

In Confidence: Not to be quoted without reference
to the Laboratory

CRUISE REPORT

FRV CLUPEA

11 May - 9 June 1972

Personnel D N MacLennan (11-13 May, 7-9 June)
D A Wileman
S T R de Silva
D Cattanach (11-13 May)
G J Booth (11 May - 2 June)
J H B Robertson (15 May - 2 June)
Mr P Yule
Skipper A Whittleton } TRS (7-9 June)

Objectives:

1. To carry out instrumented gear trials on two single boat pelagic trawls and compare their engineering performance.
2. To evaluate the performance of a new spreadmeter.

Narrative:

Having loaded the gear and scientific equipment in Buckie on 11 May, 'Clupea' put out to sea at 2200 hrs. that evening. The gear testing programme began the next day, when three instrumented tows were made in the Moray Firth before returning to Buckie for the weekend.

'Clupea' again left Buckie at 1330 hrs. on 15 May to make passage for the West Coast, arriving in Roasay Sound early on the 16th. Gear testing was continued there, the ship putting into Kyle at weekends, until 2 June.

During the period 3-6 June, a party under Mr R E Craig took over the ship in order to carry out trials on the digital sonar system while on passage back to Aberdeen.

On 7 June Mr P Yule and Skipper A Whittleton (TRS) joined the ship, to observe the operation of the pelagic trawl, while gear testing was continued in the Buchan Deeps.

'Clupea' returned to Aberdeen, berthing at 2130 hrs. on 8 June, to end the cruise.

Gears Tested

Two single boat pelagic trawls were used, namely

- (a) An Engels type net, size 1040 meshes at 20 cm. equivalent, having 400 mm. mesh in the square.
- (b) An Engels type net, size 1200 meshes at 20 cm. equivalent, having 1000 mm. mesh in the square.

The two nets were fished using the same boards and rigging, viz.

- (i) 3.1 sq.m. Suberkrub otterboards.
- (ii) Upper bridle length 30 fms.
Lower bridle length 27 plus 6 fms.
- (iii) Weights, 500 lbs. each, suspended on 2 fms. straps from the junctions in the lower bridles.

Results

The results from a preliminary analysis of the gear performance are summarised in Table 1. These figures are averages of readings recorded when towing both with and against the tide, and refer to the "steady state" performance. That is, the readings were averaged over periods when the engine RPM and ship's heading were held constant.

	Small mesh gear	Large mesh gear
Towing speed (knots)	3.0	3.0
Total drag (net plus boards - tons)	4.9	4.1
Depth of headline (fms)	42	47
Height of board centre above headline (fms)	4.5	0.0
Vertical net opening (fms)	8.9	10.2
Horizontal net opening (fms)	10	12
Warp length (fms)	200	200
Engine RPM	620	540

Table 1

These results show how the reduced drag of the larger mesh net allowed it to open better (13.8% more mouth area) and to fish deeper in the water. Additionally, the larger mesh net was found to respond more quickly to step changes in towing speed. When the RPM was suddenly increased to 580 revs., following a 15 minute period at 460 revs., the initial rates at which the gear came up were 7.2 and 6.0 fms/minute for the large and small mesh nets respectively (warp aft - 200 fms.)

The effect of changing the door attachment points was examined. Normally the middle towing bracket hole and lowest backstop positions were used. When this was changed (large mesh net only) to the most forward towing bracket hole and highest backstop positions, it was found that the board spread increased by about 7%, while the vertical net opening decreased by 10%.

Both gears were tried out in the semi-pelagic mode, that is fished with a long warp length and the weights dragging on the sea bed. There was no significant damage to either net when used in this way.

The new self recording spreadmeter (Mk 3) was tried out several times on the gear. After the receiver gain was reduced (to eliminate spurious triggering due to gear noise) and a number of other minor faults were rectified, the instrument worked well.

D N MacLennan
D A Wilemah
30 June 1972