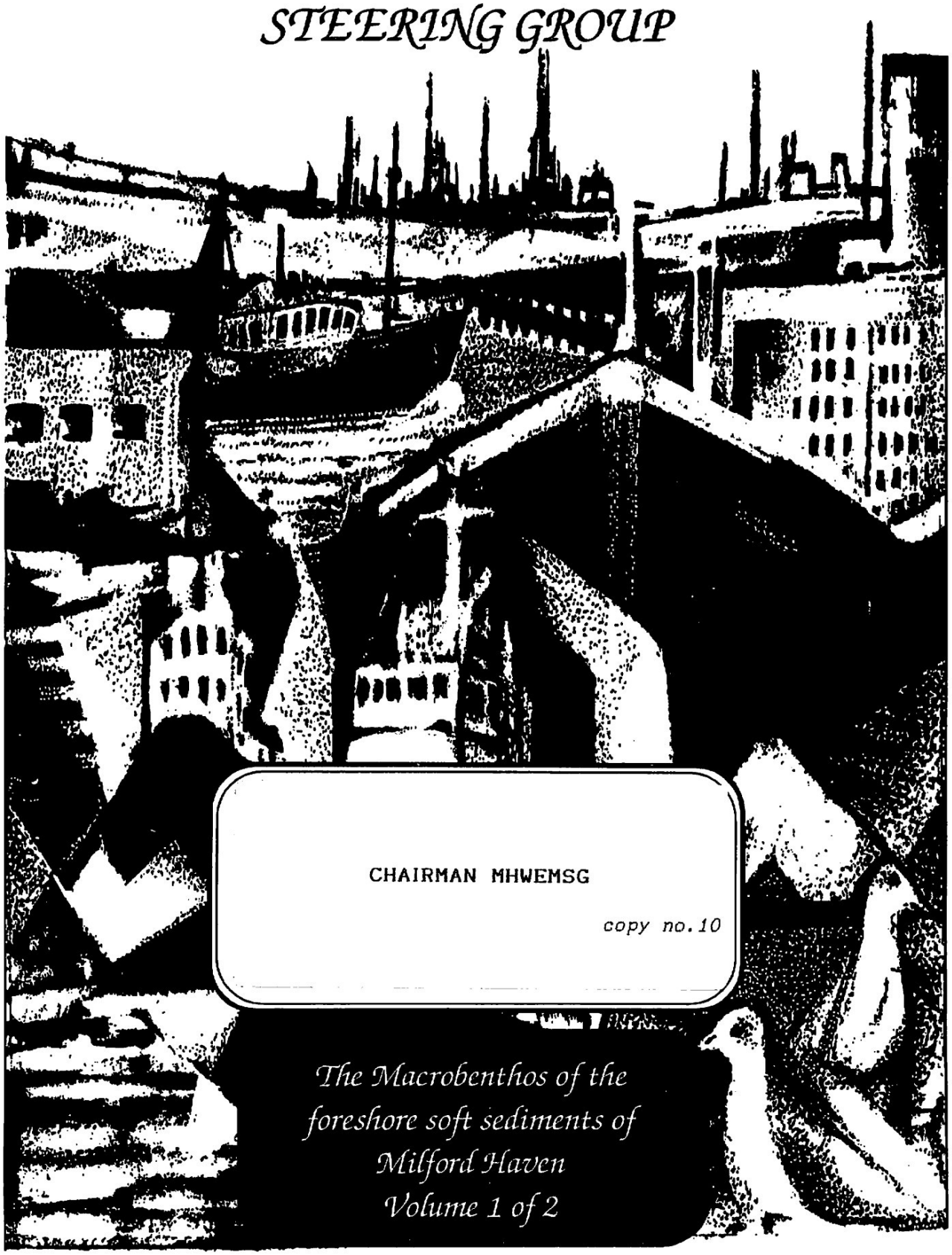
*Report commissioned by*

# MILFORD HAVEN WATERWAY ENVIRONMENTAL MONITORING STEERING GROUP



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## *The Macrobenthos of the foreshore soft sediments of Milford Haven*

*Volume 1 of 2*

SubSea Survey
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# The Macrobenthos of the Foreshore Soft Sediments of Milford Haven, 1994.

by

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A report to the Milford Haven Waterway Environmental Monitoring Steering Group from SubSea Survey, Pembroke. October 1995.

# 1. Introduction

Milford Haven was established as a major oil port about 3 decades ago, and since that time has had a history of ecological study and investigation, primarily related to monitoring the effects of the oil industry. This work was funded by various interested organisations and carried out largely by the Field Studies Council Research Centre, although additional large scale scientific projects were undertaken by Swansea University. A complete review of previous work has been completed by the Field Studies Council Research Centre (Hobbs and Morgan, 1992).

During the 1980's, with the decline in fortunes of the oil industry, monitoring studies were discontinued. Against this background, the Milford Haven Environmental Monitoring Steering Group was established in 1991 to co-ordinate the future monitoring and management of the Haven in order to maintain a rich and diverse environment. The present work was commissioned in autumn 1994 with the objective of sampling intertidal sediments at locations throughout he Milford Haven waterway to:

- describe sediment biology
- prepare and store sediment samples for physical analyses

# 2. Methods

## 2.1 Fieldwork

The fieldwork was carried out over two consecutive periods of low water spring tides. These were from October 17th to 23rd and November1st to 6th 1994. Field excursions were generally made by inflatable boat, using Hobbs Point jetty as a suitable, central departure venue. During bad weather however, it was considered safer to use road access, and two sites (Angle Bay and Dale Flats) were sampled from a land base.

Each day the field team loaded the necessary equipment onto the boat, and motored to the chosen site location. Navigational charts were used in order to locate each of the sites pre designated during the planning stage. Upon arrival, one member of the team took site photographs, station positions using both GPS and normal compass techniques, and recorded notes, instrument readings and visual observations about the site onto a plastic paper, pro forma recording sheet. Other team members sampled each designated station along the transect. At each station, 4 biological samples were obtained using steel corers of 0.01$m^2$ area. These were marked at 10cm to ensure a standard sample volume. Samples were placed into labelled plastic buckets. One

additional sample for granulometric/organic analyses was collected using a plastic corer of 5cm diameter and marked at a length of 15cm, another sample for hydrocarbon analysis was collected in a solvent washed steel scoop and placed into a labelled, solvent washed aluminium container. A third extra sample was collected in a plastic bag for metal analyses. Then a garden fork was used to dig over sediment for visible macrofauna. Redox measurements were taken at 5cm and 10cm depths in a core sample from each station. The meter used was a new, portable model with a pH combined electrode and an integrated temperature sensor. The core was also photographed to provide an illustration of the sediment profile at that station.

Sites were not sampled in any pre determined order, decisions being made on a daily basis according to weather, travel time and time of low water. In total, 15 sites were visited and 65 stations sampled. A summary of the field information is provided in Table 1.

Table 1. Summary details of the sites visited during the survey of Milford Haven soft sediment intertidal macrofauna.

| Site Name | Site Notation | Site Number | Date Sampled | Number of Stations | Low Water Time: | Low Water Height (m): |
|---|---|---|---|---|---|---|
| Slebech Woods | SW | 1 | 2/11/94 | 3 | 11.01 | 0.9 |
| Eastern Cleddau | EC | 2 | 2/11/94 | 3 | 11.01 | 0.9 |
| Picton Point | PP | 3 | 4/11/94 | 3 | 12.32 | 0.4 |
| Black Hill | BH | 4 | 19/10/94 | 3 | 13.10 | 1.0 |
| Hook Quay | HQ | 5 | 19/10/94 | 3 | 13.10 | 1.0 |
| Underwood | UW | 6 | 4/11/94 | 3 | 12.32 | 0.4 |
| Sprinkle Pill | SP | 7 | 21/10/94 | 4 | 14.10 | 1.1 |
| Garron Pill | GP | 8 | 17/10/94 | 5 | 12.00 | 1.4 |
| Carew River | BM | 9 | 20/10/94 | 6 | 13.41 | 1.0 |
| Cosheston Pill | CP | 10 | 23/10/94 | 6 | 15.13 | 1.3 |
| Pembroke River | PR | 11 | 1/11/94 | 6 | 10.13 | 1.3 |
| Pwllcrochan | MH | 12 | 18/10/94 | 4 | 12.37 | 1.2 |
| Angle Bay | AB | 13 | 22/10/94 | 5 | 14.42 | 1.3 |
| Sandy Haven | SH | 14 | 5/11/94 | 5 | 13.18 | 0.5 |
| Dale Flats | DF | 15 | 3/11/94 | 6 | 11.46 | 0.6 |