

## SECTION 6

# MANAGEMENT UNITS

## 6 MANAGEMENT UNITS (MUs)

### 6.1 Introduction

It is stated by the Ministry of Agriculture, Fisheries and Food (MAFF)<sup>(1)</sup> that, "The aim of a Shoreline Management Plan (SMP) is to provide the basis for sustainable coastal defence policies within a sediment cell and to set objectives for the future management of the shoreline." The tables following in this section attempt to summarise the four key issues to be addressed" in an SMP, namely:

- coastal processes;
- coastal defences;
- land use and the human and built environment;
- the natural environment.

The tables therefore constitute in essence the Shoreline Management Plan for the Isles of Scilly and<sup>(1)</sup>, although it does not have any statutory status, MAFF hopes that it will be useful in informing decisions on Structure, Local and Unitary Development Plans. It is also recommended" that Shoreline Management Plans should also be closely coordinated with other coastal initiatives.

### 6.2 Identification of Littoral Sub-cells

Section 3 of this report details the physical processes occurring within Scilly insofar as they can be inferred from the available current meter data and aerial photography - no mathematical modelling has been carried out. The recommendations<sup>(2)</sup> are that:

*Scilly should be regarded as a single cell with an unknown replenishment/loss of sand from surrounding deeper waters and biological sources (shell). Three sub-cells may be identified in terms of long-term sand transport pathways under tide and wave processes, namely St Mary's Sound (including Crow Bar area, the Flats between Bryher, Samson and Tresco, and the Flats between Tresco and St Martin's. It would appear that the two latter sub-cells are a source of sand for St Mary's Sound, but no qualitative data are available*

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(1) *Shoreline Management Plans, A Guide for Coastal Defence Authorities, PB2197, Ministry of Agriculture, Fisheries and Food, London, 1995*

(2) *Isles of Scilly Shoreline Management Plan: A Review of Physical Processes, R.S. Nunny, Sea Sediments Ltd, Chard, Somerset, October 1995*

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***concerning this. Inward facing embayments fringing these three sub-cells will comprise management units within them. Outward facing embayments, including all of St Agnes, should be regarded as management units within the main archipelago cell.***

The **Isles of Scilly** are defined to be one littoral cell within the meaning of the HR Coastal Management report<sup>(3)</sup> and are considered to be divided into four sub-cells as defined in Drawing 4.

- St Mary's Sub-Cell  
The St Mary's sub-cell encompasses solely St Mary's and includes Crow Bar at its north side.
- Tresco Sub-Cell  
This sub-cell incorporates the main inhabited islands of Tresco and Bryher, the large uninhabited island of Samson and the islets of St Helen's, Northwethel, Gweal, Mincarolo and various large rocks.

St Martin's Sub-Cell

The St Martin's sub-cell covers the main island of St Martin's as well as the Eastern Isles, White Island, Round Island and Tean and other large rocks.

St Agnes Sub-Cell

This cell contains the inhabited islands of St Agnes and Gugh. Owing to the depth of Smith Sound, it is considered that Annet is essentially another sub-cell in its own right (although it will not be considered in this Shoreline Management Plan).

The above sub-cells, since they are islands and therefore exposed from 360°, may be further subdivided into micro-cells which may themselves be subdivided into management units.

### 6.3 Identification of Micro-Cells and Management Units

Throughout the islands a comprehensive definition of micro-cells, and management units within them, based (entirely logically) on processes would lead to a unmanageably high number of units - some of only tens of metres in length. This degree of complexity is due to the number and small size of the islands, their 360° exposure to the elements and their geology. The potential complexity and high

(3)

*Coastal Management - Mapping of Littoral Cells, Report SR328, J.M. Motyka & A.H. Brampton, HR Wallingford, January 1993*

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number of management units is contrasted to coastlines on the mainland for which Shoreline Management Plans have been and are being undertaken. Mainland management units are larger in size and fewer in number for shorelines which are themselves an order of magnitude larger than those on the Isles of Scilly.

The following tables define what is termed in this report the "micro-cells", for which there are sometimes sub-divisions, and designate management units. They have mainly been defined between headlands where separate geomorphological processes may be identified but, where possible, and where the resource use is limited (mainly to uncultivated land) with no properties or livelihoods at risk, the opportunity has been taken to simplify the definition and bracket an entire stretch of shoreline within a single and larger micro-cell/management unit.

Two examples of the above philosophy are given below:

- deeply indented bays such as Porth Cressa form micro-cells. This particular example has been broken down into management units for various lengths within it have specific characteristics which necessitate different treatment because of geomorphology, hinterland resource and foreshore use;
- the whole of the west coast of St Martin's is treated as a micro-cell and management unit owing to the lack of erosion threatening anything.

### 6.4 inter-Relationships with Adjacent Micro-Cells and MUs

The inter-relationship between adjacent cells is founded on the asymmetry of the tidal streams. It is essentially the preferential transport of the sediments from one micro-cell area to another which forms the interaction. The group can be split into two major divisions; Bryher, Tresco, St Martin's and St Mary's being interactive and St Agnes and to some extent Samson standing alone.

#### 6.4.1 St Agnes (Isles of Scilly - South)

St Agnes makes no contribution to the other elements of the sedimentary processes in the rest of the group, as it is separated by deep water (see Drawing 4). The sediment transport pathways which emanate from the remainder of the group and from off-shore waters are guided through the deeper channels around and away from St Agnes. It can be seen from Figure 3.2 that the tidal and intertidal sedimentary system on St Agnes is fuelled by material derived locally. There are three sources of material available:

- breakdown of exposed granite by processes of weathering and, attrition due to wave action;

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- reworking of ram, alluvium and marine and aeolian sands;
- organic derivatives in the form of aquatic shell fragments.

It is clear that management options with regard to coastal defences on St Agnes and therefore Gugh, can be taken in the knowledge that there will be little or no consequence for the other islands in terms of disturbing the sedimentary status quo.

There are areas within the sub-cell which are bounded by two or more management units, e.g. Big Pool. It is not possible in this example to divorce any of the units from the overall picture because each of them has a contribution to make to the risk of inundation. However the management units themselves are isolated from each other by exposed granite promontories and therefore it is unlikely that interactive sedimentary processes are at work.

#### **6.4.2 St Mary's, St Martin's, Tresco & Bryher (Isles of Scilly - North)**

It can be seen from Figure 3.2 that the sediment transport pathways to the north of Samson, between Bryher and Tresco and, between Tresco and St Martin's converge and diverge on and around St Mary's. St Mary's is not the complete focus for the sedimentary processes: observations suggest that lateral flow in the channels between Bryher, Tresco and St Martin's occurs and that the peak velocities in the channels are sufficient to facilitate a net movement of sands and gravels north to south.

As with St Agnes there are discrete management units linked to areas which are identified as vulnerable, e.g. Great Pools on Bryher and Tresco, and, as on Tresco are unlikely to be linked by way of sedimentary processes, e.g. the threat to Great Pool via management units **T1**, **T5** and **T6**. There are management units, on the other hand, within the sub-cell "**Scillies - North**" which are assigned to different islands which are clearly interactive. The example is Pentle Bay and Block House Point on Tresco and Bar Point and Crow Bar at the northern end of St Mary's.

During recent (1996/97) easterly and south easterly storms and quite possibly due to long term aggregate extraction for building, there has been serious damage to natural beach defences and a redistribution of sands. It is speculated that Crow Bar has either migrated or become denuded causing reduced protection to Pentle Bay. There has been a massive loss of sand from the forward dune system at the head of Pentle Bay beach; however, following this event there has been considerable accretion of sands at Block House point. Without extensive investigation it is impossible to quantify the outcome of such a storm event and the consequent redistribution of material, but it is important to note that

implementation of management strategies for discrete management units within specific areas such as this, need careful consideration.

## 6.5 Cell Definitions and Management Units

The following text is comprised of two sets of tables which are complementary to each other and which are interleaved with each other. Information is presented in the tables as described below. A tabular format has been adopted in order that the information can be disseminated effectively. Descriptions are necessarily brief but comprehensive.

### 6.5.1 Cell Definitions and Characteristics

The first table describing a micro-cell defines the coastal processes and resource classification. The delineation and location of each micro-cell can be seen on Drawings 5, 6, 7, and 8. The example table on page 6-6 gives a definition of each box within the tables. In each case comments on the environment have been included but they do not, of course, represent all the data presented more comprehensively elsewhere in the report.

### 6.5.2 Options for Management Units

Each micro-cell has been divided into management units, the boundaries of which may coincide with the micro-cell boundary, i.e. the cell is being considered as a management unit itself, or there may be more than one management unit within the micro-cell itself. The second table (see that on page 6-7 for an example) for the micro-cell describes the individual management unit(s) within it.

As indicated in the MAFF guidance, assessments of benefit and cost are based on local knowledge and are indicative only. They seek to indicate whether individual schemes are likely to be viable and their possible scale. Other alternatives may be revealed on subsequent more detailed investigation for prospective individual schemes. Where a coast defence scheme has recently been constructed, actual figures have been used.

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ASPEN

Aspen Burrow Crocker

ISLAND - GENERAL LOCATION	
A1 (Coded Identifier) - Precise Coastal Location	
<b>COASTAL PROCESSES</b>	
<b>Retreat/Advance Classification</b> statement of whether retreat or advance is taking place and broad classification of how	<b>RESOURCE CLASSIFICATION</b> <b>Primary Land Use</b> description of primary land use
<b>Backshore Geomorphology</b> type of backshore from <i>Review of Physical Processes</i> (see Section 3)	<b>Secondary Land Use</b> description of secondary land uses
<b>HW Retreat Rate</b> rate of advance/retreat where estimated reliably - mainly from OS surveys of HWM changes over 100 years	<b>Hazard Zone</b> width of erosion zone or area subject to flooding
<b>Exposure</b> type of waves and origin	<b>Conservation Designation</b> conservation designations (SSSI, etc.)
<b>Beach Sediments</b> general description of beach sediments abstracted from OS maps, aerial photographs and local knowledge	<b>Landscape</b> landscape definitions (AONB, Heritage Coast, etc.)
<b>General</b> general information relating to the stretch of coastline under consideration	<b>Infrastructure</b> brief description of any infrastructure that may be affected by erosion or flooding
	<b>Archaeology and Heritage Importance</b> brief description of archaeology and scheduled monuments
	<b>Recreation</b> brief description of any recreational use
<b>MANAGEMENT OBJECTIVES</b>	
definition of general management objectives for the stretch of coastline	<b>COAST DEFENCES</b> definition of type and condition of any existing defences obtained from the Coast Protection Survey of England, 1993 (see Section 4.2) and local knowledge of new and any informal defences that are not included in the CPSE

Cell: Isles of Scilly  
 Sub - Cell: Location within the Cell  
 Micro - Cell: Precise Location within the Sub-Cell  
**Management Unit: A 1 Coded Identifier and MU Description**

**Management Options**

Do Nothing	Brief reason given where not selected option
Hold the Line	Preferred option highlighted and brief reason given
Advance the Line	Brief reason given where not selected option
Retreat the Line	Brief reason given where not selected option

**Potential Structure Types**

Beach Replenishment	Brief reason given as to why this option was not selected
Bund/Embankment	Brief reason given as to why thii option was not selected
ConcreteRevetment	Brief reason given as to why this option was not selected
Rock Revetment	Brief reason given as to why this is the preferred option
Offshore Breakwater	Brief reason given as to why this option was not selected
Sand Fencing	Brief reason given as to why this option was not selected
Sea Wall	Brief reason given as to why this option was not selected

**Environment**

Brief description of the land use and of any archaeology to be found locally

**Benefit/Cost Assessment**

Benefit :	Estimate of benefits
Cost :	Estimated cost of selected option
Benefit / Cost Ratio :	Economically viable if greater than one

Notes :	Any relevant observations affecting the Management Unit and the choice of option and the derivation of benefits
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