Mr. Hall

R1/7 In confidence: Not to be quoted without reference to the Laboratory. 4 8 MR 66

CRUISE REPORT

F.R.S. "MARA"

5th Sept. - 22nd Oct.

Personnel (from time to time)

Trained divers	Divers in training
C. C. Hemmings, S.S.O.	G. Craig, S.A.
C. J. Chapman, S.O.	J. Kinnear, S.A.
J. R. G. Hislop, S.O.	Miss V. Moodie, S.A.
J. Main, E.O.	R. Park, S.A.
B. Ross, S.A.	C. Robb, S.A.
A. Walker, S.A. (Pitlochry)	

Surface Staff

C. S. Wardle, S.O.

Objectives

1. To repeat previous year's work in placing control, surface-and bottom-tagged fish in cages in Broad Bay to assess survival.

2. To compare the physiology of fish after varying periods of capture in surface tanks and bottom cages.

3. To make observations on the capture of fish by the seine net.

4. To make recordings of underwater sound as possible.

5. To continue diver training.

General

"Mara" arrived in Stornoway on 8th ~~October~~ September and laid four cages in Broad Bay in c. 60ft of water on 12th September. Due to bad weather the first haddock were not established in the cages until the 17th.

Observations on the fish in cages were continued, as weather and circumstances permitted, until the 3rd of October when exceptionally bad weather terminated these experiments. Attention was then paid to objectives 2-4. Diver training proceeded as circumstances permitted.

Results of tagging

The following table gives the numbers of fish that were introduced into cages at the beginning of each experiment, followed by the numbers of live fish observed on subsequent days of observation.

Category	No.of fish introduced	No. of fish alive										
		1st	2	3	4	5	6	7	8	9	10	11th Days
Control (untagged)	50	-	-	45	42	40	40	40		40		40
Bottom-tagged 1.	28	26	26	26	-	26	-	26				
" " 2.	26	25	-	25	-	25						
Surface-tagged	49	12	8	8	8	-	8	-	6			

No further readings were possible after the last figure in each row of the table. The results of the tagging experiments confirmed again that the bottom-tagged fish survived much better than the surface-tagged.

Results of physiological work

Samples of seine caught haddock were killed for biochemical analysis after periods in the deck tank varying from one hour to five hours. The results suggest an immediate loss of water from the blood stream followed by swallowing of water about 30 minutes after capture. The resulting dilution of the blood stream is followed by kidney diuresis, and a balance of swallowing against excretion of water. These results parallel previous work on plaice, which was extended by keeping plaice in the underwater cages in Broad Bay prior to a similar biochemical analysis.

General Results

Round fish were not present in Broad Bay in sufficient quantities to allow much extension of the programme of seine net observations, but the observation of flatfish confirmed previous work.

Dives in Loch Erisort provided an opportunity to study the bottom fauna, tunicates and Antedon being particularly rich on the hard rock bottom. A number of saithe and pollock were seen also. Recordings of the sound of all the diver's demand valves were made.

C. C. HEMMINGS

7th November, 1966.