



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

**Burnham Beeches Special Area of Conservation (SAC)
Site code: UK0030034**



Autumn in Burnham Beeches looking west on Halse Drive © Mark Percy

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About this document

This document provides Natural England's Supplementary Advice about the European Site Conservation Objectives relating to Burnham Beeches SAC. This advice should therefore be read together with the SAC Conservation Objectives available [here](#).

This advice updates and replaces previous draft advice dated 6 June 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	Burnham Beeches Special Area of Conservation (SAC)
Location	Buckinghamshire
Site Maps	The designated boundary of this site can be viewed here on the MAGIC website
Designation Date	1 st April 2005
Qualifying Features	See section below
Designation Area	383.71 ha
Designation Changes	n/a
Feature Condition Status	Details of the feature condition assessments made at this site can be found using Natural England's Designated Sites System
Names of component Sites of Special Scientific Interest (SSSIs)	Burnham Beeches SSSI
Relationship with other European or International Site designations	n/a
Other information	Natura 2000 Standard Data Form for Burnham Beeches SAC

Site background and geography

Burnham Beeches occupies an extensive area of the Burnham Plateau where Thames gravels and underlying Reading Beds give rise to acid soils, supporting mature and developing woodland, old coppice, scrub and heath. The SAC lies within the [Thames Valley National Character Area](#) (NCA).

The site contains an extensive area of former beech *Fagus sylvatica* wood-pasture with many old pollards and associated beech and oak *Quercus* spp. high forest. It is one of the richest sites for dead-wood (saproxylic) invertebrates in the UK and it also retains important epiphytic communities, including the moss *Zygodon forsteri*.

The site also supports an extensive area of acid mire with several locally uncommon plants including bog pimpernel *Anagallis tenella*, marsh St. John's wort *Hypericum elodes* and royal fern *Osmunda regalis*.

Low intensity grazing has been reintroduced to Burnham Beeches in the last 20 years and grazing now takes place on 164 hectares of the site with the aim of creating a more open and diverse structure to the woodland.

Part of the site has open public access and has a long history as a valued open space managed by the [City of London](#). There are over 500,000 visitors to the site every year. Part of the site is also a [National Nature Reserve](#).

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:

- **H9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercion robori-petraeae* or *Ilici-Fagenion*). (“Beech forests on acid soils”)**

This qualifying habitat comprises beech *Fagus sylvatica* forests with holly *Ilex*, growing on acid soils, in a humid Atlantic climate. Sites of this habitat type often are, or were, managed as wood-pasture systems, in which pollarding of beech and oak *Quercus* spp. was common. This is known to prolong the life of these trees.

The vegetation which comprises this habitat falls within three NVC types:

- W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* woodland
- W14 *Fagus sylvatica* – *Rubus fruticosus* woodland
- W15 *Fagus sylvatica* – *Deschampsia flexuosa* woodland

Typical species include holly *Ilex aquifolium*, bracken *Pteridium aquilinum* and bramble *Rubus fruticosus*, with wavy hair-grass *Deschampsia flexuosa* in the most acidic areas.

Burnham Beeches SAC contains an extensive area of former beech *Fagus sylvatica* wood-pasture with many old pollards and associated beech and oak *Quercus* spp. Holly *Ilex aquifolium* and honeysuckle *Lonicera periclymenum* are the main components of the shrub layer of the woodlands, and bracken *Pteridium aquilinum* and brambles *Rubus fruticosus* agg. frequently dominate the ground flora, but in places these are lacking and the woodland floor may bear no more than scattered patches of wavy hair-grass *Deschampsia flexuosa* and cushions of the distinctive moss *Leucobryum glaucum*.

Qualifying Species:

Not applicable.

References

CITY OF LONDON (2010). Burnham Beeches NNR and SAC Local Management Plan 2010-2020.

JOINT NATURE CONSERVATION COMMITTEE (2011). *Habitat account-forests: 9120 Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)*

<http://jncc.defra.gov.uk/protectedsites/sacselection/habitat.asp?FeatureIntCode=H9120>

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

Table 1: Supplementary Advice for Qualifying Features: H9120. Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercion robori-petraeae* or *Ilici-Fagenion*); 'Beech forests on acid soils'

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	<p>Restore the total extent of the H9120 feature to 383.71 hectares</p> <p>There should be no loss of ancient woodland or long-established secondary woodland and no loss of veteran trees except by natural means.</p> <p>There should be no net loss of trees other than that which fits the conservation objectives of the site.</p>	<p>There should be no measurable net 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.</p> <p>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.</p> <p>The extent of the Annex I habitat feature at this SAC comprises a mosaic of plant communities including wood pasture, open mire, heath and acid grassland plus some stands of non-native conifers and poplars. The long term aim is for areas of woodland that do not currently confirm to the H9120 habitat type to be restored to compositions that were historically present, e.g. stands of non-native conifers.</p> <p>Where a feature is susceptible to natural dynamic processes, there may be acceptable variations in its extent through natural fluctuations.</p> <p>For this feature, this attribute includes the extent of the full range of semi-natural habitats which make up the habitat mosaic. Veteran trees can include dead and living trees. Tree roots (particularly of veteran trees) may extend a considerable distance beyond the boundary of the site. Loss of any woodland area which fragments a site into different parts may interrupt the movement of species between the remaining parts of the woodland, especially those with limited powers of dispersal.</p>	<p>Figures for habitat extent are based upon baseline estimates calculated at the time of SAC classification.</p>
	Spatial distribution of the feature within the site	<p>Maintain the distribution and configuration of the H9120 feature, including where applicable its component vegetation types, across the site.</p>	<p>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.</p>	<p>ATKINS FOR THE ENVIRONMENT AGENCY (2002) <i>Phase 1 Site Characterisations for the Habitats</i></p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			Fragmentation and loss of woodland and veteran trees in the past has meant there is a pressing need to maintain and increase the number of veteran trees and area of the habitat to support woodland dependent species and habitats. The best places to develop new woodland for biodiversity is adjacent to, buffering and linking existing sites from which colonisation of the relevant plants, animals (including decaying wood insects) and fungi can happen. This will increase the robustness of these populations making them more resilient to current and future pressures and stresses.	<i>Directive review of Consents, Burnham Beeches cSAC</i> CITY OF LONDON (2010) Burnham Beeches NNR and SAC Local Management Plan 2010-2020
Structure and function (including its typical species)	Vegetation community composition	<p>Ensure that at least 80% of the long-standing woodland is generally referable to and characterised by the following National Vegetation Classification types:</p> <p>W10 <i>Quercus robur</i> - <i>Pteridium aquilinum</i> - <i>Rubus fruticosus</i> woodland</p> <p>W14 <i>Fagus sylvatica</i> – <i>Rubus fruticosus</i> woodland</p> <p>W15 <i>Fagus sylvatica</i> – <i>Deschampsia flexuosa</i> woodland</p> <p>Ground flora should be present over at least 75% of the long-standing woodland.</p> <p>Approximately 10-20% of the site as a whole should be maintained as open mire, heath or acid grassland communities.</p>	<p>This habitat feature will comprise a number of associated semi-natural vegetation types and their transitional zones, reflecting the geographical location of the site, altitude, aspect, soil conditions (especially base-status and drainage) and vegetation management. In the UK these have been 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.</p> <p>The maintenance of the characteristic associated habitats such as wetlands and grasslands which add to the overall biodiversity of the site, in appropriate locations, is also important.</p> <p>Where long-established blocks of non-site native trees are present it is acceptable for replacement with more natural woodland to take place gradually to allow for an economic return to be achieved. This may reduce the potential for detrimental impacts associated with large-scale woodland management at such a sensitive site.</p> <p>At this SAC, the site includes blocks of conifers and broadleaved plantations. The objective is to replace these over time and to promote natural woodland composition and structure.</p>	
	Vegetation structure - canopy cover	<p>Maintain a canopy of open-grown native trees with free crowns over between 70-90% in areas of the site with a pasture woodland structure.</p> <p>Beech should make up at least 30% canopy cover over the feature as a whole.</p>	<p>It is desirable that beech remains a prominent component of the canopy at Burnham Beeches but it is acknowledged that there is natural variation in woodland composition across the site in relation to soil chemistry, soil wetness, soil depth etc.</p> <p>Tree planting will generally be viewed as undesirable at this site as a primary objective is to seek to maintain natural woodland</p>	CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i> 2010-2020

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		The cover of veteran and near-veteran trees should be retained. It is accepted that the number of trees is likely to diminish over time due to natural processes. The life of veteran trees should be prolonged where possible and veteran features should be increased on younger trees.	composition. The veteran tree element is a very important aspect of the special nature conservation interest. Measures should be in place to seek to prolong the life of existing veteran trees and it is desirable that long-term management strategies are in place to provide replacement cohorts of future generations of veteran trees. An age-gap of over 50 years between cohorts of veteran trees will generally be undesirable and may result in adverse impacts on assemblages of associated invertebrates and lichens. New cohorts of veteran trees should generally be of the same species as the main existing veteran tree population - many specialised species are exclusively associated with single tree species. Ideally, 'replacement' veteran trees should be located close to existing groups of veteran trees, i.e. within around 100 metres or so, as many species associated with decaying wood have poor powers of dispersal.	This attribute is monitored as part of Natural England's site condition assessments. Details of the latest condition assessment of the site are available here . BENGTSSON, V. & BENGTSSON, O. (2013). Burnham Beeches NNR Population Analysis (<i>Fagus sylvatica</i> and <i>Quercus</i> sp.) 2010 & 2012
Structure and function (including its typical species)	Vegetation structure - open space	Maintain areas of permanent/temporary open space within the woodland feature, typically to cover around 10% of area of the feature as a whole.	Woodland structure includes variations in age, tree form, layering (vertical canopy zonation), the distribution and 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. Open space may consist of 'permanent' features such as grassland, mire and heath, woodland rides and glades, or temporary features such as natural gaps in the canopy, bracken stands, areas of scrub or young re-growth or felling coups	CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan 2010-2020</i> The latest condition assessment of the SSSI which underpins this SAC
	Vegetation structure - old growth	Maintain the extent and continuity of undisturbed, mature/old growth stands (typically comprising at least 20% of the feature at any one time) and the assemblages of veteran and ancient	Good woodland structure includes variations in age, tree form, layering (vertical canopy zonation), the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. For this habitat type, old or over-mature elements of the woodland are particularly characteristic and	CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		trees.	important features, and their continuity should be a priority.	2010-2020 The latest condition assessment of the SSSI which underpins this SAC
Structure and function (including its typical species)	Vegetation structure - dead wood	Maintain the continuity and abundance of standing or fallen dead and decaying wood so that it is frequent across the wood pasture (typically at between 30 - 50 m ³ 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 (vertical canopy zonation), the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. The target for abundance of standing and fallen dead wood is intended to be indicative only and will vary naturally across the site in relation to canopy age, canopy composition and factors such as the need to maintain public safety. The key aspect is that the dead and decaying wood resource should be being retained <i>in situ</i> as much as possible. Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, is an important component of woodland ecosystems, and supports a range of specialist invertebrates, fungi, lichens and bryophytes, and associated hole-nesting birds and roosting bats, all of which are very typical of the feature. The distinctive assemblage of saproxylic invertebrate species is particularly sensitive to the availability and distribution of dead wood.	CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i> 2010-2020 The latest condition assessment of the SSSI which underpins this SAC
	Vegetation structure – ancient and veteran trees	Maintain at least a third of ancient/veteran trees in open locations or with open halo around them. Veteran features should be increased on younger trees.	Good woodland structure includes variations in age, tree form, layering (vertical canopy zonation), the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning. For this Annex I habitat type, individual trees of great age and/or size (veteran or ancient trees) are particularly characteristic and important features, and their continuity should be a priority. Protecting their root systems and the forest soils around them will also be important.	CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i> 2010-2020 NATURAL ENGLAND, 2014. Site Improvement Plan: Burnham Beeches The latest condition assessment of the

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
				SSSI which underpins this SAC
	Vegetation structure - age class distribution	Maintain at least 3 age classes of tree (pole stage/ medium/ mature) spread across the average life expectancy of the commonest trees.	<p>Woodland structure includes variations in age, tree form, layering (vertical canopy zonation), the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning.</p> <p>Having a diverse age structure of a tree population (i.e. the number of individuals of each age in the population) is important to ensure that there can be continuity of the population and woodland habitat over time.</p>	<p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan 2010-2020</i></p> <p>The latest condition assessment of the SSSI which underpins this SAC</p> <p>BENGTSSON, V. & BENGTSSON, O. (2013). Burnham Beeches NNR Population Analysis (<i>Fagus sylvatica</i> and <i>Quercus</i> sp.) 2010 & 2012</p>
Structure and function (including its typical species)	Vegetation structure - shrub layer	Maintain a diversity of cover of the shrub layer across the feature, ranging from 15-30% cover in areas of closed canopy woodland to significantly lower cover in wood pasture.	<p>Woodland structure includes variations in age, tree form, layering (vertical canopy zonation), the distribution and abundance of open space and dead wood. It plays a critical role in woodland ecosystem functioning.</p> <p>The target is indicative only, seeking to maintain an appropriate balance between the habitat requirements of species requiring dense undergrowth, such as nesting birds, and species requiring low levels of shading such as lichens of tree bases.</p> <p>The development of extensive areas of dense undergrowth of shrubs casting heavy shade, such as holly, will generally be undesirable in this type of woodland where epiphytic lichens and bryophytes are an important component of the nature conservation interest.</p>	<p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan 2010-2020</i></p> <p>The latest condition assessment of the SSSI which underpins this SAC</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
	Vegetation structure - woodland edge	Maintain a graduated woodland edge into adjacent semi-natural open habitats, other woodland/wood-pasture types or scrub.	<p>Woodland edge is defined as being the transitional zone between the forest feature and adjacent but different habitat types - the best woodland edges will have a varied structure in terms of height and cover.</p> <p>Many typical forest species, particularly birds and warmth-demanding invertebrates, make regular use of edge habitats for nesting, resting, feeding and temperature regulation attracted by high structural diversity, increased shelter and warmth, and higher levels of productivity.</p>	<p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i> 2010-2020</p> <p>The latest condition assessment of the SSSI which underpins this SAC</p>
	Tree and shrub species composition	Maintain a canopy and under-storey of which 95% is composed of site native trees and shrubs	<p>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.</p> <p>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).</p> <p>At this SAC, site-native species of tree and shrub include Beech <i>Fagus sylvatica</i>, Oak <i>Quercus robur</i> and <i>Quercus petraea</i>, Holly <i>Ilex aquifolium</i>, Bramble <i>Rubus fruticosus</i> agg., Honeysuckle <i>Lonicera periclymenum</i>, Whitebeam <i>Sorbus aria</i>, Silver birch <i>Betula pendula</i>, Downy birch <i>Betula pubescens</i>, , Alder <i>Alnus glutinosa</i>, Hazel <i>Corylus avellana</i>, Elder <i>Sambucus nigra</i>, Rowan <i>Sorbus aucuparia</i>, Grey willow <i>Salix cinerea</i>, Juniper <i>Juniperus communis</i></p> <p>The site includes blocks of conifers and broadleaved plantations. The objective is to remove these over time and to promote natural woodland composition and structure.</p>	<p>JNCC (2009) NVC floristic tables. Accessed via the JNCC website: http://jncc.defra.gov.uk/page-4265</p> <p>The latest condition assessment of the SSSI which underpins this SAC</p>
Structure and function (including its typical species)	Browsing and grazing by herbivores	Restore browsing/grazing by livestock in areas that were historically wood pasture and graze them at levels sufficient to allow tree seedlings and saplings the opportunity to exceed browse height, and which maintain the characteristic	<p>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.</p> <p>In general, both light grazing and browsing is desirable to promote</p>	<p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i> 2010-2020</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		structure of the woodland feature	<p>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.</p> <p>The objective is to seek to ensure that the nature conservation benefits of restoration of wood pasture are achieved where most appropriate. It is not intended to indicate that all areas that were historically wood pasture should necessarily be restored, especially if this is detrimental to the associated assemblages of species..</p> <p>Deer are numerous in some parts of the site and causing adverse impacts on tree regeneration and ground flora composition. In these areas a deer management strategy should be implemented. Grey squirrels are also known to cause adverse impacts at the site.</p>	<p>NATURAL ENGLAND, 2014. Site Improvement Plan: Burnham Beeches</p> <p>The latest condition assessment of the SSSI which underpins this SAC</p>
Structure and function (including its typical species)	Regeneration potential	Maintain 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.	<p>The aim is to maintain sufficient levels natural regeneration of tree and shrub species to maintain long-term canopy cover and appropriate understory.</p> <p>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 or pollards, and (where appropriate) planting. In wood pasture situations it may be sufficient to have successful tree regeneration occurring only every 50 years or so but in most woodland types evidence of significant constraints on tree regeneration over periods of as little as 5 years would be a cause for concern. Regeneration from pollarding of veteran trees should be included where this is happening.</p>	<p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan 2010-2020</i></p> <p>The latest condition assessment of the SSSI which underpins this SAC</p> <p>BENGTSSON, V. & BENGTSSON, O. (2013). Burnham Beeches NNR Population Analysis (<i>Fagus sylvatica</i> and <i>Quercus</i> sp.)</p>

Attributes	Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)	
	<p>Key structural, influential and/or distinctive species</p>	<p>Maintain the abundance of the species listed below to enable each of them to be a viable component of the H9210 feature;</p> <p>Key trees and shrubs associated with W10, W14 and W15 vegetation types e.g Beech <i>Fagus sylvatica</i> Oak <i>Quercus robur</i> and <i>Quercus petraea</i> Holly <i>Ilex aquifolium</i> Silver birch <i>Betula pendula</i> Downy birch <i>Betula pubescens</i> Hazel <i>Corylus avellana</i></p> <p>Key species of ground flora associated with W10, W14 and W15 vegetation types e.g: Bluebell <i>Hyacinthoides non-scripta</i> Dog's mercury <i>Mercurialis perennis</i>, Common Cow-wheat <i>Melampyrum pratense</i>, Wood anemone <i>Anemone nemorosa</i></p> <p>Assemblage of epiphytic mosses and lichens including Horn calcareous moss <i>Mnium hornum</i> Knothole moss <i>Zygodon forsteri</i> Bank haircap <i>Polytrichum formosum</i> Glittering woodmoss <i>Hylocomium splendens</i> Pincushion moss <i>Leucobryum glaucum</i> Elegant Silk-moss <i>Isopterygium elegans</i> <i>Cladonia</i> sp. <i>Parmelia</i> sp.</p> <p>Assemblage of invertebrates associated with dead-wood ('saproxylic') beetles e.g. <i>Ischnomera sanguinicollis</i></p>	<p>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;</p> <ul style="list-style-type: none"> □ 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. <p>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.</p> <p>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.</p>	<p>2010 & 2012</p> <p>JNCC (2009) NVC floristic tables. Accessed via the JNCC website: http://jncc.defra.gov.uk/page-4265</p> <p>The latest condition assessment of the SSSI which underpins this SAC</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
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, but if present are causing minimal damage to the H9210 feature.	<p>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.</p> <p>Once such species are established, the measures to control them 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 pheasants, grey squirrels, rabbits and non-native invertebrate 'pest' species.</p> <p>Burnham Beeches may be vulnerable to the non-native Oak Processionary moth (<i>Thaumetopoea processionea</i>); if the moth arrived at the site it could cause serious damage to the oak trees through defoliation and could result in demand to fell trees to protect public safety.</p> <p>Burnham Beeches is vulnerable to sudden oak death, a <i>Phytophthora</i> disease which can kill mature trees. This pathogen uses <i>Rhododendron</i> species as a host for part of its life cycle. Burnham Beeches may be particularly vulnerable to the disease due to Larch plantations within the SAC.</p> <p>The non-native Edible Dormouse <i>Glis glis</i> is also now present on site.</p>	<p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i> 2010-2020</p> <p>NATURAL ENGLAND, 2014. Site Improvement Plan: Burnham Beeches</p> <p>The latest condition assessment of the SSSI which underpins this SAC</p>
	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, at within typical values for the H9210 habitat.	<p>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.</p> <p>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.</p>	<p>The latest condition assessment of the SSSI which underpins this SAC</p> <p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan</i></p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			A potential threat to the soil composition is nutrient enrichment from dog waste, as the south of the site is accessible by the public.	2010-2020. FAY, N. (2014). Effects of Visitors at Burnham Beeches: An impact assessment of recreation pressure on trees. LILEY, D., HOSKIN, R., FEARNLEY, H., WHITE, J. & UNDERHILL-DAY, J. (2012) Urban development and Burnham Beeches SAC. Unpublished report for Corporation of London. .
Structure and function (including its typical species)	Root zones of ancient trees	Maintain good soil structure within and around the root zones of the mature and ancient tree cohort.	<p>The management of land within and around very old or ancient trees which form a distinctive structural component of forest habitat 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.</p> <p>The condition of the soil surrounding such trees is important because this will affect their roots and 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.</p> <p>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.</p>	<p>CITY OF LONDON (2010) <i>Burnham Beeches NNR and SAC Local Management Plan 2010-2020</i></p> <p>The latest condition assessment of the SSSI which underpins this SAC</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
Supporting processes (on which the feature relies)	Hydrology	Maintain natural hydrological processes to provide the conditions necessary to sustain the feature within the site, such as by protecting groundwater supply and groundwater quality and by protecting the site from development which may raise or lower groundwater levels, both within and outside the site boundary.	<p>Defining and maintaining the appropriate hydrological regime is a key step in moving towards achieving the conservation objectives for this site and sustaining this feature.</p> <p>Changes in source, depth, duration, frequency, magnitude and timing of water supply can have significant implications for the assemblage of characteristic plants and animals present. This target is generic and further site-specific investigations may be required to fully inform conservation measures and/or the likelihood of impacts.</p> <p>Disruption/ damage to hydrological processes could be caused by activities at some distance from the site boundary, e.g. through extraction of ground or surface waters; diverting or damming river channels; pollution of water source; channel alignment that disrupts natural geomorphological processes; tunnelling etc.</p>	<p>KELVIN, J. (2013) South Bucks District Council Burnham Beeches Hydrology Study.</p> <p>LILEY, D., HOSKIN, R., FEARNLEY, H., WHITE, J. & UNDERHILL-DAY, J. (2012) Urban development and Burnham Beeches SAC. Unpublished report for Corporation of London.</p>
	Illumination	Ensure artificial light is maintained to 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.	<p>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.</p> <p>The site is on the edge of Slough and may be sensitive to increases in artificial light adjacent to the site.</p>	The latest condition assessment of the SSSI which underpins this SAC
	Air quality	Restore the concentrations and deposition of air pollutants to within the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).	<p>This habitat type is considered sensitive to changes in air quality. Exceedance of 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.</p> <p>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</p>	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

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>understanding. There are critical levels for ammonia (NH₃), oxides of nitrogen (NO_x) and sulphur dioxide (SO₂), and critical loads for nutrient nitrogen deposition and acid deposition. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales.</p> <p>A 2006 report found that Nitrogen Oxides surpassed critical levels on Burnham Common. However, NO_x levels overall at the SAC were well below the critical level for vegetation. Ammonia levels were found to exceed the critical level. Although average SO₂ was relatively stable over the period August 2004 to April 2006, the average began a climb towards the end of the study. Dust levels over the 12 years of the study were generally below potentially damaging levels although evidence was detected of localised raised deposition levels close to roads.</p> <p>A report in 2008 carried out a desktop study of baseline rates of air quality and found that ammonia concentrations measured within the site were considered to be high. Air Pollution Information System data on background nitrogen and acid deposition rates also suggested that critical loads were being significantly exceeded. Apart from nitrogen and acid deposition, the baseline data were lower than the critical loads.</p> <p>Studies of the different concentrations of lead recorded in the soils at Burnham Beeches found that higher concentrations were recorded in soils near roads. However, in 2000 lead concentrations in lichens from Burnham Beeches were amongst the lowest recorded in samples collected over the past 200 years, in spite of being collected near roads.</p>	<p>(www.apis.ac.uk).</p> <p>JACOBS ECOLOGY (2008). Atmospheric Dispersion Modelling of Potential Anaerobic Digestion and Energy from Waste Plants, effects on Burnham Beeches SAC.</p> <p>PURVIS, O.W., CHIMONIDES, P.D.J., JEFFRIES, T.E., JONES, G.C., RUSU, A.M. AND READ, H., (2007). Multi-element composition of historical lichen collections and bark samples, indicators of changing atmospheric conditions. Atmospheric Environment, 41(1), pp.72-80.</p> <p>ENVIRONMENT AGENCY (2006). The Status of Burnham Beeches. An Environment Agency report for the Corporation of London.</p>

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				<p>PURVIS, W.O., DUBBIN, B., JAMES P.W., GARCIA-SANCHEZ, R AND JONES, G.C. (2006). Burnham Beeches Lichen Monitoring: Phase 2. Report for the Corporation of London.</p> <p>LILEY, D., HOSKIN, R., FEARNLEY, H., WHITE, J. & UNDERHILL-DAY, J. (2012) Urban development and Burnham Beeches SAC. Unpublished report for Corporation of London.</p> <p>NATURAL ENGLAND, 2014. Site Improvement Plan: Burnham Beeches</p>
Structure and function (including its typical species)	Adaptation and resilience	Restore the resilience of the H9210 feature by ensuring a diversity (at least 2 species) of site-native trees (e.g. beech, oak, birch, or holly) across the wooded areas of the site.	<p>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.</p> <p>Such environmental changes may include changes in precipitation, frequency of storms, groundwater level and temperature for example, which are likely to affect the extent, distribution, composition and functioning of a feature within a site. The</p>	Lowland beech woodlands have been classed as at medium risk to climate change (MITCHELL, R.J. ET AL (2007). England Biodiversity Strategy - Towards adaptation to climate change.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>vulnerability and response of features to such changes will vary.</p> <p>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.</p> <p>The overall vulnerability of this particular SAC to climate change has been assessed by Natural England as being <i>low</i> taking into account the sensitivity, fragmentation, topography and management of its habitats/supporting habitats. This means that this site is considered to be vulnerable overall but is a lower priority for further assessment and action. Individual species may be more or less vulnerable than their supporting habitat itself. In many cases, change will be inevitable so appropriate monitoring would be required.</p> <p>The site includes blocks of conifers and broadleaved plantations. The objective is to remove these over time and to promote natural woodland composition and structure, which will contribute to this specific objective.</p>	<p>DEFRA URL:http://nora.nerc.ac.uk/915/1/Mitchelle_talebs-climate-change.pdf</p> <p>NATURAL ENGLAND (2015). Climate Change Theme Plan and supporting NBCCV Assessments for SACs and SPAs at http://publications.naturalengland.org.uk/publication/4954594591375360</p> <p>BERRY, P. AND PATERSON, J. (2009) Impacts of Climate Change on Burnham Beeches. Environmental Change Institute, University of Oxford.</p> <p>ENVIRONMENT AGENCY (2006). The Status of Burnham Beeches An Environment Agency report for the Corporation of London.</p>
Supporting processes (on which the feature relies)	Functional connectivity with wider landscape	Maintain 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 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,	NATURAL ENGLAND, 2014. Site Improvement Plan: Burnham

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			<p>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.</p> <p>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.</p> <p>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.</p>	<p>Beeches</p> <p>LILEY, D., HOSKIN, R., FEARNLEY, H., WHITE, J. & UNDERHILL-DAY, J. (2012) Urban development and Burnham Beeches SAC. Unpublished report for Corporation of London.</p>
<p>Version Control Advice last updated: 22 September 2017- minor amendments made to some Supporting Notes, and additional references to site-based evidence added, following receipt of comments from local stakeholders on the draft advice dated 6 June 2017.</p>				
<p>Variations from national feature-framework of integrity-guidance: N/A</p>				

