

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

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1977 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 12

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

STAFF

B C Bedford
M G Pawson
M R Vince
B J Robinson 5-11 December
R Stewardson 11-18 December
M W Easey
Ms W A Dawson
N A Fenn (Hastings)
D Wright (Fleetwood)
G Holton (Univ. E. Anglia)

DURATION

Left Falmouth 2100 h 5 December
Docked Grimsby 1150 h 18 December
All times are Greenwich Mean Time

LOCALITY

Western English Channel

AIMS

1. To carry out an acoustic survey of the south coast of Devon and Cornwall.
2. To identify fish concentrations by trawling.
3. To test the new headline transducer system.
4. To make 'in situ' target strength measurements of mackerel.
5. To investigate mackerel respiratory physiology.

NARRATIVE

Difficulties encountered during the re-fit prevented sailing on the planned date and staff joined the ship in dry dock at Falmouth on 5 December. Work was completed by 1500 h that day and the ship left the dock as soon as tides permitted at 2100 h. Sailing directly into a southerly gale the ship dodged overnight in Falmouth Bay. A moderation next morning allowed passage to the south-western corner of the proposed survey grid, but a rapid deterioration immediately on arrival necessitated a further period of dodging before the survey was begun at 0830 h 7 December. Much of the western half of the grid from the longitude of Wolf Rock to the Dodman was completed as weather permitted during the next 4 days but time was lost dodging to southerly gales on both 9 and 10 December. Two midwater trawl hauls were also made during this period.

CIROLANA put into Falmouth harbour approaches at 0900h 11 December to put Mr Robinson ashore and pick up Mr Stewardson and the Fishing Skipper. Strong to gale southerly winds attended this exercise and these persisted throughout the day again preventing any work. A resumption was made on the morning of 12 December when a high pressure system established itself over the English Channel giving good weather which persisted until the end of the cruise.

Traces seen in Mounts Bay and approximately 25 miles south of the Wolf were investigated by trawl and feathers on 12 and 13 December and the northern, coastal part of the grid was re-surveyed during the night of 13/14 December. The Wolf/Lands End shoal was fished on 14 December before moving eastward to fish both south-west and south-east of the Lizard during 14/15 December.

The main survey grid was resumed on the afternoon of 15 December and echo surveying and fishing continued uninterrupted until Start Point was reached at 0630 h 17 December. Noise trials of the new propeller and hull transducer were carried out south of Portland Bill during the passage to Grimsby which was reached at 1150 h 18 December.

RESULTS

Aim 1. The survey of the proposed area was successfully completed and the area of greatest fishing activity was surveyed twice. Heavy fish traces were found during both the first and second weeks of the cruise in the Wolf Rock/Lands End area where almost all the mackerel fishing was taking place. Little was seen in the areas of the Manacles and Dodman where in previous years large mackerel concentrations had been found. Diffuse fleck type traces together with a few small clumps of fish were found at the extreme south-western corner of the area surveyed. Good fish traces were found about 4 miles SW and also 4 miles SE of the Lizard during the second week.

Heavy traces were found to the NE and E of Eddystone and one good shoal to the SW. Good traces were also found about 8 miles S and SE from Start Point. Further offshore at the eastern end of area only a few scattered hazy traces and small flecks were seen.

Aim 2. The concentrations of fishing boats prevented sampling of the Wolf Rock/Lands End shoal by trawling but live mackerel for experimental purposes were obtained there by feathering. The presence of the featherers and large vessels and their absence elsewhere indicates that this was the major mackerel shoal in the area. The area 25 miles south of Lands End was fished to try to identify the fleck traces seen there but these yielded only very few pilchard and anchovy.

Only light catches of pilchard, anchovy, sprat and a few herring together with a few mackerel were taken by midwater trawling at the Manacles and Dodman, although one haul south of Dodman took 28 baskets of bass.

The shoal picked up on the survey SW of the Lizard was fished and found to be approx 90% mackerel and 10% pilchard. Mackerel here were generally small (20-32 cm) although it could well be that only the upper part of the shoal was fished. Ships concentrated on to this shoal very quickly and in the course of 10 hours the centre of fishing activity was seen to move about 10 miles eastward until the fishing was centered SE of the Lizard.

CIROLANA found and fished heavy concentrations at this point immediately after the departure of the boats only to find them to be 100% pilchard - some 150/200 baskets being taken in approx 6 minutes fishing.

Traces at Eddystone were fished and found to be a mixture of about 80% horse mackerel and 15% mackerel, the remainder being mainly pilchard with a few herring and anchovy. A local boat working nearby reported mainly mackerel in his catch. The shoal found south-east of Start Point was found to be pure horse mackerel.

Aim 3

15 hauls were made with the midwater trawl and the new headline transducer proved an invaluable aid to the fishing skipper in directing his gear to where the fish were seen to be. The facility to observe fish passing into the mouth of the net was invaluable in assessing duration of tow and allowing an immediate response in hauling when a sample had been obtained. The trawl was fished down to within a few metres of the bottom and useful experience was gained in observing response of the gear to changes in ships speed and warp movement. The opening of the trawl was generally found to be approx 14/15 metres but on three occasions it was seen to be only 9 or 10 metres. No clear explanation for this difference was found on hauling but it was thought that the gear may have been partly fouled when shooting.

Aim 4

Two attempts were made to carry out target strength measurements of mackerel but these were largely unsuccessful. The exacting requirements for this work, ie the ship held for a sustained period over shoals of known species and size with individual fish separated one from the other, proved impossible to attain. During one attempt a major factor in preventing results being obtained, proved to be noise from other fishing vessels passing close by.

Aim 5

Live mackerel were obtained by feathering and held in a deck tank for up to 4 days. Investigations on the gas exchange, acid base balance and ionoregulation were successfully carried out on individual fish swimming at various velocities. Trawl caught mackerel were assayed for ionoregulation for up to 24 hours by which time total mortality had occurred. It was established that mackerel are able fully to oxygenate their blood when stationary in air saturated sea water.

MISCELLANEOUS

1. Hearts from some 20 large mackerel were preserved for Dr Greer Walker. Deep frozen whole bass are available for the same heart studies if required.
2. A sample of size selected mackerel was deep frozen for Mr Mitson for body measurements.
3. Samples of herring were frozen for Mr Wood.
4. Circle diagrams to measure the efficiency of the new transducer were taken in air and during the cruise.

B C Bedford
28 December 1977

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

INITIALLED: AJL

DISTRIBUTION

Basic List
B C Bedford
M G Pawson
M R Vince
B J Robinson
R Stewardson
M W Easey
Ms W A Dawson
N A Fenn (Hastings)
D Wright (Fleetwood)
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