

1971 RESEARCH VESSEL PROGRAMME

REPORT: RV CLIONE: CRUISE 9

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF

F R Harden Jones  
M Greer Walker  
G P Arnold  
W L Huggins  
J Rous  
N Pearson

DURATION

Left Lowestoft 1015 hours, 11 August

Arrived Lowestoft 1000 hours, 25 August

All times are Greenwich Mean Time

AIMS

To use the ARL sector scanner to observe the reactions of plaice fitted with Mitson-West acoustic transponding tags (the M-W tag) to a bottom trawl.

NARRATIVE

This exercise was planned as a joint cruise with R V CORELLA and both ships left Lowestoft at 1015 hours, 11 August. CLIONE entered Ljmuiden at 2045 hours and after fitting the dome left port at 2250 hours to meet CORELLA in the Brown Bank-Black Bank area on 12 August. One day was spent working-up the sector scanner and acoustic tag work began at 0750 hours, 13 August and continued until 1830 hours, 23 August. One and a half working days were lost owing to bad weather 14/15 August. At 1930 hours, 23 August, CLIONE left the working area and steamed to Harwich to enter port at 1530 hours on 24 August. The dome was removed. Dr Walker, Dr Arnold, and Mr Pearson left the ship and returned to Lowestoft. Mr Mitson and two men from S G Brown (R D Tuthill and R W Brigginsshaw) joined the ship to carry out tests on the vertical gyro of the sector scanner stabilisation system in Harwich and on passage to Lowestoft. CLIONE returned to Lowestoft at 1015 hours, 25 August.

METHODS AND RESULTS

A plaice (size range 32-48 cm) was fitted with an M-W tag, released from CLIONE and kept under surveillance for at least 3-4 hours and until it was clearly going to stay on the bottom. CLIONE then directed CORELLA to attack the fish with a bottom trawl\* and the attacks were

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\*CORELLA's trawl: 78' headline Granton: 120' footrope; 25 8" metal headline floats; ground rope 20' 8" wooden bobbins in the bossom with 3 $\frac{1}{2}$ " rubber discs in the bunts and wings; trawl doors 10' x 4'2" with 24' back strops; half round danlenos with 10' chain toe-legs and 10' wire head-legs; two tickler chains, 45' across the bunts, 72' across the midwing. On attacks plaice 1 (1-6) the trawl was rigged with 5 fm bridles, on all other attacks 10 fm bridles. Sector scanner observations indicated a door-to-door spread of 38 m, and a headline height of 3 m. For a full description of the gear see CORELLA Cruise Report 13/71.

repeated until the fish were caught or the net hauled. CORELLA averaged 2.5 attacks per hour over a 2-3 hour period. A total of 16 plaice were released and CORELLA made 63 attacks on these fish. Attacks were made during daylight and two fish were usually released, tracked, attacked and finally caught each day. When fishing was stopped at dusk a fish still at large was tracked overnight by CLIONE and attacked again the next morning. Fish tracked overnight spent part of the time well off the bottom.

The interaction between fish and gear was best observed with the ARL scanner at ranges between 130-160 m. Noise from CORELLA and the trawl produced some multiple firing from the M-W tags (depth of water 26-31 m) but this did not interfere with the observations. Of the 16 plaice released in this work one was recovered dead (plaice 9) and one was believed to be dead and not recovered (plaice 8). Plaice 16, released at 1400 hours, 23 August, stayed close to the surface and was still there at 1830 hours when work was stopped. No attacks were made on this fish.

The remaining 13 plaice gave 40 valid attacks. The results were impressive: the whole fish-capture operation could be followed from when CORELLA passed near or over a tagged plaice until the fish, safe in the codend, was near the surface after hauling. Detailed results must await analysis of the 16 mm films but the following points can be made now following a study of the video-recordings.

1. No response was observed which suggested that a plaice was disturbed by noise generated by CORELLA or the trawl (40 attacks).
2. Plaice lying outside the path swept by the doors showed no movement in response to the gear (20 attacks) even when lying within 5 m of a door (3 attacks).
3. Of the plaice lying between the path of the doors (13 out of 20 attacks) 65% were caught.
4. Of the 20 attacks made on plaice between the doors, 12 attacks were made on fish not directly in the path of the net. Some of these fish (8 out of 12 attacks, 75%) were herded towards the path of the net. Of these 8 fish, 7 were caught (87%), so the trawl caught 7 of 12 fish (58%) originally lying between the doors but not directly in the path of the net.
5. All the plaice (5 out of 5 attacks) lying within 5-10 m of a door were herded towards the path of the net. All these fish were caught. The direction of these movements was at 90° to the long axis of the net and the fish swam relatively slowly (1.0 - 1.5 m/s; 2 -4 L/S). One fish moved from within 2-3 m of one door to a position midway between the two doors (a distance of about 16 m).
6. Of 4 fish lying in the path of the bridles, only 1 was herded towards the path of the net and this was the only fish of the 4 that was caught. There were 3 fish lying in the path of the bridle close to the danlenos; 2 were herded into the path of the net, both were caught. In all, 7 fish lay in the path of the backstrop-bridle-danlenos and 3 were caught (43%).

7. Plaice lying midway between the doors did not move as the doors, bridles, and danlenos passed by. Plaice lying in the path of the net did not move before the headrope passed over them (8 attacks). Six of these fish (75%) were caught.
8. Most plaice lying in, or herded into, the path of the net (13 out of 16 attacks, 81%) were caught. The three exceptions (plaice 10, attacks 1 and 2; plaice 11, attack 4) were found in midwater, and later at the surface, after the trawl had apparently been over them. For plaice 11 it was definitely established that the fish did not leave the bottom until the net had passed over the fish. It is most likely that plaice 10 did not avoid capture by "taking-off" in front of the net and that the movement into midwater was made after the trawl went by. A possible explanation of the failure to catch these two fish in the path of the net (both fish were subsequently caught) is that they were buried relatively deep in the bottom.
9. To summarise: a preliminary examination of the results suggest that this trawl caught:
  - a) 65% of the plaice (n = 20) that lay within its path;
  - b) 58% of the plaice (n = 12) that lay between the doors but not directly in the path of the net;
  - c) 75% of the plaice (n=8) that lay directly in the path of the net

While the numbers are small, this is a step forward towards determining what proportion of the fish in the path of a trawl are caught.

#### EQUIPMENT

1. M-W tags. Eleven tags were taken to sea and 6 were brought back. All the tags were used once and 5 twice. Of the 5 tags lost, one was on plaice 8 (never recaptured), one on plaice 16 (never attacked) and the other three were torn from fish in the trawl and were seen to fall to the bottom on hauling. All tags met their specifications; there were no failures.
2. Sector scanner. The sector scanner and its ancillary equipment ran for 180 hours and for periods of continuous running up to 64 hours.
3. The dome. The dome cover was intact and in good condition on removal at Harwich. This canvas cover (pretreated RN2) made up by our own sailmakers has lasted 844 n miles (cruises 7, 8, and 9 this year.)

F R Harden Jones

25 August 1971

SEEN IN DRAFT: MR Sutcliffe, Master  
AH Button, Fishing Skipper

INITIALLED: DHC

#### DISTRIBUTION

Basic list

All staff on cruise and Corella 13/71