European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features

Birklands and Bilhaugh Special Area of Conservation (SAC) (UK0012740)

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About this document

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

This advice updates and replaces a previous version dated 18 May 2015.

This supplementary advice to the Conservation Objectives describes in more detail the range of ecological attributes which are most likely to contribute to a site's overall integrity and the minimum targets each qualifying feature needs to achieve in order to meet the site's objectives. 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. Any proposals or operations which may affect the site or its qualifying features should be designed so they do not adversely affect any of the attributes listed in the objectives and supplementary advice.

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	Birklands and Bilhaugh Special Area of Conservation (SAC)
Location	Nottinghamshire
Site Maps	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	June 1995
Qualifying Features	See below
Designation Area	271.84 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)	Birklands and Bilhaugh SSSI (Only units 4, 5, 6, 7, 10 & 12 of the SSSI are covered by the SAC designation)
Relationship with other European or International Site designations	Not applicable

Site background and geography

Covering an approximate area of 271.84 hectares, Birklands and Bilhaugh SAC is a landscape-remnant of the historic Sherwood Forest, which is of World renowned cultural significance due to the high concentration of ancient oak trees and associated folklore. The trees and open woodland- pasture habitat have been utilised over the centuries as a medieval Royal hunting forest, as a source of timber for the construction of cathedrals and English naval fleets, and more recently for public amenity, recreation and tourism. There is high public usage across the SAC supported by a network of Public Rights of Way and permissive paths. Part of the SAC forms part of the Sherwood Forest National Nature Reserve.

Birklands and Bilhaugh SAC is located in central Nottinghamshire and sits in the Pennine rain shadow with just 62.5cm precipitation per annum on average. The SAC is protected from extreme weather conditions however due to the sandy nature of the soils, stored heat is readily exchanged during the night and can result in a sudden fall in temperature, the consequence of which are frequent frosts even within summer months although drought conditions occur frequently. Average yearly temperatures are 9.4°C with maximum temperatures in July, with January the coldest.

The highest point of the SAC is 95 metres above sea level with the lowest of 55m. Soils are derived mainly from the underlying Sherwood Sandstones and in part from glacial deposits resulting in nutrient poor, light pebbly soils which are mainly acidic and excessively free draining and often only comprise a very thin humus layer overlying the mineral deposit. The sandstone is free draining to precipitation and

surface water which is able to percolate quickly to the Sherwood aquifer some depths below. Surface water is not found on site and the water table is currently 15-20m below the surface.

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.

Habitats:

- **H9190 Old acidophilous oak woods with *Quercus robur* on sandy plains**

  This habitat type generally comprises ancient lowland oak woodland on acidic, sandy or gravelly substrates. Ancient and veteran trees are relatively abundant in UK stands of this habitat type compared to examples in continental Europe, and are often associated with assemblages of notable lichens, fungi and/or invertebrates.

  Birklands and Bilhaugh SAC is the most northerly site selected in the UK for old acidophilous oak woods (dry oak woodland). The SAC is characterised by stands of ancient oak-birch woodland with a distinctive wood-pasture structure derived from its use as grazing land and one of the largest concentrations of ancient trees (over 500 years of age) in the UK. Both sessile oak *Quercus petraea* and pedunculate oak *Quercus robur* are dominant in almost even species distribution, forming vegetation consistent with the NVC types W10 *Quercus robur* – bracken *Pteridium aquilinum* – bramble *Rubus fructicosus* and W16a *Quercus* – birch *Betula* – wavy hair-grass *Deschampsia flexuosa* woodland. This mix offers good potential for maintaining the structure and function of the woodland system and a continuity of dead-wood habitats. Although birch forms extensive groves between the oaks the canopy is, over large areas, still rather open allowing a dense bracken field layer to develop. Stands of woodland are interspersed with open glades of acid grassland and heath dominated by the tussock-forming wavy-hair grass *Deschampsia flexuosa* and which contain such characteristic herbs as heather *Calluna vulgaris,* heath bedstraw *Galium saxatile* and tormentil *Potentilla erecta*.

  The H9190 woodland feature at Birklands and Bilhaugh is especially notable for its rich invertebrate fauna, particularly the groups of beetles, spiders and flies which are closely associated with and dependent upon the various micro-habitats provided by old trees and dead or decaying wood. The diversity and number of associated woodland fungi present at Birklands and Bilhaugh SAC is also particularly large, the most notable species being the bracket fungi *Grifola sulphurea* and *Fistulina hepatica* and the nationally rare Oak Polypore *Piptoporus quercinus*,

Table 1: Supplementary Advice for Qualifying Features: H9190 Old acidophilous oak woods with *Quercus robur* on sandy plains

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
Extent and distribution of the feature	Extent of the feature within the site	Restore the total extent of the H9190 feature to 271.84 hectares.	There should be no measurable net reduction (excluding any trivial loss) in the extent of this feature. Area measurements given may be approximate depending on the nature, age and accuracy of data collection. 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. For this feature, this attribute includes the full extent of the semi-natural wood-pasture mosaic, including the area under trees and areas of open space in-between. Tree roots (particularly of veteran trees) may extend a considerable distance beyond the boundary of the site. A reduction of woodland/wood-pasture area - whether at the edge or in the middle of a site - will reduce the core area where wood-pasture conditions are found. These support significant assemblages of species dependent on woodland conditions. Loss of any woodland area which fragments a site into different parts may interrupt the movement of typical species between the remaining part of the woodland, especially those with limited powers of dispersal. The extent of the feature currently requires restoration. Approximately 3.26 ha of the feature (within SSSI monitoring unit 12) comprises areas of hard-standing, buildings and made-up ground associated with the current site visitor centre constructed in the early 1970s.	FRITH, J. 1997. NVC mapping of woodland cSACs in England – Birklands and Bilhaugh. Report to English Nature. LAVERS, C. & WATKINS,C. 1996. Survey of veteran trees of Sherwood Forest. *Report to English Nature.* This attribute will be periodically monitored as part of Natural England's site condition assessments
	Distribution of the feature, including associated transitional habitats, within the site	Restore the distribution and continuity of the H9190 feature, including where applicable its component vegetation types and associated transitional vegetation types, across the site	A contraction in the range, or geographic spread, of the feature (and its component vegetation and typical species) 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.	
Structure and function (including its	Vegetation community composition	Ensure the component vegetation communities of the H9190 feature are referable to	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	

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
typical species		and characterised by the following National Vegetation Classification types; W10 *Quercus robur – Pteridium aquilinum – Rubus fructicosus and* W16a *Quercus – Betula – Deschampsia flexuosa* woodland	these have been 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.	
Structure and function (including its typical species	Vegetation structure - age class distribution	Restore the distribution of size and age classes of the major site-native tree and shrub species appropriate to the site: a minimum would be 3 different age classes which in wood-pasture would include over-mature and veteran trees. There should be at least as many saplings/ young trees (<25cm diameter at breast height) trees as there are veteran trees, preferably more and 25% as many middle aged trees (<60cm dbh) as there are veterans.	The presence of a wide distribution of size and age classes of the major site-native tree and shrub species will indicate that the woodland will continue to be present in perpetuity, and will provide the necessary variety of woodland habitats and niches expected for this type of woodland at the site in question.	This attribute will be periodically monitored as part of Natural England's site condition assessments
	Vegetation structure - old growth	Restore the extent and continuity of undisturbed, mature/old growth stands (typically comprising at least 20% of the H9190 feature at any one time) and the assemblages of veteran and ancient trees (typically at a density of >10 trees per hectare). A successor generation of mature native oak trees (>80cm dbh) should be present and average at least 5 trees per hectare.	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The targets set within this attribute reflect the most appropriate structure for the woodland feature on a particular site, taking account of its known special interest, management history, and its wider landscape context. For this habitat type, old or over-mature elements of the woodland are particularly characteristic and important features, and their continuity should be a priority. This may require active management by 'recruiting' new veterans (eg through tree ageing techniques where necessary) from the next generation of mature and younger trees, and ensuring sufficient regeneration occurs at a rate necessary to keep pace with the rate of natural veteran tree death at a particular site.	This attribute will be periodically monitored as part of Natural England's site condition assessments
	Vegetation	Restore areas of	Woodland structure includes variations in age, tree form, layering, the distribution and	This attribute will be

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
	structure - open space	permanent/temporary open space within the woodland feature, typically to cover between 20-30% of area. Conversely, canopy cover (>25% tree cover) is present across no less than 70% of the area.	abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. Having some open, sunlit and largely tree-less areas as part of the woodland community is often important to facilitate natural tree and shrub regeneration and also to provide supporting habitat for specialist woodland invertebrates, birds, vascular and lower plants. Such open space can be permanent or temporary and may consist of managed grazed areas, linear rides and glades, or naturally-produced gaps caused by disturbance events such as wind-throw, wildfire, tree fall or snow damage.	periodically monitored as part of Natural England's site condition assessments
Structure and function (including its typical species	Vegetation structure - dead wood	Restore the continuity and abundance of standing or fallen dead and decaying wood, (typically between 30 - 50 m3 per hectare of standing or fallen timber or 3-5 fallen trees >30cm per hectare, and >10 standing dead trees per hectare)	Woodland structure includes variations in age, tree form, layering, the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, is an important natural component of woodland ecosystems, and may support a range of specialist invertebrates, fungi, lichens and bryophytes, and associated hole-nesting birds and roosting bats, all of which may be very typical of the feature. This is a particularly important and distinctive attribute of this feature at this SAC.	This attribute will be periodically monitored as part of Natural England's site condition assessments
	Vegetation structure - ancient/veteran tree cohort	Maintain at least a third of ancient/veteran trees in open locations or with open halos around them, with younger cohorts of successor trees (<100 years; 100-200 years) each present over 10% of the site.	The ancient trees of this SAC are a key aspect of the woodland feature's structure and have historically grown in an open aspect. Vegetation close to the tree results in competition for nutrients and light, increased stress and reduced tree vigour. This results in dieback of the crown. By gradually allowing light back to live trees, epicormic growth is encouraged allowing photosynthetic ability of the tree to be maximised. At this SAC, baseline data (1996) identified a total number of standing veteran oaks (Live and dead) within the SAC: 789 Alive standing, 502 Dead standing (with a further 301 fallen and 71 Stumps recorded). Periodic ancient tree surveys using more accurate, GPS-based methodologies may result in this figure being updated.	CLIFTONS.J, 2000. The veteran trees of Birklands and Bilhaugh, Sherwood Forest, Nottinghamshire. *English Nature research Report no. 361.* Peterborough This attribute will be periodically monitored as part of Natural England's site condition assessments
	Vegetation structure - shrub layer	Maintain an understorey of scrub or young growth covering at least 10% of the site	There is more opportunity for growth of scrub or young tree growth in wood-pasture sites because of higher light levels (although this will be limited by the presence of grazing animals). A lower level of shrub cover than that normally associated with woodland is acceptable in wood-pasture areas.	
	Woodland edge	Maintain woodland edge which	Adjacent grasslands / arable fields managed with high doses of agro-chemicals could	

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
	structure	graduates into adjacent fringing habitats - which should be semi-natural open habitats, other woodland/wood-pasture types - or scrub.	potentially not allow this gradation of woodland edge and could have other impacts on the integrity of the site (pollution/ nutrient enrichment etc).	
Structure and function (including its typical species)	Adaptation and resilience	Maintain resilience by maintaining the diversity of site-native trees (e.g. English oak, Sessile oak, birch, holly, rowan, hawthorn) across the site.	This recognises the increasing likelihood of natural habitat features needing 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 long-term viability. The overall vulnerability of this particular 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. This means that some adaptation action for specific issues may be required, 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 required.	NATURAL ENGLAND, 2015. Climate Change Theme Plan and supporting NBCCV Assessments for SACs and SPAs [both available at http://publications.naturalengland.org.uk/publication/4954594591375360].
	Browsing and grazing by herbivores	Maintain and in some areas restore browsing/grazing (e.g. by livestock) at sufficiently low levels at least for some periods (5 years in every 20) to allow some tree seedlings and saplings to grow above browse-height.	Herbivores, especially deer, are an integral part of woodland ecosystems. They are important in influencing woodland regeneration, composition and structure and therefore in shaping woodland wildlife communities. In general, both light grazing and browsing is desirable to promote both a diverse woodland structure and continuous seedling establishment. Short periods with no grazing at all can allow fresh natural regeneration of trees, but a long-term absence of herbivores can result in excessively dense thickets of young trees which shade out ground flora and lower plant species. However, heavy grazing by deer or sheep prevents woodland regeneration, and can cause excessive trampling and/or poaching damage, canopy fragmentation, heavy browsing, bark-stripping and a heavily grazed sward.	This attribute will be periodically monitored as part of Natural England's site condition assessments

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
	Regeneration potential	Restore the potential for sufficient natural regeneration of desirable trees and shrubs; typically tree seedlings of desirable species (measured by seedlings and <1.3m saplings - above grazing and browsing height) should be visible in sufficient numbers in gaps, at the wood edge and/or as regrowth as appropriate, with shrubs at least occasional.	The regeneration potential of the woodland feature must be maintained if the wood is to be sustained and survive, both in terms of quantity of regeneration and in terms of appropriate species. This will Include regeneration of the trees and shrubs from saplings or suckers, regrowth from coppice stools, and where appropriate planting. Browsing and grazing levels must permit regeneration at least in intervals of 5 years every 20. The density of regeneration considered sufficient is less in parkland sites than in high forest. Allowing light gradually to the trunks of the live veteran trees encourages dormant buds of some trees to become active and produce new regeneration and a lower canopy.	This attribute will be periodically monitored as part of Natural England's site condition assessments
Structure and function (including its typical species)	Tree and shrub species composition	Maintain a canopy and under-storey of which 95% is composed of site native trees and shrubs including English oak, Sessile oak, rowan, silver birch, holly, willow and hawthorn.	Native trees and shrubs in general support a greater diversity of associated species than non-native species, especially amongst groups of invertebrates which depend directly on trees for food and shelter. There are many plants and animals which use or co-exist with non-native trees, but many rare and threatened woodland species are specialists adapted to one or a few native trees or shrub species (birches, willows and oaks, are examples of trees that host many specialist insect species).	This attribute will be periodically monitored as part of Natural England's site condition assessments
	Key structural, influential and/or distinctive species	Maintain the abundance of the species listed below to enable each of them to be a viable component of the H9190 Annex 1 habitat; Assemblages of; • saproxylic (wood-decay) invertebrate species; • woodland fungi; • epiphytic (tree-borne) lichens Oak polypore *Piptoporus quercinus*, Constant and preferential plant species of the W10/W16 vegetation types at this SAC	Some plant or animal species (or related groups of such species) make a particularly important contribution to the 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 habitat's structure or help to define an Annex I habitat on a site (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 site. 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.	FRITH, J. 1997. As above. CLIFTON S.J, 2000. As above. ROBERTS, P. 2002. Report on the oak polypore *Piptoporus quercinus. English Nature Research Report No. 458.* Peterborough. ALEXANDER, KNA. 2011. A review of the national importance and current condition of the saproxylic invertebrate assemblages at Birklands & Bilhaugh

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
				SSSIs, Sherwood Forest, Nottinghamshire Natural England Commissioned Report 072. FLETCHER, A, 2005. Field meeting in Nottinghamshire. *British Lichen Society Bulletin,* 96, p53-61. WILLIAMS, H. 2010. Survey results of fungi surveys at Sherwood Country Park 1996-2009. Held by Natural England.
Structure and function (including its typical species)	Invasive, non-native and/or introduced species	Ensure that invasive and introduced non-native species are rare or absent, but if present are causing minimal damage to the H9190 feature	Invasive or introduced non-native species are a serious potential threat to the biodiversity of native and ancient woods, because they are able to exclude, damage or suppress the growth of native tree, shrub and ground species (and their associated typical species), reduce structural diversity 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 pesticides). Such species can include Rhododendrons, snowberry, Japanese knotweed, giant hogweed and Himalayan balsam, for example. Similarly, this would include non-native invertebrate 'pest' species.	
	Root zones of ancient trees	Restore the soil structure within and around the root zones of the mature and ancient tree cohort to an un-compacted condition	The management of land within and around forest habitats which are characterised by ancient trees can be crucial to their individual welfare and long-term continuity, and the landscape they are part of can be just as or even more important. The condition of the soil surrounding such trees will affect their roots, associated mycorrhizal fungi and growth. Plants have difficulty in compacted soil because the mineral grains are pressed together, leaving little space for air and water which are essential for root growth. Unless carefully managed, activities such as construction, forestry management and trampling by grazing livestock and human feet during recreational activity may all contribute to excessive soil compaction around ancient trees.	

Attributes		Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
			Parts of this SAC are undergoing recovery from historic high levels of recreational trampling.	
	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, within typical values for the H9190 habitat	Soil and substrate 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 Annex I feature.	
Supporting processes (on which the feature relies)	Functional connectivity with wider landscape	Restore supporting features within the local landscape which provide a critical functional connection with the site in terms of their overall extent, quality and function; • the ancient-woodland associated with Birklands West and Ollerton Corner SSSI	This recognises the potential need at this site to maintain or restore the connectivity of the site to its wider landscape in order to meet the conservation objectives. These connections may take the form of landscape features, such as habitat patches, hedges, watercourses and verges, 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 Annex I habitat features of the site. These features may also be important to the operation of the supporting ecological processes on which the designated site and its features may 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. At this SAC, it is considered that the viability of the special invertebrate assemblage associated with the H9190 feature will be closely linked to the ancient-woodland habitats, with the wider population of ancient trees, which abut and surround the SAC. These invertebrates often have limited ability to disperse and will rely on large patches of suitable well-connected habitat. The degree to which such landscape-connectivity is important to this assemblage is an area generally requiring further research.	See published details for Birklands West and Ollerton Corner SSSI.
	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 the H9190 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, in particular nitrogen and acidity. 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 (NOx) and sulphur dioxide	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/or Explanatory Notes	Sources of site-based evidence (where available)
			(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.	
	Conservation measures	Maintain management or other measures (within and/or outside the site boundary as appropriate) necessary to maintain or restore the H9190 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.	NATURAL ENGLAND, 2015. Site Improvement Plan: Birklands & Bilhaugh (SIP016) Natural England's Views about the Management of the SSSIs which underpin this SAC are available from http://www.sssi.naturalengland.org.uk/Special/sssi/search.cfm Nottinghamshire Council/Natural England (2010). Sherwood Forest NNR Management Plan 2010-2015 (available on request).
Supporting processes (on which the feature relies)	Illumination	Ensure artificial light is maintained at a level which is unlikely to affect natural phenological cycles and processes to the detriment of the feature and its typical species at this site.	Woodland biodiversity has naturally evolved with natural patterns of light and darkness, so disturbance or modification of those patterns can influence numerous aspects of plant and animal behaviour. For example, light pollution (from direct glare, chronically increased illumination and/or temporary, unexpected fluctuations in lighting) can affect animal navigation, competitive interactions, predator-prey relations, and animal physiology. Flowering and development of trees and plants can also be modified by un-natural illumination which can disrupt natural seasonal responses.	

Attributes	Targets	Supporting and/or Explanatory Notes	Sources of site-based evidence (where available)
Version Control Advice last updated**:** May 2016; 'typical species' attribute amended to 'key structural, influential or distinctive species' and supporting notes updated 'adaptation and resilience' attribute updated with additional supporting notes 'conservation measures' attribute updated with link to SIP			
Variations from national feature-framework of integrity-guidance: Attribute for hydrology deleted as not appropriate to this feature at this site; Clarification given in Explanatory notes section on the need to maintain ancient trees in open aspect. Vegetation structure- opens space. Have amended open space target from 40 to 30% as this was agreed in the Definitions of favourable Condition used to monitor the underpinning SSSI. Have therefore clarified the cover of canopy expected as a result of this. Have removed reference to 'pollarded veterans' in regeneration potential box as these are not characteristic of this site.			

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