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FRV *Clupea*

Cruise 0699C

REPORT

20-26 April 1999

Loading: Fraserburgh

Unloading: to Fraserburgh

Personnel

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C Shand	B2
F Armstrong	B2
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F A Kennedy	B1

Objectives

1. To investigate the benthic density distribution of sandeels in the vicinity of fished grounds near the Firth of Forth.
2. To map the distribution of habitat using side-scan sonar and RoxAnn, backed up by grab sampling.
3. To collect samples of sandeels for analysis of length and age composition.
4. Collect live 1-group haddock for maturation experiments.

Out-turn days per project: 7 days - C662

Narrative

The scientific staff joined *Clupea* at Fraserburgh on the morning of 20 April and all final loading and installation of equipment was completed by 10.30. However sailing was delayed due to a freshening easterly wind, which reached gale force by lunchtime. Sailing was not possible until 0600 hours on 22 April due to continuing strong easterly winds. The ship then sailed directly to station 1 (see Figure 1). The operation of the dredge and camera system was tested on arrival and following a successful deployment a second dredge tow was carried out close to this station. Dredge tow duration was monitored using SCANMAR. A sidescan transect and two further dredge stations were completed by 2400 hours before steaming to anchorage. Further benthic mapping using RoxAnn and side scan sonar was carried out on 23 and 24 April from around 1500-2000 hours followed by dredging at a set of stations during hours of darkness. The time available for sidescan sonar transects and dredgings was limited to six to seven hours per day because of the need to return to anchorage. The areas mapped were the Wee Bankie, the southern end of Marr Bank and Berwick Bank. Sites for groundtruthing RoxAnn by Day grab

were identified during the acoustic survey. Temperature records were obtained during dredge tows using the minilogger. The vessel steamed north on 25 April to two fishing grounds east and north of Fraserburgh (identified by the skipper as suitable for obtaining haddock). Few 1-group haddock were caught at the first ground but numbers of all age classes were obtained at the second ground. Those juvenile haddock alive were transferred to a tank onboard. The ship then steamed to Fraserburgh and docked at 1430 hours. Latter that day 40 live haddock were transferred to bags and returned to the Marine Laboratory. The ship was unloaded on 26 April.

Results

1. Benthic density distribution of sandeels

The survey repeated some of the dredge tows from stations sampled in 1997 and 1998 by the ELIFONTS project, as well as stations identified during the acoustic survey. Altogether 14 grab samples and 16 dredge tows were made (Fig. 1). As the camera cable had to be lashed onto and removed from the wire during each dredge deployment the time taken for each station was around twice that for a standard deployment. However, the camera did reveal considerable variation in habitat types over relatively small scales (0.5-1 km). As such real-time monitoring of fished grounds enabled accurate estimates of the time spent fishing on the sandy sediments that sandeels inhabited. The camera revealed that sandeels disturbed by the dredge chain could escape through the mouth of the net. However, there was a general correspondence between catches and observations of avoidance of the net suggesting that the gear probably provides some relative measure of benthic density. The maximum catch per hour was 2,845 sandeels.

2. Mapping the distribution of habitat

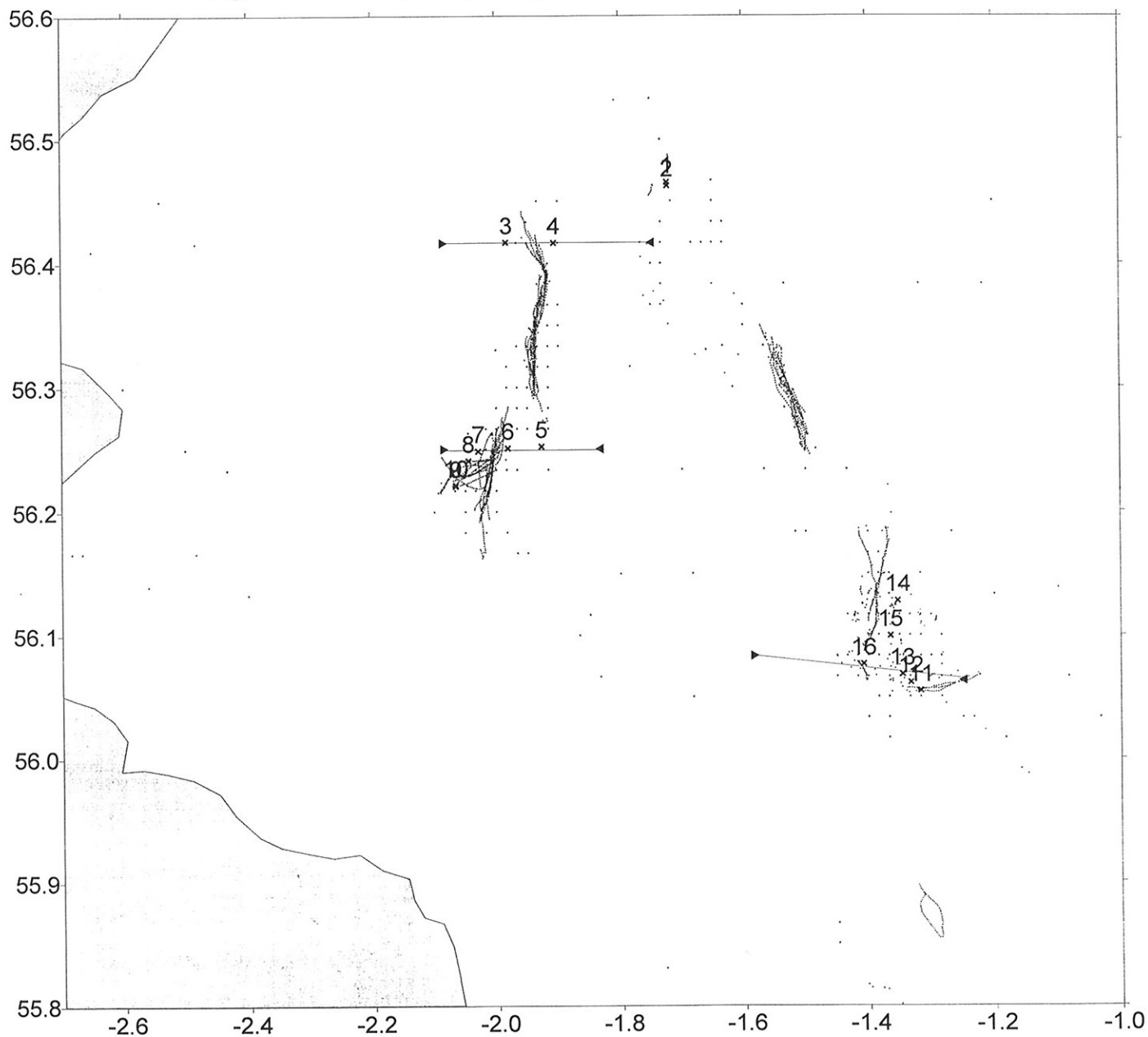
Due to time limitation only 55 kms of side scan transect were completed during the cruise. The combination of sidescan sonar and RoxAnn provided a good predictor of sandy areas with ripples. However, as shown by the video and dredge catches, we were unable to identify the specific types of sandy sediments suitable for sandeels in this survey in real-time. This problem may be overcome by more groundtruthing and better supervised clustering of the RoxAnn output at the onset of the cruise.

3. Length and age composition

Length compositions were derived from all catches and otoliths were taken for age determination. Individual weight and length data were collected for around 200 individuals using POLS balance. Samples were also frozen for later analysis of maturity.

P J Wright
8 July 1999

Fig. 1. Location of primary dredge stations and sidescan transects 0699C



Commercial fishing tows are indicated. Future surveys will complete acoustic transect coverage