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IN CONFIDENCE : NOT TO BE QUOTED WITHOUT REFERENCE TO THE LABORATORY

FRV EXPLORER

6ER81

CRUISE 6/81

REPORT

2-22 July 1981

OBJECTIVES

1. To use the remote controlled towed vehicle to observe herding in the sweep area of a trawl.
2. To examine the role of bioluminescence in making nets visible.
3. To identify non-reaction using a remotely fired flash camera.
4. One day to be devoted to Central Office of Information to film the remote vehicle technique.

NARRATIVE

Sailing of "Explorer" was delayed until Sunday 5 July due to a generator fault. Five trawl hauls were made on the Balta ground using the GOV trawl on 6 July and 7 July. One night haul was made on the 7th using a remote controlled flash camera in deep water to gain observations under objective 3. "Explorer" then steamed to the North Sound to find fish in a 30 fathom tow for objective 1. The vehicle was prepared and tested here in sheltered water during the 8th July. During the night "Explorer" steamed to Sul Bank and an echo-survey was made between 0200 and 0400 on a clean tow. No fish traces were detected and "Explorer" continued to a tow off Copinsay. One four-hour tow was made here with the remote vehicle alongside the GOV trawl, but with intermittent failure of the Decca navigator "Explorer" sailed into Kirkwall for repairs arranged during the evening. Successful observation tows were made during 12 hours of towing the GOV trawl off Noss Head during the 10th. The first tow on the 11th came fast on the Auskerry tow and the top rotor of the vehicle was damaged while hauling. The vehicle was delivered to Kirkwall for repairs. On the 12th the reserve vehicle was used to observe the GOV trawl for 10 hours on the Copinsay tow. Some measurements of bioluminescence were made at selected points in this fishing area and at points during the steam to Kirkwall where the mate and Dr Stewart were landed at 0600 on the 13th. A six-hour haul on the Auskerry tow was observed during the 13th, further bioluminescence readings were made and "Explorer" sailed for Kirkwall for the half-landing at 1600 on the 13th.

Staff from COI joined the "Explorer" on the 15th and the daylight hours were spent near Kirkwall filming the remote vehicle technique for observing fishing gear.

"Explorer" loaded the repaired vehicle and sailed early on the 16th for Fair Isle where a 5½ hour tow was observed, but not many fish were seen and we sailed to Balta for a night haul at 0100 on the 17th. Here the port

trawl board was successfully observed in 54 fathoms using the vehicle TV with lights. A four-hour daylight haul gave good observations of fish reactions, a four-hour haul off Sule Skerry on the 18th gave rare observations of many skate, an evening haul off Dounreay showed few fish. A short haul for live fish without observations was made on the 19th and a gear with bobbins, sweeps, boards and no net was fished and observed briefly. It was seen that the left wire sweep was unravelling and the gear was quickly hauled. While the GOV trawl was re-rigged, a midnight haul was made with the vehicle to show a netting panel illuminated by bioluminescent light due to turbulence. Eight-hours of observation were made during the 20th off Noss Head and Smith Bank. And a further long haul was observed crossing the Bellans on the 21st. The running depth of the vehicle was calibrated until 1900 when "Explorer" returned to Aberdeen during the night entering Aberdeen Harbour at 8am on the 22 July 1981. The computer ran successfully throughout the trip giving towing speeds from navigational sources. Delays due to weather were insignificant during this cruise as suitably sheltered fishing was easily found.

RESULTS

Experiments investigating all three objectives were carried out. Observations of the sweeps were made during a variety of tows giving a high yield of fish reactions recorded on video tape of many different species and sizes. Visibility was exceptionally good in most areas. It was notable that large numbers of small fish were seen reacting to the sweeps whereas the larger fish found in the codend were rarely seen near the sweeps. This tends to confirm that larger fish react at a greater distance from the herding stimulus. It was confirmed that bioluminescence is often sufficiently bright when disturbed by netting panels to make these panels easily visible. Video tape illustrating this phenomenon was successfully made and associated quantitative readings of bioluminescence were recorded. TV observation of the mud cloud thrown up by the trawl board in the bioluminescent conditions showed no light in the sand cloud. It is assumed that the sand particles obscure the bioluminescence. Observations of midwater boards and other gear regions are still needed in these conditions. The experiments to observe non-reaction in dark deep water at Balta failed due to the abundance of bioluminescence and also due to 35mm camera mechanism faults. The procedure using cable netsonde to identify the target and remote trigger to fire a flash camera will be attempted again in the future at a time of year when bioluminescent organisms are less abundant.

C.S. Wardle
2 March 1982