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FRV *Clupea*

Cruise 1105C

## **REPORT**

3–15 August 2005

### **Personnel**

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M Harding  
O Goudie

### **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 obtain samples of Sandeel for FL Seal diet studies being undertaken at St Andrews University.

**Out-turn days per project:** 13 days, MFO1TA

### **Narrative**

Scientific staff joined *Clupea* in Fraserburgh at 1000 on Wednesday 3 August. *Clupea* sailed from Fraserburgh at 1030 and made way for Fair Isle, where the vessel anchored at 2300. Fishing began and the survey commenced at 0700 at the West Fair Isle grounds on the morning of 4 August. The survey continued up and around the Shetland Isles and Foula, with some unseasonably poor weather and sea conditions, making operations difficult at times. Credit must be given to the Skipper and crew of *Clupea* for their professionalism and determination to complete the relevant stations during these difficult periods of weather.

The survey was encumbered with substantial gear damage from the start, resulting in the majority of the stations being undertaken in possession of only one complete set of trawl gear. It is thought that this damage was due to boulders having been dragged across previously 'clean' ground by local demersal fishing vessels that were working close inshore at the time.

*Clupea* completed the last survey station on the evening of 13 August at Fair Isle, where she anchored overnight before making for Fraserburgh the following morning, finally berthing at Fraserburgh on the evening of 14 August.

All survey gear was unloaded and scientific staff disembarked on the morning of 15 August, returning to FRS.

## Results

1. Between 4-13 August, a total of 56 valid hauls were made on historically commercially important 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 the historically most productive grounds (Mousa, Braeside and South Sands), to verify 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 1976 Kg per 30 minute haul for *A. marinus* and up to 3674 Kg per 30 minute haul for *G. semisquamatus* were achieved at the Shetland grounds

A total of 1809 *A. marinus* were scored for age/length data, with 7201 individuals being scored for length only 7825 *G. semisquamatus* and 749 individuals from 'other' eel species were also scored for length data.

Further analysis of the data gathered for both species 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 35 of the 56 valid hauls. This yielded a total of 185 individuals (184.322 Kg), all of which were scored for length, total weight, gutted weight, sex and maturity.
3. Approximately 100 Kg of sandeel (various species) samples were collected and frozen at sea for FL Seal diet studies that are currently being carried out at St Andrews University.

C Davis  
13 January 2006

Seen in Draft: A Simpson, OIC *Clupea*

Fig 1. **A.marinus 'Clupea' August 2005**  
**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	0	<1	<1	<1
W.Fair Isle	0	0	0	0
Grutnes	<1	116	<1	116
Voe	<1	16	124	140
Boddam	187	70	242	499
Mousa	612	1975	1976	4563
Braeside	944	80	495	1519
South Sands	687	112	86	885
Balta	0	0	0	0
Brekkin	<1	1	<1	1
Fethaland	<1	0	<1	<1
Sands Voe	215	11	78	304
North Foula	0	0	1	1
South Foula	123	74	140	337
Ham O Foula	32	108	50	190
Trink	222	194	268	684
Mousa (repeat)	806	445	829	2080
Braeside (repeat)	929	730	1365	3024
S.Sands (repeat)	14	*	25	39
	<b>4771</b>	<b>3932</b>	<b>5679</b>	<b>14382</b>

\* no haul undertaken

Fig 2. **G.semismamatus 'Clupea' August 2005**  
**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	0	<1	0	<1
W.Fair Isle	0	<1	0	<1
Grutnes	0	80	<1	80
Voe	2	56	781	839
Boddam	110	1215	200	1525
Mousa	893	125	333	1351
Braeside	1003	760	625	2388
South Sands	34	14	54	102
Balta	0	0	0	0
Brekkin	<1	68	<1	68
Fethaland	0	0	<1	<1
Sands Voe	0	0	<1	<1
North Foula	0	<1	<1	<1
South Foula	35	80	17	132
Ham O Foula	16	137	2	155
Trink	28	166	100	294
Mousa (repeat)	863	325	290	1478
Braeside (repeat)	2028	1789	3674	7491
S.Sands (repeat)	24	*	97	121
	<b>5036</b>	<b>4815</b>	<b>6173</b>	<b>16024</b>

\* no haul undertaken

Fig 3. **A.marinus 'Clupea' August 2005**

**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	70759	36	59	134	0	4	0	0
Braeside	104209	26892	6877	6054	2236	393	132	0
Mousa	475336	6498	2111	893	80	0	50	0
Voe	1333	836	516	528	624	71	105	55
Boddam	65264	1438	85	49	0	49	0	0
Grutnes	29041	1	1	0	1	0	0	0
E.Fair Isle	0	0	0	0	0	0	0	0
W.Fair Isle	0	0	0	0	0	0	0	0
Trink	113908	1956	0	557	140	0	111	0
South Foula	63861	1871	317	401	246	293	132	0
Ham O Foula	9252	1423	713	252	346	33	8	8
North Foula	0	5	5	3	6	1	1	0
Sands Voe	68589	0	0	0	0	0	0	0
Fethaland	46	0	0	0	0	0	0	0
Brekkin	0	3	4	6	4	4	4	2
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>
62600	2560	668	555	230	53	34	4	
Year Class	<b>2005</b>	<b>2004</b>	<b>2003</b>	<b>2002</b>	<b>2001</b>	<b>2000</b>	<b>1999</b>	<b>1998</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	10389	6172	1831	636	814	288	126	67
2004	23380	727	965	993	414	159	69	20
2005	62600	2560	668	555	230	53	34	4

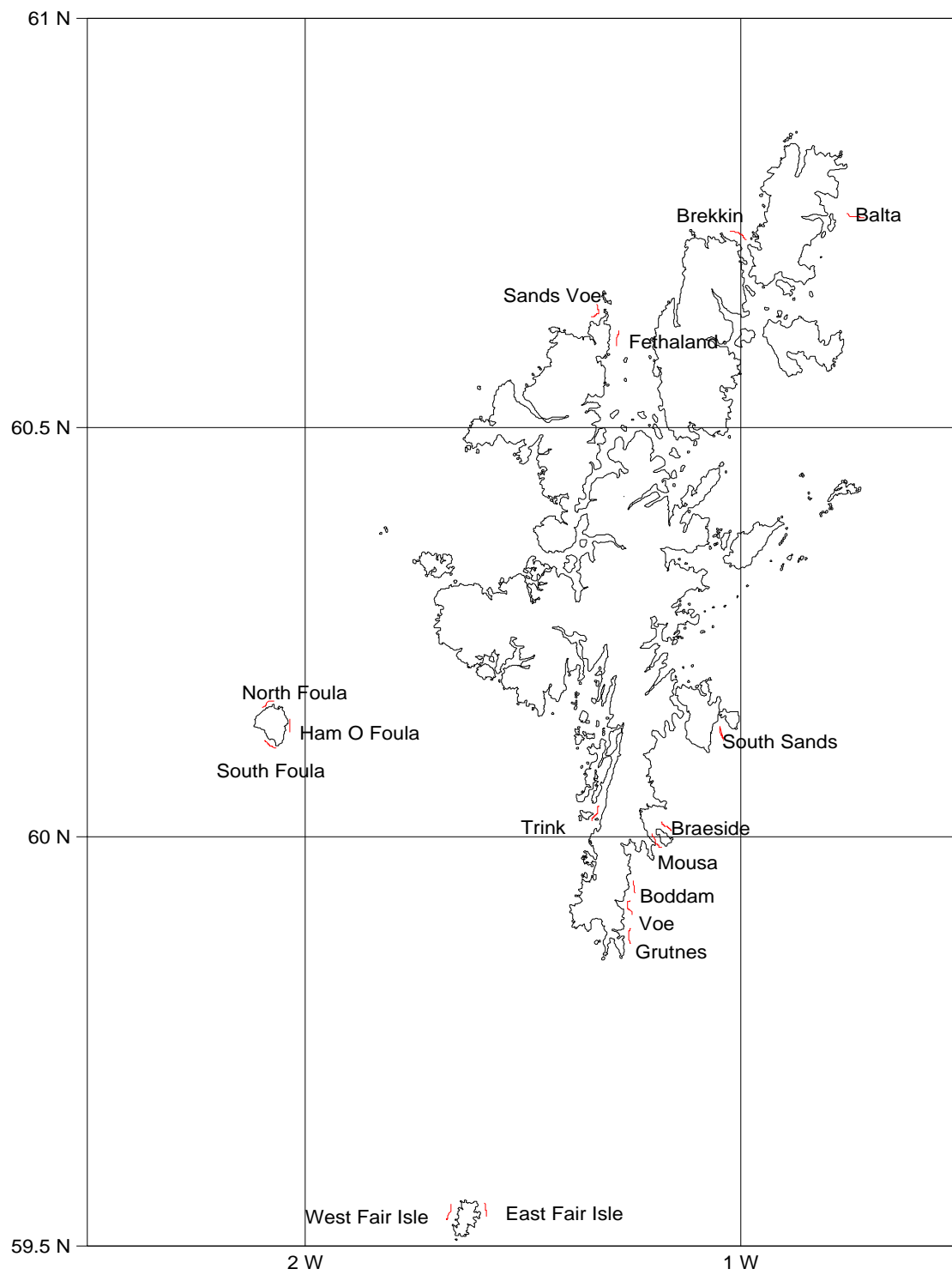


Fig 5.