Responsible Sourcing Guide: Nephrops

Version 4 - May 2010

Nephrops norvegicus Image © Scandanavian Fishing Year Book

***Nephrops norvegicus*, referred to as Nephrops in this guide, is the Latin name for the species that is sold under the names Norway lobster, Dublin Bay prawn, langoustine or, for the tail meat, scampi (1). In Scotland and the north of England they are colloquially known as prawns.**

The total annual catch for this species in the North East Atlantic is approximately 80,000 tonnes (t) per annum. It is the most valuable species currently landed in the UK, worth more than £50 million annually. The UK accounts for about half of the total world landings for *Nephrops* and is allocated the majority of the North Sea and Scottish west coast catches.

The general status of *Nephrops* stocks is good however there are areas of concern. The main issue in the management of *Nephrops* fisheries is undesirable mortality of whitefish species which are caught as by-catch. Measures, including use of selective gears and control of fishing effort, are being taken to reduce these effects.

Most *Nephrops* are caught by trawling although, in some waters, creeling or trapping is also used. They are sold live, chilled, frozen or as scampi. The emerging live trade is also of importance, supplying a high value product to the European market.

The purpose of this guide is to outline the status of *Nephrops* stocks and describe some of the measures being taken to protect them.

BUYERS' TOP TIPS

Know your stock status

Nephrops distribution is divided into stocks known as functional units (FU), located in areas with muddy sediment. Find out the management stock from which the fish has been caught. See also traceability (3,4)

Enquire about by-catch reduction

Trawl fisheries for *Nephrops* can result in significant quantities of by-catch species, including fish from recovery stocks, such as cod and hake, and also juvenile haddock and whiting. This does not mean that these fisheries should be closed, provided that suitable management measures are in place. The European Union has implemented measures to reduce these by-catch species by implementing selectivity and other management measures.

Buyers should enquire about the methods used in suppliers' fisheries. Both statutory and non-statutory methods are available (see page ??).

Seafish Responsible Sourcing Service

This is one of a series of Responsible Sourcing Guides produced by Seafish.

For further guides and information see:
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Status of *Nephrops* stocks June 2009

Biology and distribution

Nephrops are distributed throughout the North East Atlantic from Iceland and north west Norway, to the Atlantic coast of Morocco and the western and central Mediterranean.

They are found at depths from 20-800m, and from sheltered sea lochs to the continental shelf edge, west of the Hebrides.

Adult *Nephrops* inhabit burrows in muddy seabeds and emerge only to forage for food and to mate. Whilst incubating their eggs, berried (eggcarrying) females rarely emerge from their burrows (4). In most stocks this corresponds to approximately 8-9 months of the year, during which time they are protected from trawlers. They emerge to moult and mate during the spring and summer months. However, the incubating females can be captured in baited creels, since they emerge from their burrows in response to bait (4).

The table on the following page shows the status of *Nephrops* stocks.

Stock assessment and advice

In general, *Nephrops* stocks have been very resilient over recent decades. This is partly attributed to the berried female *Nephrops* being unavailable to trawlers for most of the year, allowing the maintenance of a healthy parent stock. Juvenile *Nephrops* also remain in their burrows most of the time.

Nephrops are distributed in specific areas of muddy sediment. The adults do not migrate but planktonic larvae are dispersed with water currents. The stocks are assessed as Functional Units (FU numbers 1-33) but are managed in larger areas, designated A-Q (Figure 1).

Risk assessment of *Nephrops* stocks against precautionary reference points has proved difficult (5). However, in recent years scientists have devised an approach based on independent abundance estimates and on knowledge of the growth and mortality of the stocks. This fishery independent survey method uses a sled with an underwater television (UWTV) camera and lights. This is towed by a research vessel, across the *Nephrops* grounds. The numbers of visible burrows per unit area are counted to assess the quantity of *Nephrops*. It has been recognised that many burrows counted are actually inhabited by *Nephrops* smaller than those in the exploitable stock. Correcting for this effect has enabled an absolute biomass to be estimated for the stock, rather than relying on what was effectively an index.

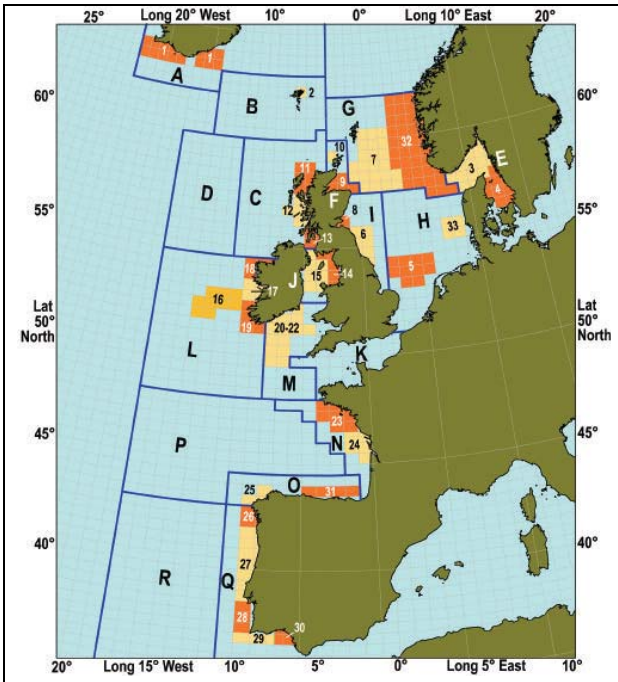
The recommended Total Allowable catch (TAC) is calculated as a percentage of the abundance (harvest ratio) using an appropriate long-term yield from the stock as a reference point. Although not all stocks are assessed using this method it is still possible to detect stock decline, such as off northern Spain and western Portugal (FUs 25, 31 and 26, 27) using other methods.

Management Stock	Agreed TAC 2010 (t) (6)	Advisory TAC 2010 (t)	MLS* M Unit	Scientific advice and management (June 2009 ICES advice)
NORTH EAST ATLANTIC *NEPHROPS* STOCKS (*Nephrops norvegicus*) www.ices.dk				
South east, south and south west Iceland (FU1)	2,200	2,200	**A**	Stock biomass has increased in recent years recruitment is expected to remain relatively good
Fladen Ground (FU7)	24,688 for m'ment units F, G, I, H & S	22,889 Overall FU7 16,400	25 **G**	Underwater TV survey (UWTV) estimates of abundance for *Nephrops* show stock has fluctuated without trend. Estimates for the last two years indicate the highest abundance in the series. Indications of stable or slightly increasing mean sizes in the length composition of catch suggests stock is being exploited sustainably.
Moray Firth (FU9) Noup (FU10)		FU9 1,372 FU10 240	25 **F**	For FU9 the UWTV survey suggests population is stable, but at a lower level than that evident from 2003-2005. Current fishery appears sustainable. There is no new advice in 2009 for FU10. ICES maintains previous advice to maintain landings at average 2003-2005 landings.
Farne Deeps (FU6) Firth of Forth (FU8)		FU6 1,210 FU8 1,567	25 **I**	For FU6 UWTV survey, fishery data and length frequency data all point to the stock at the start of the 2008 fishing season continuing to be at a low level with low recruitment. For FU8 evidence from the UWTV survey suggests population has been at a relatively high level since 2003. Current fishery appears sustainable.
Botney Gut (FU5) Off Horn Reef (FU33)		FU 5 700 FU33 1,400	25 **H**	There is no new advice. State of the stock is unknown and ICES recommends no increase in effort on these stocks. The assessment is based only on catch data and mean sizes in the catches. There are no strong indications of changes in recruitment or discarding levels.
Norwegian Deeps (FU32)		No increase in effort	25 **S**	Landings per unit effort (lpue) have been relatively stable over the last 14 years and suggest that current levels of exploitation are sustainable. Therefore, ICES recommends that effort should not be allowed to increase.
Skagerrak (FU3) Kattegat (incl Baltic) (FU4)	5,170	5,200	40 **E**	There is no new assessment. The 2008 assessment shows that the stocks are stable and current levels of exploitation appear to be sustainable at 2008 levels. ICES recommends no increase in effort. High catch rates of small *Nephrops* in 2007 may indicate strong recruitment.
North Minch (FU11) South Minch (FU12) Clyde (FU13)	16,057	8,953 Overall FU11 972 FU12 4,126 FU13 3,855	20 **C**	In 2009 the stocks are assessed as separate functional units. UWTV surveys show the North Minch stock (FU11) has declined by 40% over the past two years from a high in 2006. The South Minch (FU12) stock has declined from a record high in 2004 to a record low in 2007, but has increased in 2008. The Firth of Clyde (FU13) population has been at relatively high levels since 2003 except for 2007. The stocks are being exploited unsustainably.

Management Stock	Agreed TAC 2010 (t) (6)	Advisory TAC 2010 (t)	MLS* M. Unit	Scientific advice and management (June 2009 ICES advice)
NORTH EAST ATLANTIC *NEPHROPS* STOCKS (*Nephrops norvegicus*) contd www.ices.dk				
Irish Sea east (FU14) Irish Sea west (FU15)	22,432	13,000 Overall FU14 <1,000 FU15 5,465	20 **J**	Previously ICES provided combined advice for FU14 and FU15. In 2009 the stocks are assessed as separate functional units. In the eastern Irish Sea (FU14) although there is significant uncertainty, the stock appears to be in good condition and fishery appears sustainable. The advice remains the same as for 2009.The western Irish Sea stock (FU15) is considered overfished. UWTV survey abundance estimates declined by 42% between 2004 and 2008. ICES advised a 40% reduction in the TAC for 2010.
Porcupine Bank (FU16) Arran Grounds (FU17) Ireland north west (FU18) Ireland south west (FU19)		FU16 Lowest possible level FU17 505 FU19 800	25 **L**	Previously ICES had provided combined advice for FU 16, 17, 18 & 19. From 2008 the stocks are assessed as separate functional units. The state of the Porcupine Bank (FU16) stock is uncertain. There are indications that exploitation rate has been high in the last five years. Abundance of the Arran Grounds (FU17) stock has fluctuated widely but the 2008 survey is the lowest in the series and abundance is only 60% of 2004 levels. There is no new advice for south west and south east Ireland (FU19). Landings have been variable throughout the time-series. Landings from 2005 onwards have been around average. The current fishery appears sustainable.
Irish and Celtic Seas-South of 53º North (FU20-22)	Included in above	5,300	25 **M**	There is no new advice in 2009. Landings have fluctuated around 4600 t since the mid-1990s. Lpue indicators do not show signs of decrease in recent years. The current fishery appears sustainable. ICES advice remains the same.
Biscay North (FU23) South (FU24)	3,899	3,400	 **N**	There is no new advice. Discarding of *Nephrops* is a significant problem and selective devices have been implemented (Figure 5). Square mesh panels have been introduced to reduce hake by-catch in certain areas.
North Galicia (FU25) Cantabrian Sea (FU31)	101	Zero	 **O**	Both stocks have suffered severe recruitment failure and population decline. A recovery plan was put in place in January 2006, which aims to rebuild stocks within 10 years (9). ICES recommends stronger measures.
West Galicia FU26 Portugal N FU27 South West FU28 South FU29 Gulf of Cadiz FU30	337	FU26/27 Zero FU28/29 200 FU30 200		The status of FU26 and 27 is severely depleted and the management of these stocks is included in the recovery plan (9). FU28 and 29 are in a better state and should be managed separately. Stock in FU30 appears to be relatively stable.
MEDITERRANEAN STOCKS GFCM				
Adriatic, western and central Mediterranean	5,569			A coordinated approach to assessment of *Nephrops* in the Mediterranean using UWTV methods is being initiated.

**Minimum Landing Size – carapace length (mm)*

Figure 1: North East Atlantic *Nephrops* Functional Units and Management Units



Organisation key

FAO: The Food and Agriculture Organisation of the United Nation acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy.

ICES: International Council for Exploration of the Sea. Responsible for providing scientific advice for North East Atlantic fishery management.

EU: The European Union is responsible for fisheries management within its Exclusive Economic Zone.

GFCM: The General Fisheries Commission for the Mediterranean has an objective to promote the development, conservation and management of Mediterranean fisheries.

Management and conservation measures

Fishing methods

The majority of *Nephrops* are trawl caught with cod-end mesh sizes of between 70mm and 100mm. Traditionally, single net otter trawls have been used. However, since the early 1990s there has been an increasing trend towards the use of twin rigged trawls, particularly by more powerful vessels. Baited traps or creels are also used, particularly in inshore west coast Scottish waters. Creels result in high value catches, whereas trawl fisheries generally catch larger quantities of *Nephrops* at a price suitable for processing into scampi and other products.

The assessment of *Nephrops* stocks has improved substantially with the use of independent estimates from underwater television surveys. This technique has improved in recent years because scientists have been able to estimate the quantity of small *Nephrops* hence obtain a biomass estimate, rather than an index of abundance. The main management issues for *Nephrops* are:

Accuracy of catch data

There has been difficulty obtaining accurate catch

figures in some fisheries because of illegal overquota landings. There have been recent developments in European law implemented in the UK, such as the introduction of Registration of Buyers and Sellers Legislation (8), which should improve this situation.

Reference points

These reference points are used to indicate to fisheries managers the level of risk to the reproductive potential of the stock. It has proved difficult to define adequate precautionary reference points for *Nephrops* (see page 2). Harvest ratios of 8-15% of the estimated stock size have been recommended by scientists based on the status of the stock in relation to optimal harvesting.

Management Units

The management areas, within which TACs are allocated, do not coincide with functional units in which the stocks are assessed. ICES considers this could lead to uneven exploitation. Also, the bycatch composition and management issues vary between areas. In the future *Nephrops* stocks may be managed on a more localised basis.

Nephrops size selectivity

Size selectivity of *Nephrops*, through increased cod end mesh size, can be inconsistent (11), probably due to the animals' uneven shape. This has led to the search for other ways of increasing selectivity, including all square mesh cod ends in combination with grids in the Skagerrak-Kattegat fishery (Figure 3) and French flexible grid systems (Figure 5). Caution should be exercised when transferring techniques from different fisheries due to differing minimum landing sizes and market requirements.

By-catch and discards

Discards of cod, hake, haddock, whiting and some flatfish species can be significant in *Nephrops* trawl fisheries. The cod-ends used to capture *Nephrops* are smaller than these whitefish species. Under the long term management plan for cod (10) vessels which use more selective gear (see page 6) and particpate in other mangement schemes can be allocated the incentive of more days at sea. Seafish has also developed selective gear (17).

Environmental effects

The passage of trawlers' ground gear over *Nephrops*' burrows may close up their entrances. Provided the animals are not injured, they have been observed to be able to open up the burrows again (14). Thus apart from the small energy cost in burrow maintenance, the effect of trawl passage on uncaught *Nephrops* is minimal. It is clear that there are ecological effects due to trawling (13). However, productive *Nephrops* fisheries remain in many heavily fished areas. Management should also take into account creel fisheries, as they tend to catch a higher proportion of larger *Nephrops* and also females. Survival of returned creel-caught *Nephrops* is good (14) and there is currently research into ways of improving selectivity in creels (15).

Technical conservation measures

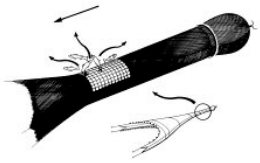


Figure 2 Square mesh panel. Statutory measure for release of haddock and whiting in EU *Nephrops* trawls; fish escape by swimming upwards through the panel.

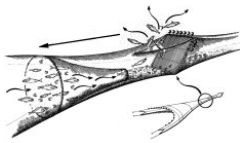


Figure 3 Swedish grid. Fish pass through the upper window of the trawl. *Nephrops* pass through the grid into the cod-end.

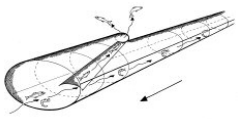


Figure 4 Inclined separator panel, as used in Irish sea fisheries, to separate cod, haddock and whiting from *Nephrops*.

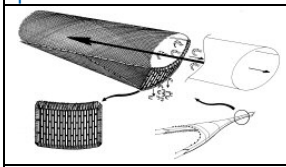


Figure 5 (Left) Flexible grid systems, as used in French fisheries, for improving *Nephrops* size selectivity (16).

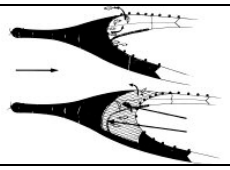


Figure 6 Coverless trawl. This is a non-statutory measure in which the trawl (A) is designed to avoid capture of haddock and whiting - the fish can swim over the top of the trawl. This is more effective than the conventional arrangement (B), where the 'cover' in the top of the trawl extends forward of the footrope and is made of large mesh (17).

Supply chain standards

Responsible practice in the chilled and frozen supply chain depends on correct catching, gutting, washing, chilling or freezing, processing and handling practices throughout the chain. Seafish has developed standards which cover these aspects from capture to retailer:

• **Responsible Fishing Scheme.** Sets best practice standards for fishing vessels, based on British Standards Institution specifications (BSi: PAS 72:2006) and • **British Retail Consortium (BRC) Global Standard & Safe & Local Supplier Approval (SALSA) certification.** Designed to raise standards in the seafood processing and wholesaling sectors.

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*European legislation available on: http://europa.eu/

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