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

1977 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 3
(Provisional: Not to be quoted without prior reference to the author)

STAFF

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DURATION

Left Grimsby 0800h 10 March
Arrived Grimsby 0230h 31 March

LOCALITY

Bay of Biscay, Celtic Sea, Porcupine Bank.

AIMS

1. To carry out a mackerel egg and larval survey in the Celtic Sea area.

2. To study the vertical distribution of mackerel eggs and larvae.

3. To study the development rates of mackerel eggs and larvae.

4. To identify fish concentrations by trawling.

5. To collect I-group fish for biochemical tissue analysis.

NARRATIVE

All staff joined CIROLANA at Grimsby on 9 March, the ship sailed at 0800h 10 March. From Grimsby CIROLANA steamed straight to Cornish waters and reached a position just east of the Lizard at 0200h 12 March. A number of fishing vessels were working a mackerel shoal between the Lizard and the Manacles but CIROLANA was unable to fish due to steering problems. At 0900h 12 March CIROLANA entered Carrick Roads, Falmouth, and lay at anchor for 24 hours while repairs were carried out. At 1000h 13 March CIROLANA sailed from Falmouth and commenced the plankton survey in deteriorating weather conditions. After completing the first station south of the Lizard CIROLANA hove to in a S Westerly gale and dodged until 0001h 16 March when a course was set for Falmouth to make further repairs to the automatic steering gear. CIROLANA left Falmouth at 0900h 17 March upon completion of repairs and steamed to a position SW of Ushant where sea conditions had moderated sufficiently to permit working early on 18 March.

The survey grid covering Biscay was made in good conditions but by the time CIROLANA had steamed north again to the Celtic Sea conditions were deteriorating and time was lost dodging overnight 24-25 March. From 1000h 25 March when the survey recommenced no further time was lost and the work was completed at a position SW of the Scillies at 2210 h 29 March.

CIROLANA steamed from the Scillies to a position off Dungeness where Dr Gueguen transferred to La Pelagia at 0745h 30 March. From Dungeness CIROLANA steamed to Grimsby and docked at 0230 31 March. Staff returned to Lowestoft later the same day.

RESULTS

1. A total of 82 plankton samples were taken with the 30" TTN and 83 discrete tows with a continuous plankton recorder (CPR). The TTN stations were worked at the centre of each $\frac{1}{2}^{o}$ x $\frac{1}{2}^{o}$ rectangle traversed by the ships track (Fig 1), and the CPR was towed between each of these stations. A preliminary examination of the samples has shown that mackerel are spawning in the immediate vicinity of the shelf edge (200m) from 45°N to a position at least as far north as Mizen Head, 51°30'N, which was the northern limit of this cruise. No eggs were seen in samples from the shelf waters of the Bay of Biscay but a few were seen in samples from the central Celtic Sea.

2. A Longhurst-Hardy plankton recorder (LHRR) was used on seven occasions (Fig 1) to collect samples in order to study the vertical distribution of mackerel eggs and larvae. Three of these samples were taken in deep water (> 200m) in the immediate vicinity of egg concentrations, the other four samples were taken in water less than 200m deep. At present these samples have not been studied.

3. A trawl sample of mackerel taken from the shelf edge at a position 45°N (Station 28, Table 1) contained ripe mackerel, some of which were used to provide material for incubation studies. Following artificial fertilisation a small number of eggs were put in tubes in an incubation block and held at 18 constant temperatures over the range 5-20°C. Visual observations and photographs were taken at regular intervals throughout the period of development up to and just following hatching. At 17.7°C larvae hatched from the egg in less than 72 hours, but at 11.5°C (approximately the mean sea temperature over the survey area) hatching did not occur until over 130 hours after fertilisation.

4. One Engels trawl and five Granton trawl stations were worked (Fig 1), but only three produced significant catches of mackerel (Table 1). These catches were made in water 180-200m deep along the shelf edge of the Bay of Biscay. They were associated with an intense demersal echo trace, which occurred along the shelf edge from the southern limit of the survey to a position at 48°30'N.
The mackerel samples were inspected for sexual maturity, otoliths were taken from the Bay of Biscay fish, and ovaries were collected for fecundity samples. A notable feature of these catches was the size of the fish, very few were less than 35cm long and the mean lengths were in excess of 38cm.

5. A variety of small gadoids were collected for biochemical tissue analysis.

General

Throughout the cruise a continuous record was made of surface temperature, pH, turbidity, oxygen and chlorophyll A concentrations. Also discrete measurements of chlorophyll A and phaeopigments were made by acetone extraction. Salinity and temperature-depth observations were made at each TTN station.
The temperature at 10m depth was recorded continuously by the CPR and a temperature depth profile was recorded by the LHPR.

Stephen J Lockwood
14 April 1977

SEEN IN DRAFT: T H Finn - Master
W J Saxby - Skipper

INITIALLED: AJL

DISTRIBUTION:

Basic List

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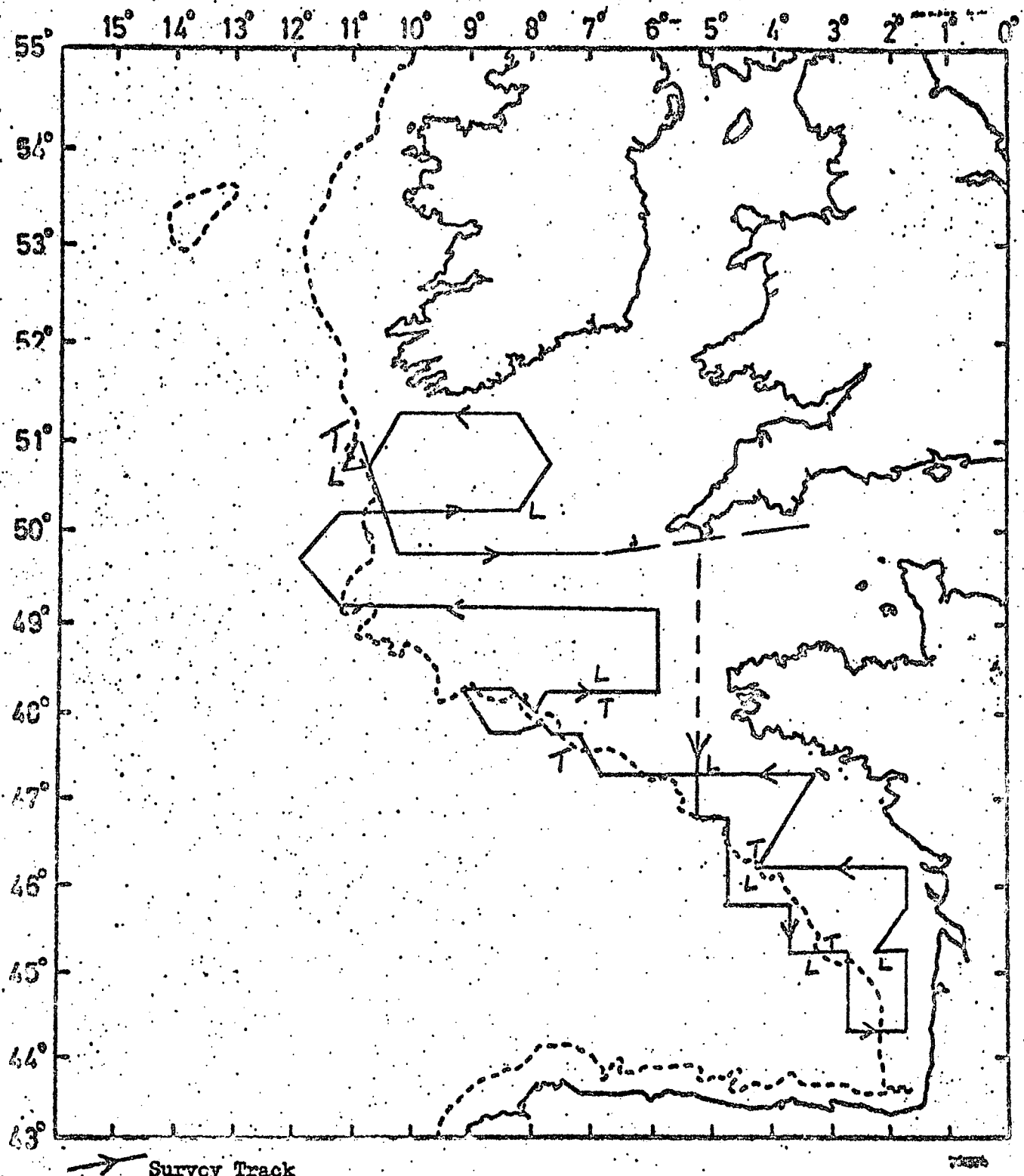
Table 1 Summary of Granton trawl catches.

STATION	28		59		81	
LATITUDE	45°16'N		46°10'N		47°45'N	
LONGITUDE	03°07'N		04°05'W		07°20'W	
DEPTH	180m		180m		180m	
DOMINANT Spp	MACKEREL		SCAD		SCAD	
MEAN LENGTH (cm)	39.6		33.4		30.9	
MACKEREL MEAN LENGTH	39.6		38.9		39.5	
% FEMALE	27		43		35	
MATURITY (%)	♂	♀	♂	♀	♂	♀
III	2.3					
IV	20.9	50.0	23.8	71.9	4.2	72.0
V	27.9	43.7	28.6	15.6	27.1	24.0
VI	48.8	6.3	47.6	9.4	68.8	4.0
VII				3.1		
OTHER COMMERCIAL SPECIES IN CATCH	Scad (36cm) Hake, squid, blue whiting		Hake		Hake, squid	

CIROLANA 3/77. CRUISE TRACK



Survey Track

T = Granton Trawl Stations

L = Longhurst-Hardy Plankton Recorder