 Kg Total catch: 724.20 CATCH/HOUR: 1448.40

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, male   | 1163.80        | 5490        | 80.35    |
| Merluccius capensis, female | 222.40         | 674         | 15.35    |
| Thyrsites atun              | 47.00          | 16          | 3.24     |
| Trachurus capensis          | 7.60           | 62          | 0.52     |
| Lepidopus caudatus          | 7.60           | 62          | 0.52     |
| Total                       | 1448.40        | 99.98       |          |

DATE: 9/11/91 PROJECT STATION: 881  
 GEAR TYPE: BT No:1 POSITION:Lat S 2143  
 start stop duration Long E 1259  
 TIME :10:40:00 11:00:00 20 (min) Purpose code: 3  
 LOG : 490.10 491.10 0.90 Area code : 2  
 FDEPTH: 273 272 GearCond.code:  
 BDEPTH: 273 272 Validity code:  
 Towing dir: 345 Wire out: 850 m Speed:290 kn\*10

Sorted: 174 Kg Total catch: 173.80 CATCH/HOUR: 521.40

| SPECIES             | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------|----------------|-------------|----------|
|                     | weight numbers |             |          |
| Trachurus capensis  | 301.80         | 1599        | 57.88    |
| Merluccius capensis | 219.60         | 342         | 42.12    |
| Total               | 521.40         | 100.00      |          |

DATE: 8/11/91 PROJECT STATION: 876  
 GEAR TYPE: BT No:1 POSITION:Lat S 2154  
 start stop duration Long E 1323  
 TIME :16:23:00 16:43:00 20 (min) Purpose code: 3  
 LOG : 368.30 369.20 1.04 Area code : 2  
 FDEPTH: 148 147 GearCond.code:  
 BDEPTH: 148 147 Validity code:  
 Towing dir: 360 Wire out: 550 m Speed:311 kn\*10

Sorted: 63 Kg Total catch: 512.90 CATCH/HOUR: 1538.70

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 530.40         | 5097        | 34.47    |
| Merluccius capensis, male   | 517.50         | 5175        | 33.63    |
| Merluccius capensis, female | 473.10         | 6240        | 30.75    |
| Thyrsites atun              | 9.90           | 3           | 0.64     |
| Sufflogobius bibarbatus     | 3.90           | 468         | 0.25     |
| Lepidopus caudatus          | 2.70           | 27          | 0.18     |
| Todarodes sagittatus        | 1.20           | 12          | 0.08     |
| Total                       | 1538.70        | 100.00      |          |

DATE: 9/11/91 PROJECT STATION: 882  
 GEAR TYPE: BT No:1 POSITION:Lat S 2141  
 start stop duration Long E 1255  
 TIME :12:00:00 12:20:00 20 (min) Purpose code: 3  
 LOG : 496.00 497.00 0.92 Area code : 2  
 FDEPTH: 286 286 GearCond.code:  
 BDEPTH: 286 286 Validity code:  
 Towing dir: 345 Wire out: 900 m Speed:285 kn\*10

Sorted: 170 Kg Total catch: 170.20 CATCH/HOUR: 510.60

| SPECIES             | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------|----------------|-------------|----------|
|                     | weight numbers |             |          |
| Trachurus capensis  | 326.40         | 2268        | 63.92    |
| Merluccius capensis | 184.20         | 243         | 36.08    |
| Total               | 510.60         | 100.00      |          |

DATE: 9/11/91 PROJECT STATION: 883  
 GEAR TYPE: BT No:1 POSITION:Lat S 2135  
 start stop duration Long E 1303  
 TIME :13:58:00 14:18:00 20 (min) Purpose code: 3  
 LOG : 508.10 509.20 0.96 Area code : 2  
 FDEPTH: 231 232 GearCond.code:  
 BDEPTH: 231 232 Validity code:  
 Towing dir: 360 Wire out: 850 m Speed:283 kn\*10

Sorted: 376 Kg Total catch: 376.20 CATCH/HOUR: 1128.60

| SPECIES             | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------|----------------|-------------|----------|
|                     | weight numbers |             |          |
| Trachurus capensis  | 657.30         | 4476        | 58.24    |
| Merluccius capensis | 471.30         | 837         | 41.76    |
| Total               | 1128.60        | 100.00      |          |

DATE: 9/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2131 Long E 1304 PROJECT STATION: 884  
 start stop duration  
 TIME :15:23:00 15:43:00 20 (min) Purpose code: 3  
 LOG : 513.30 514.30 0.93 Area code : 2  
 FDEPTH: 205 202 GearCond.code:  
 BDEPTH: 205 202 Validity code:  
 Towing dir: 360 Wire out: 800 m Speed:292 kn\*10  
 Sorted: 395 Kg Total catch: 394.80 CATCH/HOUR: 1184.40

| SPECIES             | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------|----------------|-------------|----------|
|                     | weight numbers |             |          |
| Merluccius capensis | 607.50 1416    | 51.29       |          |
| Trachurus capensis  | 576.90 4485    | 48.71       |          |
| Total               | 1184.40        | 100.00      |          |

DATE: 9/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2127 Long E 1305 PROJECT STATION: 885  
 start stop duration  
 TIME :16:44:00 17:04:00 20 (min) Purpose code: 3  
 LOG : 517.90 518.90 1.00 Area code : 2  
 FDEPTH: 179 166 GearCond.code:  
 BDEPTH: 179 166 Validity code:  
 Towing dir: 360 Wire out: 700 m Speed:300 kn\*10  
 Sorted: 52 Kg Total catch: 51.70 CATCH/HOUR: 155.10

| SPECIES             | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------|----------------|-------------|----------|
|                     | weight numbers |             |          |
| Trachurus capensis  | 77.70 594      | 50.10       |          |
| Merluccius capensis | 77.40 273      | 49.90       |          |
| Total               | 155.10         | 100.00      |          |

DATE:10/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2243 Long E 1305 PROJECT STATION: 886  
 start stop duration  
 TIME :06:30:00 07:00:00 30 (min) Purpose code: 3  
 LOG : 632.00 633.60 1.30 Area code : 2  
 FDEPTH: 305 309 GearCond.code:  
 BDEPTH: 305 309 Validity code:  
 Towing dir: 155 Wire out: 900 m Speed:270 kn\*10  
 Sorted: 249 Kg Total catch: 249.45 CATCH/HOUR: 498.90

| SPECIES                          | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|----------------------------------|----------------|-------------|----------|
|                                  | weight numbers |             |          |
| Merluccius capensis, female      | 284.80 302     | 57.09       | 294      |
| Merluccius capensis, male        | 142.60 228     | 28.58       | 293      |
| Trachurus capensis               | 45.60 144      | 9.14        | 295      |
| Helicolenus dactylopterus        | 15.40 466      | 3.09        |          |
| Chlorophthalmus atlanticus       | 3.60 114       | 0.72        |          |
| Lophius upsicephalus             | 3.00 4         | 0.60        |          |
| Galeus polli                     | 2.40 62        | 0.48        |          |
| Todarodes sagittatus             | 1.20 2         | 0.24        |          |
| Coelorhynchus coelorhynch. polli | 0.20 8         | 0.04        |          |
| Nezumia micronychodon            | 0.10 4         | 0.02        |          |
| Total                            | 498.90         | 100.00      |          |

DATE:12/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2247 Long E 1354 PROJECT STATION: 887  
 start stop duration  
 TIME :23:27:00 23:42:00 15 (min) Purpose code: 3  
 LOG : 759.10 759.60 0.70 Area code : 2  
 FDEPTH: 127 127 GearCond.code:  
 BDEPTH: 127 127 Validity code:  
 Towing dir: 345 Wire out: 350 m Speed:280 kn\*10  
 Sorted: 56 Kg Total catch: 599.30 CATCH/HOUR: 2397.20

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 1489.60 11128  | 62.14       | 297      |
| Merluccius capensis, male   | 607.60 5648    | 25.35       | 296      |
| Trachurus capensis          | 300.00 2312    | 12.51       | 298      |
| Total                       | 2397.20        | 100.00      |          |

DATE:13/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2134 Long E 1251 PROJECT STATION: 888  
 start stop duration  
 TIME :09:58:00 10:28:00 30 (min) Purpose code: 3  
 LOG : 859.80 861.10 1.60 Area code : 2  
 FDEPTH: 300 302 GearCond.code:  
 BDEPTH: 300 302 Validity code:  
 Towing dir: 340 Wire out: 900 m Speed:280 kn\*10  
 Sorted: 202 Kg Total catch: 201.70 CATCH/HOUR: 403.40

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 247.80 226     | 61.43       | 300      |
| Merluccius capensis, male   | 76.00 100      | 18.84       | 299      |
| Schedophilus huttoni        | 36.60 14       | 9.07        |          |
| Trachurus capensis          | 17.00 72       | 4.21        | 301      |
| Chlorophthalmus atlanticus  | 14.00 494      | 3.47        |          |
| Helicolenus dactylopterus   | 4.80 226       | 1.19        |          |
| MYCTOPHIDAE                 | 3.20 10        | 0.79        |          |
| Galeus polli                | 1.80 40        | 0.45        |          |
| Parapannetus longirostris   | 1.40 5         | 0.35        |          |
| Todarodes sagittatus        | 0.80 10        | 0.20        |          |
| Total                       | 403.40         | 100.00      |          |

DATE:13/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2125 Long E 1240 PROJECT STATION: 889  
 start stop duration  
 TIME :13:25:00 13:55:00 30 (min) Purpose code: 3  
 LOG : 875.20 876.80 1.51 Area code : 2  
 FDEPTH: 350 350 GearCond.code:  
 BDEPTH: 350 350 Validity code:  
 Towing dir: 360 Wire out:1100 m Speed:295 kn\*10  
 Sorted: 342 Kg Total catch: 341.50 CATCH/HOUR: 683.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 357.80 360     | 52.27       | 303      |
| Merluccius capensis, male   | 124.00 154     | 18.16       | 302      |
| MICROPHIDAE                 | 54.80 14       | 8.02        |          |
| Helicolenus dactylopterus   | 50.00 776      | 7.32        |          |
| Schedophilus huttoni        | 26.00 14       | 3.81        |          |
| zenopsis conchifer          | 25.00 22       | 3.66        |          |
| Merluccius paradoxus, male  | 14.80 28       | 2.17        | 304      |
| Taractichthys longipinnis   | 8.00 2         | 1.17        |          |
| Brama brama                 | 7.00 8         | 1.02        |          |
| Galeus polli                | 5.80 68        | 0.85        |          |
| Todarodes sagittatus        | 3.60 8         | 0.53        |          |
| RAJIDAE                     | 2.60 2         | 0.38        |          |
| Chlorophthalmus atlanticus  | 2.40 64        | 0.35        |          |
| Etmopterus pusillus         | 1.60 2         | 0.23        |          |
| Beryx splendens             | 0.40 2         | 0.06        |          |
| Total                       | 683.00         | 100.00      |          |

DATE:13/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2118 Long E 1235 PROJECT STATION: 890  
 start stop duration  
 TIME :17:22:00 17:52:00 30 (min) Purpose code: 3  
 LOG : 890.10 891.60 1.56 Area code : 2  
 FDEPTH: 398 398 GearCond.code:  
 BDEPTH: 398 398 Validity code:  
 Towing dir: 350 Wire out:1200 m Speed:307 kn\*10  
 Sorted: 95 Kg Total catch: 127.40 CATCH/HOUR: 254.80

| SPECIES                      | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|------------------------------|----------------|-------------|----------|
|                              | weight numbers |             |          |
| Merluccius paradoxus, female | 108.40 146     | 42.54       | 305      |
| Trachyrinus scabrus          | 34.40 220      | 13.50       |          |
| Helicolenus dactylopterus    | 26.40 162      | 10.36       |          |
| Deepwater fish mixture       | 25.60 10       | 10.05       |          |
| Merluccius capensis, female  | 24.80 24       | 9.73        | 307      |
| Todarodes sagittatus         | 13.60 44       | 5.34        |          |
| Schedophilus huttoni         | 12.40 4        | 4.87        |          |
| RAJIDAE                      | 5.20 4         | 2.04        |          |
| Galeus polli                 | 2.20 14        | 0.86        |          |
| Merluccius capensis, male    | 1.80 2         | 0.71        | 306      |
| Total                        | 254.80         | 100.00      |          |

DATE:13/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2114 Long E 1246 PROJECT STATION: 891  
 start stop duration  
 TIME :20:12:00 20:42:00 30 (min) Purpose code: 3  
 LOG : 903.80 905.10 1.50 Area code : 2  
 FDEPTH: 327 329 GearCond.code:  
 BDEPTH: 327 329 Validity code:  
 Towing dir: 360 Wire out:1000 m Speed:290 kn\*10  
 Sorted: 162 Kg Total catch: 171.00 CATCH/HOUR: 342.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 251.20 224     | 73.45       | 309      |
| Merluccius capensis, male   | 62.60 90       | 18.30       | 308      |
| Chlorophthalmus atlanticus  | 18.00 576      | 5.26        |          |
| Helicolenus dactylopterus   | 6.60 270       | 1.93        |          |
| Galeus polli                | 3.60 78        | 1.05        |          |
| Total                       | 342.00         | 99.99       |          |

DATE:13/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2113 Long E 1258 PROJECT STATION: 892  
 start stop duration  
 TIME :23:10:00 23:40:00 30 (min) Purpose code: 3  
 LOG : 919.00 920.20 1.50 Area code : 2  
 FDEPTH: 242 240 GearCond.code:  
 BDEPTH: 242 240 Validity code:  
 Towing dir: 360 Wire out: 750 m Speed:280 kn\*10  
 Sorted: 118 Kg Total catch: 118.00 CATCH/HOUR: 236.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 157.80 196     | 66.86       | 311      |
| Merluccius capensis, male   | 70.00 140      | 29.66       | 310      |
| Trachurus capensis          | 8.20 46        | 3.47        |          |
| Total                       | 236.00         | 99.99       |          |

DATE:14/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 2155 Long E 1300 PROJECT STATION: 893  
 start stop duration  
 TIME :06:30:00 06:45:00 15 (min) Purpose code: 3  
 LOG : 970.30 970.70 0.50 Area code : 2  
 FDEPTH: 158 156 GearCond.code: 5  
 BDEPTH: 158 156 Validity code:  
 Towing dir: 360 Wire out: 500 m Speed:240 kn\*10  
 Sorted: 45 Kg Total catch: 135.90 CATCH/HOUR: 543.60

| SPECIES                     | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------------|----------------|-------------|----------|
|                             | weight numbers |             |          |
| Merluccius capensis, female | 278.40 1584    | 51.21       | 313      |
| Merluccius capensis, male   | 204.00 1440    | 37.53       | 312      |
| Callorhynchus capensis      | 43.20 12       | 7.95        |          |
| Chelidonichthys capensis    | 7.20 12        | 1.32        |          |
| Squalus megalops            | 3.60 12        | 0.66        |          |
| Trachurus capensis          | 2.40 12        | 0.44        |          |
| Pterochiasus belloci        | 2.40 12        | 0.44        |          |
| Iepidopus caudatus          | 2.40 12        | 0.44        |          |
| Sufflogobius bibarbatatus   | 0.00 48        |             |          |
| Total                       | 543.60         | 99.99       |          |

DATE:14/11/91 PROJECT STATION: 894  
 GEAR TYPE: BT No:1 POSITION:Lat S 2056 Long E 1253  
 start stop duration Purpose code: 3  
 TIME :09:15:00 09:30:00 15 (min) Area code : 2  
 LOG : 984.70 985.30 0.80 GearCond.code:  
 FDEPTH: 244 245 Validity code:  
 BDEPTH: 244 245  
 Towing dir: 360 Wire out: 750 m Speed:310 kn\*10  
 Sorted: 97 Kg Total catch: 193.60 CATCH/HOUR: 774.40

| SPECIES                     | CATCH/HOUR    | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------------|----------|
| Merluccius capensis, female | 278.40        | 35.95         | 316      |
| Merluccius capensis, male   | 277.60        | 35.85         | 315      |
| Trachurus capensis          | 174.40        | 22.52         | 314      |
| Trachipterus jacksonensis   | 25.60         | 3.31          |          |
| Chlorophthalmus atlanticus  | 13.60         | 1.76          |          |
| Pterothrissus belloci       | 2.40          | 0.31          |          |
| Helicolenus dactylopterus   | 2.40          | 0.31          |          |
| <b>Total</b>                | <b>774.40</b> | <b>100.01</b> |          |

DATE:14/11/91 PROJECT STATION: 895  
 GEAR TYPE: BT No:1 POSITION:Lat S 2053 Long E 1247  
 start stop duration Purpose code: 3  
 TIME :10:27:00 10:57:00 30 (min) Area code : 2  
 LOG : 991.70 992.80 1.60 GearCond.code:  
 FDEPTH: 288 287 Validity code:  
 BDEPTH: 288 287  
 Towing dir: 360 Wire out: 900 m Speed:300 kn\*10  
 Sorted: 175 Kg Total catch: 408.00 CATCH/HOUR: 816.00

| SPECIES                     | CATCH/HOUR    | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------------|----------|
| Merluccius capensis, female | 439.00        | 53.80         | 318      |
| Merluccius capensis, male   | 236.20        | 28.95         | 317      |
| MYCTOPHIDAE                 | 65.20         | 7.99          |          |
| Trachurus capensis          | 22.40         | 2.75          |          |
| Neoharriotta pinnata        | 13.00         | 1.59          |          |
| Todarodes sagittatus        | 12.20         | 1.50          |          |
| Chlorophthalmus atlanticus  | 9.40          | 1.15          |          |
| Helicolenus dactylopterus   | 7.40          | 0.91          |          |
| Schedophilus huttoni        | 6.60          | 0.81          |          |
| Galeus polli                | 3.80          | 0.47          |          |
| Coelorinchus fasciatus      | 0.40          | 0.05          |          |
| Brama brama                 | 0.40          | 0.05          |          |
| <b>Total</b>                | <b>816.00</b> | <b>100.02</b> |          |

DATE:14/11/91 PROJECT STATION: 896  
 GEAR TYPE: BT No:1 POSITION:Lat S 2052 Long E 1243  
 start stop duration Purpose code: 3  
 TIME :11:53:00 12:23:00 30 (min) Area code : 2  
 LOG : 998.50 999.70 1.54 GearCond.code:  
 FDEPTH: 320 312 Validity code:  
 BDEPTH: 320 312  
 Towing dir: 360 Wire out:1000 m Speed:307 kn\*10  
 Sorted: 147 Kg Total catch: 586.00 CATCH/HOUR: 1172.00

| SPECIES                     | CATCH/HOUR     | % OF TOT. C  | SAMP.NO. |
|-----------------------------|----------------|--------------|----------|
| Merluccius capensis, female | 752.00         | 64.16        | 320      |
| Merluccius capensis, male   | 272.00         | 23.21        | 319      |
| MYCTOPHIDAE                 | 113.60         | 9.69         |          |
| Chlorophthalmus atlanticus  | 9.60           | 0.82         |          |
| Trachurus capensis          | 8.00           | 0.68         |          |
| Helicolenus dactylopterus   | 8.00           | 0.68         |          |
| PENAEIDAE                   | 4.80           | 0.41         |          |
| Galeus polli                | 4.00           | 0.34         |          |
| <b>Total</b>                | <b>1172.00</b> | <b>99.99</b> |          |

DATE:14/11/91 PROJECT STATION: 897  
 GEAR TYPE: BT No:1 POSITION:Lat S 2049 Long E 1226  
 start stop duration Purpose code: 3  
 TIME :14:33:00 15:03:00 30 (min) Area code : 2  
 LOG :1016.80 1018.30 1.58 GearCond.code:  
 FDEPTH: 365 359 Validity code:  
 BDEPTH: 365 359  
 Towing dir: 330 Wire out:1100 m Speed:307 kn\*10  
 Sorted: 153 Kg Total catch: 643.90 CATCH/HOUR: 1287.80

| SPECIES                      | CATCH/HOUR     | % OF TOT. C   | SAMP.NO. |
|------------------------------|----------------|---------------|----------|
| Merluccius capensis, female  | 754.40         | 58.58         | 322      |
| Merluccius capensis, male    | 256.20         | 19.89         | 321      |
| Merluccius paradoxus, female | 112.60         | 8.74          | 324      |
| Helicolenus dactylopterus    | 88.20          | 6.85          |          |
| Trachipterus jacksonensis    | 30.20          | 2.35          |          |
| Todarodes sagittatus         | 11.00          | 0.85          |          |
| MYCTOPHIDAE                  | 10.00          | 0.78          |          |
| Schedophilus huttoni         | 8.40           | 0.65          |          |
| Galeus polli                 | 5.80           | 0.45          |          |
| Nezumia micronychodon        | 4.20           | 0.33          |          |
| Merluccius paradoxus, male   | 4.20           | 0.33          | 323      |
| Chlorophthalmus atlanticus   | 2.60           | 0.20          |          |
| <b>Total</b>                 | <b>1287.80</b> | <b>100.00</b> |          |

DATE:14/11/91 PROJECT STATION: 898  
 GEAR TYPE: BT No:1 POSITION:Lat S 2044 Long E 1218  
 start stop duration Purpose code: 3  
 TIME :16:24:00 16:54:00 30 (min) Area code : 2  
 LOG :1025.30 1026.70 1.48 GearCond.code:  
 FDEPTH: 401 400 Validity code:  
 BDEPTH: 401 400  
 Towing dir: 320 Wire out:1200 m Speed:305 kn\*10  
 Sorted: 134 Kg Total catch: 336.00 CATCH/HOUR: 672.00

| SPECIES                      | CATCH/HOUR    | % OF TOT. C   | SAMP.NO. |
|------------------------------|---------------|---------------|----------|
| Merluccius paradoxus, female | 197.00        | 29.32         | 326      |
| Merluccius capensis, female  | 128.60        | 19.14         | 328      |
| PENAEIDAE                    | 67.60         | 10.06         |          |
| Merluccius paradoxus, male   | 59.00         | 8.78          | 325      |
| Krill                        | 54.00         | 8.04          |          |
| Todarodes sagittatus         | 49.60         | 7.38          |          |
| Trachyrinus scabrus          | 44.60         | 6.64          |          |
| Deepwater fish mixture       | 13.60         | 2.02          |          |
| Centrolophus niger           | 12.60         | 1.88          |          |
| Nezumia sp.                  | 11.00         | 1.64          |          |
| Helicolenus dactylopterus    | 11.00         | 1.64          |          |
| Merluccius capensis, male    | 6.00          | 0.89          | 327      |
| Epigonus denticulatus        | 5.60          | 0.83          |          |
| Galeus polli                 | 5.60          | 0.83          |          |
| Hoplostethus mediterraneus   | 3.60          | 0.54          |          |
| Lepidopus caudatus           | 2.60          | 0.39          |          |
| <b>Total</b>                 | <b>672.00</b> | <b>100.02</b> |          |

DATE:14/11/91 PROJECT STATION: 899  
 GEAR TYPE: BT No:1 POSITION:Lat S 2040 Long E 1221  
 start stop duration Purpose code: 3  
 TIME :18:21:00 18:51:00 30 (min) Area code : 2  
 LOG :1033.20 1034.50 1.50 GearCond.code:  
 FDEPTH: 319 319 Validity code:  
 BDEPTH: 319 319  
 Towing dir: 340 Wire out:1000 m Speed:300 kn\*10  
 Sorted: 145 Kg Total catch: 348.10 CATCH/HOUR: 696.20

| SPECIES                     | CATCH/HOUR    | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------------|----------|
| Merluccius capensis, female | 329.80        | 47.37         | 331      |
| Merluccius capensis, male   | 173.80        | 24.96         | 330      |
| Helicolenus dactylopterus   | 127.60        | 18.33         |          |
| Trachurus capensis          | 35.00         | 5.03          | 329      |
| Todarodes sagittatus        | 8.60          | 1.24          |          |
| Zenopsis conchifer          | 7.60          | 1.09          |          |
| Chlorophthalmus atlanticus  | 7.60          | 1.09          |          |
| Lophius upsicephalus        | 5.20          | 0.75          |          |
| Galeus polli                | 1.00          | 0.14          |          |
| <b>Total</b>                | <b>696.20</b> | <b>100.00</b> |          |

DATE:14/11/91 PROJECT STATION: 900  
 GEAR TYPE: BT No:1 POSITION:Lat S 2038 Long E 1223  
 start stop duration Purpose code: 3  
 TIME :19:45:00 20:15:00 30 (min) Area code : 2  
 LOG :1039.70 1041.00 1.50 GearCond.code:  
 FDEPTH: 303 302 Validity code:  
 BDEPTH: 303 302  
 Towing dir: 360 Wire out: 900 m Speed:300 kn\*10  
 Sorted: 170 Kg Total catch: 395.60 CATCH/HOUR: 791.20

| SPECIES                        | CATCH/HOUR    | % OF TOT. C   | SAMP.NO. |
|--------------------------------|---------------|---------------|----------|
| Merluccius capensis, female    | 547.00        | 69.14         | 333      |
| Merluccius capensis, male      | 177.40        | 22.42         | 332      |
| Helicolenus dactylopterus      | 29.40         | 3.72          |          |
| Chlorophthalmus atlanticus     | 28.40         | 3.59          |          |
| Galeus polli                   | 3.80          | 0.48          |          |
| Solenocera africana            | 2.40          | 0.30          |          |
| Trachurus capensis             | 1.80          | 0.23          |          |
| Coelorinchus coelorinch. polli | 1.00          | 0.13          |          |
| <b>Total</b>                   | <b>791.20</b> | <b>100.01</b> |          |

DATE:14/11/91 PROJECT STATION: 901  
 GEAR TYPE: BT No:1 POSITION:Lat S 2036 Long E 1238  
 start stop duration Purpose code: 3  
 TIME :22:24:00 22:54:00 30 (min) Area code : 2  
 LOG :1058.40 1059.70 1.50 GearCond.code:  
 FDEPTH: 279 273 Validity code:  
 BDEPTH: 279 273  
 Towing dir: 360 Wire out: 850 m Speed:290 kn\*10  
 Sorted: 111 Kg Total catch: 305.50 CATCH/HOUR: 611.00

| SPECIES                     | CATCH/HOUR    | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------------|----------|
| Merluccius capensis, female | 383.40        | 62.75         | 335      |
| Merluccius capensis, male   | 142.00        | 23.24         | 334      |
| Helicolenus dactylopterus   | 14.20         | 2.32          |          |
| Galeus polli                | 13.20         | 2.16          |          |
| Chlorophthalmus atlanticus  | 12.40         | 2.03          |          |
| MYCTOPHIDAE                 | 11.00         | 1.80          |          |
| Trachurus capensis          | 8.20          | 1.34          |          |
| Sufflogobius bibarbatu      | 6.00          | 0.98          |          |
| Pterothrissus belloci       | 5.60          | 0.92          |          |
| Neoharriotta pinnata        | 5.60          | 0.92          |          |
| Lophius upsicephalus        | 5.00          | 0.82          |          |
| Coelorinchus fasciatus      | 4.40          | 0.72          |          |
| <b>Total</b>                | <b>611.00</b> | <b>100.00</b> |          |

DATE:15/11/91 PROJECT STATION: 902  
 GEAR TYPE: BT No:1 POSITION:Lat S 2033 Long E 1245  
 start stop duration Purpose code: 3  
 TIME :00:21:00 00:34:00 13 (min) Area code : 2  
 LOG :1071.00 1071.50 0.53 GearCond.code:  
 FDEPTH: 213 211 Validity code:  
 BDEPTH: 213 211  
 Towing dir: 340 Wire out: 800 m Speed:315 kn\*10  
 Sorted: 80 Kg Total catch: 79.70 CATCH/HOUR: 367.85

| SPECIES                     | CATCH/HOUR    | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------------|----------|
| Trachurus capensis          | 150.92        | 41.03         | 338      |
| Merluccius capensis, female | 112.15        | 30.49         | 337      |
| Merluccius capensis, male   | 48.00         | 13.05         | 336      |
| Chlorophthalmus atlanticus  | 18.46         | 5.02          |          |
| Pterothrissus belloci       | 10.62         | 2.89          |          |
| Neoharriotta pinnata        | 8.31          | 2.26          |          |
| Lophius upsicephalus        | 7.85          | 2.13          |          |
| Sufflogobius bibarbatu      | 3.69          | 1.00          |          |
| Todarodes sagittatus        | 2.77          | 0.75          |          |
| Coelorinchus fasciatus      | 1.85          | 0.50          |          |
| Beryx splendens             | 1.38          | 0.38          |          |
| Lepidopus caudatus          | 1.38          | 0.38          |          |
| PORTUNIDAE                  | 0.46          | 0.13          |          |
| <b>Total</b>                | <b>367.84</b> | <b>100.01</b> |          |

DATE:15/11/91 PROJECT STATION: 903  
 GEAR TYPE: BT No:1 POSITION:Lat S 2018 Long E 1231  
 start stop duration Purpose code: 3  
 TIME :06:25:00 06:45:00 20 (min) Area code : 2  
 LOG :1112.90 1113.70 1.00 GearCond.code:  
 FDEPTH: 242 239 Validity code:  
 BDEPTH: 242 239  
 Towing dir: 255 Wire out: 750 m Speed:300 kn\*10  
 Sorted: 104 Kg Total catch: 181.30 CATCH/HOUR: 543.90

| SPECIES                     | CATCH/HOUR    | % OF TOT. C  | SAMP.NO. |
|-----------------------------|---------------|--------------|----------|
| Merluccius capensis, female | 294.00        | 54.05        | 342      |
| Pterothrissus belloci       | 114.60        | 21.07        | 340      |
| Merluccius capensis, male   | 75.00         | 13.79        | 341      |
| Trachurus capensis          | 46.20         | 8.49         | 339      |
| Neoharriotta pinnata        | 14.10         | 2.59         |          |
| <b>Total</b>                | <b>543.90</b> | <b>99.99</b> |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2020  
 start stop duration Long E 1222  
 TIME :08:07:00 08:37:00 30 (min) Purpose code: 3  
 LOG :1123.60 1125.00 1.50 Area code : 2  
 FDEPTH: 273 270 GearCond.code:  
 BDEPTH: 273 270 Validity code:  
 Towing dir: 340 Wire out: 850 m Speed:290 kn\*10  
 Sorted: 117 Kg Total catch: 586.50 CATCH/HOUR: 1173.00

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 785.00     | 810     | 66.92       | 344      |
| Merluccius capensis, male   | 278.00     | 460     | 23.70       | 343      |
| Pterothrissus belloci       | 35.00      |         | 2.98        |          |
| Trachurus capensis          | 30.00      | 110     | 2.56        |          |
| Neoharriotta pinnata        | 17.00      | 10      | 1.45        |          |
| Sufflogobius bibarbatu      | 13.00      | 450     | 1.11        |          |
| Galeus polli                | 12.00      | 60      | 1.02        |          |
| Chlorophthalmus atlanticus  | 2.00       | 50      | 0.17        |          |
| Helicolenus dactylopterus   | 1.00       | 80      | 0.09        |          |
| Total                       | 1173.00    |         | 100.00      |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2003  
 start stop duration Long E 1204  
 TIME :17:33:00 18:03:00 30 (min) Purpose code: 3  
 LOG :1177.60 1179.10 1.40 Area code : 2  
 FDEPTH: 303 307 GearCond.code:  
 BDEPTH: 303 307 Validity code:  
 Towing dir: 350 Wire out:1000 m Speed:300 kn\*10  
 Sorted: 112 Kg Total catch: 281.20 CATCH/HOUR: 562.40

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 338.00     | 420     | 60.10       | 355      |
| Merluccius capensis, male   | 154.00     | 250     | 27.38       | 354      |
| Chlorophthalmus atlanticus  | 17.60      | 890     | 3.13        |          |
| Galeus polli                | 16.00      | 340     | 2.84        |          |
| Helicolenus dactylopterus   | 15.00      | 1766    | 2.67        |          |
| Lophius upsicephalus        | 14.00      | 20      | 2.49        |          |
| Trachurus capensis          | 4.60       | 20      | 0.82        |          |
| Coelorinchus fasciatus      | 2.60       | 56      | 0.46        |          |
| Todarodes sagittatus        | 0.60       | 6       | 0.11        |          |
| Total                       | 562.40     |         | 100.00      |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2023  
 start stop duration Long E 1212  
 TIME :10:15:00 10:45:00 30 (min) Purpose code: 3  
 LOG :1136.90 1138.30 1.50 Area code : 2  
 FDEPTH: 300 300 GearCond.code:  
 BDEPTH: 300 300 Validity code:  
 Towing dir: 340 Wire out: 900 m Speed:310 kn\*10  
 Sorted: 116 Kg Total catch: 463.60 CATCH/HOUR: 927.20

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 632.80     | 720     | 68.25       | 346      |
| Merluccius capensis, male   | 253.60     | 360     | 27.35       | 345      |
| Trachurus capensis          | 15.20      | 48      | 1.64        |          |
| Chlorophthalmus atlanticus  | 14.40      | 608     | 1.55        |          |
| Helicolenus dactylopterus   | 8.80       | 568     | 0.95        |          |
| Galeus polli                | 2.40       | 24      | 0.26        |          |
| Sufflogobius bibarbatu      | 0.00       | 16      |             |          |
| Total                       | 927.20     |         | 100.00      |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2001  
 start stop duration Long E 1211  
 TIME :19:25:00 19:45:00 20 (min) Purpose code: 3  
 LOG :1189.10 1190.10 1.00 Area code : 2  
 FDEPTH: 260 262 GearCond.code:  
 BDEPTH: 260 262 Validity code:  
 Towing dir: 360 Wire out: 850 m Speed:300 kn\*10  
 Sorted: 119 Kg Total catch: 214.30 CATCH/HOUR: 642.90

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 406.20     | 501     | 63.18       | 357      |
| Merluccius capensis, male   | 174.30     | 330     | 27.11       | 356      |
| Pterothrissus belloci       | 21.00      | 120     | 3.27        |          |
| Neoharriotta pinnata        | 17.70      | 12      | 2.75        |          |
| Lophius upsicephalus        | 6.60       | 6       | 1.03        |          |
| Trachurus capensis          | 5.40       | 21      | 0.84        |          |
| Todarodes sagittatus        | 4.20       | 15      | 0.65        |          |
| Galeus polli                | 2.70       | 66      | 0.42        |          |
| Chlorophthalmus atlanticus  | 2.10       | 66      | 0.33        |          |
| Sufflogobius bibarbatu      | 1.50       | 20      | 0.23        |          |
| Helicolenus dactylopterus   | 1.20       | 75      | 0.19        |          |
| Total                       | 642.90     |         | 100.00      |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2025  
 start stop duration Long E 1206  
 TIME :11:45:00 12:15:00 30 (min) Purpose code: 3  
 LOG :1144.50 1145.80 1.47 Area code : 2  
 FDEPTH: 350 354 GearCond.code:  
 BDEPTH: 350 354 Validity code:  
 Towing dir: 340 Wire out:1050 m Speed:288 kn\*10  
 Sorted: 186 Kg Total catch: 372.10 CATCH/HOUR: 744.20

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 406.80     | 400     | 54.66       | 348      |
| Helicolenus dactylopterus   | 161.00     | 3556    | 21.63       |          |
| Merluccius capensis, male   | 100.20     | 126     | 13.46       | 347      |
| Todarodes sagittatus        | 35.80      | 78      | 4.81        |          |
| Hoplostethus mediterraneus  | 16.20      | 1226    | 2.18        |          |
| Galeus polli                | 13.40      | 190     | 1.80        |          |
| Chlorophthalmus atlanticus  | 7.80       | 196     | 1.05        |          |
| Nezumia microchodon         | 2.20       | 50      | 0.30        |          |
| Coelorinchus sp.            | 0.40       | 8       | 0.05        |          |
| Selachophidium guentheri    | 0.40       | 8       | 0.05        |          |
| Total                       | 744.20     |         | 99.99       |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1958  
 start stop duration Long E 1217  
 TIME :20:55:00 21:15:00 20 (min) Purpose code: 3  
 LOG :1198.80 1199.60 1.00 Area code : 3  
 FDEPTH: 224 224 GearCond.code:  
 BDEPTH: 224 224 Validity code:  
 Towing dir: 360 Wire out: 650 m Speed:280 kn\*10  
 Sorted: 108 Kg Total catch: 161.40 CATCH/HOUR: 484.20

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 283.20     | 459     | 58.49       | 360      |
| Merluccius capensis, male   | 143.70     | 339     | 29.68       | 359      |
| Pterothrissus belloci       | 28.50      | 168     | 5.89        | 358      |
| Trachurus capensis          | 17.10      | 90      | 3.53        |          |
| Todarodes sagittatus        | 5.40       | 15      | 1.12        |          |
| Lepidopus caudatus          | 3.60       | 9       | 0.74        |          |
| Lophius upsicephalus        | 1.80       | 6       | 0.37        |          |
| Galeus polli                | 0.90       | 15      | 0.19        |          |
| Total                       | 484.20     |         | 100.01      |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2019  
 start stop duration Long E 1159  
 TIME :13:30:00 14:00:00 30 (min) Purpose code: 3  
 LOG :1153.60 1155.00 1.43 Area code : 2  
 FDEPTH: 451 453 GearCond.code:  
 BDEPTH: 451 453 Validity code:  
 Towing dir: 330 Wire out:1250 m Speed:293 kn\*10  
 Sorted: 90 Kg Total catch: 847.40 CATCH/HOUR: 1694.80

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Hoplostethus mediterraneus  | 1534.00    | 116584  | 90.51       |          |
| Merluccius capensis, female | 80.60      | 68      | 4.76        | 350      |
| Merluccius capensis, male   | 32.20      | 60      | 1.90        | 351      |
| Coelorinchus fasciatus      | 20.80      | 676     | 1.23        |          |
| Trachyrhinus squalus        | 20.80      | 104     | 1.23        |          |
| Merluccius capensis, male   | 6.40       | 8       | 0.38        | 349      |
| Total                       | 1694.80    |         | 100.01      |          |

DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1952  
 start stop duration Long E 1149  
 TIME :06:25:00 06:55:00 30 (min) Purpose code: 3  
 LOG :1254.90 1255.70 1.50 Area code : 3  
 FDEPTH: 375 375 GearCond.code:  
 BDEPTH: 375 375 Validity code:  
 Towing dir: 340 Wire out:1000 m Speed:300 kn\*10  
 Sorted: 121 Kg Total catch: 302.80 CATCH/HOUR: 605.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 328.60     | 290     | 54.26       | 362      |
| Merluccius capensis, male   | 99.00      | 116     | 16.35       | 361      |
| Helicolenus dactylopterus   | 65.00      | 666     | 10.73       |          |
| MYCTOPHIDAE                 | 25.00      |         | 4.13        |          |
| Galeus polli                | 19.60      | 160     | 3.24        |          |
| Todarodes sagittatus        | 16.00      | 50      | 2.64        |          |
| PENAEIDAE                   | 10.00      |         | 1.65        |          |
| Coelorinchus sp.            | 10.00      | 156     | 1.65        |          |
| Schedophilus huttoni        | 9.00       | 6       | 1.49        |          |
| RAJIDAE                     | 9.00       | 10      | 1.49        |          |
| Neoharriotta pinnata        | 6.00       | 6       | 0.99        |          |
| Lophius upsicephalus        | 6.00       | 6       | 0.99        |          |
| Lepidopus caudatus          | 1.00       | 26      | 0.17        |          |
| Selachophidium guentheri    | 0.60       | 10      | 0.10        |          |
| Chlorophthalmus atlanticus  | 0.60       | 30      | 0.10        |          |
| Epigonus denticulatus       | 0.20       | 16      | 0.03        |          |
| Total                       | 605.60     |         | 100.01      |          |

DATE:15/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2006  
 start stop duration Long E 1158  
 TIME :15:40:00 16:10:00 30 (min) Purpose code: 3  
 LOG :1166.80 1168.30 1.55 Area code : 2  
 FDEPTH: 355 355 GearCond.code:  
 BDEPTH: 355 355 Validity code:  
 Towing dir: 350 Wire out:1100 m Speed:305 kn\*10  
 Sorted: 200 Kg Total catch: 199.50 CATCH/HOUR: 399.00

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 220.60     | 192     | 55.29       | 353      |
| Merluccius capensis, male   | 73.40      | 84      | 18.40       | 352      |
| Helicolenus dactylopterus   | 55.20      | 1104    | 13.83       |          |
| Hoplostethus mediterraneus  | 16.60      | 450     | 4.16        |          |
| Todarodes sagittatus        | 5.30       | 16      | 1.45        |          |
| Galeus polli                | 5.60       | 56      | 1.40        |          |
| Chlorophthalmus atlanticus  | 3.60       | 110     | 0.90        |          |
| Coelorinchus fasciatus      | 2.80       | 118     | 0.70        |          |
| Lophius upsicephalus        | 2.80       | 4       | 0.70        |          |
| Neoharriotta pinnata        | 2.80       | 2       | 0.70        |          |
| ARISTEIDAE                  | 2.40       |         | 0.60        |          |
| PENAEIDAE                   | 2.40       |         | 0.60        |          |
| Trachurus capensis          | 1.60       | 8       | 0.40        |          |
| Coelorinchus sp.            | 0.80       | 14      | 0.20        |          |
| Todaropsis eblanae          | 0.60       | 4       | 0.15        |          |
| Nezumia sp.                 | 0.60       | 4       | 0.15        |          |
| Beryx splendens             | 0.40       | 2       | 0.10        |          |
| Epigonus denticulatus       | 0.40       | 8       | 0.10        |          |
| Lepidopus caudatus          | 0.40       | 2       | 0.10        |          |
| Mullus microlepis           | 0.20       | 2       | 0.05        |          |
| Total                       | 399.00     |         | 99.98       |          |

DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1947  
 start stop duration Long E 1157  
 TIME :18:20:00 18:50:00 30 (min) Purpose code: 3  
 LOG :1266.90 1268.30 1.50 Area code : 3  
 FDEPTH: 327 326 GearCond.code:  
 BDEPTH: 327 326 Validity code:  
 Towing dir: 350 Wire out:1000 m Speed:290 kn\*10  
 Sorted: 110 Kg Total catch: 219.40 CATCH/HOUR: 438.80

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 214.80     | 284     | 48.95       | 364      |
| Merluccius capensis, male   | 150.00     | 248     | 34.18       | 363      |
| Helicolenus dactylopterus   | 32.80      | 1640    | 7.47        |          |
| Neoharriotta pinnata        | 13.60      | 8       | 3.10        |          |
| Chlorophthalmus atlanticus  | 8.80       | 340     | 2.01        |          |
| Galeus polli                | 8.00       | 136     | 2.01        |          |
| Lophius upsicephalus        | 4.60       | 8       | 1.09        |          |
| Todarodes sagittatus        | 2.80       | 8       | 0.64        |          |
| Coelorinchus sp.            | 2.00       | 64      | 0.46        |          |
| Selachophidium guentheri    | 0.40       | 4       | 0.09        |          |
| Total                       | 438.80     |         | 100.00      |          |



PROJECT STATION: 914  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1942 Long E 1206  
 start stop duration  
 TIME :10:12:00 10:42:00 30 (min) Purpose code: 3  
 LOG :1278.70 1279.90 1.40 Area code : 3  
 FDEPTH: 273 273 GearCond.code:  
 BDEPTH: 273 273 Validity code:  
 Towing dir: 350 Wire out: 850 m Speed:280 kn\*10  
 Sorted: 143 Kg Total catch: 186.40 CATCH/HOUR: 372.80

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------|---------------|----------|
|                             | weight        | numbers |               |          |
| Merluccius capensis, female | 175.00        | 254     | 46.94         | 366      |
| Merluccius capensis, male   | 83.40         | 154     | 22.37         | 365      |
| Pterothrissus belloci       | 75.20         | 366     | 20.17         |          |
| Neoharriotta pinnata        | 27.60         | 16      | 7.40          |          |
| Helicolenus dactylopterus   | 3.20          | 106     | 0.86          |          |
| Trachurus capensis          | 1.60          | 8       | 0.43          |          |
| Lepidopus caudatus          | 1.40          | 6       | 0.38          |          |
| Todarodes sagittatus        | 1.40          | 6       | 0.38          |          |
| Lophius upsicephalus        | 1.40          | 6       | 0.38          |          |
| Echinorhinus cookei         | 1.20          | 2       | 0.32          |          |
| Galeus polli                | 0.80          | 10      | 0.21          |          |
| Deepwater fish mixture      | 0.60          |         | 0.16          |          |
| <b>Total</b>                | <b>372.80</b> |         | <b>100.00</b> |          |

PROJECT STATION: 915  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1940 Long E 1213  
 start stop duration  
 TIME :11:44:00 11:54:00 10 (min) Purpose code: 3  
 LOG :1287.00 1287.30 0.50 Area code : 3  
 FDEPTH: 228 230 GearCond.code:  
 BDEPTH: 228 230 Validity code:  
 Towing dir: 360 Wire out: 700 m Speed:280 kn\*10  
 Sorted: 17 Kg Total catch: 17.00 CATCH/HOUR: 102.00

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------|---------------|----------|
|                             | weight        | numbers |               |          |
| Merluccius capensis, female | 48.60         | 78      | 47.65         | 368      |
| Pterothrissus belloci       | 17.40         | 84      | 17.06         |          |
| MYCTOPHIDAE                 | 12.00         |         | 11.76         |          |
| Sufflogobius bibarbatatus   | 12.00         |         | 11.76         |          |
| Merluccius capensis, male   | 7.80          | 24      | 7.65          | 367      |
| Lepidopus caudatus          | 3.00          | 12      | 2.94          |          |
| Galeus polli                | 1.20          | 12      | 1.18          |          |
| <b>Total</b>                | <b>102.00</b> |         | <b>100.00</b> |          |

PROJECT STATION: 916  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1924 Long E 1208  
 start stop duration  
 TIME :13:41:00 14:01:00 20 (min) Purpose code: 3  
 LOG :1302.80 1303.80 1.00 Area code : 3  
 FDEPTH: 231 232 GearCond.code:  
 BDEPTH: 231 232 Validity code:  
 Towing dir: 348 Wire out: 800 m Speed:300 kn\*10  
 Sorted: 107 Kg Total catch: 106.50 CATCH/HOUR: 319.50

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------|---------------|----------|
|                             | weight        | numbers |               |          |
| Merluccius capensis, female | 174.90        | 411     | 54.74         | 370      |
| Merluccius capensis, male   | 105.00        | 363     | 32.86         | 369      |
| Pterothrissus belloci       | 17.40         | 90      | 5.45          |          |
| Trachurus capensis          | 9.00          | 39      | 2.82          |          |
| Sufflogobius bibarbatatus   | 4.50          |         | 1.41          |          |
| Beryx splendens             | 4.50          | 21      | 1.41          |          |
| MYCTOPHIDAE                 | 3.00          |         | 0.94          |          |
| Galeus polli                | 0.90          | 18      | 0.28          |          |
| Chlorophthalmus atlanticus  | 0.30          | 9       | 0.09          |          |
| <b>Total</b>                | <b>319.50</b> |         | <b>100.00</b> |          |

PROJECT STATION: 917  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1925 Long E 1200  
 start stop duration  
 TIME :15:15:00 15:45:00 30 (min) Purpose code: 3  
 LOG :1312.80 1314.30 1.53 Area code : 3  
 FDEPTH: 275 276 GearCond.code:  
 BDEPTH: 275 276 Validity code:  
 Towing dir: 340 Wire out: 900 m Speed:310 kn\*10  
 Sorted: 111 Kg Total catch: 250.40 CATCH/HOUR: 500.80

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------|---------------|----------|
|                             | weight        | numbers |               |          |
| Merluccius capensis, female | 262.40        | 356     | 52.40         | 372      |
| Trachurus capensis          | 90.00         | 90      | 17.97         | 373      |
| Merluccius capensis, male   | 78.80         | 150     | 15.73         | 371      |
| Helicolenus dactylopterus   | 37.60         | 1764    | 7.51          |          |
| Dentex macrophthalmus       | 17.40         | 50      | 3.47          |          |
| Pterothrissus belloci       | 6.20          | 36      | 1.64          |          |
| Chlorophthalmus atlanticus  | 3.60          | 158     | 0.72          |          |
| ARISTEIDAE                  | 1.40          |         | 0.28          |          |
| Galeus polli                | 1.40          | 28      | 0.28          |          |
| <b>Total</b>                | <b>500.80</b> |         | <b>100.00</b> |          |

PROJECT STATION: 918  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1927 Long E 1149  
 start stop duration  
 TIME :17:13:00 17:43:00 30 (min) Purpose code: 3  
 LOG :1325.70 1327.10 1.61 Area code : 3  
 FDEPTH: 313 319 GearCond.code:  
 BDEPTH: 313 319 Validity code:  
 Towing dir: 300 Wire out:1000 m Speed:312 kn\*10  
 Sorted: 145 Kg Total catch: 334.40 CATCH/HOUR: 668.80

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------|---------------|----------|
|                             | weight        | numbers |               |          |
| Merluccius capensis, female | 358.40        | 392     | 53.59         | 375      |
| Merluccius capensis, male   | 198.20        | 258     | 29.64         | 374      |
| Helicolenus dactylopterus   | 63.00         | 3328    | 9.42          |          |
| Chlorophthalmus atlanticus  | 15.60         | 502     | 2.33          |          |
| Todarodes sagittatus        | 13.80         | 32      | 2.06          |          |
| Galeus polli                | 4.60          | 70      | 0.69          |          |
| Trachurus capensis          | 4.60          | 14      | 0.69          |          |
| Synagrops microlepis        | 3.20          | 162     | 1.48          |          |
| Lophius upsicephalus        | 3.20          | 4       | 0.48          |          |
| Etmopterus pusillus         | 2.40          | 4       | 0.36          |          |
| Coelorinchus sp.            | 1.80          | 46      | 0.27          |          |
| <b>Total</b>                | <b>668.80</b> |         | <b>100.01</b> |          |

PROJECT STATION: 919  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1929 Long E 1142  
 start stop duration  
 TIME :18:53:00 19:23:00 30 (min) Purpose code: 3  
 LOG :1334.90 1336.40 1.50 Area code : 3  
 FDEPTH: 349 353 GearCond.code:  
 BDEPTH: 349 353 Validity code:  
 Towing dir: 340 Wire out:1050 m Speed:300 kn\*10  
 Sorted: 196 Kg Total catch: 392.20 CATCH/HOUR: 784.40

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C  | SAMP.NO. |
|-----------------------------|---------------|---------|--------------|----------|
|                             | weight        | numbers |              |          |
| Merluccius capensis, female | 472.20        | 444     | 60.33        | 377      |
| Merluccius capensis, male   | 190.00        | 244     | 24.22        | 376      |
| Helicolenus dactylopterus   | 92.80         | 1470    | 11.83        |          |
| Todarodes sagittatus        | 10.40         | 24      | 1.33         |          |
| Galeus polli                | 4.40          | 52      | 0.56         |          |
| Coelorinchus sp.            | 4.40          | 84      | 0.56         |          |
| Lophius upsicephalus        | 4.00          | 4       | 0.51         |          |
| Trachurus capensis          | 2.00          | 4       | 0.25         |          |
| Synagrops microlepis        | 2.00          | 76      | 0.25         |          |
| Lepidopus caudatus          | 0.80          | 4       | 0.10         |          |
| Selachophidium guentheri    | 0.40          | 8       | 0.05         |          |
| <b>Total</b>                | <b>784.40</b> |         | <b>99.99</b> |          |

PROJECT STATION: 920  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1931 Long E 1137  
 start stop duration  
 TIME :20:30:00 21:00:00 30 (min) Purpose code: 3  
 LOG :1343.70 1345.20 1.60 Area code : 3  
 FDEPTH: 392 382 GearCond.code:  
 BDEPTH: 392 382 Validity code:  
 Towing dir: 25 Wire out:1200 m Speed:300 kn\*10  
 Sorted: 142 Kg Total catch: 938.60 CATCH/HOUR: 1877.20

| SPECIES                     | CATCH/HOUR     |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|----------------|---------|---------------|----------|
|                             | weight         | numbers |               |          |
| Merluccius capensis, female | 858.00         | 964     | 45.71         | 379      |
| Merluccius capensis, male   | 650.80         | 778     | 34.67         | 378      |
| Helicolenus dactylopterus   | 278.60         | 1504    | 14.84         |          |
| Neoharriotta pinnata        | 42.20          | 26      | 2.25          |          |
| Coelorinchus sp.            | 22.40          | 594     | 1.19          |          |
| Galeus polli                | 15.80          | 118     | 0.84          |          |
| Epigonus denticulatus       | 8.00           | 238     | 0.43          |          |
| Lepidopus caudatus          | 1.40           | 14      | 0.07          |          |
| <b>Total</b>                | <b>1877.20</b> |         | <b>100.00</b> |          |

PROJECT STATION: 921  
 DATE:16/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1931 Long E 1134  
 start stop duration  
 TIME :22:08:00 22:38:00 30 (min) Purpose code: 3  
 LOG :1352.00 1353.50 1.60 Area code : 3  
 FDEPTH: 450 455 GearCond.code:  
 BDEPTH: 450 455 Validity code:  
 Towing dir: 360 Wire out:1350 m Speed:330 kn\*10  
 Sorted: 117 Kg Total catch: 189.20 CATCH/HOUR: 378.40

| SPECIES                      | CATCH/HOUR    |         | % OF TOT. C  | SAMP.NO. |
|------------------------------|---------------|---------|--------------|----------|
|                              | weight        | numbers |              |          |
| Centrophorus squamosus       | 85.80         | 12      | 22.67        |          |
| Merluccius capensis, female  | 67.60         | 62      | 17.86        | 383      |
| Helicolenus dactylopterus    | 61.00         | 290     | 16.12        |          |
| RAJIDAE                      | 36.00         | 40      | 9.51         |          |
| Merluccius capensis, male    | 39.40         | 34      | 8.83         | 382      |
| Todarodes sagittatus         | 28.00         | 60      | 7.40         |          |
| Nezumia sp.                  | 18.00         | 720     | 4.76         |          |
| Hoplostethus mediterraneus   | 15.00         | 290     | 3.96         |          |
| Deepwater fish mixture       | 10.00         |         | 2.64         |          |
| Merluccius paradoxus, female | 9.40          | 14      | 2.48         | 381      |
| Trachyrhinus scabrus         | 9.00          | 160     | 2.38         |          |
| Galeus polli                 | 3.00          | 20      | 0.79         |          |
| Merluccius paradoxus, male   | 2.20          | 2       | 0.58         | 380      |
| <b>Total</b>                 | <b>378.40</b> |         | <b>99.98</b> |          |

PROJECT STATION: 922  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1903 Long E 1207  
 start stop duration  
 TIME :06:30:00 06:50:00 20 (min) Purpose code: 3  
 LOG :1404.40 1405.50 1.10 Area code : 3  
 FDEPTH: 153 151 GearCond.code:  
 BDEPTH: 153 151 Validity code:  
 Towing dir: 340 Wire out: 500 m Speed:310 kn\*10  
 Sorted: 48 Kg Total catch: 251.90 CATCH/HOUR: 755.70

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------|---------------|----------|
|                             | weight        | numbers |               |          |
| Merluccius capensis, female | 280.50        | 1260    | 37.12         | 385      |
| Dentex macrophthalmus       | 264.60        | 1884    | 35.01         |          |
| Merluccius capensis, male   | 123.00        | 867     | 16.28         | 384      |
| Trachurus capensis          | 44.10         | 315     | 5.84          |          |
| Helicolenus dactylopterus   | 14.10         | 48      | 1.87          |          |
| Trigla lyra                 | 11.10         | 48      | 1.47          |          |
| Pterothrissus belloci       | 11.10         | 48      | 1.47          |          |
| Squalus blainvillei         | 6.30          | 15      | 0.83          |          |
| Sufflogobius bibarbatatus   | 0.90          | 519     | 0.12          |          |
| <b>Total</b>                | <b>755.70</b> |         | <b>100.01</b> |          |

PROJECT STATION: 923  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1903 Long E 1200  
 start stop duration  
 TIME :07:52:00 08:22:00 30 (min) Purpose code: 3  
 LOG :1413.00 1414.40 1.50 Area code : 3  
 FDEPTH: 215 214 GearCond.code:  
 BDEPTH: 215 214 Validity code:  
 Towing dir: 340 Wire out: 650 m Speed:300 kn\*10  
 Sorted: 76 Kg Total catch: 215.80 CATCH/HOUR: 431.60

| SPECIES                     | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|-----------------------------|---------------|---------|---------------|----------|
|                             | weight        | numbers |               |          |
| Merluccius capensis, female | 278.80        | 680     | 64.60         | 388      |
| Merluccius capensis, male   | 82.20         | 334     | 19.05         | 387      |
| Trachurus capensis          | 29.00         | 142     | 6.72          | 386      |
| Pterothrissus belloci       | 15.60         | 80      | 3.15          |          |
| Sufflogobius bibarbatatus   | 12.00         |         | 2.78          |          |
| Dentex macrophthalmus       | 9.00          | 46      | 2.09          |          |
| Trigla lyra                 | 2.80          | 6       | 0.65          |          |
| MYCTOPHIDAE                 | 1.80          |         | 0.42          |          |
| Lophius upsicephalus        | 1.80          | 6       | 0.42          |          |
| Synagrops microlepis        | 0.60          | 40      | 0.14          |          |
| <b>Total</b>                | <b>431.60</b> |         | <b>100.02</b> |          |

PROJECT STATION: 924  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1907  
 start stop duration  
 TIME :09:57:00 10:27:00 30 (min) Purpose code: 3  
 LOG :1427.30 1428.70 1.60 Area code : 3  
 FDEPTH: 287 288 GearCond.code:  
 BDEPTH: 287 288 Validity code:  
 Towing dir: 340 Wire out: 850 m Speed:290 kn\*10  
 Sorted: 107 Kg Total catch: 347.70 CATCH/HOUR: 695.40

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 368.00     | 520         | 52.92    | 391 |
| Merluccius capensis, male   | 121.00     | 202         | 17.40    | 390 |
| Pterothrissus belloci       | 91.00      | 430         | 13.09    |     |
| Trachurus capensis          | 44.70      | 202         | 6.26     | 389 |
| Neoharriotta pinnata        | 32.60      | 20          | 4.69     |     |
| Dentex macrophthalms        | 27.40      | 78          | 3.94     |     |
| Synagrops microlepis        | 5.20       | 214         | 0.75     |     |
| Hyperoglyphe mosellii       | 4.00       | 6           | 0.58     |     |
| Chlorophthalmus atlanticus  | 1.40       | 78          | 0.20     |     |
| Galeus pollii               | 0.60       | 14          | 0.09     |     |
| Total                       | 695.40     |             | 100.02   |     |

PROJECT STATION: 925  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1852  
 start stop duration  
 TIME :18:58:00 19:28:00 30 (min) Purpose code: 3  
 LOG :1476.60 1478.00 1.50 Area code : 3  
 FDEPTH: 302 300 GearCond.code:  
 BDEPTH: 302 300 Validity code:  
 Towing dir: 355 Wire out: 900 m Speed:300 kn\*10  
 Sorted: 144 Kg Total catch: 861.00 CATCH/HOUR: 1722.00

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 1038.00    | 1332        | 60.28    | 402 |
| Merluccius capensis, male   | 451.20     | 648         | 26.20    | 401 |
| Helicolenus dactylopterus   | 145.20     | 416         | 8.43     |     |
| Chlorophthalmus atlanticus  | 62.40      | 1644        | 3.62     |     |
| Lophius upsicephalus        | 8.40       | 12          | 0.49     |     |
| Synagrops microlepis        | 6.00       | 276         | 0.35     |     |
| Nezumia sp.                 | 3.60       | 84          | 0.21     |     |
| Coelorinchus sp.            | 3.60       | 108         | 0.21     |     |
| Galeus pollii               | 3.60       | 168         | 0.21     |     |
| Total                       | 1722.00    |             | 100.00   |     |

PROJECT STATION: 925  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1908  
 start stop duration  
 TIME :11:38:00 12:08:00 30 (min) Purpose code: 3  
 LOG :1436.50 1438.10 1.45 Area code : 3  
 FDEPTH: 319 317 GearCond.code:  
 BDEPTH: 319 317 Validity code:  
 Towing dir: 340 Wire out: 950 m Speed:285 kn\*10  
 Sorted: 124 Kg Total catch: 279.90 CATCH/HOUR: 559.80

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 223.60     | 256         | 39.94    | 393 |
| Helicolenus dactylopterus   | 157.60     | 6300        | 28.15    |     |
| Merluccius capensis, male   | 106.20     | 144         | 18.97    | 392 |
| Trachurus capensis          | 25.20      | 154         | 4.50     | 394 |
| Synagrops microlepis        | 20.20      | 868         | 3.61     |     |
| Neoharriotta pinnata        | 14.80      | 10          | 2.64     |     |
| Coelorinchus sp.            | 5.40       | 144         | 0.96     |     |
| Galeus pollii               | 4.60       | 68          | 0.82     |     |
| Chlorophthalmus atlanticus  | 1.80       | 82          | 0.32     |     |
| Hoplostethus mediterraneus  | 0.40       | 10          | 0.07     |     |
| Total                       | 559.80     |             | 99.98    |     |

PROJECT STATION: 930  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1848  
 start stop duration  
 TIME :20:44:00 21:14:00 30 (min) Purpose code: 3  
 LOG :1487.20 1488.60 1.80 Area code : 3  
 FDEPTH: 252 252 GearCond.code:  
 BDEPTH: 252 252 Validity code:  
 Towing dir: 30 Wire out: 750 m Speed:310 kn\*10  
 Sorted: 132 Kg Total catch: 343.40 CATCH/HOUR: 686.80

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 417.00     | 416         | 60.72    | 405 |
| Merluccius capensis, male   | 139.40     | 228         | 20.30    | 404 |
| Helicolenus dactylopterus   | 39.00      | 2112        | 5.68     |     |
| Trachurus capensis          | 35.80      | 192         | 5.21     | 403 |
| Chlorophthalmus atlanticus  | 25.40      | 1280        | 3.70     |     |
| Dentex macrophthalms        | 14.60      | 46          | 2.13     |     |
| Pterothrissus belloci       | 13.60      | 72          | 1.98     |     |
| Synagrops microlepis        | 1.00       | 72          | 0.15     |     |
| Coelorinchus sp.            | 1.00       | 26          | 0.15     |     |
| Total                       | 686.80     |             | 100.02   |     |

PROJECT STATION: 926  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1912  
 start stop duration  
 TIME :13:58:00 14:28:00 30 (min) Purpose code: 3  
 LOG :1540.30 1541.90 1.53 Area code : 3  
 FDEPTH: 346 345 GearCond.code:  
 BDEPTH: 346 345 Validity code:  
 Towing dir: 330 Wire out:1100 m Speed:311 kn\*10  
 Sorted: 152 Kg Total catch: 636.30 CATCH/HOUR: 1272.60

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 572.80     | 680         | 45.01    | 396 |
| Merluccius capensis, male   | 483.00     | 614         | 37.95    | 395 |
| Helicolenus dactylopterus   | 179.60     | 2756        | 14.11    |     |
| Todarodes sagittatus        | 12.60      | 34          | 0.99     |     |
| Coelorinchus sp.            | 8.40       | 278         | 0.66     |     |
| Trachurus capensis          | 6.80       | 26          | 0.53     |     |
| Galeus pollii               | 3.40       | 26          | 0.27     |     |
| Chlorophthalmus atlanticus  | 2.60       | 110         | 0.20     |     |
| THYSANOTEUTHIDAE            | 2.60       | 26          | 0.20     |     |
| Nezumia sp.                 | 0.80       | 8           | 0.06     |     |
| Total                       | 1272.60    |             | 99.96    |     |

PROJECT STATION: 931  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1843  
 start stop duration  
 TIME :23:45:00 00:15:00 30 (min) Purpose code: 3  
 LOG :1510.80 1512.10 1.40 Area code : 3  
 FDEPTH: 230 224 GearCond.code:  
 BDEPTH: 230 224 Validity code:  
 Towing dir: 113 Wire out: 700 m Speed:260 kn\*10  
 Sorted: 153 Kg Total catch: 398.10 CATCH/HOUR: 796.20

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 260.00     | 686         | 32.66    | 407 |
| Trachurus capensis          | 194.00     | 1024        | 24.37    | 408 |
| Merluccius capensis, male   | 134.20     | 406         | 16.86    | 406 |
| Pterothrissus belloci       | 88.40      | 374         | 11.10    |     |
| Dentex macrophthalms        | 78.00      | 338         | 9.80     |     |
| Helicolenus dactylopterus   | 21.60      | 666         | 2.71     |     |
| Chlorophthalmus atlanticus  | 6.20       | 26          | 0.78     |     |
| Sufflogobius bibarbatas     | 4.20       | 832         | 0.53     |     |
| Trigla lyra                 | 4.20       | 16          | 0.53     |     |
| Lophius upsicephalus        | 3.20       | 20          | 0.40     |     |
| Synagrops microlepis        | 1.60       | 84          | 0.20     |     |
| FORTUNIDAE                  | 0.60       | 56          | 0.08     |     |
| Total                       | 796.20     |             | 100.02   |     |

PROJECT STATION: 927  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1911  
 start stop duration  
 TIME :15:27:00 15:57:00 30 (min) Purpose code: 3  
 LOG :1456.30 1457.80 1.42 Area code : 3  
 FDEPTH: 406 414 GearCond.code:  
 BDEPTH: 406 414 Validity code:  
 Towing dir: 230 Wire out:1200 m Speed:287 kn\*10  
 Sorted: 164 Kg Total catch: 802.00 CATCH/HOUR: 1604.00

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 851.00     | 870         | 53.05    | 398 |
| Merluccius capensis, male   | 285.00     | 350         | 17.77    | 397 |
| Helicolenus dactylopterus   | 264.00     | 1940        | 16.46    |     |
| Coelorinchus sp.            | 83.00      | 2120        | 5.17     |     |
| Schedophilus buttoni        | 51.00      | 20          | 3.18     |     |
| Galeus pollii               | 23.00      | 180         | 1.43     |     |
| Todarodes sagittatus        | 18.00      | 40          | 1.12     |     |
| Centroprorus sp.            | 9.00       | 2           | 0.56     |     |
| Deania profundorum          | 8.00       | 10          | 0.50     |     |
| Epigonus denticulatus       | 4.00       | 10          | 0.25     |     |
| Etmopterus pusillus         | 4.00       | 10          | 0.25     |     |
| Merluccius paradoxus        | 4.00       | 10          | 0.25     |     |
| Total                       | 1604.00    |             | 99.99    |     |

PROJECT STATION: 932  
 DATE:18/11/91 GEAR TYPE: PT No:2 POSITION:Lat S 1837  
 start stop duration  
 TIME :01:50:00 02:10:00 20 (min) Purpose code: 1  
 LOG :1522.50 1523.50 1.07 Area code : 3  
 FDEPTH: 125 140 GearCond.code:  
 BDEPTH: 226 218 Validity code:  
 Towing dir: 360 Wire out: 400 m Speed:344 kn\*10  
 Sorted: 1 Kg Total catch: 0.50 CATCH/HOUR: 1.50

| SPECIES              | CATCH/HOUR | % OF TOT. C | SAMP.NO. |  |
|----------------------|------------|-------------|----------|--|
|                      | weight     | numbers     |          |  |
| Trachurus capensis   | 0.90       | 6           | 60.00    |  |
| Synagrops microlepis | 0.60       | 78          | 40.00    |  |
| Total                | 1.50       |             | 100.00   |  |

PROJECT STATION: 928  
 DATE:17/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1858  
 start stop duration  
 TIME :17:33:00 18:03:00 30 (min) Purpose code: 3  
 LOG :1469.60 1471.20 1.60 Area code : 3  
 FDEPTH: 400 396 GearCond.code:  
 BDEPTH: 400 396 Validity code:  
 Towing dir: 360 Wire out:1200 m Speed:300 kn\*10  
 Sorted: 117 Kg Total catch: 233.20 CATCH/HOUR: 466.40

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Merluccius capensis, female | 227.20     | 224         | 48.71    | 400 |
| Helicolenus dactylopterus   | 94.80      | 1378        | 20.33    |     |
| Merluccius capensis, male   | 80.00      | 88          | 17.15    | 399 |
| Coelorinchus sp.            | 12.80      | 356         | 2.74     |     |
| Galeus pollii               | 12.40      | 132         | 2.66     |     |
| ARISTEIDAE                  | 12.00      | 40          | 2.57     |     |
| Todarodes sagittatus        | 11.20      | 40          | 2.40     |     |
| RAJIDAE                     | 6.40       | 4           | 1.37     |     |
| Deepwater fish mixture      | 4.00       | 0           | 0.86     |     |
| Etmopterus pusillus         | 3.60       | 12          | 0.77     |     |
| EMNAEIDAE                   | 2.00       | 0           | 0.43     |     |
| Total                       | 466.40     |             | 99.99    |     |

PROJECT STATION: 933  
 DATE:18/11/91 GEAR TYPE: PT No:2 POSITION:Lat S 1834  
 start stop duration  
 TIME :03:53:00 04:17:00 24 (min) Purpose code: 1  
 LOG :1534.80 1535.90 1.07 Area code : 3  
 FDEPTH: 100 130 GearCond.code:  
 BDEPTH: 245 233 Validity code:  
 Towing dir: 10 Wire out: 35 m Speed: 26 kn\*10  
 Sorted: 713 Kg Total catch: 12.90 CATCH/HOUR: 32.25

| SPECIES                     | CATCH/HOUR | % OF TOT. C | SAMP.NO. |     |
|-----------------------------|------------|-------------|----------|-----|
|                             | weight     | numbers     |          |     |
| Trachurus capensis          | 28.75      | 200         | 89.15    | 409 |
| Merluccius capensis, female | 3.25       | 3           | 10.08    |     |
| Synagrops microlepis        | 0.25       | 10          | 0.78     |     |
| Total                       | 32.25      |             | 100.01   |     |

PROJECT STATION: 934  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1834 Long E 1124  
 start stop duration  
 TIME :06:32:00 07:02:00 30 (min) Purpose code: 3  
 LOG :1548.00 1549.50 1.50 Area code : 3  
 FDEPTH: 463 457 GearCond.code:  
 BDEPTH: 463 457 Validity code:  
 Towing dir: 10 Wire out:1350 m Speed:290 kn\*10

Sorted: 171 Kg Total catch: 271.60 CATCH/HOUR: 543.20

| SPECIES                      | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------------|------------|---------|-------------|----------|
|                              | weight     | numbers |             |          |
| Merluccius capensis, female  | 153.60     | 140     | 28.28       | 412      |
| Trachyrhinus scabrus         | 76.00      | 580     | 13.99       |          |
| Coelorinchus sp.             | 68.40      | 1630    | 12.59       |          |
| Hoplostethus mediterraneus   | 52.00      | 1642    | 9.57        |          |
| Deania calcea                | 51.00      | 24      | 9.39        |          |
| Merluccius paradoxus, female | 45.00      | 54      | 8.28        | 410      |
| Merluccius capensis, male    | 42.60      | 42      | 7.84        | 411      |
| Helicolenus dactylopterus    | 32.00      | 160     | 5.89        |          |
| Maulisia microlepis          | 11.00      | 200     | 2.03        |          |
| Centrolophus niger           | 8.00       | 10      | 1.47        |          |
| Galeus polli                 | 3.00       | 30      | 0.55        |          |
| Tetragonurus atlanticus      | 0.60       | 2       | 0.11        |          |
| Total                        | 543.20     |         | 99.99       |          |

PROJECT STATION: 935  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1810 Long E 1127  
 start stop duration  
 TIME :14:10:00 14:40:00 30 (min) Purpose code: 3  
 LOG :1598.10 1600.10 1.62 Area code : 3  
 FDEPTH: 430 436 GearCond.code:  
 BDEPTH: 430 436 Validity code:  
 Towing dir: 360 Wire out:1200 m Speed:321 kn\*10

Sorted: 154 Kg Total catch: 522.90 CATCH/HOUR: 1045.80

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 317.80     | 346     | 30.39       | 420      |
| Helicolenus dactylopterus   | 204.00     | 986     | 19.51       |          |
| Hoplostethus mediterraneus  | 115.60     | 3468    | 11.05       |          |
| Merluccius capensis, male   | 108.20     | 130     | 10.35       | 419      |
| Trachyrhinus scabrus        | 74.80      | 1000    | 7.15        |          |
| Deania calcea               | 68.00      | 14      | 6.50        |          |
| Coelorinchus sp.            | 52.20      | 1006    | 4.99        |          |
| Deepwater fish mixture      | 44.80      | 6       | 4.28        |          |
| Schedophilus huttoni        | 13.60      | 6       | 1.30        |          |
| RAJIDAE                     | 12.20      | 20      | 1.17        |          |
| Epigonus denticulatus       | 6.80       | 252     | 0.65        |          |
| Etmopterus pumilus          | 5.40       | 20      | 0.52        |          |
| Todarodes sagittatus        | 4.00       | 14      | 0.38        |          |
| Merluccius paradoxus        | 4.00       | 6       | 0.38        |          |
| ARISTEIDAE                  | 3.40       | 170     | 0.33        |          |
| Galeus polli                | 3.40       | 34      | 0.33        |          |
| Dentex macrophthalmus       | 3.40       | 20      | 0.33        |          |
| Nerunia sp.                 | 2.80       | 14      | 0.27        |          |
| Ebinania costaecanarie      | 1.40       | 48      | 0.13        |          |
| Total                       | 1045.80    |         | 100.01      |          |

PROJECT STATION: 935  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1831 Long E 1128  
 start stop duration  
 TIME :08:02:00 08:32:00 30 (min) Purpose code: 3  
 LOG :1555.00 1556.40 1.50 Area code : 3  
 FDEPTH: 300 304 GearCond.code:  
 BDEPTH: 300 304 Validity code:  
 Towing dir: 10 Wire out: 900 m Speed:300 kn\*10

Sorted: 150 Kg Total catch: 579.60 CATCH/HOUR: 1159.20

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 761.60     | 760     | 65.70       | 414      |
| Merluccius capensis, male   | 253.60     | 296     | 21.88       | 413      |
| Helicolenus dactylopterus   | 108.00     | 3730    | 9.32        |          |
| Trachurus capensis          | 12.00      | 40      | 1.04        |          |
| Chlorophthalmus atlanticus  | 11.20      | 352     | 0.97        |          |
| Trachyrhinus scabrus        | 4.00       | 24      | 0.35        |          |
| Coelorinchus sp.            | 2.40       | 64      | 0.21        |          |
| Dentex macrophthalmus       | 1.60       | 8       | 0.14        |          |
| Galeus polli                | 1.60       | 16      | 0.14        |          |
| Todarodes sagittatus        | 1.60       | 8       | 0.14        |          |
| Synagrops microlepis        | 0.80       | 48      | 0.07        |          |
| Hoplostethus mediterraneus  | 0.80       | 40      | 0.07        |          |
| Total                       | 1159.20    |         | 100.03      |          |

PROJECT STATION: 939  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1806 Long E 1128  
 start stop duration  
 TIME :15:30:00 16:00:00 30 (min) Purpose code: 3  
 LOG :1603.80 1605.20 1.50 Area code : 3  
 FDEPTH: 340 345 GearCond.code:  
 BDEPTH: 340 345 Validity code:  
 Towing dir: 340 Wire out:1100 m Speed:300 kn\*10

Sorted: 143 Kg Total catch: 860.40 CATCH/HOUR: 1720.80

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 1019.00    | 984     | 59.22       | 422      |
| Merluccius capensis, male   | 354.00     | 396     | 20.57       | 421      |
| Helicolenus dactylopterus   | 198.20     | 3540    | 11.52       |          |
| Hoplostethus mediterraneus  | 99.80      | 6660    | 5.80        |          |
| Lophius upsicephalus        | 27.60      | 12      | 1.60        |          |
| Coelorinchus sp.            | 12.00      | 432     | 0.70        |          |
| ARISTEIDAE                  | 3.60       | 396     | 0.22        |          |
| Chlorophthalmus atlanticus  | 3.60       | 72      | 0.21        |          |
| Galeus polli                | 2.40       | 12      | 0.14        |          |
| Ebinania costaecanarie      | 0.60       | 12      | 0.03        |          |
| Total                       | 1720.80    |         | 100.00      |          |

PROJECT STATION: 936  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1829 Long E 1132  
 start stop duration  
 TIME :09:21:00 09:51:00 30 (min) Purpose code: 3  
 LOG :1561.60 1563.00 1.60 Area code : 3  
 FDEPTH: 226 229 GearCond.code:  
 BDEPTH: 226 229 Validity code:  
 Towing dir: 10 Wire out: 700 m Speed:310 kn\*10

Sorted: 185 Kg Total catch: 1507.50 CATCH/HOUR: 3015.00

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Trachurus capensis          | 1303.40    | 7334    | 43.23       | 415      |
| Merluccius capensis, female | 895.00     | 1110    | 29.68       | 417      |
| Merluccius capensis, male   | 315.20     | 638     | 10.45       | 416      |
| Chlorophthalmus atlanticus  | 181.40     | 7334    | 6.02        |          |
| Helicolenus dactylopterus   | 160.00     | 7170    | 5.31        |          |
| Dentex macrophthalmus       | 143.80     | 686     | 4.77        |          |
| Todarodes sagittatus        | 8.20       | 16      | 0.27        |          |
| Lepidopus caudatus          | 3.20       | 16      | 0.11        |          |
| Pterothrissus belloci       | 3.20       | 16      | 0.11        |          |
| Sepis sp.                   | 1.60       | 16      | 0.05        |          |
| Total                       | 3015.00    |         | 100.00      |          |

PROJECT STATION: 940  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1756 Long E 1129  
 start stop duration  
 TIME :17:20:00 17:50:00 30 (min) Purpose code: 3  
 LOG :1615.10 1616.70 1.45 Area code : 3  
 FDEPTH: 209 214 GearCond.code:  
 BDEPTH: 209 214 Validity code:  
 Towing dir: 320 Wire out: 750 m Speed:291 kn\*10

Sorted: 123 Kg Total catch: 520.80 CATCH/HOUR: 1041.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 494.40     | 544     | 47.47       | 425      |
| Dentex macrophthalmus       | 237.60     | 1168    | 22.81       | 424      |
| Merluccius capensis, male   | 88.80      | 224     | 8.53        | 424      |
| Chlorophthalmus atlanticus  | 73.60      | 3250    | 7.07        |          |
| Trachurus capensis          | 56.00      | 328     | 5.38        | 423      |
| Pterothrissus belloci       | 44.80      | 224     | 4.30        |          |
| Synagrops microlepis        | 36.80      | 1440    | 3.53        |          |
| Todarodes sagittatus        | 9.60       | 16      | 0.92        |          |
| Total                       | 1041.60    |         | 100.01      |          |

PROJECT STATION: 937  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1828 Long E 1141  
 start stop duration  
 TIME :11:23:00 11:49:00 26 (min) Purpose code: 3  
 LOG :1576.50 1577.60 1.30 Area code : 3  
 FDEPTH: 162 166 GearCond.code:  
 BDEPTH: 162 166 Validity code:  
 Towing dir: 275 Wire out: 500 m Speed:280 kn\*10

Sorted: 25 Kg Total catch: 25.00 CATCH/HOUR: 57.69

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Dentex macrophthalmus       | 21.00      | 155     | 36.40       |          |
| Merluccius capensis, female | 15.69      | 28      | 27.20       |          |
| Trachurus capensis          | 11.77      | 115     | 20.40       | 418      |
| Lepidopus caudatus          | 3.00       | 30      | 5.20        |          |
| Thyrzites atun              | 1.85       | 2       | 3.21        |          |
| Helicolenus dactylopterus   | 1.38       | 37      | 2.39        |          |
| Todarodes sagittatus        | 1.38       | 2       | 2.39        |          |
| Merluccius capensis, male   | 0.92       | 5       | 1.59        |          |
| Synagrops microlepis        | 0.69       | 60      | 1.20        |          |
| Total                       | 57.66      |         | 99.98       |          |

PROJECT STATION: 941  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1744 Long E 1122  
 start stop duration  
 TIME :19:27:00 19:52:00 25 (min) Purpose code: 3  
 LOG :1630.80 1632.20 1.20 Area code : 3  
 FDEPTH: 357 354 GearCond.code:  
 BDEPTH: 357 354 Validity code:  
 Towing dir: 35 Wire out:1050 m Speed:270 kn\*10

Sorted: 145 Kg Total catch: 826.60 CATCH/HOUR: 1983.84

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 964.32     | 960     | 48.61       | 428      |
| Merluccius capensis, male   | 379.68     | 401     | 19.14       | 427      |
| Helicolenus dactylopterus   | 312.24     | 1951    | 15.74       |          |
| Epigonus denticulatus       | 96.00      | 4018    | 4.84        |          |
| Lophius upsicephalus        | 58.32      | 12      | 2.94        |          |
| Hoplostethus mediterraneus  | 49.20      | 1426    | 2.48        |          |
| Deepwater fish mixture      | 46.56      | 6       | 2.35        |          |
| Merluccius polli, female    | 42.72      | 65      | 2.15        | 426      |
| Coelorinchus sp.            | 10.32      | 312     | 0.52        |          |
| Etmopterus lucifer          | 9.12       | 26      | 0.46        |          |
| Todarodes sagittatus        | 7.68       | 26      | 0.39        |          |
| Galeus polli                | 7.68       | 65      | 0.39        |          |
| Total                       | 1983.84    |         | 100.01      |          |

PROJECT STATION: 942  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1732 Long E 1127  
 start stop duration  
 TIME :21:28:00 21:58:00 30 (min) Purpose code: 3  
 LOG :1645.70 1646.90 1.50 Area code : 3  
 FDEPTH: 203 203 GearCond.code:  
 BDEPTH: 203 203 Validity code:  
 Towing dir: 20 Wire out: 600 m Speed:290 kn\*10

Sorted: 116 Kg Total catch: 116.00 CATCH/HOUR: 232.00

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 179.80     | 230     | 77.50       | 430      |
| Merluccius capensis, male   | 52.20      | 80      | 22.50       | 429      |
| Total                       | 232.00     |         | 100.00      |          |

PROJECT STATION: 943  
 DATE:18/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1723  
 start stop duration Long E 1120  
 TIME :23:05:00 23:35:00 30 (min) Purpose code: 3  
 LOG :1655.60 1657.00 1.60 Area code : 3  
 FDEPTH: 353 353 GearCond.code:  
 BDEPTH: 353 353 Validity code:  
 Towing dir: 350 Wire out:1050 m Speed:300 kn\*10  
 Sorted: 192 Kg Total catch: 576.90 CATCH/HOUR: 1153.80

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Merluccius capensis, female | 877.80     | 828     | 76.08       | 432      |
| Merluccius capensis, male   | 264.00     | 300     | 22.88       | 431      |
| Merluccius polli            | 12.00      | 12      | 1.04        |          |
| Total                       | 1153.80    |         | 100.00      |          |

PROJECT STATION: 944  
 DATE:19/11/91 GEAR TYPE: PT No:2 POSITION:Lat S 1825  
 start stop duration Long E 1131  
 TIME :10:10:00 10:40:00 30 (min) Purpose code: 1  
 LOG :1755.60 1756.80 1.20 Area code : 3  
 FDEPTH: 215 240 GearCond.code:  
 BDEPTH: 255 274 Validity code:  
 Towing dir: 340 Wire out: 550 m Speed:270 kn\*10  
 Sorted: 30 Kg Total catch: 29.80 CATCH/HOUR: 59.60

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Trachurus capensis          | 35.40      | 272     | 59.40       | 433      |
| Merluccius capensis, female | 16.00      | 26      | 26.85       | 435      |
| Merluccius capensis, male   | 8.20       | 16      | 13.76       | 434      |
| Total                       | 59.60      |         | 100.01      |          |

PROJECT STATION: 945  
 DATE:19/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1825  
 start stop duration Long E 1131  
 TIME :12:02:00 12:32:00 30 (min) Purpose code: 2  
 LOG :1763.10 1764.60 1.51 Area code : 3  
 FDEPTH: 242 252 GearCond.code:  
 BDEPTH: 242 252 Validity code:  
 Towing dir: 350 Wire out: 700 m Speed:301 kn\*10  
 Sorted: 522 Kg Total catch: 522.40 CATCH/HOUR: 1044.80

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Merluccius capensis    | 468.80     | 1194    | 64.01       |          |
| Deepwater fish mixture | 209.40     |         | 20.04       |          |
| Trachurus capensis     | 130.40     | 836     | 12.48       |          |
| Dentex macrophthalmus  | 35.00      | 144     | 3.35        |          |
| Pterothrissus belloni  | 1.20       | 4       | 0.11        |          |
| Total                  | 1044.80    |         | 99.99       |          |

PROJECT STATION: 946  
 DATE:19/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1825  
 start stop duration Long E 1132  
 TIME :14:00:00 14:30:00 30 (min) Purpose code: 2  
 LOG :1770.70 1772.10 1.48 Area code : 3  
 FDEPTH: 232 234 GearCond.code:  
 BDEPTH: 232 234 Validity code:  
 Towing dir: 10 Wire out: 800 m Speed:307 kn\*10  
 Sorted: 513 Kg Total catch: 513.00 CATCH/HOUR: 1026.00

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Merluccius capensis    | 514.60     | 926     | 50.16       |          |
| Trachurus capensis     | 258.60     | 1680    | 25.20       |          |
| Deepwater fish mixture | 204.00     |         | 19.88       |          |
| Dentex macrophthalmus  | 46.60      | 194     | 4.54        |          |
| Pterothrissus belloni  | 2.20       | 10      | 0.21        |          |
| Total                  | 1026.00    |         | 99.99       |          |

PROJECT STATION: 947  
 DATE:19/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1823  
 start stop duration Long E 1135  
 TIME :15:55:00 16:25:00 30 (min) Purpose code: 2  
 LOG :1777.30 1778.70 1.57 Area code : 3  
 FDEPTH: 190 193 GearCond.code:  
 BDEPTH: 190 193 Validity code:  
 Towing dir: 360 Wire out: 750 m Speed:314 kn\*10  
 Sorted: 295 Kg Total catch: 808.40 CATCH/HOUR: 1616.80

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Trachurus capensis     | 753.80     | 5662    | 46.62       |          |
| Merluccius capensis    | 486.40     | 886     | 30.08       |          |
| Deepwater fish mixture | 298.80     |         | 18.48       |          |
| Dentex macrophthalmus  | 77.80      | 410     | 4.81        |          |
| Total                  | 1616.80    |         | 99.99       |          |

PROJECT STATION: 948  
 DATE:19/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 1820  
 start stop duration Long E 1138  
 TIME :17:48:00 18:18:00 30 (min) Purpose code: 2  
 LOG :1783.70 1784.90 1.50 Area code : 3  
 FDEPTH: 160 163 GearCond.code:  
 BDEPTH: 160 163 Validity code:  
 Towing dir: 355 Wire out: 600 m Speed:300 kn\*10  
 Sorted: 500 Kg Total catch: 766.70 CATCH/HOUR: 1533.40

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Trachurus capensis     | 710.00     | 5370    | 46.30       |          |
| Deepwater fish mixture | 580.00     |         | 37.82       |          |
| Merluccius capensis    | 169.60     | 430     | 11.06       |          |
| Dentex macrophthalmus  | 73.80      | 496     | 4.81        |          |
| Total                  | 1533.40    |         | 99.99       |          |

PROJECT STATION: 949  
 DATE:19/11/91 GEAR TYPE: PT No:2 POSITION:Lat S 1828  
 start stop duration Long E 1133  
 TIME :20:20:00 21:16:00 56 (min) Purpose code: 1  
 LOG :1798.50 1801.50 2.80 Area code : 3  
 FDEPTH: 120 135 GearCond.code:  
 BDEPTH: 209 223 Validity code:  
 Towing dir: 300 Wire out: 350 m Speed:290 kn\*10  
 Sorted: 9 Kg Total catch: 8.70 CATCH/HOUR: 9.32

| SPECIES               | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------|------------|---------|-------------|----------|
|                       | weight     | numbers |             |          |
| Trachurus capensis    | 7.39       | 62      | 79.29       | 436      |
| Lophius upsicephalus  | 1.29       | 1       | 13.84       |          |
| Hyperoglyphe mosellii | 0.32       | 1       | 3.43        |          |
| Synagrops microlepis  | 0.21       | 21      | 2.25        |          |
| Sepia sp.             | 0.11       | 1       | 1.18        |          |
| Total                 | 9.32       |         | 99.99       |          |

PROJECT STATION: 950  
 DATE:20/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2029  
 start stop duration Long E 1237  
 TIME :12:45:00 13:00:00 15 (min) Purpose code: 2  
 LOG :1954.00 1954.70 0.82 Area code : 2  
 FDEPTH: 248 250 GearCond.code:  
 BDEPTH: 248 250 Validity code:  
 Towing dir: 320 Wire out: 800 m Speed:318 kn\*10  
 Sorted: 36 Kg Total catch: 36.30 CATCH/HOUR: 145.20

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Merluccius capensis | 140.00     | 228     | 96.42       |          |
| Trachurus capensis  | 5.20       | 24      | 3.58        |          |
| Total               | 145.20     |         | 100.00      |          |

PROJECT STATION: 951  
 DATE:20/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2048  
 start stop duration Long E 1249  
 TIME :16:29:00 16:59:00 30 (min) Purpose code: 2  
 LOG :1984.10 1985.50 1.73 Area code : 2  
 FDEPTH: 250 250 GearCond.code:  
 BDEPTH: 250 250 Validity code:  
 Towing dir: 340 Wire out: 850 m Speed:337 kn\*10  
 Sorted: 278 Kg Total catch: 452.60 CATCH/HOUR: 905.20

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Merluccius capensis    | 511.80     | 932     | 56.54       |          |
| Trachurus capensis     | 345.00     |         | 38.11       |          |
| Deepwater fish mixture | 48.40      |         | 5.35        |          |
| Total                  | 905.20     |         | 100.00      |          |

PROJECT STATION: 952  
 DATE:20/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2050  
 start stop duration Long E 1255  
 TIME :18:34:00 18:54:00 20 (min) Purpose code: 2  
 LOG :1995.90 1996.80 1.30 Area code : 2  
 FDEPTH: 168 170 GearCond.code:  
 BDEPTH: 168 170 Validity code:  
 Towing dir: 320 Wire out: 550 m Speed:310 kn\*10  
 Sorted: 103 Kg Total catch: 110.70 CATCH/HOUR: 332.10

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Merluccius capensis    | 234.60     | 825     | 70.64       |          |
| Trachurus capensis     | 72.90      | 555     | 21.95       |          |
| Deepwater fish mixture | 24.60      |         | 7.41        |          |
| Total                  | 332.10     |         | 100.00      |          |

PROJECT STATION: 953  
 DATE:20/11/91 GEAR TYPE: BT No:1 POSITION:Lat S 2050  
 start stop duration Long E 1255  
 TIME :19:40:00 20:30:00 50 (min) Purpose code: 2  
 LOG :2001.00 2003.10 2.70 Area code : 2  
 FDEPTH: 167 170 GearCond.code:  
 BDEPTH: 167 170 Validity code:  
 Towing dir: 325 Wire out: 600 m Speed:320 kn\*10  
 Sorted: 436 Kg Total catch: 436.30 CATCH/HOUR: 523.56

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Merluccius capensis    | 281.16     | 1264    | 53.70       |          |
| Trachurus capensis     | 236.04     | 1897    | 45.08       |          |
| Deepwater fish mixture | 6.36       |         | 1.21        |          |
| Total                  | 523.56     |         | 99.99       |          |

**PART II**

**SURVEYS OF THE PELAGIC STOCKS**

**23 November-16 December 1991**



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### PART II

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ANNEXES I and II





## CHAPTER 1 INTRODUCTION

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### 1.1 OBJECTIVES OF THE CRUISE

To produce biomass estimates for three of the commercially important pelagic fish species; pilchard *Sardinops ocellata*, anchovy *Engraulis capensis* and round herring *Etrumeus whiteheadi*.

To determine the distribution of pelagic horse mackerel *Trachurus capensis* and to produce a biomass estimate of this stock.

### 1.2 PARTICIPATION

The scientific staff from Namibia on the "DR. FRIDTJOF NANSEN" were:

Bernatitus Birisamub, Filimon Dauab, Derryl Smith and Benediktus Ushona.

The scientific staff from the Institute of Marine Research were:

Johannes Hamre, Terje Haugland, Jeppe Kolding, Helge Ullebust and Tore Mörk.

## CHAPTER 2 METHODS

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From the general knowledge of pelagic fish distribution and from reports of commercial fishing vessels, the survey area is in general limited to the area from Dolphin Head (26°00'S) to the Cunene River (17°15'S) and from the shore to the 120 m bathymetric line. The southern limit is formed by the cold and oxygen deficient upwelling region centred around Lüderitz and the northern boundary by Namibia's border with Angola. The R/V "BENGUELA" cruise undertaken immediately prior to this survey failed to detect significant concentrations of clupeids or anchovy in the area south of Walvis Bay. It was therefore thought unnecessary to survey this area at the beginning of the cruise, but 3 days were spent at the end of the cruise to investigate the coastal water between Walvis Bay and Dolphin Head. Since the pelagic fish distribution also extends into Angolan waters, permission was obtained from Angolan authorities to extend the present survey northward to the area west of Tombua (16°00'S).

To allow for comparison with the previous "DR. FRIDTJOF NANSEN" surveys, the region was divided into three areas;

|   |                   |                             |
|---|-------------------|-----------------------------|
| 1 | 26°00' to 21°00'S | Dolphin Head to Ambrose Bay |
| 2 | 21°00' to 17°15'S | Ambrose Bay to Cunene River |
| 3 | 17°15' to 16°00'S | Cunene River to Tombua      |

The "DR. FRIDTJOF NANSEN" left Walvis Bay at 11h00 on 23rd November and surveyed the shallow coastal water from Walvis Bay northward, with an open grid north to the Baia dos Tigres, where the acoustic instruments were calibrated on the 26th November. An intercalibration with R/V "BENGUELA" was undertaken on the 27th November and a report on these intercalibration experiments has been submitted to the Swakopmund section of the Ministry of Fisheries and Marine Resources. The "DR. FRIDTJOF NANSEN" arrived in Walvis Bay on 16th December at 06h00. 4 500 nautical miles were steamed and 107 trawl stations worked. Two hydrographic profiles were made.

The course tracks with the fishing and hydrographical stations from Dolphin Head to Ambrose Bay, from Ambrose Bay to Cunene River and from Cunene River to Tombua are shown in Figures 1a, 1b and 1c respectively. An additional northward and southward coverage of the shallow coastal area from Rocky Point ( $19^{\circ}00'S$ ) to Baia dos Tigres ( $16^{\circ}40'S$ ) is shown in Figure 1d. The frequency of transects was increased in areas of high fish density, and special efforts were made to survey inshore water south of Cape Frio ( $18^{\circ}30'-18^{\circ}50'S$ ), the waters of Cape Cross ( $21^{\circ}20'-21^{\circ}40'S$ ) and in the St. Francis Bay ( $25^{\circ}00'-25^{\circ}10'S$ ), where dense shoals of pilchard were recorded.

The distribution and biomass of offshore horse mackerel were assessed by east-west transects, 10 nm between the lines north of  $19^{\circ}20'S$ , and 20 nm between the lines south of that latitude. The distribution and biomass of small horse mackerel in inshore waters were assessed on the basis of data obtained during the coverage of the clupeids.

All catches were sampled for composition by weight and numbers of each species and the size distribution of commercially important species, using total length, was determined. The length frequencies of these species are given in Annex I. The complete records of fishing stations are shown in Annex II.

Hydrographical data were collected in standard depths at stations 2, 5, 10, 15, 25, 35 and 50 nm from the coast on two lines of latitude  $18^{\circ}00'$  and  $20^{\circ}00'S$ , while the line  $20^{\circ}00'S$  was sampled to 75 nm. These hydrographical sections were taken in order to complete the hydrographical program of the previous cruise.

Assistance in searching for and determining the distribution of pelagic fish north of Rocky Point ( $19^{\circ}00'S$ ) was obtained from the Namibian research vessel "BENGUELA" during the first week of the cruise. Relevant samples from the R/V "BENGUELA" trawl stations were used in the assessment of the stocks.

The weather was favourable for an acoustic survey throughout the cruise north of Ambrose Bay, whereas the survey of the southern area was occasionally hampered by south-westerly wind and swells.

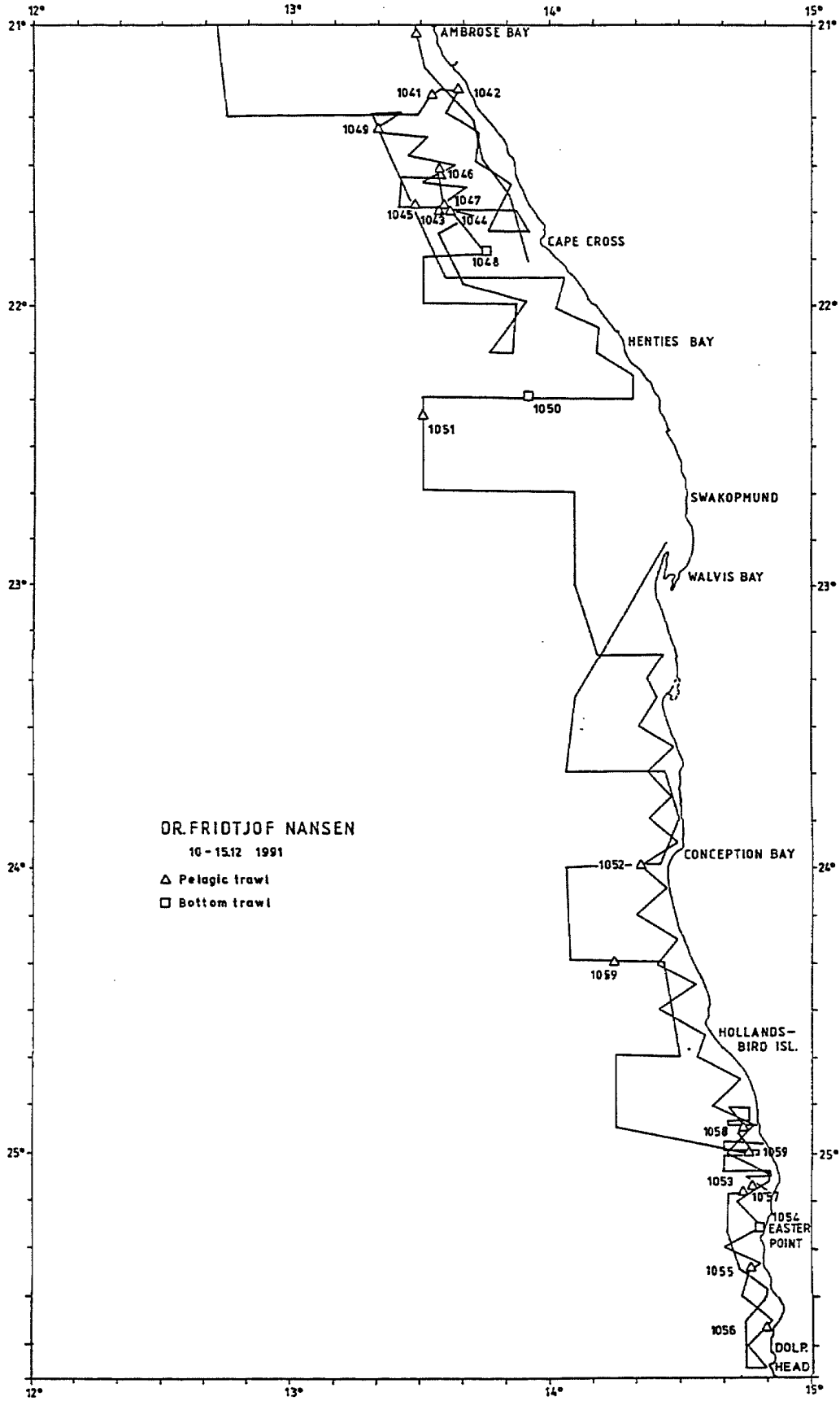


Figure 1a. Course track and fishing stations. Dolphin Head to Ambrose Bay.

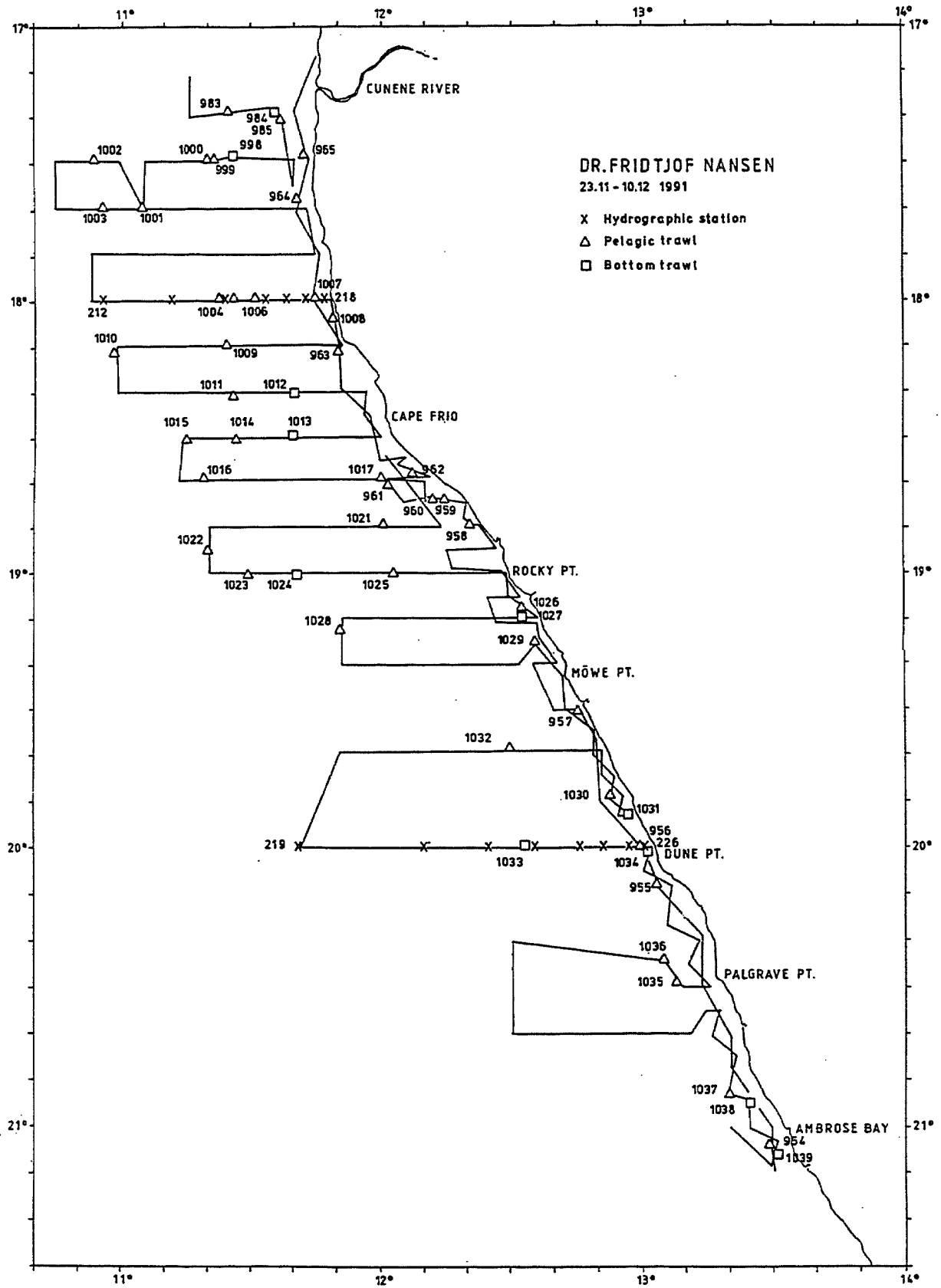


Figure 1b. Course track, fishing stations and hydrographic profiles. Ambrose Bay to Cunene River.

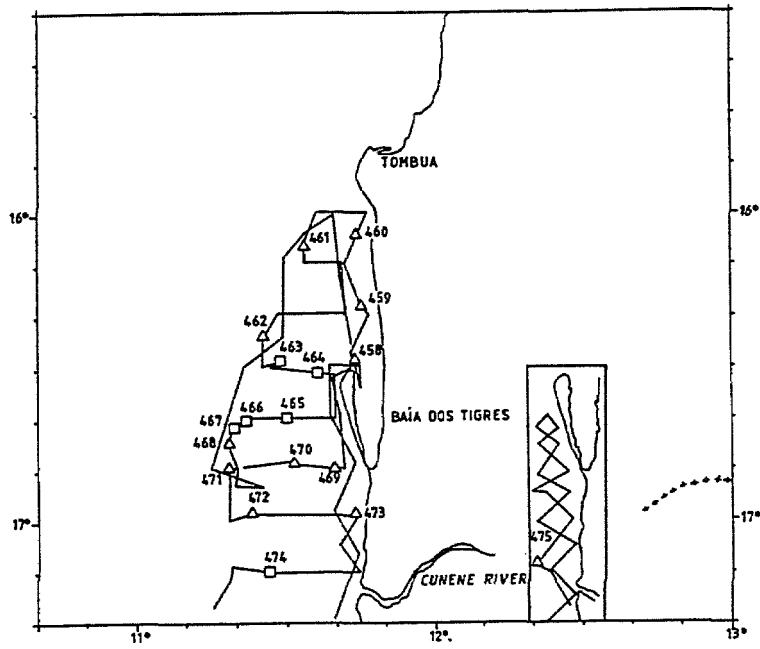


Figure 1c. Course track and fishing stations. Cunene River to Tombua.

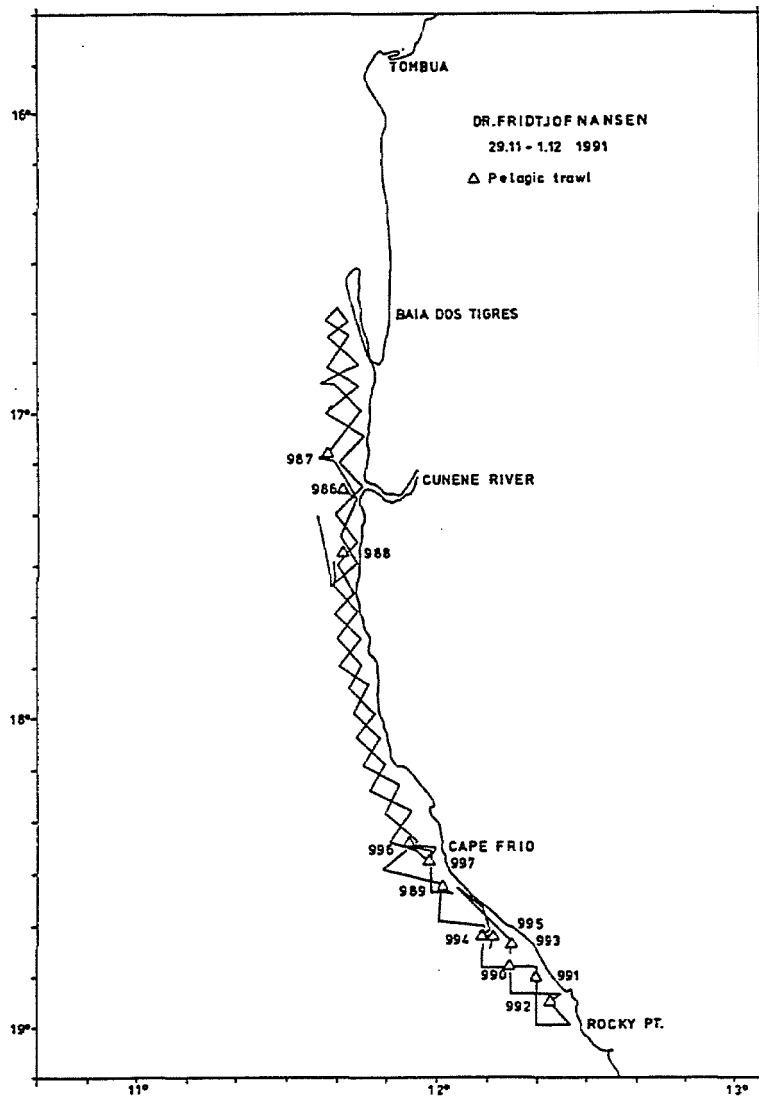


Figure 1d. Course track and fishing stations Rocky Point to Baía dos Tigres. Inshore survey of pelagic fish.

## CHAPTER 3 DISTRIBUTION AND ABUNDANCE OF PELAGIC FISH

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The acoustic integration system provided observations of fish densities averaged, usually, over 5 nm distances, but in areas of high fish concentrations over 1 nm. The unit of acoustic reflection used was  $m^2/nm^2$  with recorded readings divided by 10. The integrator values from fish targets were allocated to the following groups on the basis of trawl sampling and characteristic behaviour recognised from the echo recordings:

Pelagic fish type 1: Clupeidae (pilchard and round herring) and Engraulidae (anchovy).

Pelagic fish type 2: Carangidae (horse mackerel).

Non-commercial pelagic fish, myctophids, gobies, jellyfish and plankton.

### 3.1 Distribution

In summary, two small areas of pelagic fish (pilchard) were found south of Ambrose Bay ( $21^{\circ}00'S$ ), while further north several regions with extremely dense shoals of pilchard, in association with other pelagic species, were surveyed. Layers of recordings, consisting largely of jellyfish, small pelagic gobies and lantern fish were, as in previous surveys, found in offshore waters. In some inshore areas where dense shoals of horse mackerel did occur it was difficult to separate the type 1 species from the type 2 on the basis of the echo traces. In those cases the species composition of the trawl catches was used as identification. Sampling of fish was generally successful, except for some hauls which were disrupted by high concentrations of jellyfish.

The distributions of clupeids and engraulids are shown in Figures 2a-b, and the distribution of carangids in Figure 3. An additional map of areas of high density of pilchard is given in Figure 4. An arbitrary scale was used in the distribution charts to illustrate different levels of density.

#### Dolphin Head to Ambrose Bay

Dispersed shoals of adult pilchard were recorded off Cape Cross ( $21^{\circ}20'-21^{\circ}40'S$ ), in depth between 90 m and 120 m, and north of Easter Point ( $25^{\circ}00'-25^{\circ}10'S$ ). These shoals consisted of mature fish with modal length of 24 cm. Few other pelagic fish of commercial value was found in the area, except for large snoek *Thyrsites atun* which were caught in many of the hauls throughout this region. As in previous surveys of this region, most of the reflected echo intensity was allocated to layers of plankton, goby and lantern fish.

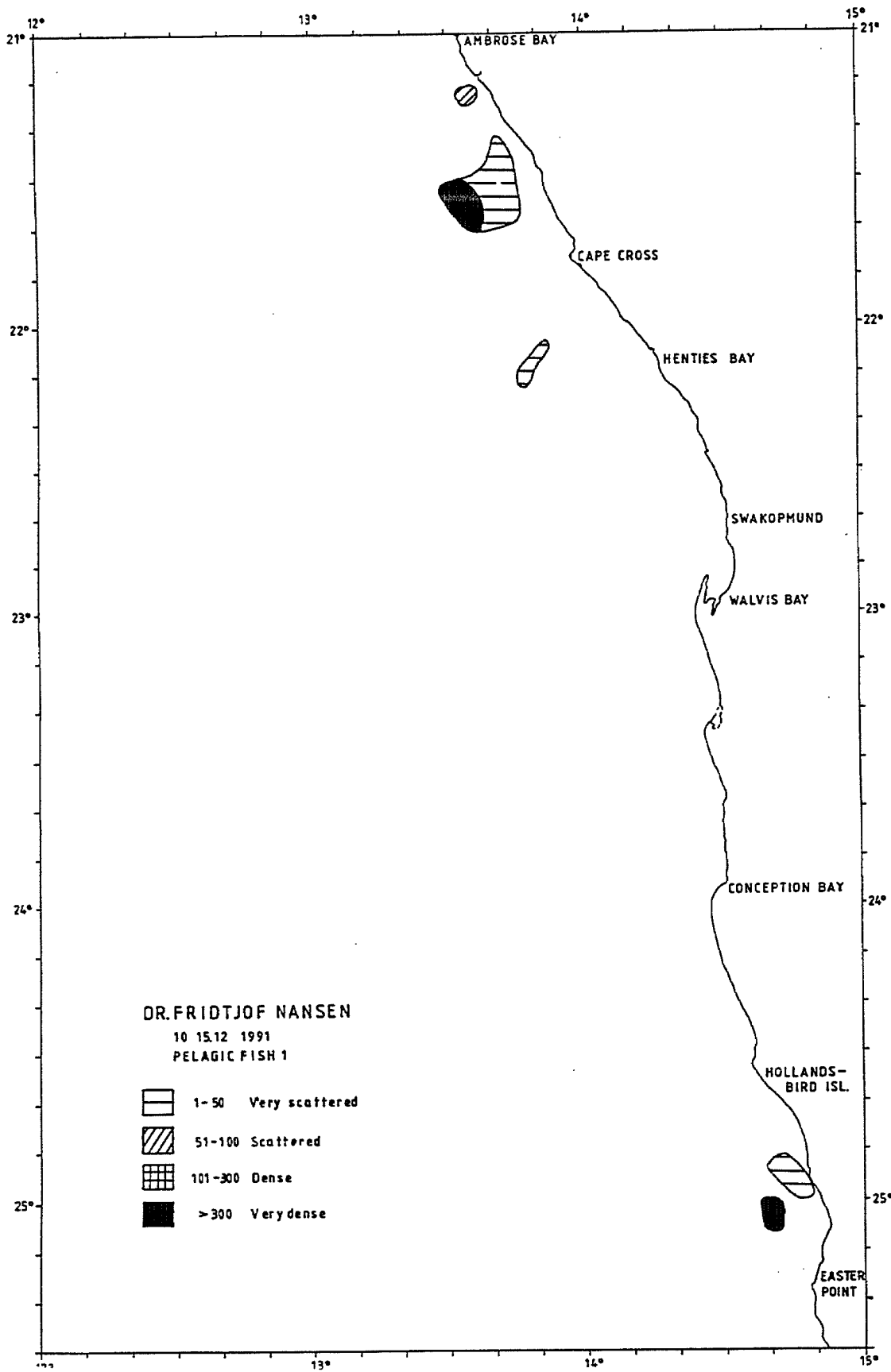


Figure 2a. Distribution of pelagic fish type 1, clupeids and anchovy. Easter Point to Ambrose Bay.

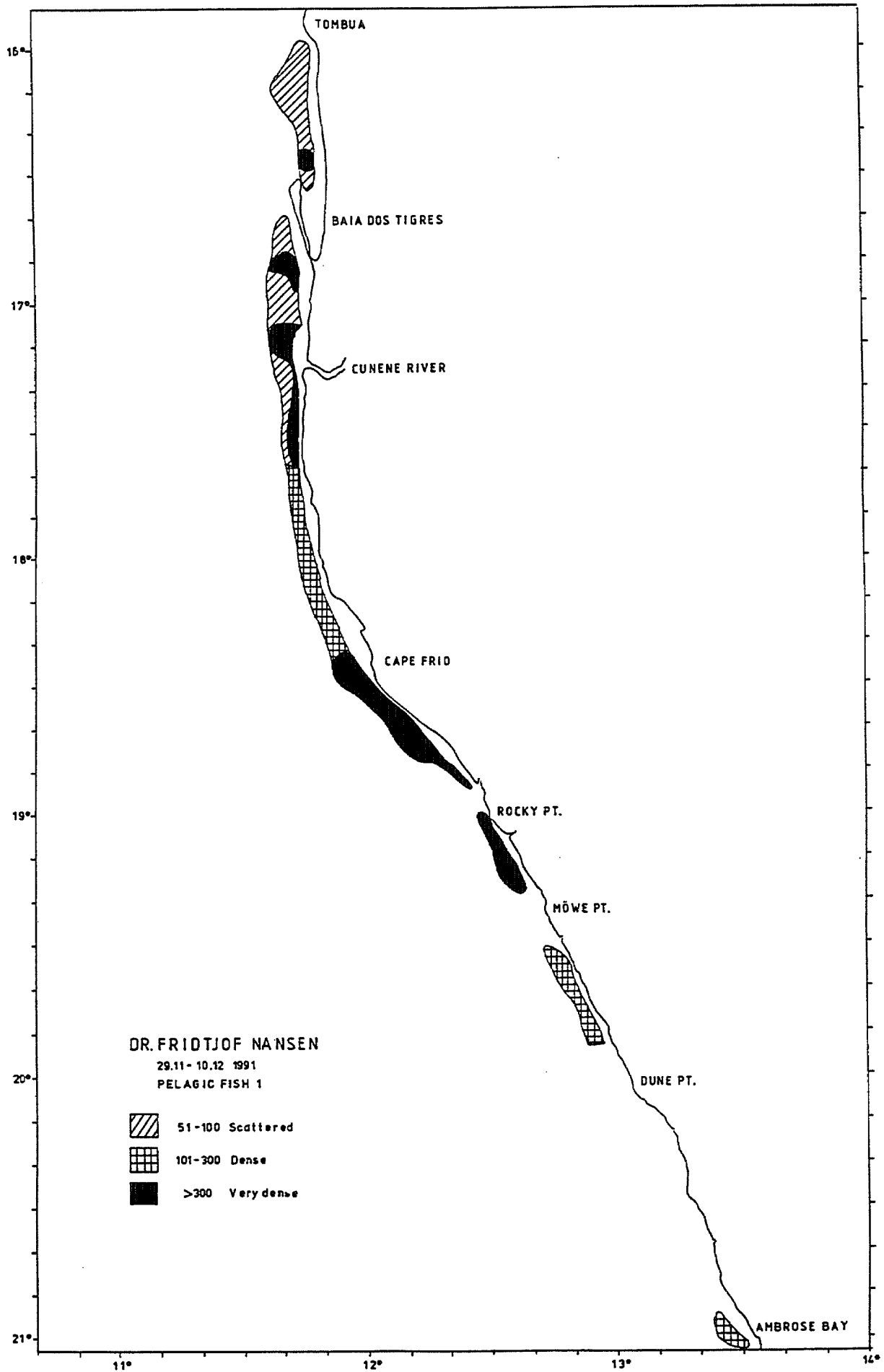


Figure 2b. Distribution of pelagic fish type 1, clupeids and anchovy. Ambrose Bay to Tombua.



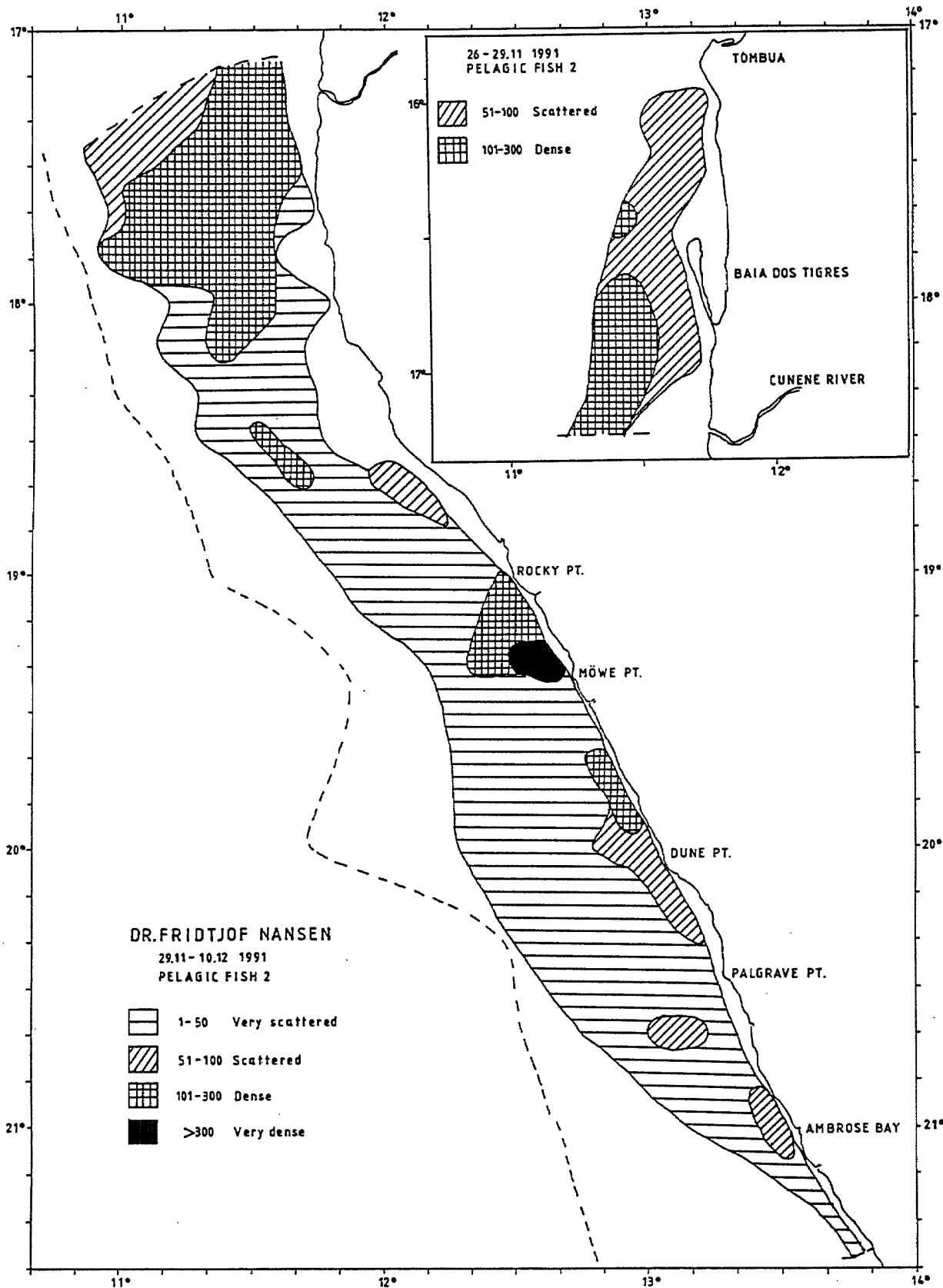


Figure 3. Distribution of pelagic fish type 2, horse mackerel. Ambrose Bay to Tombua.

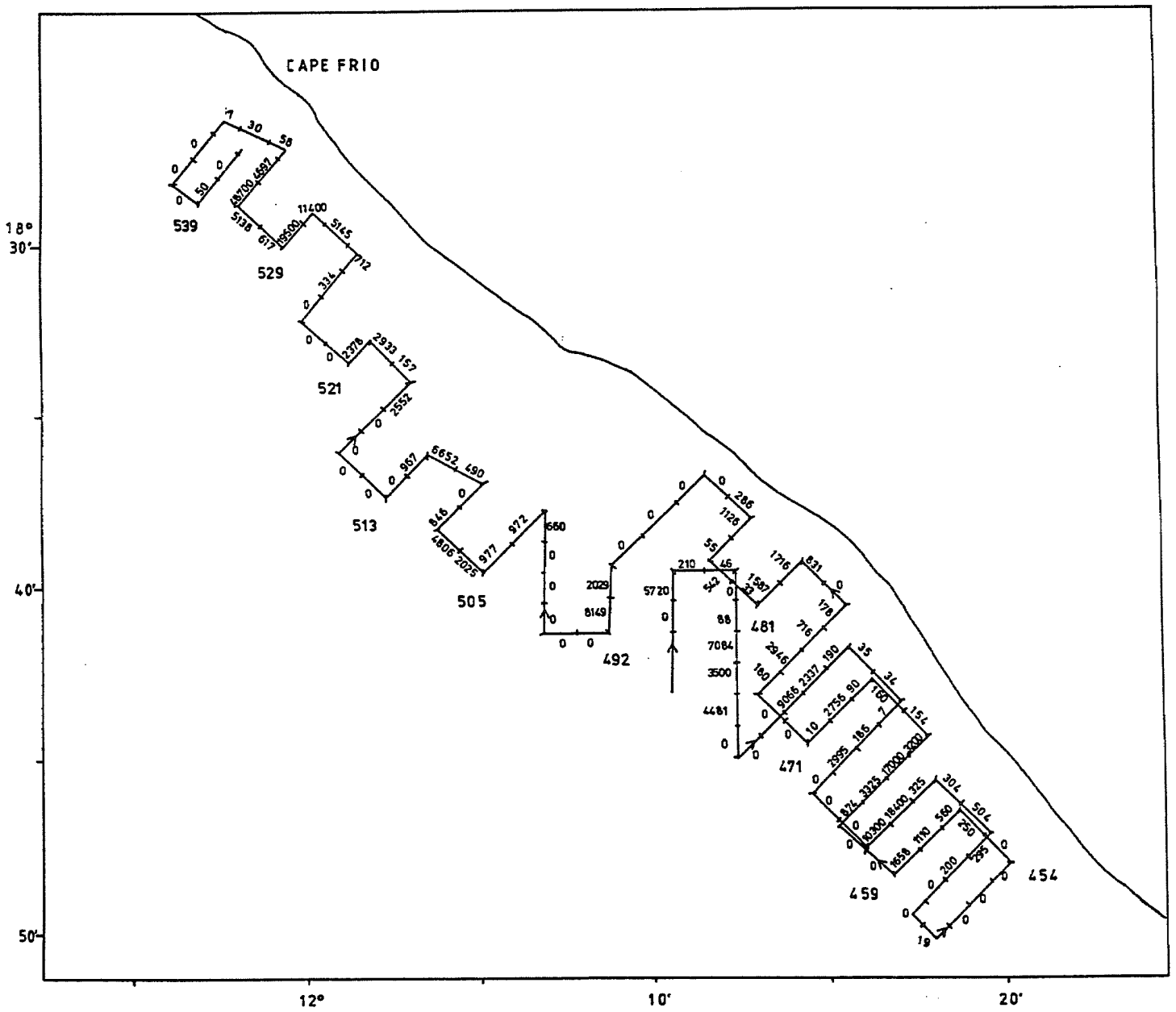


Figure 4. Distribution and density (integrator values  $\cdot 10^{-1}$ ) of pilchard. Cape Frio to Rocky Point.

## Ambrose Bay to Cunene River

The approximate distribution of areas with high fish concentrations was determined during the northwards part of the cruise and these areas were re-surveyed intensively on the return trip southwards.

In general, the distribution of pilchard in this region was similar to that found during the May/June 1990 survey and in the March survey this year.

Some few and widely dispersed small shoals of pilchard occurred between Dune Point (20°00'S) and south of Ambrose Bay (21°15'S). It is assumed that these shoals were distributed in a continuous narrow band throughout this area.

Shoals of pilchard, between Möwe Point (19°30'S) and Rocky Point (19°00'S) were recorded on the way north and later re-surveyed when returning south. The pilchard occurred together with dense shoals of horse mackerel and were difficult to identify by differences in the acoustic appearance of the shoals. On the basis of the echo traces and the trawl records the species composition was determined to be approximately 50% pilchard and 50% horse mackerel (as measured by back scattering volume). The same pattern of mixed shoals was observed in this area during the March survey this year.

A large area of dense shoals occurred from north of Rocky Point (18°50'S) to Cape Frio (18°30'S), along the coast in depths between 20 m and 50 m. Many of these shoals were extremely dense, being several hundred metres in diameter and some 30 m in vertical extension. The area was surveyed intensively on 3rd December and was re-surveyed two days later. The shoals consisted of pilchard mainly with modal lengths of 17 cm and 23 cm, the recruits being the dominant group. These shoals ascended into the surface layer at sunset. After completion of the second survey, the vessel returned to the area of the densest fish concentration for sampling, but failed to record fish shoals on the echo sounder during darkness. A trawl haul using extra floats on the headline to skim the surface, however, yielded a catch of 1.6 tonnes of fish (St. no. 1020).

In addition to this dense area of pilchard, small but dense shoals occurred throughout the region from Cape Frio (18°30'S) to the Cunene River (17°15'S), and continued into Angolan waters.

Most of the pilchard sampled in this region were fish with a modal peak of 17 cm (see Annex I).

Anchovy occurred in mixed shoals from Rocky Point to Cunene River, concurrent with the area of pilchard occurrence. These fish were almost entirely adult fish with a modal length of 13 to 14 cm.

Juvenile horse mackerel with a modal length of 13 cm occurred along the coast from north of Ambrose Bay (20°50'S) to the Cunene River. The density was particularly high close inshore from Dune Point (20°15'S) to Rocky Point (19°00'S).

Transects of 10 nm and 20 nm between the course line determined the distribution of horse mackerel in offshore waters (see Figure 1b). Horse mackerel were found beyond the 100 m depth isoline only to the north of Rocky Point. In this area, the distribution extended to some 30 nm from the coast and was relatively dense. In the offshore area south of Rocky Point the mackerel often occurred in layers of plankton and other small fish, and could only be identified by trawling.

The size distribution of horse mackerel tended to be greater in deeper waters than inshore. In waters less than 70 m deep the horse mackerel had a size distribution with modal peak at 14 cm, whereas samples collected in waters of 70 m deep and more consisted of 20 cm and larger fish mainly.

### Cunene River to Tombua

The distribution of dispersed shoals of pilchard, anchovy and round herring found south of the Cunene River extended into Angolan waters, north to 16°40'S. Another distribution area of pilchard was found north of Baia dos Tigres, in inshore waters between 16°30'S and 16°00'S. This fish was unusually large, with a modal length of 25 cm.

The Cape horse mackerel (*Trachurus capensis*) was dominant in offshore waters north of the Cunene up to 16°30'S whereas the Cunene horse mackerel (*Trachurus trecae*) dominated the catches further north.

A special report has been prepared describing the work and the results in Angolan waters.

## 3.2 ABUNDANCE OF PELAGIC FISH

The biomass estimates are based on the acoustic integration technique, similar to that used in previous assessments of the same stocks. The North Sea herring target strength was used for all pelagic fish:

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

Using a condition factor of .78, normalised to a 17 cm fish, the biomass (in tonnes) was calculated by the formula:

$$\text{Biomass} = A \cdot I \cdot 0.167 \cdot L/17$$

where A = Area (nm<sup>2</sup>)  
 I = Integrator value  
 L = Length of fish

Applying this formula, the biomass estimates will be reduced by some 25% compared to the biomass estimates of type-1 fish given in previous reports.

The biomass estimates for the clupeids and anchovy are shown in Table 1.

For horse mackerel no change has been made in the condition factor, and the biomass estimates are comparable to those given in previous reports. Table 2 shows the estimates of the present survey.

### **Pilchard, anchovy and round herring**

A strong vertical migration of type-1 pelagic fish was noted to occur during much of the survey. This resulted in the fish being above the transducer level at night and therefore being unavailable for surveying. Several areas were surveyed more than once, both during night-time and during the day, and in these areas the night-time data were discarded.

The integrator data from the northwards survey of inshore waters obtained during the first week of the cruise has not been used for assessment purposes, except for the survey in Angolan waters. The Baía dos Tigres-Tombua region was covered during the night of 27th November and was not resurveyed. 87 000 tonnes of pilchard were estimated to occur in this region, which may be an underestimate due to the fish distribution at night above the transducer range. The same uncertainty is related to the biomass estimate of mixed species occurring north of Cunene River. This estimate of 54 000 tonnes is also based on night-values mainly. The other biomass estimates are all based on integrator values obtained during day hours, between 6 am and 8 pm. The Cape Frio-Cunene River region was covered by a relatively dense zigzag grid (Fig. 1d), but after removing the night-values, parts of the area are insufficiently covered. The abundance of fish in bordering localities was, however, low and it is therefore assumed that the biomass estimate of 192 000 tonnes of mixed fish species in this region is reasonable accurate.

The most abundant area of fish occurring between Rocky Point and Cape Frio was covered twice, using 1 nm and 2 nm distances between the transects. The first coverage was, however, not completed before darkness and the northern part of this continuous dense layer of fish was therefore lost due to surface schooling after sunset. The biomass estimate of 426 000 tonnes, mainly pilchard, is thus based on the integrator data of the second survey only. This coverage giving the respective integrator values (divided by 10) per one nm is shown in Figure 4.

Another 94 000 tonnes of pilchard, anchovy and round herring were estimated to occur between Möwe Point and Rocky Point and some scattered shoals between Möwe Point and Ambrose Bay, mostly pilchard, were estimated at 43 000 tonnes.

Dense but widely dispersed shoals of adult pilchard were recorded some 20 nm west of Cape Cross, at a depth of around 100 m. The shoals which occurred in the upper 20 m surface layer could be seen on the sonar for miles without being recorded on the echo sounder (the sonar was operated with fixed beam, 90° to starboard). Under such circumstances the acoustic technique probably underestimates the biomass substantially. Although the area was extensively covered, the biomass estimate of 65 000 tonnes refers to echo integration of very few shoals and may be regarded as a minimum abundance of pilchard in the area.

| Table 1 Species composition and biomass estimates (in tonnes) of pelagic type-1 fish by area. |          |         |               |           |
|---|----------|---------|---------------|-----------|
| Area  | Pilchard | Anchovy | Round herring | Total     |
| Tombua-Baia dos Tigres  | 87 000   |         |               | 87 000    |
| Baia dos Tigres-Cunene River  | 35 000   | 70 000  | 12 000        | 117 000   |
| Cunene River-Cape Frio  | 77 000   | 77 000  | 38 000        | 192 000   |
| Cape Frio-Rocky Point   | 341 000  | 22 000  | 63 000        | 426 000   |
| Rocky Point-Möwe Point  | 56 000   | 33 000  | 5 000         | 94 000    |
| Möwe Point-Ambrose Bay  | 39 000   | 4 000   |               | 43 000    |
| Cape Cross  | 65 000   |         |               | 65 000    |
| Easter Point  | 23 000   |         |               | 23 000    |
| Total   | 723 000  | 206 000 | 118 000       | 1 047 000 |
| Total Namibia   | 601 000  | 136 000 | 106 000       | 843 000   |

### Horse mackerel

Very little horse mackerel was found south of Ambrose Bay, while northwards some 1.7 million tonnes were recorded. The horse mackerel in the inshore region constituted approximately 1/3 of the total, with some 0.4 million tonnes occurring mostly between Rocky Point and Ambrose Bay. The offshore stocks is probably underestimated due to surface schooling at night and 'hiding' in the 'dead zone' at the bottom at daytime.

| Table 2 Biomass estimates of pelagic Cape horse mackerel. Reported in millions of tonnes. |                          |                              |       |
|---|--------------------------|------------------------------|-------|
| Dolphin Head-Ambrose Bay  | Ambrose Bay-Cunene River | Cunene River-Baia dos Tigres | Total |
| -   | 1.3                      | 0.4                          | 1.7   |

## 4 CONCLUDING REMARKS

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Some surveying difficulties were encountered during the present survey of the pelagic fish stocks, but in general the coverage of the main distribution areas was considered to be adequate and the survey conditions were favourable in all areas of high fish concentration. The results should therefore be considered to be reasonably accurate.

Previously noted problems, such as the occurrence of widely dispersed shoals which require tightly spaced transects to ensure adequate coverage of such regions, were encountered off Cape Cross and north of Easter Point. These shoals consisted of adult pilchard, probably prespawners, and although the present coverage was reasonably spaced, the dispersed schooling in the upper 20 m surface layer may have led to a substantial underestimate of the mature stock.

Determining species composition of pelagic type-1 fish is difficult solely from the echo recordings and is mostly based on trawl samples. This is a possible source of error, related to differences in the catchability of the species and to the frequency of trawling. It is, however, assumed that this source of error is of minor importance for the pilchard estimate because the large shoals of pilchard which count for the bulk of the pilchard estimate are easy to recognize and are normally unmixed.

Previous surveys have reported that fish migrated at night to surface waters above transducer level, and were thus not available to be surveyed. This behavioral trend was detected in all the target species during this survey and has probably caused an underestimation of the size of the stocks, especially the horse mackerel in offshore waters.

This behaviour may be at least partially responsible for some of the surveying difficulties experienced during previous cruises, notably during the June 1990 and March 1991 surveys when dense areas of pilchard were resurveyed several days after an initial coverage and the fish could not be found.

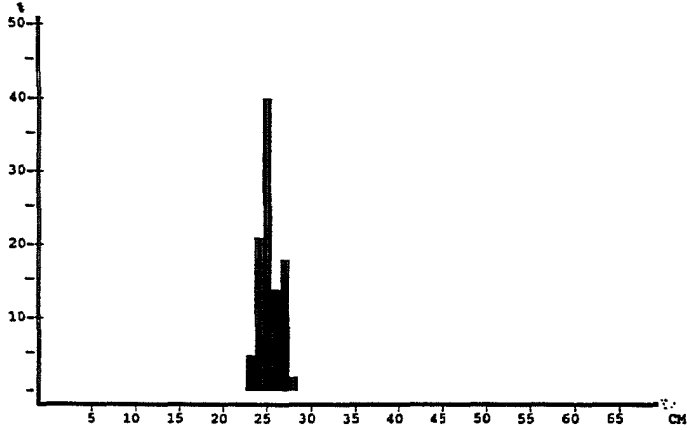
The distribution of the pilchard stock found in the region Ambrose Bay-Cunene River is comparable to the observations made by "DR. FRIDTJOF NANSEN" during the survey in June 1990, but the abundance is higher this year. Extremely dense shoals of pilchard were found at the same localities south of Cape Frio in both surveys but were approximately twice as abundant in the present survey. The total pilchard biomass of this region is estimated at 548 000 tonnes, which is considerably above the 485 000 tonnes estimated in June 1990, taking into account the adjustment of the biomass formula previously used.

In previous surveys almost the entire pilchard stock consisted of adult fish, and very few recruits have been recorded. In the present survey about 70% of the pilchard stock consisted of juvenile fish below 20 cm in length. This substantial contribution of recruits is promising for the development of the pilchard stock in the coming year.

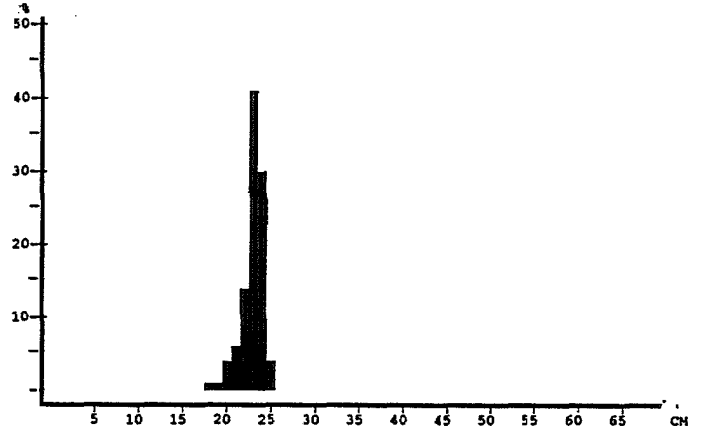




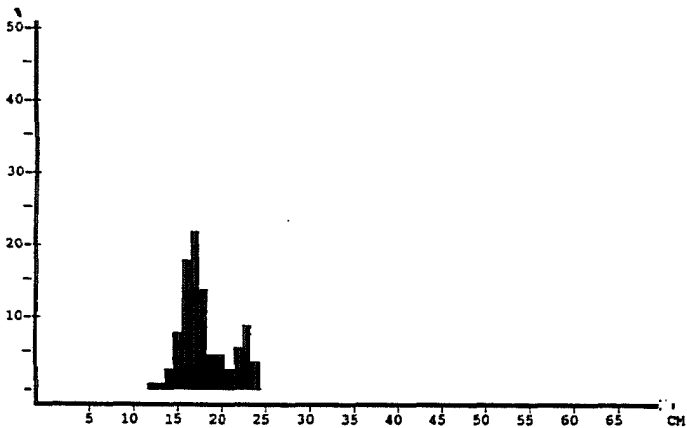
# ANNEX I LENGTH DISTRIBUTIONS OF MAIN SPECIES.



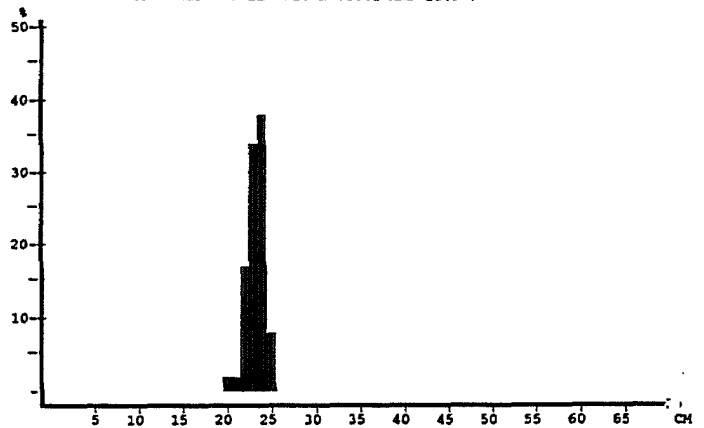
*Sardinops ocellata*  
 Angola. Tomboa - Cunene River  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 25.26cm N= 254  
 NUMBER OF SUBSAMPLES : 4  
 SAMPLES FOUND BETWEEN ST. NO. 966 AND 977.  
 SAMPLES SEARCHED BETWEEN ST. NO. 966 AND 982 .



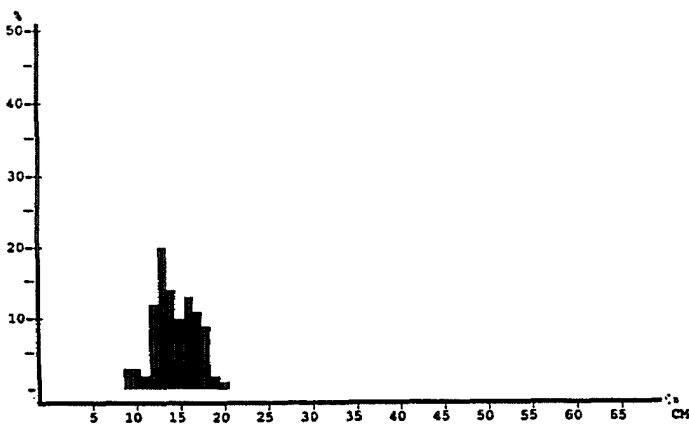
*Sardinops ocellata*  
 Ambrose bay - Cape Cross  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 22.94cm N= 180  
 NUMBER OF SUBSAMPLES : 3  
 SAMPLES FOUND BETWEEN ST. NO.1046 AND 1049.  
 SAMPLES SEARCHED BETWEEN ST. NO.1041 AND 1049 .



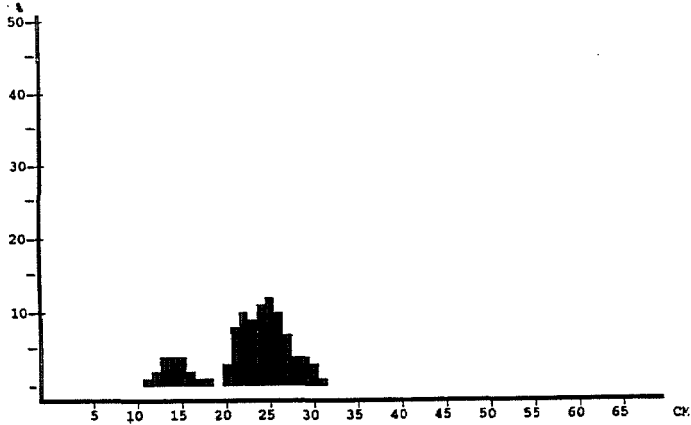
*Sardinops ocellata*  
 Namibia. Cunene - Ambrose Bay  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 18.15cm N= 1809  
 NUMBER OF SUBSAMPLES : 21  
 SAMPLES FOUND BETWEEN ST. NO. 955 AND 1038.  
 SAMPLES SEARCHED BETWEEN ST. NO. 983 AND 1040 .



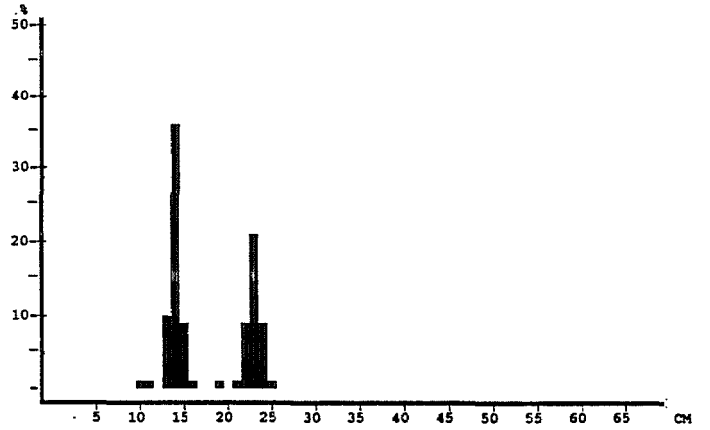
*Sardinops ocellata*  
 Hollands-Bird Isl.-Easter Pt.  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 23.26cm N= 106  
 NUMBER OF SUBSAMPLES : 1  
 SAMPLES FOUND BETWEEN ST. NO.1053 AND 1053.  
 SAMPLES SEARCHED BETWEEN ST. NO.1053 AND 1059 .



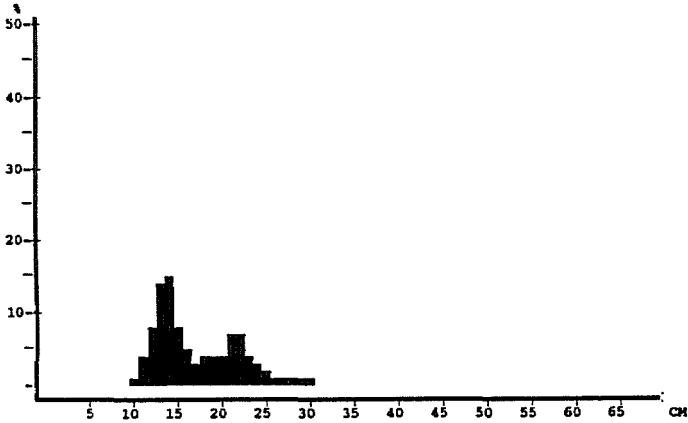
*Etrumeus whiteheadi*  
 Angola. Tomboa - Cunene River  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 14.45cm N= 327  
 NUMBER OF SUBSAMPLES : 6  
 SAMPLES FOUND BETWEEN ST. NO. 957 AND 981.  
 SAMPLES SEARCHED BETWEEN ST. NO. 966 AND 982 .



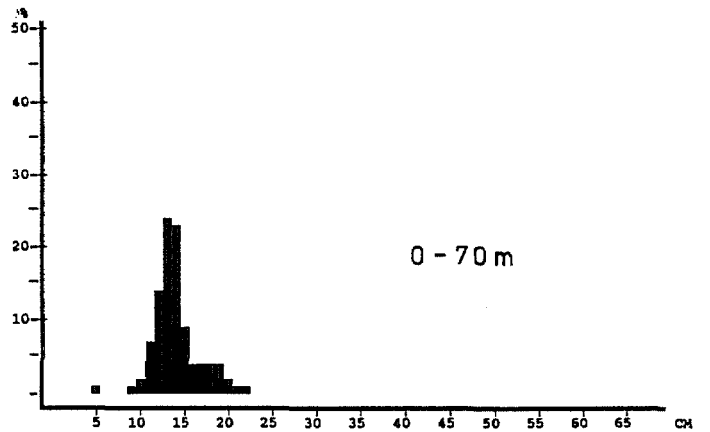
*Trachurus capensis*  
 Angola, Tomboa - Cunene River  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 22.67cm N= 1053  
 NUMBER OF SUBSAMPLES : 13  
 SAMPLES FOUND BETWEEN ST. NO. 966 AND 982.  
 SAMPLES SEARCHED BETWEEN ST. NO. 966 AND 982 .



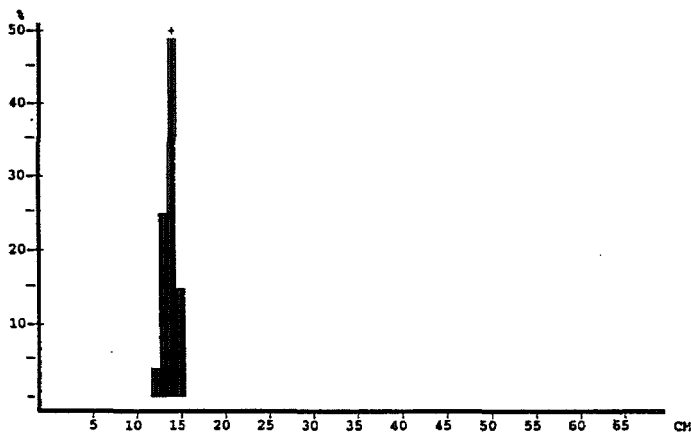
*Trachurus capensis*  
 Ambrose bay - Cape Cross  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 17.69cm N= 179  
 NUMBER OF SUBSAMPLES : 2  
 SAMPLES FOUND BETWEEN ST. NO.1042 AND 1049.  
 SAMPLES SEARCHED BETWEEN ST. NO.1041 AND 1049 .



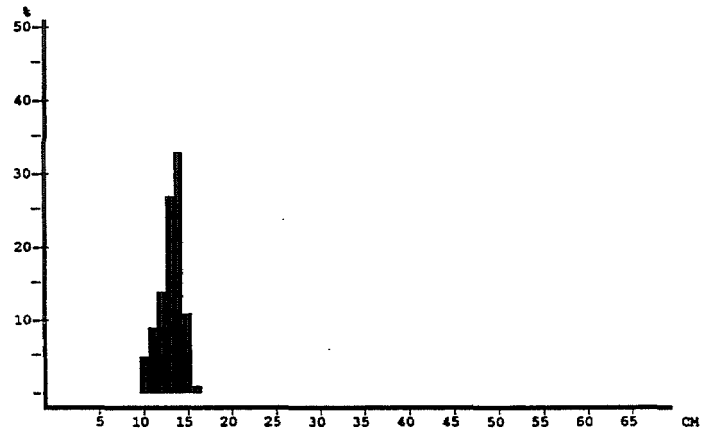
*Trachurus capensis*  
 Namibia, Cunene - Ambrose Bay  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 17.11cm N= 4428  
 NUMBER OF SUBSAMPLES : 45  
 SAMPLES FOUND BETWEEN ST. NO. 954 AND 1039.  
 SAMPLES SEARCHED BETWEEN ST. NO. 983 AND 1040 .



*Trachurus capensis*  
 Namibia, Cunene - Ambrose Bay  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 13.86cm N= 2569  
 NUMBER OF SUBSAMPLES : 22  
 SAMPLES FOUND BETWEEN ST. NO. 954 AND 1039.  
 SAMPLES SEARCHED BETWEEN ST. NO. 983 AND 1040 .



*Engraulis capensis*  
 Angola, Tomboa - Cunene River  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 13.81cm N= 275  
 NUMBER OF SUBSAMPLES : 2  
 SAMPLES FOUND BETWEEN ST. NO. 977 AND 981.  
 SAMPLES SEARCHED BETWEEN ST. NO. 966 AND 982 .



*Engraulis capensis*  
 Namibia, Cunene - Ambrose Bay  
 Pooled sample ( simple adding ).  
 MEAN LENGTH = 13.09cm N= 1302  
 NUMBER OF SUBSAMPLES : 15  
 SAMPLES FOUND BETWEEN ST. NO. 956 AND 1029.  
 SAMPLES SEARCHED BETWEEN ST. NO. 954 AND 965 .

## ANNEX II RECORDS OF FISHING STATIONS.

|  |  |  |  |  |                      |  |  |  |  |  |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
|--|--|--|--|--|----------------------|--|--|--|--|--|--|--|--|--|---------------|--|--|--|--|----------------------|--|--|--|--|----------------------|--|--|--|--|
| <p>PROJECT STATION: 954<br/>           DATE: 24/11/91 GEAR TYPE: PT No: POSITION: Lat S 2103 Long E 1309</p>   |  |  |  |  |                      |  |  |  |  | <p>PROJECT STATION: 960<br/>           DATE: 25/11/91 GEAR TYPE: PT No: POSITION: Lat S 1844 Long E 1211</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>start stop duration<br/>           TIME :01:10:00 01:30:00 20 (min) Purpose code: 1<br/>           LOG :2311.30 2312.50 1.20 Area code : 2<br/>           FDEPTH: 0 0 GearCond.code:<br/>           BDEPTH: 27 31 Validity code:<br/>           Towing dir: 170 Wire out: 100 m Speed:360 kn*10</p>                             |  |  |  |  |                      |  |  |  |  | <p>start stop duration<br/>           TIME :06:35:00 07:05:00 30 (min) Purpose code: 1<br/>           LOG :2564.20 2565.70 1.50 Area code : 3<br/>           FDEPTH: 20 10 GearCond.code:<br/>           BDEPTH: 54 38 Validity code:<br/>           Towing dir: 100 Wire out: 100 m Speed:300 kn*10</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Sorted: 15 Kg  |  |  |  |  | Total catch: 39.90   |  |  |  |  | CATCH/HOUR: 119.70   |  |  |  |  | Sorted: 31 Kg |  |  |  |  | Total catch: 248.80  |  |  |  |  | CATCH/HOUR: 497.60   |  |  |  |  |
| <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Trachurus capensis 113.10 2169 94.49 437<br/>           Galeichthys feliceps 3.90 9 3.26<br/>           Chelidonichthys capensis 1.50 51 1.25<br/>           Merluccius capensis 1.20 15 1.00<br/>           Engraulis capensis 0.00 9</p> |  |  |  |  |                      |  |  |  |  | <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Sardinops ocellata 48.00 10694 96.46 449<br/>           Etrumeus whiteheadi 12.32 320 2.48 450<br/>           Trachurus capensis 4.80 272 0.96 451<br/>           Engraulis capensis 0.48 80 0.10</p>  |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Total 119.70   |  |  |  |  | 100.00               |  |  |  |  | Total 497.60   |  |  |  |  | 100.00        |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>PROJECT STATION: 955<br/>           DATE: 24/11/91 GEAR TYPE: PT No:1 POSITION: Lat S 2009 Long E 1303</p>  |  |  |  |  |                      |  |  |  |  | <p>PROJECT STATION: 961<br/>           DATE: 25/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 1841 Long E 1202</p>  |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>start stop duration<br/>           TIME :08:50:00 09:15:00 25 (min) Purpose code: 1<br/>           LOG :2383.10 2384.10 1.00 Area code : 2<br/>           FDEPTH: 30 10 GearCond.code:<br/>           BDEPTH: 45 48 Validity code:<br/>           Towing dir: 348 Wire out: 100 m Speed:300 kn*10</p>                           |  |  |  |  |                      |  |  |  |  | <p>start stop duration<br/>           TIME :08:32:00 09:02:00 30 (min) Purpose code: 1<br/>           LOG :2579.10 2580.50 1.40 Area code : 3<br/>           FDEPTH: 92 94 GearCond.code:<br/>           BDEPTH: 92 94 Validity code:<br/>           Towing dir: 156 Wire out: 350 m Speed:270 kn*10</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Sorted: 43 Kg  |  |  |  |  | Total catch: 131.50  |  |  |  |  | CATCH/HOUR: 315.60   |  |  |  |  | Sorted: 57 Kg |  |  |  |  | Total catch: 3704.55 |  |  |  |  | CATCH/HOUR: 7409.10  |  |  |  |  |
| <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Sardinops ocellata 265.20 2676 84.03 438<br/>           Thyrsites atun 50.40 19 15.97</p>  |  |  |  |  |                      |  |  |  |  | <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Trachurus capensis 5654.00 108664 76.31 452<br/>           Merluccius capensis 1222.00 9880 16.49 453<br/>           Synagrops microlepis 449.80 32408 6.07<br/>           Pterothrissus belloni 29.90 650 0.40<br/>           Austroglossus microlepis 26.00 260 0.35<br/>           Argyrosomus hololepidotus 14.40 6 0.19<br/>           Sufflogobius bibarbatu 13.00 1716 0.18</p> |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Total 315.60   |  |  |  |  | 100.00               |  |  |  |  | Total 7409.10  |  |  |  |  | 99.99         |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>PROJECT STATION: 956<br/>           DATE: 24/11/91 GEAR TYPE: PT No: POSITION: Lat S 2000 Long E 1300</p>   |  |  |  |  |                      |  |  |  |  | <p>PROJECT STATION: 962<br/>           DATE: 25/11/91 GEAR TYPE: PT No: POSITION: Lat S 1839 Long E 1207</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>start stop duration<br/>           TIME :11:13:00 11:23:00 10 (min) Purpose code: 1<br/>           LOG :2396.80 2397.30 0.50 Area code : 2<br/>           FDEPTH: 13 13 GearCond.code:<br/>           BDEPTH: 26 25 Validity code:<br/>           Towing dir: 174 Wire out: 150 m Speed:300 kn*10</p>                           |  |  |  |  |                      |  |  |  |  | <p>start stop duration<br/>           TIME :10:30:00 10:35:00 5 (min) Purpose code: 1<br/>           LOG :2590.20 2590.50 0.30 Area code : 3<br/>           FDEPTH: 30 30 GearCond.code:<br/>           BDEPTH: 48 51 Validity code:<br/>           Towing dir: 270 Wire out: 200 m Speed:300 kn*10</p>  |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Sorted: 30 Kg  |  |  |  |  | Total catch: 900.00  |  |  |  |  | CATCH/HOUR: 5400.00  |  |  |  |  | Sorted: 31 Kg |  |  |  |  | Total catch: 947.98  |  |  |  |  | CATCH/HOUR: 11375.76 |  |  |  |  |
| <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Trachurus capensis 5310.00 278772 98.33 439<br/>           Engraulis capensis 46.80 4500 0.87 440<br/>           Sardinops ocellata 43.20 720 0.80</p>   |  |  |  |  |                      |  |  |  |  | <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Sardinops ocellata 5840.40 154080 51.34 454<br/>           Etrumeus whiteheadi 5170.80 209160 45.45 455<br/>           Engraulis capensis 353.40 25800 3.11 456<br/>           Trachurus capensis 11.16 744 0.10</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Total 5400.00  |  |  |  |  | 100.00               |  |  |  |  | Total 11375.76   |  |  |  |  | 100.00        |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>PROJECT STATION: 957<br/>           DATE: 24/11/91 GEAR TYPE: PT No: POSITION: Lat S 1932 Long E 1246</p>   |  |  |  |  |                      |  |  |  |  | <p>PROJECT STATION: 963<br/>           DATE: 25/11/91 GEAR TYPE: PT No: POSITION: Lat S 1811 Long E 1150</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>start stop duration<br/>           TIME :17:19:00 17:28:00 9 (min) Purpose code: 1<br/>           LOG :2435.10 2435.70 0.60 Area code : 3<br/>           FDEPTH: 0 0 GearCond.code:<br/>           BDEPTH: 26 30 Validity code:<br/>           Towing dir: 200 Wire out: 150 m Speed:370 kn*10</p>                              |  |  |  |  |                      |  |  |  |  | <p>start stop duration<br/>           TIME :15:29:00 15:49:00 20 (min) Purpose code: 1<br/>           LOG :2640.50 2641.70 1.20 Area code : 3<br/>           FDEPTH: 15 20 GearCond.code:<br/>           BDEPTH: 30 32 Validity code:<br/>           Towing dir: 170 Wire out: 100 m Speed:350 kn*10</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Sorted: 29 Kg  |  |  |  |  | Total catch: 438.45  |  |  |  |  | CATCH/HOUR: 2923.00  |  |  |  |  | Sorted: 7 Kg  |  |  |  |  | Total catch: 6.70    |  |  |  |  | CATCH/HOUR: 20.10    |  |  |  |  |
| <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Trachurus capensis 2420.00 163300 82.79 441<br/>           Engraulis capensis 424.00 48373 14.51 442<br/>           Etrumeus whiteheadi 37.00 2500 1.27 443<br/>           Sardinops ocellata 22.00 700 0.75 444</p>                       |  |  |  |  |                      |  |  |  |  | <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Engraulis capensis 9.00 498 44.78 459<br/>           Etrumeus whiteheadi 6.60 399 32.84 457<br/>           Sardinops ocellata 3.90 162 19.40 458<br/>           Trachurus capensis 0.60 24 2.99</p>  |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Total 2903.00  |  |  |  |  | 99.32                |  |  |  |  | Total 20.10  |  |  |  |  | 100.01        |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>PROJECT STATION: 958<br/>           DATE: 25/11/91 GEAR TYPE: PT No: POSITION: Lat S 1850 Long E 1220</p>   |  |  |  |  |                      |  |  |  |  | <p>PROJECT STATION: 964<br/>           DATE: 25/11/91 GEAR TYPE: PT No:1 POSITION: Lat S 1738 Long E 1141</p>  |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>start stop duration<br/>           TIME :03:27:00 03:42:00 15 (min) Purpose code: 1<br/>           LOG :2541.30 2542.10 0.80 Area code : 3<br/>           FDEPTH: 10 8 GearCond.code:<br/>           BDEPTH: 39 32 Validity code:<br/>           Towing dir: 90 Wire out: 150 m Speed:320 kn*10</p>                             |  |  |  |  |                      |  |  |  |  | <p>start stop duration<br/>           TIME :20:22:00 20:38:00 16 (min) Purpose code: 1<br/>           LOG :2684.80 2685.90 1.10 Area code : 3<br/>           FDEPTH: 15 10 GearCond.code:<br/>           BDEPTH: 82 90 Validity code:<br/>           Towing dir: 173 Wire out: 100 m Speed:430 kn*10</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Sorted: 32 Kg  |  |  |  |  | Total catch: 1453.50 |  |  |  |  | CATCH/HOUR: 5814.00  |  |  |  |  | Sorted: 7 Kg  |  |  |  |  | Total catch: 6.94    |  |  |  |  | CATCH/HOUR: 26.03    |  |  |  |  |
| <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Sardinops ocellata 2970.00 76900 51.08 445<br/>           Trachurus capensis 2736.00 109440 47.06 447<br/>           Engraulis capensis 108.00 5400 1.86 446</p>   |  |  |  |  |                      |  |  |  |  | <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Sardinops ocellata 10.69 101 41.07 460<br/>           Engraulis capensis 10.39 431 39.92 461<br/>           Etrumeus whiteheadi 4.88 101 18.75 462<br/>           Trachurus capensis 0.08 4 0.31</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Total 5814.00  |  |  |  |  | 100.00               |  |  |  |  | Total 26.04  |  |  |  |  | 100.05        |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>PROJECT STATION: 959<br/>           DATE: 25/11/91 GEAR TYPE: PT No: POSITION: Lat S 1843 Long E 1214</p>   |  |  |  |  |                      |  |  |  |  | <p>PROJECT STATION: 965<br/>           DATE: 25/11/91 GEAR TYPE: PT No:1 POSITION: Lat S 1728 Long E 1141</p>  |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| <p>start stop duration<br/>           TIME :05:03:00 05:18:00 15 (min) Purpose code: 1<br/>           LOG :2552.80 2553.70 0.90 Area code : 3<br/>           FDEPTH: 0 0 GearCond.code:<br/>           BDEPTH: 27 28 Validity code:<br/>           Towing dir: 300 Wire out: 100 m Speed:350 kn*10</p>                             |  |  |  |  |                      |  |  |  |  | <p>start stop duration<br/>           TIME :20:22:00 20:38:00 16 (min) Purpose code: 1<br/>           LOG :2684.80 2685.90 1.10 Area code : 3<br/>           FDEPTH: 15 10 GearCond.code:<br/>           BDEPTH: 82 90 Validity code:<br/>           Towing dir: 173 Wire out: 100 m Speed:430 kn*10</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Sorted: 9 Kg   |  |  |  |  | Total catch: 9.10    |  |  |  |  | CATCH/HOUR: 36.40  |  |  |  |  | Sorted: 7 Kg  |  |  |  |  | Total catch: 6.94    |  |  |  |  | CATCH/HOUR: 26.03    |  |  |  |  |
| <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Trachurus capensis 32.80 2084 90.11 448<br/>           Thyrsites atun 3.60 72 9.89</p>   |  |  |  |  |                      |  |  |  |  | <p>SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.<br/>           weight numbers<br/>           Sardinops ocellata 10.69 101 41.07 460<br/>           Engraulis capensis 10.39 431 39.92 461<br/>           Etrumeus whiteheadi 4.88 101 18.75 462<br/>           Trachurus capensis 0.08 4 0.31</p>   |  |  |  |  |               |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |
| Total 36.40  |  |  |  |  | 100.00               |  |  |  |  | Total 26.04  |  |  |  |  | 100.05        |  |  |  |  |                      |  |  |  |  |                      |  |  |  |  |

PROJECT STATION: 965  
 DATE: 25/11/91 GEAR TYPE: FT No: POSITION: Lat S 1727 Long E 1142  
 start stop duration  
 TIME : 22:43:00 23:03:00 20 (min) Purpose code: 1  
 LOG : 2702.20 2703.70 1.50 Area code : 3  
 FDEPTH: 10 10 GearCond.code: 1  
 BDEPTH: 53 61 Validity code:  
 Towing dir: 332 Wire out: 100 m Speed: 320 kn\*10  
 Sorted: 28 Kg Total catch: 56.36 CATCH/HOUR: 169.08

| SPECIES            | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------|------------|---------|-------------|----------|
|                    | weight     | numbers |             |          |
| Sardinops ocellata | 163.80     | 1407    | 96.88       | 463      |
| Sepia australis    | 2.10       | 18      | 1.24        |          |
| Sardinops ocellata | 1.50       | 96      | 0.89        | 465      |
| Engraulis capensis | 0.90       | 60      | 0.53        |          |
| Thyrsites atun     | 0.60       | 6       | 0.35        |          |
| Trachurus capensis | 0.12       | 198     | 0.07        | 464      |
| Total              | 169.02     |         | 99.96       |          |

PROJECT STATION: 988  
 DATE: 30/11/91 GEAR TYPE: PT No:1 POSITION: Lat S 1728 Long E 1142  
 start stop duration  
 TIME : 10:42:00 10:51:00 9 (min) Purpose code: 1  
 LOG : 3436.30 3436.90 0.60 Area code : 3  
 FDEPTH: 40 40 GearCond.code: 1  
 BDEPTH: 52 48 Validity code:  
 Towing dir: 38 Wire out: 150 m Speed: 330 kn\*10  
 Sorted: 34 Kg Total catch: 678.80 CATCH/HOUR: 4525.33

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Engraulis capensis  | 1686.67    | 80667   | 37.27       | 502      |
| Trachurus capensis  | 1413.33    | 71600   | 31.23       | 503      |
| Etrumeus whiteheadi | 898.67     | 26727   | 19.86       | 504      |
| Sardinops ocellata  | 526.67     | 6533    | 11.64       | 505      |
| Total               | 4525.34    |         | 100.00      |          |

PROJECT STATION: 989  
 DATE: 30/11/91 GEAR TYPE: PT No: POSITION: Lat S 1834 Long E 1202  
 start stop duration  
 TIME : 20:46:00 21:02:00 16 (min) Purpose code: 1  
 LOG : 3536.90 3537.80 0.90 Area code : 3  
 FDEPTH: 10 10 GearCond.code: 1  
 BDEPTH: 29 38 Validity code:  
 Towing dir: 290 Wire out: 100 m Speed: 410 kn\*10  
 Sorted: 36 Kg Total catch: 289.10 CATCH/HOUR: 1084.13

| SPECIES                  | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------|------------|---------|-------------|----------|
|                          | weight     | numbers |             |          |
| Sardinops ocellata       | 708.75     | 19211   | 65.38       | 506      |
| Trachurus capensis       | 341.25     | 20381   | 31.48       | 507      |
| Thyrsites atun           | 30.00      | 8       | 2.77        |          |
| Chelidonichthys capensis | 4.13       | 38      | 0.38        |          |
| Total                    | 1084.13    |         | 100.01      |          |

PROJECT STATION: 983  
 DATE: 29/11/91 GEAR TYPE: PT No: POSITION: Lat S 1719 Long E 1125  
 start stop duration  
 TIME : 14:25:00 15:10:00 45 (min) Purpose code: 1  
 LOG : 3246.60 3249.10 2.50 Area code : 3  
 FDEPTH: 150 100 GearCond.code: 1  
 BDEPTH: 222 190 Validity code:  
 Towing dir: 65 Wire out: 450 m Speed: 330 kn\*10  
 Sorted: 3 Kg Total catch: 3.30 CATCH/HOUR: 4.40

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Trachurus capensis  | 2.93       | 29      | 66.59       | 493      |
| Merluccius capensis | 1.47       | 1       | 33.41       |          |
| Total               | 4.40       |         | 100.00      |          |

PROJECT STATION: 990  
 DATE: 1/12/91 GEAR TYPE: PT No: POSITION: Lat S 1848 Long E 1214  
 start stop duration  
 TIME : 00:42:00 01:02:00 20 (min) Purpose code: 1  
 LOG : 3573.50 3574.70 1.20 Area code : 3  
 FDEPTH: 25 22 GearCond.code: 3  
 BDEPTH: 59 65 Validity code:  
 Towing dir: 265 Wire out: 100 m Speed: 360 kn\*10  
 Sorted: 18 Kg Total catch: 76.90 CATCH/HOUR: 230.70

| SPECIES                | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|------------------------|------------|---------|-------------|----------|
|                        | weight     | numbers |             |          |
| Trachurus capensis     | 213.00     | 8673    | 92.33       | 508      |
| Callorhynchus capensis | 9.30       | 3       | 4.03        |          |
| Thyrsites atun         | 8.40       | 3       | 3.64        |          |
| Total                  | 230.70     |         | 100.00      |          |

PROJECT STATION: 984  
 DATE: 29/11/91 GEAR TYPE: BT No:1 POSITION: Lat S 1720 Long E 1137  
 start stop duration  
 TIME : 16:42:00 16:57:00 15 (min) Purpose code: 1  
 LOG : 3262.00 3262.90 0.90 Area code : 3  
 FDEPTH: 99 100 GearCond.code: 1  
 BDEPTH: 99 100 Validity code:  
 Towing dir: 180 Wire out: 450 m Speed: 360 kn\*10  
 Sorted: 31 Kg Total catch: 2763.00 CATCH/HOUR: 11052.00

| SPECIES               | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------|------------|---------|-------------|----------|
|                       | weight     | numbers |             |          |
| Trachurus capensis    | 10692.00   | 212768  | 96.74       | 494      |
| Dentex macrophthalmus | 216.00     | 2880    | 1.95        |          |
| Merluccius capensis   | 144.00     | 1440    | 1.30        |          |
| Total                 | 11052.00   |         | 99.99       |          |

PROJECT STATION: 991  
 DATE: 1/12/91 GEAR TYPE: PT No: POSITION: Lat S 1851 Long E 1220  
 start stop duration  
 TIME : 02:35:00 03:05:00 30 (min) Purpose code: 1  
 LOG : 3588.30 3590.30 2.00 Area code : 3  
 FDEPTH: 21 10 GearCond.code: 3  
 BDEPTH: 47 38 Validity code:  
 Towing dir: 360 Wire out: 100 m Speed: 400 kn\*10  
 Sorted: 19 Kg Total catch: 76.30 CATCH/HOUR: 152.60

| SPECIES                  | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------------|------------|---------|-------------|----------|
|                          | weight     | numbers |             |          |
| Trachurus capensis       | 145.60     | 5748    | 95.41       | 509      |
| Chelidonichthys capensis | 2.40       | 24      | 1.57        |          |
| Engraulis capensis       | 2.20       | 136     | 1.44        | 510      |
| Sardinops ocellata       | 1.60       | 24      | 1.05        |          |
| Etrumeus whiteheadi      | 0.80       | 24      | 0.52        |          |
| Total                    | 152.60     |         | 99.99       |          |

PROJECT STATION: 985  
 DATE: 29/11/91 GEAR TYPE: PT No: POSITION: Lat S 1722 Long E 1136  
 start stop duration  
 TIME : 17:38:00 17:53:00 15 (min) Purpose code: 1  
 LOG : 3265.40 3266.40 1.00 Area code : 3  
 FDEPTH: 40 40 GearCond.code: 1  
 BDEPTH: 104 105 Validity code:  
 Towing dir: 350 Wire out: 200 m Speed: 400 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES       | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------|------------|---------|-------------|----------|
|               | weight     | numbers |             |          |
| N O C A T C H | 0.00       |         |             |          |
| Total         |            |         |             |          |

PROJECT STATION: 986  
 DATE: 29/11/91 GEAR TYPE: PT No: POSITION: Lat S 1716 Long E 1142  
 start stop duration  
 TIME : 21:38:00 22:15:00 17 (min) Purpose code: 1  
 LOG : 3308.20 3309.40 1.20 Area code : 3  
 FDEPTH: 25 35 GearCond.code: 1  
 BDEPTH: 46 42 Validity code:  
 Towing dir: 170 Wire out: 150 m Speed: 440 kn\*10  
 Sorted: 30 Kg Total catch: 363.30 CATCH/HOUR: 1282.24

| SPECIES                     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-----------------------------|------------|---------|-------------|----------|
|                             | weight     | numbers |             |          |
| Trachurus capensis          | 673.41     | 37204   | 52.52       | 495      |
| Engraulis capensis          | 390.71     | 25966   | 30.47       | 496      |
| Sardinella aurita           | 84.71      | 593     | 6.61        | 497      |
| Chelidonichthys capensis    | 58.24      | 127     | 4.54        |          |
| Sardinops ocellata          | 46.59      | 3642    | 3.63        | 498      |
| Argyrosomus hololepidotus   | 13.41      | 4       | 1.05        |          |
| Sepia officinalis hierredda | 6.35       | 42      | 0.50        |          |
| Etrumeus whiteheadi         | 4.59       | 127     | 0.36        |          |
| Merluccius capensis         | 4.24       | 42      | 0.33        |          |
| Total                       | 1282.25    |         | 100.01      |          |

PROJECT STATION: 992  
 DATE: 1/12/91 GEAR TYPE: PT No: POSITION: Lat S 1856 Long E 1223  
 start stop duration  
 TIME : 05:47:00 06:02:00 15 (min) Purpose code: 1  
 LOG : 3615.10 3616.10 1.00 Area code : 3  
 FDEPTH: 20 40 GearCond.code: 1  
 BDEPTH: 50 43 Validity code:  
 Towing dir: 130 Wire out: 100 m Speed: 400 kn\*10  
 Sorted: 26 Kg Total catch: 142.10 CATCH/HOUR: 568.40

| SPECIES            | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------|------------|---------|-------------|----------|
|                    | weight     | numbers |             |          |
| Trachurus capensis | 520.00     | 15772   | 91.48       | 511      |
| Thyrsites atun     | 48.40      | 24      | 8.52        |          |
| Total              | 568.40     |         | 100.00      |          |

PROJECT STATION: 993  
 DATE: 1/12/91 GEAR TYPE: PT No: POSITION: Lat S 1844 Long E 1215  
 start stop duration  
 TIME : 08:34:00 08:43:00 9 (min) Purpose code: 1  
 LOG : 3640.90 3641.40 0.50 Area code : 3  
 FDEPTH: 15 15 GearCond.code: 1  
 BDEPTH: 33 38 Validity code:  
 Towing dir: 180 Wire out: 150 m Speed: 310 kn\*10  
 Sorted: 35 Kg Total catch: 1548.70 CATCH/HOUR: 10324.67

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Sardinops ocellata  | 9600.00    | 200727  | 92.98       | 512      |
| Etrumeus whiteheadi | 700.00     | 17333   | 6.78        | 513      |
| Thyrsites atun      | 24.67      | 7       | 0.24        |          |
| Total               | 10324.67   |         | 100.00      |          |

DATE: 1/12/91 GEAR TYPE: PT No: POSITION:Lat S 1843  
start stop duration Long E 1209  
TIME :12:20:00 12:28:00 8 (min) Purpose code: 1  
LOG :3677.50 3678.20 0.70 Area code : 3  
FDEPTH: 30 25 GearCond.code: 4  
BDEPTH: 50 45 Validity code:  
Towing dir: 90 Wire out: 150 m Speed:500 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
N O C A T C H 0.00  
Total

PROJECT STATION: 994  
DATE: 1/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1843  
start stop duration Long E 1211  
TIME :13:40:00 13:50:00 10 (min) Purpose code: 1  
LOG :3685.90 3686.60 0.70 Area code : 3  
FDEPTH: 20 15 GearCond.code: 4  
BDEPTH: 46 30 Validity code:  
Towing dir: 65 Wire out: 150 m Speed:420 kn\*10

Sorted: 35 Kg Total catch: 4511.00 CATCH/HOUR: 27066.00

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Sardinops ocellata 19890.00 559170 73.49 514  
Etrumeus whiteheadi 3666.00 107640 13.54 515  
Engraulis capensis 3510.00 285186 12.97 516  
Total 27066.00 100.00

PROJECT STATION: 996  
DATE: 1/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1820  
start stop duration Long E 1155  
TIME :20:52:00 21:02:00 10 (min) Purpose code: 1  
LOG :3752.80 3753.50 0.70 Area code : 3  
FDEPTH: 15 15 GearCond.code: 4  
BDEPTH: 44 46 Validity code:  
Towing dir: 90 Wire out: 100 m Speed:400 kn\*10

Sorted: 37 Kg Total catch: 2475.15 CATCH/HOUR: 14850.90

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Trachurus capensis 13905.00 537504 93.63 517  
Engraulis capensis 801.00 50400 5.39 518  
Sardinops ocellata 72.00 1350 0.48  
Etrumeus whiteheadi 49.50 4500 0.33  
Thysites atun 23.40 12 0.16  
Total 14850.90 99.99

PROJECT STATION: 997  
DATE: 1/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1828  
start stop duration Long E 1158  
TIME :22:54:00 22:58:00 4 (min) Purpose code: 1  
LOG :3766.50 3766.70 0.20 Area code : 3  
FDEPTH: 12 12 GearCond.code: 4  
BDEPTH: 50 53 Validity code:  
Towing dir: 180 Wire out: 100 m Speed:400 kn\*10

Sorted: 19 Kg Total catch: 12586.20 CATCH/HOUR: 188793.00

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Sardinops ocellata 84140.00 4564155 44.57 519  
Etrumeus whiteheadi 3465.00 158400 1.84 520  
Trachurus capensis 1089.00 89100 0.58  
Engraulis capensis 99.00 9900 0.05  
Total 88793.00 47.04

PROJECT STATION: 998  
DATE: 2/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 1729  
start stop duration Long E 1127  
TIME :08:23:00 08:43:00 20 (min) Purpose code: 1  
LOG :3861.00 3862.20 1.20 Area code : 3  
FDEPTH: 192 187 GearCond.code: 4  
BDEPTH: 192 187 Validity code:  
Towing dir: 20 Wire out: 700 m Speed:310 kn\*10

Sorted: 62 Kg Total catch: 247.80 CATCH/HOUR: 743.40

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Merluccius capensis 390.00 723 52.46 521  
Trachurus capensis 220.20 951 29.62 522  
Synagrops microlepis 50.40 3234 6.78  
Pterothrissus belloni 27.00 165 3.63  
Dentex macrophthalmus 17.10 75 2.30  
Lampanyctodes hectoris 16.80 5643 2.26  
Belicolenus dactylopterus 16.50 99 2.22  
Chlorophthalmus punctatus 4.50 132 0.61  
Hyperoglyphe moseleyi 0.93 3 0.13  
Total 743.43 100.01

PROJECT STATION: 999  
DATE: 2/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1730  
start stop duration Long E 1122  
TIME :10:40:00 10:56:00 16 (min) Purpose code: 1  
LOG :3874.40 3875.50 1.10 Area code : 3  
FDEPTH: 70 100 GearCond.code: 3  
BDEPTH: 319 293 Validity code:  
Towing dir: 360 Wire out: 250 m Speed:420 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
N O C A T C H 0.00  
Total

PROJECT STATION:1000  
DATE: 2/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1730  
start stop duration Long E 1122  
TIME :11:35:00 12:10:00 35 (min) Purpose code: 1  
LOG :3877.40 3879.60 2.20 Area code : 3  
FDEPTH: 70 130 GearCond.code: 4  
BDEPTH: 322 370 Validity code:  
Towing dir: 270 Wire out: 450 m Speed:420 kn\*10

Sorted: 32 Kg Total catch: 444.00 CATCH/HOUR: 761.14

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Trachurus capensis 761.14 8333 100.00 523  
Total 761.14 100.00

PROJECT STATION:1001  
DATE: 2/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1740  
start stop duration Long E 1109  
TIME :15:29:00 15:49:00 20 (min) Purpose code: 1  
LOG :3909.60 3911.10 1.50 Area code : 3  
FDEPTH: 130 100 GearCond.code: 4  
BDEPTH: 1460 1400 Validity code:  
Towing dir: 82 Wire out: 400 m Speed:450 kn\*10

Sorted: 29 Kg Total catch: 856.60 CATCH/HOUR: 2569.80

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Trachurus capensis 2565.00 29145 99.81 524  
Brama brama 4.80 3 0.19  
Total 2569.80 100.00

PROJECT STATION:1002  
DATE: 2/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1129  
start stop duration Long E 1054  
TIME :18:12:00 18:42:00 30 (min) Purpose code: 1  
LOG :3931.40 3933.30 1.90 Area code : 3  
FDEPTH: 150 150 GearCond.code: 3  
BDEPTH: 2000 3000 Validity code:  
Towing dir: 280 Wire out: 500 m Speed:350 kn\*10

Sorted: Kg Total catch: 0.20 CATCH/HOUR: 0.40

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Trachurus capensis 0.40 8 100.00  
Total 0.40 100.00

PROJECT STATION:1003  
DATE: 2/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 1740  
start stop duration Long E 1056  
TIME :21:56:00 22:26:00 30 (min) Purpose code: 1  
LOG :3962.40 3964.70 2.30 Area code : 3  
FDEPTH: 0 0 GearCond.code: 4  
BDEPTH: 3000 3000 Validity code:  
Towing dir: 90 Wire out: 150 m Speed:460 kn\*10

Sorted: 72 Kg Total catch: 72.24 CATCH/HOUR: 144.48

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Thunnus albacares 76.00 4 52.60  
Trachurus capensis 49.60 518 34.33 525  
Lampanyctodes hectoris 6.62 1734 4.58  
Tetragonurus atlanticus 6.08 108 4.21  
Trachipterus trachipterus 3.54 10 2.45  
OMNASTREPHIDAE 2.64 234 1.83  
Total 144.48 100.00

PROJECT STATION:1004  
DATE: 3/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1800  
start stop duration Long E 1123  
TIME :13:52:00 14:01:00 9 (min) Purpose code: 1  
LOG :4113.60 4114.20 0.60 Area code : 3  
FDEPTH: 100 150 GearCond.code: 3  
BDEPTH: 500 440 Validity code:  
Towing dir: 100 Wire out: 450 m Speed:420 kn\*10

Sorted: Kg Total catch: 0.33 CATCH/HOUR: 2.20

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Trachurus capensis 2.20 20 100.00  
Total 2.20 100.00

PROJECT STATION:1005  
DATE: 3/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1800  
start stop duration Long E 1126  
TIME :15:33:00 15:53:00 20 (min) Purpose code: 1  
LOG :4118.80 4120.20 1.30 Area code : 3  
FDEPTH: 170 130 GearCond.code: 4  
BDEPTH: 282 264 Validity code:  
Towing dir: 90 Wire out: 450 m Speed:410 kn\*10

Sorted: 30 Kg Total catch: 120.80 CATCH/HOUR: 362.40

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Trachurus capensis 362.40 2745 100.00 526  
Total 362.40 100.00

PROJECT STATION:1006  
DATE: 3/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1132  
start stop duration Long E 1132  
TIME :16:58:00 17:13:00 15 (min) Purpose code: 1  
LOG :4125.70 4126.60 0.90 Area code : 3  
FDEPTH: 150 165 GearCond.code: 4  
BDEPTH: 214 205 Validity code:  
Towing dir: 105 Wire out: 450 m Speed:360 kn\*10

Sorted: 27 Kg Total catch: 54.70 CATCH/HOUR: 218.80

SPECIES CATCH/HOUR % OF TOT. C SAMP.NO.  
weight numbers  
Trachurus capensis 103.20 720 47.17 527  
MYCTOPHIDAE 88.00 44000 40.22  
Merluccius capensis 16.80 24 7.68  
Brama brama 10.80 8 4.94  
Total 218.80 100.01

PROJECT STATION:1007  
 DATE: 3/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1800 Long E 1144  
 start stop duration  
 TIME :20:02:00 20:22:00 20 (min) Purpose code: 1  
 LOG :4139.80 4140.80 1.00 Area code : 3  
 FDEPTH: 65 55 GearCond.code:  
 BDEPTH: 80 72 Validity code:  
 Towing dir: 60 Wire out: 250 m Speed:350 kn\*10  
 Sorted: 21 Kg Total catch: 21.10 CATCH/HOUR: 63.30

| SPECIES                | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|------------------------|-------------------|---------------------|----------|
| Trachurus capensis     | 36.90             | 525                 | 58.29    |
| Thyrssites atun        | 9.30              | 3                   | 14.69    |
| Mustelus mustelus      | 7.80              | 6                   | 12.32    |
| Callorhynchus capensis | 6.30              | 6                   | 9.95     |
| Zeus faber             | 3.00              | 3                   | 4.74     |
| Total                  | 63.30             |                     | 99.99    |

PROJECT STATION:1013  
 DATE: 4/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1830 Long E 1139  
 start stop duration  
 TIME :16:34:00 17:00:00 26 (min) Purpose code: 1  
 LOG :4314.10 4315.30 1.51 Area code : 3  
 FDEPTH: 183 188 GearCond.code:  
 BDEPTH: 183 188 Validity code:  
 Towing dir: 270 Wire out: 700 m Speed:354 kn\*10  
 Sorted: 34 Kg Total catch: 1196.30 CATCH/HOUR: 2760.69

| SPECIES                   | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------------------|-------------------|---------------------|----------|
| Trachurus capensis        | 1663.85           | 15732               | 60.27    |
| Merluccius capensis       | 888.46            | 646                 | 32.18    |
| Dentex macrophthalmus     | 185.77            | 1050                | 6.73     |
| Helicolenus dactylopterus | 22.52             | 404                 | 0.82     |
| Total                     | 2760.76           |                     | 100.00   |

PROJECT STATION:1008  
 DATE: 3/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1804 Long E 1148  
 start stop duration  
 TIME :22:02:00 22:22:00 20 (min) Purpose code: 1  
 LOG :4152.30 4153.40 1.10 Area code : 3  
 FDEPTH: 20 20 GearCond.code:  
 BDEPTH: 31 33 Validity code:  
 Towing dir: 342 Wire out: 100 m Speed:320 kn\*10  
 Sorted: 36 Kg Total catch: 569.80 CATCH/HOUR: 1709.40

| SPECIES             | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------------|-------------------|---------------------|----------|
| Sardinops ocellata  | 1492.80           | 36051               | 87.33    |
| Engraulis capensis  | 180.60            | 9540                | 10.57    |
| Trachurus capensis  | 31.20             | 480                 | 1.83     |
| Etrumeus whiteheadi | 4.80              | 192                 | 0.28     |
| Total               | 1709.40           |                     | 100.01   |

PROJECT STATION:1014  
 DATE: 4/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1831 Long E 1127  
 start stop duration  
 TIME :18:42:00 19:02:00 20 (min) Purpose code: 1  
 LOG :4326.40 4327.80 2.40 Area code : 3  
 FDEPTH: 180 170 GearCond.code:  
 BDEPTH: 335 308 Validity code:  
 Towing dir: 160 Wire out: 500 m Speed:420 kn\*10  
 Sorted: 28 Kg Total catch: 110.40 CATCH/HOUR: 331.20

| SPECIES            | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|--------------------|-------------------|---------------------|----------|
| Trachurus capensis | 189.60            | 1353                | 57.25    |
| MYCTOPHIDAE        | 128.40            | 66126               | 38.77    |
| Brama brama        | 13.20             | 12                  | 3.99     |
| Total              | 331.20            |                     | 100.01   |

PROJECT STATION:1009  
 DATE: 4/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1810 Long E 1124  
 start stop duration  
 TIME :01:42:00 02:02:00 20 (min) Purpose code: 1  
 LOG :4186.40 4187.70 1.45 Area code : 3  
 FDEPTH: 10 10 GearCond.code:  
 BDEPTH: 569 670 Validity code:  
 Towing dir: 270 Wire out: 100 m Speed:435 kn\*10  
 Sorted: 25 Kg Total catch: 24.59 CATCH/HOUR: 73.77

| SPECIES            | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|--------------------|-------------------|---------------------|----------|
| MYCTOPHIDAE        | 45.90             | 11022               | 62.22    |
| Trachurus capensis | 18.00             | 135                 | 24.40    |
| Thyrssites atun    | 5.73              | 6                   | 7.77     |
| OMASTREPRIDAE      | 4.14              | 60                  | 5.61     |
| Total              | 73.77             |                     | 100.00   |

PROJECT STATION:1015  
 DATE: 4/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 1831 Long E 1115  
 start stop duration  
 TIME :20:45:00 21:05:00 20 (min) Purpose code: 1  
 LOG :4339.40 4341.00 1.60 Area code : 3  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 1032 1166 Validity code:  
 Towing dir: 274 Wire out: 150 m Speed:470 kn\*10  
 Sorted: 7 Kg Total catch: 13.50 CATCH/HOUR: 40.50

| SPECIES                   | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------------------|-------------------|---------------------|----------|
| MYCTOPHIDAE               | 28.20             | 8070                | 69.63    |
| Tetragonus atlanticus     | 4.80              | 24                  | 11.85    |
| OMASTREPRIDAE             | 4.50              | 228                 | 11.11    |
| Trachipterus jacksonensis | 3.00              | 12                  | 7.41     |
| Total                     | 40.50             |                     | 100.00   |

PROJECT STATION:1010  
 DATE: 4/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1811 Long E 1058  
 start stop duration  
 TIME :04:32:00 04:52:00 20 (min) Purpose code: 1  
 LOG :4211.00 4212.30 1.21 Area code : 3  
 FDEPTH: 10 10 GearCond.code:  
 BDEPTH: 3000 3000 Validity code:  
 Towing dir: 180 Wire out: 100 m Speed:388 kn\*10  
 Sorted: 11 Kg Total catch: 11.23 CATCH/HOUR: 33.69

| SPECIES               | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|-----------------------|-------------------|---------------------|----------|
| Tetragonus atlanticus | 14.34             | 123                 | 42.56    |
| MYCTOPHIDAE           | 10.80             | 2622                | 32.06    |
| Schedophilus huttoni  | 4.83              | 6                   | 14.34    |
| Tubbia tasmanica      | 1.92              | 3                   | 5.70     |
| OMASTREPRIDAE         | 1.80              | 90                  | 5.34     |
| Total                 | 33.69             |                     | 100.00   |

PROJECT STATION:1016  
 DATE: 4/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 1839 Long E 1119  
 start stop duration  
 TIME :23:15:00 23:40:00 25 (min) Purpose code: 1  
 LOG :4357.00 4358.80 1.80 Area code : 3  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 660 653 Validity code:  
 Towing dir: 360 Wire out: 150 m Speed:420 kn\*10  
 Sorted: 86 Kg Total catch: 148.50 CATCH/HOUR: 356.40

| SPECIES               | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|-----------------------|-------------------|---------------------|----------|
| MYCTOPHIDAE           | 197.76            | 71194               | 55.49    |
| Thunnus albacares     | 148.56            | 5                   | 41.68    |
| Schedophilus huttoni  | 8.18              | 5                   | 2.30     |
| Tetragonus atlanticus | 1.92              | 19                  | 0.54     |
| Total                 | 356.42            |                     | 100.01   |

PROJECT STATION:1011  
 DATE: 4/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1821 Long E 1126  
 start stop duration  
 TIME :09:05:00 09:33:00 28 (min) Purpose code: 1  
 LOG :4251.20 4253.20 2.00 Area code : 3  
 FDEPTH: 150 150 GearCond.code:  
 BDEPTH: 390 320 Validity code:  
 Towing dir: 90 Wire out: 600 m Speed:400 kn\*10  
 Sorted: 30 Kg Total catch: 100.40 CATCH/HOUR: 215.14

| SPECIES                   | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------------------|-------------------|---------------------|----------|
| Trachurus capensis        | 152.36            | 1106                | 70.82    |
| MYCTOPHIDAE               | 37.93             | 17674               | 17.63    |
| Trachipterus trachipterus | 10.50             | 2                   | 4.88     |
| Brama brama               | 10.50             | 2                   | 4.88     |
| Merluccius capensis       | 3.86              | 4                   | 1.79     |
| Total                     | 215.15            |                     | 100.00   |

PROJECT STATION:1017  
 DATE: 5/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 1840 Long E 1202  
 start stop duration  
 TIME :04:21:00 04:41:00 20 (min) Purpose code: 1  
 LOG :4402.80 4404.20 1.40 Area code : 3  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 88 88 Validity code:  
 Towing dir: 150 Wire out: 150 m Speed:420 kn\*10  
 Sorted: 29 Kg Total catch: 1592.30 CATCH/HOUR: 4776.90

| SPECIES            | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|--------------------|-------------------|---------------------|----------|
| Trachurus capensis | 4770.00           | 116514              | 99.86    |
| Thyrssites atun    | 4.35              | 3                   | 0.09     |
| Mustelus mustelus  | 2.55              | 3                   | 0.05     |
| Total              | 4776.90           |                     | 100.00   |

PROJECT STATION:1012  
 DATE: 4/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 1819 Long E 1140  
 start stop duration  
 TIME :11:17:00 11:37:00 20 (min) Purpose code: 1  
 LOG :4266.60 4267.20 1.60 Area code : 3  
 FDEPTH: 138 138 GearCond.code:  
 BDEPTH: 138 138 Validity code:  
 Towing dir: 90 Wire out: 500 m Speed:290 kn\*10  
 Sorted: 41 Kg Total catch: 163.36 CATCH/HOUR: 490.08

| SPECIES                   | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------------------|-------------------|---------------------|----------|
| Dentex macrophthalmus     | 338.40            |                     | 69.05    |
| Merluccius capensis       | 79.20             |                     | 16.16    |
| Lous capensis             | 45.00             | 60                  | 9.18     |
| Trachurus capensis        | 20.70             | 108                 | 4.22     |
| Helicolenus dactylopterus | 4.08              | 108                 | 0.83     |
| Leurochirus bellocci      | 2.70              | 27                  | 0.55     |
| Total                     | 490.08            |                     | 99.99    |

PROJECT STATION:1018  
 DATE: 5/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 1839 Long E 1206  
 start stop duration  
 TIME :15:52:00 16:01:00 9 (min) Purpose code: 1  
 LOG :6501.60 6502.20 0.60 Area code : 3  
 FDEPTH: 20 10 GearCond.code:  
 BDEPTH: 40 34 Validity code:  
 Towing dir: 53 Wire out: 200 m Speed:440 kn\*10  
 Sorted: 107 Kg Total catch: 879.50 CATCH/HOUR: 5863.33

| SPECIES             | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------------|-------------------|---------------------|----------|
| Engraulis capensis  | 2566.67           | 171107              | 43.77    |
| Etrumeus whiteheadi | 1800.00           | 82220               | 30.70    |
| Sardinops ocellata  | 1000.00           | 23667               | 17.06    |
| Thyrssites atun     | 496.67            | 207                 | 8.47     |
| Total               | 5863.34           |                     | 100.00   |

DATE: 5/12/91 PROJECT STATION:1019  
GEAR TYPE: PT No: POSITION:Lat S 1830  
start stop duration Long E 1157  
TIME :20:55:00 21:05:00 10 (min) Purpose code: 1  
LOG :4549.90 4550.40 0.80 Area code : 3  
FDEPTH: 13 15 GearCond.code:  
BDEPTH: 72 82 Validity code:  
Towing dir: 45 Wire out:1004 m Speed: 1 kn\*10  
Sorted: 6 Kg Total catch: 2017.10 CATCH/HOUR: 12102.60

| SPECIES            | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------|------------|---------|-------------|----------|
|                    | weight     | numbers |             |          |
| Trachurus capensis | 12000.00   | 522348  | 99.15       | 560      |
| Thyrsites atun     | 65.40      | 24      | 0.54        |          |
| Engraulis capensis | 37.20      | 2250    | 0.31        |          |
| Todaropsis eblanae | 0.00       | 900     |             |          |
| Total              | 12102.60   |         | 100.00      |          |

DATE: 6/12/91 PROJECT STATION:1025  
GEAR TYPE: PT No:1 POSITION:Lat S 1900  
start stop duration Long E 1203  
TIME :15:14:00 15:29:00 15 (min) Purpose code: 1  
LOG :4692.60 4693.60 0.80 Area code : 3  
FDEPTH: 140 145 GearCond.code:  
BDEPTH: 174 182 Validity code:  
Towing dir: 90 Wire out: 400 m Speed:340 kn\*10  
Sorted: 35 Kg Total catch: 52.79 CATCH/HOUR: 211.16

| SPECIES                   | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------------|------------|---------|-------------|----------|
|                           | weight     | numbers |             |          |
| Trachurus capensis        | 138.40     | 2248    | 65.54       | 565      |
| Brama brama               | 37.20      | 12      | 17.62       |          |
| MYCTOPHIDAE               | 20.00      |         | 9.47        |          |
| Thyrsites atun            | 11.80      | 4       | 5.59        |          |
| Todaropsis eblanae        | 1.40       | 4       | 0.66        |          |
| Lepidopterus caudatus     | 1.28       | 4       | 0.61        |          |
| Trachipterus trachipterus | 1.08       | 4       | 0.51        |          |
| Total                     | 211.16     |         | 100.00      |          |

DATE: 5/12/91 PROJECT STATION:1020  
GEAR TYPE: PT No: POSITION:Lat S 1834  
start stop duration Long E 1201  
TIME :22:21:00 22:45:00 24 (min) Purpose code: 1  
LOG :4558.80 4560.00 1.20 Area code : 3  
FDEPTH: 0 0 GearCond.code:  
BDEPTH: 58 45 Validity code:  
Towing dir: 90 Wire out: 150 m Speed:290 kn\*10  
Sorted: 33 Kg Total catch: 1670.00 CATCH/HOUR: 4175.00

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Sardinops ocellata  | 4100.00    | 58653   | 98.20       | 561      |
| Trachurus capensis  | 52.50      | 6125    | 1.50        |          |
| Engraulis capensis  | 12.50      | 625     | 0.30        |          |
| Etrumeus whiteheadi | 0.00       | 125     |             |          |
| Total               | 4175.00    |         | 100.00      |          |

DATE: 6/12/91 PROJECT STATION:1026  
GEAR TYPE: PT No: POSITION:Lat S 1908  
start stop duration Long E 1232  
TIME :19:05:00 19:20:00 15 (min) Purpose code: 1  
LOG :4728.80 4729.30 0.50 Area code : 3  
FDEPTH: 20 20 GearCond.code:  
BDEPTH: 31 31 Validity code:  
Towing dir: 310 Wire out: 150 m Speed:380 kn\*10  
Sorted: 9 Kg Total catch: 9.10 CATCH/HOUR: 36.40

| SPECIES        | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|----------------|------------|---------|-------------|----------|
|                | weight     | numbers |             |          |
| Thyrsites atun | 36.40      | 12      | 100.00      |          |
| Total          | 36.40      |         | 100.00      |          |

DATE: 6/12/91 PROJECT STATION:1021  
GEAR TYPE: PT No: POSITION:Lat S 1850  
start stop duration Long E 1150  
TIME :03:27:00 03:47:00 20 (min) Purpose code: 1  
LOG :4601.90 4603.10 1.22 Area code : 3  
FDEPTH: 10 10 GearCond.code:  
BDEPTH: 222 227 Validity code:  
Towing dir: 270 Wire out: 150 m Speed:380 kn\*10  
Sorted: 6 Kg Total catch: 6.45 CATCH/HOUR: 19.35

| SPECIES            | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|--------------------|------------|---------|-------------|----------|
|                    | weight     | numbers |             |          |
| Trachurus capensis | 19.35      | 168     | 100.00      | 562      |
| Total              | 19.35      |         | 100.00      |          |

DATE: 6/12/91 PROJECT STATION:1027  
GEAR TYPE: PT No: POSITION:Lat S 1910  
start stop duration Long E 1232  
TIME :20:35:00 20:55:00 20 (min) Purpose code: 1  
LOG :4740.00 4741.00 1.00 Area code : 3  
FDEPTH: 10 10 GearCond.code:  
BDEPTH: 47 37 Validity code:  
Towing dir: 90 Wire out: 100 m Speed:410 kn\*10  
Sorted: 23 Kg Total catch: 116.90 CATCH/HOUR: 350.70

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Trachurus capensis  | 346.50     | 15135   | 98.80       | 566      |
| Engraulis capensis  | 1.95       | 135     | 0.56        |          |
| Merluccius capensis | 1.50       | 15      | 0.43        |          |
| Sardinops ocellata  | 0.75       | 6       | 0.21        |          |
| Etrumeus whiteheadi | 0.00       | 15      |             |          |
| Total               | 350.70     |         | 100.00      |          |

DATE: 6/12/91 PROJECT STATION:1022  
GEAR TYPE: PT No:1 POSITION:Lat S 1856  
start stop duration Long E 1120  
TIME :07:45:00 08:05:00 20 (min) Purpose code: 1  
LOG :4640.00 4641.20 1.20 Area code : 3  
FDEPTH: 150 180 GearCond.code:  
BDEPTH: 532 588 Validity code:  
Towing dir: 180 Wire out: 500 m Speed:400 kn\*10  
Sorted: 1 Kg Total catch: 2.80 CATCH/HOUR: 8.40

| SPECIES     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-------------|------------|---------|-------------|----------|
|             | weight     | numbers |             |          |
| MYCTOPHIDAE | 8.40       | 4044    | 100.00      |          |
| Total       | 8.40       |         | 100.00      |          |

DATE: 7/12/91 PROJECT STATION:1028  
GEAR TYPE: PT No:1 POSITION:Lat S 1913  
start stop duration Long E 1150  
TIME :01:50:00 02:05:00 15 (min) Purpose code: 1  
LOG :4787.00 4788.20 1.25 Area code : 3  
FDEPTH: 9 9 GearCond.code:  
BDEPTH: 296 300 Validity code:  
Towing dir: 180 Wire out: 150 m Speed:500 kn\*10  
Sorted: 6 Kg Total catch: 5.70 CATCH/HOUR: 22.80

| SPECIES     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-------------|------------|---------|-------------|----------|
|             | weight     | numbers |             |          |
| MYCTOPHIDAE | 18.00      |         | 78.95       |          |
| Brama brama | 4.80       | 4       | 21.05       |          |
| Total       | 22.80      |         | 100.00      |          |

DATE: 6/12/91 PROJECT STATION:1023  
GEAR TYPE: PT No:1 POSITION:Lat S 1901  
start stop duration Long E 1129  
TIME :10:30:00 10:45:00 15 (min) Purpose code: 1  
LOG :4657.80 4658.70 0.90 Area code : 3  
FDEPTH: 200 200 GearCond.code:  
BDEPTH: 317 309 Validity code:  
Towing dir: 150 Wire out: 550 m Speed:350 kn\*10  
Sorted: Kg Total catch: 100.00 CATCH/HOUR: 400.00

| SPECIES     | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|-------------|------------|---------|-------------|----------|
|             | weight     | numbers |             |          |
| Diaphus sp. | 400.00     | 95292   | 100.00      |          |
| Total       | 400.00     |         | 100.00      |          |

DATE: 7/12/91 PROJECT STATION:1029  
GEAR TYPE: PT No:1 POSITION:Lat S 1915  
start stop duration Long E 1235  
TIME :08:03:00 08:13:00 10 (min) Purpose code: 1  
LOG :4844.80 4845.30 0.50 Area code : 3  
FDEPTH: 30 30 GearCond.code:  
BDEPTH: 49 52 Validity code:  
Towing dir: 310 Wire out: 150 m Speed:370 kn\*10  
Sorted: 11 Kg Total catch: 1093.00 CATCH/HOUR: 6558.00

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Trachurus capensis  | 6420.00    | 343314  | 97.90       | 567      |
| Engraulis capensis  | 132.00     | 12600   | 2.01        | 568      |
| Etrumeus whiteheadi | 6.00       | 600     | 0.09        |          |
| Total               | 6558.00    |         | 100.00      |          |

DATE: 6/12/91 PROJECT STATION:1024  
GEAR TYPE: BT No:1 POSITION:Lat S 1902  
start stop duration Long E 1140  
TIME :12:14:00 12:34:00 20 (min) Purpose code: 1  
LOG :4668.80 4669.90 1.00 Area code : 3  
FDEPTH: 284 294 GearCond.code:  
BDEPTH: 284 294 Validity code:  
Towing dir: 90 Wire out: 900 m Speed:280 kn\*10  
Sorted: 62 Kg Total catch: 595.55 CATCH/HOUR: 1786.65

| SPECIES                   | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------------|------------|---------|-------------|----------|
|                           | weight     | numbers |             |          |
| Merluccius capensis       | 1185.00    | 1350    | 66.33       | 563      |
| Trachurus capensis        | 375.00     | 1980    | 20.99       | 564      |
| Helicolenus dactylopterus | 72.30      | 2790    | 4.05        |          |
| Lampanyctodes hectoris    | 66.00      | 1770    | 3.69        |          |
| Shrimps, small, non comm. | 45.00      |         | 2.52        |          |
| Chlorophtalmus punctatus  | 14.10      | 540     | 0.79        |          |
| Dentex macrophthalmus     | 13.50      | 30      | 0.76        |          |
| Schedophilus huttoni      | 9.75       | 3       | 0.55        |          |
| Synagrops microlepis      | 6.00       | 270     | 0.34        |          |
| Total                     | 1786.65    |         | 100.00      |          |

DATE: 7/12/91 PROJECT STATION:1030  
GEAR TYPE: BT No:1 POSITION:Lat S 1949  
start stop duration Long E 1253  
TIME :13:13:00 13:26:00 13 (min) Purpose code: 1  
LOG :4889.60 4890.30 0.70 Area code : 3  
FDEPTH: 42 40 GearCond.code:  
BDEPTH: 42 40 Validity code:  
Towing dir: 10 Wire out: 250 m Speed:310 kn\*10  
Sorted: 22 Kg Total catch: 1656.00 CATCH/HOUR: 7643.08

| SPECIES             | CATCH/HOUR |         | % OF TOT. C | SAMP.NO. |
|---------------------|------------|---------|-------------|----------|
|                     | weight     | numbers |             |          |
| Sardinops ocellata  | 3784.62    | 34062   | 49.52       | 569      |
| Trachurus capensis  | 3761.54    | 112048  | 49.21       | 570      |
| Merluccius capensis | 66.92      | 46      | 0.88        |          |
| Engraulis capensis  | 30.00      | 1846    | 0.39        |          |
| Total               | 7643.08    |         | 100.00      |          |

DATE: 7/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 1954 Long E 1257  
 start stop duration  
 TIME :15:34:00 15:49:00 15 (min) Purpose code: 1  
 LOG :4905.20 4905.90 0.70 Area code : 3  
 FDEPTH: 30 31 GearCond.code:  
 BDEPTH: 30 31 Validity code:  
 Towing dir: 320 Wire out: 150 m Speed:280 kn\*10  
 Sorted: 21 Kg Total catch: 511.65 CATCH/HOUR: 2046.60

| SPECIES                   | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------------|----------------|-------------|----------|
|                           | weight numbers |             |          |
| Trachurus capensis        | 1950.00        | 50472       | 95.28    |
| Galeichthys feliceps      | 44.80          | 360         | 2.19     |
| Merluccius capensis       | 27.60          | 600         | 1.35     |
| Argyrosomus hololepidotus | 11.00          | 4           | 0.54     |
| Chelidonichthys capensis  | 9.20           | 16          | 0.45     |
| Austroglossus microlepis  | 4.00           | 120         | 0.20     |
| Total                     | 2046.60        | 100.01      |          |

DATE: 9/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 2053 Long E 1319  
 start stop duration  
 TIME :10:30:00 11:00:00 30 (min) Purpose code: 1  
 LOG :5276.90 5278.60 1.70 Area code : 2  
 FDEPTH: 55 40 GearCond.code:  
 BDEPTH: 74 57 Validity code:  
 Towing dir: 180 Wire out: 200 m Speed:460 kn\*10  
 Sorted: 14 Kg Total catch: 14.00 CATCH/HOUR: 28.00

| SPECIES             | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------|----------------|-------------|----------|
|                     | weight numbers |             |          |
| Thyrates atun       | 26.00          | 10          | 92.86    |
| Trachurus capensis  | 2.00           | 22          | 7.14     |
| Merluccius capensis | 0.00           | 4           |          |
| Total               | 28.00          | 100.00      |          |

DATE: 7/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 1939 Long E 1229  
 start stop duration  
 TIME :19:52:00 20:12:00 20 (min) Purpose code: 1  
 LOG :4943.70 4944.90 1.20 Area code : 3  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 127 129 Validity code:  
 Towing dir: 259 Wire out: 150 m Speed:400 kn\*10  
 Sorted: 11 Kg Total catch: 39.30 CATCH/HOUR: 117.90

| SPECIES                   | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------------|----------------|-------------|----------|
|                           | weight numbers |             |          |
| Trachurus capensis        | 67.20          | 666         | 57.00    |
| Thyrates atun             | 36.90          | 24          | 31.30    |
| Brama brama               | 6.90           | 3           | 5.85     |
| Octopus sp.               | 5.70           | 3           | 4.83     |
| Trachipterus trachipterus | 1.20           | 6           | 1.02     |
| Total                     | 117.90         | 100.00      |          |

DATE: 9/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 2055 Long E 1325  
 start stop duration  
 TIME :12:04:00 12:16:00 12 (min) Purpose code: 1  
 LOG :5285.20 5285.80 0.60 Area code : 2  
 FDEPTH: 23 22 GearCond.code:  
 BDEPTH: 23 22 Validity code:  
 Towing dir: 330 Wire out: 100 m Speed:300 kn\*10  
 Sorted: 30 Kg Total catch: 1518.50 CATCH/HOUR: 7592.50

| SPECIES            | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|--------------------|----------------|-------------|----------|
|                    | weight numbers |             |          |
| Trachurus capensis | 7250.00        | 219765      | 95.49    |
| Sardinops ocellata | 342.50         | 2890        | 4.51     |
| Total              | 7592.50        | 100.00      |          |

DATE: 8/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 2000 Long E 1233  
 start stop duration  
 TIME :08:15:00 08:35:00 20 (min) Purpose code: 1  
 LOG :5054.60 5055.70 1.10 Area code : 3  
 FDEPTH: 138 134 GearCond.code:  
 BDEPTH: 138 134 Validity code:  
 Towing dir: 90 Wire out: 500 m Speed:350 kn\*10  
 Sorted: 27 Kg Total catch: 181.40 CATCH/HOUR: 544.20

| SPECIES               | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|-----------------------|----------------|-------------|----------|
|                       | weight numbers |             |          |
| Merluccius capensis   | 358.20         | 1404        | 65.82    |
| Trachurus capensis    | 85.20          | 402         | 15.66    |
| Dentex macropthalmus  | 66.60          | 342         | 12.24    |
| Pterothrissus belloci | 25.20          | 324         | 4.63     |
| Squalus megalops      | 3.60           | 18          | 0.66     |
| Trichurus sp.         | 3.60           | 36          | 0.66     |
| Pteroscion pelli      | 1.80           | 90          | 0.33     |
| Total                 | 544.20         | 100.00      |          |

DATE: 9/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 2106 Long E 1330  
 start stop duration  
 TIME :14:11:00 14:26:00 15 (min) Purpose code: 1  
 LOG :5301.80 5302.60 0.80 Area code : 2  
 FDEPTH: 33 28 GearCond.code:  
 BDEPTH: 33 28 Validity code:  
 Towing dir: 15 Wire out: 150 m Speed:320 kn\*10  
 Sorted: 37 Kg Total catch: 1043.50 CATCH/HOUR: 4174.00

| SPECIES                  | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|--------------------------|----------------|-------------|----------|
|                          | weight numbers |             |          |
| Trachurus capensis       | 4144.00        | 56920       | 99.28    |
| Thyrates atun            | 28.80          | 8           | 0.69     |
| Chelidonichthys capensis | 1.20           | 4           | 0.03     |
| Total                    | 4174.00        | 100.00      |          |

DATE: 8/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 2002 Long E 1300  
 start stop duration  
 TIME :13:37:00 13:49:00 12 (min) Purpose code: 1  
 LOG :5087.70 5088.20 0.50 Area code : 2  
 FDEPTH: 34 33 GearCond.code:  
 BDEPTH: 34 33 Validity code:  
 Towing dir: 360 Wire out: 150 m Speed:300 kn\*10  
 Sorted: 26 Kg Total catch: 203.57 CATCH/HOUR: 1017.85

| SPECIES                   | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------------|----------------|-------------|----------|
|                           | weight numbers |             |          |
| Trachurus capensis        | 847.00         | 16325       | 83.21    |
| Chelidonichthys capensis  | 51.80          | 70          | 5.09     |
| Argyrosomus hololepidotus | 31.50          | 10          | 5.06     |
| Merluccius capensis       | 31.50          | 140         | 3.09     |
| Austroglossus microlepis  | 25.20          | 350         | 2.48     |
| Callorhynchus capensis    | 10.85          | 5           | 1.07     |
| Total                     | 1017.85        | 100.00      |          |

DATE: 9/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2101 Long E 1253  
 start stop duration  
 TIME :19:16:00 19:31:00 15 (min) Purpose code: 1  
 LOG :5345.10 5346.10 1.00 Area code : 2  
 FDEPTH: 50 105 GearCond.code:  
 BDEPTH: 266 270 Validity code:  
 Towing dir: 180 Wire out: 200 m Speed:340 kn\*10  
 Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES       | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------|----------------|-------------|----------|
| N O C A T C H | weight numbers |             |          |
| Total         | 0.00           |             |          |

DATE: 8/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2029 Long E 1308  
 start stop duration  
 TIME :19:10:00 19:20:00 10 (min) Purpose code: 1  
 LOG :5138.90 5139.50 0.60 Area code : 2  
 FDEPTH: 65 65 GearCond.code:  
 BDEPTH: 85 84 Validity code:  
 Towing dir: 156 Wire out: 250 m Speed:310 kn\*10  
 Sorted: 11 Kg Total catch: 111.00 CATCH/HOUR: 666.00

| SPECIES            | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|--------------------|----------------|-------------|----------|
|                    | weight numbers |             |          |
| Trachurus capensis | 666.00         | 7200        | 100.00   |
| Total              | 666.00         | 100.00      |          |

DATE:10/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2116 Long E 1333  
 start stop duration  
 TIME :04:08:00 04:28:00 20 (min) Purpose code: 1  
 LOG :5423.60 5424.80 1.20 Area code : 2  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 63 51 Validity code:  
 Towing dir: 40 Wire out: 100 m Speed:356 kn\*10  
 Sorted: 25 Kg Total catch: 66.56 CATCH/HOUR: 199.68

| SPECIES                   | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|---------------------------|----------------|-------------|----------|
|                           | weight numbers |             |          |
| Sufflogobius bibarbatatus | 140.40         | 41316       | 70.31    |
| Thyrates atun             | 56.40          | 15          | 28.25    |
| Trachurus capensis        | 1.68           | 192         | 0.84     |
| Etrurus whiteheadi        | 1.20           | 72          | 0.60     |
| Total                     | 199.68         | 100.00      |          |

DATE: 8/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2020 Long E 1305  
 start stop duration  
 TIME :20:55:00 21:10:00 15 (min) Purpose code: 1  
 LOG :5150.10 5150.90 0.80 Area code : 2  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 82 79 Validity code:  
 Towing dir: 357 Wire out: 150 m Speed:350 kn\*10  
 Sorted: 3 Kg Total catch: 2.60 CATCH/HOUR: 10.40

| SPECIES            | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|--------------------|----------------|-------------|----------|
|                    | weight numbers |             |          |
| Trachurus capensis | 10.40          | 104         | 100.00   |
| Total              | 10.40          | 100.00      |          |

DATE:10/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2125 Long E 1338  
 start stop duration  
 TIME :05:24:00 05:47:00 23 (min) Purpose code: 1  
 LOG :5430.20 5431.40 1.20 Area code : 2  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 16 22 Validity code:  
 Towing dir: 150 Wire out: 100 m Speed:420 kn\*10  
 Sorted: 31 Kg Total catch: 93.00 CATCH/HOUR: 242.61

| SPECIES              | CATCH/HOUR     | % OF TOT. C | SAMP.NO. |
|----------------------|----------------|-------------|----------|
|                      | weight numbers |             |          |
| Trachurus capensis   | 212.87         | 9023        | 87.74    |
| Engraulis capensis   | 14.87          | 736         | 6.13     |
| Sardinops ocellata   | 11.74          | 250         | 4.84     |
| Galeichthys feliceps | 3.13           | 8           | 1.29     |
| Total                | 242.61         | 100.00      |          |



DATE:10/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2140 PROJECT STATION:1043  
 start stop duration Longitude E 1335  
 TIME :13:42:00 13:47:00 5 (min) Purpose code: 1  
 LOG :5504.20 5504.50 0.30 Area code : 2  
 FDEPTH: 20 20 GearCond.code: 3  
 BDEPTH: 105 105 Validity code: 9  
 Towing dir: 90 Wire out: 150 m Speed:350 kn\*10

Sorted: 4 Kg Total catch: 4.40 CATCH/HOUR: 52.80

| SPECIES         | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|-----------------|-------------------|---------------------|----------|
| Thyrssites atun | 52.80             | 12                  | 100.00   |
| Total           | 52.80             | 100.00              |          |

DATE:10/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2139 PROJECT STATION:1044  
 start stop duration Longitude E 1335  
 TIME :14:52:00 15:10:00 18 (min) Purpose code: 1  
 LOG :5511.20 5512.50 1.30 Area code : 2  
 FDEPTH: 40 25 GearCond.code: 3  
 BDEPTH: 103 98 Validity code: 9  
 Towing dir: 90 Wire out: 150 m Speed:400 kn\*10

Sorted: 4 Kg Total catch: 4.25 CATCH/HOUR: 14.17

| SPECIES         | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|-----------------|-------------------|---------------------|----------|
| Thyrssites atun | 14.17             | 3                   | 100.00   |
| Total           | 14.17             | 100.00              |          |

DATE:10/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2139 PROJECT STATION:1045  
 start stop duration Longitude E 1328  
 TIME :16:34:00 16:49:00 15 (min) Purpose code: 1  
 LOG :5522.00 5522.90 0.90 Area code : 2  
 FDEPTH: 40 40 GearCond.code: 2  
 BDEPTH: 117 120 Validity code: 9  
 Towing dir: 280 Wire out: 200 m Speed:360 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES       | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------|-------------------|---------------------|----------|
| N O C A T C H | 0.00              |                     |          |
| Total         |                   |                     |          |

DATE:10/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2132 PROJECT STATION:1046  
 start stop duration Longitude E 1334  
 TIME :19:30:00 19:48:00 18 (min) Purpose code: 1  
 LOG :5544.00 5545.20 1.20 Area code : 2  
 FDEPTH: 0 0 GearCond.code: 2  
 BDEPTH: 99 97 Validity code: 9  
 Towing dir: 360 Wire out: 150 m Speed:450 kn\*10

Sorted: 30 Kg Total catch: 3010.00 CATCH/HOUR: 10033.33

| SPECIES            | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO.  |
|--------------------|-------------------|---------------------|-----------|
| Sardinops ocellata | 9833.33           | 81943               | 98.01 582 |
| Trachurus capensis | 200.00            | 2000                | 1.99      |
| Total              | 10033.33          | 100.00              |           |

DATE:10/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2139 PROJECT STATION:1047  
 start stop duration Longitude E 13354  
 TIME :21:42:00 21:57:00 15 (min) Purpose code: 1  
 LOG :5557.10 5558.20 1.10 Area code : 2  
 FDEPTH: 0 0 GearCond.code: 2  
 BDEPTH: 102 104 Validity code: 9  
 Towing dir: 360 Wire out: 150 m Speed:400 kn\*10

Sorted: 30 Kg Total catch: 2993.00 CATCH/HOUR: 11972.00

| SPECIES             | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO.  |
|---------------------|-------------------|---------------------|-----------|
| Sardinops ocellata  | 11800.00          | 93276               | 98.56 583 |
| Merluccius capensis | 120.00            | 800                 | 1.00      |
| Trachurus capensis  | 52.00             | 800                 | 0.43      |
| Engraulis capensis  | 0.00              | 400                 |           |
| Total               | 11972.00          | 99.99               |           |

DATE:11/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 2149 PROJECT STATION:1048  
 start stop duration Longitude E 1344  
 TIME :01:03:00 01:04:00 1 (min) Purpose code: 1  
 LOG :5577.40 5577.40 Area code : 2  
 FDEPTH: 91 91 GearCond.code: 9  
 BDEPTH: 91 91 Validity code: 9  
 Towing dir: 330 Wire out: 350 m Speed: kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES       | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|---------------|-------------------|---------------------|----------|
| N O C A T C H | 0.00              |                     |          |
| Total         |                   |                     |          |

DATE:11/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2123 PROJECT STATION:1049  
 start stop duration Longitude E 1320  
 TIME :22:48:00 23:00:00 12 (min) Purpose code: 1  
 LOG :5798.40 5799.10 0.70 Area code : 2  
 FDEPTH: 10 10 GearCond.code: 2  
 BDEPTH: 116 116 Validity code: 9  
 Towing dir: 155 Wire out: 150 m Speed:400 kn\*10

Sorted: 22 Kg Total catch: 215.00 CATCH/HOUR: 1075.00

| SPECIES             | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO.  |
|---------------------|-------------------|---------------------|-----------|
| Trachurus capensis  | 785.00            | 6585                | 73.02 584 |
| Merluccius capensis | 160.00            | 2250                | 14.88     |
| Thyrssites atun     | 90.00             | 50                  | 8.37      |
| Sardinops ocellata  | 40.00             | 350                 | 3.72 585  |
| Total               | 1075.00           | 99.99               |           |

DATE:12/12/91 GEAR TYPE: BT No:1 POSITION:Lat S 2220 PROJECT STATION:1050  
 start stop duration Longitude E 1354  
 TIME :11:55:00 12:05:00 10 (min) Purpose code: 1  
 LOG :5925.10 5925.50 0.40 Area code : 2  
 FDEPTH: 108 108 GearCond.code: 2  
 BDEPTH: 108 108 Validity code: 9  
 Towing dir: 90 Wire out: 350 m Speed:290 kn\*10

Sorted: 18 Kg Total catch: 91.50 CATCH/HOUR: 549.00

| SPECIES                  | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO.  |
|--------------------------|-------------------|---------------------|-----------|
| Merluccius capensis      | 543.00            | 6054                | 98.91 586 |
| Trachurus capensis       | 4.50              | 30                  | 0.82      |
| Sufflogobius bibarbatius | 1.50              | 180                 | 0.27      |
| Total                    | 549.00            | 100.00              |           |

DATE:12/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2224 PROJECT STATION:1051  
 start stop duration Longitude E 1330  
 TIME :15:20:00 15:35:00 15 (min) Purpose code: 1  
 LOG :5954.60 5955.60 1.00 Area code : 2  
 FDEPTH: 80 70 GearCond.code: 2  
 BDEPTH: 161 163 Validity code: 9  
 Towing dir: 180 Wire out: 250 m Speed:360 kn\*10

Sorted: 4 Kg Total catch: 4.40 CATCH/HOUR: 17.60

| SPECIES     | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|-------------|-------------------|---------------------|----------|
| Brama brama | 13.60             | 8                   | 77.27    |
| MYCTOPHIDAE | 4.00              |                     | 22.73    |
| Total       | 17.60             | 100.00              |          |

DATE:13/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2400 PROJECT STATION:1052  
 start stop duration Longitude E 1422  
 TIME :08:56:00 09:10:00 14 (min) Purpose code: 1  
 LOG :6128.50 6129.40 0.90 Area code : 2  
 FDEPTH: 25 25 GearCond.code: 2  
 BDEPTH: 75 77 Validity code: 9  
 Towing dir: 225 Wire out: 150 m Speed:440 kn\*10

Sorted: 45 Kg Total catch: 449.00 CATCH/HOUR: 1924.29

| SPECIES                  | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO.   |
|--------------------------|-------------------|---------------------|------------|
| Thyrssites atun          | 1924.29           | 986                 | 100.00 587 |
| Merluccius capensis      | 0.00              |                     |            |
| Sufflogobius bibarbatius | 0.00              |                     |            |
| Total                    | 1924.29           | 100.00              |            |

DATE:13/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2508 PROJECT STATION:1053  
 start stop duration Longitude E 1447  
 TIME :21:37:00 21:47:00 10 (min) Purpose code: 1  
 LOG :6253.70 6254.40 0.70 Area code : 1  
 FDEPTH: 0 0 GearCond.code: 1  
 BDEPTH: 39 39 Validity code: 9  
 Towing dir: 243 Wire out: 150 m Speed:450 kn\*10

Sorted: 18 Kg Total catch: 35.20 CATCH/HOUR: 211.20

| SPECIES                  | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO.  |
|--------------------------|-------------------|---------------------|-----------|
| Sardinops ocellata       | 151.20            | 1272                | 71.59 588 |
| Thyrssites atun          | 42.00             | 12                  | 19.89     |
| Chelidonichthys capensis | 18.00             | 84                  | 8.52      |
| Engraulis capensis       | 0.00              | 12                  |           |
| Trachurus capensis       | 0.00              | 12                  |           |
| Total                    | 211.20            | 100.00              |           |

DATE:13/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2515 PROJECT STATION:1054  
 start stop duration Longitude E 1448  
 TIME :23:24:00 23:34:00 10 (min) Purpose code: 1  
 LOG :6266.00 6266.60 0.60 Area code : 1  
 FDEPTH: 0 0 GearCond.code: 1  
 BDEPTH: 22 19 Validity code: 9  
 Towing dir: 66 Wire out: 150 m Speed:310 kn\*10

Sorted: Kg Total catch: CATCH/HOUR:

| SPECIES            | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO. |
|--------------------|-------------------|---------------------|----------|
| Trachurus capensis | 0.00              | 6                   |          |
| Engraulis capensis | 0.00              | 12                  |          |
| Total              |                   |                     |          |

DATE:14/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2525 PROJECT STATION:1055  
 start stop duration Longitude E 1447  
 TIME :01:44:00 02:04:00 20 (min) Purpose code: 1  
 LOG :6285.90 6287.40 1.50 Area code : 1  
 FDEPTH: 0 0 GearCond.code: 1  
 BDEPTH: 37 50 Validity code: 9  
 Towing dir: 211 Wire out: 100 m Speed:450 kn\*10

Sorted: 32 Kg Total catch: 32.25 CATCH/HOUR: 96.75

| SPECIES                        | CATCH/HOUR weight | % OF TOT. C numbers | SAMP.NO.  |
|--------------------------------|-------------------|---------------------|-----------|
| Thyrssites atun                | 64.80             | 216                 | 66.98 589 |
| Small squids                   | 14.82             | 4245                | 15.32     |
| Chelidonichthys capensis       | 5.46              | 27                  | 5.64      |
| Callorhynchus capensis         | 4.68              | 3                   | 4.84      |
| Trachurus capensis             | 4.35              | 399                 | 4.50 590  |
| Engraulis capensis             | 1.32              | 120                 | 1.36      |
| Merluccius capensis, juveniles | 1.08              | 54                  | 1.12      |
| Sufflogobius bibarbatius       | 0.24              | 3                   | 0.25      |
| Total                          | 96.75             | 100.00              |           |

PROJECT STATION:1056  
 DATE:14/12/91 GEAR TYPE: PT No:3 POSITION:Lat S 2535  
 Long E 1450  
 start stop duration  
 TIME :03:53:00 04:13:00 20 (min) Purpose code: 1  
 LOG :6302.50 6303.90 1.40 Area code : 1  
 FDEPTH: 0 0 GearCond.code:  
 BDEPTH: 32 28 Validity code:  
 Towing dir: 23 Wire out: 10 m Speed: 42 kn\*10  
 Sorted: 29 Kg Total catch: 115.56 CATCH/HOUR: 346.68

| SPECIES                  | CATCH/HOUR    |         | % OF TOT. C  | SAMP.NO. |
|--------------------------|---------------|---------|--------------|----------|
|                          | weight        | numbers |              |          |
| Thyrsites atun           | 330.00        | 1152    | 95.19        | 591      |
| Trachurus capensis       | 7.80          | 2520    | 2.25         |          |
| Chelidonichthys capensis | 6.00          | 24      | 1.73         |          |
| Small squids             | 2.64          | 648     | 0.76         |          |
| Sufflogobius bibarbatu   | 0.12          | 12      | 0.03         |          |
| Engraulis capensis       | 0.12          | 12      | 0.03         |          |
| <b>Total</b>             | <b>346.68</b> |         | <b>99.99</b> |          |

PROJECT STATION:1057  
 DATE:14/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2509  
 Long E 1444  
 start stop duration  
 TIME :13:26:00 13:38:00 12 (min) Purpose code: 1  
 LOG :6386.70 6387.50 0.80 Area code : 1  
 FDEPTH: 20 27 GearCond.code:  
 BDEPTH: 51 49 Validity code:  
 Towing dir: 22 Wire out: 100 m Speed:400 kn\*10  
 Sorted: 34 Kg Total catch: 172.45 CATCH/HOUR: 862.25

| SPECIES                  | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|--------------------------|---------------|---------|---------------|----------|
|                          | weight        | numbers |               |          |
| Thyrsites atun           | 438.75        | 250     | 50.88         |          |
| Chelidonichthys capensis | 392.50        | 1825    | 45.52         | 592      |
| Trachurus capensis       | 31.00         | 675     | 3.60          | 593      |
| <b>Total</b>             | <b>862.25</b> |         | <b>100.00</b> |          |

PROJECT STATION:1058  
 DATE:14/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2456  
 Long E 1445  
 start stop duration  
 TIME :21:23:00 21:43:00 20 (min) Purpose code: 1  
 LOG :6465.90 6467.50 1.60 Area code : 2  
 FDEPTH: 5 5 GearCond.code:  
 BDEPTH: 41 44 Validity code:  
 Towing dir: 324 Wire out: 150 m Speed:441 kn\*10  
 Sorted: 5 Kg Total catch: 14.80 CATCH/HOUR: 44.40

| SPECIES                  | CATCH/HOUR   |         | % OF TOT. C   | SAMP.NO. |
|--------------------------|--------------|---------|---------------|----------|
|                          | weight       | numbers |               |          |
| Thyrsites atun           | 32.10        | 9       | 72.30         |          |
| Sardinops ocellata       | 6.60         | 78      | 14.86         | 594      |
| Chelidonichthys capensis | 5.70         | 30      | 12.84         |          |
| Engraulis capensis       | 0.00         | 6       |               |          |
| Trachurus capensis       | 0.00         | 24      |               |          |
| Merluccius capensis      | 0.00         | 15      |               |          |
| <b>Total</b>             | <b>44.40</b> |         | <b>100.00</b> |          |

PROJECT STATION:1059  
 DATE:14/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2500  
 Long E 1446  
 start stop duration  
 TIME :23:24:00 23:54:00 30 (min) Purpose code: 1  
 LOG :6478.50 6480.90 2.40 Area code : 2  
 FDEPTH: 10 10 GearCond.code:  
 BDEPTH: 40 31 Validity code:  
 Towing dir: 360 Wire out: 100 m Speed:500 kn\*10  
 Sorted: 35 Kg Total catch: 310.68 CATCH/HOUR: 621.36

| SPECIES                  | CATCH/HOUR    |         | % OF TOT. C   | SAMP.NO. |
|--------------------------|---------------|---------|---------------|----------|
|                          | weight        | numbers |               |          |
| Sardinops ocellata       | 617.40        | 5708    | 99.36         | 595      |
| Chelidonichthys capensis | 3.96          | 18      | 0.64          |          |
| <b>Total</b>             | <b>621.36</b> |         | <b>100.00</b> |          |

PROJECT STATION:1060  
 DATE:15/12/91 GEAR TYPE: PT No:1 POSITION:Lat S 2420  
 Long E 1414  
 start stop duration  
 TIME :09:00:00 09:05:00 5 (min) Purpose code: 1  
 LOG :6574.00 6574.30 0.30 Area code : 2  
 FDEPTH: 50 50 GearCond.code:  
 BDEPTH: 117 116 Validity code:  
 Towing dir: 270 Wire out: 200 m Speed:300 kn\*10  
 Sorted: Kg Total catch: 1000.00 CATCH/HOUR: 12000.00

| SPECIES      | CATCH/HOUR      |         | % OF TOT. C   | SAMP.NO. |
|--------------|-----------------|---------|---------------|----------|
|              | weight          | numbers |               |          |
| Diaphus sp.  | 12000.00        | 4800000 | 100.00        |          |
| <b>Total</b> | <b>12000.00</b> |         | <b>100.00</b> |          |



