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FRV *Clupea*

Cruise 1702C

REPORT

16 October – 4 November 2002

Personnel

Part 1

E Hatfield	SIC	16-25 October
P Copland		16-25 October
J Drewery		16-25 October
J Donald		16-25 October
O Goudie		16-25 October

Part 2

J Kinnear	SIC	25 October - 4 November
J Drewery		25 October - 4 November
J Martin		25 October - 4 November
S Wear		25 October - 4 November
AN Other		25 October - 4 November

Objectives

1. To carry out detailed acoustic surveys in selected lochs, using the EK 500 to determine the distribution of herring and sprat. Concentrations of pelagic fish to be sampled using the PT154. Species composition and length frequency distributions of the fish caught to be determined. Sub samples to be weighed and otolithed to establish length weight relationships (whole and eviscerated). Herring samples to be analysed for sex, maturity and Ichthyoponus infection. Stomachs and DNA samples to also be taken. Detailed photographs of herring will be taken for future morphometric measurements.
2. To carry out demersal trawls in Lochs Kishorn, Duich, Hourn, Nevis and Sunart as part of the Aqcess program, to determine the abundance, distribution and variation of fish species and any epibenthic mega-fauna using the BT158 trawl and the 2.8 m beam trawl where appropriate. At each trawl station the length frequency of all species to be taken and sub samples of the major commercial species weighed (whole and eviscerated) and otolithed. Stomach contents to be removed from selected species for trophic studies.
3. To remove kidney samples from as many species as possible throughout the survey area for IPN analysis.

Narrative

Clupea sailed from Fraserburgh on 16 October, arriving in Kyle on the following day where the scientific staff joined the ship. The acoustic survey using the EK 500 was started in Loch Kishorn using a similar zig-zag pattern to previous years. Suitable marks were trawled where possible and fish treated according to the laid down protocol. The survey continued unabated, the same protocols being adhered to in each of the selected lochs (Duich, Hourn, and Nevis). Extra information was also gathered from Loch Carron and Loch Alsh. No time was lost due to weather. *Clupea* docked at Kyle to change scientific staff on 25 October.

The second half of the cruise concentrated on repeating the standard demersal and beam tows as part of the Aqcess project. Beginning in Loch Kishorn, *Clupea* proceeded south completing all the work required in Lochs Duich, Hourn, Nevis and Sunart, extra surveying was also carried out off Eigg, in Loch Eisort, Loch Carron and Loch Alsh. Scientific staff were dropped off at Kyle on 1 November before *Clupea* made her way to Fraserburgh.

No down time was recorded for any part of the trip.

Results

A problem with Roxan meant that no ground discrimination data was collected during the trip, however all other objectives were met. A total of 12 pelagic, 14 demersal and 10 beam trawls were completed during the trip. Forty grab samples were taken and sieved through 2 and 1 mm mesh, the samples being retained for later identification. Mud samples were also taken for particle analysis. CTD and water samples were taken routinely at each trawl station. Positions for the pelagic and demersal tows are detailed in the attached table. A detailed species list has also been drawn up for each loch (Table 3). Analysis of the samples is underway and will be reported at a later date as part of the Aqcess project.

As part of the IPN research project 18 species of fish were examined and a total of 3765 samples taken. Table 2 lists a breakdown of samples by loch and species.

E Hatfield/J Kinnear
16 December 2002

AREA		Pelagic		trawl stations	
		Lat		Long	
L Nevis PT1	SHOOT	56	59.34	5	40.29
	HAUL	56	60.67	5	41.63
L Nevis PT2	SHOOT	57	1.79	5	42.07
	HAUL	57	1.59	5	43.11
L Hourn PT3	SHOOT	57	6.96	5	34.18
	HAUL	57	7.53	5	35.7
L Hourn PT4	SHOOT	57	7.44	5	36.12
	HAUL	57	7.83	5	38.02
L Hourn PT5	SHOOT	57	7.41	5	35.84
	HAUL	57	7.84	5	37.93
L Hourn PT6	SHOOT	57	7.02	5	54.06
	HAUL	57	54.06	5	35.68
L Duich PT7	SHOOT	57	14.33	5	27.87
	HAUL	57	14.89	5	28.79
L Duich PT8	SHOOT	57	15.9	5	30.43
	HAUL	57	15.2	5	29.2
L Kishorn PT9	SHOOT	57	22.3	5	40.73
	HAUL	57	20.87	5	42.61
L Kishorn PT10	SHOOT	57	18.07	5	44.87
	HAUL	57	19.88	5	43.4
L Carron PT11	SHOOT	57	22.4	5	31.58
	HAUL	57	22.73	5	25.97
L Carron PT12	SHOOT	57	21.92	5	31.7
	HAUL	57	22.3	5	30.96

AREA		Demersal		trawl stations	
		Lat		Long	
L Kishorn DM1	SHOOT	57	22.19	5	40.74
	HAUL	57	21.66	5	0.74
L Kishorn DM2	SHOOT	57	19.44	5	44.54
	HAUL	57	18.86	5	45
L Carron DM3	SHOOT	57	22.6	5	30.27
	HAUL	57	22.12	5	31.44
L Duich DM4	SHOOT	57	15.61	5	30.23
	HAUL	57	15.11	5	29.3
L Duich DM5	SHOOT	57	13.82	5	27
	HAUL	57	14.38	5	27.91
L Hourn DM6	SHOOT	57	7.57	5	36.72
	HAUL	57	7.86	5	37.38
L Hourn DM7	SHOOT	57	7.76	5	35.32
	HAUL	57	7.78	5	36.69
L Nevis DM8	SHOOT	57	0.89	5	41.3
	HAUL	57	0.27	5	40.87
L Nevis DM9	SHOOT	56	59.53	5	41.21
	HAUL	56	0.17	5	42.24
L Sunart DM10	SHOOT	56	39.43	5	58.01
	HAUL	56	39.29	5	53
L Sunart DM11	SHOOT	56	41.91	5	46.63
	HAUL	56	41.32	5	47.71
Eigg DM12	SHOOT	56	55.02	5	62.87
	HAUL	56	54.39	5	63.42
L Einort DM13	SHOOT	57	5.47	5	60.69
	HAUL	57	4.58	5	63.81
L Alsh DM14	SHOOT	57	15.8	5	35.6
	HAUL	57	15.85	5	37.3

Table 1

Kyle docks

Rod & Line

25-Oct-02

Species of Fish	Number Sampled	Length range (mm)
Saithe	45	135 - 270
Pollack	5	135 - 415
Whiting	2	125 - 165
Poor cod	1	165
Cod	1	180
Total	54	

Inner loch Kishorn

DT01 26-Oct-02

Species of Fish	Number Sampled	Length range (mm)
Haddock	150	115 - 160
Gurnard	2	140 - 160
Argentines	3	90 - 140
Long rough dab	38	80 - 210
Poor cod	70	75 - 165
Cod	1	310
Whiting	150	125 - 265
Norway pout	10	105 - 160
Total	424	

Outer loch Carron

DT02 26-Oct-02

Species of Fish	Number Sampled	Length range
Hake	4	270 - 390
Poor cod	10	90 - 115
Cod	1	305
Whiting	150	125 - 205
Norway pout	10	110 - 125
Haddock	150	105 - 150
Total	325	

Inner loch Carron

DT03 27-Oct-02

Species of Fish	Number Sampled	Length range
Gurnard	80	130 - 265
Cod	2	270 - 370
Haddock	23	145 - 240
Plaice	10	135 - 240
Poor cod	50	125 - 165
Whiting	150	135 - 300
Total	315	

Loch Duich near fish farm

DT04 27-Oct-02

Species of Fish	Number Sampled	Length range
Gurnard	10	130 - 205
Cod	3	300 - 380
Haddock	7	155 - 195
Poor cod	150	95 - 175
Dragonette	10	170 - 210
Whiting	150	135 - 215
Total	330	

Upper loch Duich

DT05 28-Oct-02

Species of Fish	Number Sampled	Length range
Mackerel (R & L)	5	215 - 260
Gurnard	3	170 - 200
Haddock	3	145 - 200
Poor cod	150	90 - 200
Whiting	149	115 - 230
Total	310	

Loch Hourn (Creag an'T Sagairt)

DT06 28-Oct-02

Species of Fish	Number Sampled	Length range
Whiting	150	140 - 255
Poor cod	150	100 - 165
Norway pout	150	100 - 150
Total	450	

Loch Hourn (Arnisdale)

DT07 29-Oct-02

Species of Fish	Number Sampled	Length range
Poor cod	150	100 - 175
Cod	1	295
Haddock	1	160
Hake	8	120 - 175
Whiting	150	120 - 205
Norway pout	20	115 - 135
Total	330	

Loch Nevis (Port Longaig)

DT08 29-Oct-02

Species of Fish	Number Sampled	Length range
Whiting	150	120 - 205
Hake	9	150 - 205
Norway pout	3	110 - 115
Poor cod	50	100 - 190
Total	212	

Loch Nevis (Near fish farm)

DT09 29-Oct-02

Species of Fish	Number Sampled	Length range
Haddock	50	140 - 295
Whiting	50	150 - 215
Tadpole fish	1	225
Hake	15	155 - 220
Norway pout	20	115 - 165
Poor cod	30	110 - 170
Total	166	

Table 2 Samples taken for IPN analysis.

Loch Sunart mouth

DT10 30-Oct-02

Species of Fish	Number Sampled	Length range
Haddock	13	125 - 165
Herring	50	110 - 155
Sprat	50	100 - 130
Norway pout	50	90 - 135
Whiting	50	115 - 160
Poor cod	20	110 - 140
Total	233	

Sound of Sleat (Eigg)

DT12 31-Oct-02

Species of Fish	Number Sampled	Length range
Hake	12	150 - 210
Whiting	50	155 - 220
Norway pout	30	110 - 130
Poor cod	30	110 - 125
Sprat	20	100 - 130
Herring	50	135 - 150
Total	192	

Loch Sunart (Salen)

DT11 30-Oct-02

Species of Fish	Number Sampled	Length range
Herring	10	145 - 200
Sprat	10	85 - 125
Poor cod	30	115 - 160
Haddock	42	130 - 190
Whiting	50	115 - 215
Total	142	

Loch Einort

DT13 31-Oct-02

Species of Fish	Number Sampled	Length range
Whiting	50	135 - 290
Hake	50	160 - 225
Poor cod	40	90 - 130
Total	140	

Loch Sunart (Rubha na Eaglaise)

Rod & Line

30-Oct-02

Species of Fish	Number Sampled	Length range
Cod	1	285
Mackerel	5	280 - 300
Total	6	

Loch Alsh (Sron)

DT14 01-Nov-02

Species of Fish	Number Sampled	Length range
Cod	2	375 - 395
Saithe	1	420
Gurnard	10	140 - 200
Norway pout	10	115 - 140
Scad	6	140 - 170
Haddock	23	160 - 210
Poor cod	20	110 - 175
Whiting	50	115 - 240
Plaice	10	150 - 255
Total	132	

Loch Sunart (Creag nan Sgarbh)

Rod & Line

31-Oct-02

Species of Fish	Number Sampled	Length range
Mackerel	3	210 - 285
Whiting	1	170
Total	4	

..Table 2 cont. Samples taken for IPN analysis.

SPECIES	Kishorn	Duich	Hourn	Nevis
Fish			*	*
Argentine (<i>Argentina sphyraena</i>)	*			*
Bib (<i>Trisopterus luscus</i>)		*		
Blue Whiting (<i>Micromesistius poutassou</i>)				
Butterfish (<i>Pholis gunnellus</i>)		*	*	
Cod (<i>Gadus morhua</i>)	*			
Common Dab (<i>Limanda limanda</i>)	*		*	
Conger eel (<i>Conger conger</i>)		*		
Dover sole (<i>Solea solea</i>)		*	*	*
Dragonet (<i>Callionymus lyra</i>)	*			*
Fries' Goby (<i>Lesueurigobius friesii</i>)	*			
Great Pipefish (<i>Syngnathus acus</i>)		*		*
Grey Gurnard (<i>Eutrigla gurnardus</i>)	*	*	*	*
Haddock (<i>Melanogrammus aeglefinus</i>)	*	*	*	*
Hake (<i>Merluccius merluccius</i>)	*			
Herring (<i>Clupea harengus</i>)	*	*		*
John Dory (<i>Zeus faber</i>)		*	*	*
Lesser spotted dogfish (<i>Scyliorhinus caniculus</i>)	*	*	*	*
Long Rough Dab (<i>Hippoglossoides platessoides</i>)	*	*	*	*
Norway Pout (<i>Trisopterus esmarkii</i>)	*		*	
Pearlside (<i>Maurolicus muelleri</i>)	*	*		
Plaice (<i>Pleuronectes platessa</i>)		*	*	*
Poor Cod (<i>Trisopterus minutus</i>)	*			*
Sand Goby (<i>Pomatoschistus minutus</i>)			*	
Silvery Pout (<i>Gadiculus argentus</i>)	*		*	
Sprat (<i>Sprattus sprattus</i>)	*		*	
Spurdog (<i>Squalus acanthias</i>)				*
Tadpole fish (<i>Raniceps raninus</i>)	*	*	*	
Thornback Ray (<i>Raja clavata</i>)	*	*	*	*
Whiting (<i>Merlangius merlangus</i>)	*	*	*	*
Witch (<i>Glyptocephalus cynoglossus</i>)				

Table 3

Species list from *Aqcess* lochs

Crustaceans				
Angular crab (<i>Goneplax rhomboides</i>)			*	
Brown crab (<i>Cancer pagurus</i>)			*	
<i>Calocaris macandreae</i>	*			*
Common shrimp (<i>Crangon crangon</i>)	*	*	*	
Euphausiids		*		
Green crab (<i>Carcinus maenas</i>)		*		
Harbour crab (<i>Liocarcinus depurator</i>)		*		
Hermit crab (<i>Pagurus prideauxi</i>)	*		*	*
Hermit crab (<i>Pagurus bernhardus</i>)		*		
Nephrops (<i>Nephrops norvegicus</i>)		*		
<i>Pasiphea</i> spp.	*	*	*	*
Prawn (<i>Pandalus borealis</i>)		*	*	
Shrimp (<i>Dichelopandalus bonnier</i>)		*		
Squatt lobster (<i>Galathea dispersa</i>)		*	*	*
Squatt lobster (<i>Munida rugosa</i>)			*	*
Echinoderms				
Brittle star (<i>Ophiura ophiura</i>)				
Brittle star (<i>Ophiura robusta</i>)		*	*	*
Common starfish (<i>Asteria rubens</i>)			*	
Flat starfish (<i>Anseropda placenta</i>)	*	*		
Sea potatoe (<i>Brissopsis lyrifera</i>)		*		
Sea urchin (<i>Echinus esculentus</i>)		*	*	*
Seven arm starfish (<i>Luidia ciliaris</i>)		*		
Bivalves and Molluscs				
Bivalve unid.				*
Cuttlefish (<i>Sepiatta sepiatta</i>)			*	*
Dog welk (<i>Buccinum undatum</i>)	*	*	*	*
Icelandic cyprine (<i>Arctica islandica</i>)				
Queen scallop (<i>Aequipecten opercularis</i>)		*	*	*
sea snail (<i>Scaphander lignarius</i>)		*		
Squid (<i>Todaropsis oblanae</i>)			*	
Tower shell (<i>Turritella communis</i>)			*	
Other invertebrates				
Sabellid worms				
Sea mouse (<i>Aphroditidae aculeata</i>)	*	*		
Sipunculides		*		
Alien worm	*		*	*
Funiculina		*		*
Tube anemone (<i>Cerianthus lloydii</i>)	*	*	*	*
	*	*	*	*

Table 3 cont. Species list from *Aqcess* lochs.