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

1979 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 10

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

STAFF:

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DURATION:

Left Grimsby 1400h 31 October

Arrived Grimsby 0530h 20 November

(All times are Greenwich Mean Time)

LOCALITY:

Western English Channel, Bristol Channel, S.W. Approaches.

AIMS:

1. To carry out an acoustic survey of the area of the Cornish winter mackerel fishery.
2. To carry out a combined fishing/acoustic survey aimed at determining the abundance of 0-group mackerel and 0-group scad in the general areas of Celtic Sea, S.W. Ireland and North Biscay.
3. To carry out target strength measurements on mackerel if time and opportunity permit.
4. To obtain mackerel samples to provide ALK data for the three areas Western Celtic Sea, West of Ireland (N of $51^{\circ}30'N$) and Bay of Biscay (S of $48^{\circ}.00'N$).
5. To obtain samples of scad to provide ALK data.
6. To obtain samples of I-group mackerel from different parts of the south and western area for Mr Mackenzie (DAFS).
7. To obtain samples of mackerel blood for blood protein studies at University of East Anglia (Dr Greenwood).

8. (Added after publication of cruise programme). To carry out one oceanographic section (and if possible more) of XBT casts in the area of upwelling associated with the edge of the continental shelf west of the Brittany peninsula.

NARRATIVE:

CIROLANA sailed from Grimsby at 1400h 31 October and on clearing Spurn LV set course for Smiths Knoll. The towed body transducer, having been prepared while steaming down river, was launched as soon as the ship entered sufficiently deep water and the ship's speed reduced to 10 knots. Smiths Knoll was reached at 0035h 1 November and from then until 0830h the full acoustic survey equipment was run to test it thoroughly and, in passing, to see if there were any signs of the East Anglian herring in the area. The towed body was retrieved at 0830h at The Falls and passage to Cornwall resumed at normal speed. Good conditions prevailed throughout the passage and the acoustic survey of the Cornish mackerel fishery was begun at 1334h 2 November at a point approximately 10 miles S.S.W. of the Wolf Rock. The survey, with occasional mid-water trawl hauls, continued uninterrupted until 1900h 4 November when westerly gales prevented any further work. A brief moderation during the afternoon of 5 November allowed a further 80 miles of surveying to be carried out south of the Eddystone but severe gales returned at 2039h that evening necessitating more dodging. The ship continued to dodge throughout 6 November but some feathering was possible during the afternoon as the ship steamed slowly ahead. The narrowbeam towed body was successfully connected and launched in difficult conditions during the evening and target strength trials were carried out that night while the ship continued to dodge. Two hauls were made on 7 November to identify fish giving signals measured in these trials. One more haul east of the Eddystone and associated with the survey was made on the 7th before conditions deteriorated yet again, resulting in dodging until 0430h 8 November. In improving weather passage was made to the point 10 miles S.S.W. of the Wolf Rock to resume the survey to the north of the Cornish peninsula. This survey was completed between 1219h and 0233h 9 November.

A rectangular area approximately 60 miles x 40 miles across the Bristol Channel and St Georges Channel was worked for 0-group mackerel from 0233h 9 November until 0130h 11 November. The acoustic survey equipment was run continuously during this period and six mid-water and four bottom trawls were made. The ship then moved during the early morning of 11 November to a 'box' of similar size centred 90 miles west of Lands End, where the same kind of survey was repeated between 1003h 11 November and 1800h 13 November. Six mid-water and four bottom trawl hauls were made in this area. Only one short interruption of 4 hours for bad weather on the 11th was experienced during this period.

A move was then made to Gt Sole Bank arriving at 0021h 14 November to begin another box survey, again of about 60 miles x 40 miles. Poor weather conditions during the day deteriorated steadily until the ship was forced to dodge at 0005h 15 November in severe north-westerly gales. These persisted until 0830h 16 November when further work at Gt Sole Bank was abandoned and course was set for Shamrock Canyon. Only part of the Gt Sole Bank survey was completed and only three mid-water trawl hauls were made.

The oceanographic section along Shamrock Canyon was completed between 2000h 16 November and 0700h 17 November, after which course was set back

toward Wolf Rock. The acoustic equipment was run and three mid-water hauls were made during this passage. It had been hoped that target strength work might be carried out in the general area of the Wolf Rock but arrival there at 21:14h 17 November coincided with another westerly gale. Sheltered conditions were found to the east of the Lizard off Dodman Point and target strength measurements were made there during the morning of 18 November. Two final mid-water hauls were made before work was terminated and course set for Grimsby at 1300h 18 November. After a good passage the ship docked there at 0530h 20 November.

RESULTS

1. Most of proposed survey grid of the Cornish mackerel fishery area was completed but the two most easterly legs off Start Point were abandoned because of time lost to bad weather. Heavy fish traces were seen in the area to the south of the Wolf. These traces were being fished by at least 3 large vessels on the night of 12 November. One haul by CIROLANA in this area yielded an estimated 140 baskets of mackerel in half an hour, mostly in the length range 25-32 cm. In no other area of the survey were similar traces seen and the only other concentration of fishing vessels working was seen approximately 25 miles south of the Lizard where foreign trawlers were working on 8 November. Tows on fleck type traces at the southern limit of the survey area ($49^{\circ}30'N$) yielded small mackerel of 15-18 cm total length in quantities up to 2000 fish for 40 minutes tow, between longitudes $04^{\circ}34'W$ and $05^{\circ}58'W$. A single tow on 17 November further south and west at $49^{\circ}10'N$ and $06^{\circ}40'W$ yielded more than 600 fish of the same size for less than an hour. These fish were almost certainly 0-group and in this respect the carrying out of Aim 1 went some way toward achieving Aim 2.

There was no opportunity to observe the area of activity of the feathering fleet, the ship's presence inshore near Mounts Bay and Falmouth Bay coinciding with either bad weather or darkness hours or both.

2. Time lost to bad weather set limits on the areas that could be reached in the 0-group survey and plans to work west of Ireland had to be abandoned. No 0-group mackerel were found by either mid-water or bottom trawls in the Bristol Channel/St Georges Channel box but small catches of adult mackerel were made by both gears in the deep water of the St Georges Channel. A few 0-group mackerel all between 15 cm and 19 cm total length were taken in the West Scillies box by mid-water trawl but no large catches were made. No adult mackerel were taken here by either method. Very little fishing was possible in the Gt Sole Bank box but one mid-water haul yielded 2 0-group fish. Little was seen on the echo sounder and the general impression was that pelagic species were scarce there. Reference has already been made above to the 0-group taken in mid-Channel and to the south-west of the Cornish peninsula.

Very few young horse mackerel indeed were seen in the hauls made in mid Channel but in the areas to the west both adult and 0-group fish were taken. In the Bristol Channel box both young and adults were taken by the bottom trawl and the 0-groups alone by the mid-water gear. 0-group fish were found to be between 5 cm and 13 cm total length but catch rates of fish of this size never exceeded 30 fish per hour's tow. In the West Scillies Box however numbers of 0-group taken were much greater, being up to 700 fish for a 40 minute tow with the mid-water trawl. Good catches were taken by all hauls with the mid-water trawl in this box but only one

bottom haul (in the most easterly part of the box) yielded adult scad. At Gt Sole Bank, as with the mackerel, no worthwhile conclusions could be drawn, with only 2 fish resulting from the 3 hauls.

Although 0-group scad were not present in hauls made due south of Cornwall in mid-Channel, they were mixed with the 0-group mackerel caught some 70 miles off Lands End on 17 November, some 141 being caught in less than an hour.

Mention is made here of the problem of selection within a shrimp netting cod-end of fish of the size of 0-group horse mackerel. In one haul where large numbers of fish were caught many more were observed washing down the ramp when the cod-end was hauled.

3. The improved spatial resolution of the narrow beam transducer was demonstrated and single fish echoes were easily separated out and recorded. The sampled fish were identified by feathering and trawling during one set of trials but catches were rather small for accurate sizing of the population. 6 rolls of magnetic tape records were obtained for further analysis at the Laboratory.

4 & 5. Sampling of mackerel and horse mackerel otoliths for ALKs was carried out at the appropriate levels in all areas where these species were taken.

6. A sample of fish believed to be 1 group was obtained for Mr Mackenzie from the large haul taken south of the Wolf Rock on 2 November.

7. Blood samples were taken from 18 mackerel and processed and deep frozen for Dr Greenwood.

8. A single oceanographic section along the line of Shamrock Canyon was worked with XBT casts every half an hour while steaming at 12 knots from the edge of the abyssal plain to the continental shelf. To the unpractised eye it appeared that some sort of thermocline still existed. The records await further analysis at the Laboratory. Surface salinity samples were taken at the time of each cast and the surface thermograph was run throughout the cruise.

MISCELLANEOUS

1. 20 x 10 kg boxes of small gadoids were deep frozen as fish food for F.C.G.

2. Dolphins were observed playing around the ship while working in the west Scillies area and two were unfortunately caught in the Engel trawl and drowned. Their bodies were deep frozen and brought back for Dr Christine Lockyer of the Sea Mammal Research Unit at Cambridge.

3. One dab was caught and found to be carrying what appeared to be a tumour. The fish was preserved and brought back for FDL Weymouth.

4. Mackerel taken from the last midwater haul of the cruise south of Dodman Point were found to be very badly scarred with large raw patches around the head and flanks. One fish appeared to have suffered this damage but was in the process of healing with a blister of silver grey mucous covering the affected areas. It was thought likely that these fish were examples of the effect of "slipping". The fish were deep frozen for examination at the Laboratory.

5. The 'test' run of the acoustic survey equipment from Smiths Knoll revealed no traces that might have been East Anglian herring.
6. Samples of blue whiting otoliths from west of Scillies were obtained for Mr Dann.
7. Two small samples each of herring and sprat from Bigbury Bay and Eddystone were deep frozen for Mr Wood.
8. Acoustic noise measurements for both hull and towed body transducers were made for a full range of ship's speed.

B C Bedford
20 November 1979

Seen in draft: THF
WJS

Initialed: AJL

Distribution:

Basic list +

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