



DEPARTMENT OF AGRICULTURE [NI]
AGRICULTURAL AND ENVIRONMENTAL SCIENCE DIVISION
(Aquatic Systems Group)

CRUISE REPORT - LF1598

NEPHROPS AND BYCATCH 6-10 April 1998

PERSONNEL

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OBJECTIVES

- To collect data on spatial patterns of *Nephrops* of and bycatch abundance.
- To collect data to derive a length/weight relationship for Irish Sea *Nephrops*.
- To collect ovigerous *Nephrops* for fecundity estimates.
- To assess the prevalence of the parasite *Hematodinium* in *Nephrops* catches.
- To Collect data and samples of sprat and herring for a population / feeding study.
- To record quantities of marine litter in trawl catches.

METHODS

Hauls of 60 minutes duration were completed at each station. The gear was the same as was used in earlier cruises and was a custom made *Nephrops* net of nominal mesh size 50mm throughout. Catch bulk was quantified by counting baskets filled from the catch. Sample baskets of catch were sorted to provide an assessment of species composition. The *Nephrops* in each sub-sample were divided into male and female components and the ovary maturity stage of female animals noted. Carapace length frequency distributions of both male and female *Nephrops* were measured and the number of recently moulted (soft shelled) animals counted. Whole animals were examined for the prevalence of the parasitic dinoflagellate *Hematodinium*. Ovigerous females were preserved in 4% formalin for future egg counts. The contribution of finfish in catches was quantified and their length compositions measured. Stratified sampling procedures were similar to those used during DANI groundfish surveys.

NARRATIVE

Sunday 5 April:

Following a safety brief by the Fishing Master *RV Lough Foyle* sailed at 23h.00 in order to arrive on the *Nephrops* grounds by the following morning.

Monday 6 April:

The net was shot at 07h.16 at station 106 in fine weather conditions. This was followed by stations 200, 105, 104, 103 and 102. The night was spent drifting in the vicinity of station 207.

Tuesday 7 April:

Station 207 was followed by stations 8, 107, 7, 10, 20, and 17. The night was spent drifting off the west coast of the Isle of Man. Weather fine.

Wednesday 8 April:

Stations 208, 209, 109, 35, 2 and 1 were fished in clear weather conditions. As this completed the scheduled stations for the survey *RI Lough Foyle* set course for Belfast, docking at 20h.00.

RESULTS

During the cruise 19 stations were sampled as indicated in Figure 1 and Table 1. Table 2 shows data on the *Nephrops* catch by station. Female *Nephrops* carrying eggs in an advanced state of development were preserved in 4% formalin for future fecundity studies. Infection levels by *Hematodinium* were 14.2 % in females and 9.5% in males (average 11.9%). These data are summarised in Figure 2. As noted in 1997 infection appears to be confined to juvenile *Nephrops*. Data on *Nephrops* length:weight relationship were collected from intact animals from a range of sizes. Data for male *Nephrops* are presented in Figure 3 and give a preliminary relationship:

$$\text{Weight} = 0.0003\text{CL}^{3.227}$$

This is similar to the relationship used by ICES which was derived for Scottish stocks by Pope and Thomas (1955):

$$\text{Weight} = 0.0003\text{CL}^{3.21}$$

More data are required for female *Nephrops* and from large (>35mm CL) and small (<21mm CL) male animals before a new Irish Sea relationship can be proposed.

The predominant by-catch species was whiting, *Merlangius merlangus* and Table 3 shows the amounts of *Nephrops*, cod, whiting, hake, haddock, herring, sprat and other fish caught at each station. Unusual species seen during the cruise were an electric ray, *Torpedo nobiliana* (Station 103); a tompot blenny, *Parablennius gattorugine* (Station 102) and a common skate, *Raja hatis* (Station 10). Samples of sprat and herring were frozen for future investigations.


In addition to contributing to the DANI time series data base on *Nephrops*, information from this cruise will contribute to two EU funded projects on *Nephrops* (DGXIV- 95/015 & DGXIV- 95/086).

Reference

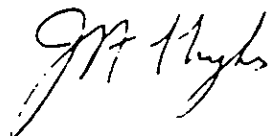
Pope, J. and Thomas, H.J. 1955. Some biometric observations on *Nephrops norvegicus* (L). ICES, CM 1955/K:180 (mimeo)

ACKNOWLEDGEMENTS

Captain Hughes, Officers and Crew of *RI Lough Foyle* are thanked for their enthusiastic co-operation throughout the cruise. The scientific personnel are congratulated on their dedication to duty throughout the cruise.


R. P. Briggs

A. Hughes (Seen in draft)



9 April 1998

Figure 1

LF1598: Map of stations trawled.
(tow length proportional to arrow length)

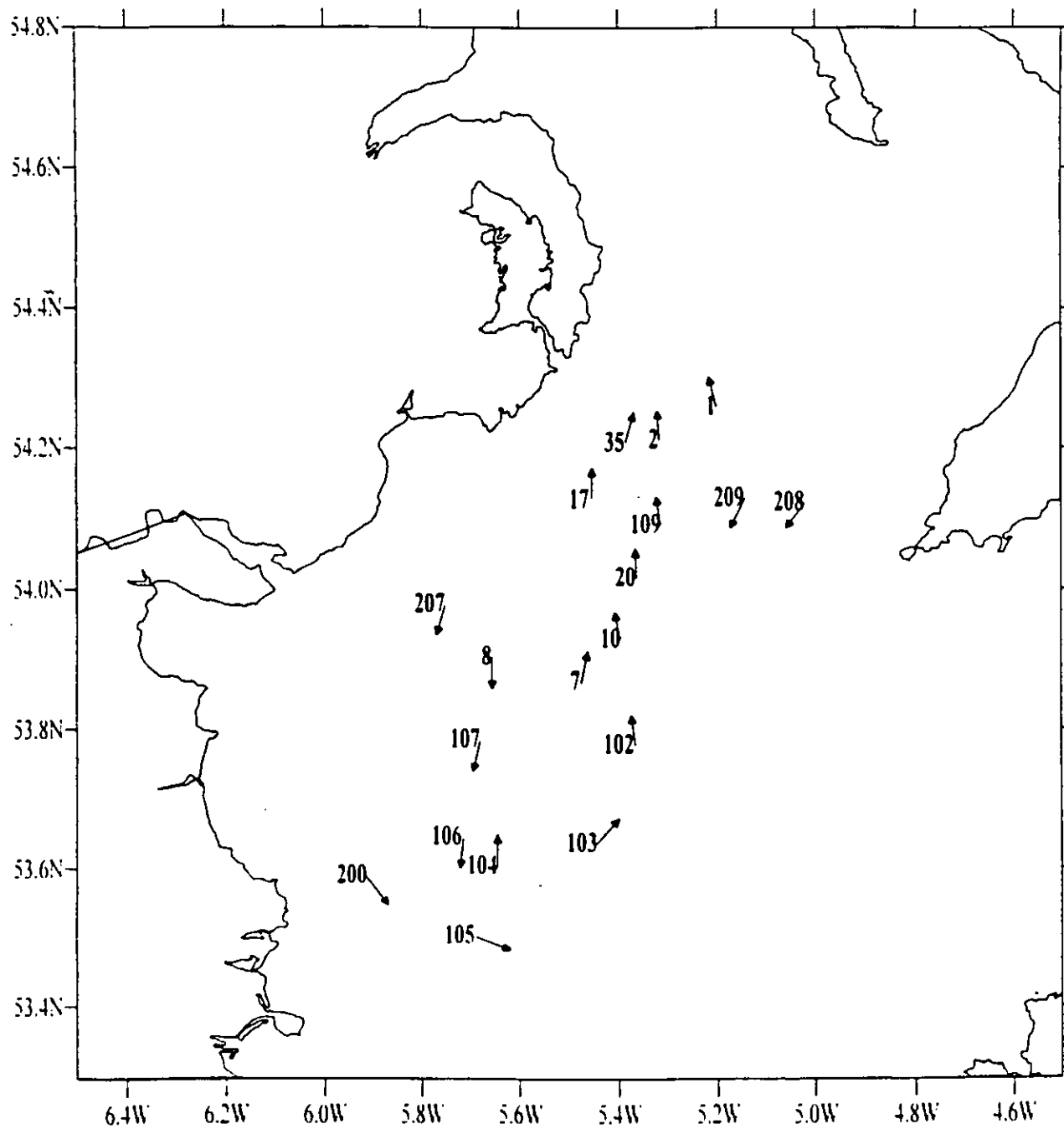


Figure 2

Prevalence of Hematodinium at each station. See Table 1 for data
(Tows with very low catch omitted)

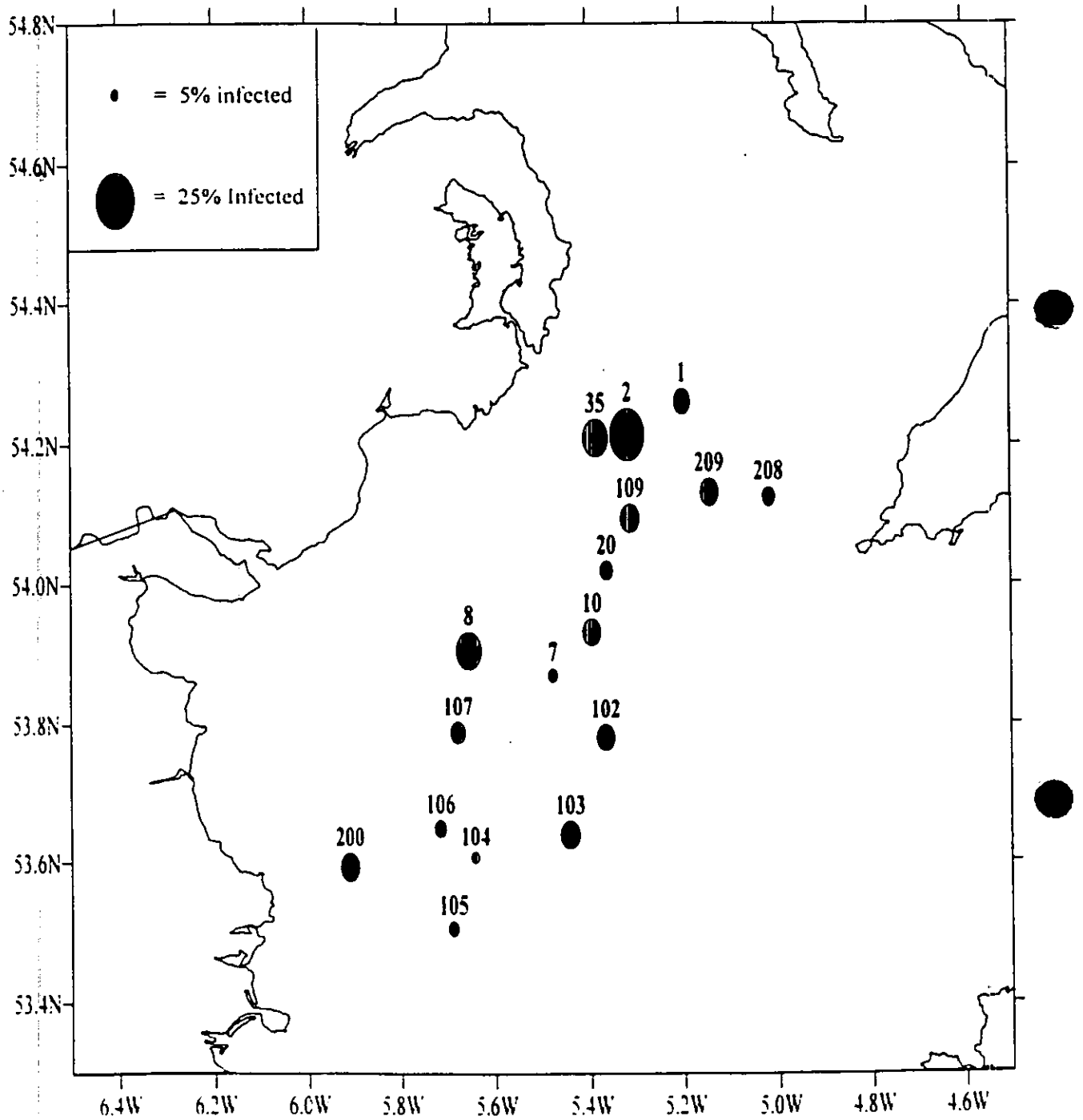


Figure 3

Length: Weight relationship for male *Nephrops* comparing cruise data with data published by Pope & Thomas as used by ICES

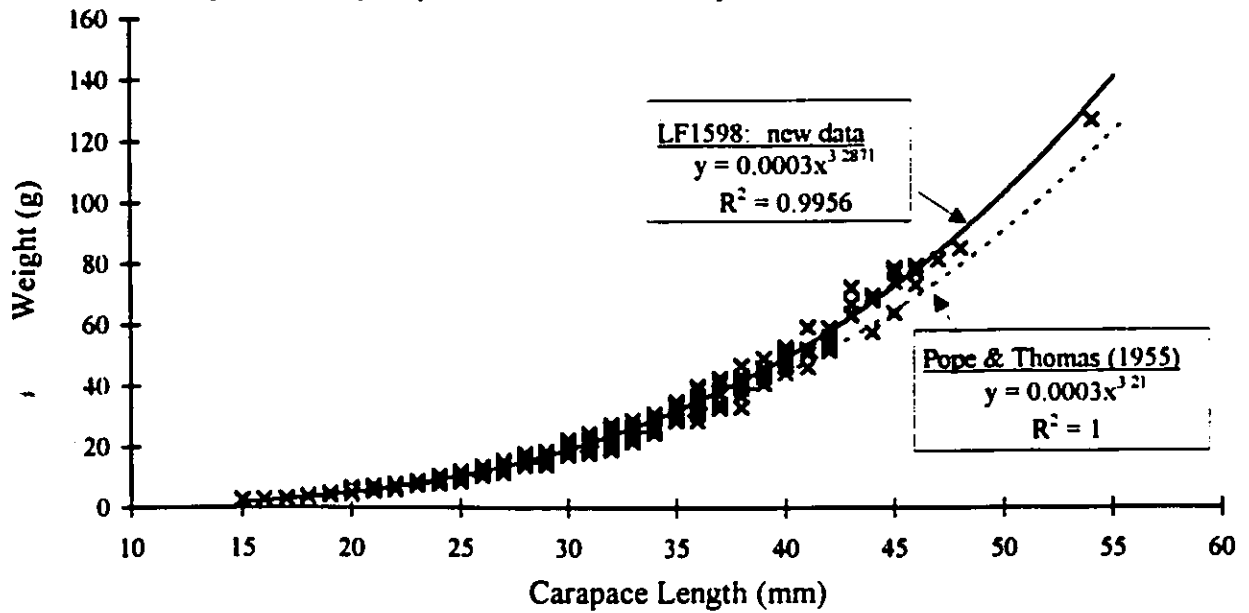


Table 1

Station positions LF1598

TOW	STN	Mean Depth(m)	Latitude IN		Longitude IN		Latitude OUT		Longitude OUT	
			Degree	Mins.	Degree	Mins.	Degree	Mins.	Degree	Mins.
1	106	76.5	53	38.93	5	42.99	53	36.34	5	43.24
2	200	45.0	53	35.54	5	54.69	53	33.07	5	52.40
3	105	74.5	53	30.28	5	41.41	53	29.13	5	37.17
4	104	92.0	53	36.39	5	38.61	53	39.07	5	38.66
5	103	96.0	53	38.36	5	26.51	53	40.51	5	23.96
6	102	92.0	53	46.85	5	22.01	53	49.48	5	22.47
7	207	51.0	53	58.86	5	45.07	53	56.32	5	46.02
8	8	90.0	53	54.37	5	39.29	53	51.64	5	39.48
9	107	84.0	53	47.29	5	40.73	53	44.65	5	41.70
10	7	99.0	53	52.25	5	28.58	53	54.77	5	27.77
11	10	97.5	53	55.92	5	23.66	53	58.43	5	24.45
12	20	102.0	54	1.19	5	21.81	54	3.60	5	21.99
13	17	58.5	54	7.78	5	27.45	54	10.25	5	27.23
14	208	79.5	54	7.53	5	1.10	54	5.49	5	3.53
15	209	120.0	54	7.91	5	8.57	54	5.48	5	10.34
16	109	96.0	54	5.68	5	18.76	54	8.16	5	19.47
17	35	50.0	54	12.58	5	23.11	54	15.12	5	22.14
18	2	62.5	54	12.86	5	19.06	54	15.40	5	19.34
19	1	54.0	54	15.65	5	12.01	54	18.28	5	13.16

Table 2

Nephrops data by station

TOW STATION	1 106	2 200	3 105	4 104	5 103	6 102	7 207	8 8	9 107	10 7
MALE CL	21.9	28.7	30.4	25.6	27.0	27.6	26.3	24.1	25.5	27.7
FEMALE CL	21.7	24.5	25.9	22.2	22.2	23.1	24.1	22.1	22.0	23.6
No per Nm	3297	110	672	6889	317	555	36	2776	1647	1723
kg per Nm	33.40	1.82	14.23	70.66	4.37	7.68	0.43	25.57	19.15	25.56
% female	37.89	24.19	30.62	44.36	38.65	32.14	44.64	37.52	28.61	27.91
% Hem Males	8.47	10.64	4.30	5.34	11.89	8.10		16.52	9.76	4.14
% Hem Females	7.22	20.00	12.39	5.80	13.99	19.66		16.50	9.57	11.65
% Hem Overall	8.00	12.90	6.78	5.54	12.70	11.81		16.51	9.70	6.23

TOW STATION	11 10	12 20	13 17	14 208	15 209	16 109	17 35	18 2	19 1
MALE CL	26.3	27.6	25.4	26.1	28.2	26.2		25.0	25.6
FEMALE CL	23.0	23.3	24.6	23.4	22.4	22.9		22.5	21.9
No per Nm	2447	447	23	5144	131	3671		825	690
kg per Nm	28.24	6.98	0.60	62.94	1.96	45.29	0.40	9.48	7.39
% female	36.34	25.62	40.91	34.39	30.26	36.38		37.64	37.14
% Hem Males	12.26	6.22		7.07	9.09	10.96	20.00	19.64	9.09
% Hem Females	10.74	15.66		11.66	19.05	16.17	13.20	28.40	14.84
% Hem Overall	11.71	8.64		8.65	12.10	12.85	16.60	22.94	11.22

shaded = Insufficient Catch for a normal sample

Table 3

Catch (kg) per nautical mile of tow

TOW	STN	Nep	Cod	Whit	Hake	Had	Herr	Sprat	Other
1	106	33.4	2.7	9.7	0.9	15.3	0.0	0.0	57.6
2	200	1.8	3.0	127.8	0.1	55.7	2.5	0.0	112.4
3	105	14.2	4.0	86.2	0.0	18.5	0.0	0.0	166.6
4	104	70.7	3.1	20.5	0.1	4.0	0.0	0.0	17.1
5	103	4.4	10.9	3.1	0.0	0.0	0.0	0.0	36.7
6	102	7.7	1.7	8.8	0.0	0.8	0.0	0.0	3.9
7	207	0.4	2.2	55.4	2.0	0.4	0.1	0.0	54.9
8	8	25.6	4.0	45.8	0.3	8.1	0.0	0.0	25.4
9	107	19.1	5.1	47.9	1.2	18.7	0.1	0.0	17.9
10	7	25.6	0.8	9.4	0.2	0.2	0.0	0.0	3.5
11	10	28.2	1.0	10.5	0.5	0.1	0.0	0.0	8.3
12	20	7.0	5.4	13.8	0.2	0.0	0.0	0.0	10.3
13	17	0.6	4.3	67.5	1.8	9.6	0.2	0.0	31.1
14	208	62.9	8.2	45.1	0.2	16.1	0.0	0.0	25.2
15	209	2.0	2.6	0.8	0.1	0.2	0.1	0.0	8.5
16	109	45.3	5.7	29.4	1.2	2.3	0.0	0.0	17.2
17	35	0.4	5.2	74.1	8.1	2.7	0.6	0.1	37.2
18	2	9.5	4.8	67.3	1.7	12.2	0.7	0.0	53.4
19	1	7.4	0.0	20.0	0.7	0.0	0.0	0.0	7.3