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

Bolton Fell Moss Special Area of Conservation (SAC)
Site code: UK0030362

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About this document

This document provides Natural England's supplementary advice about the European Site Conservation Objectives relating to Bolton Fell Moss 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	Bolton Fell Moss Special Area of Conservation (SAC)
Location	Cumbria
Site Map	The designated boundary of this site can be viewed here on the MAGiC website
Designation Date	01 February 2016
Qualifying Features	See section below
Designation Area	381.13ha
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)	Bolton Fell and Walton Mosses
Relationship with other European or International Site designations	n/a

Site background and geography

Bolton Fell is situated on a relatively flat area between tributaries of the River Irthing and the River Lyne, 8 km west of Brampton at 110 metres above sea level. It lies within the Solway Basin National Character Area (NCA), a low-lying area of gently undulating low hills that grade into the coastal plain and estuarine landscape of the Solway Firth.

The peat deposits across the site range up to approximately 11 metres in depth, overlying Devensian glacial deposits. The peat is underlain by boulder clay or glacial till, a mixture of stones, pebble, silt and clay laid down below ice-sheets during the last glaciations. This material is impervious and at the end of the glaciation it probably held a glacial lake or a series of interconnecting lakes. During post-glacial times the lakes have been progressively filled with peat formed from vegetation growing in towards the centre of the basin from the sides. The geomorphological setting is thus a peat filled hollow on a boulder clay surface with glacial rounded topography.

The layers of peat laid down during the Holocene provide an irreplaceable record of vegetation change in the area, which is invaluable for palaeoecological research. Bolton Fell Moss has provided a wealth of high resolution palaeoenvironmental records, significantly contributing to our understanding of past ecological and climatic change as well as human impact in the landscape of northern Britain, and further afield. Bolton Fell Moss is an internationally important stratigraphic site comprising an ombrotrophic (rain-fed) bog sequence dating back to the Early Holocene.

Peat has been commercially extracted from the Bolton Fell site since 1959 and although now ceased, these peat workings extended over much of the area. Significant areas of raised bog habitat remain where peat has not been extracted. The bare intervening peat within the site is part of the raised bog and is critical to the long-term sustainability and resilience of the remaining areas of active bog, and in the restoration of active raised bog within each peat body and across the complex of peat bogs that make up the site. Re-wetting and restoration of active peat-forming vegetation in these areas will address oxidation and peat loss. The other areas of the site comprise degraded bog, areas of vegetation typical of active bog communities, wet heath and also peripheral vegetation analogous to lagg communities.

The north-west part of Bolton Fell Moss supports active raised bog comprising a rich carpet of bog-mosses, cross-leaved heath *Erica tetralix* and hare's-tail cotton-grass, with heather *Calluna vulgaris* and an unusual abundance of crowberry *Empetrum nigrum*. Other typical species include round-leaved sundew *Drosera rotundifolia*, common cotton-grass *Eriophorum angustifolium* and cranberry *Vaccinium oxycoccos* occurring amongst the 'lawns' of the bog mosses papillose bog-moss *Sphagnum papillosum*, blunt-leaved bog-moss *S. palustre*, magellanic bog-moss *S. magellanicum*, soft bog-moss *S. tenellum*, lustrous bog-moss *S. subnitens*, red bog-moss *S. capillifolium*, *S. recurvum* and feathery bog-moss *S. cuspidatum*. More rarely, white beak-sedge *Rhynchospora alba*, bog-rosemary *Andromeda polifolia* and oblong-leaved sundew *Drosera intermedia* also occur.

Peripheral drainage has affected some of the communities and has increased fluctuation of the water table, demonstrating the hydrological interdependence on the larger peat body. This has allowed mosses such as bog groove-moss *Aulacomnium palustre*, common haircap *Polytrichum commune* and red-stemmed feather-moss *Pleurozium schreberi* to replace some of the bog mosses, and led to an increase in heather *Calluna vulgaris* and purple moor-grass *Molinia caerulea* and permitted the spread of downy birch *Betula pubescens* and Scots pine *Pinus sylvestris* in some areas.

The majority of Bolton Fell has been commercially milled for peat. This process does not allow vegetation to re-establish itself between cuts unlike the previous block cutting method which allows an impoverished wet heath flora to establish. Nonetheless, areas where milling has ceased are showing some early signs of recovery, supporting peatland vegetation such as cotton-grasses. Similar wet and dry heath communities remain on the edge of the site where the peat is uncut but the hydrology has been compromised owing to adjacent drainage and peat extraction

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:

- **H7120 Degraded raised bogs still capable of natural regeneration**

  Degraded raised bogs typically occur where there has been widespread disruption, usually by humans, to the structure and function of the peat body. This can involve changes to the hydrology, vegetation, and physical structure of the bog, leading to desiccation, oxidation and loss of species or changes in the balance of the species composition.

  In contrast to the H7110 Active raised bogs, peat is not currently forming in degraded bog. The vegetation of degraded bog contains several, but not all, of the species typical of active raised bogs, but the relative abundance and distribution of individual species differs.

  Degraded raised bogs are considered capable of natural regeneration where the hydrology can be repaired and where, with appropriate rehabilitation management, there is a reasonable expectation of re-establishing vegetation with peat-forming capability within 30 years.

  Extensive peat milling has taken place across the site with further domestic peat-cutting at the peripheries of the moss. This has resulted in a significant loss of peat and subsequent lowering the surface of up to 15m. This has also had a profound effect on the hydrology of the site leading to further compaction and shrinkage of the peat. The milled areas were completely devoid of bog vegetation with the exception of some areas where the mineral soil had become exposed and rushes and willow had become established. With the reintroduction of donor vegetation, this can be restored to support bog vegetation.

  There are two main areas of undisturbed bog surface that still support M18 *Erica tetralix-Sphagnum papillosum* mire and M2a *Sphagnum cuspidatum/fallax* bog pool community. There are also further remnants of the bog on the peripheries, supporting pockets of M18 together with a range of communities associated with degraded peat including M25b *Molinia caerulea-Potentilla erecta mire,* H9 *Calluna vulgaris-Deschampsia flexuosa* mire and W4a Betula pubescens-Molinia caerulea woodland on the dryer areas and small amounts of M6 *Carex echinata-Sphagnum fallax/denticulatum* mire.

  Bolton Fell Moss is surrounded by scrub and secondary woodland to the south and east and pasture to the north and west. There are significant areas of archaic peatland surrounding the site but these are within the boundary of the Site of Special Scientific Interest.

Qualifying Species:

n/a

References

Rodwell, J.S. (ed.) 1991. *British Plant Communities. Volume 1. Woodlands and scrub*. Cambridge University Press.

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

Table 1: Supplementary Advice for Qualifying Features: H7120. Degraded raised bogs still capable of natural regeneration

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**	Avoid the further degradation of the extent of the H7120 feature, whilst restoring 211 hectares of the H7120 feature to H7110 Active Raised Bogs	There should be no measurable increase in the extent and area of this feature, and in most cases, the full extent of the feature should be restored to H7110 Active Raised Bogs. 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. For this feature, 'Bog' is taken here to be the peat deposit together with typical bog vegetation, irrespective of the precise nature and condition of that vegetation. 'Lagg fen' comprises both peat deposit and vegetation, irrespective of nature and condition	NATURAL ENGLAND (2014) Site Improvement Plan Bolton Fell Moss (SIP019). Available at: http://publications.naturalengland.org.uk/publication/5889099021942784 AVERIS, B. (2009) Vegetation Survey of Bolton Fell Moss. JERRAM R (1999). Environmental Impact Assessment: Botanical Survey & Assessment NATURAL ENGLAND (2014) ISAT Whole Site Survey.
Structure and function (including its typical species)	**Soils, substrate and nutrient cycling**	Avoid further degradation of the peat substrate of the H7120 feature and restore the properties of the underlying peat type, including its structure, bulk density, total carbon, pH, soil nutrient status and fungal/bacterial ratio, to within typical values for H7110 Active Raised Bog habitat.	Changes to natural properties of the bog's peat body may affect the ecological structure, function and processes associated with this Annex I feature. The typical substrate for this feature is acidic and nutrient-poor peat. Peat is distinguished from other soil types by its high content of organic matter, which results from plant growth and waterlogging combining to reduce decomposition rates and allow a build-up, over time, of semi-decomposed plant material to form peat. Peat is naturally lacking in nutrients with typically low values of calcium, phosphate, nitrate and pH. The surface of an active raised bog should be made up of two distinct layers; an acrotelm and a catotelm. The thin upper layer, or 'acrotelm', is typically up to 30cms deep and consists of living plant material and is a zone of fluctuating water table, where relatively rapid plant decomposition occurs. Below this is the 'catotelm', a much thicker layer of peat (typically up to 10	AVERIS B (2009) Vegetation Survey of Bolton Fell Moss JERRAM R (1999)Environmental Impact Assessment: Botanical Survey & Assessment NATURAL ENGLAND (2014) ISAT Whole Site Survey BANKS J (2004) Bolton Fell Moss: Topographical Survey &

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			metres), which comprises broken down plant material and is always below the water table. The surface acrotelm layer of degraded raised bogs affected by past drainage or burning may be replaced with a single layer of damaged catotelm ('haplotelm'). There are considerable areas across the site where the past excavation has mined the peat to the fen peat layer and in some places into the underlying mineral ground. Where the peat is thin or absent the desired outcome is the restoration of fen habitats as a precursor to bog vegetation establishing in the usual successional process.	Peat Depth Survey
Structure and function (including its typical species)	**Vegetation community composition**	Restore the component vegetation communities of the H7210 feature to those resembling and characterised by the following National Vegetation Classification type(s) typical of H7110 Active Raised Bog: • M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire • M2 *Sphagnum cuspidatum/Sphagnum recurvum* bog pool community (mire expanse and rand) • M4 *Carex rostrata-Sphagnum recurvum* mire • M6 *Carex echinata-Sphagnum recurvum/auriculatum* mire • M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture • M25 *Molinia caerulea-*	This habitat feature when restored will comprise a number of associated semi-natural and natural vegetation types associated with H7110 Active Raised Bog and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and hydrology) and vegetation management. In the UK these have been categorised by the National Vegetation Classification (NVC). Restoring degraded bog vegetation to characteristic and distinctive H7110 active bog vegetation types will be important to restoring the overall habitat feature. This will also help to conserve their typical plant species (including the constant and preferential species of a vegetation community), and therefore those of the SAC feature, at appropriate levels (recognising natural fluctuations). Degraded raised bog on this site is currently characterised by an impoverished vegetation mainly dominated by purple moor-grass Molinia caerulea and lacking significant cover of bog mosses *Sphagnum* spp. These communities will have low representation as the site recovers towards H7110 Active Raised Bogs. The component wetland types of active raised bog will comprise the bog expanse, the sloping margins of the bog (or 'rand') (although this may not always be mappable) and lagg fen. The bog expanse will typically be characterised by ombrotrophic vegetation (such as M18 *Erica tetralix-Sphagnum papillosum* raised and blanket mire and M2 *Sphagnum cuspidatum/recurvum* bog pool community). It should comprise an intimate mix of typical bryophytes (predominantly *Sphagnum* spp.), grasses/sedges and dwarf shrubs, with no one group dominating at the expense of others on 'active' sites. Sphagnum should predominate on hyper-oceanic sites, while its cover may be slightly lower on eastern sites with lower rainfall. The	AVERIS B (2009) Vegetation Survey of Bolton Fell Moss JERRAM R (1999)Environmental Impact Assessment: Botanical Survey & Assessment NATURAL ENGLAND (2014) ISAT Whole Site Survey

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		Potentilla erecta mire • M27 *Filipendula ulmaria-Angelica sylvestris* mire • W5 *Alnus glutinosa – Carex paniculata* woodland • W6 *Alnus glutinosa – Urtica dioica* woodland (lagg)	bog rand will typically consist of communities of drier peat and the lagg fen by vegetation associated with swamp and fen habitats.	
Structure and function (including its typical species)	**Structural diversity**	Restore the full range of structural features (e.g. vegetation cover, surface patterning and hydrological transitions) typically associated with H7110 Active Raised Bog to the H7120 feature at this site.	Development of structural features is an indicator of hydrologically suitable conditions for restoration to the Active Raised Bogs feature. Active raised bogs in particular show varying degrees of structural variation and surface patterning reflecting hydrological gradations (which may be natural or the result of previous damage). These can occur at both macro and micro scales across the habitat and include alternative aquatic and terrestrial surface features, such as bog pools and hummocks, ridges and hollows. These features will support distinctive patterns of bog vegetation, and so will be sensitive to changes in topography and hydrology. These can be modified or disrupted by activities such as drainage, burning, grazing, vehicular access and peat digging.	
Structure and function (including its typical species)	**Key structural, influential and/or distinctive species: flora and fauna**	Restore the abundance of the species listed below to enable each of them to be a viable component of H7110 Active Raised Bog habitat; 1. Mixed assemblage of peat-forming bryophytes (predominantly *Sphagnum* spp) and plants such as cotton-grasses 2. Dwarf shrubs (mainly Ericaceae) 3. Adder *Vipera berus*	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.	

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		4. Breeding assemblage of wading birds 5. Large heath butterfly *Coenonympha tullia*	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. For this feature, the vegetation of the mire expanse should comprise an inter-mix of typical bryophytes (predominantly *Sphagnum* spp.), with dwarf shrubs, with no one group dominating at the expense of others on 'active' sites. Purple moor-grass *Molinia caerulea* may be typical and abundant on the bog margin ('rand') of active sites and more widely on degraded sites.	
Structure and function (including its typical species)	**Invasive, non-native and/or introduced species**	Ensure invasive and introduced non-native species are either rare or absent, and if present are not undermining the restoration of the H7120 feature	Invasive or introduced non-native species can be a serious potential threat to the structure and function of these habitats, because they are able to exclude, damage or suppress the growth of their associated typical species, reduce structural diversity of the habitat and prevent the natural regeneration of characteristic site-native species. Once established, the measures to control such species may also impact negatively on the features of interest (e.g. use of broad spectrum herbicides). Some isolated patches of Rhododendron exist on the site and these continue to be managed to prevent their spread.	NATURAL ENGLAND (2014) ISAT Whole Site Survey.
Structure and function (including its typical species)	**Hydrology**	At a site level, restore natural hydrological processes to provide the water levels and conditions necessary to prevent further degradation of the H7120 feature within the site and to enable its restoration to H7110 active raised bog	Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site. The restoration of this structural attribute of the H7120 degraded bog feature will be a key element of its recovery to H7110 active raised bog. The hydrology of degraded raised bog fails to support the processes and vegetation of active raised bog, which is the desired feature on this part of the site. Low and/or fluctuating water levels in the peat leads to oxidation and loss (wastage) of the peat along with loss of ability of the peat body to retain rainwater and accumulate peat. Bog species adapted to waterlogged, acidic and nutrient-poor conditions will be lost. Changes in source, depth, duration, frequency, magnitude and timing of	JBA (2011-2017) Hydrological Monitoring of Bolton Fell Moss LABADZ, JC & BUTCHER DP (2005) Walton Moss SSSI (NGR NY505666) and Bolton Fell Moss (NGR NY489690): Peatland Hydrology Research Project, Contract no.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			water supply can have significant implications for the assemblage of characteristic plants and animals present. The surface of an active raised bog has low nutrient, waterlogged or high water table conditions. An abundance of the bog-mosses *Sphagnum papillosum, S. capillifolium, S. tenellum* and *S. magellanicum* will often indicate good surface conditions. Typically, the hydrology of the H7120 habitat feature has already been degraded but is considered capable of recovery. Further detrimental changes to the hydrology of a degraded raised bog can lead to further desiccation, oxidation and a further loss of species and will undermine the aim to restore this feature to active raised bog. This target is currently generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts. The post excavation topography of this site means that it is not possible to rewet some areas of peat and these will remain dry. The majority of the area has been re-wet as part of the restoration.	JB130: end of year 1. Report to English Nature, March 2005.
Structure and function (including its typical species)	**Water chemistry**	Restore the surface water and groundwater supporting the hydrology of the bog at a low nutrient status.	Active raised bog in an undamaged state is characterised by a dome of peat which has developed through several thousand years of peat accumulation. This dome stands above the level of the surrounding land surface and effectively isolates the surface of the raised bog from the influence of groundwater. By being elevated, the raised bog is directly fed by atmospheric precipitation and so it has an acidic nature that is naturally poor in nutrients and which sustains its characteristic bog communities and associated typical species. Active raised bogs are naturally lacking in nutrients with typically low values of calcium, phosphate, nitrate and pH. The mire expanse of an active raised bog typically has low nutrient, waterlogged or high water table conditions. An abundance of the bog-mosses *Sphagnum papillosum, S. capillifolium, S. tenellum* and *S. magellanicum* will often indicate good surface condition. Any sources of water which contribute to supporting the bog habitat, including the margins of the bog and the lagg (the peripheral zone around the bog), should similarly be low in nutrients. The central area of Bolton fell Moss is lower than the surrounding periphery owing to past peat excavation. As such, there is some water that flows into the site from land and the former factory site in the north of the site. This	NATURAL ENGLAND. Unpublished data on GHG and Carbon loss on Bolton Fell Moss. Available from Natural England.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			water may contain a high nutrient status than desired within the bog but is diverted to flow through the area of fen at the northern end of the site. Water sampling has been carried out to assess the amount of carbon lost through dissolved and particulate carbon. This has decreased post restoration.	
Structure and function (including its typical species)	**Adaptation and resilience**	Restrict the further degradation of the 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 sea levels, 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. 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 recovery and long-term viability as an Active Raised Bog. The overall vulnerability of this SAC to climate change has been assessed by Natural England (2015) as being high, taking into account the sensitivity, fragmentation, topography and management of its habitats. This means that this site is considered to be amongst the most vulnerable sites overall and are likely to require the most adaptation action, most urgently. A site based assessment should be carried out as a priority. This means that action to address specific issues is likely, such as reducing habitat fragmentation, creating more habitat to buffer 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 advisable.	NATURAL ENGLAND (2015) Climate Change Theme Plan and National Biodiversity Climate Change Vulnerability Assessments (NBCCVAs). Available at: http://publications.naturalengland.org.uk/publication/4954594591375360
Supporting processes (on which the feature relies)	**Air quality**	Restore as necessary the concentrations and deposition of air pollutants to below the site-relevant Critical Load or Level values given for this	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.	More information about site-relevant Critical Loads and Levels for this SAC is available by using the 'search by site'

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		feature of the site on the Air Pollution Information System (www.apis.ac.uk).	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. 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. According to the 2015 Natural England report, Bolton Fell Moss is a very sensitive site at moderate critical load exceedance with a medium relevance to local agricultural resources.	tool on the Air Pollution Information System (www.apis.ac.uk). NATURAL ENGLAND (2015) Atmospheric nitrogen theme plan: Developing a strategic approach for England's Natura 2000 sites. Available at: http://publications.naturalengland.org.uk/file/5688662740172800
Supporting processes (on which the feature relies)	**Conservation measures**	Restore the management measures (either within and/or outside the site boundary as appropriate) which are necessary to restore the structure, functions and supporting processes for restoration to H7110 Active Raised Bog	Active and ongoing conservation management is needed to prevent further degradation of the H7120 Degraded Raised Bog feature at this site, and, more importantly, to restore it to H7110 Active Raised Bog habitat. Usually, raised bog restoration measures will aim to elevate and stabilise the underlying water table and re-establish waterlogged conditions, so the bog can re-grow and regain its characteristic structural features (e.g. bog pools) and its typical plant assemblages. 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 the Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.	NATURAL ENGLAND (2014) Site Improvement Plan Walton Moss (SIP019). Available at: http://publications.naturalengland.org.uk/publication/5889099021942784 ENGLSIH NATURE, 2005. Bolton Fell & Walton Mosses SSSI Views about Management. https://designatedsites.naturalengland.org.uk/PDFsForWeb/VAM/2000855.pdf NATURAL ENGLAND. Bolton fell Moss NNR Management Plan – In

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				Preparation

Version Control

Advice last updated: N/A

Variations from national feature-framework of integrity-guidance:

The attribute ‘Spatial distribution of the feature within the site’ is not applicable to this site as the bog is confined to deep peat. Only the lagg is within the influence of groundwater.

The attribute ‘Supporting off-site habitat’ is not applicable on this site as there are no habitats dependent upon the management of the SAC

The attribute ‘Functional connectivity with wider landscape’ is not applicable on this site since the whole hydrological functioning unit has been included within the designation of the wider SSSI and therefore the SAC is supported within this boundary.