Not to be cited without prior reference to the Laboratory

"Clupea"

Cruise 8/88

REPORT

22 August-8 September 1988

Personnel

J A Gauld	HSO (in charge)
R Priestley	SSO
P J Barkel	PTO
W S MacDonald	SO
J R Hutcheon	SO

Objectives

1. To determine the behaviour of sandeels in Shetland waters.

2. To collect biological and environmental data in relation to sandeels and to sandeel fishing grounds.

Narrative

"Clupea" sailed from Buckie at 2200 hours on 22 August and proceeded to Shetland waters. Over 23-29 August sandeel grounds at Shetland were surveyed and on 30 August the vessel put into Lerwick for a mid-cruise break. Over 31 August-6 September further grounds at Shetland were surveyed for sandeels, the 2 September being lost due to bad weather. Work at Shetland was completed on 6 September and "Clupea" sailed south to Orkney. On 7 September fishing grounds at Orkney (North Sound) and in the Moray Firth (Smith Bank) were surveyed for sandeels. "Clupea" then headed for Aberdeen where the cruise finished at 1500 hours on 8 September.

During the cruise 2 periods of 48 hours (one at fair Isle, one at South Sand) and one period of 24 hours (at Sands Voe) of continuous observation were carried out using echo-sounders, RCTV, trawls (fished in mid-water and on the bottom) and dredges. In addition 5 other grounds at Shetland were surveyed continuously during daylight hours for periods up to 6 hours. Hydrographic data and plankton samples were collected on the grounds surveyed.

Video recordings were made of scientific sampling methods and trawling operations onboard "Clupea", underwater video recordings were made of the sandeel trawl and the reaction of sandeels to the trawl.

Whilst in North Bay on 7 September liaison was established with the German research vessel "Solea" which was working in that area.

Results

The vessel's echo-sounders (50 Kz and 200 Kz) were monitored continuously when on the sandeel grounds. Few fish marks were observed. Sandeel marks were identified only at Voe and Mousa during daylight. Due to the limited area and inshore location of these grounds it was not possible to work there during darkness. The sandeel marks were recorded mainly as dense (red) streaks which extended from the sea bottom upwards over 10-40 metres. Trawl hauls through these marks gave catches of up to 4 tonnes of sandeels per 30 minute haul.

At Shetland concentrations of sandeel (A. marinus) were found only at Mousa and at Voe. On all other grounds only small quantities were caught. Concentrations of A. marinus were present both at Orkney and in the Moray Firth. The age composition of A. marinus differed between the ground sampled, at Mousa and on Smith Bank recruiting 0-group were dominant (99%) whilst at Voe and North Sound age groups 1-5 were dominant (99%). Excluding Mousa few 0-group were observed at Shetland.

Examination of fish stomach contents showed a general lack of A. marinus in those species previously identified as predating on A. marinus. Examination of A. marinus stomachs showed that, except on those grounds where concentrations of A. marinus were present, most stomachs were empty. The main prey organisms present in A. marinus stomachs were small copepods and larval gastropods. Plankton samples, taken per 20 m depth stages using a 1 m net, showed these prey organisms to be present throughout the water column on all the grounds sampled.

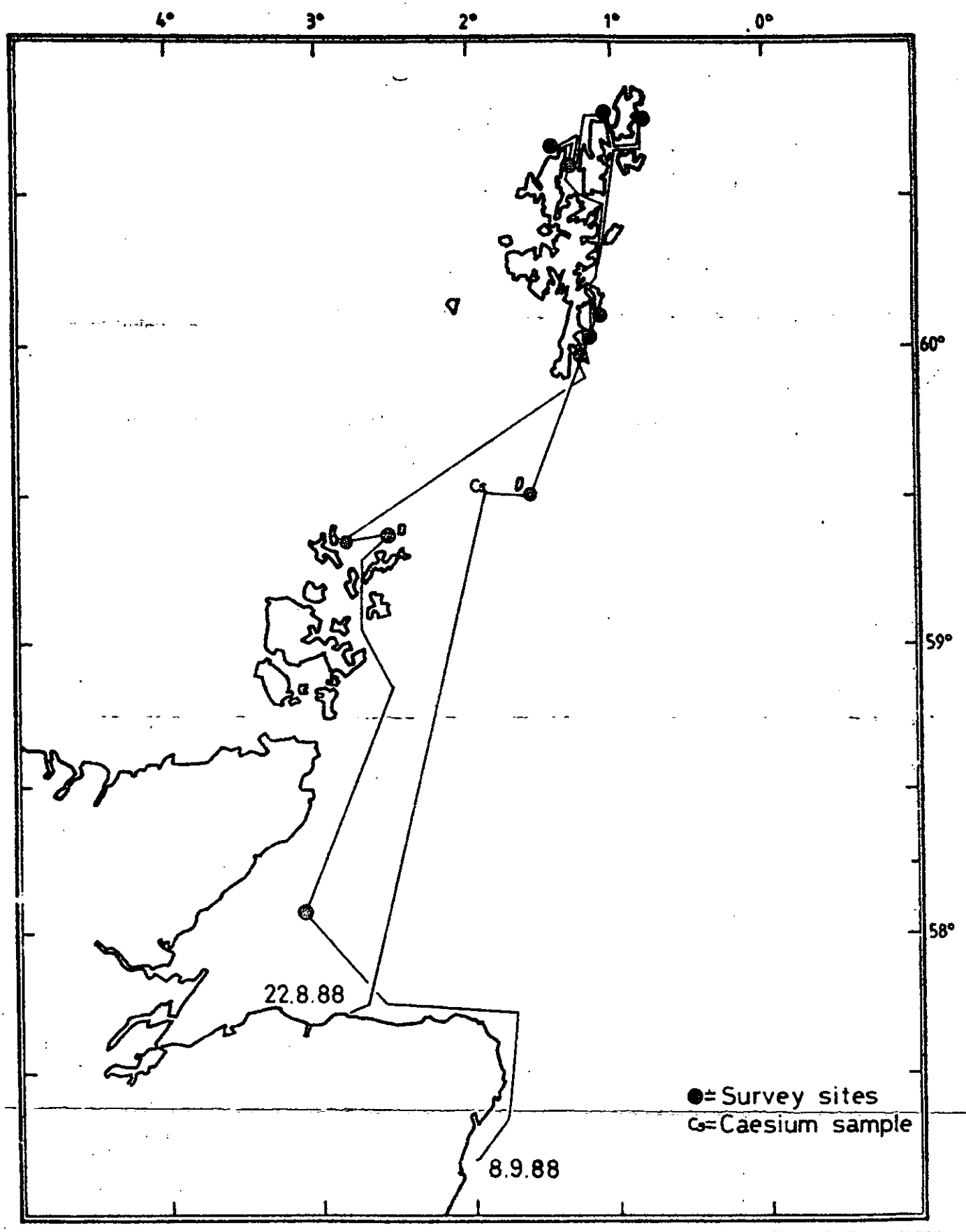
Sea surface temperatures ranged from 11.4° (Mousa) to 13.2° (Smith Bank) whilst bottom temperatures ranged from 11.2° (east coast Shetland) to 12.8° (North Sound). Salinity measurements ranged from 35.072 at the sea surface (Balta) to 34.652 at the bottom (Smith Bank).

A water sample for radio caesium analysis was collected from west of Fair Isle on 23 August.

J A Gauld

28 December 1988

Seen in draft: G Calder



FRV Clupea 22.8 - 8.9.88 8C88