R1/4

8
7ER72

CRUISE REPORT

FRS EXPLORER

18 AUGUST-7 SEPTEMBER 1972

STAFF:

D N MacLennan	SSO (in charge)
D A Wileman	SO
C Moir	HEO
D Cattanach	HSO
G Booth	ASO
A MacDonald	PTOIV
J Low	Student Assistant

OBJECTIVES

1. To compare the engineering performance of two pelagic trawls, with particular reference to net geometry and otterboard orientation.

2. To study the relationship between ship and net tracks when the gear is being manoeuvred.

3. To tow various gears over a hydrophone range laid by RV 'Clupea' in the Moray Firth.

NARRATIVE

Having loaded gear and scientific equipment at Aberdeen on 18 August, 'Explorer' sailed at 0930 hrs the next morning for Fladen. Gear testing began on arrival and continued until the 21st, when 'Explorer' proceeded to the 'Clupea' acoustic range position in the Moray Firth. Gear testing continued there until the ship returned to Aberdeen on 24 August, arriving at 1230 hrs.

Because of a crew shortage 'Explorer' had to remain in Aberdeen until Tuesday 29th, when she sailed at 1530 hrs and made passage for Shetland. Gear testing was carried out off Balta and north of Flugga until 6 September. 'Explorer' then returned to Aberdeen arriving there at 1100 hrs on the 7th.

PELAGIC TRAWLING

Fully instrumented engineering tests were carried out on two pelagic nets using the same otterboard and sweep system. The principal difference between the two nets was the mesh size, net 'A' having 400 mm and net 'B' 1000 mm mesh in the square. These tests were part of a series being undertaken to study how the horse power required to tow a pelagic gear varies with the size of net, and (for the same headline length) with mesh size (ref. 4CR72). Details of the otterboard and sweep system used are as follows:

Otterboards:	Suberkrub (4.2 sq. metre area)
Upper backstrop:	8 ft
Lower "	10 ft
Upper sweep:	40 fm
Lower "	30 fm
Headline leg:	10 ft
Footrope "	7 fm
Weight:	7 cwts suspended from a 12 ft strop attached to the footrope leg/lower sweep junction.

Table 1 shows a summary of the results obtained in the particular instance of towing a straight course at 3 knots with 200 fm warp aft. The effect of the larger mesh net which achieved a greater mouth opening with less drag is quite clearly shown by these figures. The data obtained will be more fully described in a report which is to be published about the end of this year.

GEAR MANOEUVRES

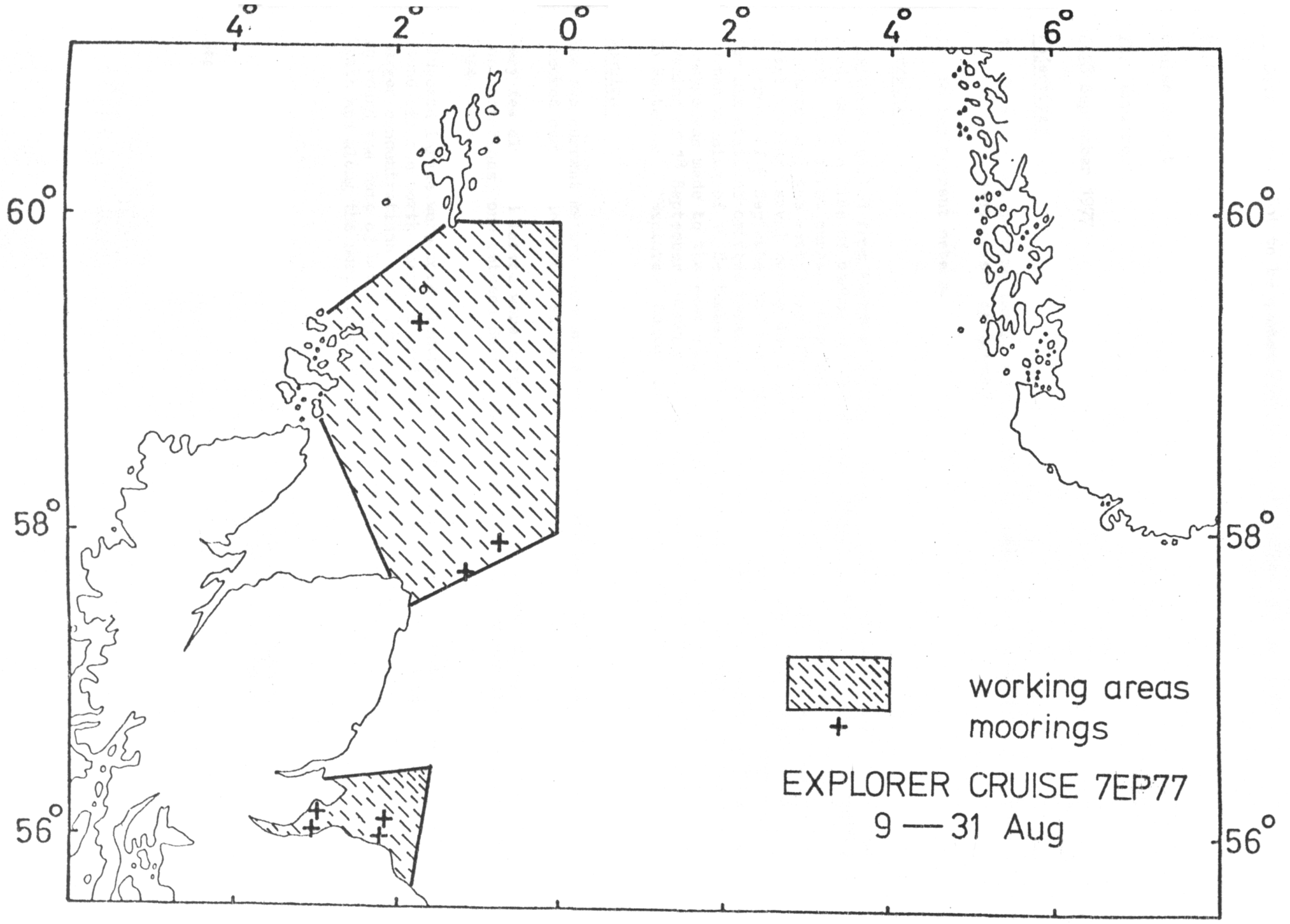
Having an acoustic telemeter attached to the headline, it is possible to determine the bearing of the gear from the ship by timing the arrival of telemeter pulses at two towed hydrophones. Such measurements were made on two trawls, a standard Aberdeen 48 ft net and a much larger Western Atlantic type gear. The ship towed alternately on a straight course and turning. Consequently the gear would firstly tend to follow behind the ship, when the towed hydrophone system could be calibrated, and then move in a circle within the turning circle of the ship.

There did not appear to be much difference between the two gears in the way they behaved when turning, although more detailed analysis later may well show up the expected variation, ie the larger gear should follow the vessel track more closely. However there was a marked difference between the performance in shallow and deep water. In 100 fm depth, for a ship turning radius of 1500 fm and warp length 325 fm, the gear track was 110 fm inside the ship track. On the other hand, in 60-70 fm water, with 250 fm warp aft and a similar ship turning radius, the corresponding gear-ship track displacement was about 65 fm. There was some evidence that immediately after a turn commenced, the ship-gear system tended to oscillate, and certainly the gear-ship displacements obtained were quite variable.

ACOUSTIC RANGE WORK

Bad weather prevented any acoustic range work being done on the one day which was available for this purpose.

D N MacLENNAN
26 October 1972


4°
2°
0°
2°
4°
6°
60°
58°
56°
working areas
moorings
EXPLORER CRUISE 7EP77
9 — 31 Aug