

R1/12

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FRV *Scotia*

Cruise 1205S

REPORT

2– 21 September 2005

Personnel

K J Peach	In Charge
H Dobby	
F Burns	
C Shand	
J Drewery	
C Davis	Part 1
C Wylie	Part 1
J Beaton	Part 1
F Neat	Part 2
E Jones	Part 2
M Campbell	Part 2
M Perutz	Part 1
K Howell	JNCC/PML
V Khlivnoy	PINRO, Part 1
T Blasdale	JNCC, Part 2
S Mehault	MSc Student, Aberdeen University (part 2)
S Ross-Russell	Student Edinburgh University (Part2)

Out-turn days: 20 RV0508 10359

Part 1 Rockall Haddock Survey

Fishing Gear

GOV Trawl fitted with ground gear C (BT 137)

Objectives

1. To undertake demersal trawling survey of the Rockall haddock population.
2. To collect additional biological data in connection with the EU Data Directive 1639/2001.
3. To identify, quantify and record all benthic invertebrate species caught.
4. To obtain temperature and salinity data from the surface and seabed at each trawling station.
5. To investigate the occurrence of *Nephrops* on the east edge of the Rockall Plateau using a TV Sledge and Drop Frame.

6. To deploy a Drop Frame to ground truth Side Scan Sonar data and map the distribution and abundance of *Lophelia* beds on the Rockall Bank and the Anton Dohrn seamount.
7. To trial and evaluate the NOAA Bottom Contact Sensor.
8. To deploy 1 sub-surface mooring with 3 current meters whilst on passage from Rockall.

Narrative

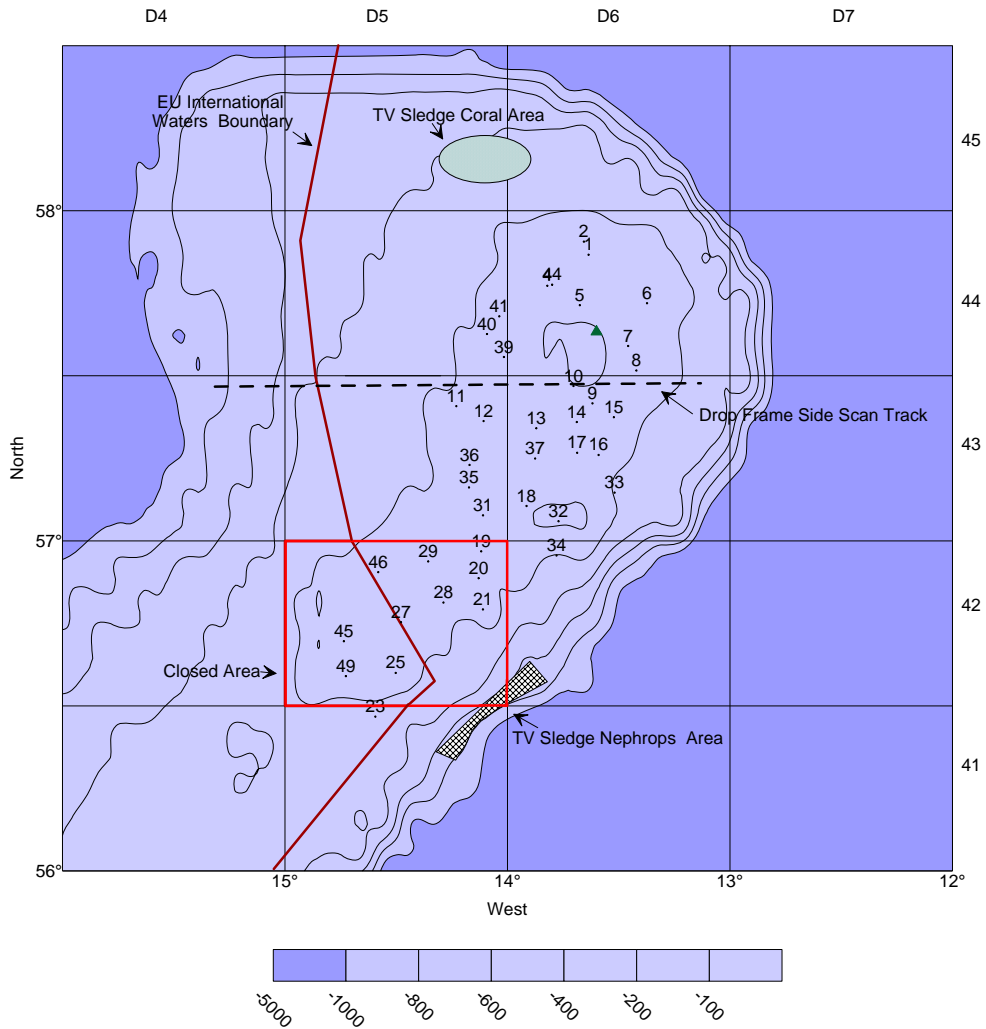
Scotia sailed from Aberdeen at 1030 on Friday 2 September and proceeded to make passage to the first trawling station at position 57.32°N 13.29°W. *Scotia* arrived on station at 0600 on 4 September when fishing commenced and continued for 6 days. In line with the WTD 6-7 hauls were completed within the 13 hour working day. The trawling survey was finally completed at 2000 on 9 September. During trawling downtime the TV sledge and Drop Frame were deployed at various locations to: 1. Assess *Nephrops* abundance; 2. ground truth side-scan sonar data collected on a DTI funded SEA7 survey. *Scotia* departed Rockall at 0100 on 10 September and made passage to the Anton Dohrn seamount to deploy a Single String Mooring at 57°25'N 11°08'W. The mooring was deployed in 608 metres on the west edge of some hard un-fishable ground. Drop Frame work continued at various locations on the seamount until freshening winds curtailed operations at 1930. *Scotia* made passage to Ullapool for the mid trip break arriving at 1500 on 11 September. Both sets of BT137 trawl gear were de-rigged on passage, with all trawl gear off loaded on the evening of 11 September. The BT184 deepwater trawl gear was loaded and rigged on 12 September and with staff changes was completed by 1500. *Scotia* set sail on Part 2 of the cruise at 1800. However it soon became apparent that the propeller was foul and *Scotia* returned to Ullapool at 1900. Arrangements were made for a local diver to be on hand to meet the vessel and he proceeded to clear the propeller of 10-15 metres of trawl net; *Scotia* eventually set sail for Part 2 at 2000 on 12 September.

Results

In recent years the regular annual survey to the Rockall Plateau has been restricted to a biennial survey (in odd years) alternating with a deepwater survey in the even dated years, with the exception of 2002 when a limited Rockall survey and a deepwater survey were combined. This year the surveys have again been combined - allowing 6 days for the Rockall Haddock survey with the remaining time being spent trawling in deep water. The normal Rockall survey consists of 42 hauls; time constraints limited this year's survey to 39 hauls, one of which was foul due to an operational problem. Net damage was minimal throughout the survey - with only small repairs made to both port and starboard wing tips as required.

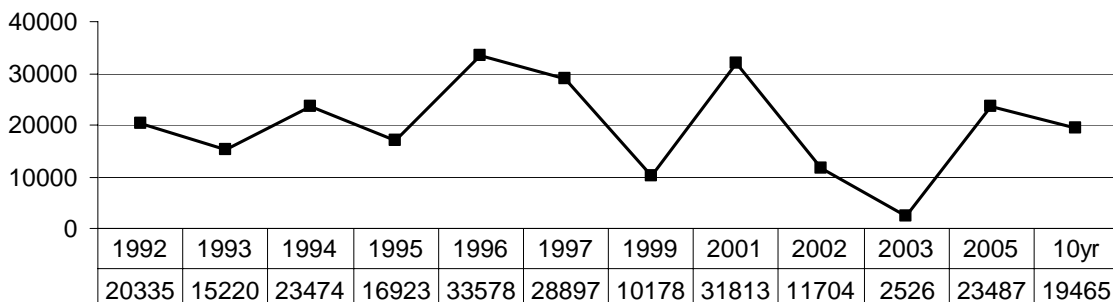
In total 14 tonnes of fish were caught. As expected Haddock were the predominant species providing 47% of the catch. The next most abundant species were Blue Whiting 26%, Grey Gurnard 11% and Norway Haddock 10%. Snake pipefish *Enrelurus aequoraeus* (a species which made its first appearance in 2003) was caught at all trawl stations with catches ranging from 4 to 305 and with a total of 2,603 being caught. Whiting catches at Rockall are rare with two fish being caught for the duration of the time series. This year, 22 0-group fish were caught at 11 different trawl stations. Another unusual capture not associated with Rockall was a solitary 8 year old herring - a species seen only once before in 1995.

2005 Rockall Trawl Stations



The primary objective of the survey is to assess the state of the haddock stock on the Rockall Plateau by comparing the strength of the respective year classes in the current year with those of previous year. The provisional 0-group index using a length rather than age based delimiter indicates a considerable improvement this year compared with both the 2003 results and the 10 year mean.

0-group haddock numbers caught per 10 hours



In line with the EU Data Directive 1639/2001 length weight data was collected for all cod, haddock & saithe. These were collected on a 1 per cm per haul basis, in addition to this all megrim and angler were sampled for length, weight, sex and maturity.

All benthic invertebrate species caught were identified and quantified.

Net geometry was monitored throughout the survey using the Scanmar system coupled with a bottom contact sensor. The NOAA single axis bottom contact sensor was attached to the centre of the trawl ground gear each haul, as it had been shown on previous trials that successful deployments depended on the sensor not fouling on the belly of the net. A total of 16 useful sets of data were collected and will be analysed and reported on at a later date.

Temperature and salinity were recorded at each station using a Seabird 19 CTD; a net mounted Seabird 37 CTD was trialled and found to be very useful. At present a vertical CTD cast is collected prior to each trawl, this process can take 20-30 minutes per station depending on depth. This impacts heavily on the trawling day particularly on IBTS surveys which are limited to daylight fishing. A net mounted CTD collects similar temperature and salinity data without impinging on the working day.

The TV sledge was deployed in an area to the south-east of the plateau to assess *nephrops* abundance, 8 tracks were covered running with the tide up the slope east to west. Of the eight tracks surveyed, two had significant burrow counts - considered to be on a par with those seen in commercial nephrops areas.

The TV sledge was deployed in an area to the north west of the Plateau in an area previously trawled during the haddock spawning season - to observe and assess possible coral damage. Footage was collected showing trawl door plough marks coupled with several patches of dead coral *Lophelia pertusa*.

The Drop Frame was deployed on four nights to ground truth side-scan data collected on a DTI funded SEA7 survey. Coral was observed on the west edge on the first deployment, across the plateau and down the east edge yielded a mixture of sand and rock with very few benthic organisms or fish being observed.

A Single String Mooring with acoustic release was deployed at position 57°25'N 11°08'W on the Anton Dohrn seamount. The mooring was made up of three current meters positioned 10 m, 50 m and 100 m from the seabed, the equipment will be recovered on cruise 1405S.

The Drop Frame was deployed four times on the seamount to survey an area perceived to be coral. Results were disappointing with large areas of sand being observed. Further deployments were planned along two of the target trawl tracks to look for possible obstructions, the first was completed successfully, strengthening winds cancelled the second deployment.

Part 2 Shelf Edge / Anton Dohrn Seamount Survey

Fishing Gear

Jackson Deepwater trawl (BT184)

Objectives

1. To map the composition, distribution and abundance of continental slope species including anglerfish (*Lophius spp.*) on the deepwater slope west of the Hebrides and also the Anton Dohrn seamount.

2. To identify, quantify and record all benthic invertebrate species caught.
3. To collect temperature and salinity data at depth during all hauls using a net mounted CTD and a data storage tag attached to the trawl headline.
4. To trial dual distance and depth Scanmar door sensors.
5. To investigate the occurrence of *Nephrops* on the upper shelf slope using the TV sledge and drop frame systems.
6. To carry out observation work on the Anton Dohrn seamount's *Lophelia* beds using a drop frame.
7. To collect biological samples and morphometric digital images for key species from both slope and seamount areas to investigate the possibility of an isolated and distinct seamount community.

Narrative

Scotia made passage from Ullapool southwards down the Minch and round Barrahead towards the first station. Heavy swell and strong winds delayed fishing until 1300 on 13 September at position 56°43'N 09°01'W. The survey continued northwards along the shelf edge taking advantage of settled weather until 1500 on 16 September. *Scotia* then headed west to the Anton Dohrn seamount to carry out four trawls at 2 depths on the crest and the south and north edges. The first haul was shot at 0100 at position 57°24'N 10°52'W. *Scotia* towed for two hours with no apparent problems but on hauling the net became fast and when recovered the gear was very badly damaged. With an increasing forecast and the need to change trawls *Scotia* returned to the shelf edge and resumed fishing at 1000 on 17 September. Fishing continued until 1300 on 18 September until strengthening winds curtailed fishing activities. *Scotia* resumed fishing at 1300 on 19 September and completed another three stations prior to setting sail for Aberdeen at 0200 on 20 September. *Scotia* arrived in Aberdeen at 0600 on 21 September.

Results

A total of 20 hauls of 2 hours duration were completed. 17 time series hauls on the shelf edge, two at 850 metres to mirror depths found on the Anton Dohrn seamount and 1 haul on the seamount (Map 1). Total weight caught per haul/depth is shown and compared to previous deep-water surveys in 2000, 2002 and 2004 (Table 1).

Temperature at depth was recorded for all hauls using a data storage sensor (Table 2). Additional weight/length information was collected from various species to augment the FRS weight/length database (Table 3). Catches ranged from 230-1750 Kgs with Roundnose grenadier *Coryphaenoides rupestris* being the most abundant by weight and numbers. A total of 116 species were caught with three new species previously unseen by FRS being caught; *Gadonus longfilis*, *Serrivomer brevidentatus* and *Nezumia sclerorhynchus*. The species list with total weight caught is shown in (Table 4).

All benthic invertebrate species caught were identified and quantified, a new recording spreadsheet and identification key is being developed.

The new deepwater rated Scanmar depth and distance door sensors proved to be a very useful addition to the survey. On previous deepwater trips the block up time was calculated after consultation with the fishing master, who gauged the touchdown by the amount of warp

out and the depth being fished. The new sensors gave a perfect picture of each door settling on the bottom combined with the door spread.

The TV sledge was deployed on two occasions to assess *nephrops* abundance. Nine tracks were covered running with the tide down the slope from east to west. Nephrops burrows were observed on seven of the nine tracks with maximum burrow density at 680 metres.

Target depths of 550 and 850 metres were chosen to investigate the possibility of an isolated community on the Anton Dohrn seamount. Bluemouth *Helicolenus dactylopterus* and *Lepidion eques* were the target species for morphometric digital imagery. A total of 120 and 90 respectively were measured and photographed from the four target shelf edge catches. Unfortunately the four hauls planned on the seamount were curtailed due to gear damage and poor weather.

Additional biological sampling carried out:

Tissue samples of fish and benthic species from 1500 and 500 m depth bands for isotope analysis to examine the trophic level of species captured.

Stomach samples from *Etmopterus princeps*, *Etmopterus spinax* and *Centroscymnus crepidater* to look at diet in these shark species.

Morphometric information and genetic samples of *Helicolenus dactylopterus* and *Lepidion eques* from the Hebridean Slope, for future comparison with populations from offshore seamounts and banks.

Genetic samples of *Aphanopus carbo*, *Centroscymnus crepidater*, *Centroscymnus coelolepis*, *Deania calceus* and 3 *Hoplostethus atlanticus* for University of Durham, as part of the MarEco Project.

Whole specimens of *Coryphaenoides rupestris* and *Centroscyllium fabricii* for PCB contaminant analysis at FRS.

25 Video tows (5 on Anton and 19 on Rockall) which will be combined with the video work carried out under the DTI strategic Environmental Assessment 7 and analysed at JNCC and SAMS to assess the potential of the area as a possible SAC under the EC Habitats Directive.

Kevin Peach
5 October 2005

Seen in draft: Captain Peter Ramsay, OIC *Scotia*

Map1.

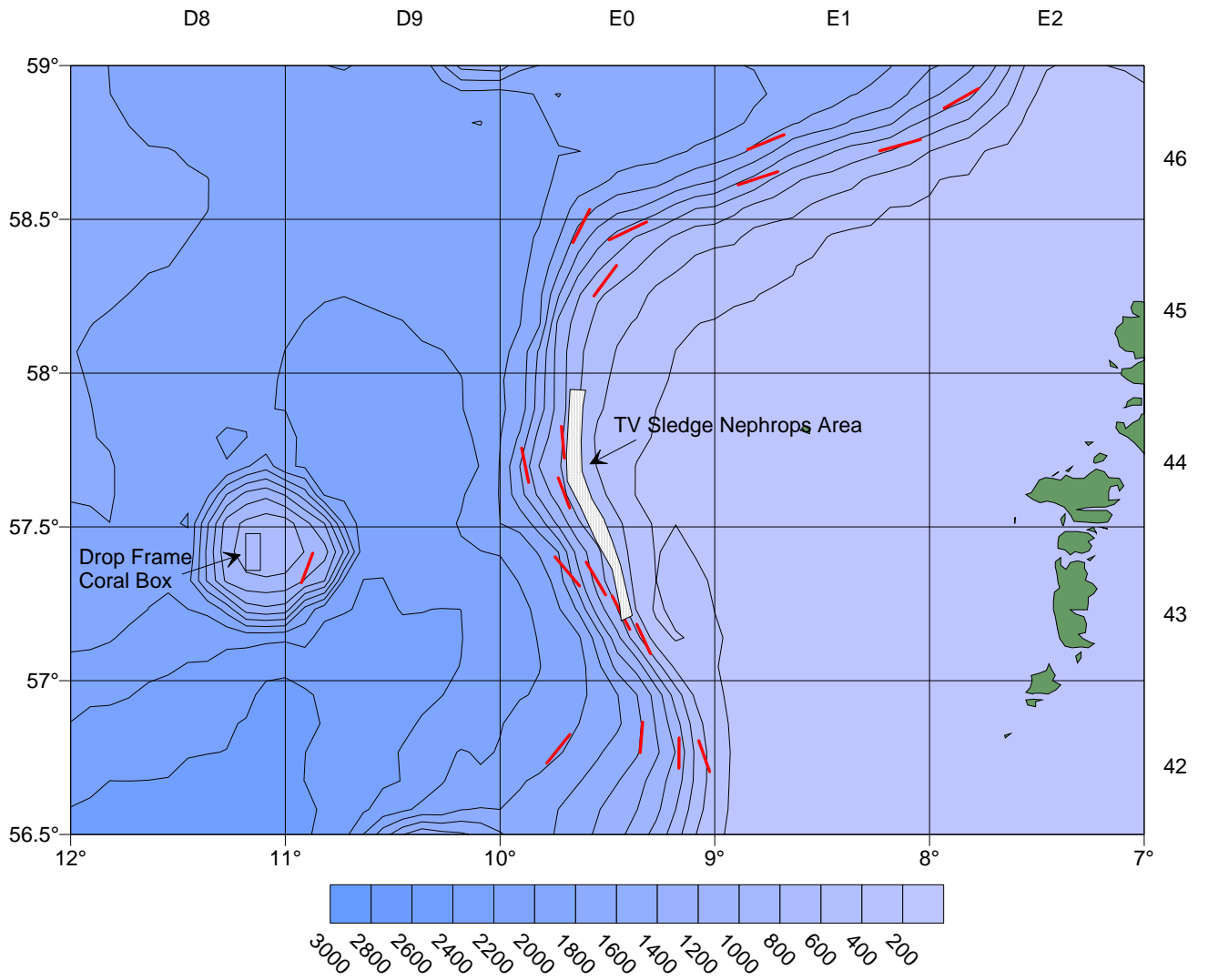


Table 1 Comparison Table Total Weight Caught Per Haul/Depth

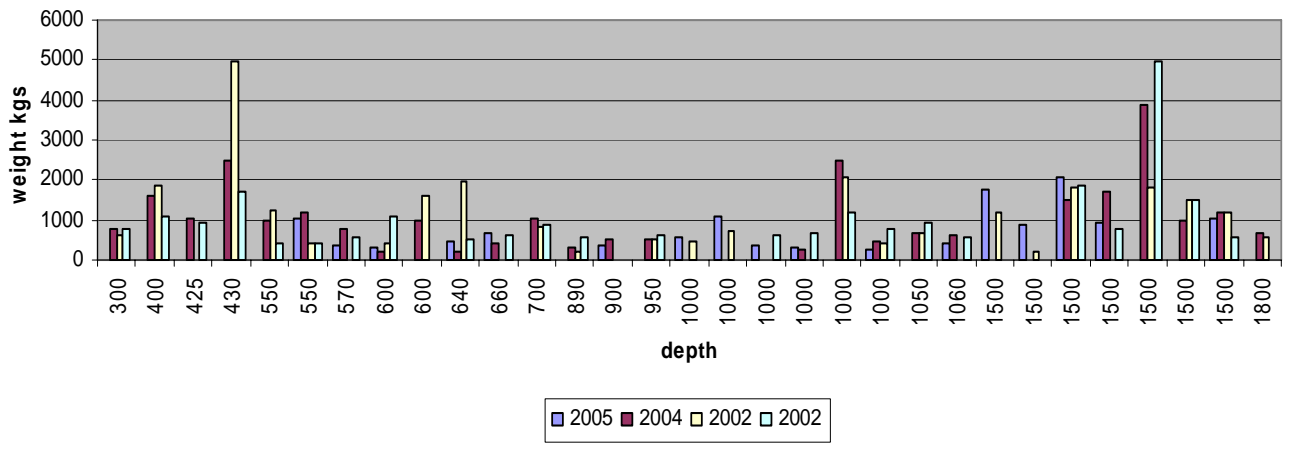


Table 2 Temperature at depth

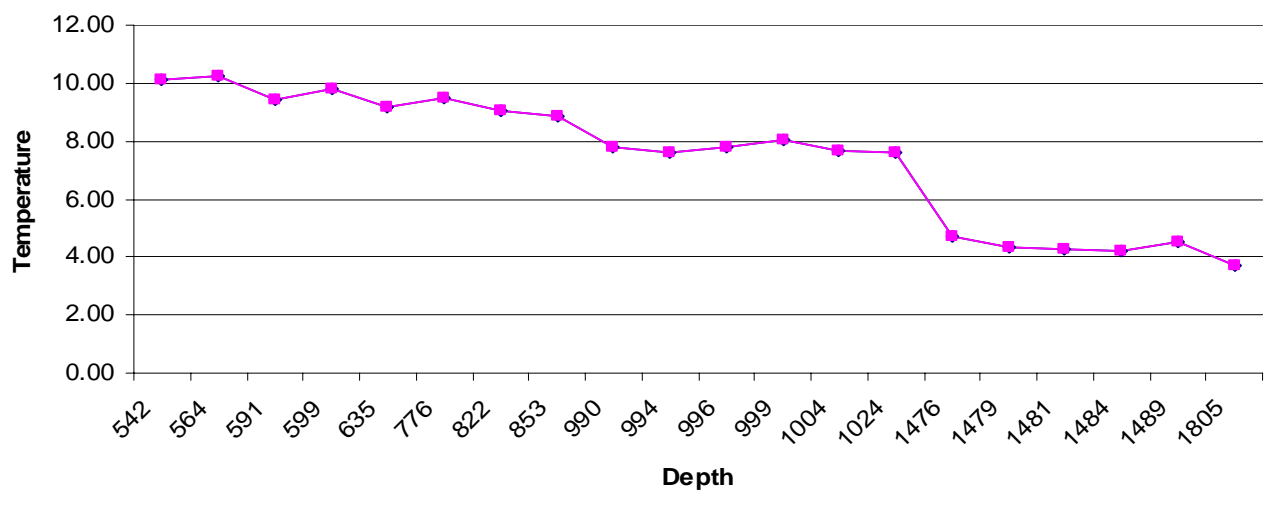


Table 3 Weight Length Summary

Species	Obs	Tot W	Gut W	Sex	Maturity
<i>Centroscymnus crepidator</i>	268	Y	Y	Y	Y
<i>Centroscyllium fabricii</i>	155	Y	Y	Y	Y
<i>Etmopterus spinax</i>	97	Y	Y	Y	Y
<i>Etmopterus princeps</i>	77	Y	Y	Y	Y
<i>Centrophorus squamosus</i>	44	Y	Y	Y	Y
<i>Deania calceus</i>	39	Y	Y	Y	Y
<i>Centroscymnus coelolepis</i>	39	Y	Y	Y	Y
<i>Lophius piscatorius</i>	31	Y	Y	Y	Y
<i>Hexanchus griseus</i>	2	Y	Y	Y	Y
<i>Raja batis</i>	1	Y	Y	Y	Y
<i>Apristurus aphyodes</i>	9	Y		Y	Y
<i>Scymnorhinus licha</i>	4	Y		Y	Y
<i>Galeus melastomus</i>	117	Y		Y	
<i>Apristurus laurussonii</i>	9	Y		Y	
<i>Rhinochimaera atlantica</i>	3	Y		Y	
<i>Raja bigelowi</i>	1	Y		Y	
<i>Phycis blennoides</i>	170	Y	Y		
<i>Synaphobranchus kaupi</i>	369	Y			
<i>Lepidion eques</i>	317	Y			
<i>Coelorhynchus labiatus</i>	251	Y			
<i>Trachyrhynchus trach..</i>	231	Y			
<i>Antimora rostrata</i>	158	Y			
<i>Coryphaenoides guentheri</i>	43	Y			
<i>Notacanthus chemnitzii</i>	29	Y			
<i>Cottunculus thomsonii</i>	13	Y			
<i>Nesiarchus nasutus</i>	2	Y			
<i>Lepidorhombus boscii</i>	1	Y			
<i>Trachipterus arcticus</i>	1	Y			
		Tail on	Tail off	For market sampling database.	
<i>Coryphaenoides rupestris</i>	284	Y	Y		

Table 4

Species Summary total weight caught (Kgs)

Species	Weight Kgs	Species	Weight Kgs
Round Nosed Grenadier	4502.78	Johnson's Scabbardfish	3.77
Smoothhead	2007.01	Spectrunculus grandis	3.60
Greater Argentine	649.40	Silvery Pout	3.26
Black Scabbardfish	603.04	Horse Mackerel (Scad)	3.10
Roughnosed Rat tail	468.55	Megrim	3.06
Hake	414.90	Iceland Catshark	2.82
Rabbit Rattfish	354.61	Pallid sculpin	2.70
Lepidion eques	342.77	Lampanyctus spp	2.61
Portuguese Shark	316.45	Ghost Catshark	2.55
Leafscale Gulper Shark	295.10	Borostomias antarcticus	2.54
Smalleye rabbitfish	285.05	Snake Pipefish	2.21
Longnose velvet dogfish	263.77	Redfish (mentella)	1.72
Cataetix latceps	261.60	Halosauropsis macrochir	1.60
Blue-mouth	219.99	Venefica proboscidea	1.51
Angler (Monk)	210.75	Whiteheaded hagfish	1.47
Blue Whiting	206.40	Bathylagus euryops	1.41
Greater Forkbeard	194.05	Round ray	1.23
Cut-throat Eel	189.72	Paraliparis bathybius	1.20
Murray's Rat tail	160.18	Bighead searsid	1.12
Black Mouthed Dogfish	140.10	Malacosteus niger	0.66
Blue Ling	105.83	Eelpout unidentified	0.65
Bentnose rabbitfish	105.20	Lycodes unid.	0.59
Smooth Rat tail	93.11	Softhead Rat tail	0.57
Torsk	78.45	Multipore searsid	0.55
Hollowsnout Rat tail	78.15	Ilyophis blachei	0.53
Greater lantern shark	74.30	Norway Lobster	0.53
Gunther's grenadier	69.40	Bigelow's ray	0.52
Shovelnosed Shark	69.25	Stomias boa ferox	0.41
Mediterranean Grenadier	53.65	Four-spot Megrim	0.22
Spear-snouted grenadier	53.40	Mackerel	0.20
Halargyreus johnsonii	45.09	Bigeye searsid	0.19
Witch	45.09	Scopelogadus beanii	0.19
Black dogfish	44.15	Scopelosaurus lepidus	0.19
Chemnitz's Spiny Eel	37.90	Fangtooth	0.19
Bonaparte's Spiny Eel	35.94	Bathysaurus ferox	0.18
Velvet Belly	33.57	Melanonus zugmayeri	0.18
Lesser Spotted Dogfish	32.80	Duckbill oceanic eel	0.17
Conger Eel	32.45	Orange Roughy	0.16
Pale Catshark	32.21	Polymetme corythaeola	0.13
Darkie Charlie	23.85	Melanostigma atlanticum	0.12
Agassiz's smooth-head	22.25	Lantern fishes unidentified	0.11
Bathyraja (unidentified)	20.50	Murray's smooth-head	0.10
Antimora	19.22	Sloan's Viperfish	0.08
Ling	17.15	Black Sawtoothed Eel	0.07
Short Finned Squid	16.74	Gadonus longfilis	0.06
Straightnose rabbitfish	15.55	Chiasmodon niger	0.05
Softskin smooth-head	13.08	Hatchetfish	0.04
Large-eyed Rabbitfish	10.84	Mouse catshark	0.04

Blackfish	10.26		Snipe Eel	0.04
Risso's Spiny Eel	9.85		Longfin smooth-head	0.03
Bluntnout Smooth-head	9.65		Argyropelecus hemigymnus	0.02
Bullseye	9.05		Gonostoma bathyphilum	0.02
Mora	8.10		Lycodonus ophidium	0.02
Esmark's Eelpout	8.08		Gonostoma elongatum	0.01
Six Gilled Shark	7.45		Howella sherborni	0.01
Deal Fish	6.50		Pelican eel	0.01
Skate	5.75		Rat tails unidentified	0.01
Spiderfish	5.26		Schnakenbeck's searsid	0.01
Bean's sawtoothed eel	3.91		Total	13923.48