

IN CONFIDENCE: NOT TO BE QUOTED WITHOUT REFERENCE TO THE LAB.

CRUISE REPORT

FRS "EXPLORER"

14-31 October 1972

OBJECTIVE:

Northern north sea pre-recruit survey.

With eight more days of this cruise yet to run, it was terminated on the 30 October 1972, on the advice of "Explorer's" Chief Engineer, following the development of a defect in the ship's rudder stock and palastre pin. This and the rough weather that set in after the first two days at sea, seriously curtailed the sampling programme; no sampling was done in the Moray Firth and off the north coast of Scotland.

The comparative trawling exercise with the Russian research vessel "Langust" was carried out fully, though owing to adverse weather conditions this took five days instead of the three allotted to it. "Explorer" made the rendezvous with "Langust" at station 36, in the middle of the Fladen area, at 7 am on the 17 October, and the 12 comparative trawls at stations south and south east of Shetland were completed.

"Explorer" docked at Leith on the 31 October 1972.

Hydrography

The sea area to the east and south-east of Shetland was fully sampled together with a few stations east of Aberdeen.

The range of temperatures observed was from 12.56°C in the south off Aberdeen to 9.97°C in the north, with the isotherms running roughly west to east. Column stability still persisted in the large central area embracing the Fladen, where bottom temperatures as low as 7.02°C were observed.

Surface salinities showed that oceanic water of 35.29‰ flowed across the 61°01'N station and had filled the area sampled down to 58°N latitude. Water of Baltic origin 33.55‰, was sampled at only one station east of 3°E.

Complete vertical mixing had taken place only in the narrow coastal strips east of Shetland and east of Aberdeenshire, which raised the surface values for nitrate, phosphate and silicate respectively to 3.70, 0.60 and 2.90. In the large central area however, lower values down to 0.60, 0.07 and 0.05 were recorded. (All values quoted are in micro gram-atoms per litre of nitrogen, or of phosphorus or of silicon.)

Plankton

Oblique hauls with the Dutch Gulf III were made at all stations and the catches deep frozen for dry weight determination. The results from this and the supporting programme of chlorophyll and carbon estimation are not yet available.

Trawling

Hauls of an hour's duration were made at 35 stations using the 48 ft Aberdeen trawl with small mesh cover. A cod-end mesh size of $3\frac{1}{2}$ inches was used for the first 26 trawls and changed to one of 3 inches for the remainder.

Catches varied from 2 to 45 baskets, the average per haul being 13 baskets. The 45-basket haul was made at a station where a large Russian trawler fleet was seen working. Better than average catches were taken off Aberdeenshire and east of Fair Isle and Shetland; the poorest of these came from the Fladen ground. Round fish made up the bulk of all the catches with haddock the dominant species, followed by whiting, cod and saithe.

The four largest catches of haddock numbering 2847, 3006, 3031 and 4234 fish, which consisted principally of three size-groups 10-17, 18-25 and 26-33 cm came from stations east of Aberdeenshire. From five other stations east of Shetland and Fair Isle came slightly smaller yields but similar in composition. One station just east of Balta produced a catch of 1149 fish that consisted almost entirely of a single age-group, 19-26 cm.

Large haddock appeared in fair numbers in three hauls north-east of the Fladen (Stat squares F18 and G18). In one of these hauls, of the 2799 fish taken, 1085 individuals measured from 34 to 66 cm.

Except for a single trawl on the $61^{\circ}01'N$ line, whiting occurred in every other haul. Fair sized catches of up to 900 individuals were taken at stations east of Aberdeenshire, but the best catch of 1309 fish came from a trawl south-east of Fair Isle. Two principal size-groups could be discerned in the length distribution - 11-17 and 21-36 cm for catches off Aberdeenshire and 11-16 and 25-42 for those in the vicinity of Fair Isle. In the trawl east of Balta already mentioned, the catch consisted exclusively of large fish 28-56 cm.

Cod occurred in every trawl, often in very small numbers. The best catches of this species came from stations that lay approximately along latitude $59^{\circ}30'N$ and stretching from Fair Isle to the Norwegian deeps. Three of these catches contained 146, 99 and 79 fish measuring 39-116 cm.

The occurrence of saithe in the trawls was confined to those made north of $59^{\circ}N$. The numbers in most catches were small, from 1 to 32 and ranged from 41-94 cm. The outstanding haul came from the trawl off Balta where 764 fish were taken in the compact size range of 34-49 cm.

Of the industrial species only T. esmarkii was prominently represented, being taken in varying numbers in every haul. Two hauls east of Aberdeenshire contained 5200 and 3554 fish in two size groups 8-11 and 13-19 cm and two other hauls in the vicinity of Fair Isle held 4659 and 3301 fish of similar size ranges.

T. minutus occurred in very small numbers in two hauls north-east of Balta and in one haul east of Aberdeen. Not a single specimen of T. luscus was taken in any haul.

M. poutassou was another species taken in those hauls made north of $59^{\circ}N$. The two best catches of 1573 and 838 fish (11-17 cm) came from stations on the western edge of the Norwegian deeps.

Flatfish made hardly any impact on the bulk of the trawls. Long rough dabs, which occurred in every haul, were best represented by two catches of 237 fish (12-25 cm) and 185 (10-24 cm) off Aberdeen, and one of 193 fish

(11-24 cm) off Fair Isle. In three hauls east of Aberdeen 624 common dab (11-28 cm) were taken.

Other flatfish recorded were lemon sole, plaice, megrim and witch, together with a single turbot (68 cm) and a single halibut (69 cm).

Of the few skate taken in ones and twos in most hauls, R. radiata (6-30 cm) was the commonest species occurring all over this area. R. batis (67-83 cm) and R. naevus (25-37 cm) were the only two other species taken.

The best catch of herring of 116 fish (21-28 cm) was made south-east of Fair Isle, and best catches of sprat of 202 fish (10-17 cm) and 197 (6-14 cm) in two hauls on the southern edge of the Fladen.

Besides the sporadic occurrence of anglers (monk fish) in most trawls in the north of this area, the haul off Balta yielded 17 individuals 8-98 cm.

Tagging

The flatfish tagging programme was limited due to scarcity of lively specimens and to difficulties in handling the special codends. 28 plaice and 8 lemon sole were tagged.

R B BURNS
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