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FRV *Clupea*

Cruise 1501C

REPORT

25 October - 8 November 2001

Personnel

| | |
|-----------------|---------------------------|
| J Kinnear (SIC) | (25 October – 8 November) |
| J Drewery | (25 October – 8 November) |
| J Martin | (25 October – 8 November) |
| R Coogan | (25 October – 8 November) |
| E Hatfield | (25 October – 31 October) |
| P Copland | (25 October – 31 October) |
| D Bova | (31 October – 8 November) |
| S Wear | (31 October – 8 November) |

Sampling Gear and Equipment

Modified PT154 with 6 mm codend
 BT158 demersal trawl with 10 mm codend
 Two 2.8 m beam trawls
 Scanmar (height and spread units)
 2 Day grabs
 Simrad EK500/RoxAnn
 Seabird CTD

Objectives

1. To carry out detailed acoustic surveys in selected lochs and the Sound of Sleat using the Seabat 602 to determine the distribution of herring and sprat. Concentrations of pelagic fish will be sampled using the PT154. Species composition and length frequency distributions of the fish caught will be determined. Sub samples will be weighed and otolithed to establish length weight relationships. Herring samples will be taken for DNA analysis.
2. To carry out demersal trawls in each of the sea lochs to determine the abundance, distribution and variation of fish species and any epibenthic mega-fauna using the BT158 trawls and the 2.8 m beam trawl where appropriate. At each trawl station the length frequency of all species will be taken and sub samples of the major commercial species will be weighed and otoliths taken. Stomach contents will be removed from selected species for trophic studies, the carcasses will be bagged and frozen for parasitic analysis. In addition where possible 100 skin samples per selected species per location will be removed for genetic studies.

Out-turn Costs Per Project: 15 days MF01t

Narrative

Clupea was delayed leaving Fraserburgh until the evening of the 26th due to bad weather. Scientific staff joined the vessel at Kyle on the evening of the 27th. *Clupea* then steamed to anchor in Balmacarra Bay where the acoustics system was calibrated prior to the start of the survey. Acoustic transects and Pelagic trawling began the following day in Loch Nevis, and were repeated in Lochs Hourn, Duich and Kishorn with only slight delays due to the weather. Bottom sediment samples were taken in Loch Alsh to validate previous Roxann data. CTD samples were taken at each trawl station.

The acoustic survey and pelagic trawling finished on 1 November and a change over of scientific staff and fishing gear took place at Kyle.

On the 2nd *Clupea* steamed to Loch Hourn where demersal and beam trawling were undertaken on suitable areas clear of creels. Similar sampling was carried out in Loch Nevis, Loch Duich and Loch Kishorn. Where possible trawls were conducted close to and away from fish farms to determine any differences in fish densities or species variability, but this proved difficult to achieve due to creel activity in the areas. Sediment samples were also taken in each loch to further check the ROXANN data collected on previous cruises. CTD samples were taken at each trawl station. Problems occurred with the ship's navigation system and anchor winch near the end of the cruise, causing minor delays. Scientific staff disembarked at Kyle on the 7th and *Clupea* left for Fraserburgh, but was delayed en route by bad weather, arriving in Fraserburgh on the 10th.

Pelagic

To ensure adequate acoustic coverage of each loch within the time constraints of the survey a pre-determined zig zag pattern of transects were carried out with approximately 300 m between turning points, Pelagic trawls were subsequently targeted at suitable fish marks pinpointed by the EK500. A total of eight pelagic trawls were conducted, three in Loch Nevis, two in Loch Hourn, two in Loch Duich and one in Loch Kishorn. Size distribution for Herring and Sprat are shown in Fig 1. Herring were otolithed and examined for sex, maturity and Ichthyophonus infection. Total and eviscerated weights were taken from a selected sample. Stomachs were collected for future analysis and fin clips were taken for DNA analysis. Sprats were measured, weighed and otolithed. An attempt was also made to use the Seabat (120 khz) to observe potential fish shoals around and beneath fish farm cages, however the shallow depth and the fixed angle of the sender unit produced unusable images. A pan and tilt may overcome this.

Juvenile Scad were present in most of the Pelagic tows this year, ranging in size from 5-12 cms.

Demersal

Bottom trawling was undertaken using the BT 158 fitted with a 10 mm cod-end. A total of 13 trawls with the BT158 were completed, three in each of the study lochs and one in the Sound of Sleat. Each trawl was sampled for all species caught. Species were sampled according to standing instructions, in addition stomach samples (three fish per cm size group) were collected from cod, haddock, whiting and saithe. The remaining carcass of each fish were frozen for additional parasite and DNA analysis.

The size range in each loch for the major species is shown in Fig 1.

CTDs were taken at each trawl station.

BeamTrawls

Beam trawling was undertaken using a 2.8 m beam with the cod-end tied to 20 mm mesh to prevent mud clogging the cod-end. Nine hauls were completed, four in Loch Nevis, three in Loch Hourn and two in Loch Kishorn. In general catches of all species were small but the variety of macrobenthic organisms was considerably higher in the beam trawl than the Otter trawl.

A complete species list is currently being prepared for all trawls .

A cruise chart is attached showing the position of each trawl undertaken during the cruise.

Grab Sampling

Sampling was undertaken at 57 stations to validate the ROXANN data from previous cruises. Positions were chosen according to the defined substate colour differences on the prepared Roxann 38 and 120 khz charts for the area.

General

As in previous cruises, fleets of creels posed a problem, severely restricting the areas available to fishing. On two occasions fleets became tangled in the gear resulting in a considerable loss of time. On each occasion the tows were clear of marker floats.

J Kinnear
14 January 2002

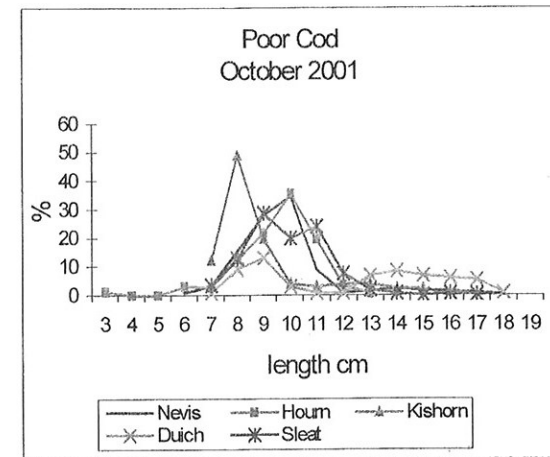
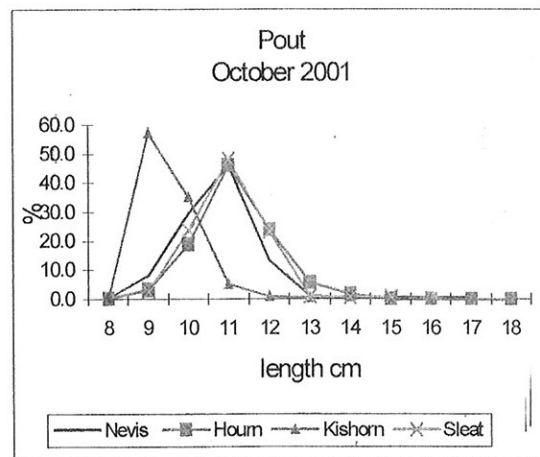
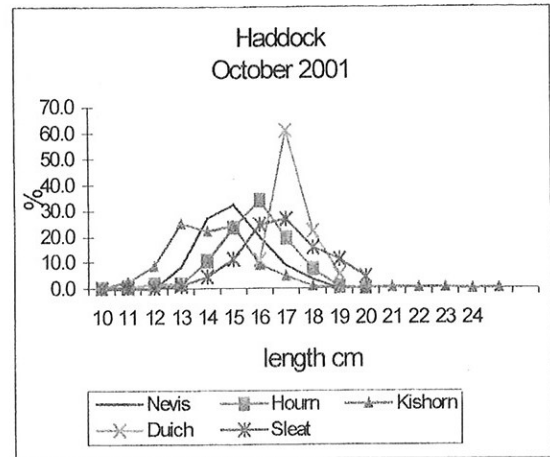
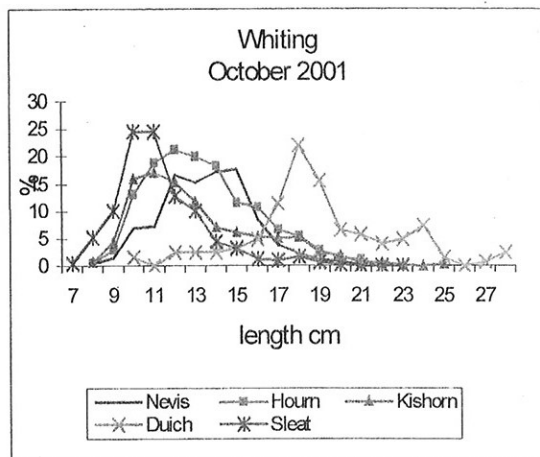
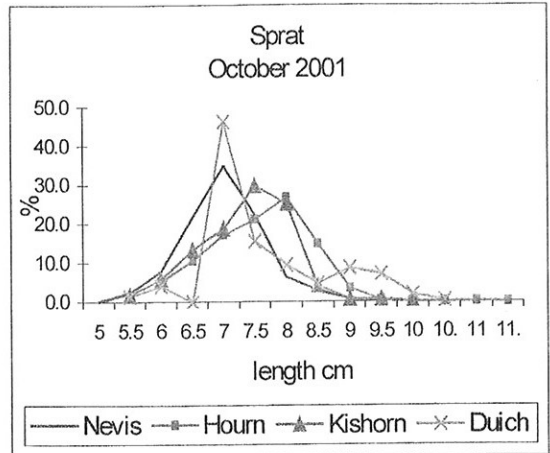
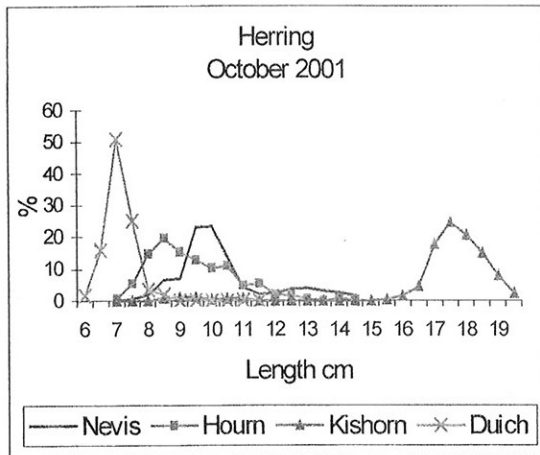
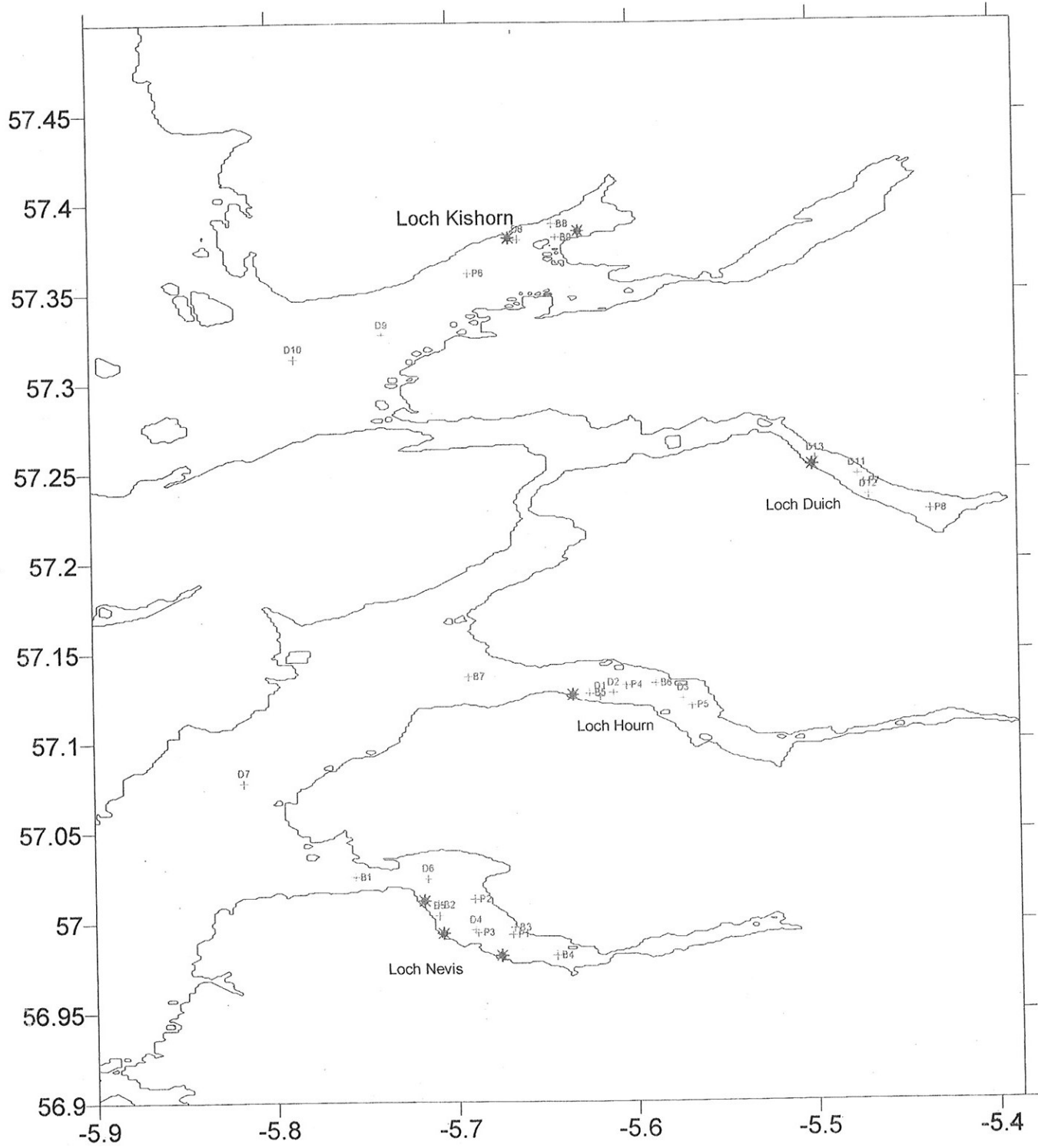


Fig 1 Size range of the most common species captured in each loch.



Trawl positions on the 1501c survey.

D - Demarsal
 P - Pelagic
 B - Beam
 * Fish Farms