JA

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P17/7 In Confidence

CRUISE REPORT

FRV MARA

18 July - 12 August 1977

Personnel:

C S Wardle	PSO	(in charge)
R S T Ferro	SSO	(part time)
J Main	HSO	(dive marshal)
R Priestley	HSO	
G I Sangster	SO	
C W Shand	SO	
W Mojsiewicz	SO	
JHB Robertson	ASO	
E Wright	ASO	
A J Tough	PTO IV	

Aims

1. To examine the behaviour of seine net ropes under different arrangements of applied weight and drag and make video tape film of the Vinge 520 net in action (2 weeks).

2. To make records of the reaction of fish to rising net and rope panels behind the footrope and relate to rising and falling lateral guidelines.

3. To extend where practical our understanding of the reaction of fish to isolated components of fishing gears.

Procedure

'Mara' sailed daily for Spey Bay on 16 days out of a possible 20 days. Four days were unsuitable for diving observations due to weather conditions. Scientists rendezvoused with 'Mara' 1 to 2 miles from Lossiemouth using the 12 man rubber boat and motor launch 'Maid' when required. During the first 10 days the Vinge 520 seine net was fished normally. On smooth good weather days 'Maid' was used to make TV records of the net and rope behaviour. When 'Maid' could not be used divers observed the behaviour of the seine ropes. During the last 10 days of the cruise, the experimental rope wing gear was fished successfully as a light trawl, using one coil of seine net rope with diverter boards. Long hauls were observed by TV worked via a cable off the stern of 'Mara' and a relay of paired divers descending the warps to operate the camera. The variety and numbers of fish were disappointing but valuable results were obtained.

Results

1. Rope experiments

Observations and records were successfully made relating the degree of bottom contact of the seine rope and the applied tension, both during the fishing of the Vinge 520 and in experimental arrangements of the ropes.

The behaviour of the rope was related to the normal deck procedures and some interesting conclusions have been drawn.

(a) The two ropes although apparently equal at the stern very rarely behaved in a similar manner on the sea bed.

(b) The rope under low tension glides easily over the sea bed lightly touching the sand during slow steaming forward and slow gear hauling.

(c) During faster hauling or steaming when the rope can gain tension of more than half a ton; that part of the seine rope close to the ship lifts off the sea bed whereas that part near the net digs into the sand. If both the seine net ropes are symmetrically on the bottom and if the increase in tension is applied at the correct time this procedure slows down the closing of the net.

(d) Nearly always the tension in the two ropes was sufficiently different to cause quite different behaviour of the ropes on the two sides of the enclosed area.

2. TV film of Vinge 520 seine

Video tapes recording a survey of a large number of different aspects of this net and the fish in it were made. These include several passages along the seine ropes from the towing ship to the net showing the characters of the rope behaviour. These records are complementary to the existing tapes and cine films of the long wing haddock seine. An edited video tape illustrating the major points is being prepared.

3. Fish reaction experiments

The rope wing gear was successfully arranged to show the reaction of fish to various angles of rise in belly panels of trawls. Three inch mesh green panels, three inch mesh orange panels, 14 inch mesh nylon panels and parallel rising rope panels were compared. The general finding is that small fish unable to rise rapidly ahead of a steeply rising panel become flattened onto the finer meshes. Flatfish remain trapped in these positions and roundfish are often able to penetrate the meshes. The same size range of fish when encountering large meshes and rising rope panels dive through these and clear the gear. Typically with the fine mesh panels large numbers of small fish are seen caught on the steeply rising meshes. Larger flats and roundfish tended to rise up as they dropped back over all the panels up to an angle of 45°. Beyond this angle they would become flattened onto the small meshes or in the large mesh and parallel ropes would continue to swim between the meshes and ropes until exhausted and then drop through the panel. Sandeels and sprats were seen to rise in groups clear to the top of all the panels to a height of 4 metres from the bottom in these tests. TV records of these reactions are being analysed for the relation between the angle of rise of the panel, the size of fish trapped, or lost through the panel and the towing speed.

4. Herding by ropes and chains

A tickler chain was towed at the mouth of the parallel rope gear with a seine rope towed 2 metres ahead of it. Evidence was recorded by TV that fish buried in the sand were passed over by the rope but put out of the sand by the heavy chain. Fish that had passed back to this rope from the rope wings tended to swim ahead of the rope until exhausted and would then turn back over the rope briefly swim ahead of the chain and then turn and pass over the chain. The numbers involved are to be analysed using the video tape recordings.

C S WARDLE
21 September 1977

Seen in draft : W T Mair