

MARITIME CLIFFS

What are MARITIME CLIFFS?

Maritime cliffs and slopes comprise sloping to vertical faces on the coastline. They are formed at a junction between the land and sea where a break in slope is formed either by slippage or erosion. Slopes vary between 15 degrees and vertical. Cliffs vary in profile, depending on the nature of the rock forming them and the geomorphology of the surrounding land. Most cliffs are formed by erosion.

Cliffs can be divided into "hard " and "soft" rock categories, dependent on geology. Hard rock cliffs, tend to be formed of rock resistant to weathering such as limestone, granite or sandstone. These are more resistant to wave action and weathering and vegetation develops on ledges or in crevices. Soft cliffs, made up of sand and clay, often with glacial deposits, are more unstable and landslides are common. Their slopes are less steep and the cliffs gradually become vegetated.

The cliff top zone extends landwards, at least to the limit of maritime influences (i.e. to the limit of salt spray deposition, about 500 metres along the Durham coast). On the seaward side, the plan area extends to the limit of the splash zone (supralittoral zone) and so includes splash zone lichens and other species occupying this habitat. This plan also includes islands, headlands and seastacks.

Where are they found in the UK?

Approximately 4000 km of the UK coastline has been classified as cliffs. Hard cliffs are widely distributed around the more exposed coasts of the UK, notably in south-west and south-east England. Soft cliffs are more restricted in distribution, occurring mainly on the east and south coast of England and along parts of the Welsh coast.

Why are maritime cliffs of CONSERVATION IMPORTANCE?

Cliffs and slopes are home to a rich variety of wildlife. They comprise a mosaic of habitats which are important for breeding seabirds, invertebrates and a great diversity of plants. Life on maritime cliffs and slopes is "living on



Other action plans and statements covering issues relevant to maritime cliffs:-

- COASTAL GRASSLANDS*****
- COASTAL GILLS*****
- COASTAL LICHENS GENERIC STATEMENT*****
- ROCKY SHORES*****

MARITIME CLIFFS

the edge"; the environment is harsh, with exposure to winds, salt spray, erosion and landslides. Soils are thin allowing development of a diverse community of flowering plants. This in turn attracts a variety of invertebrates. The flushes found at the base of the cliffs along the Durham coast are base-rich mires of conservation importance. Some contain blunt-flowered rush (*Juncus subnodulosus*) which is a rare species, being at the edge of its range in the Durham area. Other flushes contain the rare birds-eye primrose (*Primula farinosa*) and other local rarities.

MARITIME CLIFFS IN THE DURHAM AREA

The cliffs along the Durham coast are mostly non-vertical, lower than 50 metres in height and are extensively capped with glacial till. They arise where the Magnesian limestone plateau of east Durham meets the sea. Magnesian limestone rarely appears close to the surface in Britain and it is even rarer for such conditions to occur near the sea. The resulting habitat provides an unusual set of conditions for both plants and animals.

Between Trow Point and Whitburn Steel, which is designated as a SSSI, the limestone is harder and forms steeper cliffs with much less extensive development of vegetation. The Magnesian limestone cliffs at Marsden Bay support a seabird colony which includes over 5,500 breeding pairs of kittiwake, 150 pairs of fulmar and 110 pairs of cormorants as well as areas of herb-rich semi-natural grassland.

What is the state of maritime cliffs in the DURHAM AREA?

For over a century the landscape and nature conservation value of the Durham coast has been significantly altered by coal mining or related activities and to a lesser extent by agriculture. The East Durham coalfields were first exploited in the 1840s. Disposal of spoil rapidly became a problem; both solid and liquid waste from six coastal collieries was tipped directly onto the beaches of Durham's coast. In some cases the integrity of the landscape has been damaged and some soil profiles destroyed while, in other places, natural

vegetation has survived. The accumulation of spoil has meant that natural processes of erosion and deposition of salt spray have had a reduced impact on cliff vegetation. Other effects of having a large artificial raised beach of spoil at the base of cliffs are unknown. It is possible that the reduced influence of sea spray has affected the composition of plant communities. Spoil tipping ceased early in 1993 with the closure of the last remaining colliery at Easington.

WHERE do they occur in the Durham area?

Hard cliffs cover 12.96 hectares of the coast on County Durham. In Sunderland, there are examples of Magnesian limestone cliffs at Halloween Banks, Roker Cliffs and Ryhope Denemouth. At Hendon, there is a small area of concretionary limestone cliffs. The only areas of cliffs in South Tyneside are those at Marsden, between Whitburn Steel and Trow Point. At Whitburn these are low and soft, but change to hard cliffs further north as the Magnesian limestone resurfaces. The cliffs along the coast of South Tyneside cover 11 hectares.

The Magnesian limestone cliffs along the Durham Coast, from South Shields to Hart Warren, were notified as an SSSI on 6th May 1999 because of their considerable biological, geological and physiographic interest. Within this length of coastline, the built up areas around South Shields, Sunderland, Seaham and Ryhope have been omitted. Parts of this site had been previously designated as SSSIs including Trow Point to Whitburn Steel, Blackhall Rocks and Shippersea Bay and Warren House Gill; these designations were unaffected by the new notification in 1999.

The Durham Coast National Nature Reserve (NNR) comprises five parcels of land, most of which lie within Easington District. Apart from one, these parcels lie between Castle Eden Denemouth and the southern border of the County. The one remaining unit of land lies between Whitesides Gill and Blackhills Gill, some 1.4 km north of Denemouth.

North of Ryhope, the cliffs at Marsden from Trow Point to Whitburn Steel were designated as a SSSI in 1989. They are formed of Magnesian limestone with extensive wave cut platforms. These cliffs are important for their

MARITIME CLIFFS

geology, landforms and wildlife and are now re-notified as part of the Durham Coast SSSI.

The Durham Coast SSSI has been recommended as a candidate Special Area of Conservation (cSAC) because it contains habitats and/or species that are rare within a European context. The Durham Coast SSSI is considered to be one of the best examples in England of the habitat type known as vegetated sea cliffs. The cSAC runs from Trow Point in the north of the area to Crimdon in the south with only the best areas of sea cliffs included.

There are three areas of soft cliff in Sunderland, at Halliwell Banks, Roker Cliffs and Ryhope Denemouth. At Hendon, there is a small area of concretionary limestone cliffs. All these sites are designated as Sites of Nature Conservation Importance by Sunderland City Council.

Maritime cliffs are at RISK from:

CLIMATE CHANGE AND SEA-LEVEL RISE - predicted changes in sea-level and increased storm frequency are likely to increase erosion pressures on cliffs.

AGRICULTURE - local eutrophication from fertiliser run-off encourages coarse weed species at the expense of maritime species. This also leads to accelerated growth of hemp-agrimony (*Eupatorium cannabinum*) and giant horsetail (*Equisetum telmateia*). Agricultural land drains, discharging onto the cliff face, may accelerate erosion.

BUILT DEVELOPMENT - in many areas of the UK, urban and industrial development has taken place too close to the sea. Where cliffs are found to be eroding there is often political pressure to build defensive works which can result in geological exposures being obscured and bare soil and early pioneer stages of plant succession being lost. Built development also prevents cliff top biological communities from retreating in response to coastal squeeze.

REFUSE DISPOSAL - the dumping of rubbish over the edge of cliffs is a problem, particularly where residential development is close to the coast.

RECREATIONAL USE - intensive recreational use leads to trampling, disturbance and eutrophication. The siting of holiday accommodation on cliff tops reduces landscape value and may also cause heavy localised erosion and disturbance of nesting birds.

Maritime cliffs BENEFIT from:

EROSION - this is not a major factor along the Durham coast because of the hard nature of the limestone. Some rotational slumping does occur, with a peak in March, but this is a natural process and constantly renews geological exposure and botanical succession. Its main significance along the Durham coast is its effect on the flushes at the cliff bases. Colliery spoil dumped on the beaches has until recently shielded the cliffs from seaward erosion. The cleaning of the beaches by the removal of the spoil will mean that this is no longer the case and has implications for the future of cliff and slope habitats in terms of accelerated erosion.

LANDUSE CHANGE - a reversion from arable farming back to pasture would allow continued cliff retreat and the retention of important wildlife habitat. This would also limit the rate of fertiliser run-off influencing cliff-top and flush vegetation. Recreation of paramarine Magnesian limestone grassland on cliff tops improves the nature conservation value of cliff top land by restoring natural habitats and their associated diversity of species.

CONSERVATION POLICY - protection from inappropriate uses for areas of high conservation value. Buffer zones protect land of high conservation value from intensively farmed areas.

AGRI-ENVIRONMENTAL SCHEMES - Countryside Stewardship can make funds available to improve the conservation value of agricultural land and increase the ecological value of land adjacent to cliff tops.

RESEARCH - further survey and research into the ecology of cliffs and the extent and quality of this habitat in the UK is needed. In the north-east, further research is needed into the effects of dumping colliery spoil on to beaches and its subsequent cessation, particularly with regard to rates of erosion and the colonisation by non-native plants.

MARITIME CLIFFS

MANAGEMENT - appropriate management for both wildlife and geology whilst taking into account the need for essential sea defence works in some areas.

POLICY - Shoreline Management Plans should allow natural processes to continue to benefit biodiversity and geology.

INCREASED AWARENESS OF THE NATURE OF CLIFF

HABITATS AMONGST VISITORS - all visitors to the coast should have the opportunity to be informed about the ecology and geology of maritime cliffs and associated management measures via an integrated coastal interpretation strategy.

Important SPECIES for maritime cliffs in the Durham area:

KITTIWAKE

FULMAR

RAZORBILL

GUILLEMOT

SEA SPLEENWORT

THRIFT

BIRDS-EYE PRIMROSE

BLUNT-FLOWERED RUSH

CISTUS FORESTER MOTH

TARGETS

- 1** *Maintain the existing maritime cliff resource and slope habitat, both wildlife habitats and geological features along the Durham coast.*
(ONGOING)
- 2** *Maintain the free functioning of physical coastal processes acting on maritime cliff and slope habitat.*
(ONGOING)
- 3** *Retain and, where possible, increase the amount of the maritime cliff and slope habitats unaffected by coastal defence and engineering works.*
(ONGOING)
- 4** *Create two freshwater lagoons at the base of cliffs at Dawdon Blast Beach.*
(2005)
- 5** *Involve the local community in practical projects, information gathering and awareness raising events such as guided walks. Organise at least three events per annum along the Plan's coastline.*
(2002)
- 6** *Monitor the wildlife value of the maritime cliffs along the Durham coast.*
(ONGOING)
- 7** *Include contingencies for managing maritime cliffs in local strategic plans such as the ICZM Plan.*
(2002)

MARITIME CLIFFS

ACTION PLAN			
ACTION	DATE	Possible PARTNERS	Meets TARGET No.
POLICY AND LEGISLATION			
1. Promote sea defences and coastal protection policies which encourage free functioning of coastal physical processes of maritime cliffs wherever possible. Consider implications of cessation of spoil dumping.	ONGOING	EA, DEFRA, DCC, EDC, SCC, STMBC	1, 2, 3, 7
2. Consider how planning policy might discourage new built development within appropriate buffer zones in the vicinity of retreating cliff tops.	ONGOING	DETR, EN, DCC, EDC, SCC, STMBC	1, 2, 3, 7
3. Ensure that Shoreline Management Plans allow for natural processes to continue in the interests of biodiversity and geological features.	ONGOING	SCC, HBC, DWT, NT, EDC, DCC, STMBC	1, 2, 3
SITE SAFEGUARD AND MANAGEMENT			
4. Ensure appropriate management regimes for designated areas are implemented - SSSI, NNR, SAC.	ONGOING	EN, DWT, EDC, NT, STMBC	1, 4
5. Ensure that all management incentives and protection schemes are in place for key sites.	ONGOING	DWT, NT, EDC, EN	1, 4
6. Ensure that management proposals for key sites for BAP species and habitats incorporate relevant specific recommendations (see list of relevant species and habitats).	ONGOING	EN, DBAP, NT, DWT	1
7. Establish buffer zones between intensively managed agricultural land and semi-natural cliff and slope habitat.	2002	DEFRA, local farmers, NT, DCC, EDC	1, 3
8. Re-diversify the flush communities by cutting and removing tall herb communities, notably giant horsetail, and controlling hemp agrimony.	ONGOING	EN, NT, DWT	1
9. Consider creation of lagoons at base of cliffs at Dawdon Blast Beach.	2005	EN, NT, DCC, EDC	4, 7

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MARITIME CLIFFS

ACTION PLAN

ACTION	DATE	Possible PARTNERS	Meets TARGET No.
ADVISORY			
10. Encourage the adoption of policies and practices which are sympathetic to nature conservation. Prepare and disseminate "best practice" guidance materials.	ONGOING	DEFRA, EN, DWT, NT, DCC, EDC, CA	1, 2, 3, 5
RESEARCH AND MONITORING			
11. Support a national literature review to assess relative conservation value of maritime cliffs and slopes, the scope for improvement by alternative management and to what extent they are affected by coastal defence and engineering works.	2003	EN, JNCC, DCC, EDC, NT, DBAP, EA	1, 2, 3
12. Monitor erosion rates on beaches as spoil levels decrease following cessation of tipping.	CURRENT	EA, EDC, HBC, DCC, STMBC, SCC, DEFRA, Universities	1, 2, 3, 6
13. Evaluate the contribution of eroded material to the marine sedimentary budget and its effect on key habitats and neighbouring shorelines.	ONGOING	EA, DEFRA, Universities	2
14. Contribute local information regarding possible effects of climate change/sea level rise.	ONGOING	DEFRA, EA	1, 3
15. Contribute local information to proposed national survey on coastal defences that impact on maritime cliffs and slopes.	ONGOING	EA, EN, DEFRA	1, 2, 3
16. Monitor local wildlife populations e.g. birds, invertebrates, plants.	ONGOING	DWT, DBC, WeBS	6
INTERNATIONAL			
17. Utilise information on maritime cliff ecology and management available through European Union for Coastal Conservation. Use websites and published material.	ONGOING	EN, DWT, NT, EDC, STMBC, SCC, DCC,	1, 2, 4, 6

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MARITIME CLIFFS

ACTION PLAN			
ACTION	DATE	Possible PARTNERS	Meets TARGET No.
COMMUNITY AND PUBLICITY			
18. Foster public awareness of the unique nature of Durham's coastal wildlife, the need to preserve cliffs and slopes, the pressures they are facing and the value and potential of the cliffs and slopes as a wildlife resource.	ONGOING	EN, DWT, DBAP, NT, EDC, DCC, SCC, STMBC, CA	5
19. Raise awareness of the mobile nature of soft cliffs and of the likely effects of the spoil clearance on Durham's beaches. i.e. increased rate of erosion.	2001 onwards	EN, EA, DCC, EDC, STMBC, SCC	5
20. Provide information for walkers and users of cliff top paths about any ongoing management work and about the importance of cliffs and slopes for wildlife. Organise and run three guided walks a year. Prepare publicity information as part of an integrated coastal/marine interpretation package.	2001 onwards	EN, EDC, DWT, NT, SCC, STMBC, CA	5