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In confidence - not to be quoted without prior reference to the Laboratory

FRV "Clupea"  
Cruise 2/85

### Report

30 January - 19 February 1985

### Personnel

C S Wardle	SPSO	
R Priestley	SSO	
C D Hall	HSO	
C Glass	SO	
P J Barkel	PTO IV	
A Engas	)	
O Chruickshank	)	Visitors 8 February

### Objectives

To observe the reaction of fish to trawls in "darkness".

### Narrative

Scientific apparatus was loaded on the 30 1 85 and a trawl haul from live plaice made off Buckie at 1800. These fish were landed and "Clupea" sailed for the Orkney Islands at 2100. During the next 2 days various towed vehicle systems and scientific apparatus were set up and tested and on the 2 2 85 weather was unsuitable for observation of the trawl. On the 3 2 85 the gales moderated and "Clupea" sailed through the Pentland Firth to make 2 trawl tows off Dounreay and observations of fish reactions were made before and after sunset. A north west wind developed and "Clupea" moved to the Copinsay area where 2 days, including observations of 3 trawl hauls, were spent before the first half-landing on 6-2-85.

The Copinsay area was found to be unsuitable due to weather on 7 2 85 and "Clupea" returned west of Hoy for an evening observation tow. The sheave in the trawl gallows pulley block split and "Clupea" sailed for Scrabster to arrange a replacement. On the 8 2 85 "Clupea" sailed for Hoy Sound where measurements of light levels were made but with easterly gales increasing "Clupea" made for Stromness to pick up a replacement sheave. On the 9 2 85, 2 Norwegians from the fishing gear institute of Bergen arrived and with strong easterly gales the towed vehicle was towed into Scapa Flow (with Orkney Harbour's permission) and vehicle manoeuvres were demonstrated and practised. C D Hall and C Glass remained in Stromness during this 3 hour period.

With the sheave now replaced but with SE gales we sailed on the 10 2 85 to the sheltered tow off Dounreay and an afternoon and evening haul were achieved. There was poor fishing here and as the gale had subsided "Clupea" sailed 11 2 85 for the east side of Orkney. A heavy swell was still running as we approached Copinsay and fishing was postponed. The next 2 tows were on 12 2 85 at Copinsay and the half landing in Kirkwall on the 13 2 85.

With better weather for the next 3 days 5 trawl tows and other observations without a net were made in the Copinsay area. With SW gales developing during the evening tow, "Clupea" sailed for Buckie at 2200 16 2 85 and spare gear put ashore during the morning. Two trawl hauls were made off Buckie on the afternoon and night of the 17 2 85. "Clupea" docked in Buckie at midday on the 18 2 85 in preparation for calibration and noise performance checks on the SX202 sonar; 60 more live plaice were landed and the scientific gear was dismantled and packed during the afternoon. The lorries were loaded early on the 19 2 85 and the gear returned to Aberdeen.

### Results

Twenty trawl hauls were made and 17 successfully observed at known light levels and the fish reactions recorded. During the evening of the last week of the cruise, with clear starlit nights, and no moon, light levels at the surface were measured at between  $6 \times 10^{-2}$  and  $10^{-4}$  lux and at the seabed (70m) these reduced to between  $6 \times 10^{-7}$  and  $10^{-9}$  lux. The bioluminescence remained at low levels on all the tows. Light level profiles were made on all the tow positions and more than 1000 flash photographs were taken in the trawl mouth area and the trawl board area of the net at the light levels measured.

The Copinsay tow had an abundance of smaller haddock and flatfish and the reaction of these in the different light levels will be analysed from these photographs. Some herring may have been photographed in the dark on the Dounreay tow. Sprats and herring were photographed during the tows in Forres Hole off Burghead. Eighty live plaice were landed at Buckie for laboratory aquarium work, 20 on the first day and 60 on the last.

C S Wardle

22 February 1985

Seen in draft by the Skipper

James Calder