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FRV *Clupea*

Cruise 0793C

REPORT

7-20 April 1993

Personnel

J Morrison	PSO	(in charge 9-16 April)
K Patterson	HSO	(in charge 16-18 April)
P Copland	HSO	9-13 April
C Shand	HSO	9-18 April
I Gibb	SO	9-18 April
Y Stratoudakis	MSc Student	12-16 April

Objectives

1. To carry out trawl hauls at Ballantrae and at South Arran to establish the age structure of the spawning herring population in these areas.
2. To carry out grab and ROV surveys in the above areas in order to quantify total egg deposition for an assessment of spawning stock biomass.
3. To use the "Roxann" ground discrimination system in known herring spawning areas to allow the data gained to be used for assessment of potential spawning areas for oil impact studies.

Narrative

Clupea made passage from Fraserburgh to Ardrossan in the Clyde between 7 and 9 April 1993. Scientific staff joined there on the afternoon of 9 April. Scientific gear was rigged and tested that afternoon and in the evening *Clupea* proceeded to Ballantrae, anchoring there overnight.

Grabbing work was started at Ballantrae on the morning of 10 April and a patch of herring eggs was discovered to the east side of the bank. Herring marks were encountered and a trawl haul established that herring with gonads in ripe and running condition were still present - implying spawning to be still in progress. Work with the "Roxann" system was carried out in parallel to grabbing operations and the ROV was deployed in the evening to examine the egg patch. *Clupea* anchored at Ballantrae on the night of 11 April and "Roxann", grabbing and ROV work were continued the following day. The night of 11 April was spent at anchor in Loch Ryan and the following morning *Clupea* steamed to South Arran to begin survey work in this area.

At South Arran *Clupea* initially carried out a grid of grab sampling stations which established that a small spawning had taken place. Marks of herring were observed in close proximity to the sea bottom in this area and in the afternoon the ROV was deployed for a considerable period and good video material was obtained. Subsequently *Clupea* steamed for Ardrossan where staff changes took place.

On 13 April *Clupea* steamed back to Ballantrae where very few fish traces were observed and the spawning was judged to be almost complete. Two days were spent carrying out extensive surveys of the gravel beds at Ballantrae to establish that the egg patch found was the only one present, and sampling to map the extent of the egg patch and allow an estimation of total egg deposition for spawning biomass estimation. Subsequently the vessel proceeded to South Arran, where she anchored for the night of 14 April.

On 15 April *Clupea* carried out a successful trawl to obtain a sample of the herring present in the shoals at South Arran. This established that most of the fish present had not yet spawned. Further work was continued the same day to search for other egg patches in likely areas around the spawning site. None were found however and *Clupea* subsequently made for Ardrossan for staff changes.

On 16 April, on return to South Arran, two further trawl hauls were carried out, two dives were made with the ROV in the area of the egg patch and the remainder of the day was spent grabbing. The grab samples delineated the egg patch and covered a very wide area in an attempt to look for further evidence of egg deposition. *Clupea* anchored overnight in Whiting Bay and the following day grabbing work was carried out to the east of the egg patch and also in Whiting Bay in poor weather. No eggs were found in either of these locations. Subsequently *Clupea* made for Ardrossan, arriving there at approximately 1830 that evening for the end of the cruise. Scientific staff left the vessel on the morning of 18 April and *Clupea* left to make transit to Fraserburgh - arriving there on the evening of 20 April.

Results

1. Five trawl hauls were carried out, one at Ballantrae and four at South Arran. These demonstrated the length structures of the populations at the two sites to be identical, with a modal length of 29 cm and an almost complete absence of recruit spawners. It is probable that a large component of the spawning stock is still made up of the strong 1986 year class and that there has been little recruitment subsequently.

2. A total of 1028 grab stations and seven ROV dives were completed during this survey.

Comprehensive ROV and grab surveys were carried out at Ballantrae and a spawning biomass estimate will be possible for this area. In contrast, only a minimum spawning biomass estimate can be made for South Arran as spawning was not complete at the time the survey had to be terminated. (It should be noted that total survey time was much shorter on this occasion than previously and spawning dates are somewhat variable).

3. Considerable work was carried out with the "Roxann" system to assess its usefulness in recognising substrates that might provide potential spawning sites. The results of this await further analysis of the data.
4. A bi-product of the ROV surveys has been some excellent colour video material of herring on the spawning beds and also video shots of herring which appear to be actually spawning.

J A Morrison
K Patterson

14 May 1993

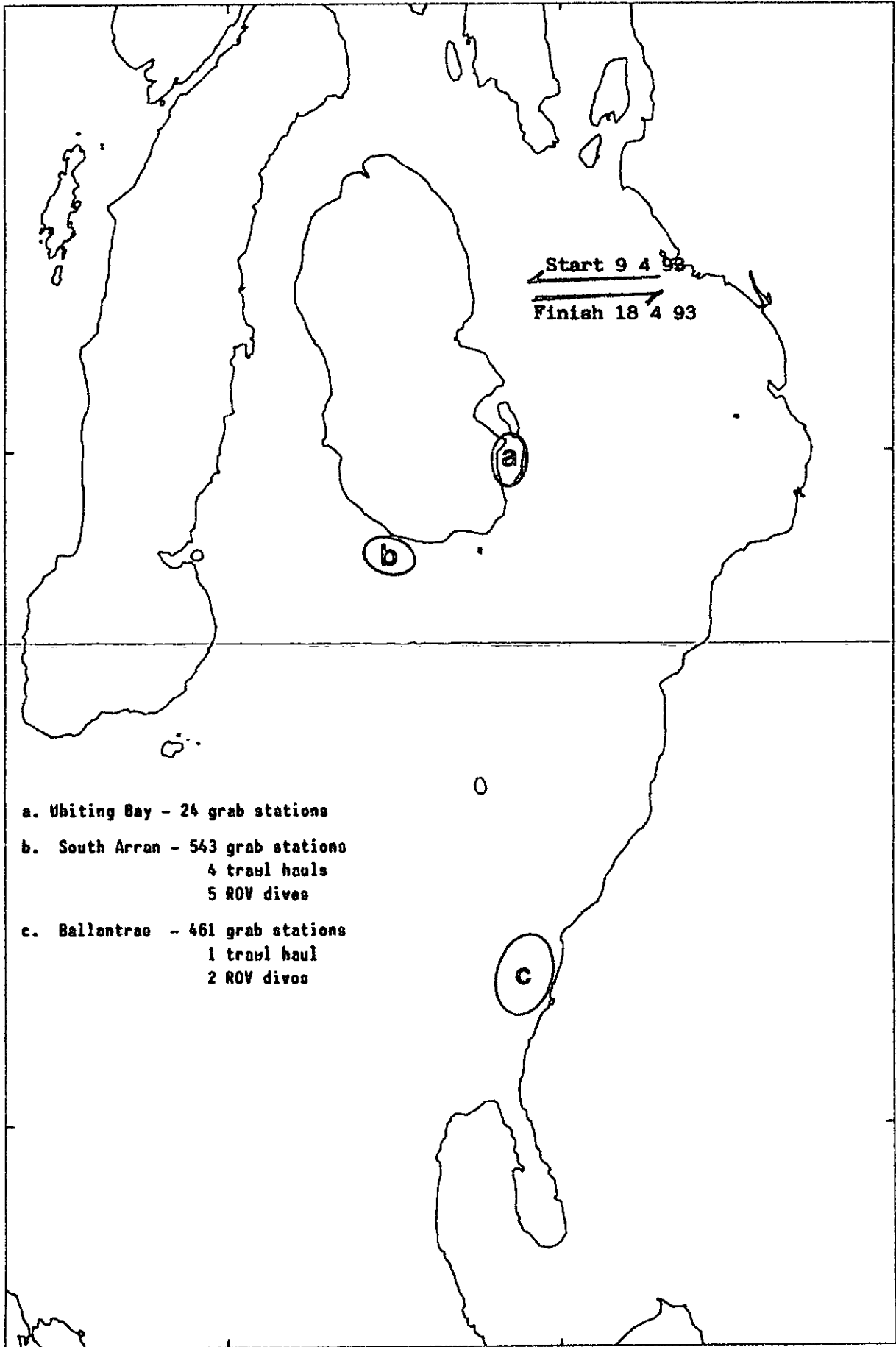
Seen in draft: S Clark

CLUPEA CRUISE 0793S

07 04 93 - 20 04 93

5 30W

4 30W



55 30N

55 30N

- a. Whiting Bay - 24 grab stations
- b. South Arran - 543 grab stations
4 trawl hauls
5 ROV dives
- c. Ballantrae - 461 grab stations
1 trawl haul
2 ROV dives

55 N

55 N

5 30W

4 30W