

R1/3

Not to be cited without prior reference to the Laboratory

Field report including the cruises of chartered vessels *Heathery Brae* and *Salar*

29 July to 25 August 1990

Ref H17

**REPORT**

**Part I - 29 July to 25 August 1990**

**Part II - 9-15 September 1990**

J Main           SSO  
G Sangster       HSO  
R Kynoch         ASO  
E Coroon         Craftsman  
I Leaver         ASO part-time 29 July -3 August  
W Mojsiewicz     SO part-time 29 July-3 August

J Main           SSO  
G Sangster       HSO  
E Coroon         Craftsman  
I Leaver         ASO

**Objectives**

**Part I**

1. To investigate the survival rates (in underwater cages) of cod, haddock and whiting escaping from cod-ends of 90 mm x 120 meshes round, 90 mm x 100 meshes round and 90 mm with an 80 mm square mesh top panel.
2. To obtain selectivity data for each cod-end.

**Part II**

3. To lift all the underwater cages and clear the site and distribute live fish for other projects.

**Narrative**

The staff travelled by car and Landrover to Gairloch on 29 July. All equipment, trawls and cages were also transported on the same day.

The underwater cages were prepared on the pier at Gairloch then transported by the local scallop dredger *Salar* to a position on the east side of Longa Island during the first week.

I Leaver and W Mojsiewicz returned to Aberdeen by Landrover on 3 August.

The Laboratory launch arrived from Aberdeen on Tuesday 31 July, was put in the water and prepared for work. During this first week haddock, whiting and codling were caught on handlines and kept in three of the cages as controls for the experiment.

The trawl gear was prepared on Gairloch pier for loading onto the *Heathery Brae* which was chartered from 6 to 17 August. During this period good catches of small haddock, whiting and some codling were taken. Fish escaping through the cod-end meshes were retained in a ringed small mesh cover for the survival experiment. These fish were all caught within the loch allowing the trawl to be towed to within a few hundred metres of the site before transfer to the cages.

Tows were conducted with each of the three cod-ends until all the cages held the required numbers of haddock and whiting. However, the numbers of codling fell short of the required totals for both controls and escapes. Additional hauls were made to obtain selectivity data.

During this period large quantities of haddock, whiting and flatfish were kept alive and transported daily to the Marine Research Unit at Firemore Bay for distribution. At the end of the experiments a few hundred fish from the cages were caught and transported to Loch Ewe.

## Results

### 1. Survival

Percentage of each group surviving after 19 days in the underwater cages\*

Cages	Haddock			Weighted average	Whiting			Weighted average	Cod			Weighted average
	1	2	3		1	2	3		1	2	3	
*90 x 120	0	43	83	42	83	97	95	93	91	100	100	96
*90 x 100	97	93	93	94	89	70	86	82	100 (5 fish only)			100
*90 with 80	72	73	82	76	88	97	100	94	-	-	100	100

\* Numbers were close to 30 of each species in each cage.

° Mesh size x number of meshes around the cod-end.

° 90 mm cod-end with 80 mm square mesh panel.

After 29 days only one more whiting had died, on day 24 in a "90 x 100" cage. There were no further deaths during the next 12 days before lifting the cages.

The highest death rates were in groups of haddock from the 90 x 120 cod-ends which occurred within 24 hours of capture, 20 haddock in one cage and 12 in another. Whiting and cod from these cod-ends survived well but were taken in separate hauls on clean ground in deeper water than the haddock. The haddock were taken with a large amount of debris, shell, weed and rough fish which was not released from this cod-end. The meshes were closed or blocked off causing turbulence which threw the fish around before escaping. As the haddock did not immediately escape, they may have suffered more stress and abrasion than the other species.

Fish held in the cages showed no signs of deterioration due to scale loss or damage until the fourth day. At this time the usual white patches of mucus appeared covering the damaged areas and lasted for a few days. Fish that had tail damage also tended to deteriorate. The tails eventually turned black and these fish usually died within a few days.

### 2. Selectivity experiments

The selectivity parameters of the cod-ends were measured using a large enclosing cover with hoops. These ensured that the cover towed well clear of the cod-end. Twelve hauls were carried out and the fish in both cover and cod-end were sampled and measured according to standard practice. The 50% retention lengths and selection ranges for haddock and whiting for the three cod-ends are listed below. These data are from grouped hauls. Very few whiting were caught and the selection parameters estimated are thus less certain than those for haddock. The haddock ranged in size from 12 to 37 cm but the whiting only from 21 to 27 cm. The 50% length for haddock in the cod-end with the 80 mm square mesh panel is lower than might have been anticipated. It was observed during the tows, however, that haddock escaped from all parts of the cod-end not just the panel. The whiting which escaped on the other hand, all emerged from the panel.

Codend*	Haddock		Whiting	
	L <sub>50</sub>	SR	L <sub>50</sub>	SR
90 x 120	25.4	5.8	27.9	4.5
90 x 100	29.5	7.3	28.7	6.2
90 with 80	26.5	6.1	30.2	6.5

\* Mesh size x number of meshes around the cod-end.

L<sub>50</sub> - 50% retention length (cm);

SR - Selection range (cm).

**J Main**

**1 November 1990**