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Charter Fishing Vessels *Unity/Seaspray*

Charter Cruise 3401H

REPORT

31 January – 9 February 2002

Personnel

A P Robb
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Fishing Gear

Sprat trawl supplied by vessels.

Objectives

To determine the proportions of sprats, herring and other species in catches taken in the Firth of Forth.

Narrative

Scientific staff joined the vessels at Burntisland harbour on 31 January and unloaded the sampling equipment. Gale force conditions at the time prevented the ships from sailing immediately and the opportunity was taken to finalise the survey procedures with the two skippers. It was agreed that all sampling would be done onboard the *Seaspray*, which was the vessel rigged for shooting and hauling the trawl gear. Several areas where sprats were historically caught were identified and a provisional daily plan constructed to cover these during the course of the charter. The basic survey technique was for the ships to steam parallel to each other, approximately 1-2 nm apart whilst following a "zig zag" course. The precise dimensions were to be decided by the geographical constraints of each locality being surveyed. It was noted that a large proportion of the waters along both shore lines were extremely shallow and therefore inaccessible to both vessels. When fish traces were found these were to be logged and then fished to determine the species composition. The 1 February was also lost due to continuing poor weather conditions but the ships were able to sail on the late afternoon of the 2nd and surveyed the area to the east and west of the rail and road bridges, including Rosyth docks, returning to Burntisland at 0800 hours on the 3rd. Bad weather once again prevented work recommencing on the evening of the 3rd and the vessels remained in Burntisland harbour until the morning of 4 February when the area from west of Inchkeith island up to the bridges was covered without interruption. The following day the area including Kircaldy Bay, East of Inchkeith and across to Leith was completed. The weather conditions continued to improve and the opportunity was taken on the 6th to successfully re-examine the areas around the bridges and to extend the survey area closer inshore at the Mortimers Deep and Hounds Point terminals.

Gale force conditions on the 7th once again prevented the vessels from sailing until the morning of the following day. On the last two days of the charter the area to the south of Inchkeith was covered and the opportunity taken to fish traces in locations which had not

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been sampled previously. On completion of the survey the vessels docked at Burntisland around mid-day on 9 February.

Results

Despite time being lost due to the poor weather conditions good coverage of the inner Firth of Forth was obtained. At the beginning of the survey the border line weather conditions and strong tides generated many false echoes, making interpretation of some traces problematical. However fish traces were found to occur over a wide area from the east side of Inchkeith island up to approximately one nm west of the road bridge and were generally concentrated along the edges of trinks leading into deeper water depths. There was almost a complete absence of fish traces in the shallower areas closer to the coastline on both the north and south sides of the Firth of Forth. The traces were usually scattered in appearance, except for the shoals found to the south east of Inchkeith island which were tightly formed. Many traces were found in mid water, even during daylight hours, but overall there was a distinct diurnal movement of shoals from bottom to surface. In total twenty one hauls were carried out, of which sixteen were valid. Initial problems with, and the subsequent complete failure of the vessel's headline transducer equipment meant that it was not possible to fish at or near the bottom with confidence. This meant that the majority of the catches were taken from shoals which were clear of the bottom. In most instances the trawl was towed for a variable period of time before any fish traces passed through the net. The length of the tows varied from 10 minutes to more than one hour depending on the density of the traces being fished, with the decision to haul being based on the frequency and apparent strength of the traces entering the net. Sprats were taken during both daylight and darkness hours and catches ranged from a few kilograms to more than one tonne. Tables 1-3 and Figures 1-2 summarise the fishing positions, the duration and the catch composition details for each haul. The catches were generally dominated by the numbers of sprats (>90 % in most cases) with the exception of haul 6 and haul 10 in which the proportion of herring was 19% and 24% of the catch respectively. These were taken in the area to the north and south of Inchkeith Island. Haul 9 which was close to haul 6 only gave a 3% by catch of herring. Hauls 13 and 14 which were in the area of the Forth road bridge gave a herring by catch of around 10%. By catches of species other than herring were negligible in all cases.

Tables 2-3 give for each haul the raised length frequency distributions for the sprat and herring catches. For sprats these were composed mainly of very small juveniles (1 year olds) with a mean length of around 6.5 cm. Only haul 1 on the west side of the Oxcar light and hauls 6 and 20 to the south of Inchkeith contained reasonable quantities of sprat greater than 7.0 cm. Haul 1 was taken in total darkness at the surface whilst the other two were fished close to the bottom as darkness closed in. The age distribution was similar for the herring catches with a mean length of around 9.6 cm.

The knowledge and assistance provided by the skippers and crew of both vessels contributed greatly to the success of the survey.

A Robb
15 May 2002

Figure 1 . Firth of Forth Trawl positions

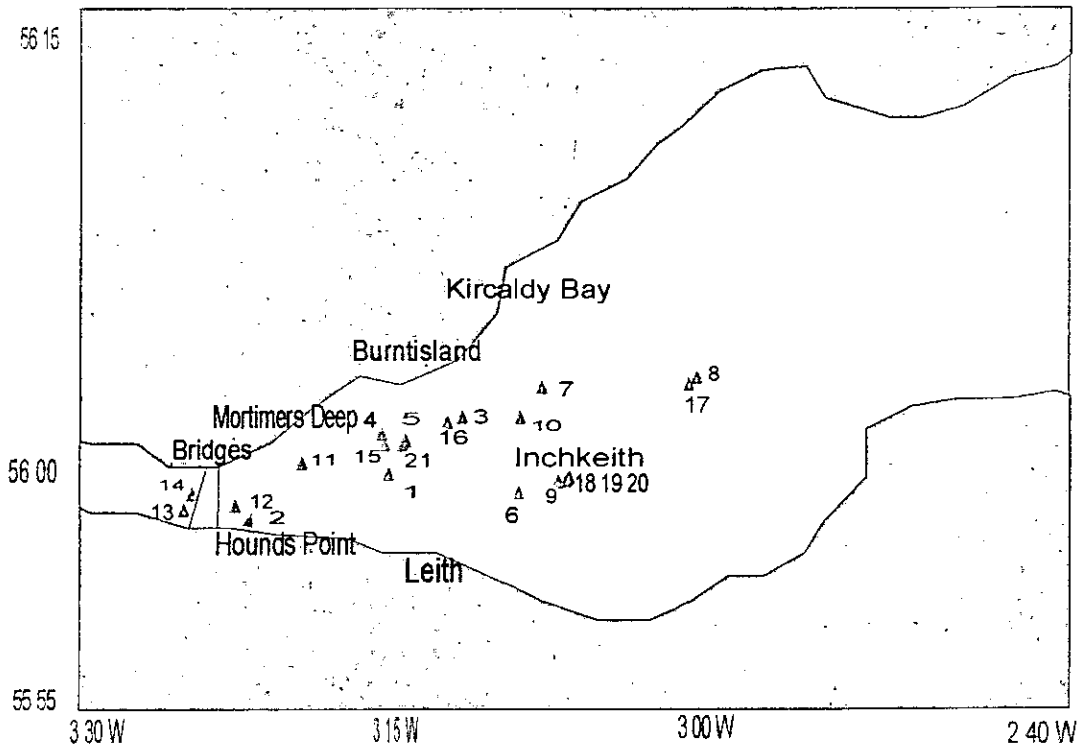


Figure 2. Percentage catch composition of herring and sprats in each haul

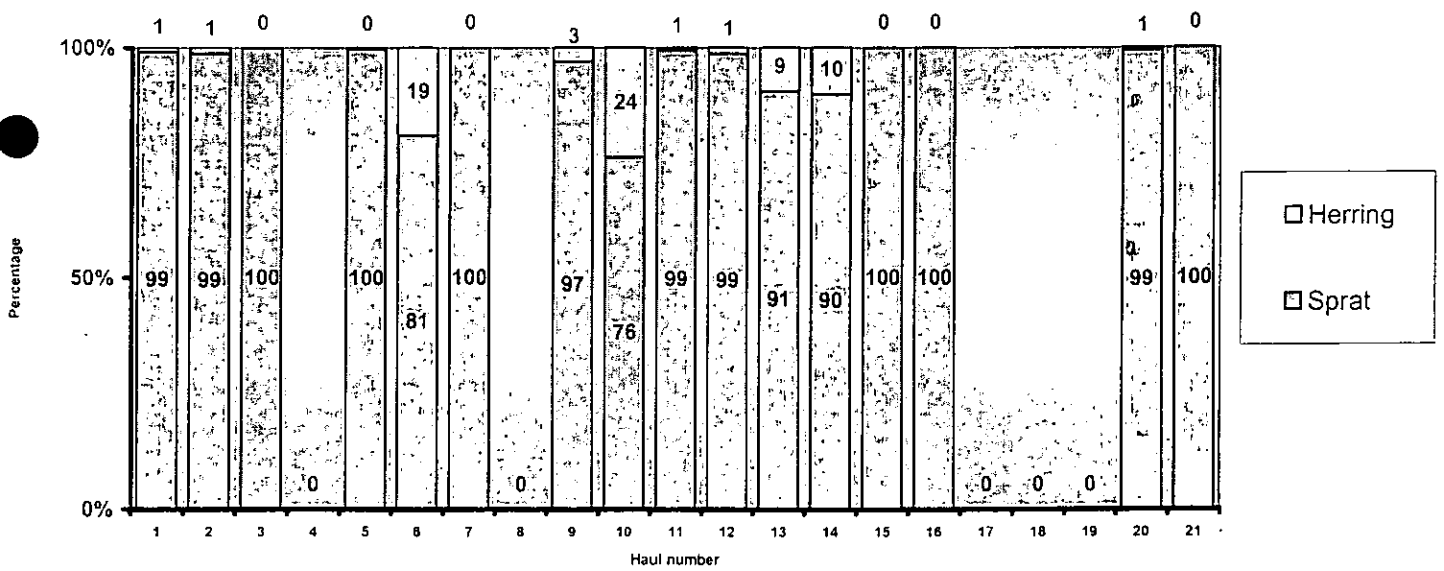


Table 1 Location, duration and percentage catch composition for each haul

Haul	Date	Time	Time	Duration (mins)	Shoot Lat	Shoot Lon (W)	Haul Lat	Haul Lon (W)	Rect	Bottom Depth (m)	Wind (force)	Dir'n	Catch (kgs)	Sprat Nos	Her Nos	%Composition (Numbers)	
																Sprat	Herring
1	2-Feb	2205	2315	70	5601.00	0315.00	5601.00	0317.55	41E6	35	4	SW	200	163892	1457	99.1	0.9
2	3-Feb	0240	0315	35	5559.00	0322.00	5600.56	0321.54	41E6	28	4	SW	7	6473	85	98.6	1.3
3	4-Feb	0930	1025	55	5602.89	0311.48	5602.05	0314.44	41E6	34	4	SSW	10	10317	15	99.9	0.1
4	4-Feb	1155	1215	20	5601.89	0315.19	5601.63	0316.35	41E6	34	4	SE	0	0	0	0	0
5	4-Feb	1245	1345	60	5602.03	0314.23	5601.99	0319.92	41E6	26	4	SE	360	353875	1314	99.7	0.3
6	4-Feb	1640	1655	15	5600.47	0308.66	5600.44	0307.25	41E6	22	4	SE	1032	494715	116423	80.9	19
7	5-Feb	910	935	25	5603.58	0307.57	5603.44	0309.63	41E6	26	5	SW	1	1664	0	100	0
8	5-Feb	1550	1620	30	5603.93	0300.08	5603.66	0300.73	41E6	32	4	SSW	0	0	0	0	0
9	5-Feb	1740	1758	18	5600.79	0306.75	5601.21	0305.86	41E6	35	4	W	9	8853	274	97.0	3
10	5-Feb	1850	1915	25	5602.89	0308.64	5602.56	0308.14	41E6	33	4	W	70	18664	5808	76.3	24
11	6-Feb	1010	1050	40	5601.32	0319.21	5600.74	0321.47	41E6	30	4	NW	4	4624	33	99.3	0.7
12	6-Feb	1155	1225	30	5600.08	0322.47	5559.99	0323.85	41E6	38	4	NW	15	18066	249	98.6	1
13	6-Feb	1405	1437	32	5559.99	0324.93	5600.48	0327.46	41E6	32	4	NW	21	13055	1358	90.5	10
14	6-Feb	1700	1715	15	5600.44	0324.55	5600.73	0325.84	41E6	15	5	NW	0.5	868	97	89.9	10
15	8-Feb	1107	1137	30	5602.21	1315.34	5602.32	0313.11	41E6	33	4	W	1	1078	0	100	0
16	8-Feb	1205	1235	30	5602.55	0312.20	5603.10	0309.29	41E6	60	4	W	7	2626	0	100	0
17	8-Feb	1405	1415	10	5603.70	0300.47	5603.15	0301.74	41E6	67	4	W	0	0	0	0	0
18	8-Feb	1515	1540	25	5600.98	0306.28	5600.53	0308.1	41E6	38	4	W	0	0	0	0	0
19	8-Feb	1605	1625	20	5600.92	0306.25	5600.48	0307.55	41E6	36	4	S	0	0	0	0	0
20	8-Feb	1650	1700	10	5600.84	0306.38	5600.43	0307.34	41E6	36	5	W	600	256372	1726	99.3	0.7
21	9-Feb	1000	1025	25	5601.88	0314.30	5602.12	0312.32	41E6	29	4	W	45	25545	0	100	0

Table 2 Sprat : Raised Length Frequencies for each haul																	
Length 0.5cm	Haul Nos																
	1	2	3	5	6	7	9	10	11	12	13	14	15	16	20	21	
3			61				8	39									
3.5	281	269									322	12					
4	11787	786	1812	11059			86	611	382	250	3285	2175	170		30		
4.5	16558	1013	2026	49764	14583		428	1873	1419	1304	5186	3222	219	46	236	477	
5	16558	993	2180	74953	23558		449	2031	2456	1515	4192	3182	191	240	393	9054	1114
5.5	16558	869	2303	71881	58334		416	1518	2892	1028	2809	2094	81	254	487	19061	4377
6	16838	786	1504	54064	65065		169	1065	3329	250	1210	564	45	232	477	22873	5411
6.5	14874	476	430	43006	68430		74	690	2620	184	778	403	45	214	467	46700	5968
7	16558	310		30718	70674		25	434	2401	92	432	322	32	78	374	46223	5730
7.5	12067	269		7987	59456		8	335	1801		173	201	4	12	143	46700	2626
8	17961	227		6144	49359			118	873			201	24	2	15	36216	318
8.5	9542	165		4301	37019			138	382			242	12		5	21444	
9	5893	103			24680				109				4			5718	
9.5	3648	83			12340							7	8			953	
10	1684	21			3365							7	8				
10.5	1403				2244							13	12				
11	842	21			3365												477
11.5	281	21															477
12	281	21															
12.5					1122												
13	281				1122												
13.5		41															
14																	
14.5																	
15																	
Total	163892	6473	10317	353875	494715	1664	8853	18664	4624	18066	13055	868	1078	2626	256372	25545	

Table 3 Herring : Raised Length Frequencies for each haul

Length 0.5cm	Haul Nos											
	1	2	3	5	6	9	10	11	12	13	14	20
5												
5.5						3	37			7		
6							19	1		13		
6.5							19				1	
7				94				4		7	5	
7.5	146	4					37		39	179	12	
8	291	23	5	281	1935	18	281	5	39	338	24	247
8.5	389	23		281	11933	58	768	11	61	305	17	493
9	291	6		188	26123	71	1124	2	55	166	17	370
9.5	340	6	5	188	27413	61	1274	5	22	106	11	370
10		6	5	188	26445	29	1255	4	17	99	5	247
10.5		11		94	13223	18	768	1	6	13	2	
11		4			3548	13	94		6	27	1	
11.5					3225	3	37		6	13	1	
12		2			645		75			13	1	
12.5					323					13		
13					645		19			20		
13.5										27		
14					323					7		
14.5					645					7		
15												
15.5										7		
Total	1457	85	15	1314	116423	274	5808	33	249	1358	97	1726