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DEPARTMENT OF AGRICULTURE [NI]
AQUATIC SCIENCES RESEARCH DIVISION

Fisheries Research Laboratory

CRUISE REPORT - LF/11/90

SQUARE PANEL PRAWN NET TRIAL 8-17 August 1990

PERSONNEL

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OBJECTIVES

1. To film the fishing performance of a Nephrops trawl net fitted with a panel of square mesh and to compare this performance to that of a conventional net.

2. To carry out a quantitative assessment of catch rates of a Nephrops trawl net with a square mesh panel compared to a conventional net using the alternate haul tecnique.

3. To collect water samples from selected stations for chemical analysis

NARRATIVE

MRV Lough Foyle sailed from Belfast at 21.50 on Tuesday 7 August with DANI personnel aboard and docked in Troon at 13.00 on Wednesday 8 August where Messrs. Robertson, Barkel (DAFS) and Arkley (SFIA) boarded the vessel. DAFS video equipment, loaded at Troon, was assembled while the vessel steamed to her first station. Trawling commenced at 09.00 on Thursday 9 August off the Co. Down coast (Figure 1) and included underwater observation using the DAFS remote controlled television vehicle (RCTV). Visitors Dr Heaney (ASRD Head) J.Hamilton (net maker) and H.Forsythe (Industry Representative) boarded MRV Lough Foyle from the fishery protection vessel Vigilant at 10.00 on Thursday 9 August. Dr Heaney and Mr Hamilton departed via the Vigilant at 17.54 and Mr Forsythe stayed aboard until Friday 10 August. Simultaneous trawling and filming continued off the south Down coast working southward as indicated in Figure 1. Nights were spent at sea, on station, ready for the next days work. The cruise was visited by camera crews (6 personnel altogether) of both BBC and UTV,

accompanied by Dr Heaney and Mr Hutley, on Monday 13 August; boarding via the Vigilant. Mr Forsythe returned to the vessel on the Monday via the same route. Having obtained convincing evidence of whiting escapement through the square meshes, supported by data from catch analysis, Tuesday 14 and Wednesday 15 August were devoted soley to experimental fishing. Prevailing calm weather conditions (SW2-3) however, changed on the Wednesday with gales moving from W to NW causing some interference to the fishing gear. Gale force winds from the west on Thursday 16 August prevented further experimental fishing trials. Using the land for shelter it was possible to film the whole net while trawling in shallow water (25m) as a check on its fishing potential for the forthcomming commercial vessel trials. Mr Forsythe disembarked via open boat off Kilkeel at 15.00 on Thursday 16 August. MRV Lough Foyle steamed north following the Northern Ireland coast for shelter as far as Larne whereupon course was set for Scotland, docking in Troon at 08.00 on Friday 17 August. Messrs. Robertson, Barkel and Arkley disembarked at Troon and the DAFS equipment unloaded. The vessel then steamed to Northern Ireland docking in Belfast at 15.25.

METHODS

During the cruise 22 hauls were completed as indicated in Figure 1. Alternate hauls of 1-3 hours duration were performed using a standard prawn trawl of 70 mm mesh size with detachable codend and extension pieces. One of these extensions was fitted with a square mesh panel as detailed in figure 2. Of the hauls performed 11 were filmed using the RCTV. Catch samples were sorted into species, weighed, individuals counted and length frequency distributions prepared for whiting and Nephrops. Catches in the filmed tows were related to the observations made and notes were prepared on the behaviour of fish species in the net. Water samples taken at stations 1,3,4,5 and off troon were returned to the Coleraine Laboratory for analysis.

RESULTS

During the cruise 10 hours of Umatic video tape was filled using the RCTV. Pictures obtained demonstrated that under tension the diamond shaped meshes of the cod-end extension are closed while the square meshes of the inserted panel remained open. All tows filmed showed good escapement of small fish through the square mesh with the most active escapes occurring at the beginning of the panel. Although trials using two panels of square mesh showed escapes through both panels this activity was mainly at the first one. Unfortunately time did not permit further experimentation with two square panels. The study clearly demonstrated the different escape reactions of a range of fish species. Clupeoids for example had a very vigorous escape response through the square mesh panel and were easily recognised. Whiting showed distinct upward noseing behaviour, pushing against the closed diamond meshes ahead of the square panel and escaped rapidly once the open square section was encountered. Although whiting usually tended to approach the netting at an angle of 15-30 degrees there were also observations of fish parallel to the netting and on entering the square mesh panel suddenly spurting upward through the mesh. In the conventional diamond codend,there was a high incidence of whiting trapped half out of the codline meshes. Cod appeared relatively passive in the net and made little attempt to escape; sometimes catching their pectoral fins in the mesh or swimming along with the

net. Nephrops tended to scuttle along the bottom of the net and came nowhere near the upper sheet or square panel. At no stage were Nephrops seen to escape through the meshes of the square mesh section. Catch composition data supported visual data with a higher proportion of whiting escaping through the net with the square panel than through the conventional all diamond mesh net (Figure 3). Anomalies in some of the data collected in the fishing trials towards the end of the cruise suggest that tidal effects, stock variability, tow direction and weather had an overwhelming effect on station comparability; a view supported by fishing experts present. Although every attempt was made to standardise tows these observations indicate that the alternate haul technique is not a viable method for obtaining conclusive selectivity data for the Irish Sea Nephrops grounds. The next phase of this project using a commercial vessel with twin rigged gear is likely to provide a more precise quantitative comparison than could be obtained here.

Results from this cruise are undergoing further analysis and will be further discussed in conjunction with those from the forthcomming commercial vessel trial.

R.P.Briggs

17 August 1990

seen in draft by:
Captain A. Niblock
J.Robertson
K.Arkley

FIGURE 1

MAP OF AREA TRAWLED DURING CRUISE
INSET SHOWS RELATIVE POSITION OF STUDY AREA IN IRISH SEA

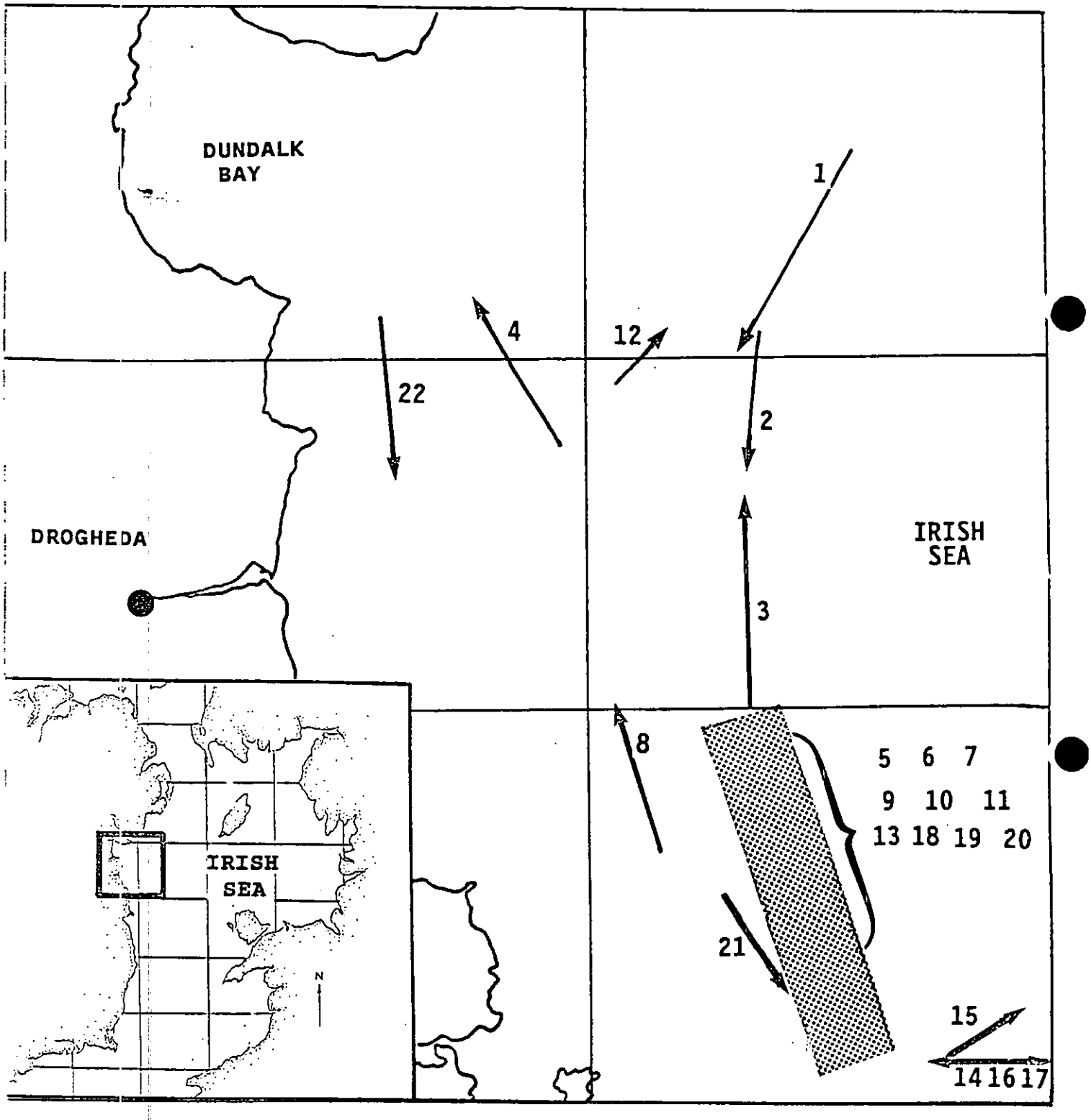
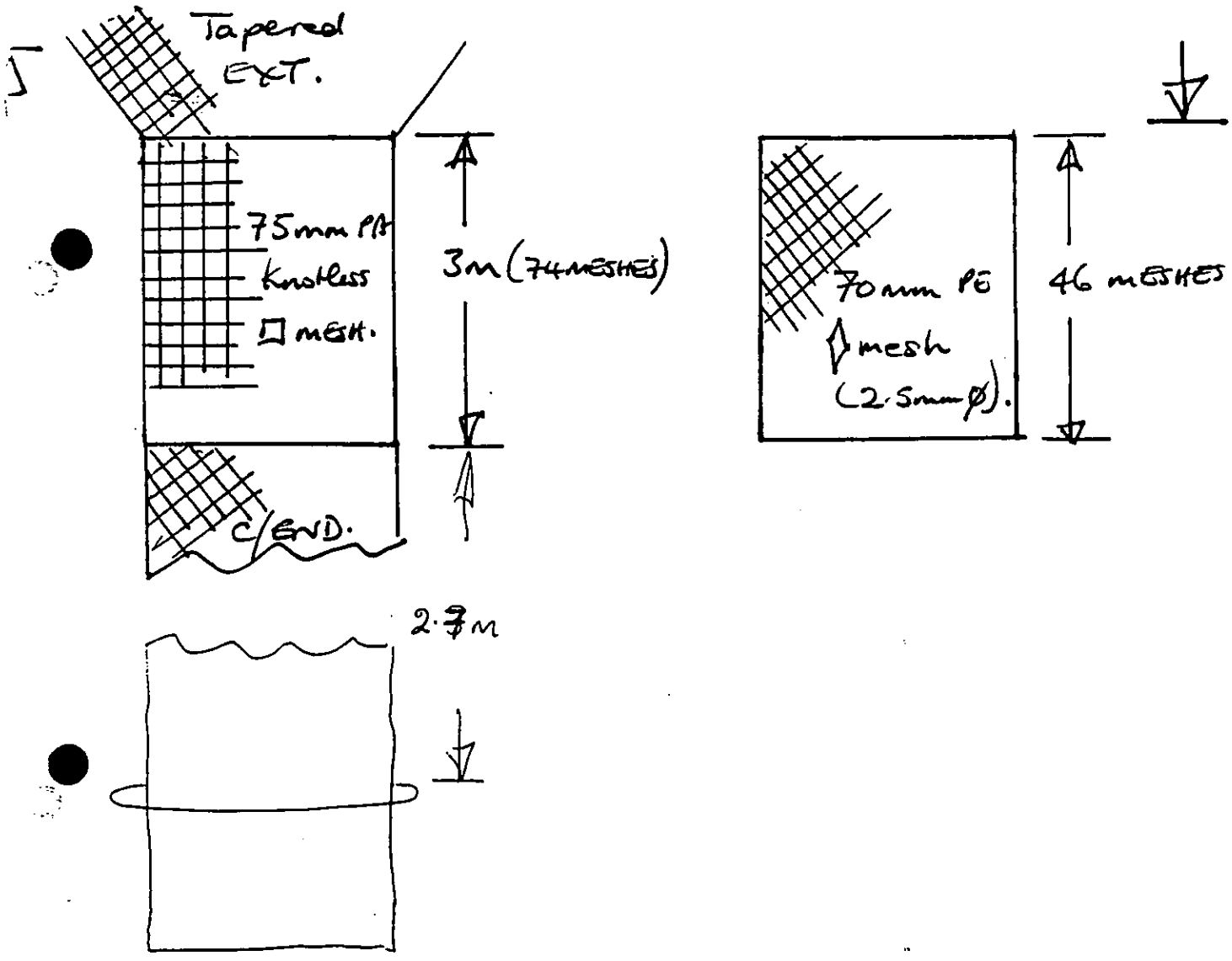


FIGURE 2

DIAGRAM OF CODEND EXTENSION OF PRAWN NET SHOWING POSITION OF SQUARE MESH PANEL



LENGTH COMPOSITION OF CATCHES USING TRAWLS WITH AND WITHOUT A SQUARE MESH PANEL FROM SELECTED STATIONS