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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1984 RESEARCH VESSEL PROGRAMME

REPORT: RV G A REAY: CRUISE 1

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

STAFF:

- G P Arnold
- P Scholes
- B H Holford
- P Walker
- R J Turner
- C P Morrice

DURATION:

Left Aberdeen 1830 h, 10 January

Arrived Aberdeen 0830 h, 30 January

All times are Greenwich Mean Time

LOCALITY:

Southern Bight

AIM:

To study, in conjunction with RV CIROLANA, the vertical distribution of plaice on their spawning grounds in relation to gonad maturation stage, lunar cycle, time of day and state of tide.

NARRATIVE:

G A REAY left Aberdeen at 1830 h 10 January and arrived in the Southern Bight late the following evening. Persistent storm force winds, however, forced her to seek shelter in the lee of the East Anglian coast and prevented any work for the next 6 days. Midwater trawling commenced at 1900 h 18 January and continued according to a predetermined timetable until midnight on 21 January, when work had to be abandoned in deteriorating weather. G A REAY then steamed to IJmuiden, where she docked at 1630 h 22 January. After having a radar repaired and taking freshwater she sailed again at 1100 h 24 January and after a rough passage sought shelter again off the Suffolk coast. Midwater trawling resumed at midday on 25 January but was interrupted again at 0300 h 26 January. G A REAY then sought shelter from south-easterly gale force winds off the north Norfolk Coast. Work resumed at 2100 h 27 January and continued until 1530 h 28 January, when a course was set for Aberdeen.

RESULTS:

G A REAY fished an Engel 398 pelagic trawl with 73 m bridles, 36 m warps and 6 m² doors. At a towing speed of 4½ knots and with 400 kg weights the gape was approximately 22 m (450 kg weights were used in 1983 giving

a gape of approximately 24 m). Fishing was carried out according to a predetermined timetable with a tow of 3 h duration centred on each successive north-going and south-going tide. A total of 16 hauls was completed, 11 by night and 5 by day. There were 5 paired hauls on consecutive tides by night. The plaice catch was 74 fish and the by-catch consisted principally of herring, whiting, gurnards and dabs in varying proportions. Two large catches of grey gurnards (18 and 25 baskets approx.) were taken on consecutive tides during the night of 18-19 January.

Catch rates

The overall catch rate of plaice for the cruise (4.6 plaice per haul) was identical to that recorded during G A REAY 1/83 but only a third of that for CORELLA 1/82 (16 plaice per haul with the much smaller 800 Engel trawl). There was again no difference in the catch rates between consecutive north-going and south-going tides by night (Table 1) but still a pronounced diurnal effect (Table 2) with 69 fish caught by night compared with only 5 by day. The overall night:day ratio of catch rates was 6.3:1; among the mature fish the ratio was 5.3:1.

Because of the bad weather sampling was confirmed to the period immediately following the date of the full moon but catches were low for the first 7 days of this 10 day period. Sixty percent of the total plaice catch and all the spent female fish were taken on or after station 12 on 25 January. Full moon was 18 January.

Sex ratios

The overall sex ratio was 1.1:1 in favour of the male plaice (38 males, 36 females) but 2:1, still in favour of the males, among the mature fish (34 males, 17 females). The 2:1 ratio among the mature fish was identical to that observed during G A REAY 1/83 but in marked contrast to the sex ratio of 2.4:1 and 1.3:1 in favour of the female fish for the mature plaice caught in midwater during CORELLA 1/81 and 1/82.

Maturity stages

Among the male plaice 90% (34 fish) were mature and 10% (4 fish) immature, a similar proportion to previous years. But among the female plaice there was a very high proportion (53%) of immature fish, which was double that recorded in 1983 (Table 3). The proportion of maturing females (stages III-V) was, in contrast, reduced and only 1 fish was caught which was in stage VI (running). The proportion of spents (stage VII) was a little higher than in 1983 but the proportion of female fish in stages VI and VII combined was considerably less (25% in 1984; 43% in 1983) suggesting that spawning may have been at a relatively more advanced stage in 1984 at the time of sampling. The occurrence of a substantial proportion (18%) of spent males (7 fish in stage VII; 27 fish in stage VI) with a concomitant reduction in the proportion of running males (71% stage VI in 1984; 91% stage VI in 1983) is consistent with this interpretation. Very few spent males have been recorded in the midwater catches in previous years.

Samples

The ovaries of 16 mature female plaice were preserved in Gilson's fluid and their carcasses and livers blast frozen; otoliths were also taken. A sample of 22 herring (length range 15-32 cm) was preserved for meristic and genetic (eye protein) analysis.

Live fish

One live 45 cm female plaice in maturity stage V was transferred to RV CLIONE for tracking.

Light meter station

A single light meter station was worked on 28 January using two integrating quantum cells (400-700 nm) to measure the down-welling quantum irradiance at depth in relation to the incident quantum irradiance at the surface.

G P Arnold
30 January 1984

SEEN IN DRAFT: WEC

INITIALLED: DJG

DISTRIBUTION:

Basic list +
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P Walker
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C P Morrice
F R Harden Jones
M Greer Walker