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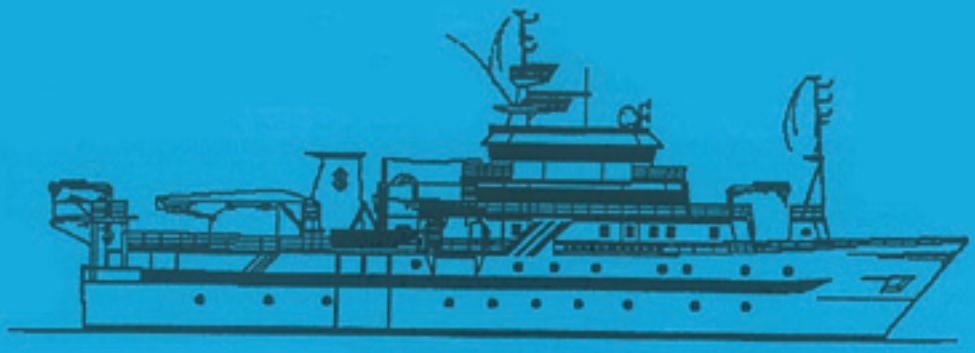
CRUISE REPORTS "DR FRIDTJOF NANSEN"



STUDIES OF SURVEY METHODOLOGY FOR HAKE

Cruise No 1/95 First version

16 January - 19 February 1995

Ministry of Fisheries & Marine Resources
Swakopmund
Republic of Namibia

Institute of Marine Research
Bergen
Norway

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CHAPTER 1 INTRODUCTION

1.1 OBJECTIVES

The investigations were planned in two parts:

Part I, 16 - 28 January
Trawling gear experiments central- and southern region

Part II, 28 January - 19 February
Intercalibration of trawls between vessels, central and southern region and RSA; other method studies

The set objectives were described as follows in the cruise plan:

"The main objective of the gear experiments under Part I is to study the effective fishing width of the standard bottom trawl for hake. Experiments will be made with different sweep lengths to study herding effects. Observations of possible escapement over the headline will be attempted. Required experimental conditions include reasonably good catch rates, good range of fish size and favorable bottom conditions. SCANMAR instruments will be used for monitoring and all catches will be measured and sampled. If a main part of the hake lifts from the bottom at night, target strength measurements will be attempted and "acoustic density" and "swept area density" compared. A further objective is to test and possibly calibrate the new type of otter board against the standard type. These tests must include different depths and other fishing conditions. Studies will also be made of the large mid water trawl fishing for pelagic hake.

Objectives under Part II include comparative fishing experiments between research vessels used in hake studies, "Dr. Fridtjof Nansen", "Welwitchia" and "Africana", to establish possible 'calibration factors'. The spare set of SCANMAR instruments of "Dr. Fridtjof Nansen" will be used by the other vessels. A further objective is a set of comparative fishing trials with a commercial monk trawler on a special monk ground to monitor its gear and compare catch rates. If time permits and favorable conditions are found, comparison of acoustic estimates of pelagic hake and swept area estimates will be continued. A further task is a brief study of the distribution, behaviour and abundance of pelagic 0-group hake."

1.2 PARTICIPATION

The scientific staff consisted of the following:

From Namibia:

Hashali Hamaukuaya, Michael Evenson,(16/1-3/2), Filimon Dausab (16/1-3/2), Sakesus Nakambunda (16/1-3/2), Johny Gamatham (4/2-18/2), Justina Shifidi (4/2-18/2) and Hilma Asino (4/2-18/2).

From Norway:

JohnW.Valdemarsen, (16-29/1), Gunnar Sætersdal, Helge Ullebust, Ingvald Svellingen, Jan Tore Øvredal, Reidar Pettersen.

From the Republic of South Africa: Chris Smith (16-29/2)

1.3 NARRATIVE

16 January	Departure Walvis Bay
29 January	Call on Lüderitz
3 February	Call on Walvis Bay
18 February	Arrival Walvis Bay

Figure 1 shows the location of the working areas and Table 1 lists some relevant information relating to the activities in each of these.

The work concerned with the performance of the trawl with different types of trawl doors and with different sweep lengths comprised a total of 65 hauls and was mainly done in Areas A and C where good catch rates of hake were obtained at different depths. The fish size on these grounds was small and medium at shallow depths and mainly large, > 50 cm at greater depths. Some final hauls in this series were made fishing deep water hake on the deep ground off Lüderitz.

The intercalibration experiments with "Africana" consisted of 12 paired hauls and gear geometry studies over three days, working in Area E south of the border.

The comparative fishing with the monk trawlers and measurements of their gear geometry included 33 hauls with our vessel, and the four days used in these activities were spent in Area F where the commercial trawlers were operating.

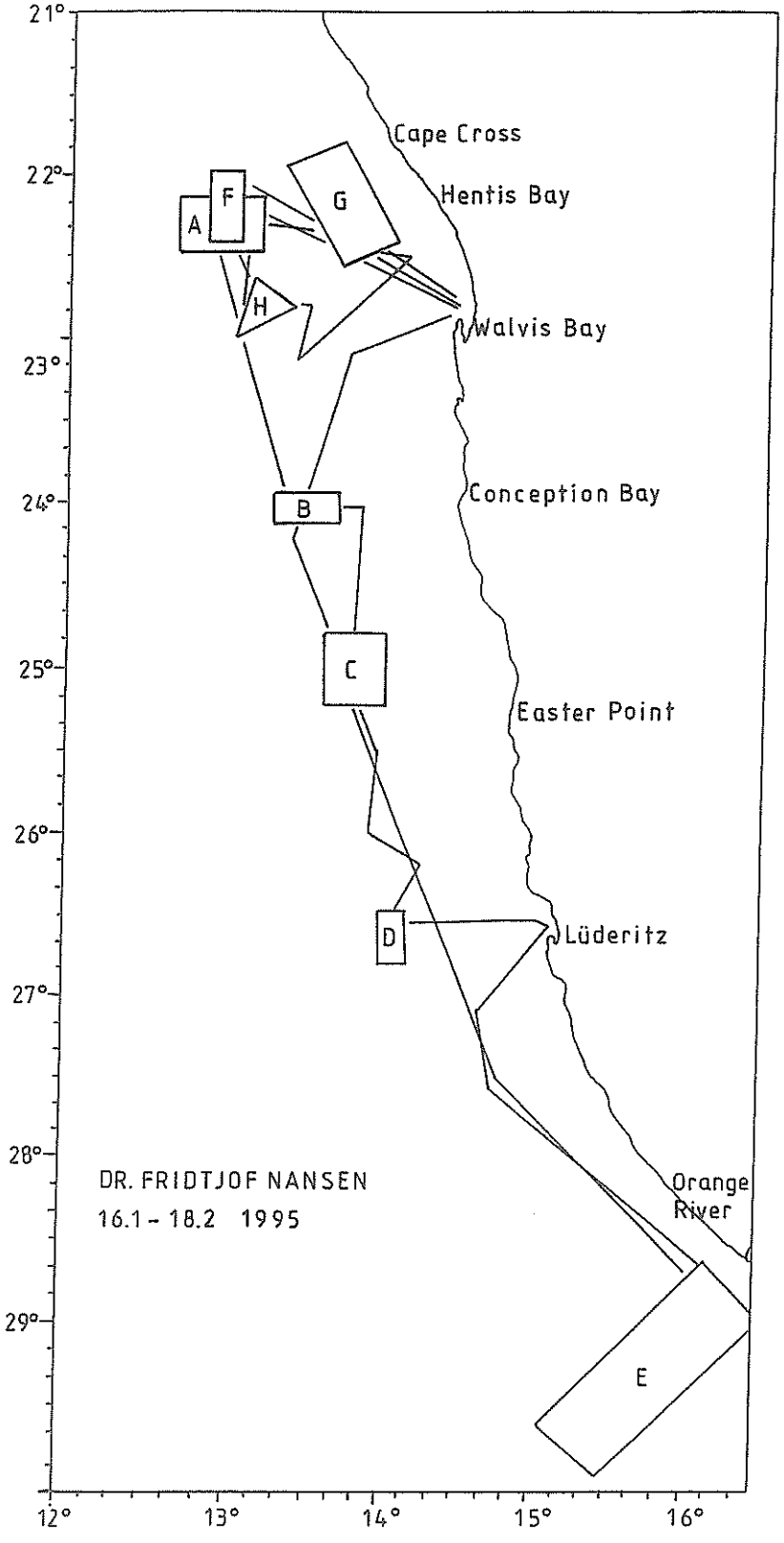


Figure 1 Location of the work areas

Table 1 Operational data by working areas.

Area A, northwest of Walvis Bay
22°10'-22°30'S; 12°49'-13°10'E
18/1-24/1, st. nos. 765-802, 38 hauls
Log 8670-9229

Mean catch rates by depth, kg/hour:

	290-310 m	320-339 m	340-360 m	450-460 m
No. hauls	17	11	5	4
Cape hake	637	1270	401	
Deep w. h.	28	58	148	262

Area B, west of Conception Bay
23°58'-24°05'S; 13°15'-13°42'E
24/1, st. nos. 805-808, 4 hauls

Catch rates, Cape hake:

180-370 kg/hour

Area C, west of Eastet Point
24°50'-25°15'S; 13°35'-14°00'E
25/1-27/1, st. nos. 810-829, 20 hauls
Log 9480-9740

Mean catch rates by depth, kg/hour:

	315-339 m	340-360 m	450-460 m
No. hauls	8	6	2
Cape hake	909	500	
Deep w. h.	27	508	552

Area D, west of Lüderitz
26°30'-26°50'S; 14°00'-14°10'E
28/1, st. nos. 830-832, 3 hauls

Mean catch rates 390 m:

Cape hake 114 kg/hour
Deep w. h. 1399 kg/hour

Area E, south of Orange River
30/1-1/2, st. nos. 833-844, 12 hauls
Log 139-467

Mean catch rates juvenile Cape hake, 77-108 m:

6 hauls: 942 m

Area F, northwest of Walvis Bay
22°00'-22°27'S; 12°50'-13°00'E
5/2-9/2, st. nos. 846-878, 33 hauls
Log 1040-1385

Mean catch rates by depth, kg/hour:

	305-325 m	328-341 m
No. hauls	17	11
Cape hake	756	1319

Area G, Henties Bay-Cape Cross
21°50'-22°35'S; 13°20'-14°00'E
10/2, st. nos. 882-884, 3hauls

Area H, westnorthwest of Walvis Bay
Around pos. 22°55'S 13°05'E
15/2-17/2, st. nos. 901-918, 17 hauls
Log 2090-2275

Mean catch rates by depth, kg/hour:

	280-300 m	310-370 m
No. hauls	6	11
Cape hake	229	557

A day and a night, 10 - 11 February was spent surveying the area off Henties Bay to Cape Cross in the 100-130 m depth range, Area G, for 0-group aggregations.

Intercalibration trials with "Welwitchia" were made in Area H, WNW of Walvis Bay and comprised 17 paired hauls with varying catch rates, low to good.

An attempt in the morning of 18 February to relocate the 0-grup hake off Henties Bay for target strength studies failed.

Some sets of hauls were made in Areas F and H to study possible effects of haul duration on catch rates of hake.

Logging of the performance of the bottom trawl, door distance, wing distance, headline height and clearance was frequently done for the two trawls, no.7 and no.8. Headline height and clearance was monitored visually on the screen in all hauls. Additional observations of the forward parts of the bottom trawl and the two pelagic trawls were made with the headline mounted sonar.

Throughout the cruise the acoustic system, EK500 38 kHz was operated in a manner adjusted to observe and record hake near the bottom and in mid water in the best possible way. The data were analysed on a daily basis with the Bergen Echo Integrator, (BEI) and the records are available in the files.

A number of experiments were made with the objective of measuring the target strength of sampled single fish distributions, both with the hull mounted transducer and with the TS sonde. Some of these trials conducted on small sized hake and on Myctophids seemed to give meaningful results.

CHAPTER 2 GEAR EXPERIMENTS "DR. FRIDTJOF NANSEN", TRAWL DOOR AND SWEEP LENGTH TRIALS. MONITORING OF GEAR GEOMETRY

(J.W. Valdemarsen, preliminary version)

Objectives

1. Study the performance and catching efficiency of the standard bottom trawl (Gisund super) rigged with two types of trawl door; 6 m^2 Waco doors and Thyborøn type 7,9 m^2 doors.

2. Compare efficiency for hake when the bottom trawls is rigged with different sweep length as a method to evaluate the fishing width of the bottom trawl.

Methods

Comparisons between the two door types were conducted as follows. Changing of door between hauls is very time consuming on board R/V "Dr. Fridtjof Nansen" (normally it will take 2 hours). Therefore a number of hauls with one set of doors were taken in different positions and in various depth during a day. The doors were changed in the evening and tested in the same position and depth the following day. To be certain that the comparative hauls were taken in same positions the Mac Sea GPS video plotter were actively utilized.

The trawl with Waco doors were rigged as for normal ground fish surveys. The rigging is illustrated in Figure 1.

When using the Thyborøn doors a 10 m PA rope was fasten between the trawl warps 125 m in front of the doors. This restraining technique had to be used because the doors otherwise will overspread the trawl. Some initial test were performed with the restraining strap in different lengths up the warp to find when the doors spread approximate 50 m which was said to be the spread with the Waco doors. Unfortunately we did not start the tests with the Waco doors, which later appeared to spread 55-56 m with warp length 3 times fishing depth and when towing at 3 knots. The comparisons were thus with the Thyborøn doors spreading 50 m and the Waco doors 55 m. The sweep angle with 50 m spread was calculated to 17^O based on simultaneous measuring of wing (21 m) and door spread. The calculated sweep angle with the Waco doors was approximately 19^O.

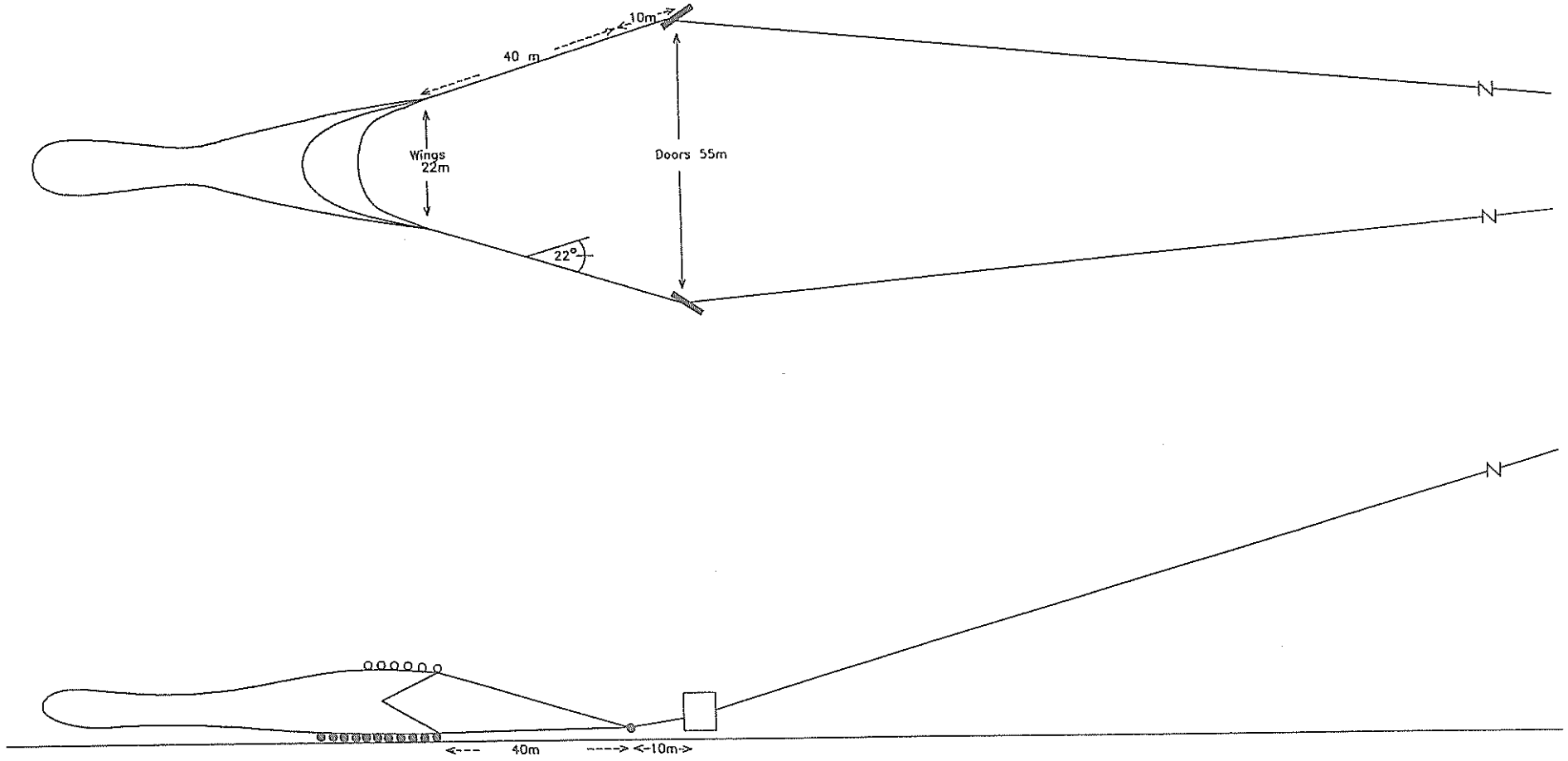


Figure 1 Waco Doors with 40 m sweeps

Three sets of comparisons were conducted during the first part of the cruise. 7 hauls with the Thyborøn doors 18 January were compared with 7 hauls with the Waco doors the following day. Two sets of hauls were compared the 20 January (Waco) and the 21 January (Thyborøn) and three sets the 25 January (Waco) and the 26 January (Thyborøn).

Geometric data (door spread, vertical height, clearance between fishing line and bottom) were recorded for every haul on PC. Distance towed was measured from the track plot on Mac Sea. This distance was also used to calculate average towing speed.

Results

The trawl performance rigged with the Thyborøn doors and 40 m sweeps was stable in all hauls. The door spread was to some extent effected by the towing pull. An increase in towing pull resulted in a slight increase in door spread. When door spread increased the vertical opening was reduced.

In depth shallower than 400 m it is recommended to use warp length that is 3.1 times fishing depth. In deeper water the ratio can be reduced to 3.

Comparable data for the two trawl doors for various depths, are shown in table 1.

Table 1. Gear performance data with Waco and Thyborøn doors rigged with 40 m sweeps and with strapping of the warps 125 m in front of the Thyborøn doors

Door type	Door spread	Wing spread	Vertical height
Waco	55-56 m	22 m	5 m (+0.3 m)
Thyborøn	50 m	21 m	5,3 m(+0,3 m)

Catch comparisons between the two door types are shown in table 2.

Table 2. Catch data from comparisons between Thyborøn (T) and Waco (W) doors

St.no. T/W	Depth (m)	Hake Kg/h	Monk Kg/h	Jacobe Kg/h	Kingclip Kg/h	Others Kg/h	Total Kg/h
763/770	97/297	788/496	27/22	118/114		137/130	1070/762
764/771	306/309	937/757	4/24	139/174	6/0	141/151	1227/1106
765/772	327/329	355/831	51/89	130/75		108/199	644/1194
766/773	298/297	663/748	9/36	89/49		103/549	864/1383
767/774	294/295	1008/524	2/27	173/114		184/451	1273/1116
768/775	297/297	1388/442	91/40	74/194		90/364	1643/1040
769/776	307/307	1012/1089	0/24	218/257		171/232	1401/1602
787/779	300/300	244/256	81/81	40/56	0/1	73/150	438/544
788/781	329/332	1645/926	5/72	999/594	35/52	306/253	2990/1897
817/810	332/330	564/1650	105/64	46/142	104/67	903/496	1722/2419
820/813	351/349	1351/1614	131/265	101/70	260/151	454/87	2063/1808
822/815	318/317	961/604	188/254	137/173	108/85	642/746	2036/1862
Aver.		910/828	58/83	189/168	43/30	278/318	1478/1428
% diff		+9,9	-30,1	+12,5	+30,2	-12,5	+3,3

Table 3 shows a preliminary analysis comparing results with 100 m and 40 m sweeps. The ratio of catch rates by weight and number of fish of different size classes are shown.

Table 3 Tests 100 m/40 m sweeps, January 1959. Cape- and deep water hakes.

Stat. no.	Depth m	Catch W/nm	Ratio W	Ratio no of fish		
				<40 cm	>40 cm	>50 cm
780/8IW	330	498/272	1.89	3.9	2.02	1.83
782/83W	350	289/168	1.70	1.3	1.85	1.53
786/87T	300	79/72	1.10	2.1	0.95	1.34
788/89T	330	484/251	1.94	2.2	1.94	1.85
790/91T	350	216/91	2.67	7.0	1.45	1.50
793/92T	460	131/73	1.79		1.24	1.06
795/94T	320	994/931	1.07	6.0	1.22	1.25
797/96T	305	178/288	0.62	0.47	0.74	1.21
799/98T	460	74/86	0.86		1.80	1.24
801/800W	325	566/334	1.70		1.67	1.36
802/800W	325	202/334	0.60	2.0	0.74	0.72
805/804W	305	80/125	0.64		0.79	0.80
806/807W	350	124/59	2.10		1.97	
811/810W	330	621/485	1.28	0.82	2.03	2.03
813/812W	350	475/224	3.45		2.63	2.62
815/814W	317	216/306	0.70	0.64	0.73	0.73
818/817T	334	704/565	1.25	0.98	1.92	1.78
819/820T	350	796/1351	0.59	0.27	0.64	0.64
821/820T	350	818/1351	0.61	0.32	0.70	0.53
825/824T	330	104/146	0.71	2.17	0.69	0.74
827/826T	500	106/255	0.41	0.25	0.41	0.84
Weighted mean				1.01	1.30	1.38

CHAPTER 3 TESTS OF EFFECT OF HAUL DURATION ON NOMINAL CATCH RATES OF CAPE HAKE

Since high by-catches of jellyfish represent at times a serious obstacle to effective trawl sampling of hake, it is of interest to see whether short trawls hauls would give biased catch rates compared with the usual 30 min hauls. In general it would not be desirable to reduce the towing time as this would be expected to increase the variance of the density estimates. High densities of jellyfish may, however, not only cause gear damage, but must also be expected to affect the catchability of the trawl through heavy clogging, reduced effective fishing width etc. in hauls of normal duration. The catchability may still be relatively unaffected in brief hauls.

Table 1 shows sets of hauls made in as far as possible the same positions with varying towing time. Attempts have been made to adjust for variations in fish availability between individual hauls by using, where available, the observed acoustic density in the 0-5 m channel. But even with this adjustment one must expect some random variation in catch rates.

Table 1 Comparative hauls of different duration in same positions.
Cape hake. n.a. - not available.

Haul no	Depth m	Duration min	Catch/nm kg	Acoust. dens.	Adjust. catch/nm	Ratios	
871	327	30	1189	15.0	1189		
872	327	15	524	10.4	756	0.6	
873	327	5	371	8.4	664	0.6	0.9
906	283	60	78	n.a.			
907	286	23	53	n.a.		0.7	
909	325	60	494	3.1	494		
910	320	10	432	n.a.		0.9	1.6
911	319	32	121	1.4	267	0.5	
913	324	30	80	2.3	80		
914	324	20	84	1.1	176	2.2	
916	365	30	145	4.7	145		
917	371	10	230	4.4	246	1.7	
918	370	10	265	5.0	249	1.7	

The results may be summarised as follows:

Shorter hauls had about same catch rates	:	2 cases
" " "	higher catch rates	:	4	"
" " "	lower " "	:	4	"

The overall mean ratio is 1.1. This indicates that there is either no bias in short hauls or a small increase of the catch rates. The latter would not be unexpected since the gear may fish during setting and heaving and the porportion of the time spent in these operations increases with decreasing towing time.

These tests were made on predominantly large sized hake in relatively deep water. One would expect less variation of catch rates in the more homogenuous distributions of smaller sized hake in shallow water on the inner shelf where the jellyfish bycatches are highest.

CHAPTER 4 COMPARATIVE FISHING EXPERIMENTS WITH OTHER VESSELS

The comparative fishing experiments with "Africana" and "Welwitchia" were intended to provide information on the geometry and the performance of the gears used by the research vessels in hake studies in the area in order to establish possible 'calibration factors'. The objective of the comparative fishing with the monk trawlers was to test the efficiency of "Dr. Fridtjof Nansen" 's trawl in catching monk and sole, compared with that of the commercial trawlers which was known to be higher.

The results of these trials provided also some information on hake behaviour in relation to capture by the trawl. These are discussed in part 5.2 of the report.

4.1 COMPARATIVE FISHING WITH "AFRICANA"

Description

"Dr. Fridtjof Nansen" arrived at the agreed position (28° 54'S and 16° 30'E) at 0730 hrs 30 January. We were invited to follow "Africana" in her survey programme of trawl sampling in randomly selected positions and oceanography and do parallel hauls where she fished.

Jan Øvredal was transferred to "Africana" with SCANMAR equipment and we did 5 hauls the first day on the inner shelf where there was smooth bottom and fair densities of small sized hake. During the night both vessels surveyed the next days positions. There was hard bottom with signs of coral spots, and we hit one spot in our first haul and cut the ground gear. Because of hard bottom we could only fish two of the day's selected positions. "Africana" has developed a technique of skipping her lighter gear over corrals and spikes, a type of fishing we could not master.

Following our proposal both vessels moved inshore the last day and we did four parallel hauls there with fair catches of small hake. "Africana" did one haul at about 100m depth during which we observed echo sounder records of fish in mid water in her wake and near her trawl, see description in Annex I part 4.

The geometry of the trawls was monitored during a number of the hauls, see samples Annex H part 4. The means of the observations were:

	Door spread	Wing spread	Headline height
"Dr. Fridtjof Nansen"	52 m	22 m*	5.5 m
"Africana"	108 m	28 m	1.8 m

Ratios: A/N 2.08 A/N 1.27 N/A 3.05 * previous observations

Hauls were 30 minutes, but speed differed between the vessels especially during the first two days, when "Africana" hauled at up to 4 knots. The trawl distance was measured from GPS data, but these data are only available for "Africana"'s hauls during the first day. In the estimates of catch per nm below it has been assumed that she had a speed of 3.5 knots the 2nd and 3rd day.

SCANMAR monitoring of bottom contact showed some irregularities in a few of the hauls of "Dr. Fridtjof Nansen" during the first day.

The following analysis is based on records of the data exchanged before parting.

Results

"Dr.Fridtjof Nansen"s data are available in the Namibia file N1 stations 833 through 844. Annex III part 4, summarizes the catch records for both vessels by weight of catch by species per 30 min and per nm.

The inner shelf 75-160 m may be analysed as one experimental area with relatively uniform conditions as regards hake size, range 10-39 cm, means 18.4-22.6 cm. On the outer shelf the hake was large, range 44-73 cm, means 49.6 and 55.9 (Nansen samples). The summarized data for the inner shelf stations are shown in Table 1.

Table 1. Inner shelf, catches by main species by stations (Nansen numbers) N: "Dr Fridtjof Nansen", A: "Africana". Kg/nm

St. no.	Hake		Gurnard		Sole		Elephant fish		Lobster	
	N	A	N	A	N	A	N	A	N	A
833	501	207	25.1	6.7	30.3	21.5	0	26.2	0	0.05
834	190	193	0.8	4.2	3.9	7.4	13.2	9.7	1.3	0.5
835	45	48	2.7	2.9		0	0.6			
836	260	236	0	7.7		0	9.3			
837	6	110	0	13.7		0	16.2			
841*	266	146	22.0	15.4	10.2	9.1	57.9	17.1	3.4	2.3
842*	240	203	26.1	29.7	17.6	12.0	34.7	8.6	1.5	4.1
843*	144	44	9.3	10.9	11.3	17.1	20.3	7.4	3.3	8.6
844*	371	375	41.7	44.6	24.4	3.4	168.0	109.0	99.7	24.6
SUM	2023	1562	127.7	155.8	97.7	70.5	294.1	204.1	109.2	40.2

Ratios N/A 1.30 A/N 1.22 N/A 1.39 N/A 1.44 N/A 2.72

* Trawl distance for "Africana" assumed = 1.75 nm

Adjusted to an equal distance between the trawl wings the ratios would be: Hake N/A 1.65; Gurnard A/N 0.96; Sole N/A 1.76; Elephant fish N/A 1.83; Lobster N/A 3.45.

The data for the two hauls on large sized hake on the outer shelf are shown in Table 2.

Table 2. Outer shelf. Catches by main species, kg/nm

St. no.	Hake		Elephant fish	
	N	A*	N	A*
839	6.4	12.6	4.5	5.7
840	58.6	205.1	27.9	64.0
SUM	65.0	217.7	32.4	69.7

Ratios A/N 3.35 A/N 2.15

* Trawl distance assumed = 1.75 nm

The adjusted ratios would here be: Hake A/N 2.63; Elephant fish A/N 1.69.

Discussion

The ratio N/A 1.60 for small hake is probably related to the difference in headline height of the two trawls and the vertical distribution of the hake in this area. In the innermost part of the experimental area echo recordings of hake above the bottom could be identified. Estimates of the mean integrator readings of hake in the depth strata above the bottom corresponding to the headline height of the two trawls during trawling at the stations in this area were as follows (units $m^2/nm^2/nm$):

Station	Integrator reading	
	0.2-2 m	0.2-5 m
833	160	228
834	71	131
841	24	85
842	17	60
843	8	35
844	61	134
Sum	341	673

Integrator readings from bottom channels should be adjusted for the blind zone, the pulse length and the integrator backstep. Thus adjusted the values are: 0.2-2 m 629; 0.2-5 m 902.

There is a high correlation between the integrator readings in the channel 0.2-5m and the catch/nm for the respective "Dr. Fridtjof Nansen" trawl stations. The integrator readings in the 0.2-2 m channel observed from the "Dr. Fridtjof Nansen" can only be expected to roughly reflect the availability of fish to "Africana". The ratio between the mean integrator readings in the two depth strata for these stations, 0.2-5 m/0.2-2 m is 1.43. The mean integrator reading of hake above the 5 m channel, nearly all within 10m from the bottom, added about 25%, which brings the ratio between fish availability in the ranges 0.2-10 m and 0.2-2 m close to 1.8.

The ratio between the mean catch rates per nm for the same stations is N/A 1.47 which adjusted to an equal wing spread is N/A 1.87. It thus seems that the difference found in the mean catch rate of juvenile hake for the two gears may be explained by the vertical distribution of the fish and the difference in headline height of the trawls. There may, however, also have been an effect of higher escapement of hake under the lighter ground gear of "Africana".

The catch ratios for gurnard adjusted to equal wing spread is close to 1, which indicates a near bottom distribution of this species. The relatively high N/A ratios for elephant fish, sole and lobster may be explained by the difference in the ground gear of the two trawls, with the rock

hopper gear of "Dr. Fridtjof Nansen" maintaining a closer bottom contact than the lighter gear used by "Africana".

A further tentative conclusion regarding these inner shelf hauls is that herding by the doors and the sweeps can not have been a typical behaviour for these fish sizes and species as there seems to be no evidence of effects of the considerable difference in door and sweep spread between the gears.

As only two hauls are available from the outer shelf, there is little basis for a discussion. There seems, however, to be a tendency for a reversal of the small sized hake ratio, "Africana"'s catch rates on the large hake are clearly higher than those of "Dr. Fridtjof Nansen". No acoustic records of hake above the bottom were made during trawling at station 840, and presumable the large hake stayed close to the bottom. It seems likely that "Africana"'s higher catch rates were due to her wider door and sweep width and that these were effective in herding the large sized hake.

4.2 COMPARATIVE FISHING WITH "WELWITCHIA"

Description

The vessels met on 11 February at 22°20'S; 13°00'E. The plan was to do the trials on the nearby ground where good catches of hake had been had by "Dr. Fridtjof Nansen" in the previous weeks comparative fishing with two commercial monk trawlers.

Hashali Hamukuaya and Øvredal were transferred in the morning of 12 February and hauls monitored by SCANMAR instruments were started. It appeared after some hauls that "Welwitchia"'s trawl had a low wingspread, 16-17 m compared with about 21-22 m of that of "Dr. Fridtjof Nansen" and her catch included relatively large amounts of bottom organisms such as swamps. In these first four hauls of the paired hauls, nos N 885-888 problems were also experienced with the gear operated by "Dr. Fridtjof Nansen" which seemed to have poor bottom contact. Hake catches were also low in the trial area. It was therefore decided to shift to another ground and in the afternoon another 4 paired hauls were made at approximately 22°47'S, 13°10E. "Welwitchia" tried here another set of trawl doors, but with largely unchanged wing spread. Another trawl, no. 8, was now operated by "Dr. Fridtjof Nansen" with improved performance. In view of the continued improper functioning of "Welwitchia"s gear it was decided to interrupt the trials and attempt to equip her with a spare set of "Dr. Fridtjof Nansen"'s larger trawl doors kept in a store in Walvis Bay.

"Welwitchia" returned equipped with Thyborøn doors in the evening of 14 February and work was resumed on the 15th with 5 paired hauls and continued on 16 February with a further 3 sets of hauls. Hake catches in this area were fair.

Results

Trawl geometry was monitored in some of the hauls of "Dr. Fridtjof Nansen" and in all of "Welwitchia"'s hauls. Mean results were:

	Wing spread	Headline hight
	m	m
"Dr. Fridtjof Nansen"	22	5.5
"Welwitchia" 12-13 Feb.	16-17	4.9-5.3
"Welwitchia" 15-16 Feb.	21	5.0

Monitoring of "Dr. Fridtjof Nansen"'s trawl no 8 at station 878 before the trials and st 915 after the trials showed a mean door distance of 52.6 m in both hauls, mean wing distances of 21.3 m and 21.5 m and headline hights of 4.9 m and 5.2 m respectively.

The warps of both vessels were strapped.

"Dr. Fridtjof Nansen"s hauls are available in the NANSIS N1 file stations no 885 - 908. The results are summarized in Table 3. Non of the gears functioned properly the first day. The mean catch rates for hake W 117 and N 109 were about the same. On 13/2 the mean rates were W 185 and N 322, which is explained by the limited wing spread of "Welwitchia"'s gear.

The gears of both vessels performed well during the two last days. There is an overall tendency for higher catch rates of "Welwitchia". The difference in catch rates in some of the hauls is surprising considering the proximity of the vessels during the hauls. The mean rates on 15/2 were W 428 and N 252; on 16/2 W 473 and N 574. There is not much difference if the two days are considered together and that may be a tentative conclusion. A considerably higher number of hauls would be needed to get more reliable results and the trials should include a wider range of depths to study possible vessel avoidance effects. The value of the SCANMAR monitoring of the gears, both for experiments and for routine survey hauls, was amply demonstrated.

Table 3 Summary of catch rates in paired hauls, kg/hr.

St. no.		Date	Hake		Total catch	
W	N		W	N	W	N
1	885	12/02	124	116	265	167
2	886	"	156	169	246	219
3	887	"	141	99	255	175
4	888	"	47	50	1046	86
5	890	13/02	109	168	731	299
6	891	"	287	714	915	1056
7	892	"	315	350	1013	890
8	893	"	28	56	277	76
10	901	15/02	351	255	710	695
11	902	"	688	298	1343	2372
12	903	"	658	272	1175	852
13	904	"	352	323	702	504
14	905	"	90	114	341	534
15	906	16/02	280	234	597	331
17	908	"	241	230	681	555
18	909	"	834	1469	1317	1859
20	911	"	538	363	1438	943

4.3 COMPARATIVE FISHING WITH MONK TRAWLERS

(All data from the monk trawlers and the analysis were provided by H. Hamaukuaya)

Description

We contacted the trawler UST 82 at the agreed position 22°05S' and 12°55'E on 5 February at 07 hrs. H. Hamukuaya and Øvredal were transferred, and after installation of the SCANMAR equipment we started trawling at 320 m. She shortened her first hauls to about 1 hour and we did at first 1/2 hour hauls, later also a few 1 hour hauls.

We worked with UST 82 for two days doing 12 hauls, one of these during the night, She had normally long tows, 6-7 hours. She used a tickler chain and we mounted tickler on one of our two available bottom trawls, and did comparative hauls. UST 82 parted for Walvis Bay early on 7 February.

Another trawler "Benguela Triumph" offered to cooperate and we did 6 hauls close to where she was fishing on 7 February. On 8 February Hamukuaya and Øvredal transferred to her for measurements of her trawl and for information on her system of catch recording, and we did 4 hauls close to her during that day, the last haul of 60 minutes duration.

Our fishing area during the period was between 22°05' and 22°25' S and 12°54' and 12°56'E, with depths ranging from 304 to 325 m.

Results

We logged UST 82's SCANMAR signals during the first part of her tows and those from the gear of "Benguela Triumph" just before our station no 869. Annex IV part 4 shows logged data from hauls by the two vessels. Mean observations were:

"UST 82"	
Door spread	50 m
Wing spread	22-23 m
Headline hight	1.1 m
Clearance	0

"Benguela Triumph"	
Wing spread	17 m
Headline height	1.3 m
Clearance	0

The main difference compared with "Dr. Fridtjof Nansen"s gear is the headline height which is about 1/5th, and "Benguela Triumph"s smaller wing spread.

Catch rates by "Dr. Fridtjof Nansen" in hauls with and without tickler chain.

Table 4 shows the catch rates of "Dr. Fridtjof Nansen" of the successful hauls with UST 82 on 5 and 6 February. Hauls no 857 and 858 were rejected as the trawl did not appear to function properly.

Table 4. Catch rates by main species in hauls with UST 82, 5-6 February , kg/hr.

ST.NO.	DEP.	Monk	Sole	Hake	Other
847	321	46.73	9.82	903.09	143.46
848	331	45.50	10.00	255.00	249.32
849	317	38.60	29.20	1014.40	196.34
850*	320	120.20	56.50	434.60	156.58
851*	314	172.10	100.90	121.80	719.96
852*	325	72.88	140.50	274.80	190.60
853	319	24.25	55.45	1346.10	480.40
854	316	18.00	32.70	1491.60	308.00
855*	315	161.10	61.10	966.80	450.00
856*	304	108.90	63.60	323.20	1157.00

* Trawl with tickler chain

Haul nos 853 and 856 had 60 minutes duration, the others 30minutes.

Mean catch rates with- and without tickler chain were as follows, kg/hr:

	Monk	Sole	Hake
With tickler chain	127.0	84.5	424
Without " "	31.4	27.4	1002

For the monk and sole the ratios are 4.0 and 3.1 respectively and the difference is apparent in all hauls, while the hake catches seem to vary randomly.

Table 5 shows the catch rates of "Dr. Fridtjof Nansen" for the hauls with and without tickler chain on 7 and 8 February when most of the time was spent fishing close to the trawler "Benguela Triumph".

Table 5. Catch rates by main species 7-8 February. Kg/hr.

ST.NO.	DEP.	Monk	Sole	Hake	Other
860*	340	158.92	1.00	1140.00	482.00
861	340	41.90	9.60	1419.30	1302.08
862*	314	53.40	97.10	884.20	353.94
863*	308	42.22	81.50	439.60	684.00
864	316	13.05	46.35	524.82	351.00
865*	305	92.50	51.20	600.40	666.00
866*	311	118.10	58.10	242.00	673.20
867	309	6.34	30.30	122.18	600.00
869*	327	84.70	9.40	2926.30	475.60
870*	313	121.00	32.80	2844.00	411.60
871	327	29.00	8.30	3328.50	210.00
874*	336	158.10	28.55	81.75	510.32

* Trawl with tickler chain

The ratio with/without tickler chain for monk at 340 m, hauls nos 860 and 861 was 3.8. For the comparable groups of hauls on 7 and 8 February respectively the mean catch rates were as follows:

	7 February (St 862-867)		
	Monk	Sole	Hake
With tickler chain, 4 haulse	64.5	72.0	541.6
Without tickler chain, 2 hauls	9.7	38.3	323.5

	8 February (st 869,870,871,874)		
	Monk	Sole	Hake
With tickler chain, 3 hauls	121.3	23.6	1950.7
With out tickler chain, 1 haul	29.0	8.3	3328.5

The ratios for monk were 6.6 and 4.2, and for sole 1.9 and 2.8, and as for the first group of hauls, these were also consistent in showing higher catch rates with use of tickler chain.

The averages of the three sets of observations of catch rates with and without tickler chain were:

Monk	4.9
Sole	2.6

Comparison with commercial trawlers

Only hauls with tickler chain were used for the comparison with the commercial trawler's catch rates shown below. For conversion to non tickler survey trawling the above means may be a guide. Since the commercial trawlers fished day and night normally with 6 hour hauls, the closest comparison that could be obtained is by days which ensures that the same grounds were fished. Annex V part 4 shows the estimated catch rates per nm of monk, sole and hake by dates for "Dr Fridtjof Nansen"s hauls with tickler and the corresponding rates for the UST 82 and "Benguela Triumph". The monk catches of the commercial trawlers were converted to round weight by a factor of 3.57 (established in samples on board the "Dr. Fridtjof Nansen") and the hake by 1.46 (sole 1).

Table 6 shows a summary of the data.

The UST82 had consistently higher monk catches than FN with a mean ratio of 1.9. For sole the mean ratio UST82/FN was 1.2. The comparison with BT was less consistent for monk and with

a ratio of only 1.15. For sole the ratio was 1.4. For hake the ratios FN/UST82 was 4.1 and FN/BT 5.4. The difference in the ratios for monk with the two vessels may partly be explained by the 1.3 times wider wing spread of the UST82 compared with the BT.

When considering rates in terms of catches per hours trawling the difference in mean trawling speed between the commercial vessels, about 2.5 knots and FN 3.0-3.2 knots should be taken into account. The mean ratio between the two commercial vessels and the survey vessel FN for monk of 1.5, would in terms of catch per hour be about 1.2, and that for sole of 1.3 would be close to 1.0.

Table 6 Comparison of mean catch rates of "Dr. Fridtjof Nansen" (FN), UST82 and "Benguela Triumph" (BT) in fishing on same ground on same dates. Round weight, kg/nm.

	No hauls	Monk	Sole	Hake
5 Febr. FN	2	46	25	90
UST82	4	100	34	30
6 Febr. FN	3	35	27	162
UST82	2	57	27	32
7 Febr. FN	4	27	25	176
BT	1	28	28	36
8 Febr. FN	3	40	8	650
BT	2	50	14	111

ANNEX I PART 4

Comments to the echodiagram of the experiment to study fish in mid-water in "AFRICANA"S wake and near the trawl.

The range used was 50 m, from 75 to 125 m. The expansion shows 0.2 to 5.0. The beam width is only 7 which made it difficult to locate the trawl.

The echodiagram shows fish in mid water, mostly as single fish echoes when we move. The target strength measurements indicate small sized fish corresponding to the size of the small hake caught.

Interpretation is difficult, but it seems that:

Fish density was higher before we entered the wake at log 459.2 and after we left at 461.4.

We recorded the trawl at 459.8 and 460.2. There was fish well above the recordings at 460.6 and 460.8 is unlikely to be the forward part, could possible be the cod end lifting up? There is plenty of fish close to these recordings which could indicate escapement over the headline.

A conclusion after at this shallow depth there is a vessel effect causing hake avoidance, but not to the extent that they all go to the bottom and are caught. They may go to the side and we had |high densities as we passed out of the wake on the port side at log 461.4. There are perhaps also indications of escapement over headline.

“Dr. Fridtjof Nansen” 1 February 1995

ANNEX II PART 4

Logging file from Africana Station no: A1793 114 2027					Height senso over Gear		
			St.No. Dr. Fr.Nansen :836				
time	Depth	Height	Clearance	Door dist.			
16:22	166	2.1	0.1	105			
16:23	166	1.9	0.1	105			
16:24	166	1.9	0.3	104			
16:25	166	1.9	0.2				
16:26	166	1.9	0.2				
16:27	166	1.9	0.1	103			
16:28	166	1.9	0.1	104			
16:29	166	1.9	0.2	104			
16:30	166	1.9	0.2	103			
16:31	166	1.9	0.2	103			
16:32	166	1.9	0.2	103			
16:33	166	1.9	0.2	103			
16:34	166	2	0.1	103			
16:35	166	1.9	0.1	106			
16:36	166	1.9	0.1				
16:37	166	1.9	0.1	108			
16:38	166	1.9	0.1	109			
16:39	166	1.8	0.2	108			
16:40	166	1.8	0.2	107			
16:41	166	1.8	0.2				
16:42	166	1.8	0.3				
average:		1.895238	0.166667	104.875			

Scanmar logging file from Africana Station no:A17194 1					15 2025
	Height sensor on the headline				
	St.No. Dr.Fr. Nansen:837				
Time	Depth	Height	clearance	Wing dist	Height+cl
	173	1.8	0.1	27.3	1.9
	173	1.8	0		1.8
	173	1.7	0	28.9	1.7
	173	1.8	0	28.3	1.8
	173	1.8	0	27.9	1.8
	173	1.7	0	27.7	1.7
	173	1.7	0.4		2.1
	173	1.8	0.2	27.7	2
	173	1.8	0.2	27.4	2
	173	1.7	0.3	27.7	2
Average:		1.76	0.12	27.8625	1.88

Time:	Door dist.	Clearance	Height	
19:24:43	51.7	0.4	5.7	
19:25:03	51.9	0.3	5.7	
19:25:23	51.9	0.2	5.8	
19:25:43	51.8	0.1	5.8	
19:26:03	51.9	0.1	5.8	
19:26:23	52.2	0.2	5.7	
19:26:43	52.2	0.4	5.6	
19:27:03	52.2	0.2	5.7	
19:27:23	52.1	0.4	5.6	
19:27:43	52.1	0.2	5.7	
19:28:03	52.3	0.1	5.7	
19:28:23	52.3	0.4	5.6	
19:28:43	52.2	0.2	5.7	
19:29:03	52	0.3	5.7	
19:29:23	52.1	0.2	5.6	
19:29:43	52	0.1	5.6	
19:30:03	51.9	-0.1	5.6	
19:30:23	52.2	0.1	5.6	
19:30:43	52	0.2	5.6	
19:31:03	51.9	0.1	5.7	
19:31:23	52	0	5.6	
19:31:43	52.1	0.4	5.6	
19:32:03	52	1.1	5.6	
19:32:23	52.1	0.6	5.6	
19:32:43	52	0.3	5.6	
19:33:03	51.7	0.4	5.6	
19:33:23	51.7	0.1	5.6	
19:33:43	51.7	0.1	5.6	
19:34:03	51.6	0.2	5.6	
19:34:23	51.8	0.5	5.6	
19:34:43	51.9	0.4	5.6	
19:35:03	52	0.3	5.6	
19:35:23	51.9	0.4	5.6	
19:35:43	51.8	0.3	5.6	
19:36:03	51.9	0	5.6	
19:36:23	52	0	5.6	
19:36:43	52.1	0.5	5.6	
19:37:03	52.1	0.2	5.7	
19:37:23	52.2	0.4	5.6	
19:37:43	52.3	-0.4	5.7	
19:38:03	52.2	-0.3	5.7	
19:38:23	52.2	-0.1	5.7	
19:38:43	52.4	0.1	5.6	
19:39:03	52.3	0	5.6	
19:39:23	52	0.2	5.6	
19:39:38	51.9	0.1	5.6	
19:39:42	51.9	0.1	5.6	
Average:	52.01489	0.212766	5.640426	
Scanmar logging Dr.Fr.Nansen station nr. 837				

ANNEX III PART 4

ART	NANSEN			AFRICANA		
STA.NR:833	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	876	1.75	500.57	403	1.95	206.67
Chelidonichtthys cap.	44	1.75	25.14	52	1.95	26.67
Austroglossus ( )	53	1.75	30.29	42	1.95	21.54
Callorhinchus cap.			#DIV/0!	51	1.95	26.15
Genypeterus cap.	37.5	1.75	21.43	21	1.95	10.77
Lophius vom.			#DIV/0!	0.117	1.95	0.06
Jasus lalandii			#DIV/0!	0.091	1.95	0.05
			#DIV/0!			#DIV/0!
TOTAL	998	1.75	577.23	591	1.95	303.05

ART	NANSEN			AFRICANA		
STA.NR:834	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	333	1.75	190.29	366	1.9	192.63
Chelidonichtthys cap.	1.47	1.75	0.84	8	1.9	4.21
Austroglossus ( )	6.8	1.75	3.89	14	1.9	7.37
Callorhinchus cap.	23.15	1.75	13.23	18.5	1.9	9.74
Genypeterus cap.			#DIV/0!	7	1.9	3.68
Lophius vom.			#DIV/0!			#DIV/0!
Jasus lalandii	2.3	1.75	1.31	0.98	1.9	0.52
			#DIV/0!			#DIV/0!
TOTAL	407	1.75	232.57	515	1.9	265.79

ART	NANSEN			AFRICANA		
STA.NR:835	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	58	1.3	44.62	85	1.75	48.57
Chelidonichtthys cap.	3.5	1.3	2.69	5	1.75	2.86
Austroglossus ( )						#DIV/0!
Callorhinchus cap.			#DIV/0!	1	1.75	0.57
Genypeterus cap.	2.7	1.3	2.08	0.4	1.75	0.23
Lophius vom.	13.8	1.3	10.62	19.5	1.75	11.14
Jasus lalandii			#DIV/0!			#DIV/0!
			#DIV/0!			#DIV/0!
TOTAL	93.8	1.3	72.15	170	1.75	97.14

ART	NANSEN			AFRICANA		
STA.NR:836	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	442.5	1.7	260.29	431	1.83	235.52
Chelidonichtthys cap.			#DIV/0!	14	1.83	7.65
Austroglossus ( )			#DIV/0!			#DIV/0!
Callorhinchus cap.			#DIV/0!	17	1.83	9.29
Genypeterus cap.			#DIV/0!	2	1.83	1.09
Lophius vom.			#DIV/0!	6	1.83	3.28
Jasus lalandii			#DIV/0!			#DIV/0!
			#DIV/0!			#DIV/0!
TOTAL	498.6	1.7	293.41	510	1.83	275.69

ART	NANSEN			AFRICANA		
STA.NR:837	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	10.65	1.8	5.92	224	2.04	109.80
Chelidonichtthys cap.			#DIV/0!	28	2.04	13.73
Austroglossus ( )			#DIV/0!			#DIV/0!

Callorhinchus cap.			#DIV/0!	33	2.04	16.18
Genypeterus cap.			#DIV/0!	2	2.04	0.98
Lophius vom.			#DIV/0!	1.7	2.04	0.83
Jasus lalandii			#DIV/0!			#DIV/0!
			#DIV/0!			#DIV/0!
TOTAL	23.16	1.8	12.87	354	2.04	173.53

ART	**NANSEN**			**AFRICANA**		
STA.NR:838	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis				141		
Chelidonichtthys cap.				55		
Austroglossus ( )	REV TRÅL					
Callorhinchus cap.				2		
Genypeterus cap.				3		
Lophius vom.				18		
Jasus lalandii						
Emmelichthys nitidus				572		
TOTAL				950		

ART	**NANSEN**			**AFRICANA**		
STA.NR:839	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	9.35	1.47	6.36	22	1.75	12.57
Chelidonichtthys cap.	6.6	1.47	4.49	10	1.75	5.71
Austroglossus ( )			#DIV/0!			#DIV/0!
Callorhinchus cap.			#DIV/0!			#DIV/0!
Genypeterus cap.			#DIV/0!			#DIV/0!
Lophius vom.	0.78	1.47	0.53			#DIV/0!
Jasus lalandii			#DIV/0!			#DIV/0!
			#DIV/0!			#DIV/0!
TOTAL	67.3	1.47	45.78	231.8	1.75	132.46

ART	**NANSEN**			**AFRICANA**		
STA.NR:840	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	82.1	1.4	58.64	359	1.75	205.14
Chelidonichtthys cap.	39.1	1.4	27.93	112	1.75	64.00
Austroglossus ( )	1.23	1.4	0.88	0.141	1.75	0.08
Callorhinchus cap.			#DIV/0!			#DIV/0!
Genypeterus cap.			#DIV/0!	0.257	1.75	0.15
Lophius vom.	23.3	1.4	16.64	84	1.75	48.00
Jasus lalandii			#DIV/0!			#DIV/0!
			#DIV/0!			#DIV/0!
TOTAL	194	1.4	138.57	892	1.75	509.71

ART	**NANSEN**			**AFRICANA**		
STA.NR:841	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	453	1.7	266.47	255	1.75	145.71
Chelidonichtthys cap.	37.4	1.7	22.00	27	1.75	15.43
Austroglossus ( )	17.4	1.7	10.24	16	1.75	9.14
Callorhinchus cap.	98.5	1.7	57.94	30	1.75	17.14
Genypeterus cap.	1	1.7	0.59			#DIV/0!
Lophius vom.	1	1.7	0.59			#DIV/0!
Jasus lalandii	5.7	1.7	3.35	4.1	1.75	2.34
			#DIV/0!			#DIV/0!

TOTAL	761	1.7	447.65	333	1.75	190.29

ART	NANSEN			AFRICANA		
STA.NR:842	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	371.4	1.55	239.61	355	1.75	202.86
Chelidonichtthys cap.	40.5	1.55	26.13	52	1.75	29.71
Austroglossus ( )	27.3	1.55	17.61	21	1.75	12.00
Callorhinchus cap.	53.8	1.55	34.71	15	1.75	8.57
Genypeterus cap.			#DIV/0!			#DIV/0!
Lophius vom.			#DIV/0!			#DIV/0!
Jasus lalandii	2.25	1.55	1.45	7.1	1.75	4.06
			#DIV/0!			#DIV/0!
TOTAL	551	1.55	355.48	484	1.75	276.57

ART	NANSEN			AFRICANA		
STA.NR:843	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	231	1.6	144.38	77	1.75	44.00
Chelidonichtthys cap.	14.8	1.6	9.25	19	1.75	10.86
Austroglossus ( )	18.1	1.6	11.31	30	1.75	17.14
Callorhinchus cap.	32.5	1.6	20.31	13	1.75	7.43
Genypeterus cap.			#DIV/0!	2	1.75	1.14
Lophius vom.			#DIV/0!			#DIV/0!
Jasus lalandii	5.3	1.6	3.31	15	1.75	8.57
			#DIV/0!			#DIV/0!
TOTAL	429.6	1.6	268.50	223.7	1.75	127.83

ART	NANSEN			AFRICANA		
STA.NR:844	V/30min.	Dist.	V/nm	V/30min.	Dist.	V/nm
Merluccius capensis	557	1.5	371.33	657	1.75	375.43
Chelidonichtthys cap.	62.5	1.5	41.67	78	1.75	44.57
Austroglossus ( )	36.6	1.5	24.40	6	1.75	3.43
Callorhinchus cap.	252	1.5	168.00	191	1.75	109.14
Genypeterus cap.	10.5	1.5	7.00	0.141	1.75	0.08
Lophius vom.			#DIV/0!			#DIV/0!
Jasus lalandii	149.5	1.5	99.67	43	1.75	24.57
			#DIV/0!			#DIV/0!
TOTAL	1118.5	1.5	745.67	1004	1.75	575.71

ANNEX IV PART 4

Scanmar meaasurement from monk-trawler UST-82 st.no. 3					
Height sensor on the headline					
St.no. Dr.Fr. Nansen 849					
Time	Depth	Height	Clearance	Wing dist.	
15:08	332	1	0	22.4	
15:09	332	1	0	22.4	
15:10	331	1	0	22.3	
15:11	331	1.1	0	22.4	
15:12	332	1.1	0	22.3	
15:13	331	1.1	0	22.1	
15:14	331	1.1	0	22	
15:15	331	1.1	0	21.8	
15:16	331	1.1	0	22.2	
15:17	331	1.1	0	21.4	
15:18	331	1.1	0	21.8	
15:19	331	1.1	0	21.3	
15:20	331	1.1	0	21.2	
15:21	331	1.1	0	21.2	
15:22	331	1.1	0	21.2	
15:23	331	1.1	0	20.7	
15:24	331	1.1	0	20.7	
15:25	330	1.1	0	21.3	
15:26	330	1.1	0	21.4	
15:27	330	1.1	0	21.4	
15:28	330	1.1	0	21.4	
15:29	330	1.1	0	21.2	
15:30	330	1.2	0	21.3	
15:31	330	1.1	0	21.3	
15:32	330	1.1	0	21.1	
15:33	330	1.1	0	21.1	
Average:	330.7692	1.092308	0	21.57308	

Time	Depth	Wing dist.	height	Clearance
08:50	318	17.5	1.2	0
08:51	318	17.3	1.2	0
08:53	318	17.3	1.2	0
08:56	318	17.2	1.2	0
08:58	318	17.3	1.2	0
09:03	319	17.2	1.3	0
09:06	319	16.9	1.3	0
09:08	319	16.8	1.3	0
09:10	319	16.9	1.2	0
09:12	319	17	1.3	0
09:14	319	17.1	1.3	0
09:18	319	17	1.3	0
09:21	318	16.5	1.2	0
09:24	318	16.8		0
09:32	320	16.7	1.3	0
09:38	321	16.9	1.4	0
Average:	318.75	17.025	1.26	
Scanmar data logged on monktrawler Benguel Triumph				

ANNEX V PART 4

Catch rates in comarative trawling experiments between "Dr. Fridtjof Nansen" and the commercial trawlers UST82 and "Benguela Triumph".

Table 1. Catch rates of "Dr. Fridtjof Nansen" fishing near UST82, 5-6 February 1995. Hauls wity tickler chain only.

St #	Monk		Sole		Hake		
850	Kg/nm	Kg/hr	Kg/nm	Kg/hr	Kg/nm	Kg/hr	Date
	39.00	120.20	18.30	56.5	141.00	434.60	05/02
851	53.80	172.10	31.50	100.9	38.00	121.80	05/02
	46.40	146.15	24.90	78.70	89.50	278.20	
852	22.80	72.88	43.90	140.5	86.00	274.80	06/02
855	50.30	161.10	19.10	61.1	302.00	966.80	06/02
856	33.00	108.90	19.30	63.6	98.00	323.20	06/02
	35.37	114.29	27.43	88.40	162.00	521.60	

Table 2. Catch rates of "Dr. Fridtjof Nansen" fishing near "Benguela Triumph" 7-9 February 1995. Hauls with tickler chain only.

St #	Monk		Sole		Hake		
862	Kg/nm	Kg/hr	Kg/nm	Kg/hr	Kg/nm	Kg/hr	Date
	15.7	53.4	28.56	97.1	260.10	884.2	07/02
863	15.08	42.22	29.11	81.5	157.00	439.6	07/02
865	28.91	92.5	16.00	51.2	187.6	600.40	07/02
866	49.21	118.1	24.21	58.1	100.83	242.00	07/02
Mean	27.23	76.56	24.47	71.98	176.38	541.55	
869	28.20	84.7	3.13	9.4	975.43	2926.3	08/02
870	40.33	121.0	10.93	32.8	948.00	2844.00	08/02
874	51.00	158.1	9.21	28.55	26.37	81.75	
Mean	39.84	119.52	9.21	7.75	23.25	650.00	08/02

Table 3. Catch rates of UST82 5-6 February 1995. Converted to round weight.

Trawl#	Monk	Sole	Hake	Date
1	71.2	40	58	05/02/95
2	142.4	20	29	05/02/95
3	142.4	40	18	05/02/95
4	43.4	38.1	29.60	05/02/95
Mean	99.85	34.53	15	
5	57	26.7	49	06/02/95
6	57	26.7	31.65	06/02/95
Mean	57	26.7		

Table 4. Catch rates of "Benguela Triumph" 3-9 February 1995. Convertrd to round weight.

Trawl#	Monk	Sole	Hake	Date
1	34.3	29.2	12	03/02/95*
2	36.8	34.7	22	04/02/95*
3	37	32.6	30	06/02/95*
4	27.7	28.2	36	07/02/95
5	38.0	24.7	19	08/02/95
6	61.9	3.5	203	08/02/95
Mean	49.95	14.1	111.1	

*records of catches prior to the arrival of "Dr. Fridtjof Nansen" in the area

CHAPTER 5 ACOUSTIC OBSERVATION AND ASSESSMENT OF HAKE DENSITIES

5.1 PELAGIC HAKE BEHAVIOUR - ACOUSTIC OBSERVATION AND ESTIMATION OF HAKE IN MID WATERS

Our experience in the Namibia surveys since 1990 of observing hake in mid water with EK 400 and EK 500 shows that pelagic occurrence is in general common. In echograms the hake will usually appear as single fish distributions, sometimes as denser aggregations. From these observations it seems that the major part of the pelagic hake will be found within 100 m of the bottom, but occurrence higher up should not be excluded.

There are inherent problems in identifying hake recordings and in estimating their density. These differ with the size and age of the fish and with their depth distribution.

0-group Cape hake, about 10 cm length, can be found in certain parts of the coast from December to February, possibly longer, in dense aggregations during the day, partly above and partly near the bottom at about 120 m bottom depth, see Figure 1. During the night these juveniles lift and are dispersed in the whole water column. They are then difficult to distinguish from layers of other small fish and other organisms.

The 1-2 year Cape hake, 20-30 cm length are found in highest concentrations in the 180-250 m depth range, where they often stay very close to the bottom during the day, but regularly lift during the night and form well defined single fish layers which are usually easily identified and may be separated for density estimates, Figure 2. In the south of Namibia, within about 30 nm of the Orange River and in the northern part of the Republic of South Africa, this group has been found close inshore, at 70-110 m depth, a difference in behaviour which is probably related to different environmental conditions. A few observations of their pelagic behaviour indicated that they could easily be identified and estimated both during day and at night, but these fish seemed to remain somewhat closer to the bottom at night than the comparable group at 200 m depth in Namibia.

With increasing size and age, above 30-35 cm and 3-4 years the Cape hake moves into deeper water within the shelf, 250-320 m, where they mix with larger fish. At these depths and in the slope, from well over 300 m to more than 400 m frequent observations have been made of pelagic hake in all surveys and their density estimated. There are, however, special difficulties in observing and measuring hake at these depth ranges, primarily because the hake occurs together with other

organism which appear as scattering layers in the echograms. To distinguish hake traces in dense layers of crustacea or myctophids up in mid water or in layers of other fish such as Jakobever or greeneyes nearer the bottom was often found to be difficult and their separation for density estimations was at times not possible. An example of masking of hake traces by a dense layer is shown in Figures 3 and 4 which shows hake traces above the bottom at 320 m depth using a 100 m echogram range and a 500 m range. Hake traces can be discerned up to about 50 m above the bottom in Figure 3, but may well be present even higher.

To describe the occurrence of pelagic hake with estimates of densities was recognized as an important task during the whole survey. The acoustic instruments were therefore used with settings which were intended to optimize conditions for observations of pelagic hake. These were as follows:

Printer 1

Range:	100 m
Range start:	Varies with bottom depth so that the bottom is presented in the lower part of the paper.
Bottom range: 6 m	
Bottom range start:	5 m
TVG:	20 logR
Sv color Min:	-72 dB

Printer 2

Range:	500 m
Range start:	0 m
Bottom Range:	12 m Bottom
Range Start:	10 m
TVG:	20 logR
Sv color Min:	-72 dB

Ethernet Communication Menu (BEI)

Range:	250 m
Range start:	Varies with depth so that the bottom is presented in the lower part of the screen
Bottom Range:	15 m
Bottom Range Start:	10 m
TVG:	20 logR

A backstep on the EK 500 of 0.2 was used throughout the cruise without problems.

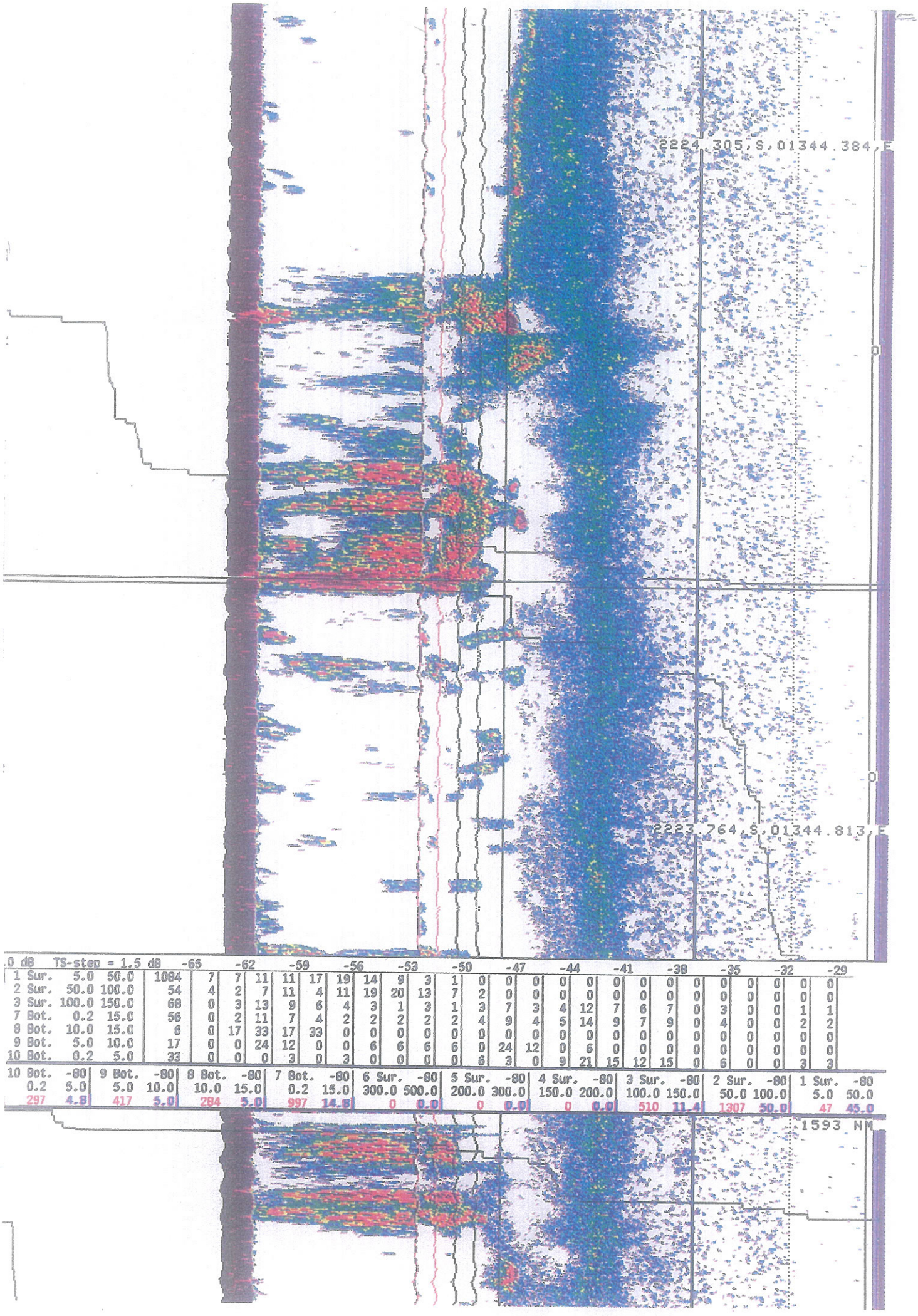


Figure 1 Echogram of 0-group hake aggregations. Working area G, near trawl station 883, at about 1200hrs GMT.

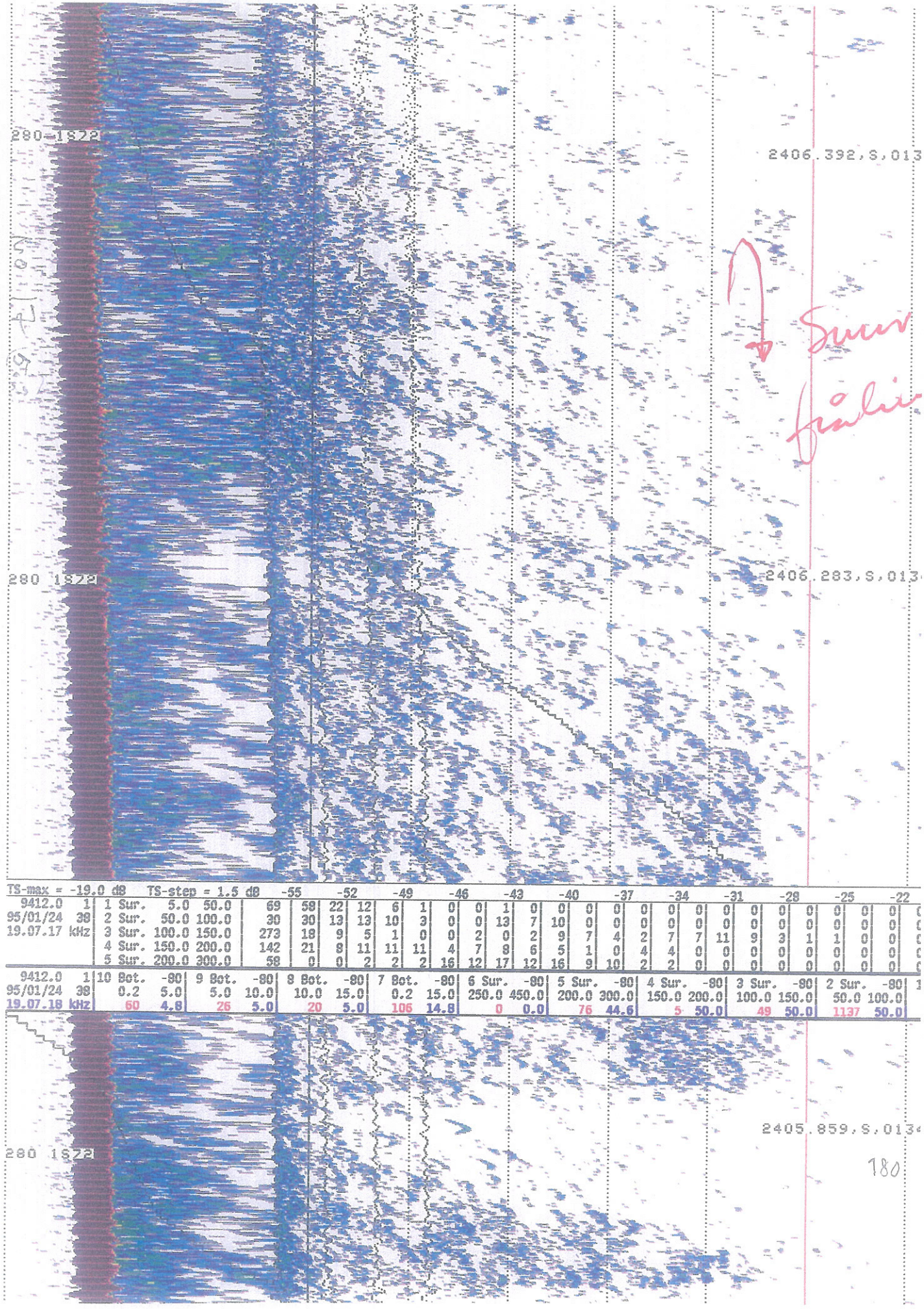


Figure 2 Echogram of 1-group hake im mid water single fish layer near trawl station 809, 250m depth at about 1900hrs GMT.

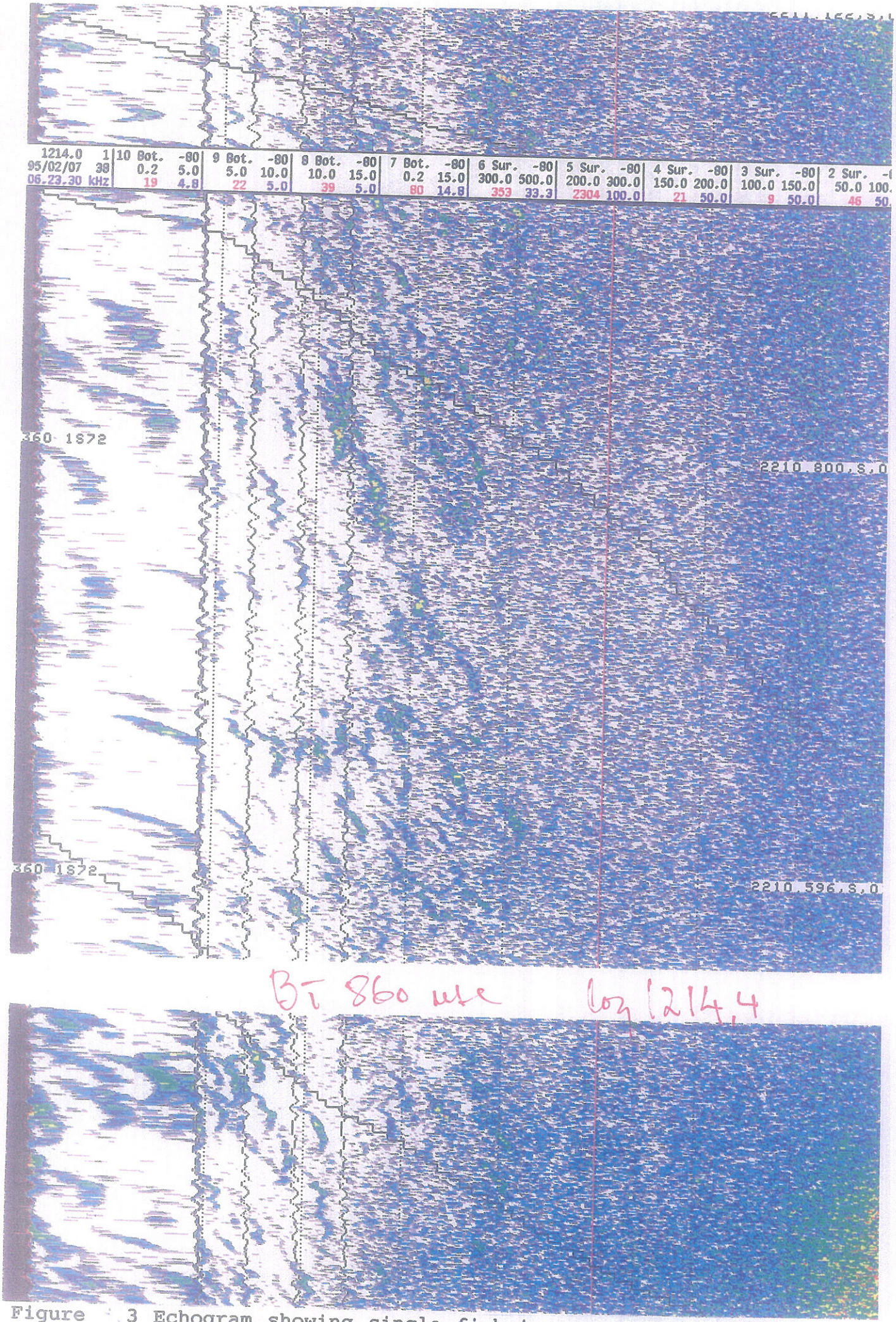


Figure 3 Echogram showing single fish traces of large sized hake in scattering layer of other organisms during setting of trawl at station 860, depth 340m, 0630hrs GMT. Printer 1, 0-100m range.

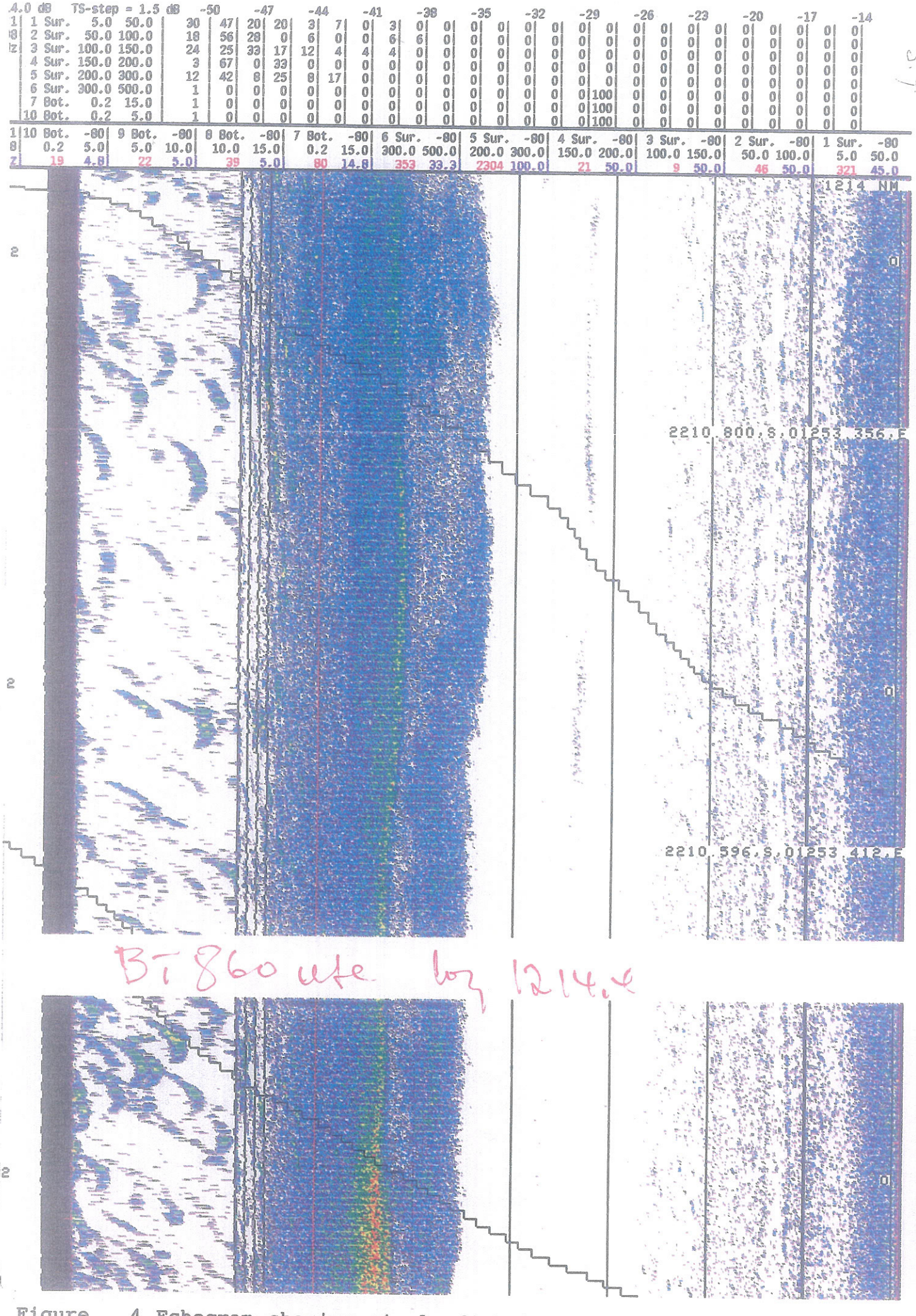


Figure 4 Echogram showing single fish traces of large sized hake in scattering layer of other organisms during setting of trawl at station 860, depth 340m, 0630hrs GMT. Printer 2, 0-500m range.

By using one of the printers with a 100 m range the echogram from a part of the water column is expanded, and traces from single fish will appear larger within the scattering layer as shown in Figures 3 and 4.

The experience from the survey shows that even if single fish traces can be clearly identified in an echogram with a 100m range, it might still be difficult to separate fish from plankton with a 500 m range on the BEI screen. The Ethernet Menu (BEI) was therefore changed to Range 250 m, and Range Start adjusted so that the bottom was presented in the lower part of the screen. With these settings one may loose part of the upper water column in the BEI, but the range is sufficient to cover the hake distribution.

The reason why this setting gives a better resolution is that *the* number of values from the EK500 to the BEI is always 500. With a 500 m range one value will represent 1m in the water column and 1 pixel on the screen. With a 250 m range one value will represent 0.5 m in the vertical plane and an echo with a range of 1 m will be presented over 2 lines on the screen.

Although the conditions for identification of hake traces are improved with this approach, we experienced many cases where the traces were masked by other scattering layers to such an extent that the hake could not be separated and estimated or that our impression was that we could only estimate a part of the pelagic fish. Figures 3 and 4 show an example of this latter case. In general it must be assumed that our estimates of pelagic fish have been and still are too low.

Records of the mean integrator contributions from hake by 5 nm intervals are available in the BEI files from the survey. They were analyzed by date, day and night and depth ranges for each of the working areas described in Part 1, separating hake records in a bottom channel 0.2-6 m, from those obtained from depths above 6 m see Annex I part 5. Average values for each area weighted by the numbers of 5 nm observations were estimated.

The data for the juvenile hake (I+ group, 20-25 cm) may be summarized as follows:

Area C, 250 m, night 23% near bottom

Area E, 100 m, day 80% near bottom, night 61% near bottom.

The general experience is that this juvenile group is found close to the bottom during the day. There is *a* need for further systematic observations to describe the behaviour of this group.

The data for adult hake are summarized for each area in Table 1. They refer to Cape hake except area A where there was a mixture of Cape and deep water hake. In all but one case, Area H at

a depth less than 320m, the mean integrator contributions of pelagic hake exceeded that of hake in the bottom channel.

Table 1 Integrator contributions of hake from a bottom channel, 0.2-6m (adjusted for near bottom loss of beam volume), and of hake present above 6m. Averages by working areas. Ratios of pelagic hake and hake in bottom channel. Adult fish. Number of sets of 5nm observations in brackets.

	DAY		NIGHT	
	< 320m pel/btm	>320m pel/btm	<320m pel/btm	>320m pel/btm
Area A				
Area C	18/18 (23) 1.9	30/42 (16) 1.4	29/22 (15) 0.8	19/24 (1) 1.3
Area F	16/24 (3) 1.9	23/134 (4) 5.8	13/50 (3)	
Area H	18/35 (19) 1.9	25/69 (22) 2.8	3.810/26 (8) 2.6	46/103 (22) 2.2
Simple mean	66/54 (13) 0.8	95/323 (7) 3.4		
				1.8
	1.3	3.4	2.6	

If it is assumed that the acoustic system observes all hake near and above the bottom and that there is no size difference between the hake found near the bottom and in the pelagic phase, the simple means indicate that the proportions of the biomass of the hake available near the bottom were as follows:

	DAY	NIGHT
Depth < 320m	43%	28%
Depth > 320m	23%	36%

The data from the day recordings are more comprehensive than those from the night, especially from the deeper waters. The day data show a clear increase in the proportion of pelagic hake with greater depth in each of the areas. It seems reasonable to associate this with special prey preference and feeding behaviour in the slope.

The results thus indicate that as the fish move deeper there is a progressive decline in its availability to the bottom trawl. As there seems to be a positive relationship between size and age of the fish and distribution at greater depth, the availability of the fish to bottom trawl would thus decline with size and age.

The data on which these conclusions are drawn are limited both in time and space. They derive from one season only and are mainly based on observations from the outer shelf and slope NW of Walvis Bay, but with some supporting data from the shelf edge west of Easter Point. Future observations of the proportion of hake in mid water should include all important Cape hake areas and especially the northern region. It is of great importance to establish whether the higher

proportion of pelagic occurrence with depth shown by the findings from this investigation reflects a general change in the behaviour of the hake with size and age.

5.2 COMPARISON OF ACOUSTIC- AND SWEPT AREA DENSITIES

Since estimates of the standing hake biomass must include both a swept area survey of the fish available to the bottom trawl and an acoustic survey of the fish in mid water not available to the trawl, a comparison of estimates of densities by the two method is of great interest. Using the EK 500 data from which hake was separated by the help of the BEI, special analyses were made, whenever possible, of recordings of hake in depth layers near and above the bottom during trawl stations.

Fish density from swept area

This may be estimated from catch by weight per nm assuming an effective fishing width of the trawl. From the sweep experiments and from the comparative fishing experiment with "Africana" it may be assumed as a working hypothesis that for juvenile hake, less than abt 40cm length, the effective fishing width is equal to the wing spread, 21 - 22m. The swept area in 1nm is then 22x1852=40744m². This is 1/84 part of 1nm². Density in tonnes/nm² is then equal to catch in kg/nm x 84/1000. For larger fish the effective fishing width is increased due to herding by the doors and sweeps.

Fish density from acoustics

This may be estimated from mean integrator readings by depth channels, unit m²/nm², and the conversion factors adjusted to the size of the fish. The conversion factor is based on the target strength and the condition factor of the fish. Use has previously been made of TS=20logL-68 and a condition factor of 0.63 which gives =.054xL/17 (according to the manual) Condition factors from length samples of Cape hake from the present survey gives means of c=0.68; from deep w hake 0.75 and from the juvenile hake in RSA 0.70. If we choose condition factor=0.69 the conversion factor becomes 0.059xL/17.

Integrator readings in bottom channels must be adjusted for loss due to dead zone, integrator backstep and pulse length (Ona, pers.comm, simplified formula: Depthx2404x$\tan^4 \Theta/\Theta^2$ plus backstep, 0.2, plus pulse length , 0.375. This is total depth correction which is applied to a channel e.g. 5m as follows: 5 + corr/5). Simplified :(Dx0.0115+0.575 +5)/5 .This assumes that the density in the "dead zone" is equal to the mean density in the 5 m bottom channel. A better

approach would have been to make the adjustment in a channel as close to the bottom as possible, but depending on a proper identification and separation of hake integrator contributions in these layers. This was attempted for some stations in Area H.

The correct application of the size dependent TS function is to make use of the full size composition of the insonified fish. If the size range is fairly narrow use may be made of the mean fish size, and this approach was used in this analysis.

Results

Annex II part 5 shows for each trawl station the integrator values by EK 500 channels and the corresponding BEI values determined as hake. The mean hake BEI values from the 5 nm which include the trawl station are also shown by two depth ranges, the 10 m bottom channel and all hake above. When estimating hake density above the 10 m channel it was in most cases necessary to use the mean 5 nm observations since the pelagic hake was often masked by other scattering layers.

In selecting the fishing stations for the comparison of the two estimates of density, the size range should be one consideration. Furthermore only fishing stations with standard bridles were included and conditions for observing the integrator contributions of hake must have been favourable. Since it seems possible that the effect of the passage of the vessel on fish behaviour in relation to the capture process is different at different depths, two different depth strata were selected. Table 2 lists the two types of estimates for all hauls where estimates of acoustic density could be made. Two groups of stations may be selected for a comparative analysis: 6 from hauls in shallow water, 77-108 m depth, Area E, south of the Orange River, with good catches of small sized hake, a narrow cohort, 22 cm mean length; and 24 stations from Areas A and F NW of Walvis Bay, deeper than 300 m of depth with catches consisting of large sized hake, mean lengths about 50 cm and higher. Only day hauls were included as it seems possible that capture behaviour of the hake may differ diurnally. (The observations from two night hauls, no 859 and 875 showed a higher ratio of acoustic - to swept area densities than the day hauls in the same area).

Table 2 Estimates of acoustic density and swept area density TS=20 logL-68, cond.f.0.69, c=0.059. Adjustment for blind zone in 5m channel. I=integratorvalue 0.2-5m channel,A:acoustic density, Ia adjusted integr. value 5m, 10m and total column. SA Dens: swept area density.

St no	L	I 5m	Ia 5m	L/17	C	A Dens 5m	Kg/nm	SA Dens	Ia 10m	Ia Tot	Ac.dens 10m	Ac.dens Tot.
765	54	5	9.35	3.18	0.188	1.8	111	9.0	13	29	2.4	3.5
766	45	6	10.7	2.65	0.156	1.7	237	20.0				
768	49	15	26.7	2.88	0.170	4.5	408	48.6				
773	45	10	17.8	2,64	0.156	2.8	220	18.5				
776	43	5	8.9	2.47	0.146	1.3	303	25.4				
778	39	4	7.1	2.29	0.135	1.0	63	5.3				
779	43	7	12.5	2.53	0.149	1.9	80	6.7				
781	52	13	24.3	3.08	0.18	4.4	272	22.8	37	46	6.7	8.3
783	42	9	17.4	2.47	0.146	2.5	168	14.1				
784	48	6	11.6	2.82	0.166	1.9	84	7.0				
787	49	4	7.12	2.88	0.170	1.2	72	6.0				
789	49	15	28.1	2.88	0.17	4.8	251	21.1				
794	50	30	54.6	2.94	0.173	9.4	931	78.2	68	78	11.8	15.5
796	37	9	16.0	2.18	0.129	2.1	288	24.2				
800	55	20	36.0	3.24	0.191	6.9	334	28.0	56	77	10.7	14.7
804	53	9	16.0	3.12	0.184	2.9	125	10.5	23	27	5.0	4.2
807	39	10	17.8	2.29	0.135	2.4	306	25.7				
833	22	228	295	1.29	0.076	22.4	501	42.1	342		26.0	
834	22	131	179			13.4	191	16.0	198		15.0	
841	22	85	111			8.4	267	22.4	176	188	13.4	14.3
842	22	60	78			5.9	240	20.2	109	117	8.3	8.9
843	22	35	46			3.5	144	12.1	63	70	4.8	5.3
844	22	134	178			13.5	372	31.2	235	254	17.9	19.3
846	42	4	5.3	2.47	0.146	0.8	64	7.6				
847	47	18	33.7	2.76	0.163	5.5	248	20.8				
848	53	3	5.6	3.12	0.184	1.0	63	5.3	10	68	1.8	12.6
849	53	12	22.4	3.11	0.183	4.1	387	32.5	33	84	6.0	15.4
850	55	3	5.6	3.24	0.191	1.1	138	11.6	9	11	1.7	2.1
852	51	3	5.3	3.0	0.177	0.94	81	6.8	10	32	1.8	5.7
853	50	5	9.4	2.94	0.173	1.62	407	34.2	18	63	3.1	10.9
854	51	12	21.6	3.0	0.177	3.8	438	36.8	33	85	5.8	15.0
855	56	6	10.8	3.3	0.194	2.1	302	25.4	19	41	3.7	8.0
856	51	7	12.5	3.0	0.177	2.2	351	29.5	19	31	3.4	5.5
869	57	30	56.1	3.35	0.198	11.1	989	83.1	77	160	15.2	31.7
870	58	45	81.0	3.41	0.201	16.3	948	79.6	106	106	21.3	21.3
871	58	40	74.8	3.41	0.201	15.0	1189	99.9	85	122	17.1	24.5
872	57	28	52.4	3.35	0.198	10.4	524	44.0	76	133	15.0	26.3
873	54	25	44.9	3.18	0.188	8.4	445	37.4	55	135	10.3	25.4
874	48	0.3	0.6	2.82	0.166	0.1	26	2.1				
875	55	52	94.0	3.24	0.191	18.0	424	35.6				
876	51	0	0			0	75	6.3				
877	50	0.5	0.9	2.94	0.173	0.2	93	7.8				
878	48	3	5.6	2.82	0.166	0.9	130	10.9				
879	38	20	36	2.24	0.132	4.8	448	37.6				
887	50	0	0				32	2.7				
890	50	0	0				52	4.3				
892	53	3	5	3.12	0.184	0.9	116	9.7				
893	53	0	0				20	1.7				
894	50	40	72	2.94	0.173	12.4	348	29.2				
897	53	2	4	3.12	0.184	0.7	67	5.6				
898	54	5*	40	3.17	0.187	7.5	206	17.3				
899	47	8*	64	2.76	0.163	10.4	222	18.2				
900	45	9	17	2.65	0.156	2.7	174	14.6				
908	40	3*	25	2.35	0.139	3.5	117	9.2				

* adjusted for integr.reading in 0-0.5m channel.

909	56	9	16	3.29	0.194	3.1	490	41.2
911	46	5	9	2.71	0.160	1.4	107	9.0
913	47	8	14	2.76	0.163	2.3	79	6.6
914	45	4	7	2.65	0.156	1.1	84	7.0
915	47	0				0	48	4.0
916	47	15	29	2.76	0.163	4.7	145	12.2
917	51	5	10	3.0	0.177	1.7	227	19.0
918	50	5	10			1.7	263	22.1

Note 917 and 918 were 1omin hauls and with varying density of fish near the bottom. difficult to say where trawl fished . BEI
had 18, 5 and 5 on three half miles. Means of 5nm on BEI were 13 and 15. This would give:

917	51	13	25	3.0	0.177	4.4
918	50	15	29	2.94	0.173	5.0

Figures 5.5 to 5.8 show the plots of mean acoustic density during trawling against swept area density assuming effective fishing within the wing ends, 22 m, for integrator outputs of hake in the 0.2-5 m channel, the 0.2-10 m channel and the whole water column.
The regression lines are as follows:

Small hake, depth about 90 m:

0.2-5 m	y= 0.52x-1.4	R^2= 0.73
0.2-10 m	y= 0.61x-0.5	R^2= 0.82
All hake	y= 0.62x-0.08	R^2= 0.84

Large hake, depth about 300 m:

0.2- 5 m	y= 0.15x + 0.42	R^2= 0.78
0.2-10 m	y= 0.18x + 1.55	R^2= 0.73
All hake	y=0.19x + 7.00	R^2= 0.32

For the small hake the correlation coefficient increases when fish recorded in the depth range 5- 10 m is included and the intercept decreases which may indicate that at least a part of this fish contribute to the catches. There is a further small increase in the coefficient of correlation when some small hake recordings made above the 10m channel are added, and the intercept attains a value very dose to 0.

For the large fish in deep waters the correlation coefficient decreases if fish recorded in the 5-10m depth interval is included and the positive intercept increases. A further sharp decrease of the correlation coefficient is obtained if also hake recorded above the 10 m channel is included. The intercept then attains a high positive value. This indicates that fish above 5 m (approximately the height of the headline) does not make important contributions to the catches at this depth.

A zero or very small intercept of the regression lines is not an unambiguous demonstration that the same fish densities have been observed with the two methods. A zero intercept would also appear if one of the methods had a bias proportional to fish density. An example would be fish close to the bottom unobservable by the acoustic system with a higher density than in the observable channel and increased in proportion to the observed density. It seems unlikely that such a distributional characteristic should always be the case. Further studies of hake behaviour dose to the bottom should, however, be made e.g. by applying the adjustment of the 'blind zone' to observations of hake in the part of the beam actually affected by the zone. (Some attempts of this were made in a part of Area H where hake was found very close to the bottom at a depth of 280-300 m, stations 897 to 908. Adjustments were made for integrator readings in the channel 0.1 to 0.6 m above the bottom assuming a correct identification had been made.)

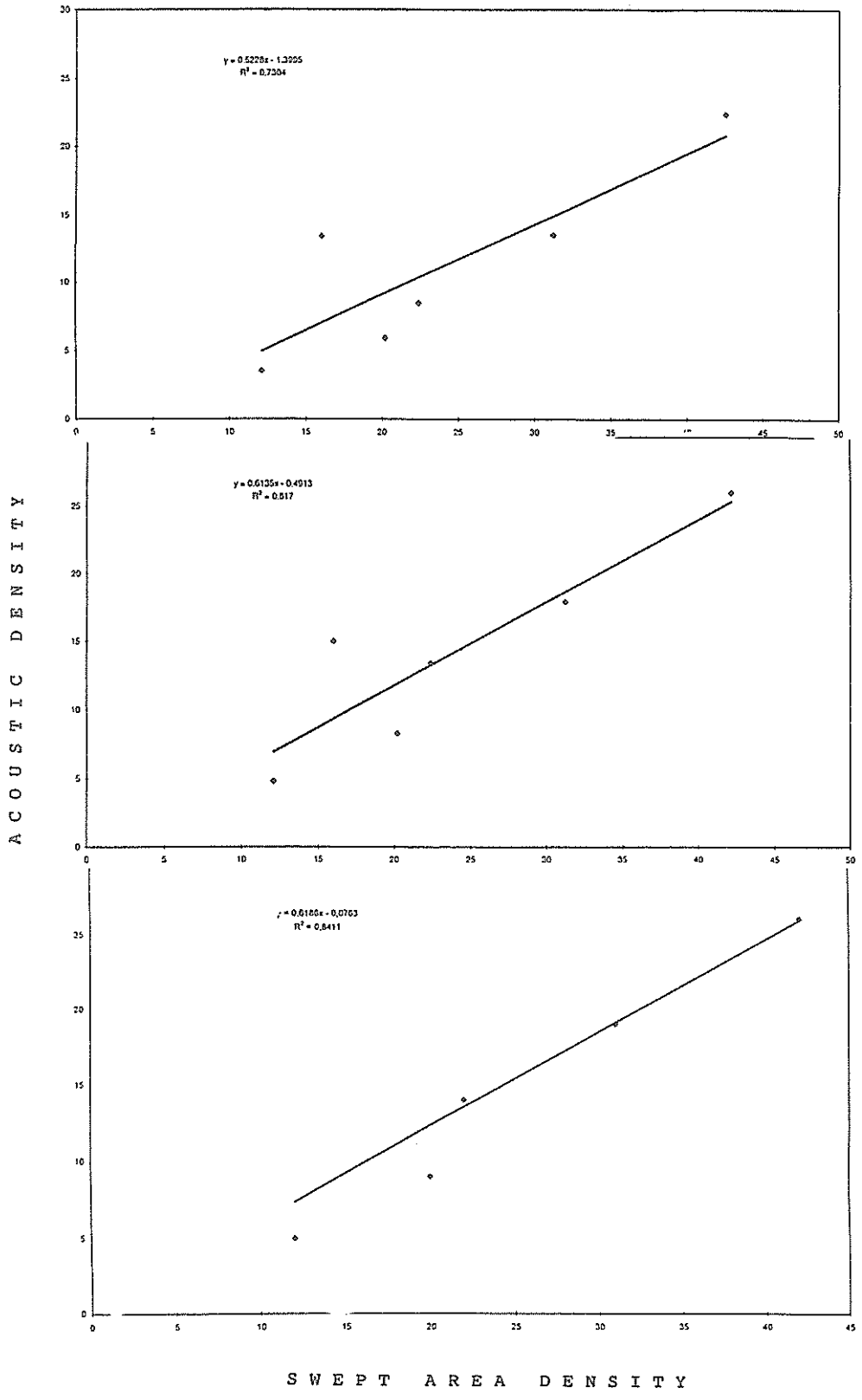


Figure 5 Plots of estimates of acustic density against swept area densety, juvenile hake, Area E, depth about 100m. Top: acoustic density in 5m channel, middle 10m channel, bottom all hake in water column.

The SAS System

MEDRE = SWEPT	
Response Distribution:	Normal
Link Function:	Identity

Parametric Regression Fit

	Model		Error				
Type	DF	Mean Square	DF	Mean Square	R-Square	F Stat	Prob > F
Line	1	387.2676	24	4.4357	0.7844	87.3068	0.0001

Summary of Fit

Mean of Response	5.1538	R-Square	0.7844
Root MSE	2.1061	Adj R-Sq	0.7754

Type III Tests

Source	DF	Sum of Squares	Mean Square	F Stat	Prob > F
SWEPT	1	387.2676	387.2676	87.3068	0.0001

Parameter Estimates

Variable	DF	Estimate	Std Error	T Stat	Prob > |T|	Tolerance	Var Inflation
INTERCEPT	1	0.4187	0.6538	0.6405	0.5279	.	0
SWEPT	1	0.1505	0.0161	9.3438	0.0001	1.0000	1.0000

Figure 6. Plot of acoustic density in 5m channel against swept area density. Areas A and F, large sized hake, day hauls, depth 300m+

The SAS System

OVRE	=	SWEPT
Response Distribution:		Normal
Link Function:		Identity

Parametric Regression Fit

	Model		Error				
Type	DF	Mean Square	DF	Mean Square	R-Square	F Stat	Prob > F
Line	1	551.7452	24	8.7373	0.7246	63.1484	0.0001

Summary of Fit

Mean of Response	7.2000	R-Square	0.7246
Root MSE	2.9559	Adj R-Sq	0.7131

Type III Tests

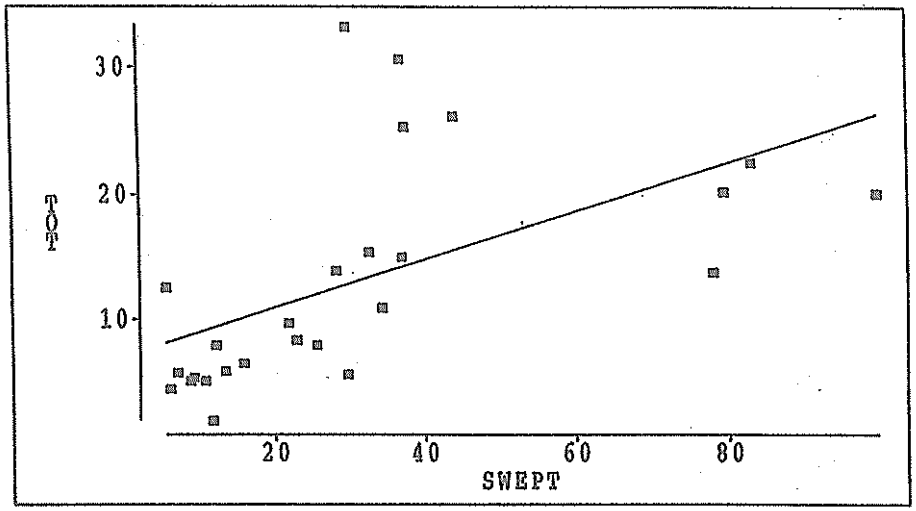
Source	DF	Sum of Squares	Mean Square	F Stat	Prob > F
SWEPT	1	551.7452	551.7452	63.1484	0.0001

Parameter Estimates

Variable	DF	Estimate	Std Error	T Stat	Prob > |T|	Tolerance	Var Inflation
INTERCEPT	1	1.5481	0.9176	1.6872	0.1045	.	0
SWEPT	1	0.1796	0.0226	7.9466	0.0001	1.0000	1.0000

Figure 7. Plots of acoustic density in 10m channel against swept area density. Areas A and F, large sized hake day hauls, depth 300m+

TOT = SWEPT
Response Distribution: Normal
Link Function: Identity



Parametric Regression Fit							
	Model		Error				
Type	DF	Mean Square	DF	Mean Square	R-Square	F Stat	Prob > F
Line	1	634.5851	24	55.1590	0.3240	11.5046	0.0024

Summary of Fit			
Mean of Response	13.0385	R-Square	0.3240
Root MSE	7.4269	Adj R-Sq	0.2959

Type III Tests					
Source	DF	Sum of Squares	Mean Square	F Stat	Prob > F
SWEPT	1	634.5851	634.5851	11.5046	0.0024

Parameter Estimates							
Variable	DF	Estimate	Std Error	T Stat	Prob > |T|	Tolerance	Var Inflation
INTERCEPT	1	6.9771	2.3054	3.0264	0.0058	.	0
SWEPT	1	0.1926	0.0568	3.3919	0.0024	1.0000	1.0000

Figure 8. Plots of acoustic density of all hake recoded against swept area density. Areas A and F large sized fish, day hauls, depth 300m+.

The comparative trawling experiments between "Dr. Fridtjof Nansen" and vessels using other types of gear may contribute some information on hake behaviour in relation to trawl fishing. As described in Part 4 of this report the intercalibration with "Africana" on small sized hake in shallow water showed a mean catch ratio "Nansen"/"Africana" of 1.47 which adjusted to an equal wing spread becomes 1.87. The ratio of the distance between the trawl doors was 50/108= 0.46 which indicate that herding by the doors and sweeps can not have been important. In a few hauls on large sized hake in deeper waters "Africana"'s catch rates were clearly higher than those of "Dr. Fridtjof Nansen" most likely a result of effective herding of this size of fish.

The ratio between the mean integrator readings during the trawling with "Africana" in the channels 0.2-5 m and 0.2-2 m (corresponding roughly to the headline height of the two trawls) was 1.43. The integrator contribution from hake above the 5 m channel, nearly all within 10m from the bottom, added about 25%, which brings the ratio between fish availability in the depth ranges 0.2-10 m and 0.2-2 m to 1.79, very close to the catch ratios between the two trawls: 1.87. The "Africana" gear thus seems to have sampled only fish up to 2 m distance from the bottom while "Nansens"'s trawl sampled up to 10 m indicating a limited vertical reaction of the small fish to the vessel and possibly the warps at this depth. Another explanation is, however, possible, escapement of hake under "Africana"'s lighter ground gear may have contributed to her lower catch rates. The catch ratios for sole and lobster indicated a closer bottom contact of "Nansen"s rock hopper gear.

When considering catch rates of hake in the comparative fishing trials with the monk trawlers, care must be taken to include only trials made during the day. Table 3 shows sets of hauls which were close in both space and time. The headline height of the monk trawlers showed a mean of 1.1 m and 1.3 m for the two gears. The fishing depth was about 320 m and the size of the fish large. The commercial trawlers usually made 5-6 hours tows while those of "Dr. Fridtjof Nansen" were 0.5-1 hour and a comparison between the catch rates is thus likely to be affected by random variation in hake availability. Still, the catch rates of "Dr. Fridtjof Nansen" were consistently higher than those of the commercial trawlers and the mean ratio of the four sets of data is 3.8 which is close to the proportion between the headline height of the trawls. The fact that the trawls fish roughly in proportion to their headline height makes it unlikely that downward displacement of hake is an important element in the catching process at this depth, confirming the conclusion of the regressions shown above. The gears used by the monk trawlers had a close bottom contact demonstrated by their high catch rates of monk and sole.

Table 5.3. Comparison of catch rates of hake by "Dr Fridtjof Nansen" and the monk trawlers"UST82" and "Benguela Triumph", daylight hauls. Data from Annex I, Part 4.

Date	"Dr F.N."	Kg/nm Hauls no	"UST82"	Kg/nm Hauls no
5/2	846-849	125	1-3	35
6/2	852-855	307	6	49
"DR. F. N."	"Benguela Triumph"			
7/2	862-867	153	4	47*
8/2	869-874	538	6	263*

* adjusted to 22m wing spread

A tentative conclusion of these comparative fishing trials is that at a depth of about 100 m small hake found in a layer up to and a little above 10 m from the bottom is available to a trawl with a 5 m headline height, but the fish above about 2 m from the bottom is not available to a trawl with a headline height of 1.9 m. At a depth of 300-340 m, with large sized hake as targets, the vertical fish availability seems roughly to be limited to the headline height of the trawls.

There is a large difference in the inclination of the regression lines for the two sets of data comparing the "acoustic" density and the "swept area" density, it is about 4 times higher for the small fish at about 100 m depth than for large sized fish at 300 m depth. A part of this difference may be explained by more effective herding of large sized fish by the doors and sweeps. The results of the experiments with doubling of sweep lengths indicated that there is herding by these parts of the gear for fish larger than 40-50 cm which result in 40% higher catch rates than for juveniles. But even if the effective fishing width is increased by 70% as used for large sized cod the Barents Sea, a considerable discrepancy would still remain between the inclinations of the regression lines.

To explain the 0.62 inclination of the regression for small sized hake in terms of horizontal gear efficiency would require an effective fishing width of 35 m for fish of 22 cm length. For the approximately 0.15 inclination of the regression at 300 m an effective fishing width of about 140 m would have to be assumed. Such assumptions are inconsistent with the results of the sweep length trials. If on the basis of these, the gear is assumed to be 50% more efficient for large sized fish, the ratio between the adjusted inclinations at 100 m and at 300 m would be around 2.5.

Undetected fish in the 'blind zone' with densities higher than, but in proportion to those observed higher up would result in low inclinations. The comparative fishing experiments which indicated that the trawls fished roughly in proportion to their headline heights do not support the existence

of a general trend of higher density of hake close to the bottom. Further studies of hake behaviour near the bottom should, however, receive high priority.

A depth related target strength could have been a possible explanation, but there are no observations which shows whether this could be the case.

5.3 HAKE OBSERVATIONS IN MID WATER ALONG THE COURSES STEAMED

Hake recordings were identified and estimated whenever present along the cruise tracks between the work areas. Their integrator contribution is more easily assessed inside the shelf than in the slope, where they are often masked by scattering layers of myctophids and other organisms. The courses steamed between working areas were as far as possible chosen so that the depth range 220-280 m was covered. Hake in this range will often consist of juvenile 1-group fish, about 25 cm length with a mid water distribution at night, but closer to the bottom during daytime.

Figures 9 and 10 show the integrator contributions of hake over the shelf parts covered. These data do not in any way represent a survey coverage of the shelf, but may still provide some indications of trends in the hake distribution. The few trawl samples which were obtained of the fish recorded (st. 809 off Conception Bay at 250 m and st. 845 off Easter Point at 260 m) showed juvenile fish of 20-25 cm mean length and it is assumed that all shelf recordings consisted of this offish. The inshore fish near the Orange River were well identified as juvenile Cape hake of 20-25 cm length.

One important observation is the absence of juvenile hake in the shelf sector off Walvis Bay between approximately Conception Bay and Cape Cross. In most of the surveys since 1990 this has been the sector of highest abundance of juvenile fish on the shelf. In the hake survey of October-November 1994 the density of juveniles in this part of the shelf was, however, unusually low and this situation seems to have persisted into January-February this year.

An area of somewhat higher abundance was located on the shelf between Conception Bay and Hollands Bird Islands. These were night recordings and assuming a fish size of 25 cm the area would have a mean fish density of about 8 tonnes/nm^2. This acoustic estimate of fish density may perhaps correspond to a density of 25 tonnes/nm^2 measured by the swept area method.

Further south from Easter Point to south of Lüderitz the integrator readings, mostly from night observations, show a more or less continuous, but perhaps narrow belt of hake. The mean observed fish density is 12.5 tonnes/nm^2, perhaps corresponding to about 50 tonnes/nm^2 in swept

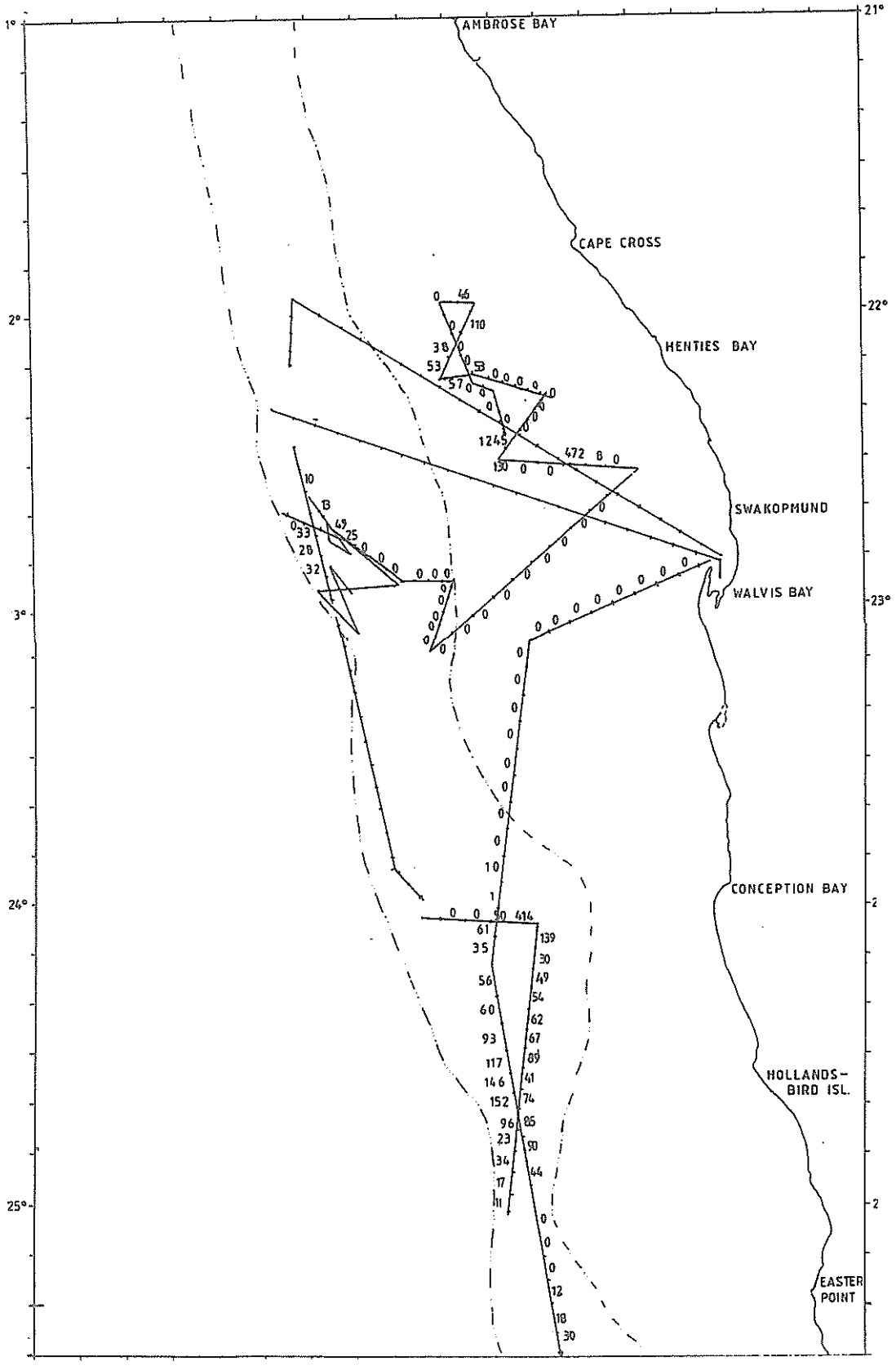


Figure 9. Integrator contributions of hake along the courses steamed on the shelf between working areas, Ester Point to Cape Cross.

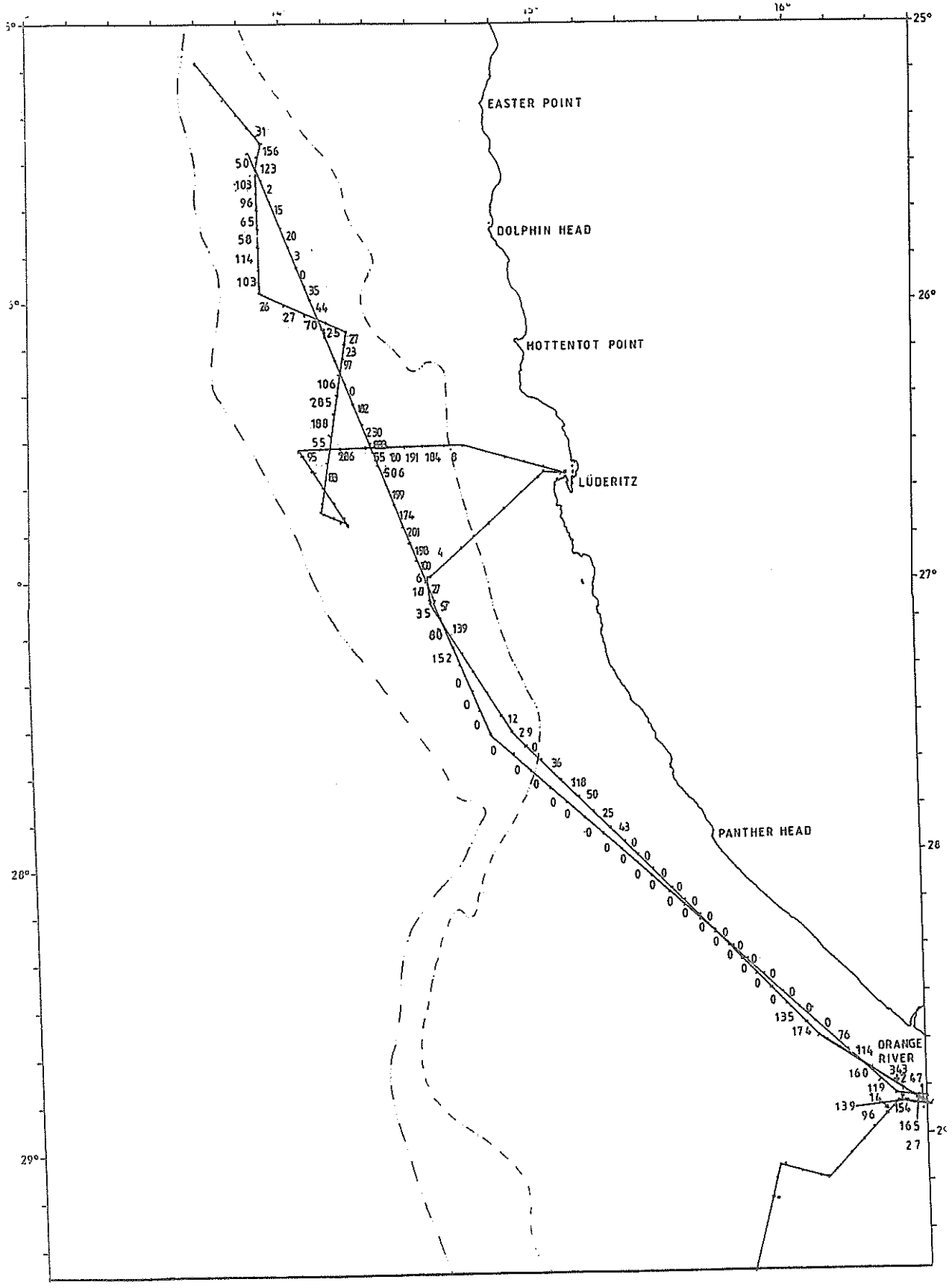


Figure 10. Integrator contributions of hake along the courses steamed on the shelf between working areas, Orange River to Ester Point.

Relatively high densities were also recorded in shallow water in the south of Namibia near the Orange River. This represents a confirmation of similar observations in the October-November 1994 survey.

A brief "mini-survey" was made for 0-group hake in the depth range l00-120 m off Henties Bay-Cape Cross were the group has been located in previous surveys. High densities were found in a limited area off Henties Bay and smaller aggregations at about the same depth further along the coast. Small amounts of 0-group hake were also present in catches from both bottom- and pelagic trawl hauls at about 300m bottom depth near the shelf edge northwest of Walvis Bay. It is, however, uncertain whether this was Cape- or deep water hake which are difficult to distinguish at that size. One should note that the catchability of 0-group hake is likely to be low both in the pelagic- and dermersal trawls.

ANNEX I PART 5

Pelagic behaviour of Cape hake. Mean integrator readings of hake in bottom channel 0-6m and above from BEI log by working areas. Day 0430-1730 HRS UTC.
Bottom channel compensation assumes same density over 6m depth range. Means are weighted by number of 5nm observations.

Area A.

	DAY		NIGHT	
Depth range	<=320m	>320m	<=320m	>320m
Date				
19/1	8/23(9)	8/22(1)	13/23(6)	10/24(1)
20/1	6/13(4)	6/48(7)	10/17(4)	
21/1	2/4(3)	16/32(4)	24/24(5)	
22/1	19/21(7)	28/37(1)		
23/1	15/47(3)			
Mean	10/18(23)	16/42(16)	16/22(15)	10/24 (1)
Adjusted mean	18/18	30/42	29/22	19/24

Nos of 5nm observations in brackets. Note that there was only 1 night observation from the deep range where the highest integrator readings were obtained.

Area C.

	DAY		NIGHT	
Depth range	<=320m	>320m	240-280m	
Date			Date	
25/1	9/24(3)	6/150(2)	27/1	16/85(5)*
27/1	17/118(2)		adjusted	25/85
Mean	9/24	12/134	* This is juvenile hake, about 25cm length.	
Adjusted	16/24	23/134		

Conditions in Area C were difficult with heavy non-fish layers. Few observations were made. Those from 27/1 are not 5nm means, but observations from limited distances and depth ranges were single fish were discernable on the BEI and estimated to be representative of integrator readings during 5 trawling stations, distributed over 8-9nm.

Area E.

The analysis is here limited to the shallow part, about 75 to 130m where the hake was small sized, a narrow cohort,mean 22cm.

Date	DAY	NIGHT
30/1	188/55 (3)	
1/2	88/40 (7)	92/79 (3)
Mean	128/44 (10)	
Adjusted	171/44	123/79

Area F

	DAY		NIGHT	
Depth range	<=320m	>320m	<=320m	>320m
Date	N	N	N	N
5/2	7/30 4	9/68 5	8/117 1	12/62 4
6/2	10/45 7	11/62 4	5/16 2	34/127 4
7/2	11/20 5	16/142 3	31/125 8	
8/2	11/44 2	21/53 7	16/86 6	
9/2	9/46 1	3/46 3		
Mean	10/35 19	13/69 22	7/50 3	24/103 22
Adjusted:	18/35	25/69	13/50	46/103

Remark: There is a time sequence in the original data which may distort day-night data.

Area H

	DAY		NIGHT	
Depth range	<=320m	>320m	<=320m	>320m
Date				
15/2	2/4 (4)	2/1(1)	10/24(5)	
16/2	52/76(9)	0/28(3)		
17/2	57/377(6)			
Mean	37/54(13)	49/323(7)	6/26(8)	
Adjusted	66/54	95/323	10/26	

ANNEX II PART 5

Logging of integrator readings of hake in bottom channels at and near fishing stations.

Trawl st. no	Log interval		Trawl distance EK500 readings BEI values 0.2-5m	5-10m	10-15m	5 nm means BEI values 0-10m	Above 10m
765	672.5-674.0	EK	12	9	10	11	13
		BEI	5	4	5		
766	679.5-681.0		6	3	4	8	2
			6	3	3		
767	684.0-685.5		6	6	7	11	2
			6	2	5		
768	691.0-692.0		17	13	17	13	8
			15	10	15		
769	695.0-696.5		3	2	4	9	18
			3	2	5		
770	726.5-728.1		7	9	10	7	11
			4	3	5		
771	732.8-734.4		13	19	15	18	36
			9	14	11		
772	736.8-738.5		13	7	5	11	19
			10	5	4		
773	743.3-745.0		12	15	10	12	6
			10	12	8		
774	747.9-749.7		6	4	5	10	9
			5	3	4		
775	754.0-755.7		5	7	8	8	7
			3	4	5		
776	758.2-760.0		9	13	26	7	17
			5	4	11		
778	848.2-849.8		11	10	8	7	10
			4	5	3		
779	854.8-856.4		8	10	11	11	9
			7	7	7		
780	868.1-869.8		11	7	7	27	12
			15	10	10		
781	875.2-876.9		19	19	15	16	19
			13	13	8		
782	881.8-883.4		19	28	26	42	48
			14	14	15		
783	888.9-890.5		12	18	15	21	79
			9	9	9		
784	896.7-898.3		14	10	12	8	34
			6	4	5		
786	945.1-946.3					7	3
	Kun BEI		4	3			

787	951.8-953.5	12	28	21	4	1
		4	3	3		
788	964.5-966.2	30	23	20	22	9
		18	12	10	9	26
789	972.8-974.5	26	18	21	42	25
		15	11	12		
790	979.4-981.0	15	17	13	20	16
		4	5	4	10	22
791	987.2-988.7	12	11	12	11	48
		5	3	4		
794	137.7-139.2	23	22	34	33	10
		30	13	10		
795	144.4-145.0	26	19	17	40	8
		23	12	10		
796	148.8-150.3	17	8	7	9	8
		9	3	3		
797	155.3-155.8	8	5	4	6	3
		4	2	2		
800	205.0-206.5	30	29	32	25	32
		20	20	21		
801	212.0-213.2	30	27		26	40
		13	14			
802	218.6-220.2	19	20	24	21	41
		11	11	12		
804	342.4-344.0	12	8	6	16	4
		9	7	4		
805	399.0-351.2	9	3	2	10	3
		7	4	2		
806	357.3-358.8	27	10	10	14	8
		9	3	3		
807	364.4-365.9	34	16	8	3	6
		10	4	2		
814	516.7-518.1	11	11		22	5
817	Estimated from smaller depth range where single fish discernable, BEI				13	80
818	"				10	80
819	"				17	120
820	"				35	210
821	"				11	100
824	"					22
825	"					24
828	"					9

Trawl st. no	Log interval	Trawl distance EK500 readings BEI values 0.2-5m	5-10m	10-15m	5 nm means BEI values 0-10m	Above 10m
833	139.6-141.35	228	47			
834	148.8-151.95	131	19			
836-839 values not obtainable						
841	440.50-442.20	85	65			
842	445.50-447.05	60	31	18		
843	452.24-453.85	35	17			
844	463.90-465.40	134	57			
846	44.6-45.6	6	4	5		
	1nm BEI	4	2	3		
847	53.00-55.00	18	25	25		
	2 nm Bei	18	20			
848	62.80-64.40	6	6	12		
	BEI	3	4	8		
849	68.20-70.50	17	14	23		
	1.30 BEI	12	11	15		
850	78.90-80.44					
	1.54nm BEI	3	3			
851	91.50-93.20 Tow in dence layer					
852	112.80-114.40					
	1.60nm	2	6	9		
	BEI	3	5	9		
853	121.5-124.6					
	3.30nm	5	9	10		
854	128.80-130.60					
	1.70nm	14	13	7		
	BEI	12	11	6		
855	134.10-135.7					

	<10m	>10m	Depth range
log40-45	10	60	10-50
log 45-50	10	65	10-30
log 50-55	37	41	10-20m
log 55-60	21	23	10-20m
log 60-65	12	54	10-20m
log 65-70	17	80	10-25m
log 70-75	25	25	10-15m
log 75-80	2	3	
log 80-85	8	40	10-30m
log 85-90	10?	115	10-60m
log 90-95	10	80	10-50m
log 95-100	20	50	10-50m
log 100-105	8	111	
log 105-110	9	110	
log 110-115	10	20	10-15
log 115-120	10	43	
log 120-125	9	50	
log 125-130	18	57	
log 130-135	18	34	

			14	9	11				
		BEI	6	8	8				
						log	135-140	9	11
856	140.60-143.90					log	140-145	13	11
	3.3								
			12	9	6				
		BEI	7	6	4				
						log	145-150	15	27
857	152.90-154.40					log	150-155	22	94 10-40m
			16	13	20				
		Trawl not functioning well sr 857 and 858							
						log	155-160	24	60 10-30
							160-165	20	105 10-40
							165-170	5	130 10-50m
							170-175	5	40 10-85
							175-180	35	190 10-30
859	181.20-182.70					log	180-185	127	110 10-25m
	1.53nm								
			63	34	30				
		BEI	70	43					
						log	185-190	9	20 10-25m
860	214.40-216.00					log	210-215	27	180 10-40m
	1.60nm								
			26	40	56				
		BEI	20	20	30				
						log	215-220	25	ca100 dense layer
861	220.20-221.70					log	220-225	33	100 10-25
			27	31	47				
		BEI	22	22	31				
862	227.30-228.80					log	225-230	22	22
	1.70nm								
			14	15	7				
		BEI	14	13					
863	230.6-232.0					log	230-235	23	8
	1.40nm								
			10	7	3				
		BEI	6	4	2				
864	235.3-236.3					log	235-240	16	18
	1.20nm								
			13	7	6				
		BEI	12	12	6				
865	238.90-240.50								
	1.6nm								
			10	5	5				
		BEI	4	6	4				
866	242.20-243.40					log	240-245	7	16
			13	6	3				
		BEI	4	4	1				
867	248.0-249.4					log	245-250	5	16 10-25
	1.63								
			14	7	5				
		BEI	5	4					
						log	250-255	20	65 20-50
						log	255-260	77	55 10-60
						log	260-265	25	109 10-40
						log	265-270	23	71 10-40
						log	270-275	20	38 10-30

					log 275-280	40	30	10-40
					log 280-285	80	400	10-50
					log 285-290	23	145	10-50
					log 290-295	35	25	10-30
869	295.40-295.90				log 295-300	40	94	10-20
	1.48							
		27	22	62				
	BEI	30	21	60				
					log 300-305	66	22	10-20
870	304.6-306.10				log 305-310	50	15	
	1.50							
		44	25	32				
	BEI	45	25					
871	309.20-310.60							
	1.40							
		48						
	BEI	40	10					
872	313.10-313.90				log 310-315	55	54	10-20
	0.80							
		31	26	57				
	BEI	28	24					
873	318.80-319.00				log 315-320	28	87	10-25
	0.30							
		13	14					
	BEI	25	10					
					log 320-325	9	34	10-30
					325-330	0	7	
874	330.0-333.0				log 330-335	0	3	
	3.1							
		4						
	BEI	0.3						
					log 335-340	0	55	30-50
					log 340-345	0	121	40-70
					log 345-350	25	160	40-50
					log 350-355	45	103	30-40
875	351.0 353.6							
		52	32	9				
	BEI	52	31					
					log 355-360	4	48	
876	356.5-358.2							
		36	14	1				
	BEI	0	3					
					log 360-365	41	55	
877	373.60-375.10				log 370-375	5	75	20-50m
	1.45nm							
		6	0	0				
	BEI	0.5	0	0				
878	379.0-380.6				log 375-380	1	37	30-50m
	1.44nm							
		9	1	0				
	BEI	3	0	0				
					log 380-385	3	25	30-40
					log 385-390	11	43	30m
					log 390-395	13	0	
					log 395-400	16	0	
					log 400-405	50	0	
					log 405-410	10	1	
					log 410-415	0	0	
					log 415-420	20	0	
879	423.10-423.40 5 min				log 420-425	15	34	10-20m
	0.25nm							

19 10 9
BEI 20 10

log 425-430 17 8

880 438.80-439.10 5 min
0.30nm
Dense layer

log 430--445 D.Layer,uncertain

log 445 - - 540 0 0

0-group hake

log 545-550 8
log 550-555 472 80-100m depth
log 555-560 0 0
log 560-565 0 0
log 565-570 719 212
log 570 4662
log 571 4893
log 572 1280
log 570-575 904 341
log 575-595 fishing trials
log 595 - - 615 0
log 615-620 50 4
log 616 200
log 617 100

887 log 792.9-794.5
1.54nm
BEI 0

log 790-795 0 0

890 log 876.50-873.10
1.6nm
1 2 2
BEI 0 0 0

log 870-875 2 0

log 875-880 7 32

log 880-885 5 5

892 log 880.10-882.0
1.85nm
3
BEI 3

log 885-905 alle 0 0

893 log 898.30-899.7
70
BEI 0

log 905-910 16 25

894 log 912.50-913.90
1.38nm
64
BEI 40

log 910-915 42 22

Dense layer

895 922.80-923.90
20min 1.1nm
Dense Jakobever layer

897 982.50-984.10

log 1980-1985 2 18 10-30m ov.b.

BEI 2 2

log 1985-1990 7 0
log 1990-1995 0 0

898 1990.9-1992.40
1.50
4 3

BEI 5 (I from 0-0.5m).

log 1995- 2000 6 0

899 2001.40-2002.80 log 2000-2005 6 0
1.40
EK 500 1.3 1.3
log 2005-2010 6 0
log 2010-2015 9 8

900 015.40-016.90 log 2015-2020 23 1
7 9 7
BEI 9 11
log 2020-2025 6 0
log 2025-2030 1 7

log 2095 2100 0 0

901 2005.70-2097.20
1.62
Fish very close to bottom, trying BEI difference 0.6-0.1 m

log 2100-2105 0 0
log 2105-2110 2 0

902 2105.4-2106.9
De nse layer

903 2110.6-2112.1 log 2110-2115 1 0
Dense layer

904 2118.7-2120.3 log 2115-2120 1 0
EK500 0.42-1.0
BEI difference 10m channel, to 0.6m=2, to 0.1m=5, lowest
0.6m-0.1m should then give 3. Determined as hake.

905 2127.1-2128.6 log 2125-2130 1 0
BEi difference 0.6m to 0.1m = 2 på 127.0-128.0

906 2175.7-2178.0 log 2175-2180 0 2
3.0
BEI 0
BEI differnce not fish

log 2180-2185 1 0

907 2184.5-2185.8 log 2185-2190 0 0
BEI 0

log 2190-2195 26 0

908 2197.1-2198.7 log 2195-2200 11 18 10-20m o b
BEI differense 0.6m-0.1m=3

909 2205.8-2208.8 log 2205 -2210 17 12
3 nm
10 15
BEI 9 6

910 2212.2-2213.6 log 2210-2215 6 0
Dense layer

log 2215-2220 6 5

911 2213.5-2216.1
BEI 5 3

log 2220-2225 0 8 10-30m

log 2230-2235 0 7 10-30m
log 2235-2240 1 13 10-40m

913 2246.3-2247.8 log 2245-2250 15 10
1.50nm
12 7 6
BEI 8 7

914 2250.5-2251.4 log 2250-2255 6 8
1.05nm
6 4 3

BEI 4 4

<5m

915 2254.5-2256.10 log 2255-2260 2 0

1.65nm

5 1

BEI 0 Obs BEI now 5 m channel

< 5m

916 2263.7-2265.5 log 2260-2265 12 100

20

BEI 15

< 5 m

917 2269.0-2269.5 10min log 2265-2270 13 101 10-40m 0.b.

0.50nm

12 24 26

BEI 5

Great variations in density and difficult to determine where the trawl has fished, It may be better ti use 5nm means.

918 2271.9-2272.4 log 2270-2275 15 250 10-40m

0.5nm

71.5-72.0 18 18 20

BEI " 5

72.0-72.5 50

125-200m depth

2325-2330 14

2330-2335 40

2340-2345 12

2345-2350 23

CHAPTER 6 TARGET STRENGTH MEASUREMENTS

(Contributed by I. Svellingen)

14 series of measurements of target strength were made, 5 with the TS sonde (ES38D) and 9 with the vessel mounted transducers. Of these latter, the 38 kHz transducer ES38B was used in 8 series of observations and the 120 kHZ transducer ES 120-7 in one. Some TS distributions were addition obtained from the BEI. Data from all of these series of observations have been further processed.

Representative sampling of the fish with trawl for species and sizes is essential for a meaningful observation of target strength. Only one species should be present in the observation volume, preferably fish of one cohort with a small size range. Most of the measurements series from the cruise do not meet these criteria.

Results

The fact that catch sampling showed the targeted fish in many series to consist of hake of a very wide size range, 15-70 cm or of a mixture of species with overlapping size range limits the data which may give meaningful results. The findings of measurements of hake in three areas and from one series of measurements of myctophids with the TS sonde are presented hereafter.

Hake

6 sets of TS data logged near Station PT 823 from EK 500 over a series line to PC were analysed. The mean target strength of these sets varied from -373 to -40.3 dB with an overall mean of 38.5 dB. Figure 1 shows a typical TS distribution from these sets as well as the size distribution of hake from station PT 823, mean length 25.77 cm. Using the overall mean of the TS measurement and the mean length from the catch sample gives the relationship TS = 20logl-66.7. The size range of the fish in the sample is, however, wide, 10-40 cm and the sample may be biased by size-related catchability.

TS data from three sets of measurements near the trawl stations 833, 834 and 835 show a similar range of averages, 2-3 dB, as from station 823. The hake here was of more uniform size, means of about 22 cm. The overall mean TS was -41.2 dB which gives the relationship TS = 20logl 68.05.

A series of measurements of 0-group fish, 12-14 cm was made on 13/2/95. One set of data comprising 227 single fish was further processed and gave a mean TS of - 45.4 dB. This gives the relationship TS = 20logl - 67.7.

Myctophids

Measurements were made in a dense layer at a depth of 250 m at station 902. The TS sonde was lowered down close to the layer enabling observations of single fish traces. A total of 1311 single echoes in three sets of data were logged. Mean TS in the three sets were: - 55.8, -56.2 and -55.8 db. The overall mean was - 55.9 dB which with a mean size of 7.28 cm gives the relationship TS = 201og1 - 73.1.

The measurements were made at a distance of from 4 to 25 m, but only a minor part was dissolved as single fish, indicating a high volume density.

Figure 2 shows a typical TS distribution of the myctophids at 250 m depth measured at a distance of 5-17 m with the sonde comprising 305 single fish echoes and the size distribution of the myctophids at station 902.

Discussion

The conditions for the measurements reported above were hardly ideal, but are probably more or less as must be expected in in-situ operations. A more active selection of uniform size groups of the targets is, however, recommended, but for hake this will most often only be possible for small sized fish in cohort distributions.

The total number of hake in the results reported here is about 3800 fish, 2570 logged over series line to PC and 1200 from BEI. The results indicate that hake seems to lie near the "cod relationship": 20 logl - 68. There is, however, a need for further studies especially of larger sized fish.

The results for the myctophids are the first reported for this fish. Myctophid layers give high integrator contributions. Experience from the Indian Ocean indicates that these fish may give resonance at 38 kHz with a fish size of 2-4 cm. The size of 7 cm as observed in these measurements should not give resonance at 38 kHZ and the high integrator values must be the effect of a high density of fish as indicated by the difficulties experienced in dissolving the layer in single fish traces at a distance of 10 m from the transducer.

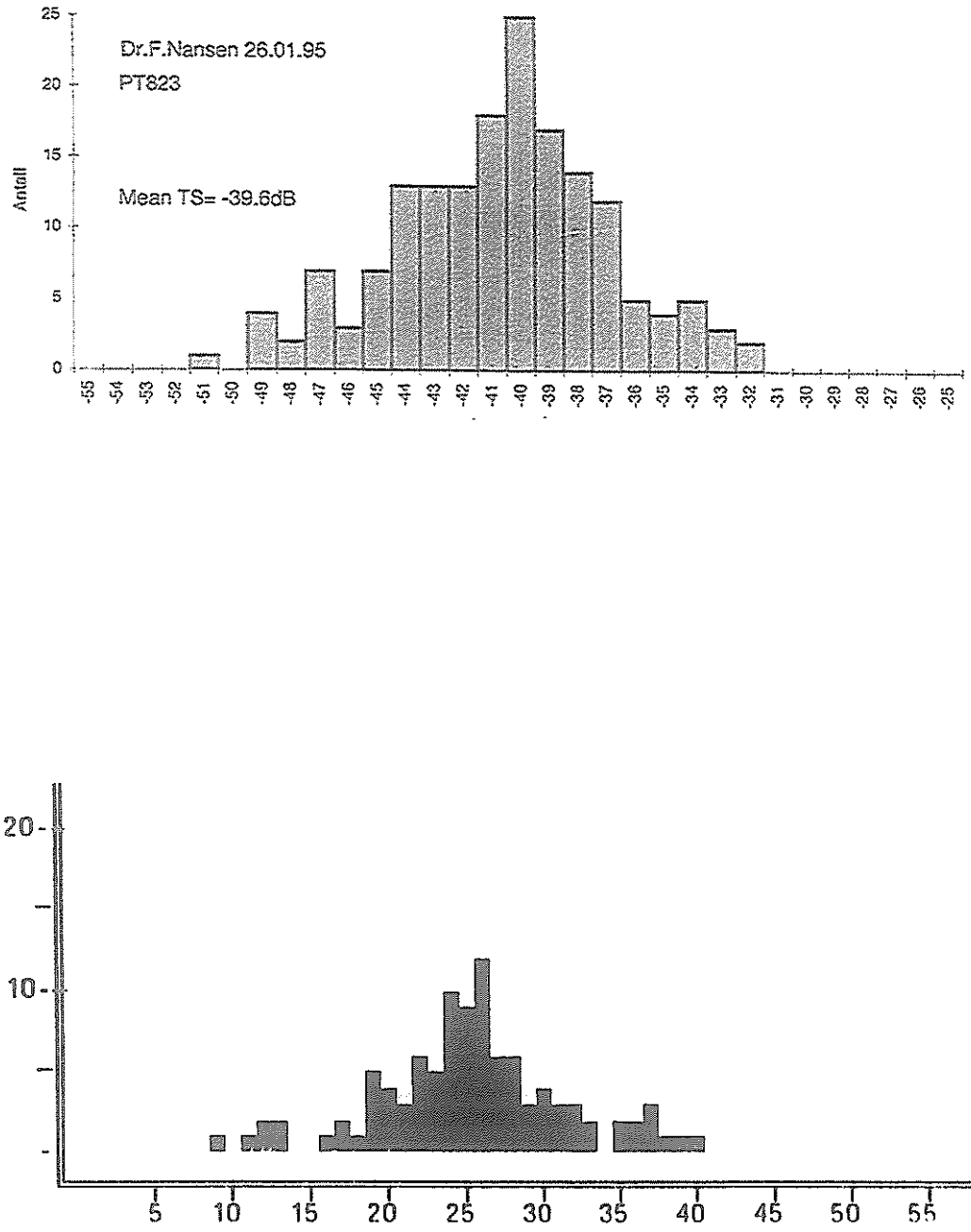


Figure 1 Distribution of target strength from one set of observations at station PT 823 (top) and size distribution of a sample of the hake caught (bottom).

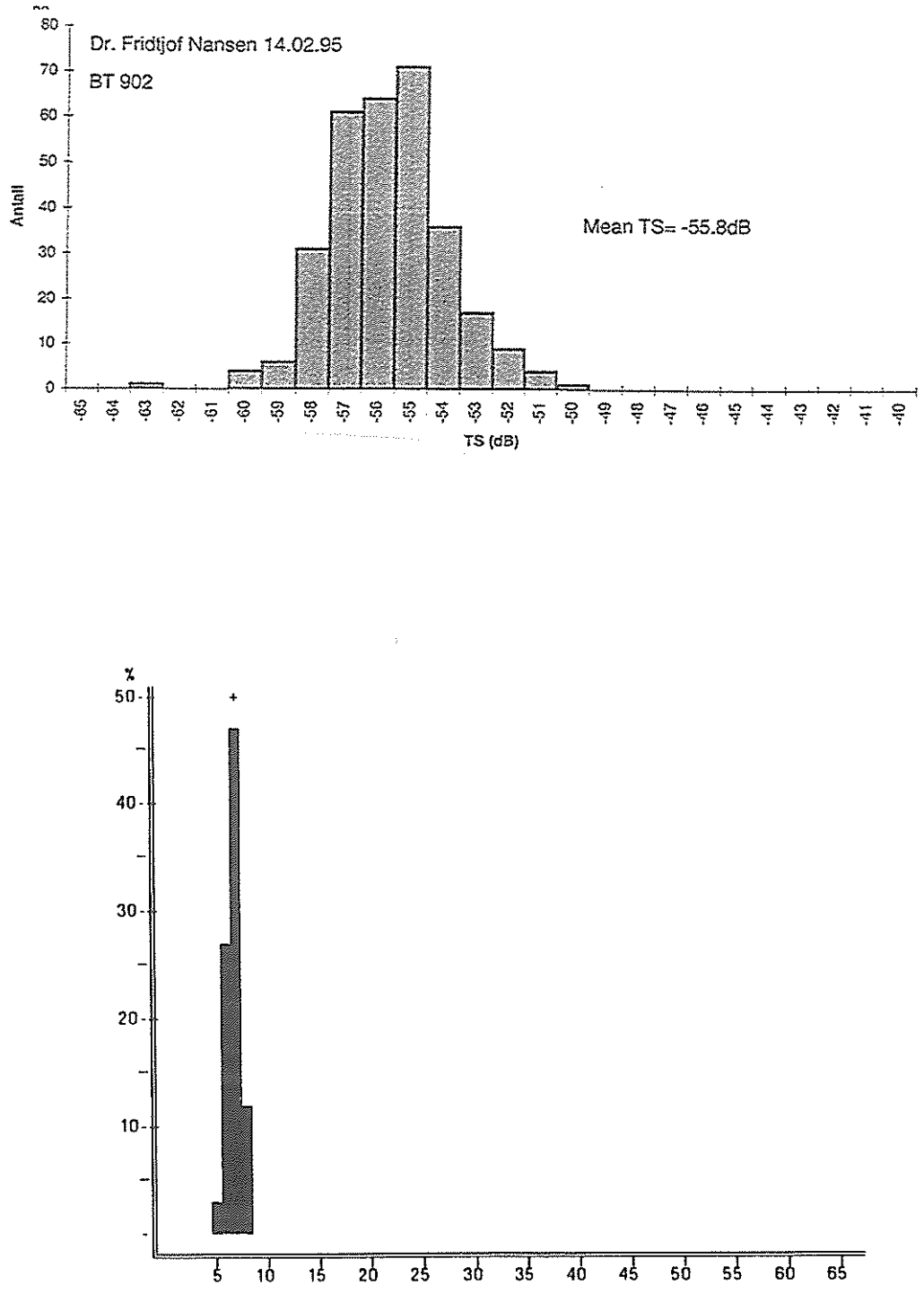


Figure 2 Distribution of target strength from one set of observations at station 902 (top), and size distribution of a sample of the myctophids caught (bottom).

CHAPTER 7 SUMMARY OF FINDINGS

Attempts will here be made to highlight the findings of most immediate interest for the future conduct of the hake surveys.

The gear experiments testing types of trawl doors and sweep length with "Dr. Fridtjof Nansen" are not fully analyzed. The trawl geometry was largely unchanged between unstrapped Waco doors and strapped Thyborøn doors and the latter may thus be used without introducing a bias. Observations showed further that in depth shallower than 400 m it is recommended to use warp length 3.1 times the fishing depth. In deeper water the ratio can be reduced to 3.0.

Only a first rough analysis has been made of the sweep tests. There is an indication that the mean catch ratios expressed in number of fish per nautical mile with 100 m versus 40 m sweeps was about 1 for fish less than 40 cm length, 1.3 for fish larger than 40 cm and 1.4 for fish larger than 50 cm length.

The relatively small number of tests of the effect of haul duration on catch rates showed large variability, but indicated that there was either a small positive bias or no bias by reducing the hauling time to 5-10 minutes.

The comparative fishing trials with other vessels were only partly successful. The gears used by "Africana" and "Dr. Fridtjof Nansen" were of very different types. The tests showed that the trawls fished small hake roughly in proportion to the height of the headlines.

The trials with "Welwitchia" showed a surprisingly high variation in closely conducted hauls, but probably no mean difference between the vessels. More trials at different depths would be needed to test possible vessel effects on catchability.

Thais with monk and sole fishing showed sharply increased catch rates for these species with use of tickler chain. Comparative fishing with commercial monk trawlers showed that these had about 50% higher catch rates per nm of monk and 30% higher for sole compared with "Dr. Fridtjof Nansen"'s hauls with tickler chain. In terms of catch/hr the ratios will be about 1.2 and 1.0.

Analysis of observed acoustic densities of hake in a bottom channel 0-6 m, adjusted for 'blind zone loss', and above with BEI data by depth layers within the working areas showed estimates of

apparent mean availability to bottom trawling of 43% at depth less than 320 m and 23% at greater depth. This indicates a trend of decreasing availability to bottom trawl with increasing depth and size and age of Cape hake. The results are limited in space and time and further studies should be made at other seasons and including all important Cape hake areas. An important experience was that echo records of pelagic Cape hake in the slope are often masked by dense scattering layers and their observation and assessment may necessitate more observations than those that may be obtained during trawling only.

Comparison of estimates of acoustic density during trawling and the corresponding swept area density was made for a large number of hauls. A set of six stations with catches of small sized hake in shallow water, 100 m, showed highest correlation and the smallest intercept if all hake in the water column, up to well over 10 m from the bottom was included in the acoustic estimate. The inclination of the regression lines was 0.6.

In a set of 27 stations with large sized hake at depth of 300 m and more, the correlation coefficient decreased and the intercept increased if hake recordings above the 5 m channel were included. These regression lines had an inclination of about 0.16.

These two sets of data indicate that at 100 m depth small sized hake observed by the vessel up to well over 10 m from the bottom was affected by the catching operation with a trawl of 5 m opening, while at 300 m and more, only fish present within the height of the trawl was affected.

The difference in the inclination of the regressions between the two sets of data must partly be due to more effective herding by the doors and the sweeps for the larger fish. A trend of increased density towards the bottom within the 5 m channel would also result in low inclination. The low intercept with the highest correlation indicate that such a trend would have to be proportional to the observed density over the range observed which may seem somewhat unlikely. And the results of the comparative fishing trials with "Africana" and the monk trawlers with trawls with very much lower headline heights, showed differences in catch rates which corresponded well with the difference in headline heights. This finding does not confirm a trend of higher density close to the bottom.

There is, however, a clear need for further studies of hake behaviour in relation to trawling and close to the bottom.

Recordings of hake contributions along courses steamed inside the shelf, while not representing any survey coverage as such, still provided some information on the distribution of young hake. Densities were remarkably low over the shelf from Conception Bay to Cape Cross, a trend continued from the October-November survey, while some areas of hake aggregations were identified further south. Acoustic coverage of pelagic hake inside the shelf edge may represent an important supplement to the swept area trawl programme.

High catch rates of Cape hake were obtained in the work areas on the outer shelf and in the slope northwest of Walvis Bay and west of Easter Point. A few hauls in the deep water off Lüderitz gave high rates of deep water hake.

Mention should also be made of high bycatches of kingklip in Area C, west of Easter Point and in three hauls west of Lüderitz with a mean catch of more than 100 kg/hr. This confirms the trend of increasing catch rates of both kingklip and monk in the surveys over a period of years and reflects the recovery of these stocks from their very low state at the end of the ICSEAF regime.

A number of series of target strength measurements were made during the cruise. Problems of wide size ranges and a mixture of species of the target fish complicated the further analysis of these data. Three series of measurements of young hake gave the following results: 26 cm hake at 230 m: TS=20logl-66.7; 22 cm hake at 100 m: TS=20logl-68.05; 13 cm hake (0-group): TS=20logl-67.7. In a layer of myctophids of 7 cm length at 250 m, measurements with the TS sonde showed TS=20logl-73.1.

APPENDIX I Records of fishing stations

PROJECT STATION: 759
DATE:17/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2221
start stop duration Long E 1254
TIME :08:35:00 09:10:00 35 (min) Purpose code: 2
LOG :8565.40 8567.40 2.00 Area code : 2
FDEPTH: 330 303 GearCond.code:
BDEPTH: 330 303 Validity code:
Towing dir: 160° Wire out: 990 m Speed: 40 kn*10

Sorted: 460 Kg Total catch: 460.00 CATCH/HOUR: 802.29

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	722.06		90.00	
Helicolenus dactylopterus	80.23		10.00	
Total	802.29		100.00	

PROJECT STATION: 760
DATE:17/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2229
start stop duration Long E 1254
TIME :09:10:00 09:40:00 30 (min) Purpose code: 2
LOG :0579.90 0578.50 1.40 Area code : 2
FDEPTH: 301 305 GearCond.code:
BDEPTH: 301 305 Validity code:
Towing dir: ° Wire out: 940 m Speed: 28 kn*10

Sorted: 123 Kg Total catch: 1161.70 CATCH/HOUR: 2323.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1680.40	1360	72.33	2492
Helicolenus dactylopterus	352.00	17974	15.15	
Schedophilus huttoni	132.80	40	5.72	
Chlorophthalmus atlanticus	84.80	3538	3.65	
Todarodes sagittatus	25.20	80	1.08	
Lophius vomerinus	17.60	40	0.76	
Galeus polli	16.40	240	0.71	
Merluccius paradoxus	14.20	86	0.61	2493
Total	2323.40		100.01	

PROJECT STATION: 761
DATE:17/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2236
start stop duration Long E 1305
TIME :12:21:00 12:51:00 30 (min) Purpose code: 2
LOG :598.00 599.90 1.90 Area code : 2
FDEPTH: 300 301 GearCond.code:
BDEPTH: 300 301 Validity code:
Towing dir: 125° Wire out: 900 m Speed: 38 kn*10

Sorted: 104 Kg Total catch: 209.64 CATCH/HOUR: 419.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	376.00	424	89.68	2494
Merluccius paradoxus	23.60	80	5.63	2495
Helicolenus dactylopterus	4.76	244	1.14	
Coelorinchus matamua	4.48	64	1.07	
Coelorinchus sp.	3.88	140	0.93	
Trachurus capensis	2.40	8	0.57	
Squalus megalops	2.00	4	0.48	
Chlorophthalmus atlanticus	1.32	72	0.31	
Galeus polli	0.84	0	0.20	
Total	419.28		100.01	

PROJECT STATION: 762
DATE:17/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2223
start stop duration Long E 1255
TIME :10:27:00 10:40:00 13 (min) Purpose code: 2
LOG :0628.70 0629.50 0.80 Area code : 2
FDEPTH: 301 297 GearCond.code: 9
BDEPTH: 301 297 Validity code: 5
Towing dir: 25° Wire out: 900 m Speed: 32 kn*10

Sorted Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 763
DATE:10/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2225
start stop duration Long E 1255
TIME :06:18:00 06:48:00 30 (min) Purpose code: 2
LOG :8664.00 8665.60 1.60 Area code : 2
FDEPTH: 296 297 GearCond.code:
BDEPTH: 296 297 Validity code:
Towing dir: 170° Wire out: 900 m Speed: 32 kn*10

Sorted: 162 Kg Total catch: 535.39 CATCH/HOUR: 1070.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	784.00	862	73.22	2496
Helicolenus dactylopterus	118.30	6790	11.05	
Chlorophthalmus atlanticus	74.20	5092	6.93	
Lophius vomerinus	27.00	16	2.52	
Schedophilus huttoni	26.60	14	2.48	
Galeus polli	18.90	406	1.77	
Coelorinchus fasciatus	7.70	280	0.72	
Todarodes sagittatus	4.20	14	0.39	
Coelorinchus coelorhinc. polli	4.20	182	0.39	
Merluccius capensis, juveniles	3.86	92	0.36	2497
Trachurus capensis	1.82	14	0.17	
Todaropsis eblanae	0.18		0.02	
Total	1070.96		100.02	

PROJECT STATION: 764
DATE:10/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2225
start stop duration Long E 1254
TIME :07:47:00 08:17:00 30 (min) Purpose code: 2
LOG :8668.70 8670.30 1.60 Area code : 2
FDEPTH: 304 307 GearCond.code:
BDEPTH: 304 307 Validity code:
Towing dir: 10° Wire out: 910 m Speed: 32 kn*10

Sorted: 143 Kg Total catch: 613.95 CATCH/HOUR: 1227.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	937.40	870	76.34	2498
Helicolenus dactylopterus	139.32	7858	11.35	
Schedophilus huttoni	47.30	26	3.85	
Chlorophthalmus atlanticus	38.70	2312	3.15	
Galeus polli	15.48	2386	1.26	
Todarodes sagittatus	12.90	26	1.05	
Coelorinchus fasciatus	12.90	594	1.05	
Trachurus capensis	7.74	36	0.63	
Genypterus capensis	6.02	26	0.49	
Lophius vomerinus	4.30	8	0.35	
Coelorinchus coelorhinc. polli	4.30	100	0.35	
Chaceon maritae	1.54	102	0.13	
Total	1227.90		100.00	

PROJECT STATION: 765
DATE:10/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2221
start stop duration Long E 1253
TIME :09:09:00 09:39:00 30 (min) Purpose code: 2
LOG :8672.70 8674.30 1.60 Area code : 2
FDEPTH: 321 333 GearCond.code:
BDEPTH: 321 333 Validity code:
Towing dir: ° Wire out: 960 m Speed: 32 kn*10

Sorted: 200 Kg Total catch: 322.16 CATCH/HOUR: 644.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	354.96	300	55.09	2500
Helicolenus dactylopterus	130.06	3144	20.19	
Lophius vomerinus	51.28	30	7.96	
Schedophilus huttoni	44.36	20	6.88	
Todarodes sagittatus	20.06	40	3.11	
Coelorinchus fasciatus	18.00	630	2.79	
Galeus polli	8.66	174	1.34	
Coelorinchus coelorhinc. polli	8.66	306	1.34	
Chlorophthalmus atlanticus	4.70	264	0.74	
Nezumia sp	1.42	102	0.22	
Aristeus varidens	0.68	194	0.11	
Selachophidium guentheri	0.68	30	0.11	
Diaphus sp.	0.52	136	0.08	
Merluccius capensis, juveniles	0.28	8	0.04	2499
Coelorinchus matamua	0.00	6		
Total	644.40		100.00	

PROJECT STATION: 766

DATE:18/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2223
start stop duration Long E 1255
TIME :10:50:00 11:20:00 30 (min) Purpose code: 2
LOG : 679.90 681.30 1.40 Area code : 2
FDEPTH: 297 298 GearCond.code:
BDEPTH: 297 298 Validity code:
Towing dir: 180° Wire out: 900 m Speed: 30 kn*10

Sorted: 140 Kg Total catch: 432.53 CATCH/HOUR: 865.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	663.40	812	76.69	2501
Helicolenus dactylopterus	89.20	4196	10.31	
Coelorinchus fasciatus	34.40	1264	3.98	
Chlorophthalmus atlanticus	30.12	1710	3.48	
Trachurus capensis	21.00	92	2.43	
Galeus polli	14.68	352	1.70	
Lophius vomerinus	9.10	36	1.05	
Coelorinchus coelorhinc. polli	3.16	110	0.37	
Total	865.06		100.01	

PROJECT STATION: 767

DATE:10/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2225
start stop duration Long E 1255
TIME :12:05:00 12:35:00 30 (min) Purpose code: 2
LOG : 684.10 685.70 1.60 Area code : 2
FDEPTH: 294 294 GearCond.code:
BDEPTH: 294 294 Validity code:
Towing dir: 180° Wire out: 900 m Speed: 32 kn*10

Sorted: 171 Kg Total catch: 683.76 CATCH/HOUR: 1367.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	1008.00	1472	73.71	2502
Helicolenus dactylopterus	172.80	9900	12.64	
Chlorophthalmus atlanticus	114.40	7118	8.37	
Trachurus capensis	36.00	96	2.63	
Galeus polli	17.60	432	1.29	
Coelorinchus fasciatus	14.40	480	1.05	
Lophius vomerinus	2.40	24	0.18	
Coelorinchus coelorhinc. polli	1.92	144	0.14	
Total	1367.52		100.01	

PROJECT STATION: 768

DATE:10/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2231
start stop duration Long E 1255
TIME :14:10:00 14:40:00 30 (min) Purpose code: 2
LOG : 690.80 692.50 1.70 Area code : 2
FDEPTH: 298 296 GearCond.code:
BDEPTH: 298 296 Validity code:
Towing dir: 180° Wire out: 900 m Speed: 34 kn*10

Sorted: 186 Kg Total catch: 821.50 CATCH/HOUR: 1643.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	1388.00	1494	84.48	2503
Lophius vomerinus	90.60	92	5.51	
Helicolenus dactylopterus	74.40	3936	4.53	
Chlorophthalmus atlanticus	47.60	3174	2.90	
Trachurus capensis	29.60	126	1.80	
Coelorinchus coelorhinc. polli	12.80	426	0.78	
Total	1643.00		100.00	

PROJECT STATION: 769

DATE:18/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2234
start stop duration Long E 1255
TIME :15:39:00 16:09:00 30 (min) Purpose code: 2
LOG :8695.10 8696.80 1.70 Area code : 2
FDEPTH: 305 308 GearCond.code:
BDEPTH: 305 308 Validity code:
Towing dir: 180° Wire out: 900 m Speed: 34 kn*10

Sorted: 160 Kg Total catch: 700.54 CATCH/HOUR: 1401.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	718.32	700	51.27	2504
Herluccius paradoxus	293.40	1200	20.94	2505
Helicolenus dactylopterus	218.12	8008	15.57	
Schedophilus huttoni	74.10	26	5.29	
Chlorophthalmus atlanticus	64.82	3706	4.63	
Galeus polli	15.24	158	1.09	
Coelorinchus fasciatus	8.68	526	0.62	
Coelorinchus coelorhinc. polli	8.40	288	0.60	
Total	1401.08		100.01	

PROJECT STATION: 770

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2226
start stop duration Long E 1255
TIME :06:43:00 07:13:00 30 (min) Purpose code: 2
LOG :8726.50 8728.10 1.60 Area code : 2
FDEPTH: 296 298 GearCond.code:
BDEPTH: 296 298 Validity code:
Towing dir: 10° Wire out: 880 m Speed: 32 kn*10

Sorted: 130 Kg Total catch: 381.33 CATCH/HOUR: 762.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	491.04	712	64.39	2507
Helicolenus dactylopterus	114.56	6056	15.02	
Chlorophthalmus atlanticus	62.98	4100	8.26	
Todarodes sagittatus	33.06	58	4.33	
Lophius vomerinus	22.00	16	2.88	
Coelorinchus fasciatus	12.82	512	1.68	
Galeus polli	11.40	370	1.49	
Trachurus capensis	7.12	28	0.93	
Herluccius capensis, juveniles	5.00	94	0.66	2506
Coelorinchus coelorhinc polli	2.56	142	0.34	
Total	762.54		99.98	

PROJECT STATION: 771

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2224
start stop duration Long E 1254
TIME :08:15:00 08:45:00 30 (min) Purpose code: 2
LOG :8732.80 8734.40 1.60 Area code : 2
FDEPTH: 309 308 GearCond.code:
BDEPTH: 309 308 Validity code:
Towing dir: 12° Wire out: 950 m Speed: 32 kn*10

Sorted: 131 Kg Total catch: 553.50 CATCH/HOUR: 1107.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	753.60	846	68.08	2508
Helicolenus dactylopterus	174.30	6414	15.75	
Coelorinchus fasciatus	54.80	1992	4.95	
Chlorophthalmus atlanticus	30.40	1894	2.75	
Lophius vomerinus	23.90	14	2.16	
Coelorinchus coelorhinc. polli	22.90	946	2.07	
Austroglossus microlepis	21.58	50	1.95	
Dentex macrophthalmus	21.58	50	1.95	
Herluccius capensis, juveniles	3.98	100	0.36	2509
Total	1107.04		100.02	

PROJECT STATION: 772

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2222
start stop duration Long E 1254
TIME :09:35:00 10:05:00 30 (min) Purpose code: 2
LOG :8736.80 8738.50 1.70 Area code : 2
FDEPTH: 323 335 GearCond.code:
BDEPTH: 323 335 Validity code:
Towing dir: 342° Wire out: 960 m Speed: 34 kn*10

Sorted: 169 Kg Total catch: 597.48 CATCH/HOUR: 1194.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	786.00	686	65.78	2511
Coelorinchus fasciatus	151.46	3530	12.67	
Lophius vomerinus	89.40	44	7.48	
Helicolenus dactylopterus	74.94	1960	6.27	
Herluccius capensis, juveniles	36.88	354	3.09	
Coelorinchus coelorhinc. polli	17.26	784	1.44	
Galeus polli	15.30	314	1.28	
Herluccius paradoxus	8.42	84	0.70	2510
Chlorophthalmus atlanticus	8.24	432	0.69	
Nezumia sp.	4.32	354	0.36	
Selachophidium guentheri	1.96	110	0.16	
Coelorinchus matamua	0.78	40	0.07	
Total	1194.96		99.99	

PROJECT STATION: 773

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2222
start stop duration Long E 1255
TIME :11:03:00 11:33:00 30 (min) Purpose code: 2
LOG :8743.30 8745.00 1.70 Area code : 2
FDEPTH: 297 297 GearCond.code:
BDEPTH: 297 297 Validity code:
Towing dir: 185° Wire out: 930 m Speed: 34 kn*10

Sorted: 167 Kg Total catch: 698.18 CATCH/HOUR: 1396.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	748.80	1060	53.63	2512
Trachurus capensis	251.20	1310	17.99	
Chlorophthalmus atlanticus	95.94	5184	6.87	
Coelorinchus fasciatus	62.40	2128	4.47	
Prionace glauca	55.00	2	3.94	
Helicolenus dactylopterus	48.66	2316	3.48	
TETRAGONURIDAE	42.90	116	3.07	
Galeus polli	39.00	396	2.79	
Lophius vomerinus	36.40	20	2.61	
Todarodes sagittatus	10.14	24	0.73	
Coelorinchus coelorhinc. polli	3.12	116	0.22	
Todaropsis eblanae	2.80	116	0.20	
Total	1396.36		100.00	

PROJECT STATION: 774

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2225
start stop duration Long E 1255
TIME :12:27:00 12:57:00 30 (min) Purpose code: 2
LOG :8747.90 8749.70 1.80 Area code : 2
FDEPTH: 296 294 GearCond.code:
BDEPTH: 296 294 Validity code:
Towing dir: 180° Wire out: 930 m Speed: 36 kn*10

Sorted: 144 Kg Total catch: 558.95 CATCH/HOUR: 1117.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Herluccius capensis	524.40	958	46.91	2513
Trachurus capensis	230.60	1230	20.63	
Schedophilus huttoni	119.40	44	10.68	
Helicolenus dactylopterus	114.40	6304	10.23	
Chlorophthalmus atlanticus	48.40	3374	4.33	
Coelorinchus fasciatus	41.80	1450	3.74	
Lophius vomerinus	27.50	20	2.46	
Galeus polli	11.40	320	1.02	
Total	1117.90		100.00	

PROJECT STATION: 775

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2231

	start	stop	duration			Long E 1255
TIME	:13:51:00	14:21:00	30 (min)	Purpose code:	2	
LOG	:8754.00	8755.70	1.70	Area code :	2	
FDEPTH:	298	296		GearCond.code:		
BDEPTH:	298	296		Validity code:		

Towing dir: 100° Wire out: 930 m Speed: 34 kn*10

Sorted: 190 Kg Total catch: 521.26 CATCH/HOUR: 1042.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	440.60	610	42.27	2514
Helicolenus dactylopterus	194.40	9064	18.65	
Schedophilus huttoni	102.00	32	9.70	
Chlorophthalmus atlanticus	89.60	6324	8.59	
Raja leopardus	76.00	32	7.29	
Trachurus capensis	43.20	190	4.14	
Lophius vomerinus	40.70	28	3.90	
Galeus polli	25.12	572	2.41	
Squalus megalops	18.12	32	1.74	
Coelorinchus fasciatus	6.60	320	0.64	
Diaphus sp.	2.22	508	0.21	
Merluccius paradoxus	2.22	16	0.21	2515
Coelorinchus coelorhinc. polli	1.58	64	0.15	
Total	1042.52		99.98	

PROJECT STATION: 776

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2235

	start	stop	duration			Long E 1255
TIME	:15:07:00	15:37:00	30 (min)	Purpose code:	2	
LOG	:0758.20	0760.00	1.80	Area code :	2	
FDEPTH:	304	309		GearCond.code:		
BDEPTH:	304	309		Validity code:		

Towing dir: 180° Wire out: 930 m Speed: 34 kn*10

Sorted: 320 Kg Total catch: 801.64 CATCH/HOUR: 1603.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	922.64	760	57.55	2516
Helicolenus dactylopterus	257.64	9200	16.07	
Merluccius paradoxus	166.44	812	10.38	2517
Schedophilus huttoni	104.88	46	6.54	
Chlorophthalmus atlanticus	88.92	5290	5.55	
Lophius vomerinus	24.00	8	1.50	
Galeus polli	22.34	320	1.39	
Coelorinchus fasciatus	11.40	546	0.71	
Coelorinchus coelorhinc. polli	5.02	182	0.31	
Total	1603.28		100.00	

PROJECT STATION: 777

DATE:19/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2234

	start	stop	duration			Long E 1254
TIME	:16:35:00	16:40:00	5 (min)	Purpose code:	2	
LOG	:0765.30	0765.60	0.30	Area code :	2	
FDEPTH:	305	307		GearCond.code:	9	
BDEPTH:	305	307		Validity code:	9	

Towing dir: 160° Wire out: 930 m Speed: 30 kn*10

Sorted: 103 Kg Total catch: 103.15 CATCH/HOUR: 1237.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	877.80		70.92	
Deepwater fish mixture	360.00		29.08	
Total	1237.80		100.00	

PROJECT STATION: 778

DATE:20/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2235

	start	stop	duration			Long E 1259
TIME	:05:33:00	06:03:00	30 (min)	Purpose code:	2	
LOG	:8848.20	8849.00	1.60	Area code :	2	
FDEPTH:	299	300		GearCond.code:		
BDEPTH:	299	300		Validity code:		

Towing dir: 180° Wire out: 930 m Speed: 32 kn*10

Sorted: 168 Kg Total catch: 245.53 CATCH/HOUR: 491.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	195.00	346	39.87	2518
Helicolenus dactylopterus	71.40	3162	14.54	
Schedophilus huttoni	43.60	10	8.88	
Chlorophthalmus atlanticus	37.20	2556	7.58	
Todarodes sagittatus	34.08	48	6.94	
Lophius vomerinus	28.80	22	5.86	
Galeus polli	20.80	304	4.24	
Hexanchus griseus	20.00	2	4.07	
Raja leopardus	10.40	4	2.12	
Coelorinchus coelorhinc. polli	8.88	340	1.81	
Trachurus capensis	7.44	36	1.52	
Coelorinchus fasciatus	5.40	72	1.10	
Merluccius paradoxus	5.30	42	1.08	2519
Austroglossus microlepis	1.96	4	0.40	
Total	491.06		100.01	

PROJECT STATION: 779

DATE:20/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2235

	start	stop	duration			Long E 1259
TIME	:07:01:00	07:31:00	30 (min)	Purpose code:	2	
LOG	:8854.80	8856.40	1.60	Area code :	2	
FDEPTH:	299	300		GearCond.code:		
BDEPTH:	299	300		Validity code:		

Towing dir: 180° Wire out: 930 m Speed: 32 kn*10

Sorted: 200 Kg Total catch: 271.64 CATCH/HOUR: 543.28

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	254.00	348	46.75	2520
Lophius vomerinus	80.50	60	14.82	
Helicolenus dactylopterus	55.70	2400	10.25	
Schedophilus huttoni	31.70	14	5.83	
Chlorophthalmus atlanticus	31.50	2330	5.80	
Raja leopardus	18.90	10	3.48	
Trachurus capensis	17.80	80	3.28	
Coelorinchus coelorhinc. polli	16.90	610	3.11	
Todarodes sagittatus	11.70	18	2.15	
Galeus polli	8.50	160	1.56	
Austroglossus microlepis	4.94	8	0.91	
Coelorinchus fasciatus	3.40	80	0.63	
ARISTEIDAE	2.70	700	0.50	
Merluccius paradoxus	2.40	16	0.44	2521
C R A B S	1.80	70	0.33	
Genypterus capensis	0.54	2	0.10	
Coelorinchus matamua	0.30	10	0.06	
Total	543.28		100.00	

PROJECT STATION: 700

DATE:20/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2235

	start	stop	duration			Long E 1253
TIME	:09:13:00	09:43:00	30 (min)	Purpose code:	2	
LOG	:8868.10	8869.80	1.70	Area code :	2	
FDEPTH:	339	326		GearCond.code:		
BDEPTH:	339	326		Validity code:		

Towing dir: 170° Wire out:1017 m Speed: 34 kn*10

Sorted: 204 Kg Total catch: 1299.98 CATCH/HOUR: 2599.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1310.60	1156	50.41	2522
Helicolenus dactylopterus	598.40	9136	23.02	
Merluccius paradoxus	175.60	678	6.75	2523
Schedophilus huttoni	86.90	40	3.34	
Todarodes sagittatus	74.80	272	2.88	
Genypterus capensis	57.30	74	2.20	
Coelorinchus fasciatus	25.16	952	0.97	
Lophius vomerinus	20.90	10	0.80	
Chlorophthalmus atlanticus	20.40	1020	0.78	
Lophius vaillanti	12.50	4	0.48	
Nezumia sp.	8.20	206	0.32	
Beryx splendens	1.20	2	0.05	
Total	2599.96		100.00	

PROJECT STATION: 701

DATE:20/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2235

	start	stop	duration			Long E 1254
TIME	:10:50:00	11:20:00	30 (min)	Purpose code:	2	
LOG	:8875.20	8876.90	1.70	Area code :	2	
FDEPTH:	330	326		GearCond.code:		
BDEPTH:	330	326		Validity code:		

Towing dir: 170° Wire out:1017 m Speed: 34 kn*10

Sorted: 394 Kg Total catch: 948.30 CATCH/HOUR: 1896.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	847.36	566	44.68	2524
Helicolenus dactylopterus	594.00	9512	31.32	
Lophius vomerinus	72.40	36	3.82	
Schedophilus huttoni	63.70	24	3.36	
Todarodes sagittatus	58.60	36	3.09	
Genypterus capensis	51.50	56	2.72	
Galeus polli	44.60	574	2.35	
Merluccius paradoxus	44.00	176	2.32	2525
Coelorinchus fasciatus	36.00	972	1.90	
Merluccius paradoxus, juvenile	34.30	224	1.81	2526
Chlorophthalmus atlanticus	16.20	756	0.85	
C R A B S	15.00	464	0.79	
Nezumia sp.	12.24	504	0.65	
Coelorinchus coelorhinc. polli	4.68	144	0.25	
Halaecephalus laevis	1.40	36	0.07	
Ebinania costaecanarie	1.00	34	0.05	
Total	1896.98		100.03	

PROJECT STATION: 702

DATE:20/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2234

	start	stop	duration			Long E 1252
TIME	:12:32:00	13:02:00	30 (min)	Purpose code:	2	
LOG	:8881.80	8883.40	1.60	Area code :	2	
FDEPTH:	350	351		GearCond.code:		
BDEPTH:	350	351		Validity code:		

Towing dir: 335° Wire out:1100 m Speed: 32 kn*10

Sorted: 202 Kg Total catch: 626.85 CATCH/HOUR: 1253.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	781.00	638	62.30	2527
Merluccius paradoxus	143.42	592	11.44	2528
Coelorinchus fasciatus	93.34	2028	7.45	
Shrimps, small, non comm	72.00		5.01	
Helicolenus dactylopterus	60.40	676	4.82	
Schedophilus huttoni	55.70	24	4.44	
Nezumia sp.	14.82	546	1.18	
Galeus polli	11.18	104	0.89	
Todarodes sagittatus	9.62	26	0.77	
Genypterus capensis	6.10	8	0.49	
Chlorophthalmus atlanticus	2.60	104	0.21	
Lophius vomerinus	2.20	2	0.18	
Selachophidium guentheri	0.52	26	0.04	
Total	1253.70		100.02	

PROJECT STATION: 783

DATE:20/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2234
start stop duration Long E 1252
TIME :14:08:00 14:38:00 30 (min) Purpose code: 2
LOG :8888.90 8890.50 1.60 Area code : 2
FDEPTH: 349 353 GearCond.code:
BDEPTH: 349 353 Validity code:
Towing dir: 345° Wire out:1100 m Speed: 32 kn*10

Sorted: 123 Kg Total catch: 515.40 CATCH/HOUR: 1030.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	437.38	318	42.43	2529
Merluccius paradoxus	108.40	466	10.52	2530
Deepwater fish mixture	88.60		8.60	
Deania calcea	68.78	56	6.67	
Helicolenus dactylopterus	66.68	684	6.47	
Coelorinchus fasciatus	35.34	778	3.43	
Schedophilus huttoni	35.20	12	3.41	
Hexanchus griseus	34.60	18	3.36	
Coelorinchus coelorhinc. polli	28.20	266	2.74	
Raja confundens	27.74	18	2.69	
Centrophorus squamosus	22.98	18	2.23	
Todarodes sagittatus	17.10	38	1.66	
Nezumia sp.	11.96	512	1.16	
Lophius vomerinus	10.10	2	0.98	
Genypterus capensis	9.80	6	0.95	
Galeus polli	8.54	114	0.83	
C R A B S	7.04	172	0.68	
Etmopterus lucifer	4.76	10	0.46	
Epigonus telescopus	3.62	94	0.35	
Selachophidium guentheri	2.66	38	0.26	
Chlorophthalmus atlanticus	1.32	94	0.13	
Total	1030.80		100.01	

PROJECT STATION: 784

DATE:20/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2234
start stop duration Long E 1252
TIME :15:51:00 16:21:00 30 (min) Purpose code: 2
LOG :8896.70 8898.30 1.60 Area code : 2
FDEPTH: 345 343 GearCond.code:
BDEPTH: 349 343 Validity code:
Towing dir: 345° Wire out:1100 m Speed: 32 kn*10

Sorted: 165 Kg Total catch: 363.72 CATCH/HOUR: 727.44

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	211.20	142	29.03	2531
Centrophorus squamosus	156.80	98	21.56	
Deepwater fish mixture	80.78		11.10	
Merluccius paradoxus	57.80	166	7.95	2532
Coelorinchus fasciatus	41.72	1064	5.74	
Deania calcea	32.48	20	4.46	
Schedophilus huttoni	29.40	14	4.04	
Neoharriotta pinnata	23.80	14	3.27	
Etmopterus lucifer	16.66	56	2.29	
Galeus polli	14.28	196	1.96	
Nezumia sp.	13.30	126	1.83	
Helicolenus dactylopterus	12.46	154	1.71	
Epigonus telescopus	12.32	518	1.69	
Lophius vomerinus	9.80	6	1.35	
Lophius vaillanti	5.80	2	0.80	
C R A B S	5.04	126	0.69	
Genypterus capensis	3.80	2	0.52	
Total	727.44		99.99	

PROJECT STATION: 785

DATE:20/ 1/95 GEAR TYPE: PT No:5 POSITION:Lat S 2223
start stop duration Long E 1253
TIME :21:10:00 21:30:00 20 (min) Purpose code: 2
LOG :8920.30 8921.30 1.00 Area code : 2
FDEPTH: 250 286 GearCond.code:
BDEPTH: 312 353 Validity code:
Towing dir: 286° Wire out: 800 m Speed: 35 kn*10

Sorted: 26 Kg Total catch: 26.03 CATCH/HOUR: 78.09

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	66.00		84.52	
Merluccius capensis	7.35	3	9.41	2533
Todarodes sagittatus	3.84	12	4.92	
Dentex macrophthalmus	0.90	3	1.15	
Total	78.09		100.00	

PROJECT STATION: 786

DATE:21/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2236
start stop duration Long E 1259
TIME :05:42:00 06:04:00 22 (min) Purpose code: 2
LOG :8945.10 8946.30 1.20 Area code : 2
FDEPTH: 300 300 GearCond.code:
BDEPTH: 300 300 Validity code:
Towing dir: 160° Wire out: 900 m Speed: kn*10

Sorted: 127 Kg Total catch: 192.18 CATCH/HOUR: 524.13

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	174.55	210	33.30	2534
Lophius vomerinus	126.82	79	24.20	
Coelorinchus coelorhinc. polli	59.56	1928	11.36	
Chlorophthalmus atlanticus	52.12	3188	9.94	
Helicolenus dactylopterus	47.35	2024	9.03	
Galeus polli	22.91	477	4.37	
Merluccius capensis, juveniles	14.45	202	2.76	2535
Austroglossus microlepis	9.16	19	1.75	
Coelorinchus fasciatus	8.97	134	1.71	
Todarodes sagittatus	7.25	19	1.38	
Halacocephalus laevis	0.76	19	0.15	
Merluccius paradoxus	0.22	3	0.04	2536
Total	524.12		99.99	

PROJECT STATION: 787

DATE:21/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2237
start stop duration Long E 1259
TIME :07:08:00 07:38:00 30 (min) Purpose code: 2
LOG :8951.80 8953.50 1.70 Area code : 2
FDEPTH: 299 300 GearCond.code:
BDEPTH: 299 300 Validity code:
Towing dir: 172° Wire out: 900 m Speed: 34 kn*10

Sorted: 169 Kg Total catch: 228.53 CATCH/HOUR: 457.06

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	230.60	246	50.45	2537
Lophius vomerinus	80.90	44	17.70	
Helicolenus dactylopterus	40.20	564	8.80	
Chlorophthalmus atlanticus	25.20	1752	5.51	
Todarodes sagittatus	19.20	36	4.20	
Coelorinchus coelorhinc. polli	16.56	564	3.62	
Trachurus capensis	12.00	36	2.63	
Merluccius capensis, juveniles	11.88	146	2.60	2538
Galeus polli	11.16	228	2.44	
Coelorinchus fasciatus	7.56	156	1.65	
Merluccius paradoxus	1.32	8	0.29	2539
Halacocephalus laevis	0.48	24	0.11	
Total	457.06		100.00	

PROJECT STATION: 788

DATE:21/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2236
start stop duration Long E 1253
TIME :09:18:00 09:48:00 30 (min) Purpose code: 2
LOG :8964.50 8966.20 1.70 Area code : 2
FDEPTH: 335 323 GearCond.code:
BDEPTH: 335 323 Validity code:
Towing dir: 170° Wire out:1017 m Speed: 34 kn*10

Sorted: 454 Kg Total catch: 1494.74 CATCH/HOUR: 2989.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1575.00	1154	52.68	2540
Helicolenus dactylopterus	999.00	16204	33.42	
Galeus polli	117.60	1776	3.93	
Chlorophthalmus atlanticus	67.20	3256	2.25	
Merluccius paradoxus	67.20	452	2.25	2542
Schedophilus huttoni	51.70	22	1.73	
Todarodes sagittatus	34.80	74	1.16	
Genypterus capensis	34.60	44	1.16	
Coelorinchus fasciatus	15.40	666	0.52	
Halacocephalus laevis	14.00	370	0.47	
Nezumia sp.	5.20	296	0.17	
Lophius vomerinus	4.98	4	0.17	
Merluccius capensis, juveniles	2.80	24	0.09	2541
Total	2989.48		100.00	

PROJECT STATION: 789

DATE:21/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2236
start stop duration Long E 1254
TIME :11:00:00 11:30:00 30 (min) Purpose code: 2
LOG :8972.80 8974.50 1.70 Area code : 2
FDEPTH: 336 325 GearCond.code:
BDEPTH: 336 325 Validity code:
Towing dir: 170° Wire out:1018 m Speed: 34 kn*10

Sorted: 235 Kg Total catch: 718.30 CATCH/HOUR: 1436.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	818.00	614	56.94	2543
Helicolenus dactylopterus	435.60	7008	30.32	
Genypterus capensis	42.20	44	2.94	
Galeus polli	40.80	644	2.84	
Merluccius paradoxus	33.60	200	2.34	2544
Lophius vomerinus	26.70	14	1.86	
Chlorophthalmus atlanticus	11.40	598	0.79	
Coelorinchus fasciatus	8.60	230	0.60	
Schedophilus huttoni	8.30	4	0.58	
Nezumia sp.	6.00	230	0.42	
Coelorinchus coelorhinc. polli	3.60	92	0.25	
Halacocephalus laevis	1.80	46	0.13	
Total	1436.60		100.01	

PROJECT STATION: 790

DATE:21/ 1/95 GEAR TYPE: BT No:8 POSITION:Lat S 2238
start stop duration Long E 1253
TIME :12:38:00 13:08:00 30 (min) Purpose code: 2
LOG :8979.40 8981.10 1.70 Area code : 2
FDEPTH: 349 357 GearCond.code:
BDEPTH: 349 357 Validity code:
Towing dir: 180° Wire out:1050 m Speed: 34 kn*10

Sorted: 227 Kg Total catch 710.79 CATCH/HOUR: 1421.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	480.60	5756	33.81	
Merluccius paradoxus	389.60	1752	27.41	2546
Merluccius capensis	343.60	242	24.17	2545
Schedophilus huttoni	36.80	12	2.59	
Epigonus denticulatus	32.60	782	2.29	
Genypterus capensis	23.10	24	1.62	
R A Y S	20.60	46	1.45	
MORIDAE	20.20	460	1.42	
Chlorophthalmus atlanticus	18.80	782	1.32	
Lophius vomerinus	16.00	12	1.13	
Nezumia sp.	15.20	552	1.07	
Coelorinchus fasciatus	12.54	322	0.88	
Galeus polli	10.60	138	0.75	
Coelorinchus coelorhinc. polli	1.34	26	0.09	
Total	1421.58		100.00	

PROJECT STATION: 791

DATE:21/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2238
start stop duration Long E 1253
TIME :14:23:00 14:53:00 30 (min) Purpose code: 2
LOG :0907.20 0908.70 1.50 Area code : 2
FDEPTH: 349 357 GearCond.code:
BDEPTH: 349 357 Validity code:
Towing dir: 170° Wire out:1050 m Speed: 30 kn*10

Sorted: 103 Kg Total catch: 250.00 CATCH/HOUR: 500.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	230.30	148	46.06	2547
Helicolenus dactylopterus	101.40	1364	20.28	
Merluccius paradoxus	42.20	210	8.44	2548
Lophius vomerinus	33.00	24	6.60	
Todarodes sagittatus	25.30	40	5.06	
Schedophilus huttoni	21.80	8	4.36	
Coelorinchus fasciatus	16.10	490	3.22	
Epigonus denticulatus	7.70	190	1.54	
Genypterus capensis	5.50	6	1.10	
Nezumia sp.	4.70	210	0.94	
Laemonema laureysi	3.30	100	0.66	
C R A B S	3.10	90	0.62	
Coelorinchus coelorhinc. polli	2.90	70	0.58	
Chlorophthalmus atlanticus	1.40	50	0.28	
Galeus polli	1.30	20	0.26	
Total	500.00		100.00	

PROJECT STATION: 792

DATE:22/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2222
start stop duration Long E 1247
TIME :06:21:00 06:51:00 30 (min) Purpose code: 2
LOG :9115.90 9117.30 1.40 Area code : 2
FDEPTH: 457 454 GearCond.code:
BDEPTH: 457 454 Validity code:
Towing dir: 160° Wire out:1350 m Speed: 28 kn*10

Sorted: 147 Kg Total catch: 365.48 CATCH/HOUR: 730.96

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachyrincus scabrus	259.20	984	35.46	
Merluccius paradoxus	202.70	262	27.73	2549
S U R I H P S	93.60		12.81	
Helicolenus dactylopterus	47.10	148	6.44	2550
Nezumia sp.	38.16	1152	5.22	
Hoplostethus cadenati	22.56	1680	3.09	
Schedophilus huttoni	20.40	24	2.79	
Etmopterus lucifer	14.88	48	2.04	
Coelorinchus fasciatus	6.96	88	0.95	
Lophius vomerinus	5.80	2	0.79	
Notacanthus sexspinis	5.04	192	0.69	
Chaceon maritae	4.96	4	0.68	
Selachophidium guentheri	4.08	72	0.56	
Epigonus denticulatus	3.60	48	0.49	
Galeus polli	1.92	24	0.26	
Total	730.96		100.00	

PROJECT STATION: 793

DATE:22/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2222
start stop duration Long E 1247
TIME :08:02:00 08:32:00 30 (min) Purpose code: 2
LOG :9123.20 9124.70 1.50 Area code : 2
FDEPTH: 457 458 GearCond.code:
BDEPTH: 457 458 Validity code:
Towing dir: 160° Wire out:1350 m Speed: 30 kn*10

Sorted: 255 Kg Total catch: 653.46 CATCH/HOUR: 1306.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius paradoxus	393.00	334	29.99	2551
Trachyrincus scabrus	347.20	1312	26.57	
Shrimps, small, non comm.	280.00	117090	21.42	
Epigonus denticulatus	55.36	672	4.24	
Helicolenus dactylopterus	52.80	150	4.04	2552
Nezumia sp.	48.64	1856	3.72	
Deania profundorum	38.00	64	2.91	
Schedophilus huttoni	24.96	32	1.91	
Coelorinchus fasciatus	20.48	320	1.57	
Centrophorus squamosus	18.88	32	1.44	
Lophius vomerinus	13.80	2	1.06	
Notacanthus sexspinis	7.36	192	0.56	
Lithodes ferox	2.88	32	0.22	
Selachophidium guentheri	2.56	64	0.20	
Hoplostethus cadenati	1.92	192	0.15	
Total	1306.92		100.00	

PROJECT STATION: 794

DATE:22/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2232
start stop duration Long E 1253
TIME :10:26:00 10:56:00 30 (min) Purpose code: 2
LOG :9137.70 9139.20 1.50 Area code : 2
FDEPTH: 320 320 GearCond.code:
BDEPTH: 320 320 Validity code:
Towing dir: 175° Wire out:1050 m Speed: 30 kn*10

Sorted: 300 Kg Total catch: 1720.50 CATCH/HOUR: 3441.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	2733.00	2490	79.42	2554
Helicolenus dactylopterus	407.00	6930	11.83	
Coelorinchus fasciatus	70.40	2530	2.05	
Merluccius paradoxus	61.00	160	1.77	2553
Galeus polli	57.20	550	1.66	
Genypterus capensis	39.60	110	1.15	
Chlorophthalmus atlanticus	38.40	1980	1.12	
Lophius vomerinus	30.00	14	0.87	
Halaelurus lasvis	4.40	110	0.13	
Total	3441.00		100.00	

PROJECT STATION: 795

DATE:22/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2232
start stop duration Long E 1253
TIME :12:01:00 12:31:00 30 (min) Purpose code: 2
LOG :9144.40 9145.30 0.90 Area code : 2
FDEPTH: 321 320 GearCond.code:
BDEPTH: 321 320 Validity code:
Towing dir: 175° Wire out:1050 m Speed: 30 kn*10

Sorted: 921 Kg Total catch: 1151.87 CATCH/HOUR: 3455.61

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	2685.00	2799	77.70	2555
Helicolenus dactylopterus	249.40	4420	7.22	
Schedophilus huttoni	141.30	108	4.09	
Todarodes sagittatus	120.96	216	3.50	
Nezumia sp.	116.64	216	3.38	
Coelorinchus fasciatus	49.60	1620	1.44	
Merluccius paradoxus	47.40	246	1.37	2556
Chlorophthalmus atlanticus	21.60	972	0.63	
Lophius vomerinus	12.75	12	0.37	
Galeus polli	10.80	108	0.31	
Total	3455.61		100.01	

PROJECT STATION: 796

DATE:22/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2235
start stop duration Long E 1255
TIME :13:20:00 13:50:00 30 (min) Purpose code: 2
LOG :9140.80 9150.30 1.50 Area code : 2
FDEPTH: 306 304 GearCond.code:
BDEPTH: 306 304 Validity code:
Towing dir: 165° Wire out: 915 m Speed: 30 kn*10

Sorted: 101 Kg Total catch: 905.66 CATCH/HOUR: 1811.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	864.00	2058	47.70	2557
Helicolenus dactylopterus	472.50	17244	26.09	
Chlorophthalmus atlanticus	241.80	13896	13.35	
Galeus polli	87.00	1638	4.80	
Todarodes sagittatus	67.20	126	3.71	
Lophius vomerinus	30.90	12	1.71	
MYCTOPHIDAE	16.40	1266	0.91	
Coelorinchus fasciatus	15.12	642	0.83	
Coelorinchus coelorhinc. polli	7.20	336	0.40	
BATHYLAGIDAE	5.80	294	0.32	
Shrimps, small, non comm.	3.40	798	0.19	
Total	1811.32		100.01	

PROJECT STATION: 797

DATE:22/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2235
start stop duration Long E 1255
TIME :14:48:00 15:18:00 30 (min) Purpose code: 2
LOG :9155.30 9156.80 1.50 Area code : 2
FDEPTH: 307 303 GearCond.code:
BDEPTH: 307 303 Validity code:
Towing dir: 165° Wire out: 915 m Speed: 30 kn*10

Sorted: 130 Kg Total catch: 383.67 CATCH/HOUR: 767.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	531.00	1078	69.20	2558
Helicolenus dactylopterus	97.80	2990	12.75	
Chlorophthalmus atlanticus	65.80	3510	8.58	
Todarodes sagittatus	24.90	52	3.24	
Lophius vomerinus	14.30	10	1.86	
Coelorinchus fasciatus	10.14	468	1.32	
Trachurus capensis	7.28	26	0.95	
Coelorinchus coelorhinc. polli	6.50	234	0.85	
Galeus polli	5.80	104	0.76	
Merluccius paradoxus	2.60	26	0.34	
Genypterus capensis	1.22	2	0.16	
Total	767.34		100.01	

PROJECT STATION: 798

DATE:23/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2222
start stop duration Long E 1247
TIME :06:26:00 06:56:00 30 (min) Purpose code: 2
LOG :9184.50 9185.75 1.25 Area code : 2
FDEPTH: 460 462 GearCond.code:
BDEPTH: 460 462 Validity code:
Towing dir: 162° Wire out:1350 m Speed: 25 kn*10

Sorted: 150 Kg Total catch: 678.09 CATCH/HOUR: 1357.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachyrincus scabrus	275.40	1122	20.28	
Merluccius paradoxus	216.30	278	15.93	2559
Shrimps, small, non comm.	186.32	44250	13.72	
Nezumia sp.	183.60	1700	13.52	
SQUALIDAE	160.82	136	11.84	
Hoplostethus cadenati	85.00	10090	6.26	
Schedophilus huttoni	44.88	34	3.31	
Notacanthus sexspinis	33.32	3468	2.45	
Todarodes sagittatus	29.58	34	2.18	
Coelorinchus fasciatus	28.56	442	2.10	
Lophius vomerinus	26.30	8	1.94	
Coelorinchus braueri	25.16	68	1.85	
Centrophorus squamosus	17.68	34	1.30	
Etmopterus lucifer	15.98	34	1.18	
Lophius vaillanti	9.50	2	0.70	
Epigonus denticulatus	5.44	34	0.40	
Helicolenus dactylopterus	4.42	68	0.33	
Galeus polli	4.08	34	0.30	
Yarella blackfordi *	3.40	204	0.25	
Laemonema laureysi	2.04	34	0.15	
Total	1357.78		99.99	

PROJECT STATION: 799

DATE:23/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2223
start stop duration Long E 1247
TIME :08:40:00 09:10:00 30 (min) Purpose code: 2
LOG :9192.60 9194.20 1.60 Area code : 2
FDEPTH: 454 464 GearCond.code:
BDEPTH: 454 464 Validity code:
Towing dir: 160° Wire out:1320 m Speed: 32 kn*10

Sorted: 148 Kg Total catch: 594.66 CATCH/HOUR: 1189.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachyrincus scabrus	353.40	988	29.71	
Merluccius paradoxus	237.48	292	19.97	2560
SQUALIDAE	208.24	152	17.51	
S H R I M P S	156.56	37182	13.16	
Helicolenus dactylopterus	57.00	418	4.79	
Nezumia sp.	52.44	38	4.41	
Coelorinchus fasciatus	45.98	570	3.87	
Epigonus denticulatus	26.22	266	2.20	
Etmopterus lucifer	14.06	38	1.18	
Hoplostethus cadenati	13.30	988	1.12	
Lophius vaillanti	10.20	2	0.86	
Laemonema laureysi	5.32	38	0.45	
Notacanthus sexspinis	2.66	38	0.22	
Galeus polli	2.66	38	0.22	
Schedophilus huttoni	2.28	38	0.19	
Centrophorus squamosus	1.52	38	0.13	
Total	1189.32		99.99	

PROJECT STATION: 800

DATE:23/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2232
start stop duration Long E 1253
TIME :10:55:00 11:25:00 30 (min) Purpose code: 2
LOG :9205.00 9206.50 1.50 Area code : 2
FDEPTH: 324 323 GearCond.code:
BDEPTH: 324 323 Validity code:
Towing dir: 170° Wire out:1000 m Speed: 30 kn*10

Sorted: 272 Kg Total catch: 720.60 CATCH/HOUR: 1441.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	992.00	820	68.83	2561
Helicolenus dactylopterus	284.20	5382	19.72	
Coelorinchus fasciatus	47.80	1288	3.32	
Chlorophthalmus atlanticus	42.40	2346	2.94	
Lophius vomerinus	37.20	20	2.58	
Raja confundens	12.00	46	0.83	
Merluccius paradoxus	9.50	56	0.66	2562
Coelorinchus coelorhinc. polli	6.40	276	0.44	
Galeus polli	5.00	92	0.35	
Genypterus capensis	2.50	6	0.17	
Nezumia sp.	2.20	46	0.15	
Total	1441.20		99.99	

PROJECT STATION: 801

DATE:23/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2233
start stop duration Long E 1253
TIME :12:38:00 12:58:00 20 (min) Purpose code: 2
LOG :9212.30 9213.30 1.00 Area code : 2
FDEPTH: 326 331 GearCond.code:
BDEPTH: 326 331 Validity code:
Towing dir: 170° Wire out:1000 m Speed: 30 kn*10

Sorted: 167 Kg Total catch: 476.45 CATCH/HOUR: 1429.35

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1004.70	930	70.29	2563
Helicolenus dactylopterus	178.20	2620	12.47	
Merluccius paradoxus	126.00	801	8.82	2564
Lophius vomerinus	48.45	24	3.39	
Coelorinchus fasciatus	21.36	804	1.49	
Chlorophthalmus atlanticus	12.75	555	0.89	
Galeus polli	10.80	138	0.76	
Coelorinchus coelorhinc. polli	9.90	303	0.69	
Genypterus capensis	7.74	24	0.54	
Nezumia sp.	5.25	303	0.37	
Malacocephalus laevis	2.40	54	0.17	
PORTUNIDAE	1.80	54	0.13	
Total	1429.35		100.01	

PROJECT STATION: 802

DATE:23/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2232
start stop duration Long E 1253
TIME :14:01:00 14:31:00 30 (min) Purpose code: 2
LOG :9218.60 9220.20 1.60 Area code : 2
FDEPTH: 326 327 GearCond.code:
BDEPTH: 326 327 Validity code:
Towing dir: 170° Wire out:1000 m Speed: 32 kn*10

Sorted: 180 Kg Total catch 608.60 CATCH/HOUR 1217 20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	617.40	646	50.72	2565
Helicolenus dactylopterus	316.00	5280	26.03	
Coelorinchus fasciatus	99.40	3764	8.17	
Chlorophthalmus atlanticus	66.20	3888	5.44	
Lophius vomerinus	29.90	18	2.46	
Merluccius paradoxus	29.20	178	2.40	2566
Coelorinchus coelorhinc. polli	19.60	768	1.61	
Galeus polli	15.80	192	1.30	
Genypterus capensis	11.50	20	0.94	
Nezumia sp.	11.40	624	0.94	
Total	1217.20		100.01	

PROJECT STATION: 803

DATE:23/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2226
start stop duration Long E 1257
TIME :16:32:00 17:02:00 30 (min) Purpose code: 2
LOG :9234.20 9235.73 1.53 Area code : 2
FDEPTH: 288 292 GearCond.code:
BDEPTH: 288 292 Validity code:
Towing dir: 180° Wire out: 860 m Speed: 30 kn*10

Sorted: 105 Kg Total catch: 200.20 CATCH/HOUR: 400.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	190.60	1040	47.60	2567
Pterothrissus belloci	74.20	420	18.53	
Helicolenus dactylopterus	55.60	2864	13.89	
Coelorinchus fasciatus	30.80	1460	7.69	
Solenocera africana	14.20	2840	3.55	
Synagrops microlepis	12.40	1620	3.10	
Austroglossus microlepis	6.20	20	1.55	
Galeus polli	4.80	200	1.20	
Trigla lyra	4.60	40	1.15	
Trachurus capensis	3.60	20	0.90	
Chlorophthalmus atlanticus	3.40	320	0.85	
Total	400.40		100.01	

PROJECT STATION: 804

DATE:24/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2358
start stop duration Long E 1320
TIME :06:48:00 07:18:00 30 (min) Purpose code: 2
LOG :9342.38 9344.00 1.61 Area code : 2
FDEPTH: 305 306 GearCond.code:
BDEPTH: 305 306 Validity code:
Towing dir: 360° Wire out: 920 m Speed: 32 kn*10

Sorted: 246 Kg Total catch: 1900.46 CATCH/HOUR: 3800.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	2926.00	9630	76.98	2570
Merluccius capensis	354.80	308	9.33	2568
Helicolenus dactylopterus	187.00	4510	4.92	
Coelorinchus fasciatus	168.30	4290	4.43	
Lophius vomerinus	72.90	46	1.92	
Merluccius capensis, juveniles	44.00	440	1.16	2571
Coelorinchus coelorhinc. polli	23.10	550	0.61	
Chlorophthalmus atlanticus	15.40	990	0.41	
Galeus polli	4.40	110	0.12	
Scomber japonicus	3.02	2	0.08	
Merluccius paradoxus	2.00	8	0.05	2569
Total	3800.92		100.01	

PROJECT STATION: 805

DATE:24/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2358
start stop duration Long E 1320
TIME :08:30:00 09:00:00 30 (min) Purpose code: 2
LOG :9349.60 9351.20 1.60 Area code : 2
FDEPTH: 305 305 GearCond.code:
BDEPTH: 305 305 Validity code:
Towing dir: 360° Wire out: 920 m Speed: 34 kn*10

Sorted: 164 Kg Total catch: 243.54 CATCH/HOUR: 487.08

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	244.00	182	50.09	2572
Helicolenus dactylopterus	124.40	2976	25.54	
Chlorophthalmus atlanticus	32.30	2054	6.63	
Lophius vomerinus	31.60	36	6.49	
Coelorinchus fasciatus	20.20	540	4.15	
Galeus polli	9.50	130	1.95	
Merluccius capensis, juveniles	7.40	74	1.52	2573
Trachurus capensis	6.60	20	1.36	
Merluccius paradoxus	6.28	12	1.29	2574
Coelorinchus coelorhinc. polli	3.00	90	0.62	
Squilla aculata calmani	1.40	70	0.29	
Malacocephalus laevis	0.40	10	0.08	
Total	487.08		100.01	

PROJECT STATION: 806

DATE:24/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2358
start stop duration Long E 1315
TIME :10:15:00 10:45:00 30 (min) Purpose code: 2
LOG :9357.30 9358.80 1.50 Area code : 2
FDEPTH: 355 348 GearCond.code:
BDEPTH: 355 348 Validity code:
Towing dir: 150° Wire out:1050 m Speed: 30 kn*10

Sorted: 158 Kg Total catch: 395.85 CATCH/HOUR 791.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	192.00	2848	24 25	
Merluccius capensis	167.30	82	21 13	2575
Merluccius paradoxus	167.00	720	21 09	2577
Coelorinchus fasciatus	70.00	1280	8 84	
Galeus polli	41.40	500	5 23	
Merluccius paradoxus	38.40	88	4 85	2576
Scomber japonicus	33.00	24	4 17	
Lophius vomerinus	25.00	8	3 16	
Etmopterus lucifer	17.20	60	2 17	
Nezumia sp.	15.80	560	2 00	
Epigonus denticulatus	12.40	540	1 57	
Chlorophthalmus atlanticus	4.20	200	0 53	
Selachophidium guentheri	3.80	200	0 48	
Yarella blackfordi *	3.20	320	0 40	
Epigonus pandionis	1.00	20	0 13	
Total	791.70		100 00	

PROJECT STATION: 807

DATE:24/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2350
start stop duration Long E 1316
TIME :11:55:00 12:25:00 30 (min) Purpose code: 2
LOG :9364.40 9365.90 1.50 Area code : 2
FDEPTH: 354 348 GearCond.code:
BDEPTH: 354 348 Validity code:
Towing dir: 150° Wire out:1050 m Speed: 30 kn*10

Sorted: 138 Kg Total catch: 246.00 CATCH/HOUR: 492.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	138.00	1764	26.02	
Merluccius paradoxus	107.80	320	21.91	2579
Coelorinchus fasciatus	93.90	10	19.09	
Merluccius capensis	70.10	28	14.25	2570
Lophius vomerinus	38.80	12	7.89	
Epigonus denticulatus	17.30	590	3.52	
Galeus polli	8.20	110	1.67	
Centrophorus squamosus	6.00	10	1.22	
Selachophidium guentheri	5.70	270	1.16	
Nezumia sp.	3.40	100	0.69	
Etmopterus lucifer	3.30	10	0.67	
Trachipterus jacksonensis	3.30	2	0.67	
Genypterus capensis	3.00	4	0.61	
Chlorophthalmus atlanticus	1.50	70	0.30	
Yarella blackfordi *	1.00	80	0.20	
Scomber japonicus	0.92	2	0.19	
Total	492.22		100.06	

PROJECT STATION: 808

DATE:24/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2403
start stop duration Long E 1322
TIME :14:06:00 15:22:00 76 (min) Purpose code: 2
LOG :9375.60 9379.40 3.80 Area code : 2
FDEPTH: 120 292 GearCond.code:
BDEPTH: 300 292 Validity code: 9
Towing dir: 360° Wire out: 300 m Speed: 30 kn*10

Sorted: 113 Kg Total catch: 870.40 CATCH/HOUR: 687.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	214.74	220	31.25	2580
Trachurus capensis	162.63	521	23.67	
Helicolenus dactylopterus	99.47	3146	14.48	
Merluccius capensis	66.79	426	9.72	
Galeus polli	60.47	1895	8.80	
Chlorophthalmus atlanticus	31.69	2207	4.64	
Coelorinchus fasciatus	26.68	821	3.88	
Lophius vomerinus	24.47	16	3.56	
Total	687.14		100.00	

PROJECT STATION: 809

DATE:24/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2404
start stop duration Long E 1349
TIME :19:23:00 19:43:00 20 (min) Purpose code: 2
LOG :9413.10 9414.25 1.15 Area code : 2
FDEPTH: 250 246 GearCond.code:
BDEPTH: 250 246 Validity code:
Towing dir: 360° Wire out: 750 m Speed: 33 kn*10

Sorted: 36 Kg Total catch: 1642.25 CATCH/HOUR: 4926.75

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	4076.20	84432	90.97	2582
Merluccius capensis	50.55	54	1.03	2581
Total	4926.75		100.00	

PROJECT STATION: 810

DATE:25/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2509
start stop duration Long E 1342
TIME :05:21:00 05:51:00 30 (min) Purpose code: 2
LOG :9488.30 9490.00 1.70 Area code : 1
FDEPTH: 327 332 GearCond.code:
BDEPTH: 327 332 Validity code:
Towing dir: 5° Wire out: 900 m Speed: 34 kn*10

Sorted: 360 Kg Total catch: 1210.20 CATCH/HOUR: 2420.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT C	SAMP
Merluccius capensis, juveniles	1119.40	10730	46.25	2585
Merluccius capensis	520.00	250	21.85	2583
Coelorinchus fasciatus	371.20	7756	15.34	
Helicolenus dactylopterus	142.10	2494	5.87	
Genypterus capensis	66.00	76	2.76	
Galeus polli	56.04	2088	2.35	
Lophius vomerinus	55.00	38	2.27	
Nezumia sp.	33.06	812	1.37	
Squilla aculeata calmani	28.42	1160	1.17	
Lophius vomerinus	9.86	116	0.41	
Austroglossus microlepis	6.80	10	0.28	
Merluccius paradoxus	2.12	2	0.09	2584
Total	2420.40		100.01	

PROJECT STATION: 811

DATE:25/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2500
start stop duration Long E 1341
TIME :07:16:00 07:46:00 30 (min) Purpose code: 2
LOG :9496.70 9498.35 1.65 Area code : 1
FDEPTH: 333 337 GearCond.code:
BDEPTH: 333 337 Validity code:
Towing dir: * Wire out: 980 m Speed: 30 kn*10

Sorted: 702 Kg Total catch: 1447.15 CATCH/HOUR: 2894.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1089.80	522	37.65	2586
Merluccius capensis, juveniles	1023.00	8640	35.35	2587
Coelorinchus fasciatus	214.80	3360	7.42	
Helicolenus dactylopterus	171.60	2940	5.93	
Lophius vomerinus	142.80	98	4.93	
Genypterus capensis	107.80	136	3.72	
Nezumia sp.	57.00	2040	1.97	
Todarodes sagittatus	29.40	60	1.02	
Squilla aculeata calmani	28.20	960	0.97	
Austroglossus microlepis	13.10	22	0.45	
Galeus polli	12.00	180	0.41	
C R A B S	4.80	60	0.17	
Total	2894.30		99.99	

PROJECT STATION: 812

DATE:25/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2501
start stop duration Long E 1341
TIME :08:58:00 09:28:00 30 (min) Purpose code: 2
LOG :9503.90 9505.60 1.70 Area code : 1
FDEPTH: 347 350 GearCond.code:
BDEPTH: 347 350 Validity code:
Towing dir: 5° Wire out:1050 m Speed: 34 kn*10

Sorted: 237 Kg Total catch: 570.75 CATCH/HOUR: 1141.50

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	383.60	162	33.60	2588
Merluccius paradoxus	377.30	832	33.05	2589
Helicolenus dactylopterus	135.80	2212	11.90	
Genypterus capensis	112.80	76	9.88	
Lophius vomerinus	96.00	80	8.41	
Coelorinchus fasciatus	17.00	304	1.49	
Squilla aculeata calmani	5.00	196	0.44	
Nezumia sp.	4.60	120	0.40	
Galeus polli	2.80	62	0.25	
Notacanthus sexspinis	2.80	100	0.25	
Todarodes sagittatus	2.60	8	0.23	
C R A B S	2.00	78	0.18	
Total	1142.30		100.00	

PROJECT STATION: 813

DATE:25/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2501
start stop duration Long E 1342
TIME :10:46:00 11:16:00 30 (min) Purpose code: 2
LOG :9511.50 9513.20 1.70 Area code : 1
FDEPTH: 348 349 GearCond.code:
BDEPTH: 348 349 Validity code:
Towing dir: 360° Wire out:1050 m Speed: 34 kn*10

Sorted: 419 Kg Total catch: 1093.92 CATCH/HOUR: 2187.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius paradoxus	1066.60	990	48.75	2591
Merluccius capensis	498.20	232	22.77	2590
Lophius vomerinus	265.40	312	12.13	
Genypterus capensis	151.80	114	6.94	
Helicolenus dactylopterus	70.20	942	3.21	
Merluccius paradoxus	49.00	388	2.24	2592
Coelorinchus fasciatus	29.80	612	1.36	
Nezumia sp.	14.40	486	0.66	
Todarodes sagittatus	12.60	26	0.58	
Galeus polli	10.52	198	0.48	
Squilla aculeata calmani	7.20	360	0.33	
Notacanthus sexspinis	6.92	260	0.32	
C R A B S	3.60	134	0.16	
Epigonus denticulatus	1.60	126	0.07	
Total	2187.84		100.00	

PROJECT STATION: 814

DATE:25/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2501
start stop duration Long E 1343
TIME :12:19:00 12:49:00 30 (min) Purpose code: 2
LOG :9516.70 9518.10 1.40 Area code : 1
FDEPTH: 317 316 GearCond.code:
BDEPTH: 317 316 Validity code:
Towing dir: 360° Wire out: 900 m Speed: 28 kn*10

Sorted: 781 Kg Total catch: 994.89 CATCH/HOUR: 1989.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	630.50	346	31.69	2593
Coelorinchus fasciatus	610.20	21134	31.07	
Merluccius capensis, juveniles	189.60	1758	9.53	2595
Helicolenus dactylopterus	183.40	3446	9.22	
Lophius vomerinus	177.60	150	8.93	
Genypterus capensis	52.70	50	2.65	
Squilla aculeata calmani	33.40	1012	1.68	
Merluccius paradoxus, juvenile	31.60	394	1.59	2596
Nezumia sp.	27.60	1232	1.39	
Galeus polli	23.60	308	1.19	
Austroglossus microlepis	14.80	36	0.74	
Merluccius paradoxus	6.78	8	0.34	2594
Total	1989.78		100.02	

PROJECT STATION: 815

DATE:25/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2501
start stop duration Long E 1343
TIME :13:54:00 14:24:00 30 (min) Purpose code: 2
LOG :9523.10 9524.50 1.40 Area code : 1
FDEPTH: 317 316 GearCond.code:
BDEPTH: 317 316 Validity code:
Towing dir: 175° Wire out: 980 m Speed: 30 kn*10

Sorted: 435 Kg Total catch: 931.90 CATCH/HOUR: 1863.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Coelorinchus fasciatus	600.60	25422	32.22	
Merluccius capensis	455.00	238	24.41	2597
Lophius vomerinus	254.60	314	13.66	
Helicolenus dactylopterus	173.40	3608	9.30	
Merluccius capensis, juveniles	129.20	1230	6.93	2599
Genypterus capensis	85.20	82	4.57	
Nezumia sp.	53.60	2500	2.88	
Squilla acuelata calmani	42.00	1496	2.25	
Austroglossus microlepis	23.60	40	1.27	
C R A B S	16.80	528	0.90	
Merluccius paradoxus, juvenile	15.00	176	0.80	2600
Galeus polli	9.20	132	0.49	
Merluccius paradoxus	5.60	8	0.30	2598
Total	1863.80		99.98	

PROJECT STATION: 816

DATE:25/ 1/95 GEAR TYPE: PT No:5 POSITION:Lat S 2456
start stop duration Long E 1345
TIME :19:57:00 20:32:00 35 (min) Purpose code: 1
LOG :9544.90 9546.80 1.90 Area code : 2
FDEPTH: 247 255 GearCond.code:
BDEPTH: 294 292 Validity code:
Towing dir: 180° Wire out: 710 m Speed: 34 kn*10

Sorted: 56 Kg Total catch: 168.00 CATCH/HOUR: 288.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	288.00	1445	100.00	2601
Total	288.00		100.00	

PROJECT STATION: 817

DATE:26/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2508
start stop duration Long E 1342
TIME :05:23:00 05:53:00 30 (min) Purpose code: 2
LOG :9569.60 9571.20 1.60 Area code : 1
FDEPTH: 329 335 GearCond.code:
BDEPTH: 329 335 Validity code:
Towing dir: 5° Wire out: 980 m Speed: 32 kn*10

Sorted: 259 Kg Total catch: 860.80 CATCH/HOUR: 1721.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Coelorinchus fasciatus	769.60	37440	44.70	
Merluccius capensis, juveniles	273.60	2532	15.89	2604
Merluccius capensis	249.80	132	14.51	2602
Genypterus capensis	103.60	108	6.02	
Lophius vomerinus	86.00	112	5.00	
Nezumia sp.	81.60	3588	4.74	
Helicolenus dactylopterus	45.80	936	2.66	
Squilla acuelata calmani	26.40	832	1.53	
Merluccius paradoxus	23.40	16	1.36	2603
Lophius vomerinus	18.60	208	1.08	
Merluccius paradoxus, juvenile	17.60	724	1.02	2605
Galeus polli	10.40	312	0.60	
Austroglossus microlepis	8.00	14	0.46	
Ebinania costaecanarie	7.20	52	0.42	
Total	1721.60		99.99	

PROJECT STATION: 818

DATE:26/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2507
start stop duration Long E 1341
TIME :09:09:00 09:39:00 30 (min) Purpose code: 2
LOG :9577.30 9578.90 1.63 Area code : 1
FDEPTH: 341 349 GearCond.code:
BDEPTH: 341 349 Validity code:
Towing dir: ° Wire out:1010 m Speed: 32 kn*10

Sorted: 339 Kg Total catch: 868.43 CATCH/HOUR: 1736.86

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Krill	318.00	636000	18.31	
Merluccius capensis	292.60	162	16.85	2606
Helicolenus dactylopterus	233.60	3676	13.39	
Merluccius capensis, juveniles	212.00	1026	12.21	2608
Coelorinchus fasciatus	185.20	3560	10.66	
Merluccius paradoxus	160.00	120	9.21	2607
Lophius vomerinus	90.00	70	5.18	
Genypterus capensis	70.32	70	4.05	
Nezumia sp.	60.00	3192	3.45	
Galeus polli	41.00	1302	2.36	
Merluccius paradoxus, juvenile	39.40	1404	2.27	2609
C R A B S	11.80	252	0.68	
Squilla acuelata calmani	11.20	420	0.64	
Notacanthus sexspinis	8.40	588	0.48	
Ebinania costaecanarie	3.40	42	0.20	
Austroglossus microlepis	0.94	2	0.05	
Total	1736.86		99.99	

PROJECT STATION: 819

DATE:26/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2501
start stop duration Long E 1341
TIME :08:50:00 09:20:00 30 (min) Purpose code: 2
LOG :9584.50 9586.05 1.55 Area code : 1
FDEPTH: 347 352 GearCond.code:
BDEPTH: 347 352 Validity code:
Towing dir: 8° Wire out:1100 m Speed: 31 kn*10

Sorted: 532 Kg Total catch: 754.50 CATCH/HOUR: 1509.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	503.00	208	33.33	2610
Merluccius paradoxus	264.20	220	17.51	2611
Genypterus capensis	144.20	108	9.56	
Helicolenus dactylopterus	125.00	1810	8.28	
Coelorinchus fasciatus	109.20	2400	7.24	
Lophius vomerinus	103.20	102	6.84	
C R A B S	93.60	80	6.20	
Nezumia sp.	68.00	2150	4.51	
Notacanthus sexspinis	26.80	900	1.78	
Merluccius capensis, juveniles	23.80	700	1.58	2612
Galeus polli	18.20	240	1.21	
Todarodes sagittatus	13.20	60	0.87	
Squilla acuelata calmani	11.80	380	0.78	
Merluccius paradoxus, juvenile	4.80	100	0.32	2613
Total	1509.00		100.01	

PROJECT STATION: 820

DATE:26/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2502
start stop duration Long E 1342
TIME :10:30:00 11:00:00 30 (min) Purpose code: 2
LOG :9592.50 9594.00 1.50 Area code : 1
FDEPTH: 352 350 GearCond.code:
BDEPTH: 352 350 Validity code:
Towing dir: 8° Wire out:1100 m Speed: 30 kn*10

Sorted: 708 Kg Total catch: 1149.00 CATCH/HOUR: 2298.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	736.00	312	32.03	2614
Merluccius paradoxus	404.00	348	17.58	2615
Genypterus capensis	260.20	162	11.32	
Coelorinchus fasciatus	195.80	4114	8.52	
Merluccius paradoxus, juvenile	189.40	1156	8.24	2616
Nezumia sp.	156.40	4634	6.81	
Lophius vomerinus	131.60		5.73	85
Helicolenus dactylopterus	100.60	1428	4.38	
Merluccius capensis, juveniles	22.00	102	0.96	2617
Notacanthus sexspinis	20.00	1020	0.87	
Squilla acuelata calmani	19.40	748	0.84	
Galeus polli	18.00	272	0.78	
C R A B S	16.20	442	0.70	
Todarodes sagittatus	14.20	68	0.62	
Trachurus capensis	9.40	34	0.41	
Epigonus denticulatus	4.80	170	0.21	
Total	2298.00		100.00	

PROJECT STATION: 821

DATE:26/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2501
start stop duration Long E 1342
TIME :12:21:00 12:51:00 30 (min) Purpose code: 2
LOG :9600.10 9601.60 1.50 Area code : 1
FDEPTH: 347 349 GearCond.code:
BDEPTH: 347 349 Validity code:
Towing dir: 10° Wire out:1100 m Speed: 30 kn*10

Sorted: 471 Kg Total catch: 756.35 CATCH/HOUR: 1512.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius paradoxus	344.00	342	22.74	2623
Merluccius capensis	328.00	168	21.68	2622
Merluccius paradoxus, juvenile	147.00	896	9.72	2624
Genypterus capensis	140.90	96	9.31	
Helicolenus dactylopterus	113.20	1736	7.48	
Lophius vomerinus	86.20	82	5.70	
Coelorinchus fasciatus	74.40	1512	4.92	
Nezumia sp.	74.20	2660	4.91	
Squilla acuelata calmani	65.40	2800	4.32	
Todarodes sagittatus	60.20	168	3.98	
Notacanthus sexspinis	35.20	1200	2.33	
Galeus polli	28.60	532	1.89	
C R A B S	13.40	364	0.89	
Epigonus denticulatus	2.00	56	0.13	
Total	1512.70		100.00	

PROJECT STATION: 822

DATE:26/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2500
start stop duration Long E 1343
TIME :13:53:00 14:23:00 30 (min) Purpose code: 2
LOG :9605.60 9607.20 1.60 Area code : 1
FDEPTH: 318 317 GearCond.code:
BDEPTH: 318 317 Validity code:
Towing dir: 178° Wire out: 980 m Speed: 32 kn*10

Sorted: 553 Kg Total catch: 1018.74 CATCH/HOUR: 2037.48

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	765.60	158	37.58	2618
Coelorinchus fasciatus	520.80	11080	25.56	
Lophius vomerinus	188.40	202	9.25	
Merluccius capensis, juveniles	180.00	1248	8.83	2621
Helicolenus dactylopterus	136.80	2928	6.71	
Genypterus capensis	108.40	102	5.32	
Nezumia sp.	43.20	1728	2.12	
Squilla acuelata calmani	26.80	1296	1.32	
C R A B S	19.20	576	0.94	
Trachurus capensis	14.80	48	0.73	
Merluccius paradoxus, juvenile	11.40	96	0.56	2620
Galeus polli	8.64	192	0.42	
Notacanthus sexspinis	5.20	192	0.26	
Merluccius paradoxus	4.40	4	0.22	2619
Sufflogobius bibarbatus	3.80	768	0.19	
Total	2037.44		100.01	

PROJECT STATION: 023

DATE:26/ 1/95 GEAR TYPE: PT No:5 POSITION:Lat S 2507
start stop duration Long E 1342
TIME :21:00:00 21:45:00 45 (min) Purpose code: 1
LOG :9649.40 9651.90 2.50 Area code : 1
FDEPTH: 220 243 GearCond.code:
BDEPTH: 320 320 Validity code:
Towing dir: 15° Wire out: 750 m Speed: 34 kn*10

Sorted: 28 Kg Total catch: 129.24 CATCH/HOUR: 172.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	159.60	1232	92.62	2623
Merluccius capensis	11.60	7	6.73	2622
Trachurus capensis	1.12	8	0.65	
Total	172.32		100.00	

PROJECT STATION: 024

DATE:27/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2507
start stop duration Long E 1342
TIME :06:26:00 06:56:00 30 (min) Purpose code: 2
LOG :9667.00 9668.40 1.40 Area code : 1
FDEPTH: 332 332 GearCond.code:
BDEPTH: 332 332 Validity code:
Towing dir: 100° Wire out:1030 m Speed: 20 kn*10

Sorted: 246 Kg Total catch: 500.12 CATCH/HOUR: 1000.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	225.60	110	22.55	2624
Coelorinchus fasciatus	109.60	5494	10.96	
Genypterus capensis	130.40	118	13.04	2625
Merluccius capensis, juveniles	126.00	1008	12.60	2627
Helicolenus dactylopterus	83.40	1488	8.34	
krill	61.60		6.16	
Nezumia sp.	52.20	1932	5.22	
Merluccius paradoxus	41.60	30	4.16	2626
Lophius vomerinus	30.20	30	3.02	
Merluccius paradoxus, juvenile	15.40	216	1.54	2628
Notacanthus sexspinis	11.04	672	1.10	
Squilla aculeata calmani	7.60	240	0.76	
Galeus polli	5.00	96	0.50	
Austroglossus microlepis	3.80	6	0.38	
Total	1000.24		100.01	

PROJECT STATION: 025

DATE:27/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2507
start stop duration Long E 1342
TIME :00:03:00 00:33:00 30 (min) Purpose code: 2
LOG :9673.50 9675.05 1.55 Area code : 1
FDEPTH: 333 330 GearCond.code:
BDEPTH: 333 330 Validity code:
Towing dir: 100° Wire out:1030 m Speed: 30 kn*10

Sorted: 222 Kg Total catch: 463.35 CATCH/HOUR: 926.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Coelorinchus fasciatus	231.40	8698	24.97	
Merluccius capensis	166.60	76	17.98	2629
Genypterus capensis	140.50	122	15.16	2631
Merluccius capensis, juveniles	116.00	1222	12.52	2632
Lophius vomerinus	69.40	70	7.49	
Nezumia sp.	64.00	3616	6.91	
Helicolenus dactylopterus	51.20	936	5.52	
Merluccius paradoxus	28.80	22	3.11	2630
Squilla aculeata calmani	17.40	494	1.88	
Todarodes sagittatus	13.80	26	1.49	
Merluccius paradoxus, juvenile	10.40	364	1.12	2633
Notacanthus sexspinis	7.20	260	0.78	
C R A B S	7.00	208	0.76	
Chlorophthalmus atlanticus	1.60	52	0.17	
Ebinania costaecanaria	1.40	26	0.15	
Total	926.70		100.01	

PROJECT STATION: 026

DATE:27/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2510
start stop duration Long E 1336
TIME :10:16:00 10:46:00 30 (min) Purpose code: 2
LOG :9684.70 9686.20 1.50 Area code : 1
FDEPTH: 502 502 GearCond.code:
BDEPTH: 502 502 Validity code:
Towing dir: 4° Wire out:1500 m Speed: 30 kn*10

Sorted: 200 Kg Total catch: 767.65 CATCH/HOUR: 1535.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius paradoxus	765.40	844	49.85	2634
Trachyrincus scabrus	473.40	720	30.83	
Hoplostethus cadenati	117.00	5004	7.62	
Notacanthus sexspinis	67.20	1116	4.38	
Todarodes sagittatus	29.00	72	1.94	
Nezumia sp.	26.20	468	1.71	
Salachophidium guentheri	18.00	468	1.22	
Galeus polli	14.80	180	0.96	
Lithodes ferox	9.10	12	0.59	
Genypterus capensis	8.20	2	0.53	
Lophius vomerinus	4.40	2	0.29	
C R A B S	1.00	36	0.07	
Total	1535.30		99.99	

PROJECT STATION: 027

DATE:27/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2509
start stop duration Long E 1336
TIME :12:00:00 12:30:00 30 (min) Purpose code: 2
LOG :9692.40 9694.00 1.60 Area code : 1
FDEPTH: 502 503 GearCond.code:
BDEPTH: 502 503 Validity code:
Towing dir: 0° Wire out:1500 m Speed: 30 kn*10

Sorted: 341 Kg Total catch: 1057.05 CATCH/HOUR: 2115.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachyrincus scabrus	936.00	3340	44.24	
Merluccius paradoxus	339.20	344	16.03	2635
Lithodes ferox	247.00	644	11.67	
Notacanthus sexspinis	129.60	1944	6.13	
Raja caudaspinosa	107.20	72	5.07	
Laemonema laureysi	80.00	1296	3.78	
Hoplostethus cadenati	68.40	1872	3.23	
Nezumia sp.	56.80	1584	2.68	
Lophius vomerinus	56.70	20	2.68	
C R A B S	42.40	144	2.00	
Galeus polli	30.80	432	1.83	
Coelorinchus braueri	13.60	144	0.64	
Total	2115.70		99.98	

PROJECT STATION: 028

DATE:27/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2510
start stop duration Long E 1343
TIME :14:40:00 15:22:00 42 (min) Purpose code: 2
LOG :9703.50 9705.50 2.00 Area code : 1
FDEPTH: 311 311 GearCond.code:
BDEPTH: 311 311 Validity code:
Towing dir: 100° Wire out: 950 m Speed: 30 kn*10

Sorted: 329 Kg Total catch: 780.50 CATCH/HOUR: 1115.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Coelorinchus fasciatus	455.71	16424	40.87	
Merluccius capensis	411.14	247	36.87	2636
Merluccius capensis, juveniles	162.86	1857	14.61	2640
Nezumia sp.	24.57	943	2.20	
Trachurus capensis	13.43	57	1.20	
Pterothrissus belloci	12.00	57	1.08	
Genypterus capensis	10.21	16	0.92	2637
Galeus polli	9.14	257	0.82	
Lophius vomerinus	8.21	11	0.74	
Austroglossus microlepis	6.57	16	0.59	2638
Merluccius paradoxus	1.14	1	0.10	2639
Total	1114.98		100.00	

PROJECT STATION: 029

DATE:27/ 1/95 GEAR TYPE: PT No:7 POSITION:Lat S 2531
start stop duration Long E 1354
TIME :19:27:00 19:47:00 20 (min) Purpose code: 1
LOG :9735.40 9736.30 0.90 Area code : 1
FDEPTH: 210 250 GearCond.code:
BDEPTH: 260 264 Validity code:
Towing dir: ° Wire out: 700 m Speed: 27 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 030

DATE:20/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2646
start stop duration Long E 1400
TIME :06:33:00 07:03:00 30 (min) Purpose code: 2
LOG :9830.14 9831.58 1.44 Area code : 1
FDEPTH: 386 387 GearCond.code:
BDEPTH: 386 387 Validity code:
Towing dir: 181° Wire out:1170 m Speed: 29 kn*10

Sorted: 200 Kg Total catch: 1084.65 CATCH/HOUR: 2169.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius paradoxus	1300.40	5808	59.95	2641
Coelorinchus fasciatus	238.60	3036	11.00	
Genypterus capensis	165.60	86	7.63	2642
Merluccius capensis	154.40	92	7.12	
C R A B S	119.40	2310	5.50	
Helicolenus dactylopterus	85.40	666	3.94	
Lophius vomerinus	49.90	20	2.30	
Nezumia sp	35.80	850	1.65	
Todarodes sagittatus	10.00	36	0.03	
Selachophidium guentheri	1.80	72	0.08	
Total	2169.30		100.00	

PROJECT STATION: 831

DATE:28/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2646
start stop duration Long E 1408
TIME :08:39:00 09:09:00 30 (min) Purpose code: 2
LOG :9838.30 9839.80 1.50 Area code : 1
FDEPTH: 388 386 GearCond.code:
BDEPTH: 388 386 Validity code:
Towing dir: 187° Wire out:1170 m Speed: 30 kn*10

Sorted: 202 Kg Total catch: 1174.05 CATCH/HOUR: 2348.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius paradoxus	1200.00	2310	51.11	2643
Krill	535.00		22.78	
Coelorinchus fasciatus	190.00	2000	8.09	
Genypterus capensis	102.00	50	4.34	2644
Merluccius capensis	99.00	40	4.22	
Nezumia sp.	87.00	1850	3.71	
Helicolenus dactylopterus	74.40	700	3.17	
Todarodes sagittatus	24.40	100	1.04	
Raja confundens	19.20	50	0.82	
Galeus polli	11.40	350	0.49	
Lamnonema laureysi	3.40	50	0.14	
Lophius vomerinus	2.30	2	0.10	
Total	2348.10		100.01	

PROJECT STATION: 832

DATE:28/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2632
start stop duration Long E 1341
TIME :13:11:00 13:41:00 30 (min) Purpose code: 2
LOG :9869.70 9871.00 1.30 Area code : 1
FDEPTH: 383 384 GearCond.code:
BDEPTH: 383 384 Validity code:
Towing dir: 180° Wire out:1170 m Speed: 26 kn*10

Sorted: 121 Kg Total catch: 940.30 CATCH/HOUR: 1880.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius paradoxus	1395.00	5630	74.18	2645
Helicolenus dactylopterus	129.00	1050	6.86	
Genypterus capensis	117.00	64	6.22	2646
Merluccius capensis	88.80	30	4.72	
Coelorinchus fasciatus	73.40	990	3.90	
Nezumia sp.	33.00	690	1.75	
Lophius vomerinus	31.80	14	1.69	
C R A B S	6.60	120	0.35	
Galeus polli	6.00	60	0.32	
Total	1880.60		99.99	

PROJECT STATION: 833

DATE:30/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2654
start stop duration Long E 1630
TIME :07:46:00 08:16:00 30 (min) Purpose code: 2
LOG :139.60 141.35 1.75 Area code : 1
FDEPTH: 81 73 GearCond.code:
BDEPTH: 81 73 Validity code:
Towing dir: 330° Wire out: 320 m Speed: 35 kn*10

Sorted: 98 Kg Total catch: 998.50 CATCH/HOUR: 1997.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	1753.60	21440	87.81	2647
Chelidonichthys capensis	88.00	480	4.41	
Genypterus capensis	75.00	26	3.76	2648
Austroglossus pectoralis	53.40	512	2.67	
Lepidopus caudatus	12.80	576	0.64	
Squalus acanthias	6.00	32	0.30	
Sufflogobius bibarbatus	3.80	190	0.19	
Squilla aculeata calmani	2.60	238	0.13	
Trachurus capensis	1.80	30	0.09	
Total	1997.00		100.00	

PROJECT STATION: 834

DATE:30/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2853
start stop duration Long E 1624
TIME :09:20:00 09:50:00 30 (min) Purpose code: 2
LOG :149.20 151.95 1.75 Area code : 1
FDEPTH: 109 106 GearCond.code:
BDEPTH: 109 106 Validity code:
Towing dir: 320° Wire out: 420 m Speed: 35 kn*10

Sorted: 84 Kg Total catch: 407.35 CATCH/HOUR: 814.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	667.80	8552	81.97	2649
Callorhinchus capensis	46.30	16	5.68	
Trachurus capensis	33.20	322	4.08	
Krill	17.00		2.09	
Austroglossus pectoralis	13.60	154	1.67	
Brama brama	10.00	4	1.23	
Squilla aculeata calmani	7.00	406	0.86	
Lepidopus caudatus	6.20	378	0.76	
Jasus lalandii	4.26	34	0.52	
Squalus acanthias	3.20	14	0.39	
Chelidonichthys capensis	2.94	28	0.36	
MYCTOPHIDAE	1.00	252	0.12	
Sepia australis	0.80	28	0.10	
Sepia sp	0.80	336	0.10	
Sufflogobius bibarbatus	0.60	84	0.07	
Total	814.70		100.00	

PROJECT STATION: 835

DATE:30/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2902
start stop duration Long E 1616
TIME :12:01:00 12:31:00 30 (min) Purpose code: 2
LOG :163.40 164.70 1.30 Area code : 1
FDEPTH: 138 139 GearCond.code:
BDEPTH: 138 139 Validity code:
Towing dir: 200° Wire out: 500 m Speed: 26 kn*10

Sorted: 34 Kg Total catch: 91.36 CATCH/HOUR: 182.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	115.80	1696	63.38	2650
Lophius upsicephalus	27.60	114	15.11	
Thyrsites atun	7.90	2	4.32	
Chelidonichthys capensis	7.00	24	3.83	
Genypterus capensis	5.40	90	2.96	
Trachurus capensis	4.20	18	2.30	
Brama brama	4.00	2	2.19	
Squilla aculeata calmani	3.00	192	1.64	
Sepia australis	2.80	132	1.53	
Etrumeus whiteheadi	2.40	30	1.31	
Sufflogobius bibarbatus	2.22	102	1.21	
Todaropsis eblanae	0.40	18	0.22	
Total	182.72		100.00	

PROJECT STATION: 836

DATE:30/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2909
start stop duration Long E 1606
TIME :14:16:00 14:46:00 30 (min) Purpose code: 2
LOG :177.20 178.90 1.70 Area code : 1
FDEPTH: 162 161 GearCond.code:
BDEPTH: 162 161 Validity code:
Towing dir: 30° Wire out: 550 m Speed: 34 kn*10

Sorted: 59 Kg Total catch: 498.80 CATCH/HOUR: 997.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	885.60	13216	88.77	2651
Etrumeus whiteheadi	78.40	1104	7.86	
Sepia australis	12.40	628	1.24	
Helicolenus dactylopterus	10.80	544	1.08	
Genypterus capensis	3.80	50	0.38	
Paracallionymus costatus	2.00	102	0.20	
Squilla aculeata calmani	1.40	102	0.14	
Todaropsis eblanae	1.40	34	0.14	
Coelorinchus fasciatus	1.00	50	0.10	
Trachurus capensis	0.80	16	0.08	
Total	997.60		99.99	

PROJECT STATION: 837

DATE:30/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2906
start stop duration Long E 1555
TIME :19:06:00 19:36:00 30 (min) Purpose code: 2
LOG :192.70 194.50 1.80 Area code : 1
FDEPTH: 167 168 GearCond.code:
BDEPTH: 167 168 Validity code:
Towing dir: 20° Wire out: 550 m Speed: 36 kn*10

Sorted: 23 Kg Total catch: 23.16 CATCH/HOUR: 46.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	21.30	424	45.98	2652
Etrumeus whiteheadi	17.40	204	37.56	
Sepia australis	6.38	324	13.77	
Paracallionymus costatus	0.34	26	0.73	
Holohalaelurus regani	0.34	2	0.73	
Helicolenus dactylopterus	0.26	12	0.56	
Lophius upsicephalus	0.24	2	0.52	
Cynoglossus capensis	0.06	2	0.13	
Total	46.32		99.98	

PROJECT STATION: 838

DATE:31/ 1/95 GEAR TYPE: BT No:6 POSITION:Lat S 2940
start stop duration Long E 1543
TIME :04:38:00 05:08:00 30 (min) Purpose code: 2
LOG :276.70 278.40 1.70 Area code : 1
FDEPTH: 174 172 GearCond.code: 8
BDEPTH: 174 172 Validity code: 9
Towing dir: 268° Wire out: 620 m Speed: 35 kn*10

Sorted: Kg Total catch: CATCH/HOUR:

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

PROJECT STATION: 039

DATE:31/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2951
start stop duration Long E 1526
TIME :09:14:00 09:44:00 30 (min) Purpose code: 2
LOG : 310.75 312.22 1.47 Area code : 1
FDEPTH: 201 203 GearCond.code:
BDEPTH: 201 203 Validity code:
Towing dir: 167° Wire out: 610 m Speed: 30 kn*10

Sorted: 67 Kg Total catch: 67.29 CATCH/HOUR: 134.58

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	24.90	90	18.50	2655
Torpedo nobiliana	19.00	2	14.12	
Merluccius capensis	18.70	20	13.90	2653
Chelidonichthys capensis	13.20	16	9.81	
Merluccius paradoxus, juvenile	12.40	192	9.21	2654
Holohalaelurus regani	9.30	40	6.97	
Emmelichthys nitidus	6.30	94	4.68	
Trigla lyra	5.70	52	4.29	
Coelorinchus fasciatus	4.40	56	3.27	
Helicolenus dactylopterus	4.12	46	3.06	
Lepidopus caudatus	3.90	16	2.90	
Squalus megalops	2.68	6	1.99	
Todarodes sagittatus	2.12	4	1.58	
Lophius vomerinus	1.56	2	1.16	
Etrumeus whiteheadi	1.38	12	1.03	
Genypterus capensis	1.02	4	0.76	
Zeus capensis	0.96	6	0.71	
Cynoglossus capensis	0.84	10	0.62	
Sepia australis	0.62	44	0.46	
Congiopodus spinifer	0.52	4	0.39	
Paracallionymus costatus	0.38	42	0.28	
Todaropsis eblanae	0.20	4	0.15	
Halaccephalus laevis	0.18	2	0.13	
Lolliguncula mercatoris	0.04		0.03	
Total	134.58		100.00	

PROJECT STATION: 040

DATE:31/ 1/95 GEAR TYPE: BT No:7 POSITION:Lat S 2944
start stop duration Long E 1520
TIME :12:55:00 13:25:00 30 (min) Purpose code: 2
LOG : 329.30 330.70 1.40 Area code : 1
FDEPTH: 181 177 GearCond.code:
BDEPTH: 181 177 Validity code:
Towing dir: 330° Wire out: 630 m Speed: 28 kn*10

Sorted: 193 Kg Total catch: 193.60 CATCH/HOUR: 387.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	164.20	110	42.39	2656
Chelidonichthys capensis	70.20	116	20.19	
Lophius vomerinus	46.60	46	12.03	
Emmelichthys nitidus	24.90	1460	6.43	
Zeus capensis	19.40	172	5.01	
Lepidopus caudatus	10.50	14	2.71	
Holohalaelurus regani	9.60	34	2.48	
Squalus megalops	7.78	20	2.01	
Trigla lyra	7.50	60	1.94	
Sepia australis	4.50	602	1.16	
Paracallionymus costatus	4.42	596	1.14	
Congiopodus spinifer	2.58	22	0.67	
Cynoglossus capensis	2.26	22	0.58	
Helicolenus dactylopterus	2.00		0.52	
Trachurus capensis	1.64	4	0.42	
Etrumeus whiteheadi	0.48	6	0.12	
Lolliguncula mercatoris	0.38	162	0.10	
Arnoglossus capensis	0.20	16	0.05	
Genypterus capensis	0.12	2	0.03	
Todaropsis eblanae	0.04	2	0.01	
Small squids	0.02	2	0.01	
MACRONHAMPHOSIDAE	0.02	2	0.01	
CHAMPSODONTIDAE	0.02	2	0.01	
Total	387.36		100.02	

PROJECT STATION: 041

DATE: 1/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2854
start stop duration Long E 1629
TIME :04:32:00 05:02:00 30 (min) Purpose code: 2
LOG : 440.50 442.20 1.70 Area code : 1
FDEPTH: 80 82 GearCond.code:
BDEPTH: 80 82 Validity code:
Towing dir: 320° Wire out: 370 m Speed: 34 kn*10

Sorted: 250 Kg Total catch: 761.49 CATCH/HOUR: 1522.98

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	907.80	10646	59.61	2657
Raja alba	240.00	6	15.76	
Callorhinchus capensis	197.80	80	12.99	
Chelidonichthys capensis	74.80	272	4.91	
Austroglossus microlepis	35.00	374	2.30	
Squalus acanthias	31.20	68	2.05	
Sufflogobius bibarbatus	14.60	1020	0.96	
Jasus lalandii	11.40	90	0.75	
Squilla aculeata calmani	4.00	306	0.26	
Congiopodus spinifer	2.30	68	0.16	
Lophius vomerinus	2.00	2	0.13	
Genypterus capensis	2.00	2	0.13	
Lepidopus caudatus	0.00	68		
Total	1522.98		100.01	

PROJECT STATION: 042

DATE: 1/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2853
start stop duration Long E 1629
TIME :05:47:00 06:17:00 30 (min) Purpose code: 2
LOG : 445.50 447.05 1.55 Area code : 1
FDEPTH: 83 79 GearCond.code:
BDEPTH: 83 79 Validity code:
Towing dir: 315° Wire out: 360 m Speed: 31 kn*10

Sorted: 93 Kg Total catch: 551.35 CATCH/HOUR: 1102.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	742.80	9390	67.36	2658
Callorhinchus capensis	107.60	44	9.76	
Chelidonichthys capensis	81.00	266	7.35	
Sufflogobius bibarbatus	57.80	3830	5.24	
Austroglossus microlepis	54.60	380	4.95	
Galeorhinus galeus	23.40	2	2.12	
Squilla aculeata calmani	22.40	1710	2.03	
Squalus acanthias	4.60	38	0.42	
Jasus lalandii	4.50	44	0.41	
Lolliguncula mercatoris	2.60	1178	0.24	
Lepidopus caudatus	1.40	114	0.13	
Total	1102.70		100.01	

PROJECT STATION: 043

DATE: 1/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2854
start stop duration Long E 1629
TIME :07:13:00 07:43:00 30 (min) Purpose code: 2
LOG : 452.24 453.85 1.60 Area code : 1
FDEPTH: 86 81 GearCond.code:
BDEPTH: 86 81 Validity code:
Towing dir: 310° Wire out: 360 m Speed: 32 kn*10

Sorted: 121 Kg Total catch: 429.60 CATCH/HOUR: 859.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	462.00	6720	53.77	2659
Raja alba	100.00	2	11.64	
Callorhinchus capensis	65.80	24	7.66	
Sufflogobius bibarbatus	41.00	3322	4.86	
Squalus acanthias	40.80	66	4.75	
Squilla aculeata calmani	39.00	3190	4.54	
Austroglossus microlepis	36.20	440	4.21	
Chelidonichthys capensis	29.60	132	3.45	
Raja straeleni	27.40	10	3.19	
Jasus lalandii	10.60	86	1.23	
Lepidopus caudatus	2.20	176	0.26	
Lolliguncula mercatoris	2.00	902	0.23	
Trachurus capensis	1.80	22	0.21	
Total	859.20		100.00	

PROJECT STATION: 044

DATE: 1/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2851
start stop duration Long E 1622
TIME :10:23:00 10:53:00 30 (min) Purpose code: 2
LOG : 463.90 465.40 1.50 Area code : 1
FDEPTH: 92 94 GearCond.code:
BDEPTH: 92 94 Validity code:
Towing dir: 140° Wire out: 360 m Speed: 30 kn*10

Sorted: 427 Kg Total catch: 1118.50 CATCH/HOUR: 2237.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	1115.00	15458	49.84	2660
Callorhinchus capensis	503.00	186	22.49	
Jasus lalandii	299.20	2408	13.38	
Chelidonichthys capensis	125.20	378	5.60	
Etrumeus whiteheadi	89.60	1728	4.01	
Austroglossus microlepis	73.40	270	3.28	
Genypterus capensis	21.00	54	0.94	
Sufflogobius bibarbatus	4.80	378	0.21	
Sardinops ocellatus	3.80	54	0.17	
Lepidopus caudatus	2.00	162	0.09	
Total	2237.00		100.01	

PROJECT STATION: 045

DATE: 2/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2529
start stop duration Long E 1355
TIME :11:44:00 11:54:00 10 (min) Purpose code: 2
LOG : 723.90 724.40 0.50 Area code : 1
FDEPTH: 263 261 GearCond.code:
BDEPTH: 263 261 Validity code:
Towing dir: 260° Wire out 850 m Speed: 30 kn*10

Sorted: 24 Kg Total catch: 505.89 CATCH/HOUR: 3035.34

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	2425.50	22932	79.91	2661
Trachurus capensis	609.84	2394	20.09	2662
Total	3035.34		100.00	

PROJECT STATION: 046

DATE: 5/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2205
start stop duration Long E 1255
TIME :05:54:00 06:14:00 20 (min) Purpose code: 2
LOG :1044.60 1045.60 1.00 Area code : 2
FDEPTH: 328 327 GearCond.code:
BDEPTH: 328 327 Validity code:
Towing dir: 5° Wire out:1020 m Speed: 30 kn*10

Sorted: 127 Kg Total catch: 233.80 CATCH/HOUR: 701.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	192.45	250	27.44	2663
Coelorinchus sp.	132.00	5796	18.82	
Lophius vomerinus	89.10	108	12.70	2664
Pterothrissus belloci	67.80	345	9.67	
Chlorophthalmus atlanticus	66.00	5346	9.41	
Helicolenus dactylopterus	60.30	1060	8.60	
Solenocera africana	42.15	723	6.01	
Austroglossus microlepis	20.25		2.89	2665
Galeus polli	19.50	705	2.78	
C R U S T A C E A N S	6.00		0.86	
PORTUNIDAE	4.80	195	0.68	
Todaropsis eblanae	0.60	45	0.09	
MYCTOPHIDAE	0.60	120	0.09	
Total	701.55		100.04	

PROJECT STATION: 047

DATE: 5/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2210
start stop duration Long E 1255
TIME :00:43:00 09:16:00 33 (min) Purpose code: 2
LOG :1053.00 1055.00 2.00 Area code : 2
FDEPTH: 321 320 GearCond.code:
BDEPTH: 321 320 Validity code:
Towing dir: 185° Wire out:1020 m Speed: 33 kn*10

Sorted: 208 Kg Total catch: 606.30 CATCH/HOUR: 1102.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	899.64	867	81.61	2666
Lophius vomerinus	46.73	31	4.24	2667
Coelorinchus coelorhinc. polli	38.91	2356	3.53	
Coelorinchus fasciatus	30.55	1536	2.77	
Chlorophthalmus atlanticus	20.36	1576	1.85	
Helicolenus dactylopterus	16.18	1169	1.47	
Pterothrissus belloci	14.91	65	1.35	
Austroglossus microlepis	9.82	36	0.89	2668
Solenocera africana	8.91	1929	0.81	
Synagrops microlepis	8.73	964	0.79	
PORTUNIDAE	3.82	95	0.35	
Merluccius capensis, juveniles	3.45	51	0.31	
MYCTOPHIDAE	1.09	495	0.10	
Total	1103.10		100.07	

PROJECT STATION: 048

DATE: 5/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2217
start stop duration Long E 1254
TIME :11:19:00 11:49:00 30 (min) Purpose code: 2
LOG :1062.00 1064.40 1.60 Area code : 2
FDEPTH: 331 331 GearCond.code:
BDEPTH: 331 331 Validity code:
Towing dir: 185° Wire out:1020 m Speed: 32 kn*10

Sorted: 151 Kg Total catch: 279.90 CATCH/HOUR: 559.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	203.00	180	36.26	2669
Helicolenus dactylopterus	90.20	5302	16.11	
Merluccius capensis, juveniles	52.00	616	9.29	2672
Lophius vomerinus	45.50	74	8.13	2670
Coelorinchus fasciatus	42.60	2482	7.61	
Chlorophthalmus atlanticus	42.00	3702	7.50	
Coelorinchus coelorhinc. polli	28.40	1410	5.07	
Pterothrissus belloci	14.60	70	2.61	
Galeus polli	10.60	322	1.89	
Austroglossus microlepis	10.00	20	1.79	2671
Solenocera africana	9.00	1686	1.61	
Shrimps, small, non comm.	7.00	9954	1.25	
C R A B S	2.60	126	0.46	
CONGRIDAE	2.00	42	0.36	
Genypterus capensis	0.32	2	0.06	
Total	559.02		100.00	

PROJECT STATION: 049

DATE: 5/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2216
start stop duration Long E 1255
TIME :13:38:00 14:08:00 30 (min) Purpose code: 2
LOG :1069.20 1070.50 1.30 Area code : 2
FDEPTH: 318 316 GearCond.code:
BDEPTH: 318 316 Validity code:
Towing dir: 10° Wire out:1020 m Speed: 26 kn*10

Sorted: 165 Kg Total catch 639 27 CATCH/HOUR: 1278.54

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1007 40	892	78.79	2673
Pterothrissus belloci	105 60	1598	8 28	
Lophius vomerinus	38 60	30	3 02	2674
Austroglossus microlepis	29 20	94	2 28	2675
Helicolenus dactylopterus	26 40	2640	2 06	
Coelorinchus fasciatus	19 00	1160	1 49	
Synagrops microlepis	15 60	2670	1 22	
Chlorophthalmus atlanticus	15 00	1402	1 17	
Shrimps, small, non comm.	7 20	9120	0 56	
Merluccius capensis, juveniles	7 00	134	0 55	2676
Solenocera africana	2 80	506	0 22	
C R A B S	1 60	64	0 13	
CONGRIDAE	1 20	28	0 09	
Coelorinchus coelorhinc. polli	1 00	32	0 08	
MYCTOPHIDAE	0 36	120	0 03	
Genypterus capensis	0 20	2	0 02	
Galeus polli	0 18	8	0 01	
Total	1278 54		100 00	

PROJECT STATION: 050

DATE: 5/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2208
start stop duration Long E 1256
TIME :16:32:00 16:52:00 20 (min) Purpose code: 2
LOG :1078.90 1080.44 1.54 Area code : 2
FDEPTH: 310 321 GearCond.code:
BDEPTH: 310 321 Validity code: 6
Towing dir: 200° Wire out:1020 m Speed: 33 kn*10

Sorted: 192 Kg Total catch: 383.94 CATCH/HOUR: 767.88

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	426.80	402	55.58	2677
Lophius vomerinus	118.40	74	15.42	2680
Austroglossus microlepis	56.50	174	7.36	2678
Pterothrissus belloci	54.60	262	7.11	
Chlorophthalmus atlanticus	37.40	3116	4.87	
Solenocera africana	21.00	5286	2.73	
Coelorinchus fasciatus	12.80	956	1.67	
Coelorinchus coelorhinc. polli	12.60	862	1.64	
Synagrops microlepis	10.60	1356	1.38	
Merluccius capensis, juveniles	7.80	126	1.02	2679
Trachurus capensis	2.60	24	0.34	
Lophius vomerinus, juveniles	1.80	30	0.23	
MYCTOPHIDAE	1.60	414	0.21	
C R A B S	1.20	88	0.16	
Helicolenus dactylopterus	0.90	40	0.12	
Galeus polli	0.80	40	0.10	
CONGRIDAE	0.42	6	0.05	
Squilla acuelata calmani	0.06	6	0.01	
Total	767.88		100.00	

PROJECT STATION: 051

DATE: 5/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2219
start stop duration Long E 1254
TIME :19:31:00 20:01:00 30 (min) Purpose code: 2
LOG :1091.50 1093.20 1.60 Area code : 2
FDEPTH: 314 313 GearCond.code:
BDEPTH: 314 313 Validity code: 6
Towing dir: 180° Wire out:1000 m Speed: 32 kn*10

Sorted: 174 Kg Total catch: 557.38 CATCH/HOUR: 1114.76

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Coelorinchus sp.	227.00	11800	20.43	
Pterothrissus belloci	226.80	2438	20.35	
Helicolenus dactylopterus	144.40	8480	12.95	
Merluccius capensis	104.60	98	9.38	2680
Austroglossus microlepis	100.90	392	9.05	2682
Lophius vomerinus	97.70	28	8.76	2681
Lophius vomerinus, juveniles	74.40	504	6.67	
Solenocera africana	55.80	3740	5.01	
Chlorophthalmus atlanticus	36.66	5364	3.29	
C R A B S	25.80	1224	2.31	
Merluccius capensis, juveniles	17.20	252	1.54	
CONGRIDAE	2.48	36	0.22	
Genypterus capensis	0.30	2	0.03	2683
Total	1114.76		99.99	

PROJECT STATION: 052

DATE: 6/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2209
start stop duration Long E 1255
TIME :05:24:00 05:54:00 30 (min) Purpose code: 2
LOG :1112.80 1114.40 1.60 Area code : 2
FDEPTH: 325 325 GearCond.code:
BDEPTH: 325 325 Validity code: 6
Towing dir: 7° Wire out:1020 m Speed: 32 kn*10

Sorted: 203 Kg Total catch: 339.38 CATCH/HOUR: 678.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	259.60	298	38.25	2684
Austroglossus microlepis	140.50	610	20.70	2686
Pterothrissus belloci	109.40	1380	16.12	
Lophius vomerinus	69.48	56	10.24	2685
Chlorophthalmus atlanticus	47.00	3692	6.92	
Merluccius capensis, juveniles	15.20	600	2.24	2687
Solenocera africana	12.40	2714	1.83	
Coelorinchus sp.	11.20	600	1.65	
Synagrops microlepis	4.00	580	0.59	
C R A B S	4.00	180	0.59	
Lophius vomerinus, juveniles	3.40	80	0.50	
Galeus polli	2.00	8	0.29	
Helicolenus dactylopterus	0.60	60	0.09	
Total	678.78		100.01	

PROJECT STATION: 053

DATE: 6/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2208
start stop duration Long E 1255
TIME :07:07:00 08:07:00 60 (min) Purpose code: 2
LOG :1121.25 1124.60 3.30 Area code : 2
FDEPTH: 320 317 GearCond.code:
BDEPTH 320 317 Validity code:
Towing dir 185° Wire out:1020 m Speed: 33 kn*10

Sorted: 236 Kg Total catch: 1906.20 CATCH/HOUR: 1906.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1346.10	1470	70.62	2688
Deepwater fish mixture	480.00		25.18	
Austroglossus microlepis	55.45	196	2.91	2689
Lophius vomerinus	24.25	40	1.27	2690
Genypterus capensis	0.40	2	0.02	2691
Total	1906.20		100.00	

PROJECT STATION: 054

DATE: 6/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2215
start stop duration Long E 1255
TIME 09:06:00 09:36:00 30 (min) Purpose code: 2
LOG 1128.00 1130.60 1.70 Area code : 2
FDEPTH 310 313 GearCond.code:
BDEPTH 318 313 Validity code
Towing dir 176° Wire out:1020 m Speed: 34 kn*10

Sorted 215 Kg Total catch: 925.44 CATCH/HOUR: 1850 00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1491.60	1514	80.59	2692
Deepwater fish mixture	308.00		16.64	
Austroglossus microlepis	32.70	116	1.77	2693
Lophius vomerinus	18.00	18	0.97	2694
Total	1850.30		99.97	

PROJECT STATION: 855

DATE: 6/ 2/95 GEAR TYPE: BT No:7 POSITION: Lat S 2219
start stop duration Long E 1255
TIME :10:31:00 11:01:00 30 (min) Purpose code: 2
LOG :1134.10 1135.70 1.60 Area code : 2
FDEPTH: 319 311 GearCond.code:
BDEPTH: 319 311 Validity code: 6
Towing dir: 183° Wire out:1020 m Speed: 32 kn*10

Sorted: 195 Kg Total catch: 819.50 CATCH/HOUR: 1639.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	966.80	740	58.99	2695
Deepwater fish mixture	450.00		27.46	
Lophius vomerinus	161.10	190	9.83	2697
Austroglossus microlepis	61.10	170	3.73	2696
Total	1639.00		100.01	

PROJECT STATION: 856

DATE: 6/ 2/95 GEAR TYPE: BT No:7 POSITION: Lat S 2225
start stop duration Long E 1254
TIME :12:15:00 13:15:00 60 (min) Purpose code: 2
LOG :1140.60 1143.90 3.30 Area code : 2
FDEPTH: 304 303 GearCond.code:
BDEPTH: 304 303 Validity code: 6
Towing dir: 200° Wire out: m Speed: 33 kn*10

Sorted: 265 Kg Total catch: 1652.70 CATCH/HOUR: 1652.70

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	1157.00		70.01	
Merluccius capensis	323.20	301	19.56	2698
Lophius vomerinus	72.70	42	4.40	2699
Austroglossus microlepis	63.60	184	3.85	2701
Lophius vomerinus, juveniles	36.20	113	2.19	2700
Total	1652.70		100.01	

PROJECT STATION: 857

DATE: 6/ 2/95 GEAR TYPE: BT No:8 POSITION: Lat S 2221
start stop duration Long E 1254
TIME :14:43:00 15:13:00 30 (min) Purpose code: 2
LOG :1152.90 1154.40 1.50 Area code : 2
FDEPTH: 318 323 GearCond.code:
BDEPTH: 318 323 Validity code:
Towing dir: 5° Wire out:1020 m Speed: 31 kn*10

Sorted: 161 Kg Total catch: 251.50 CATCH/HOUR: 503.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	319.60	236	63.54	2702
Deepwater fish mixture	180.00		35.79	
Merluccius capensis, juveniles	1.90	10	0.38	2703
Lophius vomerinus, juveniles	1.00	4	0.20	
Austroglossus microlepis	0.48	2	0.10	
Total	502.98		100.01	

PROJECT STATION: 858

DATE: 6/ 2/95 GEAR TYPE: BT No:8 POSITION: Lat S 2216
start stop duration Long E 1254
TIME :16:08:00 16:38:00 30 (min) Purpose code: 2
LOG :1158.20 1159.90 1.70 Area code : 2
FDEPTH: 327 326 GearCond.code:
BDEPTH: 327 326 Validity code:
Towing dir: 20° Wire out:1020 m Speed: 34 kn*10

Sorted: 125 Kg Total catch: 125.30 CATCH/HOUR: 250.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	193.30	150	77.13	2704
Shrimps, small, non comm.	23.60		9.42	
Helicolenus dactylopterus	14.40	1120	5.75	
Chlorophthalmus atlanticus	5.32	532	2.12	
Schedophilus huttoni	4.90	2	1.96	
Pterothrissus belloci	3.28	24	1.31	
Todaropsis sagittatus	2.44	4	0.97	
Trachurus capensis	0.90	6	0.36	
Coelorinchus sp.	0.80	44	0.32	
Solenocera africana	0.62	142	0.25	
PORTUNIDAE	0.42	14	0.17	
CONGRIDAE	0.40	14	0.16	
Galeus polli	0.08	4	0.03	
MYCTOPHIDAE	0.08	28	0.03	
Total	250.54		99.98	

PROJECT STATION: 859

DATE: 6/ 2/95 GEAR TYPE: BT No:7 POSITION: Lat S 2211
start stop duration Long E 1253
TIME :20:26:00 20:56:00 30 (min) Purpose code: 2
LOG :1181.20 1183.70 1.53 Area code : 2
FDEPTH: 343 339 GearCond.code:
BDEPTH: 343 339 Validity code: 6
Towing dir: 20° Wire out:1120 m Speed: 30 kn*10

Sorted: 245 Kg Total catch: 1209.47 CATCH/HOUR: 2418.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1955.60	1368	80.85	2705
Deepwater fish mixture	330.00		13.64	
Lophius vomerinus	104.46	120	4.32	2706
Lophius vomerinus, juveniles	23.50	52	0.97	2707
Austroglossus microlepis	4.50	10	0.19	2709
Genypterus capensis	0.88	2	0.04	2708
Total	2418.94		100.01	

PROJECT STATION: 860

DATE: 7/ 2/95 GEAR TYPE: BT No:7 POSITION: Lat S 2210
start stop duration Long E 1253
TIME :06:28:00 06:58:00 30 (min) Purpose code: 2
LOG :1214.40 1216.00 1.60 Area code : 2
FDEPTH: 341 338 GearCond.code:
BDEPTH: 341 338 Validity code: 6
Towing dir: 16° Wire out:1120 m Speed: 29 kn*10

Sorted: 288 Kg Total catch: 890.96 CATCH/HOUR: 1781.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1140.00	750	63.98	2710
Deepwater fish mixture	480.00		26.94	
Lophius vomerinus	158.92	148	8.92	2711
Genypterus capensis	2.00	4	0.11	2713
Austroglossus microlepis	1.00	2	0.06	2712
Total	1781.92		100.01	

PROJECT STATION: 861

DATE: 7/ 2/95 GEAR TYPE: BT No:8 POSITION: Lat S 2209
start stop duration Long E 1253
TIME :08:06:00 08:36:00 30 (min) Purpose code: 2
LOG :1220.20 1221.70 1.62 Area code : 2
FDEPTH: 339 341 GearCond.code:
BDEPTH: 339 341 Validity code:
Towing dir: 185° Wire out:1050 m Speed: 32 kn*10

Sorted: 244 Kg Total catch: 1386.00 CATCH/HOUR: 2772.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1419.30	964	51.20	2714
Deepwater fish mixture	1300.00		46.90	
Lophius vomerinus	41.90	46	1.51	2715
Austroglossus microlepis	9.60	14	0.35	2716
Genypterus capensis	2.08	4	0.08	2717
Total	2772.88		100.04	

PROJECT STATION: 862

DATE: 7/ 2/95 GEAR TYPE: BT No:7 POSITION: Lat S 2211
start stop duration Long E 1256
TIME :09:47:00 10:17:00 30 (min) Purpose code: 2
LOG :1227.30 1228.80 1.70 Area code : 2
FDEPTH: 313 314 GearCond.code:
BDEPTH: 313 314 Validity code: 6
Towing dir: 191° Wire out:1050 m Speed: 34 kn*10

Sorted: 225 Kg Total catch: 694.32 CATCH/HOUR: 1388.64

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	884.20	884	63.67	2718
Deepwater fish mixture	353.94		25.49	
Austroglossus microlepis	97.10	524	6.99	2720
Lophius vomerinus	53.40	74	3.85	2719
Total	1388.64		100.00	

PROJECT STATION: 863

DATE: 7/ 2/95 GEAR TYPE: BT No:7 POSITION: Lat S 2215
start stop duration Long E 1256
TIME :11:17:00 11:47:00 30 (min) Purpose code: 2
LOG :1230.60 1232.00 1.40 Area code : 2
FDEPTH: 309 306 GearCond.code:
BDEPTH: 309 306 Validity code: 6
Towing dir: 170° Wire out:1020 m Speed: 32 kn*10

Sorted: 357 Kg Total catch: 623.60 CATCH/HOUR: 1247.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	604.00		54.04	
Merluccius capensis	439.60	554	35.25	2721
Austroglossus microlepis	81.50	402	6.53	2724
Lophius vomerinus	36.70	26	2.94	2722
Lophius vomerinus, juveniles	5.52	14	0.44	2723
Total	1247.32		100.00	

PROJECT STATION: 064

DATE: 7/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2219
start stop duration Long E 1255
TIME :12:55:00 13:15:00 20 (min) Purpose code: 2
LOG :1235.30 1236.30 1.20 Area code : 2
FDEPTH: 316 316 GearCond.code:
BDEPTH: 316 316 Validity code:
Towing dir: 105° Wire out:1020 m Speed: 32 kn*10

Sorted: 132 Kg Total catch: 311.70 CATCH/HOUR: 935.10

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	513.90	489	54.96	2725
Deepwater fish mixture	351.00		37.54	
Austroglossus microlepis	46.35	126	4.96	2726
Merluccius capensis, juveniles	10.92	123	1.17	2727
Lophius vomerinus	7.05	6	0.75	
Lophius vomerinus, juveniles	6.00	36	0.64	
Total	935.22		100.02	

PROJECT STATION: 065

DATE: 7/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2222
start stop duration Long E 1255
TIME :14:14:00 14:44:00 30 (min) Purpose code: 2
LOG :1230.90 1240.50 1.60 Area code : 2
FDEPTH: 304 305 GearCond.code:
BDEPTH: 304 305 Validity code: 6
Towing dir: 175° Wire out:1020 m Speed: 32 kn*10

Sorted: 245 Kg Total catch: 705.00 CATCH/HOUR: 1410.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	666.00		47.23	
Merluccius capensis	593.80	628	42.11	2728
Lophius vomerinus	56.50	40	4.01	2729
Austroglossus microlepis	51.20	166	3.63	2731
Lophius vomerinus, juveniles	36.00	98	2.55	2730
Merluccius capensis, juveniles	6.60	52	0.47	2732
Total	1410.10		100.00	

PROJECT STATION: 066

DATE: 7/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2223
start stop duration Long E 1254
TIME :15:35:00 16:05:00 30 (min) Purpose code: 2
LOG :1242.20 1243.40 1.20 Area code : 2
FDEPTH: 311 310 GearCond.code:
BDEPTH: 311 310 Validity code: 6
Towing dir: 360° Wire out:1020 m Speed: 30 kn*10

Sorted: 333 Kg Total catch: 945.70 CATCH/HOUR: 1091.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	673.20		61.68	
Merluccius capensis	242.00	204	22.17	2733
Lophius vomerinus	65.20	42	5.97	2734
Austroglossus microlepis	58.10	174	5.32	2736
Lophius vomerinus, juveniles	52.90	144	4.85	2735
Total	1091.40		99.99	

PROJECT STATION: 067

DATE: 7/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2221
start stop duration Long E 1254
TIME :17:08:00 17:38:00 30 (min) Purpose code: 2
LOG :1248.00 1249.40 1.63 Area code : 2
FDEPTH: 309 308 GearCond.code:
BDEPTH: 309 308 Validity code:
Towing dir: 17° Wire out:1020 m Speed: 32 kn*10

Sorted: 70 Kg Total catch: 378.80 CATCH/HOUR: 757.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	600.00		79.20	
Merluccius capensis	120.90	128	15.96	2737
Austroglossus microlepis	30.30	108	4.00	2730
Lophius vomerinus, juveniles	6.34	14	0.84	
Merluccius capensis, juveniles	1.28	10	0.17	2739
Total	758.82		100.17	

PROJECT STATION: 068

DATE: 7/ 2/95 GEAR TYPE: PT No:5 POSITION:Lat S 2218
start stop duration Long E 1254
TIME :20:23:00 21:23:00 60 (min) Purpose code: 1
LOG :1266.80 1269.90 3.15 Area code : 2
FDEPTH: 270 285 GearCond.code:
BDEPTH: 331 332 Validity code:
Towing dir: ° Wire out: 840 m Speed: 32 kn*10

Sorted: 87 Kg Total catch: 87.80 CATCH/HOUR 87.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT C	SAMP
Merluccius capensis	50.80	60	57.86	2740
MYCTOPHIDAE	34.00		38.72	
Brama brama	1.07	1	2.13	
Todaroden sagittatus	0.45	1	0.51	
Merluccius capensis, juveniles	0.34	4	0.39	2741
Trachurus capensis	0.30	1	0.34	
Total	87.76		99.95	

PROJECT STATION: 069

DATE: 8/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2222
start stop duration Long E 1253
TIME :07:23:00 07:53:00 30 (min) Purpose code: 2
LOG :1295.40 1295.90 1.40 Area code : 2
FDEPTH: 322 332 GearCond.code:
BDEPTH: 322 332 Validity code: 6
Towing dir: 5° Wire out:1050 m Speed: 30 kn*10

Sorted: 360 Kg Total catch: 1748.15 CATCH/HOUR: 3496.30

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	2926.30	2212	83.70	2742
Deepwater fish mixture	475.60		13.60	
Lophius vomerinus	56.30	46	1.61	2743
Lophius vomerinus, juveniles	28.50	88	0.82	2744
Austroglossus microlepis	9.40	32	0.27	2745
Total	3496.00		100.00	

PROJECT STATION: 070

DATE: 8/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2223
start stop duration Long E 1254
TIME :09:43:00 10:13:00 30 (min) Purpose code: 2
LOG :1304.60 1306.10 1.50 Area code : 2
FDEPTH: 313 312 GearCond.code:
BDEPTH: 313 312 Validity code: 6
Towing dir: 20° Wire out:1050 m Speed: 10 kn*10

Sorted: 551 Kg Total catch: 1704.70 CATCH/HOUR: 3409.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	2044.00	1974	83.42	2746
Deepwater fish mixture	411.60		12.07	
Lophius vomerinus	80.90	76	2.37	2747
Lophius vomerinus, juveniles	40.10	124	1.10	2748
Austroglossus microlepis	32.80	106	0.96	2749
Total	3409.40		100.00	

PROJECT STATION: 071

DATE: 8/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2221
start stop duration Long E 1254
TIME :11:19:00 11:49:00 30 (min) Purpose code: 2
LOG :1309.20 1310.60 1.40 Area code : 2
FDEPTH: 327 327 GearCond.code:
BDEPTH: 327 327 Validity code:
Towing dir: 15° Wire out:1050 m Speed: 31 kn*10

Sorted: 256 Kg Total catch: 1787.90 CATCH/HOUR: 3575.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	3328.50	2466	93.08	2750
Deepwater fish mixture	210.00		5.87	
Lophius vomerinus	29.00	50	0.81	2751
Austroglossus microlepis	8.30	16	0.23	2752
Total	3575.80		99.99	

PROJECT STATION: 072

DATE: 8/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2220
start stop duration Long E 1254
TIME :12:50:00 13:05:00 15 (min) Purpose code: 2
LOG :1313.10 1313.90 0.80 Area code : 2
FDEPTH: 327 326 GearCond.code:
BDEPTH: 327 326 Validity code:
Towing dir: 190° Wire out:1050 m Speed: 32 kn*10

Sorted: 181 Kg Total catch: 522.96 CATCH/HOUR: 2091.84

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1678.04	1200	80.22	2753
Deepwater fish mixture	292.00		13.96	
Lophius vomerinus	116.20	140	5.55	2754
Austroglossus microlepis	5.60	16	0.27	2755
Total	2091.84		100.00	

PROJECT STATION: 073

DATE: 8/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2220
start stop duration Long E 1254
TIME :14:03:00 14:08:00 5 (min) Purpose code: 2
LOG :1310.00 1319.10 0.30 Area code : 2
FDEPTH: 327 327 GearCond.code:
BDEPTH: 327 327 Validity code:
Towing dir: 190° Wire out:1050 m Speed: 31 kn*10

Sorted: 141 Kg Total catch: 141.60 CATCH/HOUR: 1699.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1336.20	1152	78.64	2756
Deepwater fish mixture	270.00		15.89	
Lophius vomerinus	81.00	100	4.77	2758
Austroglossus microlepis	12.00	36	0.71	2757
Total	1699.20		100.01	

PROJECT STATION: 874

DATE: 8/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2211
start stop duration Long E 1254
TIME :15:40:00 15:40:00 60 (min) Purpose code: 2
LOG :1330.00 1333.00 3.10 Area code : 2
FDEPTH: 334 338 GearCond.code:
BDEPTH: 334 338 Validity code:
Towing dir: 320° Wire out:1050 m Speed: 31 kn*10

Sorted: 298 Kg Total catch: 770.72 CATCH/HOUR: 770.72

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	510.00		65.49	
Lophius vomerinus	158.10	140	20.30	2760
Merluccius capensis	81.75	96	10.50	2759
Austroglossus microlepis	20.55	60	1.67	2761
Genypterus capensis	0.32	2	0.04	2762
Total	778.72		100.00	

PROJECT STATION: 875

DATE: 8/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2221
start stop duration Long E 1253
TIME :19:04:00 19:35:00 31 (min) Purpose code: 2
LOG :1351.00 1352.60 1.60 Area code : 2
FDEPTH: 333 340 GearCond.code:
BDEPTH: 333 340 Validity code:
Towing dir: ° Wire out:1050 m Speed: 32 kn*10

Sorted: 216 Kg Total catch: 992.32 CATCH/HOUR: 1920.62

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1314.50	1192	68.45	2763
Deepwater fish mixture	569.03		29.63	
Lophius vomerinus	33.77	43	1.76	2765
Austroglossus microlepis	2.67	6	0.14	2764
Genypterus capensis	0.56	2	0.03	2766
Total	1920.61		100.01	

PROJECT STATION: 876

DATE: 8/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2219
start stop duration Long E 1254
TIME :20:35:00 21:05:00 30 (min) Purpose code: 2
LOG :1306.50 1350.20 1.64 Area code : 2
FDEPTH: 328 337 GearCond.code:
BDEPTH: 328 337 Validity code:
Towing dir: 345° Wire out:1070 m Speed: 33 kn*10

Sorted: 160 Kg Total catch: 250.34 CATCH/HOUR: 500.68

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	245.40	232	49.01	2767
Deepwater fish mixture	240.00		47.93	
Lophius vomerinus	10.88	20	2.17	2769
Austroglossus microlepis	4.40	16	0.88	2760
Total	500.68		99.99	

PROJECT STATION: 877

DATE: 9/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2221
start stop duration Long E 1253
TIME :05:20:00 05:50:00 30 (min) Purpose code: 2
LOG :1373.60 1375.10 1.45 Area code : 2
FDEPTH: 333 343 GearCond.code:
BDEPTH: 333 343 Validity code:
Towing dir: 350° Wire out:1100 m Speed: 29 kn*10

Sorted: 204 Kg Total catch: 455.62 CATCH/HOUR: 911.24

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	560.00		61.45	
Merluccius capensis	270.40	200	29.67	2770
Lophius vomerinus	71.50	90	7.85	2771
Austroglossus microlepis	8.90	10	0.98	2772
Genypterus capensis	0.44	2	0.05	2773
Total	911.24		100.00	

PROJECT STATION: 878

DATE: 9/ 3/95 GEAR TYPE: BT No:8 POSITION:Lat S 2217
start stop duration Long E 1253
TIME :06:51:00 07:21:00 30 (min) Purpose code: 2
LOG :1379.10 1380.60 1.44 Area code : 2
FDEPTH: 338 339 GearCond.code:
BDEPTH: 338 339 Validity code:
Towing dir: 350° Wire out:1100 m Speed: 29 kn*10

Sorted: 232 Kg Total catch: 382.10 CATCH/HOUR: 764.36

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	376.30	566	49.23	2775
Deepwater fish mixture	360.00		47.10	
Lophius vomerinus	26.40	26	3.45	2776
Austroglossus microlepis	1.66	6	0.22	2774
Total	764.36		100.00	

PROJECT STATION: 879

DATE: 9/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2240
start stop duration Long E 1309
TIME :12:36:00 12:41:00 5 (min) Purpose code: 2
LOG :1423.10 1423.40 0.25 Area code : 2
FDEPTH: 311 310 GearCond.code:
BDEPTH: 311 310 Validity code:
Towing dir: 311° Wire out:1030 m Speed: 30 kn*10

Sorted: 111 Kg Total catch: 120.70 CATCH/HOUR: 1440.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	988.80	744	68.67	2777
Merluccius paradoxus, juvenile	217.20	1368	15.00	2779
Merluccius capensis, juveniles	139.20	1632	9.61	2778
Helicolenus dactylopterus	26.16	960	1.01	
Galeus polli	20.64	240	1.43	
Trachurus capensis	12.48	72	0.86	
Austroglossus microlepis	8.16	24	0.56	
Coelorinchus fasciatus	6.96	144	0.40	
Nezumia leonis	6.96	216	0.48	
Squalus megalops	6.72	24	0.46	
Chlorophthalmus atlanticus	5.76	288	0.40	
Synagrops microlepis	4.32	432	0.30	
CONGRIDAE	2.88	48	0.20	
PORTUNIDAE	2.16	48	0.15	
MYCTOPHIDAE	0.48	96	0.03	
Total	1440.88		100.04	

PROJECT STATION: 880

DATE: 9/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2253
start stop duration Long E 1319
TIME :14:44:00 14:49:00 5 (min) Purpose code: 2
LOG :1438.80 1439.10 0.30 Area code : 2
FDEPTH: 333 334 GearCond.code:
BDEPTH: 333 334 Validity code:
Towing dir: 299° Wire out:1050 m Speed: 30 kn*10

Sorted: 236 Kg Total catch: 236.80 CATCH/HOUR: 2841.60

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	2597.40	1096	91.41	2780
Merluccius paradoxus, juvenile	205.80	2364	7.24	2781
Lophius vomerinus	28.44	12	1.00	
Genypterus capensis	6.96	12	0.24	
Austroglossus microlepis	3.36	12	0.12	
Total	2841.96		100.01	

PROJECT STATION: 881

DATE: 9/ 2/95 GEAR TYPE: PT No:2 POSITION:Lat S 2308
start stop duration Long E 1326
TIME :22:09:00 22:44:00 35 (min) Purpose code: 3
LOG :1482.50 1484.50 2.00 Area code : 2
FDEPTH: 105 85 GearCond.code:
BDEPTH: 200 200 Validity code:
Towing dir: 350° Wire out: 330 m Speed: 30 kn*10

Sorted: 2 Kg Total catch: 14.70 CATCH/HOUR: 25.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	19.20	1373	76.19	2781
Trachurus capensis	6.00	15	23.81	2782
Total	25.20		100.00	

PROJECT STATION: 882

DATE:10/ 9/95 GEAR TYPE: BT No:8 POSITION:Lat S 2225
start stop duration Long E 1344
TIME :06:46:00 06:48:00 2 (min) Purpose code: 1
LOG :1573.50 1573.50 Area code : 2
FDEPTH: 121 121 GearCond.code: 8
BDEPTH: 121 121 Validity code: 4
Towing dir: 230° Wire out: 410 m Speed: 30 kn*10

Sorted: 1 Kg Total catch: 30.00 CATCH/HOUR: 900.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	900.00	75000	100.00	2783
Total	900.00		100.00	

PROJECT STATION: 883

DATE:10/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2224
start stop duration Long E 1345
TIME :10:48:00 11:18:00 30 (min) Purpose code: 2
LOG :1589.30 1590.80 1.50 Area code : 2
FDEPTH: 122 122 GearCond.code:
BDEPTH: 122 122 Validity code:
Towing dir: 120° Wire out: 320 m Speed: 30 kn*10

Sorted: 20 Kg Total catch: 60.00 CATCH/HOUR: 120.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	120.00	10788	100.00	2784
Total	120.00		100.00	

PROJECT STATION: 084

DATE:10/ 2/95 GEAR TYPE: PT No:7 POSITION:Lat S 2223
start stop duration Long E 1343
TIME :21:07:00 21:27:00 20 (min) Purpose code: 1
LOG :1684.00 1685.00 1.00 Area code : 3
FDEPTH: 96 50 GearCond.code:
BDEPTH: 121 122 Validity code:
Towing dir: 343° Wire out: 300 m Speed: 30 km*10

Sorted: 5 Kg Total catch: 10.72 CATCH/HOUR: 32.16

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	19.95	1705	62.03	2785
Brama brama	10.56	6	32.84	
Engraulis capensis	1.50	90	4.66	
Trachurus capensis	0.15	30	0.47	
Total	32.16		100.00	

PROJECT STATION: 085

DATE:12/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2220
start stop duration Long E 1254
TIME :10:35:00 11:05:00 30 (min) Purpose code: 2
LOG :1702.10 1703.60 1.55 Area code : 2
FDEPTH: 315 315 GearCond.code: 4
BDEPTH: 315 315 Validity code: 9
Towing dir: 190° Wire out: 950 m Speed: 31 km*10

Sorted: 71 Kg Total catch: 83.28 CATCH/HOUR: 166.56

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis	101.70	136	61.06	2787
Sufflogobius bibarbatus	25.80	4000	15.49	
Trachurus capensis	18.70	162	11.23	2789
Merluccius capensis, juveniles	15.36	180	9.22	2788
Austroglossus microlepis	2.96	20	1.78	
Solenocera africana	1.52	320	0.91	
PORTUNIDAE	0.52	20	0.31	
Total	166.56		100.00	

PROJECT STATION: 086

DATE:12/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2220
start stop duration Long E 1237
TIME :12:07:00 12:37:00 30 (min) Purpose code: 2
LOG :1787.10 1788.70 1.60 Area code : 2
FDEPTH: 347 343 GearCond.code: 4
BDEPTH: 347 343 Validity code: 9
Towing dir: 360° Wire out:1000 m Speed: 34 km*10

Sorted: 95 Kg Total catch: 109.67 CATCH/HOUR: 219.34

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis	163.20	88	74.41	2790
Shrimps, small, non comm.	10.00		4.56	
HYCTOPHIDAE	10.00		4.56	
Helicolenus dactylopterus	7.80	592	3.56	
Chlorophthalmus atlanticus	6.44	472	2.94	
Pterothrissus belloci	6.36	132	2.90	
Merluccius capensis, juveniles	6.00	296	2.74	2791
Austroglossus microlepis	4.32	16	1.97	
Trachipterus jacksonensis	2.38	2	1.09	
Solenocera africana	1.20	316	0.50	
Synagrops microlepis	1.04	132	0.47	
Coelorinchus fasciatus	0.52	20	0.24	
Total	219.34		100.02	

PROJECT STATION: 087

DATE:12/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2220
start stop duration Long E 1254
TIME :13:56:00 14:26:00 30 (min) Purpose code: 2
LOG :1792.90 1794.50 1.54 Area code : 2
FDEPTH: 321 322 GearCond.code:
BDEPTH: 321 322 Validity code:
Towing dir: 190° Wire out:1000 m Speed: 31 km*10

Sorted: 54 Kg Total catch: 87.60 CATCH/HOUR: 175.20

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis	63.10	70	36.02	2792
Sufflogobius bibarbatus	57.50	8144	32.82	
Merluccius capensis, juveniles	35.80	2110	20.43	2793
Trachurus capensis	11.00	90	6.28	
Austroglossus microlepis	4.80	30	2.74	
Solenocera africana	1.90	400	1.08	
PORTUNIDAE	1.14	74	0.65	
Total	175.24		100.02	

PROJECT STATION: 088

DATE:12/ 2/95 GEAR TYPE BT No:7 POSITION:Lat S 2220
start stop duration Long E 1249
TIME :16:04:00 16:34:00 30 (min) Purpose code: 2
LOG :1803.50 1805.30 1.80 Area code : 2
FDEPTH: 396 401 GearCond.code: 4
BDEPTH: 396 401 Validity code: 9
Towing dir: 350° Wire out:1150 m Speed: 34 km*10

Sorted: 43 Kg Total catch 43.16 CATCH/HOUR: 86.32

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis	27.90	26	32.32	2794
Merluccius paradoxus	22.00	106	25.49	2795
Helicolenus dactylopterus	13.60		15.76	
Hexanchus griseus	6.20	2	7.18	
Brama brama	2.82	2	3.27	
Galeus polli	2.80	30	3.24	
Nezumia leonis	2.20	88	2.55	
Coelorinchus fasciatus	2.18	36	2.53	
Epigonus denticulatus	2.04	72	2.36	
Genypterus capensis	1.90	2	2.20	
Lacmonema laureysi	1.10	36	1.27	
Lophius vomerinus	1.06	2	1.23	
Austroglossus microlepis	0.34	2	0.39	
Chlorophthalmus atlanticus	0.18	12	0.21	
Total	86.32		100.00	

PROJECT STATION: 089

DATE:12/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2213
start stop duration Long E 1252
TIME :18:47:00 19:17:00 30 (min) Purpose code: 2
LOG :1015.40 1017.10 1.70 Area code : 2
FDEPTH: 345 344 GearCond.code:
BDEPTH: 345 344 Validity code:
Towing dir: 5° Wire out:1150 m Speed: 34 km*10

Sorted: 66 Kg Total catch: 516.30 CATCH/HOUR: 1032.60

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Deepwater fish mixture	900.00		87.16	
Austroglossus microlepis	54.00	352	5.23	2798
Merluccius capensis	45.70	30	4.43	2796
Lophius vomerinus	32.90	100	3.19	2797
Total	1032.60		100.01	

PROJECT STATION: 090

DATE:13/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2245
start stop duration Long E 1307
TIME :05:21:00 05:52:00 31 (min) Purpose code: 2
LOG :1071.50 1073.20 1.60 Area code : 2
FDEPTH: 310 313 GearCond.code:
BDEPTH: 310 313 Validity code:
Towing dir: 330° Wire out:1030 m Speed: 30 km*10

Sorted: 78 Kg Total catch: 154.46 CATCH/HOUR: 298.95

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis	109.20	120	36.55	2799
Helicolenus dactylopterus	60.97	2156	20.39	
Merluccius capensis, juveniles	58.55	4173	19.59	2802
Austroglossus microlepis	27.19	103	9.10	2801
Todarodes sagittatus	16.45	29	5.50	
Pterothrissus belloci	14.61	300	4.89	
Sufflogobius bibarbatus	4.26	832	1.42	
Lophius vomerinus	2.83	8	0.95	2800
Synagrops microlepis	1.84	203	0.62	
Shrimps, small, non comm.	1.06	213	0.35	
Chlorophthalmus atlanticus	0.77	87	0.26	
Trigla lyra	0.68	10	0.23	
CONGRIDAE	0.48	19	0.16	
Total	298.97		100.01	

PROJECT STATION: 091

DATE:13/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2243
start stop duration Long E 1304
TIME :06:58:00 07:28:00 30 (min) Purpose code: 2
LOG :1075.60 1077.10 1.50 Area code : 2
FDEPTH: 312 310 GearCond.code:
BDEPTH: 312 310 Validity code:
Towing dir: 320° Wire out:1030 m Speed: 30 km*10

Sorted: 130 Kg Total catch: 528.05 CATCH/HOUR: 1056.10

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis	691.40	680	65.47	2803
Trachurus capensis	299.60	1512	28.37	2806
Merluccius capensis, juveniles	22.96	1166	2.17	2807
Pterothrissus belloci	14.80	204	1.40	
Austroglossus microlepis	10.90	36	1.03	2804
Helicolenus dactylopterus	10.00	338	0.95	
Lophius vomerinus	4.00	6	0.38	2805
Brama brama	0.98	2	0.09	
Shrimps, small, non comm.	0.94	162	0.09	
CONGRIDAE	0.52	10	0.05	
Total	1056.10		100.00	

PROJECT STATION: 092

DATE:13/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2229
start stop duration Long E 1305
TIME :00:39:00 09:14:00 35 (min) Purpose code: 2
LOG :1080.10 1082.00 1.85 Area code : 2
FDEPTH: 312 313 GearCond.code:
BDEPTH: 312 313 Validity code:
Towing dir: 140° Wire out:1030 m Speed: 32 km*10

Sorted: 212 Kg Total catch: 519.33 CATCH/HOUR: 890.28

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Trachurus capensis	433.29	2160	48.67	2812
Merluccius capensis	313.30	205	35.18	2808
Pterothrissus belloci	58.11	951	6.53	
Merluccius capensis, juveniles	55.29	1671	6.21	2811
Helicolenus dactylopterus	17.49	591	1.96	
Lophius vomerinus	6.65	7	0.75	2809
Austroglossus microlepis	6.26	22	0.70	2810
Total	890.29		100.00	

PROJECT STATION: 093

DATE:13/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2253
start stop duration Long E 1320
TIME :12:11:00 12:41:00 30 (min) Purpose code: 2
LOG :1090.30 1099.70 1.40 Area code : 2
FDEPTH: 329 324 GearCond.code:
BDEPTH: 329 324 Validity code:
Towing dir: 120° Wire out:1050 m Speed: 32 km*10

Sorted: 30 Kg Total catch: 37.90 CATCH/HOUR: 75.80

SPECIES	CATCH/HOUR weight	CATCH/HOUR numbers	% OF TOT. C	SAMP
Merluccius capensis	41.40	172	54.62	2813
Merluccius capensis, juveniles	15.30	1096	20.18	2814
Helicolenus dactylopterus	11.50	312	15.20	
Austroglossus microlepis	2.46	12	3.25	
Trachurus capensis	2.20	12	2.90	
Sufflogobius bibarbatus	1.50	258	1.98	
Chlorophthalmus atlanticus	0.84	66	1.11	
Solenocera africana	0.54	138	0.71	
Total	75.82		100.03	

PROJECT STATION: 894

DATE:13/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2254
start stop duration Long E 1313
TIME :16:04:00 16:31:00 27 (min) Purpose code: 2
LOG :1912.50 1913.90 1.38 Area code : 2
FDEPTH: 329 329 GearCond.code:
BDEPTH: 329 329 Validity code:
Towing dir: 90° Wire out:1020 m Speed: 30 kn*10

Sorted: 106 Kg Total catch: 676.50 CATCH/HOUR: 1507.78

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	976.44	804	64.76	2815
Deepwater fish mixture	416.67		27.63	
Merluccius paradoxus, juvenile	69.71	402	4.62	2817
Lophius vomerinus	23.67	13	1.57	2818
Merluccius capensis, juveniles	21.24	167	1.41	2816
Total	1507.73		99.99	

PROJECT STATION: 895

DATE:13/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2255
start stop duration Long E 1310
TIME :19:17:00 19:37:00 20 (min) Purpose code: 2
LOG :1922.00 1923.90 1.10 Area code : 2
FDEPTH: 300 314 GearCond.code:
BDEPTH: 300 314 Validity code:
Towing dir: 99° Wire out: 950 m Speed: 33 kn*10

Sorted: 73 Kg Total catch: 177.44 CATCH/HOUR: 532.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	162.60	3091	30.55	
Galeus polli	135.00	2985	25.36	
Merluccius capensis	114.15	114	21.44	2819
Coelorinchus sp.	68.70	1680	12.91	
Lophius vomerinus	19.05	12	3.58	
Merluccius paradoxus, juvenile	16.65	111	3.13	2821
Merluccius capensis, juveniles	7.38	39	1.39	2820
Austroglossus microlepis	3.81	12	0.72	
Xenopsis conchifer	3.51	3	0.66	
Genypterus capensis	1.47	3	0.28	
Total	532.32		100.02	

PROJECT STATION: 896

DATE:13/ 2/95 GEAR TYPE: PT No:5 POSITION:Lat S 2255
start stop duration Long E 1308
TIME :21:21:00 22:12:00 51 (min) Purpose code: 1
LOG :1932.90 1935.50 2.60 Area code : 2
FDEPTH: 150 230 GearCond.code:
BDEPTH: 205 308 Validity code:
Towing dir: 96° Wire out: 450 m Speed: 40 kn*10

Sorted: 40 Kg Total catch: 40.90 CATCH/HOUR: 48.12

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Lophius vomerinus	20.10	12	41.94	2826
MYCTOPHIDAE	13.29	5193	27.63	
Merluccius capensis	9.00	12	18.70	2822
Merluccius paradoxus, juvenile	1.07	14	3.89	2824
Coelorinchus fasciatus	1.75	81	3.64	
Merluccius capensis, juveniles	0.96	31	2.00	2823
Squalus megalops	0.53	1	1.10	
Trachurus capensis	0.26	1	0.54	2825
Lepidopus caudatus	0.25	2	0.52	
Synagrops microlepis	0.02	4	0.04	
Total	48.11		99.99	

PROJECT STATION: 897

DATE:14/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2255
start stop duration Long E 1310
TIME :05:20:00 05:50:00 30 (min) Purpose code: 2
LOG :1982.50 1984.10 1.60 Area code : 2
FDEPTH: 295 315 GearCond.code:
BDEPTH: 295 315 Validity code:
Towing dir: 97° Wire out: 950 m Speed: 32 kn*10

Sorted: 123 Kg Total catch: 186.90 CATCH/HOUR: 373.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	188.70	166	50.48	2827
Coelorinchus sp.	98.00	4972	26.43	
Merluccius capensis, juveniles	24.88	616	6.66	2828
Helicolenus dactylopterus	19.04	520	5.11	
Merluccius paradoxus, juvenile	12.40	72	3.32	2829
Galeus polli	9.76	456	2.61	
Lophius vomerinus	9.10	12	2.43	
Austroglossus microlepis	4.42	16	1.18	
Pterothrissus belloci	2.88	32	0.77	
Trachurus capensis	1.78	8	0.48	
Synagrops microlepis	1.20	128	0.32	
Total	373.76		99.99	

PROJECT STATION: 898

DATE:14/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2253
start stop duration Long E 1307
TIME :07:06:00 07:36:00 30 (min) Purpose code: 2
LOG :1990.90 1992.40 1.50 Area code : 2
FDEPTH: 280 283 GearCond.code:
BDEPTH: 280 283 Validity code:
Towing dir: * Wire out: 930 m Speed: 30 kn*10

Sorted: 170 Kg Total catch: 444.90 CATCH/HOUR: 889.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	618.40	484	69.50	2830
Trachurus capensis	199.00	800	22.36	2831
Helicolenus dactylopterus	25.60	760	2.88	
Coelorinchus sp.	20.00	504	2.25	
Merluccius capensis, juveniles	12.50	386	1.40	2832
Chlorophthalmus atlanticus	5.40	390	0.61	
Austroglossus microlepis	2.60	10	0.29	
Lophius vomerinus	2.50	4	0.28	
Galeus polli	1.60	80	0.18	
Pterothrissus belloci	1.20	4	0.13	
Synagrops microlepis	1.00	130	0.11	
Total	889.80		99.99	

PROJECT STATION: 899

DATE:14/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2256
start stop duration Long E 1308
TIME :11:20:00 11:50:00 30 (min) Purpose code: 2
LOG :2001.40 2002.80 1.40 Area code : 2
FDEPTH: 283 281 GearCond.code:
BDEPTH: 283 281 Validity code:
Towing dir: 350° Wire out: 930 m Speed: 28 kn*10

Sorted: 183 Kg Total catch: 376.95 CATCH/HOUR: 753.90

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	590.10	782	78.28	2833
Lophius vomerinus	68.80	52	9.13	2835
Coelorinchus fasciatus	30.82	1300	4.09	
Merluccius capensis, juveniles	30.82	540	4.09	2834
Helicolenus dactylopterus	20.14	580	2.67	
Chlorophthalmus atlanticus	5.40	512	0.73	
Trachurus capensis	2.02	10	0.27	2836
Squalus megalops	1.42	4	0.19	
Galeus polli	1.38	60	0.18	
Pterothrissus belloci	0.82	4	0.11	
Synagrops microlepis	0.74	88	0.10	
Guentherus altivela	0.50	4	0.07	
CONGRIDAE	0.46	4	0.06	
Laemonema laureysi	0.32	4	0.04	
Total	753.90		100.01	

PROJECT STATION: 900

DATE:14/ 2/95 GEAR TYPE: BT No:7 POSITION:Lat S 2302
start stop duration Long E 1309
TIME :14:12:00 14:42:00 30 (min) Purpose code: 2
LOG :2015.40 2016.90 1.50 Area code : 2
FDEPTH: 327 317 GearCond.code:
BDEPTH: 327 317 Validity code:
Towing dir: 320° Wire out:1100 m Speed: 30 kn*10

Sorted: 215 Kg Total catch: 517.66 CATCH/HOUR: 1035.32

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	343.60	290	33.19	2837
Helicolenus dactylopterus	285.00	5076	27.53	
Merluccius capensis, juveniles	179.26	1174	17.31	2840
Coelorinchus fasciatus	78.80	2530	7.61	
Trachurus capensis	70.00	324	6.76	2841
Lophius vomerinus	33.10	20	3.20	2838
Galeus polli	29.00	1050	2.80	
Chlorophthalmus atlanticus	5.26	426	0.51	
CYNOGLOSSIDAE	4.74	24	0.46	
Genypterus capensis	2.32	6	0.22	2839
S H R I M P S	1.74	372	0.17	
PORTUNIDAE	1.50	24	0.14	
Nezumia sp.	1.00	24	0.10	
Total	1035.32		100.00	

PROJECT STATION: 901

DATE:15/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2254
start stop duration Long E 1305
TIME :08:17:00 08:47:00 30 (min) Purpose code: 2
LOG :2095.70 2097.30 1.62 Area code : 2
FDEPTH: 283 281 GearCond.code:
BDEPTH: 283 281 Validity code:
Towing dir: * Wire out: 970 m Speed: 32 kn*10

Sorted: 308 Kg Total catch: 347.40 CATCH/HOUR: 694.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Trachurus capensis	301.20	1044	43.35	2844
Merluccius capensis	202.50	200	29.15	2842
Helicolenus dactylopterus	73.50	2304	10.58	
Merluccius capensis, juveniles	52.00	564	7.48	2843
Chlorophthalmus atlanticus	32.64	2732	4.70	
Lophius vomerinus	19.50	18	2.81	
Coelorinchus sp.	10.88	396	1.57	
Austroglossus microlepis	2.60	4	0.37	
Total	694.82		100.01	

PROJECT STATION: 902

DATE:15/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2257
start stop duration Long E 1304
TIME :10:32:00 11:02:00 30 (min) Purpose code: 2
LOG :2105.40 2106.90 1.50 Area code : 2
FDEPTH: 325 316 GearCond.code:
BDEPTH: 325 316 Validity code:
Towing dir: 360° Wire out:1050 m Speed: 30 kn*10

Sorted: 177 Kg Total catch: 1186.00 CATCH/HOUR: 2372.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	997.50	352050	42.05	2846
Helicolenus dactylopterus	815.00	14076	34.36	
Merluccius capensis	271.00	202	11.46	2845
Chlorophthalmus atlanticus	100.50	13626	7.95	
Lophius vomerinus	45.70	24	1.93	
Coelorinchus sp.	27.00	800	1.14	
Merluccius capensis, juveniles	26.60	600	1.12	2847
Total	2372.10		100.01	

PROJECT STATION: 903

DATE:15/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2256
start stop duration Long E 1304
TIME :12:23:00 12:53:00 30 (min) Purpose code: 2
LOG :2110.60 2112.10 1.55 Area code : 2
FDEPTH: 316 305 GearCond.code:
BDEPTH: 316 305 Validity code:
Towing dir: 360° Wire out:1020 m Speed: 31 kn*10

Sorted: 33 Kg Total catch: 426.08 CATCH/HOUR: 852.16

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	371.70		43.62	
Merluccius capensis	247.76	326	29.07	2848
Chlorophthalmus atlanticus	104.04		12.21	
MYCTOPHIDAE	82.26		9.65	
Merluccius capensis, juveniles	24.12	340	2.83	2849
Lophius vomerinus	6.58	4	0.77	2850
Coelorinchus fasciatus	6.30		0.74	
Brama brama	5.92		0.69	
Trachipterus jackaonensis	3.48		0.41	
Total	852.16		99.99	

PROJECT STATION: 904

DATE:15/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2255
start stop duration Long E 1306
TIME :15:14:00 15:44:00 30 (min) Purpose code: 2
LOG :2110.70 2120.30 1.60 Area code : 2
FDEPTH: 284 280 GearCond.code:
BDEPTH: 284 280 Validity code:
Towing dir: 360° Wire out: 920 m Speed: 32 kn*10

Sorted: 163 Kg Total catch: 252.21 CATCH/HOUR. 504.42

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	250.00	342	49.72	2851
Helicolenus dactylopterus	104.00	2670	20.62	
Merluccius capensis, juveniles	71.60	648	14.19	2854
Chlorophthalmus atlanticus	40.00	312	8.10	
Coelorinchus fasciatus	10.72	320	2.13	
Lophius vomerinus	8.74	16	1.73	2853
Brama brama	6.44	4	1.20	
Todarodes sagittatus	2.88	8	0.57	
Austroglossus microlepis	2.76	4	0.55	2852
Pterothrissus belloci	1.84	8	0.36	
Trachurus capensis	1.60	8	0.32	
CONGRIDAE	1.20	24	0.24	
PORTUNIDAE	0.64	8	0.13	
Nezumia sp.	0.32	8	0.06	
Total	504.42		100.00	

PROJECT STATION: 905

DATE:15/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2255
start stop duration Long E 1304
TIME :17:31:00 18:01:00 30 (min) Purpose code: 2
LOG :2127.10 2128.60 1.50 Area code : 2
FDEPTH: 294 287 GearCond.code:
BDEPTH: 294 287 Validity code:
Towing dir: 360° Wire out: 970 m Speed: 30 kn*10

Sorted: 81 Kg Total catch: 266.46 CATCH/HOUR: 532.92

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	214.50	5892	40.25	
Merluccius capensis	114.40	216	21.47	2855
Chlorophthalmus atlanticus	97.24	8486	18.25	
Merluccius capensis, juveniles	49.92	780	9.37	2859
Coelorinchus fasciatus	26.26	780	4.93	
Lophius vomerinus	16.08	14	3.02	2856
Trachurus capensis	12.22	26	2.29	
PORTUNIDAE	1.30	52	0.24	
Austroglossus microlepis	0.80	2	0.15	2857
Genypterus capensis	0.20	2	0.04	2858
Total	532.92		100.01	

PROJECT STATION: 906

DATE:16/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2254
start stop duration Long E 1307
TIME :05:32:00 06:32:00 60 (min) Purpose code: 2
LOG :2175.70 2178.70 3.00 Area code : 2
FDEPTH: 282 284 GearCond.code:
BDEPTH: 282 284 Validity code:
Towing dir: 350° Wire out: 906 m Speed: 30 kn*10

Sorted: 148 Kg Total catch: 330.97 CATCH/HOUR: 330.97

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	190.20	178	57.47	2860
Helicolenus dactylopterus	47.25	1666	14.28	
Merluccius capensis, juveniles	43.90	348	13.26	2861
Trachurus capensis	12.50	35	3.78	2865
Coelorinchus fasciatus	11.65	426	3.52	
Lophius vomerinus	10.65	15	3.22	2863
Austroglossus microlepis	4.25	7	1.28	2862
Chlorophthalmus atlanticus	3.60	245	1.09	
Todarodes sagittatus	2.65	5	0.80	
Pterothrissus belloci	1.90	10	0.57	
Guentherus altivela	1.00	5	0.30	
Genypterus capensis	0.72	4	0.22	2864
CONGRIDAE	0.65	15	0.20	
Synagrops microlepis	0.05	5	0.02	
Total	330.97		100.01	

PROJECT STATION: 907

DATE:16/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2254
start stop duration Long E 1306
TIME :07:55:00 08:18:00 23 (min) Purpose code: 2
LOG :2184.50 2185.80 1.20 Area code : 2
FDEPTH: 284 289 GearCond.code: 9
BDEPTH: 284 289 Validity code:
Towing dir: 345° Wire out: 930 m Speed: 30 kn*10

Sorted: 97 Kg Total catch: 124.92 CATCH/HOUR: 325.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	113.70	117	34.50	2866
Merluccius capensis, juveniles	54.13	493	16.61	2867
Pterothrissus belloci	48.10	386	14.76	
Helicolenus dactylopterus	45.13	1529	13.85	
Krill	24.99		7.67	
Lophius vomerinus	9.50	13	2.92	2868
Chlorophthalmus atlanticus	5.17	266	1.59	
Todarodes sagittatus	4.70	5	1.44	
Coelorinchus fasciatus	4.59	104	1.41	
Trachurus capensis	2.66	5	0.82	
Synagrops microlepis	2.50	141	0.77	
CONGRIDAE	2.40	26	0.74	
S H A R K S	1.72	89	0.53	
Galeus polli	1.41	10	0.43	
Dentex macrophthalmus	1.23		0.38	
Total	320.93		98.50	

PROJECT STATION: 908

DATE:16/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2257
start stop duration Long E 1305
TIME :10:17:00 10:47:00 30 (min) Purpose code: 2
LOG :2197.10 2198.70 1.52 Area code : 2
FDEPTH: 301 289 GearCond.code:
BDEPTH: 301 289 Validity code:
Towing dir: 110° Wire out: 900 m Speed: 30 kn*10

Sorted: 145 Kg Total catch: 277.33 CATCH/HOUR: 554.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	205.80	5288	37.10	
Merluccius capensis	155.90	174	28.11	2870
Merluccius capensis, juveniles	74.30	604	13.40	2871
Chlorophthalmus atlanticus	44.60	4060	8.04	
Coelorinchus fasciatus	38.60	1594	6.96	
Lophius vomerinus	33.00	20	5.95	2872
PORTUNIDAE	1.68	56	0.30	
Austroglossus microlepis	0.78	2	0.14	
Total	554.66		100.00	

PROJECT STATION: 909

DATE:16/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2257
start stop duration Long E 1304
TIME :12:10:00 13:10:00 60 (min) Purpose code: 2
LOG :2205.80 2208.80 3.00 Area code : 2
FDEPTH: 325 325 GearCond.code:
BDEPTH: 325 325 Validity code:
Towing dir: 330° Wire out:1050 m Speed: 30 kn*10

Sorted: 240 Kg Total catch: 1859.25 CATCH/HOUR: 1859.25

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1469.00	953	79.01	2873
Helicolenus dactylopterus	292.20	6972	15.72	
Chlorophthalmus atlanticus	58.50	5510	3.15	
Lophius vomerinus	21.35	11	1.15	
Merluccius capensis, juveniles	11.60	204	0.62	2874
Coelorinchus sp.	6.60	216	0.35	
Total	1859.25		100.00	

PROJECT STATION: 910

DATE:16/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2254

	start	stop	duration			Long E 1302
TIME	:14:53:00	15:03:00	10 (min)	Purpose code:	2	
LOG	:2213.20	2212.60	0.40	Area code :	2	
FDEPTH:	320	320		GearCond.code:		
BDEPTH:	320	320		Validity code:		

Towing dir: 150° Wire out: 920 m Speed: 20 kn*10

Sorted: 263 Kg Total catch: 263.00 CATCH/HOUR: 1578.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	1015.80	1134	64.37	2875
Deepwater fish mixture	540.00		34.22	
Merluccius capensis, juveniles	22.32	270	1.41	
Total	1578.12		100.00	

PROJECT STATION: 911

DATE:16/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2256

	start	stop	duration			Long E 1304
TIME	:15:40:00	16:20:00	32 (min)	Purpose code:	2	
LOG	:2214.50	2216.10	1.60	Area code :	2	
FDEPTH:	320	318		GearCond.code:		
BDEPTH:	320	318		Validity code:		

Towing dir: 150° Wire out:1080 m Speed: 31 kn*10

Sorted: 219 Kg Total catch: 502.75 CATCH/HOUR: 942.66

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	562.50		59.67	
Merluccius capensis	335.81	394	35.62	2876
Merluccius capensis, juveniles	27.00	330	2.86	2877
Lophius vomerinus	17.34	13	1.84	
Total	942.65		99.99	

PROJECT STATION: 912

DATE:16/ 2/95 GEAR TYPE: PT No:1 POSITION:Lat S 2247

	start	stop	duration			Long E 1305
TIME	:19:29:00	20:14:00	45 (min)	Purpose code:	1	
LOG	:2229.40	2231.90	2.50	Area code :	2	
FDEPTH:	266	250		GearCond.code:		
BDEPTH:	302	286		Validity code:		

Towing dir: 195° Wire out: 750 m Speed: 25 kn*10

Sorted: 67 Kg Total catch: 104.50 CATCH/HOUR: 139.33

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
MYCTOPHIDAE	52.40	16801	37.61	
Merluccius capensis	27.87	28	20.00	2870
Austroglossus microlepis	22.67	115	16.27	2879
Pterothrissus belloci	10.72	363	7.69	
Merluccius capensis, juveniles	10.53	117	7.55	2880
Trachurus capensis	9.00	84	6.46	
Lophius vomerinus	4.47	12	3.21	
Solenocera africana	1.68	420	1.21	
Total	139.34		100.01	

PROJECT STATION: 913

DATE:17/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2256

	start	stop	duration			Long E 1303
TIME	:05:29:00	05:59:00	30 (min)	Purpose code:	2	
LOG	:2246.30	2247.80	1.50	Area code :	2	
FDEPTH:	324	324		GearCond.code:		
BDEPTH:	324	324		Validity code:		

Towing dir: 330° Wire out:1050 m Speed: 30 kn*10

Sorted: 150 Kg Total catch: 478.70 CATCH/HOUR: 957.40

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Helicolenus dactylopterus	417.60	10750	43.62	
Chlorophthalmus atlanticus	264.00	16970	27.57	
Merluccius capensis	238.80	302	24.94	2881
Lophius vomerinus	20.00	14	2.09	
Coelorinchus sp.	17.04	200	1.78	
Total	957.44		100.00	

PROJECT STATION: 914

DATE:17/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2256

	start	stop	duration			Long E 1303
TIME	:00:50:00	07:10:00	20 (min)	Purpose code:	2	
LOG	:2250.50	2251.40	1.05	Area code :	2	
FDEPTH:	334	324		GearCond.code:		
BDEPTH:	334	324		Validity code:		

Towing dir: 160° Wire out:1050 m Speed: 31 kn*10

Sorted: 96 Kg Total catch: 246.60 CATCH/HOUR: 739.80

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	450.00		60.83	
Merluccius capensis	266.25	324	35.99	2882
Lophius vomerinus	23.55	10	3.18	
Total	739.80		100.00	

PROJECT STATION: 915

DATE:17/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2259

	start	stop	duration			Long E 1305
TIME	:08:17:00	08:47:00	30 (min)	Purpose code:	2	
LOG	:2254.70	2256.10	1.65	Area code :	2	
FDEPTH:	328	327		GearCond.code:		
BDEPTH:	328	327		Validity code:		

Towing dir: 150° Wire out:1050 m Speed: 33 kn*10

Sorted: 94 Kg Total catch: 514.00 CATCH/HOUR: 1028.00

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Deepwater fish mixture	840.00		81.71	
Merluccius capensis	157.20	206	15.29	2883
Lophius vomerinus	10.90	10	1.04	
Merluccius capensis, juveniles	7.70	84	0.75	2884
Genypterus capensis	2.88	8	0.28	
Dentex macrophthalmus	0.84	2	0.08	
Austroglossus microlepis	0.44	2	0.04	
Total	1027.96		99.99	

PROJECT STATION: 916

DATE:17/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2256

	start	stop	duration			Long E 1302
TIME	:10:07:00	10:37:00	30 (min)	Purpose code:	2	
LOG	:2263.70	2265.50	1.80	Area code :	2	
FDEPTH:	363	360		GearCond.code:		
BDEPTH:	363	360		Validity code:		

Towing dir: 360° Wire out:1050 m Speed: 36 kn*10

Sorted: 129 Kg Total catch: 430.60 CATCH/HOUR: 861.20

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	522.80	664	60.71	2885
Helicolenus dactylopterus	184.20	3020	21.39	
Chlorophthalmus atlanticus	102.00	7740	11.84	
Coelorinchus sp.	36.60	1776	4.25	
Lophius vomerinus	14.50	16	1.68	
Galeus polli	1.40	88	0.16	
Total	861.50		100.03	

PROJECT STATION: 917

DATE:17/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2256

	start	stop	duration			Long E 1302
TIME	:11:30:00	11:40:00	10 (min)	Purpose code:	2	
LOG	:2269.00	2269.50	0.50	Area code :	2	
FDEPTH:	369	372		GearCond.code:		
BDEPTH:	369	372		Validity code:		

Towing dir: 160° Wire out:1050 m Speed: 30 kn*10

Sorted: 110 Kg Total catch: 208.26 CATCH/HOUR: 1249.56

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	680.40	670	54.45	2886
Deepwater fish mixture	540.00		43.22	
Lophius vomerinus	20.46	30	1.64	2888
Merluccius capensis, juveniles	8.70	36	0.70	2887
Total	1249.56		100.01	

PROJECT STATION: 918

DATE:17/ 2/95 GEAR TYPE: BT No:8 POSITION:Lat S 2257

	start	stop	duration			Long E 1303
TIME	:12:37:00	12:47:00	10 (min)	Purpose code:	2	
LOG	:2271.90	2272.40	0.50	Area code :	2	
FDEPTH:	371	370		GearCond.code:		
BDEPTH:	371	370		Validity code:		

Towing dir: 160° Wire out:1050 m Speed: 30 kn*10

Sorted: 147 Kg Total catch: 237.49 CATCH/HOUR: 1424.94

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis	789.00	820	55.37	2890
Deepwater fish mixture	540.00		37.90	
Lophius vomerinus	86.40	60	6.06	2891
Merluccius capensis, juveniles	6.00	30	0.42	2889
Genypterus capensis	3.54	6	0.25	2892
Total	1424.94		100.00	

PROJECT STATION: 919

DATE:17/ 2/95 GEAR TYPE: PT No:5 POSITION:Lat S 2219

	start	stop	duration			Long E 1306
TIME	:20:43:00	21:33:00	50 (min)	Purpose code:	1	
LOG	:2336.90	2339.50	2.60	Area code :	2	
FDEPTH:	180	200		GearCond.code:		
BDEPTH:	250	258		Validity code:		

Towing dir: 225° Wire out: 600 m Speed: 30 kn*10

Sorted: 29 Kg Total catch: 119.60 CATCH/HOUR: 143.52

SPECIES	CATCH/HOUR weight	numbers	% OF TOT. C	SAMP
Merluccius capensis, juveniles	96.00	634	66.89	2894
Merluccius capensis	47.52	43	33.11	2893
Total	143.52		100.00	