

THE NORWAY LOBSTER FISHERY IN THE CLYDE AREA

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The Norway lobster, or, as it is sometimes called, the Dublin prawn, is a close relation of the common lobster. It is easily distinguished from this by the reddish - yellow colour, the smaller size and the very thorny claws. The scientific name, "*Nephrops norvegicus*," refers to the kidney-like shape of the prominent black eyes. It is widely distributed in European seas and occurs as far north as Iceland and the North Cape of Norway, is common in the North Sea and parts of the Baltic, and is found also on our west coasts. Its range extends as far south as Morocco and there is an important fishery for it in the Adriatic.

In contrast to the ordinary lobster, which lives in shallow water on our rocky coasts, the Norway lobster inhabits mud or muddy sand at depths varying from 100 to 2000 feet. The smaller ones may burrow in the mud; in the aquarium at Millport, a 2 inch long animal made a burrow of over 4 inches. Whether the large ones also burrow is not certain but from the nature of the mud in which they live, it does not seem likely that the burrows can be as large in proportion.

The method of fishing for them is by sweeping the sea bottom with a seine net or otter trawl, not by using wicker or netting pots as is common for the rock-loving lobster. Apart from the Adriatic, where it has long been commercially important, there were till recently only small fisheries in other countries. In Britain they attracted little attention except on the

north-east coast of England, where there was a fishery off Shields. In the Clyde coast towns before the war these delicious crustaceans could be bought, cooked and ready for eating for a few pence each. They were caught by the inshore seine net boats which were fishing for plaice, cod, whiting and haddock, but the off-shore seine net boats and trawlers dumped them in large quantities.

Recently the fishery for *Nephrops* has developed in several European countries and quantities of 1 - 3 cwt a day may be caught per boat. For Scotland as a whole there has been a rapid increase in the last few years. The quantity and value of the landings are shown in the following table:—

Commercial Landings of Norway Lobsters

Year ...	...	1950	1951	1952	1953	1954
Total (cwts.) ...		2,994	4,281	5,830	9,446	10,932
Price per cwt. ...		37/-	54/-	72/-	68/-	95/-

The marketing of Norway lobsters presents special problems. They do not live so well out of water as the common lobster and consequently those caught some distance from the coast may be useless by the time they reach port. Some experiments have been made on preservation by refrigeration or by boiling. Only the narrow abdominal part, the 'tail,' is used and the preparation involves the removal of the head and the 'string' or intestine, which runs along the upper side of the 'tail.' This comes away easily in the fresh animal. Boiling does not preserve them for more than a few days. A vessel was specially fitted for preserving them by refrigeration and a moderately successful trial fishing was made on the west coast.

Despite the rapid increase in Scotland as a whole during the past five years, in the Clyde this fishery has shown large fluctuations and there is reason to believe that these are not simply the result of differences in the intensity of fishing. The average annual

yield in the Clyde area since 1950 has been 458 cwt. with a maximum of 887 cwt. in 1953 and a minimum of 128 cwt. in 1952. In order to find the causes of the changes in the fishery a study has been made on the populations of these animals in the Clyde, of their breeding, their rate of growth and their enemies.

An estimate of the number of Norway lobsters on a given area of bottom is necessarily approximate, partly because of the burrowing habit already mentioned, which may enable them to avoid the net. However, the experimental fishings indicate that changes do occur. In 1951 in an area near the Great Cumbrae, using an otter trawl with a 54 ft. headline, an average of 42 *Nephrops* was caught for every hour's fishing over an extended period; in 1952 on the same ground an average of only 27 per hour's fishing was obtained. Since then numbers have continued to be low on this ground. The total area covered by the trawl was too small for the change to be explained by over-fishing.

The size and ratio of males to females in the population of *Nephrops* in the Clyde was examined by the Scottish Home Department in 1927, many years before commercial fishing for them began and on what can therefore be considered as a natural, unfished population. The overall length varied from about 1 inch up to 10 inches; the average size of the males was a little over 5 inches and of the females 3½ inches. In the small specimens there was a slight preponderance of females, but the larger specimens were almost exclusively males. It is indeed the males which form the commercially important part of the catch. Fortunately most of the females and the smaller males escape through the meshes of the normal commercial fishing gear.

The female becomes mature at a length of about 3 inches and the eggs are carried on the swimming feet as in the common lobster. When newly laid they

are dark green; they gradually turn light green and finally before they hatch out become reddish-yellow in colour. The diameter of the egg is about $1/50$ inch and the numbers vary from about 300 on a 3 inch specimen to a maximum of about 4000 on a large specimen. The breeding season is long drawn out for they are in berry from early autumn till early spring. The larvae are readily recognised and are found off the bottom, leading a planktonic life throughout the summer.

No accurate data are available for the rate of growth of *Nephrops*. Though it seems probable that there is moult each year, a study of the sizes shows no grouping which can be assigned to year classes.

It would be desirable to know whether the changes in the *Nephrops* population in the Clyde are caused by over-fishing, by predation or by migration and further work is needed before these questions can be answered. The burrowing habit would protect the younger specimens and especially the females but the males which form the bulk of the marketable part of the catch are bigger and more readily caught by fishing gear. The imposition of a size regulation for marketable *Nephrops* is practised in other countries; in Denmark the limiting size is 16 cm. ($6\frac{1}{4}$ inches) but if this limit were introduced to Clyde catches, the fishery would be reduced by almost 90%. We conclude that the average size of specimens in Danish waters must be much higher than it is here. Possibly man is not the chief enemy of *Nephrops*. An examination of fish stomachs shows that in the Clyde it is a favourite food of the cod and other fish.

I have to thank Dr. C. E. Lucas of the Scottish Home Department Laboratory at Aberdeen, who kindly supplied the data on the commercial fishery for *Nephrops* in the Clyde. Further information can be found in "Some observations on the distribution, biology and exploitation of the Norway lobster (*Nephrops norvegicus*, L) in Scottish Waters" by J.

H. Thomas, H.M. Stationery Office, 1954; for the N.E. of England there is an account in "The prawn (Norway lobster, *Nephrops norvegicus*) and the prawn fishery of North Shields" by B. Storrow, Dove Marine Laboratory Report, 1912; and for the Clyde in "Observations on *Nephrops norvegicus* (L) and on an epizoaic population of *Balanus crenatus* Brug," by H. Barnes and T. B. Bagenal, Journal of the Marine Biological Association, 1951.