

R1/12

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FRV SCOTIA

Cruise 7/82

REPORT 78R82

7-26 July 1982 AR

Objectives

1. To carry out an acoustic and midwater trawling survey of herring in the Orkney-Shetland area and adjacent areas as part of an ICES-coordinated survey.
2. To collect water samples for radio-caesium monitoring.

Narrative

SCOTIA sailed from Aberdeen at 15.30 on 7 July, but after a steering fault developed returned to port the same day at 20.00. Repairs delayed eventual sailing until 22.00 on 9 July when SCOTIA proceeded directly to Inganess Bay, Orkney, for calibration of the acoustic equipment. As the result of discussion over the ship's radio with scientists on the Norwegian research vessel G O SARS, from 10-12 July SCOTIA carried out an echointegrator survey, trawling as required to identify echotraces, in the area to the west of Orkney and southwest of Shetland.

The following two days were spent carrying out a 5-mile grid in the area between Shetland and Fair Isle where G O SARS had recorded herring in reasonable concentrations. On 14 July, a course was set for the west of Shetland and this area was surveyed until 12.30 on 16 July. The remainder of the first half of the cruise was spent in the areas northeast, east and south of Shetland. SCOTIA docked in Lerwick for the half-landing at 09.00 on 19 July.

SCOTIA sailed from Lerwick at 11.00 on 20 July and after an acoustic calibration close by spent a further two days to the east and northeast of Shetland to complete the survey in that area. On 22 July the survey was extended to the south of Fair Isle and on 23 July a more extensive survey was carried out northeast of Orkney. That night a passage was made to the area between North Rona and the Butt of Lewis and two trawl hauls were carried out on 24 July in that area and in the North Minch. SCOTIA then proceeded direct through the Pentland Firth to the area east of Orkney. A trawl haul close inshore off Wick gave a large catch of herring and the ship then anchored in Inganess Bay for a final calibration. The anchor was weighed at 21.30 on 25 July and a course was set for Turbot Bank, off Peterhead, for short integrator survey before docking in Aberdeen at 16.30 on 26 July. The track of the survey is shown on the attached chart, with trawl hauls as numbered dots.

Echointegrator survey

Echotraces attributable to fish were widely distributed over much of the survey area, mostly occurring as relatively dispersed traces close to the seabed. Concentrations of fish echotraces were found in a number of areas

(see attached track chart), principally to the east and south of Shetland and northwest of Orkney.

During the hours of darkness these echotraces in most areas became more diffuse and in some cases ascended towards the surface. At this time they were not separable from diffuse plankton traces and the integrator survey was therefore discontinued or diverted during the period 22.30-03.30, and repeat surveys during daylight made where necessary.

The echotraces and echointegrator data will be analysed in the Laboratory to obtain estimates of herring biomass.

Midwater trawl hauls

During the cruise, 32 hauls were made to identify echotraces using a Jackson midwater trawl (PT 160) fitted with a 20mm mesh codend (see attached chart and Table 1). Out of 31 valid hauls, herring were caught in 23, and more than 100kg of herring in 15. The herring caught were variable in size (Table 1). In general, in the area around south Shetland the predominant modal size was 25-26.5cm. To the north and east of Shetland, much larger herring of modal length 32-33cm were predominant. South of Fair Isle, the main modal size was 24-25.5cm, while northeast of Orkney there was a mixture of two modal sizes (26.5 and 29-29.5cm). The modal size close inshore in the northern Moray Firth was 31cm.

The maturity stages of herring followed that of size (Table 2). In the north, up to 75% were in stage 4, while south of Shetland, the percentage at stage 4 was only 35-50%. One sample offshore east of Shetland contained 35% at stage 8 which may have been spring-spawners. The only area containing appreciable quantities of ripe herring including some ripe and running was off Wick. Very few immature herring were caught, although in the area south of Fair Isle, 25% were still only at stage 2.

Other species of fish were caught in usually smaller quantities. Whiting were caught mainly southwest of Shetland and east of Orkney. Mackerel were caught around Orkney and offshore east of Shetland. Adult Norway pout were caught in significant quantities in two hauls only, although 0-group Norway pout and 0-group sandeels were frequently found meshed in the funnel of the net. Offshore east of Shetland, a haul in midwater through small discrete traces contained 0-group haddock. Other species caught in small quantities were adult haddock, Sebastes viviparus, spurdog, grey gurnard, saithe and pollack.

Three samples of seawater were taken for radio-caesium analysis.

R S Bailey
4 August 1982

Seen in draft: J W Gillon

TABLE 1 Details of trawl hauls

No.	Date	Time (BST)	Duration (h. m.)	Shooting Position	CATCH (kg)				Specify	Main modal length HERRING	Remarks	
					HERRING	WHITING	NORWAY POUT	OTHERS				
89	11 July	1040	1.20	59°30'N 03°53'W	4600	c 10	c 7	c 7	Haddock	{ 26.5 29		
90	11 July	1740	0.20	59°35'N 02°16'W	-	c 11	-	-	-	-		
91	12 July	1335	0.40	59°47'N 02°49'W	-	c 7	1	1	Haddock	-	{ Meshing of 0-group pout and sandeels	
92	12 July	2100	0.30	60°00'N 02°06'W	c 16	-	-	1	Haddock	25	Meshed 0-group haddock	
93	12 July	2210	0.20	60°00'N 02°08'W	c 40	-	-	-	-	26		
94	13 July	0850	1.00	59°54'N 01°46'W	175	103	-	12	Mackerel Haddock	{ 25.5 16, 30.5		
95	13 July	1030	0.35	60°00'N 01°48'W	-	-	-	4	0-group haddock + whiting	-	Meshed 0-group haddock and whiting	
96	13 July	1840	0.35	59°53'N 01°31'W	254	c 5	-	2	Haddock Mackerel	{ 26 28.5		
97	14 July	0330	1.00	59°55'N 01°12'W	850	c 15	230	5	Haddock Sebastes	{ 26 31.5		
98	14 July	1436	0.40	59°39'N 01°06'W	190	c 2	-	1	Haddock	{ 26.5 29.5, 31.5	Meshed sandeels	
99	14 July	2120	0.15	59°46'N 01°58'W	24	72	2	1	Haddock	25.5		
100	15 July	1338	0.37	60°26'N 01°37'W	-	1	4	1	Haddock mackerel, spurdog	-	Meshed 0-group pout	
101	15 July	2130	0.40	60°00'N 01°26'W	520	17	-	1	Spurdog	{ 25.5 26.5		
102	16 July	0330	0.30	60°41'N 01°16'W	254	-	2	-	-	{ 33 26.5, 29.5	Meshed 0-group pout	
103	16 July	1530	0.48	60°41'N 00°31'W	8	-	1	2	Haddock Gurnard	{ 25.5 (32)		
104	16 July	1845	1.15	60°33'N 00°44'W	1907	-	18	1	Haddock	{ 32 30, 28		
105	17 July			I N V A L I D								
106	17 July	1130	0.45	60°02'N 00°55'W	2	1	2	12	Haddock Sebastes	-	Gear fishing incorrectly	
107	18 July	0925	1.00	59°21'N 01°53'W	220	1	-	3	Mackerel	25.5		
108	18 July	1515	1.45	59°02'N 01°48'W	190	1	-	4	Mackerel	24		
109	21 July	1055	1.05	60°19'N 00°35'W	-	-	1	1	-	-		
110	21 July	1600	1.00	60°11'N 00°05'W	220	-	-	175	Saithe 55kg Mackerel 40kg	26 29, 30, 31, 34.5		
111	21 July	1745	0.30	60°10'N 00°14'W	-	-	-	32	Pollock 32kg 0-group haddock	-		

TABLE 1. (contd.)

No.	Date	Time (BST)	Duration (h. m.)	Shooting Position		CATCH (kg)				Specify	Main modal length	Remarks
						HERRING	WHITING	NORWAY POUT	OTHERS			
112	21 July	2115	0.30	60°09'N	00°53'W	80	c 2	15	1	-	{ 32 27.5, 29.5	
113	22 July	0830	1.00	59°19'N	01°07'W	760		14	5	2	{ 25 26.5	Mashed 0-group sandeels
114	22 July	1500	1.00	58°50'N	01°16'W	16		2	64	1	25.5	
115	23 July	1515	0.30	59°28'N	03°45'W	3180		-	-	-	{ 29.5 30.5	
116	23 July	1905	0.30	59°27'N	03°09'W	-		-	-	254	Mackerel	Mashed 0-group pout
117	24 July	0930	0.45	58°42'N	06°00'W	953		-	-	-	26	
118	24 July	1500	0.30	58°32'N	05°14'W	-		-	-	8	Spurdogs Haddock	
119	25 July	0900	0.10	59°26'N	03°00'W	12710		-	-	-	31 28.5, 26.5	
120	25 July	1320	0.15	58°50'N	02°34'W	14	1040	-	61	Haddock 53kg Mackerel 8kg	-	Mashed 0-group sprats and sandeels

TABLE 2 Percentage maturity stages of herring, July 1982

	MATURITY STAGE							
	1	2	3	4	5	6	7	8
Northwest Shetland	-	-	21.6	74.9	3.5	-	-	-
Northeast Shetland	-	0.3	10.4	75.6	6.0	-	-	7.7
Southeast Shetland	0.5	14.5	33.1	50.7	-	-	-	1.2
East Shetland (offshore)	-	12.9	36.4	15.4	-	-	-	35.2
Foula	-	2.7	54.2	40.8	-	-	-	2.3
Southwest Shetland	1.5	9.2	44.7	43.4	-	-	-	1.3
South of Fair Isle	-	25.7	37.6	35.1	0.7	-	-	0.9
Caitness (Wick)	-	-	1.9	43.8	43.5	10.8	-	-
Northeast Orkney	-	4.7	59.6	35.8	-	-	-	-
Northeast Orkney	-	0.6	10.8	60.3	3.0	-	-	25.2
Butt of Lewis	-	5.0	50.9	41.0	-	-	-	3.6

TRACK CHART "SCOTIA" 7 July 1982. Concentrations of nc' species attributable to fish shown as small dots. Numbered dot. indicate trawl hauls

