

R1/6

Not to be cited without prior reference to the Laboratory

FRV *Clupea*

Cruise 1693C

REPORT

30 August-7 September 1993

Ports

Loading: Fraserburgh
Unloading: Dundee
Working: Dundee (4-7 September)

Personnel

D Saward	SSO	30 August-7 September (in charge)
J McKie	HSO	30 August-7 September
L Goodwin	SO	30 August-7 September
S Forsyth	SO	30 August-7 September
M Burns	ASO	30 August-5 September

Fishing Gear

BT116 *Clupea* wing trawl

Objectives

1. To collect seawater samples from the St Abb's Head and Bell Rock sewage sludge disposal sites, and from areas adjacent to the sites, for microbiological analysis on FRV *Clupea*.
2. To collect seawater samples from the St Abb's Head and Bell Rock sewage sludge disposal sites, and from areas adjacent to the sites, for measurement of suspended solids.
3. To undertake transmissometer/CTD profiles at all sampling stations, to supplement the seawater sampling programme.
4. To collect seabed sediment samples from the St Abb's Head and Bell Rock sewage sludge disposal sites, and from areas adjacent to the sites, for particle size and heavy metal analyses in the Marine Laboratory, Aberdeen.
5. To collect seabed sediment samples from the St Abb's Head and Bell Rock sewage sludge disposal sites, and from areas adjacent to the sites, for microbiological analysis on FRV *Clupea*.

6. To undertake trawl surveys at the St Abb's Head and Bell Rock sewage sludge disposal sites, and at adjacent control locations, to collect samples of representative species for heavy metal analyses in the Marine Laboratory, Aberdeen.
7. To collect seabed sediment samples from dredge spoil disposal sites within the Firth of Tay and off Eyemouth, Dunbar, Anstruther, Carnoustie, Arbroath and Montrose, for particle size and heavy metal analyses in the Marine Laboratory, Aberdeen.
8. To collect seabed sediment samples from within the Tay estuary, for particle size and heavy metal analyses in the Marine Laboratory, Aberdeen.

Out-turn Days Per Project

Eight days, BEB1

Narrative

Scientific staff joined the vessel at Fraserburgh on the morning of 30 August 1993 to load additional scientific equipment. FRV *Clupea* then proceeded to the Montrose spoil ground to undertake the sampling outlined in Objective 7. On completion, the vessel proceeded to the St Abb's Head sampling area, and the work programme outlined in Objectives 1-6 was undertaken. Upon completion of the St Abb's Head work programme, the sampling outlined in Objective 7 was undertaken at the Eyemouth and Dunbar Spoil Grounds. The vessel then proceeded to the Bell Rock sampling area. En route, the vessel diverted to the Anstruther spoil ground to undertake the sampling outlined in Objective 7. Upon arrival at the Bell Rock sampling area, the work programme outlined in Objectives 1-6 was undertaken. The work referred to above was completed by the evening of 3 September. FRV *Clupea* then proceeded to Dundee to commence the sampling outlined in Objective 7 at the four Tay Estuary spoil grounds, the Carnoustie spoil ground and the Arbroath spoil ground. That sampling was completed by the evening of 4 September, and Mr Burns disembarked on the morning of 5 September to return to Aberdeen. The sampling outlined in Objective 8 commenced on 5 September, and was completed on the afternoon of 6 September. On 7 September, scientific equipment was unloaded at Dundee and scientific staff disembarked to return to Aberdeen. All work programmes were completed on time.

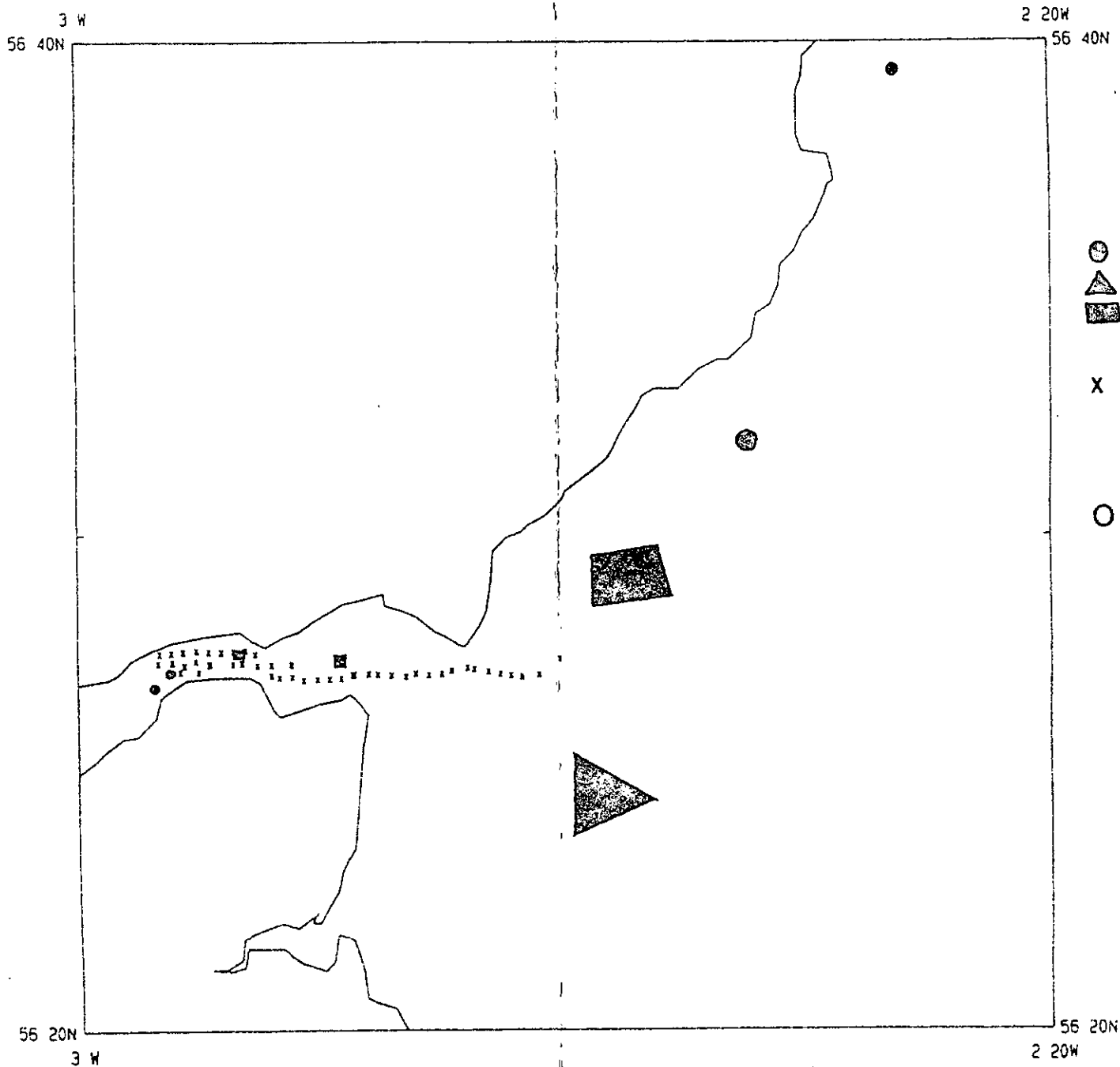
Results






1. Seawater samples were collected from three discrete depths at 10 sampling sites at St Abb's Head and 11 sampling sites at Bell Rock (including a control station at each disposal ground), for enumeration of faecal coliform and faecal streptococci. Low numbers of bacteria were isolated from the samples.
2. Seawater samples were collected from three discrete depths at 10 sampling sites at St Abb's Head and 11 sampling sites at Bell Rock (including a control station at each disposal area) for suspended solids measurements. Seawater samples were filtered onto membranes on board FRV *Clupea*.
3. Transmissometer/CTD profiles were undertaken at all water sampling stations in the Starboard and Bell Rock areas, to supplement the sampling programme.

4. Thirty five seabed sediments were collected at St Abb's Head for heavy metal analysis; and 26 for particle size analysis. Twenty nine seabed sediment samples were collected at Bell Rock for heavy metal analysis. At each of the control sampling stations, four samples were collected for the same analyses. Heavy metal and particle size data are not, as yet, available.
5. Thirteen seabed sediment samples were collected at St Abb's Head for faecal coliform, faecal streptococci and *Clostridium perfringens* spore determinations. Thirteen seabed sediment samples were collected at Bell Rock for the same determinations. Low numbers of bacteria were isolated from the samples.
6. At the St Abb's Head sewage sludge disposal site, samples of three fish species were collected for heavy metal analysis. At the Bell Rock sewage sludge disposal site, samples of two fish species were collected for heavy metal analysis. Heavy metal data are not, as yet, available.
7. A total of 54 seabed samples were collected from dredge spoil disposal sites within the Firth of Tay and off Eyemouth, Dunbar, Anstruther, Carnoustie, Arbroath and Montrose for particle size and heavy metal analyses. Heavy metal and particle size data are not, as yet, available.
8. A total of 109 grab stations in the Firth of Tay were sampled for seabed sediment. Heavy metal and particle size data are not, as yet, available.

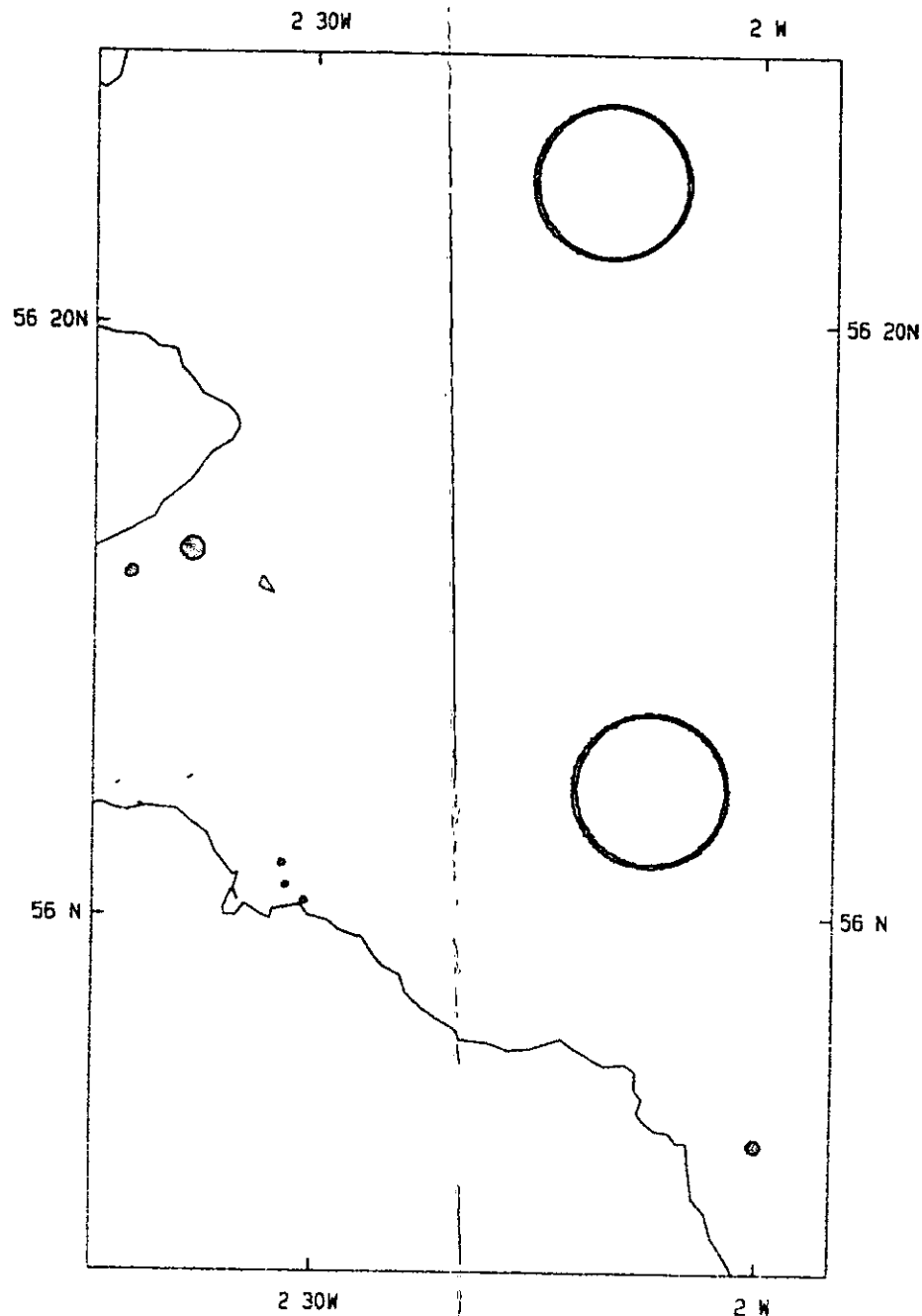
Derek Seward




May 1994



-  Dredge Spoil Disposal Sites
-  54 grab stations sampled for seabed sediments for heavy metal analyses and particle size analysis
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-  Tay Estuary Survey:
 109 grab stations sampled for seabed sediments for heavy metal analyses and particle size analysis.
-  Sewage Sludge Disposal Sites:
 - A) 64 grab stations sampled for seabed sediments:
 - i) 64 samples collected for heavy metal analyses
 - ii) 26 samples collected for particle size analysis
 - iii) 26 samples collected for microbiological analyses
 - B) 21 water stations sampled using 'Rosette' sampled for:
 - i) 63 samples collected for microbiological analyses
 - ii) 63 samples collected for suspended solid measuremer
 - iii) 31 transmissometer/CTD dip
 - C) 4 trawls undertaken using BT116 Clupea wing trawl, samples of two fish species collected for heavy metal analyses.

1693C- DREDGE SPOIL SITES AND SEWAGE SLUDGE DISPOSAL SITES SURVEY



-  **Dredge Spoil Disposal Sites:**
 54 grab stations sampled for seabed sediments for heavy metal analyses and particle size analysis
-  **Tay Estuary Survey:**
 109 grab stations sampled for seabed sediments for heavy metal analyses and particle size analysis.
-  **Sewage Sludge Disposal Sites:**
 - A) 64 grab stations sampled for seabed sediments:
 - i) 64 samples collected for heavy metal analyses
 - ii) 26 samples collected for particle size analysis
 - iii) 26 samples collected for microbiological analyses
 - B) 21 water stations sampled using 'Rosette' sampled for:
 - i) 63 samples collected for microbiological analyses
 - ii) 63 samples collected for suspended solid measurements
 - iii) 31 transmissometer/CTD dips.
 - C) 4 trawls undertaken using BT116 Clupea wing trawl, samples of two fish species collected for heavy metal analyses.