IN CONFIDENCE: NOT TO BE QUOTED WITHOUT REFERENCE TO THE LABORATORY

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CRUISE REPORT

FRV "MARA"

1 - 29 August 1973

OBJECTIVES:

(i) Hydrobiological survey of the Firth of Clyde.

(ii) Near bottom plankton sampling with Dr Beyer's bottom plankton sampler.

(iii) Juvenile plaice survey.

NARRATIVE:

FRV "Mara" arrived at Troon from Buckie during the late evening of 1 August and the scientific staff - Messrs Burns, Ballance and Dunn - joined. The hydrobiological sampling of the grid of stations embracing most of the eastern half of the Firth of Clyde was commenced on 2 August, and completed on Friday 10, after a repeat sampling of the northernmost line of 5 stations. During this period Mr Ballance had to leave because of domestic matters.

"Mara" left Troon on the morning of Monday 13, and sailed for Upper Loch Fyne where current measurements were made on the 14th. Having made a return passage to Troon during the 15th, "Mara" put Messrs Burns and Dunn ashore and picked up Drs Beyer, Hesthagen and McIntyre to conduct a bottom plankton survey in the Garroch Head area. "Mara" then returned to Troon for the weekend when Mr Adams replaced Dr McIntyre.

"Mara" left Troon on the early morning of 20 August and proceeded to Upper Loch Fyne where further bottom plankton samples were obtained with Dr Beyer's sampler and the vessel then returned to Troon in the late afternoon of the 21st. The scientific staff left that evening and Dr Beyer's equipment and samples were taken off.

On the morning of 22 August, "Mara" sailed from Troon with Messrs Murison, Basford, Poxton and Bain (student ASO) on board to carry out a survey of plaice nursery grounds off Arran, Bute and the Mull of Kintyre. (On the nights of 22 and 23 August Mr Basford stayed ashore). The "White boat" of the Benthos section was towed by "Mara" for the purpose of operating the 2-metre beam trawl in shallow water. During the three day trip beam trawl samples were collected from Whiting Bay, Campbeltown Loch, Carradale Bay, Skipness Bay, St Ninians Bay and Scalpsie Bay. Samples of Tellina tenuis were also collected from the beaches at Whiting Bay and Carradale for pesticide analyses.

"Mara" returned to Troon at 1400 hours on 24 August where the scientific staff left the ship to continue the land-based part of the plaice survey.

Messrs Burns and Hay rejoined "Mara" on the evening of 26 August, and the Irvine Bay line of stations of the hydrobiological survey was sampled before "Mara" made a return passage to Buckie.

RESULTS:

Hydrobiological Survey

Temperature and salinity: Surface temperatures ranged from 11.85°C to the east of Arran to 14.58°C in the shallow water of Irvine Bay, while bottom temperatures in the deeper water off Garroch Head reached 8.32°C. The 21-day interval between the two samplings of the Irvine Bay line, showed that the average surface temperature had increased from 13.65°C to 13.94°C.

Salinity showed the least variation of all the parameters measured, the values ranged from 33.5‰ off the Arran coast to 33.1‰ in Irvine Bay. These increased uniformly with depth to 33.9‰ off Arran.

Oyxgen: The highest oxygen surface values, from 6.07 to 6.46 ml of O_2 per litre, were recorded in the large central area, with lower values from 5.65 to 5.95 ml/l towards the coasts. In terms of saturation these figures range from 108% down to 91% for the highest and lowest figures quoted. Bottom oxygen values, especially in the deeper water off Arran, all showed undersaturation between 63 and 89%.

Nutrients: The results of nutrient sampling showed that, except along the coasts of Arran and the Scottish mainland, the general level of surface values were 0.4 to 0.6 µg-at P/l and 2.5 to 3.5 µg-at Si/l. These figures fell to 0.2 for phosphate and 0.4 for silicate in Irvine Bay, and rose to 2.1 (phosphate) and 5.7 (silicate) at 55°42'N 5°10'W where recent sludge dumping had taken place. Bottom nutrient values also showed the same trend with 1.22 units of phosphate and 10.3 of silicate in the deep water near Arran, and 0.5 and 3.2 respectively in Irvine Bay.

Other parameters: Samples were also taken for nitrate, chlorophyll and carbon estimation, at all stations, besides net tows at specific stations for plankton counts and heavy metals estimation.

Near bottom plankton

Detailed analysis and evaluation of these samples are not, as yet, available, but most were characterised by very large numbers of Sagitta.

Juvenile plaice survey

None of the collected material has been examined in detail yet, but in general the numbers and densities of plaice found appear similar to those from the same areas sampled in September 1972.

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