

R1/6

Not to be cited without prior reference to the Marine Laboratory Aberdeen

FRV *Clupea*

Cruise 0600C

REPORT

10-29 April 2000

Ports

Loading: Fraserburgh, 10 April

Unloading: Fraserburgh, 2 May

Personnel

P A Gillibrand	(In charge)
M R Robertson	
P Copland	10-15 April
G Grewar	22-29 April

Objectives

1. To deploy current meter moorings and conduct hydrographic surveys in Loch Torridon and two other sea lochs in support of the sea lice sampling and modelling work under AE1158.
2. To make intensive measurements of water column nutrient levels close to fish farms.
3. To conduct a short acoustic survey of Loch Torridon in support of the collaborative work with SNH (C221).
4. To collect sediment samples for polyaromatic hydrocarbon (PAH) analysis.

Out-turn days per project: 20 days AE1158

Narrative

Equipment was loaded aboard *Clupea* and set up on 10 April. *Clupea* sailed at 1500 hours and steamed for Loch Torridon. *En route* in the Moray Firth and North Minch, depth-integrated water samples were taken for phytoplankton analysis. On arrival, a current meter mooring was prepared and deployed in Loch Shieldaig. A depth-integrated water sample was taken for phytoplankton analysis. An acoustic survey of Loch Torridon and the adjacent coastal area was commenced and continued for three days. RoxAnn 38 kKz and 120 kHz and sidescan sonar surveys were conducted, and completed on the evening of Friday 14 April, when *Clupea* proceeded to Gairloch. Here extra equipment sent from Aberdeen was loaded aboard. On the morning of 15 April, P Copland disembarked and *Clupea* made for Loch a Bhragh on Rona where a water level recorder was deployed. A second water level recorder was then deployed in Loch Shieldaig before an intensive CTD survey of Torridon and the adjacent coastal area was begun. This survey continued for three days until 1415 hours on Monday 17 April when *Clupea* made for Loch Duich. In the evening, a current meter mooring was prepared and deployed near the fish farm in Loch Duich.

On 18 April, a line of eight stations in a transect seaward from the fish cages was sampled for temperature, salinity and dissolved nutrients at four stages of the tide (high water, ebb tide, low water, high tide). *Clupea* then proceeded to Kyle of Lochalsh where the Seabird CTD was offloaded to return to Aberdeen for repairs.

On 19 April, the current meter mooring in Loch Duich was recovered and redeployed towards the head of the loch. A short CTD survey, using a secondary CTD, was then conducted in Loch Duich.

On 20 April *Clupea* returned to Loch Torridon to complete the survey that had been started earlier in the cruise. The high resolution grid of CTD stations within and outside Torridon was completed on 22 April, when *Clupea* returned to Kyle of Lochalsh where G Grewar joined the vessel on the morning of the 23rd. During the day, a series of grab and core sediment samples were taken for polyaromatic hydrocarbon analysis in Loch Duich and Loch Hourn. On the following day, sampling in Loch Hourn was completed in the morning and *Clupea* then made passage for Torridon.

During the evening of the 24th, grab sampling was conducted in Loch Torridon, and continued the following morning until completion at 1340 hours, when passage was made to Loch Snizort in deteriorating weather conditions. Some grab sampling was carried out that evening in Loch Snizort. Sampling continued on the morning of the 26th, until 1330 hours when CTD surveys of Loch Snizort Beag and Loch Greshornish began. A survey of Outer Loch Snizort commenced but was called off at 1815 hours due to deteriorating weather conditions. On the morning of the 27th further CTD stations in Loch Snizort were worked in poor weather. Due to the difficult working conditions and the uncertain weather forecast, the survey was called off and *Clupea* began the passage back to Fraserburgh. *En route*, depth-integrated water samples to 10 m were made in the North Minch and Moray Firth for phytoplankton analysis. *Clupea* arrived back in Fraserburgh on the afternoon of the 28th, when gear was packed away in preparation for unloading.

Results

1. Current meter moorings were successfully deployed in Loch Shildaig and Loch Duich. Water level recorders were deployed in Loch Shildaig and Loch a Bhraige, Rona. Lines of CTD stations were carried out in Loch Torridon, Loch Duich and Loch Snizort. In all, 238 CTD casts were made using the Seabird SBE 25 and SBE 19 instruments. These data have all undergone preliminary processing and checking on board. Water samples collected for salinity calibration will be analysed subsequently.
2. The nutrient survey near the salmon farm in Loch Duich was completed with all eight stations sampled on four occasions. The samples will be analysed for nitrate, phosphate, silicate and ammonia on return to the laboratory. Samples for chlorophyll analysis to calibrate the fluorometer attached to the CTD were also taken.
3. The acoustic survey of Loch Torridon and adjacent coastal area was successfully completed. The survey provided good coverage of the area using RoxAnn (at 38 kHz and 120 kHz) and sidescan sonar systems.
4. Sediment grab samples and cores were taken in lochs Duich, Hourn, Torridon and Snizort. One core and 129 grab samples in total were taken. These will be analysed for sediment chemistry on return to the laboratory.

P A Gillibrand
2 June 2000

Seen in draft: A Nicol (OIC)