

**SURVEY OF THE PELAGIC FISH RESOURCES
OFF NORTH WEST AFRICA**

Cruise Report No 11/98

Part III MOROCCO

18 November - 19 December 1998

CRUISE REPORT "DR FRIDTJOF NANSEN"

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**Part III MOROCCO
18 November-19 December 1998**

by

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Bergen, 1998**

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CHAPTER 1 INTRODUCTION

1.1 SURVEY OBJECTIVES

A meeting organised by FAO and IMR in Bergen with delegates from Gambia, Mauritania, Morocco, Senegal, Russia and Norway was set in October 1998 to review the findings of the surveys in the 90ies. During this meeting there was also a session to plan the forthcoming surveys with "Dr. Fridtjof Nansen". There the following objectives were decided:

The general objectives were to estimate the biomass and map the distribution of small pelagic fish stocks off NW Africa (Morocco, Mauritania, Senegal, and The Gambia) by hydro-acoustic methods and describe the hydrographic conditions over a period of 52 days, in November-December 1998. Similar surveys in the region had been conducted annually in the same season in the period 1995-97.

The specific objectives for the survey in Morocco were:

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

The time allocated for this part of the survey was 29 days.

1.2 PARTICIPATION

Members of the scientific teams were:

Institut National de Recherches Halieutiques, Morocco:

Mostafa CHBANI IDRISSE, Hamid CHFIRI, Ahmed MARHOUM and Lahcen ABOUABDELLAH

Institute of Marine Research, Norway:

Reidar TORESEN (19.11-3-12, Cruise Leader), Tore STRØMME (3.12-19.12, Cruise leader), Marek OSTROWSKY, Oddgeir ALVHEIM, Tore MØRK, Reidar JOHANNESSEN.

1.3 NARRATIVE

The survey started with departure from Nouakchott on November 21, steaming north to Cape Blanc. The work started with a hydrographic section off Cape Blanc and continued northwards with an acoustic sampling grid with a transect distance 10 NM apart, covering the shelf and slope down until about 500 m bottom depth. Very high concentrations of sardine were found in a limited area in shallow waters between 24 and 25° N. This area was resurveyed in a dense zig-zag pattern in order to more accurately delineate the resources. Hydrographic sections were carried out off Dakhla and Cape Bojador. The vessel called on Las Palmas on November 3-5 for refuelling and technical service, whereafter the sampling grid was continued. Between Cape Juby and Cape Dra the sampling of the outer shelf was reduced to 20 NM. Hydrographic sections were sampled off Cape Juby, Cape Dra and Cape Ghir. The vessel called on Casablanca on 15-16 December for disembarkment of the Moroccan research team and a presentation of the preliminary survey results. The vessel thereafter steamed to Las Palmas with arrival 19 December. The weather gave favourable working conditions for the whole survey period.

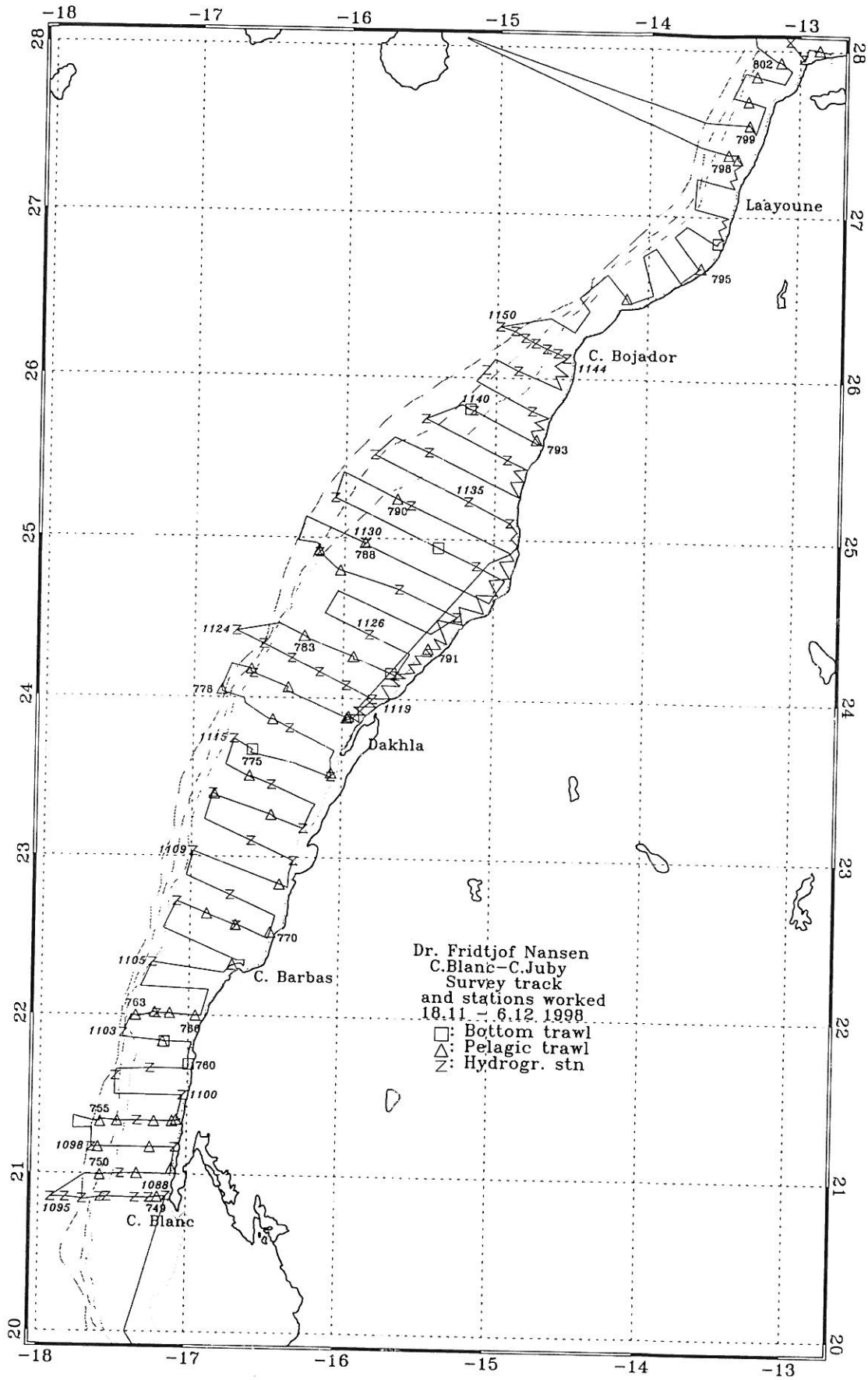


Figure 1a Course track with fishing and hydrographic stations, Cape Blanc to Cape Juby.

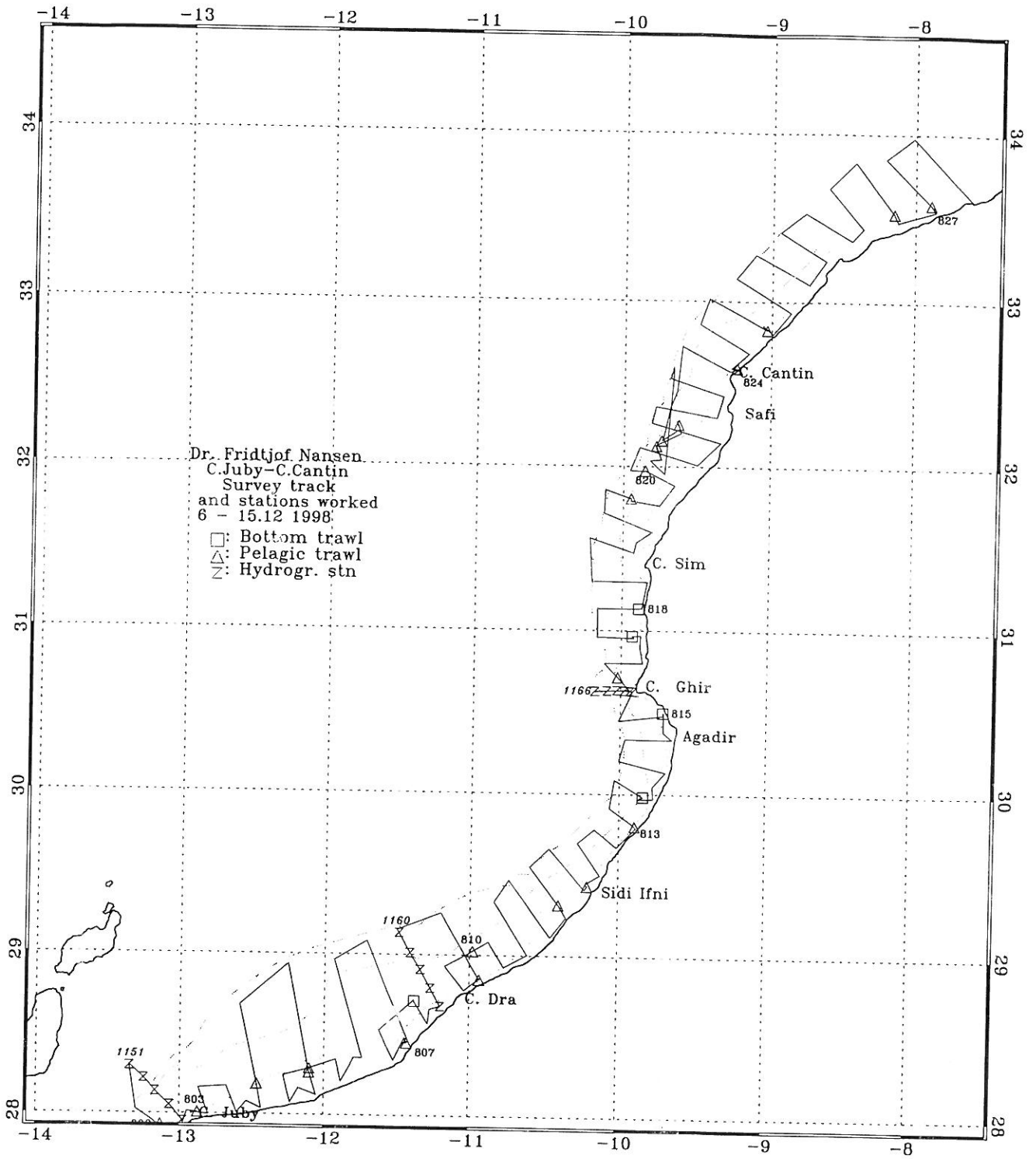


Figure 1b Course track with fishing and hydrographic stations, Cape Juby to Casablanca.

1.4 METHODS

All catches were sampled for weight and numbers of each species. Length measurements (total body length) were taken for target species. The complete records of all fishing stations are shown in Annex II.

The surface temperature and meteorological data were logged automatically and recorded with position and bottom depth every nautical mile sailed.

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

The acoustic biomass estimates were based on the integration technique. The Bergen Integrator (BEI) was used for analysis and allocation of s_A -values by species based on the composition in the trawl catches and on the characteristics of the acoustic traces. The BEI system allows a better discrimination between bottom signals and dense schools close to the bottom than the previous EK500 system used in the surveys prior to 1995.

The integrator values are plotted out in working maps and aggregations of fish are contoured, the mean integrator value of each aggregation is calculated and the areas are digitized and measured by computer software.

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

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

This is the same equation as used in previous surveys.

The biomass density in numbers/NM² of a length group i is calculated from the formula:

$$\rho_i = \frac{l}{4\pi} * \bar{s}_a \frac{n_i}{\sum_{i=\min}^{\max} n_i k_i} \text{ where } k_i = 10^{2 \log l_i - 7.2}$$

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

$$\rho_i = 1261217 * \bar{s}_a \frac{n_i}{\sum_{i=\min}^{\max} n_i l_i^2}$$

where \bar{s}_a = mean integrator value of a species within an aggregation area, in m^2/NM^2
 n_i = frequency count of length group i in a pooled representative sample from the distribution area.

l_i = mid length of fish in length group i .

The constant 1261217 incorporates the offset constant -72 in TS equation. For other TS relationships the equation constant is:

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

The densities are then converted from numbers to weight by applying a condition factor for the species, obtained from the samples. The length-weight relationship used is: $w = \frac{c}{100}l^3$

The specific condition factors applied for this survey were: 0.82 for sardine, for 0.84 sardinellas and horse mackerel and 0.54 for anchovies. Abundance, in number and weight, is obtained by multiplying the densities by the area of the aggregations. These calculations can easily be carried out in a spreadsheet where inputs are the length distribution, the mean integrator value and the area (in NM²).

The above equation shows that the conversion from s_A -value into number of fish is dependant on the size composition of the fish. In general there are many problems associated with getting representative length distributions when the various size classes are geographically segregated. When no segregation occurs the various length distributions are pooled together with equal importance. Otherwise, when the size distribution varies with the sampling site, a weighting factor is applied that takes into account the density at the location. In most cases, the mean acoustic density at the location of the sample is the most representative index of this fish density.

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

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

- Biomass is calculated as the product of the density and the area of the aggregation, and finally the area-related biomass values in a region are summed together.

The necessary calculations are done in NAN-SIS software or spreadsheets after the scientist has completed the two first steps in the above list manually.

The two sardinellas were treated as one species during the scrutinizing process and the mean s_A values were later separated by species (*S. aurita* and *S. maderensis*) according to the catch rates and the length distributions of the two species. The same procedure was applied to the horse mackerel data.

Annex III gives a description of the instruments and the fishing gear used.

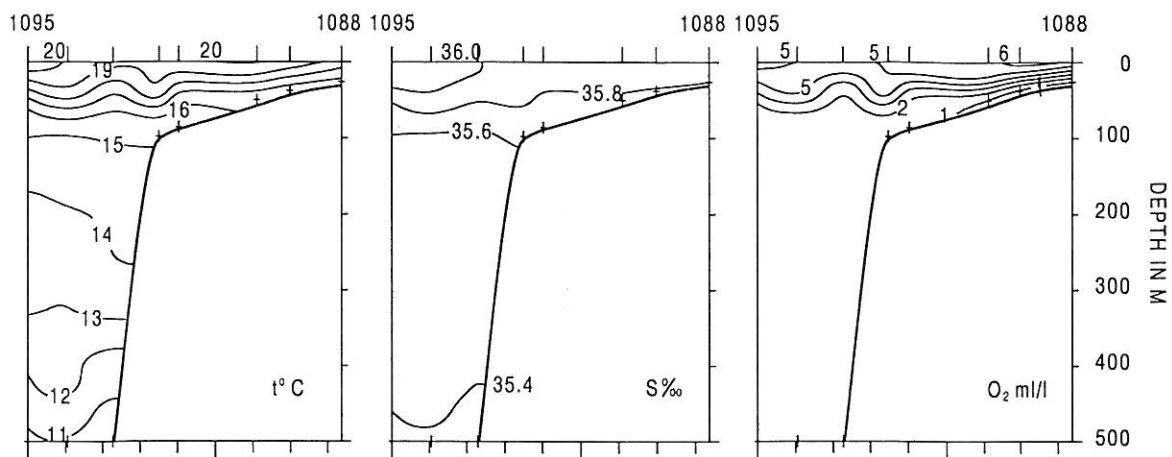
CHAPTER 2 SURVEY RESULTS

2.1 HYDROGRAPHY AND WEATHER CONDITIONS

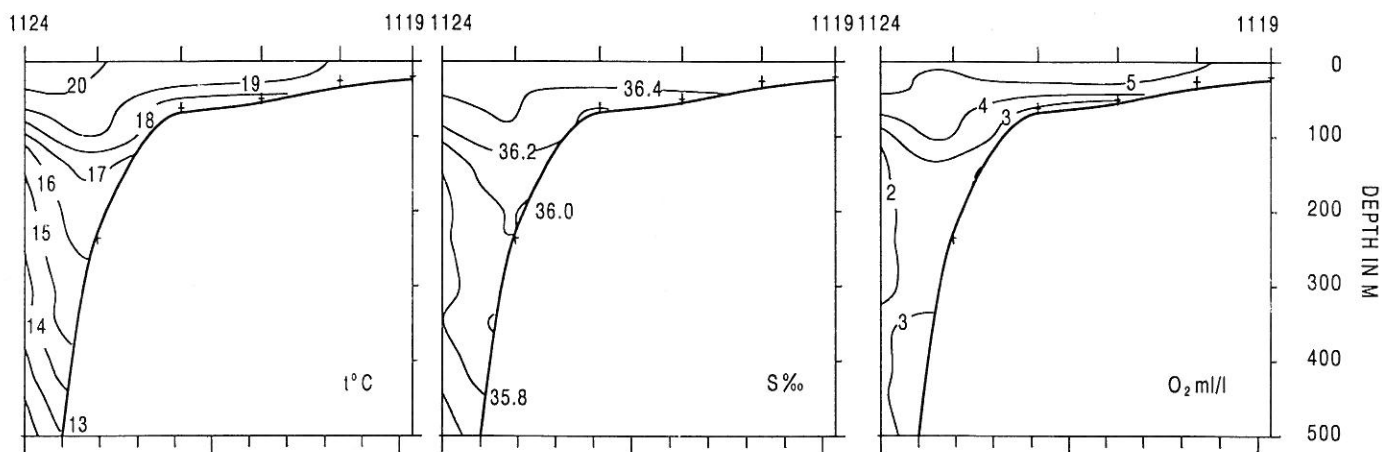
Figure 2 shows the distribution of temperature, salinity and oxygen in the six sections and Figure 3 (a-b) the sea surface temperature at 5 m depth. The distribution of surface temperature shows well developed coastal upwelling along the coast. In the area between Cape Blanc and Cape Bojador there are strong upwelling cells located between Cape Blanc and Cape Barbas and north of Dakhla. Based on the visual impression from the surface plots the upwelling in 1998 could be somewhat weaker than in 1997 when temperatures below 16°C were observed in the cells, but this requires analysis before conclusions can be drawn. For the region between Cape Juby and Safi there is close similarity with the situation in earlier years. Upwelling cells are located off Cape Sim and off Agadir. There are no signs of oxygen depletion in the water over the shelf except for the section off Cape Blanc where water containing oxygen less than 1 ml/L is found over the bottom. This is probably a local phenomenon.

The wind conditions along the survey track are shown in Figure 4 (a-b). For the first part of the survey, between Cape Blanc and Cape Juby, the winds were generally fairly stable around 20 knots and coming from the north-east. Further north the winds were more variable with short periods of relative calm around Cape Ghir and north of Cape Cantin.

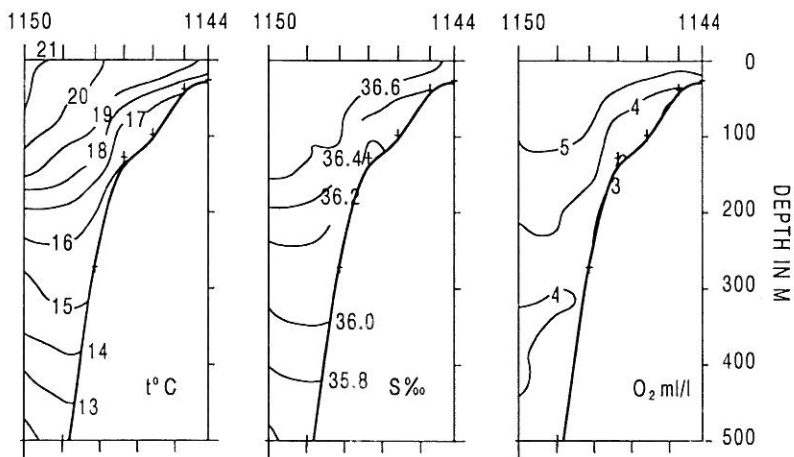
Successful acoustic surveying of sardine requires some wind as during complete calm the fish usually form surface schools, not detectable by the hull mounted transducers. In the areas of sardine aggregations the wind conditions were favourable for acoustic detection.



CAPE BLANC 10 - 20.11 1998

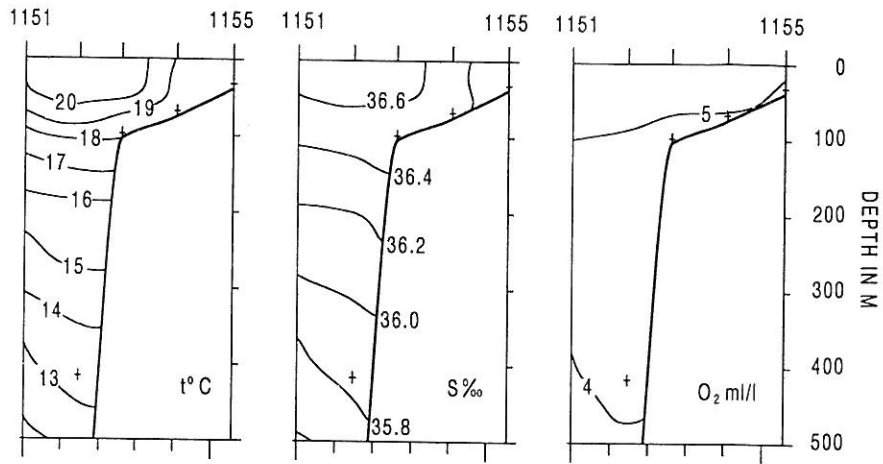


DAKHLA 25.11 1998

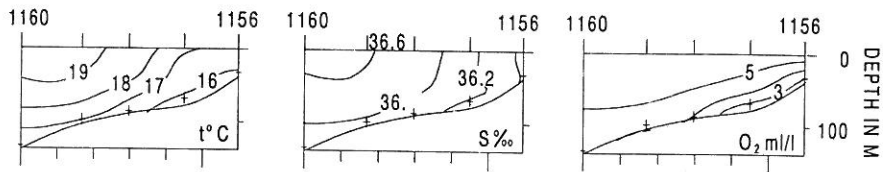


CAPE BOJADOR 1.12.1998

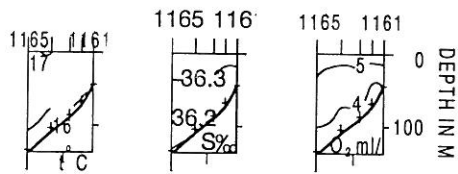
Figure 2 Hydrographic profiles with distribution of temperature, salinity and oxygen.



CAPE JUBY 6.12 1998



CAPE DRA 8.12 1998



CAPE GHIR 10.12 1998

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

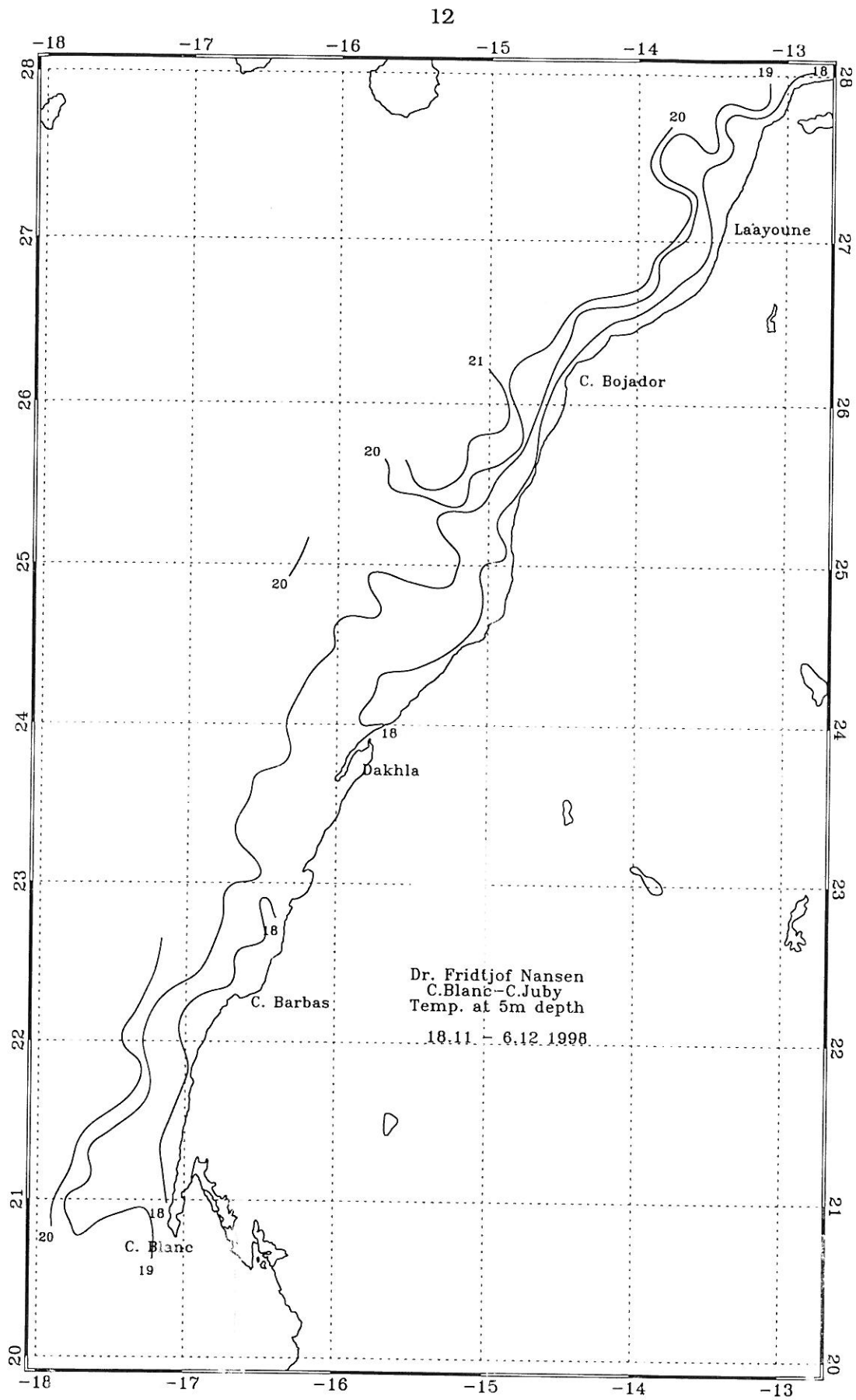


Figure 3a Sea surface temperature, Cape Blanc to Cape Juby.

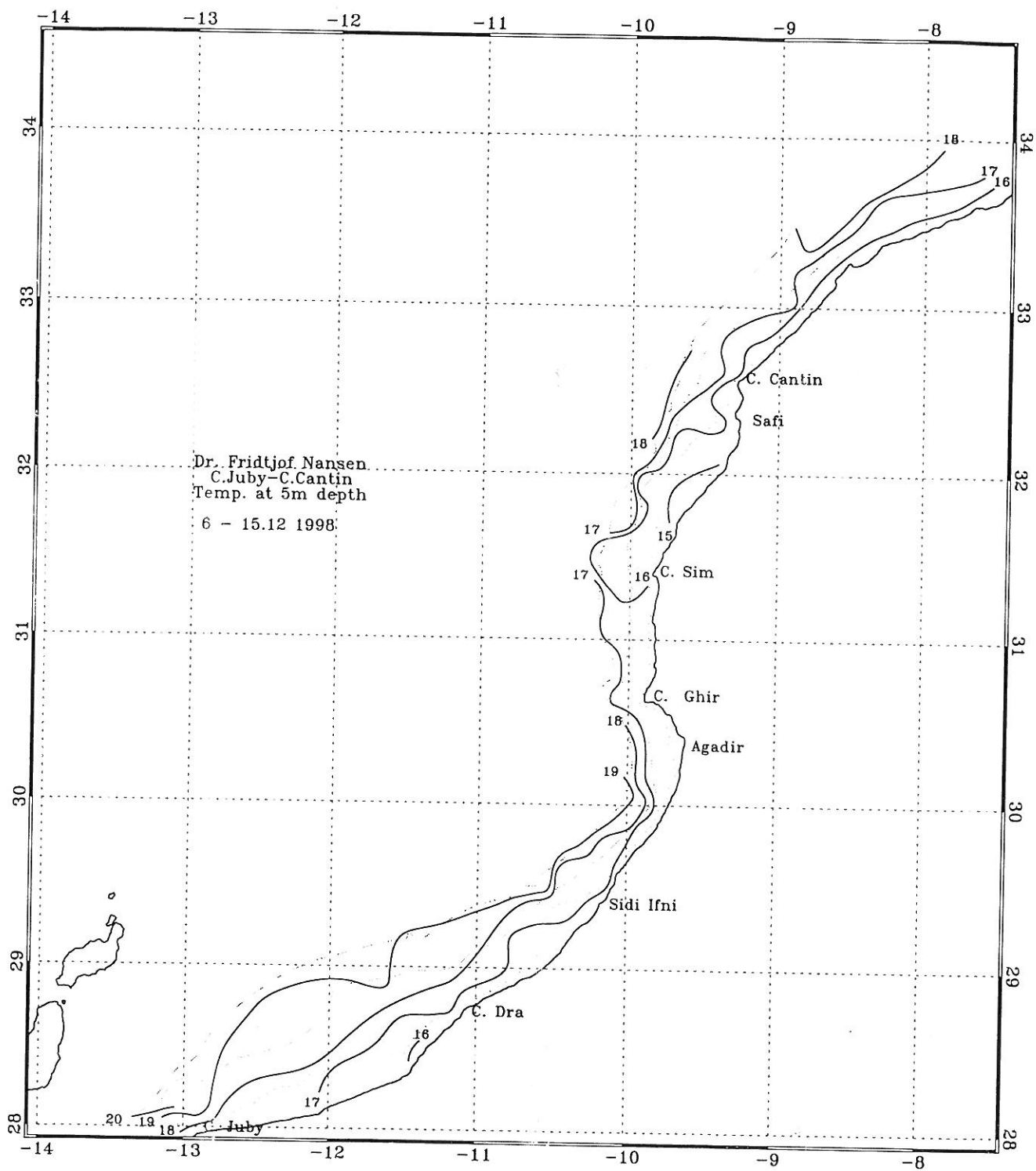


Figure 3b Sea surface temperature, Cape Juby to Cape Cantin.

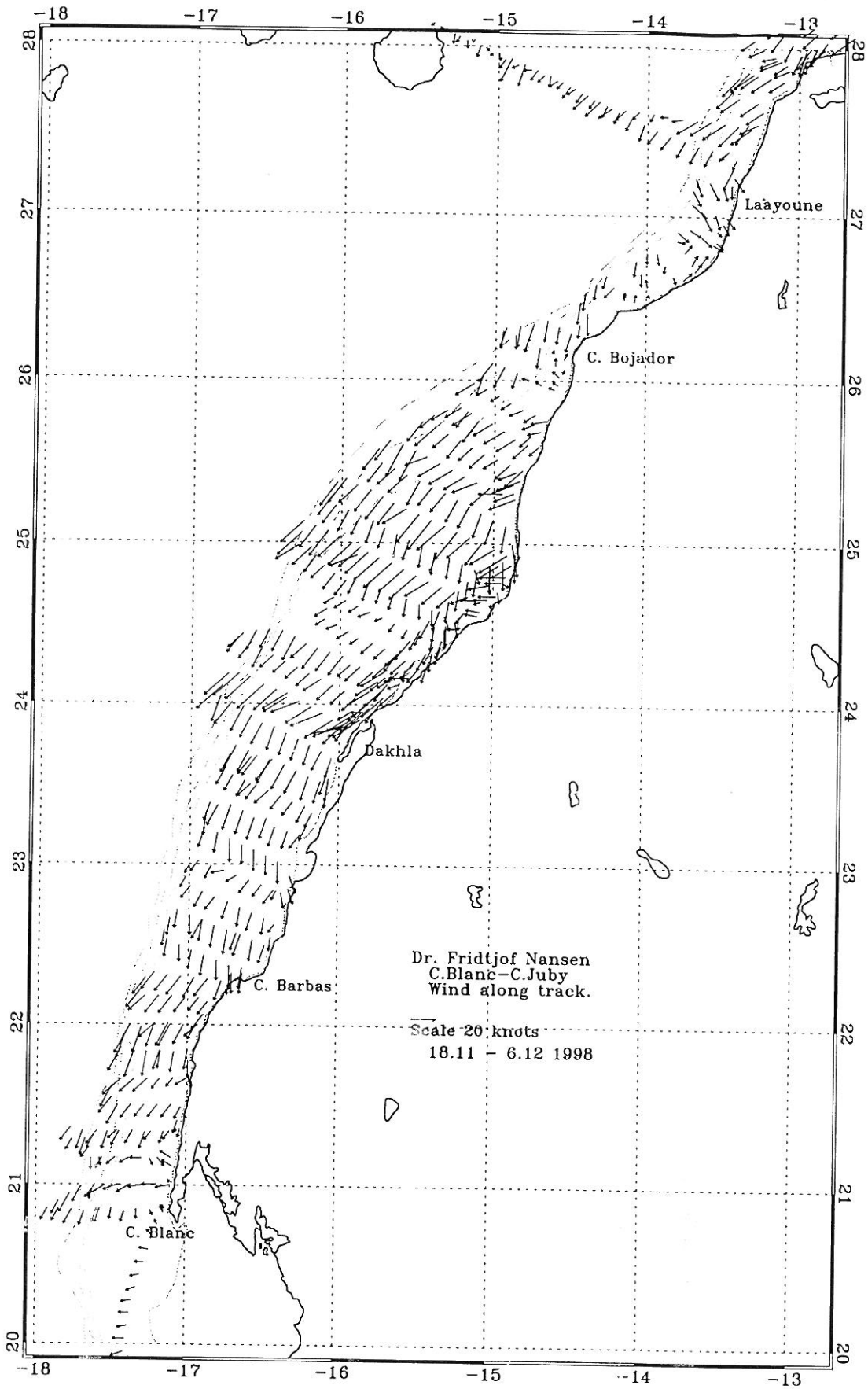


Figure 4a Wind conditions along the survey track 18 November - 6 December, Cape Blanc to Cape Juby.

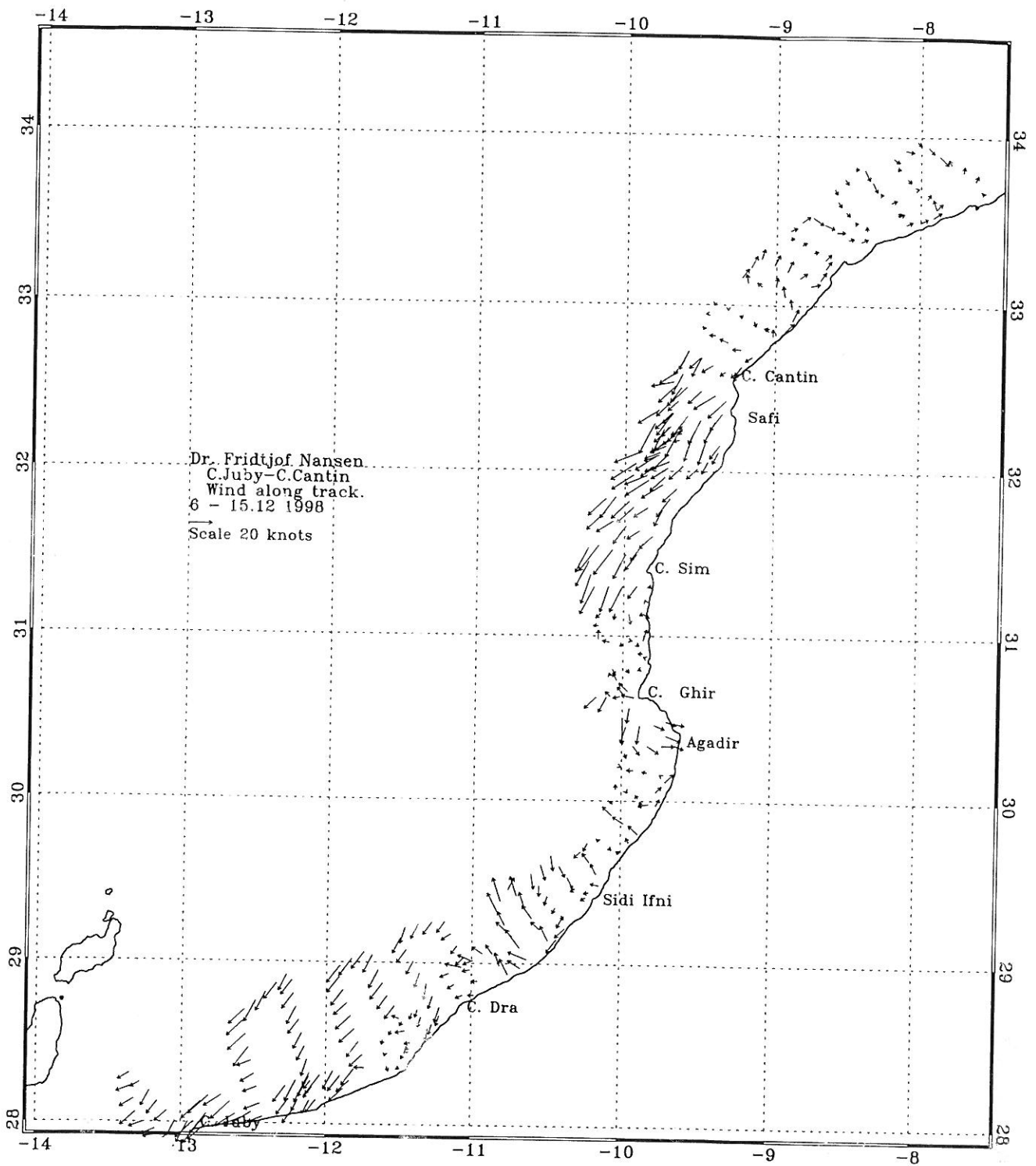


Figure 4b Wind conditions along the survey track 6-15 December, Cape Juby to Casablanca.

2.2 DISTRIBUTION OF PELAGIC FISH ON THE SHELF FROM CAPE BLANC TO CAPE JUBY

Figures 5 to 7 show the distribution of the three main species groups of pelagic fish by contoured acoustic densities.

Sardine (*Sardina pilchardus*) (Fig. 5) were found in two main concentrations between about 23°00'N and 25°20'N, - one close to the shore and the other some 20 NM further offshore. The densest aggregations, close to the shore, consisted of sardine with modal length of 18 cm. These were delineated by a repeated coverage with dense zig-zag courses. The fish were observed in dense schools, well suited for acoustic estimation. The concentrations offshore were more dispersed with modal length of 14 cm and in scattered distributions closer to surface. Two major aggregations was found between Cape Bojador and Cape Juby. Due to the call at Las Palmas there was a three day interruption in the survey in this area which could have caused some shift in the fish distributions in the intermediate period. The length frequency distribution of sardines shows that in the Dakhla area (Fig 8a) the fish is dominated by one cohort with modal lengths around 18 cm. The sardine between Cape Bojador and Cape Juby (Fig. 8b) has a modal length around 17 cm, fairly close to the Dakhla population, while the sardines north of Cape Juby is smaller as will be shown below. Traditionally it has been assumed that the fish in this area is part of the central stock, while the length compositions could indicate linkages to the Dakhla stock. More analysis is needed to clarify this.

Sardinellas were found in a few smaller aggregations between Cape Blanc and some 40 NM north of Dakhla (Figure 6). It was a mixture of flat sardinella (*Sardinella maderensis*) and round sardinella (*Sardinella aurita*), but the latter one dominated the catches with some 70%. The sardinellas were distributed in smaller schools near the surface.

Horse mackerels (*Trachurus trachurus* and *T. trecae*) were found in a more or less continuous belt along the coast from Cape Blanc to about 25°30'N (Figure 7). The two species were mixed, but with a dominance of the Cunene (*T. trecae*) in the catches by about 70 %. The horse mackerel classification was mainly based on the characteristics of the echo track.

Anchovy were only recorded at a few locations and then in very scattered densities.

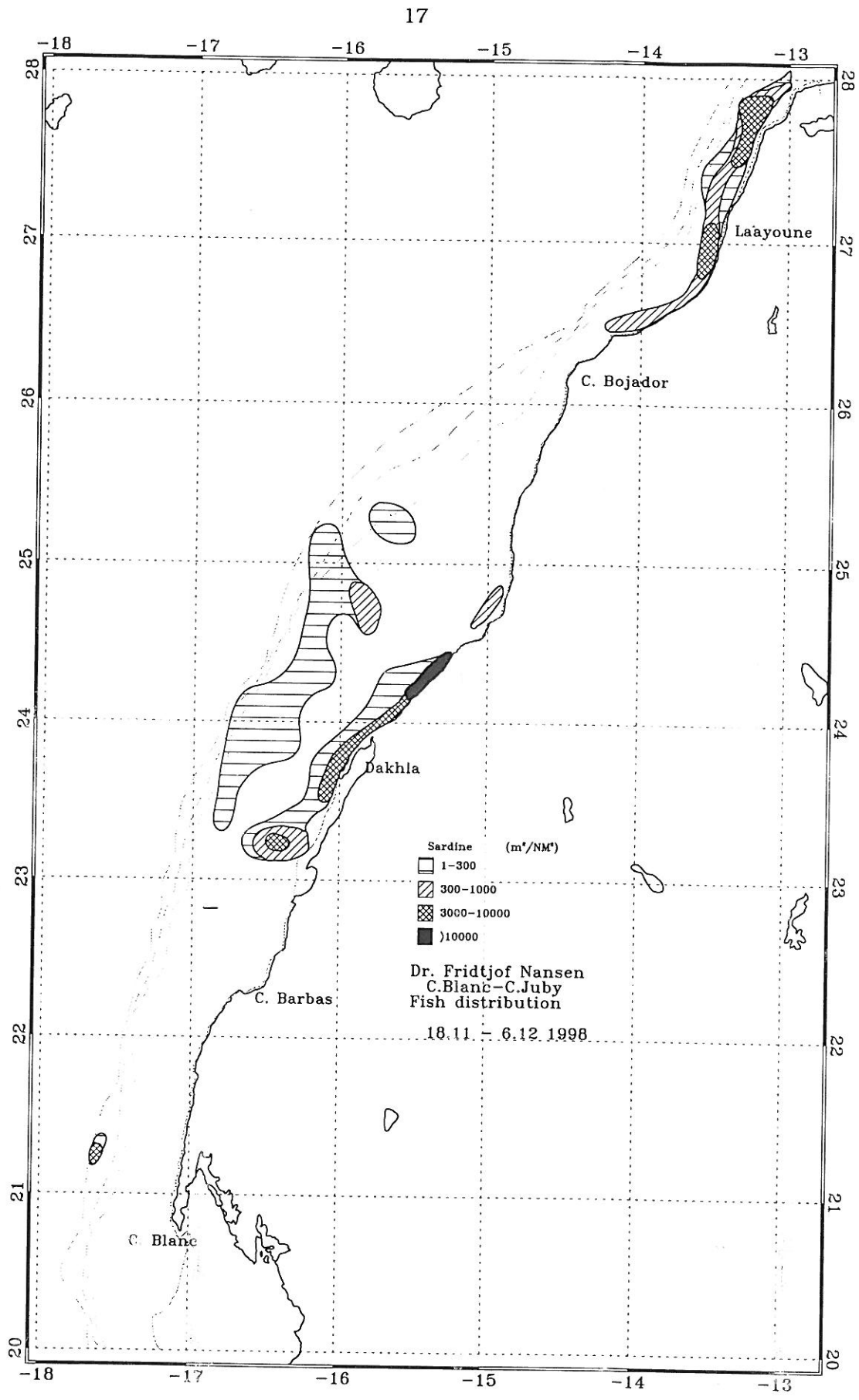


Figure 5 Distribution of sardine, Cape Blanc to Cape Juby.

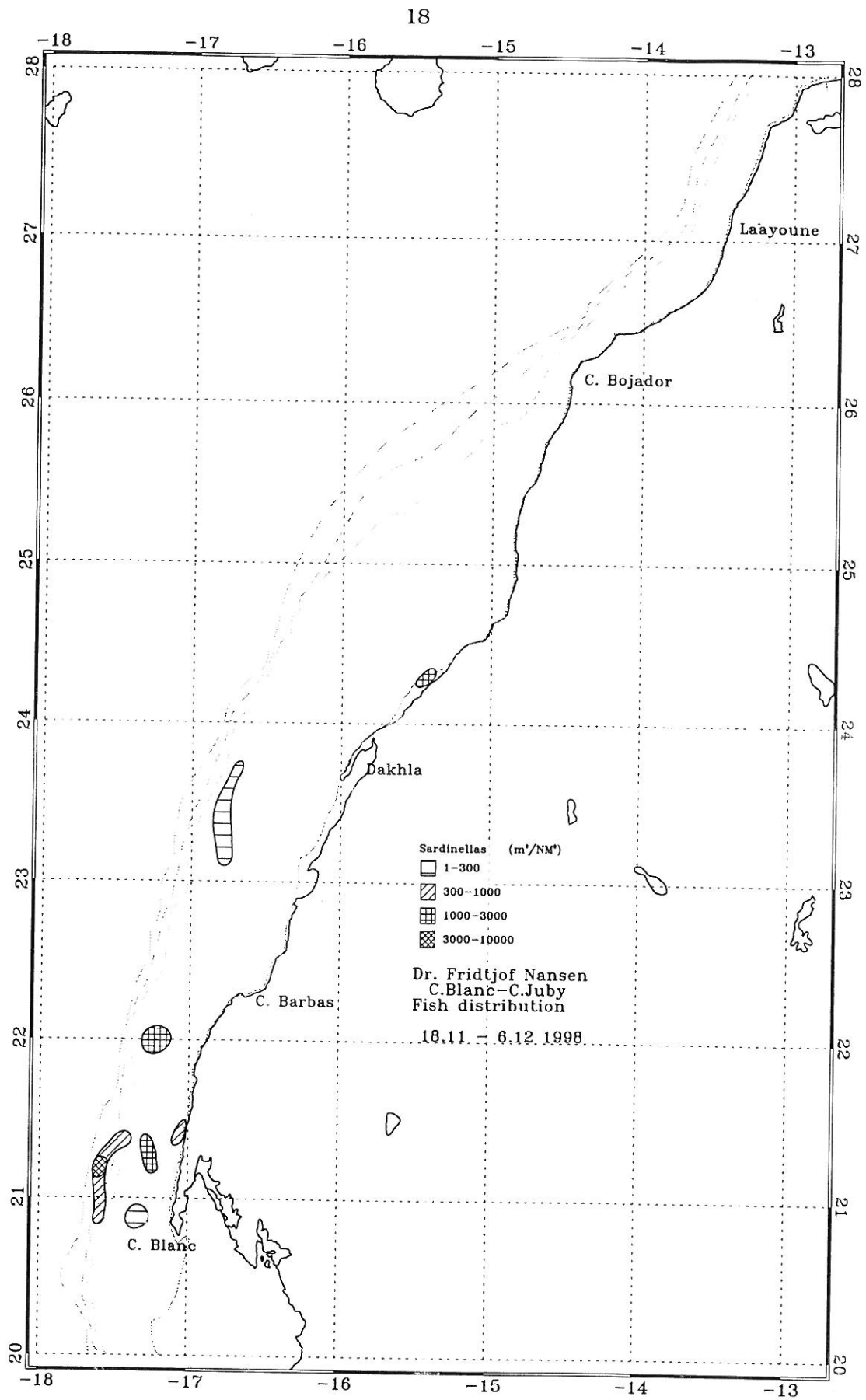


Figure 6 Distribution of sardinella, Cape Blanc to Cape Juby.

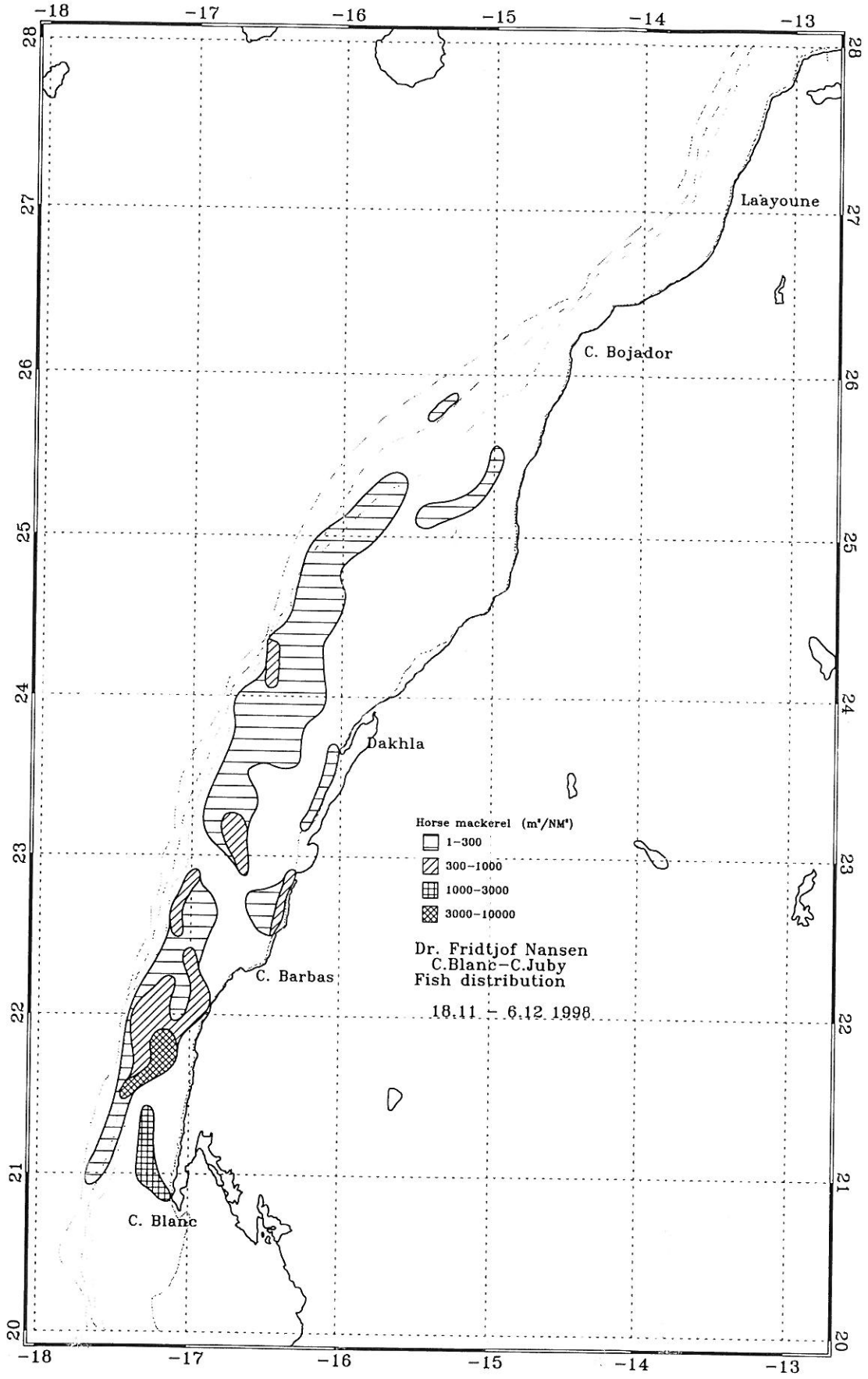


Figure 7 Distribution of horse mackerel, Cape Blanc to Cape Juby.

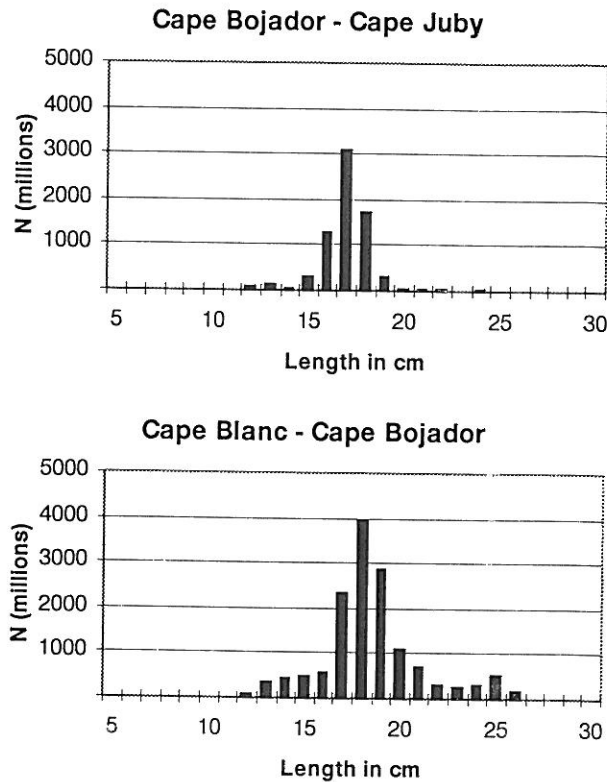


Figure 8 Length frequency distributions sardine.

2.3 DISTRIBUTION OF PELAGIC FISH ON THE SHELF FROM CAPE JUBY TO CASABLANCA.

Sardine was found in most of the shallow areas in the region (Fig. 9) up to Safi. The highest concentrations were located between Cape Juby and Cape Dra and south of Afadir. In general, the pattern was much like the distribution observed the previous year. The estimated composite length frequency distribution from the area (Fig. 11) shows that the sardine is composed of two cohorts, with modal lengths 12 and 15 cm respectively.

Anchovy (Fig. 10) was found mainly between Cape Dra and Safi, with high concentrations between Cape Dra and Sidi Ifni, off Agadir and off Safi. Most of the fish was found in shallow waters, except off Safi where it was located over 70-80 m bottom depth. The size range was 8-15 cm and mean size in the range 10-13 cm.

Horse mackerel was found only in scattered occurrences. **Chub mackerel** was located in scattered patches along the coast, usually outside the sardine distributions. Chub mackerel was hit as bycatch in some catches but never in quantities. North of Cape Juby neither species form aggregations that could be detected by the acoustic system, and no distribution maps are presented.

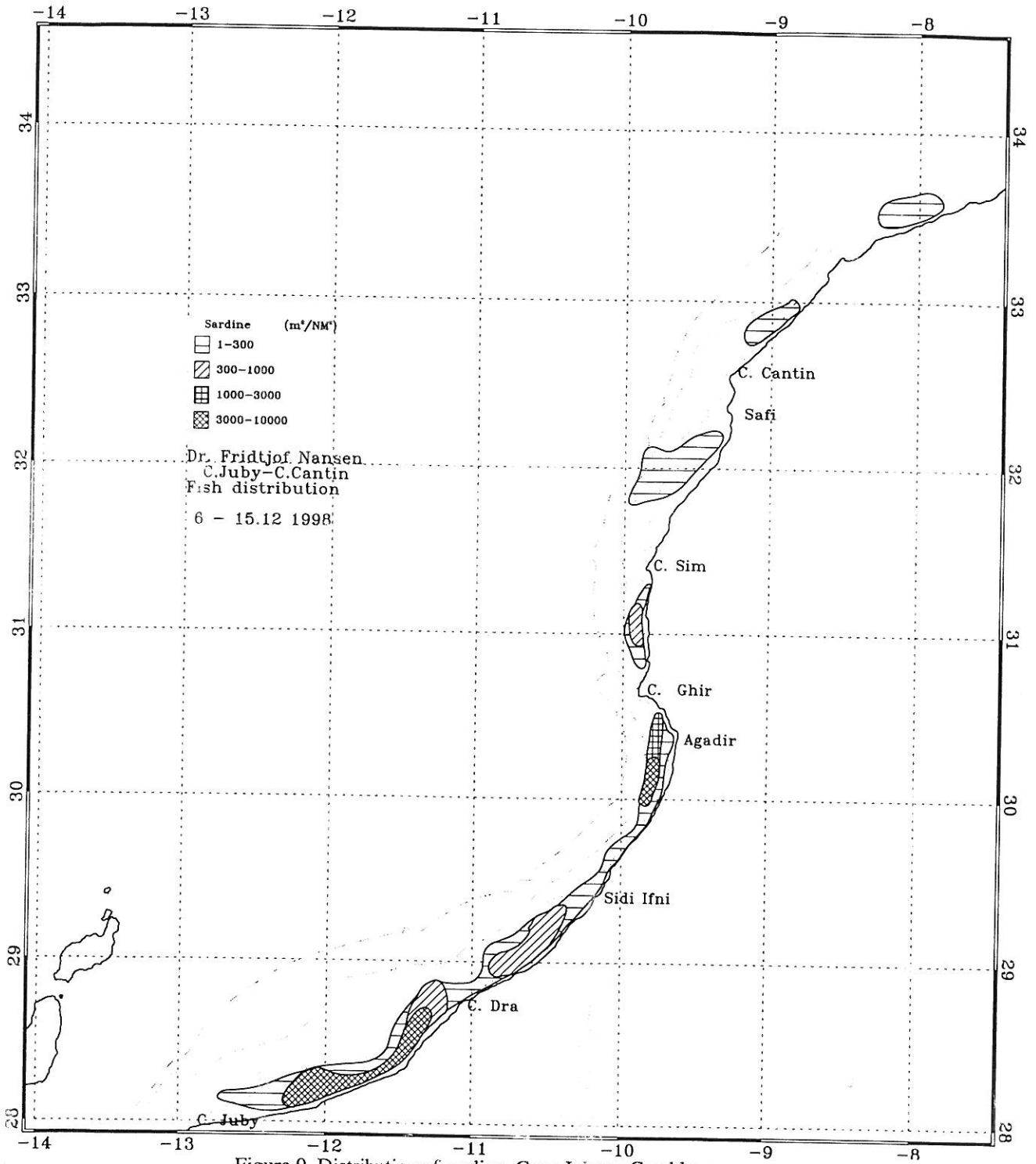


Figure 9 Distribution of sardine, Cape Juby to Casablanca.

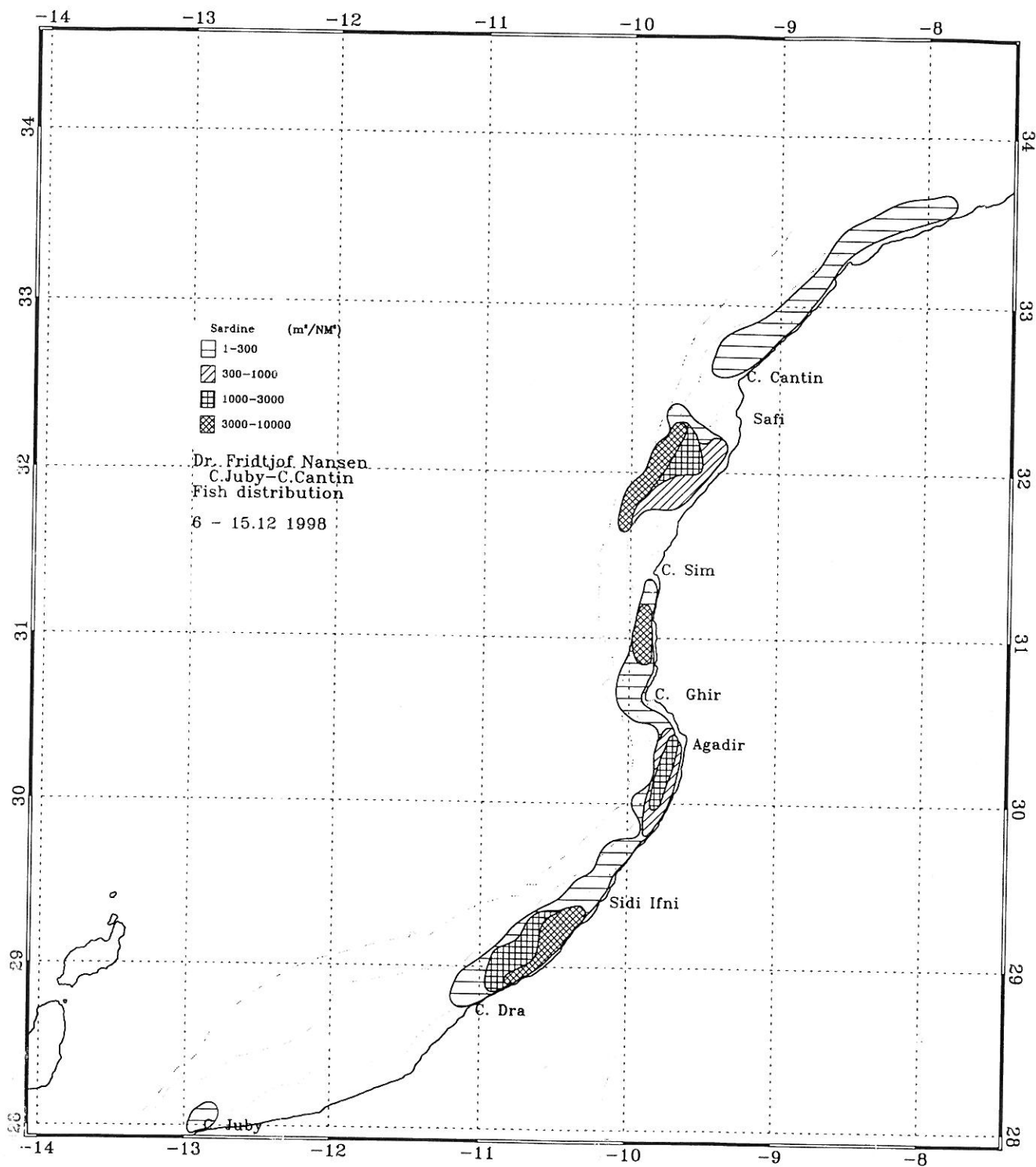


Figure 10 Distribution of anchovy, Cape Juby to Casablanca.

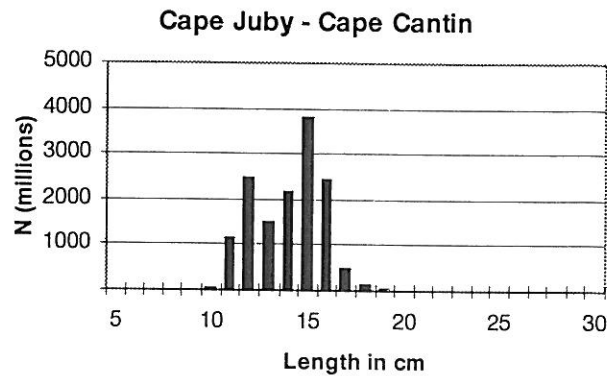


Figure 11 Length frequency distribution of sardine.

2.4 BIOMASS ESTIMATES

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

Cape Blanc-Cape Bojador

The **sardine** was estimated to 910 thousand tonnes. This figure confirms the drastic reduction in the biomass that occurred during 1997 and which was reported in the November survey last year. The length distribution is earlier shown in Figure 8. Most of the fish belong to a cohort with mean around 18 cm. This is the same cohort that was observed as dominating the 1997 population but then with a length around 12 cm. This means that there seems to be no new recruitment to the stock during 1998. Adult sardine, bigger than 19 cm, are fewer in number but due to their bigger body weight they make up almost 30% of the biomass, and is estimated to 340 000 tonnes. Compared with 1996 and 1997, the development in this part of the stock (i.e. fish >19cm) are:

1996:	4 600 000 tonnes
1997:	240 000 tonnes
1998:	340 000 tonnes

Sardinella was estimated to 320 000 tonnes, exclusively located between Cape Blanc and Cape Barbas. The total regional stock of round and flat sardinella is estimated to 1 830 000 tonnes, of which 17% was located north of Cape Blanc.

The two species of **horse mackerel** combined was estimated to 620 000 tonnes of which about 180 000 tonnes was Atlantic horse mackerel, not found south of Cape Blanc. The 440 000 tonnes Cunene horse mackerel forms part of the stock distributed also south of Cape Blanc. The regional estimate for Cunene horse mackerel is 690 000 tonnes of which thus about 65% was located north of Cape Blanc.

Cape Bojador-Cape Juby

Sardine was estimated to 340 000 tonnes which in 1998 form basis for an intensive local fishery. All fish belong to one cohort with modal length 17cm. The sardine in this area is traditionally assumed to be part of the Central stock with its centre in the Tan Tan area, while the length compositions could suggest some associations with the Dakhla stock.

No other species were estimated for this area.

Cape Juby - Cape Cantin

The **sardine** is estimated to 380 000 tonnes, mainly south of Agadir. The fish is made up of two cohorts with 11 and 15 cm modal length respectively. The relative small size of the fish gives it a considerable growth potential for the coming year if the fishing pressure is not too high. In 1997 the sardine in this area was estimated to 260 000 tonnes. In the same period the number of fish has been reduced from 17.3 billion to 14.2 billion fish. This gives an average increase in the mean body weight of sardine from 15 to 26 grams over one year and signifies a net growth in a fish population under fishing. This is a positive signal.

Anchovies was estimated to 400 000 tonnes, in a population with modes around 9 and 12 cm. In 1997 the anchovies in this area was estimated to 63 000 tonnes.

The figures for the two species indicate positive signs of fish stocks rebuilding in this area.

Cape Cantin - Casablanca

Only low estimates of fish was obtained in this area. The sardine estimate is less than 1000 tonnes and the estimate on anchovies is 12 000 tonnes.

Table 1 Morocco. Summary of biomass estimates of pelagic fish, 1000 tonnes.						
Region	Sardines	Round sardinella	Flat sardinella	Atlantic horse mackerel	Cunene horse mackerel	Anchovy
Cape Blanc-Cape Bojador	910	220	95	180	540	2
Cape Bojador-Cape Juby	340	0	0	0	0	1
Cape Juby-Cape Cantin	380	0	0	0	0	400
Cape Cantin-Casablanca	1	0	0	0	0	12
Totals	1630	220	95	180	540	415

CHAPTER 3 CONCLUDING REMARKS

3.1 Etat des stocks en 1998

The survey was conducted successfully in the period 18th November to 19th December with a course track of 4800 NM and 78 fishing stations. The limits of the school areas of the sardine, anchovy and horse mackerel are thought to have been well determined and the main areas adequately sampled. The weather conditions were favourable and did not put any constraints on the survey work.

The hydrographic data show well developed upwelling along the entire coastline, and the whole shelf holds water well enriched with oxygen. Except for the upwelling, no fronts or oceanographic barriers were observed on the shelf.

Figure 12 gives a general overview on the major aggregations of pelagic fish with rounded biomass figures. The biomass estimates are also summarised in Table 1.

Concentrations of sardine was found in shallow waters north off Dakhla, between Cape Bojador and off Agadir. The concentrations off Dakhla has the same distribution limit as in previous years and is estimated to 910 000 tonnes, an increase from the 600 000 tonnes of 1997. At the same time the number of fish has decreased from 19.7 billion fish to 14.5 billion. The figures confirms the drastic decline in biomass that was reported happen during 1997. On the narrow shelf between Cape Bojador and Cape Juby the sardine was estimated to 340 000 tonnes, an increase from 270 000 tonnes in 1997, but, again, a reduction in number from 16.6 billion to 7.1 billion fish. Both sardine populations; between Cape Blanc and Cape Bojador and between Cape Bojador and Cape Juby, are quite similar in size structure and are mainly made up of the same cohort as was dominating in 1997, now one year older. No new recruits have been observed to enter these populations during 1998. This should give reason for some concern.

Between Cape Juby and Cape Cantin the sardine stock has grown in biomass during 1998, from 280 000 tonnes to 360 000 tonnes but the estimated number of fish has decreased from 17.3 to 14.3 billion fish.

Minor aggregations of round and flat sardinellas were found between Cape Blanc and Cape Barbas. This forms the northern extension of the sardinella stock which have its center of

gravity in Senegal and Mauritania. The sardinella north of Cape Blanc was estimated to 220 000 tonnes, about 25% of the total stock (1 830 000 tonnes). In November 1996 the main share of sardinella was found north of Cape Blanc, a situation that was considered atypical. The stock seems now back to a more normal distribution pattern. In 1997 the total sardinella stock was estimated to 1 830 000 tonnes, same as during this survey.

Horse mackerel was found in high abundance between Cape Blanc and Cape Barbas, as a continuation of the distribution recorded in Mauritania. Further north, horse mackerel was generally scattered. This confirms the general distribution pattern of the species. The biomass of horse mackerel was estimated to 620 000 tonnes compared to 1 040 000 tonnes in 1997. However, as this is a shared resource with Mauritania it will not tell the full picture. The total estimate of horse mackerel from Cape Verde to Cape Bojador is 875 000 tonnes compared to 1195 000 tonnes in 1997.

Anchovies was almost absent south of Cape Juby. The highest concentrations were found between Cape Dra and Cape Cantin. The biomass was estimated to 400 000 tonnes, a considerable increase from 60 000 tonnes in 1997.

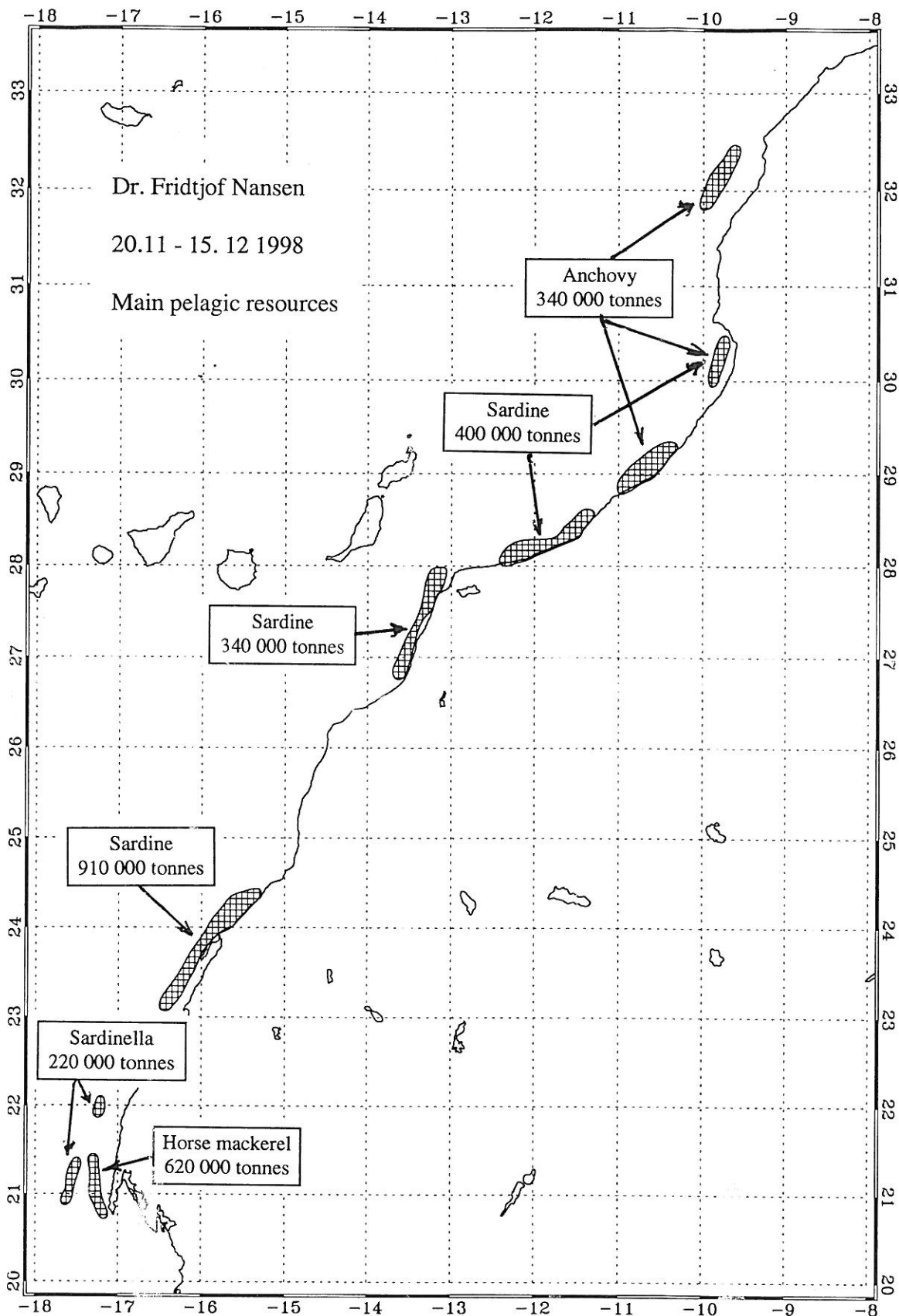


Figure 12 Map of the major pelagic fish concentrations with estimated abundance (thousand tonnes), Cape Blanc to Cape Cantin.

Trends 1995-98, sardine

Fig. 13 shows the biomass estimates of sardine compared with results from previous "Dr. Fridtjof Nansen" surveys. Fig. 14 show the biomass figures 1995-98 by length classes. The sardine stock between Cape Blanc and Cape Juby has undergone a dramatic change since the survey in November 1996. The stock estimate has declined from 5.3 million tonnes in late 1996 to 870 thousand tonnes in 1997, a reduction confirmed by the recent 930 thousand tonnes, Fig. 13. The reduction has also been confirmed by two joint Atlant Niro/INRH surveys earlier in 1998. There is still no good explanation to this drastic reduction and a change of similar order has not been reported earlier. When the event was first observed one could argue that the fish had taken on a migration and would return, but now with four surveys confirming the decline and no traces of the missing cohorts, one must assume that it has suffered from a massive mortality over a very short period. The moderate growth during 1998 is from the same cohort that was present in 1997, and no recruits have entered the area since the previous survey, Fig. 14.

The central stock between Cape Juby and Safi seems to have grown during 1998, from 260 to 380 thousand tonnes, and is now the highest observed in the 90ies. The recent growth is within-cohort-growth as no new recruits are observed, Figure 14. The sardine between Cape Bojador and Cape Juby is estimated to 340 thousand tonnes. It has not been clarified if this fish is part of the central stock, part of the southern stock or forms a separate unit. It is close geographically to the stock in the Tan Tan area, but has much the same size structure as the fish off Dakhla. If it was part of the central stock the composite biomass figures would signify a very strong growth for this stock during 1998.

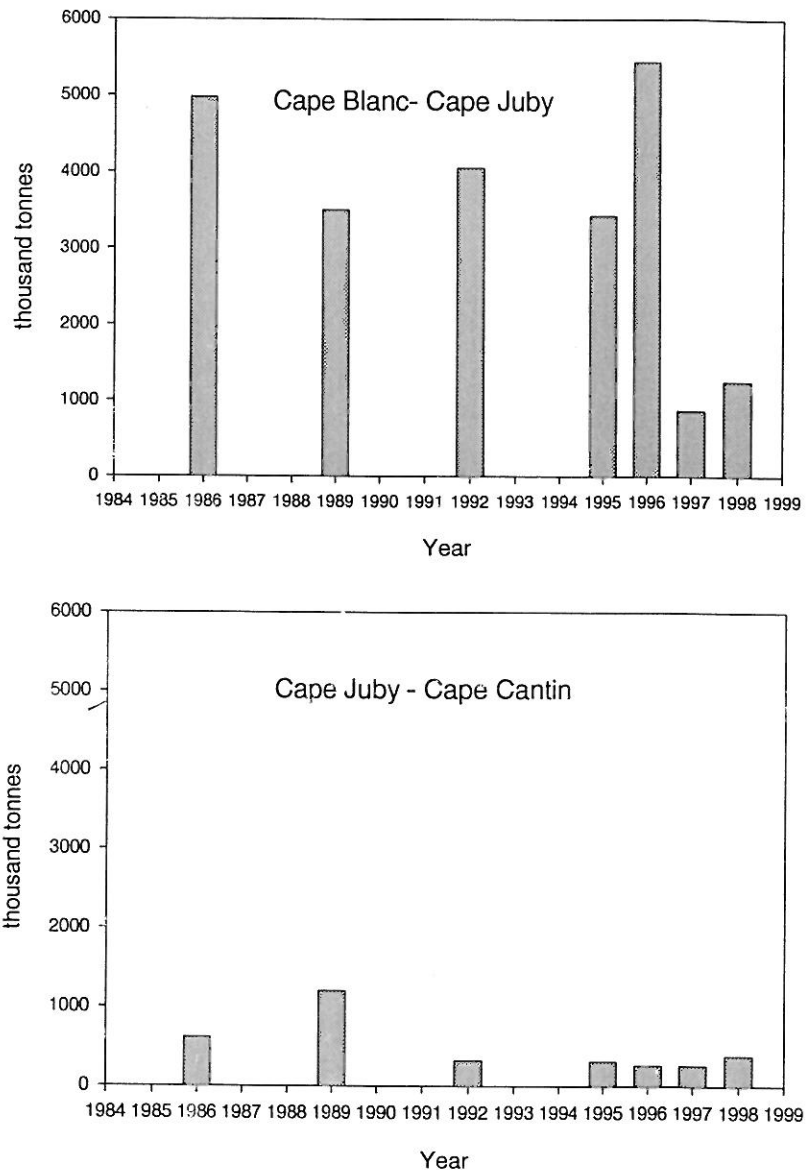


Figure 13 Sardine biomass estimates Cape Blanc-Cape Juby and Cape Juby- Cape Cantin, Dr Fridjof Nansen 1986-96.

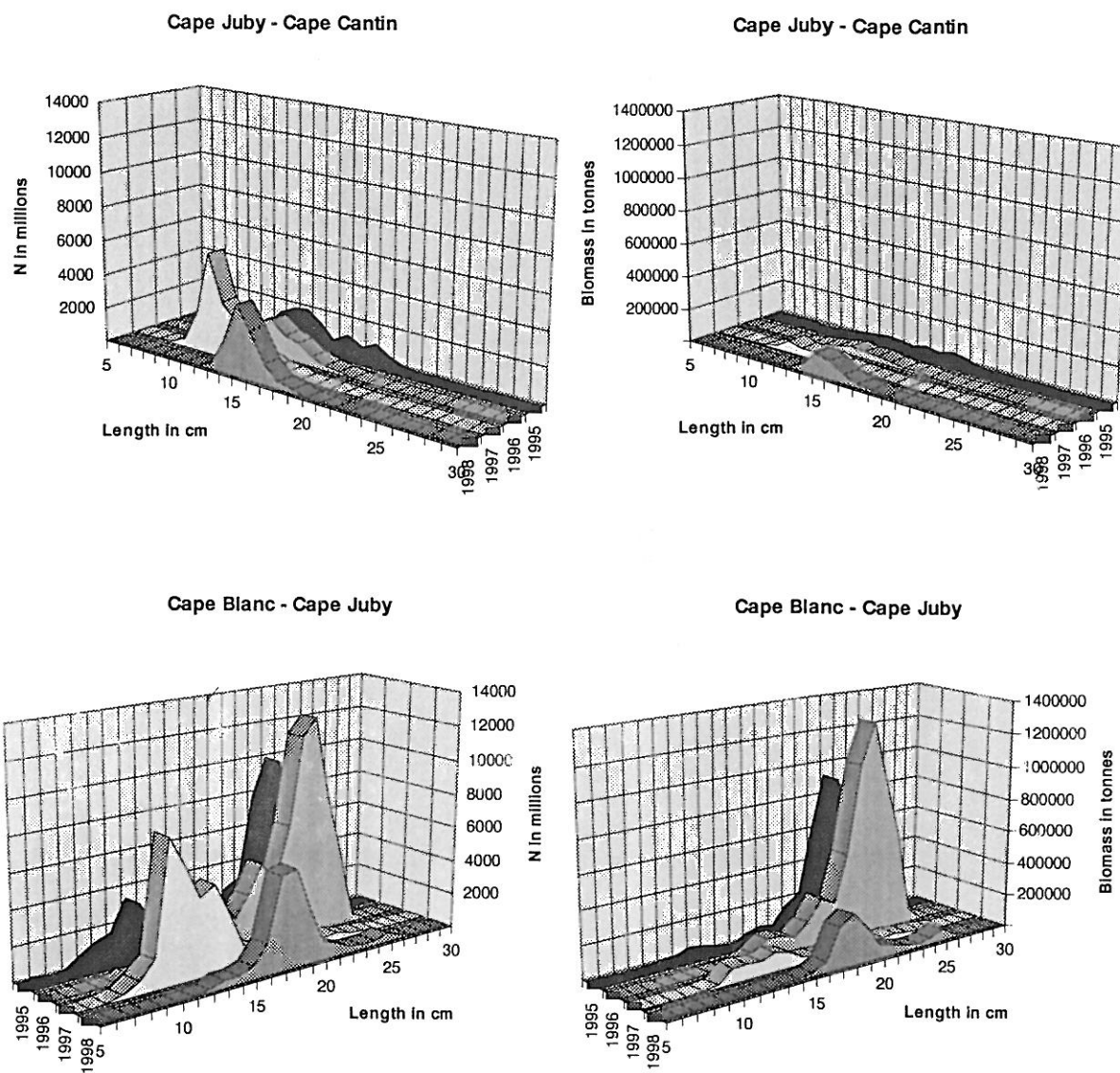


Figure 14 Numbers and biomass by length class, 1995-98. Cape Juby - Cape Cantin (top) and Cape Blanc - Cape Juby (bottom).

Annex I Biomass and number by fish length class

Sardine (*Sardina pilchardus*)

MOROCCO 1998

Length cm	C.Juby-C.Cantin		C.Bojador-C.Juby		C.Blanc-C.Bojador		Total	
	tonnes	N millions	tonnes	N millions	tonnes	N millions	tonnes	N millions
5								
6								
7								
8								
9								
10	507	53					507	53
11	14110	1131	50	4	44	3	14204	1138
12	39395	2460	1454	84	1676	97	42525	2642
13	30649	1519	2676	124	7509	348	40834	1991
14	54639	2186	1022	38	11317	424	66978	2648
15	116552	3817	9493	292	16109	496	142154	4605
16	89636	2433	49452	1266	22017	564	161104	4264
17	21805	496	143082	3081	108863	2344	273750	5920
18	6233	120	94794	1732	215073	3930	316099	5783
19	2111	35	19145	300	182599	2857	203855	3191
20	376	5	2364	32	80856	1092	83596	1129
21			5082	60	58798	690	63880	749
22			6403	66	31487	323	37890	389
23			870	8	28772	260	29642	267
24			3244	26	39101	312	42345	338
25			277	2	77824	552	78100	554
26			310	2	26784	170	27094	172
27								
28								
29								
30								
Total	376013	14256	339714	7116	908829	14461	1624557	35833

Round sardinella (*Sardinella aurita*)

SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO 1998

Length cm	Number in millions				Biomass in tonnes			
	Senegal	Mauritania	Morocco	Total	Senegal	Mauritania	Morocco	Total
5		147		147		229		229
6		516		516		1314		1314
7		2080		2080		8096		8096
8		2484		2484		14003		14003
9		2419		2419		18956		18956
10		1062		1062		11194		11194
11		2363		2363		32599		32599
12		1007		1007		17770		17770
13	3			3	66			66
14	15			15	409			409
15	17			17	564			564
16	7			7	279			279
17	11			11	522			522
18	21			21	1176			1176
19	26		6	32	1702		387	2090
20	47		15	61	3566		1123	4689
21	49	9	9	67	4350	784	776	5910
22	101	3	21	125	10199	270	2071	12539
23	109	3	32	144	12448	307	3701	16456
24	125	9	26	161	16202	1154	3425	20782
25	124	12	3	140	18120	1820	428	20369
26	163	28	6	197	26563	4586	960	32110
27	180	15		195	32761	2785		35546
28	118	18		137	23984	3685		27669
29	47	38		85	10602	8515		19118
30	38	144		182	9519	35549		45068
31		102		102		27818		27818
32	2	99	2	104	699	29704	519	30922
33	2	146	31	179	765	47649	10092	58507
34		181	62	243		64625	21989	86614
35		164	147	311		63630	56924	120554
36		78	133	210		32653	55871	88524
37		22	114	136		10084	51893	61977
38			18	18			8930	8930
39			1	1			718	718
40								
Total	1207	13150	625	14981	174499	439780	219807	834086

Flat sardinella (*Sardinella maderensis*)

SENEGAL - THE GAMBIA - MAURITANIA - MOROCCO 1998

Length cm	Number in millions				Biomass in tonnes			
	Senegal	Mauritania	Morocco	Total	Senegal	Mauritania	Morocco	Total
5								
6								
7	0			0	1	2		3
8	57	2		58	319	10		329
9	117	6		123	918	49		967
10	10	15		25	103	161		265
11	26	20		47	365	281		646
12	1	13		14	20	231		251
13	4			4	80	171		251
14	59			59	1614	322		1936
15	114			114	3794	376		4170
16	73			73	2933	132		3065
17	39			39	1844	45		1889
18	29			29	1656			1656
19	31			31	2053	235		2288
20	54			54	4102	36		4138
21	87	9		96	7630	784		8414
22	173			173	17383			17383
23	234			234	26775			26775
24	238			238	30829	1215		32045
25	216	14		230	31458	2081		33539
26	85	7		92	13840	1183		15023
27	22	73		95	4067	13321		17388
28	84	214		298	17060	43276		60336
29	51	224		275	11513	50224		61737
30	32	367	10	408	7892	90746	2387	101025
31	24	408	26	458	6578	111198	6995	124771
32	41	420	94	555	12164	125379	28067	165610
33	2	208	94	304	587	67895	30728	99210
34		164	54	218	1993	58544	19159	79696
35		153	20	173	2865	59415	7628	69907
36		81	1	82		34092	284	34376
37		52		52		23904		23904
38								
39								
40								
Total	1903	2452	297	4652	212435	685307	95247	992990

Anchovy (*Engraulis encrasicolus*)

MOROCCO 1998

Length cm	C.Juby-C.Cantin		C.Blanc-C.Juby		Total	
	tonnes	N millions	tonnes	N millions	tonnes	N millions
5						
6			3	2	3	2
7	2790	1225	35	15	2825	1240
8	43266	13046	212	64	43478	13110
9	66832	14435	697	151	67529	14586
10	50542	8085	998	160	51539	8245
11	56632	6896	929	113	57561	7009
12	77007	7301	299	28	77306	7330
13	57979	4364	67	5	58046	4369
14	37614	2285	17	1	37630	2286
15	11670	580	20	1	11690	581
16						
17						
18						
19						
20						
Total	404332	58218	3275	540	407607	58757

Atlantic horse mackerel (*Trachurus trachurus*)

MOROCCO 1998

Length cm	C.Juby-C.Cantin		C.Blanc-C.Juby		Total	
	tonnes	N millions	tonnes	N millions	tonnes	N millions
5						
6						
7						
8						
9						
10			524	50	524	50
11			7240	525	7240	525
12			13034	738	13034	738
13			8509	384	8509	384
14			20555	750	20555	750
15			14302	429	14302	429
16			7327	182	7327	182
17			3229	68	3229	68
18			14	0	14	0
19			359	5	359	5
20			6	0	6	0
21						
22						
23			2534	22	2534	22
24						
25			11	0	11	0
26			9038	55	9038	55
27			4747	26	4747	26
28			6747	33	6747	33
29			7447	33	7447	33
30			5510	22	5510	22
31			7119	26	7119	26
32			11	0	11	0
33			18076	55	18076	55
34			15765	44	15765	44
35			8578	22	8578	22
36						
37			15134	33	15134	33
38			5453	11	5453	11
39						
40						
41						
42						
43						
44						
45						
Total	0	0	181270	3516	181270	3516

Cunene horse mackerel (*Trachurus trecae*)

MOROCCO 1998

Length cm	C.Juby-C.Cantin		C.Blanc-C.Juby		Total	
	tonnes	N millions	tonnes	N millions	tonnes	N millions
5			1209	778	1209	778
6			3198	1255	3198	1255
7			972	250	972	250
8			547	97	547	97
9			850	109	850	109
10			4645	441	4645	441
11			20643	1497	20643	1497
12			18428	1044	18428	1044
13			15512	700	15512	700
14			6420	234	6420	234
15			5988	179	5988	179
16			4638	115	4638	115
17			8803	184	8803	184
18			5915	105	5915	105
19			4454	68	4454	68
20			2806	37	2806	37
21			3302	38	3302	38
22			12700	126	12700	126
23			12036	105	12036	105
24			8767	68	8767	68
25			6176	42	6176	42
26			22478	138	22478	138
27			14460	79	14460	79
28			18311	90	18311	90
29			39200	175	39200	175
30			73074	295	73074	295
31			41829	154	41829	154
32			29684	99	29684	99
33			18364	56	18364	56
34			2862	8	2862	8
35						
36			4657	11	4657	11
37			50447	111	50447	111
38			49080	100	49080	100
39			17650	33	17650	33
40						
41			13619	22	13619	22
42						
43						
44						
45						
Total	0	0	543724	8843	543724	8843

Annex II Records of fishing stations

<p>PROJECT STATION: 749 DATE:19/11/98 GEAR TYPE: PT No: 7 POSITION:Lat N 2051 Long W 1712</p>				<p>PROJECT STATION: 753 DATE:20/11/98 GEAR TYPE: PT No: 4 POSITION:Lat N 2110 Long W 1715</p>			
<p>start stop duration TIME :16:09:20 16:40:49 31 (min) Purpose code: 1 LOG :1732.57 1734.59 1.99 Area code : 3 FDEPTH: 10 10 GearCond.code: 8 BDEPTH: 39 35 Validity code: 3 Towing dir: 90° Wire out: 180 m Speed: 31 kn*10</p>				<p>start stop duration TIME :12:43:02 12:56:00 13 (min) Purpose code: 1 LOG :1869.63 1870.51 0.86 Area code : 3 FDEPTH: 10 10 GearCond.code: BDEPTH: 50 49 Validity code: Towing dir: 90° Wire out: 140 m Speed: 40 kn*10</p>			
<p>Sorted: 4 Kg Total catch: 17.04 CATCH/HOUR: 32.98</p>				<p>Sorted: 32 Kg Total catch: 270.00 CATCH/HOUR: 1246.15</p>			
<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>				<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>			
<p>weight numbers</p>				<p>weight numbers</p>			
<p>Trachurus trecae 25.16 8903 76.29 1547</p>				<p>Loligo vulgaris 1166.77 1551 93.63</p>			
<p>Loligo vulgaris 7.74 14 23.47</p>				<p>Sarda sarda 66.92 18 5.37</p>			
<p>SYNGNATHIDAE 0.04 2 0.12</p>				<p>Spondyllosoma cantharus 7.85 18 0.63</p>			
<p>Sepiella ornata 0.04 2 0.12</p>				<p>Octopus vulgaris 1.85 37 0.15</p>			
<p>Total 32.98 100.00</p>				<p>Pagellus bellottii 1.38 5 0.11</p>			
				<p>Trachinus draco 0.46 9 0.04</p>			
				<p>Total 1245.23 99.93</p>			
<p>PROJECT STATION: 750 DATE:20/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2060 Long W 1735</p>				<p>PROJECT STATION: 754 DATE:20/11/98 GEAR TYPE: PT No: 4 POSITION:Lat N 2110 Long W 1736</p>			
<p>start stop duration TIME :03:21:23 03:38:25 17 (min) Purpose code: 1 LOG :1803.73 1809.89 1.24 Area code : 3 FDEPTH: 20 20 GearCond.code: BDEPTH: 177 231 Validity code: Towing dir: 270° Wire out: 80 m Speed: 40 kn*10</p>				<p>start stop duration TIME :15:39:48 16:10:56 31 (min) Purpose code: 1 LOG :1893.54 1895.49 1.91 Area code : 3 FDEPTH: 10 10 GearCond.code: BDEPTH: 288 252 Validity code: Towing dir: 90° Wire out: 180 m Speed: 40 kn*10</p>			
<p>Sorted: 51 Kg Total catch: 255.00 CATCH/HOUR: 900.00</p>				<p>Sorted: 53 Kg Total catch: 106.00 CATCH/HOUR: 205.16</p>			
<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>				<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>			
<p>weight numbers</p>				<p>weight numbers</p>			
<p>Trachurus trecae 344.12 3261 38.24 1550</p>				<p>Sardinella aurita 118.84 488 57.93 1554</p>			
<p>Auxis thazard 165.86 49 18.43 1551</p>				<p>Sardinella maderensis 86.32 255 42.07 1555</p>			
<p>Sardinella aurita 139.41 300 15.49 1548</p>				<p>Total 205.16 100.00</p>			
<p>Trichurus lepturus 112.94 671 12.55</p>							
<p>Sardinella maderensis 102.35 318 11.37 1549</p>							
<p>MYCTOPHIDAE 35.29 3.92</p>							
<p>Total 899.99 100.00</p>							
<p>PROJECT STATION: 751 DATE:20/11/98 GEAR TYPE: PT No: 4 POSITION:Lat N 2100 Long W 1720</p>				<p>PROJECT STATION: 755 DATE:20/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2120 Long W 1736</p>			
<p>start stop duration TIME :05:54:44 06:07:15 13 (min) Purpose code: 1 LOG :1826.69 1827.46 0.75 Area code : 3 FDEPTH: 5 5 GearCond.code: BDEPTH: 66 61 Validity code: Towing dir: 90° Wire out: 150 m Speed: 40 kn*10</p>				<p>start stop duration TIME :20:44:55 21:01:26 17 (min) Purpose code: 1 LOG :1933.01 1933.89 0.88 Area code : 3 FDEPTH: 10 10 GearCond.code: BDEPTH: 392 410 Validity code: Towing dir: 340° Wire out: 130 m Speed: 30 kn*10</p>			
<p>Sorted: 9 Kg Total catch: 66.68 CATCH/HOUR: 307.75</p>				<p>Sorted: 12 Kg Total catch: 251.43 CATCH/HOUR: 887.40</p>			
<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>				<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>			
<p>weight numbers</p>				<p>weight numbers</p>			
<p>Trichurus lepturus 129.23 388 41.99</p>				<p>MYCTOPHIDAE 847.06 521827 95.45</p>			
<p>Trachinus vipera 45.23 2003 14.70</p>				<p>Sardina pilchardus 38.82 268 4.37 1556</p>			
<p>Octopus vulgaris 32.82 162 10.66</p>				<p>Loligo vulgaris 0.92 78 0.10</p>			
<p>Uranoscopus scaber 32.31 65 10.50</p>				<p>Sphyræna viridensis 0.56 28 0.06</p>			
<p>Auxis thazard 22.62 32 7.35</p>				<p>Total 887.36 99.98</p>			
<p>Scorpaena scrofa 21.00 194 6.82</p>							
<p>TETRAODONTIDAE 12.92 872 4.20</p>							
<p>Trachurus trecae 10.11 3812 3.29 1552</p>							
<p>Solea senegalensis 0.78 65 0.25</p>							
<p>Sepiella ornata 0.74 65 0.24</p>							
<p>Total 307.76 100.00</p>							
<p>PROJECT STATION: 752 DATE:20/11/98 GEAR TYPE: PT No: 7 POSITION:Lat N 2102 Long W 1706</p>				<p>PROJECT STATION: 756 DATE:20/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2120 Long W 1728</p>			
<p>start stop duration TIME :08:34:54 08:40:34 6 (min) Purpose code: 1 LOG :1843.83 1844.14 0.28 Area code : 3 FDEPTH: 10 10 GearCond.code: BDEPTH: 31 31 Validity code: Towing dir: 190° Wire out: 120 m Speed: 30 kn*10</p>				<p>start stop duration TIME :22:51:51 23:06:23 15 (min) Purpose code: 1 LOG :1945.76 1946.64 0.86 Area code : 3 FDEPTH: 10 10 GearCond.code: BDEPTH: 152 231 Validity code: Towing dir: 260° Wire out: 130 m Speed: 30 kn*10</p>			
<p>Sorted: 35 Kg Total catch: 24.60 CATCH/HOUR: 246.00</p>				<p>Sorted: 28 Kg Total catch: 139.50 CATCH/HOUR: 558.00</p>			
<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>				<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>			
<p>weight numbers</p>				<p>weight numbers</p>			
<p>Dicentrarchus punctatus * 150.00 350 60.98</p>				<p>Sardinella maderensis 260.00 660 46.59 1557</p>			
<p>Decapterus rhonchus 70.00 180 28.46 1553</p>				<p>Trichurus lepturus 200.00 700 35.84</p>			
<p>Campogramma glaycos 26.00 50 10.57</p>				<p>Trachurus trecae 90.00 880 16.13 1558</p>			
<p>Total 246.00 100.01</p>				<p>Sardinella aurita 8.04 20 1.44</p>			
				<p>Total 558.04 100.00</p>			
<p>PROJECT STATION: 757 DATE:21/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2120 Long W 1713</p>				<p>PROJECT STATION: 752 DATE:20/11/98 GEAR TYPE: PT No: 7 POSITION:Lat N 2102 Long W 1706</p>			
<p>start stop duration TIME :01:35:22 01:40:11 5 (min) Purpose code: 1 LOG :1964.36 1964.71 0.33 Area code : 3 FDEPTH: 20 20 GearCond.code: BDEPTH: 60 60 Validity code: Towing dir: 270° Wire out: 80 m Speed: 40 kn*10</p>				<p>start stop duration TIME :08:34:54 08:40:34 6 (min) Purpose code: 1 LOG :1843.83 1844.14 0.28 Area code : 3 FDEPTH: 10 10 GearCond.code: BDEPTH: 31 31 Validity code: Towing dir: 190° Wire out: 120 m Speed: 30 kn*10</p>			
<p>Sorted: 64 Kg Total catch: 1409.20 CATCH/HOUR: 16910.40</p>				<p>Sorted: 35 Kg Total catch: 24.60 CATCH/HOUR: 246.00</p>			
<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>				<p>SPECIES CATCH/HOUR % OF TOT. C SAMP</p>			
<p>weight numbers</p>				<p>weight numbers</p>			
<p>Trachurus trecae 12540.00 83004 74.16 1562</p>				<p>Trachurus trecae 150.00 350 60.98</p>			
<p>Sardinella aurita 2296.80 5808 13.58 1560</p>				<p>Decapterus rhonchus 70.00 180 28.46 1553</p>			
<p>Sardinella maderensis 626.40 2172 3.70 1561</p>				<p>Campogramma glaycos 26.00 50 10.57</p>			
<p>Scomber japonicus 528.00 1056 3.12</p>							
<p>Trichurus lepturus 211.20 528 1.25</p>							
<p>Loligo vulgaris 184.80 264 1.09</p>							
<p>Diplodus puntazzo 184.80 264 1.09</p>							
<p>Sepia officinalis hierredda 158.40 264 0.94</p>							
<p>Trachurus trachurus 126.72 528 0.75 1559</p>							
<p>Pagellus bellottii 31.68 264 0.19</p>							
<p>Pomatomus saltatrix 21.60 12 0.13</p>							
<p>Total 16910.40 100.00</p>							

PROJECT STATION: 758
 DATE: 21/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2120
 start stop duration Long W 1706
 TIME :03:02:27 03:17:32 15 (min) Purpose code: 1
 LOG :1974.28 1975.15 0.86 Area code : 3
 FDEPTH: 5 5 GearCond.code:
 BDEPTH: 42 46 Validity code:
 Towing dir: 270° Wire out: 150 m Speed: 40 kn*10
 Sorted: 15 Kg Total catch: 30.50 CATCH/HOUR: 122.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	55.20	156	45.25	
Mugil capurrii	24.00	20	19.67	
Trachurus trecae	18.00	60	14.75	
Loligo vulgaris	12.00	12	9.84	
Trichiurus lepturus	8.40	24	6.89	
Sphyraena sphyraena	4.40	12	3.61	
Total	122.00		100.01	

PROJECT STATION: 763
 DATE: 21/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2160
 start stop duration Long W 1722
 TIME :21:02:14 21:17:42 15 (min) Purpose code: 1
 LOG :2116.30 2117.18 0.87 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 84 80 Validity code:
 Towing dir: 100° Wire out: 130 m Speed: 30 kn*10
 Sorted: 7 Kg Total catch: 1056.28 CATCH/HOUR: 4225.12

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	4200.00	333192	99.41	1567
Sarda sarda	24.00	8	0.57	
Loligo vulgaris	1.12	16	0.03	
Total	4225.12		100.01	

PROJECT STATION: 759
 DATE: 21/11/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2121
 start stop duration Long W 1704
 TIME :04:46:29 04:49:29 3 (min) Purpose code: 1
 LOG :1985.71 1985.77 0.09 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 34 34 Validity code:
 Towing dir: 196° Wire out: 100 m Speed: 30 kn*10
 Sorted: 1 Kg Total catch: 1.28 CATCH/HOUR: 25.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Belone svetovidovi	14.00	100	54.69	
Trachurus trecae	5.80	40	22.66	
Decapterus rhonchus	5.80	20	22.66	
Total	25.60		100.01	

PROJECT STATION: 764
 DATE: 21/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2201
 start stop duration Long W 1714
 TIME :22:48:10 23:00:06 12 (min) Purpose code: 1
 LOG :2126.08 2126.75 0.65 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 61 64 Validity code:
 Towing dir: 90° Wire out: 130 m Speed: 30 kn*10
 Sorted: 54 Kg Total catch: 359.62 CATCH/HOUR: 1798.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	1350.00	2225	75.08	
Trachinus vipera	229.60	10940	12.77	
Sarda sarda	66.00	25	3.67	
Uranoscopus scaber	65.95	585	3.67	
Octopus vulgaris	34.00	90	1.89	
Sardinella aurita	32.50	65	1.81	1568
Sardinella maderensis	5.90	15	0.33	
Trachurus trecae	5.50	10	0.31	
Citharus linguatula	4.45	195	0.25	
Solea vulgaris	4.20	40	0.23	
Total	1798.10		100.01	

PROJECT STATION: 760
 DATE: 21/11/98 GEAR TYPE: BT No: 2 POSITION: Lat N 2142
 start stop duration Long W 1660
 TIME :13:24:07 13:42:28 18 (min) Purpose code: 1
 LOG :2062.87 2063.62 0.73 Area code : 3
 FDEPTH: 20 21 GearCond.code:
 BDEPTH: 20 21 Validity code:
 Towing dir: 180° Wire out: 120 m Speed: 30 kn*10
 Sorted: 58 Kg Total catch: 1600.00 CATCH/HOUR: 5333.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Diplodus sargus *	3000.00	3800	56.25	
Pteroscion pelli	490.00	5500	9.19	
Diplodus bellottii	420.00	5200	7.88	
Stromateus fiatola	300.00	800	5.63	
Pomadasys incisus	200.00	500	3.75	
Campogramma glaycos	200.00	500	3.75	
Diplodus vulgaris	150.00	100	2.81	
Trichiurus lepturus	150.00	800	2.81	
Argyrosomus regius	120.00	400	2.25	
Decapterus rhonchus	100.00	1300	1.88	1564
Pomadasys peroteti	100.00	2700	1.88	
Trachurus trecae	90.00	2700	1.69	1563
Pseudolithus senegalensis	15.00	3	0.28	
Total	5335.00		100.05	

PROJECT STATION: 765
 DATE: 22/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2201
 start stop duration Long W 1708
 TIME :00:43:33 01:00:38 17 (min) Purpose code: 1
 LOG :2136.28 2137.32 1.01 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 62 63 Validity code:
 Towing dir: 270° Wire out: 160 m Speed: 40 kn*10
 Sorted: 47 Kg Total catch: 91.70 CATCH/HOUR: 323.65

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	259.41	434	80.15	
Sarda sarda	44.12	14	13.63	
Rhinobatos rhinobatos	10.59	4	3.27	
Trachurus trecae	7.41	21	2.29	1569
Trachurus trachurus	2.12	7	0.66	1570
Total	323.65		100.00	

PROJECT STATION: 766
 DATE: 22/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2200
 start stop duration Long W 1657
 TIME :02:48:49 03:00:16 11 (min) Purpose code: 1
 LOG :2150.40 2151.14 0.72 Area code : 3
 FDEPTH: 5 5 GearCond.code: 8
 BDEPTH: 35 35 Validity code: 1
 Towing dir: 270° Wire out: 160 m Speed: 40 kn*10
 Sorted: 62 Kg Total catch: 855.50 CATCH/HOUR: 4666.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	3184.36	9927	68.24	1572
Trachurus trecae	901.09	27611	19.31	1571
Stromateus fiatola	229.09	229	4.91	
Sphyraena sphyraena	133.64	153	2.86	
Pomadasys incisus	99.27	840	2.13	
Loligo vulgaris	30.55	76	0.65	
Diplodus bellottii	30.55	382	0.65	
Scomber japonicus	30.55	76	0.65	
Trichiurus lepturus	22.91	76	0.49	
Argyrosomus regius	4.36	5	0.09	
Total	4666.37		99.98	

PROJECT STATION: 761
 DATE: 21/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2150
 start stop duration Long W 1710
 TIME :16:17:02 16:33:21 16 (min) Purpose code: 1
 LOG :2086.14 2087.19 1.03 Area code : 3
 FDEPTH: 20 30 GearCond.code:
 BDEPTH: 60 55 Validity code:
 Towing dir: 9° Wire out: 80 m Speed: 40 kn*10
 Sorted: 20 Kg Total catch: 20.00 CATCH/HOUR: 75.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sarda sarda	75.00	23	100.00	
Total	75.00		100.00	

PROJECT STATION: 762
 DATE: 21/11/98 GEAR TYPE: BT No: 2 POSITION: Lat N 2150
 start stop duration Long W 1710
 TIME :17:08:45 17:39:36 31 (min) Purpose code: 1
 LOG :2088.70 2090.34 1.61 Area code : 3
 FDEPTH: 57 63 GearCond.code:
 BDEPTH: 57 63 Validity code:
 Towing dir: 270° Wire out: 240 m Speed: 30 kn*10
 Sorted: 41 Kg Total catch: 96.30 CATCH/HOUR: 186.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	149.03	515	79.96	1565
Trachurus trachurus	15.10	105	8.10	1566
Loligo vulgaris	10.84	122	5.82	
Epinephelus aeneus	6.77	2	3.63	
Zeus faber	4.65	4	2.49	
Total	186.39		100.00	

PROJECT STATION: 767
 DATE: 22/11/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2219
 start stop duration Long W 1643
 TIME :12:31:45 13:02:43 31 (min) Purpose code: 1
 LOG :2236.54 2238.43 1.88 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 35 30 Validity code:
 Towing dir: 225° Wire out: 200 m Speed: 40 kn*10
 Sorted: 55 Kg Total catch: 550.00 CATCH/HOUR: 1064.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	609.68	2226	57.27	1573
Trichiurus lepturus	454.84	832	42.73	
Total	1064.52		100.00	

PROJECT STATION: 768
 DATE:22/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2239
 start stop duration Long W 1653
 TIME :20:24:08 20:39:57 16 (min) Purpose code: 1
 LOG :2308.11 2309.02 0.90 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 56 57 Validity code:
 Towing dir: 290° Wire out: 130 m Speed: 30 kn*10

Sorted: 44 Kg Total catch: 589.01 CATCH/HOUR: 2208.79

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	1170.00	77100	52.97	1575
Sardina pilchardus	930.00	47400	42.10	1574
Trachurus trachurus	59.33	780	2.69	1576
Loligo vulgaris	21.38	75	0.97	
Allotheutis subulata	14.51	3000	0.66	
Loligo vulgaris	6.23	600	0.28	
Trichiurus lepturus	2.63	4	0.12	
Campogramma glaycos	2.25	4	0.10	
Sepia orbignyana	1.58	8	0.07	
Sepia officinalis hierredda	0.90	11	0.04	
Total	2208.81		100.00	

PROJECT STATION: 769
 DATE:22/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2234
 start stop duration Long W 1642
 TIME :23:01:26 23:19:07 18 (min) Purpose code: 1
 LOG :2325.28 2326.28 0.99 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 41 42 Validity code:
 Towing dir: 300° Wire out: 130 m Speed: 30 kn*10

Sorted: 96 Kg Total catch: 227.58 CATCH/HOUR: 758.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Spondyliosoma cantharus	660.00	1280	87.00	
Trichiurus lepturus	33.33	23	4.39	
Trachurus trecae	32.00	1173	4.22	1577
Loligo vulgaris	26.67	2400	3.52	
Engraulis encrasicolus	6.60	573	0.87	1578
Total	758.60		100.00	

PROJECT STATION: 770
 DATE:23/11/98 GEAR TYPE: PT No: 7 POSITION:Lat N 2232
 start stop duration Long W 1628
 TIME :01:37:50 02:08:53 31 (min) Purpose code: 1
 LOG :2343.94 2345.98 2.04 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 28 28 Validity code:
 Towing dir: 17° Wire out: 200 m Speed: 40 kn*10

Sorted: 52 Kg Total catch: 749.80 CATCH/HOUR: 1451.23

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trecae	650.32	5884	44.81	1580
Decapterus rhonchus	472.26	1719	32.54	1579
Engraulis encrasicolus	185.81	46452	12.80	1581
Stromateus fiatola	46.45	46	3.20	
Sardinella aurita	24.77	5048	1.71	1582
Sepia officinalis hierredda	23.23	31	1.60	
Pomadasys incisus	18.58	139	1.28	
Gymnura altavela	9.68	2	0.67	
Scorpaena stephanica	7.74	15	0.53	
Halobatrachus didactylus	5.42	12	0.37	
Diplodus bellottii	3.10	15	0.21	
Loligo vulgaris	3.10	15	0.21	
Sphoeroides spengleri	0.77	201	0.05	
Total	1451.23		99.98	

PROJECT STATION: 771
 DATE:23/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2250
 start stop duration Long W 1624
 TIME :11:32:25 12:05:32 33 (min) Purpose code: 1
 LOG :2433.97 2436.04 2.04 Area code : 3
 FDEPTH: 5 5 GearCond.code:
 BDEPTH: 32 34 Validity code:
 Towing dir: 290° Wire out: 180 m Speed: 40 kn*10

Sorted: 33 Kg Total catch: 80.95 CATCH/HOUR: 147.18

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Decapterus rhonchus	46.36	180	31.50	1583
Stromateus fiatola	31.09	65	21.12	
Trichiurus lepturus	23.64	35	16.06	
Orcynopsis unicolor	16.55	2	11.24	
Campogramma glaycos	10.36	22	7.04	
Diplodus puntazzo	6.55	11	4.45	
Scomberomorus tritor	5.09	2	3.46	
Sarda sarda	2.91	2	1.98	
Trachurus trecae	2.73	16	1.85	
Sardinella aurita	0.82	5	0.56	
Sarpa salpa	0.55	2	0.37	
Diplodus vulgaris	0.55	5	0.37	
Total	147.20		100.00	

PROJECT STATION: 772
 DATE:23/11/98 GEAR TYPE: PT No: 1 POSITION:Lat N 2324
 start stop duration Long W 1651
 TIME :19:51:29 20:21:36 30 (min) Purpose code: 1
 LOG :2502.53 2504.30 1.77 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 77 73 Validity code:
 Towing dir: 110° Wire out: 130 m Speed: 40 kn*10

Sorted: 39 Kg Total catch: 155.76 CATCH/HOUR: 311.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	176.00	9512	56.50	1584
Sardinella aurita	92.00	256	29.53	1585
Trachurus trecae	15.36	776	4.93	1586
Auxis thazard	12.48	24	4.01	
Loligo vulgaris	9.08	40	2.91	
Trachurus trachurus	3.30	112	1.06	
Scomber japonicus	3.28	8	1.05	
Total	311.50		99.99	

PROJECT STATION: 773
 DATE:23/11/98 GEAR TYPE: PT No: 7 POSITION:Lat N 2316
 start stop duration Long W 1628
 TIME :22:59:56 23:19:18 19 (min) Purpose code: 1
 LOG :2527.00 2528.31 1.30 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 30 29 Validity code:
 Towing dir: 110° Wire out: 120 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 90.91 CATCH/HOUR: 287.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	265.26	6262	92.40	1587
Engraulis encrasicolus	16.20	2605	5.64	1588
Loligo vulgaris	4.74	19	1.65	
Sardinella aurita	0.88	3	0.31	
Total	287.08		100.00	

PROJECT STATION: 774
 DATE:24/11/98 GEAR TYPE: PT No: 4 POSITION:Lat N 2330
 start stop duration Long W 1637
 TIME :05:00:00 05:30:00 30 (min) Purpose code: 1
 LOG :2579.00 2580.60 1.60 Area code : 3
 FDEPTH: 5 5 GearCond.code:
 BDEPTH: 40 40 Validity code:
 Towing dir: 115° Wire out: 160 m Speed: 4 kn*10

Sorted: 4 Kg Total catch: 4.37 CATCH/HOUR: 8.74

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	3.00	2	34.32	
Sardinella aurita	2.50	6	28.60	
Loligo vulgaris	1.30	2	14.87	
Pomadasys incisus	1.00	4	11.44	
Pagellus bellottii	0.60	4	6.86	
Chelidonichthys obscurus	0.20	2	2.29	
Trachinus armatus	0.14	2	1.60	
Total	8.74		99.98	

PROJECT STATION: 775
 DATE:24/11/98 GEAR TYPE: PT No: 12 POSITION:Lat N 2340
 start stop duration Long W 1636
 TIME :09:39:00 10:09:42 31 (min) Purpose code: 1
 LOG :2614.67 2616.07 1.36 Area code : 3
 FDEPTH: 52 52 GearCond.code:
 BDEPTH: 52 52 Validity code:
 Towing dir: 240° Wire out: 165 m Speed: 30 kn*10

Sorted: 16 Kg Total catch: 15.65 CATCH/HOUR: 30.29

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Raja mantagui	9.68	4	31.96	
Scyliorhinus canicula	4.26	10	14.06	
Diplodus vulgaris	4.06	12	13.40	
Umbrina canariensis	3.10	10	10.23	
Zeus faber	3.10	4	10.23	
Spondyliosoma cantharus	2.71	19	8.95	
Trachurus trecae	1.94	4	6.40	
Trachurus trachurus	0.58	4	1.91	
Pagellus bellottii	0.39	2	1.29	
Boops boops	0.29	2	0.96	
Trigla lyra	0.19	2	0.63	
Total	30.30		100.02	

PROJECT STATION: 776
 DATE:24/11/98 GEAR TYPE: PT No: 7 POSITION:Lat N 2324
 start stop duration Long W 1604
 TIME :14:49:52 15:21:49 32 (min) Purpose code: 1
 LOG :2656.36 2658.48 2.09 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 26 28 Validity code:
 Towing dir: 180° Wire out: 200 m Speed: 40 kn*10

Sorted: 10 Kg Total catch: 10.30 CATCH/HOUR: 19.31

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sarda sarda	7.50	5	36.94	
Raja mantagui	6.94	2	35.94	
Stromateus fiatola	4.88	4	25.27	
Total	19.32		100.15	

PROJECT STATION: 777
 DATE:24/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2352 Long W 1628
 start stop duration
 TIME :19:35:52 20:03:46 28 (min) Purpose code: 1
 LOG :2696.19 2697.87 1.65 Area code : 3
 FDEPTH: 15 15 GearCond.code:
 BDEPTH: 60 60 Validity code:
 Towing dir: 290° Wire out: 130 m Speed: 40 kn*10

Sorted: 14 Kg Total catch: 86.37 CATCH/HOUR: 185.08

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	102.21	4571	55.22	1589
Boops boops	57.86	21889	31.26	
Loligo vulgaris	7.50	19	4.05	
Trachurus trecae	7.33	289	3.96	
Trachurus trachurus	7.33	289	3.96	
Sardinella aurita	2.85	2	1.54	
Total	185.08		99.99	

PROJECT STATION: 778
 DATE:24/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2403 Long W 1648
 start stop duration
 TIME :22:44:06 22:59:12 15 (min) Purpose code: 1
 LOG :2720.25 2721.06 0.80 Area code : 3
 FDEPTH: 15 15 GearCond.code:
 BDEPTH: 575 598 Validity code:
 Towing dir: 18° Wire out: 130 m Speed: 40 kn*10

Sorted: 2 Kg Total catch: 46.15 CATCH/HOUR: 184.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
MYCTOPHIDAE	180.00	150352	97.51	
Sphyræna viridensis	3.00	60	1.63	
Todarodes sagittatus	1.60	80	0.87	
Total	184.60		100.01	

PROJECT STATION: 779
 DATE:25/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2411 Long W 1637
 start stop duration
 TIME :01:58:30 02:15:52 17 (min) Purpose code: 1
 LOG :2741.77 2742.79 1.00 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 105 103 Validity code:
 Towing dir: 180° Wire out: 180 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 105.24 CATCH/HOUR: 371.44

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	211.76	12325	57.01	1590
Trachurus trachurus	148.24	11400	39.91	1591
MYCTOPHIDAE	10.59		2.85	
Neaotus tripes	0.74	32	0.26	
Engraulis encrasicolus	0.11	11	0.03	
Total	371.44		100.00	

PROJECT STATION: 780
 DATE:25/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2404 Long W 1622
 start stop duration
 TIME :05:00:48 05:22:44 22 (min) Purpose code: 1
 LOG :2761.26 2762.74 1.47 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 67 67 Validity code:
 Towing dir: 180° Wire out: 180 m Speed: 40 kn*10

Sorted: 19 Kg Total catch: 19.06 CATCH/HOUR: 51.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	47.73	965	91.82	1592
Sardinella aurita	1.91	11	3.67	
Loligo vulgaris	1.64	3	3.16	
Scomber japonicus	0.68	3	1.31	
Trachurus trecae	0.03	5	0.06	
Total	51.99		100.02	

PROJECT STATION: 781
 DATE:25/11/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2353 Long W 1558
 start stop duration
 TIME :09:09:18 09:25:58 17 (min) Purpose code: 1
 LOG :2791.21 2792.34 1.10 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 26 29 Validity code:
 Towing dir: 230° Wire out: 120 m Speed: 40 kn*10

Sorted: Kg Total catch: 0.01 CATCH/HOUR: 0.04

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachurus trachurus	0.04	21	100.00	
Total	0.04		100.00	

PROJECT STATION: 782
 DATE:25/11/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2353 Long W 1558
 start stop duration
 TIME :10:19:17 10:21:54 33 (min) Purpose code: 1
 LOG :2797.12 2798.40 2.24 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 26 29 Validity code:
 Towing dir: 270° Wire out: 135 m Speed: 40 kn*10

Sorted: Kg Total catch: 0.43 CATCH/HOUR: 0.78

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	0.78	4	100.00	
Total	0.78		100.00	

PROJECT STATION: 783
 DATE:25/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2423 Long W 1616
 start stop duration
 TIME :22:41:08 23:10:36 29 (min) Purpose code:
 LOG :2898.33 2900.15 1.79 Area code :
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 68 65 Validity code:
 Towing dir: 116° Wire out: 130 m Speed: 40 kn*10

Sorted: 6 Kg Total catch: 45.70 CATCH/HOUR: 94.55

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	68.90	2847	72.87	1593
Trachurus trachurus	25.24	1647	26.69	1594
Engraulis encrasicolus	0.04	2	0.04	
Total	94.18		99.60	

PROJECT STATION: 784
 DATE:26/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2416 Long W 1556
 start stop duration
 TIME :01:30:44 01:48:30 18 (min) Purpose code: 1
 LOG :2918.83 2920.03 1.19 Area code : 3
 FDEPTH: 1 1 GearCond.code:
 BDEPTH: 38 36 Validity code:
 Towing dir: 160° Wire out: 180 m Speed: 40 kn*10

Sorted: Kg Total catch: 0.49 CATCH/HOUR: 1.63

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	0.63	10	38.65	
Pomadasys incisus	0.47	17	28.83	
Chelidonichthys obscurus	0.27	7	16.56	
Boops boops	0.17	3	10.43	
Trachinus draco	0.10	3	6.13	
Total	1.64		100.60	

PROJECT STATION: 785
 DATE:26/11/98 GEAR TYPE: BT No: 2 POSITION: Lat N 2410 Long W 1541
 start stop duration
 TIME :04:00:07 04:11:54 12 (min) Purpose code: 1
 LOG :2936.96 2937.65 0.69 Area code : 3
 FDEPTH: 23 24 GearCond.code:
 BDEPTH: 23 24 Validity code:
 Towing dir: 290° Wire out: 120 m Speed: 35 kn*10

Sorted: 29 Kg Total catch: 70.62 CATCH/HOUR: 353.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	333.75	8825	94.52	1595
Chelidonichthys obscurus	7.50	265	2.12	
Plectorhynchus mediterraneus	3.25	5	0.92	
Trachurus trachurus	2.40	65	0.68	
Scomber japonicus	2.25	5	0.64	
Boops boops	1.80	50	0.51	
Trachinus draco	1.50	50	0.42	
Monochirus hispidus	0.50	50	0.14	
Synchiropus phaeton	0.15	25	0.04	
Total	353.10		99.99	

PROJECT STATION: 786
 DATE:26/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2448 Long W 1602
 start stop duration
 TIME :20:00:18 20:00:49 29 (min) Purpose code: 1
 LOG :3093.91 3095.63 1.67 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 70 69 Validity code:
 Towing dir: 320° Wire out: 125 m Speed: 40 kn*10

Sorted: Kg Total catch: 0.16 CATCH/HOUR: 0.33

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachinus draco	0.19	2	57.58	
Sepiolla rondeleti	0.14	81	42.42	
Total	0.33		100.00	

PROJECT STATION: 787
 DATE:26/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2456 Long W 1610
 start stop duration
 TIME :22:41:33 23:08:24 27 (min) Purpose code: 1
 LOG :3105.53 3107.30 1.80 Area code : 3
 FDEPTH: 20 20 GearCond.code:
 BDEPTH: 95 56 Validity code:
 Towing dir: 18° Wire out: 72 m Speed: 40 kn*10

Sorted: 39 Kg Total catch: 112.43 CATCH/HOUR: 249.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	200.00	6587	80.05	1596
Trachurus trachurus	43.33	1967	17.34	1597
Scomber japonicus	3.84	33	1.54	1598
Loligo vulgaris	2.67	9	1.07	
Total	249.84		100.00	

PROJECT STATION: 788
 DATE: 27/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2458 Long W 1552
 start stop duration
 TIME :04:36:03 05:06:11 30 (min) Purpose code: 1
 LOG :3151.32 3153.55 2.22 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 70 71 Validity code:
 Towing dir: 180° Wire out: 150 m Speed: 40 kn*10
 Sorted: 1 Kg Total catch: 0.99 CATCH/HOUR: 1.98

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trachinus draco	1.08	14	54.55	
Sepia officinalis hierredda	0.90	4	45.45	
Total	1.98		100.00	

PROJECT STATION: 789
 DATE: 27/11/98 GEAR TYPE: BT No: 2 POSITION: Lat N 2457 Long W 1523
 start stop duration
 TIME :16:15:20 16:45:09 30 (min) Purpose code: 1
 LOG :3247.22 3248.71 1.46 Area code : 3
 FDEPTH: 41 41 GearCond.code:
 BDEPTH: 41 41 Validity code:
 Towing dir: * Wire out: 200 m Speed: 31 kn*10
 Sorted: 1 Kg Total catch: 1.26 CATCH/HOUR: 2.52

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Loligo vulgaris	0.74	4	29.37	
Coris julis	0.50	4	19.84	
Spondyliosema cantharus	0.36	2	14.29	
SPAPRO1	0.34	6	13.49	
Chelidonichthys obscurus	0.24	2	9.52	
Pagellus bellottii	0.24	2	9.52	
Boops boops	0.10	66	3.97	
Total	2.52		100.00	

PROJECT STATION: 790
 DATE: 28/11/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2515 Long W 1539
 start stop duration
 TIME :01:30:29 01:50:01 20 (min) Purpose code: 1
 LOG :3326.77 3328.01 1.24 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 93 95 Validity code:
 Towing dir: 295° Wire out: 160 m Speed: 40 kn*10
 Sorted: 65 Kg Total catch: 65.30 CATCH/HOUR: 195.90

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Caretta caretta	96.00	3	49.00	
Sardina pilchardus	58.50	2238	29.86	1599
Trachurus trachurus	37.50	2037	19.14	1600
Sromber japonicus	3.90	51	1.99	
Total	195.90		99.99	

PROJECT STATION: 791
 DATE: 28/11/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2419 Long W 1526
 start stop duration
 TIME :18:59:48 19:04:44 5 (min) Purpose code: 1
 LOG :3476.31 3476.63 0.31 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 22 22 Validity code:
 Towing dir: 92° Wire out: 120 m Speed: 40 kn*10
 Sorted: 39 Kg Total catch: 5000.00 CATCH/HOUR: 60000.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	5200.00	1180692	92.00	1601
Sardinella aurita	4800.00	44796	8.00	1602
Total	60000.00		100.00	

PROJECT STATION: 792
 DATE: 30/11/98 GEAR TYPE: BT No: 2 POSITION: Lat N 1510 Long W 1510
 start stop duration
 TIME :17:34:33 18:04:35 30 (min) Purpose code: 1
 LOG :3882.76 3884.30 1.53 Area code : 3
 FDEPTH: 182 187 GearCond.code:
 BDEPTH: 182 187 Validity code:
 Towing dir: 295° Wire out: 600 m Speed: 30 kn*10
 Sorted: 140 Kg Total catch: 140.00 CATCH/HOUR: 280.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Dentex macropthalmus	112.00	836	40.00	
Merluccius merluccius	40.00	68	14.29	
Trachurus trachurus	28.00	568	10.00	1603
Dentex maroccanus	27.00	188	9.64	
Zeus faber	27.00	26	5.64	
Lagocephalus laevis	26.00	32	9.29	
Allotheutis subulata	5.00	2000	1.79	
Lepidopus caudatus	3.60	4	1.29	
Mullus surmuletus	3.20	10	1.14	
Pagellus acarne	1.60	4	0.57	
Merluccius senegalensis	1.40	2	0.50	
Illex coindetii	1.00	6	0.36	
Umbrina cirrosa	0.80	2	0.29	
Apogon sp.	0.70	90	0.25	
Loligo vulgaris	0.60	2	0.21	
Zenopsis conchifer	0.50	4	0.18	
Macrorhamphosus scolopax	0.42	34	0.15	
Raja miraletus	0.40	2	0.14	
Chelidonichthys obscurus	0.40	2	0.14	
Total	279.62		99.87	

PROJECT STATION: 793
 DATE: 30/11/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2537 Long W 1444
 start stop duration
 TIME :22:48:31 23:17:45 29 (min) Purpose code: 1
 LOG :3920.01 3921.60 1.58 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 45 66 Validity code:
 Towing dir: 328° Wire out: 125 m Speed: 40 kn*10
 Sorted: 116 Kg Total catch: 115.66 CATCH/HOUR: 239.30

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Trichiurus lepturus	76.55	6	31.99	
Campogramma glaycos	68.28	70	28.53	
Lepidopus caudatus	43.45	25	18.16	
Sarda sarda	22.76	6	9.51	
Sardina pilchardus	17.59	294	7.35	1603
Engraulis encrasicolus	8.28	861	3.46	1604
Loligo vulgaris	1.66	4	0.69	
Sardinella aurita	0.58	4	0.24	
Allotheutis subulata	0.17	77	0.07	
Total	239.32		100.00	

PROJECT STATION: 794
 DATE: 1/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2630 Long W 1408
 start stop duration
 TIME :23:38:09 23:54:51 17 (min) Purpose code: 1
 LOG :4124.93 4126.00 1.08 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 33 32 Validity code:
 Towing dir: 320° Wire out: 110 m Speed: 40 kn*10
 Sorted: 12 Kg Total catch: 11.81 CATCH/HOUR: 41.68

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	22.24	402	53.36	1605
Trichiurus lepturus	11.29	11	27.09	
Loligo vulgaris	4.94	85	11.85	
Sarpa salpa	1.94	7	4.65	
Trachurus trachurus	0.71	18	1.70	
Boops boops	0.32	7	0.77	
Allotheutis africana	0.14	39	0.34	
Engraulis encrasicolus	0.07	18	0.17	
Total	41.65		99.93	

PROJECT STATION: 795
 DATE: 2/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2641 Long W 1340
 start stop duration
 TIME :07:10:36 07:22:31 12 (min) Purpose code: 1
 LOG :4189.49 4190.34 0.85 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 35 38 Validity code:
 Towing dir: 240° Wire out: 120 m Speed: 40 kn*10
 Sorted: 12 Kg Total catch: 11.64 CATCH/HOUR: 58.20

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	57.50	7270	98.80	1606
Sardina pilchardus	0.65	15	1.12	
Allotheutis subulata	0.05	5	0.09	
Total	58.20		100.01	

PROJECT STATION: 796
 DATE: 2/12/98 GEAR TYPE: BT No: 2 POSITION: Lat N 2650 Long W 1333
 start stop duration
 TIME :11:32:35 11:42:54 10 (min) Purpose code: 1
 LOG :4225.88 4226.44 0.54 Area code : 3
 FDEPTH: 33 34 GearCond.code:
 BDEPTH: 33 34 Validity code:
 Towing dir: 213° Wire out: 110 m Speed: 30 kn*10
 Sorted: 37 Kg Total catch: 1200.56 CATCH/HOUR: 7203.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	7200.00	207996	99.95	1608
Scomber japonicus	7.80	24	0.11	
Pomadasys incisus	1.56	6	0.02	
Total	7209.36		100.08	

PROJECT STATION: 797
 DATE: 2/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2721 Long W 1325
 start stop duration
 TIME :19:26:23 20:22:13 28 (min) Purpose code: 1
 LOG :4298.52 4300.23 1.68 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 36 44 Validity code:
 Towing dir: 350° Wire out: 120 m Speed: 40 kn*10
 Sorted: 3 Kg Total catch: 3.00 CATCH/HOUR: 6.43

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	5.36	75	87.36	1609
Allotheutis subulata	0.26	111	0.04	
Sardinella aurita	0.24	2	3.73	
Engraulis encrasicolus	0.02	2	0.31	
Total	5.88		100.44	

PROJECT STATION: 798
 DATE: 2/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2723 Long W 1329
 start stop duration
 TIME :21:52:39 21:59:03 6 (min) Purpose code: 1
 LOG :4307.54 4307.92 0.37 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 77 77 Validity code:
 Towing dir: 300° Wire out: 129 m Speed: 40 kn*10

Sorted: 5 Kg Total catch: 500.28 CATCH/HOUR: 5002.80

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	5000.00	219750	99.94	1610
Scomber japonicus	2.80	60	0.06	
Total	5002.80		100.00	

PROJECT STATION: 799
 DATE: 5/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 1320 Long W 1320
 start stop duration
 TIME :23:45:48 23:59:30 14 (min) Purpose code: 1
 LOG :4563.28 4564.11 0.82 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 42 46 Validity code:
 Towing dir: 320° Wire out: 120 m Speed: 40 kn*10

Sorted: 33 Kg Total catch: 662.00 CATCH/HOUR: 2837.14

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	2828.57	67170	99.70	1611
Scomber japonicus	8.57	86	0.30	
Total	2837.14		100.00	

PROJECT STATION: 800
 DATE: 6/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2742 Long W 1321
 start stop duration
 TIME :03:01:39 03:09:07 7 (min) Purpose code: 1
 LOG :4588.38 4588.81 0.43 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 81 77 Validity code:
 Towing dir: 114° Wire out: 160 m Speed: 40 kn*10

Sorted: 33 Kg Total catch: 1315.80 CATCH/HOUR: 11286.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	10909.71	586869	96.66	1612
Scomber japonicus	370.29	10971	3.28	1613
Engraulis encrasicolus	6.86	686	0.06	
Total	11286.86		100.00	

PROJECT STATION: 801
 DATE: 6/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2751 Long W 1318
 start stop duration
 TIME :05:57:18 06:19:10 22 (min) Purpose code: 1
 LOG :4612.29 4613.70 1.57 Area code : 3
 FDEPTH: 50 50 GearCond.code:
 BDEPTH: 86 87 Validity code:
 Towing dir: 280° Wire out: 120 m Speed: 30 kn*10

Sorted: 1 Kg Total catch: 0.90 CATCH/HOUR: 2.45

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Scomber japonicus	2.24	35	91.43	1614
Sardina pilchardus	0.22	5	8.98	
Total	2.46		100.41	

PROJECT STATION: 802
 DATE: 6/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2756 Long W 1308
 start stop duration
 TIME :09:51:32 10:16:18 25 (min) Purpose code: 1
 LOG :4639.77 4641.46 1.66 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 55 65 Validity code:
 Towing dir: 295° Wire out: 120 m Speed: 40 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 803
 DATE: 6/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 2800 Long W 1252
 start stop duration
 TIME :20:02:22 20:29:26 27 (min) Purpose code: 1
 LOG :4720.40 4722.46 2.02 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 44 47 Validity code:
 Towing dir: 280° Wire out: 125 m Speed: 40 kn*10

Sorted: 75 Kg Total catch: 75.47 CATCH/HOUR: 167.71

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	64.80	6407	38.64	1615
Scomber japonicus	38.71	204	23.08	1617
Sardina pilchardus	32.93	862	19.64	1616
Sarpa salpa	18.76	56	11.19	
Sepla officinalis hierredda	5.42	2	3.23	
Sphyrna tygaena	3.73	2	2.22	
Loligo vulgaris	2.36	20	1.41	
Trichiurus lepturus	0.98	2	0.58	
Belone svetovidovi	0.02	4	0.01	
Total	167.71		100.00	

PROJECT STATION: 804
 DATE: 7/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2811 Long W 1228
 start stop duration
 TIME :03:27:37 03:40:43 13 (min) Purpose code: 1
 LOG :4784.64 4785.37 0.72 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 53 53 Validity code:
 Towing dir: 168° Wire out: 120 m Speed: 40 kn*10

Sorted: 50 Kg Total catch: 50.07 CATCH/HOUR: 231.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	84.92	12323	36.75	1620
Sardina pilchardus	76.06	1902	32.91	1618
Scomber japonicus	69.46	1509	30.06	1619
Loligo vulgaris	0.65	5	0.28	
Total	231.09		100.00	

PROJECT STATION: 805
 DATE: 7/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2816 Long W 1206
 start stop duration
 TIME :13:32:19 13:46:03 14 (min) Purpose code: 1
 LOG :4883.75 4884.71 0.95 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 48 49 Validity code:
 Towing dir: 348° Wire out: 160 m Speed: 40 kn*10

Sorted: 15 Kg Total catch: 4000.00 CATCH/HOUR: 17142.86

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	17142.86	482434	100.00	1621
Total	17142.86		100.00	

PROJECT STATION: 806
 DATE: 7/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2817 Long W 1206
 start stop duration
 TIME :18:44:51 19:06:53 22 (min) Purpose code: 1
 LOG :4930.94 4932.46 1.51 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 50 50 Validity code:
 Towing dir: 250° Wire out: 135 m Speed: 40 kn*10

Sorted: 6 Kg Total catch: 150.64 CATCH/HOUR: 410.84

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	409.09	11915	99.57	1622
Scomber japonicus	1.09	16	0.27	1623
Loligo vulgaris	0.65	6	0.16	
Total	410.83		100.00	

PROJECT STATION: 807
 DATE: 8/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2827 Long W 1125
 start stop duration
 TIME :09:10:30 09:46:03 36 (min) Purpose code: 1
 LOG :5068.14 5070.46 2.18 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 22 34 Validity code:
 Towing dir: 25° Wire out: 120 m Speed: 40 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Total				

PROJECT STATION: 808
 DATE: 8/12/98 GEAR TYPE: BT No: 2 POSITION: Lat N 2843 Long W 1123
 start stop duration
 TIME :14:37:44 14:50:00 12 (min) Purpose code: 1
 LOG :5115.19 5115.80 0.62 Area code : 3
 FDEPTH: 73 73 GearCond.code:
 BDEPTH: 73 73 Validity code:
 Towing dir: 330° Wire out: 180 m Speed: 31 kn*10

Sorted: 40 Kg Total catch: 535.55 CATCH/HOUR: 2677.75

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Sardina pilchardus	1258.50	45185	47.00	1624
Scomber japonicus	715.50	12705	26.72	1625
Engraulis encrasicolus	178.50	13135	6.67	1626
Diplodus vulgaris	117.75	450	4.40	
Lepidopus caudatus	117.00	75	4.37	
Loligo vulgaris	111.75	900	4.17	
Pagellus acarne	53.25	225	1.99	
Pagellus erythrinus	51.75	75	1.93	
Chelidonichthys lucerna	30.00	75	1.12	
Dentex gibbosus	22.00	5	0.82	
Mullus surmuletus	13.50	75	0.50	
Trachurus trachurus	4.50	75	0.17	
Dentex macrophthalmus	3.75	75	0.14	
Total	2677.75		100.00	

PROJECT STATION: 809
 DATE: 9/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2851 Long W 1056
 start stop duration
 TIME :02:25:07 02:33:20 8 (min) Purpose code: 1
 LOG :5219.45 5219.93 0.47 Area code : 3
 FDEPTH: 1 1 GearCond.code:
 BDEPTH: 50 52 Validity code:
 Towing dir: 20° Wire out: 160 m Speed: 40 kn*10
 Sorted: 28 Kg Total catch: 279.10 CATCH/HOUR: 2093.25

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	1209.00	336975	57.76	1629
Sardina pilchardus	547.50	46223	26.16	1627
Auxis thazard	195.75	225	9.35	
Trachurus trachurus	91.50	6795	4.37	1628
Scomber japonicus	49.50	450	2.36	
Total	2093.25		100.00	

PROJECT STATION: 810
 DATE: 9/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2901 Long W 1059
 start stop duration
 TIME :05:58:28 06:20:32 22 (min) Purpose code: 1
 LOG :5252.02 5253.53 1.48 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 92 94 Validity code:
 Towing dir: 230° Wire out: 160 m Speed: 40 kn*10
 Sorted: 5 Kg Total catch: 5.17 CATCH/HOUR: 14.10

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Mola mola	8.56	3	60.71	
Loligo vulgaris	1.94	3	13.76	
Engraulis encrasicolus	1.42	106	10.07	1630
Allotheutis subulata	0.79	153	5.60	
Sardina pilchardus	0.65	11	4.61	
Illex coindetii	0.38	3	2.70	
Scomber japonicus	0.33	3	2.34	
Total	14.07		99.79	

PROJECT STATION: 811
 DATE: 9/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 2919 Long W 1025
 start stop duration
 TIME :16:57:30 17:19:41 22 (min) Purpose code: 1
 LOG :5398.84 5360.37 1.56 Area code : 3
 FDEPTH: 5 5 GearCond.code:
 BDEPTH: 47 43 Validity code:
 Towing dir: 134° Wire out: 160 m Speed: 40 kn*10
 Sorted: 40 Kg Total catch: 771.60 CATCH/HOUR: 3164.36

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	1914.55	379222	90.98	1631
Sardina pilchardus	185.45	6873	8.81	1632
Scomber japonicus	4.36	57	0.21	1633
Total	2104.36		100.00	

PROJECT STATION: 812
 DATE: 9/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2926 Long W 1013
 start stop duration
 TIME :22:37:31 22:55:47 18 (min) Purpose code: 1
 LOG :5412.04 5413.19 1.16 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 39 44 Validity code:
 Towing dir: 320° Wire out: 130 m Speed: 40 kn*10
 Sorted: 34 Kg Total catch: 68.10 CATCH/HOUR: 227.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	117.33	33647	51.69	1635
Sardina pilchardus	98.67	4883	43.47	1634
Scomber japonicus	6.90	107	3.04	
Loligo vulgaris	3.57	7	1.57	
Trachurus trachurus	0.50	33	0.22	
Total	226.97		99.99	

PROJECT STATION: 813
 DATE: 10/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 2948 Long W 953
 start stop duration
 TIME :04:47:37 05:04:29 17 (min) Purpose code: 1
 LOG :5468.80 5469.81 0.99 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 41 49 Validity code:
 Towing dir: 307° Wire out: 160 m Speed: 40 kn*10
 Sorted: 23 Kg Total catch: 23.26 CATCH/HOUR: 82.09

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	47.65	12706	58.05	1637
Sardina pilchardus	26.12	1249	31.82	1636
Sarpa salpa	7.41	18	9.03	
Boops boops	0.60	39	0.73	
Trachurus trachurus	0.32	25	0.39	1638
Total	82.10		100.02	

PROJECT STATION: 814
 DATE: 10/12/98 GEAR TYPE: BT No: 2 POSITION: Lat N 2959 Long W 950
 start stop duration
 TIME :08:52:20 09:33:53 42 (min) Purpose code: 1
 LOG :5506.24 5508.51 1.92 Area code : 3
 FDEPTH: 95 104 GearCond.code:
 BDEPTH: 95 104 Validity code:
 Towing dir: 310° Wire out: 320 m Speed: 30 kn*10
 Sorted: 58 Kg Total catch: 57.81 CATCH/HOUR: 82.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lepidopus caudatus	60.37	36	73.10	
Pagellus acarne	7.11	24	8.61	
Engraulis encrasicolus	2.86	234	3.46	1639
Allotheutis subulata	2.86	953	3.46	
Chelidonichthys lucerna	2.60	13	3.15	
Merluccius merluccius	2.37	37	2.87	
Loligo vulgaris	1.23	3	1.49	
Octopus vulgaris	0.86	1	1.04	
Spondyliosoma cantharus	0.83	1	1.00	
Illex coindetii	0.51	9	0.62	
Sardina pilchardus	0.46	11	0.56	
Parapenaeus longirostris	0.19	177	0.23	
Chelidonichthys obscurus	0.14	1	0.17	
Zeus faber	0.07	1	0.08	
Citharus linguatula	0.06	3	0.07	
Solea sp.	0.03	3	0.04	
OPHIDIIDAE	0.01	1	0.01	
Cepola sp.	0.01	1	0.01	
Total	82.57		99.97	

PROJECT STATION: 815
 DATE: 10/12/98 GEAR TYPE: BT No: 2 POSITION: Lat N 3030 Long W 942
 start stop duration
 TIME :17:17:21 17:33:56 17 (min) Purpose code: 1
 LOG :5584.16 5585.20 1.02 Area code : 3
 FDEPTH: 32 36 GearCond.code:
 BDEPTH: 32 36 Validity code:
 Towing dir: 155° Wire out: 140 m Speed: 35 kn*10
 Sorted: 36 Kg Total catch: 431.52 CATCH/HOUR: 1523.01

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	1387.48	472334	91.10	1640
Sardina pilchardus	88.94	6162	5.84	1641
Scomber japonicus	41.08	466	2.70	
Loligo vulgaris	4.24	42	0.28	
Trachurus trachurus	1.27	127	0.08	
Total	1523.01		100.00	

PROJECT STATION: 816
 DATE: 11/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 3043 Long W 1001
 start stop duration
 TIME :01:26:29 01:44:46 18 (min) Purpose code: 1
 LOG :5650.48 5651.61 1.13 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 92 88 Validity code:
 Towing dir: 116° Wire out: 160 m Speed: 40 kn*10
 Sorted: 37 Kg Total catch: 441.60 CATCH/HOUR: 1472.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	1464.00	279753	99.46	1642
Scomber japonicus	7.20	160	0.49	
Sardina pilchardus	0.80	40	0.05	
Total	1472.00		100.00	

PROJECT STATION: 817
 DATE: 11/12/98 GEAR TYPE: BT No: 2 POSITION: Lat N 3058 Long W 955
 start stop duration
 TIME :10:58:40 11:17:29 19 (min) Purpose code: 1
 LOG :5698.74 5699.67 0.92 Area code : 3
 FDEPTH: 75 75 GearCond.code:
 BDEPTH: 75 75 Validity code:
 Towing dir: 130° Wire out: 240 m Speed: 30 kn*10
 Sorted: 91 Kg Total catch: 91.07 CATCH/HOUR: 287.59

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Lepidopus caudatus	161.31	101	56.09	
Engraulis encrasicolus	75.54	11005	26.27	1645
Trachurus trachurus	6.36	25	5.69	1644
Merluccius merluccius	8.53	268	2.97	
Sardina pilchardus	7.89	395	2.74	1643
Parapenaeus longirostris	6.47	2277	2.25	
Chelidonichthys lucerna	2.91	9	1.01	
Trisopterus luscus	2.81	85	0.98	
Lepidopus caudatus	2.43	155	0.84	
Allotheutis subulata	1.77	325	0.62	
GOBIDAE	1.20	278	0.42	
Sepiella rondeleti	0.16	98	0.06	
Conger conger	0.06	3	0.02	
OPHIDIIDAE	0.06	3	0.02	
PORTUNIDAE	0.03	3	0.01	
Sepia sp.	0.03	3	0.01	
Citharus linguatula	0.03	3	0.01	
Total	287.59		100.01	

PROJECT STATION: 818
 DATE: 11/12/98 GEAR TYPE: BT No: 2 POSITION: Lat N 3108 Long W 953
 start stop duration
 TIME :15:39:45 16:06:08 26 (min) Purpose code: 1
 LOG :5740.64 5742.05 1.39 Area code : 3
 FDEPTH: 68 79 GearCond.code:
 BDEPTH: 68 79 Validity code:
 Towing dir: 270° Wire out: 240 m Speed: 31 kn*10

Sorted: 47 Kg Total catch: 171.72 CATCH/HOUR: 396.28

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	323.77	71862	81.70	1646
Sardina pilchardus	24.53	1569	6.19	1647
Merluccius merluccius	14.35	78	3.62	
Chelidonichthys lucerna	12.12	9	3.06	
Torpedo marmorata	5.61	2	1.42	
Allotheutis subulata	4.92	1029	1.24	
Trachurus trachurus	3.05	5	0.77	
Parapenaeus longirostris	2.42	888	0.61	
Pagellus acarne	2.28	5	0.58	
GOBIIDAE	1.38	358	0.35	
Trisopterus luscus	0.65	12	0.16	
Merluccius merluccius	0.46	69	0.12	
Solea vulgaris	0.23	2	0.06	
Trachurus trachurus	0.23	46	0.06	
Scomber japonicus	0.23	12	0.06	
Cepola sp.	0.12	2	0.03	
Total	396.35		100.03	

PROJECT STATION: 819
 DATE: 12/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 3148 Long W 957
 start stop duration
 TIME :04:27:22 04:40:17 13 (min) Purpose code: 1
 LOG :5858.07 5858.93 0.86 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 96 92 Validity code:
 Towing dir: 270° Wire out: 160 m Speed: 40 kn*10

Sorted: 37 Kg Total catch: 553.05 CATCH/HOUR: 2552.54

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	2400.92	304634	94.06	1648
Sardina pilchardus	146.08	9508	5.72	1649
Scomber japonicus	4.85	69	0.19	
Allotheutis subulata	0.69	69	0.03	
Total	2552.54		100.00	

PROJECT STATION: 820
 DATE: 12/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 3158 Long W 951
 start stop duration
 TIME :08:55:08 08:59:27 4 (min) Purpose code: 1
 LOG :5894.84 5895.11 0.26 Area code : 3
 FDEPTH: 50 90 GearCond.code:
 BDEPTH: 98 97 Validity code:
 Towing dir: 210° Wire out: 90 m Speed: 40 kn*10

Sorted: 35 Kg Total catch: 1234.44 CATCH/HOUR: 18516.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	18291.00	2215905	98.78	1650
Loligo vulgaris	84.00	1050	0.45	
Scomber japonicus	76.05	1575	0.41	
Sardina pilchardus	65.55	4200	0.35	
Total	18516.60		99.99	

PROJECT STATION: 821
 DATE: 13/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 3207 Long W 947
 start stop duration
 TIME :05:29:08 05:48:37 19 (min) Purpose code: 1
 LOG :6087.35 6088.78 1.42 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 89 84 Validity code:
 Towing dir: 162° Wire out: 160 m Speed: 40 kn*10

Sorted: 43 Kg Total catch: 143.06 CATCH/HOUR: 451.77

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	383.05	31131	84.79	1651
Lepidopus caudatus	54.88	41	12.15	
Scomber japonicus	11.46	111	2.54	
Sardina pilchardus	2.37	126	0.52	
Total	451.76		100.00	

PROJECT STATION: 822
 DATE: 13/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 3215 Long W 937
 start stop duration
 TIME :08:16:57 08:40:23 23 (min) Purpose code: 1
 LOG :6110.14 6111.72 1.58 Area code : 3
 FDEPTH: 30 30 GearCond.code:
 BDEPTH: 54 81 Validity code:
 Towing dir: 335° Wire out: 90 m Speed: 40 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 823
 DATE: 13/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 3209 Long W 944
 start stop duration
 TIME :10:45:22 11:08:00 23 (min) Purpose code: 1
 LOG :6128.38 6129.61 1.21 Area code : 3
 FDEPTH: 30 30 GearCond.code:
 BDEPTH: 74 72 Validity code:
 Towing dir: 45° Wire out: 110 m Speed: 30 kn*10

Sorted: 52 Kg Total catch: 898.30 CATCH/HOUR: 2343.39

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	2299.57	223524	98.13	1652
Mola mola	43.83	5	1.87	
Total	2343.40		100.00	

PROJECT STATION: 824
 DATE: 13/12/98 GEAR TYPE: PT No: 7 POSITION: Lat N 3236 Long W 914
 start stop duration
 TIME :18:12:11 18:41:52 30 (min) Purpose code: 1
 LOG :6193.54 6195.49 1.83 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 39 52 Validity code:
 Towing dir: 230° Wire out: 110 m Speed: 40 kn*10

Sorted: 25 Kg Total catch: 25.00 CATCH/HOUR: 50.00

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	42.68	5796	85.36	1653
Lepidopus caudatus	3.72	2	7.44	
Sardina pilchardus	2.20	52	4.40	1654
Scomber japonicus	0.92	8	1.84	
Sepiella rondeleti	0.24	190	0.48	
Loligo vulgaris	0.14	2	0.28	
Allotheutis subulata	0.06	12	0.12	
Trachurus trachurus	0.02	6	0.04	
Total	49.98		99.96	

PROJECT STATION: 825
 DATE: 14/12/98 GEAR TYPE: PT No: 4 POSITION: Lat N 3250 Long W 902
 start stop duration
 TIME :01:33:43 02:01:45 28 (min) Purpose code: 1
 LOG :6258.82 6260.92 2.09 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 74 92 Validity code:
 Towing dir: 315° Wire out: m Speed: kn*10

Sorted: 41 Kg Total catch: 95.14 CATCH/HOUR: 203.87

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	166.07	22164	78.52	1655
Lepidopus caudatus	28.24	19	13.85	
Sardina pilchardus	10.22	206	5.61	1656
Allotheutis subulata	3.95	1071	1.96	
Scomber japonicus	1.55	13	0.66	
Total	203.87		100.00	

PROJECT STATION: 827
 DATE: 15/12/98 GEAR TYPE: PT No: 1 POSITION: Lat N 3335 Long W 752
 start stop duration
 TIME :03:52:30 04:16:53 24 (min) Purpose code: 1
 LOG :6486.58 6488.17 1.58 Area code : 3
 FDEPTH: 10 10 GearCond.code:
 BDEPTH: 41 37 Validity code:
 Towing dir: 136° Wire out: 160 m Speed: 40 kn*10

Sorted: 21 Kg Total catch: 115.84 CATCH/HOUR: 289.60

SPECIES	CATCH/HOUR		% OF TOT. C	SAMP
	weight	numbers		
Engraulis encrasicolus	281.40	51873	97.17	1659
Lepidopus caudatus	4.30	3	1.48	
Sardina pilchardus	3.30	240	1.14	1660
Loligo vulgaris	0.60	15	0.21	
Total	289.60		100.00	

Annex III Instruments and fishing gear used

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

Transceiver-1 menu	Transducer depth	5.5 - 6.5 m
	Absorbtion coeff.	10 dB/km
	Pulse length	medium (1ms)
	Bandwidth	wide
	Max power	2000 Watt
	2-way beam angle	-21.0 dB
	SV transducer gain	27.48 dB
	TS transducer gain	27.72 dB
	Angle sensitivity	21.9
	3 dB beamwidth	6.8 dg
	Alongship offset	-0.05 dg
	Athwardship offset	0.14 dg
Display menu	Echogram	1
	Bottom range	12 m
	Bottom range start	10 m
	TVG	20 log R
	Sv colour min	-67 dB
	TS Colour minimum	-60 dB
Printer- menu	Range	0 - 50 or 0 -100 m and 100 - 350m
	TVG	20 log R
	Sv colour min	-62 dB
Bottom detection menu	Minimum level	-40 dB

A calibration experiment using a standard copper sphere, performed in Baia dos Elefantos 3 August 1998 gave the following results:

Sv Transducer gain 27.48 dB

Ts Transducer gain 27.72 dB

Hydrography

Conductivity, temperature, density and dissolved oxygen were sampled regularly at CTD stations with Seabird 911 + CTD sonde. The salinity is computed from the data on conductivity by the software retrieving data from the sensors.

Fishing gear

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