# **High survival exemption for nephrops caught by 80-110mm otter trawl gears in ICES area 6 within 12 miles of coasts.**

*Request under Article 15.4(b) of Regulation (EU) 1380/2013 to exempt from the landing obligation nephrops (*Nephrops norvegicus*) caught in 80-110mm otter trawl gears in ICES area 6 within 12 miles of the coastline.*

**Background**

Article 15.4(b) of Regulation (EU) 1380/2013 on the Common Fisheries Policy states that the landing obligation shall not apply to:

“species for which scientific evidence demonstrates high survival rates, taking into account the characteristics of the gear, of the fishing practises and of the ecosystem”

In response to a request from industry, Fisheries Innovation Scotland (FIS), a non-profit organisation with the remit of bringing together government, scientists, industry and other key stakeholders within a formal structure to lead an on-going programme of research, knowledge exchange and education, commissioned research into the survivability of nephrops in trawl fisheries

Their research aimed to address two key questions for fisheries management:

1. *To conduct further behaviour observations on how post-trawl discard Nephrops with different degrees of damaged and exposed to different temperatures and length air exposure recover under natural conditions on the seabed and interact with potential predators using fixed and mobile underwater camera systems in order to generate a robust estimated level of Nephrops discard survival that is representative of the investigated fisheries, with any assumptions clearly stated; and*
2. *To produce recommendations for best practice to minimise post-discard mortality rates.*

To answer these questions a number of actions were taken. During summer/autumn 2016 and winter/early spring 2016/2017, observers performed a series of trials on three different commercial vessels using 80–99mm gear, fishing in the North Minch. This allowed for data from 10 tows in the summer and 14 in the winter to be compared with data obtained from previous survival trials conducted by the University of Stirling and the Scottish Association for Marine Science (SAMS), placing the survival results obtained in these trials into a wider context.

Additionally, tank-based survival trials on discarded *nephrops* were conducted over an extended period of recovery using a twin-rig vessel ‘Ocean Trust’ operating from Mallaig during summer/autumn 2016 and winter/early spring of 2017. A total of 24 recovery trials were performed covering both TR1 and TR2 mesh sizes. The captive observation method used to estimate survival was designed following recommendations set by ICES WKMEDS with monitoring periods of up to 13 days.

Similar tank-based survival trials were conducted during summer 2017 using the twin-rig fishing vessel ‘Winaway’ operating from Pittenweem on the east coast of Scotland. A total of 6 recovery trials were performed using a TR2 mesh size in June 2017. Data from a trip conducted by SFF in a different vessel (comprising data from 6 tows) was also available and comparisons between both datasets have been made.

The key findings are summarised below and the full, 219 page, report can be found here: <http://www.fiscot.org/media/1404/fis015-report.pdf>.

**Key Findings**

* Discard survival estimates were generated from samples taken during normal commercial fishing activity. The data was supplemented with observations on discard patterns from other vessels fishing in the same areas to determine the representativeness of the survival estimates for each fishery.
* In the commercial *Nephrops* trawl-fishery off the Scottish west coast (Minches) annual mean *Nephrops* discards survival estimates were 53% (24 hauls), based on data from one vessel ‘Ocean Trust’ using both TR2 and TR1 gear.
* In the commercial *Nephrops* trawl-fishery off the Scottish east coast (Firth of Forth) mean *Nephrops* discards survival estimates were 74.5% in summer (6 hauls) based on data from one vessel ‘Winaway’ using TR2 gear.
* These estimates were obtained using the captive observation method as recommended by ICES WKMEDS with monitoring periods of up to 13 days. The holding tanks caused negligible deaths during the monitoring period (control samples showed mortalities of 3% Ocean Trust trials and 0% Winaway trials) providing confidence in the survival estimates.
* Predation effects were not investigated so the survival estimates should be interpreted as discard survival that excludes marine predation.
* For the Scottish west coast (Minches) the environmental conditions, fishing practices and damage to discarded *Nephrops* from ‘Ocean Trust’ were compared with the wider fleet (3 single-rig vessels and 3 twin-rig vessels, TR2; 10 tows for comparison in the summer and 14 in the winter). In general terms, ‘Ocean Trust’ data were in range with the wider fleet information indicating that the discard survival estimates are representative of the wider fleet operating on the west coast.
* For the Scottish east coast (Firth of Forth) environmental conditions, fishing practices and damage on discarded *Nephrops* from ‘Winaway’ were compared with available data from one other vessel (6 tows). There were substantial differences in the estimates of discard rates, occurrence of injuries and immediate mortalities between the two vessels, which also fished in different locations. To apply the discard survival estimates to the whole fleet in this fishery would require assumptions that these differences do not influence overall discard survival. The survival estimates obtained in the recovery trials are likely to be most representative of smaller (<15m) vessels, such as the ‘Winaway’, operating in the inner Firth of Forth and less representative of larger vessels fishing further offshore.
* Using a remotely operated underwater vehicle (ROV) discarded nephrops were observed when they reached the seafloor. Undamaged discarded *Nephrops* appeared to exhibit normal behaviour and they began to explore their surroundings. This applied even after 3.6 h of aerial exposure (mainly winter conditions), although in these cases recovery took a few more minutes. nephropswere also observed entering existing burrows and in some cases clearing partially blocked burrows when the animals were deposited on suitable ground.
* The project also investigated factors, such as length of tow, air temperatures etc., that might be thought to influence survival in order to formulate recommendations of best practice designed to minimise discard mortality in these fisheries. It was concluded that lower survival was associated with the physiological condition of *Nephrops* at the point of release i.e. proportion in the poorest vigour category, with the proportion of *Nephrops* with signs of physical damage, and with higher weights of non- *Nephrops* catch.
* No other direct links were found between survival and other factors, such as air temperature, tow length or total catch weight. However, the proportion of discarded nephrops in the poorest vigour category was itself significantly positively correlated with higher air temperatures.

**Additional Recommendations**

In order to maximise the survival of nephrops a number of additional recommendations were made:

* A fine seawater mist spray could be installed in the catch sorting hoppers. This should have the effect of keeping air temperatures in the hopper cooler than the surrounding air at minimal cost.
* Closing the hatch over the sorting hopper or covering the hopper once the nets are emptied is also recommended. This should have the effect of keeping air temperatures in the hopper cooler than the surrounding air at minimal cost.
* Handling strategies that minimise damage would have a positive effect on discards survival (i.e. not walking on top of the catch and reducing the use of metal rakes to handle the catch).
* There is circumstantial evidence to suggest that a sloping floor in the hopper might help reduce damage to the catch by reducing the need to manually push or drag the catch through the hatch to the sorting table.
* This study suggests that survival might be improved by use of more selective fishing gear by reducing the proportion of non-*Nephrops* catch.
* *Nephrops* should be discarded over suitable grounds to improve their chances of finding burrows to shelter in when they reach the seafloor.

**Conclusions**

The UK believes that the fishing practices on the west coast of Scotland resulting in survival rates of 53% are representative of general fishing practices by the smaller vessels fishing for nephrops within 12 miles of coastlines using gear 80-110mm.

On this basis we would like to request a high survival exemption for nephrops caught by 80-110mm otter trawl gears in ICES Area 6a within 12 miles of coasts.

This would cover only three functional Units in the west of Scotland FU11 - North Minch, FU12 – South Minch and FU13 – the Firth of Clyde, and the Sound of Jura. The calculations below have been made on this basis.

**STECF table for high survivability proposal**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Exemption applied for (species, area, gear type)** | **Species as bycatch or target** | **Number of vessels subject to the landing obligation**  | **Landings (by landing obligation subject vessels)** | **Estimated Discards** | **Estimated Catch** | **Discard Rate** | **Estimated discard survival rate from provided studies** |
| Scotland | Nephrops, Area 6a, otter trawl 80mm - 110mm | Nephrops | 234 vessels in Scotland use nephrop trawls as main method of fishing | 19,601t (all landings by this gear type) | **722t** | **11,077** | 7% | 53% |