

## Effect of minimum 90mm mesh size to the VIIa Nephrops directed fishery

A review of mesh size studies in relevant Nephrops fisheries was under-taken. Results from three previous trials are summarised below. Each trial is specific to the trial design, including vessel selection and control gear character. Making transferable conclusions from any individual trial should be treated with caution. To derive generalities of effect of increased mesh size on *Nephrops* catch a meta-analysis for the three trials was carried out. The meta-analysis assess the percentage loss in *Nephrops* catch due to mesh size increase, drawing on each source of information. The results of the meta-analysis suggests indicative losses of around 13% of catch with an increase in 10mm mesh size.

### Meta-analysis

A model of Nephrops catch loss with increasing mesh size was constructed from Briggs et al., (1998), BIM (2015), and Drewery et al., (2015), reviewed below. The analysis was performed on the relationship of % catch loss Nephrops and mesh size increase between trial gear and control gear. The modelled relationship and results from individual trials are shown in Figure 1.

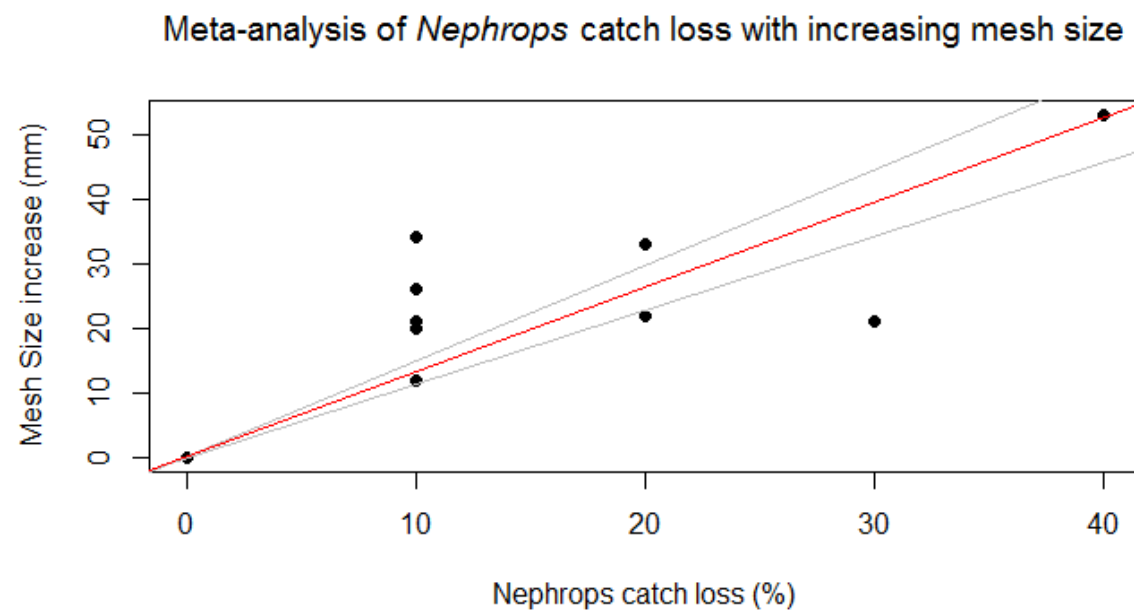


Figure 1. Relationship of mesh size increase and loss of Nephrops catch. Red line is the defined relationship with grey lines  $\pm 1$  standard deviation.

Taking the UK landings from VIIa split by mesh size the total loss of Nephrops catch could be in the range of 998 t to 1018 t.

Review:

The consequences of an increase in mesh size in the Irish Sea Nephrops Fishery: an experimental approach; Briggs et al., 1998

Area: **Irish Sea**

Mesh size comparison **70 mm and 80mm**

The result of increasing the mesh size of Nephrops trawls in the Irish Sea from 70 to 80 mm (inside-mesh) throughout was investigated. The controlled variables were fishing method (twin-trawl and parallel-trawls) and significant reductions in catch-rate of Nephrops of 26% and 34% were recorded during parallel-hauls tows when mesh size was increased to 80 mm with all other aspects of net construction remaining the same.

Assessment of an increase in cod-end mesh size in the Irish Sea Nephrops fishery; BIM 2015

Area: **Irish Sea**

Mesh size comparison **70 mm, 80mm, 90mm, 100**

The 80 mm cod-end retained ~12% less Nephrops while the 90 and 100mm retained ~ 20% less Nephrops by weight compared with the 70 mm cod-end.

Catches of the principal whitefish species, whiting and haddock, were mainly below their respective MLS of 27 and 30 cm (Fig. 8). Little difference in catches of whiting occurred between the 70 and 80 mm cod-ends but reductions in whiting catches were observed in the larger meshed 90 and 100 mm cod-ends. The results of a relationship with cod end size were

inconsistent. The catches of whiting in 100mm mesh were greater than by 90mm, although both lower than catches by 70mm and 80mm.

Effects of Codend Mesh Size and Twine Number on Nephrops Selectivity, Drewery et al., 2015

Area: **North and South Minch**

Mesh and twine comparison **80mm, 100mm, 120mm**

For Nephrops the catch rates of the 3 test gears differed significantly from each other. At a carapace length of 35 mm the 80 mm mesh showed 77% retention, the 100 mm codend showed 61% retention and the 120 mm codend showed 43% retention. For whiting the catch rates of the 3 test gears differed significantly from each other with increasing selectivity as mesh size increased. The catch rates of the 3 test gears differed significantly from that of the control net and from each other. For the 80 mm codend retention is <1% for fish under 10 cm rising to 58% at 23 cm above which there is no significant difference from the control net. For the 100 mm codend retention is <1% or for whiting under 13 cm rising to 21% at 23 cm with no significant difference from the control being demonstrated for whiting larger than 27 cm. For 120 mm codend retention is <1% for whiting under 19 cm rising to 8% for fish at 23 cm with no significant difference from the control net for individuals larger than 32 cm.

Size selectivity of Nephrops (in consistent results)

The 120mm net had same overall shape as control net

The 100mm net had higher proportion of small Nephrops than 80mm