

R1/6

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FRV *Clupea*

Cruise 0903C

REPORT

15-31 May 2003

Loading Port: Fraserburgh

Unloading Port: Fraserburgh

Working Ports: Rothesay, Ardrossan, Tarbert, Ullapool and Stornoway

Personnel

J Mckie	(In charge 21-31 May)	21-31 May
P Hayes	(In charge 15-21 May)	15-31 May
D Moore	15-25 May	
D Walker	15-31 May	
C Shand	15-31 May	
A McIntosh	15-21 May	
S O'Neill	15-21 May	
P Stainer	25-31 May	
C Shaw	25-31 May	
K Doig	21-25 May	
R Bartlett	26 May	Leeds University
J Helliwell	26 May	Leeds University

Fishing Gear

BT 158

Sampling Gear

TV sledge, TV drop frame, day grab, sieve table, shlockevitz corer and agassiz trawl.

Out-turn Days Per Project: 13 AE02n; 2 AE02a (two days lost due to engine problems)

Objectives

1. To undertake a drop frame television and RoxAnn surveys of the Fraserburgh dredged material disposal site to assess the condition of the seabed, identify the predominant benthic epifauna species, and the distribution of man-made debris. To complete the survey undertaken during cruise 0802C.
2. To undertake Agassiz, gravity corer, grab, RoxAnn and underwater television (UWT) surveys of the Stornoway dredged material disposal site.
3. To undertake Agassiz, gravity corer, grab, RoxAnn and underwater television (UWT) surveys of the seabed at Garroch Head, Cloch Point, Hunterston and Colonsay.

4. To collect fish and biota samples for biological effects measurements using bottom and/or beam trawl at Garroch Head, Cloch Point, Hunterston and Colonsay. Sample preparation and preservation to be undertaken onboard *Clupea*.
5. The biological effects samples for Objective 4 to be measured for EROD, PAH and PCB's, PAH metabolites and Vtg.
6. Sediment samples for Objectives 2-5 and 8, 10, 11-13 will be analysed for heavy metals, PCB's, PAH's and TBT in Aberdeen. Particle size and organic carbon will also be undertaken.
7. To undertake Agassiz, gravity corer, grab, RoxAnn and underwater television (UWT) surveys of the Ullapool and Mallaig dredged material disposal sites. This objective is time permitting and should be regarded as provisional.
8. To undertake a long coring survey in Loch Fyne, samples to be prepared and analysed by Leeds University.
9. To undertake grab, RoxAnn and underwater television (UWT) surveys of the Rosneath disused sea disposal site. (Additional work).
10. To undertake grab, RoxAnn and underwater television (UWT) surveys in the vicinity of the Holy Loch former submarine refitting base. (Additional work).
11. To undertake grab, RoxAnn and underwater television (UWT) surveys of the Birch Point disused sea disposal site. (Additional work).
12. To undertake grab, RoxAnn and underwater television (UWT) surveys of the Guillian Bank disused sea disposal site. (Additional work).

Narrative

Scientific equipment was loaded and set up on the 14 May and scientific staff joined the vessel at 1045 hours on 15 May and completed setting up the scientific equipment. *Clupea* departed from Fraserburgh at 1845 hours to sail to Colonsay, however, due to engine problems the ship had to return to port at 2145 hours where she stayed until 17 May. Following successful sea trials on 16 May, during which a minor problem was identified and repaired in Fraserburgh, the ship set sail for Colonsay at 0650 hours on 17 May arriving at 1710 hours on 18 May. The trawl survey commenced immediately and was completed along with the grab survey and biological samples processed at 2245 hours when the vessel was at anchor. On 19 May the *Clupea* left Colonsay and sailed for Garroch Head disposal site to start trawling, the survey was completed before the vessel sailed for Rothesay docking at 1930 hours. The next morning the *Clupea* sailed for Cloch Point to commence the trawl survey completing the work at 1315 hours, the vessel then proceeded to Skelmorlie to undertake a trawl and grab survey. On completion of the work programme at Skelmorlie the vessel picked up grab samples at Cloch Point before docking in Rothesay at 1830 hours. Departed at 0700 hours for Hunterston on 21 May to undertake trawl and grab surveys, completed surveys and then proceeded to Garroch Head to undertake same. Having completed all the trawl surveys, and half of the grabbing, outlined in Objective 5 the ship sailed for Ardrossan to embark J Mckie and K Doig and disembark A McIntosh and S O'Neill. On 22 May the vessel left Ardrossan and sailed to the Garroch Head disposal site to undertake the TV and Agassiz trawl surveys and start sediment coring. On completion of the day's objectives the *Clupea* sailed to Rothesay. At 0700 hours on 23 May the vessel departed Rothesay for the Cloch Point disposal site to commence the UWT and RoxAnn surveys followed by the Agassiz trawl survey, grab and core samples were also collected. That evening the vessel sailed for Rothesay having completed the remaining work at Cloch Point all

but two cores and some of the grabbing, the vessel docked at 1900 hours. *Clupea* sailed for Cloch Point at 0800 hours the following day to collect the remaining cores and grabs. On completion of the work programme at Cloch Point the vessel proceeded to the Rosneath disused spoil ground to undertake RoxAnn and UWT surveys. At 1520 hours following completion of these surveys the *Clupea* proceeded to the Holy Loch to undertake one UWT tow. Due to very poor visibility the work was aborted and the vessel sailed for Rothesay to exchange scientific staff, *Clupea* docked at 1730 hours. Following the embarkation of Carrie Shaw and Paul Stainer and the disembarkation of Derek Moore and Katie Doig on 25 May *Clupea* sailed from Rothesay at 0900 hours making for Garroch Head disposal ground to complete the coring survey. On completion of the coring, which completed all the work outlined in Objective 4, the vessel sailed for Birch Point disused disposal ground to undertake a UWT and RoxAnn survey. The UWT and RoxAnn survey commenced at 1250 hours and was completed before the vessel set sail for Tarbert arriving at 1915 hours. Following the embarkation of two visitors from Leeds University, *Clupea* sailed at 0730 hours for the coring stations in Loch Fyne. On completion of this work *Clupea* landed the core samples and personnel at Tarbert before sailing for Ullapool at 1110 hours. En-route to Ullapool it was decided to drop the survey work at Mallaig in favour of spending more time at the Stornoway disposal site later in the cruise. *Clupea* started the grab survey immediately on arrival at Ullapool, completing the work for Objective 8 before docking in Ullapool for the evening. Because of seabed conditions it was decided to drop the coring and Agassiz trawl surveys. *Clupea* set sail for Stornoway at 0600 hours on 28 May arriving at 1030 hours and commenced work immediately. On completion of the first phase of the survey, which included UWT, RoxAnn and grabbing the *Clupea* docked in Stornoway for the evening. At 0800 hours on 29 May *Clupea* sailed for the dredged material disposal site to complete the work for Objective 2. Immediately on completion, *Clupea* set sail for the Moray Firth arriving at Guillam Bank at 0600 hours on 30 May to start a limited UWT, RoxAnn and grab survey. On completion of the survey work at Guillam bank *Clupea* set sail for Fraserburgh sea disposal site to complete the UWT survey started in 2002. *Clupea* docked in Fraserburgh at 1730 hours on 30 May, giving the scientific staff time to complete a preliminary assessment of the survey data and demobilise the equipment. Scientific staff departed the vessel after the unloading at 0945 hours and returned to Aberdeen.

Results

1. One UWT and RoxAnn transect was completed over the final part of the proposed new Fraserburgh dredged material disposal site, early results confirm that the site is extremely rocky and may not be suitable. Further data analysis will be undertaken in Aberdeen before deciding on its suitability as a long-term replacement for the existing site.
2. At Stornoway dredged material disposal site 17 grab samples were collected, 7 UWT transects were completed along with a detailed RoxAnn survey. Preliminary seabed bathymetry plots were produced on *Clupea* and will be finalised in Aberdeen. Early indications are that previous sea disposal operations have been undertaken outside the perimeter of the site on the seaward side, we noted and logged obvious concentration of manmade debris. These findings will be discussed with the harbour authority and will be referred to when drafting future sea disposal licences. Because of seabed conditions it was decided to drop the Agassiz trawling and coring.
3. A total of 12 trawls; 42 grabs; 8 long cores; 9 Agassiz trawls; 10 UWT and numerous RoxAnn transects were completed. The UWT transects were interrogated and observations recorded on the *Clupea* and the data will be integrated with the Agassiz trawl and grab sample data in Aberdeen. Seabed bathymetry plots will be prepared and an assessment made of the level of anthropogenic contamination at each site.

Numbers of trawl and UWT transects completed at each site.

- Colonsay 1 trawl
- Skelmorlie 1 trawl
- Hunterston 2 trawls
- Cloch Point 4 trawls, 5 Agassiz, 6 UWT
- Garroch Head 4 trawls, 4 Agassiz, 4 UWT

4. All fish samples collected were processed and preserved for biological effects work in Aberdeen onboard *Clupea*.

Numbers of fish sampled at each site.

- | | |
|----------------|------------------------------|
| • Colonsay | 10 female and 10 male plaice |
| • Skelmorlie | 12 female and 8 male plaice |
| • Hunterston | 10 female and 10 male plaice |
| • Cloch Point | 14 female and 6 male plaice |
| • Garroch Head | 14 female and 6 male plaice |

5. The biological effects samples were returned to Aberdeen during the cruise for analysis.
6. Sediment samples were processed, catalogued and preserved for analysis in Aberdeen. Visual descriptions of the UWT transects were recorded and this data will be combined with positional and RoxAnn data and plots produced of the seabed bathymetry in Aberdeen.
7. Eleven grab samples were collected and samples preserved for the parameters listed in Objective 7, 4 UWT and 5 RoxAnn transects were completed at Ullapool dredged material disposal site. Considerable effort was made to classify the seabed by sediment type in and around the dumpsite to allow an assessment of its long-term suitability as a sea disposal site. Preliminary seabed bathymetry plots were produced on *Clupea* and these will be finalised in Aberdeen. The programme of work at Mallaig was cancelled to allow more time at the Stornoway dredged material disposal site.
8. Seven long cores, one grab sample and a water sample were collected from Loch Fyne and landed at Tarbert for processing and preservation in Lochgilphead before the sediment samples were returned to Leeds University for analysis.
9. Seven UWT and eight RoxAnn transects were completed over the disused spoil ground at Rosneath. Early data interpretation confirms that the seabed has not been detrimentally impacted, no significant manmade debris was recorded. The seabed in this area looks to be a productive nephrops ground. Preliminary seabed bathymetry plots were produced on *Clupea* and these will be finalised in Aberdeen. Grab sampling was not undertaken.
10. One UWT transect was started in the Holy Loch in the vicinity of the former floating submarine dock but had to be aborted due to poor visibility part way through.
11. Two UWT and five RoxAnn transects were completed over the Birch Point disused disposal site, no significant manmade debris were recorded. Preliminary seabed bathymetry plots were produced on *Clupea* and these will be finalised in Aberdeen. Grab sampling was not undertaken.

12. At the Guillam Bank disused cryolite disposal site four UWT and RoxAnn transects were completed covering approximately 25% of the disused dumpsite, in addition sediment samples from 11 grabs were collected for analysis back in Aberdeen. Visual analysis of the UWT transects show that there are no obvious traces of manmade debris over the survey area. Preliminary seabed bathymetry plots were produced on *Clupea* and these will be finalised in Aberdeen.

The scientific staff would like to thank the officers and crew for their first class co-operation and hard work during the cruise.

James Mckie
29 October 2003

Seen in draft: A Nicol, OIC *Clupea*