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

Harbottle Moors Special Area of Conservation SAC
Site code: UK0030333

Date of Publication: 15 February 2019

About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Harbottle Moors SAC. This advice should therefore be read together with the SAC Conservation Objectives available here.

This advice updates and replaces a draft version of the advice dated 17 February 2017 following the receipt of comments from the site's stakeholders.

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	Harbottle Moors Special Area of Conservation SAC
Location	Northumberland
Site Maps	The designated boundary of this site can be viewed here on the MAGiC website
Designation Date	01 April 2005
Qualifying Features	H4030 European Dry Heath
Designation Area	936.30 hectares
Designation Changes	Not applicable
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	Harbottle Moors SSSI
Relationship with other European or International Site designations	Not applicable
Other information	Harbottle Moors SAC Natura 2000 Standard Data Form

Site background and geography

This SAC is situated entirely within the Northumberland Sandstone Hills National Character Area (NCA) and falls within the boundary of the Northumberland National Park, 0.8 km southwest of Harbottle village and 16 km west of Rothbury. The underlying geology of the area is Carboniferous rocks with the SAC situated on predominately sandstone ridges.

This site has a diverse landscape with dry heath, scree slopes, mixed broad-leaved woodland, outcrops of gritstones and exposed boulders including the prominent ancient landmark known as the Drake Stone. The main public access on the site is a permissive walk, along the western edge of the site, from West Wood car park to the Drake Stone.

The Forestry Commission own 158 ha of the SAC area. The remainder of the area is mainly on land owned by the Ministry of Defence. The Forestry Commission and Northumberland Wildlife Trust have agreed to manage the moorland jointly. The site has previously been subject to areas of accidental burning.

This SAC is just a little less than 400 m in altitude and is a good example of a relatively unmanaged low-lying upland European dry heath. This habitat is dominated by heather *Calluna vulgaris* with some crowberry *Empetrum nigrum*, bilberry *Vaccinium myrtillus* and bell heather *Erica cinerea*.

The southern area of the site supports a high density of Bracken *Pteridium aquilinum* with some bare patches, which may be as a result from accidental fire damage. The vegetation structure in the northern

part of the site has less bare patches, instead supporting patches of fairly diverse species rich dwarf shrub and species poor mature to late mature heather, *Calluna vulgaris*. This is a valuable habitat for ground nesting birds and not a common habitat found in Northumberland. Bog myrtle *Myrica gale* occurs extensively over the wetter areas of the site in quantities rarely recorded in England. Overall, this site has a low impact from grazing.

In addition to the SAC's dry heath feature, this site supports localised areas of blanket bog habitat where heather, hare's-tail cotton-grass *Eriophorum vaginatum* and deer-grass *Trichophorum cespitosum* are the dominant cover over a ground layer of bog mosses Sphagnum spp. Between the sandstone ridges bog mosses have developed into a hummock-and-hollow complex supporting species such as sundew *Drosera rotundifolia*, bog asphodel *Narthecium ossifragum* and cranberry *Vaccinium oxycoccos*. The nationally rare bog orchid *Hammarbya paludosa* has also been recorded within this area. This orchid is typically associated with very wet, infertile peaty soils and is only found in a few scattered locations in Northern England.

Towards the northern area of the site bordering Barrow Meadow SSSI the River Coquet has eroded Barrow Scar resulting in scree slopes which now support species such as wild thyme *Thymus praecox* and primrose *Primula vulgaris*. In the deeper valley section of Barrow Burn wet woodland has formed dominated by birch *Betula spp.* and alder *Alnus glutinosa* with a scattering of hazel *Corylus avellana* and sallow *Salix cinerea*. Within this area base-rich flush communities support species including golden saxifrage *Chrysosplenium oppositifolium*, melancholy thistle *Cirsium helenioides* and lesser skullcap *Scutellaria minor*.

There are two lakes within this site - Harbottle Lake and Linshiels Lake. Both are notable for their aquatic invertebrates and attract a range of wildfowl. Birds recorded from the site include curlew *Numenius arquata*, skylark *Alauda arvensis*, meadow pipit *Anthus pratensis*, whinchat *Saxicola ruberta*, wheatear *Oenanthe oenanthe*, sedge warbler *Acrocephalus schoenobaenus*, willow warbler *Phylloscopus trochilus*, reed bunting *Emberiza schoeniclus*, linnet *Carduelis cannabina* and lesser redpoll *Carduelis cabaret*. Peregrine falcon *Falco peregrinus*, buzzard *Buteo buteo* and raven *Corvus corax* have also been recorded recently. There are further historic records of ring ouzel *Turdus torquatus* and black grouse *Lyrurus tetrix,* although there have been no recent sightings.

Harbottle Moors SAC supports a wide range of invertebrate species and is a very good area for Lepidoptera with both the large heath butterfly *Coenonympha tullia* and the green hairstreak butterfly *Callophrys rubi* recorded.

Adder *Vipera berus*, slow worm *Anguis fragilis* and common lizard *Lacerta vivipara* have all been recorded on the site.

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:

- **H4030 European Dry Heath**

European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather *Calluna vulgaris*, which often occurs in combination with gorse *Ulex spp*., bilberry *Vaccinium spp*. or bell heather *Erica cinerea*, though other dwarf-shrubs are important locally.

Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock or, in upland areas, as grouse moors. Generally dry heath is found on low nutrient content soils with a peat depth <0.4m under our current climate.

Dry heaths vary in their flora and fauna according to climate, and are also influenced by altitude, aspect, soil conditions especially base-status and drainage, maritime influence, and grazing and burning intensity. There is a gradation from southerly to northerly kinds of dry heath, and there are also both western oceanic and eastern more continental forms.

In the cooler oceanic climate further north, *E. cinerea* and *Calluna* are abundant together in H10 *Calluna – Erica* heath, especially on more southerly-facing slopes. On more sheltered, humid slopes there are H21 *Calluna – Vaccinium* – Sphagnum heaths with a high cover of bog-mosses *Sphagnum* spp. and hypnaceous mosses, which are best-developed in Scotland. At low to moderate elevations in the less oceanic areas of north-east England there are often extensive species-poor heaths H9 *Calluna – Deschampsia* heaths with an overwhelming dominance of *Calluna* and frequent wavy hair-grass *Deschampsia flexuosa*.In upland regions further north, there are sub-montane *Calluna*-dominated heaths with abundant bilberry *Vaccinium myrtillus* and crowberry *Empetrum nigrum ssp. nigrum.*

The dry heath vegetation on this SAC corresponds to the UK NVC types H12 *Calluna vulgaris – Vaccinium myrtillus* and H18 *Vaccinium myrtillus – Deschampsia flexuosa*.

Qualifying Species:

There are no qualifying species for this SAC.

References:

RODWELL, J.S. (ed.) 1991. *British Plant Communities. Volume 2. Mires and heath*. Cambridge University Press.

Table 1: Supplementary Advice for Qualifying Features: H4030. European dry heaths

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence where available
Extent and distribution of the feature	**Extent of the feature within the site**	Maintain the total extent of H4030 European dry heath to 596.8 hectares.	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. Approximately 596.8 ha of the site supports the SAC feature of European dry heath. The remainder of the site comprises approximately 122.9 ha of blanket bog; 35.6 ha of fen, marsh and swamp; 10.4 ha of open water; 8.5 ha and broadleaf mixed and yew woodland.	Aerial photo 2008 held by Natural England This attribute will be periodically monitored as part of Natural England's site condition assessments
	Spatial distribution of the feature within the site	Maintain the distribution and configuration of the H4030 feature, including where applicable its component vegetation types, across the site	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 1 habitat feature. 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	This attribute will be periodically monitored as part of Natural England's site condition assessments PEAY, S. 1983. Habitat Survey. Held by Natural England.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence where available
			specialist species associated with the Annex I habitat feature. This site has pressures of fragmentation from burning, bracken encroachment, succession and grazing to a lesser extent.	
Structure and function including its typical species	**Vegetation community composition**	Ensure the component vegetation communities of the H4030 feature are referable to and characterised by the following National Vegetation Classification types; H12 *Calluna vulgaris – Vaccinium myrtillus* heath H18 *Vaccinium myrtillus – Deschampsia flexuosa* heath	This H4030 habitat 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 categorised by the National Vegetation Classification NVC. Maintaining these characteristic and distinctive vegetation types, will be important to sustaining the overall H4030 dry heath habitat. This will also help to conserve their typical plant species i.e. the constant and preferential species of the H12 and H18 communities at this site, and therefore that of the SAC feature, at appropriate levels recognising natural fluctuations.	This attribute will be periodically monitored as part of Natural England's site condition assessments PEAY, S. 1983. Habitat Survey. Held by Natural England.
	Vegetation community transitions	Maintain any areas of transition between the H4030 feature and communities such as blanket bog, marsh, fen, swamp, broadleaved mixed and yew woodland and open water.	Transitions/zonations between adjacent but different vegetation communities are usually related to naturally-occurring changes in soil, aspect or slope. Such 'ecotones' retain characteristics of each bordering community and can add value in often containing species not found in the adjacent communities. Retaining such transitions between dry heath, blanket bog, fen, swamp, marsh and broadleaf mixed and yew woodland can provide further diversity to the habitat feature, and support additional flora and fauna. This is an important attribute as many characteristic heathland species utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle.	
	Vegetation structure: cover of dwarf shrubs	Maintain an overall cover of dwarf shrub species which is typically between 50-75%	Variations in the structure of the heathland vegetation height, amount of canopy closure, and patch structure is needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. Many species also utilise the transitions between vegetation types or use different vegetation types during different stages of their life cycle. The structural character of the heathland feature is strongly influenced by the growing habits of its dominant species. The most common characteristic dwarf-shrubs in this H4030 habitat are heather or ling *Calluna vulgaris* and bilberry or blaeberry *Vaccinium myrtillus.* Notably, bog myrtle *Myrica gale* is present	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
			throughout the dry heath but susceptible to grazing pressures and over the last few years its distribution has decreased. The site continues to recover after the burn in 2007 with good stands of bilberry within burnt areas and rocky outcrops where grazing pressure is low. Heather is further continuing to regenerate in burnt areas. However, bare ground is still extensive and may need to be monitored. In the areas not effected by the burn, heather cover is extensive with a range of age stages present. Further, where possible, ensuring SAC constraints are maintained, geological, geomorphological and industrial archaeological features should be protected by not letting scrub and associated root damage be detrimental to these features.	
Structure and function including its typical species	**Vegetation composition: bracken cover**	Restore the cover of dense bracken to <10% of the H4030 feature	The spread of bracken *Pteridium aquilinum* is a problem on these heathlands. The unpalatable nature and density of bracken as a tall-herb fern, and its decomposing litter, can smother and shade out smaller and more characteristic heathland vegetation. Bracken encroachment, especially from the woodland areas to the north of the site and the established bracken stand on the craggy areas should be continually monitored and active management considered.	This attribute will be periodically monitored as part of Natural England's site condition assessments
	Vegetation structure: cover of gorse	Maintain the cover of gorse *Ulex europeaeus* at <50% of the H4030 feature	Gorse as a component of heathland is a very valuable wildlife habitat, and often a marker of relict heath and common. Both dense and spiny, it provides good, protected cover for many wildlife species: birds, mammals and reptiles; breeding habitat for rare or declining bird species, and excellent winter roosting. The flowers, borne at a time of year when other sources of pollen or nectar are in short supply, are particularly good for insects and other invertebrate pollinators. However gorse may cause problems if unchecked by dominating an area, eliminating other typical heathland species. Extensive stands of mature gorse may also be serious fire hazards. Gorse encroachment is currently not a problem for this site.	
	Vegetation structure: tree cover	Maintain the open character of the H4030 feature, with a typically scattered and low cover of	Scrub mainly trees or tree saplings above 1 m in height and isolated trees are usually very important in providing warmth, shelter, cover, food plants, perches, territorial markers and sources of prey for typical heathland invertebrates and vertebrates. But overall cover of scrub and trees across this H4030 habitat should	Habitat Management Plan 2007-12 held by Natural England

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence where available
		trees and scrub <20% cover.	be maintained to a fairly sparse level, with a structurally complex edge and with characteristic heathland vegetation as ground cover. If scrub is locally important for any associated species with their own specific conservation objectives, then a higher level of cover will be acceptable. The area of scrub/tree cover should be stable or not increasing as a whole. This is with the exception of some Juniper *Juniperus communis* which has been planted in 2000 and 2009 in the gullies of the central to eastern area of the site. Juniper has intrinsic value as a native shrub (BAP and s41 priority species) and provides habitat for invertebrates and cover for bird species. Limited gorse has also been maintained due to its importance for invertebrates and to provide cover for birds. Tree and scrub cover on this site is within an acceptable quantity. However, periodically monitoring should continue take place to ensure this level is maintained. The encroachment of birch and willow scrub around the northern border should be monitored especially. Conifers, especially Sitka Spruce *Picea sitchensis* may also seed into the H4030 habitat area and should be monitored and removed periodically.	
	Vegetation structure: heather age structure	Maintain a diverse age structure amongst the ericaceous shrubs typically found on the site	Each phase of growth associated with the characteristic heathers which dominate this feature also represents different microclimatic conditions and microhabitats which may provide shelter or food to other organisms. Therefore, it is important to maintain a mosaic of heather in different phases of growth over a wide area. Typically this age structure will consist of between 10-40% cover of pseudo pioneer heathers; 20-80% cover of building/mature heathers; < 30% cover of degenerate heathers and less than <10% cover of dead heathers. Heather is further continuing to regenerate in areas badly affected by accidental burns. However, bare ground is still extensive and may need to be monitored. In the areas not effected by the burn, heather cover is extensive with a range of age stages present and a high proportion of late mature heather stands present in the far north of the site.	This attribute will be periodically monitored as part of Natural England's site condition assessments
Structure and function including its typical	**Vegetation: undesirable species**	Maintain the frequency/cover of undesirable species to within acceptable levels of	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	This attribute will be periodically monitored as part of Natural

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence where available
species		<1% and prevent changes in surface condition, soils, nutrient levels or hydrology which may encourage their spread. Undesirable species include: Thistles *Cirsium arvense* and *Cirsium vulgare*; common sorrel *Rumex acetosa;* Creeping buttercup *Ranunculus repens;* common nettle *Urtica dioica*	the particular feature, and in some cases these species may be natural/acceptable components or even dominants. All invasive non-native species are included as undesirable species. Overall, the occurrence of undesirable species is currently minimal and below <1%. However, monitoring should continue on site, especially on bare ground areas which are more susceptible to the growth of undesirable species. Annual monitoring for invasive species should continue especially along River Coquet, Barrow Burn and other adjacent watercourses.	England's site condition assessments
	Key structural, influential and distinctive species	Maintain the abundance of the species listed below to enable each of them to be a viable component of this H4030 Annex 1 habitat; Heather *Calluna vulgaris,* Cross-leaved heath *Erica tetralix,* Bell heather *E.cinerea,* Bilberry *Vaccinium myrtillus,* Crowberry *Empetrum nigrum,* Cowberry *V.vitis-idaea* *W*oolly moss *Racomitrium lanuginosum*.	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. 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.	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
			It is particularly important to ensure that distinctive species growing on the low lying accessible areas of the site are not over grazed or trampled by sheep and walkers. Attention should also be given to restoring the floristic diversity previously found on areas of the site which have been subject to an accumulation of historic fire damage.	
Structure and function including its typical species	**Functional connectivity with wider landscape**	Restore the overall extent, quality and function of any supporting features within the local landscape which provide a critical functional connection with the site	This recognises the potential need to maintain the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections include habitat patches, watercourses and sandstone ridge habitats outside of the designated site boundary which are either important for the migration, dispersal and genetic exchange of those typical species closely associated with qualifying H4030 dry heath habitat. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features rely. In most cases increasing actual and functional landscape-scale connectivity would be beneficial. Where there is a lack of detailed knowledge of the connectivity requirements of the qualifying feature, Natural England will advise as to whether these are applicable on a case by case basis. In this site, due to accidental fire damage, it is important to concentrate on re-connecting areas of habitat which have been fragmented due to fire damage through encouraging regeneration of dwarf shrubs and a bryophyte understorey.	
	Adaptation and resilience	Maintain the H4030 feature's ability, and that of its supporting processes, to adapt or evolve to wider environmental change, either within or external to the site	This recognises the increasing likelihood of natural habitat features to absorb or adapt to wider environmental changes. Resilience may be described as the ability of an ecological system to cope with, and adapt to environmental stress and change whilst retaining the same basic structure and ways of functioning. Such environmental changes may include changes in precipitation and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The vulnerability and response of features to such changes will vary. The overall vulnerability of this SAC to climate change has been assessed by Natural England as being *moderate*, taking into account the sensitivity, fragmentation, topography and management of its habitats. These sites are considered to be vulnerable overall but moderately so. This means that some adaptation action for specific issues may be required, such as reducing habitat fragmentation, creating more habitat to buffer	NATURAL ENGLAND, 2015a. Climate Change Theme Plan and supporting NBCCV Assessments for SACs and SPAs [both available at http://publications.naturalengland.org.uk/publication/4954594591375360].

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence where available
			the site or expand the habitat into more varied landscapes and addressing particular management and condition issues. Individual species may be more or less vulnerable than their habitat itself. In many cases, change will be inevitable so appropriate monitoring would be required. Using best available information, any necessary or likely adaptation or adjustment by the feature and its management in response to actual or expected climatic change should be allowed for, as far as practicable, in order to ensure the feature's long-term viability.	
Structure and function including its typical species	**Soils, substrate and nutrient cycling**	Maintain the properties of the underlying soil types, including structure, bulk density, total carbon, pH, soil nutrient status and fungal/bacterial ratio, to within typical values this H4030 habitat.	Soil is the foundation of basic ecosystem function and a vital part of the natural environment. Its properties strongly influence the colonisation, growth and distribution of those plant species which together form vegetation types, and therefore provides a habitat used by a wide range of organisms. Soil biodiversity has a vital role to recycle organic matter. Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this H4030 habitat.	
Supporting processes on which the feature relies	**Conservation measures**	Maintain the management measures (either within and/or outside the site boundary as appropriate) which are necessary to maintain the structure, functions and supporting processes associated with the H4030 feature.	Active and ongoing conservation management is needed to protect, maintain or restore this feature at this site. Further details about the necessary conservation measures for this site can be provided by contacting Natural England. This information will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements. An important tool in maintaining the dry heath habitat is through managing activities of grazing. This site has previously had light grazing so it is important to ensure that this is maintained and stocking rates are constantly reviewed. The MoD monitor bracken *Pteridium aquilinum* encroachment on site and a management control programme is being implemented over the next few years. However, maintaining small pockets of bracken on a case by case basis is potentially important for conservation management. Managed burning would not normally be considered an appropriate management tool over for this feature. Proposals to do so would require further agreement and consent. If burning is considered to be necessary it should only be undertaken during the burning season (1st October to 15th April). Cutting is an alternative	ENGLISH NATURE, 2005. Views about the management of Harbottle Moors SSSI. NATURAL ENGLAND, 2014. Site Improvement Plan: Harbottle Moors (SIP099). Available at http://publications.naturalengland.org.uk/publication/5106741108801536

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence where available
			management tool to burning to create a mosaic of habitats with vegetation of different ages, composition and structure. This in turn supports a wide diversity of species. Areas with particularly sensitive species or habitats should be identified and avoided. Cutting or burning should not be carried out unless a suitable grazing regime is in place because heavy grazing of land that has recently been burnt especially in winter can prevent regeneration of the dwarf shrubs and lead to a rapid conversion of the site to grassland. Further, due to the increased risk that this site has to accidental burns, management by reducing the fuel load by cutting and/or burning purple moor-grass and heather habitats outside the SAC boundary may be a beneficial way in preventing fire spread (together with some management inside the site boundary). A range of invertebrates and plants require bare ground/peat where it is not too frequently disturbed by vehicles or feet.	
Supporting processes on which the feature relies	**Air quality**	Maintain the concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (APIS).	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 a habitat's 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 NOx 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. 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. The level of air pollutants on this site has not yet been determined.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site' tool on APIS.
Version Control: **Last update: 15 February 2019.** References added to the supporting/explanatory notes with regard to: the presence of juniper and geological, geomorphological and industrial archaeological features, and to the cutting of vegetation as a management tool.				
Variations from national feature-framework of integrity-guidance: n/a				