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FRV *Clupea*

Cruise 1106C

## REPORT

11–24 August 2006

### Personnel

C G Davis (SIC)  
R Watret (SIC 18-20 August)  
I Martinez  
N Dawson (Aberdeen University)

### Objectives

1. To determine the distribution and relative abundance of sandeel on inshore fishing grounds around the Shetland Isles and Fair Isle. With particular emphasis on both *Ammodytes marinus* and *Gymnammodytes semisquamatus*.
2. To obtain a length frequency and additional biological parameters for all Angler fish (*L.piscatorius*, *L. budegassa*), caught on Shetland inshore waters during the survey.
3. To train a junior member of staff so that they are equipped to undertake SIC duties for this survey in 2007.

**Out-turn days per project:** 14 days, MFO1TA

### Narrative

Scientific staff joined *Clupea* in Fraserburgh at 1030 on Friday 11 August. *Clupea* sailed from Fraserburgh at 1200 hours and made way for Fair Isle, where the vessel anchored at 0130 on the morning of 12 August. Fishing began and the survey commenced at 0720 at the East Fair Isle grounds on the morning of 12 August. The survey continued up and around the Shetland Isles and Foula, with no weather or gear related difficulties *Clupea* completed the last survey station on the evening of 22 August at Fair Isle, anchoring overnight before making for Fraserburgh the following morning, finally berthing at Fraserburgh on the evening of 23 August.

All survey gear was unloaded and scientific staff disembarked and returned to FRS on the morning of 24 August.

### Results

1. Between 12 and 22 August, a total of 60 valid hauls were made on commercially important (historically) sandeel grounds around the Shetland Isles and Fair Isle, using the 'Sunbeam' sandeel trawl (BT 169). All designated grounds were surveyed on three occasions, during different time periods (0700-1100, 1100-1500, 1500-1900) and where practical, on different dates. Repeat tows were carried out at Mousa, Braeside, South Sands (historically most productive), Boddam, Voe and

Grutnes grounds to compare with the results achieved there during the initial tows undertaken at the beginning of the survey. Repeating these stations was a useful exercise as the tides had been particularly strong at these grounds when first surveyed and may have had an effect on sandeel behaviour.

Catch rates of up to 6,623 Kg per 30 minute haul for *A. marinus* and up to 2,569 Kg per 30 minute haul for *G. semisquamatus* were achieved at the Shetland grounds.

A total of 2375 *A. marinus* were scored for age / length data, with 9456 individuals being scored for length only 8381 *G. semisquamatus*, 584 *H. lanceolatus* and 26 *H. immaculatus* were also scored for length data.

Further analysis of the data gathered for both *A. marinus* and *G. semisquamatus* will be carried out at FRS.

Figure 1 gives the catch rate by time of day in kilogrammes, raised to a standard 30 minute haul for *A. marinus*.

The catch rate for *G. semisquamatus*, in kilogrammes, raised to a standard 30 minute haul can be seen on Figure 2.

The numbers at age for *A. marinus* caught per standard 30 minute haul are shown in Figure 3.

Survey indices, mean number of fish at age per 30 minute tow for years 1984–2005 are shown in Figure 4.

Grounds surveyed are shown on Figure 5.

2. Angler fish (*L. piscatorius*) were found to be present in 40 of the 60 valid hauls. This yielded a total of 219 individuals (197.98 Kg), all of which were scored for length, total weight, gutted weight, sex and maturity.
3. This objective was fully achieved.
4. Cod (*G. morhua*) were found to be present in 24 of the 60 valid hauls. This yielded a total of 1761 individuals, which were scored for length. 1344 of these were 'O' group fish (2006 year class), with the remainder being made up of primarily 1 year old fish.

C G Davis  
26 September 2006

Seen in draft: A Simpson, OIC *Clupea*

Fig1. **A.marinus 'Clupea' August 2006**  
**Kg caught per 30 minute haul during different time periods**

<b>Ground</b>	<b>07-1100hrs</b>	<b>11-1500hrs</b>	<b>15-1900hrs</b>	<b>Total for Ground</b>
E.Fair Isle	<1	<1	3	3
W.Fair Isle	<1	<1	0	<1
Grutnes	<1	26	<1	26
Voe	286	112	303	701
Boddam	501	146	471	1118
Mousa	491	3001	970	4462
Braeside	4470	3643	3591	11704
South Sands	179	420	3	602
Balta	0	0	0	0
Brekkin	0	0	<1	<1
Fethaland	3	0	0	3
Sands Voe	0	0	69	69
North Foula	<1	0	<1	<1
South Foula	56	139	147	342
Ham O Foula	188	17	618	823
Trink	83	173	633	889
Mousa (repeat)	3274	1788	6623	11685
Braeside (repeat)	591	1604	2307	4502
S.Sands (repeat)	0	73	23	96
Boddam (repeat)	397	*	*	397
Voe (repeat)	150	*	*	150
Grutnes (repeat)	8	*	*	8
	<b>10677</b>	<b>11142</b>	<b>15761</b>	<b>37580</b>

\* no haul undertaken

Fig 2. **G.semismamatus 'Clupea' August 2006**  
**Kg caught per 30 minute haul during different time periods**

<u><b>Ground</b></u>	<u><b>07-1100hrs</b></u>	<u><b>11-1500hrs</b></u>	<u><b>15-1900hrs</b></u>	<u><b>Total for Ground</b></u>
E.Fair Isle	<1	0	<1	<1
W.Fair Isle	0	0	0	0
Grutnes	<1	7	<1	7
Voe	56	21	502	579
Boddam	15	20	210	245
Mousa	229	359	74	662
Braeside	255	417	2569	3241
South Sands	16	0	<1	16
Balta	6	12	0	18
Brekkin	88	543	21	652
Fethaland	24	0	0	24
Sands Voe	0	<1	0	<1
North Foula	<1	0	<1	<1
South Foula	274	209	112	595
Ham O Foula	127	18	957	1102
Trink	321	513	121	955
Mousa (repeat)	156	2356	167	2679
Braeside (repeat)	170	6	143	319
S.Sands (repeat)	0	10	35	45
Boddam (repeat)	53	*	*	53
Voe (repeat)	55	*	*	55
Grutnes (repeat)	3	*	*	3
	<b>1848</b>	<b>4491</b>	<b>4911</b>	<b>11250</b>

\* no haul undertaken

Fig 3.

**A.marinus 'Clupea' August 2006****Numbers of fish at age per ground surveyed**

<b>Ground</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
South Sands	29222	281	88	51	15	2	6	0
Braeside	350847	106351	55362	1633	3248	1948	0	0
Mousa	492416	73250	10359	1066	1005	387	0	0
Voe	606263	88991	10927	1025	1128	517	0	0
Boddam	455750	37098	2157	267	13	71	0	0
Grutnes	16620	23531	1159	755	106	124	0	0
E.Fair Isle	31	120	0	0	0	0	0	0
W.Fair Isle	16	1	0	0	0	0	0	0
Trink	0	19268	1004	46	209	0	23	19
South Foula	31231	3597	298	54	292	424	158	89
Ham O Foula	5028	20355	612	27	2	0	0	0
North Foula	1	18	1	0	0	0	0	0
Sands Voe	1315	1911	530	30	0	0	0	0
Fethaland	78	4	16	3	2	1	0	0
Brekkin	0	1	0	0	0	0	0	0
Balta	0	0	0	0	0	0	0	0
Revised overall Indices :	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Year Class	124301 <b>2006</b>	23424 <b>2005</b>	5157 <b>2004</b>	310 <b>2003</b>	376 <b>2002</b>	217 <b>2001</b>	12 <b>2000</b>	7 <b>1999</b>

Fig 4.

**A.marinus 'Clupea' August 2005**  
**Survey indices, Mean No. fish per 30 minute tow 1984 – 2005**

Year	0	1	2	3	4	5	6	7
1984	345774	47590	34613	9921	3999	1369	856	258
1985	121905	74509	38843	23455	10872	1959	962	119
1986	681869	49816	11399	15376	7049	2893	1210	191
1987	-	-	-	-	-	-	-	-
1998	73371	898	7189	4843	4612	3031	1619	20
1989	813752	9059	977	3820	3893	2017	462	86
1990	90148	30118	3771	1346	1736	1142	444	329
1991	1009024	10001	1925	1694	750	53	21	5
1992	199301	465958	1215	347	168	43	10	12
1993	635331	18180	73176	2176	361	150	72	23
1994	98653	135158	14272	41299	3369	296	12	17
1995	-	-	-	-	-	-	-	-
1996	589368	23056	12513	1836	1185	1387	524	72
1997	2953350	88582	6519	8938	1211	1353	1159	357
1998	559203	222137	18583	2841	1840	227	607	175
1999	1165594	6410	10766	10377	1351	360	365	54
2000	7915	26166	2740	6213	1997	301	239	17
2001	5296	11410	18008	5036	2624	736	113	56
2002	104437	2490	1002	1254	608	200	34	28
2003	8627	6492	1999	641	825	286	126	72
2004	27524	786	1034	1082	443	177	78	23
2005	62600	2560	668	555	230	53	34	4
2006	124301	23424	5157	310	376	217	12	7

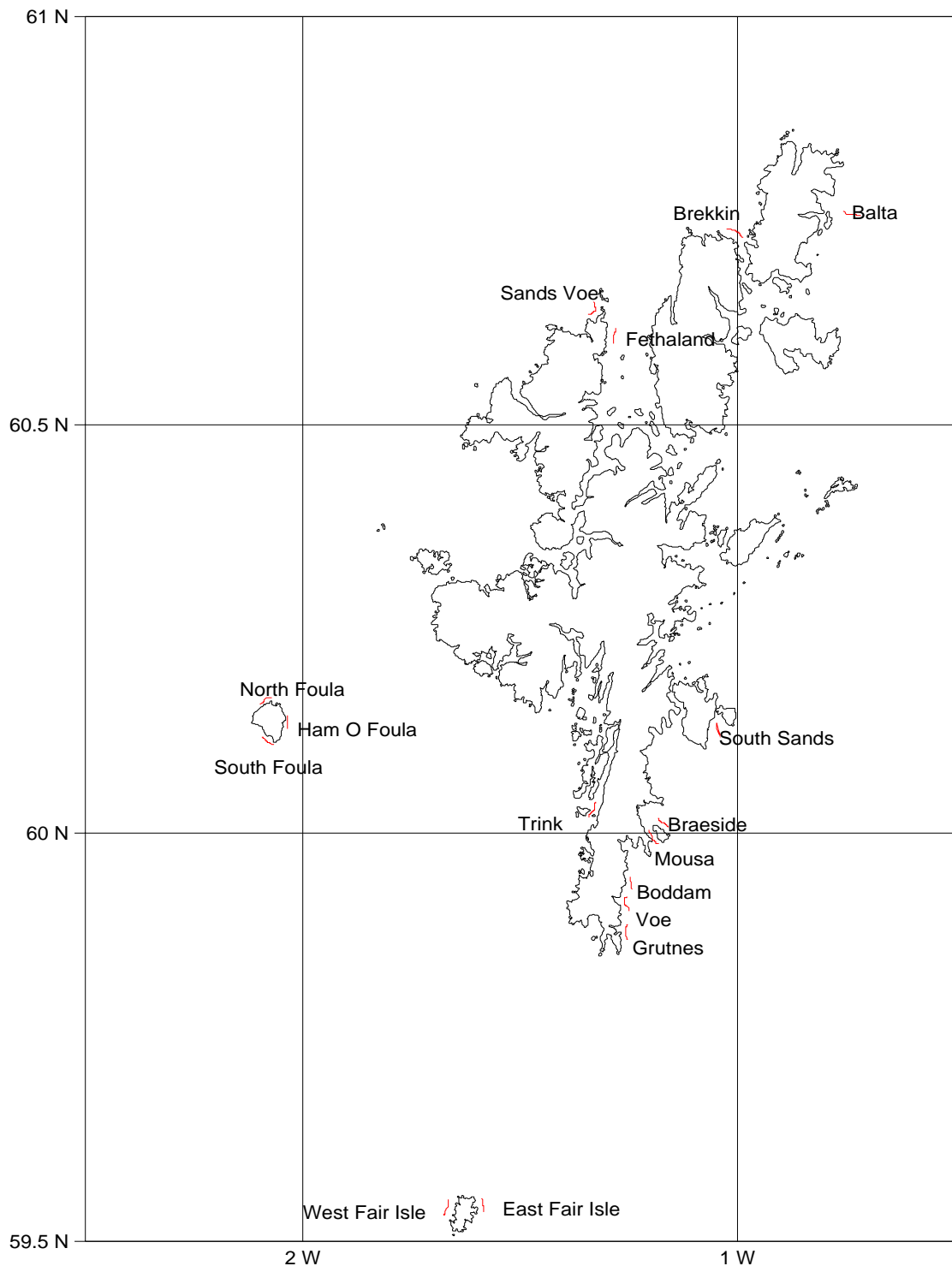


Fig 5.