R1/12

IN CONFIDENCE - not to be quoted without reference to the lab.

FRV 'Scotia' 1SR81
Cruise 1/81
Report

13 - 20 February 1981

Objectives

1. To measure the towing performance of two commercial pelagic nets.
2. To assess the suitability of these nets for sampling herring and mackerel, particularly at high towing speeds.

Narrative

'Scotia' sailed from Aberdeen at 1500 on 14 February. Three instrumented hauls were made with the Cosalt pelagic trawl (PT 157) off Cape Wrath and in the Sound of Raasay before net damage forced a change to the Jackson pelagic trawl (PT 158). Three further hauls were made to measure the performance of this trawl during 16 and 17 February.

Acoustic surveys were undertaken during the nights of 15 and 16 February. On this evidence and additional searches prior to shooting, three fishing hauls were conducted off Stornoway and the Point of Stoer on 17 and 18 February. A fourth fishing haul was made at Clythness in the Moray Firth before 'Scotia' docked in Aberdeen at 23.30 on 19 February.

Results

1. The Cosalt pelagic trawl (PT 157). The trawl was not strong enough to withstand the rugged handling normally encountered on a large stern trawler although it may be suitable for vessels of smaller horsepower.

The high tensions occurring in the netting during shooting and hauling with the net drum were seen to cause damage.

The netsounder cable may have caused damage if too high tension setting were used. The net would then be towed partly by the netsounder cable causing net distortion and consequent damage.

Extensive damage was sustained on the third haul. No fishing trials were conducted.

2. The Jackson pelagic trawl (PT 158). The limited trials - 3 instrumented hauls and 4 fishing hauls - were sufficient to show that this net has potential as a high speed sampling net for pelagic fish.

Although no significant damage was sustained the net would be improved by the addition of selvedge ropes and the strengthening of the trawl doors.

A summary of the main engineering parameters is given below when using $3m^2$ trawl boards, 230 m warp, 400 kg on each wing end, 55 m bridles and a 1 m

extension in the lower bridle at 4 knots.

Speed	4 knots
Vertical mouth opening	10 m
Horizontal mouth opening	29 m
Footrope depth	33 m
Warp length to depth ratio	6.8
Net drag (estimated)	8.8 tonnes
Upper bridle tension	2.4 tonnes
Lower bridle tension	2.2 tonnes

There was insufficient time to determine how much more weight should be added at the wing-ends to achieve warp length to depth ratios of 5 to 1 at speeds over 4.5 knots. However, it is likely that weights of approximately 800 kg per side would be required. These would also improve the vertical mouth opening. The maximum speed at which the net can be towed in calm weather is in the region of 5 knots at 210 rpm. However, the ship's log was not calibrated during the trip and the speed measurements quoted here are provisional.

During the acoustic surveys few fish concentrations were found. Only on two of the four fishing hauls were significant quantities of herring caught. These hauls were made off the Point of Stoer when two baskets of herring were caught on each occasion from scattered marks between 0 and 10 fathoms from the seabed.

J W Gillon Seen in draft

R S T Ferro
17 March 1981