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AMM

In Confidence - Not to be quoted without prior reference to the Laboratory

FRV "Clupea"

6CR82

Cruise 6/82

REPORT

21 June - 30 July 1982

Objectives

- 1 To sample the Nephrops populations in all major Nephrops fishing areas, and to obtain basic biometric parameters of each population.
- 2 To examine, using underwater television and cameras, Nephrops communities in the Sound of Jura and the Clyde.
- 3 To examine, using underwater television and cameras the areas in and adjacent to the sewage sludge dumping grounds off Garroch Head.
- 4 To collect samples of sediment from the dumping ground for benthic and chemical analysis.
- 5 To collect water samples from specified positions for analysis of radio-caesium contamination.
- 6 To collect live specimens of lesser spotted dogfish for the Institute of Marine Biochemistry.
- 7 To collect samples of sediment from the Garroch Head dumping ground for microbiological analysis.

Narrative

The cruise started at Buckie on 21 June, and Nephrops trawl hauls were made at five stations in the Moray Firth. "Clupea" then proceeded to the Firth of Forth making a trawl haul at Arbroath en route. Nine trawl hauls were made at stations in the Forth. "Clupea" spent the weekend 26-27 June at Leith, but was unable to leave on schedule until spare trawls had been loaded on board to replace damaged gear. After recommencing trawl work "Clupea" then left the Forth on 30 June and steamed north for the Orkneys. Two trawl hauls were made on the Noup grounds, "Clupea" then steamed to Kirkwall.

Leaving Kirkwall at 0005 on 5 July, "Clupea" headed for the North Minch, where six trawl hauls were made before proceeding to Stornoway on 7 July. The period 8-12 July was scheduled as a long weekend, and the scientific staff returned to Aberdeen. The crew and scientists rejoined "Clupea" on 13 July, and the vessel proceeded to the South Minch where eight trawl hauls were made on different Nephrops grounds. The weekend 17-18 July was spent in Oban, where additional scientific equipment was loaded and two scientists joined the ship.

"Clupea" left Oban on 19 July, two trawl hauls were made in the Sound of Jura before entering the Clyde further scientific equipment was loaded at Campbeltown, and six trawl hauls were made at stations in the Clyde. On 22 July four sets of sedimentation traps were laid on the Garroch Head dumping ground prior to the arrival of the two dump ships. A series of 12 grab hauls were made at selected positions on and around dump area. Sediment samples were taken for analysis.

A transect over the dump was made using the camera sledge. On 23 July, the sedimentation traps were recovered but some damage was sustained during recovery, and "Clupea" then steamed for Campbeltown. On 26 July after a trawl haul in Kilbrannan Sound, the sedimentation traps were again set on the Garroch Head dump, and grab samples were taken from the vicinity of each trap position. A series of camera transects were made from east to west across the dump and adjoining areas.

The traps were retrieved on 27 July. Two trawl hauls were made, one across the dumping ground, followed by a series of camera transects from north to south across the dump.

"Clupea" then headed for Troon. The scientific staff left the vessel at Troon on 28 July, and "Clupea" set sail for Aberdeen where she arrived on 30 July.

Results

Nephrops trawling: Samples of the Nephrops catches from all areas fished were taken for biometric analysis. The measurements made included total length, carapace length and tail width (mm), and total weight and tail weight (gm). The weights were obtained using an electronic balance connected to a Commodore computer, which eliminated errors due to the motion of the vessel, and thus allowed weighing to be undertaken at sea.

A total of 2599 Nephrops (1253 ♀ and 1346 ♂) were measured in this way. Regression equations of length and weight are currently being calculated.

Catches of Nephrops were very poor in the Moray Firth and Firth of Forth, but generally good on the west coast.

White-fish catches consisted primarily of cod, haddock and whiting. On the west coast quantities of lesser spotted dogfish were caught, and these were retained and transported to the Institute of Marine Biochemistry. Samples of trawled Nephrops and white-fish from the Garroch Head dumping ground, and from Ardrossan were retained for heavy metal analysis.

Garroch Head sludge dumping ground: Sediment traps were deployed 10 m above the bottom at four stations along a north-easterly axis corresponding to 0, 0.75 miles, 1.5 miles and 2.25 miles from the centre of the dump. They were deployed on two occasions for about, 24 hours, and in each case two sludge loads were dropped. The best data set was from the second collection when all the traps were recovered. It showed clearly that over 0.75 miles from the dump site centre, little sludge was collected. This confirmed data from the first collection when one set (0.75 miles) was lost, but little sludge was evident at 1.5 miles and beyond.

Sediment samples from 16 stations on and around the dump were taken for faecal bacteria analysis. Total coliform counts ranging from 1000 to >15000 gm^{-1} were obtained, with E. coli counts from 10 to 160 gm^{-1} . Faecal streptococci counts ranged from 0 to 580 gm^{-1} . The highest counts were obtained from samples taken closest to the centre of the dump. Samples of the material taken in the sedimentation traps was also examined. Highest counts were again obtained close to the centre of the dump; total coliforms 1750 ml^{-1} , E. coli 200 ml^{-1} and faecal streptococci 7000 ml^{-1} .

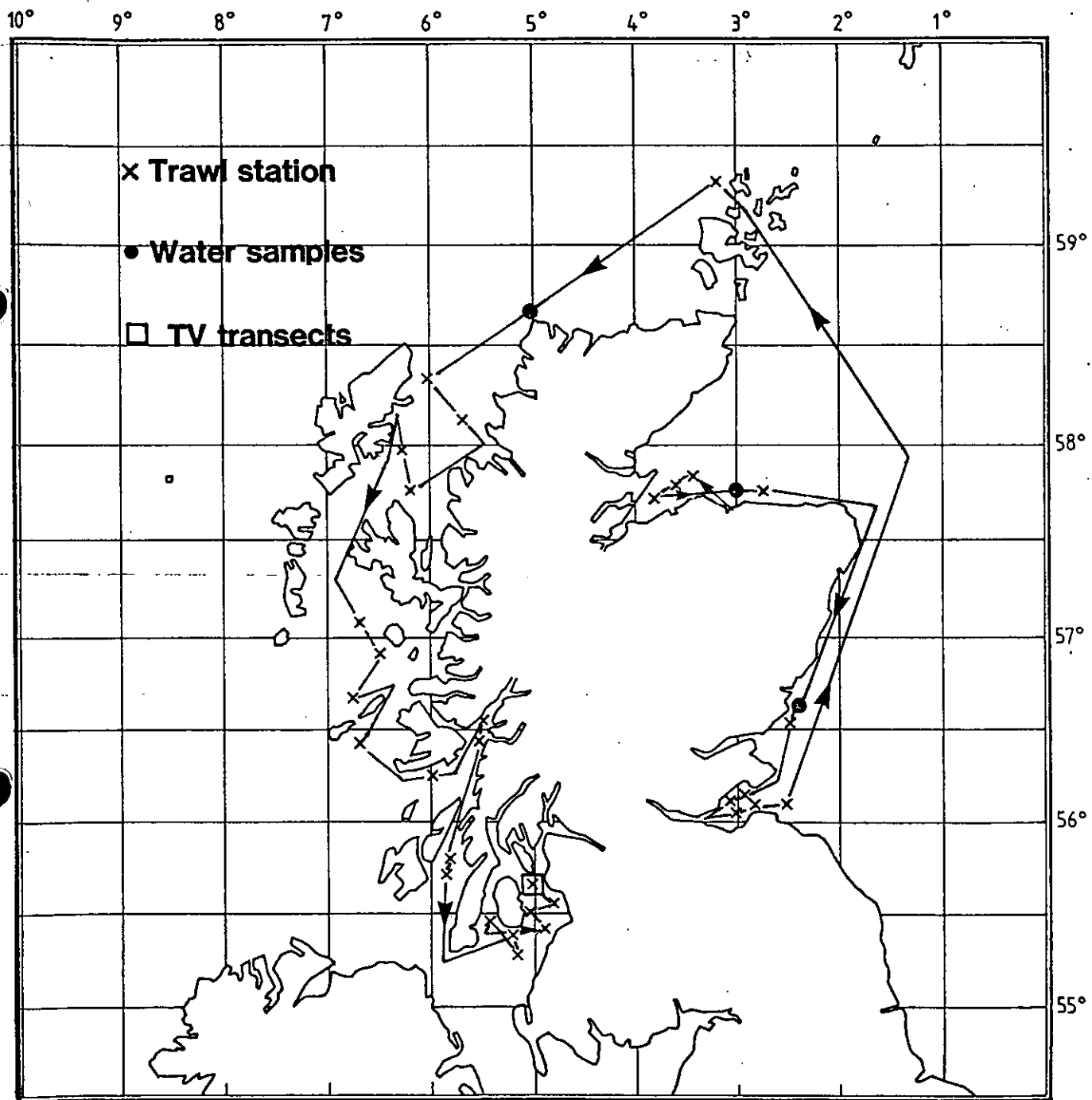
Photographic survey: A series of nine transects were made on the N-S and E-W axes of the Garroch Head dump. Preliminary analysis of the results revealed the central area to be almost devoid of epifauna and to have a different sediment texture to areas outside the dump ground. In areas away from the dump the characteristic fauna of a Nephrops community was observed. Owing to lack of time, objective 2 was not carried out.

Radio-caesium analysis: Water samples were taken at stations off Buckie, Arbroath and Cape Wrath.

Seen in draft: G Geddes

F G Howard

11 November 1982



FRV Clupea 21/6—30/7/82

CR6/82