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Charter Vessel ORCADES was chartered to collect and record the behaviour of Nephrops and fish in the mouth of a Dual Purpose Fish/Prawn Trawl using diving techniques with the towed underwater vehicle TUVII.

To observe and record the behaviour of commercial round fish species in the trawl in shallow water off the islands of Cauna, Eigg and other areas known to the skipper of the Orcades. To observe and record the behaviour of fish and Nephrops to a two level trawl.

The vessel worked daily from Mallaig and no time was lost due to bad weather. Even when gale force winds stopped diving sheltered areas were found where fishing could still take place.

All diving observations of Nephrops took place on grounds close to the north end of Eigg in 18 fathom of water and for fish off Canna, Moonan Bay Skye and Coll. To achieve the cruise objectives it was necessary on a few occasions to sail at 0430 hours and not return to port until 2030 hours the same evening. Normal sailing time was 0630 hours.

Results

All three objectives were achieved during this 3 week charter.

Nephrops Behaviour

Observations by the research team diving and using the underwater vehicle TUVII were made of the whole fishing gear towing at the ships normal fishing speed.

Nephrops were never seen in front of the Vee boards or when manoeuvring the vehicle from one board to the other across the area to be swept by the net.

Nephrops were seen on the surface in an area 10 feet wide to the inside of the sweep wire (25 Nephrops were counted on one occasion) and it appeared they were more frequently on the surface in this region ahead of the wing end. On one occasion two small Nephrops were seen to be touched by the rubber leg of the bridle and they both moved over it and escaped. None of the observed Nephrops were seen to be herded by the sweep wires.

A number of Nephrops emerged from the mud at the wing end, rose vertically and swam into the wing netting. Nephrops were also chased out of the mud directly in front of the 3 inch rubber busom of the footrope. These Nephrops did not appear to rise high but passed over the footrope in the mud streaming off the top of the busom and remained close to the belly netting. Nephrops were also observed in the codend where a few were seen escaping through the 72 mm mesh.

Experiments were conducted with a 520 Boris Dual Purpose Fish/Prawn trawl arranged with a large meshed (85 mm) separating panel. The fishing line of the panel was positioned directly above the rubber footrope and each finished in a separate codend. The top having a 67 mm mesh size and the bottom a 72 mm one.

When the fishing line of the separating pane. was set with a $3\frac{1}{2}$, 2 and $1\frac{1}{2}$ feet level from the footrope Nephrops were found in both the top and lower panels.

A second smaller meshed separating panel (50 mm) was fitted replacing the 85 mm one and from this point on only a few individual Nephrops were found in the top panel with the same fishing line settings. Direct observations were not able to show Nephrops striking the separating panel from underneath and the Nephrops were most likely shaken from the lower panel through the 85 mm mesh when the trawl was being hauled. It is interesting to note that the main net was made from 80 mm mesh netting.

Fish behaviour

Last years observations on the behaviour of haddock, cod and whiting in the mouth of the trawl was confirmed with each species displaying slightly different reactions when falling back into the net; some fish rising others keeping low.

Using the 520 Boris Fish/Prawn trawl with the separating panel set at a 2 foot level good separation was achieved with Nephrops, cod, flatfish, dogfish and angler passing to the lower codend and the haddock and whiting to the top.

It was noticeable that the condition and appearance of the fish in the top codend was very good compared with fish in the lower one mixed with the Nephrops.

Observations were made of both haddock and cod in the mouth of the trawl and their reactions to the separating panel. The majority of the haddock were caught in the top panel and the cod in the lower one.

~~All observations were recorded on video tape for subsequent detailed analysis.~~

J MAIN

23 June 1981