

Dynamic coastal landforms and habitats

(A new plan included in May 2009)

1. A Definition

Devon's coastline includes a number of important geomorphological systems with associated terrestrial habitats which are reliant on the natural movement and build up of sand and gravel by coastal processes. Well known examples include the sand dunes of Braunton Burrows, the spit of Dawlish Warren and the shingle bar fronting Slapton Ley. Many other smaller examples exist, however, but all underpinned by natural coastal sediment systems. They support habitats dominated by colonising plants with a remarkable ability to thrive in extreme conditions of water stress, typical absence of soil and potential exposure to salt spray. Once stabilised, though, a succession to grassland, scrub and eventually woodland, may take place. Periodic events, such as storms, however, may still retain the potential to dramatically effect the habitat, for instance through erosion or new deposition and hence 'reset' the ecological clock. It is this actual or potential dynamism which underpins the soft sediment systems included within this HAP.

2. Why an Action Plan?

Coastlines are dynamic systems, affected on a daily basis by marine sedimentary processes and the related effects of changing weather systems. The most obvious effects concern soft sediment systems such as sandy beaches, shingle bars and ridges and sand dunes. Many species are adapted to these unstable habitats, having evolved strategies to either adapt or take advantage of changing substrates. Marram grass on sand dunes is a well known example but a number of other plants such as yellow horned poppy and sea kale on shingle ridges are other examples. A number of species of birds also take advantage of shingle and sand dune systems as nest sites. Typically such areas include a mosaic of habitats from bare sediment to stabilised and vegetated, even wooded areas is represented, periodic erosion as a result of storms being crucial to maintaining such variety.

Nevertheless, to maintain this ecological change and variety, an understanding of the underlying geomorphological processes is essential, which includes broader aspects of coastal cell dynamics – to maintain one dynamic coastal landform may therefore require appropriate decision making within the relevant sediment cell some miles down drift from the site itself. Raising awareness of the 'knock-on' effects implicit to management interventions in coastal systems is therefore fundamental and the intimate relationship

between coastal geomorphological processes and the habitats they generate justifies why and integrated geo- and biodiversity Action Plan is necessary.

3. & 4. Characteristic wildlife & special species

Please note: this action plan has been developed during a review to enhance the geological content of this integrated BAP. The emphasis has been on geological features rather than wildlife. In due course, the 'Characteristic wildlife' and 'Special species' sections will be revised and enhanced.

In the meantime, you can get a good feel for the wildlife of dynamic coastal habitats by reading the citations for the following Sites of Special Scientific Interest:

Braunton Burrows
Dawlish Warren
Slapton Ley

The citations can be viewed on Natural England's website:

www.sssi.naturalengland.org.uk/Special/sssi/search.cfm

A number of key species and habitats are closely associated with dynamic coastal landforms and processes. Many are opportunistic colonisers with a special ability or strategy to overcome the inherent problems of such a substrate, such as water stress, salt spray, lack of soil and unstable substrates. Typical plant species have deep roots, thick cuticles and some also have the ability to spread using extensive rhizome systems. Yellow horned poppy, sea beet, sea kale and marram grass are key examples. In areas of grazing including by rabbits, a short sward can include a number of flowering plants such as the very rare sand (or 'Warren') crocus. Invertebrates are often associated with pools and other water bodies which may develop within dune systems.

5. Special geodiversity features

Key geological features represented within Devon's dynamic coastal landforms include:

- Geomorphological features, erosional and depositional processes, and landscapes: Atlantic coastal dunes

6. Dynamic coastal landforms and associated habitats distribution in Devon

Wherever coastal sediment systems exist around the Devon coast and produce features that persist above mean high water mark this HAP is applicable. Nevertheless, it is in areas where notable geomorphological features exist that it is most relevant. Key examples include:

- High storm beaches of the Abbotsham etc area
- Westward Hoe
- Northam Burrows
- Braunton Burrows
- Croyde Burrows
- Woolacombe 'sands'
- Avon Estuary including Bantham and Burgh Island tombolo
- Start Bay beaches including Slapton Ley
- Dawlish Warren
- Exmouth spit
- Otter estuary spit/ Budlesigh Salterton Beach
- Axmouth spit

7. Current extent

No specific figures exist for the extent of the habitat but, with the exceptions of Braunton Burrows, Dawlish Warren and Slapton Ley, the habitat has only limited coverage.

8. Current problems for dynamic coastal landforms and associated habitats in Devon

- Presence of development or infrastructure – including roads, railways and development – in vulnerable coastal locations leading to demands for coastal defence works which can adversely affect natural coastal systems.
- Similarly, many of the county's most significant coastal landforms have been modified or constrained by human intervention to such a degree that they can no longer behave as natural systems and hence have become vulnerable to storm events, as they can no longer naturally readjust.
- Pressures for further development in coastal zones due to very high property prices and consequent potential for future coastal engineering works which might adversely affect coastal systems.

- Conflicts between recreational and touristic demands on delicate coastal systems and conservation priorities, including issues such as erosion, disturbance and development / defence of infrastructure (including related businesses).
- Resistance or inland barriers to alternative and more sustainable management options such as managed retreat and the removal of coastal defence schemes or non-intervention which can help maintain coastal systems and hence provide longer term 'natural' coast protection.
- Removal of sediment, including cobbles, for domestic and commercial purposes, including garden design.
- Constraints placed on natural systems such as shingle bars and sand dunes by development and infrastructure which prevents them from evolving naturally and hence becoming stabilised and losing biodiversity value as vegetational succession occurs. Overzealous stabilisation can have the same effect.
- Historical dredging and removal of sediment from coastal systems leading to increased and continued erosion as the systems readjust.
- Similarly, natural systems have been modified or interrupted by coastal defence works which can create down-drift sediment starvation issues and hence increased erosion and consequent coastal defence proposals which can have a further and damaging knock-on effect.

9. Recent changes in number and extent

Although no coastal landforms systems have been lost in their entirety, modification by engineering works continues and several examples have taken place in recent years. These include construction of a new road on the Slapton Lay barrier and artificial shingle relocation/ beach feed, knock-on effects of coastal works at Sidmouth leading to loss of storm beach east of Pennington Point, engineering works at Axmouth Harbour and dredging at Crow Point in the Taw-Torridge estuary system.

10. Current site protection

Many coastal SSSIs include significant areas of storm beach and active coastal landforms, including:

Mermaid's Pool to Rowden Gut SSSI, Westward Ho! Cliffs SSSI, Northam Burrows SSSI, Braunton Burrows SSSI, Saunton to Baggy Point Coast SSSI, Hallsands-Beesands SSSI, Slapton Ley NNR, Dawlish Warren NNR, Exe Estuary SSSI, Budleigh Salterton Cliffs SSSI, Otter Estuary SSSI, Sidmouth to Beer Coast SSSI, Axmouth-Lyme Regis NNR.

Areas of dynamic coastal landforms are likely to be included within several County Geological Sites. The recent establishment of a database of CGS in Devon will ultimately facilitate the listing of such sites.

Braunton Burrows is the core of North Devon's Biosphere Reserve:
www.northdevonbiosphere.org.uk

Coastal landforms on the east Devon coast east of Exmouth are included in the Dorset and East Devon World Heritage site: www.jurassiccoast.com

11. Current positive initiatives for dynamic coastal landforms and associated habitats in Devon

- The County Geological Sites (CGS) and County Wildlife Sites (CWS) schemes identify non-statutory sites of (at least) County importance for their geology and wildlife, and provide planning authorities with this information to steer development away from such sites or to ameliorate potential damage.
- Devon RIGS Group (Regionally Important Geological/Geomorphological Sites) promotes geological conservation, by working with local authorities, landowners and others, and provides advice, on request, on County Geological Sites and the management needed to retain or enhance their geological interest. The RIGS Group is undertaking detailed district by district surveys, completed surveys include North Devon AONB, mining districts in West Devon, Torbay, Exeter, South Hams, East Devon, Teignbridge and Dartmoor.
- Devon County Council, the Unitary Authorities and National Park Authorities, as the Mineral Planning Authorities of Devon, implement policies for mineral planning (*e.g.*: those set out in the Devon Minerals Local Plan), which include striking a balance between the demand for mineral resources and the need to protect the environment, having regard to the need for sustainable development, including in the context of coastal processes.
- The Ussher Society is a forum for presenting and discussing the results of geological and geomorphological research in south west of England.
- The Dorset and East Devon 'Jurassic Coast' World Heritage Site has implications for sites near the coast of East Devon and a Local Geodiversity Action Plan has been prepared.
- EU project on dynamic coastal habitats – more details to be supplied.
- Following storm events which damaged the coastal road on the Slapton Ley barrier, a report was commissioned to investigate the

geomorphological processes affecting the structure and hence aid future management decisions.

- Shoreline management plans examine coastal process and risks and provide a framework for the sustainable management of coastal areas.

12. Biodiversity planning context

National BAP Context

Habitats of Principal Importance in England (NERC Act, S.41):

- Coastal sand dunes
- Coastal vegetated shingle

Current national BAP targets can be viewed on the [Biodiversity Action Reporting System](#) (BARS).

Regional BAP Context

Regional targets for priority BAP habitats can be found on the website of [Biodiversity South West](#).

Associated Action Plans within the Devon BAP:

- Estuaries
- Rocky foreshore
- Sea cliff and slope

13. Biodiversity objectives and targets for dynamic coastal landforms and associated habitats in Devon

Objective 1

Seek to integrate the objectives of wildlife and Earth heritage conservation in the management of dynamic coastal landforms and related habitats.

Target: Geomorphological process reports for all key dynamic coastal landforms by 2012.

Objective 2

Identify all significant areas of dynamic coastal landforms and related habitats in the County and derive conservation objectives and guidelines for each.

Targets:

- Complete survey and identification, including as a basis for County Geological Site or County Wildlife Site designation, by 2010 and inform all relevant decision makers in governmental bodies and local authorities.

Objective 3

Wherever possible, maintain natural coastal processes to safeguard dynamic coastal landforms and their related habitats and, again where possible, remove artificial constraints on such systems (e.g. coastal defence and other structures). Ensure that no further development is permitted which could lead to damage, either directly or indirectly, to these features.

Targets:

- All development plans for coastal local authorities to have appropriate policies.

Objective 4

Foster greater public awareness and understanding of the value of dynamic coastal landforms as key features of Devon's coastline and the location of rare and important species and habitats.

Targets:

- By 2010 have published guides to the geomorphology and ecology of Devon's key dynamic coastal landforms and related habitats.
- Ensure adequate educational materials are available via publications and / or web sites.

14. Wider benefits from pursuing these objectives

The pursuit of the objectives and targets set out in this Plan will improve the naturalness of Devon's coastline and improve associated habitats and species. Conservation has wider benefits and advantages for society, however, by providing a resource which is the basis of many aspects of the local economy, and by adding to the quality of life of the people of Devon in ways which are beyond financial measure. Thus enhancing the interests of bio- and geodiversity will also enhance the interests of society as a whole. In particular, the maintenance of natural coastal systems will improve their ability to respond naturally to changes such as rising sea levels and help maintain their ability to provide natural coastal protection, hence reducing the need for expensive and time-limited artificial schemes.

15. Priority or indicative actions for dynamic coastal landforms and associated habitats in Devon

Action	Key Partners
1. Produce a site or system specific assessment for each of the key dynamic coastal landform sites by 2012 to guide future management including establishment of policies for future decision making. Each assessment should consider the processes that underpin the systems and determine their geomorphological and ecological significance thereby establishing management priorities.	LAs; NE; DWT; LAs; Universities; DRIGSG.
2. Complete survey and identification of key sites as a basis for County Geological Site or County Wildlife Site designation, by 2010 and inform all relevant decision makers in governmental bodies and local authorities.	DRIGSG; DWT; LAs; DCC.
3. By 2010 have published guides to the geomorphology and ecology of Devon's key dynamic coastal landforms and related habitats.	DCC; NE; DRIGSG; RSPB; DWT; LAs; FSC.
4. Undertake monitoring of all key systems at least annually to determine the nature of changes and inform management accordingly.	DCC; NE; DRIGSG; RSPB; DWT; LAs; FSC.

Dynamic coastal landforms and habitats Action Plan Champion – to be established

Abbreviations used in text and table

CGS	County Geological Site
CWS	County Wildlife Site
DCC	Devon County Council
DRIGSG	Devon RIGS Group
DWT	Devon Wildlife Trust
FSC	Field Studies Council
LAs	Local Authorities
NE	Natural England
RIGS	Regional Important Geological/Geomorphological Sites