

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

CRUISE REPORT – LF33/99

NEPHROPS AND ASSOCIATED FAUNA 16-25 August 1999

PERSONNEL

Richard Briggs, *PSO (Scientist in Charge)*
Willie McCurdy, *SSO*
Michael McAliskey, *SO*
John Peel, *ASO*
Nuala McQuaid, *QUB*
Rebecca Senior, *QUB (16-21 Aug)*
Nigel Godden, *QUB (21-25 Aug)*

OBJECTIVES

- To collect data on spatial patterns of *Nephrops* and bycatch abundance.
- To use a small beam trawl to sample juvenile *Nephrops* and small associated taxa at each station.
- To collect live *Nephrops* and perform *Nephrops* holding experiments as part of a QUB postgraduate project (N. McQuaid).
- To assess the prevalence of the dinoflagellate parasite *Hematodinium* in *Nephrops* catches.
- To trawl new stations on the eastern Irish Sea *Nephrops* grounds.
- To retain live *Nephrops* in deck tanks.
- To take gill arch tissue from haddock, whiting, megrim and hake for a CEFAS genetics study.
- To collect data towards an ongoing survey of marine litter.
- To remove otoliths from haddock and whiting for an EFAN workshop in Crete.
- To serve as a training course in fish taxonomy for personnel (R.Senior and N.Godden) engaged in an EU funded discard project.
- To collect *Nephrops* from selected stations for PAH determination.

METHODS

Hauls of 60 minutes duration were completed at each station. The gear was the same as was used in earlier cruises and is a custom made 20-fathom *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 to the nearest mm below. Whole animals were examined for the prevalence of the parasitic dinoflagellate *Hematodinium*. 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. Gill arches from a

range of fish species were preserved in 95% ethanol as part of a CEFAS genetics project. *Nephrops* from selected stations were retained alive in large tanks for future studies at the QUB Marine Station in Portaferry. A two metre beam trawl was towed for 5 minutes at each station and large fauna were removed from the catch, measured, weighed and counted. Smaller organisms were preserved in 4% formalin for future analysis. Juvenile *Nephrops* were removed, measured and retained in deck tanks for growth studies at Portaferry. A series of new DANI stations were fished on the eastern Irish Sea *Nephrops* grounds. These stations (Fig. 1) were based upon stations sampled during an *RV Clione* (MAFF) cruise in 1980 (R.Briggs) and from previous knowledge of the grounds (J.Lynch).

Sunday 15 August

Scientific staff boarded during the evening in readiness for an early sail on Monday morning.

Monday 16 August

RV Lough Foyle sailed at 06.00, proceeding south to the *Nephrops* Grounds. The net was shot at 10.00 at station 1 in a slight westerly breeze. This was followed by stations 2, 35 and 17. A 5 minute beam trawl tow was completed at each station. The night was spent drifting in the region of station 208.

Tuesday 17 August

Stations 208, 209, 109, 20 and 10 were fished with both prawn net and beam trawl. Weather, force 6 winds and rain. The night was spent at anchor in Dundrum Bay.

Wednesday 18 August

The trawl was deployed at 07.12 on station 30 followed by a beam trawl tow. This procedure was repeated at stations 15, 7, 101, 108. Weather fine and calm. The night was spent in the vicinity of station 207.

Thursday 19 August

The trawl was shot at station 207 at 07.11 in calm weather conditions. This was followed by stations 8, 107, 102 and 103. The night was spent in the area of station 200.

Friday 20 August

Stations 200 and 106 were fished in calm conditions and *RV Lough Foyle* set course for Dublin, docking at 14.30 for the mid cruise break. To avoid contamination of retained *Nephrops* by river water a closed system aerated by an electric pump was established.

Saturday 21 August

The day was spent in Dublin where essential supplies were loaded. Rebecca Senior disembarked and Nigel Godden joined the ship.

Sunday 22 August

RV Lough Foyle sailed at 10.30 and proceeded to station 105 where the trawl was shot at 13.00. This was followed in a force 5 easterly breeze by station 104. The vessel then steamed to the eastern Irish Sea where the night was spent dodging off the Cumbria coast.

Monday 23 August

Station 301 was followed by stations 302, 303, 304 and 305 (Fig. 1). Both *Nephrops* and beam trawls were deployed at each station as with the western stations. The night was spent at anchor off Whitehaven.

Tuesday 24 August

The trawl was shot at station 306 at the most northern boundary of the *Nephrops* grounds. This was followed by stations 307 and 308, an area being worked by a number of *Nephrops* trawlers. A broken bridle during the hauling of station 308 slowed things down but the haul was considered valid and a final haul at station 309 was completed with a new port bridle on the trawl net. After net cleaning operations were complete *RV Lough Foyle* set course for home. As it was essential to land the retained live *Nephrops* during the day for speedy transportation to Portaferry the night was spent at anchor off Bangor.

Wednesday 25 August

RV Lough Foyle docked into Belfast at 09.15

RESULTS

During this successful cruise 32 stations were sampled by both *Nephrops* trawl and beam trawl, as indicated in Table 1 and Figure 1. Table 2 is the mean size, catch rate, proportion of female *Nephrops* and incidence of *Hematodinium* in catches. Live *Nephrops* were retained for *in vitro* studies at the QUB Marine Laboratory in Portaferry. Infection levels of *Hematodinium* were lower (mean prevalence = 1.7%) as is normally the case in August. No trace of the parasite was observed in the eastern stock. These data are summarised in Table 2.

The predominant bycatch species was whiting (*Merlangius merlangus*) and Figure 2 are the pooled whiting size composition from western and eastern grounds expressed as catch at length per 3 nautical miles. Juvenile haddock were common on the western grounds but scarce in the east, while small numbers of juvenile cod were taken at most stations. These data are summarised in Figures 3 and 4. Table 3 is a summary of *Nephrops* and main bycatch species caught at each station.

Approximately 10-15 whole *Nephrops* were collected from selected stations for PAH determination. Data on marine litter was once again collected and added to a time series database. Otoliths from 300 whiting and 50 haddock were collected for an EFAN workshop to be held in Crete (W. McCurdy)

ACKNOWLEDGEMENTS

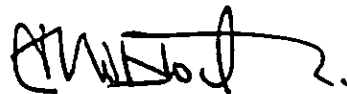
Captain Niblock, Officers and Crew of *RV Lough Foyle* are thanked for their enthusiastic co-operation during the cruise. The scientific personnel are congratulated on their dedication to duty, teamwork and valuable contribution to the cruise.



Richard Briggs

Scientist in Charge

25 August 1999



Andrew Niblock

Master

Table 1

Mid-point position and depth of stations fished during cruise

TOW	STN	Latitude °N		Longitude °W		Depth m	<i>Nephrops</i> nm ⁻¹
1	1	54	16.41	5	15.83	77.0	37.1
2	2	54	13.55	5	18.06	76.0	55.9
3	35	54	13.20	5	22.81	54.0	103.6
4	17	54	8.48	5	27.45	54.0	81.7
5	208	54	6.68	5	2.31	76.5	235.5
6	209	54	6.96	5	8.85	113.0	9.5
7	109	54	6.05	5	19.02	98.5	36.7
8	20	54	1.94	5	21.85	98.5	53.3
9	10	53	58.00	5	23.62	96.0	35.6
10	30	54	6.44	5	35.94	46.0	41.5
11	15	54	4.68	5	31.15	68.5	86.3
12	7	53	53.16	5	27.90	95.0	24.2
13	101	53	55.10	5	21.32	112.0	19.0
14	108	53	51.13	5	7.05	65.0	93.3
15	207	53	56.90	5	45.99	49.5	115.3
16	8	53	52.24	5	39.53	85.5	98.2
17	107	53	46.57	5	40.98	82.5	155.6
18	102	53	47.59	5	21.99	90.0	91.2
19	103	53	38.53	5	25.95	96.0	3.8
20	200	53	34.62	5	52.80	48.5	20.6
21	106	53	37.01	5	42.91	75.5	80.0
22	105	53	29.58	5	38.80	72.5	35.7
23	104	53	38.08	5	39.00	91.0	5.3
24	301	54	20.04	3	55.38	38.0	40.3
25	302	54	21.08	3	46.04	38.0	47.2
26	304	54	16.71	3	42.64	36.5	0.9
27	305	54	14.11	3	38.41	29.5	4.0
28	303	54	22.70	3	37.42	21.0	0.3
29	306	54	24.41	3	45.29	29.5	1.8
30	307	54	19.71	3	47.09	39.0	72.4
31	308	54	16.58	3	45.77	35.5	7.1
32	309	54	19.08	3	44.34	34.5	40.4

Table 2

Nephrops trawl catch data

WEST

TOW	1	2	3	4	5	6	7	8	9	10	11	12
STATION	1	2	35	17	208	209	109	20	10	30	15	7
MALE CL	25.1	24.9	26.0	26.9	24.8	29.5	28.2	26.7	26.3	28.2	27.8	27.3
FEMALE CL	23.8	23.1	24.3	25.4	24.7	25.7	25.2	23.9	24.8	26.1	25.1	25.4
No per Nm	3504	5400	9204	6324	22012	602	2590	4403	3095	2891	6470	1874
kg per Nm	37.1	55.9	103.6	80.8	235.5	9.5	36.7	53.3	35.6	41.5	86.3	24.2
% female	44.6	47.4	57.6	59.9	70.2	45.7	43.0	50.8	48.7	58.0	46.9	53.6
% Hem Males	0.3	0.6	0.0	0.0	0.7	0.0	0.0	1.0	2.9	4.3	1.5	6.8
% Hem Females	1.2	1.0	1.3	0.7	0.9	0.0	0.9	0.0	1.3	3.1	0.4	3.6
% Hem Overall	0.7	0.8	0.8	0.4	0.8	0.0	0.4	0.5	2.1	3.7	1.0	5.1

TOW	13	14	15	16	17	18	19	20	21	22	23
STATION	101	108	207	8	107	102	103	35	17	109	104
MALE CL	29.0	25.9	25.1	23.2	23.9	28.0	28.2	25.9	24.5	27.7	27.4
FEMALE CL	25.4	25.6	24.5	22.4	22.1	24.8	25.2	23.6	23.5	29.9	25.1
No per Nm	1242	6945	9227	10924	16822	6580	215	1720	7709	1716	400
kg per Nm	19.0	93.3	115.3	98.3	155.7	91.2	3.8	20.6	79.9	35.7	5.3
% female	45.6	67.6	58.1	54.8	56.1	46.9	42.0	48.8	54.2	70.3	45.2
% Hem Males	2.9	3.3	5.5	1.6	1.2	2.8	1.2	2.4	0.7	2.6	1.1
% Hem Females	2.3	1.6	3.0	0.8	2.8	1.8	0.6	2.1	0.9	1.1	2.7
% Hem Overall	2.6	2.1	4.1	1.2	2.1	2.3	0.9	2.2	0.8	1.6	1.8

EAST

TOW	24	25	26	27	*28	29	30	31	32
STATION	301	302	304	305	303	306	307	308	309
MALE CL	24.0	25.8	26.5	28.1		28.3	25.2	25.2	25.1
FEMALE CL	23.6	26.2	25.7	26.1		25.5	25.1	24.7	24.7
No per Nm	3421	3465	140	271		109	5852	580	3333
kg per Nm	40.3	47.2	2.0	4.0		1.8	72.4	7.1	40.4
% female	47.2	66.7	62.3	55.2		47.4	60.8	50.0	58.4
% Hem Males	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
% Hem Females	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
% Hem Overall	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0

* no Nephrops