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

1983 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
P Walker
R J Turner
C P Morrice
P Sykes

DURATION

Left Aberdeen 1830 h, 20 January
Arrived Aberdeen 0600 h, 4 February
All times are Greenwich Mean Time.

LOCALITY

Southern Bight

AIM

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

NARRATIVE

G A REAY left Aberdeen at 1830 h 20 January and steamed to the Southern Bight. Work commenced in an area south west of the Brown Ridge during the morning of 22 January and continued until 1200 h 29 January, when fishing was stopped by bad weather. G A REAY then steamed to Aldeburgh Napes to rendezvous with RV CLIONE. Live fish were transhipped to RV CLIONE on the evening of 29 January and the following morning G A REAY set sail for IJmuiden to take fresh water. The pilot service was suspended, though, as a result of the bad weather, and G A REAY was unable to enter port until the morning of 31 January. With continuing storm force winds she remained there until 1600 h 2 February, when she set sail for Aberdeen.

RESULTS

G A REAY² fished on Engel 398 pelagic trawl with 73 m bridles, 36 m warps and 6 m² doors. At a towing speed of 4½ knots the gape of the net was approximately 18 m. Fishing was carried out in accordance with a predetermined timetable with a tow of 3 h duration centred on each successive north-going and south-going tide. A total of 25 hauls was completed, 15 by night and 10 by day. There were 7 valid paired hauls

by night and 2 by day. The plaice catch was 115 fish and the by-catch consisted principally of herring, whiting, gurnards and dabs in varying proportions.

Catch rates and sex ratios

Despite the very much greater gape of the net compared with that of the 800 mesh Engel midwater trawl used in the two previous years the total catch was very much reduced. The overall catch rate for the cruise (4.6 plaice per haul) was only one third of that for CORELLA 1/82 (16 plaice per haul). As in 1982 there was no difference in the catch rates between north-going and south-going tides (Table 1). But there was still a pronounced diurnal effect with 94 fish caught by night compared with 21 by day. The night:day catch ratio of 4.5:1 was, however, substantially less than that of 40:1 recorded during CORELLA 1/82.

There were other obvious differences between 1982 and 1983. Among the spawning fish (mature males and maturing/spent-females) proportionately more individuals were caught after midnight than before (Table 2) and the sex ratio was 2:1 in favour of the males (66 males, 33 females). This was in marked contrast to the sex ratios of 2.4:1 and 1.3:1 in favour of the females recorded among mature fish caught in midwater during CORELLA 1/81 and 1/82.

Maturity stages

These differences might, perhaps, reflect the apparently more advanced state of spawning encountered in 1983. In 1982 most of the female fish (44%) were in maturity stage IV and only a few in stages VI (running) and VII (spent). But the situation was reversed in 1983 with 43% of the females in stages VI and VII and only 4% in stage IV (Table 3). Several of the stage VI fish were noted to be only partially spawned with substantial numbers of hyaline eggs still present in the gonads. The percentages of immature and stage V female fish were similar in both years. The percentages of running males (stage VI) were identical (93% in 1983; 92% in 1982).

Samples

Blood samples were taken from 37 female plaice and from 21 male plaice caught during the night. The ovaries of 30 plaice were preserved in Gilson's fluid and the carcasses blast frozen.

Live fish

Two maturing female plaice in maturity stage V and one running male (stage VI) were transferred to RV CLIONE for the tracking work together with two live lumpsummers for laboratory experiments.

G P Arnold
8 February 1983

SEEN IN DRAFT: WEC (Master)

INITIALLED: DJG

DISTRIBUTION:

Basic list:

G P Arnold

P Scholes

P Walker

R J Turner

C P Morrice

P Sykes

F R Harden Jones

M Greer Walker

Table 1 Catches of spawning plaice (running males and maturing/spent females) by night for paired tows with an Engel midwater trawl on consecutive north-going and south-going tides in the Southern Bight (January 1982 and 1983)

No of paired tows	Nos of plaice caught on each tide		Catch rate on each tide		Paired t-test		
	N	S	N	S	t	df	P
<u>1982</u>							
6	90	116	15.0	19.3	1.08	5	NS
<u>1983</u>							
7	30	43	4.3	6.1	1.04	6	NS

Table 2 Midwater trawl catches of spawning plaice by day and night in the Southern Bight (January 1982 and 1983)

Period	Number of hauls		Numbers of plaice		Numbers of plaice per haul	
	1982	1983	1982	1983	1982	1983
Sunrise to sunset	10	10	13	19	1.3	1.9
Sunset to midnight	11	8	216	31	19.6	3.9
Midnight to sunrise	6	7	120	49	20.0	7.0

Table 3 Maturity stages of female plaice caught in midwater in the Southern Bight close to a centre of spawning (January 1982 and 1983)

	Maturity stage						Totals
	I	III	IV	V	VI	VII	
<u>1982</u>							
n	81	4	112	36	10	10	253
%	32	1.6	44.2	14.2	4	4	100
<u>1983</u>							
n	11	2	2	10	10	9	44
%	25	4.6	4.6	22.7	22.7	20.4	100

1982		1983		Total
n	%	n	%	
191	75.5	191	43.4	382
62	24.5	253	56.6	315
129	50.0	444	100.0	573