



European Site Conservation Objectives: Supplementary advice on conserving and restoring site features

**Beast Cliff – Whitby (Robin Hood's Bay) Special Area of Conservation (SAC)
Site Code: UK0030086**



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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Beast Cliff- Whitby (Robin Hood's Bay) SAC. This advice should therefore be read together with the SAC Conservation Objectives available [here](#).

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England when developing, proposing or assessing an activity, plan or project that may affect this site.

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email HDIRConservationObjectivesNE@naturalengland.org.uk

About this site

European Site information

Name of European Site	Beast Cliff – Whitby (Robin Hood's Bay) Special Area of Conservation (SAC)
Location	North Yorkshire
Site Map	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	01 April 2005
Qualifying Features	See section below
Designation Area	260.20 ha
Designation Changes	N/A
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	Robin Hoods Bay: Maw Wyke to Beast Cliff SSSI The SAC falls entirely within the SSSI, but the SSSI extends further north around the coast from Robin Hoods Bay to Maw Wyke.
Relationship with other European or International Site designations	N/A

Site background and geography

The site is located on the North Yorkshire coast between Whitby and Scarborough within the North York Moors and Cleveland Hills National Character Area ([NCA 25](#)). Beast Cliff – Whitby is an east coast complex of hard and soft cliffs and the combination of geology, topography and plant communities found on the site are unique making it one of the best examples of vegetated sea cliffs on the north-east coast of England. The underlying geology varies from base-rich to base-poor, and this variation is reflected in a characteristic and diverse flora across the site. Vertical hard cliffs support maritime crevice and ledge vegetation, and the more gently sloping parts of Beast Cliff itself are covered by scrub and woodland. Sandstone boulders support a luxuriant growth of mosses and ferns and pools on the cliff shelf support wetland plants and scrub. Due to the frequent land slippage occurring on the site, the woodland is constantly changing and being rejuvenated with mainly young trees forming secondary woodland. North of Beast Cliff to Ravenscar the vegetation is more open and reflects alternating strata of rich and poor base-status. Areas of calcareous clays support typical calcareous grassland and wet flush plant communities, whereas heathland species occur on more acidic sandstone outcrops. From Ravenscar north to Robin Hood's Bay the cliffs are composed either partly or entirely of soft boulder clay. This clay is continually being eroded by wave action and slippage, and supports pioneer plant communities typical of this changing habitat.

About the qualifying features of the SAC

The following section gives you additional, site-specific information about this SAC's qualifying features. These are the natural habitats and/or species for which this SAC has been designated.

Qualifying habitats:

- **H1230 Vegetated sea cliffs of the Atlantic and Baltic coasts**

Vegetated sea cliffs are steep slopes fringing hard or soft coasts, created by past or present marine erosion, and supporting a wide diversity of vegetation types with variable marine influence. Cliff structure and geomorphological processes are major influences on cliff vegetation. 'Hard' cliffs with vertical or very steep faces are characteristic of hard igneous, metamorphic and sedimentary rocks and also of chalk, which, although a soft rock, nevertheless forms vertical cliffs. 'Soft' cliffs have a sloping or slumped profile, often with a distinct 'undercliff'; they occur on a range of soft rocks, or on hard rocks interspersed with softer deposits. The more mobile soft cliffs occur where there are unstable soft deposits such as mudstones or glacial drift deposits. They may be subject to mudslides or landslips, which create complexes of pioneer and more mature vegetation.

Cliff structure and geomorphological processes are major influences on cliff vegetation. This can range from near vertical cliffs and ledges to less extreme slopes where species tolerant of exposure to wind and salt spray and of thin soils can get a foothold. On relatively stable soft cliffs a wide range of communities, including grassland, heath, scrub and woodland can occur. More mobile soft cliffs show a complex sequence of successional communities related to degrees of instability and the age of the slope. The vegetation of these areas form a mosaic of pioneer, ruderal, grassland, scrub and woodland communities.

The second major influence on maritime cliff vegetation is the nature of the underlying rock or drift deposit, notably whether it is basic or acidic. In exposed areas this can be masked by the saline influence of sea spray, but more sheltered cliffs support communities closely related to those on similar substrates inland. Thus, chalk and limestone cliffs can support calcareous grassland communities, while acidic hard rock support heath communities.

Table 1: Supplementary Advice for Qualifying Features: H1230. Vegetated sea cliffs of the Atlantic and Baltic coasts

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution	Extent of hard or soft cliff capable of supporting sea cliff vegetation	Maintain the total extent of the cliff system which is capable of supporting H1230 sea cliff vegetation to approximately 153 ha.	There should be no measurable reduction (excluding any trivial loss) in the extent and area of this feature, and in some cases, the full extent of the feature may need to be restored. The baseline-value of extent given has been generated using data gathered from the listed site-based surveys. Area measurements given may be approximate depending on the methods, age and accuracy of data collection, and as a result this value may be updated in future to reflect more accurate information. The extent of an Annex I habitat feature covers the sum extent of all of the component vegetation communities present and may include transitions and mosaics with other closely-associated habitat features. Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations. Where a reduction in the extent of a feature is considered necessary to meet the Conservation Objective for another Annex I feature, Natural England will advise on this on a case-by-case basis. The whole system acts to provide the range and variation of vegetation types and mosaics with bare ground. Extent may be measured in different ways but there are issues with measuring area of vertical cliffs. Reduction in extent can include smothering cliff slope, cliff foot or cliff top surfaces by artificial or dumped materials. The majority of cliff area at this site can reasonably be classified as soft cliff habitat with the only areas of hard cliff (steep rocky slopes) found between Old Peak and the southern end of the Coomb, with occasional outcrops occurring along the inland margin of the site as far as Petard Point. These hard cliff areas are however mainly situated a substantial distance from the sea with little maritime influence so may not be hard cliffs in the truest sense. The site is therefore one of predominantly soft cliff habitat. Definitions of soft and hard cliff taken from Hill et al. (2001)	This attribute will be periodically monitored as part of Natural England's site condition assessments. MILLIKEN & PENDRY (2003) HILL <i>et al.</i> (2001)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Extent of habitats is taken from MILLIKEN & PENDRY (2003), which is the first full survey of the SAC feature and which has been used to set the baseline for habitat extent for future monitoring. This survey assessed the following habitat types: Early successional vegetation on drier ground; Late successional vegetation on drier ground; Early successional vegetation on wetter ground; Late successional vegetation on wetter ground; flushes and running water (not mapped). The remainder of the SAC area consists of geological exposures and littoral rock. As geomorphological processes continue to occur, the boundary of the designated site may need changing in future to allow these natural processes to continue within the protected site area.	
Extent and distribution	Spatial distribution of the feature within the site	Maintain the distribution and continuity of the habitat and any associated transitions which reflects the natural functioning of the cliff system	A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species, plus transitional communities) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. This may also reduce and break up the continuity of a habitat within a site and how well its typical species are able to move around the site to occupy and use habitat. Such fragmentation can impact on their viability and the wider ecological composition of the Annex I habitat. Smaller fragments of habitat can typically support smaller and more isolated populations which are more vulnerable to extinction. These fragments also have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for some of the typical and more specialist species associated with the Annex I habitat feature. Transitions include cliff top and cliff foot transitions to terrestrial or marine habitats.	This attribute will be periodically monitored as part of Natural England's site condition assessments. Spatial distribution of habitats is taken from Milliken & Pendry (2003)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			The site is subject to coastal erosion with landslips and slumping events resulting in habitat extent and location being subject to change. Robin Hood's Bay, which comprises the northern half of the site, is largely composed of eroding and slumping boulder clays underlain by Lower Lias shales, where the cliffs become correspondingly higher. These shales become more exposed towards the southern end of the bay. The vegetation on the cliff slopes is mainly made up of a mixture of mesotrophic grasslands with patches of scrub and occasionally bracken on the more stable ground, and colonising vegetation on the slumping and often flushed boulder clays. Annex 1 shows the NVC maps. At Old Peak, south of the Peak Fault, alum shales of the Upper Lias are exposed, overlain by sandstones and calcareous deposits of the Dogger Formation. From here southwards the cliffs are mostly divided into an upper cliff (largely sandstones) and a lower cliff (largely shales and boulder clays) separated by a flattish plateau. The alternation of base rich and base poor strata results in diverse vegetation, varying between heath, acidophilous grassland, calcareous grassland and scrub on the steeper slopes, and bracken on the plateau. The eroding boulder clays and shales of the lower cliff slopes bear a mixture of colonising vegetation, grasslands with scrub and a narrow fringe of maritime grassland. Beast Cliff, the southernmost part of the site, is also made up of two cliffs separated by a plateau. The wooded upper cliff is composed of Middle Jurassic sandstones and shale while the lower cliff is primarily made up of eroding shales and boulder clay, and supports a mixture of grasslands, bracken and scrub. The plateau in-between these cliffs, which narrows towards the southern end, is partly wooded and partly covered by bracken. A number of small pools occur on this plateau, fed by springs from the cliffs above, and consequent flushing on the lower cliffs results in a characteristic pattern of erosion consisting of parallel gullies in the loose shales.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution	Future extent of habitat within the site and ability to respond to seasonal changes	Maintain active processes such that the system can adjust to longer-term natural change, including landward recession, and that fluctuations in the extent of vegetated areas to bare rock occur over time and space within the site.	This recognises the need to allow for natural fluctuations in the extent and the distribution of this habitat feature, often during particular seasons and usually as a result of natural coastal processes.	
Structure and function (including its typical species)	Geo-morphological naturalness	Maintain the geomorphological naturalness of the sea cliff system (from cliff top to foreshore connection with the intertidal zone)	The physical landforms associated with this habitat feature, and the processes that shape them, will be a primary influence on sea-cliff habitat. A key criteria for selecting SACs for this habitat feature was that they had no or minimal artificial modification and so demonstrates good geomorphological naturalness. Having a well-developed sea-cliff structure, shaped by natural geomorphological processes, will ensure the full range of natural variation can occur. The Tyne to Flamborough Head Shoreline Management Plan (SMP) has a policy of no active intervention in support of the overriding natural value of this section of the coast. At Robin Hood's Bay village, directly to the north of the SAC boundary the policy is to hold the line.	GUTHRIE & LANE (2007)
Structure and function (including its typical species)	Presence of mosaic of microhabitats	Maintain the diversity and range of microhabitats and bare areas resulting from active coastal processes/landslips	Each site will have a different configuration of geology and hydrology and maritime exposure, which will also change over time and space. The key aim is to maintain the full, naturally expected range of these in as natural a state as possible. The conditions created by regular cliff slippages and slumping, especially at the northern end of the site, offer a continuity of microhabitats which are variable and subject to change through natural processes.	MILLIKEN & PENDRY (2003)
Structure and function (including its typical species)	Vegetation community composition	Ensure the component vegetation communities of the feature are referable to and characterised by the following National Vegetation	This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been	This attribute will be periodically monitored as part of Natural England's site condition assessments

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Classification types:	categorised by the National Vegetation Classification (NVC). Maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. This will also help to conserve their typical plant species (i.e. the constant and preferential species of a community), and therefore that of the SAC feature, at appropriate levels (recognising natural fluctuations). The presence, composition, location and extent of maritime scrub, heath and/or grassland, plus mosaics of the three, on cliff slopes or cliff tops will be determined by the interaction of natural geomorphological processes with exposure and soil characteristics and management where relevant. There is substantial micro-variation in the vegetation at Robin Hood's Bay – Beast Cliff, particularly in Robin Hood's Bay itself and in the lower areas of the cliff further south which is partly a consequence the dynamic erosion process (resulting in alternation between early successional, late successional and more established communities). Much of the cliff area is therefore composed of a complex mosaic of vegetation types which could not be mapped as separate areas and which are therefore mapped as mosaics. The National Vegetation Classification communities currently known on the site are listed below, together with a small number of other vegetation types (either broader than NVC types or not defined within the NVC). This list should not be considered exhaustive because active coastal processes and succession mean that communities are dynamic and also some small stands of vegetation may have been missed by the vegetation mapping to date. Calcareous grassland CG2 <i>Festuca ovina</i> – <i>Avenula pratensis</i> grassland Mesotrophic grassland MG1a <i>Arrhenatherum elatius</i> grassland – <i>Festuca rubra</i> sub	MILLIKEN & PENDRY (2003)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			community MG1c <i>Arrhenatherum elatius</i> grassland – <i>Filipendula ulmaria</i> sub-community MG5a <i>Cynosurus cristatus</i> – <i>Centaurea nigra</i> grassland – <i>Lathyrus pratensis</i> sub community Maritime communities MC8d <i>Festuca rubra</i> – <i>Armeria maritima</i> maritime grassland <i>Holcus lanatus</i> sub community MC9 <i>Festuca rubra</i> – <i>Holcus lanatus</i> maritime grassland Calcifugous grassland U2b <i>Deschampsia flexuosa</i> grassland – <i>Vaccinium myrtillus</i> sub community U16 <i>Luzula sylvatica</i> – <i>Vaccinium myrtillus</i> tall herb community Heath H10 <i>Calluna vulgaris</i> – <i>Erica cinerea</i> heath Woodland W1 <i>Salix cinerea</i> – <i>Galium palustre</i> woodland W5c <i>Alnus glutinosa</i> – <i>Carex paniculata</i> woodland – <i>Chrysosplenium oppositifolium</i> sub community W8e <i>Fraxinus excelsior</i> – <i>Acer campestre</i> – <i>Mercurialis perennis</i> woodland – <i>Geranium robertianum</i> sub community W9a <i>Fraxinus excelsior</i> – <i>Sorbus aucuparia</i> – <i>Mercurialis perennis</i> woodland – typical sub community W21a <i>Crataegus monogyna</i> – <i>Hedera helix</i> – <i>Urtica dioica</i> sub community W22 <i>Prunus spinosa</i> – <i>Rubus fruticosus</i> scrub W23c <i>Ulex europaeus</i> – <i>Rubus fruticosus</i> scrub – <i>Teucrium scorodonia</i> sub community W24a <i>Rubus fruticosus</i> – <i>Holcus lanatus</i> underscrub – <i>Cirsium arvense/vulgare</i> sub community W25b <i>Pteridium aquilinum</i> – <i>Rubus fruticosus</i> underscrub – <i>Teucrium scorodonia</i> sub community Willow woodland	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Mire and swamp M23b <i>Juncus effusus/acutiflorus</i> – <i>Galium palustre</i> rush pasture – <i>Juncus effusus</i> sub community S26b <i>Phragmites australis</i> – <i>Urtica dioica</i> tall herb fen S8 <i>Scirpus lacustris ssp. lacustris</i> swamp Open vegetation OV24a <i>Urtica dioica</i> – <i>Galium aparine</i> community – <i>Arrhenatherum elatius</i> – <i>Rubus fruticosus</i> agg. sub community OV26d <i>Epilobium hirsutum</i> community – <i>Arrhenatherum elatius</i> – <i>Heracleum sphondylium</i> sub community OV27b <i>Epilobium angustifolium</i> community – <i>Urtica dioica</i> – <i>Cirsium arvense</i> sub community Pioneer vegetation <i>Agrostis stolonifera</i> – <i>Tussilago farfara</i> successional vegetation <i>Equisetum telmateia</i> dominated flushes	
Structure and function (including its typical species)	Vegetation: undesirable species	Restore the frequency/cover of the following undesirable species to within acceptable levels and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread: Invasive non-native plant species should be absent or rare if already present Bracken and scrub should be no more than occasional in maritime grassland/heathland Species that should be no more than rare: <i>Cirsium arvense</i> <i>Cirsium vulgare</i>	Undesirable non-woody and woody vascular plants species may require active management to avert an unwanted succession to a different and less desirable state. Often they may be indicative of a negative trend relating to another aspect of a site's structure and function. These species will vary depending on the nature of the particular feature, and in some cases these species may be natural/acceptable components or even dominants. There are a range of non-native plants affecting coastal cliffs, and due to difficulties of access, these often pose problems with management. The key objective is to prevent any introductions or planting. This includes the dumping of spoil or organic waste on cliff tops or slopes within or beyond the site boundary which may contain plant seeds or propagules or enrich the site. The native species listed are natural components of a range of vegetation types within the SAC and many are beneficial to a number of invertebrates and other species. However, in certain circumstances (such as when they encroach on stands of rare plants) they can be undesirable and/or indicate negative	This attribute will be periodically monitored as part of Natural England's site condition assessments MILLIKEN & PENDRY (2003) NATURAL ENGLAND (2014)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<i>Lolium perenne</i> <i>Rumex obtusifolius</i> <i>Rumex crispus</i> <i>Senecio jacobaea</i> <i>Trifolium repens</i> <i>Urtica dioica</i> In exposed situations broad-leaved grasses such as <i>Agrostis stolonifera</i>, <i>Dactylis glomerata</i> and <i>Holcus lanatus</i> should be sub-dominant to <i>Festuca rubra</i>	pressures on the site. The main issues that are likely to result in increases in these species are reduction in grazing, eutrophication, and disturbance (e.g. from fire). Target set to Restore because it was noted in the 2003 NVC survey that hawthorn <i>Crataegus monogyna</i> scrub is gradually encroaching into the areas of calcareous grassland on Common Cliff and that bracken <i>Pteridium aquilinum</i> is spreading on the undercliff areas. These species are considered to be negative indicators in these areas. These species may also be a result of the undergrazing (Natural England 2014).	
Structure and function (including its typical species)	Key structural, influential and/or distinctive species	Maintain the abundance of the species listed to enable each of them to be a viable component of the Annex I habitat feature: Important species include grass-of-Parnassus <i>Parnassia palustris</i>; Autumn gentian <i>Gentianella amarella</i>, field gentian <i>G. campestris</i>, bee orchid <i>Ophrys apifera</i>, frog orchid <i>Coeloglossum viride</i>, greater butterfly orchid <i>Platanthera chlorantha</i>, lesser butterfly orchid <i>P. bifolia</i>, broad-leaved helleborine <i>Epipactis helleborine</i> with the very local wood vetch <i>Vicia sylvatica</i> found on slumped ground. Invertebrate species include: very rare rove beetle <i>Trimium brevicorne</i>; uncommon <i>Mesopoldras amaenus</i>; the scarce pill woodlouse	Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function and/or quality of an Annex I habitat feature at a particular site. These species will include; • Structural species which form a key part of the Annex I habitat's structure or help to define that habitat on a particular SAC (see also the attribute for 'vegetation community composition'). • Influential species which are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of soil/sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat) • Site-distinctive species which are considered to be a particularly special and distinguishing component of an Annex I habitat on a particular SAC. There may be natural fluctuations in the frequency and cover of each of these species. The relative contribution made by them to the overall ecological integrity of a site may vary, and Natural England will provide bespoke advice on this as necessary.	NATURAL ENGLAND (2009) MILLIKEN & PENDRY (2003)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		<i>Armadillidium pulchellum</i>; The flushes support species including rare or local: marsh arrowgrass <i>Triglochin palustris</i> and common butterwort (<i>Pinguicula vulgaris</i>). Red Data Book flies (<i>Oxycera pardalina</i>; <i>Dolichopus signifer</i>) are found near flushes on Beast Cliff.	The list of species given here for this Annex I habitat feature at this SAC is not necessarily exhaustive. The list may evolve, and species may be added or deleted, as new information about this site becomes available.	
Structure and function (including its typical species)	Regeneration potential	Restore semi-natural vegetation on the cliff-top (either within and/or beyond the site boundary as appropriate), and its connectivity with the lower cliff slopes.	This is important to ensure that there is a continuous supply of seed-rich semi-natural vegetation material from the clifftops to feed the sea-cliff system below. As the top of the cliff slumps and recedes as a result of natural processes, the vegetation dropping onto the lower slopes should provide suitable material for their re-colonisation with native plant species from adjacent semi-natural habitats above. The majority of habitat adjacent to the SAC is semi-improved grassland except for approximately 4 fields of arable land adjacent to Peter White Cliff.	
Supporting processes (on which the feature relies)	Physical features supporting vegetation: crevices, ledges, isolated stacks etc	Maintain the associated physical components of the vegetated cliff feature (crevices, ledges, isolated stacks) with changes to them determined by natural processes only	Cliff structure and geomorphological processes are major influences on sea-cliff vegetation. 'Hard' cliffs with vertical or very steep faces are characteristic of hard igneous, metamorphic and sedimentary rocks and also of chalk, which, although a soft rock, nevertheless forms vertical cliffs. More mobile 'Soft' cliffs have a sloping or slumped profile, often with a distinct 'undercliff'; these occur on a range of soft rocks, or on hard rocks interspersed with softer deposits and may be subject to mudslides or landslips. These processes all create smaller structural elements such as ledges, crevices and stacks which create complexes of pioneer and more mature vegetation which are typical of this habitat feature.	MILLIKEN & PENDRY (2003)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature relies)	Hydrology/ drainage	At a site level, maintain the natural hydrological processes to provide the conditions necessary to sustain the feature within the site	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature. Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations such as a hydrological study may be required to fully inform conservation measures and/or the likelihood of impacts. From Robin Hood's Bay to Old Peak flushes are a regular feature of the coast and are partly responsible for the slumping of the boulder clays. Between Miller's Nab and Old Peak the cliffs become higher and the slopes are cut by gulley's, terminating in small waterfalls over the shale cliff below.	MILLIKEN & PENDRY (2003)
Supporting processes (on which the feature relies)	Maritime exposure including salt spray effects	Maintain an appropriate degree of exposure to maritime effects, such as salt spray, both from regular inputs and storm events	Excessive exposure to salt spray can cause episodic die-back of sea cliff vegetation in some circumstances, although this may not be applicable to all sites.	
Supporting processes (on which the feature relies)	Water quality	Where the feature is dependent on surface water and/or groundwater, maintain water quality and quantity to a standard which provides the necessary conditions to support the feature	For many SAC features which are dependent on wetland habitats supported by surface and/or ground water, maintaining the quality and quantity of water supply will be critical, especially at certain times of year. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type. Typically, meeting the surface water and groundwater environmental standards set out by the Water Framework Directive (WFD 2000/60/EC) will also be sufficient to support the achievement of SAC Conservation Objectives but in some cases more stringent standards may be needed. Further site-specific investigations may be required to establish appropriate water quality standards for the SAC. The site is within the Environment Agency Esk and Coast Management Catchment and Robin Hoods Bay Operational Catchment with the Hayburn Wyke/Thorny Beck catch (drains	ENVIRONMENT AGENCY (2015 & 2016)

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			to North Sea) waterbody (GB104027068610) being the only waterbody listed in the catchment. The waterbody is currently (2016) in Poor Ecological Status, failing on fish with pressures on the waterbody listed as ammonia, physical modifications and sediment. The Target is for Good Ecological Status by 2027. The waterbody is however not well connected to the site and drains to the North Sea to the south of the SAC boundary and underpinning SSSI.	
Supporting processes (on which the feature relies)	Air quality	Maintain or restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	This habitat type is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. Critical Loads and Levels are recognised thresholds below which such harmful effects on sensitive UK habitats will not occur to a significant level, according to current levels of scientific understanding. There are critical levels for ammonia (NH₃), oxides of nitrogen (NO_x) and sulphur dioxide (SO₂), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. There is currently no critical load value available for this habitat on APIS. Critical loads/levels for the components of the relevant features of Robin Hood's Bay: Maw Wyke to Beast Cliff SSSI (neutral grassland, calcareous grassland, fen, marsh	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on the Air Pollution Information System (www.apis.ac.uk).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			and swamp and wet woodland) should be used. Restore target applicable where critical loads for nitrogen and acid deposition for some features are exceeded.	
Supporting processes (on which the feature relies)	Cliff morphology, slope and elevation	Maintain the natural processes that determine cliff morphology, slope and elevation	These physical components greatly influence the structure of this habitat type. Allowing natural dynamic processes to operate is important to providing optimal conditions which will allow the long-term conservation of this habitat feature. Interruption of these processes, through partial stabilisation or slowing of cliff erosion and recession rates, with artificial management of cliff slope vegetation, does not produce naturally-occurring conditions which could lead to undesirable changes in characteristic sea cliff vegetation.	
Version Control Advice last updated: N/A				
Variations from national feature-framework of integrity-guidance: N/A				

References

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