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FRV *Clupea*

Cruise 0601C

REPORT

25 April - 10 May 2001

Ports

Loading:	Fraserburgh
Unloading:	Fraserburgh
Working:	Ardrossan 27/28 April, Rothesay 29/30 April, 1/2 May, Kyle 4/5 May, Scalloway 6/7 May, Bruray Harbour 7/8 May

Personnel

D Saward	25 April - 10 May	(In charge)
L Adams	25 April - 10 May	
C Shand	25 April - 10 May	
D Walker	27 April - 5 May	
D Moore	29 April - 5 May	
E Pizzolla	29 April - 2 May	
P Stainer	4 May - 10 May	

Fishing Gear

Modified 3 metre light beam trawl.

Objectives

1. To undertake a grab survey in the vicinity of the former sewage sludge disposal sites off Garroch Head, to collect seabed samples for microbiological analyses on FRV *Clupea* and physical and chemical analyses at the FRS Marine Laboratory (FRS ML).
2. To undertake a Craib corer survey of the former sewage sludge disposal sites off Garroch Head, to collect seabed sediment samples for Eh/pH analyses on FRV *Clupea*.
3. To undertake an Agassiz trawl survey in the vicinity of the former sewage sludge disposal sites off Garroch Head to identify the predominant benthic epifauna species and, if possible, to collect representative species for chemical analysis at FRS ML.
4. To undertake an underwater television survey in the vicinity of the former sewage sludge disposal sites off Garroch Head, to assess the distribution of man-made debris and to supplement the Agassiz trawl surveys.
5. To undertake beam trawl surveys at selected locations in the Firth of Clyde, to collect *Buccinum* and *Neptunia* spp. for TBT and DBT analyses at FRS ML.

6. To undertake grab surveys at selected dredged material disposal sites in the Firth of Clyde, the North Channel, the Sea of Hebrides and the Minch, to collect seabed sediment samples for physical and chemical analyses at FRS ML.
7. To undertake underwater television surveys at selected dredged material disposal sites in the Firth of Clyde, the North Channel, the Sea of Hebrides and the Minch, to confirm the levels of man-made debris and to identify the predominant benthic epifauna species.
8. To undertake grab surveys at selected dredged material disposal sites around the Shetland Isles and Fair Isle, to collect seabed sediment samples for physical and chemical analyses at FRS ML.
9. To undertake underwater television surveys at selected dredged material disposal sites around the Shetland Isles and Fair Isle, to confirm the levels of man-made debris and to identify the predominant benthic epifauna species.
10. To undertake underwater television surveys at the Helmsdale and Fraserburgh dredged material disposal sites, to confirm the levels of surface debris and to identify the predominant benthic epifauna species.

Out-turn days per project

14 days AE02n
2 days AE11p

Narrative

Scientific equipment was loaded on board *Clupea* on 18 April. Scientific staff joined the vessel, and completed loading and setting up of equipment on the morning of 25 April. *Clupea* sailed at 1330 hours and made passage for the Firth of Clyde. At 1000 hours on 26 April, a CTD deployment was made north of Rona, on request of the Coastal Hydrobiology Group, and at 1030 hours the vessel re-commenced its passage to the Clyde.

Clupea arrived at the Garroch Head survey area at 0800 hours on 27 April to commence Objective 4. Underwater television surveys were suspended due to very poor visibility, and Objective 1 commenced. *Clupea* berthed in Ardrossan overnight to allow for onboard processing of microbiological samples. Objective 1 was completed on 28 April, and Objective 4 re-commenced. *Clupea* anchored in Kilchattan Bay overnight and the remaining microbiological samples were processed. Objective 4 resumed on 29 April and was suspended in the evening to allow the vessel to proceed to Rothesay for D Moore and E Pizzolla to join the cruise. Objectives 3 and 5 commenced on 30 April. *Clupea* anchored overnight at Kilchattan Bay. Objectives 2 and 3 were completed on 1 May and the vessel berthed overnight in Rothesay to allow E Pizzolla to disembark on the morning of 2 May.

On 2 May, Objective 5 continued with *Clupea* anchoring in the Holy Loch overnight. Objective 5 was completed at 1515 hours on 3 May and the vessel departed the survey area to steam to Kyle. Arrived at Kyle at 1145 hours on 4 May. P Stainer joined the vessel at 1730 hours. At 0700 hours on 5 May, D Moore and D Walker disembarked and the vessel departed Kyle to steam to Foula. At 0930 hours a second CTD dip was made north of Rona on request of the Coastal Hydrobiology Group. At 1000 hours *Clupea* resumed passage to Shetland.

Arrived Foula at 0645 hours on 6 May and commenced Objectives 8 and 9. Departed Foula at 0945 hours and proceeded to Scalloway survey area. Departed Scalloway at 1530 hours and proceeded to Punds Voe survey area. At 1615 hours *Clupea* proceeded to Scalloway where she berthed overnight. *Clupea* departed Scalloway at 0700 hours on 7 May and proceeded to Cullivoe survey area. Operations were completed at 1500 hours and the vessel proceeded to Out Skerries survey area. Operations were completed at 1845 hours and *Clupea* berthed overnight in Bruray Harbour, Out Skerries. At 0800 hours on 8 May, the vessel departed Bruray and proceeded to North Haven, Fair Isle survey area. Survey operations commenced, completing Objectives 8 and 9, at 1615 hours and *Clupea* made passage for Helmsdale. Arrived Helmsdale at 0330 hours on 9 May and went to anchor until 0800 hours. Objective 10 commenced at 0830 hours. Survey operations were completed at 1030 hours and the vessel departed for Fraserburgh survey area. Commenced and completed survey operations at Fraserburgh between 1630 hours and 1730 hours. With the cruise objectives having been completed one day ahead of schedule (due to extremely favourable weather conditions), *Clupea* proceeded to Fraserburgh. Scientific staff commenced the demobilisation of equipment. At 0800 hours on 10 May D Saward disembarked to return to Aberdeen. At 1400 hours, L Adams, P Stainer and C Shand completed unloading of equipment and returned to Aberdeen.

Results

1. Grab sampling was undertaken at a total of 54 sampling stations in the vicinity of the Garroch Head sewage sludge disposal site, the former Garroch Head sewage sludge disposal site and the adjacent control areas. Fifty four Day grab deployments were made, and 54 seabed sediment samples collected. Sediment samples were processed for microbiological determinands onboard FRV *Clupea* and also sub-sampled and frozen for physical and chemical analyses at FRS ML.
2. Corer sampling was undertaken at a total of 13 of the Objective 1 grab sampling stations. Sixteen Craib corer deployments were made, and 13 core samples were collected. Eh/pH measurements undertaken onboard FRV *Clupea*.
3. Eleven Agassiz trawls of approximately 15 minutes duration were undertaken. The benthic epifauna present in the trawls were identified and enumerated on FRV *Clupea*, to compare the epifauna populations.
4. Eleven towed sledge underwater television transects, of varying duration, were undertaken.
5. Sixteen Beam trawls of approximately 30 minutes duration were undertaken at six selected locations. Samples of *Buccinum* and *Neptunia* spp. were retained for chemical analyses at FRS ML. Grab sampling was undertaken at each of these locations to collect sediment samples for chemical and physical analyses at FRS ML. Fourteen Day grab deployments were made, and 12 seabed sediment samples collected.
6. Objective deleted from cruise requirements.
7. Objective deleted from cruise requirements.
8. Grab sampling was undertaken at a total of 45 sampling stations in the vicinity of dredge material disposal sites at Foula, Scalloway, Punds Voe, Cullivoe, Out Skerries and Fair Isle. One hundred and nineteen Day grab deployments were made, and 19 seabed

7. Objective deleted from cruise requirements.
8. Grab sampling was undertaken at a total of 45 sampling stations in the vicinity of dredge material disposal sites at Foula, Scalloway, Punds Voe, Cullivoe, Out Skerries and Fair Isle. One hundred and nineteen Day grab deployments were made, and 19 seabed sediment samples collected. All sediment samples were frozen for physical and chemical analyses at FRS ML.
9. Nine towed sledge underwater television transects, of varying duration, were undertaken in the vicinity of dredge material disposal sites at Foula, Scalloway, Cullivoe, Out Skerries and Fair Isle.
10. Three towed sledge underwater television transects, of varying duration, were undertaken in the vicinity of dredge material disposal sites at Helmsdale and Fraserburgh.

L C Adams
25 September 2001

Seen in draft: A Simpson, OIC

Cruise 0601C - Sampling Locations

