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Cruise 12/88

12SR88

REPORT - SCOTIA

3-23 November 1988

Personnel

M Walsh	SSO
R Payne	HSO (3-10 November)
W MacDonald	SO
I Gibb	ASO
J McWilliam	ASO
W Leiper	Craftsman
G Leaper	NCC (3-10 November)
E Henderson	PSO (3 November)

Objectives

1. To carry out a survey of 0 and 1 group mackerel.
2. To monitor sea surface temperature and salinity throughout the survey.
3. To collect water samples for hydrographic investigation at the south eastern end of the Fair Isle - Munken Line.
4. To obtain fish, sediment and water samples from the area around the northern side of Piper Alpha.
5. To collect water samples for radio caesium monitoring.
6. To test a prototype navigator system for use on sludge dumping vessels.

Narrative

"Scotia" departed from Aberdeen at 1430 on 3 November and after collecting a water sample for radio caesium monitoring headed northward to an area off Rattray Head to test a prototype navigation system. After completing these tests E Henderson departed by zodiac for Fraserburgh at 1900. "Scotia" then sailed for Piper Alpha, arriving there the following morning. A line of four hydrographic grab stations at 500 m, 1000 m, 2000 m and 5000 m north east of the platform were worked and one trawl haul was made at a range of 1600 m from the platform. At 1600 "Scotia" departed for the mackerel survey area arriving there by 0800 the following morning after having completed the Fair Isle radio caesium station en route.

During the 5 day period up to the half landing, 13 trawl hauls were made between latitudes 58°30' and 61°N using the GOV trawl fitted with a 20 mm codend. This trawl was used throughout the cruise, with heavy ground gear C, short (47 metre) sweeps, 'flown' wings and scanmar monitors to record headline height and wing end spread. In addition to trawling a line of 5 hydrographic stations along the Fair Isle - Munken Line was completed on the night of 5-6 November. A short period of working time was lost due to bad weather on 5 November and the need to make a diversion to Kirkwall on 7 November to pick up 2 kites for the GOV trawl. "Scotia" arrived in Stornoway for the half landing at 1000 on 10 November where R Payne and G Leaper departed.

"Scotia" sailed from Stornoway 24 hours later but no trawling was undertaken that day due to a severe south westerly gale. The trawl survey was resumed on the morning of 12 November and continued without interruption until the last haul was made shortly before midnight on 21 November. During this period a further 39 hauls were made. All

but one of the rectangles in the prescribed area north of 55°N and an additional 17 rectangles between latitudes 50° and 55°N were fished. Radio contact was maintained with the research vessel "Tridens" and the Irish fishing vessel "Shay" also participating in the survey. "Scotia" docked in Greenock at 2300 on 22 November. Fishing and scientific gear were off loaded on the morning of 23 November and the scientific staff departed at 1000.

Results

A cruise track showing positions of fishing, hydrographic and radio caesium stations is given in Figure 1. The prototype navigation system tested at the start of the cruise off Rattray Head proved effective in giving accurate position fixes in this area. At Piper Alpha one water sample and 2 sediment samples were collected at each station. In addition samples of cod, haddock, whiting, herring, saithe, ling, angler, squid and pandalus were obtained from the trawl haul in the area.

In the mackerel recruit survey a total of 52 hauls, including 11 foul or invalid tows, were made. Catches of mackerel per hour's trawl, by age group, are shown on the attached charts. The highest concentrations of first-winter (0-group) mackerel were found west of Donegal Bay with smaller concentrations west and north west of Ireland. No mackerel of this age group were found north of 55°N, in contrast to 1987 when the distribution was more widespread, but abundance west of Ireland was higher.

The main concentrations of second-winter mackerel were found off St Kilda and west of Eagle Island amongst large catches of herring. The abundance of this age group was greater than in the previous 2 December surveys and comparable to that of the strong 1984 year class sampled in December 1985.

The overall age composition of sampled catches was:-

Age group	0	1	2	2+
Year class	1988	1987	1986	1985
Percentage	70.1	14.5	4.0	11.4

Among other pelagic species, adult horse mackerel were abundant in the catches over most of the survey area but juveniles (<20 cms) were virtually absent as in 1987. Herring were abundant in catches in the St Kilda area and west of Ireland.

During the course of the cruise sea surface temperature and salinity were logged every 10 minutes and radio caesium samples were collected at Aberdeen and Fair Isle.

A mackerel weight-length relationship was determined from 176 observations:-

$$\text{Weight (gms)} = 0.005695 \times \text{Length (cms)}^3.10417$$

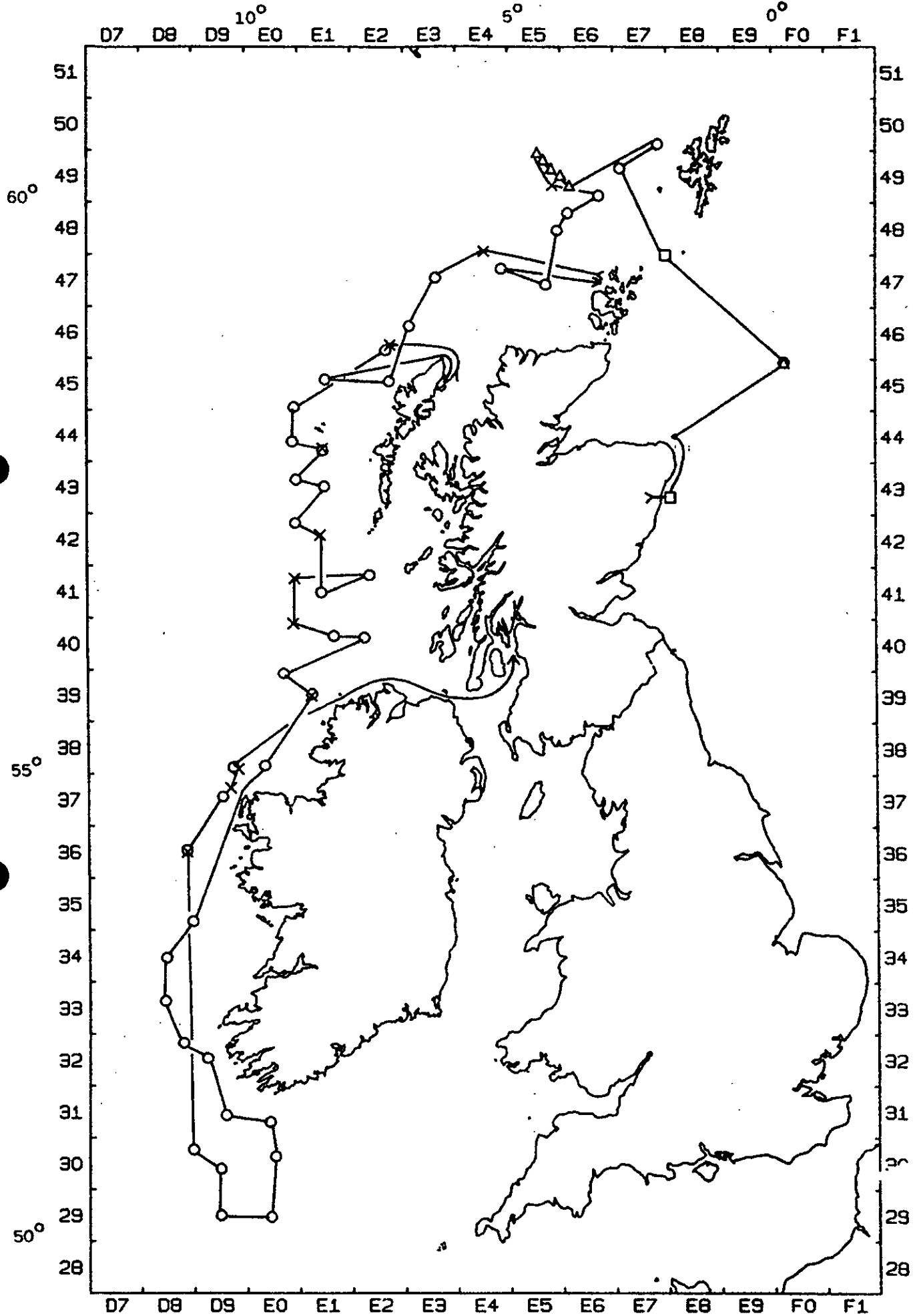
A small number of mackerel ovary and liver samples were collected for fecundity and parasitology investigations. In addition a collection of 15 different fish species was made for Aberdeen University for their skeletal structure studies.

M Walsh

5 January 1989

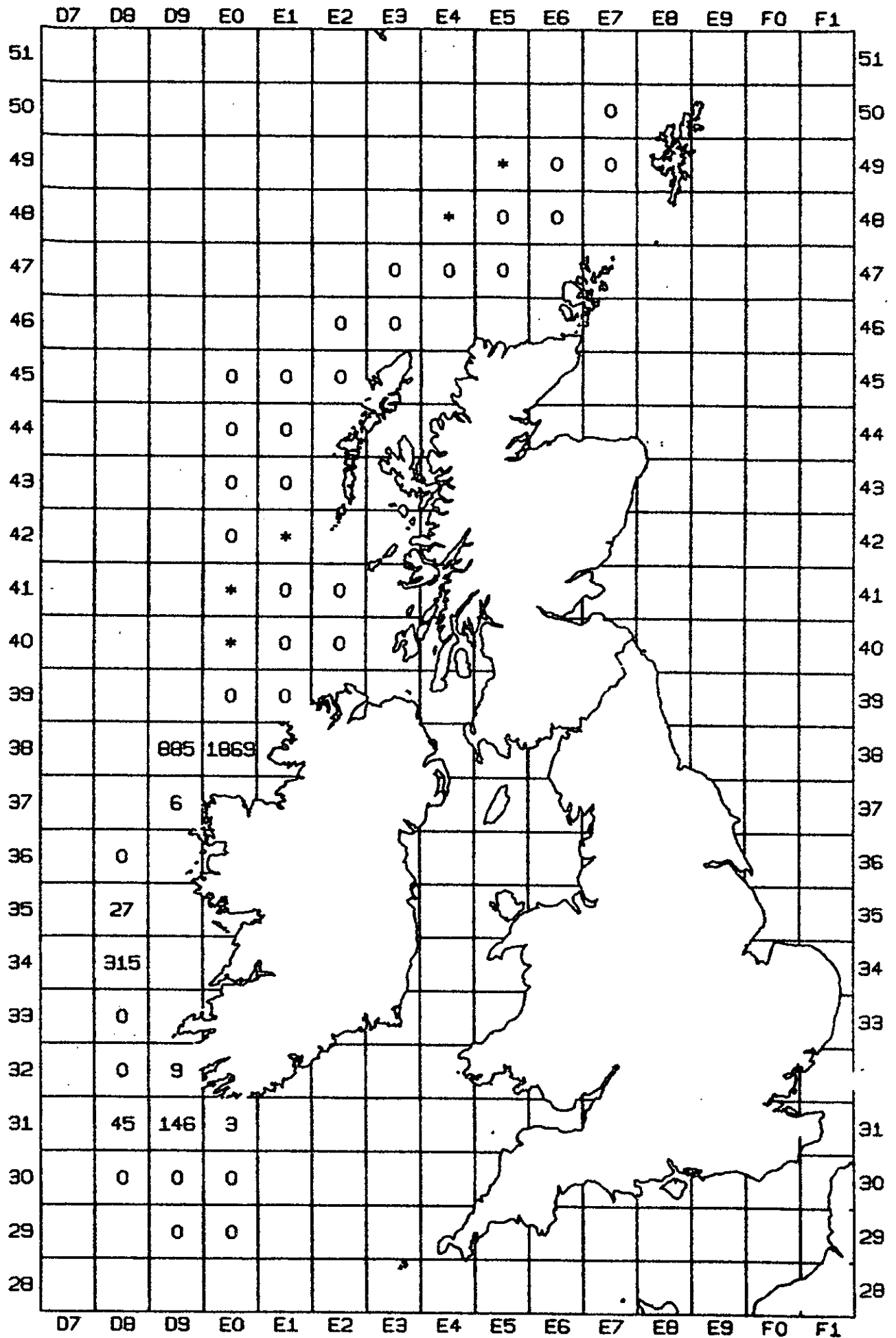
Seen in draft: T G McInnes

Figure 1 Cruise Track SCOTIA 12/88 3-23/11/88



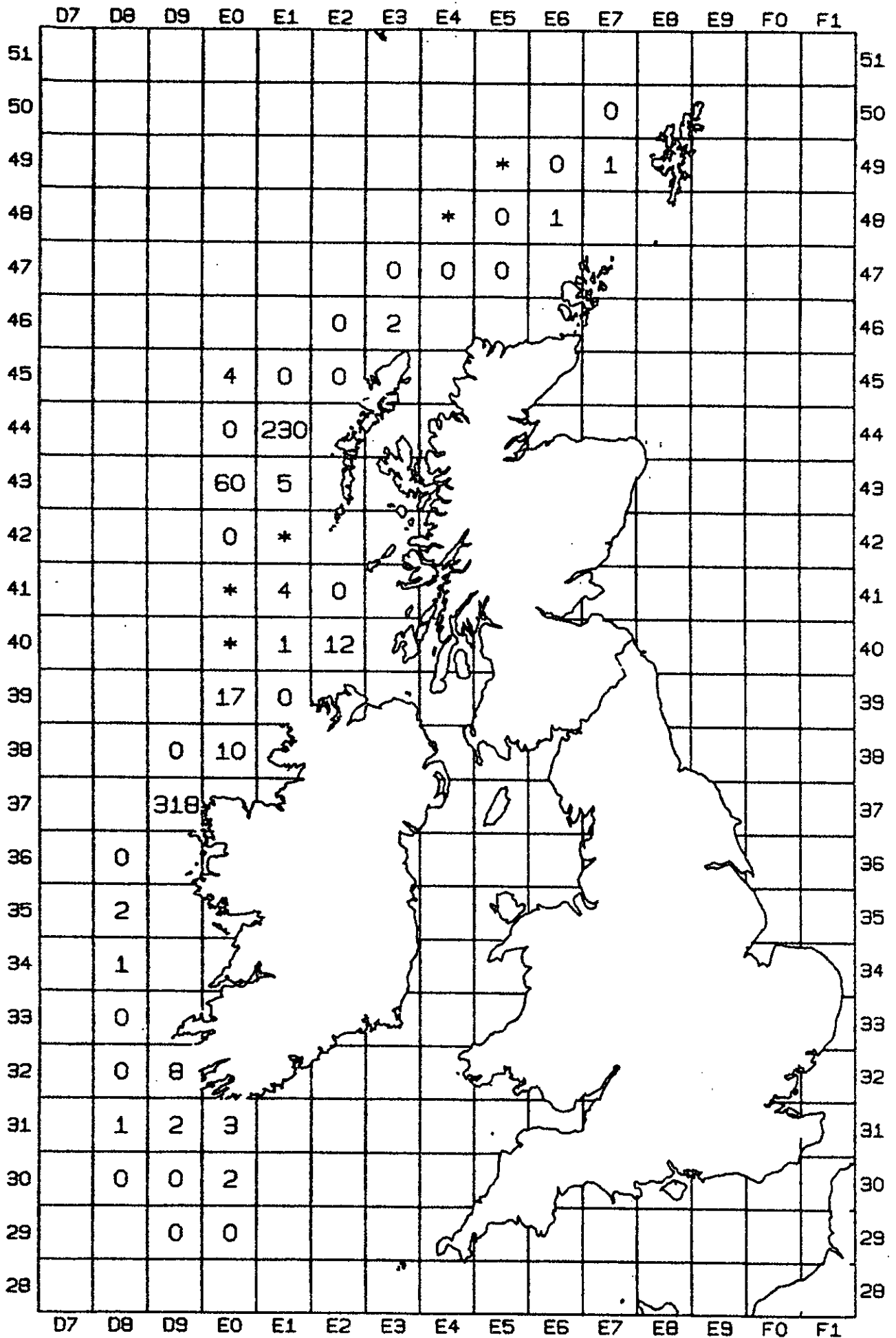
GOV Trawl: o valid tow x invalid tow Δ hydrography □ radio caesium

0-Group Mackerel November 1988 .Number per hours trawl.



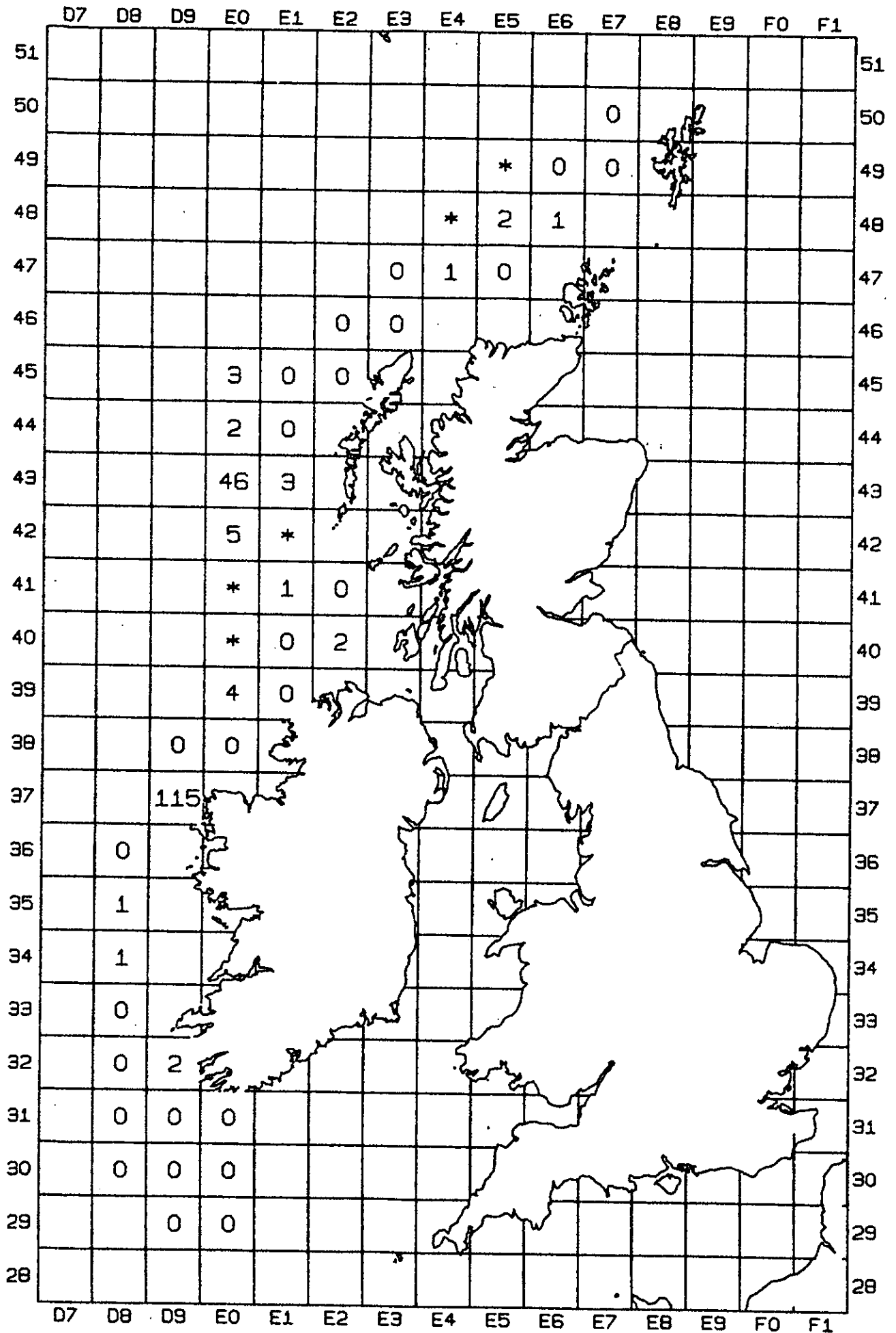
* Foul haul

1-Group Mackerel November 1988 .Number per hours trawl.



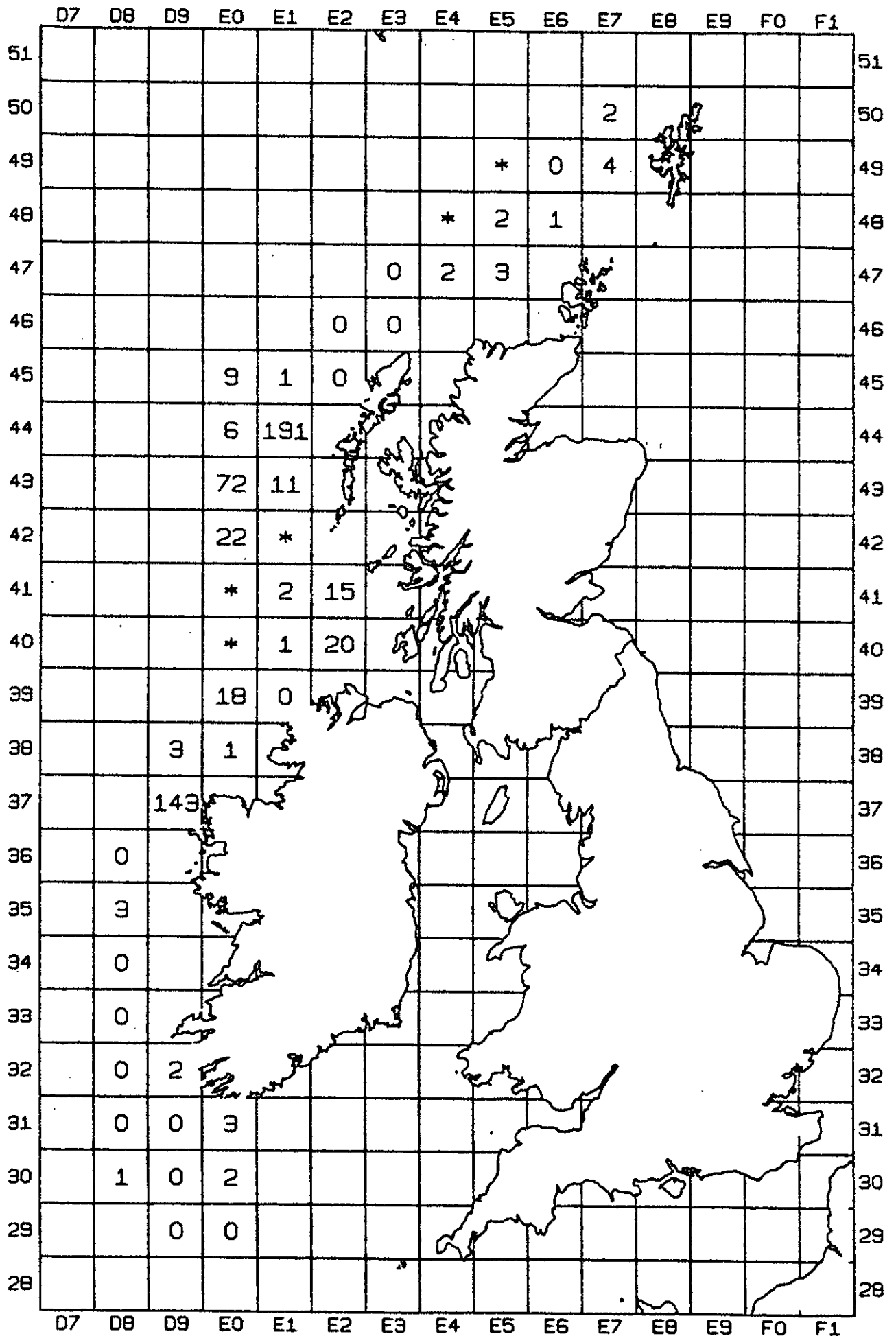
* Foul haul

2-Group Mackerel November 1988 .Number per hours trawl.



* Foul haul

2+ Group Mackerel November 1988 .Number per hours trawl.



* Foul haul