ASSESSMENT OF THE RE-HABILITATION OF THE SEABED FOLLOWING MARINE AGGREGATE EXTRACTION

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Introduction

Investigations of the physical and biological status of licensed extraction sites in the UK following the cessation of commercial aggregate dredging are very limited. As a result judgements as to the likely progress towards environmental restoration and the timescales involved continue to be based on predictions rather than real data.

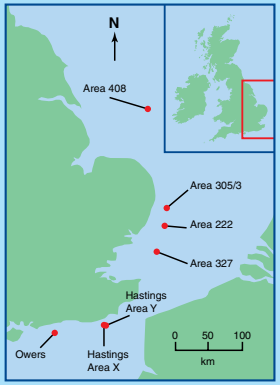

Figure 1: Exploratory sites sampled in 2000

A four year research programme was initiated in 2000, with the aim of assessing the status of seabed substrata and associated benthic communities within and outside areas where dredging activity has ceased, and to conduct follow-up sampling to monitor progress towards 'recovery'. Environmental studies at relinquished extraction areas and at disused zones within dredging areas provide an important opportunity to validate predictions concerning the progress of recolonisation and the rate of recovery of the seabed environment.

The main objectives of this study are:

1) to understand the rate at which the seabed recovers following marine aggregate extraction
2) to identify measures to enhance the potential for the rehabilitation of dredged areas

Exploratory studies in 2000 identified seven locations considered representative of dredging practices and habitats in UK waters (Figure 1). Each varies in the time-interval since cessation of dredging and therefore has the potential to represent different stages in the 'recovery' process. More comprehensive surveys were conducted in 2001 and 2002 at Area 408 (Humber), Area 222 (Thames), and Hastings Areas X and Y.

Methods and survey design

A wide range of techniques are being employed in this four year study to assess the status of the former extraction sites.

Data was extracted from the Crown Estate's Electronic Monitoring System. This system has recorded the date, time and position of all extraction activity in UK waters since 1993.

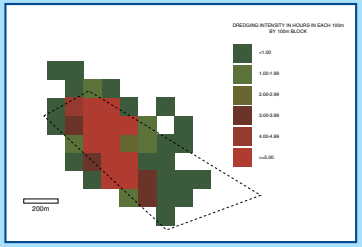

Figure 2: Example of EMS output data from Area 222 showing different levels of dredging intensity

The sampling strategy involves the selection of 3 treatment groups:

1) where the recorded dredging intensity is considered to be high, and
2) where the recorded dredging intensity is low.
3) in addition, reference sites outside the influence of dredging effects and representative of the wider environment are sampled.

Acoustic surveys

Intensive sidescan surveys covering 100% of the seabed using a digital chirps sidescan sonar system (Figure 3) are carried out annually, with post processing software being used to mosaic the sidescan tracks (Figure 4). An acoustic ground discrimination system (AGDS) is also being employed to assist in the description of the substrata.

Figure 3: Digital sidescan sonar towfish

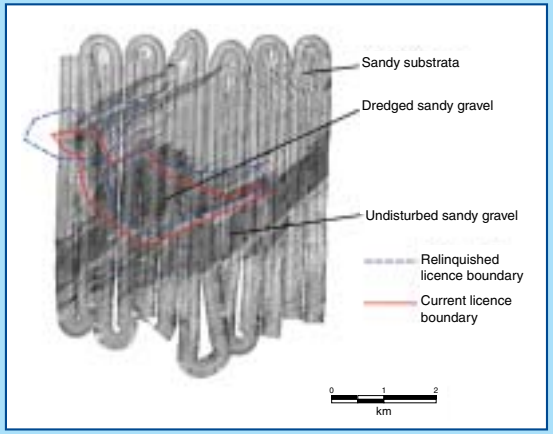

Figure 4: Example of mosaiced sidescan sonar survey from Hastings extraction area illustrating different substrate types

Surveys of the fauna

At each extraction site, a 0.1m² Hamon grab fitted with an underwater video camera and light (Figure 5) is being used to sample the biological communities and sediments from each of the three treatment groups. In addition, sampling of the epifauna is being carried out using a 2m heavy duty beam trawl (Figure 6), and video footage from across the survey area is being collected using a drop camera frame mounted with video camera and lights.

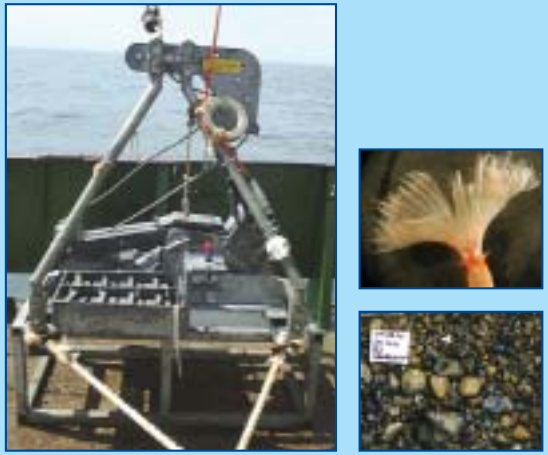

Figure 5: Hamon grab mounted with video and lights with an example of macrofauna and a typical grab sample

Figure 6: Heavy duty 2m beam trawl with examples of beam trawl samples collected from an area of high dredging intensity and a reference location

Future work

It is intended that the results from this work will be published in additional posters, peer-reviewed journals and in a final report in 2004. Knowledge and techniques developed during this work will contribute to the assessment of impacts on dredge areas, and their recovery post-dredging. Their eventual outcome should be valuable for aggregate companies, their consultants, regulators and the marine research community generally.

Acknowledgements

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