CENTRE FOR ENVIRONMENT, FISHERIES & AQUACULTURE SCIENCE
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 0HT

1997 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 5b

STAFF: J .T. Addison (SIC)
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T. Locke

DURATION: 26 April - 2 May 1997

LOCALITY: North Sea (English east coast)

AIMS:

1. To use side-scan sonar and RoxAnn to identify variation in seabed in the inshore fishing grounds of the east Yorkshire coast, and relate this variation to known localised levels of exploitation and the abundance and size distribution of the lobster and crab catch.

2. To 'ground truth' the area using underwater TV camera and stills photography.

3. To collect sediment samples using a Day grab to establish the type of substrate in each sub-area.

4. To repeat 1-3 above (if time permits) on offshore crab grounds off the Humber and on Race Bank where ovigerous female crabs are thought to be present.

NARRATIVE:

Staff travelled to North Shields to join CORYSTES on 26 April (Mr Lovewell and Mr Elson were already aboard following cruise 5a). CORYSTES sailed at 1818 and steamed south to start work off Redcar and Saltburn.

General

On each night throughout the cruise rough RoxAnn grids off the North Sea coast were carried out to delineate specific areas of crab and lobster grounds for more detailed surveys with side scan sonar. During daylight hours, side scan sonar transects were run across known lobster and crab grounds. RoxAnn was run in the background during all of these side scan transects. These images were then 'ground truthed' using underwater television (UWTV) and by collecting samples with the Day grab (when the sediment was suitable for such sampling). At certain stations the sea bed samples were calibrated with the Questor Tangent Corporation (QTC) seabed classification system.

Daily narrative

Overnight on 26, 27 and 28 April a rough RoxAnn grid was carried out off the North Yorkshire coast from Saltburn down to Flamborough Head with transects run perpendicular to the coast and running two to six miles offshore. Transects were two miles apart.

On 27 and 28 April, side scan sonar transects (with associated UWTV and grab work) were carried out off the North Yorkshire coast between Redcar and Whitby High Light both parallel and perpendicular to the coast, although fog prevented any survey work too close to shore on 27 April.

On 29 and 30 April a series of east-west side scan transects (with associated UWTV and grab stations) were run off the Bridlington Bay and Holderness coastline. These transects completed a series began on Corystes 13/96, and covered the whole of the inshore lobster and crab fishery. During the night of 29/30 April a rough RoxAnn grid was carried out on the fishing grounds 4 to 9 miles offshore from the Holderness coastline.

On the night of 30 April CORYSTES steamed offshore from the Humber and undertook a rough RoxAnn grid on grounds previously fished for crabs, approximately 40 miles offshore to the north of the Sole Pit. On 1 May side scan surveys followed by UWTV and Day grab stations were completed on the area surveyed by RoxAnn the previous night to determine the nature of these offshore grounds.

CORYSTES then steamed to the Dudgeon Shoal and carried out a rough RoxAnn grid on the night of 1 May. On the morning of 2 May brief side-scan and UWTV work was carried out around the crab grounds off Race Bank, completing the survey work on Race Bank at 1100. CORYSTES then returned to Lowestoft coming alongside the MAFF quay at 1700.

The plots of each RoxAnn grid and side scan transect are shown in Figure 1.

RESULTS:

Redcar to Whitby area

A significant amount of static gear was encountered in the inshore area, which helped, along with historical records of fishing positions, to identify lobster ground, but which made the work towing the side-scan and the use of the dunking camera particularly difficult at times. The side scan work in this area showed bedrock outcrops close inshore, except for a patch at the northern end of this area where the features ran further offshore. The static gear was concentrated in this inshore area. Further offshore the bedrock receded into clay which appeared to be covered in fines from the Tees.

Bridlington Bay / Holderness coast

In comparison to the Redcar to Whitby area, the grounds in Bridlington Bay and off the Holderness coast proved to be a particularly complex area consisting of a mosaic

of sand, gravel, stones, shingle and reefs. This varied habitat may account for the high productivity of lobsters in the area. The information collected from the side scan sonar transect and the UWTV data was combined with that from Corystes 13/96 to produce a SURFER plot delineating the extent of the inshore fishery exploited by Bridlington and Hornsea vessels and quantifying the extent of various types of substrate (Fig. 2). This data will be combined with catch rates and size distribution data for the lobster and crab fishery and plotted in MapInfo, a geographical information package, allowing interpretation of fishery information in relation to seabed type. With estimates of density of lobsters on each type of substrate it would be possible to provide fishery-independent estimates of exploitation rate and abundance of lobsters.

Humber offshore grounds

Side scan images and grab samples showed that these grounds varied between mud and fine sand, to coarser sand, shingle and gravel, with the difference in sediment related primarily to depth. In this area it appeared relatively easy to interpret the side-scan traces in relation to actual observations of the sea bed. This suggests that it would be possible to map such offshore grounds to delineate the nature of the sediment in relation to fishing activity.

Race Bank

The side scan images and the UWTV stations showed that the ground on the shallow fingers of the bank was primarily sand with some shingle, with gravel in the deeper areas of the channel. As with the Humber offshore grounds it would be relatively easy to map such offshore grounds to delineate the nature of the sediment, although a small vessel would be needed to survey the areas of shallow water.

ACKNOWLEDGEMENTS

It is pleasure to acknowledge the professionalism of the officers and crew of RV Corystes, whose support and flexibility throughout the cruise contributed greatly to the success of the programme.

J. T. Addison
2 May 1997

SEEN IN DRAFT: B. A. Chapman, Master

M. G. Reynolds, Senior Fishing Mate

DISTRIBUTION:

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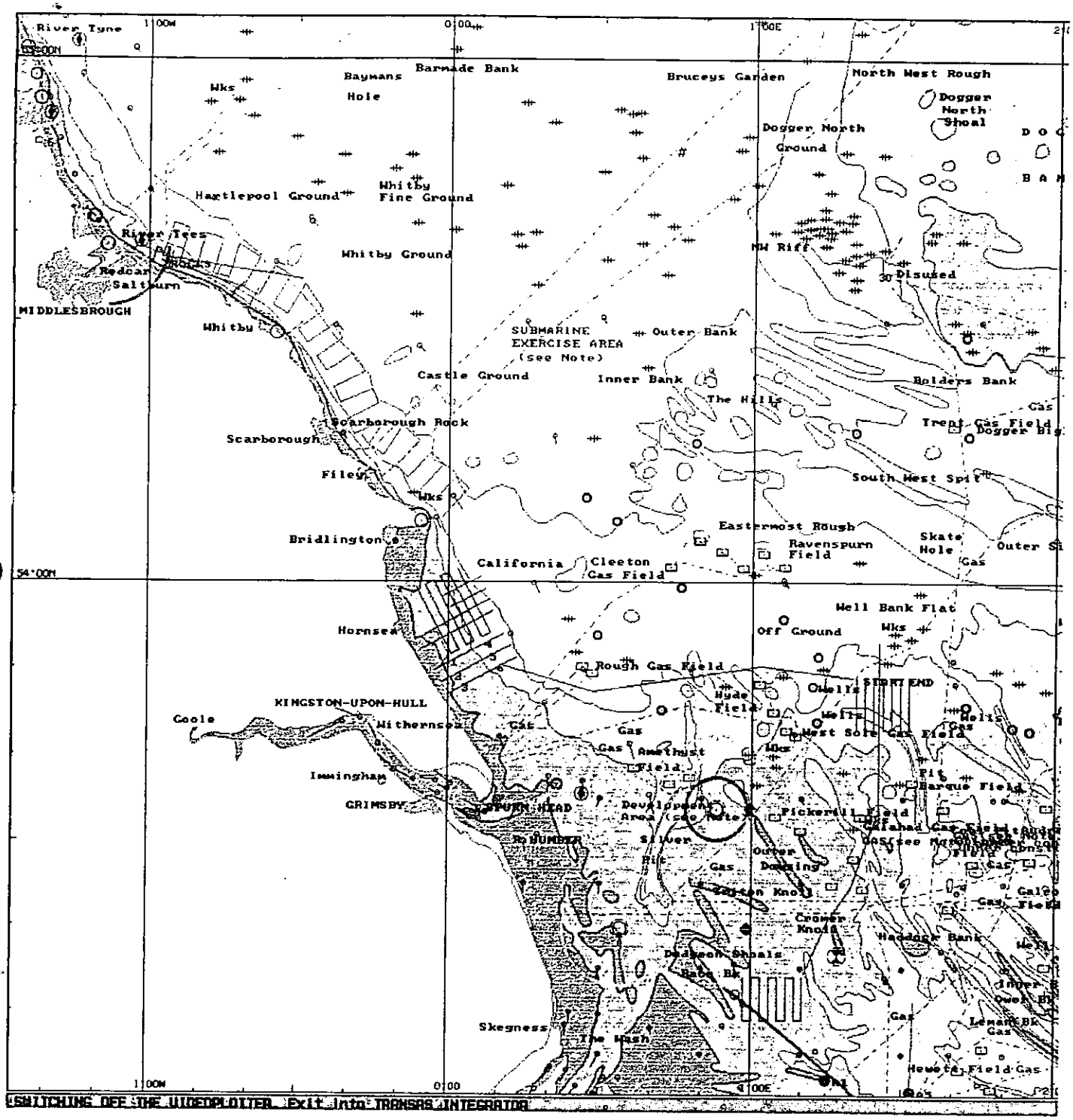

Figure 1 Corystes 5b/97 Track of Roxann grids and side scan lines

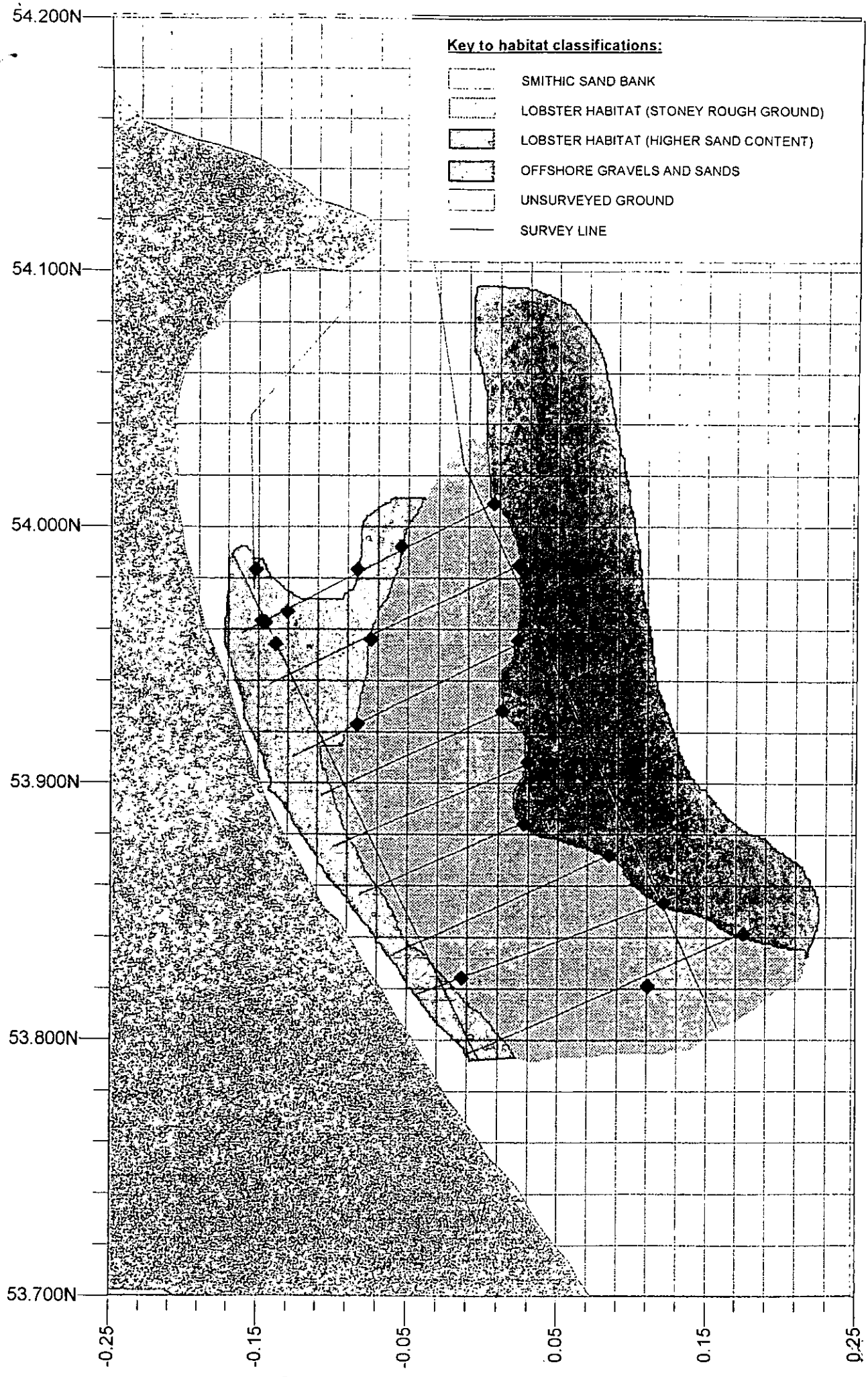

FIGURE 2

Habitat Classification of Bridlington Bay based on sidescan sonar and underwater video data