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In Confidence

CRUISE REPORT

FRV 'Clupea'

8 - 29 June 1977

Objectives

1. To carry out an echointegrator and midwater trawling survey for sprats in the area between Orkney and the Outer Hebrides.

2. To investigate the extent of any sprat concentrations found and to determine sustainable catch rates, at different times of day and night.

3. To carry out biological sampling of sprats.

Narrative

'Clupea' sailed from Buckie at 1730 on 8 June and carried out an echointegrator survey north to the Orkney area. The remainder of the first week was spent surveying the area north of Orkney and the ship docked in Kirkwall at 1730 on 10 June.

Sailing at 0600 on 13 June, the second week was spent on an echointegrator and midwater trawling survey from Orkney to 5°30'W. An echointegrator calibration was carried out in Loch Eriboll during the evening of 14 June. 'Clupea' docked in Kirkwall at 1045 on 17 June.

On 20 June, 'Clupea' sailed at 0500 and made a northwest passage to resume the echointegrator survey north of the Outer Hebrides. The survey was continued until 1200 on 23 June when a second calibration was carried out at Tiumpan Head. The following day the north Minch was surveyed and 'Clupea' tied up at Ullapool at 1530.

'Clupea' sailed at 0630 on 27 June, completed the echointegrator grid and then made for an area west of Orkney where sprat concentrations had been found earlier in the survey. In heavy seas, she anchored at 2100 on 28 June off Strathy Point. After experiencing some engine trouble early the following day, 'Clupea' made for Buckie and docked at 2200.

Echointegrator Survey

The programmed grid was completed during the cruise, using two of the Laboratory's echointegrators. The water column was divided into 5 strata: 0-25 m, 25-50 m, 50-100 m, 100-350 m, and a bottom following layer 5-10 m from the seabed. Recordings of the integrator readings were made at half-hourly intervals.

The survey showed a complicated pattern of echotraces. A diffuse planktonic trace was present above 50 m especially in the more offshore parts of the survey area and in the north Minch and was largely absent from the area of neritic water to the west and north of Orkney. This gave rise to strong

echointegrator readings and on numerous occasions it was not possible to discriminate these from shoals of pelagic fish.

Midwater shoaling fish were patchily distributed with some indication of concentrations in the area around Sule Skerry and north of the Butt of Lewis. A number of distinct plumes were recorded but few were sufficiently intense to indicate the presence of substantial concentrations of herring. In addition to midwater traces large parts of the area had discrete traces very close to the seabed, and these were not recorded by the integrator.

Excluding planktonic traces, concentrations of echoes were recorded by the echointegrator west of Orkney, north of the Butt of Lewis in the northeastern part of the Minch and along the west coast of Lewis.

Midwater Trawling

A total of 21 hauls were made using either a small gadoid trawl or the larger 1040 midwater trawl. Sprats were caught in nine hauls, the largest catches being 18 baskets near Sule Skerry, and 7 baskets in the north Minch. The sprats were mostly spawning or partially spent and ranged in length from 9-15 cm, the modal length being 10-12 cm. Herring were caught in small numbers in three hauls.

Since many hauls were made very close to the seabed to sample the predominant type of echotrace, other species of fish were frequently caught. Nine hauls contained sandeels (almost all Ammodytes marinus) ranging in length from 6-19 cm. The largest catch was of two baskets west of Sule Skerry.

Norway pout were also caught in seven hauls the largest catch being two baskets in the North Rona area. The only other fish caught in any numbers were dogfish (Squalus acanthias) mostly in the size-range 30-60 cm. Very few 0-group gadoids were caught.

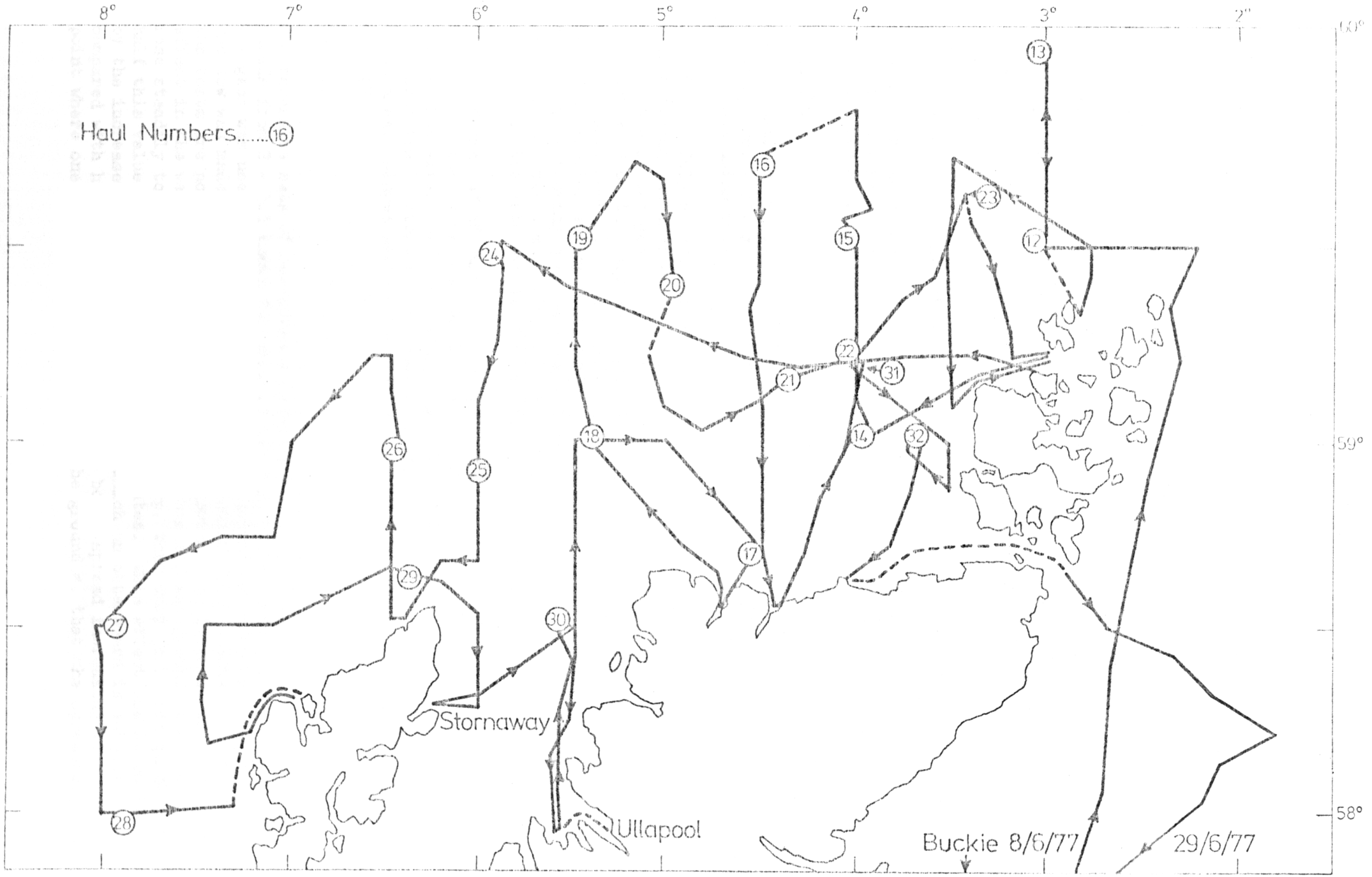
Conclusions

Owing to the complexity of the echotrace s and the occurrence of mixed species concentrations, no simple interpretation of the echointegrator survey is possible. The main problems are

a) the difficulty of identifying the many types of fish traces encountered,
and b) the overlap between planktonic and fish traces.
c) the fact that echoes within 5 m of the seabed can not be integrated.

R S Bailey
3 August 1977

Seen in draft G Geddes



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