R1/6 12CR83

REPORT

IN CONFIDENCE: Not to be quoted without reference to the laboratory

FRV 'Clupea'
Cruise 12/83
3-18 November 1983

Objective

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 compare catch rates of PT154 and PT163 pelagic trawls.
4) To carry out an acoustic survey to estimate herring biomass in the Clyde.
5) To investigate the availability and abundance of suitably sized organisms in the Clyde for use as diet for ranched salmon.

Narrative

Scientists and crew joined 'Clupea' in Buckie on 3 November and sailed on the morning tide to reach the Clyde in the early hours of 5 November. The routine trawling survey, using an international young gadoid trawl (PT154) fitted with a 12mm codend, was commenced later that day after an initial trial haul and after overcoming some problems with the netsonde equipment. Three stations were completed that day before heading for Troon to pick up Mr McQueen of the Pitlochry Laboratory. During the next three days a further 11 routine trawl stations were completed before changing nets. On 9 and 10 November 6 stations were repeated using the 'Clupea' high speed sampling trawl (PT163) fitted with a 20mm codend liner. After the first haul using this net the last 6 feet of the codend liner were replaced by 12mm mesh netting to prevent escape of the smallest herring. Five out of the 6 hauls with the PT163 trawl were invalid as a result of net damage and it was decided to revert to the PT154 for the remainder of the cruise. Two further stations were completed before heading for Troon for the half landing.

During the half landing on 11 November Mr McQueen, left for Pitlochry and Mr S Forbes joined 'Clupea'. The following morning a passage was made for Lamlash Bay where an acoustic calibration was carried out. A fault in the computer logging system meant that this had to be carried out manually, while initial difficulties with the echo-integrator prevented commencement of the acoustic survey work until the following day. The next 5 days were spent carrying out acoustic surveys of respectively East Arran, Pladda and South Kilbrennan Sound, North Kilbrennan Sound and North Arran, Inchmarnock and lower Loch Fyne and Loch Striven and the upper Clyde. During this period the trawl was shot on 9 occasions to identify echotraces. A second acoustic calibration was carried out on the evening of 16 November off Rothesay and completed the following morning. 'Clupea' arrived in Greenock on the evening of 17 November where the gear was off loaded. Scientists and crew departed the following morning.

Results

In the routine trawling survey herring were taken at 14 out of 16 stations sampled with an average catch rate of 822 fish per one hour haul. A provisional split of the data into the mean number of fish per age group per one hour haul is given in the table below with, for comparison, equivalent data from the previous 4 surveys:

Survey Year	Stations sampled	Mean Nos herring per one hour haul			
		0-group	I-group	Older age groups	Total
1979	28	82	252	32	366
1980	25	126	50	47	223
1981	29	259	6	< 1	256
1982	15	226	172	2	400
1983	16(15)	128(136)	674(51)	20(2)	822(188)

The bracketed values are those derived if the largest haul, which provided a very high proportion of the total catch, is ignored.

The distribution of herring appeared to be somewhat different from the pattern of previous years. Herring of all age groups were noticeably scarcer in the Inchmarnoch area while the tendency for 0-group herring to be more abundant in the inner Clyde and sea lochs and for I-group herring to be more abundant in the outer Clyde was less evident than in previous surveys.

The other abundant fish species taken in the catches were sprats, small whiting, Norway pout and small saithe as in all previous surveys. The mean numbers per one hour haul for whiting and post were at about the mean level of the previous 4 surveys while that for sprats was the lowest recorded in the last 5 years.

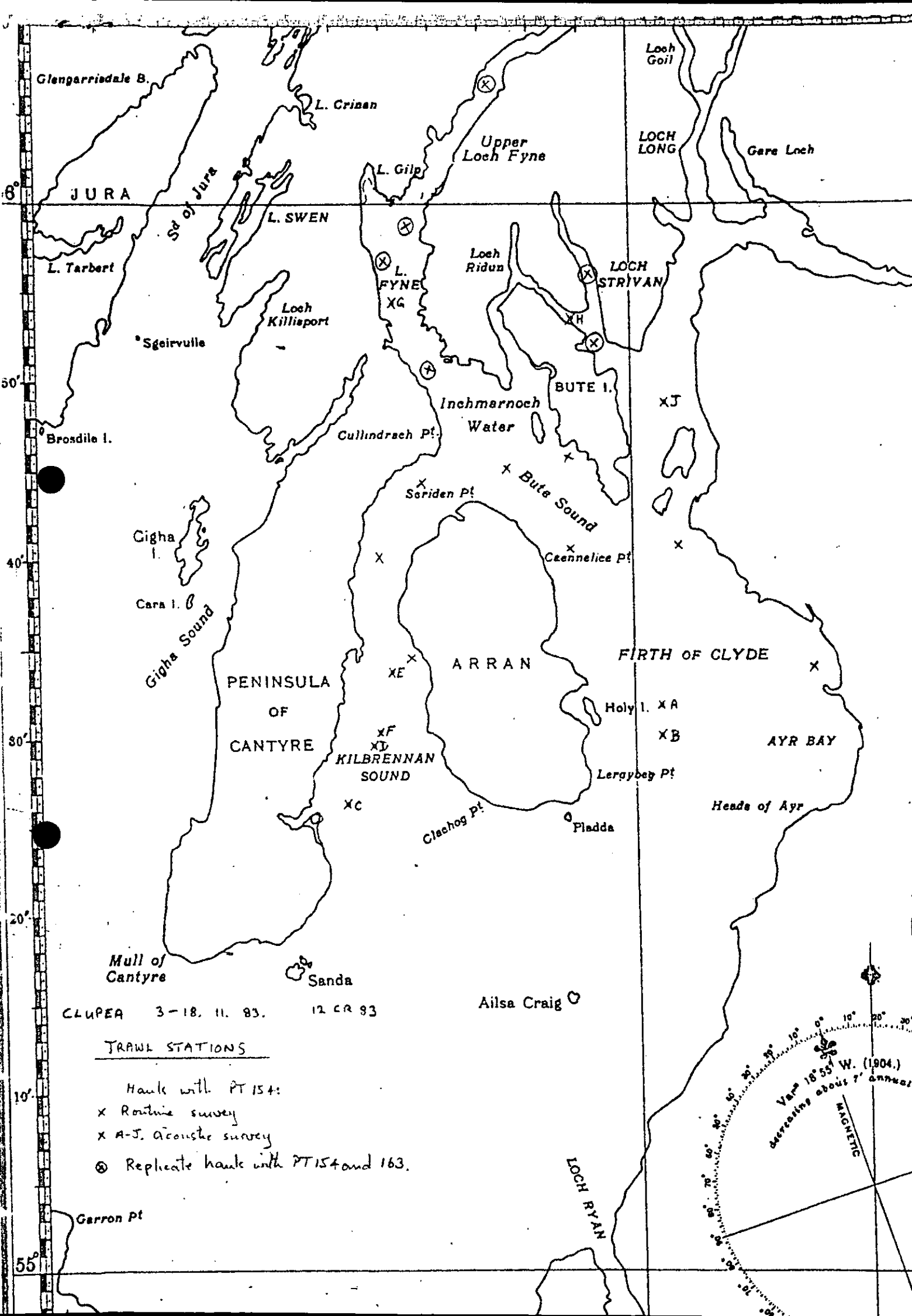
No meaningful comparison between catch rates of the PT154 and PT163 trawls could be made in view of the high proportion of invalid hauls with the latter net.

In the acoutic survey a fuller coverage was achieved than in previous years and echotraces were successfully identified in the majority of cases. Detailed results have yet to be analysed.

Further data to meet the fifth objective of the cruise were collected by Mr McQueen of Pitlochry to supplement those collected last year. In addition to the main objectives of the cruise weight-length data were collected for sprats as well as a small number of herring ovaries for fecundity analysis.

Seen in draft
G Geddes

M Walsh
12 December 1983


Glenparriedale B.
L. Crinan
Loch Goil
LOCH LONG
Gare Loch
Upper Loch Fyne
L. Gilp
JURA
Sd of Jura
L. SWEN
L. Tarbert
L. FYNE
XG
Loch Ridun
LOCH STRIVAN
XH
Loch Killisport
Sgeirvulle
BUTE I.
XJ
Inchmarnoch Water
Brosdile I.
Cullindrach Pt.
Soriden Pt
Bute Sound
Cigha I.
Ceannelice Pt
Cara I.
Cigha Sound
PENINSULA OF CANTYRE
XE
ARRAN
FIRTH OF CLYDE
Holy I.
XA
XB
AYR BAY
XF
XD
KILBRENNAN SOUND
Lergybey Pt
Heads of Ayr
XC
Clachog Pt
Pladda
Mull of Cantyre
Sanda
Ailsa Craig
CLUPEA 3-18. 11. 83. 12 CR 83
TRAWL STATIONS
Hauls with PT 154:
× Routine survey
× A-J. Acoustic survey
⊗ Replicate hauls with PT 154 and 163.
Garron Pt
LOCH RYAN
Var 18° 55' W. (1904.)
decreasing about 7' annually
MAGNETIC
6°
50'
40'
30'
20'
10'
55°