

Exe Estuary Coastal Management Study Progress Report

Interim Summary Report
February 2008



Halcrow

Halcrow Group Limited
Ash House, Falcon Road, Sowton, Exeter, Devon EX2 7LB
Tel +44 (0)1392 444252 Fax +44 (0)1392 444301
www.halcrow.com

Halcrow Group Limited has prepared this report in accordance with the instructions of their client, East Devon District Council, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

© Halcrow Group Limited 2008

Contents

1	INTRODUCTION	1
2	KEY STAKEHOLDERS	2
3	PROGRESS TO DATE.....	3
3.1	SPECIFIC OBJECTIVES.....	3
3.2	EXISTING POLICIES, PLANS AND STRATEGIES	4
3.3	WAVE AND WATER LEVEL CLIMATE.....	5
3.4	COASTAL EVOLUTION	5
3.5	EXISTING FLOOD DEFENCES	6
3.6	STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)	7
3.7	OPTIONS APPRAISAL.....	8
4	THE WAY FORWARD	10

1 Introduction

The Exe Estuary Coastal Management Study commenced in March 2007 and is being undertaken by Halcrow on behalf of a partnership of East Devon District Council, the Environment Agency, Natural England, Teignbridge District Council, the Exe Estuary Partnership, Devon County Council, Exeter City Council and Network Rail. The ultimate aims of the study are to:

- Identify the preferred options for a long-term sustainable management strategy for coastal defences at Dawlish Warren and Exmouth seafront; and
- Present the detailed work programme required to implement this management study.

Figure 1 shows the limits of the study area, which include:

- The tidal limit at St James Weir, Exeter;
- Straight Point in the east; and
- Langstone Rock in the west.

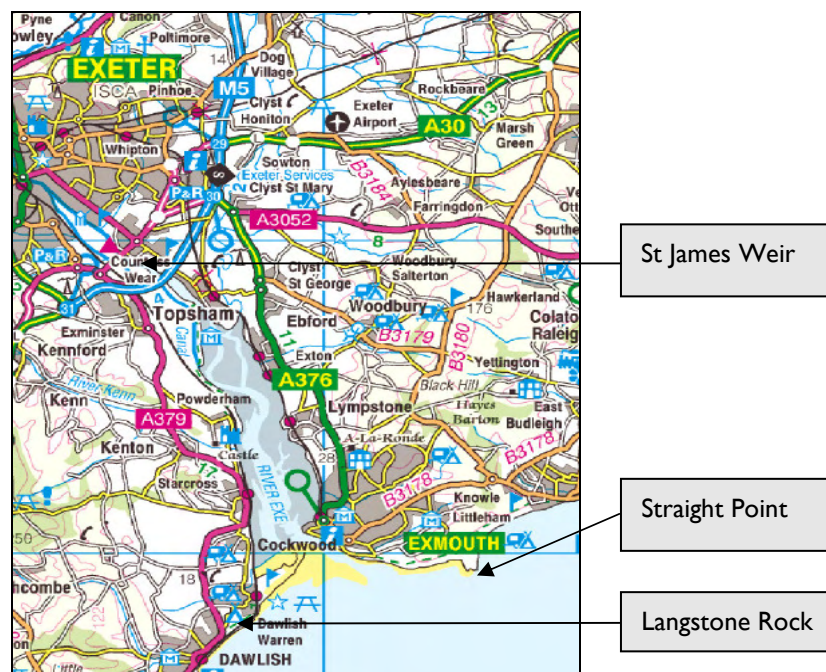


Figure 1: Exe Estuary Coastal Management Study area.

This report provides a summary of work to date and a brief description of tasks to be undertaken during the rest of the study which is due to complete in June 2008.

2 Key Stakeholders

The Exe Estuary has many stakeholders with key interests in how the defences, specifically at Dawlish Warren and Exmouth, will be managed.



“The Council’s purpose is to improve people’s quality of life within the District without spoiling the outstanding local environment.” Source: East Devon District Council website.



“We aim to reduce the likelihood of flooding by:

- *managing river and coastal systems;*
- *constructing and managing defences, where appropriate.”*

Source: Environment Agency website.



“The coast is a common asset and requires a co-ordinated approach to its management and protection to ensure it remains a vibrant and prosperous place and opportunities to enhance its features and resources are embraced.”

Source: Teignbridge District Council website.



“Natural England is here to conserve and enhance the natural environment or its intrinsic value, the wellbeing and enjoyment of people and the economic prosperity that it brings.”

Source: Natural England website.



“Our Mission is to provide a safe, reliable and efficient railway fit for the 21st century.” Source: Network Rail website.



“The partnership aims to encourage all those who use and manage the estuary to work together to avoid conflicts and pursue opportunities for improvement.” Source: EEP website.

These individual organisations’ aims need to be considered when developing the long-term strategy for the Estuary. Due to the diversity of interests, it has been imperative that each organisation has been engaged in the project since its inception. To that end, each of the partners are represented on the Project Steering Group and Project Board.

3 Progress to Date

3.1 Specific Objectives

Six specific project objectives have been developed in order to address the ultimate study aims stated in Section 1. These are:

1. Investigate the function, and the best solution for long-term, sustainable flood risk management of the groyne and gabion defences at Dawlish Warren, and the defences being maintained, removed or partially removed. In addition, the implications and effectiveness of beach recharge (along the frontage of the sea wall and groyne/gabion defences) should also be investigated;
2. Investigate the possible options and determine the best solution for long-term, sustainable flood risk management and coastal protection to maintain the long-term stability of Exmouth sea wall;
3. Determine the best long-term management solution to achieve and maintain favourable condition for Dawlish Warren and Exe Estuary SSSI;
4. Determine the most appropriate long-term management solution to restore and enhance the amenity value of Dawlish Warren and Exmouth seafront, where appropriate;
5. Review existing SMP policies and inform the delivery of future SMP requirements;
6. Inform the development of related studies including, for example, the South West Coastal Monitoring Programme; the Exe Estuary Management Plan; Clyst & Powderham Banks Managed Re-alignment Projects etc.



Dawlish Warren



Exmouth Seawall

Halcrow are achieving these objectives by undertaking a variety of technical, analytical and appraisal activities, which will ultimately result in the development of a long-term sustainable management strategy for the coastal defences at Dawlish Warren and Exmouth seafront.

These tasks include:

- Appraisal of existing policies, plans and strategies relevant to the Exe Estuary;
- Examination of forcing conditions within the estuary, including waves and water levels;
- Developing a detailed understanding of the historic to present day coastal evolution;
- Examining various future evolutionary scenarios;
- Assessment of the existing defences within the Estuary;
- Undertaking a Strategic Environmental Assessment (SEA);
- Development and appraisal of various coastal defence management options.



Boats on the Exe, 2006

(Courtesy of R.Partridge)

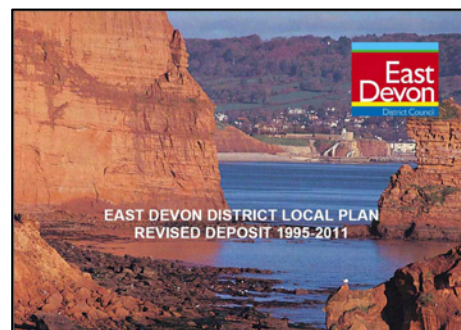
3.2 Existing Policies, Plans and Strategies

This task involved the review of all relevant existing policies, plans and strategies, produced by the Environment Agency and other stakeholders, for example:

- Management policy;
- Coastal strategy /SMP policy review;
- Role of the various organisations in the current management of the coastline;
- Current Defra coastal defence policies;
- Potential conflicts of management practice and policy;
- Regulatory implications contained within, for example, WFD, Habitats Directive;
- Policies relating to land use management, including tourism, recreation and conservation; and
- Conservation objectives for SSSI, SPA.

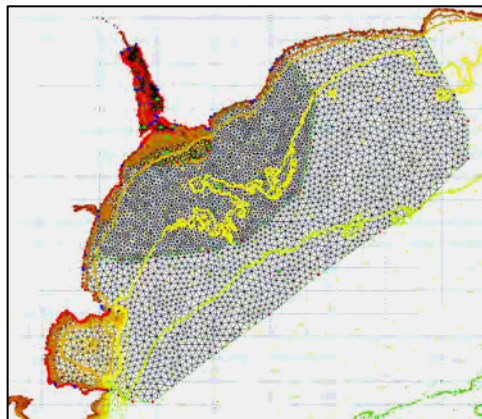
Planning initiatives within and around the study area will have massive implications for the development of the long-term strategy for Dawlish and Exmouth frontage. The following Plans were interrogated, which have influence on the study area:

- Devon Structure Plan 2001-2016;
- East Devon Local Plan 1995-2011 (adopted 2006); and
- Teignbridge Local Plan 1995-2011 (Initial Deposit).



3.3 Wave and Water Level Climate

In order to inform option development for providing a strategic long-term, sustainable management policy for the Exe Estuary, it is necessary to develop an understanding of the wave and water level climate across the study area.



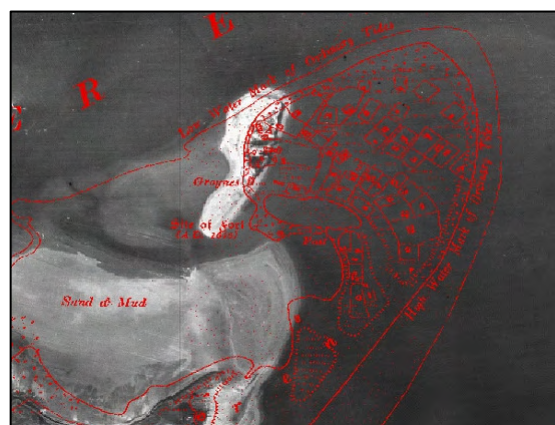
Wave Model Grid

Thus, analysis was undertaken of the wave and water level climate of the study area, both along the open coast outside of the Exe estuary including Dawlish Warren and Exmouth, as well as locations inside of the Exe estuary. The analysis carried out for this study included review of existing data, as well as determination of extreme wave and water level climate.

3.4 Coastal Evolution

One of the most important and complex activities within the present study is the development of a detailed understanding of the evolution of the Estuary and in particular the features associated with the mouth. Dawlish Warren spit provides protection to the inner estuary, as it prevents the majority of storm waves from penetrating the inner reaches of the estuary. It also provides an important flood defence function for Dawlish Warren village and the small settlements in its lee.

This morphological understanding is fundamental in underpinning the Coastal Management Study, since it provides a basis for predicting the future changes within the estuary, which affect both morphology and habitats. Understanding such changes is a key factor in assessing the sustainability of long-term plans for coastal erosion and flood defence options around the estuary.

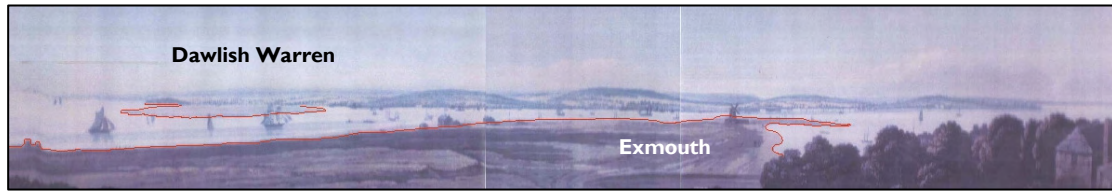


Aerial Photography (circa 1947)

Halcrow has undertaken various technical activities in order to develop and provide confidence to the understanding of coastal evolution.

These independent analyses generally complement one another in that they suggest that the estuary mouth appears to be following a cyclical evolutionary pattern

whereby accretion and erosion processes are oscillating between the Dawlish Warren and Exmouth spits.



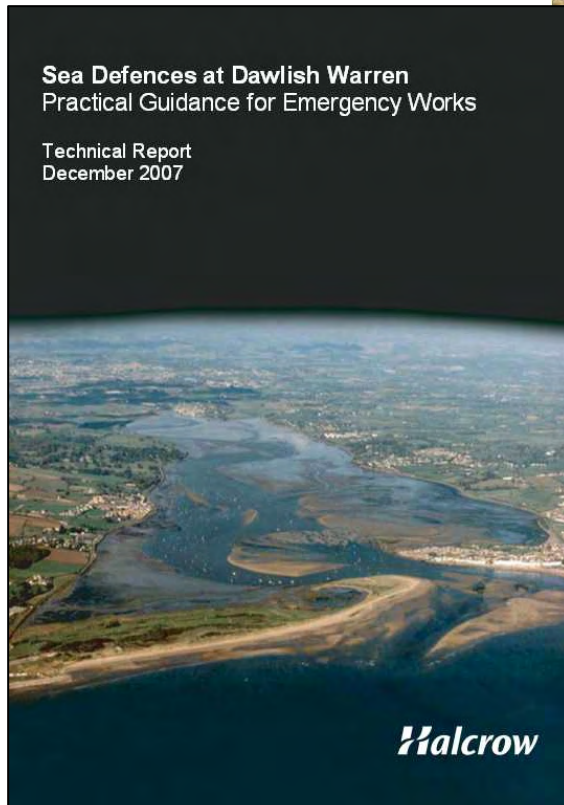
Exe Estuary Mouth (Haster/Lewis, 1818)

It is also clear that anthropogenic intervention plays a strong role in constraining Dawlish Warren to its present alignment and that without beach management structures in place, the Warren would initially be expected to recede.

3.5 Existing Flood Defences

The existing defences within the study area include:

- A series of timber groynes and gabion basket revetments, installed by the Environment Agency at Dawlish Warren in the 1960s; and
- The existing seawall frontage, owned and maintained by East Devon District Council at Exmouth.



As part of this study, Halcrow has undertaken a complementary assessment of Emergency Works for the sea defences at Dawlish Warren and a brief appraisal of management techniques at Exmouth Sand Dunes.

Further defence information has been identified from a variety of other sources, including the Environment Agency's National Flood and Coastal Defence Database (NFCDD) and Network Rail.

Using this defence data, an assessment of the standard of protection offered against both wave overtopping and undermining (structural stability) can be made. This assessment has utilised the joint probability extreme wave and water level highlighted in Section 3.3.

3.6 Strategic Environmental Assessment (SEA)

The study area contains a number of internationally and nationally important wildlife sites. It is crucial that these sites and other environmental issues are considered carefully during the option selection process to ensure that the options provide sustainable and environmentally acceptable coastal defence solutions for the area.

The Environmental Assessment of Plans and Programmes Regulations 2004 (the SEA Regulations) do not formally require a Strategic Environmental Assessment (SEA) of flood risk management strategies. However, due to the environmental sensitivity of the study area and in accordance with current Defra guidance it has been decided that a non-statutory SEA should be produced to accompany the Study and that statutory guidance should be followed.



Dawlish Warren Sand Dunes

The SEA process will be integrated with other elements of the study to ensure that environmental constraints and opportunities are fully considered throughout strategy development. The first stage in the SEA process was the baseline data collection, identifying significant environmental issues, developing draft environmental objectives and consultation, as a basis for preparing an environmental Scoping Report.

The production of this Scoping Report is a key requirement of the SEA Directive as it outlines the approach that will be taken in the appraisal of environmental issues, Strategy development and in the production of the Environmental Report.

This Scoping Report began the consultation process with the aim of encouraging constructive participation to ensure that key environmental issues are identified. It

also allowed draft environmental objectives to be refined to ensure an effective strategic environmental appraisal of options is carried out.

This consultation process was carried out through the Exe Estuary Partnership website (www.exe-estuary.org.uk).

3.7 Options Appraisal

There are many factors to consider when developing and appraising the various possible scheme options for the Exe Estuary study area. These include defence function, environmental factors, economics and long-term planning initiatives. Halcrow will consider all of these issues when developing the long-term Strategy and will liaise closely with the Steering Group partners during this process.



Powderham Banks

As the existing Shoreline Management Plan did not extend into the Estuary, this Study will have to develop higher level planning policies for the inner estuary in support of the South Devon and Dorset SMP Review.

Using the higher level plans as guidance, the following management approaches will be considered in developing options:

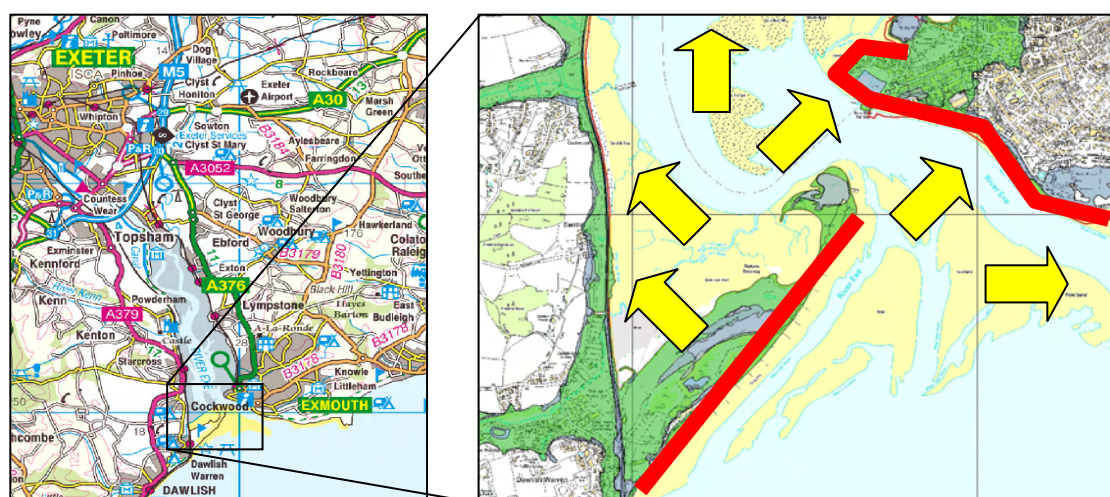
- **No Active Intervention** (base case against which the benefits of all other options will be assessed);
- **Hold the Line**, with the following sub-options:
 - ⇒ **Maintain** existing flood defences in their current form throughout the study area. As sea levels rise with time, the standard of protection would gradually reduce.;
 - ⇒ **Sustain** present standard of protection throughout the study area (i.e. increase defence levels to sustain the standard of protection as sea levels rise); and,
 - ⇒ **Improve** the existing defences to achieve the FCDPAG3 indicative standard of protection throughout the study area;
- **Managed Realignment** of the frontage by landward retreat of the existing line of defence;
- **Advance the Line** in front of the existing defences.

Appraisal objectives form an important part of the decision making process, representing qualities that the flood risk management options should ideally seek to fulfil and hence identify required levels of performance for sustainable flood risk management into the future. There is a potential for conflict between objectives and the ultimate choice of a preferred option will usually represent a trade-off between objectives with opportunities sought to mitigate the effects of any compromised

objectives. Each objective can be expressed by a range of performance indicators and targets where appropriate.

These objectives can loosely be classified under:

- **Technical** (Constructability, Maintenance and standard of defence required/provided);
- **Economic** (relative cost of option implementation);
- **Health and Safety** (construction, operation/Maintenance and Demolition risks);
- **Natural Processes** (effects and implications on evolution of the coast and implications for estuary processes); and
- **Environmental** (physical environment, water resources, pollution sources, natural environment, nature conservation, human and built environment, local community and economy, cultural heritage and archaeology, landscape and infrastructure).



Influence of Primary Management Units

Initially, the Primary Management Units of Dawlish Warren and Exmouth will be considered as they have a fundamental influence on the rest of the Study options throughout the Study area.

This stage produces a long list of scheme options that are aligned with the management approaches and forms the basis for options appraisal. The process is currently ongoing.

4 The Way Forward

This report provides a summary of work to date in formulating the Exe Estuary Coastal Management Study.

The project is due to complete in June 2008. During the period from now to project completion, Halcrow will continue to work alongside each of the project partners in order to develop the most appropriate long-term sustainable strategy for the coastal defences within the Exe Estuary.

Specific work includes a 30-day data acquisition campaign to support further hydrodynamic modelling activities. Progress will also continue on the development of the long-term strategic options appraisal for the Primary Management Units, before moving on to an appraisal of the other Management Units within the inner estuary.

Consultation on the findings of the Study is expected to start in May 2008, with finalisation planned for later in the summer



The Exe Estuary