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The Nephrops fisheries of England and Wales

by

D. J. Symonds

Fisheries Laboratory, Burnham-on-Crouch, Essex



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INTRODUCTION

Landings of Nephrops in England and Wales during 1969 amounted to only 7 per cent by weight of the total Nephrops landings in the United Kingdom. Even so, their value of £267 000 made them, after lobsters and crabs, the third most important shellfish in these countries. Two fisheries for Nephrops are regularly exploited at the present time, one off the coast of Northumberland in the North Sea (ICES Statistical Area IVb), from which a large proportion of the annual landings in England and Wales are taken, and the other, of much less importance, off the coast of Cumberland in the Irish Sea (ICES Statistical Area VIIa). Other landings of Nephrops made at ports in England and Wales usually form part of the by-catch from whitefish operations.

1 CENTRAL NORTH SEA FISHERY

The present fishery for Nephrops is based mainly on North Shields (Northumberland) but substantial landings have also been made since 1966 at the smaller ports of Seahouses, Amble and Blyth in Northumberland, and Hartlepool in County Durham (see Table 1). The grounds worked by vessels from North Shields are from 10 to 15 miles (approximately 16 to 24 km) from the coast adjacent to the River Tyne, but a northerly extension of these grounds is worked mainly by visiting Scottish vessels which land their catches at English ports. The main concentrations of Nephrops are found within the 40 fathom (approximately 73 m) contour of the deep water which extends southwards from the Farne Deeps. The information given in this section has been taken from a more detailed report on the Nephrops fishery off the north-east coast of England (Symonds, in preparation).

Boats and gear

In recent years the tendency has been for the main effort to be concentrated on Nephrops during the last and/or first quarters of the year and, when fishing is at its peak, almost 60 local vessels (about half of which work from North Shields) are involved. In addition, up to 60 Scottish

vessels, mainly from ports on the Firth of Forth, also work off the north-east coast of England and land at English ports at the same time.

Local vessels range in size from 12 to 20 metres, averaging about 15 metres. Horsepower ranges from 60 to 250 bhp with an average of about 100 bhp. The majority of landings are made by trawl, the same net being used for catching whitefish, but with a tendency to tow more slowly when fishing for Nephrops. In general, the length of the groundrope is between 36 and 39 metres, the headline being about $3\frac{1}{2}$ metres shorter. In the majority of cases the mesh size (70 mm) is uniform throughout the net, although a few fishermen work a larger mesh in the wings. The most popular trawl in use at the present time is the Bridport-Gundry 16 fathom prawn trawl.

Catch and effort

Nephrops have been exploited commercially for at least 70 years off the north-east coast of England. In fact the annual landings at North Shields between 1905 and 1911, of between 480 and 750 metric tons (Storrow 1912), were greater, on average, than those of the present fishery from the same port. Substantial landings (mainly at North Shields and Sunderland) were made in the late 1920s and early 1930s (Table 1) but no data on fishing effort are available, so that it is not known whether the gradual decline in the fishery recorded during this period was due to changes in effort or to changes in the abundance of Nephrops. The development of the fishery during the 1960s lagged behind that of most of the fisheries around Scotland (Thomas 1965) and in the Irish Sea (O'Riordan 1964), which had already started this upward swing in the early 1950s.

Although reliable information on the landings by all vessels involved in the fishery from north-east England is available, that for fishing effort cannot be obtained. However, monthly catch and effort figures from selected trawlers under 24 metres in length, landing at North Shields and known to be fishing for Nephrops during the period June 1962 to December 1970 inclusive off the north-east coast of England in statistical rectangles C9, D9, C8 and D8, were obtained and are shown in Table 2, together with the catch per unit effort. The landings by these Nephrops trawlers made up a very high proportion of the total landings at North Shields.

In general, landings, fishing effort and catch per unit effort were low or non-existent during the summer, rising to a maximum in the autumn or winter. This has been particularly noticeable from 1968 onwards, when the landings and fishing effort in the period September to December (inclusive) have formed much higher proportions of the annual totals than

previously (reaching over 90 per cent in 1970). To a certain extent, these recent changes in the fishery resulted from increased interest in other seasonal fisheries. However, the seasonal differences in catch per unit effort have been a regular feature of the fishery since 1962 (it was also noted by Storrow (1912) in 1911) and there is evidence, from length composition data, that the rapid increase in catch-rate in the autumn is the result of recruitment to the fishable stock; the low values occurring in the summer may be due to the presence of, or the predation by, the large numbers of cod normally found on the grounds during this season.

By-catch

The annual by-catches of Nephrops trawlers working from North Shields since 1962 are given as catch per unit effort (kg per one hour's fishing) in Table 3 and kg per 100 kg Nephrops landed in Table 4. In each year, the by-catch exceeded the catch of Nephrops, the main species by weight being cod, haddock and whiting, with dogfish to a lesser extent. A more detailed breakdown of the by-catch in 1969 into months is given in Tables 5 and 6; similar information for other years is available.

2 THE IRISH SEA FISHERY

A small regular fishery for Nephrops in the Irish Sea from the north-west ports of England (mainly Fleetwood and Whitehaven) started in 1966, following the discovery of a previously unexploited Nephrops ground 6 to 12 miles (approximately 10 to 20 km) off the Selker Rocks, Cumberland. Before then, some Nephrops had been landed, and still are, as by-catch from whitefish trawling, but the information given refers only to those vessels known to be fishing primarily for Nephrops.

The fishery at present is prosecuted mainly during the summer months, and the number of boats involved depends to a large extent on the availability of other fish. Trawlers from Fleetwood, the main port used by English vessels, fish for up to 4 days before landing, whereas vessels from Kilkeel and Portavogie, Northern Ireland, usually land every second day, mostly at Whitehaven, Cumberland.

The main area fished is still off the Cumberland coast (ICES statistical rectangles A8, A7 and A6), although some landings come from the grounds between the Isle of Man and the Irish coast (squares ZZ7 and YY7); it has not been possible to separate the landings from these two areas.

Boats and gear

The local vessels involved in this fishery are from 14 to 20 metres in length, with an average horsepower of about 130 bhp. The Northern Irish boats from Portavogie are from 15 to 20 metres with an average horsepower

of 150 bhp, whereas the Kilkeel boats are rather larger, from 18 to 21 metres with an average horsepower of about 220 bhp.

The gear in use is generally a Boris box trawl or a Skagen trawl fished with a fairly light rubber-covered footrope, wrapped round with chain. The Sea Fishing Industry Orders allow British vessels fishing solely for Nephrops within the Irish Sea and landing all their catch at a port bordering the Irish Sea to use a net in which the mesh in the cod-end is 50 mm or less. Most of the boats working for Nephrops take advantage of this concession although it was reported that, in 1970, some of the English boats had changed to 70 mm mesh cod-ends.

Catch and by-catch

Monthly landings by local and "stranger" vessels are given in Table 7; these include a few small landings from the Clyde (YY9), accounting for about $\frac{1}{2}$ metric ton in 1967 and a smaller quantity in 1968. No detailed information on fishing effort is available, but the maximum numbers of boats taking part in any one month are given in the table. The effort has been increasing since 1967, with the Irish vessels becoming more important in the fishery during recent years.

A breakdown of the by-catch by species is not available; the total monthly weights are given in Table 8. In 1966 the large by-catch was mainly whiting, but since then the stocks of whiting have been much reduced. Although the by-catch is much smaller and composed of more species, whiting still remains the principal variety.

REFERENCES

- O'RIORDAN, C. E., 1964. Nephrops norvegicus, the Dublin Bay prawn, in Irish waters. *Scient. Proc. R. Dubl. Soc.*, Ser. B, 1, 131-157.
- STORROW, B., 1912. The prawn (Norway lobster, Nephrops norvegicus) and the prawn fishery of North Shields. *Rep. Dove mar. Lab., N.S.*, 1, 10-31.
- SYMONDS, D. J. (in preparation). The fishery for the Norway lobster (Nephrops norvegicus L.) off the north-east coast of England. *Fishery Invest., Lond.*, Ser. 2, Vol. 27, No. 3.
- THOMAS, H. J., 1965. The distribution of the Norway lobster around Scotland and the stock composition in areas of different fishing intensity. *Rapp. P.-v. Réun. Cons. perm. int. Explor. Mer*, 156, 176-182.

Table 1 Landings of Nephrops in metric tons by British vessels at each north-east English port and the total landings in north-east England and in England and Wales. (- = no landings)

	North Shields	Hartlepool	Amble	Blyth	Seahouses	Sunderland	Totals		
							NE. England	England and Wales	
1926	227.4	1.4	-	-	-	81.4	310.2	342.6	
7	310.0	5.6	-	-	-	197.3	512.9	593.0	
8	303.1	18.6	-	-	-	156.4	478.1	564.3	
9	318.4	7.5	-	-	-	161.3	487.2	557.0	
30	271.4	5.2	-	-	-	185.4	462.0	597.9	
1	238.2	5.2	-	-	-	158.3	401.7	514.4	
2	299.8	2.6	-	-	-	162.4	464.8	576.5	
3	226.6	0.4	-	-	-	118.2	345.2	493.8	
4	260.2	0.5	-	-	-	124.4	385.1	472.6	
5	263.8	1.0	-	-	-	102.9	367.7	480.8	
6	190.5	-	-	-	-	28.2	218.7	316.4	
7	92.5	2.3	-	-	-	5.4	100.2	152.5	
8	104.1	0.6	-	-	-	0.6	105.3	141.6	
9	91.0	4.4	-	-	-	-	95.4	129.4	
40	3.0	0.3	-	-	-	-	3.3	35.6	
	No records								
47	0.1	-	-	-	-	-	0.1	0.1	
8	2.3	-	-	0.3	-	-	2.6	16.4	
9	2.7	-	-	-	-	-	2.7	21.6	
50	20.4	0.3	-	-	-	-	20.7	78.9	
1	20.8	-	-	-	-	-	20.8	51.8	
2	12.2	-	-	-	-	-	12.2	37.8	
3	31.9	-	-	-	-	-	31.9	231.9	
4	24.1	-	-	0.1	-	-	24.2	251.9	
5	30.5	-	-	-	-	-	30.5	279.3	
6	16.9	-	-	-	-	-	16.9	219.3	
7	18.8	-	-	-	-	-	18.8	276.6	
8	9.4	-	-	-	-	-	9.4	395.2	
9	23.4	0.1	-	-	-	-	23.5	326.0	
60	254.4	1.6	-	-	-	-	256.0	431.2	
1	488.1	0.5	-	-	-	-	488.6	770.3	
2	161.9	0.2	-	-	-	-	162.1	324.9	
3	179.3	-	-	-	-	-	179.3	297.7	
4	211.8	1.0	-	-	-	-	212.8	357.3	
5	272.9	-	17.2	2.6	-	-	292.7	406.4	
6	501.8	21.5	171.7	52.3	80.4	-	827.7	1063.7	
7	422.4	28.7	94.8	76.9	75.6	-	698.4	767.9	
8	486.2	35.2	178.9	119.6	74.2	-	894.1	983.6	
9	409.4	39.4	77.9	135.7	24.8	-	687.2	858.7	
1970*	257.9	80.8	47.9	26.4	12.2	-	425.2	612.3	

* Provisional figures.

Table 2 Landings of Nephrops (metric tons), hours' fishing and catch per unit effort (kg/hour's fishing) for Nephrops trawlers landing at North Shields. Annual landings at all north-east coast ports included. (- = no landings)

	Landings (m. ton)	Hours' fishing	C.p.e. (kg/h)	Landings (m. ton)	Hours' fishing	C.p.e. (kg/h)	Landings (m. ton)	Hours' fishing	C.p.e. (kg/h)
	1962			1963			1964		
January				3.0	195	15.6	43.5	1 183	36.8
February				1.1	90	12.4	24.2	1 297	18.7
March	No data			4.8	402	11.9	27.0	1 179	22.9
April				4.1	431	9.5	28.7	1 266	22.6
May				1.1	111	10.1	0.2	28	7.3
June	5.2	730	7.1	-	-	-	-	-	-
July	1.3	243	5.2	0.1	9	5.7	-	-	-
August	11.9	2 162	5.5	0.7	98	7.3	-	-	-
September	27.9	1 920	14.5	9.2	552	16.8	2.6	162	16.3
October	38.3	2 284	16.8	24.1	1 467	16.4	6.9	468	14.8
November	14.4	971	14.9	72.0	2 180	33.0	11.0	675	16.3
December	29.3	1 177	24.9	20.5	930	22.0	20.5	1 051	19.5
Total	128.3	9 487	13.5	140.7	6 465	21.8	164.6	7 309	22.5
Total NE. ports				179.3			212.8		
	1965			1966			1967		
January	8.1	312	26.1	18.3	780	23.5	45.3	2 900	15.6
February	17.9	712	25.2	23.3	978	23.8	31.8	1 788	17.9
March	79.6	2 286	34.8	48.8	1 399	34.9	3.5	464	7.4
April	35.9	1 700	21.1	9.5	468	20.3	2.0	481	4.1
May	0.8	109	7.0	40.1	1 874	21.4	9.2	831	11.1
June	0.3	27	9.4	7.9	560	14.2	12.2	1 013	12.1
July	1.5	138	11.0	18.0	1 175	15.3	6.9	1 480	4.7
August	1.6	188	8.4	13.7	995	13.8	27.9	1 530	18.3
September	4.9	417	11.7	67.4	2 708	24.9	73.2	3 769	19.4
October	20.4	1 440	14.2	39.6	1 948	20.3	54.2	2 768	19.6
November	17.5	844	20.7	84.3	2 683	31.4	74.1	3 629	20.4
December	37.0	1 821	20.3	75.3	2 922	25.8	40.7	2 170	18.8
Total	225.5	9 994	22.6	446.2	18 490	24.1	381.0	22 380	17.0
Total NE. ports	292.7			827.7			698.4		
	1968			1969			1970		
January	28.4	2 639	10.8	58.6	3 525	16.6	1.1	341	31.3
February	28.5	2 394	11.9	7.0	858	8.1	0.3	27	9.4
March	2.7	417	6.6	21.3	1 553	13.7	-	-	-
April	1.6	340	4.6	6.1	597	10.3	-	-	-
May	0	9	0	0.1	18	5.7	-	-	-
June	-	-	-	-	-	-	-	-	-
July	-	-	-	-	-	-	0.9	80	10.8
August	4.3	321	13.3	-	-	-	4.6	354	12.9
September	44.4	1 790	24.8	53.5	3 067	17.5	63.1	3 257	19.4
October	169.8	6 138	27.7	114.5	5 315	21.5	73.3	4 127	17.8
November	88.4	4 013	22.0	94.2	4 428	21.3	59.4	2 824	21.0
December	98.4	4 134	23.8	49.7	3 804	13.1	32.4	1 643	19.7
Total	466.5	22 195	21.0	405.0	23 165	17.5	235.1	12 653	18.6
Total NE. ports	894.1			687.2			425.2		

Table 3 Annual catch per unit effort (kg/hour) of Nephrops and the main by-catch species for Nephrops trawlers landing at North Shields, 1962-70. (- = no landings; + = < 0.05 kg/hour)

	1962*	1963	1964	1965	1966	1967	1968	1969	1970
<u>Nephrops</u>	13.5	21.8	22.5	22.6	24.1	17.0	21.0	17.5	18.6
Cod	10.5	5.0	5.4	8.6	8.6	6.5	5.3	4.7	3.6
Haddock	0.3	3.5	5.6	1.2	1.0	0.2	0.5	12.8	4.8
Whiting	10.3	23.6	16.6	20.0	7.2	4.9	6.4	5.7	12.5
Plaice	1.2	2.8	4.7	3.2	3.5	3.0	3.3	2.7	2.5
Lemon sole	+	+	0.5	1.4	1.2	1.2	1.1	0.7	0.1
Skate/ray	2.3	2.5	3.0	1.8	0.9	0.7	0.7	0.6	0.2
Dogfish	0.3	1.4	1.1	0.5	1.6	0.8	2.6	1.9	2.7
Unspecified	4.4	8.5	10.6	6.8	5.6	5.8	5.6	5.3	5.3
Total pelagic	+	+	+	0.2	0.2	0.6	0.1	+	0.1
<u>Pandalus borealis</u>	-	-	-	-	-	0.4	0.3	+	0.4
Total by-catch	29.3	47.3	47.5	43.7	29.8	24.1	25.9	34.4	32.2

Table 4 Annual landings of Nephrops and the by-catch, together with the species composition of the by-catch, for Nephrops trawlers landing at North Shields, 1962-70. (- = no landings)

	1962*	1963	1964	1965	1966	1967	1968	1969	1970
<u>Nephrops</u> (metric tons)	128.3	140.7	164.6	225.5	446.2	381.0	466.5	405.1	235.0
By-catch (metric tons)	279.0	305.9	347.7	438.0	553.4	542.5	578.1	797.9	406.4
Species composition (kg/100 kg <u>Nephrops</u>)									
Cod	77.7	22.9	24.0	38.3	35.6	37.9	25.1	26.7	19.2
Haddock	2.2	16.2	24.7	5.1	4.1	1.4	2.5	73.3	25.9
Whiting	76.3	108.2	73.6	88.9	29.9	29.0	30.7	32.6	67.2
Plaice	8.7	12.9	20.9	14.1	14.6	17.8	15.7	15.5	13.6
Lemon sole	0.3	0.1	2.3	6.4	5.0	7.3	5.5	4.1	0.6
Skate/ray	17.3	11.3	13.5	8.1	3.8	4.1	3.5	3.7	1.0
Dogfish	2.6	6.3	5.0	2.4	6.5	4.7	12.5	10.7	14.4
Unspecified	32.3	39.2	47.1	30.2	23.4	33.9	26.7	30.2	28.3
Total pelagic	0.2	0.1	0.1	0.7	1.0	3.6	0.3	0.1	0.7
<u>Pandalus borealis</u>	-	-	-	-	-	2.6	1.5	0.1	2.2
Total by-catch	217.6	217.2	211.2	194.2	123.9	142.3	124.0	197.0	173.1

* June-December only.

Table 5 Monthly catch per unit effort (kg/hour) in 1969 of Nephrops and the main by-catch species for Nephrops trawlers landing at North Shields. (- = no landings; + = < 0.05 kg/hour.) No landings in June, July or August

	Jan	Feb	Mar	Apr	May	Sept	Oct	Nov	Dec
<u>Nephrops</u>	16.6	8.1	13.7	10.3	5.7	17.5	21.5	21.3	13.1
Cod	11.3	3.6	4.7	27.0	28.2	3.2	1.5	0.5	5.8
Haddock	10.7	8.9	5.9	2.6	11.3	16.2	13.8	11.1	17.9
Whiting	9.2	8.2	5.6	-	-	5.1	4.1	4.6	6.8
Plaice	4.5	6.5	7.5	3.0	2.8	1.7	1.6	0.4	3.3
Lemon sole	1.1	2.7	3.9	4.0	5.7	0.2	0.2	-	0.1
Skate/ray	2.3	1.2	1.3	1.9	-	0.1	0.2	0.1	0.3
Dogfish	-	-	-	-	-	2.1	6.5	+	0.6
Unspecified	5.1	3.4	4.8	5.7	8.5	5.7	5.9	4.6	5.7
Total pelagic	-	-	-	-	-	+	0.1	-	-
<u>Pandalus borealis</u>	-	0.3	-	-	-	-	+	-	-
Total by-catch	44.2	34.8	33.7	44.2	56.5	34.3	33.9	21.3	40.5

Table 6 Monthly landings in 1969 of Nephrops and the by-catch, together with the species composition of the by-catch, for Nephrops trawlers landing at North Shields. (- = no landings.) No landings in June, July or August

	Jan	Feb	Mar	Apr	May	Sept	Oct	Nov	Dec
<u>Nephrops</u> (metric tons)	58.6	7.0	21.3	6.1	0.1	53.5	114.5	94.2	49.7
By-catch (metric tons)	155.4	29.7	52.3	26.3	1.0	105.3	179.6	94.5	153.8
Species composition (kg/100 kg <u>Nephrops</u>)									
Cod	67.7	43.8	34.3	262.0	500.0	18.3	6.8	2.2	44.0
Haddock	64.2	110.2	42.6	24.8	200.0	93.0	64.3	52.2	137.2
Whiting	55.4	100.7	41.0	-	-	29.2	19.0	21.6	52.1
Plaice	26.9	79.6	54.8	28.9	50.0	10.0	7.4	2.0	24.9
Lemon sole	6.6	32.8	28.1	38.8	100.0	1.0	0.9	-	1.0
Skate/ray	14.0	14.6	9.5	18.2	-	0.4	0.8	0.4	2.2
Dogfish	-	-	-	-	-	12.0	30.0	0.2	4.5
Unspecified	30.5	41.6	34.8	55.4	150.0	32.5	27.2	21.8	43.3
Total pelagic	-	-	-	-	-	0.1	0.4	-	-
<u>Pandalus borealis</u>	-	3.6	-	-	-	-	0.1	-	-
Total by-catch	265.3	426.9	245.1	428.1	1000.0	196.5	156.9	100.4	309.2

Table 7 Landings of Nephrops (in metric tons) by Nephrops trawlers at ports of north-west England from the Irish Sea. (- = no landings)

	Local	"Stranger"	Total	Local	"Stranger"	Total	Local	"Stranger"	Total
	vessels	vessels		vessels	vessels		vessels	vessels	
	1966			1967			1968		
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	-	-	-	-	-	-	-	-	-
April	-	-	-	-	-	-	-	-	-
May	1.6	4.9	6.5	3.0	-	3.0	1.5	4.1	5.6
June	17.1	10.1	27.2	12.1	-	12.1	1.5	6.1	7.6
July	39.0	40.1	79.1	11.1	-	11.1	11.2	8.5	19.7
August	7.7	17.3	25.0	7.2	-	7.2	3.4	4.7	8.1
September	3.8	2.2	6.0	0.7	-	0.7	4.2	0.5	4.7
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	1.8	-	1.8
December	-	-	-	-	-	-	0.1	1.4	1.5
Total	69.2	74.6	143.8	34.1	-	34.1	23.7	25.3	49.0
Maximum no. of boats	16	40	56	28	-	28	8	21	29
	1969			1970					
January	-	1.1	1.1	-	0.6	0.6			
February	-	-	-	0.2	0.2	0.4			
March	-	1.0	1.0	-	-	-			
April	-	0.4	0.4	0.3	-	0.3			
May	2.4	3.1	5.5	5.9	30.9	36.8			
June	12.3	26.0	38.3	22.0	62.3	84.3			
July	16.4	16.3	32.7	6.9	20.6	27.5			
August	13.9	4.0	17.9	11.8	11.4	23.2			
September	3.7	-	3.7	9.2	6.5	15.7			
October	-	-	-	-	-	-			
November	-	-	-	-	0.1	0.1			
December	-	-	-	-	0.1	0.1			
Total	48.7	51.9	100.6	56.3	132.7	189.0			
Maximum no. of boats	14	36	50	10	56	66			

Table 8 Total by-catch (in metric tons) of Nephrops trawlers landing at ports of north-west England from the Irish Sea. (- = no landings)

	1966	1967	1968	1969	1970
January	-	-	-	16.3	30.5
February	-	-	-	-	3.6
March	-	-	-	13.2	-
April	-	-	-	10.3	3.6
May	101.4	0.9	2.5	53.6	9.7
June	212.9	4.1	7.6	94.2	7.6
July	185.7	3.7	61.0	64.0	6.1
August	151.7	2.5	40.6	56.4	51.8
September	20.9	0.2	20.3	5.1	18.3
October	-	-	-	-	-
November	-	-	12.7	-	2.3
December	-	-	55.9	-	2.3
Total	672.6	11.4	200.6	313.1	135.8