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IN CONFIDENCE: Not to be quoted without reference  
to the Laboratory.

## CRUISE REPORT

FRS "EXPLORER"

31 OCTOBER-20 NOVEMBER 1970

OBJECTIVE: West coast fish-environmental survey.

During the 21 days "Explorer" was at sea carrying out this survey, the weather over the West of Scotland was dominated by a complex system of low pressure areas. The resulting spells of severe weather hampered the work seriously and, on a few occasions, only by "dodging" on the spot, waiting for moderation, could some of the work be accomplished. Even so "Explorer" successfully completed 26 of the 40 stations on the programme.

Two short breaks were taken at Stornoway - one on 5 November to effect a change of personnel and for Dr W R P Bourne, Ornithologist from Aberdeen University to join the ship, and the second on 17 November to pick up a new trawl and to disburse weekly pay to the men.

Contact with the Captain and Scientists of the French research ship "Thalassa" was made in Stornoway on 5 November.

"Explorer" docked in Aberdeen on 20 November 1970.

## HYDROGRAPHY

Most of the stations worked were within coastal influence where salinity varied from 34.29 to 34.98‰, while oceanic water north of the Butt of Lewis and on the Atlantic shelf west of the Hebrides had salinity that varied from 35.18 to 35.35‰. The highest surface temperatures ca 11.2°C were recorded within the enclosed waters of the Upper Minch, while outside this area lower temperatures ca 10.5°C prevailed.

The highest nutrient values of 0.68 µg-at/l for phosphate and 8.70 µg-at/l for nitrate were found between Barra Head and Northern Ireland where oceanic influence is strong. Over the remaining areas, slightly lower values of 0.55 and 6.50 respectively were recorded. Oxygen saturation values of approximately 98% (6.01-6.10 ml/l in absolute terms) were recorded in all areas.

## PLANKTON

Zooplankton was sampled with the Gulf III and the WP3. In the Moray Firth large numbers of Salpa fusiformis and Clione limacina dominated the plankton catches while in other areas - ie the north coast, the Minches and the Atlantic shelf west and south of the Outer Hebrides - Calanus, Candacia armata, Sagitta elegans, S. serratodentata, Thysanoessa inermis and Nyctiphanes couchii were the major forms, although never abundant.

The siphonophores Agalma elegans and Physophora hydrostatica and the medusoid Cosmetira pilosella were noticeable at a number of stations but not in the Moray Firth.

#### TRAWLING

The 26 positions sampled covered 8 of the 9 trawling areas into which this survey was divided; only the Clyde, where there were two stations, was not visited.

Hauls of one hour duration were made with the French trawl either with ground rope or with bobbins. The ground rope appeared to pick up stones, at positions successfully trawled on previous occasions with the Granton trawl. Such a position was station 12, 20 miles north of the Butt of Lewis, where two trawls made at right angles to one another came up with badly torn bellies and only  $\frac{1}{4}$  basket fish in the cod-end.

Haddock was the most abundant species in nearly all the hauls. The largest catches of this species were taken from grounds off the north coast of Scotland and north of the Butt of Lewis, where, in successive hauls 4158, 3635, 3180 and 4668 individuals were taken. Two catches of 3823 and 2450 haddock were also taken on the Atlantic shelf west of Barra. The bulk of the catches were in the size ranges 26-34 cm in the north, 27-37 cm on the Atlantic shelf and 30-39 cm in Northern Ireland waters. Very few large haddock were taken.

Whiting was never the dominant species in any of the hauls. Except for two catches of 905 and 505 fish (25-41 cm) off the north coast, their numbers in the catches from other areas were small.

Cod were caught in small numbers in most of the hauls; the two best catches of 16 and 17 individuals (19-81 cm) came from the Moray Firth. Notes on worm infestation in cod were recorded at most of the stations.

Hake in the size range 20-88 cm were caught in a number of hauls, the largest being 17, 26 and 54 individuals, in three hauls from neighbouring positions in the South Minch. Grey and red gurnards from north of the Butt of Lewis and grey gurnards (17-34 cm) from Northern Ireland waters were also prominent in the catches.

Two catches of skate on the north coast just west of Orkney, together comprised 92 Raja naevus (14-41 cm) and 92 R. montagui (13-50 cm). Other species of skate taken were 17 R. clavata (21-56 cm) from the South Minch, 4 R. radiata (14-29 cm), one R. batis (41 cm) from the Moray Firth and two R. circularis (47 and 54 cm) from St Kilda.

A number of flatfish species occurred in the catches throughout the area. Common (15-34 cm) and long rough dabs (11-22 cm), plaice and lemon sole were prominent/catches from the Moray Firth while megrim (16-52 cm) occurred in substantial numbers in the South Minch.

Industrial species were poorly represented in the hauls. M. poutassou occurred in only 3 hauls on the Atlantic shelf, the largest catch being one of 25 fish (27-31 cm). T. esmarkii was best represented by a haul of 726 fish (8-18 cm) from the Moray Firth, with smaller catches from the north coast.

Dogfish occurred in widely varying numbers throughout the area. Squalus acanthias was the most abundant species and was taken in largest numbers off the north coast (one very large catch off North Rona burst the codend) and to the north and south of Skye. Scyllium canicula occurred with Squalus acanthias in smaller numbers except in a haul south of St Kilda where the best catch of 73 individuals (44-74 cm) was made. A third variety Pristiurus melanostomus was absent from catches in the north, but present (also in small numbers) in the other areas.

R B BURNS  
21 December 1970