R1/6 AMM

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FRV "Clupea" 15CR81

REPORT

Cruise 15/81

26 October - 19 November 1981

Objectives

1 To survey the distribution and abundance of young herring and sprats in the Clyde with an echo sounder and mid-water trawl.

2 To investigate the biological composition of young herring and sprats in the Clyde.

3 To carry out an acoustic survey for herring in the Clyde.

4 To investigate the residue burden of organic pollutants in herring samples, water samples and bottom sediments in the Clyde.

Narrative

"Clupea" sailed from Aberdeen on the 26th of October reaching Campbeltown on the 28th. The trawling survey was begun on the following day and six trawl stations were completed by the end of the week. The weekend was spent in Troon where a visiting scientist from Pitlochry joined "Clupea".

During the following week a further 14 trawl stations were completed and all programmed grab/water stations plus two additional ones were sampled. Bad weather, prevented successful operation of the grab at two of these stations and also resulted in some loss of working time on two days. The scientist from Pitlochry left the ship in Troon on the morning of 8 November. The weekend was spent in Campbeltown.

During the first half of the third week the remaining nine trawl stations were completed before docking in Troon on 11 November where D MacLennan joined "Clupea" and repairs to the bridge echo sounder were effected. A first calibration of the ships acoustic equipment was carried out in Lamlash Bay that night. On the remaining two days of the week acoustic surveys were made to the east and west of Arran between $55^{o}23^{o}$N and the north end of Arran. An intermittent fault in the acoustic equipment developed during the East Arran survey but this was rectified before the West Arran survey was undertaken. The weekend was spent in Campbeltown where a second acoustic calibration was made.

On 16 November a search was made to locate an area where two separate mid-water echo-trace layers were present in the water column. A suitable area was located in lower Loch Fyne and replicate runs were made over the same transect

with the integrator set to count the two layers separately. A trawl tow was made through each layer to identify their respective species compositions.

On the remaining two days an acoustic survey was carried out in the Inchmarnoch area where the greatest concentrations of herring-type echo-traces had been observed in previous weeks. Within this area an intensive survey was carried out in the Lamont shelf region. Two trawls were made there.

"Clupea" docked in Troon on the evening of 18 November, scientists and crew departing the following morning.

Results

In the trawling survey herring were taken at 28 of the 29 fixed trawl stations with an average catch rate of 265 per one hour tow. This compares to catch rates of 362 and 222 in 1979 and 1980 respectively. A preliminary investigation of the length compositions indicates that 0-group herring made up about 98% of the catch with about 2% 1-group and less than 1% older fish. The mean catch rate of 0-group herring was higher than in the two preceding surveys while those of 1-group and older fish were much lower. The distribution of 0-group herring was very similar to that found in previous years with higher catch rates occurring in the upper Clyde and lochs than in the outer Clyde.

As in the previous two surveys the other most abundant species taken in the catches were sprats, small whiting, Norway pout and euphausiids (Meganyctiphanes norvegica). The catch rate of sprats was about three times as high as in 1979 and 1980 while the catch rates for small whiting and Norway pout were lower.

Analysis of echo sounder recordings during the routine trawling survey indicated that herring older than one year of age were largely confined to the northern end of Kilbrannan Sound, the Inchmarnoch and lower Loch Fyne areas and Pladda.

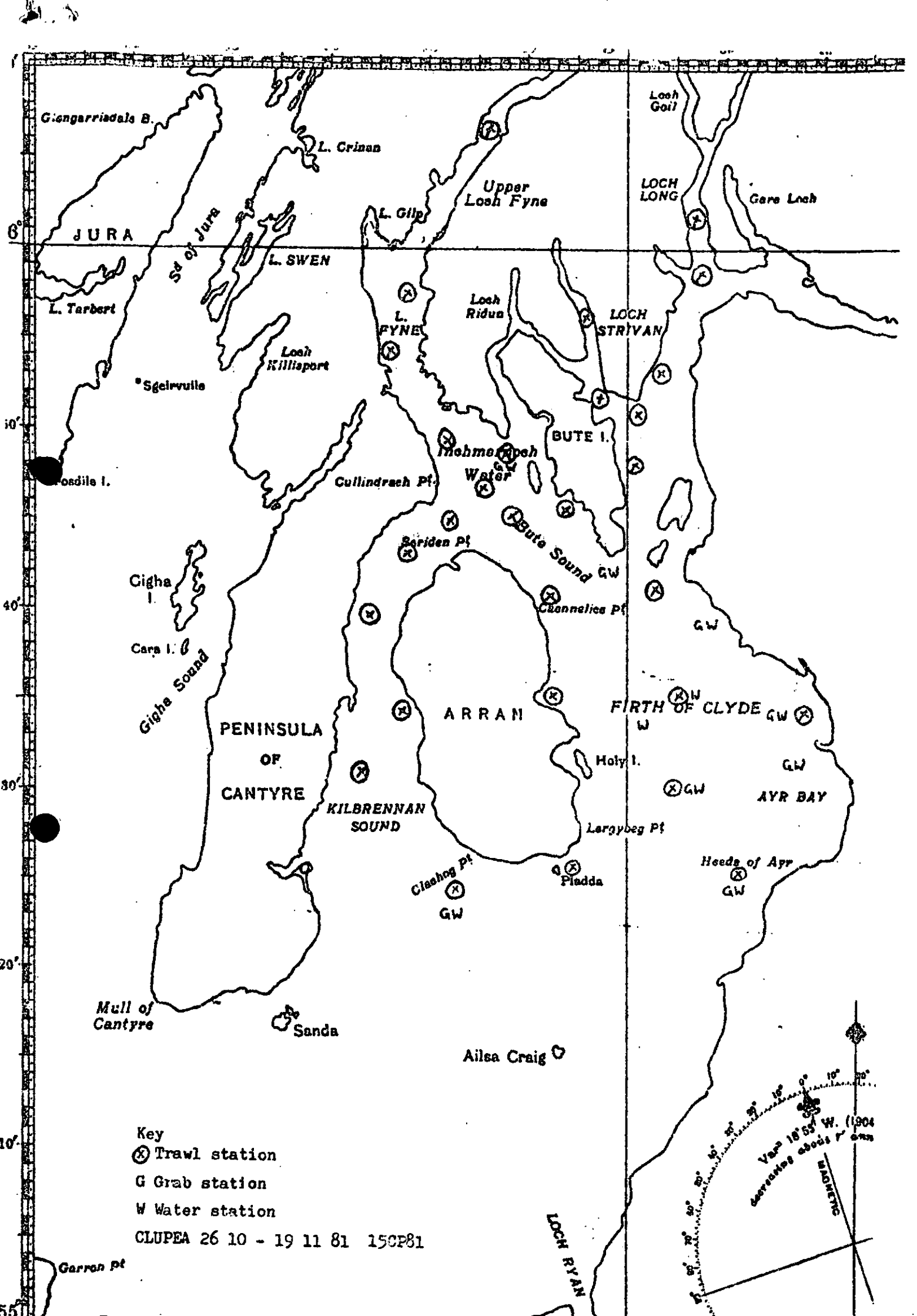
During the acoustic survey, which was concentrated in the above areas, definite herring traces were observed in two localities, Skipness and the Lamont shelf area. In the latter area several large echo-traces were observed and surveyed with the echo integrator. A trawl through some of these confirmed that they were herring, with a modal size of 22 cms (1-group). Estimates of biomass have yet to be made.

Investigations of the double layer of echo-traces observed in lower Loch Fyne indicated a clear difference both in the composition and density of the two layers. While catches from both layers were predominently of sprats the haul from the upper layer contained only small sprats, with a modal size of 5 cms, while the haul from the lower layer contained only large sprats, with modal sizes at 12.5 and 10.5 cms. The lower layer was extremely dense and extended over a distance of several miles.

Seen in draft G Geddes

M Walsh

1 December 1981


Glengarriedale B.
L. Crinan
Loch Goil
Upper Loch Fyne
LOCH LONG
Gare Loch
JURA
Sd of Jura
L. SWEN
L. Gilp
L. Tarbert
L. FYNE
Loch Ridua
LOCH STRIVAN
Loch Killisport
Skeirvuile
BUTE I.
Inchmarnock Water
Cullindreach Pt.
Scriden Pt
Bute Sound
Cigha I.
Cara I.
Cigha Sound
Channelies Pt
PENINSULA OF CANTYRE
ARRAN
FIRTH OF CLYDE
Holy I.
AYR BAY
KILBRENNAN SOUND
Largybeg Pt
Clashog Pt
Pladda
Heads of Ayr
Mull of Cantyre
Sanda
Ailsa Craig
LOCH RYAN
Garron Pt
Key
Trawl station
G Grab station
W Water station
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MAGNETIC