

NORFOLK BIODIVERSITY ACTION PLAN

MARITIME CLIFF AND SLOPES

Maritime cliffs and slopes comprise sloping to vertical faces on the coastline where a break in slope is formed by slippage and/or coastal erosion. There appears to be no generally accepted definition of the minimum height or angle of slope which constitutes a cliff, but the zone defined as cliff-top (also covered in this plan) should extend landward to at least the limit of maritime influence (ie limit of salt spray deposition), which in some exposed situations may continue for up to 500 m inland. This plan may therefore encompass entire islands or headlands, depending on their size. On the seaward side, the plan extends to the limit of the supralittoral zone and so includes the splash zone lichens and other species occupying this habitat.

Ref 2/H6	Tranche 2	Habitat Action Plan 6
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Plan Co-ordinator:	Coastal BAP Topic Group	
Plan Leader:	Natural England	
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1. CURRENT STATUS

National Status

- Approximately 4,000km of the UK coastline has been classified as maritime cliff. Cliffs can be broadly classified as 'hard cliffs' or 'soft cliffs', though in practice there are a number of intermediate types. Hard cliffs are vertical or steeply sloping; they are inclined to support few higher plants other than on ledges and in crevices or where a break in slope allows soil to accumulate. They tend to be formed of rocks resistant to weathering, such as granite, sandstone and limestone, but can be formed of softer rocks, such as chalk, which erode to a vertical profile. Soft cliffs are formed in less resistant rocks such as shales or in unconsolidated materials such as boulder clay; being unstable they often form less steep slopes and are therefore more easily colonised by vegetation. Soft cliffs are subject to frequent slumping and landslips, particularly where water percolates into the rock and reduces its effective shear strength.
- Cliff profiles vary with the nature of the rocks forming them and with the geomorphology of the adjoining land. While most maritime cliffs have been formed by coastal erosion, steep slopes falling to the sea in mountainous districts may have been formed long before the sea level reached its present position; in such cases only the lower part of the slope will have been steepened by the sea.
- The vegetation of maritime cliff and slopes varies according to several factors: the extent of exposure to wind and salt spray; the chemistry of the underlying rock; the water content and stability of the substrate; and, on soft cliffs, the time elapsed since the last movement event. Cliff-top habitats can also be transformed by soil erosion processes.

- Hard cliffs are widely distributed around the more exposed coasts of the UK, occurring principally in south-west and south-east England (the latter area having the bulk of the 'hard' chalk cliffs), in north-west and south-west Wales, in western and northern Scotland and on the north coast of Northern Ireland. Soft cliffs are more restricted, occurring mainly on the east and central south coasts of England and in Cardigan Bay and north-west Wales. There are also examples on the coasts of Fife and Skye in Scotland and Antrim in Northern Ireland.
- Soft cliffs provide important breeding sites for sand martins *Riparia riparia*, which burrow into soft faces exposed by recent slippages, but they are particularly important for invertebrates as they provide a suite of conditions which are rarely found together in other habitats. The combination of friable soils, hot substrates and open conditions maintained by cliff slippages offer a continuity of otherwise very restricted microhabitats and these support many rare invertebrates which are confined to such sites. These include the ground beetle *Cicindela germanica*, the weevil *Baris analis*, the shore bug *Saldula arenicola*, and the Glanville fritillary *Melitaea cinxia*.
- Seepages, springs and pools are a feature of many soft cliff sites and these provide the wet muds required by many species of solitary bees and wasps for nest building. They also support rich assemblages of other invertebrates including many rare species which are confined to this habitat. These include the craneflies *Gonomyia bradleyi* and *Helius hispanicus*, and the water beetle *Sphaerius acaroides*.

Links with Other Action Plans

- The Lowland Heathland and Littoral and Sublittoral Chalk Habitat Action Plans have objectives and actions which are relevant to this plan.

Norfolk Status

- The total length of cliff in Norfolk is c24km. The cliffs can be divided into two main types:
 - Hard vertical cliffs composed of chalk and carstone (a ferruginous sandstone) occur for 1.3km at Hunstanton;
 - Soft cliffs composed of glacial sands and clays with rafts of chalk occur for most of the coastline between Weybourne and Happisburgh with an estimated length of 22.7km. A few short sections also occur further south. They tend to separate into those with predominately vertical cliffs as at Weybourne and Happisburgh and those with extensive areas of slumping as between Cromer and Mundesley. Extensive areas of grassland are associated with the slumping cliffs covering an estimated 129ha. Seepages are an important feature of the cliffs between Cromer and Mundesley and to a lesser extent between Sheringham and Cromer. Cliff top grassland is present at Hunstanton and between Weybourne and Mundesley sometimes as golf courses or caravan sites. Eastwards the land is generally cultivated to the cliff edge. The habitat is important for a range of species or groups including purple broomrape (*Orobanche purpurea*), bryophytes, lichens, invertebrates (particularly woodlice, *Diptera* and *Coleoptera*), fulmar and barbastelle bat.
- The main cliff areas in Norfolk are summarised in Table 1 below:

Table 1: Distribution and Status of Maritime Cliffs in Norfolk

Site	Status	Interest	Type
Hunstanton	SSSI	Geological	Hard rock
Weybourne to Sheringham	SSSI	Geological	Soft vertical
Sheringham to Cromer	Part SSSI	Geological	Soft slumping
Cromer to Overstrand	cSAC and SSSI	Biological and Geological	Soft slumping, many seepages
Overstrand to Mundesley	SSSI	Geological	Soft slumping, many seepages
Mundesley to Bacton	Part SSSI	Geological	Soft slumping
Ostend to Happisburgh	Part SSSI	Geological	Soft vertical
Scratby			Soft? vertical

2. CURRENT FACTORS CAUSING LOSS OR DECLINE IN NORFOLK

- Sea defence works are present along many stretches either in the form of a concrete apron or revetments set forward of the base of the cliffs. These were mostly constructed in the period between 1950 and 1980. In many instances, these are gradually deteriorating.
- Arable cultivation continues to the edge, particularly between Overstrand and Mundesley.
- Declines in quality of cliff top grassland through lack of management including increase in Alexanders (*Smyrnum olusastrum*). Management by cutting in spring or spot spraying may be required to reduce the vigour of this long established alien.

3. CURRENT ACTION IN NORFOLK

- A biodiversity document has been produced for the Shoreline Management Plan area between Kelling and Lowestoft.
- Information board placed at West Runton.
- Consultation underway for the review of the Shoreline Management Plan between Kelling and Lowestoft.

4. ACTION PLAN OBJECTIVES AND TARGETS

National

- Seek to maintain the existing maritime cliff resource of cliff-top and slope habitat, of about 4,000 km.
- Maintain wherever possible free functioning of coastal physical processes acting on maritime cliff and slope habitats.
- Retain the amount of maritime cliff and slope habitats unaffected by coastal defence and other engineering works.
- Where possible increase the amount of maritime cliff and slope habitats unaffected by coastal defence and other engineering works.
- Increase the area of cliff-top semi-natural habitats by at least 500 ha over the next 20 years.
- Improve by appropriate management the quality of at least 30% of the maritime cliff and slope habitats, including cliff-top vegetation, by 2010.
- Improve by appropriate management the quality of as much as possible of the remaining maritime cliff and slope habitats, including cliff-top vegetation, by 2015.

Norfolk

- Maintain and where possible enhance the maritime cliff and slope in Norfolk.
- Increase the area of cliff top grassland by arable reversion. (*Quantitative target to be set following further research and survey.*)

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.1	Policy and Legislation			
5.1.1	Promote sea defence and coastal protection policies which encourage the free functioning of the coastal physical processes of maritime cliffs wherever possible.	Ensure SMP takes account of free-functioning coastal processes and requirements of maritime cliffs. Ensure Local Development Frameworks take account of the importance of coastal zone management.	EA, NE, NNDC, KLWNBC, GYBC NNDC, KLWNBC	
5.1.2	In the light of research findings, give consideration to how planning policy might discourage new built development within appropriate buffer zones in the vicinity of retreating cliff-tops.	Ensure that Local Development Framework policies for built developments reflect government guidance.	NNDC, KLWNBC, GYBC	
5.1.3	Look into the feasibility of developing provisions within the planning systems to encourage the re-siting of housing and holiday developments which are vulnerable to cliff erosion.	No action proposed.		
5.1.4	Where appropriate promote agri-environment schemes which encourage management and restoration of maritime grassland, heathland and other cliff-top habitats.	Identify within targetting statement maritime cliff sites which would benefit from agri-environment schemes.	NE	
5.2	Site Safeguard and Management			
5.2.1	By 2004 apply conservation designations to all remaining areas of maritime cliff and slopes which meet national or international criteria and ensure appropriate management of all designated sites.	Review CWS suite to identify new maritime cliff sites. Review SSSI boundaries with a view to including both present and future cliffs as well as a portion of the littoral zone.	NWT NE	

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.2.2	Encourage a presumption against stabilisation of any cliff face except where human life, or important natural or man-made assets, are at risk.	Ensure SMP takes account of free-functioning coastal processes and requirements of maritime cliffs. Ensure that hydrological issues relating to cliff drainage are assessed prior to any consent.	EA, NE, NNDC, KLWNBC, GYBC EA, NNDC	
5.2.3	Where stabilisation of a cliff face is necessary (as defined in 5.2.2), ensure adequate mitigation and/or compensation to maintain the overall quantity and quality of maritime cliff and slopes habitat.	No action proposed.		
5.2.4	Encourage the increased use of soft (eg foreshore recharge) rather than hard engineering techniques where some degree of cliff stabilisation is essential.	Encourage the increased use of soft (eg foreshore recharge) rather than hard engineering techniques where some degree of cliff stabilisation is essential.	NE, NNDC	
5.2.5	Consider non-replacement of coastal cliff defences which have come to the end of their useful life.	Promote non-replacement of coastal cliff defences which have come to the end of their useful life. Seek the removal of the existing revetments where possible. Ensure SMP takes account of free-functioning coastal processes and requirements of maritime cliffs.	EA, NE, NNDC, KLWNBC, GYBC NNDC NNDC, KLWNBC	
5.2.6	Promote the management of maritime grassland and heath habitats by scrub control and grazing where appropriate, through relevant agri-environment schemes and management agreements.	Review the need for management action to conserve the conservation interests of these sites.	NE	

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
		Enhance the quality of cliff top grassland where appropriate. Encourage three cliff top landowners to promote sustainable grassland management by 2010.	NE	
		Promote effective regulation of waste disposal activities on cliff tops.	EA, NNDC	
5.2.7	Conduct operations to remove rats, cats or other introduced predators affecting breeding seabirds on maritime cliff and slope sites, identified by "Seabird 2000" and other surveys.	No action proposed.		
5.2.8	Assess the impact of agricultural land drainage on maritime cliffs and slopes, especially in SACs, and carry out a review of the effectiveness of the current consents procedure.	No action proposed.		
5.3	Advisory			
5.3.1	Encourage by 2002 the adoption of policies and practices in the engineering management of soft cliffs which are sympathetic to the nature conservation interest, by preparing and disseminating 'best practice' guidance material.	Promote and disseminate best practice manual/ material if available.	Coastal BAP Topic Group	
5.3.2	Encourage by 2002 appropriate habitat management of maritime cliff and slope habitats by preparing and disseminating 'best practice' guidance material.	Promote and disseminate best practice manual/ material if available.	Coastal BAP Topic Group	

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.4	International			
5.4.1	Promote the exchange of information on maritime cliff ecology and management among European maritime states through the European Union for Coastal Conservation and Eurosite.	No action proposed.		
5.5	Monitoring and Research			
5.5.1	By 2003 commission a literature review and full survey of the maritime cliff and slope resource in the UK to assess its relative conservation value, how much can be improved by alternative management, and to what extent it is affected by coastal defence and engineering works.	Commission production of a maritime cliff and slope inventory for Norfolk, including land-use/ ownership within 50m from cliff, and extent and quality of habitat.	Coastal BAP Topic Group, NE, NWT	
5.5.2	By 2003 commission a study to identify areas in the UK suitable for the re-creation of maritime grasslands and heathlands.	Use inventory to identify areas suitable for re-creation of maritime grassland and heathlands.	Coastal BAP Topic Group	
5.5.3	By 2003 commission a study to identify possible coastal and sea defence strategies that may be more sympathetic to the nature conservation interests of maritime cliffs, and identify stretches of coastline where such sympathetic modifications are feasible.	Ensure that SMP takes account of requirements for a naturally functioning coastline.	NE, EA, NNDC, KLWNBC	
5.5.4	By 2003 implement a baseline study to determine the extent and quality of the maritime cliff and slope resource in the UK in order to enable the effective assessment of	No action proposed.		

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
	progress towards meeting the objectives of this plan.			
5.5.5	By 2003 complete an assessment of the maritime cliff sites in the UK where the native flora and fauna is being affected by introduced species.	No action proposed.		
5.5.6	Carry out an evaluation of cliff erosion and how its contribution to the marine sediment budget could be affecting other key habitats.	No action proposed.		
5.5.7	Carry out an assessment of how the conservation interest of maritime cliffs may be affected by climate change.	Make available results from UEA study on coastal management/modelling cliff erosion in north-east Norfolk.	Coastal BAP Topic Group	UEA
5.5.8	By 2003, in order to meet objective 4.3, develop an inventory of coastal defences that impact on maritime cliff and slope habitats and identify the most appropriate defences for removal.	Ensure SMP takes account of free-functioning coastal processes and requirements of maritime cliffs.	NE, NNDC, KLWNBC	
5.6	Communications and Publicity			
5.6.1	Raise public awareness of the mobile nature of soft cliffs and the value of maintaining unrestricted coastal processes.	Prepare promotional material on importance of maritime cliffs and natural process. Promote the importance of soft cliff habitats as a habitat and sediment supply. Encourage field study centres and educational establishments' promotional material to cover the importance of the coastline.	Coastal BAP Topic Group Coastal BAP Topic Group Coastal BAP Topic Group	

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.6.2	Promote awareness of the implications of the policies in this plan among coastal local authorities and ensure that the relevant details are incorporated into coastal zone management plans including Shoreline Management Plans.	Promote sustainable management at caravan sites. Promote dissemination of SMP.	Coastal BAP Topic Group NE, EA, NNDC	
5.6.3	Raise public awareness of the potential damage that can be inflicted on the native flora and fauna of maritime cliffs by introduced species.	No action proposed.		

NORFOLK DISTRIBUTION

Please see Table 1.

MANAGEMENT GUIDANCE

Generally a non-intervention habitat on the slopes. Encourage cliff-top grassland creation to replace existing arable land-use.

REFERENCES AND CONTACTS

Restoring Biodiversity to Soft Cliffs. EN Research Report No 398, 2001.

Maritime Cliff and Slope Inventory. EN Research Report No 425, 2002.