SW

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

1975 RESEARCH VESSEL PROGRAMME

REPORT: RV CLIONE: CRUISE 1

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

STAFF

PART A	P O Johnson	PART B	R R Dickson
	J P Bridger		J P Bridger
	I L Davies		I L Davies
	R N Tucker		R N Tucker
	J Dann		B Riches
	B Riches		

DURATION

Left Lowestoft 13.15 hours 2 January

Arrived Lowestoft 08.25 hours 13 January

LOCALITY

Western English Channel

AIMS

Using the ARL Scanner

PART A: (i) Investigate the feasibility of employing acoustic tags for tracking mackerel.

(ii) Study the movements of pelagic shoals in relation to current.

(iii) In conjunction with RV CIROLANA determine the reactions of pelagic shoals to the underwater towed camera unit and Engel mid-water trawl.

(iv) Obtain records of shoals on the Alden recorder using the scanner as a side-scan sonar.

PART B: (i) Topographic survey of dredging Area 260, Poole Bay.

NARRATIVE

PART A: CLIONE made a good passage to Plymouth, docking there at 22.30 h 3 January. The ARL scanner dome was then fitted, but sailing was delayed due to a fault in one of the generator engines. This was rectified by the following morning and after a satisfactory test run CLIONE sailed at 15.30 h 4 December.

Passage was then made to the anticipated working area off Dodman Point the Scanner being test-run en route in conjunction with the Alden recorder.

On 5 January the acoustic tag tracking work commenced after catching some suitably sized mackerel by feathering and carrying out preliminary trials with dummy tags on fish in the deck tanks in order to decide the best method and

position of attachment. On 6 and 7 January further mackerel were tagged and tracked with varying success, the two most successful fish ultimately beconing lost in large shoals.

On 8 January an anchored station was carried out in an attempt to observe fish shoal movements in relation to current, but this was eventually abandoned due to a scarcity of suitable shoals moving past the ship. It was not possible to anchor in the vicinity of the main shoal concentrations because these were then lying in a depth of water beyond the vessel's anchoring limit. Later that day an attempt was made to track a large individual shoal, but after dark it gradually spread and dispersed to a stage where it could no longer be identified as a specific unit.

On 9 January a joint exercise was carried out with CIROLANA, following the underwater towed camera unit with an acoustic tag attached to it, in an attempt to determine the response of fish to this body. Later in the day a close grid was carried out over the main mackerel fishing area using the Scanner as a side-scan sonar and recording results on the Alden recorder, this exercise being repeated on 10 January when the work ended. CLIONE then proceeded to Plymouth Sound where Dr P O Johnson and Mr J Dann were transferred by rubber boat to the CIROLANA at 16.30 h. CLIONE then departed for Poole Bay to pick up Dr Dickson for the last part of the trip.

PART B: Dr Dickson joined CLIONE by small boat off Poole Bar at 09.00 h, 11 January and CLIONE then proceeded to survey dredging Area 260 using the Scanner and Alden recorder. Between 10.20 h and 18.06 h, a grid of 10 survey legs were worked across the area and its surrounding seabed at a speed over the ground of approximately 4 kts. The Alden and echo sounder records were annotated with the Decca position at 2 minute intervals. From 18.48 to 20.22 h, three additional legs were surveyed outside area 260 to confirm that dredging had been restricted to the licence area.

CLIONE then proceeded to Southampton to de-done before continuing to Lowestoft where she docked at 08.25 h 13 January.

RESULTS: PART A

1. Four mackerel, ranging in length from 37 - 43 cm were tagged with acoustic tags and successfully tracked. Two of these did not move very far from their release points and ultimately finished on the bottom: after they had been in this position for several hours it was concluded they were probably dead. The two more successful releases were each tracked over 2 - 3 miles before they eventually became lost in large shoals where it was impossible to discriminate the tag signal from that of fish around it. The effects of delayed shock may influence the viability of mackerel after release. Only very carefully selected fish were kept for observation in the deck tanks and, although up to 50% survived for up to 12 hours, the longest period any survived was about 24 hours. The acoustic tags were attached directly to wire bridle Lea hydrostatic tags inserted just in front of the dorsal fin, and the fish seemed reasonably happy with them in this position.

2. Aim 2 was not realised due to a scarcity of suitable shoals in the immediate vicinity of the anchorage. Tides were also at minimum neap levels which could also have reduced the flow of fish past the ship.

3. The under-water towed camera was successfully tracked in relation to what were probably mackerel shoals. However, when this entered the large shoals its signals were lost or became uncertain and it was not possible

to discriminate the responses of fish close to the camera unit under these conditions. Although some shoals did appear to dive under the camera when it was being towed in about mid-water (i.e. 20 - 25 metres off the botton), this response was not seen whilst it was being towed 5 - 10 metres off the sea bed.

4. Using the Scanner in a side-scan position and recording the signals on Alden recorder paper produced some quite interesting results. On the first run made over the main mackerel fishing area during daylight the large shoal aggregations produced rather complex 'ridge-like' patterns taking the form of horizontally elongated, rather irregular bands of fish, which gradually lost their identity after dark and evolved into a more uniformly distributed, dispersed pattern spread through a large part of the water column. At this time single-fish targets were also clearly recorded when the fish were thinly enough distributed.

In daylight the following day the shoals were aggregated into much more discrete dense clumps, and it was clear that a much longer period of observation would be needed to adequately cover the various changes in shoal configurations likely to be encountered.

Throughout the period of the survey the nights were very dark, with no moon and mainly heavy overcast, and all the fish shoals seen invariably dispersed after darkness.

5. The mackerel feathering vessels were mainly working within a sector 4 - 6 miles off the coast between about Fowey and Polperro, with up to 50 - 60 vessels operating on some days.

PART B

1. The survey of Area 260 showed no evidence of pits or other major local deepenings of the sea bed through dredging. The most abrupt topographic features were the natural sand ridges which occur in the northeastern and southwestern parts of the area, and sections of these ridges had been removed by dredging.

2. The three survey legs worked outside the license area confirmed that dredging had not encroached onto the surrounding sea bed to the north. The sea bed there was characterised by minor sandwaves and ridges.

SEEN IN DRAFT JRF
GFL

P O Johnson
10 January 1975

INITIALLED AJL

R R Dickson
13 January 1975

DISTRIBUTION
Basic List +

Dr Johnson
Dr Dickson
Mr Bridger
Mr Davies
Mr Tucker
Mr Dann
Mr Riches
Mr Edwards (Crown Estate Commissioners)